

Serving the CoCo Community for

The

RAINBOW

10
YEARS

THE COLOR COMPUTER MONTHLY MAGAZINE

April 1991 Vol. X No. 9

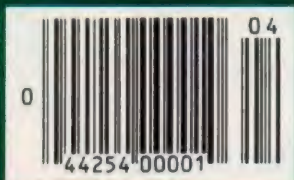
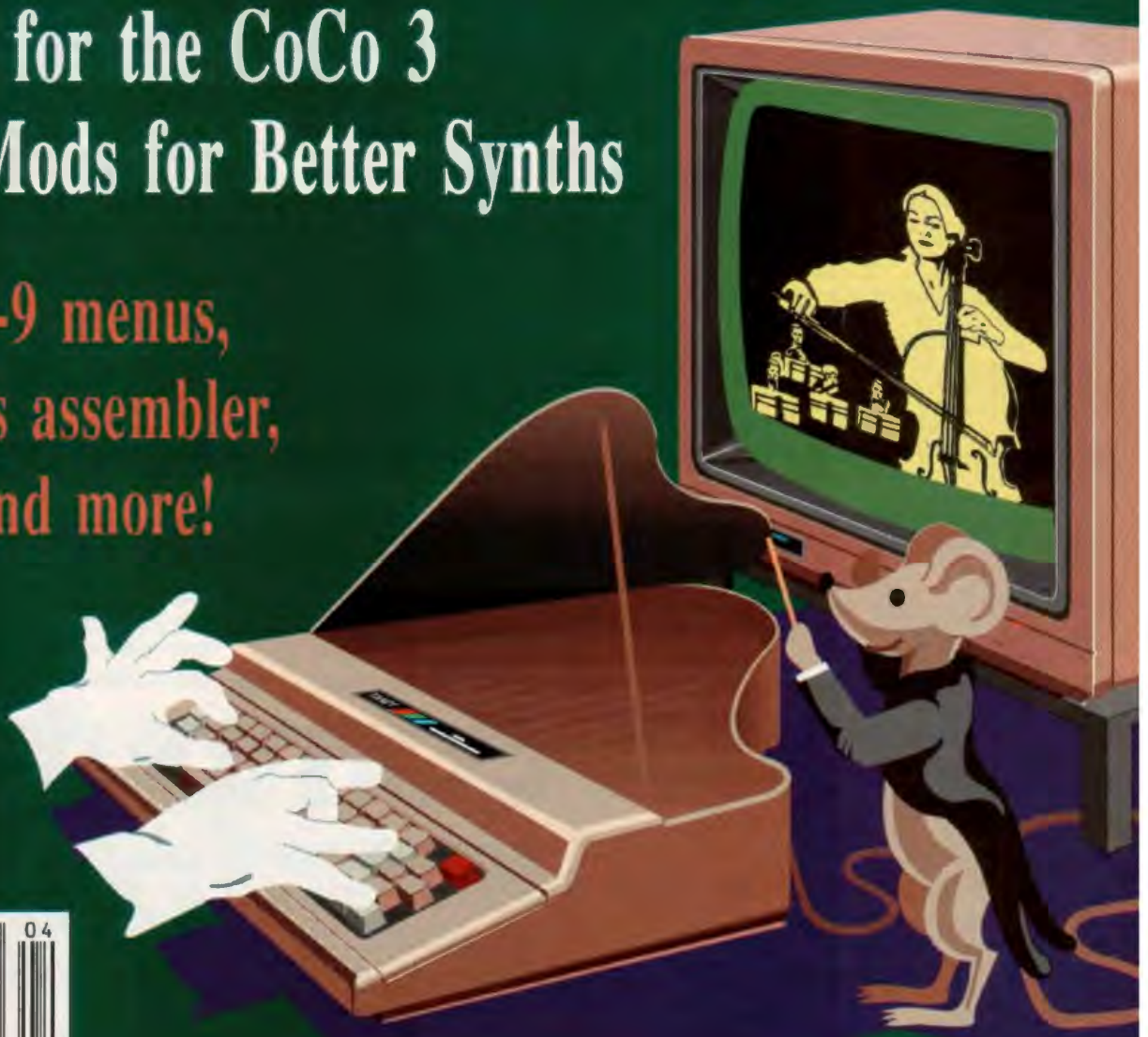
Canada \$4.95 U.S. \$3.95

CoCo Tunes Up

Music+ for the CoCo 3

MIDI Mods for Better Synths

Plus OS-9 menus,
Barden's assembler,
games and more!



From Computer Plus to YOU ...

PLUS after PLUS after PLUS



Tandy 1400 HD \$999*
Tandy 102 32K \$439
Tandy WP-2 \$279



Tandy 2500 XL \$1119
Tandy 3000 NL \$869*
Tandy 4020 SX \$1679



Tandy 1000 RL \$499
Tandy 1000 TL/3 \$799



DMP-134 \$219*



Color Computer Disk Drive
Drive 0 \$239 Drive 1 \$149



TandyFax \$439

BIG SAVINGS ON A FULL COMPLEMENT OF RADIO SHACK COMPUTER PRODUCTS

COMPUTERS

Tandy 1000 HX 1 Drive 256K	179.00 *
Tandy 1500 HD 1 Drive 640K	1499.00
Tandy 2810 HD 1 Drive 1 Meg RAM 1	2049.00
Tandy 1000 RL HD-1 Drive-512K	829.00
Tandy 1100 FD 1 Drive 640K	599.00 *

PRINTERS

Radio Shack DMP-107 120 CPS	219.00
Radio Shack DMP-302 270 CPS	469.00
Radio Shack DMP-134 160 CPS	219.00 *
Radio Shack DMP-442 300 CPS	359.00 *
Tandy LP-950 Laser Printer	1299.00
Tandy DMP-240 192 CPS 8 color	415.00
Panasonic KXP 1180 192 CPS	189.00 *
Panasonic KXP 1191 240 CPS	259.00 *
Panasonic KXP 1124 192 CPS	299.00 *
Okidata 320 300 CPS	369.00
Okidata 390 270 CPS 24 Wire HD	515.00
OKI Laser 400 4PPM	699.00 *

MODEMS

Radio Shack DCM-6	52.00
Radio Shack DCM-7	85.00
Cardinal 1200 Baud External	99.00
Cardinal 2400 Baud	129.00

COLOR COMPUTER MISC.

Radio Shack Drive Controller	89.00 *
Extended Basic Rom Kit (26 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
COCO 3 Service Manual	29.95
Serial to Parallel Converter	59.95
Radio Shack Deluxe Joystick	19.95
Magnavox 8135 RGB Monitor	299.00
Magnavox Green or Amber Monitor	99.00
Radio Shack CM-8 RGB Monitor	249.00
Radio Shack Pistol Grip Joystick	17.95 *
PBJ OK COCO 3 Upgrade Board	24.95
PBJ 512K COCO 3 Upgrade	99.00
Tandy OK COCO 3 Upgrade Board	39.95
Tandy 512K COCO 3 Upgrade	129.00

COLOR COMPUTER SOFTWARE

	TAPE	DISK
The Wild West (COCO 3)		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
TW-80 by Spectrum (COCO 3)	39.95
TeleWriter 64	49.95
TeleWriter 128	79.95
Elite Word 80	79.95
Elite Calc 3.0	69.95
CoCo 3 512K Super Ram Disk	19.95
Home Publishing by Tandy (CoCo 3)	35.95
Sub Battle Sierra by Epyx (CoCo 3)	26.95
Thexder by Sierra (CoCo 3)	22.45
Kings Quest III by Sierra (CoCo 3)	31.45
Flight Sim. II by SubLogic (CoCo 3)	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 4-30-91

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

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



computer plus


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


SINCE 1973


IN MASSACHUSETTS CALL (508) 486-3193


Features



10 
Resounding CoCo
 George Quellhorst
A CoCo 3 remake of a popular music program

20 
Easy Come, Easy Go!
 James Bush
Bet a little, bet a lot...

38 
Menu System
 Joseph Cheek
Get there from here

50 
Tic-Tac
 David Ridings
CoCo 3 returns to the classics


10

Product Reviews

In the Limelight

First Prize/Zebra Systems	64
Bed/Robert W. Ruedy	66
Caveman/J.T. Rawlinson Software	70
CC3FAX/Robert Gault	68
Kyum-Gai -- OS-9/Sundog Systems	72
Level II Tools/Alpha Software Technologies	68
Math.I Library/Bits-N-Bytes	66
SoundTrax Instrument Disks/Sundog Systems	70

62
MIDI Mods
 Cecil C. Houk
Fighting back against barely sufficient synthesizer designs

 The cassette tapetdisk 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 9.






62

Departments

Advertisers Index	81
Back Issue Info	80
Letters to Rainbow	4
Received & Certified	74
Submitting Material	42
Subscription Info.	23

Novices Niche

31	
Music Test	Perry Friesen
53	
Freedom	Richard Estrado
60	
Music Grid	Tim Hennon

Columns

32	
Barden's Buffer	William Barden, Jr. <i>EZ assembler</i>
28	
BreakPoint	Greg Law <i>Making directories</i>
46	
CoCo Consultations	Marty Goodman <i>Modem upgrades</i>
54	
Delphi Bureau	Eddie Kuns <i>Conference</i>
8	
Print#-2	Lonnie Falk <i>Editor's notes</i>
58	
Wishing Well	Fred Scerbo <i>Lifeskills 7</i>
75	
Wrapping the Rainbow	Cray Augsburg <i>Unwrapping the Rainbow</i>

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**, **RAINBOWtest** and **THE RAINBOW** and **RAINBOWtest** 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. 1991. **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 Cray Augsburg
Associate Editor Sue Fomby
Copy Editor Rob Moore
Submissions/Reviews Editor Tony Olive
Technical Editor Greg Law
Technical Assistants Ed Ellers,
Gregory Shultz
Editorial Assistant Julie Hutchinson
Contributing Editors
William Barden, Jr.
Tony DiStefano
Martin Goodman, M.D.
Fred Scarbo
Eddie Kuns
Art Director Heidi Nelson
Designers Sharon Adams, O'Neil Arnold,
Teri Kays
Consulting Editors Judi Hutchinson,
Laurie D. Falk

Typesetter Debbie Diamond

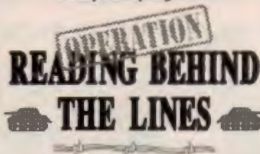
Falsoft, Inc.

President Lawrence C. Falk
General Manager Peggy Lowry Daniels
Asst. General Mgr. for Finance Donna Shuck
Admin. Asst. to the Publisher Kim Thompson
Editorial Director John Crawley
Director of Production Jim Cleveland
Chief Bookkeeper Diane Moore
Dealer Accounts Judy Quashnock
Asst. Gen. Manager For Administration
Sandy Apple
Corporate Business Technical Director
Calvin Shields
Customer Service Manager Beverly Bearden
Customer Service Representative
Patricia Eaton
Chief of Printing Services Melba Smith
Dispatch Tim Whelan
Business Assistant Wendy Falk Barsky

Chief of Building Security and Maintenance
Lawrence Johnson
Development and Advertising Manager
Ira Barsky
Advertising Representatives Belinda Kirby,
Kim Lewis
Advertising Assistant Carolyn Fenwick
(502)228-4492

For RAINBOW Advertising and Market-
ing Office Information, see Page 95

Proudly Participating In . . .



Letters to the RAINBOW

A Sound Situation

Editor:

Over the last couple of years, I have been building a MIDI music studio. My ESQ-1 Keyboard (ENSONIQ) has a built-in sequencer, but editing is a pain. Shopping for computers with MIDI capability was a depressing adventure. Then, I saw the Micro-com ad for MIDI hardware and software for the CoCo 3. Do you have any other information on CoCo 3 MIDI applications or product reviews? Your help is appreciated.

Sean Edwards

P.O. Box 105

Mechanicsburg, IL 62545

See the review of CoCo MIDI Pro on Page 74 of the February 1991 issue. Two other products to consider are Lyra, from Rulaford Research, and UltiMusE III, from Second City Software. Read Jeffrey Parker's "Play it again, CoCo" (December 1989, Page 74) for an overview of MIDI and the CoCo.

Clearing the Air

Editor:

I would like to tell you about a scam that I think is going on. Last spring when all the hype started about a CoCo 4, a company called Kenneth-Leigh Enterprises advertised in your magazine about its new computer. I wrote for information, which I received. There was a special newsletter advertised for \$9.95, which was supposed to start in July. The newsletter was to inform interested parties about updates, new software, and so on. I never received anything, but they cashed my check. I wrote several months ago asking for a refund. I have since bought a Tandy 1000 TL/2 and subscribe to PCM, so now I don't want the newsletter. I did not get any reply, nor did I receive a refund.

Kenneth C. Brownson
Newark, Delaware

THE RAINBOW's advertising manager, Ira Barsky, contacted Kenneth-Leigh Enterprises (now known as Interactive Media Systems). Following is IMS' reply:

Dear Ira:

It was with great pleasure that Interactive Media Systems, Inc., received your fax concerning Ken Brownson's order for our newsletter. It shows once again that THE RAINBOW, like IMS, is dedicated to cus-

tomers service.

After a very pleasant and productive chat with Mr. Brownson, I asked our North Carolina offices to send Mr. Brownson a refund and a free subscription. Even though Mr. Brownson has left the CoCo world, we noted that he was still interested in our coverage of the PC-compatible multimedia standards just announced by Microsoft, IBM and Intel.

Naturally, IMS will have no association with "scams," as Mr. Brownson understands. We strive to provide our customers with the quality and consistency they have come to expect from the Color Computer industry — especially as exemplified by THE RAINBOW, which has been the best source of information for the Tandy CoCo for a decade.

We're happy to have resolved this snafu with Mr. Brownson. Thank you for giving us the opportunity to help out, Ira.

Paul K. Ward

President

Interactive Media Systems, Inc.

Programmers Take Notice

Editor:

I spend a lot of time entering listings from THE RAINBOW and, like many others, I have difficulty with the 3-column listings. But I can accept this if it means more listings per issue.

However, I suggest that programmers could make things easier for readers who have difficulty entering the smaller listings if they would avoid the use of "I" and "Q" as variable labels. These are not easy to distinguish from "1" and "O".

Keiran Kenny
Cremorne, NSW, Australia

Kudos

Editor:

I would like to publicly thank Mr. Tom DiMarco of Gimmesoft for the fine service he gave me during the holidays. He called me at home to tell me he was temporarily out of a certain program I had ordered for Christmas. He then went out of his way to ship a substitute by Express Mail so I would receive it by Christmas. This is truly outstanding service.

Two other RAINBOW advertisers are also worthy of mention: Computer Plus and Dayton Associates. I recently ordered products from both and in each case had the items in my hands less than 48 hours after

COCO HARDWARE CATALOG

UPGRADES

512K UPGRADE: No Soldering. Comes with easy picture instructions and \$100 worth of software (512K Ramtest / Ramdisk / Spooler / Backup Lightning & OS9 Level II Ramdisk). **\$99.**

OK Board (w/ software): **\$39**

1 MEG UPGRADE (from Disto). **\$199.** (0 K: \$149)

64K Upgrade for CoCo I/II: \$29

MONITORS

MAGNAVOX 1CM135 RGB: Razor sharp picture, 14" screen, Stereo sound, speaker, Tilt Swivel Stand & 2 Year Warranty. For CoCo 2 & 3. **\$298**

MAGNAVOX COCO3 RGB CABLE: \$19.95

DISTO PRODUCTS

Disto Mini Controller: **\$74.95**

Disto Super Controller: **\$99.95** Super II: **\$129.95**

Eprom Programmer Add-on: **\$54.95**

Hard Drive Adapter: **\$39.95** w/ RS232: **\$69.95**

3-in-1 Multi-Board Adapter: **\$74.95**

4-in-1 Multi-Board Adapter: **\$129.95** MEB Adapter: **\$35**

RS232 Super Pack (replacement for RS232Pack): **\$54.95**

COMMUNICATIONS

Communications Extravaganza 2400: Includes Zoom 2400 Baud Modem, Cable, Autoterm Software & Compuserve Access Offer & free access time. : **\$169.95**

Communications Extravaganza 1200: \$109.95

Avatex 1200 Modem (w/ 2 yr warr.): \$85

Zoom 2400 Modem (w/ 7 yr warr.): \$129

EPROM

Intronics EPROM Programmer: Programs 2516,27xx/xxx EPROMS. Includes docs and software. CoCo 1,2,3: **\$137.95**

DATARASE Eprom Eraser: \$49.95

BOTH Programmer & Eraser: \$179.95

2764 Eprom: \$8 27128 Eprom: **\$9**

BLANK CARTRIDGE (Disk Cont. Size): \$9.95

KEYBOARDS

6 Feet Keyboard Extension Cable: \$39.95

CoCo 3 Keybd: \$39.95 w/ Ext Cable: **\$69.95**

CoCo 2 Keybd: \$29.95 w/ Ext Cable: **\$49.95**

CHIPS

Genuine RSDOS 2.1 Disk Chip: \$29.95

68B09E Chip: \$14.95 CoCo 3 GIME Chip: **\$49**

Multipak PAL Chip Upgrade Kit w/ instructions (specify Multipak Model #26-3024/3124): \$19.95

FLOPPY DRIVE SYSTEMS

Our Drive 0 & 2 Drive Systems included BRAND NEW Double Sided Drives, Disto Mini Controller (with ROMs to access both sides of the drive), Official 200-page Radio Shack Manual & \$60 worth of software.

Drive 0: \$199 2 Drive System: **\$299**

Drive 1: \$129 Bare 5 1/4" Drive: **\$89**

Cable for 1 Drive: \$16.95 2 Drives: \$22.95 4 Drives: \$34.95

FD501 Upgrade Kit & Instructions: \$109

FD502 Upgrade Kit & Instructions: \$119

Toshiba 3 1/2" Drive w/ PS & Case: \$149

Toshiba 3 1/2" Bare Drive: \$89

HARD DRIVE SYSTEMS

Hard Drive Systems include Seagate Hard Drive, Western Digital Controller, Cables, CoCo XT Interface, Case (with fan, Power Supply & room for second drive), software & instruction manuals. Assembled/tested/formatted. Ready to Plug'N' Run.

Seagate 20 MEG System: \$459

Seagate 40 MEG System: \$549

From Burke & Burke...

CoCo XT Interface: \$69.95 w/ RTC: **\$99.95**

CoCo XT ROM: \$19.95

HYPER IO: \$29.95 HYPER III: **\$12.95**

512K COCO 3

Comes with complete manuals & \$100 worth of software. Only **\$259.** Note: 512K Installation Voids Warranty.

CABLES & INTERFACES

Magnavox 8505/8515/8CM643 Cable: \$24.95

Magnavox 1CM135 RGB Cable: \$24.95

Serial-to-Parallel Interface: \$44.95

15" Shielded Multipak Extension Cable: \$36.95

40-pin Y Cable: \$34.95

RGB Analog Extender Cable: \$19.95

Modem Cable (4 pin to DB25): \$19.95

RS232 2 Position Switcher (4 pin): \$29.95

Hi-Res Joystick Interface: \$11.99

Other Good Stuff...

Advanced Gravis Joystick: \$59.95

Deluxe 2 Button Joystick: \$16.95

Multipak Locking Plate (spec. Model #): \$8

5 1/4' DS/DD Disks: \$.40 ea 3 1/2": **\$.79 ea**

NX1000 Ribbon: \$8.50 Color Ribbon: **\$12.95**

MICROCOM SOFTWARE •1387 Brighton Henrietta Town Line Rd •Rochester, NY 14623

To Order: All orders \$99 & above (except Printers, Drives, Monitors, Computer) shipped 2nd Day Air at no extra Charge in Continental US. We accept Visa, MC, Discover, Amex (3% sur), check, MO & School PO's. COD Orders (<\$100) within US add \$5 extra. Please add 5% shipping (min \$3) S&H in US & 10% (min \$5) for Canada, Alaska & PR. All foreign orders except Can. pay actual shipping charges (min \$5). NYS residents please add sales tax. Monitors (\$12 S&H/\$40 in Can.); Drives (\$10 S&H/\$30 in Can.); Computers (\$8 S&H; \$25 in Can.)

For Orders (10-5) pm M-Sat: 1-800-654-5244. Tech Info & Order Status (3-5 pm): 716-292-1786



calling in the order. That's fast! (Though, UPS also deserves some of the credit.)

In this period of declining support from Radio Shack, we in the CoCo Community are very fortunate to have such excellent mail-order companies supporting us. There is no reason to fear ordering from any RAINBOW advertiser. Over the past few months I have purchased over a thousand dollars worth of hardware and software for my Color Computers from RAINBOW advertisers, large and small, and in every case the service was courteous, helpful, and very prompt. RAINBOW advertisers deserve our support!

I know a lot of people gripe about the shrinking size of the magazine, the different binding, and the smaller type for the listings. I just want you to know that I think you are doing a fantastic job in the face of declining advertiser revenue. Let's face it, we are in the twilight of the Color Computer era. All magazines for the Commodore 64/128 have passed from existence. *Incider* for the Apple has a subscription base over four times as large as that of THE RAINBOW (I checked), yet the magazine is even thinner and not nearly as informative. Of course, people who bought other computers aren't nearly as intelligent as we CoConuts . . .

Thomas Fann
Akron, Ohio

Thanks for the kind words and the realistic understanding of our position.

Graphically Speaking

Editor:

Is there a way to scroll text over a Hi-Res picture without affecting it? How can I save pictures in memory and then use them to make animation?

Raul Guido Rosey
Box 402
Boqueron, Puerto Rico 00622

We know of no easy way to scroll text over graphics without disturbing the image. However, several articles have appeared in past issues that offer insight into various methods you can use for this, as well as for graphics animation.

Computer Expo

Editor:

I am the president of the Modem Support Group (M.S.G.) of Michigan and have the privilege of overseeing the telecom activities of this year's MAXIT Computer Show. MAXIT (Michigan Annual Expo of Information Technology) is sponsored each year by the Michigan Computer Consortium (organization membership consists of area computer clubs). Our computer shows began in 1986. The best attendance to date

has been 5,000. We hope to exceed that number for this year's show. Our mid-Michigan area Tandy Color Computer and OS-9 users are participating in MAXIT '91.

MAXIT '91 will be held on Sunday, April 21, from 10 a.m. to 5 p.m. at the Clarion Hotel in Lansing, Michigan. General admission is \$3. Children 12 and under are admitted free. For more information, contact Skip Osterhus, P.O. Box 6452, East Lansing, MI 48826, or call the MAXIT Voice Hotline by dialing (517)-487-6180 (use voice mailbox 629).

John C. Evans, Jr.
Lansing, Michigan

Interested in Ham Radio

Editor:

First, I would like to add my thanks to THE RAINBOW for your 10 years of programs, articles, and product reviews. You have helped this reader become computer literate. Also, my thanks to the many advertisers who support our little jewel — especially Microcom Software (it's a shame more of your readers don't live as close as I do to meet these fine people in person) and T&D Subscription Software, whose service is always excellent.

Also, can anyone help me find public domain software for amateur radio? I am interested in any programs for either Disk BASIC or OS-9, with emphasis on using the CoCo 3 to receive CW via software and a simple cable interface. I would gladly pay for the media, either tape or disk. Thanks again RAINBOW!

Ed Howell
1102 Leicester Road
Caledonia, NY 14423

Something for Any Occasion

Editor:

Somebody once said "Never judge a book by its cover." I don't know who it was, or what type of books were being talked about, but when it comes to THE RAINBOW the saying should be changed to; "never judge the magazine by its size." As I renew my subscription for another year I'd like to explain what I mean.

I have continuous issues of the magazine dating back to January 1985. In every issue there has been some article, program, or letter that has taught me something new about my CoCo, or about writing programs for it. When I upgraded from a CoCo 1 to a CoCo 3, the information was there. The information was also there when I went to 512K, when I changed disk drives, when I added a hard disk, when I modified a Multi-Pak, when I started using OS-9, and when I joined Delphi. As far as I know, there isn't another computer magazine that can walk a person through changes and upgrades like

this without any other form of help.

There's still a world of things I want to do with my CoCo and I know I can count on THE RAINBOW to help me learn to do them. Although THE RAINBOW has lost a few pages since January 1985, it's still packed full of information and ideas that can't be found with any other single source. And, for anyone who thinks it's strange to hold on to back issues like I do, there's an article in the January 1985 issue about C programming that I still haven't read. But when I'm ready, it'll be there.

I don't know how you've kept the subscription price unchanged for so long, but here's my check for another year of this fine magazine. And I'm sure I'll be doing the same thing in another year. You know, THE RAINBOW really could have been called The Diamond, because it's a true gem among computer magazines.

Robert W. Kemper
Ft. Stewart, Georgia

Thanks — we needed that!

Serial/Parallel Dilemma

Editor:

I recently purchased a parallel printer and have no way to connect it to my CoCo 3. (I am currently using a serial printer.) I have heard there is a converter available that allows this, but no one has been able to tell me where I can get one. The parallel printer is a Wright Hand 1200L printer. I have the cable for the printer, but as you know the CoCo 3 only has a 4-pin connector for an output. The cable for this printer has 25 pins. This is where I need the converter. What can you do to help me?

Donald H. Taylor
20 S. Miriam Street, #2
Claycomo, MO 64119

A serial-to-parallel converter can be used to change the serial data coming from the four-pin port on the CoCo's backside to a parallel form. Such devices are available from a number of RAINBOW advertisers, including Dayton Associates, Microcom Software and Supersoft.

The Search for Flippies

Editor:

This is in response to the letter from Roger Rance, which appeared in the January 1988 issue of THE RAINBOW. Like Roger, I had difficulty finding floppy disks. In fact, several dealers (including one Radio Shack store) insisted that there was no such thing. Others would correct me and say, "oh, you mean floppy disks!"

A company that used to advertise in THE

Continued on Page 76

COCO SOFTWARE /BOOKS CATALOG

Word Power 3.3

(The Ultimate Word Processor for CoCo 3)

This power-packed word processor features: • Blazing Fast 2 Mhz Speed • 72K (460K on 512K) available text memory • 40/80 column display • Pull down menus • Full screen editor • Extensive editing & delete commands • Key click, typeahead, tabs, word count & OOPS recall • HELP screen • Spooler, Sort, Mail Merge, Split Screen Editing & Graphics Support • Pop-up calculator • 2 Column & Macro Support • Save/load w/ Automatic Backup • Works with any printer • What You See Is What You Get Display • Allows Printer Option Codes Embedding • 80,000 word spelling checker • Punctuation Checker • Complete Documentation. Only **\$79.95**

BOOKS

500 Pokes Peeks & Execs: \$16.95
Supplement to 500 Pokes Peeks & Execs: \$9.95
300 Pokes Peeks & Execs for CoCo 3: \$19.95
All 3 Poke Peeks & Execs Books: \$39.95
Extended Color Basic Unravalled: \$39.95
Disk Basic Unravalled: \$19.95
Both Extended & Disk Basic Unr.: \$49.95
Super Extended Basic Unravalled: \$24.95
All 3 Unravalled Books: \$59.95
CoCo 3 Service Manual: \$39 CoCo 2: \$29.95
Multipak Service Manual (specify model #): \$19.95
Full Turn of Screw (Disto): \$19.95
Assembly Language Programming: \$18
Addendum for CoCo 3: \$12
Start OS9 Book & Disk: \$32.99
Inside OS9 Level II: \$29.95
Complete Rainbow Guide to OS9: \$19.95
Complete Rainbow Guide to OS9 Disks: \$29.95
Rainbow Guide to OS9 II: \$19.95 Disks: \$19.95

OS9 SOFTWARE

From Alpha Software Technologies...

Data Windows: \$59.95 Data-Merger: \$19.95
Presto Partner: \$29.95 Level II Tools: \$24.95
Disk Manager Tree: \$29.95 Zapper: \$19.95
Multi-Menu: \$19.95 Warp I: \$34.95
OS9 Level II BBS: \$29.95

From Burke & Burke...

RSB: \$39.95 EZGen: \$19.95 Wild Card MV: \$19

From Kenneth Leigh Enterprises...

Start OS9 Book & Disk: \$32.99
Goldberg Utilities Vol I: \$24.95 Vol II: \$24.95

Other Software...

GSC File Xfer: \$44.95 Multi-View Version: \$54.95
SDISK 3: \$29.95 SDISK: \$29.95
OS9 RAMDISK (for 512K & 1 MEG): \$29.95
Screen Control Utility: \$19.95 Menu. Util: \$19.95
Point-&-Shoot File Selection: \$19.95

RSDOS SOFTWARE

From Zebra Systems...

CoCo Graphics Designer Plus: \$29.95
Pictures, Fonts & Border Disks: \$14.95 ea
Label Designer: \$29.95 First Prize: \$69.95

From Colorware...

CoCo Max III: \$39.95 Fonts (95): \$29.95
Max 10: \$34.95 Fonts (36): \$14.95
CGP220/NX1000 Rainbow Driver: \$14.95
Max Edit: \$14.95 SP Checker: \$14.95

From Musicware...

Musica II: \$29.95 Lyra: \$49.95
CoCo Midi Interface: \$99.95 Software: \$59.95

From Microcom...

Color Schematic Designer: \$39.95
Super Tape/Disk Xfer: \$24.95
Disk Label Maker: \$19.95 Screen Dump: \$19.95
VCR Organizer: \$19.95 Bowling Score: \$19.95
Maillist Pro: \$19.95 Comput. Checkbook: \$19.95
RGB Patch: \$24.95

Other...

VIP Database III: \$69.95 VIP Calc III: \$69.95
Autoterm: \$39.95 Vterm: \$39.95
CoCo Util II (Xfer between IBM & CoCo): \$39.95
Xenocopy: \$79.95 Telewriter 64: \$57.95
ADOS 3: \$34.95 Ext. ADOS 3: \$39.95

Call for Cercomp Products.

GAMES

Treasury Pack #1,2 (8 Games ea): \$29.95 ea
Space Pac (8 Games): \$29.95
Classic Pac: TP1, TP2 & Space Pac: \$69.95
Slots & Cards: \$39.95 Kyum Gai: \$29.95
Sinistar: \$34.95 Quest for Thelda: \$34.95
The Contras: \$34.95 Crystal City: \$34.95
Wizards Castle: \$19.95 Pinball Factory: \$34.95
Fury: \$24.95 Speed Racer: \$34.95
Time Bandit: \$29.95 Outhouse: \$19.95
Cashman: \$29.95 Demon Seed: \$19.95

MICROCOM SOFTWARE • 1387 Brighton Henrietta Townline Road • Rochester, NY 14623

To Order: 1-800-654-5244. Tech Info: 716-292-1786. (See Page 7 for Ordering Information)



CoCo Hits a High Note

I have always been sort of addicted to music and sounds. Unfortunately, music (but, perhaps, not sounds) has never been addicted to me.

My mother could sing pretty well — or at least I thought so — and encouraged “family sing-alongs” in the car when traveling. My father was not much of a singer and was known chiefly for his rendition of “I’m Forever Blowing Bubbles”, which (fortunately) was usually voiced in a humorous vein.

Mother decided, of course, that I was an outstanding singer and, after appropriate consultation with school authorities, enrolled me in private singing lessons with Miss Bessie Rice, well-known in Birmingham, Alabama (where I grew up), as a wonderful teacher of voice.

I was about 12 and a “child soprano,” as my mother and Miss Bessie put it. My school selected me as its representative to the All County Chorus. And one year I sang with other kids in front of a whole lot of people.

Lessons from Miss Bessie were two days a week. Mother dropped me off, went home for 45 minutes or so, and came to get me. During my hour, Miss Bessie played the piano and I sang songs she (or sometimes I) wanted me to sing. I even practiced some at home.

One fateful day about this time of year, the beginning of spring when the sap was starting to rise, Miss Bessie was leading me through “I Believe” when I got to the part where I was supposed to sing “I believe” three times, each one a little higher in pitch than the last. I didn’t make it through the last one. My voice cracked.

Miss Bessie stopped playing, got up from the piano, went to the telephone, and called my mother.

“You might as well come and get him,” she said. “His voice is changing.”

I never saw Miss Bessie again.

I was never asked to sing in public again, either.

However, I have never fully convinced myself that I cannot sing and have always liked to make music. For that reason, music on the Color Computer has always held me in fascination.

I think sometimes we see these programs, of which there are several, in THE RAINBOW and think they are for “musicians” who compose their own songs. This, of course, is true and there are a lot of musical talents out there who do, indeed, write music on the CoCo.

I cannot write music, either. But I like to play it and sing along. And, really, all it takes is a song book, a CoCo, and one of the music programs offered by a number of people on these pages.

Cecil Houk, as you know, opens all of our RAINBOWfests with “The Star Spangled Banner.” While Cecil is a musician who has “arranged” our national anthem, I have successfully duplicated it in a simple one-voice song which sounds pretty good. Moreover, it was fun to do.

Unfortunately, the family of which I am the father takes an even dimmer view of my singing than the family of which my father was the father. So there are not many sing-alongs. Still, now and again, the songs that are family favorites get keyed in and I have a fine time singing with the computer.

I honestly think this is an enjoyable use which may have been overlooked in computer music. And maybe it is one your family might like to explore. Best of all, you can have all your favorite songs on a disk and just go from one to another.

And CoCo can still hit the high Cs in “I Believe.”

— Lonnie Falk

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 RAIN-

BOW 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, 9 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. _____

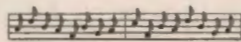
*U.S. currency only, please. On order to hold down costs, we do not bill. Kentucky residents add 6% sales tax; Canadian residents, 7% GST. Please allow 6 to 8 weeks for delivery of first copies. Joint subscriptions to THE RAINBOW and RAINBOW ON TAPE or RAINBOW ON DISK begin with the current issue.

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.



Resounding CoCo



by George Quellhorst

Ever since our family has had a Color Computer we've made music with it. Each music processor we acquired was tried, examined, and finally put aside to be replaced once again with the *Music+* program first published in the June 1984 issue of *THE RAINBOW* (updates appear in the 1986 and 1987 June issues). We did not replace *Music+* until we bought a third-party music processor. For a while everyone in our house was happy. But, alas, the time came when I wanted to enter a song called "Elvira Madigan," and our commercial processor did not have the range required for this song. So, back we went to the good old standby, *Music+*. It did have the required range, but entering a complicated piece of music was an almost impossible task, especially with the small five note window. It was at this point that my son jokingly remarked that perhaps I should write a new screen editor for *Music+* using the Color Computer 3's HSCREEN. After some serious thought I decided to give it a try, although I did not think at the outset BASIC would be fast enough to do the job, or that enough memory would be available. After six months of "spare time," and some tricky programming, the task was accomplished. "Elvira Madigan" was entered, and any bugs that may have been left in the new music editor were quickly found and fixed.

The result of my effort is *Music3+*, a screen editor for *Music+* that uses HSCREEN 4. It is very user-friendly and uses real

notes, not numbers or letters. It has a 17-column, 68-note window, does everything *Music+* does, and sports a few other added features. You can Play starting from the cursor position, Move-Play with a start and end input, and Copy to the end and/or middle of your music file. *Music3+* is fully compatible with *Music+*. Any *Music+* file can be loaded into *Music3+*.

An "on HSCREEN," ON ERR GOTO routine was added (mainly for Disk I/O) to prevent the computer from leaving the HSCREEN and ending the program. For example, if you enter a non-existing filename, the program allows you to enter another filename without having to run the program again.

Two additional bonuses are the added machine-language routines for Insert and Delete. The original BASIC program took 2½ minutes to delete or insert the first column of notes in a 1200-column file. Since I had never written a machine-language program before, I got William Barden Jr.'s book, *TRS-80 Color Computer Assembly Language Programming*, off the shelf and managed to write the two routines. Now it takes less than ¼ second to insert or delete the first row of notes in a 1200-column file. The machine-language routines are loaded in memory just below the existing CLEAR routine. The CLEAR statement in Line 1 was changed from &H4C8F to &H4C8B to make room for the added routines.

Another "goodie" is the playback of music in the high-speed mode of the Color Computer 3. It doubles the sampling rate of the synthesizer to the DAC converter. This doubles the frequency response of the computer and makes the final result sound 100 percent better. Your music sounds even better if you install a speaker output jack in your monitor and use a better speaker to play your creations. Better yet, run the audio signal to a stereo system.

Playback in the high-speed mode raised the pitch of the music by an octave. To remedy this, the note table (which is poked into memory as the program is loaded) had to be changed. One octave was removed from the top of this table. The values needed to add a lower octave were calculated and added to the bottom of the table, thus lowering the pitch of the synthesizer by one octave. Unfortunately, this process created an incompatibility with existing *Music+* files. When they are played with *Music3+*, they sound one octave higher than they should be since the note table is saved to the disk along with the music. To make everyone happy, and to keep the two programs fully compatible, I added a conversion utility. To convert your old files, simply load them into *Music3+* and press F2. The new note table is poked into your old song, the tempo is divided by two, and the new value is poked in as a permanent part of the song. The whole process takes less than two seconds. Now save the song to disk and the conversion is complete. It does no harm to convert a song more than once. However, an error-trap routine prevents you from converting the same song twice. When you press F2, the program checks if the correct note table is in memory. If so, the warning buzzer sounds and nothing else happens.

Finally, I added Directory and Drive Change commands. Pressing 0, 1, 2, or 3 while at the Main menu sets the drive specified and displays the directory with the free granules in five columns on the 80-column screen. A POKE 59078,51 preserves the HSCREEN. Pressing any key on the keyboard instantly puts the HSCREEN with your music back on your screen.

Since I received the dreaded Out of Memory error while working on this program, I made two compromises. First, all the values in the DATA statements were

George Quellhorst has had a CoCo since the days of 4K. He has two CoCo 2s and a CoCo 3 with an RGB monitor. He enjoys writing programs with his computer equipment. He can be contacted at 63 S. State Street, Apt. 10, Painesville, OH 44077.

converted to Hexadecimal, saving 299 bytes of memory. Also, all the REM statements were removed, which saved another 812 bytes for a total of well over 1K of memory space. For those who might be interested, the REM statements are shown in Figure 3.



Figure 1

Entering the Program

For those of you who do not receive RAINBOW ON TAPE or RAINBOW ON DISK, a few notes are in order before you start entering the listing. The funny looking character in Line 37, immediately after `TI=INT(128/2`, is called a *caret*. This character is generated by pressing the up-arrow key. The lower case g in Line 11 must be entered by pressing the F1 key, and the reversed slash in Line 57 is generated by holding SHIFT and simultaneously pressing the CLEAR key.

Using Music3+

The following information is printed on the screen at all times: Tempo, drive number, current memory location (which informs you where in the music memory the cursor is located), high memory indicator (which shows the highest memory location the cursor has reached), cursor note (printed in red), and number of the last note in the file. *Music3+* allows a total of 2498 columns. A single note consumes five memory locations, one for the length of the note and one for each voice. Therefore, the note counter advances or decreases by one when the cursor is moved right or left, while the memory location counter advances or decreases in increments of five. *Music3+*'s buffer starts at 20258, which is the number printed on your screen as the current memory location when no music file is in memory.

I inadvertently pressed BREAK several times while trying to press the up arrow, so I disabled the BREAK key by poking a value of 255 into address 41598. (SHIFT-BREAK still works.) The BREAK key is restored to normal each time you press SHIFT-BREAK. Pressing SHIFT-BREAK and running the program again does not erase the music in memory.

Music3+ has two menus. The Main menu is displayed when *Music3+* is run for the

first time. The second menu is the Music Entering menu. The two menus can be toggled by pressing F1. This does not, however, switch to the music scoring part of the program.

Entering Music

Automatic key-repeat is always in effect for the four arrow keys. Music is entered with the help of the cursor, which looks like an equal sign (=). It is located at the far left side of the screen at the middle C position. Notice you can move the cursor up and down, but not to the left or right. You cannot, at this time, enter music to the left of the cursor since you are at the beginning of the music buffer. Nor can you enter music to the right of the cursor, since you have not yet entered music at the current cursor location. The rule is that the cursor cannot be moved further to the right, or higher in memory, until a note or rest has been entered at the current location. This is to prevent you from accidentally leaving a blank spot in the music memory, which signals the computer that the end of the music file has been reached.

Press F1 to switch menus (not necessary, but it helps) and move the cursor to the position on the music bar where you plan to enter a note. As you move the cursor to the top or bottom of the screen, little help lines are drawn on the screen to help you locate the desired note position. This only happens when the up or down arrows are pressed. The lines drawn by the cursor remain on the screen until you have entered

The arrows also have a wrap-around feature. For example, when a $1/64$ note (the shortest note available) is displayed on the screen, pressing the left arrow causes it to be changed to a whole note. Conversely, pressing the right arrow while a whole note is displayed changes it to a $1/64$ note. Common note values are carried through, making it easy to enter repeated note lengths. In other words, the next time you press the space bar, the last note length used is drawn. The last note displayed on the screen becomes the immediate default after loading a music file. Since all four notes in a single location must be the same length (the computer cannot play a whole note and a quarter note at the same time), all note lengths in a single row or location are changed to the value of the note displayed after pressing ENTER. See Figure 2 for an example of this.

Pressing CLEAR while a flashing note is displayed on the screen erases or clears that note and returns you to the Main menu. Note that if you clear the last note in a column using the CLEAR key, a rest is printed in place of the cleared note since a column cannot be empty. The same thing happens when you insert a note.

Sharps and Flats

Before pressing ENTER, but while the note is still blinking on the screen, press F1 to insert a flat sign in front of the note, making that note flat. Similarly, press F2 to insert a sharp sign. The down arrow erases either a flat or a sharp.

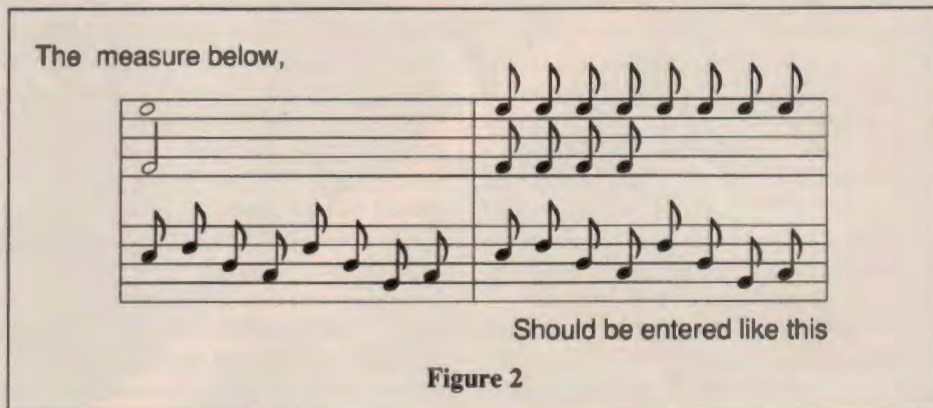


Figure 2

a note or rest and pressed ENTER, after which only those extra lines that are needed remain on the screen. Press the space bar to set the cursor position. Once you are in the music entering mode, the cursor position cannot be changed.

As soon as you press the space bar, a blinking quarter note is drawn on the screen at the cursor position. (See Figure 1 for note lengths.) Using the left and right arrows, you can change the length (duration) of this note. The left arrow decreases the duration of the note and the right arrow increases it.

To change a note from flat to sharp, you do not have to erase the current sign first. To change a flat to a sharp, simply press F2 and vice versa.

There are a few things you should know about how the computer handles sharps and flats. The computer cannot distinguish the difference between a C sharp or a D flat since they are both the same note. Therefore, the same number is put in memory for both notes and all flats are treated as sharps by the computer when the notes are drawn on the screen. If, for example, you enter a

D-flat, the computer automatically changes the note to a C-sharp as soon as you press ENTER.

A word of caution: There is no such thing as a C-flat. Therefore, should you insert a flat in front of a C, the computer prints a B on the screen instead. However, since a C-flat is indeed a B, the program did give you what you asked for. The same thing goes for sharps. For example, if you enter an E-sharp, the computer changes it to an F.

Press ENTER for two entire rows of notes to be read by the computer. It checks for sharps, flats, and rests as well as records the length of the last note entered. These numbers, as well as the note length, are immediately poked into memory. The entire row of notes is erased by using a simple HGET/HPUT routine. The row of notes is redrawn to the screen using the values previously poked into memory. While it does this, all unnecessary lines that might have been drawn by the cursor are erased. The program checks the distance between adjacent notes and does not print any flags on a note if the stem of this note touches the bottom of the note printed immediately above it. Afterwards, control is returned to the main menu and you may reposition the cursor for the next note.

Rests

As shown in Figure 2, a note and a rest cannot be printed or stored in memory in a single column. If you have less than four notes in a single column, the computer automatically adds the rests. Pressing the space bar while the cursor is in a column containing a rest erases the rest, and a blinking note is printed at the cursor position. To enter a rest, press R while a blinking note is on the screen. This causes all notes in that particular column to be erased, and a rest is printed in the middle C position of that column. The length of the rest may be manipulated in the same way you changed the length of a note. Also, should you press the letter N while a rest is blinking on the screen, the rest is changed to a note of equal length. A rest is always printed at the middle C location.

If you enter more than four notes in a single column, the last note entered is erased and the program returns to the main menu. You do not have to enter the notes one column at a time. The computer always knows where the cursor is located. You may enter the entire top or bottom row first, move the cursor back to the left, and enter another row of notes or rests. Also, you can jump to any location within the music file and make changes and/or additions.

The Main Menu

As you may have noticed, the bottom part of the screen contains a window in which all prompts and error messages are printed. It is in this window that you enter any additional information the program requires. I will go over each menu item and give a brief explanation of how it works. Every prompt asking you to enter information can be aborted by pressing ENTER, but only when the prompt is displayed. When more than one entry is required, you may abort at each prompt by pressing ENTER.

Load and Save

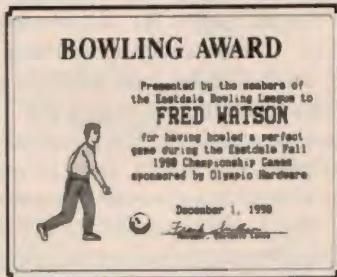
The program loads and saves only with disk. The INPUT for the filename does not accept more than eight characters, and an automatic .BIN extension is given to each program. You cannot load a file when another file is already in memory. A warning buzzer sounds and the input prompt is not displayed in the window.

The same rule applies when you try to save a file and there is no file present in memory. You do not have to return to Column 1 to save a file. You may do so at any time regardless of where the cursor is located.

A tick is heard about once a second during all computer operations requiring a

Awards, Certificates, Licenses, and Diplomas

First Prize™ features an extensive collection of templates with superbly crafted art and titles. After selecting a template, you choose a border, fill in the date and signature lines, and type in whatever you want to say in the main text area. Many titles can also be edited.



First Prize
Includes Nine
Template Disks,
Program Disk,
Labeled Disk-
Storage Box,
32 Page User's
Manual, and 64
Page Template
Directory.
Price \$49.95

Program requires a mouse or joystick, 64K CoCo II or 3, disk drive and compatible printer. Printer support is mostly similar to our Label Designer, but please specify your printer(s) when ordering.

Ordering Instructions: All orders add \$3.00 Shipping & Handling. UPS COD (cash only) add \$4.00 more. VISA/MC Accepted. PA residents add sales tax.
Zebra Systems, Inc., 121 S. Burrowes Street,
State College, PA 16801 (814) 237-2652

REVOLUTIONARY.

The MM/1. A revolutionary computer system designed by you.



Two years ago, the first MM/1™ design was laid out. Shaped by the latest computer technology -- and by your needs -- the MM/1 is the most affordable, powerful system you can buy. • The MM/1 uses your existing RGB-A monitor. It uses your joystick, floppy drives, printer, and modem. • Designed around industry standards, your future peripherals will fit nicely in your MM/1 system.



And the MM/1 already runs Amiga™ graphics utilities, PC animation, Macintosh™ sounds, and follows important elements of the Compact Disk-Interactive™ standard. IMS offers word-processing, databases, and applications brought over from the DOS and UNIX worlds. • Smooth stereo DMA sound lets the MM/1's 68070 processor work undisturbed. DMA 1.4 Megabyte floppy drive. Expandable to five floppies, seven hard disk or tape drives, five serial ports. Two parallel ports. Joystick port. You can network 128 MM/1s together.

Call 800/866-9084 for brochure or video.

 **IMS** Interactive
Media Systems

little time (i.e. copying, changing the waveform, etc.). This lets you know the computer is working.

Move

All the numerical input functions, with the exception of tempo and waveform, have a four-digit limit. (Tempo and waveform have a three-digit limit.) Should you try to enter too many digits, the computer ignores your efforts. The Move function allows you to play a section of music without playing the whole song. You are prompted for a starting and ending column number. You can play as little as one column, or the entire song. You cannot play the song backward, though. If the second column number specified is smaller than the first, the buzzer sounds and you are prompted to try again.

Jump

This allows you to jump to another memory location. If, for example, you enter 123, the screen clears and is redrawn with the 123rd column appearing first on the screen. Error routines do not allow you to jump to Column 225 if only 223 columns are in memory. The program does not allow you to jump to a column number greater than 2498.

Tempo

The Tempo entry has a three-digit limit, which enables you to go as high as 999. The music produced is not of great quality, though. The tempo printed on the screen is not necessarily the same tempo as you have entered. This is due to the truncation that occurs when integer values are taken from the number entered. Also, any value less than 28 produces a tempo of 28 and values over 950 produce a value of 950.

Insert and Delete

Press I or D while at the main menu to insert or delete a row of notes at the cursor position. Since inserting a note produces an empty column with no music in it, (a no-no), a whole rest is printed at the middle C position in that column after the insertion is completed. If you are going to enter notes in that column, ignore the rest — it is erased as soon as you press the space bar.

Clear

Press C at the Main menu to clear the music from memory. A buzzer sounds and a warning message is printed in the window. Press ENTER to abort the Clear action or press SHIFT-CLEAR to proceed. The screen is cleared with the HPUT command, which clears one column at a time in a FOR NEXT loop while the memory is cleared with an ML subroutine called by BASIC with a USR

instruction. It takes less than one second to complete the entire operation.

Copy

Since C has already been used, *Music3+* uses the letter K for this function. The Copy selection copies any part of the music file to any other part, even in the middle of the file.

```
000 — Load ML program and draw
      screen
002 — Check if ML program
      present, if not poke it in
013 — Arrows and cursor
022 — Score music
046 — Set and retrieve tempo
051 — Play
052 — Play from cursor
053 — Compute move and cursor
      play start
058 — Load a file
059 — Save a file
061 — Delete
063 — Insert
064 — Draw notes from memory
      values
074 — Jump
078 — Move
083 — Copy
089 — Input numbers subroutine
094 — Input filename subroutine
102 — Convert music file
104 — Draw extra music lines; up
      and down arrows
106 — Draw statements and
      screen-prints
114 — Compute memory displayed
      in window
115 — Compute end of song after
      Load
122 — Compute and print cursor
      note number
129 — Erase screen
130 — Erase window
132 — Break trap
133 — Error trap
137 — Dir
147 — Waveform adjust
153 — Data statements
```

Figure 3: The Missing REM Statements

You are prompted for three numbers: the start, end, and destination positions. The destination position must always be higher in memory than the last note to be copied. Also, the ending position must be greater than the starting position. Copy is aborted if the result would create a file that is longer than 2498. Remember, Copy is not an Insert! If you copy columns 1-10 to columns 20-30, the original music that was located in the destination columns are gone. After the

process is finished, the last note copied is the first note on your screen. Therefore, if you copy something to the end of the file, only a single note is printed on your screen.

Play and Cursor Play

Press P to play the entire song in memory. Press the ALT key, or @, to play your song starting at the cursor position. This last feature is handy after entering a row of notes.

Waveform

This allows you to change the waveform, or timbre, of the music being played. The new waveform is saved to disk with the music file and stays in effect until you change it back to normal, or turn your computer off and re-run the program. (See *THE RAINBOW*, June 1986, Page 52.) You are asked for the five percentage values for the fundamental and four harmonics used in the waveform. The sum of these five values must be 100.

A built-in error trap is included. Five input prompts are displayed in the window. The default values for the waveform are 50-25-25-0-0, which is an organ sound. Note that you must enter zeros, even if you enter the number 100 for the fundamental only. Press ENTER to abort the procedure.

Non-Menu Items

Two options are not listed on the main menu mainly because the screen was full. The first is the space bar, which must be pressed to enter music. The second includes the numbers 0-3, which set the drive number and produce a disk directory. (Both of these were mentioned earlier.)

Left and Right Scrolling

When the left arrow is pressed while the cursor is at the far left side of the screen, and not at the start of the file, the notes sort-of scroll to the right. We are working in HSCREEN 4, and anything drawn to the screen must first be erased before something else can be drawn in its place. Therefore, we use the HPUT loop mentioned earlier to clear the screen and re-draw the screen with all notes shifted 12 places to the right. The first four notes on the screen when you pressed the left arrow are now the last four notes on the screen. And since you are scrolling left, the cursor is on the fifth note counting from the right side of the screen. The cursor is on the same note it would have been on after pressing the left arrow if there had been no need to scroll. For example, if the first note on the screen was 34 when you pressed the left arrow the cursor ends up on note 33, but notes 34, 35, 36, and 37 still are on the screen to the right of the cursor.

This was done since the redrawing of the screen takes a few seconds and you would not want to scroll over every single note once the screen is full. Therefore, we scroll 12 notes at a time and leave the extra four notes on the screen to allow you to get your bearings, so to speak. The reverse is

true when you press the right arrow on the far right side of the screen.

