March 1988 Canada $4.95 U.S. $3.95

Just for your Tandy Color Computer 1, 2 and 3

The RAINBOW

THE COLOR COMPUTER MONTHLY MAGAZINE

KEYING IN ON BUSINESS

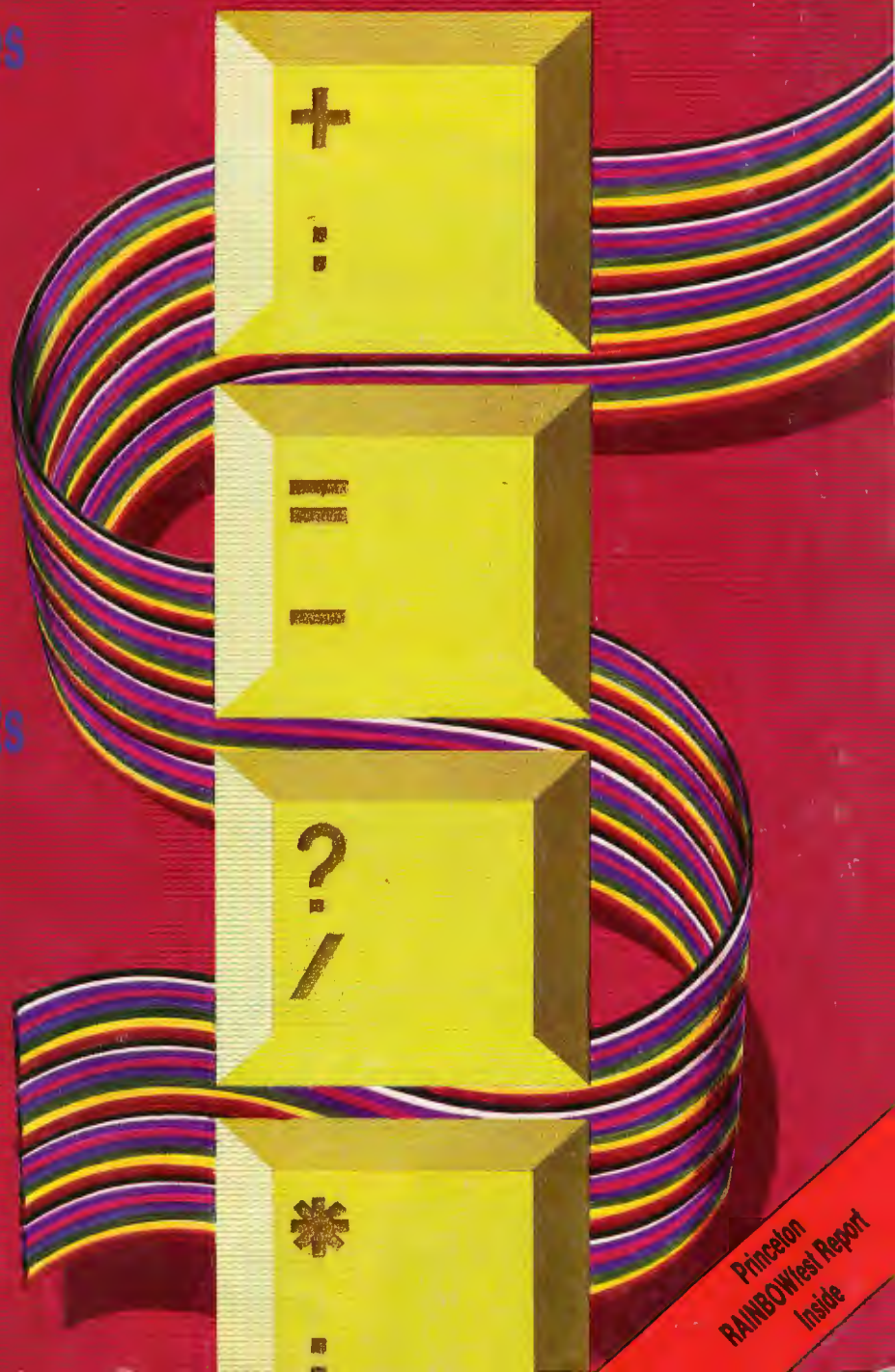
Generate Customer Invoices and Mailing Lists

Keep Track of Inventory

Predict Sales from Advertising

See How Your Stocks Stack Up

Create Simple Spreadsheets



Plus,
A Bookkeeping System for Newspaper Carriers
Helicopter Hero and More

0 44254 00001 03

Princeton RAINBOWfest Report Inside

DIECOM PRODUCTS INC.

THE RAT GRAPHIC DESIGN PACKAGE

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

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

$69.95 U.S.
$99.95 Can.

AVAILABLE APPROX. SEPT. 1, 1987

Requires 128 k Coco 3 and one disk drive

IRON FOREST

This is the first in our series of light phaser games. You have just been teleported to a strange land. As the mist clears you find a light phaser in your hand and yourself deep inside the Iron Forest. Your mission: to protect the sacred White Dove and all good creatures from the evil of the forest. As you aim, you zap a space pod, and then quickly turn and zap an evil spinning blade as it comes dangerously close to the Dove. Many evil creatures inhabit the forest. How long can you keep them under control? Many different backgrounds and increasing difficulty make this a unique new game for your Coco 3.

Iron Forest
$28.95 U.S.
$38.95 Can.

Light Phaser with interface
$34.95 U.S.
$49.95 Can.

Game and phaser together
$59.95 U.S.
$83.95 Can.

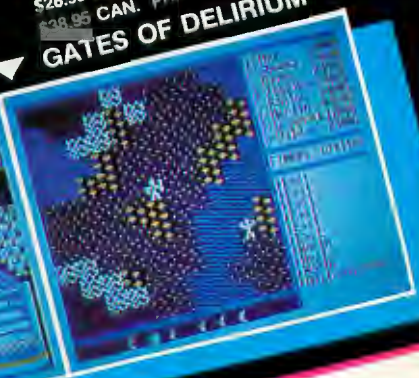
AVAILABLE APPROX. SEPT. 1, 1987

Once you have purchased one light phaser you will only need to purchase future games at regular price.

Requires 128 k Coco 3 and one disk drive

GATES OF DELIRIUM

$28.95 U.S. NEW LOW
$38.95 CAN. PRICE DISK ONLY



WRESTLE MANIAC

$28.95 U.S.
$38.95 CAN.

BOUNCING BOULDERS

$28.95 U.S.
$38.95 CAN.

GANTELET

$28.95 U.S.
$38.95 CAN.

For the Coco 1, 2 or 3

DIECOM PRODUCTS INC.

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

We accept:
VISA MasterCard
cheque or money order

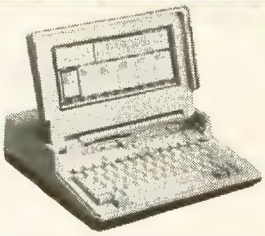
24 hr. order line:
(416) 878-8358
personal service 9-5

Please add $2 for shipping & handling. Ontario residents add 7% sales tax. C.O.D. Canada only. Dealer inquiries invited. Looking for new software.

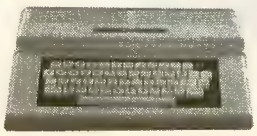
SEE BACK COVER FOR OTHER DIECOM GAMES

From Computer Plus to YOU . . .

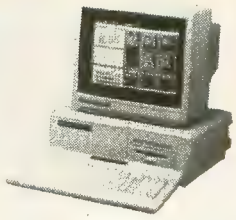
PLUS *after* PLUS *after* PLUS



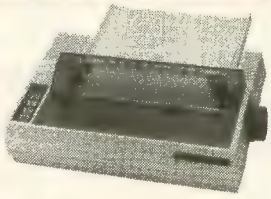
Tandy 1400 LT $1239
Tandy 102 24K $379
Tandy 200 24K $429



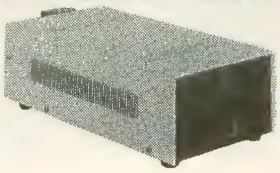
Color Computer 3
w/128K Ext. Basic $159



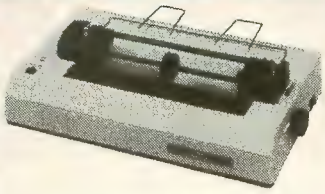
Tandy 1000 HX $539
Tandy 1000 TX $889



DMP-130A $279



Color Computer Disk Drive
Drive 0 $249 Drive 1 $149



DMP-106 $169

BIG SAVINGS ON A FULL COMPLEMENT OF RADIO SHACK COMPUTER PRODUCTS

COMPUTERS

Tandy 1000 EX 1 Drive 256K	429.00
Tandy 1000 SX 1 Drive 384K	649.00
Tandy 3000 HL 1 Drive 512K	899.00
Tandy 4000 1 Drive 1 Meg. Ram	1959.00
Color Computer 2 w/64K Ext. Basic	89.00

PRINTERS

Radio Shack DMP-106 80 CPS	169.00
Radio Shack DMP-130A 120 CPS	
Radio Shack DMP-430 180 CPS	559.00
Radio Shack DWP-230 Daisy Wheel	339.00
Star Micronics NP-10 100 CPS	169.00
Star Micronics NX-10 120 CPS	199.00
Star Micronics NX-15 120 CPS	359.00
Panasonic P-1080i 120 CPS	199.00
Panasonic P-1091i 160 CPS	229.00
Panasonic P-1092i 240 CPS	349.00
Okidata 182 120 CPS	229.00
Okidata 192+ 200 CPS	359.00
Okidata 292 240 CPS	479.00

MODEMS

Radio Shack DCM-6	52.00
Radio Shack DCM-7	85.00
Radio Shack DCM-212	179.00
Practical Peripheral 1200 Baud	149.00

COLOR COMPUTER MISC.

Radio Shack Drive Controller	99.00
Extended Basic Rom Kit	14.95
64K Ram Upgrade Kit	39.00
Radio Shack Deluxe Keyboard Kit	24.95
HI-RES Joystick Interface	8.95
Color Computer Deluxe Mouse	44.00
Multi Pak Interface	89.00
Multi Pak Pal Chip for COCO 3	14.95
CM-8 6' Extension Cable	19.95
Serial to Parallel Conv.	59.95
Radio Shack Deluxe Joystick	26.95
Magnavox 8515 RGB Monitor	329.00
Radio Shack CM-8 RGB Monitor	249.00
Radio Shack VM-4 Green Monitor	99.00
PBJ 512K COCO 3 Upgrade	99.00
Tandy 512K COCO 3 Upgrade	129.00
Mark Data Universal Video Driver	29.95

COLOR COMPUTER SOFTWARE

	TAPE	DISK
The Wild West (CoCo3)		25.95
Worlds Of Flight	34.95	34.95
Mustang P-51 Flight Simul.	34.95	34.95
Flight 16 Flight Simul.	34.95	34.95
Nuke the Love Boat (CoCo3)		34.95
The Magic of Zanth (CoCo3)		34.95
Sam Sleuth Private Eye	24.95	27.95
Color Max 3 (CoCo3)		59.95
COCO Util II by Mark Data		39.95
COCO Max by Colorware	69.95	
COCO Max II by Colorware		79.95
AutoTerm by PXE Computing	29.95	39.95
TelePatch III by Spectrum		29.95
C III Graphics by Spectrum (CoCo3)		19.95
Font Bonanza by Spectrum (CoCo3)		29.95
TW-80 by Spectrum (CoCo3)		39.95
TeleWriter 64	49.95	59.95
Elite Word 80		79.95
Elite Calc 3.0		69.95
CoCo 3 512K Ram Disk by CerComp		19.95
OS-9 Level II by Tandy		71.95
Inside OS-9 Level II Book by FHL		39.95
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.

CALL TOLL FREE
1-800-343-8124

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

VISA AMERICAN EXPRESS MasterCard

computer plus

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

SINCE 1973

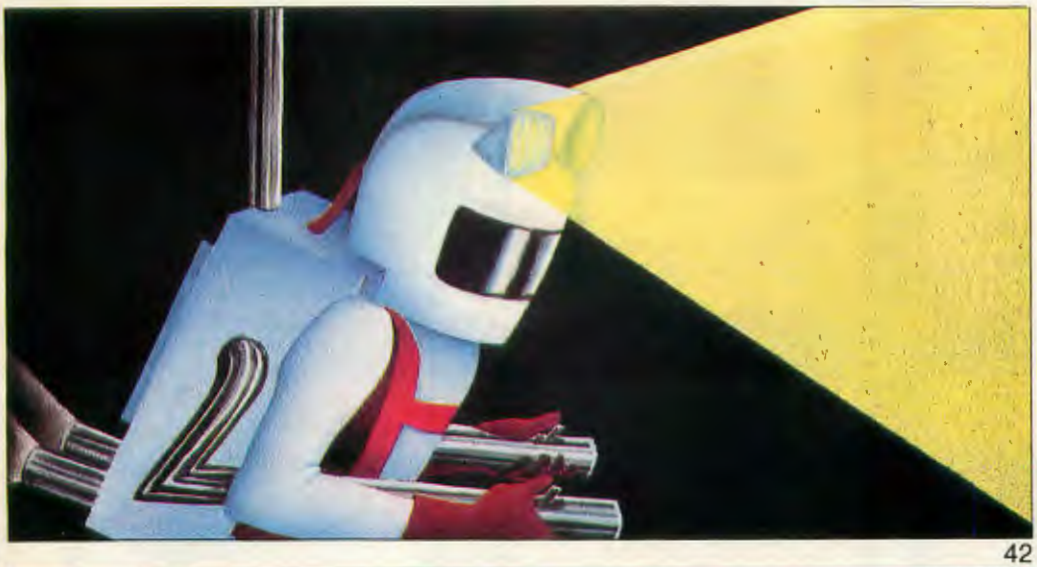
IN MASSACHUSETTS CALL (617) 486-3193

TRS-80 is a registered trademark of Tandy Corp.

RAINBOW

Table of Contents

March 1988
Vol. VII No. 8



42

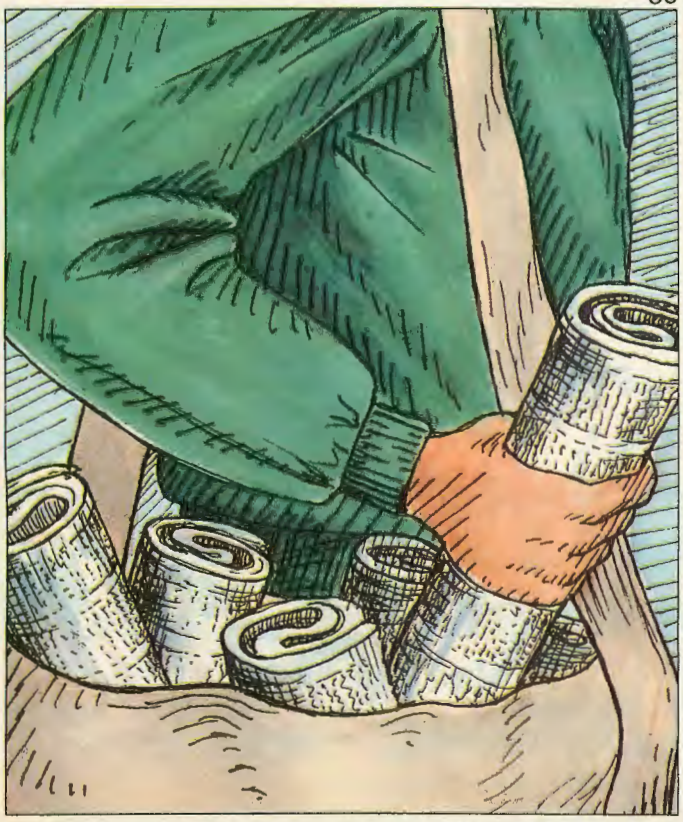
Features

20
Putting It on Their Tab
Shawn Conant
Generate invoices for parts and labor

25
RAINBOWfest Reporter
Cray Augsburg
The scoop on the Princeton show

32
Advertising Profit Predictor
Bill Bernico
A utility to help you decide whether or not to market your product

36



36
Delivering the Goods
Dale James Leistico
A bookkeeping system for newspaper carriers

42
Helicopter Hero
Phil Holsten
Rescue miners from the volcanic caverns

48
The Care and Handling of Tapes and Disks
Ed Ellers
Tips on tape and disk maintenance

54
'Spread'ing It on a Little Thicker
Saul Mooallem
Enhancements to Cheap Spread

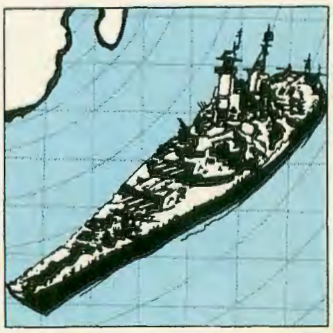
60
Taking Stock
Charles May
Getting 'stock' answers to your inventory questions

82
BASIC for Beginners IV
David W. Ostler
The final installment of a four-part programming tutorial

94
Stock Analysis
James E. Franz
Timing your investment decisions

100
Rule of 78's
Jack W. Eizenga
Determine whether you save or lose by paying off a loan ahead of schedule

104
The Post Office
Orman Cyril Beckles II
A CoCo 3 database that holds more than 900 addresses



122

122
Sub Search
Steven Sward
War under the waves

146
CoCo 3 Number Cruncher
David Archer
A scrolling spreadsheet, plus hints on the CoCo 3's GIME chip

Novices Niche

72 **In Good Form**
E.C. Thompson

73 **Worksheet Printer**
Don Hitko

74 **Creating Data Files**
Raymond Doss

74 **Reading Data Files**
Bill Bernico

75 **A Star Like a Wheel**
Jim Pruyne

76 **Five in a Row**
John James

The cassette tape/disk symbols beside features and columns indicate that the program listings with those articles are on this month's RAINBOW ON TAPE and RAINBOW ON DISK. Those with only the disk symbol are not available on RAINBOW ON TAPE. For details, check the RAINBOW ON TAPE and RAINBOW ON DISK ad on Page 99.

Departments

Advertisers Index ____ 192
Back Issue Information ____ 169
CoCo Gallery ____ 18
Corrections ____ 40
Letters to Rainbow ____ 6
Maxwell Mouse ____ 114
One-Liner Contest Information ____ 189
Racksellers ____ 190
Rainbow Info ____ 10
Received & Certified ____ 139
Scoreboard ____ 90
Scoreboard Pointers ____ 92
Submitting Material to Rainbow ____ 188
Subscription Info ____ 16

Columns

68 **BASIC Training**
Joseph Kolar
Mission interchangeable — there's more than one way to get the job done

16 **Building March's Rainbow**
Jutta Kapfhammer
Managing Editor's notes

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

140 **Delphi Bureau**
Cray Augsburg
Sending Mail messages, and Hutchison's database report

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

89 **Education Notes**
Steve Blyn
Fun with phonics

12 **PRINT#-2,**
Lawrence C. Falk
Editor's notes

158 **Turn of the Screw**
Tony DiStefano
Bigger and better EPROMs

78 **Wishing Well**
Fred Scerbo
Sentence savvy

Rainbowtech

167 **Barden's Buffer**
William Barden, Jr.
Font Fascination

180 **KISSable OS-9**
Dale L. Puckett
A view of Multi-Vue

Product Reviews

Address/*R.J.F. Software* ____ 132
Autoterm 6.1/*PXE Computing* ____ 132
Avatex 2400 Modem/*Cinsoft* ____ 134
CoCo Base I/*JTJ Enterprises* ____ 130
CoCo Newsroom
Microcom Software and Spectrum Projects ____ 129
Color Computer Artist/*Tandy Corporation* ____ 131
Printer Lightning/*Owl-Ware* ____ 135
Shanghai/*Activision* ____ 138
T/S Spell/*Tandy Corporation* ____ 135

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

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

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

The Rainbow

Editor and Publisher
Lawrence C. Falk

Managing Editor Jutta Kapfhammer
Associate Editor Jody Gilbert
Reviews Editor Judi Hutchinson
Submissions Editor Angela Kapfhammer
Copy Editor Lauren Willoughby
Technical Editors Cray Augsburg, Ed Ellers
Editorial Assistants Sue H. Evans, Wendy Falk, Toni Frank, Monica Wheat
Contributing Editors William Barden, Jr., Steve Blyn, Tony DiStefano, Richard Esposito, Martin Goodman, M.D., Joseph Kolar, Dale Puckett, Fred Scerbo, Richard White
Art Director Heidi Maxedon
Designers Robert Hatfield, Jr. Rita Lawrence, Denise Webb
Typesetter Jody Doyle

Falsoft, Inc.

President Lawrence C. Falk
General Manager Patricia H. Hirsch
Asst. General Mgr. for Finance Donna Shuck
Admin. Asst. to the Publisher Sarah Levin
Executive Editor James E. Reed
Editorial Coordinator Jutta Kapfhammer
Senior Editor T. Kevin Nickols
Production Coordinator Cynthia L. Jones
Chief Bookkeeper Diane Moore
Dealer Accounts Judy Quashnock
Asst. General Manager For Administration Bonnie Frowenfeld
Director of Fulfillment Sandy Apple
Word Processor Manager Patricia Eaton
Customer Service Representative Beverly Beardon
Development Coordinator Ira Barsky
Chief of Printing Services Melba Smith
Director of Production Jim Cleveland
Dispatch Tony Olive, Sharon Smith
Business Assistant Laurie Falk
Advertising Coordinator Doris Taylor
Advertising Representatives Belinda Kirby, Kim Vincent
Advertising Assistant Debbie Baxter
(502) 228-4492

For RAINBOW Advertising and Marketing Office Information, see Page 192

Cover illustration copyright © 1988 by Fred Crawford

Letters to the RAINBOW

A Thief by Any Other Name . . .

Editor:

This is in reference to the growing awareness in the computer community of the illegality of software theft/piracy. I'm a SysOp of a CoCo 20Mb BBS, The Crusader. I've been online 1½ years now. I am not a "pirate," nor do I condone piracy. On my BBS for over eight months now we have been waging open attack on the subject of piracy, more honestly called theft.

Now, there have been a lot of good comments lately in THE RAINBOW on this subject. I myself have been trying to get any SysOp or user I talk with to turn in known pirates and pirate BBSs they know of or run into. I firmly believe that if the SysOps were to blacklist and ban from their BBSs known pirates, if they refused to allow magazine or other *pirated programs* on their BBSs, if they refused to allow access to a user who will not leave honest log information (what has an honest person to hide?), and if they personally verified any user of their systems, piracy would stop fast.

What never ceases to amaze me is the number of otherwise honest people who would condemn shoplifting and other kinds of theft and yet defend or at least condone piracy. The worst are the SysOps — either from the mistaken idea that users will not call unless they have pirated programs for downloading or from trying to be one of the "don't rock the boat" crowd. Worse, some SysOps do not even have the guts to call it theft and look the other way — like the ostrich, they feel that if they don't see it, it won't touch them, and so they allow open trading (piracy) messages on their BBSs or allow magazine programs to be uploaded.

Come on, this may sound harsh, but look at the facts. When a SysOp allows, or worse, *encourages* piracy and does not stop it dead when he sees it, he is helping it spread even when he himself is not doing it.

This is a subject that badly needs addressing. When a new user comes into the BBS world, he sees magazine programs, etc. Well, of course he gets the idea it is common and OK (he might even feel it's wrong but he's new, so says nothing). He in turn passes on what he gets, and if someone tells him it is not OK, well, it was on such and such's BBS, so mind your own business. And the crime goes on.

I also hear the excuse that software costs too much. OK, fair enough. But would *you* steal a car or TV that cost more than you thought it was worth? I doubt it. You would either save up for it or buy a different model or brand. Real simple. So much for that excuse. Then there is the "Well, I'm only 13, and I don't have enough cash" excuse. Hmmm, that is more legitimate, at least, but jobs are there if you are willing to work and look for them.

Others use the excuse that software companies should protect their software better. Are you willing to pay extra for it? How about, "The software companies should sue if they really don't want us to steal."

Now, what are kids new to BBSing learning from all this? 1) Theft is condoned and OK if you do not get caught. 2) The computer community is a good place to learn to steal. 3) SysOps are thieves, so piracy is OK.

I frankly have received more heat from these otherwise honest SysOps than from all the pirates I've openly been condemning.

When the piracy scene is looked at fairly simply with all the excuses aside, we have theft plain and simple (yet people still claim it's not a crime). I spent five years in jail, and guess what? Not one guy I ever met there was guilty of a crime — he was a victim of *society*! Sound familiar?

There was a letter in RAINBOW a while back by an ex-pirate saying how sorry he was. Well, if he's really sorry he should send to the companies he stole from the money for their stolen wares plus the names of the people he gave copies to if they do not agree to do the same.

How hard is it to stop piracy? Not very. We just need *honest* SysOps who demand *honest* users. My BBS is temporarily off line, but the number is (213) 661-3568.

Jackie W. Farmer
Hollywood, CA

Back Talk

Editor:

In reference to "Accessing the Back Side" in January 1988's "CoCo Consultations" (Page 149), I would like to point out that all versions of my program, *KDSK*, can access the back side of the disk. *KDSK* uses a unique drive numbering scheme due to the many possible ROMs and patches available. Just add 4 to the physical drive number: Drive 4 is the back side of Drive 0; Drive 5 is the back side of Drive 1; and Drive 6 is the back side of Drive 2.

I also provide patches to registered owners of *KDSK* for unusual system configurations whenever possible. Finally, *KDSK* avoids ROM calls to ensure compatibility when new ROMs are released. I would not recommend disassembling *KDSK* since I've embedded numerous encryption routines throughout to discourage undocumented user modification.

Ken Wuelzer
113 Arrowhead Drive
Montgomery, AL 36117

Dragons Not Extinct in UK

Editor:

Although the Dragon 32/64 is no longer being manufactured in the UK (or in Spain), there are many very active Dragon owners. These enthusiasts rely on the *Dragon User* and RAINBOW magazines for support.

Now that Tandy in the UK is phasing out CoCos 1 and 2 and are not importing the CoCo 3, that software source will no longer be available shortly. However, there is still a small band of commercial software producers for the Dragon, in addition to enthusiastic amateur programmers.

Apart from local user groups up and down the country, there are the National Dragon Users Group and an OS-9 User Group (European), which are both very active.

Because of the reduction in software sources, I was very interested in the desktop publishing program written by H. Allen Curtis and listed in the October '87 issue of RAINBOW ("Desktop Publisher on a Shoestring," Page 58).

I tapped in the program, changed the file handling routine to the Dragon system, and quickly produced a Christmas greetings card for the office. The only other change made was to the I/O memory area to make it compatible with my "dump" program. For any other Dragon owners interested, here are the changed lines for the program:

Desktop Low

```
15 GOSUB440:CLS:PRINT@193,
"FILENAME: ";:LINEINPUT" TELL
ME!";SAVE F$+".LR",&HC00,
&H2400,&HA0EA:RETURN
20 GOSUB440:CLS:PRINT@193,
"FILENAME: ";:LINEINPUT
"WHICH ?";F$:LOADF$+".LR":
RETURN
```

Genfont1

```
900 CREATE "FONT1"
1000 F$="FONT1"
1010 FOR I= 1 TO 84
1020 FWRITE F$;F$(I):NEXT
1030 FOR I=1 TO 84
1040 FWRITE F$;M(I):NEXT
1050 FWRITE F$;D:FWRITE F$;S:
CLOSE
```

Genfont2

```
990 CREATE "FONT2"
1000 F$="FONT2"
1010 FOR I= 1 TO 84
1020 FWRITE F$;F$(I):NEXT
1030 FOR I=1 TO 84
1040 FWRITE F$;M(I):NEXT
1050 FWRITE F$;D:FWRITE F$;S:
CLOSE
```

Geoffrey H. Smith
Cheshire, England

INFO PLEASE

Editor:

I am looking for information about a company called BMC International, which was based in California and sold computer

RUNS ON COCO 2 & 3

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

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

EASY COMMUNICATION + WORD PROCESSING + TOTAL AUTOMATION

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

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

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

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

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

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

printers. I am in need of a printer head for the model #BX-80 printer. I have called several companies with no success. BMC must have been bought out by another company. I will welcome any information!

Gary Anderson
1010 Tullar Road, Apt. B
Neenah, WI 54956

Don't Give this Teacher an Apple!

Editor:

Although RAINBOW is intended for CoCos, many subscribers probably have other equipment, too. One piece of hardware I am trying to hook up is a PC Viewer, a large LCD display that fits over an overhead projector. Whatever is displayed on the computer screen is what is displayed on the overhead. It is a great idea, if you have a PC. What I have is an older Apple IIe, sending out a composite signal.

Since the Zenith monitor worked with both the Apple and the CoCo hooked up to a Universal Plus monitor, I thought I could just connect the CoCo to the composite interface on the PC Viewer. It almost worked. Block graphics came out OK, high resolution was a blank and text looked like it skipped every other line.

The information that comes with the PC Viewer is scanty, but it does list several computers that use an RGB interface. Since the Universal Video Interface supports RGB (doesn't it, for CoCo 2?), why shouldn't this work? If, after looking at the signal hookups, there is absolutely no hope of hooking up the CoCo 2, what about the CoCo 3? Would it be possible to run the CoCo 2 software on the CoCo 3, and interface it with the PC Viewer?

My reason for all this foolishness has to do with the technology and my desire to use the CoCo in the classroom. One computer does not go too far with 30 students, but using the printer as our output device, we have been able to work with some interesting simulations. Having direct access to the computer via the PC Viewer would be great. I prefer to write programs for the CoCo rather than use Apple BASIC. If there is any possible way to hook up this new device, I want to give it my best shot. The alternative is to become proficient in Apple BASIC and translate programs. Please save me from this fate. I am a desperate man.

Also, I am interested in hearing from other teachers who use CoCos in the classroom.

Michael Franich
Lakeridge Jr. High
5909 Myers Rd. E.
Sumner, WA 98390

Derby City RAINBOWfest?

Editor:

It occurred to me (and hopefully will also to the people at THE RAINBOW) that it would be interesting to have a RAINBOWfest in Louisville. This would allow CoCo enthusiasts to venture out to Prospect to see where THE RAINBOW is published. I feel this would be very exciting. In addition, this choice of location would allow a different group to attend a RAINBOWfest that previously has not had the chance because of geographical limitations. Possibly the event would not be as large as some others, but please give it a chance.

Also, I am very interested in finding more information about a special hardware project. I would like to obtain an IBM-type computer case for the purpose of installation of my disk drives, modem, and the insides of my CoCo with a separate keyboard. If anyone can help or pass on information, I would be extremely grateful. Any technical information would be of help.

Thank you for such a fine magazine.

William Bartley
Box 26 Haggin Hall UK
Lexington, KY 40526

Would you travel to Louisville to attend a RAINBOWfest? If so, let us hear from you.

The Original Touch

Editor:

I am looking for software to use with Theodore P. Hasenstaub's light pen hardware project in April 1983's RAINBOW, Page 90, for creating original graphics from a television image. I have a CoCo 3 and the Radio Shack TV/Monitor. A digitizer is fine, but I much prefer the original touch.

D'Arcy Brownrigg
P.O. Box 292
Chelsea, Quebec
Canada J0X 1N0

PEN PALS

• I am looking for pen pals seriously interested in OS-9 programming (assembler, C, BASIC09). I have a CoCo 3 with two disk drives, a mouse and a monochrome monitor. No beginners, please.