A Final Note

After this article was written, one slight incompatibility with existing *Music+* files was found. This program assumes that all

music is entered with the highest note in Voice 1 (the soprano position) and the lowest note in Voice 4 (bass position). If this was not done when the song was entered using *Music+*, the flags on the notes are not printed correctly to the screen. Before a note is drawn on the screen, this program checks how much higher on the screen the previous note is drawn. If the stems of the notes touch each other, it does not draw any flags on the note below it. This is to make it easier to read the music. It is also done in normal music notation. When, in such a file, the first note being printed is the lowest note in the column, there is no note above it for the computer to check. Consequently, if the program contains a row of 1/64 notes, four flags are drawn on each note, regardless of their position on the screen. It is easy to spot this condition since the program draws the bottom note of a particular row first and then the next one up, and so on. However, this will not affect the playing or editing of that particular song, it only affects the screen drawing.

I sincerely hope that you get as much enjoyment out of this program as I did while writing it. It was quite a challenge. If you have any questions or comments about *Music3+*, feel free to write to me. For a response, please enclose an SASE. □

CaCo 3 Disk									
2	28	53	20	102	173	142	214		
5	230	58	140	105	29	147	61		
7	8	62	36	107	51	151	187		
11	40	66	65	110	137	156	251		
16	69	70	157	116	213	162	191		
23	162	78	8	120	91	168	171		
30	174	85	44	125	3	173	167		
38	130	90	4	132	198	END	142		
46	233	96	234	136	154				

You must enter POKE 25,14:POKE3584,0:NEW before loading MUSIC3+.

The Listing: MUSIC3+

Ø *MUSIC3+

** WRITTEN BY GEORGE QUELHORST

** COPYRIGHT (C) APRIL 1991

** BY FALSOFT, INC.

** RAINBOW MAGAZINE

1 CLEAR1380,&H4C88:RGB:POKE59078

,141:PALETTE0,56:PALETTE1,32:PAL

ETTE2,63:PALETTE3,8:HBUFF1,1367:

HBUFF2,2719:POKE65497,,:POKE4159

8,255:ONBRKGO132:Q=2:WIDTH80:C

LS1:POKE65434,56:ATTR0,0:POKE&HF

80F,0:POKE&HF84F,0:POKE&HF89C,0:

POKE140,175

2 ONERRGOTO133:TT=17113:A1=19712

:A2=20099:A3=20100:A4=20257:A5=2

0258:A6=19671:A7=19682:A8=20173:

A9=20128:DEFUSR0=A3:DEFUSR1=A6:D

EFUSR2=19627:DEFUSR3=19596:IFPEE

COLOR RIBBONS & PAPER

COLOR RIBBONS				COLOR PAPER	
RED, BLUE, GREEN, BROWN, PURPLE, YELLOW				BRIGHT PACK -	
Ribbons	Price Each	Black	Color	Heat Transfer	
Radio Shack -					200 Sheets/50 ea. color: Red, Blue, Green, Yellow. 9 1/2 x 11 - \$10.90/pk.
- DMP 107/132/133	4.50	6.00	7.50		
- DMP 120/200	6.25				
- DMP 240	4.00	5.00	7.50		
- DMP 300/2102	6.00	9.00			
- DMP 430	11.00				
- DMP 440	18.50				
- DMP 442	5.00	7.50			
- DMP 500	.				
- DMP 2100/2110	4.75	6.75	9.00		
Citizen 180/140	4.00	5.00	7.50		
Citizen GSX 140 4-Color		.			
Epson FX80/LX800	3.75	4.50	6.75		
Okidata 180/192	5.00	7.50			
Panasonic 1180/1124	5.00	7.50			
Seikosha SP800/1000	4.50	6.00	7.50		
Star NX10/NL10	5.00	6.00	7.95		
Star NX 1000	3.50	4.50	6.75		
Star NX 1000 - 4-Color	6.25	10.00			
T-SHIRT RIBBONS (Heat Transfer) - Call For Price & Avail.					
COLORS: Red, Blue, Green, Brown, Purple, Yellow, Black					
COLOR DISKETTES					
5 1/4" DS/DD Rainbow Pack. 10/pack - \$9.95					
For ribbons & paper not listed above, call for price. Price & spec. subject to change w/o notice. Min. order \$25.00. S & H \$4.50 minimum. Visa, M.C., C.O.D.					
RAMCO COMPUTER SUPPLIES					
P.O. Box 475, Manteno, IL 60950 U.S.A.					
(U.S.A.) 800-522-6922 • (Canada) 800-621-5444					
815-468-8081					

SELLING FAST.

The MM/1. The revolutionary computer system that everybody wants.



Interactive Media Systems designed the MM/1 for the future -- and for a wide range of users. Industry and higher education are buying the MM/1. IBM-PC owners are buying the MM/1. Software engineers and multimedia developers are buying the MM/1.

Now you can, too.



The computer industry, dominated by IBM and Apple, is growing at only 8-10% per year. *Personal Computing* magazine reports that multimedia computing will more than triple by 1992. The multimedia MM/1 is designed for the future, changing the way you think about computing.

Join us and the rest of the Color Computer community. Multimedia computing. Windows. Multi-tasking. Familiar operation. High resolution graphics. Stereo sound. 16.7 million color palette. Networking. The MM/1.

Welcome to your next computer.

Call 800/866-9084 for brochure or video.

IMS Interactive Media Systems

```

K(20100)=22ANDPEEK(20101)=0ANDPEEK(20102)=136ANDPEEK(20103)=134 THEN5
3 LOCATE26,12:PRINT"POKING ML PROGRAM INTO MEMORY":FORT=1TO41:READA$:NEXTT:FORD=A1 TO A4:READT$:POKED,VAL("&H"+T$):NEXT:FORD=A6 TO A7:READP$:POKED,VAL("&H"+P$)
4 NEXT:FORT=19596TO19622:READP$:POKET,VAL("&H"+P$):NEXTT:FORT=19627TO19642:READP$:POKET,VAL("&H"+P$):NEXTT:C=USR1(0)
5 D=PEEK(2394):CLS1:LOCATE33,12:PRINT"DRAWING SCREEN":POKE59065,57:HSCREEN4:POKE59065,32:HCLS0:HCOLOR1:HPRINT(12,0),"MUSIC+ FOR THE COLOR COMPUTER III. BY: GEORGE QUELLHORST":EXEC43350:M=A5:ME=A5:LM=A5:A=3:P1=65496:P2=65497:GOSUB106
6 H=0:V=52:HCOLOR2:FORT=1TO5:V=V+8:GOSUB113:NEXTT:V=100:FORT=1TO5:V=V+8:GOSUB113:NEXTT:HLINE(0,60)-(0,140),PSET:HLINE(640,60)-(640,140),PSET:HCOLOR3:HDRAW"BM15,95"+TC$:HDRAW"BM7,138"+BC$:HCOLOR3:HPRINT(0,20),"Tempo":HGET(40,8)-(72,159),1
7 HGET(0,40)-(640,56),2:HLINE(86,160)-(86,169),PSET:HLINE(239,160)-(239,169),PSET:HLINE(376,160)-(376,169),PSET:HLINE(510,160)-(510,169),PSET:HPRINT(48,20),"Crs r Note":HCOLOR1:HPRINT(59,20),CNS:HCOLOR3:HPRINT(65,20),"Last Note: 0001"
8 GOSUB50:HPRINT(12,20),"Cursor mem: 20258":HPRINT(31,20),"High Mem":HLINE(0,169)-(640,169),PSET:HLINE(0,19),P1$:X=55:PX=90:Y=104:PY=108:HDRAW"BM55,104"+D$:GOSUB130:GOSUB110:HCOLOR1:HPRINT(0,19),"Drv.":HPRINT(3,19),STR$(D)
9 POKE59108,230:HSCREEN4:POKE65434,56:POKE59108,231:IFPEEK(A5)>0 THENGOSUB114:GOSUB64:X=55:Y=104:GOSUB115
10 P$=INKEY$:IFP$="0"ORP$="1"ORP$="2"ORP$="3"THEN137ELSE11
11 P=INSTR(1,"gIPCLTSMKD@JW "+CHR$(4),P$)
12 IFP$=""THEN13ELSEON P GOTO 11,2,61,51,54,58,46,59,78,61,83,52,74,146,22,102
13 IFPEEK(343)=247THENPX=X:PY=Y:X=X-35:ME=M:M=M-5:GOSUB118:IFX=20 THENRB=1 ELSE19
14 IFME=20258ANDB=1 THENGOSUB101:M=A5:X=55:PY=90:RB=0:GOTO10ELSEIFRB=1 THEN99
15 IFPEEK(344)=247ANDPEEK(M)>0 THENPX=X:PY=Y:X=X+35:ME=M:M=M+5:GOSUB118:IFX=650 THENRA=1 ELSE19
16 IFRA=1 ANDM<32753 THENGOSUB114:RA=0:X=55:GOSUB129:SM=SM+65:EM=SM+80:X=55:GOSUB64:X=195:GOSUB118
17 IFPEEK(341)=247THENGOSUB104:P=X:X:PY=Y:Y=Y-4:IFY=28 THENY=32:PY=36 ELSE19
18 IFPEEK(342)=247THENGOSUB104:P=X:X:PY=Y:Y=Y+4:IFY=164 THENY=160:PY=156
19 IFHPOINT(X+5,Y-4)=3 THENHCOLOR2:GOSUB41:HDRAW$ ELSEHCOLOR1:GOSUB41:HDRAW$

```

```

20 IFHPOINT(PX+5,PY-4)=3 THENHCOLOR3:HDRAW"BM"+STR$(PX)+"",+STR$(PY)+D$ ELSEHCOLOR0:HDRAW"BM"+STR$(PX)+"",+STR$(PY)+D$
21 GOTO10
22 P$=INKEY$
23 IFP$="R"THENQ=1:GOSUB131
24 IFQ=1 THENY=104:HCOLOR0:GOSUB41:HDRAW$(7):HCOLOR3:GOSUB41:HDRAW$(A)
25 IFP$="N"THENHCOLOR0:HDRAW"BM"+STR$(X)+"",104"+R$(7):Q=2
26 IFP$=CHR$(13)THEN35
27 IFPEEK(343)=247 THENA=A+1:IFA=8 THENA=1
28 IFPEEK(344)=247 THENA=A-1:IFA=0 THENA=7
29 IFQ=2 ANDHPOINT(X-3,101)=3 THENHCOLOR0:HDRAW"BM"+STR$(X)+"",104"+R$(7) ELSEIFQ=2 THENGOSUB42:HCOLOR3:GOSUB41:HDRAW$(A)
30 IFQ=2 ANDPEEK(343)=191 THENGOSUB43:HCOLOR3:GOSUB41:HDRAW$(A)
31 IFQ=2 ANDPEEK(344)=191 THENGOSUB43:HCOLOR3:GOSUB41:HDRAW$(A)
32 IFQ=2 ANDPEEK(342)=247 THENGOSUB43
33 IFP$=CHR$(12)ANDQ=2 THENGOSUB42:GOSUB43:T=Y:GOSUB45:GOTO35
34 GOTO22
35 W=0:FORT=32TO160STEP4:IFHPOINT(X-2,T-4)=3 THENW=W+1:N(W)=T
36 IFW=5 THENHCOLOR0:EXEC:GOSUB42:GOSUB43:T=Y:GOSUB45:GOTO35
37 NEXTT:TI=INT(128/2^(A-1)+.5):POKEM,TI:FOR=1TO4:IFN(S)=0 THENPO(S)=0:GOTO39 ELSEP(S)=N(S)/4-8:PO(S)=VAL(MID$(NO$,P(S)*4+1,3))
38 IFHPOINT(X-5,N(S)-3)=3 THENPO(S)=PO(S)+2 ELSEIFHPOINT(X-6,N(S)-5)=3 THENPO(S)=PO(S)-2:T=N(S):HCOLOR0:GOSUB44:HDRAW$(A):GOSUB44:HDRAW$(A):GOSUB45
39 POKEM+S,PO(S):N(S)=0:NEXTS:SM=M:EM=M:GOSUB131:X1=X:GOSUB64:X=X1
40 Q=2:EXEC:GOTO10
41 HDRAW"BM"+STR$(X)+"",+STR$(Y):RETURN
42 HCOLOR0:GOSUB41:HDRAW$(7):RETURN
43 HCOLOR0:GOSUB41:HDRAW$(7):GOSUB41:HDRAW$:RETURN
44 HDRAW"BM"+STR$(X)+"",+STR$(T):RETURN
45 HCOLOR2:IFHPOINT(X-8,T-4)=2 THENHLINE(X-3,T-4)-(X+15,T-4),PSET:RETURN ELSERETURN
46 EXEC:H=7:V=20:HPUT(54,159)-(82,167),2,PSET
47 GOSUB89:H=6:TE=LO:IFTE=0 THENTE=1
48 TE=INT(TT/TE):IFTE<18 THENTE=1 ELSEIFTE>600 THENTE=600
49 T1=INT(TE/256):T2=TE-256*T1:POKEA8,T1:POKEA8+1,T2:LO$="" :HPUT(54,159)-(82,167),2,PSET:GOSUB50:GOTO10
50 HCOLOR3:T9=256*PEEK(A8)+PEEK(A8+1):T9=INT(TT/T9):HPRINT(6,20),T9:RETURN
51 POKEA9,0:POKEA9+1,128:C=USR(0):GOTO10
52 ZT=INT((M-A5)/5)+1:GOSUB53:C=USR(0):GOTO10
53 ZT=128+5*(ZT-1):ZU=INT(ZT/4096):ZV=ZT-4096*ZU:ZW=INT(ZV/256):

```

```

ZL=ZV-256*ZW:ZU=16*ZU+ZW:POKEA9,ZU:POKEA9+1,ZL:RETURN
54 GOSUB101:GOSUB130:GOSUB125
55 P$=INKEY$:IFP$="" THEN55 ELSE EXEC
56 IFP$=CHR$(13) THENGOSUB130:GOSUB110:GOTO10
57 IFP$="" THENX=55:GOSUB129:C=USR1(0):HCOLOR0:X=55:Y=104:M=A5:L=M-A5:DE=A5:GOSUB130:GOSUB110:GOSUB118:GOTO10 ELSE55
58 IFPEEK(A5)<>0 THENGOSUB101:GOTO10 ELSEGOSUB130:GOSUB126:H=40:V=32:GOSUB94:POKEP1,..LOADMLO$:LO$="" :POKE&HFF40,0:POKEP2,..GOSUB130:GOSUB110:HPUT(54,159)-(82,167),2,PSET:GOSUB50:GOSUB114:X=55:GOSUB64:M=A5:GOSUB115:X=55:Y=104:GOTO10
59 IFPEEK(A5)=0 THENGOSUB101:GOTO10 ELSEGOSUB130:GOSUB126:H=40:V=32:LO$="" :GOSUB94
60 FORQ1=LM+5 TO LM+10:POKEQ1,0:NEXTQ1:POKEA9,0:POKEA9+1,128:POKEP1,..VERIFYON:SAVEML0$,A1,Q1,A3:POKE&HFF40,0:LO$="" :GOSUB130:GOSUB110:POKEP2,..GOTO10
61 EXEC:X1=X:SM=M:K=LC=(INT(X-55)/35)+2:LC=(17-LC):EM=K+(LC*5)+9:GOSUB129:IFP=2 THEN63
62 D1=INT((LM+4)/256):D2=(LM+4)-(D1*256):POKE&H4CB,D1:POKE&H4CB,E,D2:C=USR2(M):X=X1:EM=EM-4:GOSUB64:X=X1:Y=104:M=K:LM=LM-5:GOSUB118:GOTO10
63 HCOLOR1:LM=LM+5:IFLM>32753 THEN10 ELSE D1=INT(M/256):D2=M-(D1*256):POKE&H4CA8,D1:POKE&H4CA9,D2:C=USR3(LM):GOSUB64:X=X1:Y=104:M=K:GOSUB118:GOTO10
64 HCOLOR3:Y1=Y:NS=0:W=0:FORT=SM TO EM STEP5:NL=PEEK(T):IFNL=0 THENRETURN ELSEIFNL=1 THENNL=2:POKET,2
65 A=INT(8-(LOG(NL)/LOG(2))):FOR=1TO4:NO=PEEK(T+S):IFNO=0 THENW=W+1:GOTO72
66 N$=RIGHT$(STR$(NO),LEN(STR$(NO))-1):N$=STRING$(3-LEN(N$),0)+N$:Y=INSTR(1,NO$,N$):IFY=0 THENNO=NO-2:NS=1:GOTO66 ELSEY=((Y-1)/4)+8*4:IFY>0 THENR=R+1:Y(R)=Y
67 HCOLOR2:IFQ=1 THEN69 ELSEIFY>-32 ANDY<-56 THENIFINT(Y/8)=Y/8 THENHENG=Y-4 ELSEG=Y
68 IFG>0 THENFORI=6 TO 56STEP8:HLINE(X-6,I)-(X+18,I),PSET:NEXTI:QQ=1:G=0
69 IFY=1520RY=156 ANDHPOINT(X-2,148)<>3 THENHLINE(X-6,148)-(X+18,148),PSET ELSEIFY=160 THENHLINE(X-6,156)-(X+18,156),PSET:IFHPOINT(X-2,148)<>3 THENHLINE(X-6,148)-(X+18,148),PSET
70 QQ=0:GQ=0:HCOLOR3:IFY(R)-Y(R-1)<-20 ANDA>3 ANDY(R-1)<Y(R) THENGOSUB41:HDRAW$(3) ELSEGOSUB41:HDRAW$(A)
71 IFNS=1 THENGOSUB41:HDRAW$:NS=0
72 NEXTS:R=0:IFNL<>0 ANDW=4 THENHDRAW"BM"+STR$(X)+"",104"+R$(A)
73 X=X+35:W=0:NEXTT:Y=Y1:X=X1:RETURN
74 GOSUB130:GOSUB124:H=44:V=23
75 GOSUB89:IFLO=<0ORLO>2498ORLO>VAL(LN$) THENGOSUB101:HCOLOR3:HPR

```



```

INT(H,V),LO$:LO$="" :GOTO75
76 X=55:GOSUB129:SM=(LO*5)+A5-5:
EM=SM+80:GOSUB64:X=55:ME=M:M=SM
77 GOSUB130:LO$="" :GOSUB110:GOSU
B118:GOTO10
78 GOSUB130:GOSUB121:GOSUB128:H=
34:V=23
79 GOSUB89:ZT=LO:IFZT=0 THENZT=1
80 OL$=LO$:LO$="" :H=47:GOSUB89:S
E=L0
81 IFZT>SE OR SE>2498THENHCOLOR3
:GOSUB101:HPRINT(34,V),OL$:HPRIN
T(47,V),LO$:LO$="" :OL$="" :GOTO79
ELSEGOSUB53:SE=(SE*5)+A5:TP=PEEK
(SE):POKESE,0:C=USR(0):POKESE,TP
82 GOSUB130:OL$="" :LO$="" :GOSUB1
10:GOTO10
83 GOSUB130:GOSUB121
84 GOSUB123:H=24:V=23:GOSUB89:ST
=LO:LO$="" :H=37:GOSUB89:EN=LO:LO
$="" :H=58:GOSUB89:DE=LO:LO$=""
85 IF EN<ST OR DE<EN THENHCOLOR3
:HPRINT(23,V),ST:HPRINT(36,V),EN
:HPRINT(57,V),DE:GOSUB101:GOTO84
86 ST=A5+(ST*5)-5:EN=A5+(EN*5)-1
:DE=A5+(DE*5)-5:AM=EN-ST:AM=DE+A
M+1:IFAM>32762 ORPEEK(DE-5)=0 TH
ENEN=1:ST=2:GOTO85
87 X=55:Z=0:GOSUB129:FORT=ST TO
EN:L=PEEK(T):POKEDE,L:DE=DE+1:GO
SUB152:NEXT
88 X=55:SM=AM-5:EM=SM+80:GOSUB64
:GOSUB130:GOSUB110:M=AM-5:GOSUB1
18:X=55:GOTO10
89 P$=INKEY$:IFP$="" THEN89 ELSEI
FP$=CHR$(8) ORP$=CHR$(13)THENEXE

```

```

C:GOTO90 ELSEIFASC(P$)<48 ORASC(
P$)>57THEN89ELSEEXEC
90 IFLO$="" ANDP$=CHR$(8)THENP$=""
":GOTO89 ELSEIFP$=CHR$(8)THENHCO
LOR3:HPRINT(H,V),LO$:HCOLOR2:LO$
=LEFT$(LO$,LEN(LO$)-1):HPRINT(H,
V),LO$:GOTO89
91 IFP$=CHR$(13)ANDLO$="" THENGOS
UB130:GOSUB110:GOTO10
92 IFP$=CHR$(13)THENLO=VAL(LO$):
RETURNELSEIF(P=60RP=13)ANDLEN(LO
$)->3THEN89ELSEIFLEN(LO$)->4THEN
89
93 LO$=LO$+P$:HCOLOR2:HPRINT(H,V
),LO$:GOTO89
94 P$=INKEY$:IFP$="" THEN94ELSEEX
EC
95 IFP$=CHR$(8)ANDLO$="" THENP$=""
":GOTO94 ELSEIFP$=CHR$(8)THENHCO
LOR3:HPRINT(H,V),LO$:LO$=LEFT$(L
O$,LEN(LO$)-1):HPRINT(H,V),LO$:H
COLOR2:HPRINT(H,V),LO$:GOTO94
96 IFP$=CHR$(13)ANDLO$="" THENGOS
UB130:HCOLOR3:GOSUB110:GOTO10
97 IFP$=CHR$(13)THENRETURN ELSEI
FLEN(LO$)->8THEN94
98 LO$=LO$+P$:HCOLOR2:HPRINT(H,V
),LO$:GOTO94
99 X=55:X1=475:GOSUB129:SM=SM-65
:IFSM<A5 THENSM=A5:X1=(M-A5)/5
):X1=(X1*35)+55
100 EM=SM+80:X=55:GOSUB64:X=X1:G
OSUB118:RB=0:GOTO10
101 FORU=1TO20:EXEC:NEXTU:RETURN
102 IFPEEK(19971)=55 THENGOSUB10
1:GOTO10 ELSEGOSUB130:RESTORE:PO

```

```

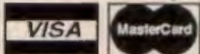
-19967:Z=0:HCOLOR2:HPRINT(30,22)
,"CONVERT MUSIC FILE":HPRINT(18,
23),"PRESS ENTER TO PROCEED / SP
ACEBAR TO ABORT":GOSUB101
103 P$=INKEY$:IFP$="" THENGOSUB1
30:GOSUB110:GOTO10 ELSEIFP$=CHR$(
13)THENFORT=1TO297:GOSUB152:REA
DA$:NEXT:FORT=1TO132:PO=PO+1:GOS
UB152:READP$:POKEPO,VAL("&H"+P$)
:NEXT:GOSUB130:GOSUB110:GOSUB101
:TE=INT(T9/2):GOTO48 ELSEIFP$=""
THEN103
104 IFY=32 OR Y=40 OR Y=48 OR Y=5
6 OR Y=152 OR Y=160 THENHCOLOR2 EL
SERETURN
105 IFHPOINT(X-2,Y-4)=3 THENHLIN
E(X-7,Y-4)-(X-4,Y-4),PSET:HLIN(E
X+15,Y-4)-(X+18,Y-4),PSET:XL=0:R
ETURN ELSEHLIN(X-7,Y-4)-(X+18,Y
-4),PSET:XL=0:RETURN
106 N$(1)="BU2BLR12EU2HL12GD2FBF
BD":N$(2)=N$(1)+"BUBR13U21BD22BL
13":N$(3)=N$(2)+"BUBH2R14UL14UR1
4BD5BL12":N$(4)=N$(3)+"BR13BU22R
4DBD21BL17":N$(5)=N$(4)+"BR13BU1
8R4DBD17BL17":N$(6)=N$(5)+"BR13B
U14R4DBD13BL17":N$(7)=N$(6)+"BR1
3BU10R4DBD9BL17"
107 TC$="HL3GR5DL5FR3EU32E3R4F3D
3G6L9G8D5F5R16E4U4H4L10G3D3RBD5B
L4H5BRU4E7BR9BU2ESU3H2BD18RF3D4G
3":BC$="E18BR4R2EUHL2GR4DL4BDL3
U6BR3FR2EUHL2GR4DL4BL3H4BDF3D6G4
BU14BRL13G6DFR2EUHFL4DR4BU2BL2E4
":D$="BRBU3R9BU2L9":F$="BL11BUU8
BD3R5DG4LBDDBR11"

```

SUPER SUPER SPECIAL

All 530 Public Domain Programs-\$145 Value
 All 1,020 Subscription Programs-\$260 Value
 All 250 Graphic Pictures-\$70 Value
ENTIRE PACKAGE Regularly \$475

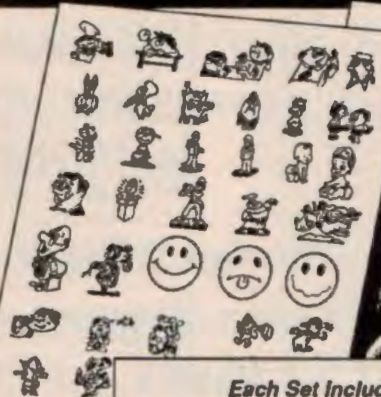
Now Only...



\$279.00!

SEE PAGE 67 FOR DETAILS

Over 250 Quality Pictures



Each Set Includes
 An Excellent Graphics Editor!
 Pictures are CoCo-MAX II compatible.

**Each Set Of 10 Disks
 Only \$35.00!
 Buy 2, Get One Free!**

Set #1	Set #2	Set #3
Clipart	Celebrities	Adult Only
Space Pictures	Cartoon Characters	R-Rated
Animals	Great Graphics	Beautiful Women
More	More	

T&D Subscription Software • 2490 Miles Standish Dr., Holland, MI 49423 • 616-399-9648

```

108 S$="BL11BUU6BR4D6BU2BR2L8BU2
R8BD5BR5":R$(1)="BU2L3UR3U3R11D3
R3DL14":R$(2)=R$(1)+"BL3D16":R$(
3)=R$(2)+"BU17R14UL11UR11":R$(4)
=R$(3)+"BL14BD2D17R5":R$(5)=R$(4)
)+"BU4L5":R$(6)=R$(5)+"BU4R5":R$(
7)=R$(6)+"BU4L5":CNS="0001":LNS
=CNS
109 NO$="112,108,106,102,098,096
,092,088,084,082,078,074,072,068
,064,060,058,054,050,048,044,040
,036,034,030,026,024,020,016,012
,010,006,002":RETURN
110 HCOLOR2:HPRINT(0,22),"<L>OAD
<M>OVE <T>EMPO <I>NSER
T <P>LAY <F1> MENUS <W
> WAVEFORM":HPRINT(0,23),"<S>AVE
<J>UMP <C>LEAR <D>ELET
E <K>OPY <F2> CNVRT <@
> CRS.PLAY":PQ=1:RETURN
111 HCOLOR2:HPRINT(0,22),"<N> NO
TE -> RAISE LENGTH <ENT>
INSTAL NOTE <F1> FLAT
DWN. ARROW":HPRINT(0,23),"<R> RE
ST <- LOWER LENGTH <CLR>
CLEAR NOTE <F2> SHARP
CLEAR F+S":PQ=0:RETURN
112 GOSUB130:IFPQ=1THENGOSUB111:
GOTO10 ELSEGOSUB110:GOTO10
113 HLINE(H,V)-(640,V),PSET:RETU
RN
114 LC=INT((X-55)/35)+1:SM=M-(LC
*5)+5:EM=SM+80:IFX=650THENRETURN
ELSEReturn
115 PE=PEEK(M):IFPE=0THEN117
116 M=M+25:GOSUB152:GOTO115
117 FORT=M TO M-25STEP-5:M=M-5:I
FPEEK(M)=0 THEN117 ELSELM=M:M=A5
:GOSUB118:GOSUB101:RETURN
118 HCOLOR3:IFM<20258 THENM=2025
8 ELSEIFM>LM THENLM=M
119 HPUT(189,159)-(233,167),2,PS
ET:HPUT(325,159)-(369,167),2,PSE
T:HPRINT(23,20),M:HPRINT(40,20),
LM:HPUT(469,159)-(504,167),2,PSE
T:HPUT(605,159)-(640,167),2,PSET
120 CN$=STR$(INT((M-A5)/5)+1):CN
$=RIGHT$(CN$,LEN(CN$)-1):CN$=STR
INGS$(4-LEN(CN$),"0")+CN$:HCOLOR1
:HPRINT(59,20),CN$:LNS=STR$(INT(
(LM-A5)/5)+1):LNS=RIGHT$(LNS,LEN
(LNS)-1):LNS=STRINGS$(4-LEN(LNS),
"0")+LNS:HCOLOR3:HPRINT(76,20),L
NS:RETURN
121 HCOLOR2:IFP=8THENHPRINT(16,2
2),"PLAY"ELSEIFP=10THENHPRINT(16
,22),"COPY"
122 HPRINT(21,22),"BLOCK OF MUSI
C / PRESS ENTER ONLY TO ABORT":R
ETURN
123 HCOLOR2:HPRINT(17,23),"Start
":HPRINT(32,23),"End":HPRINT(4
5,23),"Destination":RETURN
124 HCOLOR2:HPRINT(16,22),"JUMP
TO SPECIFIC COLUMN / PRESS ENTER
TO ABORT":HPRINT(29,23),"Column
number":RETURN
125 HCOLOR2:HPRINT(30,22),"CLEAR
MUSIC MEMORY":HPRINT(20,23),"SH
IFT-CLEAR TO PROCEED / ENTER TO
ABORT":RETURN
126 HCOLOR2:IFP=5 THENHPRINT(21,
22),"LOAD" ELSEHPRINT(21,22),"SA
VE"
127 HPRINT(26,22),"A PROGRAM / P
RESS ENTER TO ABORT":HPRINT(30,2
3),"FILENAME":RETURN

```

```

128 HCOLOR2:HPRINT(27,23),"Start
":HPRINT(42,23),"End":RETURN
129 FORT=X TO615STEP35:H=T-14:V=
T+18:HPUT(H,8)-(V,159),1,PSET:NE
XT:RETURN
130 EXEC43350:HPUT(0,175)-(640,1
92),2,PRESET:RETURN
131 HPUT(X-14,8)-(X+18,159),1,PS
ET:RETURN
132 POKE41598,3:CLS1:ATTR0,0:STO
P
133 POKEP2,:RESTORE:LO$="":GOSU
B101:FORT=0TO ERNO:READER$NEXT:
POKE59078,51:HSCREEN4:POKE65434,
56:HCOLOR1:HPRINT(3,19),PEEK(239
4)
134 GOSUB130:HCOLOR2:HPRINT(16,2
2),"YOU HAVE ENCOUNTERED A":HPRI
NT(39,22),ER$:HPRINT(42,22),"ERR
OR IN LINE NUMBER":HPRINT(62,22)
,ERLIN:HPRINT(19,23),"PRESS BAR
TO RETRY / ENTER TO BREAK PROGRA
M":POKE59078,141
135 P$=INKEY$:IFP$=""THEN135
136 IFP$=CHR$(32)THENGOSUB130:GO
SUB110:GOTO10 ELSEIFP$=CHR$(13)T
HEN132 ELSEIFP$=CHR$(13)
137 HCOLOR0:HPRINT(3,19),STR$(D)
:POKE59078,51:HSCREEN0:WIDTH80:D
=VAL(P$):DRIVED:LOCATE20,0:PRINT
"DIRECTORY OF DRIVE":D:"/":FREE(
D):"FREE GRANULES":H=0:V=3
138 FORI=3TO11:DSKI$D,17,I,A1$,A
2$:FORJ=1TO8:IFJ<5 THENK=(J-1)*3
2ELSEK=(J-5)*32
139 IFJ=5THENA1$=A2$
140 A3$=MID$(A1$,K+1,8)+" "+MID$
(A1$,K+9,3)
141 IFASC(LEFT$(A3$,1))=255THEN1
44ELSEIFASC(LEFT$(A3$,1))=0THEN1
43
142 LOCATEH,V:PRINTA3$,:H=H+17:I
FH>68THENH=0:V=V+1
143 NEXTJ,I
144 LOCATE30,21:PRINT"== PRESS A
NY KEY =="
145 IFINKEY$<>""THENHSCREEN4:POK
E65434,56:HCOLOR1:HPRINT(3,19),P
EEK(2394):POKE59078,141:GOTO10EL
SE145
146 GOSUB130:HCOLOR2:HPRINT(6,22
),"Fundamental....: First
Harmonic: Second Harmon
ic":HPRINT(6,23),"Third Harmon
ic: Fourth Harmonic:"
147 H=23:V=22:GOSUB89:Z=0:LC(0)=
LO:LO$="":H=47:GOSUB89:LC(1)=LO:
LO$="":H=71:GOSUB89:LC(2)=LO:LO$
="":H=23:V=23:GOSUB89:LC(3)=LO:L
O$="":H=47:GOSUB89:LC(4)=LO
148 LO$="":LC=0:FORT=0TO4:LC=LC+
LC(T):NEXT:IFLC<>100 THENGOSUB10
1:GOSUB130:HPRINT(17,23),"SUM OF
PERCENTAGES MUST BE 100 / PRESS
ANY KEY" ELSEGOSUB130:GOTO150
149 IFINKEY$<>""THENHSCREEN4:GOT
O146ELSE149
150 HPRINT(21,23),"CALCULATING N
EW WAVEFORM - PLEASE WAIT":FORI=
0TO4:LC(I)=LC(I)/100:NEXT:FORI=
0TO255:AR=2*3.14159*I/256:SC=LC(
0)*SIN(AR)+LC(1)*SIN(2*AR)+LC(2)
*SIN(3*AR)+LC(3)*SIN(4*AR)+LC(4)
*SIN(5*AR):SC=32+INT(31*SC+.5):P
OKEA1+I,SC
151 GOSUB152:NEXT:GOSUB130:GOSUB
101:GOSUB110:GOTO10

```

```

152 Z=Z+1:IFINT(Z/25)=Z/25THENEX
EC:RETURNELSEReturn
153 DATA NF,SN,RG,OD,FC,OV,OM,UL
,BS,DD,/0,1D,TM,OS,LS,ST,CN,FD,A
O,DN,10,FM,NO,IE,DS,UF,NE,BR,DF,
OB,WP,FN,FS,AE,FO,SE,VF,ER,DS,HR
,HP
154 DATA D,E,F,11,12,14,15,16,18
,19,1B,1C,1D,1F,20,22,23,26,27,2
9,2A,2B,2D,2E,30
155 DATA 31,32,34,35,37,38,38,39
,3B,3B,3C,3C,3E,3E,3E,3F,3F,3F,3
F,3F,3F,3F,3E,3E
156 DATA 3E,3C,3C,3C,3B,3B,39,38,37
,37,35,34,32,31,30,2E,2E,2D,2B,2
A,29,27,26,24,23
157 DATA 22,20,1F,1F,1D,1C,1B,1B
,19,19,18,18,16,16,15,15,15,15,1
5,15,15,15,15,15
158 DATA 15,15,15,16,16,16,18,18
,18,19,19,1A,1A,1B,1B,1B,1C,1C,1
E,1F,1F,20,20,22
159 DATA 22,22,22,22,23,23,23,23
,23,23,23,22,22,22,22,20,20,20,1
F,1F,1D,1D,1C,1C
160 DATA 1B,19,19,18,16,15,15,14
,12,12,11,F,E,E,D,B,B,A,8,8,7,7,
6,6,4,4,3,3,3,1
161 DATA 1,1,1,1,1,0,0,0,0,0,1,1
,1,1,1,1,1,3,3,3,3,4,4,4,4,4,6
,6,6,6,6,6,6,7
162 DATA 7,7,7,7,7,6,6,6,6,6,6
,6,6,6,4,4,4,4,4,4,4,4,4,3,3,3
,4,4,4,4,4,4,6,6
163 DATA 6,7,7,7,8,A,A,B,D,0,0,1
,37,1,4A,1,5E,1,72,1,88,1,A0,1,B
9,1,D3,1,EE,2,0C
164 DATA 2,2B,2,4C,2,6F,2,94,2,B
B,2,E4,3,10,3,3F,3,71,3,A5,3,DC,
4,17,4,56,4,98,4
165 DATA DD,5,28,5,76,5,C9,6,21,
6,7F,6,E2,7,4A,7,B9,8,2F,8,AC,9,
30,9,8B,A,50,A
166 DATA ED,B,93,C,43,C,FE,D,C4,
E,95,F,73,10,5F,11,58,12,60,13,7
7,14,A0,15,DA,17
167 DATA 26,18,87,19,FC,1B,88,1D
,2B,1E,E7,20,BE,22,B0,24,C0,26,E
F,29,40,28,B4,2E
168 DATA 4D,31,0E,16,0,88,86,4C,
1F,8B,86,3F,B7,FF,23,1A,50,30,8D
,FE,6A,9F,C3,9F
169 DATA C6,9F,C9,9F,CC,30,8D,0,
80,9F,C0,39,9E,C0,A6,80,97,C2,39
,31,8D,FF,50,A6
170 DATA 80,EE,A6,DF,CF,A6,80,EE
,A6,DF,D1,A6,80,EE,A6,DF,D3,A6,8
0,EE,A6,DF,D5,9F
171 DATA C0,39,10,8E,0,BE,A6,9F,
4C,C3,AB,9F,4C,C6,A9,9F,4C,C9,A9
,9F,4C,CC,87,FF
172 DATA 20,DC,C4,D3,CF,DD,C4,DC
,C7,D3,D1,DD,C7,DC,CA,D3,D3,DD,C
A,DC,CD,D3,D5,DD
173 DATA CD,31,A2,26,6,A,C2,27,C
,20,C7,A6,80,20,0,20,0,20,0,20,C
1,39,17,FF,75,8D
174 DATA 91,81,0,26,4,4F,1F,88,3
9,8D,8E,8D,AB,20,F0,8E,4F,22,4F,
A7,80,8C,7F,F1
175 DATA 26,F9,39,BD,B3,ED,1F,02
,A6,A2,A7,25,10,BC,4C,A8,26,F6,C
E,00,00,86,80
176 DATA A7,A0,EF,A1,EF,A4,39,BD
,B3,ED,1F,02,A6,25,A7,A0,10,BC,4
C,BD,26,F6,39

```



In your face Graphics!



Show 'em where you stand with your own
customized T-shirts, sweat shirts, underwear, caps, jackets...
just about anything!

New MAXWEAR patented process allows transfer of anything you print. Create your own artwork with CoCo Max (or any other graphics program)...print it with any dot matrix printer...add colors with crayons or markers...transfer on item with an iron.

Call 1-800-221-0916
1-203-656-1806

Special introductory offer
...enough for eight T-shirts, etc...
Only \$19.95!

*A portion from each order to be
donated to the U.S.
Marine Corps
Scholarship Fund.*

\$19.95
YOU CAN'T
MISS

COLORWARE

242 West Ave.
Darien, CT 06820

How to order: Use Visa, Mastercard or M.O. C.O.D. add \$4.00 extra. Purchase Orders subject to credit approval. Connecticut residents add 8% sales tax. Shipping \$4.00 per order, usually UPS ground. UPS 2nd day air \$4.00 extra. Next day service available. Canada: \$6.00 per order (Airmail). Outside U.S. & Canada add 10% of order total.



Bet a little, bet a lot . . .



Easy Come Easy Go!



by
**James
Bush**

Easy Come, Easy Go was inspired by *Card Guppies*, a game I found on a local BBS. Everyone who called loved the game, but it was run on a Tandy 1000. I thought the CoCo Community would enjoy this kind of game. It works similar to the bonus round on the game show *Card Sharks*. While writing *Easy Come, Easy Go*, I got a lot of ideas from a *Solitaire* game that appeared in THE RAINBOW.

After you enter the listing, save it by entering SAVE"EASYGO.BAS:0" (for disk) or CSAVE"EASYGO.BAS" (for tape). When you run the game, you are asked whether or not you want it to use the high-speed poke. You are also asked whether or not you want to see the instructions. After you make these choices, a message appears at the top of the screen telling you the cards are being selected. This takes more time than anything else in this program, but be patient. After this, just press ENTER to start the game.

Rules of Play

Easy Come, Easy Go is easy to play (no pun intended). You see 12 playing cards

drawing used, scientific notation is out. The game won't stop until you go over \$50,000,000 so, if you get up to \$49,999,999 and double it on a bet, you can score as much as \$99,999,998 when you break the bank.

When you first start the game, all the cards are face down, except the first card on the bottom row. You bet on whether you think the next card is higher or lower than the card being shown. For example, if a 7 is showing, you bet on whether the next card is higher or lower. In this case, the odds are 50 percent that the next card is higher and 50 percent that the next card is lower. This would be a perfect time for the Change Card option. When you press C, the card to the left of the row you're working on is turned face up, and it replaces the current card. Following our example, the 7 would be changed to another card, say a 2. Use this change option wisely and sparingly — you have only one Change Card per row.

Since a 2 is showing, you would bet everything that the next card is higher since nothing is lower than 2. (The same goes for the Ace — nothing is higher than the Ace.) Press P to Place your bet, and type in the amount of the bet. At this point, an up arrow and a down arrow are drawn on the screen. If your guess is that the next card is higher, press the up-arrow key. Otherwise press the down-arrow key. Win or lose, the amount of the bet is added or subtracted from your account accordingly.

If you enter the wrong amount for a bet, press the left arrow and the screen will be

drawn on the screen along with three "change" cards. The 12 playing cards are arranged into three rows with six cards on the bottom row, four cards in the middle, and two cards on top. A change card appears to the left of each row. The change card can replace your current card on the playing board, should you choose to do so. Under the playing board you see the options: C for Change Card and P for Place Bet. Printed under these options is the amount of money you have in your account. You always start with \$20, and your objective is to break the bank. I set the bank limit at \$50,000,000 because of BASIC. Fifty million is eight digits long. If you work with numbers larger than that on the CoCo, you end up with lots of scientific notation. Because of the string manipulations and

James Bush, an electronics technician, has had a CoCo system for about five years and is president of his local Color Computer Club. His non-computer hobbies include working on high-performance cars. He can be contacted at 1545 Ferris Rd., Apt. C-3, Columbus, OH 43224.

redrawn. Then you can re-enter your bet. If you bet more than you have in your account (this is known as cheating), the bet is not acknowledged by the computer. One last thing about placing bets: If you are on the top row with only two cards, the first is turned up and the second is turned down, it is the final bet of the game. Since it is sort of like the grand finale, you must bet at least half of your account or the CoCo won't acknowledge your bet.

If you bet everything and lose, you are bankrupt and the game is over. You have the option of quitting or starting a new game.

If you draw a Joker, you are forced into bankruptcy and have the same options of starting a new game or quitting. If you break the bank you are rewarded with a nice song and celebration.

About the Program

Writing *Easy Come, Easy Go* was just like making the rules for a card game. (There are so many IF/THEN statements, I don't care if I ever see one again!) The first thing the program does is select the cards. This is done by arranging an array with 53 elements (52 cards, plus a Joker). As a novice programmer, I made what I think is an astonishing discovery. I originally used the RND statement to select the cards from the array. This worked fine until I loaded the program a few times and discovered that I was coming up with the same cards in every game. I later found that this is because of the CoCo's internal timer. I put in a lot of commands to throw the timer out of whack and finally succeeded in getting a good approximation of random choices.

After the computer selects a given card for a game, the card is marked so it cannot be chosen again. The computer then checks to see what card you are on and is ready to draw the screen using many DRAW statements. The options are drawn using variables defined near the beginning of the program. You can place a bet or change the card. The cards are compared to see if you guessed right. Program operation is broken down into simple sections and highlighted with REM lines in the listing.

Ending the Game

When you want to quit, do so at one of the menus showing the Quit option. The game operates in the high-speed mode on the CoCo 1 and 2, and normal operation is

resumed when you select Quit. CoCo 3 users should change POKE 65495,0 to POKE 65497,0 in Line 20 and POKE 65494,0 to POKE 65496,0 in lines 25 and 1025. You can exit the game by pressing BREAK at any time, but remember to enter POKE 65494,0 (or POKE 65496,0) before doing any disk or tape I/O.

If you want to play a more challenging game, delete Line 830 and you'll run into the Joker more often. If you want your game to be easier, change the RND(3)s in Line 920 to something like RND(20) and you might never draw a Joker.

32K Extended

25	169	360	176	770	143	1185	191
85	162	425	93	835	201	1215	81
125	15	460	154	875	223	1245	100
150	67	510	159	930	73	1275	63
165	119	555	132	975	45	1305	196
185	39	590	205	1015	51	1335	81
215	183	620	176	1055	81	1365	110
245	247	640	230	1085	246	1395	127
275	176	685	67	1135	47	END	174
310	121	725	48	1170	182		

The Listing: EASYGO

```

1 'EASY COME EASY GO
2 'WRITTEN BY JAMES BUSH
3 'COPYRIGHT (C) APRIL 1991
4 'BY FALSOFT, INC.
5 'RAINBOW MAGAZINE
10 CLS:PRINT" easy come / e
asy go":PRINT:PRINT:PRINT"A GAME
OF WINNING AND LOSING. (WHAT
ELSE DO YOU DO IN GAMES?":PRINT
:PRINT:PRINT"HIGH SPEED POKE (Y/
N)?"
15 G$=INKEY$
20 IFG$="Y" THEN POKE65495,0:GOT
0 35
25 IFG$="N" THEN POKE65494,0:GOT
0 35
30 GOTO 15
35 PRINT@480,"DO YOU WANT INSTRU
CTIONS (Y/N)?"
40 G$=INKEY$
45 IFG$="Y" THEN 1180
50 IFG$="N" THEN 60
55 GOTO 40
60 CLS:CLEAR2000:M=20:JJ=100
65 DIMN$(15),T$(2),L$(28),F$(8),
A$(15),B$(15),A(15),D(53),E(8),H
$(8)
70 GOSUB150
75 FORI=1TO15:A(I)=0:NEXTI:I=S=0
80 GOSUB 785
85 PRINT@480,"PRESS <ENTER> TO S
TART GAME":
90 G$=INKEY$
95 IFG$=CHR$(13) THEN 105
100 GOTO 90
105 GOSUB935
110 GOTO200
115 DRAW"BM24,136:XL$(27)":DRAW
"BM27,136:XL$(3)":DRAW"BM34,136
:XL$(28)":DRAW"BM42,136:XL$(8)":
DRAW"BM49,136:XL$(1)":DRAW"BM
56,136:XL$(14)":DRAW"BM63,136:X
L$(7)":DRAW"BM70,136:XL$(5)":
120 DRAW"BM84,136:XL$(3)":DRAW"
BM91,136:XL$(1)":DRAW"BM98,136:
XL$(18)":DRAW"BM105,136:XL$(4)":
"
125 DRAW"BM24,148:XL$(27)":DRAW
"BM27,148:XL$(16)":DRAW"BM34,14
8:XL$(28)":DRAW"BM42,148:XL$(12
)":DRAW"BM49,148:XL$(1)":DRAW"
BM56,148:XL$(3)":DRAW"BM63,148:
XL$(5)":
130 DRAW"BM77,148:XL$(2)":DRAW"
BM84,148:XL$(5)":DRAW"BM93,148:
XL$(20)":
135 DRAW"BM27,188:XL$(5)":DRAW"
BM34,188:XL$(1)":DRAW"BM41,188:
XL$(19)":DRAW"BM49,188:XL$(25)":
DRAW"BM63,188:XL$(3)":DRAW"BM
70,188:XL$(15)":DRAW"BM77,188:X
L$(13)":DRAW"BM84,188:XL$(5)":
140 DRAW"BM98,188:XL$(5)":DRAW"
BM105,188:XL$(1)":DRAW"BM112,18
8:XL$(19)":DRAW"BM120,188:XL$(2
5)":DRAW"BM134,188:XL$(7)":DRA
W"BM141,188:XL$(15)":
145 GOTO305
150 N$(0)="BUU4ER2FD4GL2H":N$(1)
="U4E2F2D2L3R3D2":N$(2)="BU5ER2F
DGL2GD2R4":N$(3)="BR3L2HBU4ER2FD
GLRFDG":N$(4)="BR3U6G3DR4":N$(5)

```

```

="BR3L2HBU5R4L4D2R3FD2G":N$(6)="
BR3L2HU4ER2FBD2BL3R2FDG"
155 N$(7)="BU6R4DG3D2":N$(8)="BR
3L2HUEHUER2FDGL2R2FDG":N$(9)="BU
FR2EU2L3HUER2FD4":N$(10)="R2LU5L
RUBR5R2FD4GL2HU4E":N$(11)="UDR3U
6L2R4":N$(12)="BR1HU4ER2FD4GLBUF
2":N$(13)="U6BR4G3F3":N$(14)="R2
L6DLRBRBDS"
160 N$(15)="U2E1U2E1F1D2F1D2L4R5
E5R1F2L1H1D1G1D1G1L8D3F1D2F1R2E1
U2E1U3"
165 T$(1)="R20F2D30R1U30D30G2E2L
1G2L20D1R20U1L20H2U30E2"
170 T$(2)="R20F2D30R1U30D30G2E2L
1G2L20D1R20U1L21H2U30E2D34R2U34R
2D34R2U34R2D34R2U34R2D34R2U34R2D
34R2U34R2D34E2U30"
175 L$(1)="U4E2F2D2L3R3D2":L$(2)=
"U6R3F1D1G1L3R3F1D1G1L3":L$(3)=
"R3E1G1L3U6R3F1":L$(4)="R2E2G2L2
U6R2F2D2":L$(5)="R4L4U3R3L3U3R4":
L$(6)="U3R3L3U3R4":L$(7)="R3E1U
1L1R1D1G1L3U6R3F1":L$(8)="U6D3R4
U3D6":L$(9)="R4L2U6R2L4":L$(10)=
"U1D1R3U6R2L5"
180 L$(11)="U6D3E3G3F3":L$(12)="
R4L4U6":L$(13)="U6F2E2D6":L$(14)=
"U6D1F4D1U6":L$(15)="U6R4D6L4":
L$(16)="U6R3F1D1G1L3":L$(17)="R2
E1H1F2H1U4H1L2G1D4F1":L$(18)="U6
R3F1D1G1L3F3":L$(19)="R3E1U1H1L2
H1U1E1R2"
185 L$(20)="U6R2L4":L$(21)="U6D6
R4U6":L$(22)="H2U4D4F2E2U4":L$(2
3)="U6D6E2F2U6":L$(24)="U1E2F2D1
U1H4U1D1F2E2U1":L$(25)="U3E2U1D1
G2H2U1":L$(26)="R4L4U1E4U1L4":L$
(27)="H3E3":L$(28)="E3H3"
190 AA$="T403L8DP32DP32DL4.GL4.B
L8DP32DP32DL4.GL2.BP32":AB$="L4G
P32L8GF#P32F#P32EP32EL2.DP32":AC
$="L8DP32DP32DL4.F#L4AP32L8DP32D
P32DL4.F#L2.AP32":AD$="O4L4DL8EP
32DP32CP32O3BAL2G"
195 RETURN
200 PMODE4,1:COLOR0,1:PCLS(1):SC
REEN1,1
205 IF A(13)=0 THEN DRAW"BM4,0;X
T$(2);" ELSE DRAW"BM2,0;XT$(1);"
:DRAW"BM7,20;XA$(13);"
210 IF A(11)=0 THEN DRAW"BM126,0
;XT$(2);" ELSE DRAW"BM125,0;XT$(
1);":DRAW"BM130,20;XA$(11);"
215 IF A(12)=0 THEN DRAW"BM162,0
;XT$(2);" ELSE DRAW"BM160,0;XT$(
1);":DRAW"BM165,20;XA$(12);"
220 IF A(14)=0 THEN DRAW"BM4,44;
XT$(2);" ELSE DRAW"BM2,44;XT$(1)
:":DRAW"BM7,64;XA$(14);"
225 IF A(7)=0 THEN DRAW"BM90,44;
XT$(2);" ELSE DRAW"BM90,44;XT$(1)
:":DRAW"BM95,64;XA$(7);"
230 IF A(8)=0 THEN DRAW"BM126,44
;XT$(2);" ELSE DRAW"BM125,44;XT$(
1);":DRAW"BM130,64;XA$(8);"
235 IF A(9)=0 THEN DRAW"BM162,44
;XT$(2);" ELSE DRAW"BM160,44;XT$(
1);":DRAW"BM165,64;XA$(9);"
240 IF A(10)=0 THEN DRAW"BM196,4
4;XT$(2);" ELSE DRAW"BM195,44;XT
$(1);":DRAW"BM200,64;XA$(10);"
245 IF A(15)=0 THEN DRAW"BM4,88;
XT$(2);" ELSE DRAW"BM2,88;XT$(1)
:":DRAW"BM7,108;XA$(15);"
250 IF A(1)=0 THEN DRAW"BM55,88;
XT$(2);" ELSE DRAW"BM55,88;XT$(1
);":DRAW"BM60,108;XA$(1);"
255 IF A(2)=0 THEN DRAW"BM90,88;
XT$(2);" ELSE DRAW"BM90,88;XT$(1
);":DRAW"BM95,108;XA$(2);"
260 IF A(3)=0 THEN DRAW"BM126,88
;XT$(2);" ELSE DRAW"BM125,88;XT$(
1);":DRAW"BM130,108;XA$(3);"
265 IF A(4)=0 THEN DRAW"BM162,88
;XT$(2);" ELSE DRAW"BM160,88;XT$(
1);":DRAW"BM165,108;XA$(4);"
270 IF A(5)=0 THEN DRAW"BM196,88
;XT$(2);" ELSE DRAW"BM195,88;XT$(
1);":DRAW"BM200,108;XA$(5);"
275 IF A(6)=0 THEN DRAW"BM230,88
;XT$(2);" ELSE DRAW"BM230,88;XT$(
1);":DRAW"BM235,108;XA$(6);"
280 IFA$(N-1)=N$(15) THEN FORX=1
TO1000:NEXTX:JJ=0:GOTO1065
285 IFA(12)>0 THEN FORX=1TO1000
:NEXTX:GOTO1145
290 IFM<1 THEN FORX=1TO1000:NEXT
X:GOTO1065
295 IFM>500000000 THEN FORX=1TO10
00:NEXTX:GOTO995
300 GOTO115
305 REM CHECK ACCOUNT
310 DRAW"BM27,160;XL$(1);":DRAW"
BM34,160;XL$(3);":DRAW"BM41,160;
XL$(3);":DRAW"BM48,160;XL$(15);"
:DRAW"BM55,160;XL$(21);":DRAW"BM
62,160;XL$(14);":DRAW"BM71,160;X
L$(20);":DRAW"BM78,156;R4;":DRAW
"BM78,158;R4;":DRAW"BM87,160;XL$(
19);":DRAW"BM89,161;U8;"
315 DRAW"BM87,160;"
320 U=INT(M)
325 FORV=1TO8
330 U=U*.1
335 IF U < 1 THEN 345
340 NEXTV
345 FORW=1TO(8-V):F$(W)=N$(0):NE
XTW
350 IFV=3 THEN VV=6 ELSE IF V=4
THEN VV=5 ELSE IF V=5 THEN VV=4
ELSE IF V=6 THEN VV=3 ELSE IF V=
7 THEN VV=2 ELSE IF V=8 THEN VV=
1 ELSE IF V=2 THEN VV=7 ELSE IF
V=1 THEN VV=8
355 FOR W = VV TO 8 STEP1:U=U*10
360 Z=FIX(U)
365 IFZ=0 THEN F$(W)=N$(0)
370 IFZ=1 THEN F$(W)=N$(14)
375 IFZ=2 THEN F$(W)=N$(2)
380 IFZ=3 THEN F$(W)=N$(3)
385 IFZ=4 THEN F$(W)=N$(4)
390 IFZ=5 THEN F$(W)=N$(5)
395 IFZ=6 THEN F$(W)=N$(6)
400 IFZ=7 THEN F$(W)=N$(7)
405 IFZ=8 THEN F$(W)=N$(8)
410 IFZ=9 THEN F$(W)=N$(9)
415 U=U-Z
420 NEXTW
425 DRAW"BM95,160;XF$(1);":DRAW"
BM103,160;XF$(2);":DRAW"BM111,16
0;XF$(3);":DRAW"BM119,160;XF$(4)
:":DRAW"BM127,160;XF$(5);":DRAW"
BM135,160;XF$(6);":DRAW"BM143,16
0;XF$(7);":DRAW"BM151,160;XF$(8)
;"
430 *REM WAIT FOR INPUT
435 H$=INKEY$
440 IFH$="C" OR H$="c" THEN SOUN
D200,1:GOTO1035
445 IFH$="P" OR H$="p" THEN SOUN
D200,1:GOTO455
450 GOTO435
455 DRAW"BM27,172;XL$(8);":DRAW"
BM34,172;XL$(15);":DRAW"BM41,172
;XL$(23);":DRAW"BM55,172;XL$(13)
;":DRAW"BM62,172;XL$(21);":DRAW"
BM69,172;XL$(3);":DRAW"BM76,172;
XL$(8);":DRAW"BM87,172;XL$(19);"
:DRAW"BM89,173;U8;"
460 FORX=1 TO 8:H$(X)=N$(0):E(X)
=0:NEXTX
465 P=0
470 FORJ=1TO8
475 G$=INKEY$
480 IFG$="0" THEN E(J)=0:H$(J)=N
$(0):SOUND150,1:GOTO740
485 IFG$="1" THEN E(J)=1:H$(J)=N
$(14):SOUND150,1:GOTO740
490 IFG$="2" THEN E(J)=2:H$(J)=N
$(2):SOUND150,1:GOTO740
495 IFG$="3" THEN E(J)=3:H$(J)=N
$(3):SOUND150,1:GOTO740
500 IFG$="4" THEN E(J)=4:H$(J)=N
$(4):SOUND150,1:GOTO740
505 IFG$="5" THEN E(J)=5:H$(J)=N
$(5):SOUND150,1:GOTO740
510 IFG$="6" THEN E(J)=6:H$(J)=N
$(6):SOUND150,1:GOTO740
515 IFG$="7" THEN E(J)=7:H$(J)=N
$(7):SOUND150,1:GOTO740
520 IFG$="8" THEN E(J)=8:H$(J)=N
$(8):SOUND150,1:GOTO740
525 IFG$="9" THEN E(J)=9:H$(J)=N
$(9):SOUND150,1:GOTO740
530 IFG$=CHR$(13) THEN 555
535 IFG$=CHR$(8) AND J=1=0 THEN
SOUND 75,1:GOTO475
540 IFG$=CHR$(8) AND J=1>0 THEN
SOUND75,1:GOTO105
545 GOTO 475
550 NEXTJ
555 SOUND50,1:P=(E(1)*(10^7))+E
(2)*(10^6))+E(3)*(10^5))+E(4)*
(10^4))+E(5)*(10^3))+E(6)*(10^
2))+E(7)*(10^1))+E(8)*(10^0))
560 IFJ=1=0 THEN 470
565 IFJ=1=1 THEN P=P*.0000001 EL
SE IFJ=1=2 THEN P=P*.000001 ELSE
IF J=1=3 THEN P=P*.00001 ELSE I
F J=1=4 THEN P=P*.0001 ELSE IF J
=1=5 THEN P=P*.001 ELSE IF J=1=6
THEN P=P*.01 ELSE IF J=1=7 THEN
P=P*.1 ELSE IF J=1=8 THEN P=P
570 P=P+.1:P=INT(P)
575 IF P>M THEN 105
580 IFB$(11)>T$(2) AND A(11)>0
AND P<(M/2) THEN 105
585 *REM GUESS HIGH OR LOW
590 DRAW"BM170,160;U7G3E3F3;":DR
AW"BM170,165;D7H3F3E3;":DRAW"BM1
71,161;U7G3E3F3;":DRAW"BM171,166
;D7H3F3E3;"
595 G$=INKEY$
600 IFG$=CHR$(94) THEN L=1:SOUND
175,1:DRAW"BM179,160;XL$(8);":DR
AW"BM186,160;XL$(9);":DRAW"BM193
,160;XL$(7);":DRAW"BM200,160;XL$(
8);":DRAW"BM207,160;XL$(5);":DR
AW"BM214,160;XL$(18);":GOTO615
605 IFG$=CHR$(10) THEN L=0:SOUND
175,1:DRAW"BM179,172;XL$(12);":D
RAW"BM186,172;XL$(15);":DRAW"BM1
93,172;XL$(23);":DRAW"BM200,172;
XL$(5);":DRAW"BM207,172;XL$(18);
":GOTO615
610 GOTO 595
615 *REM FIND VALUE OF CARDS
620 FORX=1TO500:NEXTX
625 IFA$(N)=N$(1) THEN JJ=14 ELS
E IF A$(N)=N$(13) THEN JJ=13 ELS

```

```

E IF A$(N)=N$(12) THEN JJ=12 ELS
E IF A$(N)=N$(11) THEN JJ=11 ELS
E IF A$(N)=N$(10) THEN JJ=10 ELS
E IF A$(N)=N$(9) THEN JJ=9 ELSE
IF A$(N)=N$(8) THEN JJ=8 ELSE IF
A$(N)=N$(7) THEN JJ=7
630 IF A$(N)=N$(6) THEN JJ=6 ELSE
IF A$(N)=N$(5) THEN JJ=5 ELSE I
F A$(N)=N$(4) THEN JJ=4 ELSE IF
A$(N)=N$(3) THEN JJ=3 ELSE IF A$
(N)=N$(2) THEN JJ=2
635 IF A$(N)=N$(15) THEN JJ=0
640 IF A$(N-1)=N$(1) THEN KK=14 E
LSE IF A$(N-1)=N$(13) THEN KK=13
ELSE IF A$(N-1)=N$(12) THEN KK=12
ELSE IF A$(N-1)=N$(11) THEN KK=1
1 ELSE IF A$(N-1)=N$(10) THEN KK=
10 ELSE IF A$(N-1)=N$(9) THEN KK=
9 ELSE IF A$(N-1)=N$(8) THEN KK=
8
645 IF A$(N-1)=N$(7) THEN KK=7 EL
SE IF A$(N-1)=N$(6) THEN KK=6 ELS
E IF A$(N-1)=N$(5) THEN KK=5 ELS
E IF A$(N-1)=N$(4) THEN KK=4 ELS
E IF A$(N-1)=N$(3) THEN KK=3 ELS
E IF A$(N-1)=N$(2) THEN KK=2
650 *REM DETERMINE HIGHER OR LOW
ER
655 IFL=1 AND JJ>KK THEN 685
660 IFL=0 AND JJ<KK THEN 685
665 IFL=1 AND JJ<KK THEN 700
670 IFL=0 AND JJ>KK THEN 700
675 IF JJ=0 THEN 700
680 IF JJ=KK THEN 720
685 DRAW"BM179,188;XL$(23);":DRA
W"BM186,188;XL$(9);":DRAW"BM193,
188;XL$(14);":DRAW"BM200,188;XL$
(14);":DRAW"BM207,188;XL$(5);":D
RAW"BM214,188;XL$(18);"
690 SOUND225,2:M=M+P:A(N)=1:FORX
=1TO750:NEXTX
695 GOTO105
700 DRAW"BM179,188;XL$(12);":DRA
W"BM186,188;XL$(15);":DRAW"BM193
,188;XL$(19);":DRAW"BM200,188;XL
$(5);":DRAW"BM207,188;XL$(18);"
705 SOUND225,2:M=M+P:A(N)=1:FORX
=1TO750:NEXTX
710 IF JJ=0 THEN M=0
715 GOTO105
720 DRAW"BM179,188;XL$(5);":DRA
W"BM186,188;XL$(17);":DRAW"BM193,
188;XL$(21);":DRAW"BM200,188;XL$
(1);":DRAW"BM207,188;XL$(12);"
725 SOUND225,1:FORX=1TO75:NEXTX:
SOUND225,1:A(N)=1
730 FORX=1TO750:NEXTX
735 GOTO105
740 IFJ=1 THEN DRAW"BM95,172;XH$
(1);"
745 IFJ=2 THEN DRAW"BM103,172;XH
$(2);"
750 IFJ=3 THEN DRAW"BM111,172;XH
$(3);"
755 IFJ=4 THEN DRAW"BM119,172;XH
$(4);"
760 IFJ=5 THEN DRAW"BM127,172;XH
$(5);"
765 IFJ=6 THEN DRAW"BM135,172;XH
$(6);"
770 IFJ=7 THEN DRAW"BM143,172;XH
$(7);"
775 IFJ=8 THEN DRAW"BM151,172;XH
$(8);"
780 GOTO 550
785 *REM SELECT CARDS
790 CLS:PRINT@0,"*****SELECTI

```

```

NG CARDS*****";
795 FORX=1TO53:D(X)=X:NEXTX
800 FORI=1TO15
805 F=RND(100):FORX=1TOF:NEXTX:G
=RND(-TIMER):H=(G*100)
810 X=INT(H)
815 IFX>53 THEN 805
820 IFD(X)=0 THEN 805
825 IFX<1 THEN 805
830 IFX=53 THEN 920
835 IFX=53 THEN A$(I)=N$(15)
840 IFX=2 OR X=15 OR X=28 OR X=4
1 THEN A$(I)=N$(3)
845 IFX=3 OR X=16 OR X=29 OR X=4
2 THEN A$(I)=N$(4)
850 IFX=4 OR X=17 OR X=30 OR X=4
3 THEN A$(I)=N$(5)
855 IFX=5 OR X=18 OR X=31 OR X=4
4 THEN A$(I)=N$(6)
860 IFX=6 OR X=19 OR X=32 OR X=4
5 THEN A$(I)=N$(7)
865 IFX=7 OR X=20 OR X=33 OR X=4
6 THEN A$(I)=N$(8)
870 IFX=8 OR X=21 OR X=34 OR X=4
7 THEN A$(I)=N$(9)
875 IFX=9 OR X=22 OR X=35 OR X=4
8 THEN A$(I)=N$(10)
880 IFX=10 OR X=23 OR X=36 OR X=
49 THEN A$(I)=N$(11)
885 IFX=11 OR X=24 OR X=37 OR X=
50 THEN A$(I)=N$(12)
890 IFX=12 OR X=25 OR X=38 OR X=
51 THEN A$(I)=N$(13)
895 IFX=13 OR X=26 OR X=39 OR X=
52 THEN A$(I)=N$(1)
900 IFX=14 OR X=27 OR X=40 OR X=
1 THEN A$(I)=N$(2)
905 D(X)=0
910 NEXTI
915 RETURN
920 J=RND(3):K=RND(3)
925 IFJ=K THEN 835
930 GOTO 810
935 *REM CHECK FOR CURRENT CARD
940 IFS=0 THEN A(1)=1:S=1
945 IFA(1)<>0 AND A(2)=0 THEN N=
2
950 IFA(2)<>0 AND A(3)=0 THEN N=
3
955 IFA(3)<>0 AND A(4)=0 THEN N=
4
960 IFA(4)<>0 AND A(5)=0 THEN N=
5
965 IFA(5)<>0 AND A(6)=0 THEN N=
6
970 IFA(6)<>0 AND A(7)=0 THEN A$
(7)=A$(6):N=8:A(7)=1
975 IFA(8)<>0 AND A(9)=0 THEN N=
9
980 IFA(9)<>0 AND A(10)=0 THEN N
=10
985 IFA(10)<>0 AND A(11)=0 THEN
A$(11)=A$(10):N=12:A(11)=1
990 RETURN
995 CLS:PRINT@0,"*****CONGRAT
ULATIONS!*****";
1000 PRINT@64,"YOU HAVE BROKEN T
HE BANK WHICH IS CURRENTLY SET
AT $50,000,000 DOLLARS. DON'T YO
U WISH IT WAS REAL MONEY!"
1005 PLAYAAS+AB$:PLAYACS+AD$
1010 PRINT@256,"END OF GAME OPTI
ONS: <1> START NEW GA
ME <2> QUIT";
1015 G$=INKEY$
1020 IFG$="1" THEN RUN
1025 IFG$="2" THEN CLS:PRINT"THA

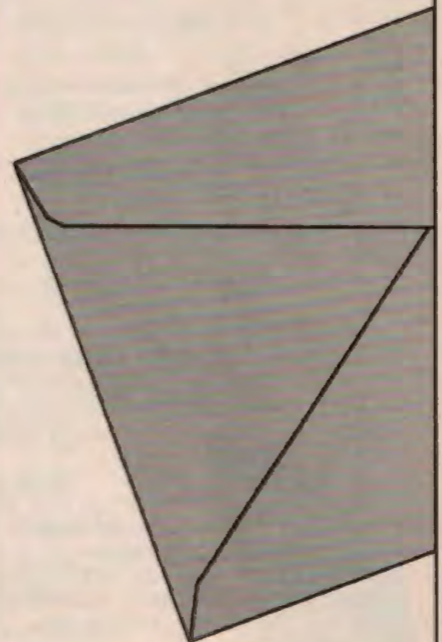
```

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. Send your correspondence to our editorial offices at Falsoft, Inc., The Falsoft Building, P.O. Box 385, Prospect, KY 40059.



```

NKS FOR PLAYING 'EA
SY COME / EASY GO'!:POKE65494,0
:END
1030 GOTO 1015
1035 'REM CHANGE CARD
1040 IFN<=6 AND A(15)=0 THEN A(1
5)-1:A$(N-1)-A$(15):GOTO105
1045 IFN>=7 AND N<=10 AND A(14)=
0 THEN A(14)-1:A$(N-1)-A$(14):GO
T0105
1050 IFN>11 AND A(13)=0 THEN A(1
3)-1:A$(N-1)-A$(13):GOTO105
1055 DRAW"BM10,184;XL$(14):" :DRA
W"BM17,184;XL$(15):"
1060 GOTO435
1065 CLS:IFJJ<>0 THEN PRINT"DUE
TO CARELESS BETTING AND THE HOPE
S THAT THE CARDS WOULD PLAY IN Y
OUR FAVOR, YOU HAVE GONE":M=0
1070 IFJJ=0 THEN PRINT"DUE TO UN
FORSEEN MYSTICISM IN THE CARDS
YOU DREW, THE JOKER HIMSELF H
AS FORCED YOU":M=0
1075 FORR=96 TO 416 STEP 32:G=R/
2: SOUNDG,1
1080 PRINT@R,"*****bankrup
t*****";
1085 FORX=1T050:NEXTX:PRINT@R,"
:
1090 NEXTR
1095 FORR=416 TO 96 STEP-32:G=R/
2:PRINT@R,"
":FORX=1T025:NEXTX
1100 PRINT@R,"*****bankrup
t*****";
1105 SOUNDG,1
1110 NEXTR
1115 PRINT@448,"PRESS <E> TO END
OR"
1120 PRINT@480,"PRESS <ENTER> TO
START NEW GAME";
1125 G$=INKEY$
1130 IFG$=CHR$(13) THEN 60
1135 IFG$="E" THEN CLS:PRINT"THA
NKS FOR PLAYING 'EA
SY COME / EASY GO'!:POKE65494,0
:END
1140 GOTO 1125
1145 CLS:PRINT@0,"*****GAM
E OVER*****";:PRINT@128,"
END OF GAME OPTIONS:
<1> CONTINUE ON WITH NEXT GAME
<2> START NEW GAME
<3> QUIT";
1150 PRINT@64,"YOU FINISHED WITH
$M";
1155 G$=INKEY$
1160 IFG$="1" THEN 75
1165 IFG$="2" THEN 60
1170 IFG$="3" THEN CLS:PRINT"THA
NKS FOR PLAYING 'EA
SY COME / EASY GO'!:POKE65494,0
:END
1175 GOTO 1155
1180 CLS:PRINT"
instructions *****in the be
ginning*****YOU START WITH A
GAME BOARD OF 12 CARDS PLUS 3 '
CHANGE CARDS'. THE 12 CARDS ARE
ARRANGED WITH 6 CARDS ON THE BO
TTOM ROW, 4 IN THE MIDDLE ROW, A
ND 2 ON THE"
1185 PRINT"TOP ROW. THERE IS 1 C
HANGE CARD SET OFF TO THE LEFT O
F EACH ROW.WHEN THE GAME IS FIRS
T STARTED, THE FIRST CARD ON THE

```

```

BOTTOM ROWIS TURNED FACE-UP SO
AS TO SHOW THE VALUE OF IT. YOU
START WITH $20 AND ARE TRYING TO
BREAK THE BANK."
1190 PRINT@480,"PRESS <ENTER> TO
CONTINUE";
1195 G$=INKEY$
1200 IF G$=CHR$(13) THEN 1210
1205 GOTO 1195
1210 CLS:PRINT"
instructions *****play op
tions*****AFTER THE GAME IS
STARTED YOU HAVE THESE OPTION
S:
<C>-CHANG
E CARD THIS OPTION ALLOW
S YOU TO USE THE 'CHANGE CARD'
FOR YOUR ROW."
1215 PRINT"YOU MAY USE THIS OPTI
ON ONLY ONETIME PER ROW, SO USE
IT WISELY. YOU WOULD USE THIS OP
TION IF THECURRENT CARD IS NOT A
VERY SAFE BET. FOR EXAMPLE, IF
YOUR CARD WAS A 7, ODDS ON THE
NEXT CARD ARE 50% HIGHER AND 50
% LOWER. CHANGE THAT CARD!"
1220 PRINT@480,"PRESS <ENTER> TO
CONTINUE";
1225 G$=INKEY$
1230 IFG$=CHR$(13) THEN 1240
1235 GOTO 1225
1240 CLS:PRINT"
instructions *****play op
tions***** <P>-PLAC
E BET WHEN YOU GET A FA
IRLY SAFE CARD TO BET ON, USE TH
IS OPTION. IF YOU HAVE A BAD CA
RD AND HAVE ALREADY USED YOUR
CHANGE OPTION"
1245 PRINT"THEN YOU MUST MAKE A
BET ANYWAY,BUT JUST MAKE A SMALL
ONE TO BE SAFE. IF YOU GET A 2
THEN BET EVERYTHING YOU HAVE B
ECAUSE THE NEXT CARD CANNOT BE L
OWER THAN 2. DITTO FOR THE ACE.
NO CARD ISHIGHER THAN THE ACE."
1250 PRINT@480,"PRESS <ENTER> TO
CONTINUE";
1255 G$=INKEY$
1260 IFG$=CHR$(13) THEN 1270
1265 GOTO 1255
1270 CLS:PRINT"
instructions *****play op
tions*****IF YOU MAKE A MIS
TAKE IN PLACINGYOUR BET, HIT THE
BACKSPACE KEY AND THE SCREEN WI
LL BE REDRAWN AND YOU CAN PLACE
THE BET ALL OVER AGAIN. AS YO
U TYPE IN YOUR"
1275 PRINT"BET, YOU WILL HEAR A
BEEP TO LETYOU KNOW THE NUMBER H
AS BEEN ACKNOWLEDGED. HIT <EN
TER> AFTER YOU KEY IN THE LAST D
IGIT OF THEBET. IF YOUR BET IS 8
DIGITS, YOU DON'T HAVE TO HIT
ENTER."
1280 PRINT@480,"PRESS <ENTER> TO
CONTINUE";
1285 G$=INKEY$
1290 IFG$=CHR$(13) THEN 1300
1295 GOTO 1285
1300 CLS:PRINT"
instructions *****play op
tions*****AFTER YOUR BET IS
PLACED, YOU NEED TO TELL THE
COMPUTER IF YOUTHINK THE NEXT CA
RD WILL BE HIGHER OR LOWER I
N VALUE. THIS IS DONE USING THE

```

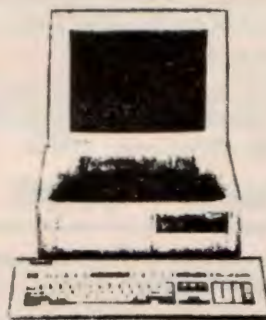
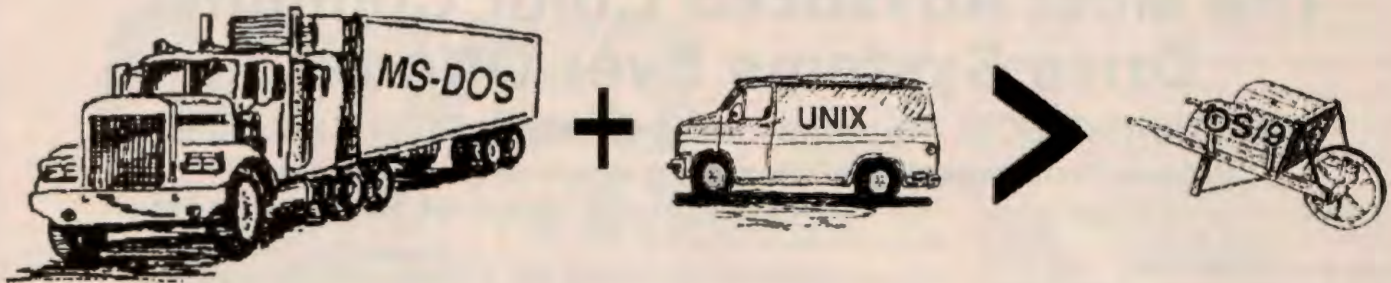
```

UP AND DOWN"
1305 PRINT"ARROW KEYS, RESPECTIV
ELY. IF YOUHIT THE UP ARROW KEY,
THE WORD 'HIGHER' WILL BE DISP
LAYED ON THE SCREEN. HIT THE D
OWN ARROW KEY AND THE WORD 'LOW
ER' WILL BEDISPLAYED. A FEW SECO
NDS LATER 'WINNER' OR 'LOSER' W
ILL BE DIS-PLAYED."
1310 PRINT@480,"PRESS <ENTER> TO
CONTINUE";
1315 G$=INKEY$
1320 IFG$=CHR$(13) THEN 1330
1325 GOTO 1315
1330 CLS:PRINT"
instructions *****play op
tions*****IF YOU LOST THE B
ET. THE MONEY WILL BE DEDUCTED
FROM YOUR ACCOUNT. LIKewise
IF YOU WIN THEBET, THE MONEY WI
LL BE ADDED TO YOUR ACCOUNT. NOW
FOR THE SCARY"
1335 PRINT"PART, ON THE TOP ROW
THERE ARE ONLY TWO CARDS, MEANI
NG ONLY ONEBET FOR THIS ROW. YOU
MUST BET AT LEAST HALF OF YOUR
ACCOUNT OR THE BET WON'T BE A
CKNOWLEDGEDAT ALL. THIS MAKES FO
R A QUICK WAY TO WIN ALOT OR LO
SE ALOT."
1340 PRINT@480,"PRESS <ENTER> TO
CONTINUE";
1345 G$=INKEY$
1350 IFG$=CHR$(13) THEN 1360
1355 GOTO 1345
1360 CLS:PRINT"
instructions *****play op
tions*****THUS THE NAME 'EA
SY COME / EASY GO'! OF COURSE IN
STRIVING TO BREAK THE BANK YO
U WILL HIT MANYDOWNFALLS AND MAY
BE EVEN HIT THEJOKER WHICH MAKES
YOU BANKRUPT"
1365 PRINT"AUTOMATICALLY. IT WIL
L TAKE MANYCONSECUTIVE GAMES TO
BREAK THE BANK BUT IT REALLY CA
N BE DONE! ONCE THE BANK HAS BEE
N BROKEN YOU WILL BE REWARDED
WITH A SONGAND A SARCASTIC REMAR
K ABOUT THEMONEY YOU WON (WISHIN
G IT WAS REAL)."
1370 PRINT@480,"PRESS <ENTER> TO
CONTINUE";
1375 G$=INKEY$
1380 IFG$=CHR$(13) THEN 1390
1385 GOTO 1375
1390 CLS:PRINT"
instructions *****end of game
options*****AT THE END OF EVE
RY GAME YOU AREGIVEN THE OPTION
TO CONTINUE WITH YOUR PRESENT
ACCOUNT, STARTA NEW GAME, OR QU
IT. IF YOU GO BANKRUPT OR HIT T
HE JOKER, YOUR"
1395 PRINT"OPTIONS ARE TO START
A NEW GAME OR TO QUIT. IF YOU BR
EAK THE BANK, YOU WILL GET YO
UR VICTORY SONG AND THE OPTIONS
TO START A NEW GAME OR QUIT. GOO
D LUCK AND HAVE FUN WITH 'EASY C
OME / EASY GO'. BREAK THAT BANK!
"
1400 PRINT@480,"HIT <ENTER> TO G
ET THINGS GOIN'";
1405 G$=INKEY$
1410 IFG$=CHR$(13) THEN 60
1415 GOTO 1405

```


Would You Buy a Car You Couldn't Get Fuel For? Why Buy a Computer You Can't Get Software For?

Many of you are now considering an alternative to the Color Computer to run OS/9. Are you really going to invest in an untried alternative with very limited software? Why not buy a computer that will run a UNIX Compatible (OS/9 like) operating system AND MS-DOS. According to published articles, this combination of industry-standard operating systems would run more than 90% of ALL of the software that has EVER been written. Compare the software bases represented below. We call these systems the OWL ATom.TM Can your alternative to the CoCo be fixed locally? On-site service is available most areas on the ATom.



These highly adaptable computers we call the OWL ATomTM series. They are not newcomers to the computer world, but are the current versions of computers which we have been building for more than 6 years. All systems can be configured with your choice of hard drive, graphics monitor, and 6 different processors. The systems described here are typical of the new versions of our line which offer 2 industry-standard operating systems.

OWL ATomTM ET or SX

For general features of our OWL ATom including expansion capabilities, check out the table below. Comparisons are also given to several TandyTM computers. The resolution of the optional VGA is also given.

Typical system components:

Processor: 80286-12 or 80386SX-16
 Floppy drive: 1.2 or 1.44 Meg
 Memory: 1MB
 Hard Drive: 40 MB, 28 ms.
 Monitor: TTL Monochrome (720X350)

MS-DOS Software:

MS-DOS (with all utilities)
 GWBASIC
 Integrated Software including:
 Desktop Organizer with tracker
 Outliner
 Word Processor

Spelling Checker
 Spreadsheet
 Data Base
 Graphics program
 Communications
UNIX Compatible Software:
 CoherentTM (A UNIX Compatible Operating System)
 C Compiler
 Full Screen Editor
 Line Editor
 Text Formattor
 AWK Language and Yacc
 Standard UNIX utilities
Documentation:
 Over 1500 pages and VHS Tape
One of the best features is the price:

\$1295/\$1495

First year on-site service \$45 (Most areas)
 VGA Color (800X600X256 colors) \$400.
 Call 215-837-1917 for other options

FEATURES	OWL ATom	2500 XL*	1000 TL/2*
Processor (Speed)	80286(12)	80286(10)	80286(8)
Total Slots	8	3	4
16 Bit Slots	6	3	0
Standard Memory	1024K	1024K	640K
Max. on Board RAM	4096K	1024K	768K
Graphics Output	VGA	VGA	CGA
Max. Resolution	1024X768	640X480	640X200
Drive Slots	5	3	3
Hard Drive Interface	Yes(16 Bit)	Yes(16 Bit)	Yes(8 Bit)
Floppy Drive	1.2 or 1.44 Meg	1.44 Meg	720K
Power Supply (Watts)	200	70	67
Warranty (Parts and Labor)	1 Year	1 Year	1 Year

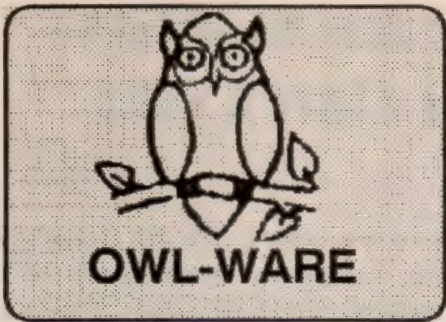
OWL-WARE

P.O. Box 116
 Mertztown, PA
 19539

Call to Order:
 (800)245-6228
 PA and Support:
 (215)837-1917



* Trademarks as follows: Model numbers -Tandy Corporation, MS-DOS- Microsoft, Inc., OS/9 -MicroWare, Inc., UNIX- AT&T, Inc.



Proven

On the Razor's Edge of

The New Frontier:

The Most Advanced Color Computer Drive Systems Ever Offered!

Fast No-Halt SCSI Floppies Using Optional SCSI Controller
Proven Performance for Demanding Home or Business Users

This is the most advanced, fully assembled CoCo hard drive system offered. Using the optional OMTI 5200 SCSI controller with our Hard Drive Interface, our new system will support no-halt floppy drives. You need not wait while typing or worry about clock time losses. Why be limited to 3 floppy drives? A complete system could now consist of 1-3 standard CoCo floppy drives, 1-2 (or more) hard drives, and 1-3 no-halt floppies using standard (not just CoCo) OS/9 format. You can use

single or double-sided 40 or 80 track drives with the SCSI no-halt controller.

There are several new features with this improved interface. These include:

- Full SASI/SCSI compatible (this allows many add-ons to the versatile SCSI buss)
- No-Halt Floppies with optional SCSI controller allows full type-ahead during access
- Low factory-direct prices

- Fast Delivery from factory stock
- Optional Real Time Clock with built in battery (3-10 year lifetime)
- With the Clock you have 240 Bytes of battery backed up RAM for password protection or data storage!
- Same super stable LRTech quality

Interface Price only: **\$85.**

Real Time Clock-RAM: **\$25.**

20 or 30 Meg. 40 Meg. 80 Meg.

System Prices: (Includes Hard Drive, case, & fan, SCSI Controller*, LR/OWL Interface, Software. Fully assembled and tested.)

\$495. \$535. \$875.

Super System Prices: (LR/OWL System as above but OMTI 5200 SCSI Controller AND 3.5" or 5.5" HD 80 Track Floppy in same case)

\$595. \$645. \$1039.(2 cases)

*SCSI controller is OMTI 5100. Add \$75 for OMTI 5200 with FDC.

Introducing the **Quick-Link™** Interface

Provides both a 64K Printer Buffer and Serial and Parallel Interfaces.

Serial to Parallel Printer Interface (64K Buffer) \$65.

Converts serial computer output to parallel printer and also provides a 64K buffer in front of the printer. Serial side Female DB-25 and Parallel side is Centronics. Includes Centronics to Centronics cable and power AC-adaptor. If you need an adaptor from the CoCo 4-pin serial to DB-25 add \$9. From 300-38,400 Baud.

Parallel to Serial Interface (64K Buffer) \$45.

Same as above except it converts Centronics parallel computer output to DB-25 Female serial. Plug into an IBM printer cable to provide output to a serial plotter.

Parallel to Parallel (64K Buffer) \$39.

This is parallel printer buffer with no conversion.

Drive System Parts

Hard Drives

20/30 Meg	ST/PTI	\$229.
40 Meg	PTI	265.
80 Meg	ST4096	590.

SCSI Controllers

OMTI 5100	HD Only	\$79.
OMTI 5200	HD/FD	169.
OMTI 5400	HD/FD/Tape	199.

(Note: We have no drivers for tape yet)

Cases and Cables

Case, 45 Watt PS, Fan	\$105.
Cable set (3 pieces)	25.

Drives have a 1-year limited warranty. Other parts are 90-day warranty. Please Note - At these prices, only very limited support can be given.

Technology

the Color Computer Frontier

DISK DRIVES

Bonus!
Special
Bundled
Software
with any
Disk Drive
Purchase!



Floppy Drive Systems

The Highest Quality for Years of Service

Drive 0 Systems (Half Height, Double Sided,

Direct Drives) **\$189.**

Drive 0 systems complete with drive, controller, legal DOS, cable, case, power supply, and manual

Drive 1 Systems (Half Height, Double Sided,

Direct Drives) **\$115.**

New 3.5", 720K Drives for OS-9 with case

& Power Supply **\$149.**

Drive 1 Systems have drive, case, power supply. (You may require optional cable and/or DOS chip to use)

Special for 0/1 Combos (0,1,2,3) \$259.

SALE Prices on Drives!

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 **Only \$119.**

500, 501, or 502

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 7 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

Fax: 1-215-837-1942

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.)

3 UTILITIES

A copy verify, copy, and DOS utility.

2 GAMES

We will select 2 games from our stock. These are sold for more than \$20 each.

Do not mistake this software with cheap "Public Domain" software which others offer. 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!!**

512K Upgrade

Again at a popular price. Fully assembled and tested before shipping. Easy to install. Uses fast 120 ns. chips.

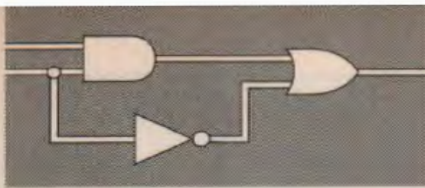
Only \$85.

Now includes **memory test, Ram Disk Lighting, Printer Lighting, and Backup Lighting.** All with an upgraded manual exclusive with OWL!

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**



Making Directories

by Greg Law
Technical Editor

Recently I ran into a problem while installing new software and rearranging my hard drive. This particular problem involved creating dozens of directories, moving hundreds of files to new locations and removing the old directories. Moving the files wasn't much of a problem; `dsave` and `delDir` came to the rescue when I needed to remove the old directories. But simply put, `mkdir` made my job a lot more difficult. I had planned to create directories several levels deep, but `mkdir` can only create one directory at a time. This proved a slow and cumbersome process. After a few moments of debate, I finally decided that it shouldn't be difficult to write a version of `mkdir` to automatically create multiple-level directories. For example, in an attempt to create `/dd/SOURCE/GAMES/SMASH`, the new version of `mkdir` should create `/dd/SOURCE` and `/dd/SOURCE/GAMES`, if necessary, and then create `/dd/SOURCE/GAMES/SMASH`.

The first obstacle was to split the pathlist into its individual components. Since the slash is used to separate each component, a search routine can be used to locate each slash. Rather than reinventing the wheel, I decided to browse through the C compiler manual to see if any of the library functions would help. On pages 4-29 and 4-30, I saw that `index()` returns a pointer to the first occurrence of the specified character in a string and `rindex()` returns a pointer to the

last occurrence of the specified character. Both functions return NULL (or zero) if the character is not found in the string. Before I sat down to write the program, I considered the possible variations to the pathlist. The program must handle *full pathlists* and *relative pathlists*. A full pathlist always starts with the drive name and contains every directory name needed to locate the desired file or directory, such as `/dd/SOURCE/GAMES/SMASH`. A relative pathlist refers to the desired file or directory from the current directory, which might be `SOURCE/GAMES/SMASH`, `GAMES/SMASH`, or `.../SOURCE/GAMES/SMASH`.



Taking this into account made the job a little more complex. Since there are two basic methods of creating the same directory, the program should be written to handle both methods without any side effects. Assume the current directory is the root directory of drive `/dd`. To create the desired directory, the basic pathlist given to `mkdir` can be one of the following:

```
/dd/SOURCE/GAMES/SMASH
.../SOURCE/GAMES/SMASH
SOURCE/GAMES/SMASH
```

Now that we can see the various pathlists next to each other, the differences are a little easier to determine. One of the problems as I see it, is that the program should never attempt to create the root directory. This means the program needs to skip `/dd` and create `/dd/SOURCE` first. Another problem is that the program should never attempt to create an *anonymous directory*.

An anonymous directory is a series of one or more periods that refers to the current or higher-level directories (as in the second pathlist above).

Now that the exceptions have been defined, we can form two rules to handle them. Rule 1: If the pathlist begins with a slash, skip the drive name. Rule 2: If the pathlist begins with a period, skip the anonymous directories. These rules can be applied using two simple `if` statements.

```
if(path[0] == '/')
if(path[0] == '.')
```

These statements compare the first character in the string to a slash and a period, respectively. Now we need to determine what methods can be used to apply these exceptions. In the pathlists above, both the drive name and anonymous directories are separated from the first directory name by a slash. To handle the exceptions, the program needs to skip the first two slashes if the pathlist begins with a slash and the first slash if the pathlist begins with a period. That is, the first directory created should be `/dd/SOURCE` or `.../SOURCE`.

Both exceptions can be handled with one routine. Remember, `index()` returns a pointer to the first occurrence of a specified character in a string. A dummy pointer can be used to point to the second character in the string. The code used for this can be defined as `ptr = path + 1`, where `path` is the original pointer to the string. This allows `index()` to locate the slash immediately preceding the first actual directory name to be created. As viewed through the dummy pointer (`ptr`), both strings are as follows:

```
dd/SOURCE/GAMES/SMASH
.../SOURCE/GAMES/SMASH
```

In addition to being OS-9 Online SIGop, Greg Law enjoys programming on all types of computers and has worked on systems ranging from the CoCo to the Burroughs B6700 super mainframe. He lives in Louisville, Kentucky.

Now `index()` can be used with the dummy pointer to locate the first slash. The address returned can also be assigned to the

The Listing: `makedir.c`

```
#include <modes.h>
#include <stdio.h>
#include <string.h>

main(argc, argv)
int argc;
char *argv[];
{
    char *path;
    char *ptr;
    int i = 0;

    if(argc < 2)
        help(argv[0]);

    while(--argc)
    {
        ptr = path = argv[++i];

        if(path[0] == '/' || path[0] == '.')
            ptr = index(ptr + 1, '/') + 1;

        while((ptr = index(ptr, '/')) != 0)
        {
            *ptr = '\0';
            I_MakDir(path);
            *ptr = '/';
            ptr++;
        }
        I_MakDir(path);
    }

    I_MakDir(path)
char *path;
{
    int status;

    status = mknod(path, 077);

    if(status == -1)
        printf("%-40s -- ERROR %03d\n", path, errno);
    else
        printf("%-40s -- created\n", path);
}

help(name)
char *name;
{
    printf("This utility is used to create multiple directories\n");
    printf("and subdirectories in one pass. It will also create\n");
    printf("all directories specified in a pathlist as required\n");
    printf("\n");
    printf("The syntax for %s is: \n", name);
    printf("    %s pathlist <pathlist> <...>\n", name);

    exit(0);
}
```

```
ptr = path;

if(path[0] == '/' || path[0] == '.')
{
    ptr++;
    ptr = index(ptr, '/');
    ptr++;
}
```

Figure 1a

```
ptr = path;

if(path[0] == '/' || path[0] == '.')
    ptr = index(ptr + 1, '/') + 1;
```

Figure 1b

```
while((ptr = index(ptr, '/')) != NULL)
    ptr++;
```

Figure 2a

```
while((ptr = index(ptr, '/')) != NULL)
{
    *ptr = '\0';
    I_MakDir(path);
    *ptr = '/';
    ptr++;
}
```

Figure 2b

dummy pointer since the original address is no longer needed. The code used to perform this step can be defined as

```
ptr = index(ptr, '/');
```

At this point, both strings are `/SOURCE/GAMES/SMASH`. All that remains is to increment the dummy pointer by one address (`ptr++`) so that it skips this slash. This makes the string `SOURCE/GAMES/SMASH`. Tying all of this together, the exception handler can now be written as shown in Figure 1a.

Remember, the pointer is incremented the first time to skip the initial slash or period. The pointer is incremented the second time to skip the slash preceding the first directory name to be created. Now the initial exception handler can be shortened by rearranging the increments as shown in Figure 1b.



At this point, the program deals with one type of pathlist regardless of the actual pathlist passed on the command line. Remember, `path` is still pointing to the original string. Now a loop can be used to create each of the subdirectories as required. Before continuing any further, we must determine the type of loop used and the conditions of the loop. We know that `index()` returns `NULL` if the specified character isn't found in the string. We also need to increment the dummy pointer at the bottom of the loop so that `index()` finds the next slash. Otherwise, `index()` keeps finding the same slash over and over. With this in mind, a `while` loop can be used as shown in Figure 2a.

Now that the program is stepping through each of the slashes, you need to determine how to separate the components and create the actual directories. One method is to use a string-copy routine. Since `path` always points to the original string and `ptr` points to the current slash, the length of the current pathlist string can be determined by subtracting `path` from `ptr`:

```
length = ptr - path;
strcpy(name, path, length);
```

Although this method works, it is more complex and slower than what I want. Remember, `ptr` always points to the current slash in the pathlist. Also, `C` terminates strings with a `NULL` character. Any ideas? What would happen if the current slash was replaced with a `NULL` character? Since the string is terminated at the current slash, `path` would effectively point to the current pathname and the remainder of the string would be ignored. After stuffing the `NULL` character into the string, the directory could be created. However, the original slash needs to be stuffed back into the string before incrementing `ptr`. Otherwise the program would create the first directory over and over. Now the loop can be built as shown Figure 2b.

Examine the loop and step through it mentally using the pathlist `/dd/SOURCE/GAMES/SMASH`. On entry to the loop, `ptr`

points to `SOURCE/GAMES/SMASH` and `path` points to `/dd/SOURCE/GAMES/SMASH`. When the loop is entered the first time, `ptr` points to `GAMES/SMASH` and `path` points to `/dd/SOURCE`. On the second pass, `ptr` points to `SMASH` and `path` points to `/dd/SOURCE/GAMES`. This brings up an important point. On the third pass through the loop, `index()` returns `NULL` because there are no more slashes in the string and the loop is terminated. This means the last directory isn't created in the loop. But the string pointed to by `path` is restored to its original state so the program can call `I_MakDir(path)` immediately below the loop to create the final directory.

Now that the basic foundation is built, you can focus on the last detail, which is handling multiple pathlists from the command line. On entry to the program, `argc` contains the number of arguments passed on the command line and `argv` is an array of pointers to the command line parameters. The first argument is always the name of the program, so `argv[0]` should be skipped. Therefore, the first loop in the program can be defined as:

```
i = 0;
while(--argc)
{
    path = argv[++i];
    ptr = path;
    .
    .
    .
}
```

Note that pre-increment and pre-decrement operators are used so the values are incremented and decremented *before* being used. Remember, you don't want to use `argv[0]`, so `i` is incremented to a value of 1 before the assignment `path = argv[i]` is executed. Also, since the first argument is not being used, `argc` is decremented before it is compared to non-zero. This keeps `argc` one argument behind and `i` one argument ahead.



The complete program is shown in Listing 1. Last minute additions include the creation of the `I_MakDir()` and `help()` functions as well as the test at the beginning of the program. This test makes sure that at least two arguments are passed on the command line — the name of the program and the pathlist of at least one directory. If less than two arguments are passed, the `help()` function is called to explain how to use the program.

The `I_MakDir()` function calls the `mknod()` function to actually create the directory and checks the status returned from `mknod()`. If `mknod()` created the directory without any errors, the pathlist is printed on the screen followed by the word "created." Otherwise the pathlist is printed on the screen followed by the error code. The program continues creating the directories regardless of the status.

You may want to add additional error checking to the `I_MakDir()` function. If `mknod()` returns an error condition, you can determine which error was detected by examining the contents of `errno`. The most common errors are:

214 — no permission: The program may as well give up and continue with the next pathlist, if any, since it will not be able to create any subdirectories under this one.

215 — bad pathname: This should be treated the same as Error 214. If the current directory name contains an illegal character, all of the subdirectories referenced in this pathlist may as well contain illegal characters.

218 — file already exists: The program should continue since the user may be creating subdirectories under pre-existing directories.

235 — bad name: Same as Error 215.

237 — system memory full: The program should give up totally because the kernel doesn't have enough free memory to perform the operation.

240-249 — device errors: These errors are caused by a physical hardware problem in the drive or a defect in the media. There's nothing the program can do about the error, so it should exit immediately.

250 — device busy: Another process has the drive open in non-sharable mode. Sleep for a while and try again.

252 — record is locked: Another process is updating the directory. Sleep for a while and try again.

253 — non-sharable file busy: Another process has the directory opened in non-sharable mode. Sleep for a while and try again.

You may also want to check the validity of the parameters passed on the command line. An unsuspecting user may be trying to figure out how to use the program by passing wild arguments.

Novices Niche

Music Test

By Perry Friesen

Music Test is a program designed to help budding musicians learn the lines and spaces on the treble and bass clefs. So put away those flashcards and enjoy a colorful Hi-Res display while you learn. *Music Test* first draws a play screen featuring a graphics display of the grand staff (both the treble and bass staves together). The program uses the RND function to select a note. Then it plays that note and displays a quarter note in the appropriate position for the pitch. You must then press the letter on the keyboard that corresponds with the displayed note. The TIMER function limits the response time, which can be changed by modifying Variable TM. If the response is correct, *Music Test* affirms your choice. If the response is not correct, the correct note is displayed.

The Listing: MUSICTST

```

1 *MUSIC TEST
2 *WRITTEN BY PERRY FRIESEN
3 *COPYRIGHT (C) APRIL 1991
4 *BY FALSOFT, INC.
5 *RAINBOW MAGAZINE
10 HBUFF 1,300
20 POKE65497,0
30 A$="C4;BM34,105;D2F2R2E2U5I2
R2F2D4GDGDGDGDGDGDGDGDGDGDGD
2GD4FDFFRFRFR4EREREVEUEU4HUHHL
HL4GLGLGDGD4F
40 B$="C4;BM35,132;LH2U4EVERERER
2FRFRF3DFD6GD2GD2GDGDGDGLDLDL
BU27BRI4RDLUBD10RDLU
50 C$="C7;D2FU4ED5FU7RD7RU7ED8RU
8RD7RU7FD6EU4D4EU30
60 HSCREEN 2:HCLS2:POKE&HFF9A,11
70 A=50:NC=0:TT=10:C=0:TM=300
80 ****DRAW PLAY SCREEN***
90 HCOLOR8:HPRINT(7,0),*** M U S
I C T E S T ***:HCOLOR4
100 FOR I=1T05
110 A=A+10:HLINE(30,A)-(290,A),P
SET
120 NEXT I
130 A=A+10
140 FOR I=1T05
150 A=A+10:HLINE(30,A)-(290,A),P
SET
160 NEXT I
170 HLINE(30,60)-(30,160),PSET:H
LINE(287,60)-(287,160),PSET:HLIN
E(290,60)-(290,160),PSET
180 HDRAW A$+B$:POKE65496,0
190 ****MAIN LOOP***
200 C=C+1:TIMER=0:N=RND(25):V=N*
5+45
210 FORI=1T025
220 READ NN,P$,II$
230 IFNN=N THEN250
240 NEXT I
250 RESTORE:HCOLOR4,2:HLINE(30,1
80)-(290,192),PRESET,BF:HGET(160
,V-30)-(175,V+5),1:HDRAW "BM160,
"+STR$(V)+";"+C$
260 PLAYP$
270 I$=INKEY$:IFTIMER>TM THEN380
ELSEIFI$=""THEN270
280 HCOLOR4:IFI$<"A"ORIS$>"G"THEN
HPRINT(10,24),"That's not a note
!":GOTO390
290 IF I$=II$ THENGOSUB420ELSE38
0
300 HPUT(160,V-30)-(175,V+5),1,P
SET:IFC<>TT THEN200
310 NC$=STR$(NC):NW$=STR$(TT-NC)
:SC$=STR$(NC/TT*100)
320 HCOLOR0:HPRINT(2,2),"Number
correct:"+NC$
330 HPRINT(2,2),"Number wrong:"
+NW$
340 HPRINT(12,4),"Your score:"+S
C$+"%"
350 HPRINT(2,21),"** PRESS <CLEA
R> FOR ANOTHER TEST **"
360 I$=INKEY$:IFI$=""THEN360
370 IFI$=CHR$(12)THEN20ELSEEND
380 HCOLOR4:HPRINT(12,24),"Right
answer is "+II$
390 PLAY"L803FDFD":GOTO300
400 DATA 1,04A,A,2,04G,G,3,04F,F
,4,04E,E,5,04D,D,6,04C,C,7,03B,B
,8,03A,A,9,03G,G,10,03F,F,11,03E
,E,12,03D,D,13,03C,C,14,02B,B,15
,02A,A
410 DATA 16,02G,G,17,02F,F,18,02
E,E,19,02D,D,20,02C,C,21,01B,B,2
2,01A,A,23,01G,G,24,01F,F,25,01E
,E
420 HCOLOR4:HPRINT(12,24),I$+"
s correct":NC=NC+1:PLAY"L1003CEG
04C03G04L4C":RETURN

```





EZ Assembler

by William Barden, Jr.
Contributing Editor

Forget BASIC09, C, and Pascal. The fastest of all computer languages is machine language. Programmers use an assembler program, which allows you to enter assembly-language mnemonics, to compile instructions for the system into the native machine language used by the microprocessor in the computer. In the case of the CoCo, that microprocessor is a 6809, a classic Motorola microprocessor with a terrific instruction repertoire. Assembly language on the CoCo results in code that is hundreds of times faster than interpretive BASIC and dozens of times faster than BASIC09. Of course, there are catches to using this speed. Assembly language is difficult to learn and is a tedious language in which to write programs. Assembly language requires that you write from scratch things that other languages allow you to do automatically, such as processing with floating-point numbers.

There are several assemblers available for the CoCo. One of the best of these is EDTASM+, a cassette or disk-based assembler that combines an editor, assembler, and debugger in one interactive package. Although the disk version is available by special order from Radio Shack, it's hard to get. Other assemblers may be too esoteric for your needs. The OS-9 assembler is a lot more difficult to use. (I always get death threats from the OS-9 crowd after making statements like this.) This brings me to the

Bill Barden has written 35 books and hundreds of magazine articles about small computers. His newest Color Computer project, Connecting the CoCo to the Real World, is a book of CoCo interfacing projects. He has over 20 years experience in the industry on systems ranging from mainframes to micros.

point — *Barden's EZASM*. This is a simple, screen-oriented CoCo 3 assembler that may give you the flavor of what assembly language is all about before you go into it whole hog. *EZASM* uses a powerful subset of all 6809 instructions. This subset should cover 95 percent of your needs. It's also very easy to use, and the mnemonics and codes are generally the standard ones used by Motorola and *EDTASM+*. Along with providing the code, I'll provide instructions about assembly language in general.

Source for the Assembler

So you can get started immediately, let me provide the code. The listing is the complete BASIC program for *EZASM*. The program runs only on a CoCo 3. I considered allowing for the use of the CoCo 1 and 2 for the assembler, but the whole package relies on using several dozen screen lines — something the CoCo 1 and 2 do not

support. The listing is quite long, so be extra careful as you enter it.