Alain Smedts
Joseph Wuytslaan 37
8700 Deur NE
Belgium

• I am a 13-year-old boy and I'm looking for a pen pal, preferably a girl from 12 to 15 years old. I have a CoCo 3 with a free access, 24-hour bulletin board on it. Some of my interests outside of the computer realm include band, comic books, etc.

Daven Howard
R.R. #2 Box 23B
Gays Mills, WI 54631

• I am 15 years old, have a CoCo 2 and 3, DMP-105 printer, three disk drives, a CCR-81 cassette and a modem. I would like to have pen pals from anywhere in the world.

Luis Martinez
LUMA
2 C-10 Royal Town
Bayamon, PR 00619

• A CoCo user over 50 years old would like to communicate with other users who share an interest in game playing. I have a CoCo 2, cassette recorder and a DMP-130 printer. I enjoy Adventure games but need help solving most of them.

Carla E. Sheridan
P.O. Box 501
Rodman, NY 13682

• I would like to have pen pals from anywhere in the USA, Canada, Australia, New Zealand, Europe or Africa. I own a CoCo 3, 128K with a DMP-110 printer, disk drive, Multi-Pak Interface, direct connect modem pak, and a speech cartridge. I'm 38 years old.

James W. Andrews
1732 Orange Lane
Kissimmee, FL 32741

• I am 16 years old. I have a CoCo 2, two double-sided, double-density drives, a Multi-Pak, a 1200 baud modem, a DMP-105, a cassette player, a light controller and a plotter. I am looking for anyone who would like to help me in my quest for knowledge of the CoCo. Or anyone who just likes to talk. I'll answer as many letters as humanly possible.

Erik Bixby
3441 E. Dahlia Drive
Phoenix, AZ 85028

• I am 15 years old and looking for pen pals all over the world, especially in the USA, Canada and Australia. I have a 64K CoCo, CCR-81 cassette recorder and a new Tandy FD-501 disk drive (including Drive 1).

Daniel Alvarez
Sucre 2220 4 'B'
C.P. 1428 Capital Federal
Republica Argentina

• I'm looking for pen pals from all over the world. I have a 64K CoCo 1 with a cassette player and I like to play games and Adventures.

Tal Pery
Havakefet Str. 3
Kiron 55408
Israel

• I have a 64K CoCo and a cassette recorder, and I would like a pen pal from anywhere, especially in South America.

Michael A. Lees
Rua das Valsas, 167
Jacarepagua
Rio de Janeiro — RJ
CEP — 22743 — Brazil

• I am a collector of public domain CoCo 2 and 3 pictures and would like to obtain pen pals who have good public domain pictures they would like to share. I am particularly interested in CoCo 3 pictures.

Chris Steeves
P.O. Box 255
Petitcodiac, New Brunswick
Canada E0A 2H0

BULLETIN BOARD SYSTEMS

• Come on and enter the Dungeon BBS, 300/1200 baud. Offers a great online games area, SIGs, forums, downloads, and news and information. Currently operating on a four-drive system, soon to upgrade to 10Mb. Hours: 6 p.m. to 6 a.m. Monday through Friday, 24 hours Saturdays and Sundays. Call (919) 726-9737.

Chuck Katsekes, SysOp
410 Scott Drive
Newport, NC 28570

• I would like to announce the opening of my BBS, The Tomb. It is up 24 hours a day, 300/1200 baud, 8/N/1. It is run on a 512K CoCo 3 with four drives. Call (515) 432-7853.

Steve Kratz
217 West 2nd Street
Boone, IA 50036

• I am happy to announce the arrival of a new BBS, The Mindmaster's Domain of Chicago, running on a *Colorama* system. It is operating at 300/1200 baud, 7 bits, even parity, 24 hours, seven days a week. Call (312) 463-8932. The SysOp is Mindmaster.

David Lucas
4451 N. Christiana
Chicago, IL 60625

• I am the secretary and treasurer of the Enid Chapter of CoCo Inc., The Central Oklahoma Computer Organization. We are presently expanding our support network for CoCo users. We have a new newsletter, are building SIGs, and have added a BBS (405-237-9282). I would like to hear from anyone interested in starting a McAlester, OK, chapter. We also support a budding Public Domain library and P/D swap disk.

David Graham
724 E. Maple
Enid, OK 73701

• I would like to announce a new CoCo 3 BBS in Montreal, serving most of the city. It has nice online games and a few boards. Give it a call at (514) 351-2130. Open 24 hours a day, seven days a week.

Jean Beland
7720 Pierre-de-Coubertin (est)
Montreal, P.Q.
Canada H1L 2B2

• I would like to announce Tri City BBS, sponsored by the Citrus Color Computer Club in San Bernardino, California. It runs *PBBS* 5.0 on a CoCo 3, and is online 24 hours, seven days a week, 7-E-1. Many topic areas, all callers welcome. Please fill out application on first call to be validated. First callers have limited access. Call (714) 885-3789.

James C. Gracey
101541
2686 W. Mill St.
San Bernardino, CA 92410

• Call Dial-Your-Match #399, a computerized dating and meeting BBS system. All persons over 18 are welcome. Call (201) 261-1977 or (201) 265-2481. This is a free service. CoCo SIG online.

David Fischer
P.O. Box 423/898-A Blvd.
New Milford, NJ 07646

• Color Galaxy BBS in Santa Ana, California, is now online 24 hours, 300/1200 baud, 7-O-1, featuring Xmodem uploads and downloads, games, utilities, graphics, music, 10 message bases and the ability to send private uploads to an individual user! Call (714) 839-5830 for free access.

Dave Cragun
901 S. Toland St.
Santa Ana, CA 92704

• The CoCo' Nuts BBS now operates at 300/1200 baud, 24 hours a day. Call (919) 425-8242 for BBS; (919) 425-7751 for voice. The BBS operates at 7 bits, even parity, 1 stop bit. We welcome all users to come and visit us anytime. I am presently with the Army, stationed in Honduras, California. But the BBS is still in operation at the North Carolina address.

Tommie Taylor
6310 Belle Terre
Fayetteville, NC 28304

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.

The Best Has Arrived

Word Power 3

(The Ultimate Word Processor for the CoCo 3)

Are you still using your CoCo 2 word processor on the CoCo 3 with patchwork? You don't have to any more. With Word Power 3, Microcom answers the challenge of word processors for the CoCo 3. It bridges the gap between "what is" and "what should be" in word processors. **No other word processor offers such a wide array of features that are so easy to learn and use.** Check out the impressive features:

DISPLAY

The 80-column display with true lowercase lets you view the full width of a standard page. **All the prompts are displayed in plain English in neat colored windows.** The current column number, line number, page number and the percentage of memory remaining is displayed on the screen at all times. The program even displays the bottom margin perforation so you know where one page ends and the other begins. You can also change the foreground/background color of the screen to suit your needs!

AVAILABLE MEMORY

Unlike most other word processors, Word Power 3 gives you 80K of memory with a 128K CoCo 3 and more than 460K with a 512K CoCo 3 to store text.

TYPING/EDITING

Word Power 3 has one of the most powerful and user-friendly full-screen editors with wordwrap. All you do is type; Word Power 3 takes care of the text arrangement. It even has a built-in **Auto-Save** feature which saves the current text to disk at regular intervals; so you know that your latest version is saved on disk. Here are some of the editing features of Word Power 3:

Auto-repeat; Key-Click; Cursor up, down, left, right, beginning of line, end of line, next word, previous word, top of text, end of text; page forward, backward; 4-way scrolling; block copy, move, delete; global search and replace (with wild-card search); line positioning (left, right or center); insert/overstrike modes; delete to beginning/end of line, next/previous word; and tabs. You can also embed printer codes in text to take advantage of underlining, sub/superscript and other printer functions. Define left, right, top and bottom margins, and page length.

MAIL MERGE

Ever try mailing out the same letter to 500 different persons? Could be quite a chore. Not with the Mail Merge feature of Word Power 3. Using this feature, you can type a letter, follow it through with a list of addresses and have Word Power 3 print out personalized letters. It's that easy!

LOADING/SAVING FILES TO DISK

Word Power 3 creates ASCII format files which are compatible with almost all terminal, spell-checking, and other word-processing programs. It allows you to load, save and kill files and also to create and edit Basic, Pascal, C and Assembly files. Supports double-sided drives and various drive step rates.

PRINTING

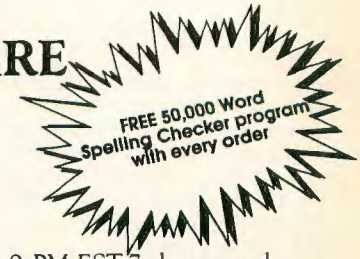
Word Power 3 drives almost any printer (DMP series, EPSON, GEMINI, OKIDATA, etc.). Allows print options such as different baud rates, line spacing, page pause, partial print, multi-line headers/footers, page numbers, page number placement, and right justification. You can also change the values for these print options within the text by using embedded printer option codes.

INSTRUCTION MANUAL

Word Power 3 comes with a well-written and easy-to-comprehend instruction manual that makes writing with Word Power 3 a breeze.

Word Power 3 comes on disk for only **$69.95.**

MICROCOM SOFTWARE
P.O. Box 214
Fairport, N.Y. 14450
Phone (716) 223-1477



Call Toll Free (For Orders) 1-800-654-5244 9 AM – 9 PM EST 7 days a week
Except NY. **Order Status,** Information, Technical Information, NY Orders call **1-716-223-1477**

All orders shipped by UPS 2nd Day Air at no extra charge. Last minute shoppers can benefit.
VISA, MC, AMEX, Check, MO. Please add $3.00 S&H (USA & Canada), other countries $5.00 S&H.
NYS residents please add sales tax.
Computerized processing & tracking of orders. Immediate shipment.

RAINBOW Info

How To Read Rainbow

Please note that all the BASIC program listings in THE RAINBOW are formatted for a 32-character screen — so they show up just as they do on your CoCo screen. One easy way to check on the accuracy of your typing is to compare what character "goes under" what. If the characters match — and your line endings come out the same — you have a pretty good way of knowing that your typing is accurate.

We also have "key boxes" to show you the *minimum* system a program needs. But, *do* read the text before you start typing.

Finally, the little disk and/or cassette symbols on the table of contents and at the beginning of articles indicate that the program is available through our RAINBOW ON DISK or RAINBOW ON TAPE service. An order form for these services is on the insert card bound in the magazine.

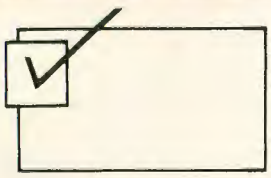
What's A CoCo?

CoCo is an affectionate name that was first given to the Tandy Color Computer by its many fans, users and owners.

However, when we use the term CoCo, we refer to both the Tandy Color Computer and the TDP System-100 Computer. (While many TDP-100s are still in service, the TDP Electronics division of Tandy no longer markets the CoCo look-alike.) It is easier than using both of the "given" names throughout THE RAINBOW.

In most cases, when a specific computer is mentioned, the application is for that specific computer. However, since the TDP System-100 and Tandy Color are, for all purposes, the same computer in a different case, these terms are almost always interchangeable.

Rainbow Check Plus



The small box accompanying a program listing in THE RAINBOW is a "check sum" system, which is designed to help you type in programs accurately.

Rainbow Check PLUS counts the number and values of characters you type in. You can then compare the number you get to those printed in THE RAINBOW. On longer programs, some benchmark lines are given. When you reach the end of one of those lines with your typing, simply check to see if the numbers match.

To use *Rainbow Check PLUS*, type in the program and save it for later use, then type in the command RUN and press ENTER. Once the program has run, type NEW and press ENTER to remove it from the area where the program you're typing in will go.

Now, while keying in a listing from THE RAINBOW, whenever you press the down arrow key, your CoCo gives the check sum based on the length and content of the program in memory. This is to check against the numbers printed in THE RAINBOW. If your number is different, check the listing carefully to be sure you typed in the correct BASIC program code. For more details on this helpful utility, refer to H. Allen Curtis' article on Page 21 of the February 1984 RAINBOW.

Since *Rainbow Check PLUS* counts spaces and punctuation, be sure to type in the listing exactly the way it's given in the magazine.

```
10 CLS:X=256*PEEK(35)+178
20 CLEAR 25,X-1
30 X=256*PEEK (35)+178
40 FOR Z=X TO X+77
50 READ Y:W=W+Y:PRINT Z,Y;W
60 POKE Z,Y:NEXT
70 IFW=7985THENB0ELSEPRINT
   "DATA ERROR":STOP
80 EXEC X:END
90 DATA 182, 1, 106, 167, 140, 60, 134
100 DATA 126, 183, 1, 106, 190, 1, 107
110 DATA 175, 140, 50, 48, 140, 4, 191
120 DATA 1, 107, 57, 129, 10, 38, 38
130 DATA 52, 22, 79, 158, 25, 230, 129
140 DATA 39, 12, 171, 128, 171, 128
150 DATA 230, 132, 38, 250, 48, 1, 32
160 DATA 240, 183, 2, 222, 48, 140, 14
170 DATA 159, 166, 166, 132, 28, 254
180 DATA 189, 173, 198, 53, 22, 126, 0
190 DATA 0, 135, 255, 134, 40, 55
200 DATA 51, 52, 41, 0
```

OS-9 and RAINBOW ON DISK

The OS-9 side of RAINBOW ON DISK contains two directories: CMDS and SOURCE. It also contains a file, `read.me.first`, which explains the division of the two directories. The CMDS directory contains executable programs and the SOURCE directory contains the ASCII source code for these programs. BASIC09 programs will only be offered in source form so they will only be found in the SOURCE directory.

OS-9 is a very powerful operating system. Because of this, it is not easy to learn at first. However, while we can give specific instructions for using the OS-9 programs, you will find that the OS-9 programs will be of little use unless you are familiar with the operating system. For this reason, if you haven't "learned" OS-9 or are not comfortable with it, we suggest you read *The Complete Rainbow Guide to OS-9* by Dale Puckett and Peter Dibble.

The following is not intended as a course in OS-9. It merely states how to get the OS-9 programs from RAINBOW ON DISK to your OS-9 system disk. Use the procedures appropriate for your system. Before doing so, however, boot the OS-9 operating system according to the documentation from Radio Shack.

1) Type `load dir list copy` and press ENTER.
2) If you have only one disk drive, remove the OS-9 system disk from Drive 0 and replace it with the OS-9 side of RAINBOW ON DISK. Then type `chd/d0` and press ENTER. If you have two disk drives, leave the sytem master in Drive 0 and put the RAINBOW ON DISK in Drive 1. Then type `chd/d1` and press ENTER.
3) List the `read.me.first` file to the screen by typing `list read.me.first` and pressing ENTER.
4) Entering `dir` will give you a directory of the OS-9 side of RAINBOW ON DISK. To see what programs are in the CMDS directory, enter `dir cmds`. Follow a similar method to see what source files are in the SOURCE directory.
5) When you find a program you want to use, copy it to the CMDS directory on your system disk with one of the following commands:

One-drive system: `copy /d0/cmds/` *filename* `/d0/cmds/` *filename* `-s`

The system will prompt you to alternately place the source disk (RAINBOW ON DISK) or the destination disk (system disk) in Drive 0.

Two-drive system: `copy /d1/cmds/` *filename* `/d0/cmds/` *filename*

Once you have copied the program, you execute it from your system master by placing that disk in Drive 0 and entering the name of the file.

The Rainbow Seal

RAINBOW CERTIFICATION SEAL

The Rainbow Certification Seal is our way of helping you, the consumer. The purpose of the Seal is to certify to you that any product that carries the Seal has actually been seen by us, that it does, indeed, exist and that we have a sample copy here at THE RAINBOW.

Manufacturers of products — hardware, software and firmware — are encouraged by us to submit their products to THE RAINBOW for certification. We ascertain that their products are, in actuality, what they purport to be and, upon such determination, award a Seal.

The Seal, however, is not a "guarantee of satisfaction." The certification process is different from the review process. You are encouraged to read our reviews to determine whether the product is right for your needs.

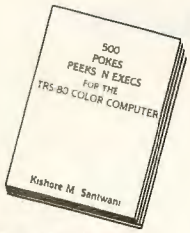
There is absolutely no relationship between advertising in THE RAINBOW and the certification process. Certification is open and available to any product pertaining to CoCo. A Seal will be awarded to any commercial product, regardless of whether the firm advertises or not.

We will appreciate knowing of instances of violation of Seal use.

BOOKS & GRAPHICS

500 POKEs, PEEKs, 'N EXECs

FOR THE TRS-80 COCO



NEVER BEFORE has this information of vital significance to a programmer been so readily available to everyone. This book will help you 'GET UNDERNEATH THE COVER' of the Color Computer and develop your own HI-QUALITY Basic and ML programs. SO WHY WAIT??
This 80-page book includes POKEs, PEEKs and EXECs to:

- ★ **Autostart** your basic programs
- ★ **Disable** Color Basic/ECB/Disk Basic commands like LIST, LLIST, POKE, EXEC, CSAVE(M), DEL, EDIT, TRON, TROFF, PCLEAR, DLOAD, RENUM, PRINT USING, DIR, KILL, SAVE, LOAD, MERGE, RENAME, DSKINI, BACKUP, DSKI$, and DSKO$.
- ★ **Disable** BREAK KEY, CLEAR KEY and RESET BUTTON.
- ★ **Generate** a Repeat-key.
- ★ **Transfer** ROMPAKS to tape (For 64K only).
- ★ **Speed Up** your programs.
- ★ **Reset**, MOTOR ON/OFF from keyboard.
- ★ **Recover** Basic programs lost by NEW.
- ★ **Set** 23 different GRAPHIC/SEMIGRAPHIC modes
- ★ **Merge** two Basic programs.
- ★ **AND MUCH MUCH MORE!!!**

COMMANDS COMPATIBLE WITH 16K/32K/64K/COLOR BASIC/ECB/DISK BASIC SYSTEMS and CoCo 1, 2, & 3.

ONLY $16.95

SUPPLEMENT to 500 POKES, PEEKS 'N EXECS

ONLY **$9.95**

200 additional Pokes, Peeks 'n Execs to give you MORE PROGRAMMING POWER. Includes commands for:

- **Rompak Transfer to disk**
- **PAINT with 65000 styles!**
- **Use of 40 track single/double sided drives with variable step-rates**
- **High-Speed Cassette Operation**
- **Telewriter 64®, Edtasm+® and CoCo Max® Enhancements**
- **Graphics Dump (for DMP printers) & Text Screen Dump**
- **AND MUCH MUCH MORE!**
- **500 POKES, PEEKS 'N EXECS is a prerequisite**

NEW! 300 POKES PEEKS 'N EXECS FOR THE COCO III

Get more POWER for your CoCo III. Includes commands for:

- **40/80 Column Screen Text Dump**
- **Save Text/Graphics Screens to Disk**
- **Command/Function Disables**
- **Enhancements for CoCo 3 Basic**
- **128K/512K Ram Test Program**
- **HPRINT Character Modifier**
- **AND MANY MORE COMMANDS**

ONLY **$19.95**

"MUST" BOOKS

UNRAVELLED SERIES: These books provide a complete annotated listing of the BASIC/ECB and DISK ROMs.

EXTENDED COLOR BASIC UNRAVELLED: $39.95
DISK BASIC UNRAVELLED: $19.95
BOTH UNRAVELLED BOOKS: $49.95
SUPER ECB (CoCo3) UNRAVELLED: $24.95
ALL 3 UNRAVELLED BOOKS: $59.95
COCO 3 SERVICE MANUAL $39.95
COCO 2 SERVICE MANUAL: $29.95
INSIDE OS9 LEVEL II $39.95
RAINBOW GUIDE TO OS9 LEVEL II ON COCO 3: $19.95
RAINBOW GUIDE TO OS9 II DISK: $19.95
INSIDE OS9 LEVEL II DISK: $20.00
COCO 3 SECRETS REVEALED: $19.95
ASSEMBLY LANGUAGE PROGRAMMING*: $18.00
ADDENDUM FOR COCO 3: $12.00
UTILITY ROUTINES VOL 1 BOOK: $19.95

NEW!

COCO GRAPHICS DESIGNER

Greeting Cards
Signs
Banners

The CoCo Graphics Designer allows you to create beautifully designed Greeting Cards, Signs and Banners for holidays, birthdays, parties, anniversaries and other occasions. Comes with a library of pre-drawn pictures. Also includes utilities which allow you to create your own character sets, borders and graphic pictures. Requires a TRS-80 COLOR COMPUTER I, II OR III OR TDP-100 with a MINIMUM OF 32K, ONE DISK DRIVE and a PRINTER compatible with DISK BASIC 1.0/1.1, ADOS 1.0/1.1 AND JDOS. Supports the following printers: DMP 100/105/110/130/430, CGP 220, EPSON RX/FX, GEMINI 10X, SG-10, NX-10 & OKIDATA.

DISK ONLY **$29.95**

PICTURE DISK #1: 100 more pictures for CGD: **$14.95**
FONT DISK #1: 10 extra fonts! **$19.95**
COLORED PAPER PACKS $24.95

COCO MAX III

It's finally here! CoCo Max for the CoCo III. Includes all the features of the acclaimed CoCo Max II and more: CoCo III hi-res screen, display of 64 colors at a time, 50% larger editing window, special effects with animation and much much more! Comes with special hi-res interface, conversion utilities and a comprehensive manual. Disk only **$79.95** Min Req: 128K CoCo III with a disk drive.

COCO MAX II

Disk **$77.95**; Tape **$67.95**

MAX PATCH

An excellent software patch to run COCO MAX II on COCO III. Req. RS Hires Joystick Interface. No chip replacements or soldering. Disk only **$24.95**
BOTH MAX PATCH & HI-RES INTERFACE: $34.95

COLOR MAX III DELUXE

This is the sequel to the popular Color Max III. Additional features include multiple screen editing, animation, etc. Includes printer drivers for EPSON, GEMINI, DMP & CGP-220 printers. Disk only **$69.95.** Minimum Requirements: 512K CoCo 3, RS Hi-Res Joystick Interface and Tandy Disk Controller.

MICROCOM SOFTWARE
P.O. Box 214
Fairport, N.Y. 14450
Phone (716) 223-1477

All orders $50 & above shipped by 2nd day Air UPS with no extra charge. Last minute shoppers can benefit.

VISA, MC, AMEX, Check, MO. Please add $3.00 S&H (USA & Canada), other countries $5.00 S&H. NYS residents please add sales tax. **Computerized processing & tracking of orders. Immediate shipment.** Dealer inquiries invited.

Call Toll Free (For Orders) 1-800-654-5244 9 AM–9 PM EST 7 days a week
Except NY. **Order Status**, Information, Technical Information, NY Orders call **1-716-223-1477**

Yes, Alan, There Is a Future for the Color Computer

Dear Mr. Falk:

I have been a loyal CoCo user since 1982 and a RAINBOW reader just as long. We (CoCo Community) have looked to THE RAINBOW for honest, unbiased answers to our questions. You have not let us down!

Please answer this letter without regard to the fact that Tandy is a major contributor to THE RAINBOW and that members of your staff are directly associated with Tandy.

How much time does the CoCo have? In particular, the CoCo 3. There have been drastic price reductions on the CoCo 3 and rumors float heavy among members of my user group and others in the surrounding area that Tandy thinks the CoCo 3 was a mistake, and will suffer the same fate as the Model I, III, 4 and even the almighty 2000, not to mention the Tandy savior 1000EX and SX.

Don't get me wrong, I love my CoCo and still have the old gray horse. I wouldn't trade either of them for a trainload of 1000s. I have megabucks invested in my CoCo 3, monitor, 512K, two drives, Multi-Pak, etc., etc., the list is awesome. Help!

Alan L. Parker
Kokomo, IN

Thanks for writing, Alan, because I think it is time to dispel a few rumors myself. Your letter gives me a chance to do so.

Let me put it to you this way: If you had a product that outsold every other product in its classification every year — year in and year out — would you discontinue that product? The answer, of course, is that you would not. And that is just what is happening with the Color Computer.

Yes, I am pleased to be able to report that, in terms of numbers of units sold, for the umpteenth year in a row, the CoCo has outsold every other type of Tandy computer during the season just past.

COCO 3 UTILITIES GALORE

(All utilities support 40/80 columns for CoCo 3)
(CoCo 2 versions are available for most utilities)

SUPER TAPE/DISK TRANSFER

● Disk-to-Disk Copy (1-3 passes) ● Tape-to-Disk Copy ● Tape-to-Disk Automatic Relocate ● Disk-to-Tape Copy ● Tape-to-Tape Copy
Copies Basic/ML programs and DATA files. CoCo 1, 2 & 3. 32K Disk System (Disk to Disk Copy requires 64K). Disk Only **$24.95**

OS9 LEVEL II RAMDISK

Lightning Fast Ramdisk with Auto Formatting. A must for any OS9 Level II User. Req. 512K **$29.95.** (Only $14.95 with the purchase of 512K Upgrade & Ramdisk!!).

HI-RES JOYSTICK SOFTWARE

Wish you could use the hi-res joystick interface from Basic? You can now. This program will let you access 640 x 640 pixels from your joystick for extra precision. CoCo 3 Disk **$14.95**

COCO NEWSROOM

Now available for the CoCo III! You can design your own newspaper with Banner Headlines/6 articles using sophisticated Graphics, Fonts and Fill Patterns. Comes with 22 fonts & 50 pictures! Over 140K of code. Disk only **$49.95**

MAILLIST PRO

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

DISK LABEL MAKER

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

COMPUTERIZED CHECKBOOK

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

BOWLING SCORE KEEPER

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

VCR TAPE ORGANIZER

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

512K RAMDISK/SPOOLER

Turns your 512K RAM into super-fast in-memory disk drives. Reduces chances of IO errors and disk access is lightning fast. 512K Spooler keeps your computer free for programming when printing documents to the printer. A must for 512K users. CoCo 3 Disk Only **$24.95**

ADOS3

Advanced Disk Operating System for CoCo 3. **$34.95 ADOS: $27.95**

COCO UTIL II

(Latest Version): Transfer CoCo Disk files to IBM compatible computer. Transfer MS-DOS files to CoCo. **$39.95**

SPIT 'N IMAGE

Makes a BACKUP of ANY disk **$32.95**

RGB PATCH

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

ALL SOFTWARE COMPATIBLE WITH COCO 1, 2 & 3

WORD PROCESSORS

TeleWriter-64: Best Word Processor For CoCo 1 & 2. (Cas) **$47.95** (Disk) **$57.95**
TW-80: 80 Column Display & more features for TW-64. CoCo 3 Disk **$39.95**
TELEFORM: Mail Merge & Form Letters for TW-64. **$19.95**

DATABASE

Pro Color File * Enhanced* 2.0: Multi-feature Database. **$59.95**

COMMUNICATIONS

Autoterm: Superb Terminal Program. Works with any modem! (Cas) **$29.95** (Disk) **$39.95**
Wiz: For OS9 II. 300-19200 baud rate, windows! Req 512K & RS232 Pak **$79.95**

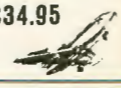
ASSEMBLERS/COMPILERS

EDT/ASM 64D: Best Disk Based Editor-Assembler for CoCo. **$59.95** (Specify CoCo 1, 2 or 3)
THE SOURCE: Best Disassembler for CoCo. **$34.95** (Specify CoCo 1, 2 or 3)
CBASIC: Most powerful Basic Program Compiler. **$149.95** (Specify CoCo 1, 2 or 3)

GAMES

(DISK ONLY)

***IRON FOREST: $28.95**
LIGHT PHASER W/INTERFACE: $34.95
MISSION! RUSH'N ASSAULT: $28.95
***GRANDPRIX CHALLENGE: $28.95**
***GANTELET II: $28.95**
GANTELET: $28.95
MISSION F-16 ASSAULT: $28.95
MARBLE MAZE: $28.95
PAPER ROUTE: $28.95
KNOCK OUT: $28.95
KARATE: $28.95
WRESTLE MANIAC: $28.95
BOUNCING BOULDERS: $28.95
THE GATES OF DELIRIUM: $28.95
CALADURIAL FLAME OF LIGHT: $28.95
LANSFORD MANSION: $28.95
P-51 MUSTANG SIMULATION: $34.95
WORLDS OF FLIGHT: $34.95
PYRAMIX: Cubix® for CoCo 3: $24.95
VEGAS SLOTS (CoCo III Only): $34.95
FLIGHT 16: $34.95



MICROCOM SOFTWARE
P.O. Box 214
Fairport, N.Y. 14450
Phone (716) 223-1477

All orders $50 & above shipped by UPS 2nd Day Air at no extra charge. Last minute shippers can benfit. VISA, MC, AMEX, Check, MO. Please add $3.00 S&H (USA & Canada), other countries $5.00 S&H. NYS residents please add sales tax. **Computerized processing & tracking of orders. Immediate shipment.** Dealer inquiries invited.

Call Toll Free (For Orders) 1-800-654-5244 9 AM – 9 PM EST 7 days a week
Except NY. **Order Status,** Information, Technical Information, NY Orders call **1-716-223-1477**

That means more CoCos than 1000s. More Color Computers than 3000s. More than *anything* else. Period.

Would *you* discontinue a computer that sold so well? I wouldn't. And Tandy wouldn't, either.

Since we're talking about the holiday season sales in particular, I am tempted to paraphrase that famous column from the editor of the Baltimore *Sun* to a little girl named Virginia who wrote in to say that all her friends were telling her there was no Santa Claus. The editor wrote back on Page One to say, "Your little friends are wrong, Virginia."

Let me say, Alan, that your friends — be they little or big — are wrong, too.

Later in the same reply, the editor wrote that Santa "lives and lives forever." We all know it won't quite happen this way, Alan, but the truth is that the CoCo seems to be living forever, too.

One of the reasons this is so, Alan and friends everywhere, is simply because of the very thing about which you are concerned — the special prices established at holiday time.

Two excellent marketing people, Bernie Apell — president of Radio Shack — and Barry Thompson — CoCo's product manager — are the ones behind that pricing. Price reductions are possible for a number of reasons. Among them:

- Economies in production, which are, of course, going on throughout the year, are usually most felt with the holiday manufacturing cycle.
- The largest single "buy" of Color Computers is for the holiday period. Everyone understands quantity discounts.
- In this year's case, the decision to manufacture the CoCo 3 in Korea was particularly good for Tandy.

Fortunately, the company is large enough to make on-shore/off-shore decisions and take advantage of them. (Incidentally, CoCos will be manufactured in the United States during 1988, another example of this versatility. In this case, Tandy will be taking advantage of the international currency situation.)

A nice thing about Tandy's pricing is that if they can make it cheaper, they will sell it cheaper. That means "passing the savings along." And, as they bring more and more people into the CoCo Community, we all benefit.

You are, however, wrong about two things, Alan. First of all, Tandy is not a "major contributor" to THE RAINBOW. Their main contribution is for advertising space — and they pay the same rates as other people. They buy fewer pages than a number of other advertisers, as well. Other than that, there is no "contribution" by Tandy to THE RAINBOW. We're an independent company and an independent magazine. We do, of course, like Tandy products. If we didn't, we'd be foolish to publish magazines in support of them.

"For the umpteenth year in a row, the CoCo has outsold every other type of Tandy Computer."

Also, Alan, there is no member of my staff who is "directly associated with Tandy." None. Zero. Zilch. As I said above, we're an independent company and an independent publication.

Of course, we have good friends at Tandy. People in marketing information and computer merchandising. People on the "executive floors" and people in the manufacturing plants. When we're searching for information, we try to find out as much as we can.

And, based on that sort of inquiry, I can find no information whatsoever that Tandy plans to discontinue production or sale of the Color Computer now or in the foreseeable future. For one thing, it is their best-seller. For another, they are building a new manufacturing plant in Texas just for CoCo.

Rumors like this, Alan, crop up here and there every year. They have, obviously, never been true and they are not true now.

For instance, if the CoCo were to be dropped, why would Tandy be signing contracts for new software from several major software houses? Why would Tandy have developed *Multi-Vue*? Why would Tandy invest in a new version of OS-9 for CoCo 3? Why would Tandy have contracted with us for still another OS-9 book?

Tandy is more active in the Color Computer software field than ever before. All the signs point to more activity, not less. And if so, they certainly want to increase, as much as they can, the number of people who would be interested in buying these products. So they keep on manufacturing and selling Color Computers.

Seems logical to me.

* * *

As an aside, the third-party market seems to be more and more interested in the CoCo every month. We've been getting more and more inquiries from people interested in new and exciting things for the CoCo.

Readers who have been with us for more than a little while will remember a column in which I compared the CoCo 3 with the original Color Computer in terms of where each machine was in its development. At the time, I saw the "3" as being far ahead in terms of people writing and developing applications.

I re-surveyed that observation just before Mr. Parker's letter arrived. The case is even more true now than it was. More people are starting to do more new things for the CoCo 3 than were doing anything for the original machine at the same time in its development stage.

You are already seeing some new names to go with some of the more familiar ones in the advertising space of THE RAINBOW. I encourage you to encourage these advertisers — old and new — by closely examining their offerings and supporting them (and, incidentally, the CoCo Community) by buying their products. Many of them are excellent.

And, yes, you will see some familiar names disappear from these pages. Our advertising department did a recent survey and found those firms with new products and new ideas were reporting sales increases. Those who were riding along with the same version of the same product and the same business approach they had in 1983 were not doing so well. Frankly, we have tried to counsel with a number of these old friends, but — for some — the message has never gotten through.

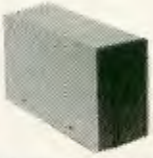
All of us here are very optimistic about the CoCo market. There is no reason whatsoever not to be.

— Lonnie Falk

ALL HARDWARE COMPATIBLE WITH COCO 1, 2 & 3

DISK DRIVES

Double Sided, Double Density 360K 40 track disk drives for the Color Computer 1, 2 and 3. Buy from someone else and all you get is a disk drive. Buy from us and not only do you get a quality disk drive, you also get $60 worth of disk utility software (Super Tape/Disk Transfer and Disk Tutorial) and our DISKMAX utility which allows you to use BOTH sides of our disk drives. It's like buying TWO disk drives for the price of ONE!!



DRIVE 1 (Completely Assembled) **$149.95**
DRIVE 0 (With J&M Controller & Cable) **$229.95**
(90 day warranty on all drives)
J&M CONTROLLER (With RSDOS) **$79.95**
DISTO SUPER CONTROLLER: $99.95

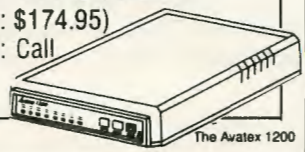
DRIVE CABLES: 1 DRIVE CABLE: $19.95 2 DRIVE CABLE: $24.95 4 DRIVE CABLE: $39.95
(For Drives, add $7.00 S&H in USA/CANADA)

COMMUNICATIONS EXTRAVAGANZA

1) AVATEX 1200 MODEM: Hayes compatible 300/1200 Baud, Auto-Dial/Answer/Redial (Reg. $129.95)
2) MODEM CABLE (Reg. $19.95)
3) AUTOTERM TERMINAL SOFTWARE
4) FREE COMPUSERVE OFFER and ACCESS TIME
5) UPS 2nd DAY AIR Shipping.

ONLY $149.95

(With AVATEX 1200hc instead of AVATEX 1200: $174.95)
AVATEX 2400: Call



The Avatex 1200

UPGRADES

512K UPGRADE FOR COCO III

Fast 120ns chips. Fully tested. Easy installation. No soldering. Comes with complete documentation and RAM test program on disk.

ONLY **$89.95**

(With purchase of our 512K RAMDISK program below)
512K Upgrade without chips $44.95

512K RAMDISK

Have 2 superfast RAMDISKs & a print spooler.

$24.95

64K Upgrade for 26-3134 A/B CoCo II: $39.95
64K Upgrade for CoCo I's, CoCo II's with Cat #26-3026/7, 26-3134 & 26-3136: $29.95

CABLES/SWITCHERS/ADAPTERS

RS232 Y CABLE: Hook 2 devices to the serial port. ONLY **$18.95**
Y CABLE: Use your Disk System with CoCo Max, DS69, etc. ONLY **$24.95**
15' PRINTER/MODEM EXTENDER CABLE: ONLY **$16.95**
MODEM CABLE: 4 pin to DB 25: **$19.95**
15" MULTIPAK/ROMPAK EXTENDER CABLE: $29.95
3-POSITION SWITCHER: Select any one of three RS232 devices (printers/modems) from the serial port. **$37.95**
WICO TRACK BALL: $29.95
WICO ADAPTER: Use Atari type Joysticks with your CoCo. **$29.95**
RS HI-RES JOYSTICK INTERFACE: $11.99
MAGNAVOX 8505/8515/8CM643 Analog RGB Cable: $24.95
CM-8 RGB Analog Ext. Cable: $19.95
SONY Monitor Cable: $39.95

VIDEO

UNIVERSAL VIDEO DRIVER: For monochrome or color monitor. **$29.95**
VIDEO CLEAR: Reduce TV interference. **$19.95**

PRINTER INTERFACES

SERIAL TO PARALLEL INTERFACE: With 6 switch selectable baud rates (300-9600) Comes with all cables. **$44.95**

EPROM

INTRONICS EPROM PROGRAMMER: Best EPROM Programmer for the CoCo. Lowest Price Anywhere. **$137.95**
EPROM ERASER (Datarase): Fast erase of 24/28 pin EPROMs. **$49.95**
EPROMS: 2764 – **$8.00**, 27128 – **$9.00** Call for other EPROMs.

BOTH EPROM PROGRAMMER and ERASER: $179.95
ROMPAK w/Blank PC Board 27xx Series: $12.95

KEYBOARDS/ACCESSORIES

KEYBOARD EXTENSION CABLE: Why break your back when typing on the CoCo? Our keyboard extender cable allows you to move your keyboard away from the computer and type with ease. You can use your existing keyboard with this cable or leave your present keyboard intact and use a second keyboard. A MUST for all CoCo Users. Only **$39.95**. Cable with CoCo II keyboard: **$49.95**
COCO 3 KEYBOARD (includes FREE FUNCTION KEYS software value $19.95): **$39.95**

CHIPS, ETC.

Disk Basic Rom 1.1 (Needed for CoCo III): **$29.95**
Multi-Pak PAL Chip for CoCo 3 (Specify Multipak Cat #): **$19.95**
PAL Switcher: Now you can switch between the CoCo II and CoCo III modes when using the Multi-Pak. You need the OLDER and NEW PAL chip for the 26-3024 Multipak. Only **$39.95**/With NEW PAL Chip **$49.95**

MICROCOM SOFTWARE
P.O. Box 214
Fairport, N.Y. 14450
Phone (716) 223-1477

All orders $50 and above (except Disk Drives) shipped by UPS 2nd Day Air at no EXTRA charge. We accept VISA/MC/AMEX, Check or MO. Please add $3.00 S&H (USA/CANADA; other countries $5.00), except where otherwise mentioned. NYS Residents please add sales tas. Prices are subject to change. All products are covered by manufacturer's warranty.

VISA MasterCard

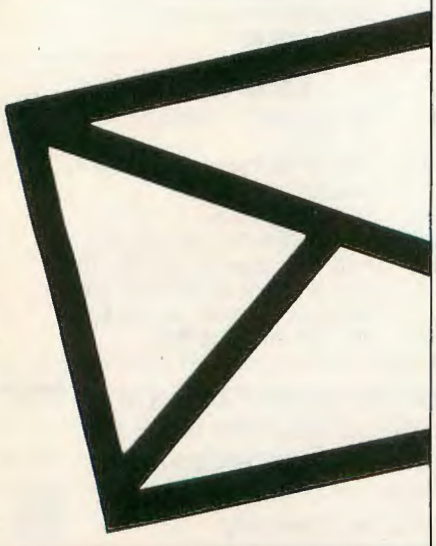
Call Toll Free (For Orders) 1-800-654-5244 9 AM – 9 PM EST 7 days a week
Except NY. **Order Status**, Information, Technical Information, NY Orders call **1-716-223-1477**

About Your Subscription

Your copy of THE RAINBOW is sent second class mail. You must notify us of a new address when you move. Notification should reach us no later than the 15th of the month prior to the month in which you change your address. Sorry, we cannot be responsible for sending another copy when you fail to notify us.

Your mailing label also shows an account number and the subscription expiration date. Please indicate this account number when renewing or corresponding with us. It will help us help you better and faster.

For Canadian and other non-U.S. subscribers, there may be a mailing address shown that is different from our editorial office address. Do not send any correspondence to that mailing address. Send it to our editorial offices at Falsoft, Inc., The Falsoft Building, P.O. Box 385, Prospect, KY 40059. This applies to everyone *except* those whose subscriptions are through our distributor in Australia.



Building March's Rainbow

So it's time for our annual Business and Finance issue. Whenever we arrive at this time of year, some of us think back to our first Business and Finance issue and one of our rare "Now, wait a minute!" discussions with cover artist Fred Crawford. Our "problem" concerned his finished art for the March 1984 issue of THE RAINBOW.

If you've been with us for a while, think back to the cover with the distinguished guy in a vest, sitting in an easy chair in his den and looking over a printout. We had asked Fred to portray an obviously successful-looking man relaxing while he reviewed his stock portfolio performance. Fred had taken that concept and brought it to life, but with one major unanticipated twist: The computer sitting on the desk in the background was a Model III. When we first saw the finished art, we exclaimed, "That's *not* a CoCo!!" To which Fred replied, "Well, you said this was the *business* issue, so I figured you'd want a *business* computer." Do I have to tell you that a short sermon ensued? And the cover art *did*, quite literally, go back to the drawing board.

No, the CoCo cannot easily handle all business-related computer needs any more than a pickup truck can haul a big herd of cattle. But just as you can manage to transport a couple of steers in a stake pickup, or haul a few bales of hay, a cord of firewood, a load of sand, or a party of duck hunters, when it comes to computing, you can do just about everything you need with a CoCo and a little time. You may have to load and reload more often than with a bigger machine sporting integrated packages, but the CoCo is nothing if not versatile.

Singer Mickey Newbury does a number about a man whose wife one day grabs his pickup truck and runs away, taking with her the kids and his best hound dog. The last line of the song is: "I sure miss that truck." Well, a lot of us feel that strongly about our CoCo. We'd rather fight than switch. Well, now that we have the CoCo 3 with up to 512K and OS-9 Level II, our little machine can "get down to business," too. The fact is, our little "pickup truck" computer can handle some mighty big jobs. With OS-9, for instance, our CoCo can now have 40- or 80-track, double-sided drives, the new 3½-inch drive with 720K of storage space or even a hard disk if we want (RAINBOW Technical Editor Cray Augsburg has a 35Mb hard disk hooked up to his CoCo 3).

Along with storage, our CoCo can zip along, as well. Tandy's Ed Juge said recently that one of their software engineers ran some unofficial tests comparing CoCo 3 and IBM "throughput" (which refers to how fast the microprocessor actually handles its instructions, rather than being a strict measure of CPU speed). Of course, the IBM PC has a much faster clock speed than does the CoCo 3, but the operating system has a considerable influence on how quickly a job gets done. The results? The CoCo 3 with OS-9 ran about 35 percent faster than the standard IBM PC!

With as much as 512K available to us, more program data can be memory-resident, reducing disk access time and, thus, speeding up things even more. Increased memory also allows room for help files or even integrated packages, complete with pop-up windows. And, of course, OS-9 gives us the ability to run several applications on the same screen, at the same time, each in its own window. How many windows? Well, even though he says 14 is practically the upper limit, Tandy's Mark Siegel recalls once having almost 30 going simultaneously! Maybe we should have a contest!

The point of all this is that getting down to "serious business" doesn't mean you have to trade in that sporty little pickup of a CoCo for some stodgy, cattle-truck PC or PC clone. But if you are considering business applications, it does mean you may want to investigate the power and performance of OS-9 on the CoCo 3. Yes, the learning curve of OS-9 is a bit steep at the beginning, but once you've completed the setup, you're past the hardest part. After all, in any business, you do have to make an investment to earn the dividends.

In closing, I'll remind you that it makes good business sense to invest in a subscription to THE RAINBOW: You save 35 percent of the newsstand price.

— Jutta Kapfhammer

COMPUTER AIDED INSTRUCTION

Educational Programs for Students Grade K-12 and Adult Self Studies

NEW PROGRAMS FOR YOUR TANDY 1000 AND TRS-80 COLOR COMPUTER

Compatible with Apple - Atari - Commodore - TRS 80 I, III, 4 - IBM PC Jr.

16 New Programs now available in Basic Spanish

• NEW! VIDEO CASSETTES FOR VHS!

InnerActive™ Video Tutorials
Complete with audio narration

4 cassettes with 8 programs in each of the following subject areas:

- **Basic Spanish Grammar**
- **Basic Algebra**
- **Reading by Phonics**
- **Basic Fractions**

2 programs per tape. Running time: 45 minutes per tape.

$19.95 per/tape

16 Programs on 8 VHS Tapes $159.00

CALL TOLL FREE
FOR MORE INFORMATION

Interactive Tutorial Programs for Home or Classroom Use

Over 1000 programs for your selection with 32 now available on disk for the Color Computer and 500 now available for the Tandy 1000.

"We're Your Educational Software Source"

Subject	No. of Programs
Reading Development	256 (4 on disk)
Reading Comprehension	48 (4 on disk)
Mathematics	128
Algebra	16 (16 on disk)
History	32 (4 on disk)
Spelling	16
Government	16
Physics	16 (4 on disk)

16 Programs in each of the following:

Children's Tales - Carpentry - Electronics
Health Services - Office Skills - Statistics
First Aid/Safety - Economics - Business
Accounting - Psychology - MUCH MORE!

Send for our free catalog of over 1000 Dorsett educational programs for Atari, TRS 80, Apple, IBM PC Jr., Commodore, Tandy 1000, etc.

Apple II, TRS 80 I, III, & 4, and Commodore 64 computers require respective conversion kits (plug-in board and stereo cassette player), **$99.00**. Atari 400/600/800/1200 computers require the Atari cassette recorder and the Dorsett 4001 Educational Master Cartridge, **$9.95**. For the IBM PC Jr. a cassette adapter cable and a good cassette recorder are required. The Tandy 1000 requires the Dorsett M1001 speaker/PC board kit, **$69.00**, and a standard cassette recorder. A Radio Shack CCR-81 or CCR-82 is recommended.

CASSETTES: $59.50 for an album containing a 16-program course (8 cassettes with 2 programs each); $9.95 for a 2-program cassette.

DISKS: $14.95 for a one-program disk; **$28.95** for two disks; **$48.95** for four disks. All disks come in a vinyl album.

Dealer Inquiries Welcome

Dorsett Educational Software features:

- Interactive Learning
- User Friendly
- Multiple Choice and Typed
- Program Advance with Correct Response
- Full-time audio narration (Cassette Programs Only)
- Self-Paced Study
- High Resolution Graphics
- Easy Reading Text

For more information, or to order call:

TOLL FREE 1-800-654-3871
IN OKLAHOMA CALL (405) 288-2301

MasterCard VISA

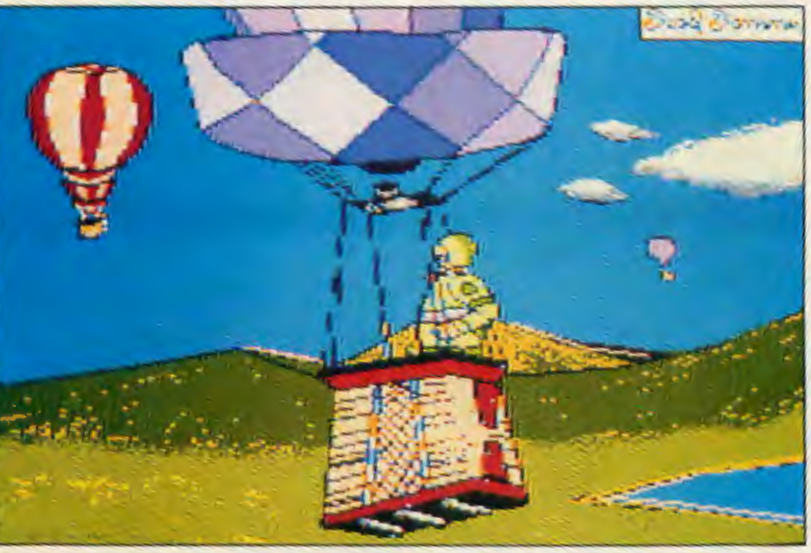
DORSETT
Educational Systems, Inc.
Box 1226, Norman, OK 73070

The CoCo Gallery

1st
COCO 3

Indian
Wally Mayes

This intense graphic was generated with *CoCo Max III*. Wally has had his CoCo for two years and really enjoys its graphics capabilities. He lives in Hamilton, Ohio.



2nd

Ballooning
Brad Bansner

Color Max Deluxe was put to use to illustrate this hobby. Brad lives in Wyomissing, Pennsylvania, and is a sophomore in high school.

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

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

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

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

— Angela Kapfhammer, Curator

We are taking "CoCo Gallery" to RAINBOWfest Chicago!
See Page 35 for details.

3rd

School
John Murvine, Jr.

John, of Ebensburg, Pennsylvania, used *Color Max 3* to develop this panorama of an educational institution.

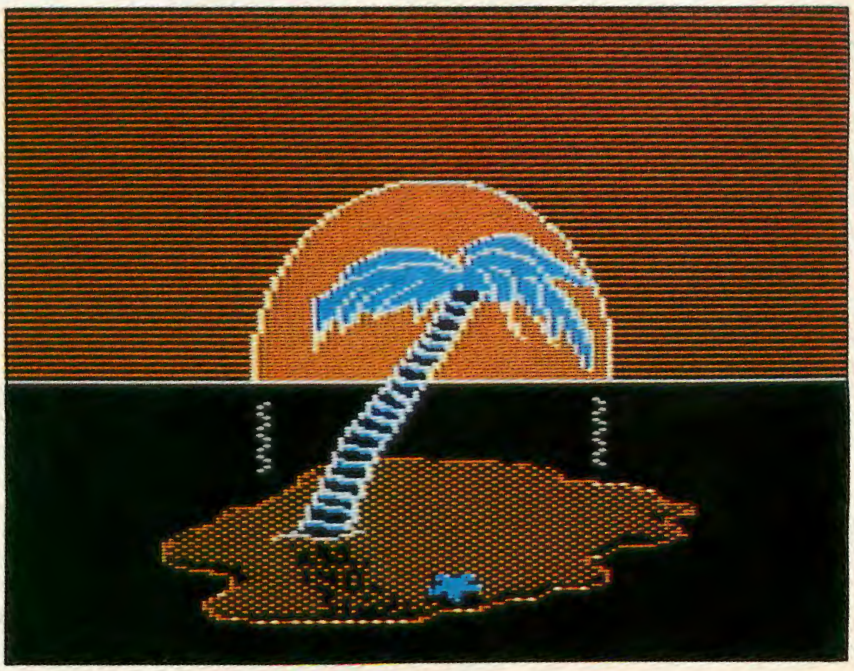
HONORABLE MENTION

Peterbilt '86
Darren L. Nye and Michael Kofile

This frontal view of a 1986 Peterbilt tractor trailor was produced with *Color Max 3*. Darren and Michael live in Somerville, New Jersey.

1st

COCO 1 & 2



Island
Christopher Lee Mayeux

Christopher, a self-employed electrician who enjoys programming in BASIC and BASIC09, produced this scene with *McPaint*. He lives in Chalmette, Louisiana.

A utility that prints invoices for parts and labor

Putting It on Their Tab

By Shawn Conant

Bill Generator is a handy program for anyone who needs to bill for labor plus materials. I use it constantly in my business as a self-employed cabinetmaker.

The program is simple to use. Upon running, you are asked for the number of hours to be billed, followed by the hourly wage. The prompts are generated by either INPUT or LINE INPUT statements, so you must press ENTER after answering each one.

Next you are asked for the markup for net prices and the discount for list prices. I always plan to make a small profit on the materials purchased for a job, but some supply companies bill me with a list price, then give a discount when the monthly bill is paid. Other suppliers give a net price, with no further discounts. If I am to make a profit, I must mark up the net prices for what I buy. But I don't want to make *too* much money, so I just take the discount from list prices as my profit.

It is always good to know just how much profit I have made on materials for any job, and this program keeps track of that for me. The markup and discount are entered as whole numbers for percentages, so 15 would be the entry for a markup of 15 percent.

When entering the cost of materials, it is necessary to indicate whether each amount is a net or list price by pressing N or L. When you have finished inputting materials, simply press ENTER instead of an amount, and you will be presented with your totals onscreen and asked if you want a bill printed. I often use the program up to this point for estimating jobs.

To print a bill, press Y and follow the prompts for the date and the client's address information. The Job Description category is a very simple text entry mode, sort of like an electronic typewriter. If you stop each line by pressing ENTER just before the graphics character on the screen, you will get a neat-looking bill. As you did with the materials list, press ENTER on an empty line when you're finished entering text. The final prompt is for any down payment received. If a printer is connected, two copies of the bill will print out, one for your client and another for your records. Added to the bottom of your copy will be the total cost of materials and your profit.

You will need to edit a couple of lines to customize it for your use. Line 390 should contain your name and address. Line 40 limits your job description to 10 lines; change that to a larger number if you want. The printer codes are for a Tandy DMP-130 and are clearly remarked in the program, making it easy to change to suit other printers. Line 50 sets the baud rate of the printer to 1200.

May your business always prosper.

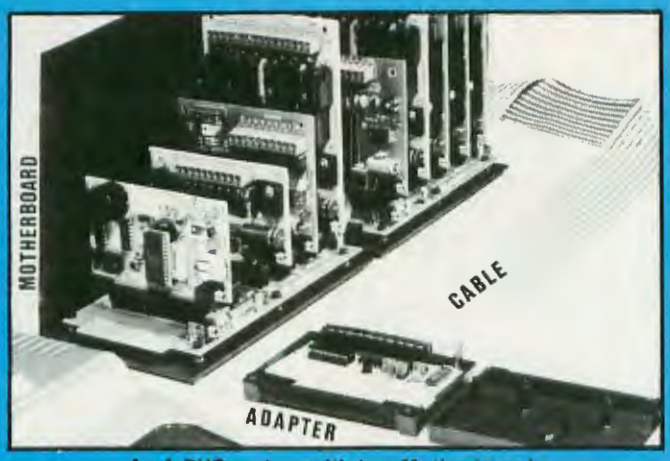
(Questions or comments may be directed to the author at RFD Box 170, Guildhall, VT 05905. Please enclose an SASE when writing for a response.) □

Shawn Conant is a self-employed cabinetmaker living in the remote "Northeast Kingdom" of Vermont. He and his wife and five children use the CoCo to combat "cabin fever" during the long winters.

```
                                   John Doe
                                   Main Street
                                   Hometown, Vt. 05905
                                   88/02/12


John D. Customer
1234 Purchase Avenue
Lexington, KY, 40502

Repair toner system on office copier

                    Labor=          $47.25
                    Materials=     $195.37
                    Total=         $242.62
                    Received=       $50.00
                    Balance due=   $192.62

                    Thank You!


                    Materials cost= $179.85
                    Profit          $15.52
```

The Amazing A-BUS

NEW



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

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

Plug into the future

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

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

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

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

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

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

About the A-BUS system:

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

Relay Card — RE-140: $129

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

Reed Relay Card — RE-156: $99

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

Analog Input Card — AD-142: $129

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

12 Bit A/D Converter — AN-146: $139

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

Digital Input Card — IN-141: $59

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

24 Line TTL I/O — DG-148: $65

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

Clock with Alarm — CL-144: $89

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

Touch Tone® Decoder — PH-145: $79

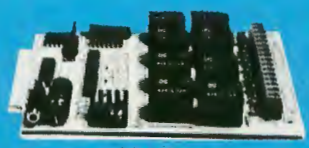
Each tone is converted into a number which is stored on the board. Simply read the number with INP or POKE. Use for remote control projects, etc.

A-BUS Prototyping Card — PR-152: $15

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

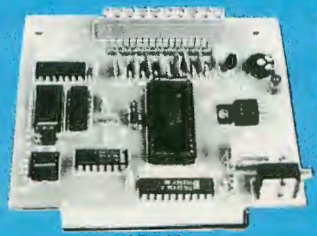
ST-143

CL-144



RE-140

IN-141



AD-142

Smart Stepper Controller — SC-149: $299

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

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

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

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

Stepper Motor Driver — ST-143: $79

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

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

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

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

Current Developments

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

A-BUS Adapters for:

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

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

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

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

A-BUS Motherboard — MB-120: $99

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

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

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

a Sigma Industries Company

ALPHA Products

242-W West Avenue, Darien, CT 06820

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

NEW FROM COLORWARE:

MAX·WEAR™

TRANSFERS

① DESIGN

② IRON

Special introductory offer:

$19.95

Eight 8 1/2 x 11" Sheets
Enough for 8 T-Shirts, etc.

Max-Wear transfers let you easily create your own Sweatshirts, T-Shirts, etc. **Max-Wear** transfers are 8.5 x 11" sheets of a special patented material. Anything your printer can print could be transfered to any cotton or cotton blend item.

You can use your own designs to make custom T-Shirts, Sweatshirts, caps, etc. Best of all, it's done in 3 easy steps. First use *CoCo Max*, (or any other graphics program) to create your design. Then print it on a **Max-Wear** transfer sheet with your regular printer and ribbon. (You can even print in color with the CGP-220, or add color with crayons if you wish.) The printed **Max-Wear** transfer sheet is then ironed onto the clothing, ready to wear! Of course, it's washproof.

SOME IDEAS: Cap insignia, Club T-shirts, Personalized gifts, Humorous underwear, Monograms, Pennants, etc.

③ WEAR

Super Special Free Font Disk

with your CoCo Max II or CoCo Max III order

Please specify disk number when ordering.

See facing page for ordering information.

Disk #1

Digital Medium
Digital Large
Futura
Grid Small
GRID LARGE
HAIFA
Victory
BABY TEETH LG.
BOBO BOLD
Cartwheel
Normande Small
Normande Medium
NORMANDE LG.
Piano
SINALOA

Disk #2

Harlow
Koloss
maharajah
Peignot Small
Peignot Large
PROGRAM SMALL
PROGRAM MEDIUM
PROGRAM LARGE
Futura Black Small
FUTURA BLK. LG.
LIQUID CRYSTAL
Москва Ларге
ORBIT
POINT OUT
Printout Small
PRINTOUT LARGE
STOP

Disk #3

Bocklin
Broadway
BROADWAY ENG.
Dot Matrix
Old English
PIONEER
URBAN
Xerxes Small
XERXES MEDIUM
XERXES LARGE
celtic
HARTLAND
Script
STENCIL
Thin Man
Tip Top
WOLT-AR

Disk #4

APOLLO
CHINESEWIN
EDONY
METAL
SLICE
COVERUP
RELIEF
Schwer
Square
traffic

FONT DISKS FOR **COCO MAX I, II AND III:**

Each: $24.95. SPECIAL: all 4 disks for only $49.95

COLORWARE

INTRODUCING THE NEXT GENERATION: CoCo Max™ III*

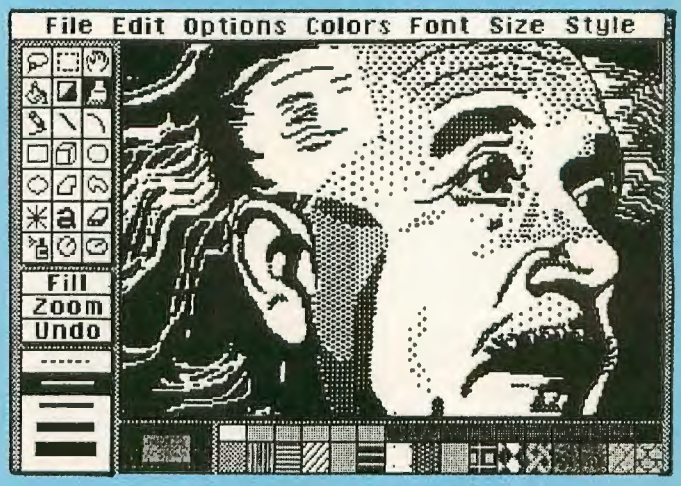
More Resolution · More Power · More Color · Built-in Animation · More Speed · More Type Styles · More Tools · Amazing Color Sequencing

"The best program ever written for the Color Computer"

That's how thousands of enthusiastic users rated the **CoCo Max II** drawing program. With **CoCo Max III** we are ready to amaze them again. Instead of "patching" CoCo Max II, we rewrote it from scratch to take advantage of the CoCo Max III hardware. The results will knock your socks off! Below is a brief list of some of the *new* features, but some, such as **animation**, **color sequencing**, or the **slide show**, have to be seen. Send for the Demo Disk, and see for yourself.

Everybody's favorite drawing package features:
- A 50% larger editing window. - Zoom area **400%** larger. - New drawing tools: **rays**, **3D cubes**, **arcs**,... - New editing tools: shadow,text size,... - Rotate by 1.5° steps - Select any 16 of the 64 possible colors (all 64 colors displayed at once!) - Powerful **color mix**: additive, subtractive, overlay,... - Full **color editing** of patterns and color changing patterns. - Incredible **special effects** with **color cycling** up to 8 colors with variable speed. -**Animation** adds the dimension of motion to your image. (Must be seen.) - Sophisticated data compression saves up to 70% of disk space when saving pictures.

In addition, there are dozens of enhancements to the multitude of features that made CoCo Max II a best seller.



Imagine this picture in sixteen colors!

Guaranteed Satisfaction
Use CoCo Max for a full month. If you are not delighted with it, we will refund every penny.

System Requirements:
Any CoCo 3 disk system with a Joystick or a Mouse.

We apologize to tape users, CoCo Max III needs the flexibility of a disk.

The **CoCo Max III** system includes: • The special Hi-Res interface (for your mouse or joystick) • The CoCo Max III disk • Many utilities: (To convert Max II pictures, Max colors, etc.) • A detailled User's Manual. Complete system; nothing else to buy. **CoCo Max III: $79.95***

More about CoCo Max III

- CoCo Max III is not an upgrade of CoCo Max II. It is entirely rewritten to take advantage of the new CoCo 3 hardware (More memory, resolution, colors, speed,...)
- The new CoCo Max III **Hi-Res Interface** and the CoCo Max II **Hi-Res Pack** are *not* interchangable.
- The new interface plugs into the joystick connector.
- The CoCo Max III disk is not copy protected.
- CoCo Max III only works with the CoCo 3.
- A Y-Cable or Multi-pak is not necessary.
- Colors are printed in five shades of gray.
- CoCo Max III can read CoCo Max II pictures.