If you find the program difficult to enter, I'll be happy to send you a copy. To make it easy on your columnist, send a stamped, self-addressed disk mailer with suitable backing material. Also, include a formatted 35-track standard CoCo disk. Do not include a 200-page listing with several dozen questions to be answered about the listing and the meaning of life. (I set things like this aside, meaning to answer them when I get time, and they're never seen again...). Send to:

William Barden, Jr.
P.O. Box 3568
Mission Viejo, CA 92692

That's all until next month, at which time we'll look at how to use *EZASM* when entering assembly-language programs. □

CoCo 3 Disk

<input checked="" type="checkbox"/>	170 76	1050 13	2010 161	2810 109
	280 200	1140 171	2110 150	2910 11
	380 108	1220 190	2180 103	3000 72
	490 78	1320 217	2250 212	3080 218
	610 3	1420 200	2340 40	3150 237
	690 232	1520 126	2410 232	3220 194
	780 217	1640 94	2470 197	3290 126
	830 91	1720 227	2540 80	3400 229
	870 177	1810 146	2610 118	3480 100
	960 154	1910 94	2690 144	END 192

The Listing: EZASM

```

100 ' COCO INTERACTIVE ASSEMBLER *****
110 ' COPYRIGHT 1990, WILLIAM BARDEN, JR. *
120 ' *****
130 ' DATA D
140 ' ICTIONARY

```


140 *****

 *
 150 'A\$=TEMPORARY VARIABLE
 160 'AA\$=ALLOWABLE ADDRESSING MO
 DES
 170 'AL=1 IF BINARY DATA ON SCRE
 EN
 180 'AM\$=CURRENT ADDRESSING MODE
 CHARACTER CODE
 190 'AM=DECODED ADDRESSING MODE
 200 'CH=1 IF LINE CHANGED
 210 'CP=SCREEN CHARACTER POSITIO
 N, 0 TO 79
 220 'DI=DISPLACEMENT VALUE OF OP
 ERAND
 230 'E1=EA MS BYTE
 240 'E2=EA LS BYTE
 250 'EA=COMPUTED EFFECTIVE ADDRE
 SS
 260 'EB=LAST BINARY DATA LOCATIO
 N
 270 'I=GENERAL WORKING INDEX
 280 'J=GENERAL WORKING INDEX
 290 'L\$(22)=SCREEN LINE ARRAY
 300 'LI=NUMBER OF BYTES IN MACHI
 NE CODE
 310 'LO=CURRENT LOCATION FOR BIN
 ARY
 320 'LR=LAST SOURCE ROW USED
 330 'M1\$=ALL ONE-BYTE OP CODES
 340 'M2\$=ALL TWO OR THREE-BYTE O
 P CODES
 350 'M3\$=ALL THREE OR FOUR-BYTE
 OP CODES

360 'ML\$=CURRENT PARTIAL OP CODE
 STRING
 370 'MM\$=FIRST BYTE OF MACHINE L
 ANGUAGE
 380 'MN=NUMERIC VALUE OF MNEMONI
 C
 390 'MS\$=SECOND BYTE OF MACHINE
 LANGUAGE
 400 'NA=0 IF NO BINARY, 1 IF BIN
 ARY ON SCREEN
 410 'NV=NUMERIC VALUE OF OPERAND
 420 'OB\$=ALL ONE-BYTE MNEMONICS
 430 'OO\$=OBJECT OUTPUT FILE NAME
 440 'PN=PASS NUMBER, 0 OR 1
 450 'PS\$=ALL PSEUDO OPS, MNEMONI
 CS
 460 'RW=SCREEN ROW, 0 TO 22
 470 'S(26)=SYMBOL TABLE
 480 'SA=STARTING ADDRESS FOR ASS
 EMBLED PROGRAM
 490 'SB=FIRST BINARY DATA LOCATI
 ON
 500 'SC=SAVE CHARACTER POSITION
 510 'SG=SIGN OF RELATIVE DISPLAC
 EMENT
 520 'SI\$=SOURCE INPUT FILE NAME
 530 'SO\$=SOURCE OUTPUT FILE NAME
 540 'SR=SAVE ROW
 550 'ST\$=FCC STRING
 560 'SY=CURRENT SYMBOL, WORKING
 570 'T1\$=ALL TWO OR THREE-BYTE M
 NEMONICS, PART ONE
 580 'T2\$=ALL TWO OR THREE-BYTE M
 NEMONICS, PART TWO
 590 'TH\$=ALL THREE OR FOUR BYTE

MNEMONICS
 600 'Y=GENERAL WORKING INDEX
 610 'Z\$=GENERAL WORKING STRING
 620 'ZA\$=TEMPORARY FOR SINGLE CH
 ARACTER
 630 'ZC=CHAR POSITION, WORKING
 640 'ZE=ERROR CODE
 650 'ZS\$=WORKING STRING FOR INDE
 XING CHARACTERS
 660 'ZT\$=OP CODE FOR INDEXING TY
 PE
 670 *****

 *
 680 ' PRELIMI
 NARY - 1
 690 *****

 *
 700 CLEAR 2000,&H7EFF
 710 CLS
 720 PRINT "COCO INTERACTIVE ASSE
 MBLER 1.0"
 730 PRINT "COPYRIGHT 1990, WILLI
 AM BARDEN, JR."
 740 INPUT "SOURCE INPUT FILE:";
 SI\$
 750 INPUT "SOURCE OUTPUT FILE:";
 SO\$
 760 INPUT "OBJECT OUTPUT FILE:";
 OO\$
 770 *****

 *
 780 ' MNEMONI

HARDWARE SPECIALS

- ◆ Magnavox 1CM135 RGB monitor - \$285! (ship \$10 US, 35 CDN)
- ◆ Epson 3.5" bare drive (720k, incl. rails) - \$59! (ship \$5 US, 9 CDN)
- ◆ AMT Star 2400-baud modem - \$95! (ship \$3 US, 6 CDN)
- ◆ Tandy FD-502 disk system (complete) - \$119! (\$8 US, \$20 CDN)
- ◆ Adaptec 4000a SCSI HD controller (for Disto) - \$99! (std. ship)

Now shipping! **CoCoPRO! RS-232 PAK!!**

Designed and produced by Marty Goodman! This serial pak is FULLY compatible with the Howard Medical SLOTPAK-3, and also works perfectly with a Y-cable. NO Multipak needed! This clever conversion of the Tandy DCModem pak brings NEW life to a little-used product. Available as a complete pak, or buy the kit and modify your own DCM pak!

Pak- \$44.95
 Kit- \$26.95

Tandy Flight Simulator II

OS-9 Iv. II flying fun! Req. CoCo-3 \$9.95

512k
 only \$74!

Japan Scenery Disk for above
 Rare supplement from subLOGIC. \$24.95

Home Publisher (OS-9, CC3) - \$12.95

WHERE IN THE WORLD IS CARMEN SANDIEGO?— Award-winning educational adventure game. Includes FREE World Almanac!

Retail \$34.95 **CoCoPRO! \$12.95**

Canada-add 10% addtnl. shipping (\$5 min.)

All prices U.S. funds

VISA/MC add 5%.

GAMER'S SMORGASBORD

Buy two, take 20% off each!

CALADURIL 2 - \$38	OVERLORD - \$29
MINE RESCUE - \$25	BASH! - \$25
KNOCK OUT - \$20	SEVENTH LINK - \$38
CALADURIL - \$20	Z'89 - \$30
SINISTAAR - \$35	WARRIOR KING - \$30
KYUM-GAI (REG. VER.) - \$30	
THOSE DARN MARBLES - \$32	

KYUM-GAI: TO BE NINJA OS-9 VERSION! **\$29.95**
 (HERE AT LAST!)

ALSO, for incredible savings on new and used CoCo soft- and hardware (over 250 different CoCo items), send \$12 for 12 monthly issues of our catalog!

Add \$4 Ship on all orders. COD add \$4.

COCO PRO!

1334 BYRON AVE.
 YPSILANTI, MI 48198
 (313) 481-DAVE (3283)

NEW BBS! (313) 292-4713
 3-12-2400 8-N-1 24 HRS.

CS AND OP CODES

```

790 *****
*****
*
800 'ONE-BYTE INSTRUCTIONS - NO
FOLLOWING BYTES - 0 TO 29
810 OB$="ABX ASLA ASLB ASRA ASR
B CLRA CLRB COMA COMB DAA DECA
DECB INCA INCB LSLA LSLB LSRA LS
RB MUL NEGA NEGB NOP ROLA ROLB
RORA RORB RTS SEX TSTA TSTB "
820 M1$="3A485847574F5F4353194A5
A4C5C485844543D40501249594656391
D4D5D"
830 'TWO- OR THREE-BYTE INSTRUCT
IONS DEPENDING UPON IMMEDIATE OR
EXTENDED OPRND
840 '30 TO 103
850 T1$="ADCA ADCB ADDA ADDB ADD
D ANDA ANDB ANDCCASL ASR LBCC
LBCS LBEQ LBGE LBGT LBHI LBHS BI
TA BITB LBLE LBLO LBLS LBLT LBMI
LBNE LBPL LBRA LBRN LBSR LBVC L
BVS CLR "
860 T2$="CMPA CMPB CMPX COM DEC
EORA EORB INC JMP JSR LDA
LDB LDD LDU LDX LEAS LEAU LE
AX LEAY LSL LSR NEG ORA ORB
ORCC PSHS PSHU PULS PULU ROL R
OR SBCA SBCB STA STB STD STU
STX SUBA SUBB SUBD TST "
870 M2$="89C98BCBC384C41C4847242
5272C2E222485C52F25232D2B262A162
11728294F81C18C434A88C84C4E8D86C
6CCCE8E121310114844408ACA1A34363
537494682C287C7CDCF8F80C0834D"
880 'INSTRUCTIONS OTHER THAN REL
ATIVE WITH LEADING 10
890 '104 TO 111
900 TH$="CMPD CMPS CMPU CMPY LDS
LDY STS STY "
910 M3$="1083118C1183108C10CE108
E10CF108F"
920 'PSEUDO-OPS - 112 TO 115
930 PS$="FCB FCC FDB ORG "
940 'ALLOWABLE ADDRESSING MODES.
SUBTRACT HEX 40 TO FIND 000BEIX
R WHERE
950 'B IS OP BYTE (B=0);E=EXTEND
ED;I=IMMEDIATE;X=INDEXED;R=RELAT
IVE.
960 AA$=".....
.....NNNN^NNDJJAAAAAAAAANAAAAA
AAAAAJNN^JJNNJZZN^^^BBBBJJJNND
DDDDJJNNJJZZNN^J^^^JJ..."
970 *****
*****
*
980 ' PREL
IMINARY - 2
990 *****
*****
*
1000 DIM L$(22), S(26)
1010 HSCREEN 4
1020 HBUFF 1,300
1030 HGET(0,0)-(111,7),1
1040 GOSUB 3390
1050 *****
*****
**
1060 '
MAIN LOOP
1070 *****
*****

```

```

**
1080 LR--1
1090 PN=0
1100 AL=0
1110 GOSUB 1220
1120 IF CP<53 THEN HLINE(13*8,RW
*8)-(13*8+7,RW*8+7),PRESET,BF EL
SE HLINE(53*8,
RW*8+7)-(53*8+7,RW*8+7),PRESET,B
F
1130 GOSUB 2140
1140 RW=RW+1
1150 IF RW=23 THEN RW=0: IF CP<4
0 THEN CP=54 ELSE CP=14
1160 IF CP>53 THEN CP=54 ELSE CP
=14
1170 GOTO 1110
1180 *****
*****
**
1190 '
EDITOR
1200 *****
*****
**
1210 'SUBROUTINE TO ENTER LINE O
F TEXT
1220 ZA$=INKEY$: IF ZA$="" THEN
HLINE (CP*8,RW*8+7)-(CP*8+7,RW*8
+7),PSET,B: HLINE (CP*8
,RW*8+7)-(CP*8+7,RW*8+7),PRESET,
B: GOTO 1220
1230 '***UP ARROW***
1240 IF ZA$<>CHR$(94) THEN GOTO
1300
1250 IF CH=1 THEN CH=0: GOSUB 21
40
1260 RW=RW-1
1270 IF RW<>-1 THEN GOTO 1220
1280 IF CP>39 THEN RW=22: CP=14:
GOTO 1220 ELSE RW=22: CP=54: GO
TO 1220
1290 '***DOWN ARROW***
1300 IF ZA$<>CHR$(10) THEN GOTO
1360
1310 IF CH=1 THEN CH=0: GOSUB 21
40
1320 RW=RW+1
1330 IF RW>23 THEN GOTO 1220
1340 IF CP>39 THEN RW=0: CP=14:
GOTO 1220 ELSE RW=0: CP=54: GOTO
1220
1350 '***LEFT ARROW***
1360 IF ZA$<>CHR$(8) THEN GOTO 1
400
1370 CP=CP-1
1380 IF CP=13 THEN CP=38: GOTO 1
220 ELSE IF CP=53 THEN CP=78:GOT
O 1220 ELSE GOTO 1220
1390 '***RIGHT ARROW***
1400 IF ZA$<>CHR$(9) THEN GOTO 1
440
1410 CP=CP+1
1420 IF CP=39 THEN CP=14: GOTO 1
220 ELSE IF CP=79 THEN CP=54: GO
TO 1220 ELSE GOTO 1220
1430 '***CLEAR CURRENT PROGRAM**
*
1440 IF ZA$<>CHR$(12) THEN GOTO
1490
1450 ZA$=INKEY$: IF ZA$="" THEN
GOTO 1450 ELSE IF ZA$<>CHR$(12)
THEN GOTO 1490
1460 GOSUB 3390
1470 RETURN

```

```

1480 '***F1=ASSEMBLE, SAVE SOURC
E AND BINARY***
1490 IF ZA$<>CHR$(103) THEN GOTO
1650
1500 PN=1
1510 GOSUB 3530
1520 LO=&H7F00: SC=CP: SR=RW: CP
=14
1530 FOR RW=0 TO 22: GOSUB 2150:
NEXT
1540 CP=54
1550 FOR RW=0 TO 22: GOSUB 2150:
NEXT
1560 OPEN"O",#1,S0$
1570 FOR I=0 TO 22: WRITE#1,L$(I
): NEXT I
1580 CLOSE 1
1590 IF SB<>0 THEN SAVEM 00$,SB,
EB,SA
1600 CP=SC: RW=SR
1610 AL=1
1620 PN=0
1630 GOTO 1220
1640 '***F2=READ SOURCE, NO BINA
RY***
1650 IF ZA$<>CHR$(4) THEN GOTO 1
810
1660 GOSUB 3510
1670 HCLS
1680 OPEN"I",#1,S1$
1690 CP=14: RW=0
1700 FOR I=0 TO 22: INPUT#1, L$(
I): NEXT
1710 FOR I=0 TO 22: IF MID$(L$(I
),1,39)=STRING$(39," ") THEN HPR
INT (0,I),
"
.....": N
EXT ELSE HPRINT (0,I),
MID$(L$(I),1,39): NEXT
1720 FOR I=0 TO 22: HPRINT (39,I
),A$: NEXT
1730 FOR I=0 TO 22: IF MID$(L$(I
),41,38)=STRING$(38," ") THEN HP
RINT (40,I),
"
.....":
NEXT ELSE HPRINT (40,I),
MID$(L$(I),41,38): NEXT
1740 GOSUB 3570
1750 CLOSE 1
1760 LO=&H7F00: PN=0: CP=14
1770 FOR RW=0 TO 22: GOSUB 2150:
NEXT
1780 CP=54
1790 RW=0: CP=14
1800 GOTO 1220
1810 '***LOOK FOR SHIFT, UP ARRO
W***
1820 IF ZA$<>CHR$(95) THEN GOTO
1940
1830 IF AL=1 GOSUB 3510: AL=0
1840 IF CP>40 THEN J=RW: GOTO 18
90
1850 IF RW=22 THEN GOTO 1870
1860 FOR I=RW TO 21: MID$(L$(I),
1,38)=MID$(L$(I+1),1,38): NEXT
1870 MID$(L$(22),1,38)=MID$(L$(0
),41,80)
1880 J=0
1890 IF J=22 THEN GOTO 1910
1900 FOR I=J TO 21: MID$(L$(I),4
1,80)=MID$(L$(I+1),41,80): NEXT
1910 MID$(L$(22),41,80)="
"
1920 HCLS: GOSUB 1710
1930 RETURN

```

```

1940 '***LOOK FOR SHIFT, DOWN AR
ROW***
1950 IF ZA$<>CHR$(91) THEN GOTO
2050
1960 IF AL=1 THEN GOSUB 3510: AL
=0
1970 IF CP>40 THEN J=RW ELSE J=0
1980 FOR I=21 TO J STEP -1: MID$(
L$(I+1),41,39)=MID$(L$(I),41,29
): NEXT
1990 MID$(L$(J),41,39)="
"
2000 IF CP>40 THEN GOTO 2040
2010 MID$(L$(0),41,39)=MID$(L$(2
2),1,38)
2020 FOR I=21 TO RW STEP -1: MID
$(L$(I+1),1,38)=MID$(L$(I),1,38)
: NEXT
2030 MID$(L$(RW),1,38)="
"
2040 GOTO 1920
2050 CH=1
2060 IF ZA$=CHR$(13) THEN RETURN
2070 GOSUB 3290: HPRINT (CP,RW),
ZA$
2080 CP=CP+1
2090 IF ((CP=39) OR (CP=79)) THE
N RETURN
2100 GOTO 1220
2110 '*****
*****
**
2120 ' A
SSEMBLER

```

```

2130 '*****
*****
**
2140 'SUBROUTINE TO PROCESS LINE
OF TEXT
2150 IF CP>53 THEN ZC=55 ELSE ZC
=15
2160 IF MID$(L$(RW),ZC,14)=""
" THEN RETURN
2170 '***FIRST PROCESS POSSIBLE
SYMBOL***
2180 IF MID$(L$(RW),ZC,1)<>" " T
HEN SY=ASC(MID$(L$(RW),ZC,1)) EL
SE GOTO 2220
2190 IF MID$(L$(RW),ZC+1,1)<>" "
THEN ZE=2: GOTO 3330
2200 IF ((SY>64) AND (SY<91)) TH
EN GOTO 2210 ELSE ZE=1: GOTO 333
0
2210 SY=SY-65: IF S(SY)=-1 THEN
S(SY)=LO ELSE IF (PN=0) AND (S(S
Y)<LO) THEN ZE=1: G
OTO 3330
2220 '***NOW FIND 5 CHARACTERS O
F MNEMONIC***
2230 ZC=ZC+2
2240 IF MID$(L$(RW),ZC+5,1)<>" "
THEN ZE=2: GOTO 3330
2250 MN=INSTR(OBS,(MID$(L$(RW),Z
C,5)): IF MN=0 THEN GOTO 2300
2260 IF MID$(L$(RW),ZC+5,7)<>"
" THEN ZE=3: GOTO 3330
2270 MN=(MN-1)/5
2280 ML$=MID$(M1$,MN*2+1,2)

```

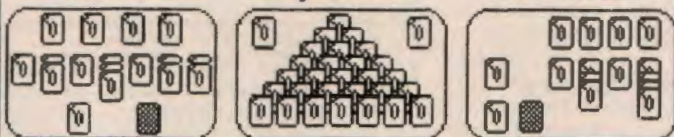
```

2290 GOTO 2610
2300 MN=INSTR(T1$,MID$(L$(RW),ZC
,5)): IF MN<0 THEN MN=(MN-1)/5:
GOTO 2320
2310 MN=INSTR(T2$,MID$(L$(RW),ZC
,5)): IF MN=0 THEN GOTO 2330 EL
S E MN=(MN-1)/5 + 32
2320 ML$=MID$(M2$,MN*2+1,2): MN=
MN+30: GOTO 2370
2330 MN=INSTR(T3$,MID$(L$(RW),ZC
,5)): IF MN=0 THEN GOTO 2350
2340 ML$=MID$(M3$,((MN-1)/5)*4+1
,4): MN=(MN-1)/5 + 104: GOTO 237
0
2350 MN=INSTR(P3$,MID$(L$(RW),ZC
,5)): IF MN=0 THEN ZE=3: GOTO 33
30 ELSE MN=((MN-1)/
5)+112
2360 '***NOW FIND OPERAND TYPE**
*
2370 EA=99999: NV=99999: DI=9999
9: ST$=""
2380 ZC=ZC+6
2390 'FIRST LOOK FOR $XXXX - EXT
ENDED ADDRESSING - MUST BE HEX
2400 IF MID$(L$(RW),ZC,1)="$" TH
EN EA=VAL("&H"+MID$(L$(RW),ZC+1,
4)): IF EA=0 THEN ZE=4:
GOTO 3330 ELSE GOTO 2610
2410 'LOOK FOR #XXXX - IMMEDIAT
E TWO OR FOUR DIGIT HEX
2420 IF MID$(L$(RW),ZC,2)="#$" T
HEN NV=VAL("&H"+MID$(L$(RW),ZC+2
,4)): GOTO 2610

```

Classic Solitaire

Klondike • Pyramid • Canfield



Play these classic favorites in 16 color high-res graphics
128K CoCo3 One Disk Drive Joystick \$14.95

La Belle Lucie Solitaire

This solitaire is not for the faint of heart! Hoyle rules.

128K CoCo3 One Disk Drive Joystick \$14.95

software submissions invited

Tazman (CoCo3)(requires OS9/II & 512K).....	\$24.95
(A game of Space Commerce)	
Armchair Admiral (CoCo3).....	\$14.95
(Battleship - play friends or computer!)	
Riddle of the Ring (CoCo3/CoCo2).....	\$10.00
(Text adventure)	
Games Pack I (CoCo3/CoCo2).....	\$10.00
(Hangman, Concentration, Mastermind)	
Zenix (CoCo3).....	\$29.95
(Arcade. Superb graphic movement)	
Zenix Demo Disk (CoCo3).....	\$2.00

Checks, Money Orders, MasterCard & Visa \$2.00 S&H.
COD additional \$2.00. WA addresses add 8.2% sales tax.

Eversoft Games, Ltd
P.O. Box 3354
Arlington, Wa 98223

30 day money back guarantee
(206) 653-5263
10am - 6pm PST

OS9/68000

JUST THE FACTS!

The PT68K4 SINGLE BOARD COMPUTER - As seen at the ATLANTA COCOFEST - is available for IMMEDIATE SHIPMENT in Assembled or Kit Form!

Upgrade to a powerful 68000 microprocessor on an XT-size system board with 4 serial/2 parallel ports and up to 12MB of memory. The K4 is IBM PC/XT hardware compatible - and also supports VGA, SVGA plus high density floppy drives!

16MHZ PT68K4 Assembled Board
with 1MB DRAM - ~~\$699.00~~

BARE BONES KIT: System Board,
1MB RAM, Cabinet, PS, High
Density Floppy, OS9 - ~~\$699.00~~

Professional OS9 Operating System
with C COMPILER \$299.00

See the DELMAR AD for systems
information!

PERIPHERAL TECHNOLOGY

1480 TERRELL MILL RD. #870
MARIETTA, GA 30067
404/984-0742

OS9 is a trademark of Microware

```

2430 'LOOK FOR #XXXXX - IMMEDIAT
E DECIMAL
2440 IF MID$(L$(RW),ZC,1)="# TH
EN NV=VAL(MID$(L$(RW),ZC+1,5)):
GOTO 2610
2450 'LOOK FOR + OR - WITH XXX,R
2460 IF (MID$(L$(RW),ZC,1)<>"-
AND MID$(L$(RW),ZC,1)<>"") THEN
GOTO 2500
2470 ZS=MID$(L$(RW),ZC+4,2): IF
(ZS$<>".Y" AND ZS$<>".X" AND ZS
$<>".U" AND ZS$<>".S")
THEN ZE=5: GOTO 3330
2480 IF ZS$="X" THEN ZT$="88" E
LSE IF ZS$="Y" THEN ZT$="A8" EL
SE IF ZS$="U" THEN ZT$="C
8" ELSE ZT$="E8"
2490 DI=VAL(MID$(L$(RW),ZC,4)):
GOTO 2610
2500 IF MN<112 THEN GOTO 2560
2510 IF MN<>113 THEN GOTO 2540
2520 FOR I=ZC TO ZC+15: IF MID$(
L$(RW),I,1)="# THEN GOTO 2530 E
LSE ST$=ST$ + MID$(L$(RW)
,I,1): NEXT
2530 GOTO 2610
2540 IF MID$(L$(RW),ZC+5,1)<>" "
THEN ZE=5: GOTO 3330 ELSE NV=VA
L(MID$(L$(RW),ZC,5)): GOTO 2610
2550 'MUST BE SYMBOLIC ADDRESS H
ERE
2560 IF MID$(L$(RW),ZC+1,1)<>" "
THEN ZE=5: GOTO 3330
2570 SY=ASC(MID$(L$(RW),ZC,1)) -
65
2580 IF (SY<0 OR SY>25) THEN ZE=
5: GOTO 3330
2590 IF S(SY)<>-1 THEN EA=S(SY):
GOTO 2610 ELSE IF PN=1 THEN ZE=
1: GOTO 3330
2600 IF CP>53 THEN HPRINT (53,RW
),"#": EA=0 ELSE HPRINT (13,RW),
"#": EA=0
2610 '***NOW HAVE VALID MNEMONIC
AND ARGUMENT, CONSTRUCT MACHINE
LANGUAGE***
2620 IF CP>39 THEN ZC=40 ELSE ZC
=0
2630 IF MN>29 THEN GOTO 2770
2640 LI=1
2650 IF CP>39 THEN IF RW+22<LR T
HEN IF PN=0 THEN GOSUB 3530: GOT
O 2700
2660 IF CP<=39 THEN IF RW<LR THE
N IF PN=0 THEN GOSUB 3530: GOTO
2700
2670 IF PN=0 THEN GOTO 2700
2680 HPRINT (ZC,RW),RIGHT$("0000
"+HEX$(LO),4)+" "+ML$
2690 FOR I=0 TO LEN(ML$)/2-1: PO
KE LO+I, VAL("&H"+MID$(ML$,I*2+1
,2)): NEXT
2700 IF SB>LO THEN SB=LO
2710 LO=LO+LI
2720 EB=LO-1
2730 IF CP>39 THEN IF RW+22<LR T
HEN LR=RW+22
2740 IF CP<=39 THEN IF RW>LR THE
N LR=RW
2750 RETURN
2760 'FIRST CHECK FOR RELATIVE A
DDRESSING
2770 IF MN>111 THEN GOTO 3170
2780 AM$=MID$(AA$,MN+1,1)
2790 IF AM$<>"A" THEN GOTO 2880
2800 IF MN=56 THEN ML$="16": LI=

```

```

3: GOTO 2830
2810 IF MN=58 THEN ML$="17": LI=
3: GOTO 2830
2820 ML$="10"+ML$: LI=4
2830 EA=EA-LO-LI: IF EA<0 THEN S
G=1: EA=ABS(EA) ELSE SG=0
2840 E1=INT(EA/256): E2=EA-(E1*2
56)
2850 IF SG=1 THEN E2=256-E2: E1=
255-E1: IF E2=256 THEN E2=0: E1=
E1+1
2860 ML$=ML$+RIGHT$("00"+HEX$(E1
),2)+RIGHT$("00"+HEX$(E2),2)
2870 GOTO 2650
2880 'NOW CHECK FOR IMMEDIATE AD
DRESSING
2890 IF NV=99999 THEN GOTO 2950
2900 AM=ASC(AM$)-&H40
2910 IF (AM AND 4)<>4 THEN ZE=4:
GOTO 3330
2920 IF (AM AND 16)<>16 THEN ML$
=ML$+RIGHT$("00"+HEX$(NV),2) EL
S E ML$=ML$+RIG
HT$("0000"+HEX$(NV),4)
2930 LI=LEN(ML$)/2: GOTO 2650
2940 ML$=ML$+RIGHT$("0000"+HEX$(
NV),4): LI=3: GOTO 2650
2950 'NOW CHECK FOR EXTENDED ADD
RESSING
2960 IF EA=99999 THEN GOTO 3030
2970 AM=ASC(AM$)-&H40
2980 IF (AM AND 8)<>8 THEN ZE=4:
GOTO 3330
2990 IF LEN(ML$)=4 THEN MM$=LEFT
$(ML$,2) ELSE MM$=""
3000 IF LEN(ML$)=4 THEN MS$=RIGH
T$(ML$,2) ELSE MS$=ML$
3010 ML$=MM$+RIGHT$("00"+HEX$(VA
L("&H"+MS$)+48),2)+RIGHT$("0000"
+HEX$(EA),4)
3020 LI=LEN(ML$)/2: GOTO 2650
3030 'NOW CHECK FOR INDEXED ADDR
ESSING
3040 IF DI=99999 THEN ZE=10: GOT
O 3330
3050 IF DI>127 OR DI<-128 THEN Z
E=11: GOTO 3330
3060 IF DI<0 THEN DI=256+DI
3070 AM=ASC(AM$)-&H40
3080 IF (AM AND 2)<>2 THEN ZE=10
: GOTO 3330
3090 IF LEN(ML$)=4 THEN MM$=LEFT
$(ML$,2) ELSE MM$=""
3100 IF LEN(ML$)=4 THEN MS$=RIGH
T$(ML$,2) ELSE MS$=ML$
3110 ML$=MM$+RIGHT$("00"+HEX$(VA
L("&H"+MS$)+32),2)+ZT$+RIGHT$("0
000"+HEX$(DI),2)
: LI=LEN(ML$)/2: GOTO 2650
3120 GOTO 2650
3130 'CHECK FOR OP-CODE FCB OR G
REATER
3140 IF EA<>99999 THEN ML$=LEFT$(
ML$,2)+RIGHT$("00"+HEX$(VAL("&H
"+MID$(ML$,3,2) +48),2)+ RI
GHT$("0000"+HEX$(EA),4): LI=4: G
OTO 2670
3150 IF NV<>99999 THEN IF NV>655
35 THEN ZE=6: GOTO 3330
3160 IF NV<>99999 THEN ML$=ML$+R
IGHT$("0000"+HEX$(NV),4): LI=4:
GOTO 2670
3170 'CHECK FOR FCB
3180 IF MN=112 THEN IF ( NV=9999
9 OR NV>255 ) THEN ZE=6: GOTO 33
30 ELSE ML$=RIGHT$

```

```

("00"+HEX$(NV),2):LI=1: GOTO 267
0
3190 'CHECK FOR FCC
3200 IF MN=113 THEN ML$=CHR$(34)
+LEFT$(ST$,6)+CHR$(34): LI=LEN(S
T$): GOTO 2670
3210 'CHECK FOR FDB
3220 IF MN=114 THEN IF NV>65535
THEN ZE=6: GOTO 3330 ELSE ML$=RI
GHT$("0000"+HEX$ (NV),4): LI
=2: GOTO 2670
3230 'CHECK FOR ORG
3240 IF MN>115 THEN IF EA=99999
THEN ZE=6: GOTO 3330
3250 LO=EA: ML$="": LI=0: GOTO 2
670
3260 '*****
*****
**
3270 ' UTILI
TY SUBROUTINES
3280 '*****
*****
**
3290 '***SUBROUTINE TO CLEAR CUR
RENT CHARACTER POSITION AND STOR
E CHAR***
3300 HLINE (CP*8,RW*8)-(CP*8+7,R
W*8+7),PRESET,BF
3310 MID$(L$(RW),CP+1,1)=ZA$
3320 RETURN
3330 '***ERROR PROCESSING FOR LI
NE***
3340 IF CP>53 THEN ZC=53 ELSE ZC
=13
3350 HLINE (ZC*8,RW*8)-(ZC*8+7,R
W*8+7),PRESET,BF
3360 HPRINT (ZC,RW),"**"
3370 RETURN
3380 '***CLEAR EVERYTHING SUBROU
TINE***
3390 LO=&H7F00: SA=LO: SB=LO
3400 PN=0
3410 FOR I=0 TO 22: L$(I)="
"+A$+"
": NEXT
3420 FOR I=0 TO 26: S(I)--1: NEX
T
3430 GOSUB 3510
3440 HCLS
3450 CP=14: RW=0
3460 AS=CHR$(124)
3470 FOR Y=0 TO 22: HPRINT (0,Y)
. . . . .
. . . . .
. . . . .": NEXT
3480 FOR Y=0 TO 22: HPRINT (39,Y
),A$: NEXT
3490 GOSUB 3570
3500 RETURN
3510 '***CLEAR BINARY DATA AND S
CREEN***
3520 FOR I=0 TO 26: S(I)--1: NEX
T
3530 FOR I=0 TO 22: HPUT(0,I*8)-
(103,I*8+7),1,PSET: NEXT
3540 FOR I=0 TO 22: HPUT(320,I*8
)-(423,I*8+7),1,PSET: NEXT
3550 RETURN
3560 '***PRINT TITLE***
3570 HPRINT (0,24),"BARDEN'S EZA
SM: F1 SAVES/F2 LOADS/CLEAR/SHFT
,UP ARR DELETES/SHFT,DN ARR INSE
RTS"
3580 RETURN

```

CBASIC Editor/Compiler The ULTIMATE Color Computer Basic Compiler!!!

If you want to write fast machine language programs but you don't want to spend the next few years trying to write them in Assembly Language, then CBASIC is the answer!!!

CBASIC is the only fully integrated Basic Compiler and program editing system available for the Color Computer. It will allow you to take full advantage of all the capabilities available in your color computer without having to spend years trying to learn assembly language programming. CBASIC allows you to create, edit and convert programs from a language you are already familiar with Extended Disk Color Basic, into fast efficient machine language programs easily and quickly.

"The most complete Editor/Compiler I have seen for the CoCo..." -The RAINBOW March 1986

CBASIC is a powerful tool for the Beginner as well as the Advanced Basic or M.L. programmer. CBASIC features well over 150 compiled Basic Commands and Functions that fully support Disk Sequential and Direct access files, Tape, Printer and Screen I/O. CBASIC supports ALL the High and Low Resolution Graphics, Sound, Play and String Operations available in Enhanced Color Basic, including Graphics H/GET, H/PUT, PLAY and H/DRAW, all with 99% syntax compatibility.

Specify Coco 1, 2 or 3 Disk \$149.00

512K Only \$99

Give your COCO 3 all the power it deserves with this easy to install (no soldering/plug in) 100% Tandy compatible 512K memory upgrade. Completely assembled and tested. Includes Ramdisk & Memory Test software described below. \$99 or get 512K and Window Master for just \$149 and save \$20.00!!

CoCo 3 Turbo Charger

Turbo Charge your 512k CoCo 3 with this ALL Machine Language program that will run your machine at double speed all the time even for floppy disk access and give you 2 ULTRA High Speed Ram Disks. It's Reset protected so it won't disappear like other Ramdisk programs. You also get a 512K memory tester program, it performs several bit tests as well as an address test.

Requires 512K & DISK \$19.95

EDT/ASM III

EDT/ASM III is a Disk based co-resident Text Editor & Assembler. It is designed to take advantage of the new features of the COCO 3. It has 8 Display formats from 32/40/64/80 columns. The disk also contains a free standing ML Debug Monitor.

EDT/ASM III has the most powerful, easy to use Text Editor available in and Editor/Assembler package for the Color Computer.

- * Local and Global string search and/or replace.
- * Full Screen line editing.
- * Load and Save standard ASCII formatted files.
- * Block Move & Copy, Insert, Delete, Overtyping.
- * Create and Edit files larger than memory.

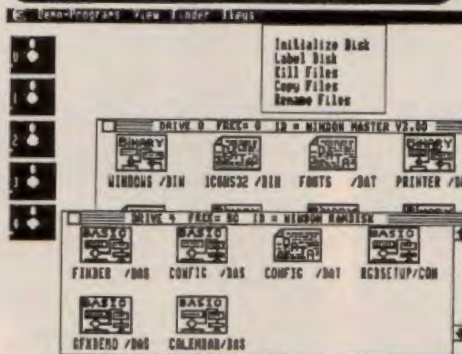
The Assembler features include:

- * Conditional If/Then/Else assembly.
- * Disk Library files up to 9 levels deep.
- * Supports standard Motorola directives.
- * Allows multiple values in FCB/FDB directives.
- * Allows assembly from Buffer, Disk or both.

Specify Coco 1, 2 or 3 Disk \$59.95

CER COMP

Window Master V3.0



The Ultimate User Friendly Point & Click operating System for your CoCo 3. Simple enough even for children to use, just point and click to run programs, select files, do disk or file maintenance or almost any task you currently do by typing commands. You also get things like a print spooler, Programmable Function Keys, a Buffered Keyboard, Ramdisk, Serial I/O port and Deluxe Pak support along with Windows, Icons, Buttons, Pull Down Menus, Edit Fields and Mouse functions all in one program. It has multiple fonts in 54 possible sizes and styles, Enhanced Basic Editing and much much more. It add over 50 commands and Functions to Basic to fully support the Point & Click System without OS9.

"...It offers so many features that it is probably underpriced. I recommend this software to all CoCo3 owners." -The Rainbow February 1989

It is completely compatible with existing Basic programs and takes absolutely no memory away from basic. It requires 1 Disk Drive, R.S. hires interface & Joystick or Mouse.

Includes 128 & 512K Versions for only \$69.95

LOOK!

"The Source"

The SOURCE will allow you to easily and quickly Disassemble machine language programs directly from disk and generate beautiful, Assembler Source Code. And "The Source" has all the features and functions you are looking for in a Disassembler.

- * Automatic Label generation.
- * Allows specifying FCB, FCC and FDB areas.
- * Disassembles programs directly from Disk.
- * Automatically locates addresses.
- * Output listing to the Printer, Screen or both.
- * Generates Assembler source directly to disk.
- * Built in Hex/ASCII dump/display.
- * 8 Selectable Display formats 32/40/60/80.
- * Built in Disk Directory and Kill file commands.
- * Menu display with single key commands.
- * Written in Ultra fast machine language.

Specify Coco 1, 2 or 3 Disk \$49.95

Window - Ware

Window Writer- A point & click Word Processor, features both Mouse & Keyboard type editing, proportional printer support, powerful formatting capability, works with any printer. On screen Italic, bold etc. WYSIWYG

"Window Writer is a powerful word processor that is fun to use, very user friendly..... The Environment compares favorably to that of Microsoft Windows" - RAINBOW Dec. 1989

Requires Window Master & 512K - \$59.95

Window Writer/W- same as above for non Window Master owners, 512K & Disk \$79.95

Window Basic Compiler- similar to CBASIC only it compiles all the Window Basic Statements to create super fast Machine Language programs & Desk Accessories. \$99.00

Window Edit/Asm- A full featured Editor & Assembler for Window Master. \$49.95

Font/Icon Editors- A utility disk with the Font & Icon Editors to create or edit your own, includes Basic & M.L. versions \$19.95

Advanced Programmers Guide- A guide for Basic & M.L. programmers on interfacing to Window Masters complete system including System Calls, Memory Map, Interrupt handling & Memory Access. \$24.95

The Memory game- A point & Click concentration game, lots of fun. \$19.95

Desk Accessory Pak- Installs up to 7 resident D.A. programs, including: Font & Icon Editors, Function Keys, Terminal program, Graphics Editor & Calendar and more. \$39.95

DataPack III Plus V1.1

AUTOPILOT and AUTO-LOG Processors
X-MODEM DIRECT DISK FILE TRANSFER
VT-100 & VT-52 TERMINAL EMULATION

- No lost data even at 2400 Baud on the Serial I/O port.
- 8 Selectable Display Formats, 32/40/64/80 columns
- ASCII & BINARY disk file transfer via XMODEM.
- Directly record receive data (Data Logging).
- VT-100 emulation for VAX, UNIX and other systems.
- VT-100/52 cursor keys, position, PF & Alt. Kbd. keys.
- Programmable Word Length, Parity, Stop Bits
- Complete Full and Half Duplex operation,
- Send full 128 character set from Keyboard.
- Complete Editor, Insert, Delete, Change or Add.
- 9 Variable length, Programmable Macro Key buffers.
- Programmable Printer rates from 110 to 9600 Baud.
- Send Files from the Buffer, Macro Key Buffers or Disk.
- Display on Screen or Print the contents of the Buffer.
- Freeze Display & Review information On line.
- Built in Command Menu (Help) Display.

Supports: Modem-Pak & Deluxe Pak or Serial Port.

Specify Coco 1, 2, 3 Disk \$49.95

Money Saving Specials

Window Master and Writer....\$99.00
Adv. Pgm Guide and DA Pak...\$49.00
Font/Icon Editors & Memory Game \$19.95
Edt/Asm III and The Source...\$89.00
CBASIC Editor/Compiler.....\$125.00

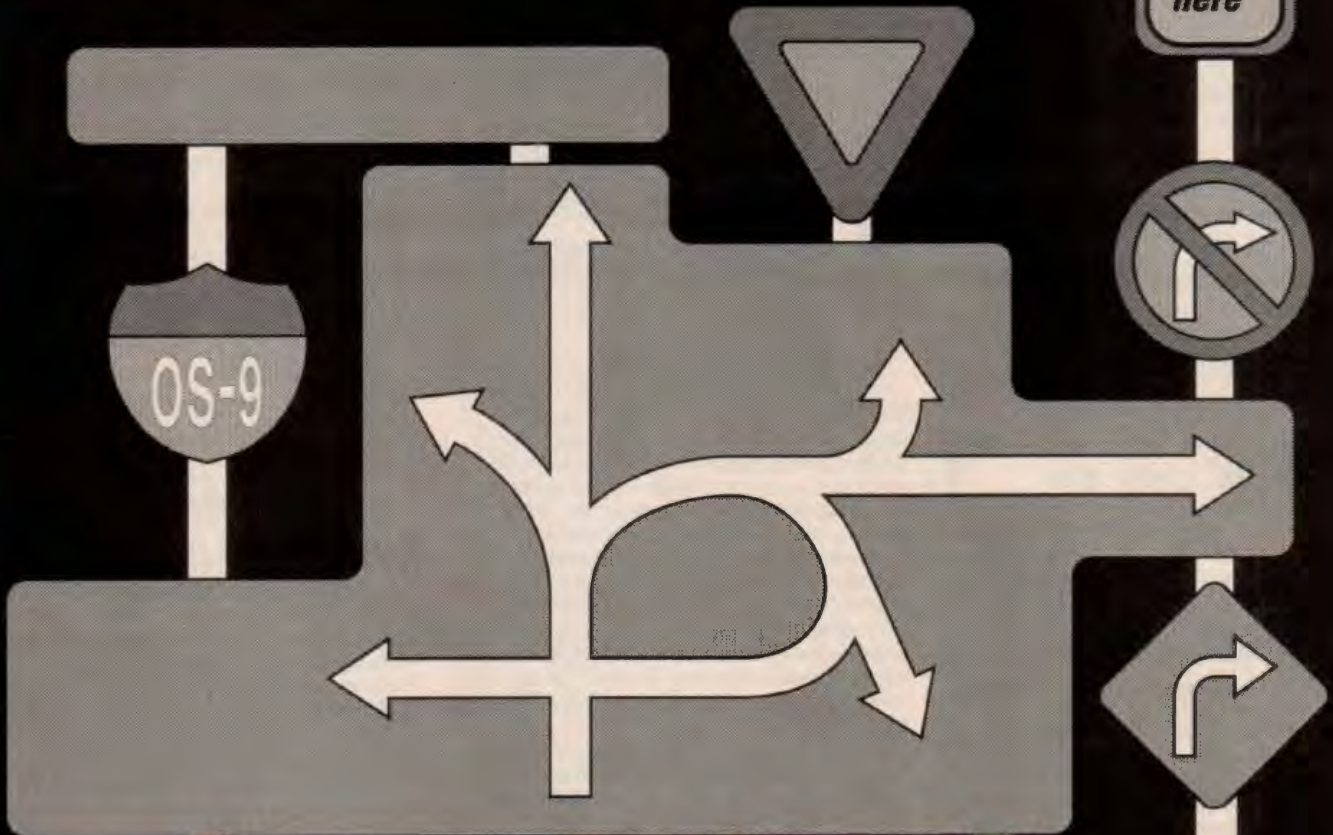
To order by mail, send check or money order for the amount of the program plus \$4.00 for shipping and handling to the address listed below.

To order by VISA, MASTER-CARD or COD 1-800-383-8529
(Monday thru Saturday, 8am to 5pm PST).

Cer-Comp Ltd.
5566 Ricochet Avenue
Las Vegas, NV 89110
702-452-0632

Menu System

by Joseph Cheek



Even though I like OS-9 and enjoy its technical aspects, the rest of my family disliked it and wanted it to be as simple as possible. They had trouble understanding the concepts of data and execution directories, parameter specification, command-line modifiers, and so on. Their best efforts to master OS-9 were limited to step-by-step instructions for program execution. And they said, "The system at work has a menu. All I have to do is press a key," and "Gee, *WordPerfect* is so easy! Why can't your system be easy?" I introduced them to *Multi-View*, but they had trouble mastering that, too. Finally I decided the solution was a custom, no-fuss, no-hassle menuing sys-

Joseph Cheek, a high school senior, began using a CoCo I nine years ago. He has been programing ever since, and his interests lean toward effective use of BASIC09. He can be contacted at 6007 W. Eaton Way, Kearns, UT 84118. (801) 968-5579.

tem that would appear when they turned the computer on (almost). *MS*, my menuing system, was born.

MS is easy to use. Press a key and a menu appears. Another key press and a program executes. No fuss, no hassle, and all programs can be run from it. The menuing system is easy to set up and modify, and it does not rely on the directory system for its structure. Programs can be password-protected, and the system can be set to prompt the user for necessary parameters.

To use *MS*, enter Listing 1 and pack it with

```
pack* /dd/cmds/ms
```

Exit BASIC09 and create a directory called /dd/SYS/MENUS. Fire up a word processor and enter Listing 2, which is a sample menu file. Save it in the /dd/sys/menus directory under the name main.mnu. From the command prompt, type `ms #16K` and watch the menu come up.

You now have a working menu system. However, you cannot do much with it until you learn how to create your own menus. Menus are created from information in text files stored in the /dd/sys/menus directory. The initial menu is always the file

32-by-16	(VDG, supported with /v1 only)
40-by-24	(40-by-24 text window)
80-by-24	(80-by-24 text window)
640-by-192-by-2	(640-by-192, two-color graphics window)
320-by-192-by-4	(320-by-192, four-color graphics window)
640-by-192-by-4	(640-by-192, four-color graphics window)
320-by-192-by-16	(320-by-192, 16-color graphics window)

Figure 1: Screen Types for the /screen Switch

named main.mnu. The general format of a menu file is as follows:

```

Title
/at ###,###
Option 1
/switch 1
/switch 2
/switch 3
/etc.
Option 2
/switch 1
/switch 2
/etc.
Option 3
/switch 1
/etc.

```



Every piece of menu information in the file is stored on a line-by-line basis, one piece per line. Every line has a slash as the first character, except for the actual menu options. In other words, lines beginning with a slash are considered *MS* commands. Lines without slashes are printed onscreen as options the user can select. The first line has the /title switch. This line specifies the menu title. The second line has the /at switch indicating to *MS* the upper-left coordinates where the menu should appear on the screen. These two switches affect the entire menu, all other switches affect only the menu option directly preceding them.

Study Listing 2 carefully. To build your own menu, decide on a name for the menu,

OS-9 Level II

Listing 1: ms.b09

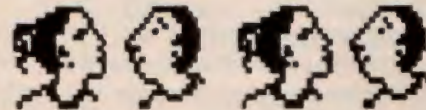
```

PROCEDURE ms
0000   CHD "/dd/sys/menus"
0011   LOOP
0013     RUN gfx2("dwnd")
0020     RUN gfx2("dwset",2,0,0,80,24,0,1,2)
0045     RUN gfx2("curoff")
0053     RUN gfx2("palette",0,63)
0068     RUN gfx2("color",5,4)
0078     RUN gfx2("erline")
0089     PRINT "MS-Menuing System v1.0";
00A6     PRINT " ";
00C3     PRINT "Written by Joseph Cheek for CSS"
00E6     RUN gfx2("curxy",0,23)
00F9     RUN gfx2("erline")
0107     PRINT " Break or / = previous menu";
0127     PRINT " ";
013C     PRINT "Arrow keys + ENTER or number selects";
0165     RUN gfx2("color",0,1)
0178     RUN domenu("main.mnu")
0188   ENDL00P

PROCEDURE toupper
0000   PARAM text:STRING[255]
000C   DIM work:STRING[255]
0018   DIM ltr:STRING[1]
0024   DIM c:INTEGER
002B   work=""
0032   FOR c=1 TO LEN(text)
0044     ltr=MID$(text,c,1)
0052     IF ltr>"a" AND ltr<="z" THEN
0067       ltr=CHR$(ASC(ltr)-32)
0074     ENDIF
0076     work=work+ltr
0082   NEXT c
008D   text=work
0095   END

PROCEDURE eko
0000   PARAM echoon:BOOLEAN
0007   TYPE optsec=res1:STRING[4]; echo:BYTE; res2:STRING[27]

```



EVERYONE'S TALKING ABOUT...

DUAL HI-RES JOYSTICK ADAPTER
Colorware Hi-Res Tandy Hi + Low
Res, cassette jack \$40

HI & LO-RES JOYSTICK ADAPTER
Tandy Hi + Lo-Res \$27

HAWKSoft keyboard cable \$25

DOMINATION war game \$18

MYDOS extended DOS for you! \$15

HAWKSoft

P.O. Box 7112 Elgin, IL 60121

(708) 742-3084 eves and ends

SASE for more info and price list.

S/H (US & CAN) always included

M.O. Check C.O.D. no credit cards

1 year warranty on ALL hardware !!

((((((((NEW!))))))))

From MillSoft Co.

MillSofts' Baseball Card Catalog

by Paul Miller

NOW YOU CAN PUT ALL YOUR
Baseball Cards on disk! Requires
COCO3 with two Diskdrives and
128k. It is also available for 1 and
2 with tape drives.

To order, please send a check
or money order to:
MillSoft Co. • Box 2377
Amagansett, NY 11930

\$18.95. Please specify which
System you have. NY Res.,
Please add 7.5% Tax.

where you want it to appear on the screen,
and which options it will have. A single
menu can contain up to nine options.

The switches tell *MS* all it needs to know
about their associated options. For example,
they tell *MS* whether a given menu option
calls up another menu or runs a program,
what menu or program is to be called, and
(if it is a program) what type of screen to
use. All switches pertaining to a certain
option are found on the lines immediately
following that option, until another option
is encountered. So, to make a menu option,
have a line in the menu file with the name of
the option on it. List all the switches for that
option, one to a line. Follow this in a similar
manner with the remaining menu options.

Menu Switches

Here is a list of all the switches *MS*
supports, what they mean, and how to use
them:

/exec — The */exec* switch specifies the
program to run. For example, */exec mvcanvas*
causes *MVCanvas* to execute.

/type — The */type* switch specifies
whether the particular option is used to
select another menu, execute a program, or
quit the menu system. If no */type* switch is
used, *MS* assumes the option calls a pro-
gram. Example: */type menu* or */type quit*.

/pause — This switch tells the system to
wait for the user to press a key before the
menu is returned. When used, the current
screen remains viewable until the user is
ready to continue. Example: */pause*.

```
0028 TYPE Regs=cc,a,b,dp:BYTE; x,y,u:INTEGER
0040 DIM ops:optsec
0056 DIM r:Regs
005F DIM CCode:BYTE
0066 CCode=$8D
006E r.a=0
0079 r.b=$00
0085 r.x=ADDR(ops)
0093 RUN syscall(CCode,r)
00A2 IF echoon THEN
00AB ops.echo=1
00B6 ELSE
00BA ops.echo=0
00C5 ENDIF
00C7 CCode=$8E
00CF RUN syscall(CCode,r)
00DE END

PROCEDURE domenu
0000 TYPE menutype=name,password:STRING[25]; choicetype:STRING[1
]; params,pauseatend,chainto:BOOLEAN; screentype:BYTE
; parammsg,execution,directory:STRING[50]
PARAM menufile:STRING[80]
0046 DIM menu(9):menutype
0052 DIM line:STRING[80]
0060 DIM menutitle,line2:STRING[25]
006C DIM key:STRING[1]
007C DIM c,c1,maxlen:INTEGER
0088 DIM path,numberofchoices,xpos,ypos,errnum,curc:BYTE
0097 DIM exit:BOOLEAN
00B2 ON ERROR GOTO 200
00B9 RUN eko(FALSE)
00BF exit=FALSE
00C6 curc=1
00CC xpos=2
00D3 ypos=2
00DA menutitle="Menu"
00E1 ON ERROR GOTO 100
00EC OPEN #path,menufile:READ
00F2 ON ERROR GOTO 200
00FE c=0
0104 LOOP
0108 REPEAT
010F EXITIF EOF(#path) THEN
0119 exit=TRUE
011F ENDEXIT
0123 READ #path,line
012D UNTIL line<>" " AND ASC(line)<>35
0140 EXITIF exit THEN
0149 ENDEXIT
014D IF ASC(line)=47 THEN
015A line=RIGHT$(line,LEN(line)-1)
016A IF SUBSTR(" ",line)=0 THEN
017A line2=line
0182 ELSE
0186 line2=LEFT$(line,SUBSTR(" ",line)-1)
0199 ENDIF
019B RUN toupper(line2)
01A5 line=RIGHT$(line,LEN(line)-LEN(line2)-1)
01BA IF line2="TITLE" THEN
01CB menutitle=line
01D3 ENDIF
01D5 IF line2="AT" THEN
01E3 xpos=VAL(LEFT$(line,SUBSTR(" ",line)-1))
01F8 ypos=VAL(RIGHT$(line,LEN(line)-SUBSTR(" ",line)))
020F ENDIF
0211 IF line2="PASSWORD" THEN
0225 menu(c).password=line
0234 RUN toupper(menu(c).password)
0244 ENDIF
0246 IF line2="PARAMS" THEN
0258 menu(c).params=TRUE
0265 menu(c).paramsg=line
0274 ENDIF
0276 IF line2="CD" THEN
0284 menu(c).directory=line
0293 ENDIF
0295 IF line2="SCREEN" THEN
02A7 IF LEFT$(line,2)="80" THEN
02B8 menu(c).screentype=2
02C6 ENDIF
02C8 IF LEFT$(line,2)="40" THEN
02D9 menu(c).screentype=1
02E7 ENDIF
02E9 IF LEFT$(line,2)="32" THEN
02FA menu(c).screentype=9
0308 ENDIF
030A IF LEFT$(line,3)="640" AND RIGHT$(line,1)="2" THEN
0327 menu(c).screentype=5
0335 ENDIF
```



```

0337 IF LEFT$(line,3)="320" AND RIGHT$(line,1)="4"
THEN
0354 menu(c).screentype=6
0362 ENDIF
0364 IF LEFT$(line,3)="640" AND RIGHT$(line,1)="4"
THEN
0381 menu(c).screentype=7
038F ENDIF
0391 IF LEFT$(line,3)="320" AND RIGHT$(line,2)="16"
THEN
03AF menu(c).screentype=8
03BD ENDIF
03BF ENDIF
03C1 IF line2="PAUSE" THEN
03D2 menu(c).pauseatend=TRUE
03DF ENDIF
03E1 IF line2="TYPE" THEN
03F1 RUN toupper(line)
03FB menu(c).choicetype=line
040A RUN toupper(menu(c).choicetype)
041A ENDIF
041C IF line2="EXEC" THEN
042C menu(c).execution=line
043B ENDIF
043D IF line2="NOCHAIN" THEN
0450 menu(c).chainto=FALSE
045D ENDIF
045F ELSE
0463 c=c+1
046E EXITIF c>9 THEN
047A ENDEXIT
047E menu(c).name=line
048D menu(c).choicetype=""
049B menu(c).password=""
04A9 menu(c).pauseatend=FALSE
04B6 menu(c).params=FALSE
04C3 menu(c).chainto=TRUE
04D0 menu(c).screentype=2
04DE menu(c).parammsg=""
04EC menu(c).execution=""
04FA menu(c).directory=""
0508 ENDIF
050A ENDOLOOP
050E CLOSE #path
0514 numberofchoices=c
051C maxlen=LEN(menu(c).name)-5
0528 FOR c=1 TO numberofchoices
0539 IF maxlen<LEN(menu(c).name) THEN
054D maxlen=LEN(menu(c).name)
055C ENDIF
055E NEXT c
0569 RUN gfx2("owset",1,xpos,ypos,maxlen+9,nu
rofchoices+4,1,3)
0597 PRINT " "; menutitle
05A0 PRINT
05A2 FOR c=1 TO numberofchoices
05B3 IF menu(c).choicetype="M" THEN
05C6 PRINT "+"
05CB ELSE IF menu(c).choicetype="" THEN
05E0 PRINT ">"
05E5 ELSE
05E9 PRINT
05EB ENDIF
05ED ENDIF
05EF NEXT c
05FA RUN gfx2("cwarea",1,1,maxlen+7,numberofchoic
es+2)
061C RUN gfx2("color",0,1)
062F RUN gfx2("clear")
063C PRINT
063E FOR c=1 TO numberofchoices
064F PRINT " "; c; ". "; menu(c).name
0668 NEXT c
0673 GOSUB 1010
0677 10 LOOP
067C GET #0,key
0685 IF key=CHR$(12) THEN
0692 GOSUB 1000
0696 curc=curc-1
06A1 IF curc=0 THEN
06AD curc=numberofchoices
06B5 ENDIF
06B7 GOSUB 1010
06BB ENDIF
06BD IF key=CHR$(10) THEN
06CA GOSUB 1000
06CE curc=curc+1
06D9 IF curc>numberofchoices THEN
06E6 curc=1
06ED ENDIF

```

SYSTEM IV COMPUTER



THE SYSTEM IV is a high performance computer system based on the Motorola 68000 microprocessor operating at a clock speed of 16 MHz and has been designed to provide maximum flexibility and versatility. Microware's Professional OS9/68000 operating system is included with the SYSTEM IV providing an efficient multi-user and multi-tasking environment. This provides the user with a PC for home use, small business applications and a viable low-cost solution for many industrial control applications (embedded systems). Special requirements (such as midi, sound, A-D/D-A, net-working, etc.) are easily handled with readily available low-cost PC/XT boards which can plug into the SYSTEM IV expansion slots. And, as user requirements change or improved special function boards become available, they may be added or replaced at the user's option. Thus, when software requiring multi-media or other new capability becomes a reality, the user will be able to add that capability easily and have the latest technology at his disposal.