Note: CoCo Max II (for the CoCo 2) is still available on disk ($79.95). CoCo Max I is still available on tape ($69.95). For details, refer to our double page ad in any *Rainbow* from January '86 to July '87

Toll Free operators are for orders only. If you need precise answers, call the **tech line.** (Detailled CoCo Max specs are included with the Demo Disk.)

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

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

* Beware of inferior imitations that *DO NOT* include a Hi-Res Interface or charge extra for each utility.

WITH COUPON ONLY

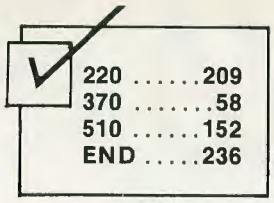
FREE DEMO DISK

Name .....
Street .....
City .....
State Zip .....
Printer used: .....

Please include $2 to help defray Processing and Shipping costs. (Check, Money Order, etc. Sorry, no COD or Credit Cards). Coupon (or copy) must be mailled to:

COLORWARE
A division of Sigma Industries, Inc.

COLORWARE
242-W West Avenue
Darien, CT 06820



The listing: BILLGEN

```
1Ø '*  BILL GENERATOR          *
2Ø '*  BY SHAWN CONANT         *
3Ø '*  NOVEMBER, 1987          *
4Ø DIM J$(1Ø):CLEAR1ØØØ
5Ø POKE149,Ø:POKE15Ø,18:'
**PRINTER BAUD RATE-12ØØ**
6Ø CLS:W=Ø:TFM=Ø:TCM=Ø
7Ø PRINT"HOW MANY HOURS";:INPUTH
8Ø PRINT"WHAT IS YOUR HOURLY RAT
E";:INPUTR
9Ø W=R*H:X=Ø:Z=Ø
1ØØ INPUT"WHAT'S THE MARKUP FOR
NET PRICES";MU
11Ø INPUT"AND THE DISCOUNT FOR L
IST PRICES";D
12Ø PRINT"TYPE MATERIALS COST, <
ENTER>,   THEN PRESS <N> TO INDI
CATE A NET PRICE OR <L> TO INDIC
ATE A LIST PRICE"
13Ø X=X+1
14Ø PRINTX;:INPUTM:IF M=ØTHEN21Ø
15Ø C$=INKEY$
16Ø IF C$<>"L"AND C$<>"N"THEN15Ø
17Ø IFC$="N" THEN GOSUB62Ø
18Ø IFC$="L"THEN GOSUB63Ø
19Ø TPROF=TPROF+PROF:TFM=TFM+FM:
TCM=TCM+CM
2ØØ GOTO13Ø
21Ø CLS:PRINT"PROFIT=",:PRINTUSI
NG"$$####.##";TPROF
22Ø PRINT:PRINT"MATERIALS COST="
,:PRINTUSING"$$####.##";TCM
23Ø PRINT:PRINT"BILL MATERIALS-"
,:PRINTUSING"$$####.##";TFM
24Ø PRINT:PRINT"WAGES=",:PRINTUS
ING"$$####.##";W
25Ø PRINT:FB=TFM+W:PRINT"TOTAL B
ILL=",:PRINTUSING"$$####.##";FB
26Ø PRINT:PRINT"DO YOU WANT A BI
LL PRINTED?<Y/N>"
27Ø A$=INKEY$:IF A$<>"Y"AND A$<>
"N"THEN27Ø
28Ø IFA$="N"THENEND
29Ø POKE282,Ø:'*UPPER/LOWER CASE
 DISPLAY*
3ØØ INPUT"DATE-ØØ/ØØ/ØØ";D$
31Ø INPUT"MAKE BILL TO:";N$
32Ø INPUT"STREET ADDRESS:";S$:IN
PUT"CITY:";CI$:INPUT"STATE";ST$:
INPUT"ZIP";Z$
33Ø CLS:POKE111Ø,246:Z=Z+1
34Ø LINE INPUT"JOB DESCRIPTION:
<ENTER> TO END ";J$(Z)
35Ø IFJ$(Z)=""THENGOTO36ØELSEGOT
O33Ø
36Ø INPUT"HOW MUCH DOWN PAYMENT"
;DO:BAL=FB-DO
37Ø POKE282,255:FORX=1TO2
38Ø FORY=1TO6:PRINT#-2:NEXTY
39Ø PRINT#-2,TAB(4Ø),"John Doe":
PRINT#-2,TAB(4Ø),"Main Street":P
RINT#-2,TAB(4Ø),"Hometown, Vt. Ø
59Ø5"
4ØØ PRINT#-2,TAB(4Ø),D$
41Ø PRINT#-2:PRINT#-2,TAB(1Ø),N$
42Ø IFS$=""AND CI$=""ANDST$=""TH
ENGOTO44Ø
43Ø PRINT#-2,TAB(1Ø),S$:PRINT#-2
,TAB(1Ø),CI$", "ST$", "Z$
44Ø PRINT#-2:PRINT#-2
45Ø FOR Y=1TOZ:PRINT#-2,TAB(1Ø),
J$(Y):NEXTY
46Ø PRINT#-2:PRINT#-2,TAB(3Ø),"L
abor=",:PRINT#-2,USING "$$####.#
#";W
47Ø PRINT#-2:PRINT#-2,TAB(3Ø),"M
aterials=",:PRINT#-2,USING"$$###
#.##";TFM
48Ø PRINT#-2:PRINT#-2,TAB(3Ø),"T
otal=",:PRINT#-2,USING"$$####.##
";FB
49Ø IF DO=Ø THEN GOTO53Ø
5ØØ PRINT#-2:PRINT#-2,TAB(3Ø),"R
eceived=",:PRINT#-2,USING "$$###
#.##";DO
51Ø PRINT#-2:PRINT#-2,TAB(3Ø),"B
alance due=",:PRINT#-2,USING"$$#
###.##";BAL
52Ø PRINT#-2,CHR$(27);CHR$(31):'
**BOLDFACE**
53Ø PRINT#-2:PRINT#-2,TAB(3Ø),"T
hank You!"
54Ø PRINT#-2,CHR$(27);CHR$(32):'
**END BOLDFACE**
55Ø IF X=1THENPRINT#-2,CHR$(12):
'**FORM FEED**
56Ø NEXT X
57Ø FORY=1TO6:PRINT#-2:NEXTY
58Ø PRINT#-2:PRINT#-2,TAB(3Ø),"M
aterials cost=",:PRINT#-2,USING"
$$####.##";TCM
59Ø PRINT#-2:PRINT#-2,TAB(3Ø),"P
rofit",:PRINT#-2,USING"$$####.##
";TPROF
6ØØ PRINT#-2,CHR$(12):'
**FORMFEED**
61Ø END
62Ø PROF=M*(MU/1ØØ):FM=M+PROF:CM
=M:RETURN
63Ø PROF=M*(MD/1ØØ):FM=M:CM=M-PR
OF:RETURN
```

Prospect, Kentucky
Vol. 2
No. 5

Reporter: Cray Augsburg
Photographer: Ed Ellers

RAINBOWFEST

PRINCETON OCT. 9-11

REPORTER

®Falsoft Inc., All Rights Reserved

CoCo Past, Present and Future at Princeton RAINBOWfest

The 14th RAINBOWfest opened at 7 p.m., Friday, October 9, 1987. It was cold outside, but inside, it was all warmth and happiness. As some people jammed the aisles in an attempt to find those long-awaited bargains, others took the time to relax and meet with old and new friends.

On Saturday morning, many early risers attended the traditional CoCo Community Breakfast. Sharing the head table with Lonnie Falk, RAINBOW's editor and publisher, were many CoCo notables including RAINBOW contributing editors Marty Goodman, Dale Puckett and Richard Esposito, Delphi personalities Greg Law and Don Hutchison, RAINBOW Managing Editor, Jutta Kapfhammer, and Executive Editor, Jim Reed. Also seated at the head table were Tandy dignitaries Barry Thompson, Mark Siegel, Fran McGehee and Srini Vasan.

Jim Reed delivered the keynote address concerning where the CoCo Community has been, where it is now and where it is going. Jim also offered personal accounts of some of the more humorous incidents at RAINBOW over the years.

Over 10,000 people attended the Princeton show.

The CoCo Community Breakfast offers early risers a chance to relax and reflect before the exhibit hall opens.

In closing, Jim took a few minutes to roast his employer, Lonnie. Fortunately, for Jim's sake, Lonnie was in an excellent mood.

Saturday's seminars, which covered everything from hardware hacking to OS-9, were very well attended.

Sunday's exhibit hall activities gave way to many great bargains and the showroom maintained a "get that good deal" atmosphere.

Attendees got answers to their questions at the show.

New Hardware on CoCo Horizon

A hardware hacker finds parts bargains.

At the Disto booth, Tony DiStefano announced that he has designed a new Super Controller, the SC-2. This high-performance disk controller will have "no wait" operation under OS-9. Tony indicated that interest in this new product was extremely high.

Also in the works is a new mini-bus system that will give the CoCo user great flexibility in setting up a CoCo system.

Sardis technology sold out of their Dual Mode Controller (DMC) at the Princeton show and then sold "seconds" for $30 off the regular price of $149.50 and good units for $15 off.

The DMC allows "no halt" operation under OS-9. Its second mode gives the user complete compatibility when using Disk BASIC.

At Owl-Ware, disk drives seemed to be the main target, as Drive 0 systems were going for $139 and a Drive 1 could be had for $85 (bare drives were $45). Also, 10Mb hard drive systems were priced at $439 and 20Mb drives sold for $659.

Owl-Ware has answered many a CoCoist's prayers by introducing an IBM keyboard adapter. This unit is designed to convert the signals from any standard IBM-type keyboard for the CoCo, and will retail for $119.

The winner of Owl-Ware's "Name the Owl" Contest was Robby Allen for his entry of "Wholio." For his inspiration, Robby received a prize worth $250.

A newcomer to the Princeton show was Burke & Burke. They were offering the CoCo XT and CoCo XT-RTC.

The CoCo XT is a hard disk interface designed to accept standard Western Digital hard drive controllers and allow connection of a standard hard drive to a CoCo via the Multi-Pak Interface.

The CoCo XT-RTC is similar to the CoCo XT except that it includes a real-time clock. The CoCo XT retails for $69.95 and the RTC version retails for $99.95.

Drives were the story at the Southwestern Digital booth. Here you could pick up a single-sided Drive 0 for $109 or a double-sided Drive 0 for $129.

The HDS disk controller kit went for $40, while a fully assembled unit with ROM sold for only $60.

The CoCo Cat Educational Sandbox attracted many of the younger CoCo experts.

Radio Shack Offers Two 100% Discounts!

Radio Shack opened the show Friday night selling CoCo 3s for $100. Saturday, however, they raised the price to $115.

Other bargains included the DMP-130 for $239, FD-501 Drive 0 for $175, DMP-106 printer for $159.95, CM-8 monitor for $239.95, and the DWP-230 printer for $289.95.

The single-button mouse was selling for just $20. 64K CoCo 2s went for $29.95 and 16K machines sold for a mere $9.95. Needless to say, they went fast!

In addition to the above bargains, Radio Shack brought in boxes of 64K chips (500 kits, 16 chips to the kit) and the Plug & Power Controllers (4600 units, retailing for $99.95) and gave them away as freebies!

Manager John Hutchinson said, "The CoCo market is definitely alive and well . . . it is thriving!"

Tandy executives Mark Siegel, left, and Barry Thompson, right, get assistance from CoCo Cat.

CoCo Club Supports 'fest

To support the CoCo Community and to help RAINBOW, the Mercer County Color Computer Club attended the 'fest in force.

They were there selling Princeton '87 T-shirts, as well as tickets for their own club raffle.

The club members always had time for helping attendees find their way around and for offering information and answers to the many questions that were asked. As usual, their presence was a big help and it is greatly appreciated.

Tandy's Fran McGehee helps at the Radio Shack booth.

RAINBOW Technical Editor Cray Augsburg deals with OS-9.

Chocolate CoCos On a Stick!

In addition to bringing their complete line of educational software, Computer Island had boxes of 10 double-sided, double-density disks for only $5. One of the items many people stocked up on, though, were the chocolate computer lollipops!

Cheryl and Shari Blyn of Computer Island rest a moment.

Usernames and User Faces

Greg Law (above) of the OS-9 Online SIG was on hand to field the latest questions, as was Don Hutchison, the CoCo SIG database manager. John Gibney and Paul Hodosh were also available as representatives of the Delphi system.

Jessie Jackson and Mona Rowe of J & R Electronics offered complete 512K upgrades, with software, for $99.95

Sight and Sound from Dr. Preble's Programs

The first thing many people saw when they entered the exhibit hall in Princeton was Dr. Preble's booth. On a CoCo screen was a digitized image of Dr. Larry Preble. In the background, one could hear his digitized voice.

Vocal Freedom, a digital voice recorder, caught the attention of many. This program allows the user to record speech using a CoCo 1, 2 or 3 and was selling for $29.95. It allows several minutes of speech to be recorded on a 512K machine, and doesn't use up memory for silent sections of the speech.

"The show is wonderful," Dr. Preble said. "It has been a while since the last show we attended, and the people are still really great!"

Dr. Larry Preble demonstrated some of his unique software at the "CoCo As a Mind Interface" seminar.

Clearly OS-9 at Clearbrook

Paul Kehler of Clearbrook Software Group spent a great deal of time demonstrating *CSG IMS*, a relational database manager; *Serina*, a system mode debugger; *Erina*, a symbolic user-mode debugger; and *MSF*, an MS-DOS file manager.

MSF, which was selling for one-third off the regular price of $45, allows the direct use of MS-DOS disks under OS-9.

"Other than problems with customs (at the Canadian border), things are really going well for us, Mr. Kehler said. "And we are happy to be here."

Graphics Going Strong

Graphics has always been the name of the game at Computize. At RAINBOWfest their big special was a bundled software package worth $179 selling for $69.95.

The bundle included *Color Max 3 Deluxe, Picture Converter, BASIC Tool and Gallery*, and several utilites.

Also, since this was the first show for *Color Max 3 Deluxe*, upgrades were available for those who had purchased the original *Color Max 3*. Over a hundred attendees were able to take advantage of this $15 offer (this offer is still in effect through Computize). On hand to answer questions were *Color Max 3* programmers Erik Gavriluk and Greg Miller.

At Diecom, the *RAT* graphics design package was selling for $59.95.

RAT includes its own high-quality optical mouse and mouse pad and is a full-featured design package for the CoCo 3.

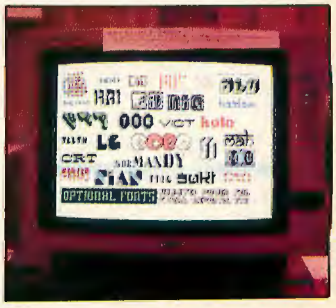
Diecom President David Dies said, "In the future, we hope to provide several games designed to work with the Light Phaser like *Iron Forest* does."

This was the RAINBOWfest debut of Colorware's new *CoCo Max III*, a full-featured graphics development program.

CoCo Max III resembles *CoCo Max II* except that it has three columns of icons on the left side of the screen, allowing the selection of the many new features.

The option of a free *Max Font* disk ($24.95 value) or the purchase of a complete font library (nearly 100 fonts) for $29.95 was included in the cost of *CoCo Max II* for $79.95.

While it wasn't for sale, one of the show stoppers in Princeton was a homemade robotic arm designed by John Monin. The arm was driven with the Alpha Products A-Bus and controlled by a standard CoCo.



A view of *CoCo Max 3*

CoCo 3 Well Supported

Gimmesoft and J&R Electronics put together a package including a 512K upgrade board (0K installed) from J&R Electronics, and *FKEYS III* and *SIXDRIVE* from Gimmesoft. The package sold for $69.95.

Gimmesoft was offering their new Multi-Pak Interface Locking Plate for $7.95. They also offered special deals on *FKEYS III*, *SIXDRIVE*, *Multi-Label* and *Custom Palette Designer.*

At Microcom, the hottest item was *Super Tape/Disk Transfer.* In addition, Microcom sold 10 of the Intronics EPROM programmers.

Said Manohar Santwani, owner of Microcom, "What we have seen indicates that people really want to get into the programming end of the machine.

Sharing a booth with Microcom was Spectrum Projects. According to Bob Rosen, "The CoCo 3 has really hit well. We've sold more products for it than anything else at this show."

The hot item at the Sugar Software booth was the *Calligrapher* combo, a package that included *CoCo Calligrapher* and 54 fonts for $69.95.

Another big seller was *Galactic Hangman*, a graphics version of the popular word game.

Bob Hengstebeck was marketing a new program sure to be of interest to serious OS-9 users, *The Hard Disk Organizer* — a compiled C program designed to allow users to develop menu-driven pathlists so that applications can easily be accessed from the hard drive. The price for *The Hard Disk Organizer* is $24.95.

Art Flexser, of Spectro Systems, was selling ADOS 1.02 for the CoCo 1 and 2, ADOS-3 for the CoCo 3 and *Peeper*, a machine language program tracer. ADOS really seems to be a hot-seller anywhere it goes since it allows the user to customize his system from a software standpoint.

Steve Bjork, owner of SRB Software, was busy demonstrating his new product, *Warp Fighter 3-D*. This space simulation game utilizes features of the CoCo 3 along with game enhancements through 3-D technology.

According to Steve, "The gameplayers really seem interested in this one. I took this show as a good opportunity to test-market *Warp Fighter 3-D*. So far the results are pleasing."

Barry Thompson fields a question at the "Talk to Tandy" seminar.

Mark Siegel, left, and Dale Puckett.

A lesson to learn!

***DaVinci 3* attracts attention.**

Breakfast speaker Jim Reed, left, and Lonnie Falk.

Goodies Galore

"Everything seems to be selling equally well. The stand-outs are the Magnavox monitor and the 512K upgrades," said Fran Purcell of Computer Plus. "These are really hot."

"As people move into the CoCo 3 and begin using OS-9, we are seeing an excellent market for new hardware and software offerings," Fran said.

While competition in the disk drive market was stiff in Princeton, Howard Medical had little difficulty selling their Drive 0 system for a show special of $178.45.

Of the show, Manager Ross Litton said, "We have seen many different people here at the RAINBOWfest and all of them seem to share a common goodwill."

Bargains to be found at the Microworld booth included the DMP-130A for $215 and the CM-8 monitor for $239.

All software went for 20 percent off the regular price. Also, CoCo 3s were available for only $115, brand new in the box. You could even pick up a pair of joysticks for $10.

Direct from Mt. Sivai: Saint John

This was the first RAINBOWfest exhibit for R.J. Babich and family of Mt. Sivai, New York. Their company, The St. John Gallery Press and Software, offered several utilities, including a feature-packed disk editor.

The feature offering was *Astro Fortune Teller*, which completely fills a disk, yet, due to a modular approach, runs on any system having at least 32K. Another big seller was *The Best BBS*, which was going for $12.

T & D "Expecting" Great Things

At T & D Subscription Software, a one-year subscription was going for $60 for tape and $70 for disk. Each of their 64 issues contains 10 programs and was being sold at a show special of just $5.

The story of Tom and Marianne Dykema, owners of T & D, has taken an exciting twist. It seems they will be hearing the pitter-patter of little feet around their home in early May. Best wishes and lots of luck to them!

Public Domain: The Library's Growing

Public Domain Software Copying Company ran a last-day special in which the user could purchase any 10 disks from the 36-disk library for only $25. And the complete library was going for $75.

In addition to CoCo software, Public Domain also had several offerings in their MS-DOS library.

Public Domain's Al Zucker said, "By the Chicago show in '88 we expect to have a complete CoCo 3 library. We think this is a big need in the Community right now."

Telewriter-128™

the Color Computer 3 Word Processor

For over 5 years now, Telewriter has been the #1 Color Computer word processor, both in popularity and in performance. Telewriter's near perfect mix of sophisticated professional features and a very natural user interface, has earned it the highest praise in numerous magazines, and an intensely loyal following among tens of thousands of Color Computer users all over the world.

HISTORY

Throughout the history of the Color Computer, Telewriter has pioneered software breakthroughs that set the standards.

In 1981, it was Telewriter 1.0 that first took the Color Computer's inadequate 32X16 all-uppercase display, and replaced it with a graphics-based 51X24 upper and lowercase display.

A few years later, Telewriter-64 added high density 64X24 and 85X24 displays and access to the full 64K of the newer Color Computers.

THE NEW AGE

Today, Telewriter-64 is recognized as the standard Color Computer word processor. It runs on all Tandy Color Computers — from the original Color Computer 1, to the Color Computer 2, and 3.

But the Color Computer 3 brings a whole new level of power to low cost computing and, so, a new Telewriter is here to put that power to work for you. We call it Telewriter-128.

TELEWRITER-128

You don't mess with a good thing, so Telewriter-128 is still Telewriter-64 at heart. The commands, and the user interface are essentially the same. If you know Telewriter-64, then you already know Telewriter-128. And, if you don't know Telewriter-64, you'll still have an easy time learning and using Telewriter-128.

80 COLUMNS

But there are major differences as well. First, Telewriter-128 uses the Color Computer 3's new 80 column screen display.

This means, simply, that using Telewriter-128 on a low cost Color Computer 3 will look a lot like using a more expensive word processor on a much more expensive IBM PC, PS/2, or clone.

SPEED

Second, Telewriter-128 is lightning fast. Telewriter-64 was fast in its own right, but, by accessing the Color Computer 3's video hardware directly, and by running the machine in double speed mode, Telewriter-128 is able to provide extremely fast scrolling and instant paging — functions whose speed is crucial to serious word processing.

In this department, Telewriter-128 doesn't simply keep up with IBM-based word processors — it generally surpasses them!

EASE

Third, Telewriter-128 adds a host of new features big and small, that make it even easier to use.

Features like: Quick function key access to the editor or the menus — an instant on-line help screen summarizing all Telewriter commands and special characters — an option file where you store your personal set of format and screen settings so you only have to set them once!

Then, there's a quick save feature which allows you to save all your current work without leaving the editor. There's a simple way to cursor through the disk directory and read in a file by just hitting ENTER. And there's more.

NEW POWER

Telewriter-64 always had the power to handle any kind of serious writing, from letters to textbooks. But, here too, Telewriter-128 adds major features.

Like Macros — which let you insert whole words or phrases (even sets of control codes or format commands) into your text, with a single keypress. And every time you power up Telewriter-128, the macro definitions are automatically loaded*, so they're always there.

Then there's a Print Preview feature that shows you, on-screen, the way your printed text will look — with margins, headers, centering, justification, page numbering, and page breaks. This guarantees letter perfect documents every time, and makes tasks like widow/orphan line elimination, a breeze.

TELEWRITER-64 OR TELEWRITER-128

We could go on listing features, but the point is this: If you own a Color Computer, you already have the hardware for the most powerful, low cost word processor in town. All you need now is to add the heart and soul:

Telewriter-64, for the Color Computer 1 and 2, costs $59.95 on disk, $49.95 on cassette.

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

To order by Mastercard or Visa call (619) 755-1258 anytime, or send check or money order plus $2 shipping (Californians add 6% sales tax) to:

COGNITEC
704 Nob Ave.
Del Mar, CA 92014

To upgrade from Telewriter-64 to Telewriter-128, return your original disk or cassette with $39.95. (Add $10 if you're also upgrading from cassette to disk. Deduct $10 with proof of Oct '87 - Feb '88, purchase of Telewriter-64.)

When I first got Telewriter-64 last year, I was in heaven. I couldn't believe the program's versatility and ease of use.
-The RAINBOW, Oct. 1985

TELEWRITER-64 FEATURES: Compatibility with any printer that works with the Color Computer; embedded control codes for underlining, boldface, sub/superscript, variable fonts; format commands for headers, centering, margin and spacing changes anywhere in the document; Format menu to set margins, spacing, page numbering, BAUD rate, lines per page, justification; Chain printing for one shot printing of multi-file documents. Fast, full-screen editor with wordwrap, block copy/move/delete, global search and replace, wild card search, fast 4-way auto-repeat cursor, fast scrolling, forward and backward paging, text alignment, tabs, error protection, word and line counter. Insert or delete text anywhere on the screen. Simple, easy to remember commands. Optional ASCII files for compatibility with spell checkers, terminal programs, and BASIC. Load, save, append, partial save files to disk or cassette. Kill, rename and list disk files. Cassette verify and auto-retry on error.

TELEWRITER-128 - ADDITIONAL FEATURES: Print preview from editor; multiple copy print; footers; hanging indents; cursor thru disk directory to load, append, rename and kill files; quick file save from editor; keyclick; key repeat; true block move; 24, 25, or 28 line screen; 40 or 80 column screen; dual speed cursor; on-line help; overstrike mode; word delete; wordwrap at margin; user definable macros; nested macros; instant status window for information on cursor position, word count, etc.; instant function key access to menus or editor; options menu for setting character and screen colors, key repeat and delay rates, definable foreign symbols.

IBM and PS/2 are trademarks of International Business Machines Inc. *disk version only

T & D SUBSCRIPTION SOFTWARE CONTINUES ITS

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

ISSUE #19, JANUARY 1984
BANNER
PROBE
DISK DIRECTORY PROTECTOR
OPTICAL CONFUSION
WORD PROCESSOR
WORD SEARCH
ASTRONAUT RESCUE
STAR TRAP
PIE CHART
FORCE FIELD

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

ISSUE #21, MARCH 1984
BASIC CONVERSIONS
FINANCIAL ADVISE
CASTLE STORM
DOS HEAD CLEANER
COCO TERMINAL
SNAKE CRAWLER
WAR CASTLE
SKY FIRE
EASY BASIC
DOTS 3-D

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

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

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

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

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

ISSUE #27, SEPTEMBER 198
COCO TO COM 64
GALACTIC SMUGGLER
INDY RACE
ACCOUNT MANAGER
CASSETTE MERGE UTILITY
STRING PACKING TUTORIAL
SPACE DUEL
BUGS
TRAP-BALL
BALLOON FIRE

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

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

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

ISSUE #31, JANUARY 1985
TREASURES OF BARSOOM
BATTLE GROUND
STRUCTURED COMPILED LANGUAG
LIBRARY MODULE
MINIATURE GOLF
STAR DUEL
ARITHMETIC FOOTBALL
GRID RUN
SPIRAL ATTACK
FAST SORT
MUNCHMAN

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

ISSUE #33, MARCH 1985
LIGHT CYCLE
PAINT
SKEET SHOOTING
GUITAR NOTES
ML DISK ANALYZER
PERSONAL DIRECTORY
NAUGHA ADVENTURE
EGGS GAME
DISK DIRECTORY PRINT
SPEED KEY

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

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

VISA

MasterCard

SUPER SAVINGS

Single Issue $8.00
2–5 Issues ..... $6.00 ea.
6–10 Issues ..... $5.00 ea.
11 or more Issues . $4.50 ea.
All 67 Issues $185.00

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

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

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

RAINBOW
CERTIFICATION SEAL

BACK ISSUE SALE OF OVER 670 PROGRAMS!

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

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

ISSUE #38, AUGUST 1985
- GOLF PAR 3
- WIZARD ADVENTURE
- KITE DESIGN
- ROBOTS
- GOMOKU
- AMULET OF POWER
- LINE COPY UTILITY
- DISK PLUMBER
- SUPER RAM CHECKER
- GRAPHIC HORSE RACE

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

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

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

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

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

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

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

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

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

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

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

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

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

ISSUE #52, OCTOBER 1986
- ACCOUNTS RECEIVABLE
- WORKMATE SERIES.
- CALENDAR
- INVASION
- THE TRIP ADVENTURE
- FOOT RACE
- FLIPPY THE SEAL
- SCREEN CALCULATOR
- ABLE BUILDERS
- SUPER ERROR 2

ISSUE #53, NOVEMBER 1986
- CORE KILL
- LUCKY MONEY
- COOKIES ADVENTURE
- NICE LIST
- SPANISH QUIZZES
- PAINT EDITOR
- CAVERN CRUISER
- SNAP SHOT
- MEGA RACE
- KICK GUY

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

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

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

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

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

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

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

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

ISSUE #62, AUGUST 1987
- PENSION MANAGEMENT
- HERB GROWING
- CATALOGER UTILITY
- RAIDERS
- ALPHABETIZING
- W.F.O.
- ELECTRONICS V
- RAMBO ADVENTURE
- BLOCKS
- MULTI SCREEN CAVES

ISSUE #63, SEPTEMBER 1987
- GENEOLOGIST HELPER
- SMART COPY
- MAINTENANCE REPORTING
- COCO 3-COCO 2 HELPER
- DIRECTORY PICTURE
- SUB STTACK
- SAVE THE MAIDEN
- CAVIATOR
- ELECTRONICS VI
- MONKEY SHINE

ISSUE #64, OCTOBER 1987
- GARDEN PLANTS
- FORT KNOX
- ELECTRONICS FORMULAS
- SNAKE IN THE GRASS
- CYCLE JUMP
- GEOMETRY TUTOR
- WIZARD
- GAME OF LIFE
- ELECTRONICS VII
- FLIGHT SIMULATOR

ISSUE #65, NOVEMBER 1987
- TAXMAN
- DAISY WHEEL PICTURES
- SIR EGGBERT
- CROWN QUEST
- GYM KHANA
- COCO 3 DRAWER
- FOOTBALL
- ELECTRONICS 8
- CHOP

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

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

Gentlemen,
"I just received my first order and I am very pleased! Enclosed is a check for all the remaining back issues plus a 1-year subscription."
Gary Rhodes
Fontana, CA

Dear T&D,
"As the Computer Instructor for our school, I have been a subscriber to T&D software for two years. I love your programs. The quality is excellent!"
Barry R Goblin
Staten Island, NY

MAIL TO:

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

Name _____

Address _____

City _____ State _____ ZIP _____

Credit Card # _____

Expires _____

TOTAL AMOUNT $ _____

CIRCLE ISSUES DESIRED

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

PLEASE CIRCLE TAPE or DISK

A utility to help you decide whether or not to market your product

Advertising Profit Predictor

By Bill Bernico

Most of you RAINBOW readers have probably written at least one really good program you've considered marketing commercially. Being a first-timer, you're probably a little leery about shelling out the advertising dollars necessary to get the project off the ground. You're not quite sure what your chances are for success.

If some of your questions could be answered, would you take a chance? *Advertising Profit Predictor* helps answer some of those questions and puts things in their proper perspective.

Run the program and we'll go through it together. First, you're asked for the number of people who subscribe to the publication you're considering (total paid circulation). This is important because it gives you an idea of how many potential buyers are out there for you. You can find circulation figures somewhere in the front of most magazines. If you don't see the figure there, write the company and ask.

Next, input the selling price of the product you're marketing. After that, enter your cost per unit. In other words, take into consideration things like blank disks or tapes, envelopes, stamps, etc. This is your cost per unit. After you've entered this amount, enter the cost of the magazine ad. To simplify this example, enter the cost of a one-time ad. When you've entered this amount, the display will show your profit per unit.

Bill Bernico is the author of over 200 Color Computer programs and is a frequent RAINBOW contributor whose hobbies include golf, writing music and programming. Bill is a drummer in a rock band and lives in Sheboygan, Wisconsin.