TO ACCESS THE LARGEST SOFTWARE BASE available, an MS-DOS board, the ALT86, will be available shortly as a low-cost option. This board has a V30 (8086) microprocessor running at 10 MHz, includes 1 Meg of 0-wait state RAM, uses the Chips and Technology BIOS, has a socket for an 8087 math co-processor and plugs into one of the SYSTEM IV expansion slots. Additionally, an OS9/6809 software emulator/interpreter will be available soon. The emulator/interpreter will permit running most COCO OS9/6809 software on the SYSTEM IV.

OTHER OPERATING SYSTEMS may be installed. These include CPM, UNIFLEX, MINIX, STARDOS, REXDOS and most any other operating system capable of running on the 68000 microprocessor chip.

THE DESIGN OF THE SYSTEM IV is derived from previously successful designs and uses components that have been tested and proven in other systems. SYSTEM IV's uniqueness stems from the ability of its designer and manufacturer, Peripheral Technology, to provide well designed, reliable hardware at a low cost. Further, only the functions necessary to the basic operation have been designed into the mother board. Seven PC/XT compatible expansion slots allow an unrestricted selection of standard PC/XT accessory boards by the user. The user is not locked into any preconceived notions of what is best.

THE MOTHER BOARD is a 4 layer XT size board which holds the microprocessor, sockets for up to 4 Mbytes of 0-wait state RAM, a battery backed-up clock, 4 serial ports, 2 parallel ports, a high density (37C65) floppy disk controller, 7 PC/XT compatible expansion slots, a memory expansion connector to allow an additional 6 Mbytes of 0-wait state DRAM, keyboard connector and the necessary system support chips.

THE TERMINAL SYSTEM includes the mother board with 1 Mbyte of on-board DRAM, a high density floppy disk drive (3 1/2" or 5 1/4"), 4 serial port connectors, a parallel printer port connector, a 200 watt power supply, mini-PC style case capable of holding 5 half-height drives and Professional OS9/68000. This configuration requires the use of an external terminal(s). You may use your existing CoCo, along with a suitable terminal program, as a terminal.

THE CONSOLE SYSTEM adds a VGA (800 x 600 x 16) graphics board and an AT style keyboard and provides full graphics capability at the console. Terminals may be added.

TERMINAL System \$ 999.00

CONSOLE System \$1,149.00

THE SYSTEM IV comes with a one (1) year parts and labor warranty.

OPTIONS

3 MByte additional DRAM	\$120.00
Hard Disk Controller and driver	\$ 69.00
40 MByte Hard Disk	\$295.00
20 MByte Hard Disk	\$240.00
Additional 5 1/4" or 3 1/2" HD Floppy Drive	\$ 92.00
AT Style keyboard and 800 x 600 x 16 VGA Card and driver	\$159.00
For 1024 x 768 x 256 VGA Card w/1 Meg of Memory in place of standard VGA card	add \$170.00
Mono Display Card in place of VGA card	deduct \$ 50.00

Special monitor prices when ordered with the SYSTEM IV.

Prices subject to change without notice

For kits, contact Peripheral Technology at 406-394-0742

delmar co *

Middletown Shopping Center - PO Box 78 - Middletown, DE 19709
302-378-2555 FAX 302-378-2556

Submitting Material To Rainbow

Contributions to THE RAINBOW are welcome from everyone. We like to run a variety of programs that are useful, helpful and fun for other CoCo owners.

WHAT TO WRITE: We are interested in what you want 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 that 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 in ASCII format 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 wanting 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.

```

06EF      GOSUB 1010
06F3      ENDIF
06F5      IF key="/" OR key=CHR$(8) THEN
070A 200  RUN gfx2("owend")
071A      END
071C      ENDIF
071E      IF key=CHR$(13) OR key=CHR$(9) THEN
0733      GOSUB 1020
0737      ENDIF
0739      IF key>="1" AND key<=STR$(numberofchoices) THEN
074F      GOSUB 1000
0753      curc=VAL(key)
075D      GOSUB 1010
0761      GOSUB 1020
0765      ENDIF
0767      ENDOLOOP
076B 100  RUN gfx2("bell")
077A      END
077C 200  errnum=ERR
0785      IF errnum=2 OR errnum=3 OR errnum=211 THEN
079F      GOTO 20
07A3      ENDIF
07A5      RUN gfx2("owset",1,30,8,20,7,1,3)
07C7      RUN gfx2("cwarea",1,1,18,5)
07E1      RUN gfx2("color",0,1)
07F4      RUN gfx2("clear")
0801      PRINT " OS9 Error #"; errnum
0815      PRINT
0817      PRINT " Press any key"
082A      GET #0,key
0833      RUN gfx2("owend")
0840      GOTO 10
0844      PRINT #2,"OS9 Error #"; errnum
0858      END
085D 1000 RUN gfx2("curxy",2,curc)
0875      RUN gfx2("color",0,1)
0888      PRINT curc; ". "; menu(curc).name
089C      RETURN
089E 1010 RUN gfx2("curxy",2,curc)
0886      RUN gfx2("color",5,2)
08C9      PRINT curc; ". "; menu(curc).name
08DD      RETURN
08DF 1020 IF menu(curc).password<>" THEN
08F4      RUN gfx2("owset",1,7,8,66,7,1,5)
0916      RUN gfx2("cwarea",1,1,64,5)
0930      RUN gfx2("color",0,1)
0943      RUN gfx2("clear")
0950      PRINT
0952      PRINT
0954      PRINT " Password: ";
0965      RUN gfx2("curon")
0972      READ #0,line
0978      RUN gfx2("curoff")
0989      RUN toupper(line)
0993      RUN gfx2("owend")
09A0      IF line<>menu(curc).password THEN
09B3      RETURN
09B5      ENDIF
09B7      ENDIF
09B9      IF menu(curc).choicetype="M" THEN
09CC      RUN domenu(menu(curc).execution+"mnu")
09E2      ENDIF
09E4      IF menu(curc).choicetype="Q" THEN
09F7      RUN gfx2("owset",1,28,8,24,5,1,3)
0A19      PRINT " Exit MS"
0A25      RUN gfx2("cwarea",1,1,22,3)
0A3F      RUN gfx2("color",0,1)
0A52      RUN gfx2("clear")
0A5F      PRINT
0A61      PRINT " Are you sure [Y/n]?";
0A7A      GET #0,key
0A83      RUN toupper(key)
0A8D      IF key<>"N" THEN
0A9A      RUN gfx2("dwend")
0AA7      RUN gfx2("dwset",2,0,0,80,24,0,1,2)
0ACC      RUN gfx2("palette",0,63)
0AE1      RUN eko(TRUE)
0AE8      RUN gfx2("curon")
0AF5      STOP
0AF7      ELSE
0AFB      RUN gfx2("owend")
0B08      ENDIF
0B0A      ENDIF
0B0C      IF menu(curc).directory<>" THEN
0B1E      CHD menu(curc).directory
0B29      ENDIF
0B2B      IF menu(curc).choicetype="" THEN
0B3D      IF menu(curc).params THEN
0B4C      RUN gfx2("owset",1,10,8,60,7,1,3)
0B6E      RUN gfx2("cwarea",1,1,58,5)

```

Now! NRI training assures your success in three of today's fastest growing computer fields

These days, success comes to those who know how to get the most from a computer. People who know how to analyze systems, design and develop software to meet specific needs, program in the languages that will get the job done.

Now NRI has the training you need to get a competitive advantage in today's rapidly expanding computer world. Choose from NRI at-home training in PC Systems Analysis, PC Software Engineering Using C, or Computer Programming...and get the computer, the software, and the hands-on skills you need for advancement, a new career, or a business of your own.

1. Learn the art of systems analysis and get ahead in today's competitive business world

The name of the game in business today is setting up systems that will increase efficiency, productivity, and profits—using a computer both as the analysis tool and the ultimate system solution.

Now, NRI's new at-home training in PC Systems Analysis gives you the computer, the software, and the analytical skills to perform this vital role for any size business.

Step by step, you learn the art of systems analysis: how to define and break down the problem, interview users, interpret and model data, prepare proposals—every skill you need to map out the optimal system solution. But that's just the beginning.

Training includes a powerful computer system and software you keep

NRI gives you hands-on experience with an AT-compatible computer system—complete with 1.2 meg floppy drive, monitor, modem, and a full meg of RAM—all yours to train with and keep!

You begin by learning BASIC, today's most popular PC programming language. Then, using the Microsoft® Works software also included in your training, you master four essential PC applications: word processing, spreadsheets, database management, and data communications.

Soon your computer becomes your most important analysis tool, allowing you to produce cost-benefit analyses, feasibility studies, long-range projections, complex databases, and more.

Send today for your free NRI catalog, and discover how NRI's new training can make you a key player on any business team.



2. Build your own software as you build a money-making career with NRI's new training in PC Software Engineering Using C

Jobs in developing custom software will boom in the 1990's, according to the Bureau of Labor Statistics—up from about 500,000 positions in 1986 to over 1.2 million by the year 2000. Now you can get in on the rapid growth of this multi-billion dollar industry with NRI's new training in PC Software Engineering Using C.

Train with Borland C++® and a powerful AT-compatible computer

Your NRI training gives you hands-on experience with a powerful IBM PC/AT-compatible computer system, including 2400 baud internal modem, 30 meg hard drive, VGA color monitor, and advanced programming software—Borland's Turbo C++.

You learn software engineering from start to finish, mastering each of the essential phases involved in developing a full range of applications. From analysis to design to

advanced programming in C, you're in command as you assemble the building blocks for success as a software engineer. Send for your free NRI catalog today!

3. Begin a high-paying career—even a business of your own—in computer programming

Now, with NRI training in Computer Programming, you can give computers the power to carry out an astonishing range of business, professional, and personal applications. Because only NRI gives you hands-on programming experience with a powerful AT-compatible computer, plus training in four of today's hottest computer languages—BASIC, Pascal, C, and COBOL.

NRI gives you everything you need to succeed in programming, today's top-growth computer career field

Your NRI lessons first guide you step by step through the fundamentals, giving you a clear understanding of the programming design techniques used every day by successful micro and mainframe programmers. Then the fun really begins.

With your personal NRI instructor always available to help, you use your computer and software to actually design, code, run, debug, and document programs in BASIC, Pascal, C, and COBOL.

Discover how NRI gives you the experience and the know-how, the computer and the software to advance on the job or build a money-making business of your own in your choice of today's top computer fields. Send for your free catalog today!

If the coupon is missing, write to NRI Schools, McGraw-Hill Continuing Education Center, 4401 Connecticut Avenue, NW, Washington, DC 20008.

IBM is a registered trademark of IBM Corporation

SEND COUPON TODAY FOR FREE NRI CATALOG

NRI Schools

McGraw-Hill Continuing Education Center
4401 Connecticut Avenue, NW
Washington, DC 20008



YES! Send me the free catalog I've checked and show me how NRI can give me the state-of-the-art computer training I need for success.

Check one free catalog only

- PC Systems Analysis
- PC Software Engineering Using C
- Computer Programming

Other computer career training:

- Microcomputer Servicing
- Desktop Publishing and Design
- Word Processing Home Business

Name _____ Age _____

Address _____

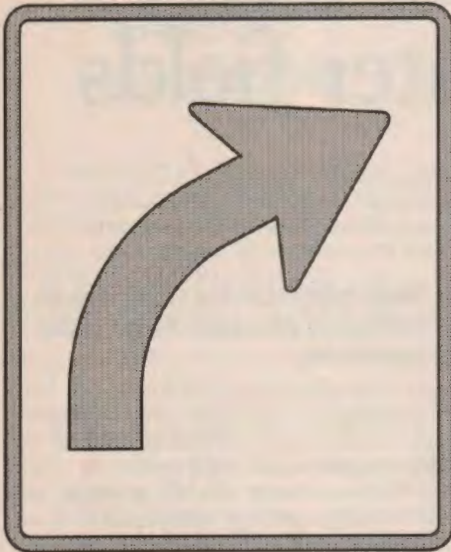
City _____ State _____ Zip _____

Accredited Member, National Home Study Council

4548-041



/params — If this switch is used, the user is asked to enter parameters for the program. If any text is found after the **/params** switch in the menu file, it is displayed when the parameters are requested. Examples: **/params**, or **/params enter filename to edit**.



/password — Programs may be password-protected with this switch. The user must type the password correctly to proceed. Example: **/password coco3**.

/screen — This specifies the type of screen to be used when executing a program. Possible screen types are shown in Figure 1. If your system has a **/v1** window descriptor, the 32-by-16 screen type is supported. If no **/screen** switch is used, an 80-by-24 screen size is assumed. Examples: **/screen 80-by-24**, **/screen 40-by-24** and **/screen 32-by-16**.

/cd — The **/cd** switch is used to specify a new directory in the event the software requires it (some software must be run from specific directories, or perhaps you already have your programs set up to run from specific directories). Example: **/cd /dd/mydir**.

/nochain — The **/nochain** switch is used to tell *MS* not to have the shell chain to the specified program, but instead just fork (run) it. Normally, the shell is called to chain to a program by using the **ex** command because this saves memory. Sometimes, however, this is not possible or not wise, and using this switch disables the chaining feature for the particular program. Example: **/nochain**.

Menu Considerations

Make sure the menu has room to fit on the screen. Using a menu that does not fit causes *MS* to crash. If necessary, move it to the left or higher on the screen.

When setting up a menu, the name of the menu becomes the **/exec** parameter, but

```

0888      RUN gfx2("color",0,1)
0898      RUN gfx2("clear")
08A8      PRINT
08AA      IF menu(curc).parammsg="" THEN
08BC          PRINT " Enter Parameters:"
08D2      ELSE
08D6          PRINT " "; menu(curc).paramsg; ":"
08E9      ENDIF
08EB      PRINT
08ED      PRINT " j";
08F4      RUN eko(TRUE)
08FB      RUN gfx2("curon")
0C08      READ #0,1line
0C11      RUN gfx2("curoff")
0C1F      1line=" "+1line
0C2B      RUN eko(FALSE)
0C32      RUN gfx2("owend")
0C3F      ELSE
0C43          1line=""
0C4A      ENDIF
0C4C      IF menu(curc).chainto THEN
0C5B          RUN execute("ex "+menu(curc).execution+1line,menu(
rc).pauseatend
          ,menu(curc).screentype)
0C8A      ELSE
0C8E          RUN execute(menu(curc).execution+1line,menu(curc).pauseatend
          ,menu(curc).screentype)
0CB7      ENDIF
0CB9      ENDIF
0CBB      IF menu(curc).directory<>"" THEN
0CCD          CHD "/dd/sys/menus"
0CDE      ENDIF
0CE0      RETURN

PROCEDURE help
0000      RUN gfx2("curon")
000D      RUN eko(TRUE)

PROCEDURE execute
0000      TYPE regs=cc,a,b,dp:BYTE; x,y,u:INTEGER
0025      PARAM execstr:STRING[80]; pauseatend:BOOLEAN
0037      PARAM screentype:BYTE
003E      DIM r:regs
0047      DIM key:STRING[1]
0053      DIM path,oldpath,errnum,xmax:BYTE
0066      errnum=0
006D      IF screentype=9 THEN
0079          OPEN #path,"/v1":UPDATE
0087      ELSE
0088          OPEN #path,"/w":UPDATE
0098          IF screentype=1 OR screentype=6 OR screentype=8 THEN
00B2              xmax=40
00B9          ENDIF
00BB          IF screentype=2 OR screentype=5 OR screentype=7 THEN
00D5              xmax=80
00DC          ENDIF
00DE          RUN gfx2(path,"dwset",screentype,0,0,xmax,24,0,1,2)
010C          RUN gfx2(path,"palette",0,63)
0126      ENDIF
0128          xmax=0
012F          PUT #path,xmax
0139          RUN gfx2(path,"select")
014C          r.a=0
0157          RUN syscall($82,r)
0165          oldpath=r.a
0170          CLOSE #0,#1,#2
017D          r.a=path
0189          RUN syscall($82,r)
0197          RUN syscall($82,r)
01A5          RUN syscall($82,r)
01B3          ON ERROR GOTO 10
01B9          SHELL execstr
01BE 10      errnum=ERR
01C7          ON ERROR
01CA          RUN gfx2("curoff")
01D8          IF pauseatend AND errnum=0 THEN
01E8              PRINT "<-MS 1.0-Hit any key->";
0206              GET #0,key
020F          ENDIF
0211          CLOSE #0,#1,#2
021E          IF screentype<>9 THEN
022A              RUN gfx2(path,"dwend")
023C          ENDIF
023E          r.a=oldpath
024A          RUN syscall($82,r)
0258          RUN syscall($82,r)
0266          RUN syscall($82,r)
0274          CLOSE #path
027A          RUN gfx2("select")
0288          RUN eko(FALSE)

```

```

028F      IF errnum<>0 THEN
029B      RUN gfx2("owset",1,30,8,20,7,1,3)
02BD      RUN gfx2("cwarea",1,1,18,5)
02D7      RUN gfx2("color",0,1)
02EA      RUN gfx2("clear")
02F7      PRINT
02F9      PRINT " OS9 Error #": errnum
030D      PRINT
030F      PRINT " Press any key":
0323      GET #0,key
032C      RUN gfx2("owend")
0339      ENDIF
033B      END

```

Listing 2: main.mnu

```

/title Main Menu
/at 2.2
Applications
/exec apps
/type menu
Games
/exec games
/type menu
System Utilities
/exec sutils
/type menu
Shell
/exec shell
Quit
/type quit

```



the .mnu extension should *not* be included. For example,

```

My Personal Menu
/exec mymenu
/type menu

```


uses the menu in the file mymenu.mnu when the My Personal Menu option is chosen.

To select an option, press its number, or use the up and down arrow keys to move the highlight bar over the choice and press ENTER. To move back a level (to the previous menu), press BREAK (or SHIFT-BREAK or CTRL-BREAK) or the slash key. The right arrow also serves as an ENTER key, and the left arrow functions as a slash.

MS also supports password protection for menus and the /type quit switch.

MS should be run with at least 16K. Using 8K, the default, allows it to have only a few menus on the screen at one time.

To have MS execute automatically on boot-up, place the following line at the end of your startup file: ms #16K. Or, use cmdgen to create the following script: runb ms #16K. Call the script autoexec and place it in your execution directory.

I hope you enjoy MS, and that it will help your family, too, better appreciate the power of your CoCo. 



Burke & Burke
P.O. Box 733
Maple Valley, WA 98038

U.S. ORDER DESK:
(800) 237-2409

INT'L & TECHNICAL:
(206) 432-1814

OS9 Software (* >= 256K; ** >= 512K required):

CYBERVOICE (Software only)* -- Run your S/S SuperVoice w/ OS9!	\$24.95
FILE SYSTEM REPACK -- Popular disk defragmenter.	\$29.95
FILE RECOVERY SYSTEM -- helps rebuild crashed disks	\$24.95
R. S. B.* -- Real Disk BASIC for Level 2 (BASIC ROM required).	\$39.95
EZGEN 1.09 -- Bootfile editor. NEW VERSION!	\$19.95
PERTASCII* -- Multi-user scrambled letter word game.	\$19.95
WILD & MV -- Wildcard & move directory entry utilities.	\$19.95

BASIC Software (* >= 256K; ** >= 512K required):

HYPHER-I/O -- 16K Hard disk / big floppy BASIC. B&B or DISTO	\$29.95
DAGGORPATCH -- Disk patch for Dungeons of Daggorath.	\$ 9.95

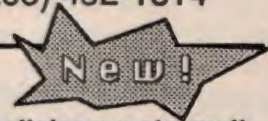
HYPHER-I/O comes on floppy disk & is EPROMable. HYPHER-I/O allows large floppy and hard disk directories, with good M/L compatibility. We recommend HYPHER-I/O for BBS & BASIC use, but it may be incompatible with some of your commercial M/L S/W.

Affordable Color Computer Hardware:

CYBERVOICE -- Speech Synthesizer w/ OS9 software.	\$99.95
COCO XT -- Adapts PC hard drives to CoCo. OS9 S/W included.	\$69.95
COCO XT-RTC -- CoCo XT, with battery backed real-time clock.	\$99.95
XT-ROM -- Boots OS9 from B&B hard disk automatically.	\$19.95

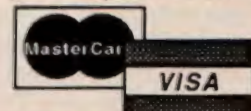
News About Upcoming Products...

We've got a lot of new products under development right now, both for the Color Computer 3 and for the new OS9-68000 machines. A few of the products you can expect to see over the next few months are a DIALOG BOX MANAGER for OS9/OSK; the PIXELBOX adapter that lets you use LogiTech ScanMan handheld scanners with the CoCo 3, and OSK ports of several popular Burke & Burke utility packages. Stop by our booth at the Chicago Rainbowfest for the latest news! -- Chris Burke



CyberVoice speaks well for OS9!

We've mated a high-tech SC-02 speech synthesizer with an entirely new kind of OS9 device driver that actually lets you specify your own pronunciation rules. You can even use escape sequences to control the style and pitch of the voice - male, female, high, low, fast, slow - billions of combinations. Advanced features like instantaneous inflection control produce high-quality speech! CyberVoice is compatible with the Speech Systems SuperVoice - buy H/W & S/W, or just the CyberVoice software.



WA RESIDENTS ADD 8.2% SALES TAX.
U.S. COD's add \$3.75. Min. U.S. shipping \$4.00. Min. shipping to Canada \$5.00. Please allow 2 weeks for delivery. Overnight or 2-day delivery available for in-stock items. Software upgrades \$5.00 each w/receipt, including U.S. shipping.



Modem Upgrades

by Marty Goodman
Contributing Editor

Q *Can I convert a 300-bps DC Modem Pak to operate at 1200 or 2400 bps by some simple operation, such as replacing the crystal connected to the 74HC943 modem chip?*

Dale Wardell (NITOR)
Millinocket, Massachusetts

A No, you cannot. Speed is not the only difference between 300-, 1200- and 2400-bps modem circuits — the entire method of encoding data is different. It is simply impossible to turn any 300-bps modem into a 1200- or 2400-bps modem by any means short of literally building an entirely new modem. However . . .

In the past I urged folks to literally throw out the DC Modem Paks they had purchased. But I got tired of telling unhappy DC Modem Pak owners this, so I decided to do something about the problem. I have developed a way of altering the Pak (by removing the modem portion) so it functions as an RS-232 Pak. The method will be published in an upcoming issue of THE RAINBOW along with information about having the upgrade performed by a third party. Of course, once the DC Modem Pak has been converted, you'll still need a 1200-bps or higher external modem. You'll also need a Multi-Pak Interface, Slot Pak or a Y cable to use the new

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.

pack with your terminal program and disk drives.

Q *Printers and Word Processors*
Q *My DMP-107 printer does not seem to print correctly in some type styles using DeskMate. What other printers in the \$200 to \$300 range do you recommend? What other CoCo word processors in the \$50 to \$150 range do you recommend?*

Brian Spano
Center Marches, New York

A The Panasonic KX-P1124 is an excellent 24-pin (very high quality, NLQ) printer. It is fully compatible with EPSON print codes and can be purchased new for under \$300. I highly recommend it. Any other 24-pin printer in this price range would be good, too. Note that used Hewlett-Packard DeskJet printers can be found in the \$300 to \$400 range. You might consider one of these. I use *Telewriter 80* as my text editor. Many prefer the better features (though poorer screen display) of *Telewriter 128*. VIP software users prefer either *VIP Writer III* or the less expensive and feature-packed *Simply Better*. Others like Microcom's *Word Power 3.2* for its ability to handle columns and a large file size.

Adding Drives

Q *How can I use an old, full-height TRS-80 Disk Drive as Drive 1 with my FD-502 disk drive system as Drive 0?*

George Pindell
Baltimore, Maryland

A You would have to make, or order, a custom cable to hook the FD-502 controller to both the FD-502 and the other drive. You'd also have to make sure the jumpers on the other drive are set to make it think it

is Drive 1. These settings depend on the brand of drive used. Then, you must determine if the FD-502 uses a terminator resistor. If so, remove the terminator resistor from the other drive. If not, put a terminator resistor in the other drive. I wrote an article on interfacing disk drives to the CoCo that covered topics like this in a bit more detail (March and April 1990).

Fried 68B09E

Q *My lovely 3-year-old daughter unplugged the disk controller from my CoCo 3 while it was on. The CoCo now appears to work all right for the first few moments, but then it goes crazy as soon as any key is touched. Any suggestions?*

Dan Van Hoy (NV7L)
Naselle, Washington

A Your best bet is to assume the 68B09E processor chip is fried. Desolder it, install a socket and replace the chip. This should cure the problem. If you have access to other CoCo 3s, test the memory and the GIME chip from your CoCo 3 in them (they are all socketed and easily tested). The GIME chip occasionally gets zapped in this situation and, even more rare, memory chips or the PIA gets zapped. But by far the most common scenario is the 6809 getting burned.

Hyperactive Drives

Q *I have a Tandy FD-502 disk drive system that is behaving erratically. Sometimes the drive lights come on of their own accord or a directory is scrambled. This problem occurs with the system plugged into either my old 64K CoCo 2 or my CoCo 3. Any ideas as to what is wrong?*

Christine Megens
Fergus, Ontario
Canada

A Any number of things could be wrong. Some testing is probably in order. First, clean the edge connector on the disk controller. Use a pencil eraser to make both sides of the 40-pin connector bright and shiny. Does that fix the problem? Next, take your disk controller and drives to a friend, or a Radio Shack, and try your controller in a different system. Does the problem appear? If so, you have a bad controller. Next, try their controller with your physical disk drives and cable. Does the problem appear? If so, the problem is either in your cable, the result of a bad drive or a result of improper drive termination. Note that defective 7406 (or 7416) chips in the controller could cause your problem.

Composite Video, To Go

Q I have a PBJ Word Pak, an ancient 80-column device for the CoCo 1 and 2. I'd like to know if it can be used to help me get monochrome composite video output from my CoCo.

Kevin Boggs (KEVINBOGGS)
Statesville, North Carolina

A The PBJ 80-column card is a complex video generator with on-board RAM and video-display hardware. Only about two or three of its transistors were used to

create and output the NTSC composite-video signal. The circuit used there would not work, in any case, with the Motorola VDG chip in the CoCo. However, it's easy to get excellent composite-monochrome video out of a CoCo 1 or 2. I produced and sold for years a circuit to do this. If you are designing your own circuit, you have to realize that the Y output on the 6847 VDG chip is nearly a proper composite-monochrome video signal, except it is inverted. My little circuit uses three transistors; an emitter follower on the input, then an inverting amplifier followed by a final amplifier. I also used an extra resistor and capacitor to "peak" the circuit and sharpen the image. I still have a few of those circuit boards and kits for that video driver. If you are interested, write me in care of THE RAINBOW. Some CoCo vendors may still be selling video drivers for the CoCo 1 and 2, but supply of those is running out I would think.

Portable CoCo

Q I am in the process of putting a CoCo 3 into a portable case and using a battery power supply. I have successfully licked the problem of providing regulated +5 volts for the main circuit, +10 volts for one half of the RS-232 converters, and the zero-crossing and voltage-comparator cir-

cuits. But I need a way to get -10 volts for the other half of those circuits. Can you suggest a solution?

Carl J. Boll (CBJ)
Chicago, Illinois

A Two solutions come to mind. The most effective solution is to get a modular DC-to-DC inverter that takes +5 volts as input and provides a -12-volt output. I have a couple of such items, made by ASTEC (the same folks who made the inverter blob used in the Tandy RS-232 Pak that takes +5 volts and puts out 12 volts). Another, less elegant, approach is to simply use a 9-volt transistor radio battery for the negative voltage. Current drain on that line is very low, so the 9-volt battery would probably last for a number of hours. I would recommend the former approach, though, as the best alternative. The problem is getting (in a quantity of one) the inverters — they are not commonly offered at local electronic supply houses. However, they are commonly found at surplus shops and amateur-radio swap meets.

Quick Change Monitor Switch

Q I have ordered an MM1, but have only one analog RGB monitor to use with both my CoCo 3 and my MM1 when it

Lyra, the ever popular music editor that lets you compose music on a graphics music staff with a mouse, is on sale for only \$20! And this includes the 100 page Lyra Companion which is packed with useful information and examples.

Lyra can be used to play music on any MIDI synthesizer or through your TV or monitor speaker. You don't need an expensive interface; just a simple cable you can easily make (or order for \$10) is all that is needed. You can easily modify the supplied music files to create room filling sound from your synthesizer. Or even make it sound like a 8 piece band playing! Transcribing from sheet music is easy; you don't need to be a musician. If you own a CoCo (any version with at least 64K memory), you can't afford to pass up this opportunity. There are only 100 copies of this sale package left, so get it while you can!

CoCo MIDI Pro is a complete 16 track MIDI recording studio. Imagine a multi-track tape recorder with all the features you could wish, including CD quality reproduction, ability to bounce tracks, over dub tracks, and punch in and out. CoCo MIDI Pro gives you all of that plus a lot more! Since it records digital data coming from your MIDI synthesizer, it plays back exactly what it records, including every timing nuance. And then every little detail can be edited to perfect the recording. You can easily add tempo and volume changes, even smooth changes from soft to loud or slow to fast. And while the sale lasts, you also get a conversion program that converts Lyra files so CoCo MIDI Pro can read them, a \$10 value, free! A CoCo 3 with 512K memory and a Multi-Pak or Y-cable is required. Through the end of April, it is on sale for only \$100. This includes the program, a comprehensive manual, and a hardware MIDI interface that provides high speed MIDI in and out.

And don't forget our other goodies—collections of music for Lyra (*Streidt's Classics* and *Lyra Lybrary Classics* each comprising 2 disks \$20.00 each), and CoCo MIDI (2 disks of genuine piano roll music, \$20.00), those hard to find Y cables (\$25.00), *Hot CoCo*, the 50 minute tape of electronic music (\$7.00), and *PC-Lyra*, the IBM PC version of Lyra (\$35.00 for CoCo version owners).

Ordering information: Payment by money order, check, or credit card (Visa or Mastercard) is welcome. Please include \$3.00 for shipping on all orders. Most orders are shipped within 24 hours.



MusicWare
Hamlet Route 1261
Seaside, OR 97138

1-800-321-1490 (orders only, please!)
1-503-738-0119 (inquiries)

arrives. How might I go about building a switch box for my monitor to switch it between the two computers?

Brian Wright (POLTERGEIST)
Chicago, Illinois

A Your best bet is to purchase a generic, two-position DB-9 switch box. These are available from most PC-clone vendors. Rogers Specialists (805-251-2520) sells such a device (Part Number DS-092) for \$18, plus shipping. All you need to do is make appropriate cables to go between the CoCo, the MM/1, the monitor and the DB-9 female connectors on the switch box. Tandy sells DB-9 connectors and hoods. If you contact me via Delphi or THE RAINBOW, I can get you the needed 10-pin, crimp-on connectors used for the CoCo's RGB port. I suggest you use flat ribbon cable wherever possible, and surround each active signal line (R,G, B, Hsync, Vsync) with Ground lines. This process involves a little rescrambling when you solder the wires to the connectors. In the case of the 10-pin, CoCo RGB connector, I usually crimp that to flat ribbon cable. Then, after six inches of cable, shred that cable and solder it to another cable in a fashion that surrounds every active signal with ground wires. For standard CoCo RGB, this requires an 11-conductor ribbon cable

(if you want ground on both edges as well as between all five active lines). This approach results in a cleaner video image in cases where there is more than about five feet of cabling involved — the every-other-line-to-ground sort of flat cables behave almost as if they were composed of separate coaxial cables on each active line.

Speaking of Monitors

Q I foolishly put some speakers on my color monitor, and now the effect of those strong magnets near the picture tube has resulted in a discolored part of the image when I use the monitor. I guess my monitor doesn't do its own degaussing! How can I fix this problem?

Scott Corley (SCOTTJ)
Clairton, Pennsylvania

A Your monitor probably does its own degaussing (to some extent) but was not up to the amount of magnetizing of the tube's innards that you accomplished with those strong speaker magnets. I recommend you get a cassette-tape or video-tape bulk eraser. Turn the eraser on a couple of feet from the picture tube and slowly bring it closer to the tube. Once it is against the tube, move the eraser around with a wiping motion over the area of the surface of the tube that is affected.

After about 30 seconds, slowly remove the eraser from the picture tube before turning it off. I once found this approach to work with a color monitor I had "discolored" by resting another operating color monitor on top of it, influencing it with its magnetic field. You may not be able to totally cure the problem immediately, but it should improve a lot. The set's own demagnetization will then likely take over and completely cure the discoloration after a while.

Multi-Pak Upgrade

Q I just bought an older 26-3024 Multi-Pak Interface. Is this the one that requires a \$15

upgrade consisting of replacing a socketted PAL chip? Should I strap the *CART interrupt pins on the Multi-Pak?

Francis Swygert (DSRTFOX)
Warner Robins, Georgia

A Yes, the older 26-3024 Multi-Pak is upgraded by replacing a 20-pin, socketted PAL chip with a new PAL chip. If you will not be using autostart ROM packs in this Multi-Pak, and especially if you intend to use the MPI with an OS-9 system, it is desirable to strap the *CART interrupts on the unit. This consists of shorting Pin 8 on each of the four slots together and tying them to Pin 8 on the edge connector that plugs into the CoCo. You may want to remove the pull-up resistors connected to Pin 8 on two or three of the 40-pin slots.

Direct-Drive Serial Ports

Q I'm working on a project that involves hooking the input and output pins of a 6551 ACIA (like that used in the RS-232 Pak) directly to another device without running them through TTL to RS-232 level converters. How long a cable can I use for the TTL-level, serial signals generated by the 6551 chip?

Lonnie McClure (LMCCLURE)
Chattanooga, Tennessee

A This question is similar to that of "how far can I run a parallel printer cable?" If anything, I would think the signals from the 6551 at TTL (0/5-volt) levels might go a little further than in a parallel printer cable because they are not carrying as much data as fast. Based on this line of reasoning, I am rather confident that you could use a cable of up to six feet without problems and you might find you could take the signals 12 feet, or more, and still have a reliable system. For increased reliability at even greater lengths, I suggest using large-gauge (22 or bigger) wires in the cable. Note that the TTL-level signals coming out of the 6551 chip are inverted with respect to the usual signal levels (-12 to +12 volt) expected for RS-232.

I Can't Hear a Thing

Q Recently, I found I could not get audio through my CoCo 3 RGB port, but the audio was available from the RCA phono connector on the back of the CoCo. How should I proceed to find the problem and fix it?

Ted Jaeger (TEDJAEGER)
Fayetteville, North Carolina

A Pin 7 of the RGB port should be connected directly to the center pin of the RCA phono jack for audio. Apparently, this

GRANITE COMPUTER SYSTEMS

MODEMS

NEW PRICE 2400 Baud V.42/V.42bis data modems. MNP1-5/LAPM.

Error correction and data compression (much higher effective throughput — as much as 9600 Baud). External \$189 (+\$7 S&H).

NEW PRODUCT 9600 Baud Send/Receive Fax modems.

Send/Receive text/graphics files from/to your computer/any Fax machine in the world. Full 2400 Baud data modem capability.

Includes software. External \$149/Internal \$139 (+\$5 S&H)

NEW PRICE 9600 Baud SendFax modems.

Send text/graphics files from your computer to any Fax machine in the world. Full 2400 Baud data modem capability.

Includes software. External \$129/Internal \$119 (+\$5 S&H).

NEW PRICE 2400 Baud Data modems

External \$109/Internal \$99 (+\$5 S&H).

These are all high quality modems made by Zoom Telephonics in the USA.

Fully Hayes compatible. Two year mfg warranty. Software available.

S&H Canada (Air PP and Ins) V.42/V.42bis \$12.00 Sendfax/Data \$8.00

GCS FILE TRANSFER UTILITIES — Version 3.0

The GCS File Transfer Utilities provide a simple and quick method to transfer text/binary files from/to a variety of floppy disk formats.

Commands PC, RS, FLEX disks: Dir, Dump, Read, Write
PC disks: Rename, Delete, Format

Handles most 5.25 and 3.5 formats. Any level sub-directories (PC).

Binary files. Use pipes for multiple file transfers. Multi-Vue version can be used under Multi-Vue or as stand alone Shell commands.

Requires OS-9 L2 for COCO 3, L1 for COCO 1 or 2. 2 drives (one can be hard/ramdisk, one floppy 40 T DD DS). Multi-Vue for Multi-Vue version.

SDISK3 for COCO3 - SDISK for COCO 1 or 2.

Multi-Vue version \$54.95 Standard version \$44.95
V3.0 updates (provide disk number) \$15.00

D.P. Johnson Software SDISK or SDISK3 \$29.95 L1+L2 Utils \$75.00
Shipping and handling — any software \$2.00

Orders must be prepaid or COD. VISA/MC accepted. COD is additional.

571 Center Road, Hillsboro, NH 03244 USA

(603) 464-3850

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.



connection has been severed for some reason, perhaps due to a cold solder joint where Pin 7 of the RGB port is connected. Or perhaps the pad for Pin 7 has cracked from repeated plugging and unplugging of an RGB connector. This situation could also be caused by a hairline crack or break in the traces on the board.

I would confirm that there is no continuity between Pin 7 of the video connector and the center of the audio connector. Use an ohmmeter set on the RX10 scale.

If you get 0 ohms resistance between Pin 7 of the RGB connector and the center conductor of the audio jack, the problem is not in your CoCo at all, but rather in the cable for your monitor, or in the amplifier or speaker of the monitor. Perhaps the 10-pin connector is now making flaky contact with the cable due to tugging during insertion and removal. This can be fixed by recrimping the connector, or by removing the connector and crimping on a new one.

If the ohmmeter goes to infinity (no continuity) between Pin 7 of the RGB connector and the center of the audio jack, run a jumper wire between Pin 7 of the RGB connector and the center of the audio connector. If you want to trace things, note that the sound output comes from the negative (minus) side of C56 (a 10- μ F, 25-volt electro-

lytic cap), whose positive side is fed by the collector of transistor Q4. Q4 and C56 are located near the audio-output connector. There's also a .022- μ F capacitor going from the final audio output to ground. This is C57, which acts as a high-frequency filter.

Halted by a Cable

Q I have a problem using a No-Halt controller when my Multi-Pak Interface is separated from my CoCo by 30 cm of 40-conductor ribbon cable. What is wrong?

Maarten (AMJ) Van Wamelen
Oedelem, Belgium

A Even very short lengths of ribbon cable between the CoCo and the Multi-Pak Interface can cause subtle problems. The cause is probably capacitance in the ribbon cable. I recommend not using ribbon cable at all, or using a very short ribbon cable (3 cm or less). Why are you using that ribbon cable? To better make room for the CoCo system on your desk? If so, let me suggest a better solution that results in a more reliable machine. Put the CoCo, with the MPI plugged directly into it, off to one side or above or below your main work area. Buy either a Bob Puppo-style IBM keyboard adapter from Frank Hogg Laboratories, or a "Marty Goodman" key-

board-extender cable from Microcom. Either allows you to have most of your system away from the desktop and still have the keyboard comfortably in your lap or on your desk. Extending the keyboard through a ribbon cable does not cause the same reliability problems as extending the fragile 40-conductor, high-speed main bus of the computer.

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.

JWT Enterprises

Attention! MM1 programmers wanted. Many prospective projects already planned. Write for more information.

Optimize Utility Set 1 **NEW!**

Optimize your disks by eliminating fragmented files and compacting your directories for faster file access. Also includes a utility to assess file fragmentation and directory fragmentation as well as excess directory padding.

Optimize Utility Set 1 \$29.95 Foreign postage, add \$3.00

Nine-Times: Each issue contains: 9 helpful and useful programs to help build your OS-9 library * Instructions, examples, and samples of Basic09 procedures and subroutines to help with your own programs and your understanding of Basic09 * C programs and programming examples * Hints, Help columns, and informative articles to advance your knowledge of OS-9 * Supplied totally of 5.25" disk * Bound manual sent to each new subscriber for help in getting Nine-Times up and running, as well as tips on using it with a ram disk or hard disk * All graphic/joystick interface for ease of use.

1-Year Subs, \$34.95 Canadian postage, add \$1.00
Article/programming submissions wanted Foreign postage, add \$7.00

Back Issues: Available for the May 1989 through March 1991 issues. Please write for information on Back Issue contents.

Back Issue, ea. \$7.00 Foreign postage, add \$1.50 ea.

Magazine Source: Due to many inquiries, the source code for the magazine graphic shell is being provided as an informational tool. Included is the actual Basic09 source code and compiled modules on disk, as well as documentation and a printed copy of the source code.

Source, \$24.95 Foreign postage, add \$3.00

To order, please send U.S. check or money order to:

JWT Enterprises
5755 Lockwood Blvd.
Youngstown, OH 44512



Technical Assistance:
(216)-758-7694

Sorry, no C.O.D.'s or credit cards; Foreign & Canadian orders, please use U.S. money orders. U.S. checks, allow 3-4 weeks for receipt of first issue/back issue.

Copyright (C) 1991 OS-9 is a trademark of Microvare Systems Corp. and Microvare, Inc.

Free Disk-ZAP with any purchase! VIP Software for the CoCo 3

VIP Writer III includes VIP Speller.....\$79.95
VIP Calc III.....\$69.95
VIP Database III.....\$69.95
VIP Library /WDCE.....\$179.95
Upgrade Writer to Writer III.....\$49.95
Upgrade Calc to Calc III.....\$29.95
Upgrade Database to Database III....\$39.95
Upgrade Library to Library /WDCE....\$99.95

VIP Software for ALL CoCos

VIP Writer includes VIP Speller.....\$69.95
VIP Calc.....\$59.95
VIP Database.....\$49.95
VIP Disk-Zap.....\$29.95
VIP Integrated Library.....\$149.95
Upgrade any VIP pgm to VIP Library \$99.95

Upgrading? Send disk only + amount + S/H
See January '90 ad for product descriptions.

VISA

M/C

SD Enterprises info line (805) 566-1317
P. O. Box 621 Carpinteria Ca 93013

VIP Library orders add \$4 S/H USA, \$5 Canada & \$10 Foreign
Other orders add \$3 S/H in USA, \$4 Canada, \$6 Foreign. COD orders add an additional \$2.75. Checks allow 3 weeks for delivery. Calif. res. add 6 1/4 % tax.

CoCo 3 returns to
the classics

Tic-Tac

by David Ridings

Tic-Tac is a computerized version of the classic game *Tic-Tac-Toe*. The competition is not with another person, but with a computer-generated opponent and an onscreen Cat. (For those unfamiliar with the rules of *Tic-Tac-Toe*, any games not won by you or your opponent are automatically scored in favor of the Cat.) Competition is tough as you try to outwit the computer's strategy. But beating your inanimate opponents is not as easy as it sounds. *Tic-Tac* requires more than just casual participation; it demands careful planning to ensure victory.

The program requires a CoCo 3. To get it going, plug a joystick into the right joystick port and enter RUN" TIC-TAC". The players appear onscreen with the game-board. Press the joystick button to turn on a spotlight and start the game. The computer chooses which player begins the game. To make a move, press the number that corresponds to the desired square on the board. Press the joystick button to enter your selection and place the X on the board. If you

David Ridings spends his spare time writing CoCo software for his son, Dan, who has cerebral palsy. Through running these programs, Dan gains a sense of pride in showing others what he can do. David can be contacted at 3058 Donnycave, Maryland Heights, MO 63043, (314) 291-2854.

change your mind after pressing the number, press the space bar and enter another number. The program records the number of games won by each player during com-

petition. The first player to win 10 games is the champion.