All right, so now you know how much you could make on each transaction. What does this translate to in terms of a mass audience? To find out, press any key and you'll be taken to the statistics section.

From here you can break things down three different ways. Let's try each way and see what happens. I'll give you some sample figures to work with; when you get familiar with the program's operation, simply substitute your own actual figures.

For circulation, let's use 75,000 as a round figure. For a selling price, try $9.95. Let's assume your cost per unit is $4.00. For an ad price, enter $235.00. Your profit per unit should be $5.95 less the price of the ad. OK, now we're at the statistics section.

First, let's try Option 2. Enter an amount that you see as your goal. In other words, when all is said and done, how much money do you want to make on this venture? For this sample, input $5000.00 to see the outcome. The display will show that in order to make $5,000, you'll need to sell 840 units. This also means that you have to capture only 1.1 percent of the magazine's readers. After deducting the cost of the ad, you will net a profit of $4,765. Not bad!

Now that you know it takes only a small percentage of readers to respond, let's try Option 1. It asks you what percentage of the readers you think you can sell to. Try 3 percent as an example. You'll notice that selling to only 3 percent of those 75,000 readers results in a sale of 2,250 units with a profit of $13,387.50 less the $235 for the ad. Still, you're left with a whopping $13,152.50 for your efforts. Now we're talking big business.

Finally, let's try Option 3. Suppose you jumped ahead of yourself and anticipated selling a certain number of units. Suppose you have already bought 1,000 blank disks, 1,000 envelopes and 1,000 stamps. What will it take to move all those units out? That's the question Option 3 will answer. Input 1000 at the prompt. The program then tells you that if you do, indeed, sell your 1,000 units, you have sold to 1.3 percent of the readership. You will also have made $5,950 dollars in the attempt (less the $235 for the ad). Your net profit is $5,715. Still want to debate whether or not to spend money to advertise your product?

With this program, you can also do a lot of "what if" predictions. For example, *if* the price and cost figures stay the same but the circulation goes up, so does your chance for success. *If* you can lower your cost but the selling price stays the same, your profit goes up. *If* you try for that extra percentage of readers, what will that mean to you in additional profits? See what I mean? *Advertising Profit Predictor* can answer lots of marketing questions.

Don't let your fear of initial costs keep you from marketing what you consider to be a top-notch program. The readers are waiting for your program. Simply have faith in yourself, offer a good product at a fair price and deliver what you promise. The rest is easy.

(Questions or comments about this program may be directed to the author at 708 Michigan Ave., Sheboygan, WI 53081. Please enclose an SASE when writing for a reply.) □

The listing: ADPROFIT

```
1 'ADVERTISING PROFIT PREDICTOR
2 'by Bill Bernico
3 B$=STRING$(32,14Ø)
4 BB$=STRING$(32,131)
5 CLS:INPUT"HOW MANY SUBSCRIBERS
 DOES THIS  PUBLICATION HAVE";S
6 PRINTB$;:LINEINPUT"WHAT IS THE
 SELLING PRICE OF    YOUR PRODUC
T $";SF$
7 SF=VAL(SF$)
8 PRINT B$;:LINEINPUT"HOW MUCH D
OES EACH UNIT COST YOUTO PRODUCE
 $";CP$
9 CP=VAL(CP$)
1Ø PRINT B$;:LINE INPUT"WHAT IS
THE PRICE OF AN AD IN   THIS PUB
LICATION $";AD$
11 AD=VAL(AD$)
12 PRINT B$;:PRINT"YOUR PROFIT P
ER UNIT IS $";SF-CP
13 PRINT"(LESS THE PRICE OF THE
AD)"
14 PRINT B$;
15 PRINT@483,"HIT ANY KEY FOR ST
ATISTICS";
16 FOR X=15Ø4 TO 1535
17 POKE X,PEEK(X)-64:NEXT X
18 IF INKEY$=""THEN 18
19 CLS:PRINT@7,"AVAILABLE OPTION
S
2Ø FOR X=1Ø24 TO 1Ø55
21 POKE X,PEEK(X)-64:NEXT X
22 PRINT BB$;:PRINT"1. ESTIMATE
THE PERCENTAGE          OF BUYERS
 YOU THINK YOU          CAN SELL
YOUR PRODUCT TO
23 PRINT B$;:PRINT"2. ESTIMATE P
OTENTIAL NET            PROFIT YOU
 CAN MAKE IF            YOU ADVERT
ISE YOUR                PRODUCT.
24 PRINT B$;:PRINT"3. ESTIMATE N
UMBER OF                POTENTIAL
BUYERS FOR              YOUR PRODU
CT.
25 PRINT B$;:PRINT@49Ø,"SELECT (
1-3)";
26 FOR X=15Ø4 TO 1535
27 POKE X,PEEK(X)-64:NEXT X
28 A$=INKEY$:IF A$=""THEN 28
29 A=VAL(A$):ON A GOTO 31,4Ø,55
3Ø GOTO 28
31 A=SF-CP:CLS:PRINT"WHAT PER CE
NTAGE OF THE"S
32 INPUT"READERS DO YOU THINK YO
U CAN    SELL";PS
33 PB=(S*PS)/1ØØ
34 PRINT B$;:PRINT"IN ORDER TO C
APTURE"PS;"%"
35 PRINT"OF THE MARKET, YOU'LL H
AVE TO   SELL";INT(PB);"UNITS. Y
OUR PROFIT
36 PRINT"WILL BE $";PB*A
37 PRINT"MINUS $"AD"FOR THE AD
38 PRINT"NETTING YOU $"(PB*A)-AD
39 PRINT BB$;:GOTO 67
4Ø PR$="###.#":CLS
41 LINE INPUT"WHAT PROFIT FIGURE
 ARE YOU      AIMING FOR $";PF$
42 PF=VAL(PF$)
43 A=SF-CP
44 TP=INT(PF/A)
45 PR=(TP/S)*1ØØ
46 PRINT B$;:PRINT"IN ORDER TO M
AKE $";PF
47 PRINT"YOU'LL NEED TO SELL"TP"
UNITS
48 PRINT"OR";
49 PRINT USING PR$;PR;
5Ø PRINT"% OF THE READERS.
51 PRINT"DEDUCT $"AD"FOR THE AD
52 PRINT"AND YOU STILL NET $"PF-
AD
53 PRINT BB$;
54 GOTO 67
55 PR$="###.#":A=SF-CP:CLS
56 INPUT"HOW MANY UNITS DO YOU T
HINK YOU CAN REALISTICALLY SELL"
;NB
57 PRINT B$;
58 PRINT"IF YOU'RE ABLE TO SELL"
NB
59 PRINT"UNITS, YOU WILL HAVE SO
LD TO
6Ø PRINT USING PR$;(NB/S)*1ØØ;
61 PRINT"% OF THE READERS.
62 PRINT"YOUR PROFIT ON THIS TRA
NSACTION
63 PRINT"WILL BE $"NB*A
64 PRINT"MINUS $"AD"FOR THE AD
65 PRINT"NET PROFIT IS $"(NB*A)-
AD
66 PRINT BB$;
67 PRINT@481,"nEW FIGURES  sAME
FIGURES  eND";
68 F$=INKEY$:IF F$=""THEN 68
69 IF F$="N"THEN 5
7Ø IF F$="S"THEN 19
71 IF F$="E"THEN CLS:END
72 GOTO 68
```

RAINBOWfest is the only computer show dedicated exclusively to your Tandy Color Computer. Nowhere else will you see as many CoCo-related products or be able to attend free seminars conducted by the top Color Computer experts. It's like receiving the latest issue of THE RAINBOW in your mailbox!

RAINBOWfest is a **great opportunity** for commercial programmers **to show off new and innovative products for the first time. Chicago is the show** to get information on capabilities for the new CoCo 3, along with a terrific selection of the latest CoCo 3 software. In exhibit after exhibit, there will be demonstrations, opportunities to experiment with software and hardware, and special RAINBOWfest prices.

Set your own pace between visiting exhibits and attending the valuable, free seminars on all aspects of your CoCo — from improving BASIC skills to working with the sophisticated OS-9 operating system.

Many people who write for THE RAINBOW — as well as those who are written about — are there to meet you and answer questions. You'll also meet lots of other people who share your interest in the Color Computer. It's a person-to-person event and a tremendous learning experience in a fun and relaxed atmosphere.

A special feature of RAINBOWfest is the **Educational Sandbox**, which features **child-oriented workshops** to give hands-on experience to an age group often neglected. There are sessions for the kindergarten through third-graders, and for fourth- through seventh-graders. And, as an additional treat for CoCo Kids of all ages, we've invited frisky feline CoCo Cat to join us for the show. RAINBOWfest has something for everyone in the family!

If you missed the fun at our last RAINBOWfest in Princeton, why don't you make plans now to join us in Chicago? For members of the family who don't share your affinity for CoCo, there are many other attractions in the Chicago area.

The Hyatt Regency Woodfield offers special rates for RAINBOWfest. **The show opens Friday evening** with a session from 7 p.m. to 10 p.m. It's a daytime show Saturday — the CoCo Community Breakfast (separate tickets required) is at 8 a.m., then the exhibit hall opens promptly at 10 a.m. and runs until 6 p.m. On Sunday, the exhibit hall opens at 11 a.m. and closes at 4 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 special room rate.

The POSH way to go. You can have your travel arrangements and hotel reservations handled through RAINBOW affiliate, POSH Travel Assistance, Inc., of Louisville. For the same POSH treatment many of our exhibitors enjoy, call POSH at (502) 893-3311. All POSH services are available at no charge to RAINBOWfest attendees.

BE THERE!

SPECIAL EVENT!

COCO GALLERY LIVE
SHOWCASE YOUR BEST AT RAINBOWFEST

We are taking the popular "CoCo Gallery" on the road to RAINBOWfest Chicago — and we'd like you to submit your own graphics creations to be exhibited at the show!

RULES

- You can enter color or black-and-white photographs or printouts of your original artwork produced on the CoCo 1, 2 or 3. Entries should be framed, mounted or matted, and may not be smaller than 5-by-7 inches or larger than 11-by-14 inches.
- Don't send us anything owned by someone else; this means no game screens, digitized images from TV programs or material that's already been submitted elsewhere. A digitized copy of a picture that appears in a book or magazine is ***not*** an original work.
- Along with your entry, send a cover letter with your name, address and phone number, detailing how you created your picture (what programs you used, etc.). Please include a few facts about yourself, too!
- Your name, address and phone number, along with the title of your work, must be clearly marked on the back of each entry, and a disk copy of each piece must also be included.
- Entries may be mailed to THE RAINBOW before May 1, 1988, or brought to the RAINBOWfest registration booth by 10 a.m., Saturday, May 21.
- Your work will be returned if sent with a postage paid return envelope, or entries can be picked up at the close of the show — Sunday, May 22 at 4 p.m.

There will be two categories: one for graphics produced on the CoCo 1 and 2, and one for CoCo 3 graphics. Several awards will be made in each category. Winners will be determined by votes from RAINBOWfest attendees. In case of any ties, winners will be determined by our chief judge, CoCo Cat.

Prizes and ribbons will be presented Sunday, May 22, and winning entries will be published in the September '88 issue of THE RAINBOW. Send your entry to "CoCo Gallery Live," THE RAINBOW, 9509 U.S. Highway 42, Prospect, KY 40059.

YES, I'm coming to **Chicago!** I want to save by buying tickets now at the special advance sale price. Breakfast tickets require advance reservations.

Please send me:

_____ Three-day tickets at $9 each total _____

_____ One-day tickets at $7 each total _____
Circle one: Friday Saturday Sunday

_____ Saturday CoCo Breakfast at $12 each total _____

_____ RAINBOWfest T-shirts at $6 each total _____
(Advance sale-priced T-shirts must be picked up at the door)

Handling Charge $1 _____

TOTAL ENCLOSED _____

(U.S. Currency Only, Please)

☐ Also send me a hotel reservation card for the Hyatt Regency Woodfield ($64, single or double room).

Name _____
(please print)

Address _____

City _____ State _____

Telephone _____ ZIP _____

Company _____

☐ Payment Enclosed, or Charge to:

☐ VISA ☐ MasterCard ☐ American Express

Account Number _____

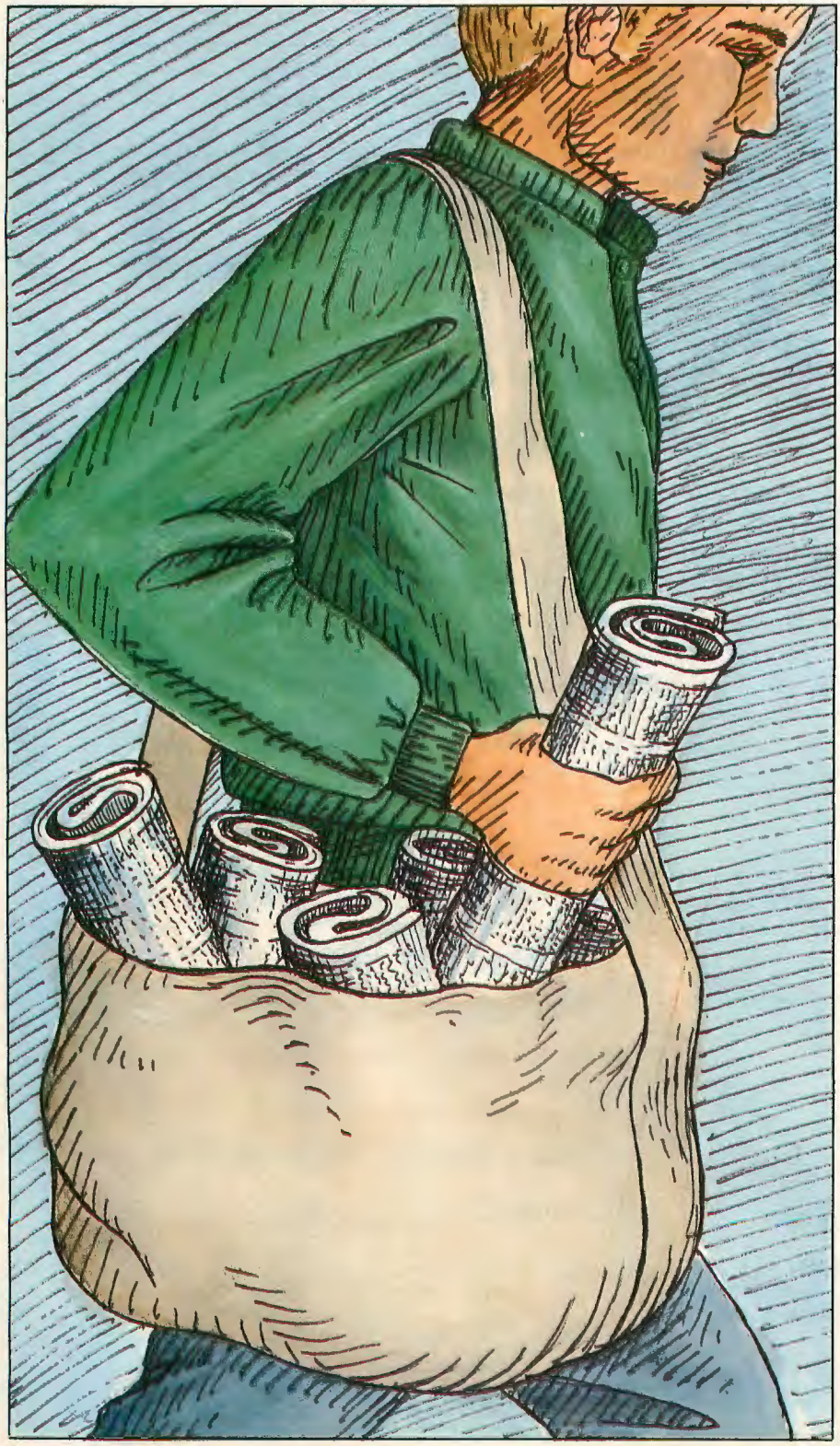
Exp. Date _____

Signature _____

Advance ticket deadline: May 13, 1988. 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 show. Children 4 and under, free; over 4, full price.

Make checks payable to: The RAINBOW. Mail 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.

A bookkeeping system for newspaper carriers



Delivering the Goods

By Dale James Leistico

Responsibilities of having a paper route include collecting and submitting customer checks in addition to delivering the paper to customers' doorsteps before their morning coffee. My son has a paper route, and my daughter is soon going to follow in his footsteps. In fact, she has had substitute carrier jobs that required her to do collecting and bill paying.

To help with all this bookkeeping, I looked for a program that would do the job of listing out checks and figuring balances. I couldn't find what I wanted, but I remembered a program called *Refund-A-File* by Donald A. Turowski in the April 1986 RAINBOW. This program seemed like a good jumping-off point for the program I had in mind, what would become *Paper Route.*

Dale Leistico lives in Lompoc, California, and works in the aerospace industry. He uses his CoCo for help with home finances and word processing.

After examining *Refund-A-File*, I modified it to suit my purposes. I changed its sort routine to a partition sort. I deleted the "Replace Item" routine because I felt the "Add-Delete" routine would adequately take its place. Also, I changed the search routine to make it more versatile and incorporated a file check routine.

I included the ability to save the data to either tape or disk, with the data defaulting to the tape. This way users won't have to change anything when they upgrade to disk.

The program has the ability to check printer status and inform the user if the printer is not ready. And I added the feature of calling the directory from within the program.

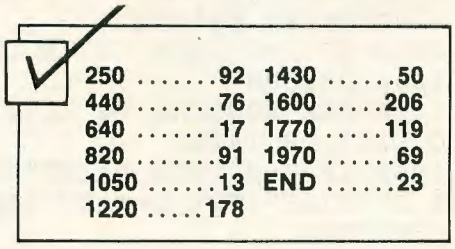
Line 830 sets $99.99 as the upper limit of each customer check. The total amount of checks and bills is limited to $9,999.99 by lines 910 through 1010.

Paper Route's operation needs little explanation as the program is menu-driven and prompts for information.

I believe *Paper Route* provides an excellent example of how a program can be customized to do another job. For example, with just a few more changes, my program would be useful to people who must submit a series of checks to pay their bills.

```
CARRIER ROUTE... 123
CARRIER NAME.... SARAH MILLS
  1  Allen Briggs    11.2Ø
  2  Beth Herbert    15.75
  3  James Aubrey    11.2Ø
  4  John Doe        15.75
  5  Mary Wilson     11.2Ø
  6  Robert Jones    11.2Ø
                    ========
CUST CHK TOT      $   76.3Ø
COUPON            $    Ø.ØØ
CASH              $    Ø.ØØ
... SARAH MILLS   $    Ø.ØØ
                    ========
TOTAL             $   76.3Ø
```

(Questions or comments about this program may be directed to the author at 313 Somerset Place, Lompoc, CA 93436. Please enclose an SASE when writing for a reply.) □



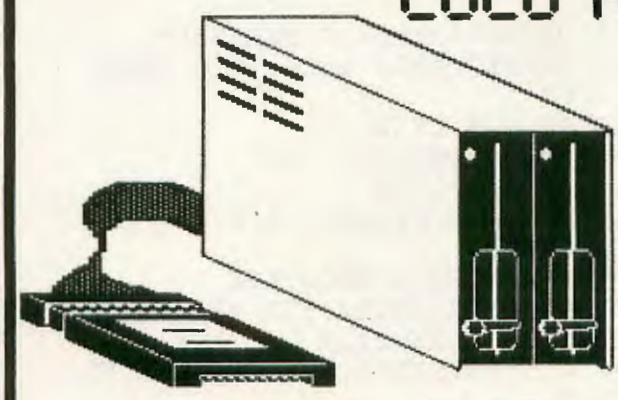
The listing: PAPERS

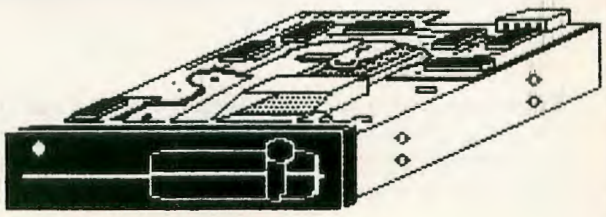
```
1Ø GOTO 219Ø
2Ø 'MODIFIED FROM REFUND
3Ø 'APRIL 1986 RAINBOW, PAGE 95
4Ø 'BY DALE LEISTICO
5Ø '313 SOMERSET PLACE
6Ø 'LOMPOC, CALIF,93436
7Ø CLEAR 3ØØØ:DIMS$(3ØØ),EX(3ØØ)
8Ø CLS(RND(8)):PRINT@32*6+1Ø,"PA
PER ROUTE"
9Ø FOR Q=1TO1ØØØ:NEXT Q:CLS
1ØØ GOSUB 172Ø
11Ø CLS
12Ø PRINT:PRINT"   ******select
choice******":PRINT
13Ø PRINT" (1)input checks to li
st"
14Ø PRINT" (2)add to the check l
ist"
15Ø PRINT" (3)delete checks from
 list"
16Ø PRINT" (4)print entire list"
17Ø PRINT" (5)save check list "
18Ø PRINT" (6)load check list "
19Ø PRINT" (7)alphabetize list"
2ØØ PRINT" (8)search check list"
21Ø PRINT" (9)directory"
22Ø PRINT"(1Ø)end session"
23Ø PRINTTAB(8);"SELECTION (1-1Ø
)";
24Ø INPUT M
25Ø IF M<Ø OR M>1Ø THEN 11Ø
26Ø ON M GOSUB 29Ø,41Ø,51Ø,7ØØ,1
Ø7Ø,123Ø,138Ø,162Ø,176Ø,156Ø
27Ø GOTO 11Ø
28Ø ' ROUTINE TO INPUT/ADD ITEMS
29Ø IF Y=Ø THEN 4ØØ
3ØØ PRINT" do YOU wish TO erase
THE "
31Ø PRINT:PRINT " records IN THE
 computer ?"
32Ø LINEINPUT "<Y>ES OR <N>O..";
W$
33Ø IF W$="Y" THEN 37Ø
34Ø IF W$="N" THEN RETURN
35Ø CLS:GOTO 3ØØ
36Ø FOR Q=1 TO 1ØØØ: NEXT Q:RETU
RN
37Ø CLS:PRINT@32*3+5,"OLD RECORD
S ERASED"
38Ø PRINT@32*6+5,"START NEW RECO
RD"
39Ø FOR Q=1 TO 1ØØØ:NEXT Q
4ØØ Y=1
41Ø CLS:PRINT"input/add items ro
utine"
42Ø GOSUB 217Ø
43Ø PRINT:PRINT "CUSTOMER NAME"
Y;
```

```
44Ø LINEINPUT S$(Y)
45Ø IF LEN(S$(Y))>15 THEN PRINT"
PLEASE RE-ENTER A SHORTER NAME":
GOTO 44Ø
46Ø IF S$(Y)="" THEN RETURN
47Ø PRINT"CHECK AMOUNT $";:INPUT
 EX(Y)
48Ø Y=Y+1
49Ø GOTO 43Ø
5ØØ REM ROUTINE TO DELETE ITEMS
51Ø N=Ø
52Ø CLS:PRINT"delete items routi
ne"
53Ø GOSUB 217Ø
54Ø PRINT"NOTE-->delete from hig
hest":PRINT"          item number
 to ":PRINT"       lowest item n
umber!"
55Ø PRINT:INPUT "CUSTOMER NUMBER
 TO DELETE";N
56Ø IF N>Y-1 THEN 55Ø
57Ø IF N=Ø THEN RETURN
58Ø PRINT N;:PRINT"  ";:PRINTS$(
N);:PRINTEX(N)
59Ø PRINT"DO YOU WISH TO DELETE"
6ØØ LINE INPUT "<Y>ES OR <N>O.."
;W$
61Ø IF W$="Y" THEN 62Ø ELSE 52Ø
62Ø PRINT"  ITEM DELETED":GOSUB
36Ø
63Ø FOR X=N TO Y-2
64Ø S$(X)=S$(X+1)
65Ø EX(X)=EX(X+1)
66Ø NEXT X
67Ø Y=Y-1
68Ø GOTO 51Ø
69Ø REM ROUTINE TO PRINT ITEMS
7ØØ EB=Ø:EC=Ø
71Ø CLS:PRINT"LIST ITEMS ON SCRE
EN(S) OR ON   PRINTER(P)":PRINT"
---ENTER 'S' OR 'P'..";:LINE INP
UT W$
72Ø IF W$="P" THEN D=-2:T=1Ø:GOS
UB 2Ø7Ø:GOTO 75Ø
73Ø IF W$="S" THEN D=Ø:T=Ø:GOTO
75Ø
74Ø GOTO 71Ø
75Ø CLS:PRINT" ENTER COUPON TOTA
L ":LINEINPUT CO$
76Ø PRINT" ENTER CASH TURN IN ":
LINEINPUT CA$
77Ø PRINT "ENTER YOUR BILL":LINE
INPUT EB$
78Ø CO=VAL(CO$):CA=VAL(CA$):EB=V
AL(EB$)
79Ø CLS
8ØØ FOR X=1 TO Y-1 STEP 13
81Ø FOR Z=X TO X+12
82Ø IF D=-2 THEN PRINT@32*8," pr
inting---stand by!!!!!!!!!!!":IF
 S$(Z)="" THEN 86Ø
83Ø PRINT#D,TAB(T):PRINT#D,USING
"###";Z;:PRINT#D,TAB(T+5)S$(Z);
84Ø PRINT#D,TAB(T+2Ø):PRINT#D,US
ING "##.##";EX(Z)
85Ø EC=EC+EX(Z)
86Ø NEXT Z
87Ø IF D=Ø GOSUB 175Ø
88Ø NEXT X
89Ø PRINT#D,TAB(T+17)"========"
9ØØ PRINT#D,TAB(T)"CUST CHK TOT"
;
91Ø PRINT#D,TAB(T+17):PRINT #D,U
SING"$####.##";EC
92Ø PRINT#D,TAB(T)"COUPON";
93Ø PRINT#D,TAB(T+17):PRINT#D,US
ING"$####.##";CO
94Ø PRINT#D,TAB(T)"CASH";
95Ø PRINT#D,TAB(T+17):PRINT#D,US
ING"$####.##";CA
96Ø ET=EC+CO+CA
97Ø IF D=Ø THEN NN$="YOUR CHECK"
98Ø PRINT#D,TAB(T)NN$;
99Ø PRINT#D,TAB(T+17):PRINT#D,US
ING"$####.##";EB-ET
1ØØØ PRINT#D,TAB(T+17)"========"
1Ø1Ø PRINT#D,TAB(T)"TOTAL";
1Ø2Ø PRINT#D,TAB(T+17):PRINT#D,U
SING"$####.##";EB
1Ø3Ø IF D=Ø THEN GOSUB 175Ø
1Ø4Ø RETURN
1Ø5Ø REM ROUTINE TO SAVE ITEMS T
O DISK OR TAPE
1Ø6Ø IF Y=Ø THEN PRINT"NO RECORD
S IN FILE":FOR Q=1 TO 1ØØØ:NEXT
Q:RETURN
1Ø7Ø GOSUB 187Ø
1Ø8Ø CLS(8):PRINT@135,"save item
s on "GG$;
1Ø9Ø SOUND 2ØØ,3:SOUND 2ØØ,3
11ØØ IF CC$="D" THENPRINT@32*8+8
,"insert data disk":SOUND 2ØØ,3:
111Ø GOSUB 175Ø
112Ø PRINT@161,"FILE NAME TO SAV
E..."
113Ø LINEINPUT FF$
114Ø IF CC$="T" THEN PRINT"PRESS
 play AND record" :GOSUB 175Ø
115Ø CLS(Ø):PRINT@224,"saving" F
F$ " on "GG$"---stand by!";:SOUN
D 2ØØ,3
116Ø PRINT FF$: PRINT HH
117Ø OPEN "O",#HH,FF$
118Ø FOR X=1 TO Y-1
119Ø IF CC$="T" THEN PRINT#-1,S$
(X),EX(X) ELSE WRITE#1, S$(X),EX
(X)
12ØØ NEXT X
121Ø CLOSE #HH:SOUND 2ØØ,3:RETUR
N
122Ø REM ROUTINE TO LOAD FROM DI
SK OR TAPE
```

```
123Ø GOSUB 187Ø
124Ø CLS(4):PRINT@134,"load data
 from "GG$;:SOUND 2ØØ,3
125Ø IF FF$="D" THEN PRINT@32*8+
8,"insert data disk!";
126Ø IF FF$="T" THEN PRINT @32*5
+8,"press play on recorder";
127Ø GOSUB 175Ø
128Ø PRINT@161,"FILE NAME TO LOA
D..."
129Ø LINEINPUT FF$
13ØØ CLS(Ø):PRINT@224,"loading "
FF$" from "GG$"-stand by";:SOUND
 2ØØ,3
131Ø OPEN"I",#HH,FF$
132Ø Y=1
133Ø IF EOF(HH) THEN 137Ø
134Ø INPUT #HH, S$(Y),EX(Y)
135Ø Y=Y+1
136Ø GOTO 133Ø
137Ø CLOSE #HH:SOUND 2ØØ,3:RETUR
N
138Ø REM ALPHABETIZE ROUTINE
139Ø IF Y=Ø THEN PRINT"NO record
s IN file":FOR Q=1 TO 1ØØØ:NEXT
Q:RETURN
14ØØ CLS(RND(8)):PRINT@32*8,"sta
nd by----alphabetizing list!"
141Ø L=Y
142Ø L=INT(L/2)+2
143Ø FOR I=1 TO Y-L
144Ø IF S$(I+L)="" THEN 15ØØ
145Ø IF S$(I)<S$(I+L)THEN 149Ø
146Ø T$=S$(I):F=EX(I)
147Ø S$(I)=S$(I+L):EX(I)=EX(I+L)
148Ø S$(I+L)=T$:EX(I+L)=F
149Ø NEXT I
15ØØ IF L=1 THEN 154Ø
151Ø IF L>5 THEN 142Ø
152Ø L=L-1:GOTO 143Ø
153Ø GOTO 142Ø
154Ø CLS(3):PRINT@32*8,"alphabet
izing completed!!!!!!!!":SOUND 2
ØØ,3:FORQ=1TO5ØØ:NEXTQ:RETURN
155Ø 'END WARNING
156Ø CLS:FOR B=1 TO 8:CLS(RND(8)
):SOUND 2ØØ,2:NEXT B
157Ø PRINT@32*3,"before ending t
his session,":PRINT"be sure to s
ave all changes":PRINT"on your d
isk or tape file!!!":PRINT:PRINT
"if you are sure you want to":PR
INT"end the session, then press
'E'":PRINT"otherwise, press and
<enter> anyother";
158Ø PRINT" key to return to the
 main menu"
159Ø INPUT R$
```


COCO ACCESSORIES





DISK DRIVES

NEW-4 DRIVE SYSTEM (2 DSDD DRIVES ACCESSED UNDER RS DOS) *-$379.95

2 DRIVE SYSTEM *-(2 DSDD DRIVES IN ONE CASE) ——$329.95——

DRIVE 1 UPGRADE (1 DSDD UPGRADE FOR YOUR 26-3129,3131, OR 3132-$119.95———PLEASE SPECIFY CATALOG NUMBER WHEN ORDERING ! ! ——DRIVE 0-SSDD F/H DRIVE *-$199.95 ——

DRIVE 1-SSDD F/H DRIVE (USE W/EXISTING DR0) ——$125.95——

*-INCLUDES EITHER R.S. OR DISTO CONTROLLER

COCO 3

512K UPGRADE-$109.95 TECH MANUAL-$29.95

RAM DISK & DIAGNOSTICS-$19.95

MONITOR CONNECTOR FOR CM-8-$4.95

OTHER STUFF

MONITOR INTERFACE-$29.95 ADOS-$29.95

KEYBOARDS-$24.95 ADAPTERS-$9.95

SERIAL TO PARALLEL CONVERTERS-$44.95

NEW—EPSON LX-800 PRINTER 160 CPS DRAFT/ 36 CPS NLQ— TRACTOR INCLUDED ONLY $189.95

FULL LINE OF EPSON PRINTERS IN STOCK ! ! ! CALL FOR BEST PRICES ???