I hope *Tic-Tac* finds a good home in your software library. □

CoCo 3							
22	182	362	32	672	209	831	126
40	186	391	252	711	57	868	200
65	109	412	126	717	215	884	158
125	160	452	188	725	7	917	110
211	212	492	219	811	63	END	0
235	184	543	31	817	97		
299	242	621	189	824	110		
333	94	636	246	828	214		

The Listing: TIC-TAC

```

1 'TIC-TAC
2 'WRITTEN BY DAVID RIDINGS
3 'COPYRIGHT (C) MARCH 1991
4 'BY FALSOFT, INC.
5 'RAINBOW MAGAZINE
11 GOSUB911
12 PC=7:NC=3:BC=11:GOSUB926
15 X$="BM-X;,-Y:"
17 HBUFF1,99:HBUFF2,999:HBUFF3,9
99:HBUFF4,2999
21 TT$="D110BR40U110035R40L120BD
40R120"
22 TA$="C12R89D4L89U4C8":TB$="C1
2R4D84L4U84C8":TC$="C12BL2BD2E69
F3G69H3C8":TD$="C12BR1F69G3H69E3
C8"
31 HLINE(3,44)-(316,48),PSET,B:H
PAINT(4,46),BC,8
33 HLINE(100,3)-(104,44),PSET,B:
HPAINT(101,5),BC,8:HLINE(206,3)-
(210,44),PSET,B:HPAINT(207,5),BC
,8
34 A=-55:B=22:FORD=1T03:A=A+104:
HLINE(A,B)-(A+9,B+4),PSET,B:HPAI
NT(A+1,B+1),BC,8:NEXTD
35 X=28:Y=18:GOSUB830
36 X=235:Y=19:GOSUB812
37 X=129:Y=18:GOSUB831

```

```

38 HPAINT(5,5),10,8:HPAINT(109,5
),10,8:HPAINT(214,5),10,8
40 X=79:Y=18:GOSUB829:X=183:Y=18
:GOSUB829:X=287:Y=18:GOSUB829
43 HCIRCLE(11,37),4:HCIRCLE(112,
37),4
45 HLINE(176,55)-(310,180),PSET,
B:HPAINT(7,52),14,8
47 A=135:B=44
48 FORD=1T08:B=8+16:GOSUB95:NEXT
D
49 B=44:A=A-16:IF A<18 THEN61
50 GOTO48
61 HCOLOR14:HLINE(5,51)-(31,75),
PSET,BF:HCOLOR8
62 HDRAW"BM22,65D7F2R2E2U12H2L2G
2D5U3L12G2D4F2R12L5BU8U13L1D13"
63 HPAINT(21,65),8,8:HPAINT(23,6
5),3,8
65 HCOLOR12:HLINE(20,163)-(115,1
79),PSET,B:HCOLOR11:HLINE(21,164
)-(114,178),PSET,B:HCOLOR12:HLIN
E(22,165)-(113,177),PSET,B:HPAIN
T(55,170),10,12:HCOLOR8
66 HPRINT(3,21),"TIC-TAC-TOE"
91 GOSUB922:GOTO101
95 HCIRCLE(A,B),6:HPAINT(A,B),11
,8:RETURN
101 HPAINT(23,65),1,8
103 HCOLOR1:HLINE(26,61)-(169,58
),PSET:HLINE(169,58)-(169,111),P
SET:HLINE(169,111)-(26,70),PSET:
HCOLOR8
104 HPAINT(43,67),0,1:GOSUB121:G
OTO125
121 HCOLOR11:X=223:Y=61:HDRAWX$+
TT$:X=224:Y=63:HDRAWX$+TT$:HCOLO
R10:X=225:Y=62:HDRAWX$+TT$:HCOLO
R8:RETURN
125 X=242:Y=112:GOSUB829:X=201:Y
=77:GOSUB833:X=284:Y=157:GOSUB83
3
127 HGET(188,62)-(218,93),2:HGET
(228,102)-(258,133),3
128 HCOLOR4:HLINE(188,62)-(218,9
3),PSET,BF:HLINE(228,102)-(258,1
33),PSET,BF:HLINE(268,142)-(298,
173),PSET,BF:HCOLOR8:GOSUB129:GO
TO202
129 HPRINT(25,9),"1 2 3":H
PRINT(25,14),"4 5 6":HPRIN
T(25,19),"7 8 9":RETURN
133 X=202:Y=158:HDRAWX$+TC$
134 GOTO134
202 HPAINT(11,37),10,8:HPAINT(11
2,37),10,8:R=RND(2):ON R GOTO 21
1,261
211 HPAINT(11,37),3,8:A$=INKEY$
212 IF A$>CHR$(48)AND A$<CHR$(58
)THEN221
213 GOSUB851
214 HPAINT(11,37),10,8
215 GOSUB851
216 GOTO211
221 IF A$=CHR$(49)THEN GOSUB311
222 IF A$=CHR$(50)THEN GOSUB321
223 IF A$=CHR$(51)THEN GOSUB331
224 IF A$=CHR$(52)THEN GOSUB341
225 IF A$=CHR$(53)THEN GOSUB351
226 IF A$=CHR$(54)THEN GOSUB361
227 IF A$=CHR$(55)THEN GOSUB371
228 IF A$=CHR$(56)THEN GOSUB381
229 IF A$=CHR$(57)THEN GOSUB391
235 GOSUB918:GOSUB711:IF T=9 THE
N731
237 HPAINT(11,37),10,8

```

```

239 GOTO261
261 FORF=1T01:HPAINT(112,37),3,8
262 FORP=1T03:GOSUB851:NEXTP
264 HPAINT(112,37),10,8
265 FORP=1T03:GOSUB851:NEXTP
266 HPAINT(112,37),3,8
267 NEXTF
271 R=RND(9):GOSUB861
272 ON R GOSUB411,421,431,441,45
1,461,471,481,491
275 GOSUB918:GOSUB711:IF T=9 THE
N731
277 HPAINT(112,37),10,8
298 GOTO211
299 GOTO299
311 IF L(1)=1 THEN 211
312 N(1)=24:N(2)=9:N(3)=1:GOSUB3
97
313 L(1)=1:A(1)=1:T=T+1
314 HPUT(188,62)-(218,93),2
315 RETURN
321 IF L(2)=1 THEN 211
322 N(1)=29:N(2)=9:N(3)=2:GOSUB3
97
323 L(2)=1:A(2)=1:T=T+1
324 HPUT(228,62)-(258,93),2
325 RETURN
331 IF L(3)=1 THEN211
332 N(1)=34:N(2)=9:N(3)=3:GOSUB3
97
333 L(3)=1:A(3)=1:T=T+1
334 HPUT(268,62)-(298,93),2
335 RETURN
341 IF L(4)=1 THEN211
342 N(1)=24:N(2)=14:N(3)=4:GOSUB
397
343 L(4)=1:A(4)=1:T=T+1
344 HPUT(188,102)-(218,133),2
345 RETURN
351 IF L(5)=1 THEN211
352 N(1)=29:N(2)=14:N(3)=5:GOSUB
397
353 L(5)=1:A(5)=1:T=T+1
354 HPUT(228,102)-(258,133),2
355 RETURN
361 IF L(6)=1 THEN211
362 N(1)=34:N(2)=14:N(3)=6:GOSUB
397
363 L(6)=1:A(6)=1:T=T+1
364 HPUT(268,102)-(298,133),2
365 RETURN
371 IF L(7)=1 THEN211
372 N(1)=24:N(2)=19:N(3)=7:GOSUB
397
373 L(7)=1:A(7)=1:T=T+1
374 HPUT(188,142)-(218,173),2
375 RETURN
381 IF L(8)=1 THEN211
382 N(1)=29:N(2)=19:N(3)=8:GOSUB
397
383 L(8)=1:A(8)=1:T=T+1
384 HPUT(228,142)-(258,173),2
385 RETURN
391 IF L(9)=1 THEN211
392 N(1)=34:N(2)=19:N(3)=9:GOSUB
397
393 L(9)=1:A(9)=1:T=T+1
394 HPUT(268,142)-(298,173),2
395 RETURN
397 HCOLOR4:HPRINT(N(1),N(2)),N(
3):FORD=1T029:IF BUTTON(0)=1 THE
N HCOLOR8:RETURN
398 B$=INKEY$:IF B$=CHR$(32)THEN
HCOLOR8:HPRINT(N(1),N(2)),N(3):
GOTO211
399 NEXTD:HCOLOR8:HPRINT(N(1),N(

```

```

2)),N(3):FORF=1T049:NEXTF:GOTO39
7
411 IF L(1)=1 THEN 271
412 L(1)=1:A(1)=2:T=T+1
413 HPUT(188,62)-(218,93),3
419 RETURN
421 IF L(2)=1 THEN271
422 L(2)=1:A(2)=2:T=T+1
423 HPUT(228,62)-(258,93),3
429 RETURN
431 IF L(3)=1 THEN 271
432 L(3)=1:A(3)=2:T=T+1
433 HPUT(268,62)-(298,93),3
439 RETURN
441 IF L(4)=1 THEN 271
442 L(4)=1:A(4)=2:T=T+1
443 HPUT(188,102)-(218,133),3
449 RETURN
451 IF L(5)=1 THEN 271
452 L(5)=1:A(5)=2:T=T+1
453 HPUT(228,102)-(258,133),3
459 RETURN
461 IF L(6)=1 THEN 271
462 L(6)=1:A(6)=2:T=T+1
463 HPUT(268,102)-(298,133),3
469 RETURN
471 IF L(7)=1 THEN 271
472 L(7)=1:A(7)=2:T=T+1
473 HPUT(188,142)-(218,173),3
479 RETURN
481 IF L(8)=1 THEN 271
482 L(8)=1:A(8)=2:T=T+1
483 HPUT(228,142)-(258,173),3
489 RETURN
491 IF L(9)=1 THEN 271
492 L(9)=1:A(9)=2:T=T+1
493 HPUT(268,142)-(298,173),3
499 RETURN
511 HGET(3,3)-(100,44),4
512 HPUT(193,75)-(290,116),4
515 GOTO541
521 HGET(104,3)-(206,44),4
522 HPUT(193,75)-(295,116),4
525 GOTO541
531 HGET(210,3)-(316,44),4
532 HPUT(193,75)-(299,116),4
535 GOTO541
541 HPRINT(25,16),"W I N N E R"
542 GOSUB917
543 FORF=1T029:PALETTE0,49:FORP=
1T049:NEXTP:PALETTE0,62:FORP=1T0
49:NEXTP,F
544 FORZ=1T04:HBUFF(Z)=0:NEXTZ
545 SA=0:SB=0:SC=0:GOTO1
551 GOTO551
611 SA=SA+1:HCOLOR10:HLINE(64,8)
-(96,38),PSET,BF:HCOLOR8:X=79:Y=
18:IF SA=10THENGOSUB811:GOTO651
612 IF SA=9THENGOSUB828:GOTO651
613 IF SA=1THEN GOSUB816:GOTO651
614 IF SA=2THENGOSUB818:GOTO651
615 IF SA=3THENGOSUB820:GOTO651
616 IF SA=4THENGOSUB822:GOTO651
617 IF SA=5THENGOSUB824:GOTO651
618 IF SA=6THENGOSUB825:GOTO651
619 IF SA=7THENGOSUB826:GOTO651
620 IF SA=8THENGOSUB827:GOTO651
621 SB=SB+1:HCOLOR10:HLINE(168,8)
-(200,38),PSET,BF:HCOLOR8:X=183
:Y=18:IF SB=10THENGOSUB811:GOTO6
61
622 IF SB=9THENGOSUB828:GOTO661
623 IF SB=1THENGOSUB816:GOTO661
624 IF SB=2THENGOSUB818:GOTO661
625 IF SB=3THENGOSUB820:GOTO661
626 IF SB=4THENGOSUB822:GOTO661

```

```

627 IF SB=5THENGOSUB824:GOTO661
628 IF SB=6THENGOSUB825:GOTO661
629 IF SB=7THENGOSUB826:GOTO661
630 IF SB=8THENGOSUB827:GOTO661
631 SC=SC+1:HCOLOR10:HLIN(272,8
)-(304,38),PSET,BF:HCOLOR8
632 X=287:Y=18
633 IF SC=1THENGOSUB816:GOTO671
634 IF SC=2THENGOSUB818:GOTO671
635 IF SC=3THENGOSUB820:GOTO671
636 IF SC=4THENGOSUB822:GOTO671
637 IF SC=5THENGOSUB824:GOTO671
638 IF SC=6THENGOSUB825:GOTO671
639 IF SC=7THENGOSUB826:GOTO671
640 IF SC=8THENGOSUB827:GOTO671
641 IF SC=9THENGOSUB828:GOTO671
642 IF SC=10THENGOSUB811:GOTO671
651 *WIN-DAN
652 FORD=1T03:GOSUB917:NEXTD
653 GOTO681
661 *WIN-COMP
662 GOSUB917:FORD=1T03:GOSUB921:
NEXTD
663 GOTO681
671 *WIN-CAT
672 GOSUB917:FORD=1T09:GOSUB918:
NEXTD
673 GOTO681
681 FORF=1T019:PALETTE0,49:FORP=
1T049:NEXTP:PALETTE0,62:FORP=1T0
49:NEXTP,F
682 HCOLOR4:HLIN(178,57)-(308,1
78),PSET,BF:HCOLOR8
691 FORQ=1T09:A(Q)=0:L(Q)=0:NEXT
Q:T=0
693 IF SA=10THEN511
694 IF SB=10THEN521
695 IF SC=10THEN531
697 GOSUB121:GOSUB129
699 GOTO202
711 IF A(1)=2 AND A(1)=A(2)AND A
(1)=A(3)THEN X=198:Y=75:TL$=TA$:
GOTO751
712 IF A(1)=2 AND A(1)=A(4)AND A
(1)=A(7)THEN X=201:Y=75:TL$=TB$:
GOTO751
713 IF A(1)=2 AND A(1)=A(5)AND A
(1)=A(9)THEN X=209:Y=81:TL$=TD$:
GOTO751
714 IF A(2)=2 AND A(2)=A(5)AND A
(2)=A(8)THEN X=241:Y=75:TL$=TB$:
GOTO751
715 IF A(3)=2 AND A(3)=A(6)AND A
(3)=A(9)THEN X=281:Y=75:TL$=TB$:
GOTO751
716 IF A(3)=2 AND A(3)=A(5)AND A
(3)=A(7)THEN X=209:Y=149:TL$=TC$:
GOTO751
717 IF A(4)=2 AND A(4)=A(5)AND A
(4)=A(6)THEN X=198:Y=115:TL$=TA$:
GOTO751
718 IF A(7)=2 AND A(7)=A(8)AND A
(7)=A(9)THEN X=198:Y=155:TL$=TA$:
GOTO751
721 IF A(1)=1 AND A(2)=1 AND A(3
)=1 THEN X=198:Y=75:TL$=TA$:GOTO
771
722 IF A(1)=1 AND A(4)=1 AND A(7
)=1 THEN X=201:Y=75:TL$=TB$:GOTO
771
723 IF A(1)=1 AND A(5)=1 AND A(9
)=1 THEN X=209:Y=81:TL$=TD$:GOTO
771
724 IF A(2)=1 AND A(5)=1 AND A(8
)=1 THEN X=241:Y=75:TL$=TB$:GOTO
771
725 IF A(3)=1 AND A(6)=1 AND A(9
)=1 THEN X=281:Y=75:TL$=TB$:GOTO
771
726 IF A(3)=1 AND A(5)=1 AND A(7
)=1 THEN X=209:Y=149:TL$=TC$:GOT
0771
727 IF A(4)=1 AND A(5)=1 AND A(6
)=1 THEN X=198:Y=115:TL$=TA$:GOT
0771
728 IF A(7)=1 AND A(8)=1 AND A(9
)=1 THEN X=198:Y=155:TL$=TA$:GOT
0771
729 RETURN
731 GOTO631
751 HDRAWX$+TL$:HPAINT(X+1,Y+1),
0,12:GOTO621
771 HDRAWX$+TL$:HPAINT(X+1,Y+1),
0,12:GOTO611
811 X=X-11:Y=Y-5:TN$="D20R5U20L5
BR12G3D14F3R9E3U14H3L9BD4BR3G1D1
0F1R3E1U10H1L3":HDRAWX$+TN$:HPAI
NT(X+1,Y+1),NC,8:HPAINT(X+12,Y+1
),NC,8:XA$="TEN":RETURN
812 X=X+12:Y=Y+2:CT$="BL1E2U8G6H
3L7G3H6D8F2D7F7R6E7U7":HDRAW X$+
CT$
813 HCIRCLE(X-16,Y),3...6:HCIRCL
E(X-8,Y),3...6:HCIRCLE(X-12,Y+4)
,3...8:HCIRCLE(X-12,Y+9),5...4
814 HLINE(X-6,Y+3)-(X+4,Y+3),PSE
T:HLIN(X-6,Y+6)-(X+1,Y+10),PSET
:HLIN(X-18,Y+3)-(X-24,Y+3),PSET
:HLIN(X-18,Y+6)-(X-24,Y+10),PSE
T
815 HPAINT(X-1,Y-1),15,8:XB$="C
AT":RETURN
816 X=X-3:Y=Y-2:OE$="D16L4D3R14U
3L4U20L9D3R2"
817 HDRAW X$+OE$:HPAINT(X+2,Y),N
C,8:XB$="ONE":RETURN
818 X=X-10:Y=Y-1:TW$="U3E3R13F3D
8G3L11D4R9U2R5D6L19U9E3R10E1U4H1
L7G1D2L5"
819 HDRAW X$+TW$:HPAINT(X+1,Y-2)
,NC,8:XB$="TWO":RETURN
820 X=X-10:Y=Y-1:TH$="U3E3R13F3D
6G2F2D6G3L13H3U4R5D2F1R6E1U3H1L6
U4R6E1U3H1L6G1D2L5U2":HDRAW X$+T
H$:HPAINT(X+2,Y),NC,8
821 XB$="THREE":RETURN
822 X=X+5:Y=Y-7:FO$="D11R5D5L5D7
L5U7L11U5E11R5L5B8D4L5E5"
823 HDRAW X$+FO$:HPAINT(X-1,Y+1)
,NC,8:XB$="FOUR":RETURN
824 X=X-9:Y=Y-6:FI$="R17D5L12D3R
9F3D7G3L14U5R11E1U1H1L1U12":HDR
AW X$+FI$:HPAINT(X+2,Y+2),NC,8:XB
$="FIVE":RETURN
825 X=X+9:Y=Y-1:SX$="U3H3L11G3D1
6F3R11E3U7H3L9U3E1R5F1D1R5B8D6L6
L5G1D2F1R5E1U2H1":HDRAW X$+SX$:H
PAINT(X-2,Y-2),NC,8:XB$="SIX":R
ETURN
826 X=X-9:SV$="U6R2D5G9D8L6U9E9
L9D2L5":HDRAWX$+SV$:HPAINT(X+2,Y
-2),NC,8:XB$="SEVEN":RETURN
827 X=X-7:Y=Y+5:EI$="H2U6E3R14F3
D6G2F2D6G3L14H3U6E2BR5BU3H1U2E1R
6F1D2G1L6B8D5G1D2F1R6E1U2H1L6":HD
RAWX$+EI$:HPAINT(X+2,Y),NC,8:XB$
="EIGHT":RETURN
828 X=X-7:Y=Y+11:NI$="D3F3R11E3U
15H3L11G3D6F3R9D3G1L6U2L5B8D6R6R
5E1U2H1L5G1D2F1":HDRAWX$+NI$:HPA
INT(X+2,Y+1),NC,8:XB$="NINE":RE
TURN
829 X=X-5:Y=Y-5:ZE$="G3D14F3R12E
3U14H3L12B4D4R3G1D10F1R6E1U10H1L
6":HDRAWX$+ZE$:HPAINT(X+2,Y+1),N
C,8:XA$="ZERO":RETURN
830 HCIRCLE(X,Y+5),12:HCIRCLE(X,
Y-4),13,13,.3:HPAINT(X,Y-4),12,1
3:HCIRCLE(X,Y-4),13,8,.3:HA$="C8
BL5BD2R2D2L2U2BR8R2D2L2U2BD4BL2L
2D2R2U2BR4BD2D1G3L4H3U1BL8U5BR26
D5":HDRAWX$+HA$:XC$="HAPPY":RETR
URN
831 HCIRCLE(X,Y+5),13:HCIRCLE(X-
5,Y+4),6...5:HCIRCLE(X+5,Y+4),6
...5:HPAINT(X,Y-3),8,8:VI$="BD10B
L1U2R2D2L2BD2L2G1E1R6F1L8BL5BU9U
12D1H1F2BR16F2E6G1U1D12U12F1H2BL16
G2":HDRAWX$+VI$
832 RETURN
833 CX$="G9R6E5F5R6H9E9L6G5H5L6F
9":HDRAWX$+CX$:HPAINT(X+1,Y),3,8
:RETURN
851 C=RND(155):C=C+9:D=RND(130):
D=D+57:CC=RND(15):HGET(C-4,D-4)-
(C+4,D+4),1:HCIRCLE(C,D),2,CC:HP
UT(C-4,D-4)-(C+4,D+4),1:RETURN
861 G=1:H=2:J=3:GOSUB895
862 G=1:H=4:J=7:GOSUB895
863 G=1:H=5:J=9:GOSUB895
864 G=2:H=3:J=1:GOSUB895
865 G=2:H=5:J=8:GOSUB895
866 G=3:H=1:J=2:GOSUB895
867 G=3:H=5:J=7:GOSUB895
868 G=3:H=6:J=9:GOSUB895
869 G=4:H=7:J=1:GOSUB895
870 G=4:H=5:J=6:GOSUB895
871 G=5:H=6:J=4:GOSUB895
872 G=5:H=9:J=1:GOSUB895
873 G=5:H=8:J=2:GOSUB895
874 G=5:H=7:J=3:GOSUB895
875 G=6:H=9:J=3:GOSUB895
876 G=6:H=4:J=5:GOSUB895
877 G=7:H=8:J=9:GOSUB895
878 G=7:H=1:J=7:GOSUB895
879 G=7:H=3:J=5:GOSUB895
880 G=8:H=9:J=7:GOSUB895
881 G=8:H=2:J=5:GOSUB895
882 G=9:H=1:J=5:GOSUB895
883 G=9:H=7:J=8:GOSUB895
884 G=9:H=3:J=6:GOSUB895
885 G=1:H=7:J=4:GOSUB895
887 RETURN
895 IF T=8 AND A(R)=0 THEN 272
896 IF A(G)=1 AND A(H)=1 AND A(J
)=0 THEN R=J
897 IF A(G)=2 AND A(H)=2 AND A(J
)=0 THEN R=J:GOTO272
899 RETURN
911 ON BRK GOTO 916
912 PALETTE RGB:HSCREEN2:HCLS4:H
COLOR8:POKE65497,0:PALETTE0,62:P
ALETTE10,49:PALETTE11,14:PALETTE
12,2:PALETTE13,4:PALETTE14,7:PAL
ETTE15,52:RETURN
916 PALETTE RGB:END
917 PLAY"01T160CDEFGAB02CDEFGAB0
3CDEFGAB04CDEFGAB":RETURN
918 PLAY"02T160CDEFGAB":RETURN
919 FORT=151T0141 STEP-1:SOUNDT,
1:NEXTT:SOUND41,9:RETURN
921 PLAY"01T160CDEFGAB01CDEFGAB0
1CDEFGAB01CDEFGAB":RETURN
922 IF BUTTON(0)=1 THEN RETURN
923 GOTO922
925 RETURN
926 HLINE(3,3)-(316,188),PSET,B:
HPAINT(1,1),BC,8:RETURN

```

Novices Niche

Freedom

By Richard Estrado

Freedom is a graphics program that creates a snake of lines that move randomly around the screen, much like the arcade game *Qix*. CoCo 1 and 2 users need to change Line 80 to POKE 65495,0. If your CoCo doesn't support the high-speed mode, leave Line 80 out altogether. After pressing BREAK to stop the program, make sure you set the computer back to normal speed using POKE 65496,0 (or POKE 65494,0 for the CoCo 1 and 2). Explore and enjoy!

The Listing: FREEDOM

```

1 'FREEDOM
2 'WRITTEN BY RICHARD ESTRADO
3 'COPYRIGHT (C) APRIL 1991
4 'BY FALSOFT, INC.
5 'RAINBOW MAGAZINE
10 '*****
20 '**      FREEDOM      *
30 '**      *
40 '** by R. ESTRADO *
50 '*****
60 '
70 '      OMIT LINE 80 FOR CO
CO1,COCO2
80 POKE 65497,0
90 '      INITIALIZE

```

```

100 DIM R(20),P(20),Q(20),S(20)
110 PMODE 4,1:SCREEN 1,1:PCLS
120 P(0)=128:Q(0)=100:R(0)=128:S
(0)=100
130 P=1:PP=2
140 '      MAIN PROGRAM
150 A=RND(0)*2-1:B=RND(0)*2-1:C=
RND(0)*2-1:D=RND(0)*2-1
160 A=A*5:B=B*5:C=C*5:D=D*5
170 FOR X=1 TO 15+RND(20)
180 GOSUB 290
190 IF P=20 GOSUB 350
200 IF ABS(P(P)-R(P))>50 THEN A=
-A:C=-C
210 IF ABS(Q(P)-S(P))>40 THEN B=
-B:D=-D
220 LINE (P(PP),Q(PP))-(R(PP),S
(PP)),PRESET
230 LINE (P(P),Q(P))-(R(P),S(P))
,PSET
240 P=P+1:IF P=21 THEN P=1
250 PP=PP+1:IF PP=21 THEN PP=1
260 NEXT X
270 GOTO 140
280 '      CHECK BOUNDARIES
290 P(P)=P(P-1)+A:IF P(P)>250 OR
P(P)<5 THEN A=-A:P(P)=P(P)+A
300 Q(P)=Q(P-1)+B:IF Q(P)>192 OR
Q(P)<5 THEN B=-B:Q(P)=Q(P)+B
310 R(P)=R(P-1)+C:IF R(P)>250 OR
R(P)<5 THEN C=-C:R(P)=R(P)+C
320 S(P)=S(P-1)+D:IF S(P)>250 OR
S(P)<5 THEN D=-D:S(P)=S(P)+D
330 RETURN
340 '      LINK ARRAY
350 P(0)=P(20):Q(0)=Q(20):R(0)=R
(20):S(0)=S(20)
360 RETURN

```

Choose From 4 GREAT Money Saving Packages!

1 OISTO
SC-II
+
4 in 1
\$200

• SC-II \$130 • 0K SR-3 \$30
• SC-I \$99 • 512K \$70
• MC-I \$75 • 1-MEG Kit \$150

2 OISTO
SC-II
+
1-MEG
\$235

• RTC \$35 • MPROM \$50
• 3in1 \$70 • H. DISK \$50
• 4in1 \$130 • RS-232 \$40

3 OISTO
SC-II
+
512K
\$165

• 1-MEG (0K) \$140
• RS-232 PAK \$55
• HD & RS-232 \$60

4 OISTO
4 in 1
+
1-MEG
\$235

• Turn of the Screw Book \$20
(With any Special Package \$10)
• Project Board \$10

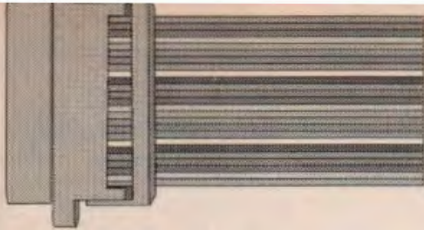
CRC Inc.

11 Boul. Des Laurentides, Laval, Quebec, Canada H7G 2S3

Include S&H of \$8 MC/VISA or Money Order Accepted

1-514-967-0195

Sorry: No personal cheques



Conference

by Eddie Kuns
OS-9 SIG Database Manager

Last month I explained the basic slash commands, such as /SEND and /TIME. Now you're ready for some of the more specialized commands. Conference has a number of special slash commands that only apply while you are in that area, and several new slash commands have been added recently.

First, let's review how to enter and use Conference. You can enter Conference from any SIG menu, or from the Delphi Main menu by entering C0. The Conference area in each SIG is different, except that the CoCo and OS-9 SIGs share a Conference area, as do some other SIGs. This means if you want to talk to someone, you should be in the same SIG. There are exceptions, but this is the general rule.



When you enter Conference, you see the Conference> prompt. You are now "idle" in Conference, which means you have not yet entered a Conference group. (Groups are user-definable areas within Conference. Delphi allows several separate groups of people to talk with each other in each Conference area.) There are several commands you can use in idle, but you can't talk to anyone yet. The first command I usually enter at this prompt is /NAME Eddie. This slash command gives me a handle, or nickname, which lasts for as long as I am in Conference or until I use the command

Eddie Kuns is pursuing a PhD in physics at Rutgers University. He lives in Aurora, Illinois and works as a programmer and researcher at Fermilab. Eddie is co-manager of the CoCo SIG; his username is EDDIEKUNS.

again. Now, if you enter the /WHO command, you see something like

```
GROUP LIST: 02:05:46
13) SCRAMBLE Word Game
    GAME, Jim
20) Late Night Chat
    Joel, Bob K, Rick
    - idle
    Eddie
```

```
AVAILABLE LIST: () = in conf
MYCROFTH, (EDDIEKUNS),
(JOELHEGBERG), (JIMISSEL),
(BOBKEMPER), (GAME),
DANMONDAY, JAHICKS,
(RICKADAMS)
— [8 in this area]
```

This is similar to the normal (outside Conference) /WHO slash command, but gives you more information. For example, people are listed by their handles, if they have set one. The members of the different groups in this Conference area are also listed. You can belong to more than one group at a time, but that's a topic for later discussion — it can get really confusing!

In the above listing, you see two groups in Conference: SCRAMBLE Word Game and Late Night Chat. If you want to join an existing group, enter

JOIN *groupname*

When I joined Late Night Chat by entering JOIN late, my arrival in the group was announced with

```
** .Eddie just joined "Late Night Chat" (4 members now) **
```

Notice that you need only type enough of the group name to make it unique. Also,

my name has a period before it in the announcement. The period is Delphi's way of telling you the name is a handle and not an actual Delphi username. Another way to join a group is to enter

JOIN *groupnumber*

using the group number shown by /WHO.

Once you have entered a group, anything you type (except a slash command) is sent to everyone in the group when you press ENTER. And you see everything entered by everyone else in the group. A short bit of discussion may look like:

```
.Jim> THAT doesn't happen often.
.Rick> yes it does!
.Randy> Me too. I have pretty well ruled out electrical interference.
RICKADAMS>> it's a thought.
.Joel> Crashed again, but I think the modpatch worked.
Whew!
.Eddie> Whew!
.Joel> I just got an invalid mod patch command at the end, but I think it's
.Joel> just a blank line.
** .Steve just joined "Chat" (6 members now) **
```

Remember last month when I covered /SEND? Look carefully. A regular Conference message has the sender's name (or handle) followed by a single greater-than sign (>). A message sent to you with /SEND has the person's Delphi username followed by two greater-than signs (>>). This tells you the message is private, or personal. I was the only user to see the message from RICKADAMS shown above. On some termi-



Not only does Tandy produce our favorite CoCo, we think it produces the best portable and MS-DOS computers as well. We've found that when satisfied Color Computer users decide to add portability or MS-DOS to their computing habits, many stick with Tandy. For these people we publish PCM, The *Premier Personal Computer Magazine for Tandy Computer Users*.

Each month in PCM, you'll find information and programs for the Tandy 100, 102 and 200 portable computers. And you'll find even more coverage for Tandy's MS-DOS machines — from the graphics of the 1000 to the power of the 5000.

PROGRAMS AND PROGRAM DISKS!

We learned from THE RAINBOW that readers want programs to type in, so each month we bring you an assortment of them: games, utilities, graphics, and home and business applications. For those who don't have time to type in listings, we offer a companion disk with all the programs from the magazine. Also included in PCM each month is the *Software Shopper*, an "onmail" database service from which you can order the latest shareware products from our Delphi databases for Tandy MS-DOS and PC users — even if you don't have a modem!

TUTORIALS AND PRODUCT REVIEWS!

As if all this weren't enough, we offer regular tutorials on *DeskMate*, telecommunications and hardware; assembly language, BASIC and PASCAL programming tips; and in-depth reviews of the new software, peripherals and services as they are released. Add it all up and we think you'll find PCM to be the most informative and fun magazine for this market today!

YES! Please send me a one year (12 issues) subscription to PCM for only \$28.* A savings of 22% off the newsstand price.

Name _____

Address _____

City _____

State _____

ZIP _____

In order to hold down costs, we do not bill.

My check in the amount of _____ is enclosed.

Charge to my:

VISA MasterCard American Express

Acct. # _____

Exp. Date _____ Signature _____

To order by phone (credit card orders only) call 800-847-0309, 9 a.m. to 5 p.m. EST. For other inquiries call 502-228-4492.

* Canadian subscribers U.S. \$38 plus 7% GST. Surface rate elsewhere \$64, airmail \$85. Allow 6 to 8 weeks for first copy. Kentucky residents add 6% sales tax. U.S. currency *only*, please.

Mall to: PCM, The Falsoft Building, P.O. Box 385, Prospect, KY 40059

nals, and with most terminal programs, a bell rings or the computer beeps when you receive a personal message.

Note the two occurrences of Whew! in the above dialog. The first time you see it is when I typed it. The second time is a "repeat" from Delphi. Remember, unless otherwise instructed, Delphi's Conference system sends all messages to all people in the group, even the original sender. To turn this off, use /NOREPEAT. To turn it back on, enter /REPEAT.

Many telecommunications programs provide a "conference mode" where you type and edit line(s) of text in a window. When you press ENTER, the lines are sent through Delphi to the other users. If you are using such a conference mode, you may not want to see everything you type twice. If not, the /NOECHO command is for you. This is generally the second command I enter at the Conference> prompt. If you change your mind, /ECHO restores the echoing of each keypress. If you don't want to see what you type at all, use the /NOREPEAT command, you won't get Conference messages from yourself. These settings last only until you leave the Conference area. You need to enter them each time you enter Conference.

From Scratch

So, how do you create a new Conference group? At the Conference> prompt, enter

```
JOIN groupname
```

where *groupname* is a name not currently in use by another group. You see something like

```
Conference> join Hi Ho!
You have just created group "Hi Ho!"
(Type Control-Z to exit back to menu)
```

and you are now alone in a new Conference group. Doesn't sound like much fun, eh? What do you do? Well, you can /SEND messages to other people, and invite them to talk to you: (Actually, you can do this before creating the new group.) You can also use the /PAGE command. For example, entering

```
/PAGE RICKADAMS
```

sends a message to RICKADAMS telling him you want to talk with him in Conference. The /PAGE command also specifies the SIG from which you are sending the page.

If you receive a page from another user, you can use /REJECT to reject the page, or /ANSWER (or /ACCEPT) to answer the page. The latter commands bring you right into

the same Conference group as the person who paged you. However, you must already be in Conference to use /ANSWER. If you change your mind, you can use /CANCEL to cancel all non-answered pages. When possible, it's a better idea to /SEND someone an invitation into a Conference. This allows you to ask a question or mention what you want to talk about.

To leave Conference, press CTRL-Z or enter /EXIT to get back to the Conference> prompt. Press CTRL-Z or enter /EXIT once more to return to the SIG prompt. As usual, enter /HELP if you need it. There are more slash commands available in Conference, so you will see a longer list if you enter /HELP while you are there. For more help, you can enter /HELP FULL.

Miscellaneous

A useful (and fun) Conference slash command is /GNAME, which you use to change the name of the current group. To change the group name Late Night Chat to Early Morning Talk, enter

```
/GNAME Early Morning Talk
```

One silly slash command (definitely not for use during serious meetings) is /FUDDLE, which befuddles everything you type. Type /FUDDLE ? to list all available befuddlements. For example:

```
/fuddle flu
New befuddlement is FLU
Hello there. I have a cold in the nose.
.Eddie> Hello there. I have a good cold in the nose.
```

Another fun command is /ACTION, which generates a random saying. /NOACTION generates a string of several random sayings. Try them!

We'll take a closer look at other slash commands next month.

Database Information

In OS9 Online, Bruce Isted released a number of useful utilities and a powerful, multipurpose driver, VRN. Tim Kientzle posted *Help 2.0*, a huge help-file archive along with a *Help* program to call it. This help archive is quite useful for anyone, but you'll need a hard drive for storage. Tim also released *XYDown*, a stand-alone program that downloads using Xmodem and Ymodem batch protocols. Marie-Louis Marcoux contributed a new version of *dEd*, which makes it easier to edit a disk's CAT (Cluster Allocation Table). Mike Passer posted an IAPL interpreter for anyone who might be interested in this unusual and powerful language.

Francis Swygart's posting, *CoCo2IBM*, allows an IBM PC to read a Disk BASIC-formatted disk. If you use *Autoterm* and want to automate your use of Delphi, you'll want Carl Boll's *Autoterm KSM(s)*. Marty Goodman posted a bundle of information about the Hayes-compatible modem command set and register settings.

Conferences

Finally, let me mention the regularly scheduled conferences. All conferences occur at 10 p.m. EST:

Steve Bjork — Games Programming
First Monday every month
Tim Kientzle and Eddie Kuns —
Using Delphi
Second Monday every month
Jeff Parker — The CoCo Publisher
Third Wednesday every month

In addition to these regularly scheduled conferences, Carl Boll (CBJ) has informed me that he's hosting two open conferences, one March 9 and the other March 24 at 10:30 p.m. EST. Feel free to drop in and chat! ☐

Database Report

OS-9 SIG

Utilities:

GEMINI PRINTER SETUP	
NITOR	Dale Wardwell
SLOW DOWN I/O	
BRUCEISTED	Bruce Isted
LINE INPUT FOR BASIC09	
BRUCEISTED	Bruce Isted
CHOP TEXT FILES	
BRUCEISTED	Bruce Isted
NEW ALGORITHM LF STRIPPER	
MATHOMPSON	Matthew Thompson
BFORMAT	
WJMOORE	Warren Moore
DEL.F.AR	
DAMIONGREY	Greg A. Jandl
DHRYSTONE BENCHMARK 'C' SOURCE	
BUDDCAR	Bob Palmer
DED_PLUS IPATCH	
MARLOU	Marie-Louis Marcoux
UNZIP VERSION 3.0	
PERFUMER	Newton White
HELP 2.0	
TIMKIENTZLE	Tim Kientzle

Device Drivers:

VIRQ RAM NULL DRIVER	
BRUCEISTED	Bruce Isted

Patches:

SERIAL MOUSE DRIVER	
BRUCEISTED	Bruce Isted
MMAP PATCH	
DOCBEAR	John Wesson
CUSTOM BOOT	
KINGTRENT	Mike Huskey

Telcom:

XYDOWN 1.1	
TIMKIENTZLE	Tim Kientzle

Graphics & Music:

CHRISTMAS CM3 PICTURES ARCHIVE
R90S Phil Mortensen
SVIEW
SEBJMB Jeff Blower
HOW OFTEN I HAVE CALLED YOU
DFYE Danny Fye
WHOLE LOTTA LOVE
RAGTIMER Mike Knudsen
BEATLES FOR UMUSE 3
RAGTIMER Mike Knudsen
JUKEBOX PLAYER FOR ULTIMUSE
RAGTIMER Mike Knudsen
PLAY ICON AND AIF
BACKFIRE Christopher Johnson
BEATLES.AR
DFYE Danny Fye
THANKSGIVING.AR
DFYE Danny Fye
PIANO INVENTION #1 BY BACH
PDUNC Paul Duncan
DOCTOR WHO
DEANHOLDER Dean Holder
LINGERIE GIF'S
GRAPHICSPUB Bob Montowski
BEATLES ALBUM COVER IMG
DEANHOLDER Dean Holder
3D FRACTAL FERNS
MCRISWELL Marty Criswell

Programmers Den:

IAPL INTERPRETER
MPASSER Mike Passer
SET GLOBAL MOUSE PORT/RESOLUTION
MISHOO Mike Shook
FILTER LF & CTRL
BOBKEMPER Robert Kemper

68K-OS9:

DHRYSTONE/WHETSTONE
TJMARTIN Timothy Martin

CoCo SIG

General Information:

COCO 3 CONSUMER INFORMATION
TOMFANN Tom Fann

CoCo 3 Graphics:

WHO.IMG
TRAS Richard P. Trasborg
ENTERTAINMENT TONIGHT "BREAST'S"
STEVEPDX Steve Ricketts
MORE "MARRIED... W/CHILDREN"
STEVEPDX Steve Ricketts
IMGVUE2.BAS
TRAS Richard P. Trasborg
RAS3D10.BAS
TRAS Richard P. Trasborg
ANDREA.IMG
JOHNHOHN John Hohn
CALENDAR GALS IN IMG
LDMOORE Larry Moore
NEW STAR TREK SCANS, ISHARA YAR
STEVEPDX Steve Ricketts
MARRIED... WITH CHILDREN SCANS
STEVEPDX Steve Ricketts
COCO 3 GRAPHICS
RICKFRANZ Rick Franz
MORE DS69B 4096 COLOR NUDES
STEVEPDX Steve Ricketts
SOAP OPERA NUDES
LDMOORE Larry Moore
640 SLIDE VIEWER VER.2 AND PICS
LDMOORE Larry Moore

NADINE AND OTHER NUDES
LDMOORE Larry Moore
LINDA BLAIR NUDE
LDMOORE Larry Moore

Utilities & Applications:

COCO21BM
DSRTFOX Francis Swygart
DIRLABEL.BAS
MATTASHE Matt Ashe
LOTTO80.BIN
MISHOO Mike Shook
BIORHYTHMS/BAS
JOHNALE John Alexander
BOWLING STATS V5.1
REDCOAT Don Joyce

Games:

POP.ARC
COSMONAUT Steve Secord

Classic Graphics:

XMAS CARD
BOBCAR Bob Carson

Telecommunications:

AUTOTERM KSM(S)
CBJ Carl Boll
HAYES REFERENCE TABLES
MARTYGOODMAN Marty Goodman

Soapbox (chitchat):

MORE DRUG LIES FROM BENNETT AND
MARTYGOODMAN Marty Goodman

Exclusive!

CIII PagesE v. 2.0

Desktop Publishing, Greeting Card Designer, Form maker, Calligrapher or CAD for the CoCo3. Page size 640x384. Pull-down menus, icons and dialog boxes. Import ASCII text or enter from keyboard, mix text with graphics, flow text around irregular shapes. Magnify, rotate, flip, enlarge, reduce, stretch and slide screen in seconds. Page preview, select printers from pull-down menu. Req: CoCo3, Tandy Hi-Res interface, RGB/CMF monitor, joystick/mouse, Epson or compatibles, DMP105/106, CGP220 B/W, Imagewriter, C.I.TON 8510 Printer still only \$49.95



CIII ClipartE

1500+ clipart for CIII PagesE. \$29.95

Font Set 2/ Set 3

14 Banner fonts each set

for CIII PagesE v.2.0 1 set \$14.95 2 sets \$21.95

DIO Fonts

10+ new document fonts for all versions of MAX-10 only \$14.95

CIII Fonts

(see Rainbow review 7/90)

59 "MAX" like fonts for the ColorMax, Newspaper series and the RAT... only \$19.95

CIII Lettrex

Letter-quality text directly from your current ASCII files. 14 great NLQ text fonts. Req. 64K CoCo 1/2/3, monitor, 1 drive, mouse, Epson or compatible printer.. only \$19.95

CIII D-Link

(see Rainbow review 9/90)

Disk to Disk Tele File Transfer Program. Graphics interface. Req. CoCo3, RGB or CMF monitor, modem, 1 Drive, joystick/mouse... only \$24.95 2 for \$29.95



UPGRADE POLICY: CIII Pages V.1.0 owners can upgrade to CIII PagesE v.2.0 by sending the original system disk, copy of the sales slip and \$12.00 to the address listed below.

Above programs sold exclusively through



1917 Madera St. #8
Waukesha, WI 53186
Phone (414) 549-0750



Write/call for FREE catalog containing discounts

Send Check or Money Orders - No COD's

All Orders add \$3.00 SH, WI Residents add 5% Sales Tax

Hyper-Tech Software

MVCCanvas 2.0

Finally a professional full screen editor for OS-9 Level II and Multi-Vue. MVCCanvas is the only CoCo graphics editor to support multiple resolutions with up to 16 colors of 64 displayed in 320 x 200 mode with palette animation and full functional clipboard.

MVCCanvas also supports multiple fonts with ~~inverse~~, bold underlining, and proportional options. Printer support includes: Epson, Star, C.Itoh, DMP (Tandy), with color printer supported for Star NX-1000 R, Citizen GSX-140, Tandy DMP-240 and CGP-200, Epson LQ-2550 and compatibles.

ShellMate 2.2

ShellMate is the epitome of what a point and click file management system was meant to be. With ShellMate, you have access to commands such as copy, move, delete, rename, mkdir and free at the touch of a button. It also gives you point and click access to the Public Domain picture display utilities VEFShow and GIFOS9, as well as the archive utility Ar.

The biggest benefit of ShellMate is that it allows you to manipulate large batches of files with one mouse click when either copying, moving, deleting or archiving. You can also easily move through simultaneously displayed Source and Destination directory trees by either double clicking on a subdirectory name, or clicking on the "Parent" command.

System Requirements (both programs)

CoCo3, OS-9 LVL II, Multi-Vue, Disk Drive and 512k
MVCCanvas\$49.95
ShellMate\$24.95
\$3.00 S/H \$2.50 C.O.D (U.S. only) Nev. res. add 6% sales tax

Send Check / Money Order

Hyper-Tech Software / 4341 Gannet Cir. #174 / Las Vegas, NV 89103
Phone: (702) 362-5346



Wishing Well

Lifeskills 7

by Fred B. Scerbo
Contributing Editor

Back in 1985 I started a series of six programs titled *Lifeskills*, which were computer simulations designed to help users react to real-life situations. It has been many years since I added any programs to the *Lifeskills* library. (I still use the original programs.) Therefore, now seems as good a time as any to add to that well-received series.

Lifeskills 7 is the filename used for this latest installment, and it attempts to familiarize users with checkbook skills. In some ways, it is similar to *Lifeskills 1* which dealt with subtraction skills. Instead, *Lifeskills 7* uses a combination of written and mathematical problems to simulate the skills needed for balancing a checkbook. I designed this program with up to nine skill levels that can be selected from the title card by pressing the corresponding numbers on the keyboard.

Another useful feature is the program's ability to give hints. After you choose your skill level, the following appears on the screen:

ALLOW HINTS (Y/N)?

If the user presses Y, the program restates any math problem on the screen and indicates whether addition or subtraction skills are needed. If the user presses N, the program leaves it to the user to decide how

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.

the problem should be stated and which skills to use.

This program should be used with pen and paper available to help go through the problems manually as needed. This is not a program that balances a checkbook for you. Instead, it makes you go through the steps, teaching you to do it yourself. Let's face it, most of us probably already do this job by hand, even if we have a CoCo or another personal computer. Most programs I have seen that deal with checkbooks have been too much trouble to use regularly. *Lifeskills 7* is designed to teach skills that are lost by

many youngsters in this age of pocket calculators.

When the problems actually appear on the screen, you are given a random account balance with which to work. Starting with the first problem, you are asked if you have enough money to purchase a certain item. If so, you go through the subtraction steps needed to deduct that amount from your checking account.

Once the amount in your account gets too low, you cannot purchase anything, but you must still answer the questions as to whether or not you have enough money in

16K Extended

✓

25	102	395	31
55	201	435	107
110	25	490	111
170	186	555	132
225	145	595	235
280	222	645	130
330	92	END	100

The Listing: LIFESKL7

```

1 REM*****
2 REM* LIFE SKILLS SIMULATION *
3 REM* CHECKBOOK SKILLS *
4 REM* BY FRED B.SCERBO *
5 REM* 60 HARDING AVE *
6 REM* NORTH ADAMS,MA 01247 *
7 REM* COPYRIGHT (C) 1990 *
8 REM*****
9 CLS0
10 FORI=1T032:PRINTCHR$(204);:NE
XT
15 FORI=1T0192:READA:PRINTCHR$(A
+128);:NEXT
20 FORI=1T032:PRINTCHR$(195);:NE
XT
25 DATA93,88,96,93,88,84,94,92,9
0,93,92,93,,126,124,122,125,,11
2,126,116,126,116,126,16,116,126
,,117,124,125
30 DATA85,,85,,90,80,88,85,,84
,,122,,120,117,16,118,16,,122,,
122,,16,122,,117,,116
35 DATA85,,85,,91,90,96,85,83,
82,,75,67,66,69,70,16,,74,,74,
,16,74,,69,67,67
40 DATA85,,85,,90,88,,85,80,,

```

your account. If you can't afford an item, you are asked how much, in addition to your current balance, is needed to make the purchase.

At this point, the program gives you checks to add to your checking account. Here's where the addition skills come into

play. Once a working balance has been achieved, you may once again go on a shopping spree.

That's really all there is to it. The constant shifting of skills and questions keeps the program from getting boring too quickly. It also helps to ensure that this simulation

actually reviews skills that are needed in everyday life.

You may check your score and progress at any time by pressing the @ key. Pressing C returns you to where you left off. A percentage grade score is given from the scorecard whenever you check it. □

```
,32,,74,69,68,66...74..74..16,74
...69
45 DATA85,,90,85...90...85..81..
16,42,,42,37,,36,34,,42,,42,37,1
6,42,37,37,,37
50 DATA87,83,90,87,82,81,91,80,,
87,83,87,,43,35,42,39,34,32,43,
33,43,33,43,39,33,43,39,37,35,39
55 PRINT@293," COMPUTER SIMULAT
ION ";
60 PRINT@325," CHECKBOOK SKILL
S ";
65 PRINT@357," BY FRED B.SCERB
O ";
70 PRINT@389," COPYRIGHT (C) 19
90 ";
75 PRINT@453," SKILL LEVEL (1-
9) ";
80 X$=INKEY$:IFX$=""THEN80
85 W=VAL(X$):IFW=0THEN80
90 PRINT@453," ALLOW HINTS? (Y/
N) ";
95 X$=INKEY$:IFX$="Y"THEN110
100 IFX$="N"THEN115
105 GOTO95
110 DL=1:GOTO120
115 DL=0
120 CLS0
125 Z=500
130 DIMB$(10):FORI=1TO10:READB$(
I):NEXTX=RND(-TIMER)
135 CLS0:Q=RND(10)
140 FD=0
145 X=INT(RND(Z))*W*2:A=X/100
150 Y=INT(RND(Z))*W*2:B=Y/100
155 CL=INT(RND(15)/2)
160 N$="###.###"
165 CLS0:PD=PD+1:PR=1
170 GOSUB460:PRINT "YOU HAVE A B
ALANCE OF ";;PRINTUSING"$###.###";
A:PRINT " IN YOUR CHECKING ACCOUN
T."
175 PRINT "THE ";B$(Q);" YOU WAN
T COST";:IF W>1THENPRINT " A"
180 IF W=1THENPRINT "S A"
185 PRINT " TOTAL OF ";;PRINTUSIN
```

```
G"$###.###";B:;PRINT". DO YOU HAVE
"
190 PRINT " ENOUGH MONEY TO BUY T
HE NEW"
195 PRINT " ";B$(Q);
200 PRINT " ? (Y)ES OR (N)O"
205 GOSUB460
210 X$=INKEY$:IFX$=CHR$(3)THEN21
0
215 IFX$="N"THEN250
220 IFX$="Y"THEN235
225 IFX$="@"THEN465
230 GOTO210
235 IF A>B THEN PRINT " CORRECT!
YOU HAVE ENOUGH.":CR=CR+1
240 IF B>A THEN PRINT " SORRY! YO
U NEED MORE MONEY.":WR=WR+1
245 GOTO260
250 IF A>B THEN PRINT " SORRY! YO
U HAVE ENOUGH.":WR=WR+1
255 IF B>A THEN PRINT " CORRECT!
YOU NEED MORE MONEY.":CR=CR+1
260 GOSUB460
265 IF B>A THEN 305
270 PRINT " HOW MUCH MONEY WILL Y
OU HAVE":PRINT " LEFT?";
275 IFDL=0THEN285
280 PRINT " (";;PRINTUSINGN$;A;:P
RINT"-";:PRINTUSINGN$;B;:PRINT")
";
285 PRINT"-> $ ";
290 GOSUB340
295 IF INT(C*100000+.5)=INT((A-B
)*100000+.5)THEN400
300 IF INT(C*100000+.5)<>INT((A-
B)*100000+.5)THEN420
305 PRINT " HOW MUCH MORE MONEY D
O YOU":PRINT " NEED? ";
310 IF DL=0THEN320
315 PRINT(";;PRINTUSINGN$;B;:PR
INT"-";:PRINTUSINGN$;A;:PRINT")"
;
320 PRINT"-> $ ";
325 GOSUB340
330 IF INT(C*100000+.5)=ABS(INT(
(B-A)*100000+.5))THEN410
```

```
335 IF INT(C*100000+.5)<>ABS(INT
((B-A)*100000+.5))THEN430
340 Y$=""
345 X$=INKEY$:IFX$=""THEN345
350 IFX$=CHR$(13)THEN385
355 IFX$=CHR$(8):IFMW=0THEN375
360 IFX$="@"THEN465
365 IF ASC(X$)<13THEN345
370 Y$=Y$+X$:PRINTX$;:GOTO345
375 WW=LEN(Y$):IFMW=0THEN340
380 PRINTX$;:Y$=LEFT$(Y$,WW-1):G
OTO345
385 C=VAL(Y$):IFLEN(Y$)=0 AND X$
=CHR$(13)THEN340
390 PRINT:GOSUB460
395 RETURN
400 PRINT " CORRECT! YOU HAVE ";;
PRINTUSING"$###.###";C:;PRINT " LEF
T.":CR=CR+1
405 GOTO435
410 PRINT " CORRECT! YOU NEED ";;
PRINTUSING"$###.###";C:CR=CR+1
415 NM=1:GOTO435
420 PRINT " WRONG! YOU HAVE ";;PR
INTUSING"$###.###";A-B;:PRINT " LEF
T.":WR=WR+1
425 GOTO435
430 PRINT " WRONG! YOU NEED ";;PR
INTUSING"$###.###";B-A:WR=WR+1:NM=1
435 GOSUB460:PRINT " PRESS <<<ENT
ER>>> TO CONTINUE.":;POKE1535,96
:FORI=1TO300:NEXTI
440 FD=1
445 X$=INKEY$:IFX$=CHR$(13)THEN5
45
450 IFX$="@"THEN465
455 GOTO445
460 SQ=(143+(CL*16)):FORQS=1TO32
:PRINTCHR$(SQ);:NEXTQS:RETURN
465 CLS:PRINT:PRINT:PRINT
470 PRINTTAB(3)"PROBLEMS COMPLET
ED = "PD:PRINT
475 PRINTTAB(3)"CORRECT RESPONSE
S = "CR:PRINT
480 PRINTTAB(3)"INCORRECT RESPON
SES = "WR:PRINT
```

Revelation!

This operating system enhancement gives you some extraordinary advantages for greatly increasing your productivity. Here's what you get:

- 4 additional lines of text (40 x 29 and 80 x 29)
- 24 additional lines of graphics (640/320 x 231)
- 62 MACRO keys (10 are defined to instantly produce a disk directory, run or list a program, set up 32, 40, or 80 column screen, select RGB or CMP color set, or display a line width ruler)
- Control characters (That is, enter ASCII values 1-26 directly from the keyboard.)
- International characters (Enter 37 international characters from the keyboard.)

Enter commands in lower case use disk while in FAST mode Simple one-key FAST/SLOW mode switch. Many minor CoCo III errors are corrected, and many more minor enhancements are made and explained in the documentation. \$25.00 512k CC2, Disk Drive Req.

Blackjack III 512k

This extraordinary game was a hit at the CoCoFEST in Atlanta. The superb graphics and talking dealer make this game a must-see and must-hear. The digitized voice of the dealer actually speaks to you from your television or monitor WITHOUT ANY ADDITIONAL HARDWARE and each card has been individually drawn with care to preserve its proper representation. \$5.00 512k CC2, 401k Drive req.

Slake Freeman INVASION OF THE MUTANT LIZARD MINERS

Over 1000 locations, in excess of one meg of compressed graphics, extraordinary textual descriptions, full text commands, and a humor-filled fantasy environment like no other make this an adventure that no serious adventurer will want to be without. You'll spend hours exploring a town overrun with mutant punkers, skinheads and others, then searching a dark cemetery guarded by a rude monk, descending into a limestone mine roamed by dwarven miners, and entering the goblin city, inhabited by the debauchorous goblins and their lizard-women consorts. Each scene is constructed of a great number of images, composited to form a single frame in much the same way that

animators form a frame of an animated film. This special technique allows unprecedented realism. You won't find a better or more challenging game for the CoCo III. \$40.00 512k CC2, 401k Drive req.

Send check or money order to:
Robert Dffermann
2447 Oak Park Way
Orlando, FL 32822

```

485 TR=CR+WR:IFTR=0THENTR=1
490 SC=INT(CR/TR*100)
495 PRINTTAB(3)"YOUR TOTAL SCORE
  = "SC"%":PRINT
500 PRINTTAB(3)"ANOTHER TRY (Y/N
) OR (C) ?":
505 X$=INKEY$:IFX$=""THEN505
510 IFX$="Y"THEN RUN
515 IFX$="N"THEN CLS:END
520 IFX$="C"THEN 530
525 GOTO505
530 PD=PD-1:IF FD=0 AND PR=1 THE
N 165
535 IF PR=2THEN560
540 IF FD=1 THEN 135
545 IF NM=0THEN A=A-B:GOTO150
550 IF A-B<=0THEN A=A ELSE A=A-B
555 Y=INT(RND(Z))*W*2:B=(Y/100)+
2
560 CLS0:PD=PD+1:PR=2
565 GOSUB460:PRINT" YOU HAVE A B

```

```

ALANCE OF "":PRINTUSING"$##.##":
A:PRINT" IN YOUR CHECKING ACCOUN
T."
570 PRINT" YOU HAVE JUST RECEIVE
D A CHECK"
575 PRINT" FOR "":PRINTUSING"$##
.##":B:PRINT". HOW MUCH"
580 PRINT" WILL YOUR NEW BALANCE
BE ?"
585 GOSUB460
590 PRINT" RECORD YOUR NEW BALAN
CE HERE.":IF DL=0THEN600
595 PRINT" ("":PRINTUSINGN$:A::P
RINT"+":PRINTUSINGN$:B:PRINT")
":
600 PRINT"=> $ ":
605 GOSUB340
610 IF INT(C*100000+.5)=ABS(INT(
(A+A)*100000+.5))THEN620
615 IF INT(C*100000+.5)<>ABS(INT
((A+B)*100000+.5))THEN630

```

```

620 PRINT" CORRECT! YOU HAVE "":
PRINTUSING"$##.##":C:CR=CR+1
625 GOTO635
630 PRINT" WRONG! YOU HAVE "":PR
INTUSING"$##.##":A+B:WR=WR+1
635 GOSUB460:PRINT" PRESS <<<ENT
ER>>> TO CONTINUE. "":FORI=1TO30
0:NEXTI
640 NM=0:FD=0
645 X$=INKEY$:IFX$=CHR$(13)THEN6
60
650 IFX$=""THEN465
655 GOTO645
660 CLS0:Q=RND(10)
665 FD=0
670 A=A+B
675 Y=INT(RND(Z))*W*2:B=Y/100
680 GOTO150
685 DATA SHIRTS,CANDIES,SOCKS,DI
SKS,BOOKS,PADS,PENS,CARPETS,SUNG
LASSES,TAPES

```



Novices Niche

Music

CoCo 3

Music Grid by Tim Hennon

If you've ever seen *Close Encounters of the Third Kind*, you may remember the scene where the humans talk to the aliens using different musical tones while at the same time flashing differently colored lights on a board. This program creates a similar effect. To see what I mean, enter the program and save it. Then enter RUN "MUSCGRID".

A white grid is drawn on the screen. The boxes are filled one at a time, left to right, with one of eight different colors. Each color is accompanied by a specific sound. Eventually, all the boxes will be white. When the program runs across a white box, it skips a tone. You'll see, and hear, what I mean when you run the program. To stop the program, press the BREAK key.

The Listing: MUSCGRID

```

0 *MUSIC GRID
** WRITTEN BY TIM HENNON
1 *COPYRIGHT (C) MARCH 1991
** BY FALSOFT, INC.
2 *RAINBOW MAGAZINE
3 HSCREEN 2
4 HCLS 8
5 C=4

```

```

6 V=30
7 HCOLOR C
8 HLINE (20,V)-(300,V),PSET
9 IF V=100 THEN 11 ELSE V=V+10
10 GOTO 7
11 H=20
12 HCOLOR C
13 HLINE (H,30)-(H,100),PSET
14 IF H=300 THEN 16 ELSE H=H+40
15 GOTO 12
16 FOR V=35 TO 95 STEP 10
17 FOR H=40 TO 280 STEP 40
18 C=RND(8)-1

```

```

19 HPAINT (H,V),C,4
20 SOUND (C*25)+5,2
21 NEXT H
22 NEXT V
23 GOTO 16

```



Protect and highlight your important magazine collection with sturdy 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 6% sales tax; Canadian residents, 7% GST. 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.

Fighting back against barely sufficient synthesizer designs

MIDI Mods

by Cecil C. Houk

I bought my first MIDI synthesizer in 1986 and now (somehow) I have 13 of them. The first of these was a Yamaha DX-100. At that time I used a 64K F-board CoCo 1 and a 64K CoCo 2. There was never a problem using *Lyra* with these combinations (with the serial I/O port for MIDI OUT). A few months later I picked up a Casio CZ-230S and discovered I could not connect it to the CoCo 1 without getting a lot of MIDI errors. There were no problems with the CoCo 2 and CZ-230S combination.

To make a long story short, I discovered there was no problem if I made a chain of synthesizers with the DX-100 first in line. I added more synthesizers over the following months and had only an occasional stuck note on the CZ-230S. This configuration is not recommended by most MIDI experts, but I have successfully used it with both the CoCo and PC-compatible systems.

Two weeks ago, a friend brought his new Kawai K1r to me in hopes I could figure out how he could use it with his other MIDI equipment. When I connected it between the Roland MPU-1PC (the industry standard for PC-compatible MIDI interfaces) and the DX-100, all sorts of strange things happened. The DX-100 de-tuned. My CR-1000 Digital Drummer shut off in the middle of a song. The K1r produced several stuck notes. All of these things seemed to occur randomly. When I reversed the position of the DX-100 and the K1r in the chain, operation improved, but was not 100 percent correct. When I connected the chain of synthesizers to my CoCo 3, the result was almost 100-percent correct operation.

Cecil Houk, the owner of Rulaford Research, started making music with CoCos in 1983. Having discovered the world of MIDI in 1985, he now has more than 12 synthesizers. He can be contacted at 3687 Rosa Linda Street, San Diego, CA 92154, (619) 690-3648.

Having an inquiring mind, I connected an oscilloscope to various points in the equipment to see what was going on. With the K1r connected to the MPU-IPC, there was serious ringing on the MIDIOUT signal of the MPU-IPC. This did not occur with the DX-100 connected to the MPU-IPC. I examined the circuitry in all my synthesizers and interfaces and discovered the following:

1. The Roland MPU-IPC uses an open-collector, Hex-inverter IC for the MIDI OUT and Sync circuits — without a pull-up resistor. Not good! Every data sheet for this type of IC clearly states that a pull-up resistor is required for proper operation. I discovered similar omissions on the MIDI THRU circuits in many other synths.

2. Kawai has put incorrectly tuned RFI filters on the MIDI IN, MIDI OUT, and MIDI THRU signal lines of the K1, K1m, K1r, and K1 II.

When these situations are combined, the result is that false start signals are generated. This causes all manner of problems, including stuck notes and false control commands. The bottom line is you cannot use a Kawai K1 series synthesizer with the Roland MPU-IPC — unless you change a few things first.

We are quite fortunate that there are pin-for-pin replacement ICs available that will eliminate most of the problems with MIDI. For years, the opto isolators in the MIDI circuits have been blamed for the problems encountered when chaining synthesizers. They aren't the culprits. The problem is the use of open-collector circuits without the mandatory pull-up resistors. It's no wonder these devices don't work the way they were intended.

Down to the Fix

As we look at the methods I found to correct the problems, bear in mind opening your synthesizer voids the warranty in most cases. Most manufacturers prohibit user alterations to the circuitry. Neither I, nor THE RAINBOW, assume any liability for damage resulting from the modifications outlined in this article.

In the Roland MPU-IPC, remove IC12 (a 74LS03) and replace it with a 74LS14. Also, remove R38, R39 and R40 (4700 ohm). While you are at it, put a jumper from Pin 5 of IC12 to Ground. This eliminates a "floating" gate condition in the unit.

For the Kawai K1/K1M, remove IC U25. From the K1 II, remove IC U10. Remove IC2 from K1r. This is a 74LS03, which should be replaced with a 74LS132. Also, remove all

the RFI filter components in the circuit.

In the Casio CZ-230S, the 74LS04 should be replaced with a 74LS14. Remove all the RFI filters (including the two C101 capacitors). Add a 220-ohm resistor in series with Pin 1 of the PC900 and the MIDI IN jack.

In the Roland MT-32, IC25 (a 74HC04) should be replaced with a 74LS14. Three of the gates in IC25 are not used. Two of these gates can be used to replace Q6 and Q7. But this is *not* a job for novices. If you are a skilled hacker, though, you should be able to take care of this.

Because IC2 cannot be changed to a Schmidt Trigger in the Yamaha FB-01, pull-up resistors should be added to pins 4 and 10. Use a value of approximately 1K.

If I didn't mention your particular synth, it isn't because there isn't a problem. Many other synthesizers need correcting, and I hope to provide more information in the future.

If you encounter problems in making these modifications, or if you have a problematic synthesizer not mentioned, leave a message for me on the Rulaford Research MIDI BBS and I'll try to help. To contact the BBS, call (619) 662-2428. The modifications I have described here are intended to correct design problems in the MIDI THRU ports on commercial equipment. ☺

Quality 099 Software from ColorSystems

Specialty Programs

MVBanner *Brand New!*

Make Printed Banners in the Multi-View Environment
Features Include:
"Pull Down" Menus
On-Screen Previewing
27 Built-In Images
Two Fonts, Image Editor
and Much More!
512K and Mouse/Joystick
Required
Only **\$20**

WPShe1

A Word Processing
Oriented Graphics Shell
A "Point and Click"
Interface to all your
Word Processing Needs
"Pull Down" Menus
User Customizable
Works with any Editor,
Text Formatter &
Spelling Checker

"WPShe1 is a bargain",
Dale Puckett
Dec '90 Rainbow
Only **\$22**

All Programs
Require Multi-View
Window Module Support

Please add \$3 for
Overseas Shipments
NC Residents
add 5% Sales Tax

ColorSystems is pleased to
announce affiliation with the
Interactive Media Systems
Developer's Association and
plans to offer full support
for the IBM/1 and OS/2 Windows

Games

Announcing 3 New Games

Minefield

You must get a secret message
to Headquarters but a
Minefield stands between you!

Sea Battle

It's you against the computer in
a heated battle at sea. Be the
first to sink all of your
opponents task force to win!

Other Games

Pyramid Solitaire
Reviewed in The Rainbow
October 1990

KnightsBridge

A variation of Chess
with randomness thrown in!

CoCothello

Othello for CoCo3
NOW For 1 or 2 Player Game!

CoCoYahtzee

Dice Paker for CoCo3
All games in full color and
require a mouse or joystick
All Games just **\$10** each
or any 3 for **\$25**

Special Game Pack, all
6 Games on the same disk **\$40!**

ColorSystems
P.O. Box 540
Castle Hayne, NC 28429
(919) 675-1706 (voice)
(919) 675-1847 (BBS)

(owned & operated by Zeck C. Sessions)

RICK'S

SUPER SOFTWARE AT AFFORDABLE PRICES!!

CC3FLAGS..... Reviewed August, 1989.....page 97.....\$10.00
VOCAB..... "quite a good program for \$19.00"-March '89, page 104..... \$10.00
MASTERDIR "a very good disk cataloger..."October '89, page 106.....\$10.00
PROGRAMS FOR FRIENDS.....INCLUDES.....WACKO.....CANADA.....EUROPE.....AND
SMARTY THE PIG.....\$10.00
GALLERY MAKER...W/NIB COMPRESSOR.....create COCO galleries... \$10.00
PUZZLES...W/NIB COMPRESSOR...8 hi-res. jigsaws.....\$10.00

CURRENT BEST SELLER!!!

THE RAINBOW INDEXES BRAND NEW DATABASES OF ARTICLES, PRODUCT
REVIEWS, AND TAPE/DISK OFFERINGS FROM THE RAINBOW...STARTS WITH RAINBOW'S ORIGINAL
ISSUE ENDS WITH JUNE 1990...100% ML...OVER 7200 ENTRIES...COMES WITH BOTH COCO 1/2
AND COCO 3 VERSION...THUMB THRU DATABASES WITH A SINGLE KEY...COCO 3 DISPLAYS 15
ENTRIES ON SCREEN (COCO 1/2 SHOWS 2 AT A TIME) EXCELLENT FOR FINDING INFORMATION
FROM YOUR COLLECTION...THESE ARE USEFUL, MUST-HAVE PROGRAMS...ONLY!!!...\$10.00

BRAND NEW

TETRA...BRAND NEW...Fantastic fun with my version of a popular home
entertainment game. Colorful display, high score save, 10 levels of difficulty, random
piece selection +...REQUIRES COCO III.....\$10.00
SYNCOM Platinum Flippy Diskettes...great value for single sided disk drive
owners. (\$2.00 shipping/handling any size order).....box of 10...\$8.00

COMING SOON: A NEW SUPER CC3/RGB MASTER DIR 3

SPECIAL ORDER 3 PROGRAMS FOR \$25 AND RECEIVE A FREE BOX OF FLIPPIS

SEND CASH, CHECK OR MONEY ORDER FOR FAST RETURN
PLEASE INCLUDE \$2.00 FOR SHIPPING/HANDLING

RICK'S COMPUTER
ENTERPRISE P.O. BOX 276
LIBERTY, KY. 42539

THE RAINBOW IS A REGISTERED TRADEMARK OF FALSOFT, INC.

First Prize

Having recently moved some 20 miles from North Ridgeville, Ohio, to Strongsville, my life is packed away in a hundred or so cardboard boxes. This means it takes me 20 minutes to find my stapler and another 20 to find the staples. I thought I had everything reasonably planned out. I connected my CoCo 3 system and everything looked good. When I turned the power on, the Read/Write light on my hard drive came on. (Uh, oh!)

I stopped backing up my hard drive some time ago (the procedure used more than 80 disks and took hours.) I quickly realized I wouldn't be running OS-9 for a while. It was a good time to get a Disk BASIC program to review for THE RAINBOW.

First Prize, by Zebra Systems, Inc., produces diplomas, certificates, licenses, awards, and similar official looking documents. *First Prize* runs on either a CoCo 1 or 2 with 64K or any CoCo 3. You must also have a mouse or joystick and a compatible dot-matrix printer. I used a CoCo

3 with an older-style Radio Shack joystick and an Epson FX-86E. *First Prize* is not copy-protected (thank you Zebra Systems) and you are encouraged to make a backup. It can use up to four floppy drives and employs Zebra Systems' graphics user interface. The program is very easy to use — creating documents requires little effort.

Although *First Prize* comes on a set of 10 disks, nine of the disks contain the template files that are used to create documents. If you spend any time with the users manual, read the brief section about templates. Understanding the components of templates is essential to effectively use *First Prize* since you build documents by assembling the various parts of a template. You cannot preview a complete document on the screen.

You must print the document (design) to your printer to review your work in progress. However, this is not a big drawback.

Templates have six parts as follows:

1. Borders — you can select from a dozen or so.

2. Title — many of the 100 templates already have titles. You can design others yourself.

3. Artwork — I'm not sure why artwork is considered a separate part. Either there is artwork in a given template, or there isn't. You don't do anything with this part and cannot design your own artwork. Plenty of artwork is already provided in the 173 templates.

4. Body Text — enter anything you can type in seven lines. You can also pick from the five fonts included.

5. Signature Line — this is the text that is to appear below the signature line.

6. Date line — enter the date to be printed on the document.

A printed template directory contains references to the 173 templates. The directory shows pictures of all templates and is essential to using the program because the template files are numbered T101-T825. With descriptive filenames like that, you'll spend a long time loading and printing the indi-

vidual template files if you lose the directory. (Maybe this is some new form of copy protection.) My advice is to keep the directory in a safe place.

The documentation consists of a 60-page template directory and a 35-page users manual. The users manual is well-written and has plenty of helpful illustrations. If you're already familiar with *Label Designer*, you probably won't need to spend much time with the users manual, though.



First Prize is available for \$49.95, plus shipping and handling. When you consider that many software companies charge \$8 to \$20 for accessory disks, the nine you get free from Zebra Systems make *First Prize* a first-rate product.

I'd like to say something about Zebra Systems' customer service, but *First Prize* never gave me any reason to call them. The program works flawlessly and its graphic interface makes using it natural and logical.

If you need, or want, to produce official looking documents try *First Prize*. It is another excellent bit of programming by Jeff Street, author of *Label Designer*. I do not find fault with the program except that it does not permit previewing completed documents before printing them. I think *First Prize* is very useful. However, I didn't expect that when I gave my secretary a Secretary of the Month award, she'd ask me for a raise. Thanks a lot Zebra Systems!

(Zebra Systems, Inc., 121 S. Burrowes Street, State College, PA 16801; 814-237-2652; \$49.95, plus \$3 S/H)

— Ernest F. Zore

The Rainbow Bookshelf

The Rainbow Book of Simulations

20 award-winning entries from THE RAINBOW's first Simulations contest.

The Second Rainbow Book of Simulations

The 16 Winners from our second Simulations contest.

The Complete Rainbow Guide to OS-9

Authors Dale Puckett and Peter Dibble demonstrate OS-9's multitasking and multiuser features.

The Complete Rainbow Guide to OS-9 Level II Vol.I: A Beginners Guide to Windows

Puckett and Dibble uncover the mysteries of the new windowing environment.

The First Rainbow Book of Adventures

Contains 14 winning programs from our first Adventure contest.

The Second Rainbow Book of Adventures

Featuring 24 of the most challenging Adventure games ever compiled.

The Third Rainbow Book of Adventures

The Excitement continues with 19 new Adventures.

The Fourth Book of Adventures

Fourteen fascinating new Adventures from the winners of our fourth Adventure competition.

A Full Turn of the Screw

The Rainbow Introductory Guide to Statistics

Dr. Michael Plog and Dr. Norman Stenzel give a solid introduction to the realm of statistical processes.

Name _____
 Address _____
 City _____
 State _____ Zip _____
 Payment Enclosed, or Charge to:
 VISA MasterCard American Express
 Account Number _____
 Card Expiration Date _____
 Signature _____

<input type="checkbox"/> The Rainbow Book of Simulations (first)	\$ 9.95 \$ 3.50	_____
<input type="checkbox"/> Rainbow Simulations Tape (first)	\$ 9.95 \$ 3.50	_____
<input type="checkbox"/> First Simulations Package	\$19.90 \$ 6.00	_____
<input type="checkbox"/> The Second Rainbow Book of Simulations	\$ 9.95 \$ 4.95	_____
<input type="checkbox"/> Second Rainbow Simulations Tape	\$ 9.95 \$ 4.95	_____
<input type="checkbox"/> Second Rainbow Simulations Disk	\$10.95 \$ 4.95	_____
<input type="checkbox"/> Second Simulations Package with Tape	\$19.90 \$ 8.95	_____
<input type="checkbox"/> Second Simulations Package with Disk	\$20.90 \$ 8.95	_____
<input type="checkbox"/> The Complete Rainbow Guide to OS-9	\$19.95 \$12.95	_____
<input type="checkbox"/> Rainbow Guide to OS-9 Disk Set (2 disks)	\$31.00 \$19.95	_____
<input type="checkbox"/> Rainbow Guide to OS-9 Package	\$47.95 \$29.95	_____
<input type="checkbox"/> The Windows & Applications Disk for The Complete Rainbow Guide to OS-9 Level II, Vol. I	\$19.95	_____
<input type="checkbox"/> The Rainbow Book of Adventures (first)	\$ 7.95 \$ 2.00	_____
<input type="checkbox"/> Rainbow Adventures Tape (first)	\$ 7.95 \$ 2.00	_____
<input type="checkbox"/> First Adventure Package	\$15.90 \$ 3.50	_____
<input type="checkbox"/> The Second Rainbow Book of Adventures	\$13.95 \$ 6.95	_____
<input type="checkbox"/> Second Rainbow Adventures Tape	\$13.95 \$ 6.95	_____
<input type="checkbox"/> Second Adventure Package	\$27.90 \$11.95	_____
<input type="checkbox"/> The Third Rainbow Book of Adventures	\$11.95 \$ 6.95	_____
<input type="checkbox"/> Third Adventures Tape	\$ 9.95 \$ 6.95	_____
<input type="checkbox"/> Third Adventures Disk Set (2 disks)	\$14.95 \$ 7.95	_____
<input type="checkbox"/> Third Adventure Package with Tape	\$21.90 \$11.95	_____
<input type="checkbox"/> Third Adventure Package with Disk	\$26.90 \$12.95	_____
<input type="checkbox"/> The Fourth Rainbow Book of Adventures	\$10.95 \$ 7.95	_____
<input type="checkbox"/> Fourth Adventures Tape	\$ 9.95 \$ 6.95	_____
<input type="checkbox"/> Fourth Adventures Disk	\$14.95 \$11.95	_____
<input type="checkbox"/> Fourth Adventure Package with Tape	\$20.90 \$13.90	_____
<input type="checkbox"/> Fourth Adventure Package with Disk	\$25.90 \$18.90	_____
<input type="checkbox"/> A Full Turn of the Screw	\$19.95	_____
<input type="checkbox"/> Introductory Guide to Statistics	\$ 6.95 \$ 2.95	_____
<input type="checkbox"/> Guide to Statistics Tape or Disk (indicate choice)	\$ 6.95 \$ 2.95	_____
<input type="checkbox"/> Guide to Statistics Package	\$12.90 \$ 4.95	_____
(indicate choice of tape or disk)		_____
Add \$2 per book Shipping and Handling in U.S.		_____
Outside U.S., add \$4 per book		_____
Kentucky residents add 6% sales tax		_____
Canadian residents add 7% GST		_____
(Allow 6 to 8 weeks for delivery)	Total	_____

FILL OUT
YOUR COCO
LIBRARY
WITH
THESE
SELECTIONS

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 Microwave Systems Corporation.

Math.1 Library

The *Math.1* package from Bits-n-Bytes is a relatively complete math library for the OS-9 C compiler, and it includes most trigonometric functions. The disk includes the complete *Math.1 Library*, five sub-library modules that can be used to create custom libraries, and shell scripts to assist you in building custom libraries. All of the relocatable object files are also included in case you want to build a custom library consisting of one or more modules from each component library.

The trigonometric functions supported include the basic cosine, sine, and tangent. To that it adds secant, cosecant, cotangent, arcsecant, arcsine, arctangent, arccosecant, arccosine, and arccotangent. It also supports the hyperbolic versions of all of these functions. Other functions include factorial, square root, natural logarithm and Base-10 logarithm, power and Base-10 power, sign, double absolute value, a random number generator, truncation and rounding. An oddity here is that `ln()` finds the

The *Math.1* package from Bits-n-Bytes is a relatively complete math library for the OS-9 C compiler.

natural logarithm and `log()` handles Base-10 logarithms, which is the standard for mathematicians. However, the standard among most math libraries is that `log()` finds the natural logarithm and `log10()` finds Base-10 logarithms. Be aware of these differences. It would also help if more intuitive function names were used in several of the functions. For example, the cosecant function could have been called `cosec()` instead of `csc()`.

An obvious omission from the package is a header file to prototype each of the functions included in the library. This is

particularly troublesome since the C compiler assumes all functions return an integer value unless explicitly told otherwise. By default the compiler either automatically casts the value returned to a signed integer, or assumes the value returned is an integer and thereby returns seemingly random garbage if the actual function returns values of type `float` or `double`. Unfortunately, the author implies in the examples that you will manually type the prototype, or function declaration, for each function in every program you use. As an alternative, I suggest the author include a `math.h` file with the function prototypes in the `DEFS` directory in a future revision.

The manual is confusing in certain instances and seems thrown together in a random manner (with no index). You spend most of your time trying to locate each function in the manual rather than actually programming. The material in the manual is broken into logical sections (General Math Functions, Basic Trigonometric Functions, etc.), but locating a specific function is difficult without the aid of an index. Some of the functions, such as `red_root()`, are documented in such a way as to make you wonder if the function is included in the library or you are supposed to enter the source code provided to emulate the function. However, the global variable list for the `sqrt()` function on the previous page shows that it is included in the library. The manual does provide a lot of useful information, including a list of external references, the amount of memory required for code and data, and an example of each function. Even so, I think the author could have spent a little more time organizing and formatting the manual to make it more readable.

The only real problem I ran into with the *Math.1 Library* is that each function causes your program to exit abruptly if an error is detected. No error-checking option is given. You either check the values to make sure they are in the proper range before calling the trigonometric functions, or take your chances. I had always assumed that the programmer had the responsibility for deciding how to handle errors. Well, that's definitely not the case in this library.

The results generated by each of the functions are accurate according to my calculator. One confusion factor to be aware of is that many formulas given in the manual appear incorrect. For example, the manual appears to state that the formula for calculating the secant is $1+\cos(x)$. Fortunately,

this is a case of mistaken identity. If you use a magnifying glass you will discover that a mathematical division symbol is used, even though it looks strikingly similar to a plus sign. In other sections of the manual, a slash is used to denote division. The manual also uses a lowercase `x` for multiplication instead of an asterisk, perhaps just to keep you on your toes. Well, there's something to be said for standardization and easy-to-read manuals.

Obviously a C library is not standard fare for the average computer user. But if you need a math library, and you take into consideration the caveats listed here, this package should get you going. All things considered, *Math.1 Library* is a good deal.

(Bits-N-Bytes, 4140 Victory Drive SW, Port Orchard, WA 98366; \$27.42)

— Greg Law

Bed

What would you think of if you were asked to review a program called *Bed*? All kinds of ideas went through my mind. Thoughts of some sort of sexy game were at the top of the list. Well, I was surprised to find that *Bed* is actually a neat binary-editor, disk-utility program that allows the user to change the contents of and repair a crashed disk.

Bed works on any CoCo equipped with a disk drive. It's not copy-protected, so you can make a backup for safekeeping. The program does not require many instructions on its use. Be cautious, however, because it's easy to destroy a file or program if you don't know what you are doing. *Bed* is for experienced users who understand sectors, granules, and file allocation tables.

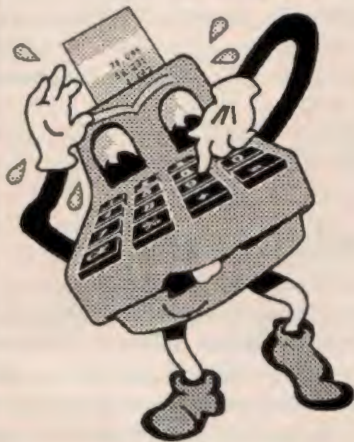
Loading and running *Bed* is a snap. You are presented with a menu of available options:

R — reads a sector after entering the track and sector numbers.

E — allows you to edit the disk contents in ASCII, Decimal, or Hex. Use the up and down arrows to reach the desired sector.

D — displays a sector, but does not allow you to edit. It's best to use this feature when exploring, so you can't harm the disk contents.

Add UP THESE Public Domain VALUES!



UTILITIES 1-8

- 12 Programs Each, 1-4 Require Disk
- U1 - Backup 35, Basicmap, Timer, Tape-to-Disk, +
- U2 - Customize, DiskTest, MasterDisk, Offset, +
- U3 - View 64, DiskAid, Disk Library, Atari, +
- U4 - AutoBook, MacPicture, StateLog, UniBack, +
- U5 - Disassembler, Graph, PaintPot, Squeeze, +
- U6 - Clock, List 32, MiniDos, Pixcomp, +
- U7 - Head Print With 30 Mini Pictures
- U8 - Fig Forth Language With Tutorial

EDUCATION 1-4

- E1 - 12 Programs For Young Kids
- E2 - 12 Programs For High School Kids
- E3 - 11 Programs Teaching Coco Commands
- E4 - 5 Graphics Programs About Australia

GRAPHICS 1-14

- GR1 - Atlanta, Cube, Space, +
- GR2 - Objects, Wargame, Wordmap, +
- GR3 - 9 Coco 3 Graphic Programs
- GR4 - 22 Coco Max Pictures
- GR5 - 22 Coco Max Pictures
- GR6 - 22 Coco Max Pictures
- GR7 - 15 Coco Max Pictures
- GR8 - 22 .Bin Pictures
- GR9 - 22 .Bin Pictures
- GR10 - 14 Large .Bin Pictures
- GR11 - 8 Mge Pictures
- GR12 - Coco Max 3 Pictures
- GR13 - Macpaint Graphic Editor
- GR14 - 5 Macintosh Pictures

Music 1-7

- M1 - 8 Utilities & 8 Songs
- M2 - 17 Musica Files
- M3 - 16 Musica Files
- M4 - 16 Musica Files
- M5 - 25 Orchestra Files
- M6 - 23 .Bin Files Ready To Run
- M7 - 23 .Bin Files Ready To Run

Requires Musica

GAMES 1-11

- Each Disk/Tape Contains 12 Programs
- GA1 - 3D Tic Tac, Missile, Poker, Tycoon, +
- GA2 - Amazing, Balloons, Motor Jump, Slots, +
- GA3 - Battleship, Golf, Lander, Zero G, +
- GA4 - ABM, LunarWorld, Protect, Subchase, +
- GA5 - Blackjack, Lazer, Tipan, Utopia, +
- GA6 - Kings, Maze, Shuffle, Tempest, +
- GA7 - Chess, City, Life, StarTrek, +
- GA8 - Chute, Germ, Hurkie, Lunar, +
- GA9 - Civil War, Go-Fish, Stock, UFO Maze, +
- GA10 - Cave, HiLow, Scramble, Word Hunt, +
- GA11 - Biorythms, Crape 3, Gunner, Martians, +

ADVENTURES 1,2

Ready To Run
Order A1 Or A2

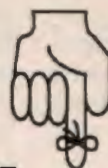
TELECOMMUNICATIONS 1-3

- T1 - Haysae, Kermi, Mikeyterm, Teleterm
- T2 - Cobbs BBs Terminal Package
- T3 - GETERM Communications

HOME MANAGEMENT 1-4

- 12 Programs Each Disk/Tape
- H1 - Checkbook, Loan, Word Processor, +
- H2 - Cash Journal, Invest, Mollist, +
- H3 - Life, Database, Stocks, +
- H4 - Spelling Fix, Spelling Checker, +

And Don't Forget
Monthly Back Issues
Of Original
Subscription Software



ISSUE #91, JAN 1990
TRENCH FIGHTER
COVERTS
SPEED GAMES
BUSINESS STARTER
CAVERN QUEST 3 PT. 2
BUILDERS HELPER
TARZAR IV
ADDRESS IT
ANIMAL GRAPHICS
SKYWAY

ISSUE #92, FEB 1990
PENTA-SAME
ROTISSERIE LEAGUE
NICK'S QUEST
SOLITAIR
EDUCATION 4
IBM - BASIC
BASEBALL CARD ORG.
MUNCHY 3
RIVER RAID 3
CUBAN

ISSUE #93, MAR 1990
MR. MOVIE
INVADERS
COCO3 RECIPE MACHINE
SILVERCAPE 3 ADV.
BABY-SITTERS BASE
BIBLE SCRIPTURE
VOCABULARY QUIZ
DROP PACK
DOCTOR WHO 3
GRABBER

ISSUE #94, APR. 1990
FLASH CARD
REAL ESTATE LISTINGS
BIBLE QUESTIONS 1
SPELLING QUIZ 1
NO LEFT 3
PICTURE VIEWER 3
TANK SHOWDOWN
TARZAR 5 ADVENTURE
GENESIS
FOURHOOD

ISSUE #95, MAY 1990
DREAMTIME ADVENTURE
XT/AT SYSTEMS
BIBLE QUIZ 2
16 FLAGS
FRACTIONS
SOLITAIRE PUZZLE 4
512K RAM DRIVES 3
FOOD FACTORY 3
WHO PART 2
TRAPFALE

ISSUE #96, JUN 1990
ENTREPRENEUR
DR. PHRED!
PRINTER FONT CODES
BIBLE QUESTIONS PT. 3
CALO ADVENTURE
FORM MAKER
DRAGON ESCAPE
PLANE EXPLORER
WHO PART 3
MAYMAY

ISSUE #97, JULY 1990
FCC EXAM HELPER
EMPLOYEE SCHEDULE
FLYING SAUCER ADV.
SPEECH AID
MOWER MADNESS
JET TRIVIA
INSTANT CALENDAR
WORLD MASTER 3
A/R WAR 3
SKRAMBLE

ISSUE #98, AUG. 1990
FLIPPY TUTORIAL
RECIPE/MEAL/GROCERY
DUNGEON MAZE
SNOW SKI
HOT LOAD
SHIP WAR
ERROR TRAP
SPACE WAR 3
MAZE MASTER 3
WIZARD'S DEN

ISSUE #99, SEPT. 1990
IDEA TREE
MASTERS LABYRINTH
MORSE CODE
TELESALE CONTACTS
PROMISED LAND QUIZ
PROPOSAL WRITER
ALPHABET SCRAMBLE 3
MAGIC PUMPKIN
DR. WHO3 PART 4
FANGMAN

ISSUE #100, OCT. 1990
ZOT MIND GAME
SUPER TEXT EDITOR
SUPER TEXT FORMATTER
TURTLE SEARCH 3
COAST TO COAST
EASY BASIC 3
DRAGON ADVENTURE
WRITE OUT UTILITY
TRYTHIS
DONUT DILEMMA

ISSUE #101, NOV. 1990
GOSSIP
COST ESTIMATOR
SALON INVENTORY
PERSONAL STATISTICIAN
BINGO CALLER 3
ALAIX - 3
DEATH HUNT
512K/AM/CATALOGER 3
DUCK HUNT
THE FROG

ISSUE #102, DEC. 1990
REAL ESTATE ANALYSIS
COCO PAYROLL
DR. STRANGE ADVENTURE
TANNING SALON
TREASURE HUNT
RIVERBOAT BLACKJACK
TURTLE RACE 3
SUPER SCREEN DUMP
KEYBOARD REMAP
GRASH

Last 12 Issues Shown Here

TOM MIX GAMES

SINGLE ISSUE.....	\$ 8.00
2-5 ISSUES.....	\$ 6.00 EA
6-10 ISSUES.....	\$ 5.00 EA
11 OR MORE ISSUES.....	\$ 4.50 EA
ALL 102 ISSUES.....	\$ 260.00

PURCHASE 20 ISSUES AND RECEIVE A FREE 6 MONTH SUB

BACK ISSUES

PLEASE CIRCLE

1	9	17	25	33	41	49	57	65	73	81	89	97
2	10	18	26	34	42	50	58	66	74	82	90	98
3	11	19	27	35	43	51	59	67	75	83	91	99
4	12	20	28	36	44	52	60	68	76	84	92	100
5	13	21	29	37	45	53	61	69	77	85	93	101
6	14	22	30	38	46	54	62	70	78	86	94	102
7	15	23	31	39	47	55	63	71	79	87	95	
8	16	24	32	40	48	56	64	72	80	88	96	

1 YEAR SUBSCRIPTION ONLY \$ 60.00 !

Public Domain

Single Disk/Tape...\$8.00 each
2- 5 disks/tapes....\$6.00 each
6 or more.....\$5.00 each
All 53 disks/tapes \$145.00

CIRCLE ISSUES DESIRED

M1	GR1	E1	U1	GA1
M2	GR2	E2	U2	GA2
M3	GR3	E3	U3	GA3
M4	GR4	E4	U4	GA4
M5	GR5		U5	GA5
M6	GR6	H1	U6	GA6
M7	GR7	H2	U7	GA7
	GR8	H3	U8	GA8
A1	GR9	H4		GA9
A2	GR10			GA10
	GR11			GA11
T1	GR12			
T2	GR13			
T3	GR14			

PLEASE CIRCLE
TAPE DISK

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

Call or write for a FREE catalog !



- WE SEND 1ST CLASS - NO CHARGE •
- PERSONAL CHECKS WELCOME •

Name _____

Address _____

City _____ State _____ Zip _____

Credit Card # _____

Expires _____

TOTAL AMOUNT \$ _____

W — writes your changes to the disk. You can also make a hard copy if you have a printer. This is recommended before you do any editing so you can go back and make corrections if needed.

F — searches the disk and finds bad sectors. This is a very powerful feature that helps you fix a crashed disk.

As always, it's best to make a backup of the original disk and use the backup to do the actual editing and writing. Since this is not always possible with a crashed disk, the author provides some neat tricks you can try. A fairly simple explanation of disk data storage is provided in the instructions. Using this information as well as reading other publications on how the CoCo disk system works can provide some excellent training, thus giving even a novice user valuable knowledge.

Bed is a powerful disk-editing and repair utility that I recommend. It does just what it's supposed to do without a lot of fanfare. The onscreen displays are uncluttered and easy to read.

(Robert W. Ruedy, 129 Prairie, Verdon, IL 62690; \$13.95, plus \$2.95 S/H)

— Robert Gray

Amateur Radio

CoCo 3

CC3FAX

CC3FAX is a radio-facsimile (fax) receiving program written for the 512K CoCo 3 with a disk drive and two-button joystick. Obviously, you also need a shortwave radio receiver capable of receiving facsimile signals. Such a receiver is suitable if it can receive SSB (Single Side Band) or CW (Continuous Wave, or Morse Code) transmissions. The receiver must be very stable to prevent frequency shift and subsequent picture distortion.

Generally, solid-state shortwave and amateur-radio receivers are excellent for this purpose. Hookup and operation are as simple as attaching the speaker or headphone output of the short wave receiver to the cassette (black) plug of the CoCo 3. The Main menu appears when you load and run *CC3FAX.BAS*. The 80-column screen shows the menu with these options:

- 1 Run fax program
- 2 Enable 40-track
- 3 Get instructions
- 4 Exit program

The fax program screen is similar to the

WEFAX program published in *THE RAINBOW* (February 1985, Page 42). Notable exceptions are the ability to clear the video screen, a *SOUND* command, and easier to understand View and Load options. As with *WEFAX*, all onscreen commands are selected with the joystick using the point-and-click method. The *CLEAR* command is helpful when you want to clear all of the graphics from memory. This prevents getting fragments of old pictures mixed in with new images. The *SOUND* command turns on your video monitor speaker so you can hear the level of audio coming into the cassette port. This is helpful in those cases when plugging into the radio receiver's headphone jack disconnects the set's internal speaker. Other options include the selection of 60, 90 or 120 lpm (lines per minute). You can also select either the upper or lower sideband if you are not sure which one the fax station uses. However, virtually all fax transmissions are sent in the upper sideband. Interstation interference may be less on the other sideband. *CC3FAX* flips white and black based on your sideband selection, so received colors are correct. Also, post-reception noise filtering (light or heavy) can be used to clean noisy images. This is especially helpful to users who live in the center of the United States where reception of U.S. Navy faxes is problematic.

Unlike *WEFAX*, which displays fax images on *PMODE 4* screens, *CC3FAX* receives in the CoCo 3 Hi-Res mode. Although my finished printed copy is no different, the onscreen image is much better with *CC3FAX*. The full image is equivalent to *PMODE 4* screens. You can move the joystick over the entire image, but you can't see it all at once onscreen. [Editor's Note: *The author has told us that Version 2.0 allows you to view the entire multi-screen image in a condensed form on a single screen. This lets you get an overview image, although it is necessarily distorted.*] Pressing the second joystick button allows you to toggle between pixel resolutions of 256-by-225 and 640-by-225, making larger images easier to see. A command for printing the image is also available. A command is included to reverse the image. I do this when there is a lot of black in the image; this saves quite a bit of ink in the printer ribbon.

CC3FAX also incorporates a 40-track disk option. Using this option allows you to save all of the fax image if you have a double-sided drive. Such a disk can store 1920 lines or 16 minutes of data at 120 LPM. Single-sided disks work fine, but can only store about half of the larger images.

The operating instructions, including popular fax frequencies, are included on the disk and can be read onscreen or sent to a printer. Operation is fairly simple, but first-

time users may encounter some problems due to unfamiliarity with fax transmissions. Once you get used to fax, you will be hooked. *CC3FAX* is a fine program if you are interested in expanding your use of the CoCo. Shortwave listeners (SWLs) and amateur radio operators (hams) will be delighted with it.

(Robert Gault, 832 N. Renaud, Grosse Pointe Woods, MI 48236; \$29 plus \$4 S/H)

— Jerry Semones

Utility

OS-9 Level II

Level II Tools

Level II Tools is a software utility package offered by Alpha Software Technologies for use on a Color Computer 3 with at least one disk drive and running OS-9 Level II. With this package you can use wild cards with the copy, del and attr commands. You can also map your directories, and take control of color manipulation and window functions. This package includes filters to convert text files from uppercase to lowercase and vice versa, and an assortment of other utilities.

OS-9 has always lacked the convenience of wild cards. Wild cards provide the ability to specify partial filenames using the meta-character *. For example, if I want to copy all filenames in a specific directory with the extension .c from my hard drive to a floppy, I must type each filename in a copy command line. With the wcopy wild-card command, I need only enter

```
wcopy /h0/C_programs/*.c /d0
```

All filenames with the extension .c are then copied from the C_PROGRAMS directory on the hard drive to the floppy.

The four wild-card commands included are wcopy, wdel, wattr and wmatch. These commands are similar to copy, del, attr and dir, respectively. Each wild-card command performs flawlessly. I had only one slight "problem" with these commands — the ability to wipe out an entire group of files by accidentally typing wdel *. While the documentation warns you several times that you could wipe out an entire directory this way, there should be some type of confirmation when you specify all filenames by typing the meta-character by itself.

wdel and wmatch are stand-alone programs, while wcopy and wattr require copy and attr and fail if they are not present in your execution directory.

The directory structure commands allow you to map your directories and sort filenames. `otree` and `dtree` allow you to build a road map of your directories. `otree` graphically represents the directories on a device, such as your floppies or hard drive. `dtree` allows you to specify just a subdirectory with the option of including filenames. Both commands work fine, except for one small problem with `dtree` when you use the `-f` option. If a directory or file is renamed, and the new name is shorter than the original, `dtree` gives you the new name with the additional characters left over from the old filename. If the old name was `real_long_name` and the new name is `short_name`, `dtree` reports the file name as `short_namename`.

`dirsort` is just what its name implies — a directory-sorting utility that allows for ascending or descending sorts. There is an option that makes subdirectories have uppercase letters and filenames have lowercase letters for those who want to stay within OS-9 standards.

Four color-manipulation commands are included in the utility package. They allow for quick changes of the foreground, background and border colors, and any of the palette registers. Simply type the command followed by a decimal number. No need to

use the display command included with OS-9, which requires you to use hexadecimal codes.

With Level II Tools you can use wild cards with the copy, del and attr commands.

Three window-handling commands allow you to change the current window type, and open and close an overlay window. The `wconfig` command uses a syntax similar to the `wcreate` command, except it allows you to change a window that is already defined. The `window` command pulls up an overlay

window complete with border and optional title. The `wend` command ends an overlay window created with the `window` command. Both `window` and `wend` can be used in command files to create impressive displays.

The `upcase`, `locase` and `dislex` commands are used to alter text files. `Upcase` converts all lowercase characters in a file to uppercase, while `locase` converts all uppercase characters to lowercase. `dislex` produces, literally, a mirror image of a file. I can see a use for `upcase` and `locase`, but few uses for `dislex`. The manual, however, mentions file encryption or just plain fun.

Two command-file commands, `goto` and `pause`, are also included. These are useful in procedure files to pause the screen with a message and to repeat a section of the file. `goto` is limited in that there is no way to conduct conditional testing.

The remaining six tools are listed as utility commands. `ascii` converts any character to its proper ASCII value. `convert` allows you to perform base conversions between decimal, binary and hexadecimal. `devname` returns the name of the current device associated with a device or file. Under OS-9 Level II, `devname` is useful for reporting the current window being used. `calendar` is a simple reminder program

New Programs for Home & Office

BANKMAN. Continuously updates your checkbook. Save, Edit and print files. Lets you analyze spending; reconciles, summarizes banking transactions. Uses 32K. Manual. . . \$39.95

GENERAL STATISTICS. Computes over 50 stats, including Standard deviation & error, Covariance, Correlation, Chi-Square and ANOVA. Includes screen tables and manual. Edits, Saves and Prints data. User friendly. Has Manual. . . \$39.95

ENVELOPE WRITER. Prints return and mailing addresses directly on the envelope with a DWP or on tractor envelopes with a DMP. Saves on labels! Memorizes return addresses. Prints with custom fonts on TANDY printers. Uses 16K. . . . \$19.95

BASEBALL STATS. Keeps track of 20 statistics. Continuously updates. Full of options! Uses 32K. Includes Manual. \$39.95

QUICK STATS. A Baseball Scoreboard! Keeps track of over a dozen stats. Lets you save, edit and print out data. . . \$24.95

BALL CARDS. A database for baseball card collectors. . \$24.95

BRAINBUSTERS. Multiple Choice/True-False Test Writing program. Lets you Save, Edit, Select, Randomize & Print. Many more options! Use professionally or for fun. . . \$39.95

THE EXAMINER. Use with above program to take "On Screen" tests. Grades and Saves results. For home or class. . . \$24.95

TRIVIA 1-3. Try these BRAINBUSTER quizzes. Each. . \$10.95

COCO LABELS. Sets up alphabetic screen Index. 32K. . \$29.95

CALCULATOR PROGRAM. Unique! Prints out data. 16K. \$14.95

Specify COCO 1, 2 or 3.
Disk Only. Send check or money order. Add \$3.00 Shipping/Handling.
Illinois Residents add 6.25% Sales Tax.

TRADING POST

DISTRIBUTORS OF
5-STAR SOFTWARE
P.O. BOX 3453
CARBONDALE, IL
62902



Alpha Software Technologies



Data - Windows



This is the ultimate database package for the COCO. System features include user definable fields, multiple key fields, automatic sorting, fast searching, browsing, user definable edits, user definable windows (database views), import/export/merge, cut/copy/paste, and even report and mailing label generation facilities. Makes full use of Multi - Vus, but does not require it to run! Multi - Vus style interface makes it Easy to use! 512k OS9 Level II Required.....\$59.95



Data - Merger



Easily create personalized mail-merge documents for your client/customer database, create invoices for your small business. Many capabilities include conditional printing, conditional print blocks, page formatting, repeating blocks, and more. Can be used with your favorite word processor for ultimate printing control. 512k OS9 Level II Required.....\$19.95

Presto-Partner

All in one RAM Resident software for the COCO. Includes Non-Pad, calculator, calendar, alarm, auto-dial phone book, clock, OS9 command macros and more! Runs in the background! 512k OS9 Level II Req.....\$29.95

Utilities

Level II Tools

25 Great tools to make your OS9 life easier. Complete wildcard, directory tree, and windowing commands help beginners and experts alike! 128k OS9 Level II Required.....\$24.95

Disk Manager Tree

No more fighting with complex directory structures, and long path names. Use windows to view, create, copy, and delete files and directories with single keystrokes! 512k OS9 Level II Required.....\$29.95

The Zapper

Patches anything! Patch commands on disk, patch the OS9Boot file, fix CRCs, save lost files, fix disks. 64k OS9 Level I or II Req.....\$19.95

Multi-Menus

Create your own pop-down menus easily! Run any OS9 program from the menu. No programming required! 512k OS9 L II & Multi-Vus Req.....\$19.95

Communications

OS9 Level II BBS

Complete system comes ready to run. Use the built in setup or create your own. Completely customizable. Features: X/Y Modem, keywords, unlimited message bases, ANSI graphics, see the board while it runs, and more! 512k OS9 L II Req.....\$29.95

Warp - I

Complete terminal program includes Auto-Dial/Macro, X & Y modems, ANSI graphics, buffer capture, chat mode, timer, and more! 512k OS9 Level II & RS-232 Pak Req.....\$34.95

Hardware

Comm - 4

Get an incredible 4 serial ports in 1 PAK! Connect four modems/printers at once! Connect a Microsoft (PC) mouse! Special pulsed IRQ prevents lockups. Comes with networking software to share peripherals! Perfect for a multi-line BBS! COCO 3 Req.....\$124.95

(504)649-5176 (voice) Alpha Software Technologies (504)649-5761 (BBS)
Please add \$3.00 Shipping & Handling 210 Bluefield Dr. Slidell, LA. 70458 COD Orders add \$2.00 extra

that allows you to update or list current reminders.

With browse, you can look through a text file using the arrow keys to scroll forward and backward. Since browse uses a fixed buffer, it cannot read more data than the size of its buffer. This makes the program good only on files equal to or smaller than the size of its buffer. The remaining command is mmap which prepares a graphic map (using Xs and Os) of the memory in the computer.

The manual included with this package is 30 pages long. It shows the proper syntax for each command along with some examples. There is an introduction by the author along with installation procedures for moving the utilities to your working floppies or hard drive.

The package contains 25 utilities for a cost of \$24.95. This amounts to just under a dollar per utility. Given the limitations of some utilities and the cost per utility, this package is a fair bargain.

(Alpha Software Technologies, 210 Bluefield Drive, Slidell, LA 70458; 504-649-5176; \$24.95, plus \$3 S/H)

— Carmen Izzi, Jr.

Game

CoCo 3

Caveman

In the year 2061, after the great war had decimated the human race, only a few pockets of humanity survived. Among those people were Evil Lord Dracus and a sage named Kubai. Lord Dracus is now busy repopulating the world with Robodroids, creatures half human and half machine, which threaten the few remaining villages. This world is without leadership and on the brink of chaos. It is felt that only Kubai can lead the remnants of mankind back to a civilized life. Unfortunately, Dracus had Kubai kidnapped and it is up to you, who seek adventure, to locate Kubai and return him to the village.



That is the scenario, but let's look at the actual game. *Caveman* is of the platform-arcade genre in which you play the warrior who has to work his way from one side of the screen to the other by jumping or reaching various plateaus and exiting each of 20 game screens. To impede your progress,

Caveman is of the platform-arcade genre in which you play the warrior who has to work his way from one side of the screen to the other by jumping or reaching various plateaus.

mines are placed throughout each cave. Some of these mines are in plain sight while others are invisible. There are three ways to rid passages of mines. One is to drop one of 60 pieces of dynamite onto the mines. The second is to simply stomp on a mine. And the third way is to run into it. The last method, however, causes your warrior damage or death and is not recommended.

There are keys, piles of gold, bottles of magic potion, and mystery treasure chests scattered throughout the caves. The gold adds energy points, which are the warrior's health indicators. Each warrior starts off with 10 energy points and must forfeit one of his four lives should that energy reach zero. Potions allow the warrior to see the hidden mines, but only for a split second. Treasure chests either deduct or add energy points. While mapping is not really necessary, you may want to note where each door in the later stages leads, as some take you back to previous screens.

Caveman is a machine-language game that requires a CoCo 3 and a joystick, preferably the two-button type. The game comes on two floppy disks (that is, two disks and four sides). Disk switching is necessary throughout the game. The graphics are fair, although not crisp or very detailed. An RGB monitor is recommended. Play is easy and relaxing as the game is not timed and there are no moving objects to contend with.

There are a few minor items that could

improve the game. While it does not effect play, it would be helpful to have each cave or level displayed on the screen so players know how much progress has been made. A final screen listing points, previous scores, and how far a player has gone when the game ends would also be a nice touch. Randomizing the location of keys, mines, and gold would improve the game — each game would then be a new adventure. So, if you are looking for a fast-paced, shoot-'em-up game, *Caveman* will be a disappointment. However, if you often do not get past the first screen with other games, this will be a joy. It can be successfully completed within an hour.

(J.T. Rawlinson Software, #361 St. Germain Ave., Toronto, Ontario M5M 1W6 Canada; 416-782-2217 evenings only; \$14.95 plus \$3 S/H)

— George Aftamonow

Music

CoCo 3

SoundTrax Instrument Disks

I recently reviewed *SoundTrax*, a sound-sequencing program for the CoCo 3 from Sundog Systems (January 1991, Page 76). On the back of the *SoundTrax* program disk are several instrument and sound files from which to pick and choose.

Although there were a few dozen of these voices to use in recordings, their scope was somewhat limited. For instance, the guitar voice sounded good, but its one octave range was restricting. Similarly, the drum samples sounded a bit stale after hearing the exact same thud or cymbal crash over and over. What the program needed was a wider variety of samples.

Sundog Systems has come to the rescue with supplemental instrument-set disks. There are three different sets, each with approximately 40 sound samples. Each set comes on one "flippy" disk. These are not stand-alone programs — you do need the *SoundTrax* program to use them.

One criticism I have is that related instrument samples aren't all on the same set. If your favorite instrument is the piano you need to buy sets one and three. If you're laying down a drum track and doing drum rolls, then decide you'd like to use the open and closed hi-hat sounds, you'll find the samples are on two different sets. How about some organization? Put all drum voices on one disk, all voices for piano on

The New Generation of **Star** Printers



7 Color
Printer!

RAINBOW NX-1020

This next generation color printer sets new standards in color printer performance... 225 cps, 4 NLQ fonts including Script, plus a new high speed draft font; but the enhancements don't stop there. Add a 16k buffer, a special quiet mode, top feed, bottom and rear tractor, and the list goes on. Seven on-demand colors, 8 color graphics modes, Epson and IBM emulation for maximum software compatibility. Virtually everything desired in a printer is here - *speed, color and versatility* at an affordable price with a 2 year warranty.

OUR PLUG 'N GO FOR THE COCO SYSTEM INCLUDES:

- NX-1020 Rainbow Multi-Font Printer
- Blue Streak Ultima
- Software Support Disk**
- Color Screen Dump Utilities

~~\$259⁹⁵~~
+\$10 Shipping & Insurance

~~\$249⁹⁵~~
+\$10 Shipping & Insurance

COMPLETE

NX-1001 MULTI-FONT

This enhanced version of the legendary NX-1000II is the latest low-cost high-performance printer from Star Micronics. Fully featured with 4 NLQ plus a draft font. 10 character sizes from subscript to quadruple size, 4k buffer, 180 cps, friction and tractor feed, and much much more. Backed by a 2 year warranty. Epson and IBM emulation modes for maximum software compatibility. A performer so versatile you may never exhaust it's creative possibilities.



OUR PLUG 'N GO FOR THE COCO SYSTEM INCLUDES:

- NX-1001 Multi Font Printer
- Blue Streak Ultima
- Software Support Disk**

~~\$199⁹⁵~~
+\$10 Shipping

~~\$188⁸⁸~~
+\$10 Shipping

COMPLETE

The Smallest, Sleekest, Fastest Serial To Parallel Converter You Can Buy!

7 Switchable Baud Rates
300 • 600 • 1200 • 2400 • 4800
• 9600 • 19200

Use this "smart" cable to connect a Centronics parallel printer to any version CoCo or use it to improve performance of your current printer. The cables are long-life, high quality shielded cables with moulded plugs for extra durability.

The Blue Streak Ultima

~~\$39⁹⁵~~
+\$2 Shipping

Powered version
add \$6.00.

~~\$34⁹⁵~~
+\$2 Shipping



FREE
with purchase of any
NX-1020 or
NX-1001 System

All Dayton Associate's products have a 30 day moneyback guarantee.
All printer systems are "Plug 'n' Go for the CoCo".

****The Software Support Disk**
A Dayton Associates exclusive that comes with any printer purchase. It consists of a CoCo Installation Tutorial, a CoCo Graphics Screen Dump Utilities and a Control Code Tutorial. Provided to help you get the most out of your system!

Epson is a registered trade mark of Seiko Epson Corp.
IBM is a registered trade mark of International Business Machines Corp.
Price and Specifications are subject to change without notice

Order Your System Today... Call (513) 885-5999

DAYTON ASSOCIATES of W.R. Hall, INC.
9644 Quailwood Trail • Spring Valley, Ohio 45370

Visa & Master accepted within the continental U.S.
Ohio residents add 6.5% sales tax
COD add \$3.00

Shipping charges to Canada, P.R., HI, AK, APO, FPO are double. Triple charge to all other countries.

one disk, and scatter miscellaneous sounds throughout. Of course, if you buy all three sets you can configure your instruments any way you deem fit, but this is no excuse for their present state.

Another minor flaw is with the identification of the sample files. On the screen and in the program manual, the files have eight

The addition of these instrument-set disks makes *SoundTrax* a more attractive and viable sound-sequencing alternative.

letter filenames. It would have been nice had the author expanded on filename descriptions in the manual. I'm still not sure which instrument is represented by the filename MGTRBNT3.

Loading in all of these new samples could take a lot of time. Thoughtfully, though, Sundog Systems has provided Config files that load samples into memory. There are six Config files, one for each side of the three instrument disks.

After sampling the new voices, you'll hear how much these new files add to music compositions. You now have greater flexibility with your musical creations. Instead of the sparse drum accompaniment, create full drum backbeats with the new tom-tom, cymbal, snare, hi-hat, and bass drum samples.

If you like guitars, you're in for a big surprise. The supplemental disks provide over 20 new guitar sounds. There are also 15 acoustic and electric piano samples. Some of the other instruments included are the bassoon, English horn, oboe, recorder, flute, whistle, woodblock, bongo, jingle bell and steel drum. Some humorous voice samples of laughing, sneezing, and a crowing rooster aroused a chuckle. With over 100 new samples, there is a little something for everybody to enjoy.