The Computer Center

5512 POPLAR MEMPHIS, TN 38119 901-761-4565

ADD $4.90 FOR SHIPPING AND HANDLING. VISA/MC & MONEY ORDERS ACCEPTED.
ALLOW 3 WEEKS FOR PERSONAL CHECKS. NO CODS. PRICES MAY CHANGE WITHOUT NOTICE

```
16ØØ IF R$="E" THEN CLS:END
161Ø RETURN
162Ø LINE INPUT"NAME TO SEARCH F
OR...";NN$
163Ø CLS(5)
164Ø FOR I=1 TO Y-1
165Ø FT=INSTR(1,S$(I),NN$)
166Ø IF FT>Ø THEN PRINTS$(I);:PR
INT"   ";:PRINTUSING "###.##";EX
(I)
167Ø IF FT>Ø THEN GOSUB 175Ø
168Ø NEXT I
169Ø PRINT "END OF SEARCH"
17ØØ GOSUB 175Ø
171Ø RETURN
172Ø PRINT"THIS PROGRAM WILL KEE
P A FILE OFYOUR PAPER ROUTE CHEC
KS.":PRINT"YOU WILL HAVE ROOM FO
R ABOUT 15Ø-3ØØ ENTRIES(DEPENDIN
G ON THEIR LENGTH)!"
173Ø PRINT"  THERE WILL ALSO BE
A PRINTER    OPTION FOR YOUR LIS
T WHEN YOU     WANT A HARD COPY.
"
174Ø PRINT"note:  DO NOT USE COM
MAS WHEN          ENTERING ITEMS
!"
175Ø PRINT@32*13+5,"PRESS enter
TO CONTINUE";:LINE INPUT R$:CLS:
RETURN
```

Corrections

"Preparing for Uncle Sam" (January 1988, Page 112): Due to a production error, Line 160 of Listing 1, TAX.BAS, appears incorrectly in the magazine. The line should be entered as it appears below.

```
16Ø DATA97,98,99,1Ø1,1Ø2,1Ø3,1Ø5
,1Ø9,111,113,117,119,12Ø,121,123
,124,125,126
```

For quicker reference, Corrections will be posted on Delphi as soon as they are available in the Info on Rainbow topic area of the database. Just type DATA at the CoCo SIG> prompt and INFO at the TOPIC> prompt.

```
176Ø IF PEEK(49152) = 68 THEN 18
ØØ
177Ø CLS: PRINT"THIS FEATURE IS
DISABLED FOR    NON DISK SYSTEMS
"
178Ø GOSUB 175Ø
179Ø RETURN
18ØØ CLS:DIR
181Ø PRINT @((32*12)+25),"press"
182Ø PRINT@((32*13)+23),"<ENTER>
"
183Ø PRINT@((32*14)+28),"to"
184Ø PRINT@((32*15)+22),"CONTINU
E"
185Ø LINEINPUT R$:CLS:RETURN
186Ø RETURN
187Ø PRINT"SELECT <D>ISK OR <T>A
PE"
188Ø LINEINPUT CC$
189Ø IF PEEK(49152)=68 THEN 191Ø
19ØØ CC$="T"
191Ø IF CC$="D" THEN GG$="disk":
HH=1:RETURN
192Ø IF CC$="T" THEN 194Ø
193Ø GOTO 188Ø
194Ø GG$="tape":HH=-1
195Ø CLS(RND(8))
196Ø PRINT"SETUP TAPE AND RECORD
ER"
197Ø PRINT"PRESS <play> ON THE R
ECORDER"
198Ø PRINT"THE MOTOR WILL GO ON
WHEN"
199Ø PRINT"enter IS PRESSED"
2ØØØ PRINT"PRESS enter  TO TURN
IT OFF"
2Ø1Ø GO SUB 175Ø
2Ø2Ø MOTOR ON:AUDIO ON
2Ø3Ø GO SUB 175Ø
2Ø4Ø MOTOR OFF:AUDIO OFF
2Ø5Ø RETURN
2Ø6Ø 'PRINTER SUBROUTINE
2Ø7Ø PS=PEEK(65314):IF (PS)/2=IN
T((PS)/2) THEN 212Ø
2Ø8Ø CLS:PRINT@71,"SET up the PR
INTER"
2Ø9Ø SOUND 2ØØ,3
21ØØ GOSUB 175Ø
211Ø GOTO 2Ø7Ø
212Ø PRINT" ENTER CARRIER NUMBER
  ":INPUT MN
213Ø PRINT" ENTER CARRIER NAME "
:LINEINPUT NN$
214Ø PRINT#-2,TAB(1Ø)"CARRIER RO
UTE..."MN
215Ø PRINT#-2,TAB(1Ø)"CARRIER NA
ME."NN$
216Ø RETURN
217Ø PRINT @34,"PRESS enter WHEN
 FINISHED"
218Ø RETURN
219Ø PCLEAR1:GOTO7Ø
```

NOW Your Computer Writes PROGRAMS for YOU with QUIKPRO+II

In minutes even if you know nothing about programming!
For COCO, IBM, Tandy, Apple, Commodore, and others.

OVER ½ OFF

To Computer Users.

Now you can tell your computer what you want and your computer can write your programs for you in minutes to your custom design — easily and without requiring any programming background from you...with QUIKPRO+II.

A Breakthrough In Micro Computer Technology

You know your computer is fantastically fast...once it knows what to do. Programs and software are what makes it happen. Every task your computer performs for you requires some kind of program. Until now, you could only get programs in just one of two ways: buy a canned package that many times doesn't meet your needs or hand over hundreds or thousands of dollars for a custom programming job. Now, you have a better choice...

Programs Without Programming

Automatic programming is what it's all about. And, with QUIKPRO+II the Automatic Program Writer, your computer can actually write programs for you. You can quickly generate a new individual application program when you want it with QUIKPRO+II. Each program you create is a completely stand alone program that will run in the standard BASIC language you already have on your own computer. QUIKPRO+II creates filing, data retrieval, and report programs. Best of all, **you do not have to become a programmer** to use QUIKPRO+II. The QUIKPRO+II software becomes your personal programmer, waiting to do your work for you any time of the day or night you choose to use it.

QUICKPRO+II comes complete in its own vinyl storage binder, with 80 page manual and disk ready to use.

Proven and Widely Used

Businesses, Schools, Hobbyists and Government are among our thousands of users...

John Hopkins
U.S. Department of Agriculture
Proctor & Gamble
Federal Express
American Express
Monsanto
Ford Motor Company
Duracell International
NASA
Westinghouse
U.S. Navy
NCR
DuPont
RCA
Exxon
AT&T
Texas Tech
General Electric
Random House
Tandy Corporation
Satellite Broadcasting

RAINBOW CERTIFICATION SEAL

APPLICATION CHECKLIST

Here are a few of the thousands of possible applications you can do with QUIKPRO+II...And most can be created in a few minutes.

BUSINESS USES
Customer Filing
Master Files for General Ledgers
Accts. Receiv.
Accts. Payable
Telephone Logs
Telephone Lists
Hotel/Travel Data
Reservations
Property Control
Library Catalogues
Inventories

EDUCATIONAL USES
Student Records
Grade Records
Teacher Lists
School Lists
Program Design
Course Design

HOME & HOBBY USES
Personal Records
Check Lists
Club Rosters
Telephone Directories
Recipe Files

ORDER NOW - OVER ½ OFF

CALL TOLL FREE 24 HOURS

1-800-872-8787, Operator *815*

(From Georgia Call 1-800-874-5112, Operator 815)

YES, send me QUIKPRO+II for $29.50 plus $4.50 shipping & handling $34.00 total. **SAVE OVER ½ OFF** the reg. $149 price.

Check your computer type & payment

[ ] Color Computer 2 or 3 with Disk
[ ] TANDY 1000, 1200, 3000
[ ] IBM/Compatible
[ ] Commodore 64
[ ] Apple 2, 2C, 2E
[ ] TRS-80 Mod 3
[ ] TRS-80 Mod 4
[ ] TRS-80 Mod 2

[ ] Payment enclosed
[ ] MasterCard [ ] VISA
Card # _____
Expiration Date _____

Name _____
Address _____
City/State/Zip _____

Mail Orders to: ICR FutureSoft, P.O. Box 1446-OE
Orange Park, FL 32073

Rescue miners from the volcanic caverns

Helicopter Hero

By Phil Holsten

Equipped with a heli-prop pack and a dynamite-shooting crash helmet, you hover into the volcanic caverns where several lost miners await rescue. You hear a cry behind a wall. Immediately you toss some dynamite, which explodes the wall on impact and reveals a lost man beyond the rubble. Your fuel gauge reads dangerously low. As you desperately attempt to find more fuel, you hear your engine sputter to a stop and you go spiraling down.

You are Helicopter Hero. Your mission is to fly through caverns rescuing as many men as possible while trying to save your own life. The walls neutralize your heli-prop packs on contact, and the rescue squad provided you with only three packs.

Running the Program

Helicopter Hero will run on all CoCos, requiring only 16K Extended Color BASIC and one joystick. Just load and run the program.

Phil Holsten is a senior at Modesto Christian High School, has programmed for the CoCos for six years, and is enjoying his CoCo 3. His other interests include mathematics, bicycling and racquetball.

After the title page, the program asks if you would like to enact a speed-up poke (located in Line 120). Then it asks for double or triple speed. Next, input the level desired (20 is the easiest and 2 is the hardest). A "score" screen is displayed while the cavern is constructed and includes the number of caverns you have been in, the level, the heroes left, shields left, men saved, men left behind and the percentage of men saved (if lower than 100 percent).

At the bottom of the game screen is a yellow fuel bar, which turns red as fuel is used up. When the yellow is gone, the game is over. If the yellow bar is not disappearing, you have more fuel than it can indicate.

Your hero is red and the miners (sitting) are green. The walls of the cavern are blue — do *not* touch them! On Level 20, there are no walls except for the edges of the screen. Level 20 is a wide-open area good for beginners to practice their flying. Every time a screen is cleared of lost men, the level goes down by an increment of two.

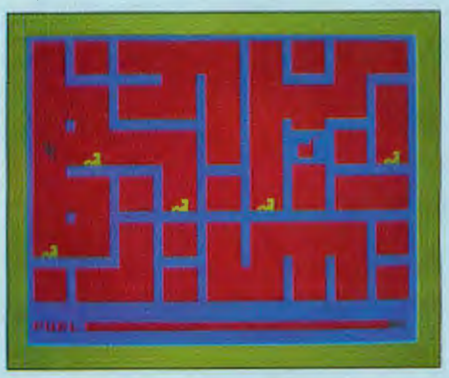
The game ends when you run out of fuel or heroes. The scoring screen shows you the final results and asks if you would like another game. By answering "no" (pressing N), a slow-down poke is executed and the game ends (Line 840).

Controls

The keyboard is used to move your hero throughout the caverns. The right and left arrows move you to the sides and the space bar moves you up. You will go down if no buttons are pressed. You may hold a direction button down instead of tapping it over and over, thanks to the peeks and pokes in lines 430 through 450.

The @ key fires a bomb from your helmet. It will blow up when it hits anything blue (the walls). All miners are reconstructed after every fourth shot (just in case there are some wise guys out there who decide to blow up the walls directly below one of the miners to destroy him). If you have no intention of going on a bombing spree, you may delete the end of Line 370 after the GOSUB statement and delete lines 730 through 750.

The right joystick (preferably self-centering with x-axis "free") controls the prop pitch of your rotor blades. Moving the stick all the way to the left gives you no pitch, and, therefore, won't allow you to move in any direction; however, you may use the arrow keys to turn around in place.



As you move the stick to the right, your hero moves faster in all directions. Using a high prop pitch is dangerous when moving from side to side, but it is ideal for going up or down quickly. The lower pitches are valuable for the tedious movement required in rescuing the miners.

The right joystick also controls your shields. By moving it up all the way (be sure to center it after you hear the tone), your shield is turned on. A blue circle surrounds you for less than 10 seconds, and this shield will "eat" away anything it comes in contact with. You are given only one shield at the start of the game.

Shields serve no useful purpose except that on Level 2 they are a precaution against killing yourself trying to get through a horizontal wall extending clear across the screen (there would be no way to blast through it with dynamite). The shield's only other use is for getting through walls quickly when fuel is low.

Here is a tip for arranging your fingers on the keyboard: Use your right hand for the buttons. Place your index finger on the @ key and your

Table 1

Line	Description
Initialization	
20-70	Title page
80-140	Ask for speed-up poke and get level
150	Defines variables and strings
160	GOSUBs scoring screen
170-230	Define variables; construct game screen
240	Draws "Fuel"; check joystick for warning message
250-310	Place miners; place fuel tank (if GS=1)
320	Shows game screen
Main Loop	
330	Draws hero
340-350	Maintain fuel bar; check amount left
360	Erases variables = draw variables
370	Checks for throwing dynamite
380-410	Check for shield switch on
420	Gets prop pitch from JOYSTK reading
430-460	Check buttons, PPOINTs around hero, number of men rescued
Subroutines	
480-530	Check PPOINTs around hero when falling
540-560	Which man was rescued?
570-620	Firing bomb right; check for wall, fuel, or miner
630-670	Firing bomb left; check for wall, fuel, or miner
680	Explosion
690-720	Get more fuel; check for extra shield; update fuel bar
730-750	Redraw miners in case destroyed
850-860	Score screen
Loss of a Hero	
760-770	Kill hero; check number killed
780-810	Out of gas, falls, and dies
820-840	Game Over displayed; ask for another game

Table 2

Variable	Description
A	Horizontal screen location
B	Vertical screen location
P	Right/left DRAW string for hero
C, D, Q	Erase hero
A, B, P	
E	Horizontal position of bomb
F	Vertical position of bomb
G, H	Erase bomb
E, F	
I	Men left behind
J	Total men rescued
K	Men rescued on the screen
L	Lost men on the screen
M	Horizontal position of fuel tank
N	Vertical position of fuel tank
O	Prop pitch (JOYSTK(0)/4)
R	Heroes left
S	Fuel left
T	Shields left
V, W, X	Miscellaneous (FOR-NEXT)
Y, Z	

Variable	Description
CV	Caverns been in
GS	Gas tank on-off switch
LL	Level number
PP	Shot count (resets at 4)
TT	Shield on-off switch
String	**Description**
A$, B$	Miscellaneous (title page)
I$	Speed-up poke? double or triple?
J$	Play again?
P$(1), P$(2)	Draw hero right or left
R$	Draw miner sitting
S$	Draw fuel can
Array P(x,y)	**(Miner Description)**
x	Column number
y	1 P(x,y) = Horizontal position (P(x,y))
y	2 P(x,y) = Vertical position (P(x,y))
y	0 P(x,y) = 0 if not there (P(x,y)) or = 1 if not rescued (P(x,y))

thumb on the space bar. Your other two "big" fingers should fall nicely on the right and left arrow keys. Your left hand is free to use the joystick.

Fueling Up

Several times during the game, you will get low on fuel and will need to find some more. Fuel is represented by a yellow gas can on a blue background. To get at it, simply shoot it and your reserves will increase by a random amount. Sometimes a new shield is awarded when you pick up fuel; this is signaled by a siren.

Rescuing Miners

To rescue a miner, simply float down slowly and touch your toe (toe, not heel) to him. This is the only point on your heli-suit that checks for green contact. When all men on the screen are rescued, the score screen is shown while another cavern is constructed. If you need fuel before going on to the next level, get it *before* you rescue the last man!

How It's Animated

Helicopter Hero uses a technique of animation that is not very popular, but is very effective. The old GET and PUT "box" method simply will not do here. We need something that doesn't have a "cushion" around it.

The DRAW statement works fine when we define a string for the hero. Look at Line 330. The symbols within the quotes (=C; and =D;) are used in the place of numbers. You may put a variable in the place of any number within a DRAW string or a PLAY string, just so long as an equal sign precedes and a semicolon follows. However, something like =V+2; will not work. Instead, let W=V+2 and then put the variable W in the string.

The DRAW statements in Line 330 contain two sets of variables: A, B, P and C, D, Q. The first set draws the man and the second set erases the man. As the program goes through the main loop, A, B and P change, but C, D and Q still retain the values they were assigned in Line 360. This way, the "old" man is erased, and an instant later the "new" one is drawn. This prevents the flashing effect that would occur if it were done the other way around.

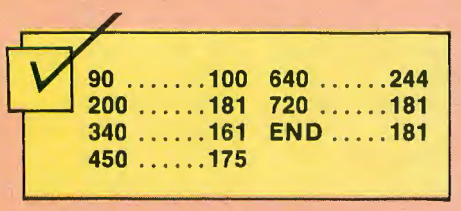
Modifications

Those of you who own a CoCo 3 and would like to be warned when fuel is getting low, insert PALETTE3,7 in lines 130 and 710, and enter this line:

```
355 IF S>170 THEN PALETTE 3,
RND(63)
```

If you would like the game to run a little faster and don't mind giving up your shields, delete the following: Line 700, the T=1: in Line 150, and lines 380 through 410. In Line 850, change the 196 to 228 and delete PRINT@260,"SHIELDS LEFT ";T;:.

(Questions or comments about this program may be directed to the author at 908 Peachwood Court, Modesto, CA 95350. Please enclose an SASE when writing for a reply.) □



The listing: HELIHERO

```
10 'Helicopter Hero  (C) 1985
 Phil Holsten  908 Peachwood Ct
 Modesto, CA   95350
20 DATA66,10,102,2,134,2,138,4,1
66,2,170,2,198,8,230,6,262,6,296
,4,330,2,362,2,394,4
30 PLAY"V20O1L255T255":CLS2:FORX
=1TO32:A$=A$+CHR$(159):B$=B$+CHR
$(143):NEXT:PRINT@480,B$;:PRINT@
448,A$;:PRINT@491,"^ OUR HERO ^"
;:FORX=1TO13:READ Y,Z:FORW=1TO Z
:PLAY"P5C":PRINT@Y+W,CHR$(191);:
NEXTW,X
40 A$(1)="HELICOPTER HERO":A$(2)
="BY PHIL HOLSTEN":A$(3)="COPYRI
GHT  1985":W=176
```

```
5Ø FORX=1TO3:FORY=173TO191:PLAY"
C":PRINT@Z,CHR$(159);:PRINT@Y,CH
R$(191);
6Ø IF Y>176THENPRINT@Z,MID$(A$(X
),Y-176,1);
7Ø Z=Y:NEXTY:PRINT@191,CHR$(159)
;:FORV=1TO7ØØ:NEXTV:FORY=173TO19
1:PLAY"A":PRINT@Z,CHR$(159);:PRI
NT@Y,CHR$(191);:Z=Y:NEXTY:PRINT@
191,CHR$(159);:FORV=1TO4ØØ:NEXTV
,X:FORX=31TO1STEP-2:PLAY"P2Ø;1":
PRINT@48Ø,A$;:PLAY"V=X;2":NEXT
8Ø CLS3
9Ø PRINT@199,"SPEED UP POKE (Y/N
)";:I$=INKEY$:IF I$=""THEN9Ø
1ØØ IF I$<>"Y"THEN13Ø
11Ø PRINT@293,"DOUBLE OR TRIPLE
 (2/3)";:I$=INKEY$:IF I$=""THEN1
1Ø
12Ø IF I$="3"THENPOKE65497,ØELSE
POKE65495,Ø
13Ø PRINT@361,;:INPUT"LEVEL (2-2
Ø)";LL:IF LL>2ØTHEN LL=2Ø
14Ø IF LL<2THEN LL=2
15Ø S=Ø:T=1:CV=1:R=Ø:I=Ø:J=Ø:PLA
Y"O1T255V2ØL255":P$(1)="R2D3NR2U
8NR2D2NR2L2D2L2U6NL2NR2":P$(2)="
L2D3NL2U8NL2D2NL2R2D2R2U6NL2NR2"
:R$="R4U6L2D1BD3D1L4NU1L2D1":S$=
"D1L2D7R2U7R2D7R2U7R2ND7U3R1E1R1
E1"
16Ø GOSUB85Ø
17Ø PMODE3,1:PCLS3:K=Ø:A=14:B=18
:P=1:C=A:D=B
18Ø COLOR2,3:IF LL=2ØTHEN LINE(4
,4)-(248,164),PSET,BF:GOTO23ØELS
E FORY=4TO16ØSTEP28:FORX=4TO236S
TEP28:LINE(X,Y)-(X+2Ø,Y+2Ø),PSET
,BF:NEXTX,Y:FORY=25TO16ØSTEP28:F
ORX=4TO236STEP28:IFRND(LL)=1THEN
2ØØ
19Ø LINE(X,Y)-(X+2Ø,Y+8),PSET,BF
2ØØ NEXTX,Y:FORX=26TO236STEP28:F
ORY=4TO16ØSTEP28:IFRND(LL)=1THEN
22Ø
21Ø LINE(X,Y)-(X+8,Y+2Ø),PSET,BF
22Ø NEXTY,X
23Ø LINE(38,178)-(246,182),PSET,
BF:IF S>ØTHEN COLOR4,3:LINE(244-
S,178)-(248,182),PSET,BF
24Ø DRAW"C2BM4,182U2NR4U2R4BR4D4
R4U4BR4NR4D2NR4D2R4BR4NR4U4":IF
JOYSTK(Ø)>5THEN PRINT@227,"move
joystick to the left";
25Ø L=9:FORX=14TO238STEP28:Z=((X
-14)/28)+1:IFRND(3)=1THEN P(Z,Ø)
=Ø:L=L-1:GOTO29Ø
26Ø Y=(RND(6)*28)-4:DRAW"C1BM=X;
,=Y;"+R$
27Ø IFPPOINT(X,Y+1)=2THENDRAW"C2
BM=X;,=Y;"+R$:Y=Y+2:DRAW"C1BM=X;
,=Y;"+R$:GOTO27Ø
28Ø P(Z,1)=X:P(Z,2)=Y:P(Z,Ø)=1
29Ø NEXTX:IFRND(3)=1THENGS=Ø:GOT
O32Ø
3ØØ GS=1:M=(RND(7)+1)*28+4:N=(RN
D(4)+1)*28+4:IFPPOINT(M+6,N+2Ø)=
1THEN3ØØ
31Ø COLOR3,3:LINE(M,N)-(M+2Ø,N+2
Ø),PSET,BF:X=M+6:Y=N+8:DRAW"C2BM
=X;,=Y;"+S$
32Ø SCREEN1,Ø
33Ø DRAW"C2BM=C;,=D;"+P$(Q):DRAW
"C4BM=A;,=B;"+P$(P)
34Ø S=S+.2:IF S>ØTHENLINE(248-S,
178)-(248-S,182),PSET
35Ø IF S>2Ø9THEN78Ø
36Ø C=A:D=B:Q=P:PLAY"V8;1"
37Ø IFINKEY$="@"THENONP GOSUB57Ø
,63Ø:PP=PP+1:IF PP=4THEN PP=Ø:GO
SUB73Ø
38Ø IFJOYSTK(1)=ØTHEN T=T-1:IF T
<ØTHEN T=Ø:GOTO42ØELSESOUND15Ø,4
:TIMER=Ø:TT=1
39Ø IF TT=ØTHEN42Ø
4ØØ IFB>154ORB<14ORA<12ORA>238OR
TT=1ANDTIMER>5ØØTHENTT=Ø:GOTO42Ø
41Ø PLAY"O4V25;12":CIRCLE(A,B-3)
```


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

RAINBOW CERTIFICATION SEAL

Leonardo's Pencil

(Reviewed in Oct. 87 RAINBOW) Makes programming sensational-looking graphics as easy as moving a joystick! Converts precision drawings into "DRAW" commands which can be stand-alone BASIC programs or merged into other programs. Also includes "DEMO" and "PAINT" programs. Requires a spring-centered joystick or touch-pad. 32k ECB **tape or disk $14.95**

?ENIGMA?

Transform your computer into an ultra-secret code machine capable of enciphering and deciphering in over 12 million virtually unbreakable codes! (not simple substitution codes). Print hard copy or store & retrieve coded data on tape or disk. Only the person who has the password can read it! 32k ECB **tape or disk $12.95**

New! *EZ Writer*

Just answer the prompts & type your message; "EZ WRITER" will put it into perfect letter form and send it to your DMP or DWP. Professional-quality, single-page letters every time! Do one letter or multiple copies for "personalized" mailings. Saves letters and mailing lists. Even does labels. Menu-driven. Undoubtedly the EZ-est letter writing system available! Free sample on request! 32k ECB **tape or disk $19.95**

EZ MATH PACKAGE

FOUR superior educational "games": "RACEWAY", "GO TO THE TOP" (multiplication tables drill), "WORD PROBLEMS", & "PYRAMID". Covers addition, subtraction, multiplication, & division. Different levels of difficulty. Exciting graphics & sounds. EZ and fun! 32k ECB **tape or disk $19.95**

KEYBOARD COMMANDER **New!**

Probably the most exciting typing tutor available for your CoCo. You are the commander of a space ship & it's your job to shoot down alien letters & words as they speed toward you & attack your spaceship. Exciting Hi-Res action! 32k ECB **tape or disk $24.95**

E.Z. FRIENDLY SOFTWARE

HUTTON & ORCHARD STS. • RHINECLIFF, NY 12574 • (914) 876-3935

(Add $1.50 s/h to all orders. NY residents add state sales tax.)

```
,1Ø,3:CIRCLE(A,B-3),1Ø,2:CIRCLE(
A,B-2),1Ø,2:PLAY"O1V1Ø"
42Ø O=INT(JOYSTK(Ø)/14)
43Ø IFPEEK(343)=247THENIFPPOINT(
A-6,B+3)=3ORPPOINT(A-6,B-5)=3ORP
POINT(A-2,B-7)=3THENP=2:GOTO76ØE
LSEPOKE343,255:A=A-O*2:P=2:GOTO4
5Ø
44Ø IFPEEK(344)=247THENIFPPOINT(
A+6,B+3)=3ORPPOINT(A+6,B-5)=3ORP
POINT(A+2,B-7)=3THENP=1:GOTO76ØE
LSEPOKE344,255:A=A+O*2:P=1:GOTO4
5Ø
45Ø IFPEEK(345)=247THENIFPPOINT(
A-4,B-8)=3ORPPOINT(A+4,B-8)=3THE
N76ØELSEPOKE345,255:B=B-O:GOTO47
Ø
46Ø ONP GOSUB48Ø,51Ø:B=B+O:IF K=
L THEN CV=CV+1:LL=LL-2:IF LL<2TH
EN LL=2:GOTO16Ø:ELSE16Ø
47Ø GOTO33Ø
48Ø IFPPOINT(A+4,B+4)=3ORPPOINT(
A-2,B+1)=3ORPPOINT(A-4,B-6)=3THE
N76Ø
49Ø IFPPOINT(A+4,B+4)=1THEN54Ø
5ØØ RETURN
51Ø IFPPOINT(A-4,B+4)=3ORPPOINT(
A+2,B+1)=3ORPPOINT(A+4,B-6)=3THE
N76Ø
52Ø IFPPOINT(A-4,B+4)=1THEN54Ø
53Ø RETURN
54Ø FORX=1TO9:IF P(X,Ø)=ØTHEN56Ø
55Ø IF ABS(P(X,1)-A)<=14AND ABS(
P(X,2)-B)<=14THEN P(X,Ø)=Ø:J=J+1
:K=K+1:SOUND2ØØ,1:DRAW"C2BM=P(X,
1);,=P(X,2);"+R$:X=9
56Ø NEXTX:RETURN
57Ø E=A+4:F=B-4
58Ø PSET(G,H,2):PSET(E,F,4):G=E:
H=F
59Ø E=E+2:IFPPOINT(E+2,F)<>2THEN
6ØØELSE58Ø
6ØØ IF PPOINT(E+2,F)<>3OR E>244T
HEN PSET(G,H,2):RETURN
61Ø IF GS=1AND E<M+26AND E>M-4AN
D F>N-1AND F<N+21THEN69Ø
62Ø GOTO68Ø
63Ø E=A-4:F=B-4
64Ø PSET(G,H,2):PSET(E,F,4):G=E:
H=F
65Ø E=E-2:IFPPOINT(E-2,F)<>2THEN
66ØELSE64Ø
66Ø IF PPOINT(E-2,F)<>3OR E<16TH
ENPSET(G,H,2):RETURN
67Ø IF GS=1AND E>M-4AND E<M+26AN
D F>N-1AND F<N+21THEN69Ø
```


Run VIP on your CoCo3!

VIP Integrated Library	*$149.95
VIP Writer/Speller	*$69.95
VIP Calc	*$69.95
VIP Database	*$59.95
VIP Terminal	*$49.95
VIP Speller	$34.95
VIP Disk-Zap	$24.95

All products are RSDOS Disk versions only.
* Available at Radio Shack stores through express order.

Upgrade your VIP Writer, Speller, Calc, Database or Terminal to run on your CoCo1, 2 or 3 for only $30.00 each! Send diskette only and check or money order for $30.

Upgrade ANY Product to VIP Library
which includes VIP Writer, Speller, Calc, Database, Terminal and Disk-Zap, for only $105.95. You save $45! Send original product and check or money order for $105.95.

S D Enterprises
P.O. Box 1233, Gresham, OR. Ph. (503) 663-2865
Include $3 shipping. Checks allow 3 weeks for delivery.

One-Liner Contest Winner . . .

Use your right joystick to draw with the "rubber band" approach. When you have positioned a line where you want it, press the joystick button to set it. The next line rotates around the previous line's endpoint. Pressing any key will skip to the current joystick location without drawing the line.

The listing:

```
Ø PMODE1,3:PCLS:PMODE1,1:SCREEN1
:H=128:V=96:FORJ=ØTO1STEPØ:X=JOY
STK(Ø)*4:Y=JOYSTK(1)*3:LINE(H,V)
-(X,Y),PSET:A$=INKEY$:IFA$>""THE
NPCOPY3TO1:PCOPY4TO2:H=X:V=Y:NEX
TELSEIF(PEEK(6528Ø)AND1)THENPCOP
Y3TO1:PCOPY4TO2:NEXTELSEPCOPY1TO
3:PCOPY2TO4:H=X:V=Y:NEXT
```

Gary Haussman
Loveland, CO

(For this winning one-liner contest entry, the author has been sent copies of both *The Third Rainbow Book of Adventures* and its companion *The Third Rainbow Adventures Tape.*)

```
68Ø FORX=1TO11STEP2:CIRCLE(E,F),
X,4:PLAY"V25;=X;":NEXTX:FORX=1TO
11STEP2:CIRCLE(E,F),X,2:NEXTX:FO
RX=ØTO2STEP2:LINE(X,X/2)-(25Ø+X,
167+X/2),PRESET,B:NEXT:RETURN
69Ø PSET(G,H,2):GS=Ø:X=M+1Ø:Y=N+
1Ø:COLOR4,3:PLAY"V15":FORZ=ØTO1Ø
STEP2:LINE(X-Z,Y-Z)-(X+Z,Y+Z),PS
ET,B:PLAY"V-EEFFFFGGGG":NEXT:COL
OR2,3:FORZ=ØTO1ØSTEP1:LINE(X-Z,Y
-Z)-(X+Z,Y+Z),PSET,B:NEXT
7ØØ IF RND(5)=3THEN T=T+1:FORX=1
TO5:PLAY"O5L1ØØ;1;2;3;4;5;6;5;4;
3;2;":NEXT:PLAY"O1L255"
71Ø S=S-5Ø-(RND(25)*2):IF S<ØTHE
NLINE(38,178)-(246,182),PSET,BF:
RETURN
72Ø LINE(38,178)-(248-S,182),PSE
T,BF:RETURN
73Ø FORZ=1TO9:IF P(Z,Ø)=ØTHEN75Ø
74Ø X=P(Z,1):Y=P(Z,2):DRAW"C1BM=
X;,=Y;"+R$
75Ø NEXTZ:RETURN
76Ø DRAW"C2BM=C;,=D;"+P$(Q):DRAW
"C4BM=A;,=B;"+P$(P):PLAY"V25":R=
R+1:I=I+(L-K):FORX=11TO1STEP-2
77Ø PLAY"V-;9;8;7;6;":CIRCLE(A,B
-2),X,2:PLAY"4;3;2;1;":NEXTX:IF
R=3THEN82ØELSE CV=CV+1:GOTO16Ø
78Ø PLAY"V31":I=I+(L-K)
79Ø DRAW"C2BM=A;,=D;"+P$(Q):DRAW
"C4BM=A;,=B;"+P$(P):Q=P:D=B:B=B+
BB:BB=BB+.5:IF RND(2)=1THEN P=3-
P
8ØØ PLAY"V-DC":IF B>17ØTHEN B=B-
BB:GOTO81ØELSE79Ø
81Ø PLAY"V31O1":FORX=1TO4Ø:PSET(
RND(7)*2+A-8,RND(15)+B-1Ø,RND(2)
):PLAY"CC":NEXT:FORX=1TO5ØØ:NEXT
82Ø CLSRND(9)-1:FORX=1TO2Ø:PLAY"
V31O5L255;1;2;4;3;5":PRINT@RND(4
ØØ)," GAME OVER ";:NEXTX
83Ø GOSUB85Ø:PRINT@484,;:INPUT"a
nother mission (Y/N)";J$
84Ø IF J$="Y"THEN CLS3:GOTO13ØEL
SE CLS:IF I$="3"THEN POKE65496,Ø
:END ELSE POKE65494,Ø:END
85Ø CLS4:PRINT@68,"CAVERNS  ";CV
;:PRINT@1ØØ,"LEVEL  ";LL;:PRINT@
196,"HEROES LEFT  ";3-R;:PRINT@2
6Ø,"SHIELDS LEFT  ";T;:PRINT@356
,"MEN SAVED  ";J;:PRINT@388,"MEN
 LEFT BEHIND  ";I;:IF I>ØTHENPRI
NT@42Ø,"SAVE %  ";INT((J/(J+I))*
1ØØ);
86Ø RETURN
```


SPECIAL DEAL ON 500 PROGRAMS IS BACK!

BACK BY POPULAR DEMAND! GET OUR LATEST 50 DISKS OR TAPES FULL OF OVER 500 PROGRAMS. HERE IS WHAT YOU'LL RECEIVE:

★Over 250 Utility/Home Application Programs including a Word Processor, Database, Spreadsheet, Disk Utilities, Business Software, Electronics Series, Educational Programs for Kids, plus much more!

★Over 200 exciting games including King Pede, Kron, Star Trek, Flight Simulator, Wizard, Horse Races, Football, plus much more.

★Over 30 adventures including Rambo, Haunted House, Power Sword, Skid Row, plus 32k graphic adventures.

Individual issues sell for $9.00 each or $450.00 for all 50. We slashed the price to only $150.00!

REG. $450 NOW $150.00

★★THIS MONTH ONLY★★

Buy this package of 500 programs and receive a free 6 month subscription.

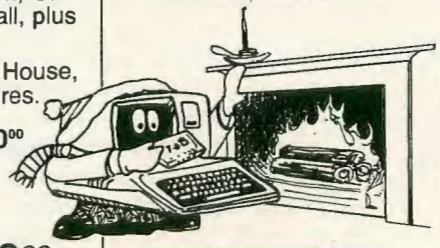
VISA

RAINBOW CERTIFICATION SEAL

WARM UP TO OUR WINTER PRICES ON SUBSCRIPTION SOFTWARE

THERE IS NO BETTER WAY TO ENJOY THE WINTER THAN TREATING YOUR COLOR COMPUTER TO 10 READY-TO-RUN PROGRAMS EACH MONTH. GET 12 DISKS OR TAPES A YEAR CONTAINING OVER 120 QUALITY PROGRAMS. A SUBSCRIPTION TO T & D SOFTWARE CONSISTS OF 10 READY-TO-LOAD PROGRAMS DELIVERED BY FIRST CLASS MAIL EVERY MONTH.

NO, WE ARE NOT THE SAME AS THE RAINBOW ON TAPE. IN FACT, MANY SUBSCRIBERS HAVE WRITTEN IN AND SAID THAT WE ARE MUCH BETTER THAN RAINBOW ON TAPE!



PRICES

	TAPE OR DISK	THIS MONTH ONLY
1 YEAR (12 issues)	~~79.00~~	60.00
6 MO. (6 issues)	~~49.00~~	35.00
1 ISSUE	~~9.00~~	8.00

Michigan Residents Add 4%
Overseas Add $10 to Subscription Price
Personal Checks Welcome!

★ Available on COCO 1, 2, and 3
★ Includes Documentation
★ Over 4,500 Satisfied Customers
★ Back Issues Available From July '82 (Over 670 Programs)

PLEASE SPECIFY TAPE OR DISK

TURN TO PAGE 30 & 31 FOR A COMPLETE LISTING

MasterCard

T & D SUBSCRIPTION SOFTWARE, 2490 MILES STANDISH DR., HOLLAND, MI 49424 (616) 399-9648

The Care and Handling of Tapes and Disks

By Ed Ellers
Rainbow Technical Editor

In response to Page R. Edmonson's request for information on the care and handling of floppy disks ("Letters to the Rainbow," December 1987, Page 7). . .

Cassettes

Should I use those special "computer cassettes," or are normal audio cassettes OK? What kind of tapes should I use?

Any standard audio cassette (often called "normal bias" or "Type I") will work, although it's best to use one of the better quality tapes on the market. Since the CoCo writes and reads data as an audio signal, the requirements are the same as for audio recording.

The one thing you want to look for is a tape that has as few surface imperfections as possible, to avoid losing data due to "dropouts." If in doubt, try recording some music on the tape you're considering, using the best recorder you have, and listen for dropouts in one or both channels; if you don't hear any, and the sound is reasonably clear (not muffled or "hissy"), the tape should be suitable for computer use.

The special "computer cassettes" sold by Radio Shack and other dealers actually use just a high-quality audio tape. The major advantage of these cassettes is their length — typically five, 10 or 20 minutes long. Some computer cassettes are supplied without leaders at the ends so that you can start recording on the beginning of the tape without having to wind past the leader. (Actually, it's a good idea to skip the first few seconds of the tape, anyway — that's the area most likely to be damaged, whether the cassette has a leader or not.) Any length up to 60 minutes will do, although you should avoid the C-90, C-120 and C-180 cassettes because they consist of thinner tape that may be less reliable.

There's another type of computer cassette you may come across, one that has a large notch in the housing between the two record-protect tabs. These data cassettes are designed for some "streamer" backup systems (as well as some older computers and terminals), and are not suitable for use with the CoCo. Also, avoid the "high bias" or metal-particle tapes; these won't be any better than a good normal bias tape, and may not work properly in your recorder.

What's the proper way to store cassettes?

Cassettes should be stored at room temperature, in their cases (if you have them). You might want to buy empty cases for the tapes that don't have them, but it's not mandatory. Contrary to popular belief, audio cassettes won't be damaged by being stacked horizontally. Also, rewind the tape to the beginning (either side will do) before putting it away. If you can see that the tape was wound unevenly, run it all the way to one end and then back to the other; this will pack the tape on the reel properly and prevent the tape from becoming creased.

What volume setting should I use?

The correct volume setting will depend on the recording level of the tape you're trying to load. We've found that a setting between 2 and 3 works best on the Radio Shack CTR-80 and CCR-81. On other recorders you'll have to find it by trial and error; one way to start is to type `AUDIOON:MOTORON`, press ENTER, and then play a tape through the CoCo. Adjust the volume to the highest point before the signal starts to become distorted, then try a `CLOAD` at that setting; if you still can't get tapes to load, start turning the volume *down* until you get good results.

What about head alignment?

It's very common for a recording head to be misaligned with respect to

---

Ed Ellers, a RAINBOW and PCM staff member, is a self-confessed electronics fanatic who takes time off to pursue other interests, including science fiction.

the tape, and far too often the head gap in your recorder may not match the tracks recorded by another machine. This causes the playback to be somewhat muffled, with the high end rolled off, resulting in a large number of errors when you try to load the file into your CoCo. (Head alignment errors are so common that some of the better stereo cassette decks have a "tracking" control to match the alignment of any tape you play.)

If you need to adjust the head in your recorder, enter the AUDIOON:MOTORON command and play the tape you need to match, then insert a small Phillips screwdriver through the tiny hole in the nameplate until it reaches the alignment screw. Turn the screw one way or the other to get the clearest signal.

When you've finished loading a balky tape this way, you'll need to reset your recorder using a cassette you've recorded on previously. A special alignment cassette would be even better, if you're able to find one.

How do I clean the heads on my recorder?

The best way to clean the heads is with a cotton swab dipped in alcohol or a special head-cleaning solution. Simply soak the swab and gently rub it over the heads to remove any oxide or other stains. (I don't recommend using a head-cleaning cassette; although some are OK, others can do more harm than good.)

What about demagnetizing the heads?

Believe it or not, some authorities say that it's not necessary to demagnetize, or degauss, recording heads — they say that the "bias" signal fed through the head during recording removes any residual magnetic field. Other experts aren't so sure. In any case, it does no harm to demagnetize the recording head, using a demagnetizing "wand" such as Radio Shack's 44-225 or 44-207. If you have a recorder other than one of the Radio Shack computer cassette recorders, check to make sure that the erase head moves back and forth when the Play button is pressed. If it only moves forward for recording, keep the demagnetizer away from it — it's probably a permanent-magnet head, and if you demagnetize it your recorder won't erase properly!

What about bulk tape erasers?

Bulk erasers are mainly intended to be used when you have to erase an entire tape or disk. It's often said that a bulk eraser will erase a tape more completely than the erase head on the recorder, but this isn't necessarily the case.

If you decide to use a bulk eraser, remember to keep it well away from any other tapes or disks, possibly in another room.

Can my tapes be damaged by X-rays or magnetic fields in transit?

Recordings can indeed be damaged by stray magnetic fields, not only in the mail but around your home or office, from things like hi-fi speakers or large electric motors. If you're mailing tapes or disks, it's a good idea to label the package, warning postal officials to watch out for magnets.

As for X-rays, I'm told that they do *not* erase tapes or disks, but that many X-ray machines generate strong magnetic fields in operation and will therefore erase magnetic recordings that are passed through them.

Disks

What's the real difference between single-sided and double-sided disks?

It's true that "single-sided" diskettes do have a magnetic coating on both sides and are actually identical to the same maker's "double-sided" disks. The difference is that disks sold as "double-sided" are tested for errors on both sides, while single-sided disks are tested only on the first side. The single-sided disks could be disks that passed on Side A but had one or more errors on Side B. More likely, they are disks that were left over after the needed number of double-sided disks were selected from a batch. In this case, the "other" side will not have been tested, and may or may not be in good shape. Nobody will break down your door to bust you for using the second side of a single-sided disk — in fact, a lot of people do use both sides — but it's at your own risk, and you may get more errors than you bargained for.

What type of disks should I buy?

If anything, this question is even more hotly debated in the case of disks than it is for cassettes. Some users say you should buy the best disks you can afford; others say that the cheapest disks around are just fine. Actually, since disks are one of the few products that are either "good" or "bad," you will probably do well with any disks sold by a reputable company that is willing to replace any disks that are defective — which would include any disk that has one or more bad tracks when formatted for the first time. Warranties do vary, all the way from covering just the first use of the disk to a full, lifetime warranty.

Polaroid has a rather unusual warranty on its Professional disks, which have gray jackets. These not only have a full, lifetime warranty, but if one of these disks is damaged they will copy its data to a new disk for you at no charge — you just ship the disk to Polaroid and they return the new disk the same way you sent the old one. The Professional disks may be worth considering for your most important programs and data files.

How should disks be stored?

Disks should be stored at room temperature and away from dust and dirt, preferably in the boxes (if any) they came in. As with cassettes, it doesn't matter if the disks are stored vertically or horizontally. It is important to keep them away from heat or magnetic fields, and to place them so that they won't be bent. Above all, keep the disks out of the sun — they warp very quickly.

How do I clean the disk drive head?

Disk drive heads are very difficult to reach, even if you take the cover off the drive, so the best way to clean them is with a wet-type head-cleaning disk, such as Radio Shack's 26-408. The "dry system" cleaning disks can easily damage a head and are definitely not recommended.

Are bulk erasers useful for disks?

Unlike tape recorders, disk drives do not have a separate erase head; instead, the read/write head simply writes over the old data. Since the "modified FM" system always records at full strength, this normally completely replaces the previous data. But in some situations you may want to erase the whole disk before saving an important file. This may also be true if you're sending a disk to someone to ensure they get only the files you want them to have. As with cassettes, do your bulk erasing well away from any other tapes or disks.

'SUPER VOICE' T.M.

COCO'S MOST ADVANCED SPEECH SYNTHESIZER.

IT TALKS, SINGS AND MORE.

only . . . $79.95

WITH EARS PURCHASE

only . . . $59.95

CoCo 3 Compatible

SUPER VOICE is no ordinary speech synthesizer. It uses Silicon Systems, Inc. SSI-263, the most advanced speech/sound chip available. SUPER VOICE is not only capable of highly intelligible speech, sound effects, and singing over a 6 octave range, but now we have turned SUPER VOICE into a monophonic Super Music Synthesizer with our PIANO KEYBOARD.

IT TALKS. A free TRANSLATOR text-to-speech program makes writing your own talking program as easy as SAYING "HELLO."

SUPER VOICE works in any 32K or 64K computer. A disk system requires a Y-Cable or Multi-Pak.

FREE "REACTION" To Test Your Reflexes

FREE SUPER VOICE SINGS THE STAR SPANGLED BANNER

FREE "SIMON" To Test Your Memory

Here are the facts; the decision is yours.

	SUPER VOICE	REAL TALKER	RS SPEECH CARTRIDGE	VOICE-PAK
Synthesizer Device	SSI-263	SC-01	SP-256	SC-01
Speaking Speeds	16	1	1	1
Volume Levels	16	1	1	1
Articulation Rates	8	1	1	1
Vocal Tract Filter Settings	255	1	1	1
Basic unit of Speech	64 phonemes 4 durations each	64 phonemes	64 allophones 5 pause lengths	64 phonemes
Pitch Variations	4096 (32 absolute levels with 8 inflection speeds)	4	1	4

SAVE $24.95

FREE

SUPER TALKING HEADS

Paul and Pauline, our talking heads program is normally $24.95. Until Dec. 15 we will include them with each SUPER VOICE order.

FREE BLANK DISK OR TAPE WITH EVERY ORDER

VISA MasterCard

Dealer Inquiries Invited

We accept CASH, CHECK, COD, VISA and MASTER CARD orders.
Shipping and handling US and Canada $3.00
Shipping and handling outside the US and Canada $5.00
COD charge $2.00
Illinois residents add 6¼% sales tax

Speech Systems

38W 255 DEERPATH ROAD
BATAVIA, ILLINOIS 60510
(312) 879-6880 (TO ORDER)

CALL ANY DAY TO ORDER. ALSO ORDER BY MAIL

Now Your Computer Can Listen To You!

EARS™

Electronic
Audio
Recognition
System

$99.95

- SPEECH RECOGNITION
- HANDS OFF PROGRAMMING
- HIGH QUALITY SPEECH REPRODUCTION

EARS Does It All!

INCREDIBLE!

Two Years In the Making. Speech Systems was formed to develop new and innovative speech products. After 2 years of intensive Research and Development, we have created a truely sophisticated speech recognition device. Recognition rates from 95% to 98% are typical. Until now, such a product was outside the price range of the personnel computer market, and even small businesses.

EARS is trained by your voice and capable of recognizing any word or phrase. Training EARS to your particular voice print takes seconds. Up to 64 voice prints may be loaded into memory. You may then save on tape or disk as many as you like so that your total vocabulary is virtually infinite.

Speech and Sound Recognition. EARS is really a sound recognition system, so it really doesn't matter whether you speak in English, Spanish, or French. In fact you do not have to speak at all, you can train EARS to understand sounds such as a musical note or a door slamming.

Hands Off Programming. Imagine writing your own BASIC programs without ever touching the keyboard. Everything that you would normally do through a keyboard can now be done by just speaking.

Programming EARS Is Easy. LISTEN, MATCH and other commands have been added to BASIC so that programming EARS is a piece of cake! The single BASIC line: 10 LISTEN: MATCH will instruct EARS to listen to you and return the matching phrase.

It Talks. EARS is also capable of high quality speech. We mean REALLY high quality. The speech is a fixed vocabulary spoken by a professional announcer. Speech Systems is currently creating a library of thousands of high quality words and phrases. For a demonstration call **(312) 879-6844**, you won't believe your ears or our EARS.

DISK OWNERS. EARS will work with any disk system with either a MULTI-PAK or Y-CABLE. Our new Triple Y-CABLE was specifically developed for those wishing to add SUPER VOICE as a third device.

You Get Everything You Need. You get everything you need including a specially designed professional headset style noise cancelling microphone. The manual is easy to use and understand. Several demonstration examples are included so you don't have to write your own programs unless you want to. EARS will work in any 32K or 64K Color Computer.

SUPER VOICE $20 OFF

Imagine talking to your computer and it talking back to you. When you need an unlimited vocabulary, you can't beat SUPER VOICE. For a limited time, we will give you the SUPER VOICE for $59.95 with your EARS purchase. Even if you already have another speech unit, here is your chance to buy the best and save $20.

VOICE CONTROL

Applications for EARS are astounding. Here is our first of many listening programs to come. VOICE CONTROL is a program specifically designed to allow you to control any appliance in your house with your voice and our HOME COMMANDER (sold separately) or the Radio Shack Plug 'N' Power controller. For example, you can control your TV by saying "TV ON" or "TV OFF". . **$24.95**

FREE BLANK DISK OR TAPE WITH EVERY ORDER

VISA MasterCard

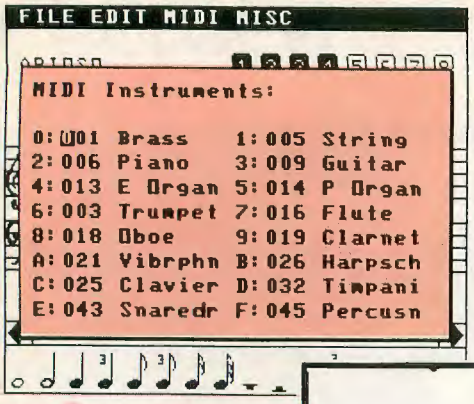
Dealer Inquiries Invited

We accept CASH, CHECK, COD, VISA and MASTER CARD orders.
Shipping and handling US and Canada $3.00
Shipping and handling outside the US and Canada $5.00
COD charge $2.00
Illinois residents add 6¼% sales tax

Speech Systems

38W255 DEERPATH ROAD
BATAVIA, ILLINOIS 60510
(312) 879-6880 (TO ORDER)

CALL ANY DAY TO ORDER. ALSO ORDER BY MAIL



Introducing

COCO MIDI 2

Lyra COMPATIBLE!

Coco 1, 2, 3 Compatible

Confused about MIDI?

"Understanding MIDI"

$3.95

80 pages

NOW Print Single Voice/ Track files using **LYRA PRINT** **$29.95**

Now your COCO can talk to your MIDI music synthesizer. Whether you have a Korg, Roland, Casio, Yamaha, or Moog, it doesn't matter as long as it's MIDI equipped. Choose from our entry level MUSICA MIDI system that plays MUSICA files or our Professional COCO MIDI 2 system.

- Supports 16 Track recording and playback.
- Adjustable tempo.
- Over 45 Kbytes available (Over 15,500 MIDI events possible).
- Record to any track.
- Low Level track editing.
- LYRA editing. (one voice per track).
- Playback from any number of tracks.
- Quantizing to 1/16, 1/32, 1/64 intervals.
- Dynamic memory allocation.
- Filter out MIDI data: Key pressure, Program change, Pitch wheel, Control Change, Channel Pressure, System Message
- Graphic Piano Keyboard Display in both record and playback mode.
- Adjustable Key (Transposition) for each track.
- Save recording to disk for later playback or editing.
- Syncs to drum machine as MASTER or SLAVE.
- PUNCH IN and PUNCH OUT editing.
- Sequencer features.
- 100% machine code.
- "Musician Friendly" Menu Driven.
- Metronome
- Many songs included.

Includes MIDI hardware interface, 2 MIDI cables, detailed manual, and software. Requires 64K CoCo, Y-Cable or Multi-Pak.

COCO MIDI 2 (disk only) #CM147 . **$149.95**
DOUBLE Y-CABLE #DY181 . . . . . **$28.95**
TRIPLE Y-CABLE #TY173 . . . . . **$34.95**

DX LIBRARIAN™

Save and load voice parameters for the Yamaha DX series of synthesizers (DX-7, DX-100, DX-21 etc.). Save sounds individually or as a group letting you load the entire synthesizer in seconds. Comes with professionally developed voices for the DX-7 worth 10 times the price. Requires COCO MIDI hardware interface.
DX LIBRARIAN (Disk only) #DX143 . . . . . $39.95

CASIO LIBRARIAN

Save and load voice parameters for any Casio synthesizer (CZ-101, CZ-1000, CZ-5000 etc.) You can save from the: presets, cartridge, memory or buffer. Requires COCO MIDI hardware interface.
CASIO LIBRARIAN (Disk only) #CL169 . . . . . **$39.95**

MUSICA MIDI™

MUSICA MIDI takes any MUSICA 2 music file and plays it through your MIDI synthesizer. We offer you over 800 tunes from our MUSIC LIBRARY series (sold separately) or create your own music using MUSICA 2. Inlcudes: documentation, plenty of music, and the cable to connect between the COCO and your synthesizer.
MUSICA MIDI Complete (Disk Only) #CM126 . . . . . **$39.95**

MIDI KEYBOARD

If you own the Casio CZ-101 or similar MIDI synth, you know that the mini keys and the short 3 or 4 octave keyboard is limiting. MIDI KEYBOARD when used with our full size 5 octave keyboard gives you the flexibility you need. Comes with cable to connect the COCO to your MIDI synth.
MIDI KEYBOARD (Disk only) #MK167 . . . . . **$29.95**

NEW!
LYRA PRINT
NOW PRINT LYRA FILES ON YOUR RADIO SHACK, OKIDATA 92, GEMINI, PANASONIC & COMPATIBLE PRINTER
$29.95

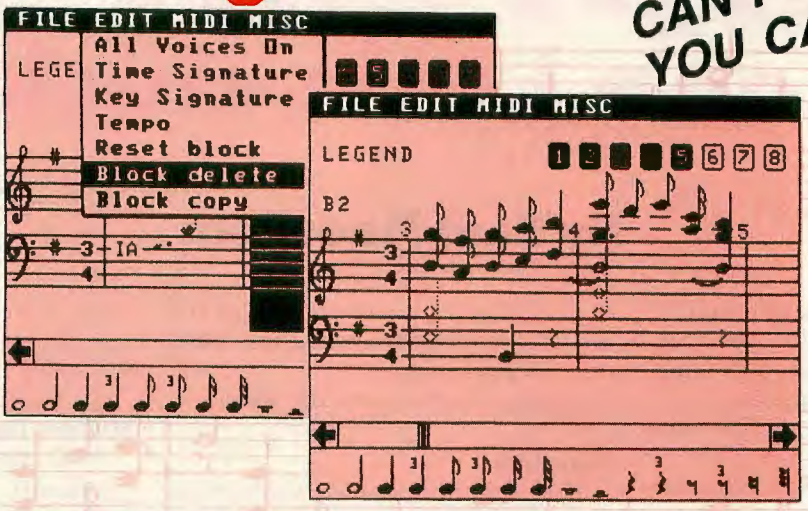
Lyra™

The Musical Coco Max™

IF YOU CAN POINT, YOU CAN COMPOSE

PULL DOWN MENUS

ICONS!



Coco 1, 2, 3 Compatible

A MUST FOR MIDI USERS

LYRA is the most powerful music composition program we have seen on any computer. We don't mean just the COCO, we really mean any computer. Whether you are a novice trying to learn music or a professional musician with MIDI equipment you will find LYRA a powerful tool. You see, we wrote LYRA for musicians that hate computers. If you want proof, purchase a LYRA demo for $7.95. We will apply the demo price to your purchase. MIDI output requires the LYRA MIDI cable (#MC158) or COCO MIDI Seq/Editor (#CM147).

- Ultra Easy to use, just point with joystick or mouse and click.
- Compose with up to 8 completely independent voices.
- Room for over 18,000 notes. (This is not a misprint!)
- Super Simple Editing Supports:
  - Note insert
  - Note delete
  - Note change
  - Block insert
  - Block delete
  - Block copy
- Output music to:
  - TV Speaker
  - STEREO PAK
  - SYMPHONY 12
  - MIDI Synth
  - Monitor Speaker
  - ORCHESTRA 90
  - COCO MIDI S/E
  - MIDI Drum Machine
- Output up to 4 voices without additional hardware.
- Output all 8 voices using either SYMPHONY 12 or one or more MIDI synthesizers and drum machines.
- Output any voice on any of the 8 MIDI channels.
- Transpose music to any key.
- Modify music to any tempo.
- Automatically inserts bar for each measure as you compose.
- Key signature lets you specify sharps and flats only once, LYRA will do the rest.
- Plays MUSICA 2 files using LYRA CONVERT (#LC164).
- Each voice may be visually highlighted or erased.
- Each measure is numbered for easy reading.
- Solo capability
- Block edits are highlighted.
- Tie notes together for musical continuity.
- Name of note pointed to is constantly displayed.
- Jump to any point in the score instantaneously.
- Memory remaining clearly displayed, however you will have plenty of memory even for the most demanding piece.
- Help menu makes manual virtually unnecessary.
- LYRA is 100% software, no need for extra hardware unless you want more power.
- Music easily saved to tape or disk.
- Requires 64K and mouse or joystick.

LYRA (Disk only) #LY122 . . . . . **$54.95**

LYRA OPTIONS

These LYRA options are **not** required. They are provided for those wishing additional flexibility.

LYRA CONVERT
A program to convert MUSICA 2 files to LYRA files.
(Disk) #LC164 . . . . . **$14.95**

VERSION UPDATE
To receive the latest version of LYRA return your original disk. #UP162 . . . . . **$10.00**

LYRA MIDI CABLE
A cable to connect your computer to your MIDI synthesizer.
#MC158 . . . . . **$19.95**

LYRA SYMPHONY 12 ENHANCER
Lets LYRA play all 8 voices through SYMPHONY 12.
(Disk) #LS177 . . . . . **$19.95**

LYRA LIBRARY
A collection of 50 songs ready to play for hours. Most have 7 and 8 voices. #LL137 . **$39.95**

SYMPHONY 12
A real hardware music synthesizer, lets LYRA play all 8 voices in stereo.
(T or D) #SY149 . . . . . **$69.95**

COCO MID Seq/Editor
A professional quality MIDI interface for MIDI synthesizers.
(Disk only) #CM147 . . . . . **$149.95**

MUSIC LIBRARY
A collection of over 900 songs. When used with CONVERT, it gives an incredible LYRA library. Each volume 100 songs.
(T or D) #MLXXX **$29.95**

COCO MAX is a trademark of Colorware.
ORCHESTRA 90 is a trademark of Radio Shack.

We accept CASH, CHECK, COD, VISA and MASTER CARD orders.
Shipping and handling US and Canada $3.00
Shipping and handling outside the US and Canada $5.00
COD Charge $2.00
Illinois residents add 6¼% sales tax.

Speech Systems

38W255 DEERPATH ROAD
BATAVIA, ILLINOIS 60510
(312) 879-6880

Enhancements to Cheap Spread

'Spread'ing It on a Little Thicker

By Saul Mooallem

Bill Reed's spreadsheet program, *Cheap Spread* [April 1987, Page 174], is an outstanding example of a practical and useful application for a wide range of CoCo users. To make it even more convenient and useful, I have added four important new capabilities:

1) a capacity allowing spreadsheets to be saved to or loaded from tape (for those of us with lower budgets who really need spreadsheets);
2) optional row and column headings, which are handy for large or complex spreadsheets (this feature can be used to "lock in" headings on the screen, avoiding the need to move the display window back and forth);
3) use of the right and down arrow keys for successive data entry into multiple cells (you no longer need to repeatedly use the DAT command — just move to the next cell);
4) alphanumeric cell labels, which speed up typing and improve readability, especially in functions (brackets are completely eliminated; for instance, the function [5,3]+[5,4]/[5,5] becomes simply E3+E4/E5).

Due to the modularity of the program, I was able to implement these features independently of one another.

Saul Mooallem is a sales representative for a major computer company. He holds a master's degree in computer science and has extensive experience in software development.

If you prefer to incorporate some but not all four enhancements, just make the changes shown in the listing corresponding to the features you want.

Tape Files

This enhancement is self-explanatory. Of course you are not asked if you want to replace an existing spreadsheet or save a new one, as you are asked when using disk files.

Headings

The first row and the first column are considered the headings. A new HDG command allows you to turn the display of headings on or off. Headings are initially off, and the program functions exactly as before. However, after you turn them on by typing HDG, they appear as the first column and top row of the portion of the spreadsheet displayed on the screen. To turn off headings, just type HDG again.

When headings are displayed, there is one less column and row available for actual data, but this is often a small inconvenience compared to moving the window back to check headings. Note that when headings are turned on:

- the first row and column do not have labels in the margins. This is how you can tell whether you have turned the headings on or off.
- row and column numbers in the J (jump) command refer to the upper-left cell of the desired display *not* including headings.
- you are not able to enter or change headings without first turning them off.
- the operation of the P (print) command is not affected.

Incidentally, I find it convenient to enter a spreadsheet title such as "87 BUDGET" in Cell [1,1].