If you already enjoy using *SoundTrax*, just wait until you get these sets. As with the original sample files, the sound quality of the new sets is surprisingly good. And remember, if you still don't have that unique sound you've been looking for, it's possible to create samples with *Studio Works* and

other similar digitizing packages on the market.

My two earlier criticisms of these new sets do not effect the sound quality of this package in any way, shape, or form. The addition of these instrument-set disks makes the original program, *SoundTrax*, a more attractive and viable sound-sequencing alternative.

(Sundog Systems, P.O. Box 766, Manassas, VA 22111; 703-330-8989; \$12.95 per set, \$29.95 for all three, plus \$2.50 S/H)

— Tony Olive

Game OS-9 Level II

Kyum-Gai: To Be Ninja — in OS-9

Many people thought that porting a Disk BASIC arcade game to OS-9 while keeping the Hi-Res graphics intact would not be an easy feat. They never expected anyone would do it. If the game in mind were *Pong*, fewer people would have been as skeptical of a successful conversion. But, the game was not *Pong*, it was *Kyum-Gai: To Be Ninja*. *Kyum-Gai* is a marvel of game programming by Glen Dahlgren. About a year ago Glen announced his plans to port his game to OS-9. The CoCo community waited patiently.

Word was that Kevin Darling was making headway with the project, but previous commitments left him precious little time for working on *Kyum-Gai*. Kevin managed to get the bulk of the conversion process behind him. Glen, who wanted to get this landmark achievement on the market as soon as possible, found another programmer to fix the remaining loose ends. The



final touches to the port were added by Eddie Kuns. I take my hat off to Kevin Darling and Eddie Kuns for their marvelous accomplishment.

Kyum-Gai — OS-9 requires a 512K (actually, 256K minimum) CoCo 3 running OS-9 Level II. Due to Tandy licensing re-

strictions, an OS-9 boot file is not included on the *Kyum-Gai* disk. You need to boot OS-9 before playing this game.

Even this OS-9 neophyte had no problems loading the game. All that is necessary is that you create and move to a VDG window, set the data and execution directories, and enter *ninja*. Loading instructions and hard drive installation are clearly explained in the manual.

After the title screen credits you are greeted by the same real-time Hi-Res graphics animation and digitized sounds made popular by the original version. Simply put, there is no difference. For further information on game play, refer to the original review (December 1989, page 92).

The benefits of using the OS-9 version speak more for the operating system itself. You can multitask and have *Kyum-Gai* running in up to three windows on a 512K CoCo 3. Of course, you probably won't want to play three games simultaneously, but you get the idea. When you switch windows, the game automatically pauses until you return.

Perhaps this game offers another stepping stone for CoCoists who hesitate to delve into OS-9. This program has finally proven that fast-action arcade games are possible in the OS-9 environment. Sundog hopes *Kyum-Gai* spawns similar attempts of Disk BASIC/OS-9 version games.

(Sundog Systems, P.O. Box 766, Manassas, VA 22111; 703-330-8989; \$29.95, plus \$2.50 S/H)

— Tony Olive

Audio Tape

Mystical Data

About 10 years ago I experienced a project in San Francisco called Audium — an experiment in sound-sculptured space. People sat in a darkened room and listened to computer-generated sounds. The sounds, heard through a surround-sound speaker arrangement, created a presence of emotion that lent itself to vivid imagery.

Mystical Data, although different in the sense that there is distinguishable instrumentation, lulls the listener into the realm of imagination as well.

Mystical Data is a cassette tape recorded by Michael Milazzo. Using some high-tech musical equipment in conjunction with a Color Computer 3 sporting CoCo MIDI 3, he has produced a high-quality product.

The first track, "Lunar", produces a sense of floating in a zero-gravity environment.

The changes are subtle in this relaxing tune. Piano, drums, and synthesizers dominate the track. It flows on and on, producing a spacewalk feeling.

"Dragonslair", the next track, starts with a medieval opening. I immediately thought of dark, foreboding castles and stealthily journeying deep into the corridors of a cavernous mountain in search of the fair maiden who might be found resting on a treasure in the dragon's bane. There is a clock-like tick, or drip, throughout — very reminiscent of trickling stalactites — which lends a certain urgency to this song.

"Equinox", a more reflective passage, pulsates and sounds like a march. This one reminded me of the band Latitude, who use a Fairlight to achieve a similar calming affect with their music.

"Renaissance" begins with liquid bells and eerie wind swirls. This song sounded a bit more futuristic than charms from the days of yore. Though, again, the music is relaxing and a good source of soothing pleasure after a hectic day.

"Excursion", track number five, is aptly titled. The piece travels through three peaceful thematic ideas before returning to the main theme and gently fading away. All of the tracks on Side One should lower your blood pressure and set your mind at ease. If

I had to categorize *Mystical Data*, it would fall somewhere in the New Age/Easy Listening music arena.

Side Two brings us to "Round Table 1990". At first I thought of a ballroom dance, but a flute or woodwind sound followed by electric brass changed the imagery to a woodland, or possibly a road leading to or from a modern-day Camelot. The fanfare hinted of a procession. Again, the winds of change swirled. Although there were no bird chirps or leaves falling, I felt this to be an autumn or winter song. This one put me in a reflective state.

"Moondrone", steady tapping of the high hat gets this hypnotic drone going. Don't expect any keyboard outburst (ala Emerson, Lake and Palmer) here. Instead, this piece provides more introspective passages, like those on Side One.

"Midnight Frost" has a haunting feel, much like the movie soundtrack to *Midnight Express*. The use of flutes and the overall rhythm make this piece sound somewhat Eastern in nature.

"Into the Light", the finale, opens with the tickling of keys and a seminary choir's lament. This piece has more discernable breaks and bridges. The changes were refreshing. My only criticism of this piece is that it is too short.

All songs on *Mystical Data* were conceived, performed, recorded, engineered, produced, and packaged by Michael Milazzo. Here is a list for those wondering what equipment he used for this recording:

- Kawai K-1
- Roland MKS-100
- Yamaha FB01, RX17, R100
- Vestafire and Boss digital and analog delays
- Tandy CoCo 3 with CoCo MIDI 3
- Real-time sequencer software
- Tascam 244 Mixer, A2300SX
- 1/4-track deck

Mystical Data is soothing mood music, not necessarily "elevator music" or Muzak. As I stated earlier, these songs will probably lower your blood pressure and help drain tensions. So, if you're going crazy tuning your radio dial past the screaming whammy bars and techno-pop garbage that has all but monopolized the airwaves, sit down with a cup of hot tea and take a load off with *Mystical Data*.

(Rulaford Research, P.O. Box 530328, San Diego, CA 92153; 619-690-1181; \$9.95)

— Jamie Hensen

 * A T T E N T I O N *
 * CHESS LOVERS & STRADegy GAMERS *
 * T A K E N O T E *
 * GAME GEM GAMES ANNOUNCES *
 * P O W E R P I E C E S *
 * THE EPIC OF CONQUEST *
 * FOR A 512K CoCo 3 *
 * EXPERIENCE THE THRILL OF:MOVING *
 * , ATTACKING, RECONNAISSANCE *
 * AND DISTANCE ATTACKING *
 * ALL SCALED TO CHESS BOARD SIZE *
 * SAVE AND LOAD GAMES *
 * NO TWO GAMES THE SAME *
 * SPLENDID POINT AND CLICK *
 * ENVIRONMENT AND ALL FOR *
 * ONLY \$19.95 *
 * SEND CHECK OR MONEY ORDER TO, *
 * GAME GEM GAMES *
 * PO Box 487 *
 * CLARKSBURG, WV *
 * 26301 *
 * CHECKS ALLOW 2-4 WEEKS DELIVERY *
 * SORRY NO COD'S *
 * 512K CoCo3 1 DISK DRIVE *

**PRICES SLASHED ON ALL
 ADOS PRODUCTS
 LIMITED TIME ONLY!**

EXTENDED ADOS-3\$29.95
 (Requires ADOS-3)
 Disto real-time clock driver, \$5.
 Adapter for controllers lacking 28-pin ROM socket, \$10.

ADOS-3\$24.95

EXT. ADOS-3 PLUS ADOS-3\$49.95

SMARTWATCH REAL-TIME CLOCK\$29.95
 Usable in controllers with 28-pin ROM socket, or in ROM pack,
 \$10. Includes OS-9 Level II driver. Ext. ADOS-3 driver, \$5 with
 clock, \$10 separately.

ADOS FOR CoCo 1 and 2\$14.95

— All ADOS software is sold on disk with configuring utilities that
 generate an EPROMable binary file. Information is provided for
 having an EPROM burned by mail for \$15.
 — See our earlier ads, and reviews in July 1987 and October 1989
 Rainbows (available on request) for product descriptions.

SPECTROSYSTEMS 

11111 N. Kendall Dr.
 Suite A108
 Miami, FL 33176
 (305) 274-3899

PLEASE ADD \$2 S-HIPPING • NO DELAY ON PERSONAL CHECKS
 WE CANNOT ACCEPT CREDIT CARDS

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.

Super Comics+, an improved version of *Comics+*. The new version features an improved window for the pencil, an inverted box instead of fill-box, expanded hand (Get/Put) options, a 512K RAM-disk, two-color painting, improved error handling for the CoCo 3, a utility for customizing clip art, six picture files, and a new expanded 24-page manual. Requires a CoCo 2 or 3, a disk drive, a self-centering joystick, and a DMP-105/107 or DMP-130/134 printer. *E.Z. Friendly*, 118 Corlies Avenue, Poughkeepsie, NY 12601; \$21.45 plus \$1.50 S/H. Owners of COMICS+ may upgrade for \$14.45 plus S/H.

Picture Bingo, a program requiring a Color Computer 3, disk drive, mouse or joystick, and DMP-105/107 or DMP-130/134 series printer. This program creates picture bingo cards and acts as the "caller" for the game. A Speech/Sound Cartridge may be used with this feature. *Picture Bingo* is fun for young children, has an educational application in helping students learn a foreign language and would make for a unique "party" game if the cards used personalized pictures. *E.Z. Friendly*, 118 Corlies Avenue, Poughkeepsie, NY 12601; \$19.95 plus \$1.50 S/H.

N*Banner, a banner-creating program requiring a CoCo, a 35-track disk drive, and a printer. Works on a 32, 40, or 80-column screen. Four fonts to choose from; Standard, Gothic, Digital and Standard Bold. Options include printing in double wide mode, using different graphics block codes, and selection of 600-9600 baud. *Johnson Software*, 5803A Reinke, Crestview, FL 32536; \$9.95.

Caveman — In Quest of Kubai, graphics arcade game requiring a CoCo 3, an RGB monitor, a disk drive, and a two-button joystick. In the year 2061, after the great war, the human race has been destroyed, and only a few survivors remain. One of these survivors, the Evil Lord Dracus, has created a new race of robodroids, part machine, part human, that threaten the village and the good people of the land. In order to save humanity, you must rescue Kubai, the great wise man and professor, who is being held hostage in the underground caverns. *J. T. Rawlinson Software*, #361 St. Germain Avenue, Toronto, Ontario, M5M 1W6, Canada; \$14.95 plus \$3 S/H.

NIB Compressor, a graphics compressor for the CoCo 3. *NIB* allows you to save your HSCREEN pictures in a compressed format. *NIB* was used in the creation of CoCo Gallery on Disk for THE RAINBOW. Features include palette save, automatic save, fast compression, and fast loading. Use this as a stand-alone program or in conjunction with *Gallery Maker*. *Rick's Computer Enterprise*, P.O. Box 276, Liberty, KY 42539; \$2.50 plus \$2 S/H.

Gallery Maker, now you can create a personalized CoCo gallery on disk with your pictures and this program. *Gallery Maker* organizes your pictures, graphics data, and background information into a beautiful art gallery. Each finished gallery consists of eleven *NIB* pictures, a menu driver, and support files necessary to make the gallery complete. Requirements are a CoCo 3, a disk drive and an RGB or CMP monitor. *Rick's Computer Enterprise*, P.O. Box 276, Liberty, KY 42539; \$10 plus \$2 S/H.

Crystal City, a 128K/512K space-arcade game requiring a CoCo 3, a joystick, and a disk drive. It is the first

commercial product to use the CoCo 3's horizontal hardware scrolling. Try to evade the evil overlords and penetrate level upon level of defenses to get close enough to free the enslaved people of the Crystal City. Written by Jeremy Spiller, author of *Zenix*. Available from *Sundog Systems*, P.O. Box 766, Manassas, VA 22111; (703) 330-8989; \$34.95 plus \$2.50 S/H.

CyberVoice, a versatile phoneme-based speech synthesizer using the Votrax SC-02 chip set. It offers independent control of the speech rate, pitch, pitch movement rate, amplitude, articulation rate, vocal tract filter response, and phoneme selection and duration. Included is a unique text-to-speech server program for the *CyberVoice*. This program executes in the background, cooperating with the *CyberVoice* device drivers, to translate ordinary English text into *CyberVoice* commands. Compatible with *Speech Systems' SuperVoice*. Requires a CoCo 3 and OS-9 Level II. *Burke & Burke*, P.O. Box 733, Maple Valley, WA 98038; (800) 237-2409; \$74.95 for *Speech Synthesizer w/ OS-9 software*; \$24.95 for *software only*; plus \$3 minimum S/H.

The *Seal of Certification* 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 program 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.



Wrapping the RAINBOW

Unwrapping the RAINBOW

Long time, no hear from, eh? The purpose of "Wrapping the RAINBOW" is to address changes in the magazine and other aspects of production that affect you. When I have nothing to report, I would rather free this page for other material. So, then, what *do* I have to report?

Starting with last month's issue (March 1991), we stopped using the plastic Sitma wrappers on THE RAINBOW. In making this decision, we looked at the history of our sending wrapped copies of the magazine. The original decision to "poly-bag" THE RAINBOW was in response to reader complaints about magazines getting destroyed in the mail. The number of complaints was relatively low; however, our goal is to serve you -- so, on with the wrappers. But, to make a long story short, the complaints continued.

We have tried several approaches to solve the problem, none of which were really effective. The post office offered many explanations for how this destruction might occur, but few point to anything other than careless handling. In our case, it doesn't appear the Sitma wrappers have much effect on this. So, our new way of handling the problem is to go back to the old way -- we'll replace *unusable* copies of the magazine that have been destroyed in the mail. The difference is that we'll also be putting the buck where it belongs, so to speak.

We have contacted the postal service and received assurance that they will do what they can to ensure proper delivery. If you receive a copy of THE RAINBOW you cannot read, let us know. We'll immediately fire off letters to the local and destination postmasters, the Postmaster General of

the United States and the congressional representatives involved. In short, we'll be making a nuisance of ourselves any time we (or you) are not satisfied with the service. You should do the same. A big portion of the money you pay for a subscription to THE RAINBOW goes toward postage, which increased nearly 22 percent this February. So *do* let us know, but *you* complain to your postmaster, too. Every magazine we ship leaves here in good condition. In the meantime, we'll continue to serve those readers who encounter problems.

This doesn't mean we will never use the Sitma wrappers again. The plastic bags allow a greater number of options to advertisers. They are also very useful should we want to send supplemental information. But our experience has shown that using them as a regular course of action is not an effective means of ensuring you get your RAINBOW in good shape.

* * * * *

Our mail bag shows an increase in the number of questions being asked about OS-9. To handle the increase, we have decided to publish a new question/answer column in the magazine. "OS-9 Hotline" is intended as an open forum for your questions. It is our hope this column will provide a smoother entry for those just starting with OS-9. But we'll accept queries from intermediate and advanced users, too. While we don't guarantee we'll know all the answers, we'll give it our best shot and try to steer you in the right direction. Send your OS-9-related questions to OS-9 Hotline, c/o THE RAINBOW, P.O. Box 385, Prospect, KY 40059.

— Cray Augsburg

RAINBOW had them. However, since their advertisements no longer appear, I have no idea if they are even still in business. That company was Datamatch, Inc., in Redford, Michigan.

I finally resorted to making my own floppy disks. In addition to the second notch, it is necessary to punch a second index timing hole. To do this, it is necessary to measure and mark the exact location (on both sides of the disk) of the second hole. (It is simple enough to find this spot by referring to the existing index timing hole. The new one is on the opposite side of the large center hole.) Then, using a single-hole paper punch, carefully punch a hole in the plastic cover. Do not punch the magnetic disk, or you will ruin it! Also, be careful not to handle the disk, don't even let the punch touch it if you can possibly avoid it. Punch the second hole on both sides of the disk cover.

I have been very successful in making my own floppy disks with this method. I am sure there are several experts who advise you not to do it, but the method works. It is like having twice as many disks as you had previously.

I might also advise you should be sure the disks you buy are DSDD disks. Although the SSDD disks can be altered to become floppy disks, the manufacturer guarantees only the one side to be top quality. In other words, convert the SSDD disks at your own risk.

I hope this information helps Roger and anyone else who may have had the same problem. I strongly feel that, as readers of THE RAINBOW, we need to come to the aid of one another. As Radio Shack seems to be phasing out our beloved CoCo, we need THE RAINBOW and each other.

It is obvious that THE RAINBOW and its various advertisers are doing their part. Let us hope that we are doing ours. Keep the CoCo alive!

Bill Swartz
Washington, D.C.

To the best of our knowledge, no data exists regarding the effects of rotating a disk in both directions (as must be done with flippies). It would seem that dirt picked up by the disk while going one way could be imbedded in, or scratch, the disk when moved in the opposite direction. In any case, we recommend caution and common sense should anyone decide to follow this practice.

Printer Selections

Editor:

Since the DMP-107 replaced the DMP-106

in Radio Shack's printer line, some CoCo users have been trying to use graphics software by selecting DMP-106 printer drivers. As it turns out, this does not work.

The DMP-107 Tandy Graphics modes seem to be the same as the DMP-130, not the DMP-106. Zebra's *CoCo Graphics Designer Plus*, *Label Designer*, and *First Prize* all give excellent results using the DMP-130 printer driver for the DMP-107 printer.

DMP-107 owners will, no doubt, find that DMP-130 printer drivers on other vendor's graphics software also support their printer.

Stewart Newfeld
President, Zebra Systems, Inc.
State College, Pennsylvania

Many thanks for the tip, Stewart.

A Helping Hand for Home Publisher Editor:

I received my January issue of THE RAINBOW this week and, as usual, began by reading the "Letters to THE RAINBOW". I would like to reply to Douglas Bacon and Sanceria Thomas.

I have *Home Publisher* and have run into many of their problems. Though my system has more on it than either of their descriptions, the key factors are the same: I have a CoCo 3 and a DMP-133 printer. Both Doug and Sanceria can solve most of their problems by reading Appendix E in the manual. *Home Publisher* comes with the driver for a DMP-13x installed. The x is because this driver works in the Tandy mode for the 130, 130a, 132, and 133. Doug's problem stems from the fact that the printer (not the software) is limiting him to two columns of the three-column mode and creating a problem with the single-column mode. According to the information in a file referenced by Appendix E, Doug should cure his problem by setting the printer to Tandy mode, IBM character set, setting the printer to take advantage of his parallel interface and installing the DMP13bn printer driver. (Read on for installation information.) If he wants to continue using the DMP-130n driver and the serial interface, there are special settings for the single-column mode to coax it into working with this printer driver. (See the file AppendE on Side 2 of the original disk.)

Sanceria's problem may come from having the DMP-130 driver installed when in fact the DMP-105 driver may need to be installed. To find out which driver is currently installed, and to change it as required, click on the Options area. Next click System Set-up. Then click Printer Definitions. Finally, click Printer Driver. A small window opens, stating the current driver. If you've changed nothing since purchasing the software, it will be the DMP-130n driver.

Below this window another window opens. This contains the menu of available drivers. Click on the appropriate driver as mentioned above. The software now changes the file that sets up the system when you boot the software. Unless I have misguessed, this should cure the problems with *Home Publisher*, or at the very least cause it to run in a more predictable manner.

Sanceria's second problem is trying to get the Color Computer to act as a typewriter. Even though there have been programs published as *One-liner* entries in THE RAINBOW that accomplish this conversion, I can never find the one I want when I need it. I agree that what Sanceria is really looking for is a word processor. An OS-9-based text editor or word processor would allow direct importation of text into *Home Publisher*. As an exercise in learning why text editors and word processors cost what they do, and to meet Sanceria's stated goals, type in the program on Page 191 of the "Color Computer Extended BASIC" manual. Then flip the page and follow the instructions on Page 192 that modify the program to output to the printer rather than the screen. This allows very limited editing (as long as you edit before you press ENTER) and allows printing of text to the printer without having to imbed the text in data statements.

Good luck to both of you. One last comment to Sanceria. When you meet someone (or something) new, the relationship cannot be as friendly as it becomes once you become better acquainted. As the Editor replied, "hang in there." Read the manuals, try the examples, and above all give yourself the time to learn. Don't you let that fire of eagerness turn to frustration. Relax! The dawn will come if you just keep at it.

Alan J. Wagner, Sr.
Quakertown, Pennsylvania

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.

Wake up and smell the CoCo!

Bring your drawings and designs to vivid, colorful life with the amazingly popular CoCo Max III!

**NOW
\$3995**

Zoom! Rotate! Animate! 13 Fantastic Fonts! 40 paint brush shapes! CoCo Max III dazzles the eye! Get crisp, clear picture resolution (two full hi-res 320x192 screens)... a big, big edit window... 28 "eat-your-heart-out" drawing tools. Rotate at miniscule 1.5° angles. Undo boo-boos with a click. Animate for special effect. Pick n' choose from 16 colors out of 64. Go absolutely fruity with fonts (8 sizes, 5 styles & more available!) and an astounding 40 different brush styles! No wonder this software is recognized as the CoCo community's all-time favorite! Works with both 128K and 512K. Colors print in 5 shades of gray. Printers supported: Epson RX, FX, MX, LX and compatibles; Star/Gemini NX-10, NX-1000; DMP100, 105, 106, 110, 120, 130, 200; OKI 82A, 182, 192 CGP-220 (B&W).

CoCo Max III Add-Ons

Max Fonts disks: 95 fonts on 4 disks. Now only **\$29.95**
 Or two sets of two disks each **\$14.95**
Max Edit The font editor as creative as your imagination **Only \$14.95**
Color Printer drivers NX-1000 Rainbow. CGP-220 and Okimate 20. For glorious color that wins hands down! **\$14.95**

Get Max-10 - the CoCo word processor that's fun and furiously fast!

**NOW AT
LOWEST EVER
PUBLISHED PRICE OF
\$3495**

Get that easy-as-pie Macintosh feel without giving up your first-born! This program will stretch your CoCo to the limit. Mix graphics, text, large headlines, arrange multiple columns, you name it... Max-10 will swiftly oblige. Includes paper-saving full-page preview (graphics, too!) to make your prose look proud. This is the CoCo word processor that will leave you speechless. Printers supported: Epson FX, MX, RX, LX and compatibles; DMP 105, 106, 130; CGP 220 (B&W); OKI 182, 92, 192; STAR NX-10, NX-1000.

Max-10 Add-Ons

Max-10 Fonts 36 super fonts on 2 disks. Call for list. Now **\$14.95**
Spell Checker 35,000 word dictionary. Online spell checking to make you look the perfect professional. **\$14.95**

Buy both CoCo Max III and Max-10

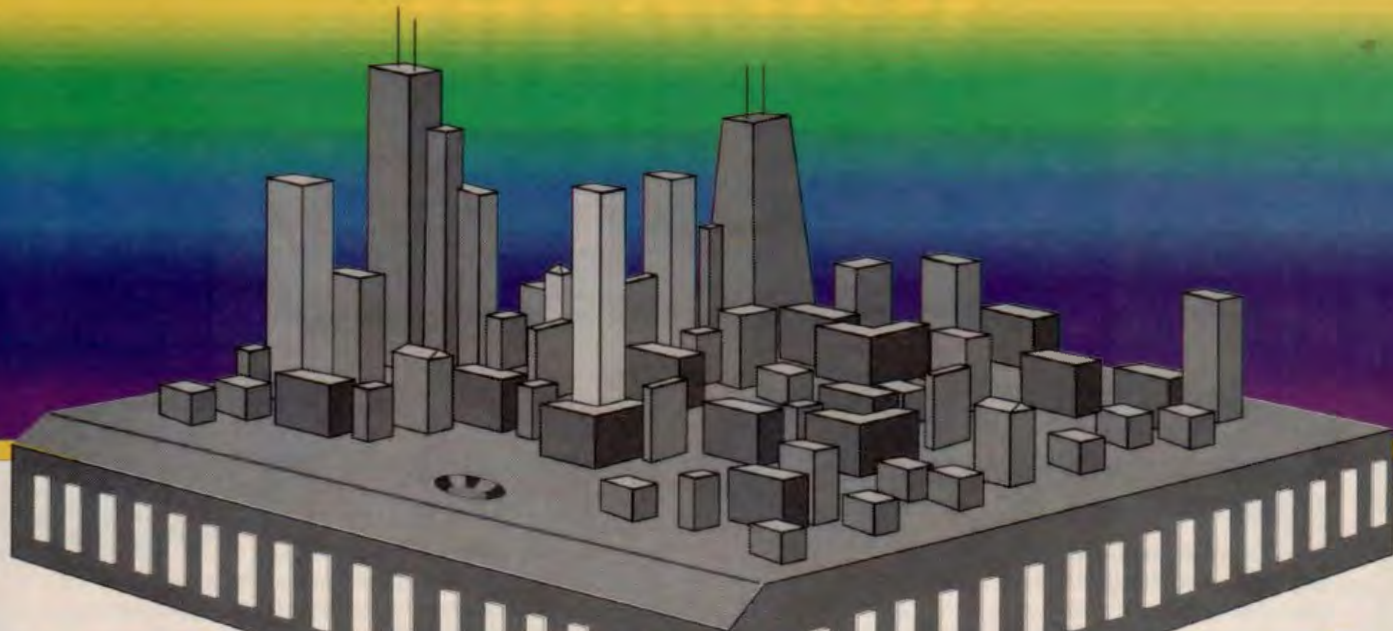
\$4995

Call 1-800-221-0916 1-203-656-1806

How to order: Use Visa, Mastercard or M.O. C.O.D. add \$4.00 extra. Purchase Orders subject to credit approval. Connecticut residents add 8% sales tax. Shipping \$4.00 per order, usually UPS ground. UPS 2nd day air \$6.00 extra. Next day service available. Canada: \$6.00 per order (Airmail). Outside U.S. & Canada add 10% of order total.

COLORWARE 242 West Avenue
Darien, CT 06820





GAME Chicago '91!

For over 10 years, THE RAINBOW has been bringing RAINBOWfest to the CoCo Community. Being our 20th consecutive show, this RAINBOWfest promises to be a show to be talked about for time to come.

Come and walk the aisles — set your own pace between visiting the exhibits and attending the many invaluable, free seminars. Take part in the seminars offered, ranging in topics from BASIC to the sophisticated OS-9 operating system.

Stop by the RAINBOW booth and meet the faces behind THE RAINBOW. As well, those who are written about throughout its pages will be there to meet you and answer your questions. While you're at the RAINBOW booth, you can also take advantage of the reduced prices on the entire RAINBOW bookshelf. In addition, prices on all back issues will be reduced, giving you a chance to fill those holes in your library. You'll also meet many other people who share your interest in the Color Computer. RAINBOWfest is a person-to-person event, not to mention a tremendous learning experience in a fun and relaxed atmosphere.

While you're walking through the exhibit hall, keep your eyes open for CoCo Cat. Children and adults alike always enjoy the furry feline. And our mascot is no

dummy — always looking for great deals, perhaps CoCo Cat has a hot tip for you.

RAINBOWfest is the place where commercial programmers show their newest programs and hardware for the first time. Plus, they will be listening to your comments and offering "special show prices." RAINBOWfest Chicago, is the

Show Information

RAINBOWfest - Chicago

Dates - April 26-28, 1991

Hotel - The Hyatt Regency - Woodfield, Schaumburg

For more info, call toll free

1 (800) 847-0309

in KY, call (502) 228-4492

place to get information on the capabilities of the CoCo, and find a terrific selection of the latest CoCo products. In exhibit after exhibit, there will be demonstrations, opportunities to try software and hardware, and special RAINBOWfest prices.

If you missed the fun at our last RAINBOWfest, why don't you make plans to join us in Chicago? For those members of the family who don't share your affinity

toward the CoCo (for reasons we will never understand), there are many other attractions in the Chicago area.

Once again we are pleased to be holding RAINBOWfest at The Hyatt Regency-Woodfield, Schaumburg, Illinois. The show opens Friday evening with a session from 7:00 p.m. to 10:00 p.m. It's a daytime show Saturday - The CoCo Community Breakfast (separate ticket required) is at 8:00 a.m. sharp, and the exhibit hall opens promptly at 10:00 a.m. and runs through 5:00 p.m. On Sunday, the exhibit hall opens at 11:00 a.m., and the show closes at 3:00 p.m.

Tickets for RAINBOWfest may be obtained directly from THE RAINBOW. We'll also send you a reservation form so you can get a reduced room rate at the Hyatt Regency.

The POSH way to go. You can have your travel arrangements and hotel reservations handled through RAINBOW-affiliated Posh Travel Assistance, Inc., of Louisville. For the POSH treatment many of our exhibitors enjoy, call POSH at (502) 893-3311. All POSH services are available at no charge to RAINBOWfest attendees.

If your ticket order is one of the first five orders received from your state, you will receive a **Free RAINBOWfest T-Shirt!**

RAINBOWFEST

1991

— COCO COMMUNITY BREAKFAST —

KEYNOTE ADDRESS Chris Burke, Burke & Burke

Color Computing has been the ultimate adventure for Chris Burke, who chose the wild and unknown territory of the Color Computer over the mediocrity of other computer markets. Take a trip down memory lane and discover how we'll build future memories as Chris offers his insights on why working with the Color Computer is so fun and rewarding. So come and join the excitement with Chris and the Rainbow staff at the CoCo Community Breakfast!

— COCO SEMINARS —

Cray Augsburg
RAINBOW Managing Editor
Behind the Rainbow

Art Flexser
SpectroSystems
Adding Features to the BASIC ROM

Mike Knudsen
Author of UltiMusE
Music & MIDI Advancements

Greg Law
RAINBOW Technical Editor
*BreakPoint Live &
OS-9 For Absolute Beginners*

Kevin Darling
OS-9 Users Group, President
OS-9 Q&A Open Forum

Marty Goodman
RAINBOW Contributing Editor
CoCo Consultations Live

Eddie Kuns
Rainbow Contributing Editor
Delphi Bureau Live

Eric Wolf
Rainbow Contributor
Graphics Applications for the CoCo

— EXCLUSIVE RAINBOWfest SEMINAR —

OS-9 68K Open Forum
Ed Gresick
Delmar
Frank Hogg
Frank Hogg Laboratory
Paul Ward
Interactive Media Systems

YES! I'm coming to Chicago! I want to save by buying tickets now at the special advanced sale price. Breakfast tickets require advance reservations.

Three-day ticket(s) @ \$9 each total _____

One-day ticket(s) @ \$7 each total _____

circle one: Friday Saturday Sunday

Saturday CoCo Breakfast @ \$13 each total _____

RAINBOWfest T-shirt(s) @ \$6 each total _____

circle size: S M X XL

(T-shirts must be picked up at the door)

Handling charge \$1 + \$1.00

TOTAL ENCLOSED \$ _____

(U.S. Currency Only, Please)

Also send me a hotel reservation card for The Hyatt Regency Woodfield (\$69, single or double room).

Name _____ (please print)

Address _____

City _____ State _____

Telephone _____ Zip _____

Company _____

Payment Enclosed

VISA MasterCard American Express

Account Number _____

Exp. Date _____

Signature _____

Advance ticket deadline: April 12, 1991. Orders received less than two weeks prior to show opening will be held for you at the door. Tickets will also be available at the door at a slightly higher price. Tickets will be mailed six weeks prior to the show. Children 4 and under, free; over 4, full price. Make checks payable to: RAINBOWfest, The Falsoft Building, 9509 U.S. Highway 42, P.O. Box 385, Prospect, KY 40059. To make reservations by phone, in Kentucky call (502) 228-4492, or outside Kentucky call (800) 847-0309.

**GET 'EM WHILE
THEY'RE**

STILL HOT

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

Available issues through June 1982 are provided on white paper in a reprint form. All others are in regular magazine form. VISA, MasterCard and American Express accepted. Kentucky residents please add 6 percent sales tax; Canadian residents, 7 percent GST. 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 below and mail it with your payment.

For greater convenience, order through the Rainbow Magazine Services area of our Delphi CoCo SIG.

RAINBOW INDEX

A complete index for, July 1981 through June 1984, is printed in the July 1984 issue. Separate copies are available for \$2.50 plus 50¢ handling.

Indexes for subsequent years are published annually in the July issues of THE RAINBOW.

TOTAL _____
 KY RESIDENTS ADD 6% _____
 CANADIAN RESIDENTS ADD 7% GST _____
 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.

send to:

THE RAINBOW
 The Falsoft Building
 P.O. Box 385
 Prospect, KY 40059

Please send me the following back issues:

JUL 81	VOLUME 1			MAY 87	Printer	\$3.95	<input type="checkbox"/>
AUG 81	Premier Issue	\$2.00	<input type="checkbox"/>	JUN 87	Music	\$3.95	<input type="checkbox"/>
NOV 81		\$2.00	<input type="checkbox"/>	JUL 87	Anniversary	\$3.95	<input type="checkbox"/>
FEB 82		\$2.00	<input type="checkbox"/>		VOLUME 7		
	VOLUME 2			AUG 87	Games	\$3.95	<input type="checkbox"/>
JUN 83	Printers	\$2.95	<input type="checkbox"/>	SEP 87	Education	\$3.95	<input type="checkbox"/>
	VOLUME 3			OCT 87	Graphics	\$3.95	<input type="checkbox"/>
AUG 83	Games	\$2.95	<input type="checkbox"/>	NOV 87	Data Comm.	\$3.95	<input type="checkbox"/>
SEP 83	Education	\$2.95	<input type="checkbox"/>	DEC 87	Holiday	\$3.95	<input type="checkbox"/>
OCT 83	Graphics	\$3.95	<input type="checkbox"/>	JAN 88	Beginners	\$3.95	<input type="checkbox"/>
MAR 84	Business	\$3.95	<input type="checkbox"/>	FEB 88	Utilities	\$3.95	<input type="checkbox"/>
APR 84	Gaming	\$3.95	<input type="checkbox"/>	MAR 88	Business	\$3.95	<input type="checkbox"/>
MAY 84	Printer	\$3.95	<input type="checkbox"/>	APR 88	Home Help	\$3.95	<input type="checkbox"/>
JUN 84	Music	\$3.95	<input type="checkbox"/>	MAY 88	Printer	\$3.95	<input type="checkbox"/>
JUL 84	Anniversary	\$3.95	<input type="checkbox"/>	JUN 88	Music	\$3.95	<input type="checkbox"/>
	VOLUME 4			JUL 88	Anniversary	\$3.95	<input type="checkbox"/>
AUG 84	Games	\$3.95	<input type="checkbox"/>		VOLUME 8		
SEP 84	Education	\$3.95	<input type="checkbox"/>	AUG 88	Games	\$3.95	<input type="checkbox"/>
OCT 84	Graphics	\$3.95	<input type="checkbox"/>	SEP 88	Education	\$3.95	<input type="checkbox"/>
NOV 84	Data Comm.	\$3.95	<input type="checkbox"/>	OCT 88	Graphics	\$3.95	<input type="checkbox"/>
DEC 84	Holiday	\$3.95	<input type="checkbox"/>	NOV 88	Data Comm.	\$3.95	<input type="checkbox"/>
JAN 85	Beginners	\$3.95	<input type="checkbox"/>	DEC 88	Holiday	\$3.95	<input type="checkbox"/>
FEB 85	Utilities	\$3.95	<input type="checkbox"/>	JAN 89	Beginners	\$3.95	<input type="checkbox"/>
MAR 85	Business	\$3.95	<input type="checkbox"/>	FEB 89	Home Help	\$3.95	<input type="checkbox"/>
APR 85	Simulations	\$3.95	<input type="checkbox"/>	MAR 89	Hardware	\$3.95	<input type="checkbox"/>
MAY 85	Printer	\$3.95	<input type="checkbox"/>	APR 89	Business	\$3.95	<input type="checkbox"/>
JUN 85	Music	\$3.95	<input type="checkbox"/>	MAY 89	Printer	\$3.95	<input type="checkbox"/>
JUL 85	Anniversary	\$3.95	<input type="checkbox"/>	JUN 89	Summer Fun	\$3.95	<input type="checkbox"/>
	VOLUME 5			JUL 89	Anniversary	\$3.95	<input type="checkbox"/>
AUG 85	Games	\$3.95	<input type="checkbox"/>		VOLUME 9		
SEP 85	Education	\$3.95	<input type="checkbox"/>	AUG 89	Beyond BASIC	\$3.95	<input type="checkbox"/>
OCT 85	Graphics	\$3.95	<input type="checkbox"/>	SEP 89	Education	\$3.95	<input type="checkbox"/>
NOV 85	Data Comm.	\$3.95	<input type="checkbox"/>	OCT 89	Graphics	\$3.95	<input type="checkbox"/>
DEC 85	Holiday	\$3.95	<input type="checkbox"/>	NOV 89	Data Comm.	\$3.95	<input type="checkbox"/>
JAN 86	Beginners	\$3.95	<input type="checkbox"/>	DEC 89	Holiday	\$3.95	<input type="checkbox"/>
FEB 86	Utilities	\$3.95	<input type="checkbox"/>	JAN 90	Beginners	\$3.95	<input type="checkbox"/>
MAR 86	Business	\$3.95	<input type="checkbox"/>	FEB 90	Home Help	\$3.95	<input type="checkbox"/>
APR 86	Home Help	\$3.95	<input type="checkbox"/>	MAR 90	Hardware	\$3.95	<input type="checkbox"/>
MAY 86	Printer	\$3.95	<input type="checkbox"/>	APR 90	Business	\$3.95	<input type="checkbox"/>
JUN 86	Music	\$3.95	<input type="checkbox"/>	MAY 90	Printer	\$3.95	<input type="checkbox"/>
JUL 86	Anniversary	\$3.95	<input type="checkbox"/>	JUN 90	Summer Fun	\$3.95	<input type="checkbox"/>
	VOLUME 6			JUL 89	Anniversary	\$3.95	<input type="checkbox"/>
AUG 86	Games	\$3.95	<input type="checkbox"/>		VOLUME 10		
SEP 86	Education	\$3.95	<input type="checkbox"/>	AUG 90	OS-9	\$3.95	<input type="checkbox"/>
OCT 86	Graphics	\$3.95	<input type="checkbox"/>	SEP 90	Education	\$3.95	<input type="checkbox"/>
NOV 86	Data Comm.	\$3.95	<input type="checkbox"/>	OCT 90	Graphics	\$3.95	<input type="checkbox"/>
DEC 86	Holiday	\$3.95	<input type="checkbox"/>	NOV 90	Data Comm.	\$3.95	<input type="checkbox"/>
JAN 87	Beginners	\$3.95	<input type="checkbox"/>	DEC 90	Holiday	\$3.95	<input type="checkbox"/>
FEB 87	Utilities	\$3.95	<input type="checkbox"/>	JAN 91	Beginners	\$3.95	<input type="checkbox"/>
MAR 87	Business	\$3.95	<input type="checkbox"/>	FEB 91	Home Help	\$3.95	<input type="checkbox"/>
APR 87	Home Help	\$3.95	<input type="checkbox"/>	MAR 91	Hardware	\$3.95	<input type="checkbox"/>
				APR 91	Business	\$3.95	<input type="checkbox"/>

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.

Alpha Software Technologies ..	69	Hawksoft	39	Rainbow Bookshelf	65
Burke & Burke	45	Hyper-Tech Software	57	Rainbowfest	78
Cer-Comp	37	Interactive Media Systems	13	Rainbowfest	79
CoCo Pro	33	Interactive Media Systems	15	Rainbow on Tape and Disk	9
Coless	57	JWT Enterprises	49	Ramco	15
Color Systems	63	Microcom Software	5	Rick's Computer Supply	63
Colorware	19	Microcom Software	7	Robert Offerman	59
Colorware	77	Millsoft Co.	40	SD Enterprises	49
Computer Plus	IFC	Musicware	47	Spectro Systems	73
CRC/Disto	53	NRI	43	Sundog Systems	IBC
Dayton Associates		Owl-Ware	25	T & D Software	17
of W.R. Hall, Inc.	71	Owl-Ware	26	T & D Software	67
Delmar Company	41	Owl-Ware	27	Tandy	BC
Eversoft Games, Ltd	35	PCM Magazine	55	Trading Post	69
Frank Hogg Laboratories	82	Peripheral Technology	35	Zebra Systems	13
Game Gem Games	73	Rainbow Back Issues	80		
Granite Computer Systems	48	Rainbow Binder	61		



Call:
Belinda Kirby
Advertising Representative
(502) 228-4492



Call:
Kim Lewis
Advertising Representative
(502) 228-4492

The Falsoft Building
9509 U.S. Highway 42, P.O. Box 385, Prospect, KY 40059

FAX (502) 228-5121

FULL SPECTRUM

Compare the TOMCAT - See the POWER

TC9

→ TC70

→ TC K-68000

→ TC K-68030

CoCo3

MM1

Mac

Mac II

Mac Ix

**TOMCAT, the FULL SPECTRUM computer that can be everything you want it to be!
NEVER OUTDATED! - NEVER OBSOLETE! - AVAILABLE NOW!!!**

SOFTWARE, HARDWARE AND ACCESSORIES FOR THE TOMCAT AND COCO3

HARD DRIVES FOR THE COCO (FULL 1 year warranty!!)		
Burke & Burke 20 meg hard drive with 40 MS Fast Drive!		\$459.95
Burke & Burke 30 meg hard drive with 40 MS Fast Drive!		\$499.95
Burke & Burke 40 meg hard drive with 28 MS Fastest Drive!		\$559.95
Burke & Burke XT Interface		\$69.95
Burke & Burke XT RTC Interface (Real Time Clock)		\$99.95
Burke & Burke XT ROM		
Auto Boot OS9		\$19.95
The Eliminator 20 meg hard drive system with 40 MS Fast Drive!		\$849.95
The Eliminator 40 meg hard drive system with 28 MS Fastest Drive!		\$949.95
The Eliminator (2 RS232, 1 Parr, Hard/Floppy disk interface)		\$119.95
Battery backed Real Time Clock for The Eliminator		\$30.00
Western Digital WD1002-05 hard & floppy controller for Eliminator		\$299.95
Memory		
Populated 512K and software		\$98.00
512K bare board		\$29.95
1 MEG bare board		\$159.95
Populated 1 MEG		\$199.95
512K for TC9		\$49.95
Populated 1 MEG for TC9		\$109.95
SLOT-PACK III by Chris Hawks (3 Slot Multi-Pak replacment)		
12volt adaptor for Slot-Pack III		\$19.95
KEYBOARD 101 keys w/click		\$69.95
CoCo 3 PC keyboard adaptor		\$94.95
Keyboard and adaptor		\$159.95
MAGNAVOX 1CM135 analog with stereo sound and high grade composite screen - 640 X 240 resolution at 12 Mhz with .42 dot pitch. (\$14 ship)		
Cable for CC3 (not req. for TC9)		\$19.95
Teac 40 Track double sided drive		\$99.95
Teac 720K/1.2 MEG 5.25 drive		\$99.95
Teac 720K/1.2 MEG 3.5 drive		\$89.95
5.25 Bracket for 3.5" Teac drive		\$12.95
MISC.		
5.25" Disks	25 for	\$10.00
3.5" Disks	25 for	\$15.00
Mini Tower Case with 200 watt power supply for the TC9		\$159.95
AB Switch two printers etc on one serial port (DB25 or DB9)		\$29.95
GIMI Chlp for CoCo 3:		\$34.95
68B09E Chip:		\$14.95
Zoom 2400 Modem:		\$129.95

SOFTWARE	
The WIZ communications with windows for RS OS9 (SALE!!)	\$59.95
FBU file backup for hard disk RS OS9	\$35.00
FBU file backup for hard disk OS9/68000 (Includes 6809)	\$50.00
DynaStar 3.5 powerful, menu-driven word processor for RS OS9 (NEW VERSION)	\$99.95
DynaSpell easy to use spelling checker for RS OS9 only	\$19.95
UPGRADE to DynaStar 3.5 - OS9 LII	\$25.00
OS9/68000	\$50.00
DynaStar 3.5 powerful, menu-driven word processor for OS9/68000 (NEW VERSION)	\$149.95
IMS Information Management System is a powerful and flexible database and application development system for RS OS9 (SALE!!!)	\$99.95
IMS Information Management System is a powerful and flexible database and application development system for OS9/68000 (SALE!!!)	\$299.95
Super Sleuth examine/modify binary programs for RS OS9	\$50.00
Super Sleuth examine/modify binary programs for OS9/68K	\$100.00
TOP DISKS 15 720K Disks PD software for OSK (35 MEG when decompressed!)	\$50.00

PC Utility lets you copy files between OS-9/68k and MS-DOS	\$99.00
R.S.B. Run Radio Shack Basic under OS-9.	\$39.95
OS-9 User's Group disks \$6 ea or \$99 for all on 11 720K disks	
QCom communications package for OS-9/68K	\$150.00
EZGEN 1.08 Bootfile editor NEW VERSION!	\$19.95
HYPER I/O	
Run RSDOS on hard disk	\$29.95
MVCanvas Graphics editor for OS9 and Multi-View	\$49.95
ShellMate point and click file management for OS9	\$24.95
Alpha Data-Windows Database for OS9	\$59.95
Alpha Data-Merger mail-merge	\$19.95
Alpha Presto-Partner DAs for OS9	\$29.95
Alpha Level II Tools	
25 great utilities for OS9	\$24.95
Alpha Disk Manager Tree	\$29.95
Alpha The Zapper	
Patch anything for OS9!	\$19.95
Alpha Multi-Menu	
Pop down menus for OS9	\$19.95
Alpha BBS for OS9	
Complete system ready to run	\$29.95
Alpha Warp - I	
Terminal program for OS9	\$34.95
BOOKS	
OS9 INSIGHTS (The only book on OS9/68000)	\$44.95
A Full Turn Of The Screw	\$19.95

**SEE
THE
TC9
AND
TC70
AT
THE
CHICAGO
'FEST**

ORDERING INFORMATION

VISA and M/C, check and C.O.D. Contential U.S. software shipping add \$5.00 Ground - \$8.00 Two Day Air. Hardware add \$15 ground - \$27 Two Day Air. Please call for Next Day Air costs and C.O.D. Foreign add 10% Shipping (Minimum \$5 USD). NY residents please add 7% sales tax.

Frank Hogg
LABORATORY
INC.

Since 1976
204 Windemere Road
Syracuse, NY 13205
FAX 315/469-8537

Call 315/469-7364

NEW FOR '91

SUNDOG SYSTEMS

The Quest for THELDA



Better men than you have failed the quest, but the hand of the good princess Thelda is too much to resist! Stolen by the evil necromancer Divinax, she has been secreted far from prying eyes and it is now up to you to regain the pieces of the mystical Life Force and save the fair lady. The Quest for Thelda is an outstanding arcade program that combines action and adventure to bring you an incredible video game playing experience. Travel throughout over 500 different screens searching for magical objects and spells, fighting horrible creatures, and gathering the various parts of the Life Force guarded by ever-increasing terrors. You'll enjoy the highest quality 320x200 resolution 16 color graphics and digital sound effects that you've come to expect from Sundog Systems. The game play is fast and furious, and only you can rescue the princess and complete the LEGEND OF THELDA! Req. 128K CoCo 3, disk drive, and joystick (2-button joystick supported).

\$34.95

Hint book now available for Thelda! Contains clues, maps, and even a BASIC program to modify your own characters! **\$4.95**

ZENIX



You have been chosen to pilot the spacecraft wielding the plutonium plasma laser against the notorious insectoids, the Zenixs. These bugs have been ripping off the space trade lines for years; now they're about to find a victim who can fight back! Beat back the swarm of pests to their home planet Zenix, and use the laser to end the menace once and for all. Zenix is a lightning fast arcade game for the 128K CoCo 3. The 320x225 16 color graphics are amazing, as are the digital background music score and effects, all on a 128K computer! The fast action and game play will astound you in this GALAGA of extermination. Plug in your joystick and strap in for the ride of your life! Call to order a demo disk to see the action before you buy! Req. 128K CoCo 3, disk drive, and joystick.

\$29.95

★ THE CONTRAS ★



In the year 2671, a mysterious object landed on Earth, heralding the alien invasion of the Red Falcon. Only two courageous soldiers have a hope of stemming this alien infestation. Armed with your military training and the latest weapon technology, you and a friend must fight back the horde. Sundog Systems presents our second 512K game, **The Contras**. You'll see why we decided to use 512K on this project! Amazing graphics with 320x225 resolution, 16 color full screen animation and horizontal smooth scrolling! Background digital sound effects and real-time music! One or two player action AT THE SAME TIME! You'll agree that this is one of the best arcade games yet for your 512K CoCo 3. Needless to say, playing here won't be easy; playing **The Contras** will be tougher! Req. 512K CoCo 3, disk drive and 2-button joystick.

\$34.95

Crystal City



The superior technology of the evil Overlords has ensnared yet another innocent planet, however, this one contains the Crystal City, bastion of democracy and independence. Earth has had enough! Break through level upon level of their virtually invulnerable defenses, defeat the end guardians, and make your way ever closer to freeing the slaves of the Crystal City! This amazing arcade game is an achievement in its own right! Full 128K/512K utilization! Super fast horizontal hardware scrolling on the 128K computer! Wild digital sound effects and background music score! 30 minutes, or over 30 megabytes, of non-repeating 320x200 resolution, 16 color graphics! This game has it all, order a demo disk to see it first! Can you save the Crystal City from unbeatable foes? Req. 128K CoCo 3, disk drive and joystick.

\$34.95

Sinistaar



You've raved about this 512K arcade game! The graphics and animation are amazing! You've got to hear the digital sounds! 512K (three disks) packed with excitement! 512K CoCo 3 only. **\$34.95**

KYUM-SAI TO BE NINJA



This martial arts arcade game remains a CoCo 3 phenomenon. One of our best sellers to date! Play the incredible combat experience that you've been missing, and call for the availability of the OS-9 version. 128K CoCo 3 action. **\$29.95**

OS-9 Version Now Available

SOUNDTRAX



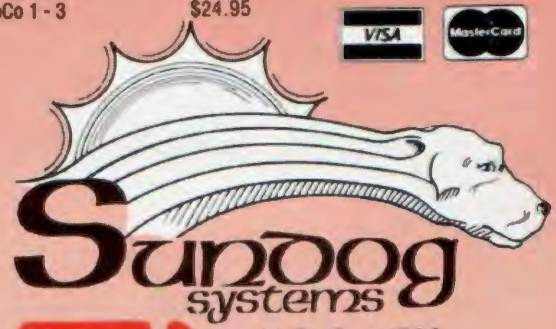
This 128K/512K sound sequencing system has become an immensely popular program. Create musical scores using polyphonic digitized sounds and a user-friendly point and click editor. Call to order the SoundTrax demo program, and get 10% off your purchase with receipt. **\$34.95**

Now Available: SoundTrax instrument sample disks! Guitars, strings, woodwinds, and just plain weird instruments for your composing pleasure. Completely compatible with the SoundTrax system. 3 floppy (2 sides) disks full of sounds. **\$12.95** each or **\$29.95** for all three.

ALSO AVAILABLE:

- Hall of the King 1, 2, or 3
CoCo 1 - 3 **\$29.95 ea.**
- Hall of the King Trilogy **\$74.95**
- White Fire of Eternity
CoCo 1 - 3 **\$19.95**
- Dragon Blade
CoCo 1 - 3 **\$19.95**
- Champion
CoCo 1 - 3 **\$19.95**
- Paladin's Legacy
CoCo 1 - 3 **\$24.95**
- Warrior King
CoCo 3 **\$29.95**
- In Quest of the Star Lord
CoCo 3 **\$34.95**
- Hint Sheet **\$ 3.95**
- Kung-Fu Dude
CoCo 1 - 3 **\$24.95**

Visa, Mastercard, Check, Money Order, and COD (USA only, please) accepted. All foreign orders must be sent in US currency Money Orders. Include \$2.50 for shipping in USA and Canada. \$5.00 Foreign. \$3.00 extra for COD orders. PA residents add 6% sales tax. Dealer inquiries welcome. Authors: we're looking for new software!



We've Moved!

**P.O. Box 766
Manassas, VA 22111
703/330-8989**



BUY NOW

Buy any CoCo software title at half price...
and get a second program for only \$5!

It's true! Bring the attached coupon to your local Radio Shack. Then when you purchase any Color Computer software title in stock—at half the regular price—you can pick one of these eleven great titles on the list for just five dollars more! Choose from popular CoCo titles—exciting action and strategy games, personal finance and other productivity tools, challenging and fun educational programs for all ages. It's a double deal you can't refuse!

Radio Shack
AMERICA'S
TECHNOLOGY
STORE

Choose from These Fine Bonus Packages:

- DONALD DUCK'S PLAYGROUND, 26-3245
- MICKEY'S SPACE ADVENTURE, 26-3247
- DUNGEONS OF DAGGORATH, 26-3093
- PERSONAL FINANCE II, 26-3106
- WINNIE THE POOH, 26-3244
- MICRO-MISSION, 26-3271
- GFL FOOTBALL, 26-3172
- COLOR FILE II, 26-3110
- SHANGHAI, 26-3084
- SOKO-BAN, 26-3161
- THEXDER, 26-3072