Multiple Data Entry

While entering data (using the DAT command), you can move between cells using the right arrow or down arrow keys. This speeds up data entry substantially by allowing you to fill in an entire column of data by entering DAT only once. The left arrow key backspaces as before.

Alphanumeric Cell Names

Rows are now designated by the letters A through Z, so the comma between row and column are eliminated. For instance, the command F3,2 is now entered as F C2, and CR2-5 (copy row) becomes CR B-E.

The best improvement is that brackets are no longer needed in functions. However, there are two kinds of limitations imposed by this feature: Command names may not contain spaces, and a space must appear between the command name and the cell name. Also, you are limited to 26 rows.

Correction

The original *Cheap Spread* yields a BS Error in Line 16550 when the user jumps to a nonexistent cell with the J command and then tries to verify formulas with "VF." To correct this, alter Line 16540 as shown:

```
16540 IF (I+DR-1>MR) OR (J+
DC-1>MC) THEN 16580
```

□

Editor's Note: The altered program will replace the four listings below on this month's RAINBOW ON DISK and RAINBOW ON TAPE. It will be saved under the filename SPREAD2.

Listing 1: TAPE

```
Ø REM changes for tape save/load
7Ø2Ø REM delete line 7Ø2Ø
7Ø3Ø OPEN"I",#-1,F$
7Ø4Ø INPUT#-1,MR,MC
7Ø8Ø INPUT#-1,C$(I,J)
712Ø INPUT#-1,FC$(I,J)
714Ø CLOSE#-1
751Ø REM delete line 751Ø
752Ø PRINT@32,STRING$(3Ø,32);:PR
INT@32,"";:INPUT"FILENAME: ";F$
753Ø REM delete line 753Ø
754Ø REM delete line 754Ø
755Ø OPEN"O",#-1,F$
756Ø PRINT#-1,MR,MC
759Ø PRINT#-1,C$(I,J)
763Ø PRINT#-1,FC$(I,J)
765Ø CLOSE#-1
```

Listing 2: HEADING

```
Ø REM changes for data entry
16Ø IF CN=1 THEN GOSUB 4ØØØ:IF E
R$<>"" THEN GOSUB 95ØØ:GOTO 6Ø:'
ENTER DATA
8Ø2 IM$="S"
1532 IF C8=9 OR C8=1Ø THEN IM$=C
8$:PRINT@PS," ";:C9=VAL(C9$):RET
URN
2562 IF MID$(IP$,I,1)<>"-" AND M
ID$(IP$,I,1)<>"," THEN ER$="DELI
MITER MUST BE '-' OR ','"
259Ø REM delete line 259Ø
4ØØ2 IM$="M"
4Ø22 IF IM$="M" THEN 4Ø29
4Ø24 IF ASC(C8$)=1Ø THEN O1=O1+1
:GOSUB 257Ø
4Ø25 IF ASC(C8$)=9 THEN O2=O2+1:
GOSUB 3Ø7Ø
4Ø26 IF ER$<>"" THEN 4Ø29
4Ø27 GOSUB 35ØØ:IF ER$<>"" THEN
GOSUB 95ØØ ELSE 4ØØ2
4Ø29 IM$="S"
```

Listing 3: DATA

```
Ø REM changes for headings
3Ø2 IF CN=18 THEN HD=1-HD:PRINT@
32,STRING$(3Ø,32);:PRINT@32,"HEA
DINGS "+MID$("OFFON ",3*HD+1,3);
:GOSUB 12ØØØ
532 HD=Ø
6ØØ NC=18:DIM VC$(NC),V$(2Ø)
64Ø DATA DAT,F,I,D,SPREAD,V,J,CR
,CC,P,S,H,ERASE,CLRD,U,VF,Q,HDG
351Ø IF CN<9 AND (O1>DR+13-1 OR
O1<(DR+HD)) THEN 355Ø
352Ø IF CN=9 AND (O1>DC+3-1 OR O
1<(DC+HD)) THEN 355Ø
353Ø IF CN<6 AND (O2>DC+3-1 OR O
2<(DC+HD)) THEN 355Ø
815Ø PRINT@14*32+2,"P - PRINT
   HDG- HEADINGS";
1ØØ52 IF HDG=Ø OR (I<>1 AND J<>1
) THEN II=I+DR-1:JJ=J+DC-1:GOTO
1ØØ6Ø
1ØØ54 IF I=1 AND J<>1 THEN II=1:
JJ=J+DC-1:GOTO 1ØØ6Ø
1ØØ56 IF J=1 AND I<>1 THEN II=I+
DR-1:JJ=1:GOTO 1ØØ6Ø
1ØØ58 GOTO 1ØØ7Ø
1ØØ6Ø PRINT@96+(I-1)*3Ø+I*2+(J-1
)*1Ø,C$(II,JJ);
1Ø52Ø FOR I=HD+1 TO 3
1Ø58Ø FOR I=HD+1 TO 13
11Ø1Ø DR=O1-HD:DC=O2-HD:RETURN
```

Listing 4: CELL

```
Ø REM changes for alphanumeric c
ell labels
92 IF CN>7 THEN 98
94 GOSUB 17ØØØ:IF ER$<>"" THEN G
OSUB 95ØØ:GOTO 6Ø
96 GOSUB 3ØØØ:IF ER$<>"" THEN GO
SUB 95ØØ:GOTO 6Ø
98 IF CN<>9 THEN 132
132 IF CN<>8 THEN 14Ø
134 GOSUB 17ØØØ:IF ER$<>"" THEN
GOSUB 95ØØ:GOTO 6Ø
136 GOSUB 175ØØ:IF ER$<>"" THEN
GOSUB 95ØØ:GOTO 6Ø
534 AL$="ABCDEFGHIJKLMNOPQRSTUVW
XYZ"
78Ø PRINT@13*32+4,"# OF ROWS(DEF
.&MAX.=26)";:INPUT MR:IF MR=Ø TH
EN MR=26
782 IF MR>26 THEN 78Ø
2Ø2Ø 'GET COMMAND NAME
2Ø4Ø IF INSTR(NM$+" ",MID$(IP$,I
,1))>Ø THEN 2Ø7Ø
```

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.**

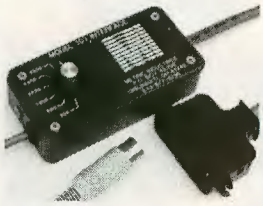
Binders are $13.50 per two-binder set plus $2.50 shipping and handling. If your order is to be sent via U.S. mail to a post office box or foreign country, please add $2. Kentucky residents add 5% sales tax. U.S. currency only, please. In order to hold down non-editorial costs, we do not bill.

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

All other inquiries call (502) 228-4492.

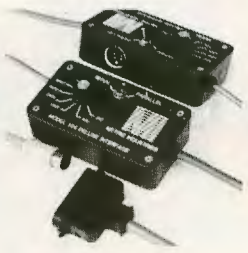
```
2Ø5Ø CM$=CM$+MID$(IP$,I,1)
253Ø IF INSTR(NM$+" ",MID$(IP$,I
,1))>Ø THEN O1$=O1$+MID$(IP$,I,1
) ELSE 255Ø
654Ø PRINT@32,"ENTER START,END R
OW";:INPUT R1$,R2$:R1=INSTR(AL$,
R1$):R2=INSTR(AL$,R2$)
6542 IF R1=Ø OR R2<R1 OR LEN(R1$
)<>1 OR LEN(R2$)<>1 THEN ER$="IN
VALID ROW":GOSUB 95ØØ:GOTO 653Ø
854Ø PRINT@32,"ENTER START ROW T
O CLEAR";:INPUT S2$
8542 S2=INSTR(AL$,S2$):IF S2=Ø T
HEN PRINT@32,STRING$(3Ø,32);:GOT
O 854Ø
95Ø2 PRINT@32,STRING$(3Ø,32);
1Ø59Ø PRINT@64+(I*32),MID$(AL$,I
+DR-1,1);
1352Ø II=2:IF LEFT$(IP$,1)="R" T
HEN GOSUB 17ØØØ ELSE GOSUB 25ØØ
1355Ø IF LEFT$(IP$,1)="R" THEN G
OSUB 175ØØ ELSE GOSUB 3ØØØ
14Ø4Ø IF INSTR(AL$,I9$)>Ø THEN G
OSUB 145ØØ:GOTO 14Ø7Ø
1451Ø O4$=""
1452Ø REM delete line 1452Ø
1453Ø REM delete line 1453Ø
1454Ø REM delete line 1454Ø
1455Ø REM delete line 1455Ø
1456Ø O3=INSTR(AL$,I9$)
1458Ø IF I>LEN(IP$) THEN 1462Ø
1461Ø REM delete line 1461Ø
1462Ø O4=VAL(O4$):I=I-1
17ØØØ '*** VALID ROW? ***
17Ø1Ø FOR I=II TO LEN(IP$)
17Ø2Ø IF MID$(IP$,I,1)<>" " THEN
 17Ø5Ø
17Ø3Ø NEXT
17Ø4Ø ER$="ROW INVALID OR MISSIN
G":GOTO 17Ø7Ø
17Ø5Ø O1=INSTR(AL$,MID$(IP$,I,1)
):II=I+1:IF O1=Ø THEN 17Ø4Ø
17Ø6Ø IF CN<9 AND O1>MR THEN ER$
="MAX. NO. OF ROWS IS"+STR$(MR)
17Ø7Ø RETURN
175ØØ '*** VALID DELIMITER & SEC
OND ROW? ***
1751Ø IF MID$(IP$,II,1)<>"-" AND
 MID$(IP$,II,1)<>"," THEN ER$="D
ELIMITER MUST BE '-' OR ','":GOT
O 1753Ø
1752Ø II=II+1:O2=INSTR(AL$,MID$(
IP$,II,1)):IF O2=Ø THEN ER$="ROW
 INVALID OR MISSING"
1753Ø RETURN
```


Model 101 Interface $39.95



- Serial to parallel interface
- Works with any COCO
- Compatible with "Centronics" parallel input printers
- 6 switch selectable baud rates 300-600-1200-2400-4800-9600
- Small size 4.5" x 2.5" x 1.25"
- Comes complete with cables to connect to your computer and printer

Model 104 Deluxe Interface $51.95



Same features as 101 plus
- Built in serial port for your modem or other serial device
- Switch between parallel output and serial output
- Size is 4.5" x 2.5" x 1.25"
- Comes complete with cables to connect to your computer and printer

Model 102 Switcher $35.95

- Connect to your COCO serial port and have 3 switch selectable serial ports
- Color coded indicator lights show switch position
- Lights also serve as a *power on* indicator for your COCO
- Heavy guage blue anodized aluminum cabinet with non-slip rubber feet

The 101 and 104 require power to operate. Most printers can supply power to your interface. (Star, Radio Shack and Okidata are just a few that do - Epson and Seikosha do not). The interfaces can also be powered by an AC adaptor; Radio Shack model 273-1431 plugs into all models. If you require a power supply, add a "P" to the model number and add $5.00 to the price. (Model 101P $44.95, Model 104P $56.95).

Model 105 Switcher $14.95

- Connects to your COCO to give you 2 switch selectable serial ports
- 3 foot cable to connect to your COCO's serial port
- The perfect item to use to connect a printer and a modem to your COCO
- Small in size, only 4.5 x 2.5 x 1.25

The Model 101, 102, 104 and 105 work with any COCO, any level basic and any memory size. These products are covered by a **1 year warranty.**

The Model 101 and 104 work with any standard parallel input printer including Gemini, Epson, Radio Shack, Okidata, C. Ioth, Seikosha, Panasonic and many others. They support BASIC print commands, word processors and graphic commands.

We manufacture these products - dealer inquiries are invited.

Cassette Label Program $6.95

- New Version - tape transferrable to disk - save and load labels from tape to disk
- Prints 5 lines of information on pin-feed cassette labels
- Menu driven, easy to use
- Standard, expanded and condensed characters
- Each line of text automatically centered.
- Label display on CRT, enabling editing before printing
- Program comes on tape and is supplied with 24 labels to get you started
- 16K ECB required

Other Quality Items

High quality 5 screw shell C-10 cassette tapes. **$7.50/dozen**

Hard plastic storage boxes for cassette tapes. **$2.50/dozen**

~~Pin-Feed~~ Cassette Labels
White **$3.00/100**
Colors **$3.60/100** (specify red, blue, yellow, tan)

NEW! Cables for your COCO

- U.L. listed foil-shielded cable
- 2 Types: male/female extension cables (used between a serial device and existing cable) male/male cables (used between two serial devices such as a modem and one of our switchers).
- 3 ft./$3.95, 6 ft./$4.49, 10 ft./$5.59 Specify M/M or M/F and length.

Ordering Information

Free shipping in the United States (except Alaska and Hawaii) on all orders over $50.00. Please add $2.50 for shipping and handling on orders under $50.00.
Ohio residents add 6% sales tax.
Call (513) 677-0796 and use your VISA or MASTERCARD or request C.O.D. (Please add $2.00 for C.O.D. orders).
If you prefer, send check or money order; payable in U.S. Funds to:

Metric Industries
P.O. Box 42396
Cincinnati, Ohio
45242

Come to Radio Shack for the Very

We've got the selection!

At Radio Shack, we're dedicated to making sure that you never run out of ways to use and enjoy your Color Computer. We've got a terrific line of software—here's just a sample!

Games for the whole family

Let your Color Computer open the door to a world of fun and adventure. Choose from a dazzling selection of popular and challenging games.

Explore a secret cave in *Downland.* Challenge the evil wizard in *Dungeons of Daggorath.* Avoid the Great White Bat of *Cave Walker.* Take part in a daring raid in *Koronis Rift.* Or enter the changing worlds of *Rogue* or *The Interbank Incident.*

You'll think your feet have left the ground as you take off into the realism of the wild blue yonder of *Flight Simulator II.* Battle the enemy for your survival as you challenge the depth and the intricacies of an underground fortress in *Thexder* or overcome the danger of the depths of the ocean as well as the treacherous enemy of *Sub Battle Simulator.*

Or go even further as you transport supplies between two galaxies of *Zone Runner.* Marvel at the 3-D color graphics of *Rescue on Fractalus* and *Springster.* Get down to earth and play *Color Baseball.* Or introduce yourself to the 3,000-year-old game of Mahjong in the smokey backrooms of *Shanghai.*

Make learning fun

One of the most valuable potentials of your Color Computer is in providing your children a head start in their education. We've got learning programs for children of all ages that will provide hours of productive fun!

Children in grades 1 through 8 enjoy the challenging fun of *Color Math.* With testing options at all levels, *Color Math* assures progress. Older kids enjoy learning facts from the World Almanac as they venture through the great capitals of the world while in search of the stolen Statue of Liberty's torch in *Where in the World is Carmen Sandiego?* Children embark upon a journey of another type as they venture through

Koronis Rift and Rescue on Fractalus/TM LucasFilm Games. Rogue and Sub Battle Simulator/TM Epyx. Flight Simulator II/TM subLOGIC Corp. Thexder/TM Game Arts.

Best in Color Computer Software

the human body of *Microscopic Mission*. Imagine your child's excitement and anticipation while journeying through the blood vessels from the leg through the kidneys, liver, heart, lungs and finally, to the brain itself. The *Color Computer Artist* helps children realize creative skills at an early age. With this selection you'll find programs that help develop hundreds of useful skills.

Boost your productivity

No matter what your personal needs, we've got programs that'll put your Color Computer to work where you need it most. *Personal Finance II* and *Color File II* organize paperwork and filing. Get *Color SCRIPSIT® II* and *TSSPELL* for perfect letters and reports. Or run complex spreadsheets using *Spectaculator*.

For the programmer's delight we have *OS-9 Level Two* and the development system. And for the solution of many of your software needs, consider the enhanced *DeskMate® 3*. With Text word processing, Ledger spreadsheet, Paint, Index Cards filing, Telcom telecommunications, Calendar and Calculator programs, *DeskMate 3* is seven of the most popular applications in one simple-to-use program.

Need more suggestions? Send in the coupon for a free copy of our 1988 Computer Catalog & Software Reference Guide. Radio Shack is your one-stop software center.

Radio Shack®
The Technology Store™
A DIVISION OF TANDY CORPORATION

Send me a 1988 computer catalog.

Mail to: Radio Shack, Dept. 88-A-705
300 One Tandy Center, Fort Worth, TX 78102

Name _____
Address _____
City _____
State _____
ZIP _____
Phone _____

Shanghai and Microscopic Mission/TM Activision. Where in the World is Carmen Sandiego?/TM Broderbund. OS-9/TM Microware and Motorola

Getting 'stock' answers to your inventory questions

TAKING STOCK

By Charles May

Stock, a direct access inventory program, allows you to take stock of your goods, permitting up to 99,999 units per record.

The program has provisions for an 11-digit stock number, unit descriptions, purchases, returns, wholesale and retail costs, and more. Along with figuring gross profit, it also calculates final inventory balance, total purchases, gross receipts, returns and allowances, and inventory given to personal use.

All this information can be printed in an inventory report, using your printer's condensed mode to fit 133 characters on a line. The program is currently configured for a DMP-105, but it can easily be modified to accommodate other printers. (Line 890 puts the printer in condensed mode, and Line 1105 returns it to standard print. Just substitute your appropriate printer code.)

The program listing is "blocked off" in modular style, making it very easy to understand.

Running the Program

Stock is menu-driven, prompting you along. On running the program you will see the main menu and its five options:

1) Enter New Stock Numbers
2) Inventory Activity
3) Print Report
4) Review Status
5) Exit

The first step is to enter all stock numbers correctly and in proper sequence — select Option 1 from the main menu. Stock numbers can be up to 11 characters of any combination of letters and numbers — but the final three characters *must be numbers*! These three numbers will become the record number the disk uses to store and access records. They *must* begin in this sequence: 001, 002, 003 . . . 099, 100, 101, etc. For example, your first number might be A137690-001; the 001 is the disk record number.

Should you begin with any other sequence, the disk will skip space, leaving blank all unassigned records. For example, if you begin with 100 instead of 001, the disk leaves the first 99 records blank. When you printed your report, you would get nothing but garbage. It is extremely important that you assign stock and record numbers correctly.

Thirty-two spaces are assigned to the Unit Description field; five spaces are assigned to all "count" fields, and eight spaces are assigned to all "money" fields in each record. This means that the files can contain up to 99,999 units per record and dollar amounts of $99,999.99. For amounts over these limits you must alter the code.

Only the stock number, description, quantity purchased, cost and retail are entered during the initial entry routine. New purchases, sales, returns and personal use entries can be entered only as "Inventory Activities."

Inventory Activities are coded in such a way that they adhere to standard accounting principles. For instance, Total Receipts will contain receipts that are to be deducted on the returns and allowances adjustments of your income statement — and on the IRS' Schedule C of Form 1040. Other entries, such as dollar amounts of items withdrawn for personal use, are income statement adjustments, also.

Should you purchase goods that have changed in cost, you will need to make a separate record of each item as though it were a brand new entry. The stock number can be identical to the original except for the final three digits, the record number. For example, suppose stock number 3001A-019 originally cost $8.65 but now costs $9.15. Your new number might become 3001A-139. 3001A is not stored in records 019 and 139. This is the only way to keep your sales and income figures correct.

You will be asked for the *actual* selling price. If your selling price differs from retail, enter it so.

Refunds will be the total dollar amount of the refund — not the unit refund amount. For example, suppose a customer returns three items that you sold for $10 each; you refund $30 —

Charles May owns his own carpet and upholstery cleaning business and prepares taxes in season. He used his CoCo for all business transactions for three years, and now lets his IBM PC share some of the load.

enter $30.00 at the prompt.

Your report gives a final inventory balance of your stock on hand. This figure may be different from physical inventory count, but this final inventory balance must be used on your income statement and on Schedule C to show your true net income.

To begin a new year with accurate data, save the program on a new disk and reenter all stock data as though it were for the first time.

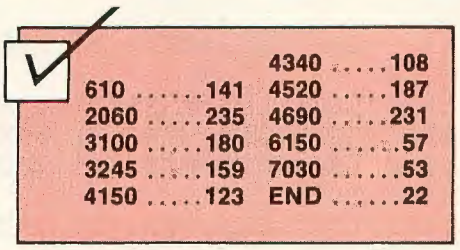
(Questions or comments about this program may be directed to the author at Rt. 1, Box 234P, Desoto, TX 75115. Please enclose an SASE when writing for a response.) □

INVENTORY REPORT FOR PERIOD ENDING FEBRUARY 13, 1988

STOCK NO.	UNIT DESCRIPTION	QTY PURCH	UNIT COST	QTY SOLD	QTY RETRN	QTY PRSON USE	UNIT RETAIL	AMOUNT REFUNDED	AMOUNT PERSONAL USE	RECEIPTS THIS ITEM	PROFIT THIS ITEM	UNITS ON HAND
26-3334-001	128K COLOR COMPUTER 3	13	87.20	4	0	2	129.95	0.00	174.40	519.80	171.00	7
26-3215-002	CM-8 RGB COLOR MONITOR	10	191.23	3	0	4	299.95	0.00	556.86	899.85	326.16	5
26-3131-003	FD-501 COLOR THINLINE DRIVE 0	10	139.74	6	0	6	299.95	0.00	836.34	1199.70	361.26	2
26-3132-004	FD-501 DRIVE 1	6	84.19	0	0	8	179.95	0.00	1004.72	0.00	0.00	4
26-3124-005	MULTI-PAK INTERFACE	8	53.71	3	0	0	99.95	0.00	0.00	299.85	138.72	5
26-3025-006	COLOR MOUSE	8	19.32	3	0	9	49.95	0.00	1024.04	149.85	91.89	4
26-2226-007	RS-232 PROGRAM PAK	10	32.65	5	0	0	79.95	0.00	0.00	399.75	236.50	5
26-1280-008	DMP-130 PRINTER	4	248.53	2	0	10	349.95	0.00	1272.57	599.90	102.84	1
26-1385-009	DCM 212 INTELLIGENT MODEM	3	127.96	1	0	11	199.95	0.00	1400.53	199.95	71.99	1

GRAND TOTALS

FINAL INVENTORY BALANCE	TOTAL PURCHASES	GROSS RECEIPTS	RETURNS & ALLOWANCES	PERSONAL USE	GROSS PROFIT
10305.54	14474.36	4268.65	0.00	6269.46	1500.36



The listing: STOCK

```
100 '**************************
101 '*** CHARLES MAY ***
102 '*** RT. 1 BOX 234P ***
103 '*** DESOTO, TX.,75115 ***
104 '*** (214) 223-3767 ***
105 '**************************
110 '
500 '**************************
510 '** INITIALIZE VARIABLES **
520 '**************************
540 CLEAR 1000
550 F1$="QTY
 AMOUNT  RECEIPTS  PROFIT    UNI
TS"
560 F2$="QTY    UNIT    QTY   QT
Y  PRSON   UNIT    AMOUNT  PERSO
NAL   THIS     THIS       ON"
570 F3$=" STOCK NO.       UNIT DE
SCRIPTION              PURCH   CO
ST   SOLD  RETRN  USE   RETAIL
REFUNDED    USE     ITEM     ITE
M     HAND"
580 F4$="%          % %
                    % ##### ####
#.## ##### ##### ##### #####.##
#####.## #####.## #####.## #####
.##   ######"
590 F5$=STRING$(133,"=")
600 F6$="  FINAL"
610 F7$="INVENTORY    TOTAL
GROSS    RETURNS &   PERSONAL
 GROSS"
620 F8$=" BALANCE   PURCHASES  R
ECEIPTS  ALLOWANCES    USE
 PROFIT"
630 F9$=" #####.##  #####.##   #
####.##  #####.##    #####.##
#####.##"
890 PRINT#-2,CHR$(27)CHR$(20)
900 GOSUB5000
1000 '************************
1010 '*** ROUTINE SELECTIONS***
1020 '************************
1040 GOSUB 2000
1060 IF Z$="5" THEN 1105
1070 ON VAL(Z$) GOSUB 3000,4000,
6000,7000
1080 GOSUB 2000
1100 GOTO 1060
1105 PRINT#-2,CHR$(27)CHR$(19)
1110 CLS:CLOSE#1
1140 PRINT@200,"END OF PROGRAM"
1150 END
2000 '************************
2010 '***   MENU   ***
```

```
2Ø2Ø '************************
2Ø4Ø CLS
2Ø5Ø PRINT TAB(1Ø)"M E N U"
2Ø6Ø PRINT " "
2Ø7Ø PRINT "CODE    SELECTION"
2Ø8Ø PRINT " "
2Ø9Ø PRINT"1.-ENTER NEW STOCK NU
MBERS"
21ØØ PRINT"2.-INVENTORY ACTIVITY
"
211Ø PRINT"3.-PRINT REPORT"
2115 PRINT"4.-REVIEW STATUS"
212Ø PRINT"5.-EXIT "
213Ø PRINT " "
214Ø PRINT "ENTER CODE 1-5 :";
215Ø Z$=INKEY$: IF Z$=""THEN215Ø
216Ø IF Z$>="1"ANDZ$<="5"THEN 21
7Ø ELSE 2ØØØ
217Ø RETURN
3ØØØ '************************
3ØØ5 '*** DATA ENTRY ***
3Ø1Ø '************************
3Ø2Ø K=LOF(1):CLS:PRINT"THE LAST
 RECORD NUMBER WAS ";K
3Ø25 PRINT" "
3Ø3Ø PRINT "STRIKE ANY KEY TO CO
NTINUE"
3Ø4Ø Z$=INKEY$:IFZ$=""THEN3Ø4Ø
3Ø5Ø CLS:PRINT"ENTER NEW STOCK N
UMBER"
3Ø6Ø LINE INPUT"11 CHARACTERS MA
X  "; A$
3Ø7Ø RN=VAL(RIGHT$(A$,3))
3Ø8Ø PRINT"ENTER STOCK DESCRIPTI
ON"
3Ø9Ø LINE INPUT B$
31ØØ INPUT"NUMBER OF UNITS BOUGH
T";C
311Ø L=C
313Ø INPUT"ENTER UNIT COST";D
314Ø INPUT"ENTER UNIT RETAIL PRI
CE";E
315Ø PRINT"ARE ALL ENTRIES CORRE
CT? Y/N"
3155 Z$=INKEY$:IFZ$=""THEN 3155
316Ø IF Z$="N" THEN CLS:GOTO 3Ø8
Ø
317Ø IF Z$="Y"THEN 32ØØ ELSE 315
Ø
32ØØ LSET AA$=A$ :'STOCK NO.
32Ø5 LSET BB$=B$ :'DESCRIPTION
321Ø LSET CC$=MKN$(C) :'QTY UNIT
S
3215 LSET DD$=MKN$(D) :'UNIT COS
T
322Ø LSET EE$=MKN$(E) :'UNIT RET
AIL
3225 LSET GG$=MKN$(Ø) :'PERSONAL
 USE
323Ø LSET HH$=MKN$(Ø) :'RECEIPTS
3235 LSET JJ$=MKN$(Ø) :'REFUNDED
324Ø LSET KK$=MKN$(Ø) :'$ AMT PE
RSONAL
3245 LSET LL$=MKN$(L) :'UNITS ON
 HAND
325Ø LSET PP$=MKN$(P) :'UNIT PRO
FIT
3255 LSET RR$=MKN$(Ø) :'QTY RETU
RN
326Ø LSET SS$=MKN$(Ø) :'QTY SOLD
328Ø PUT #1, RN
329Ø PRINT"DO YOU HAVE ANOTHER E
NTRY Y/N?"
33ØØ Z$=INKEY$:IFZ$=""THEN33ØØ
332Ø IF Z$="Y" THEN 3Ø5Ø
333Ø IF Z$="N" THEN 337Ø ELSE 32
9Ø
337Ø RETURN
4ØØØ '************************
4Ø1Ø '*** ACTIVITY ***
4Ø2Ø '************************
4Ø3Ø CLS:PRINT"ENTER STOCK NUMBE
R"
4Ø4Ø INPUT A$
4Ø5Ø RN=VAL(RIGHT$(A$,3))
4Ø6Ø GET #1,RN
4Ø7Ø A$=AA$:B$=BB$:C=CVN(CC$):D=
CVN(DD$):E=CVN(EE$):H=CVN(HH$):J
=CVN(JJ$):L=CVN(LL$):S=CVN(SS$):
P=CVN(PP$)
```


THE POWER STONES OF ARD

THE QUEST FOR THE SPIRIT STONE

You're tired, you're hungry, not to mention you're badly injured. No one in town seems to want to talk to you. Your magic sword has stopped glowing, the room is dark, you're out of spells, you can't get your wand to work, you won't swear to it but you may be lost, you have no idea what that last puzzlement, and you hear something large moving just beyond the only door. The old sage warned you there would be days like this!

"QUEST FOR THE SPIRIT STONE" is an Adventure that will keep you playing for hours. It features single keystroke commands, 16 color graphics, 100% Hi-Res graphics screens, full game save, extensive playing area, level advancement, and the disk is not copy-protected. You choose your character's name, race, sex, and ability scores. The use of arrow keys simplify movement. This one is easy to play but a challenge to complete!

ONLY $18.00 AND WE PAY SHIPPING!

North Carolina residents add 5% sales tax

COLOR COMPUTER 3 AND ONE DISK DRIVE REQUIRED

Send check or money order to: THREE C's ROJECTS
P.O. Box 1323
Hamlet, NC 28345

ANNOUNCEMENT!

FRANK HOGG LABORATORY BUYS OUT INVENTORY OF *Sculptor!* SELLS FOR LESS THAN DISTRIBUTOR COST!!!

Frank Hogg Laboratory purchased the remaining inventory of another *Sculptor* distributor! Because we got them so low we can offer them to you at **tremendous** savings.

Sculptor for the CoCo III with OS9 Level II* is

ONLY $149

$149 is below **distributor** cost! The list price is **$450!!** Once they are gone the prices will go back to normal. This is a great opportunity to buy the most powerful Database/4th Generation Language available today!!

They won't last long.
Hurry and get yours **today!!!!**

Also on SALE *Sculptor* MS/DOS $149 - *Sculptor* OS9/68K $499

See Dale Puckett's February 1988 Rainbow column for information on this great package.

ORDERING INFORMATION VISA, M/C and AMEX. NY residents add 7% sales tax. US shipping add $3.50. Please call for Air Express shipping. Send for FREE FHL NewsLetter and catalog. * Requires OS9 LII and 512K.

Frank Hogg Laboratory, Inc.
770 James Street - Syracuse, NY 13203
Telex 646740 - FAX 315/474-8225
Call 315/474-7856!

```
4ØØØ CLS:PRINTTAB(1Ø)A$
4Ø9Ø PRINTB$
412Ø PRINTTAB(5)"1.-PURCHASES"
413Ø PRINTTAB(5)"2.-SALES"
414Ø PRINTTAB(5)"3.-RETURNS/ALLO
WANCES"
415Ø PRINTTAB(5)"4.-PERSONAL USE
"
416Ø PRINTTAB(5)"5.-REVIEW ONLY"
417Ø PRINTTAB(5)"6.-EXIT TO MAIN
 MENU"
418Ø PRINT" "
419Ø PRINT"SELECT 1 - 6"
42ØØ Z$=INKEY$:IF Z$=""THEN42ØØ
421Ø IF Z$>="1"ANDZ$<="6"THEN421
5 ELSE 4ØØØ
4215 IF Z$="6"THEN 469Ø
422Ø CLS:PRINTTAB(1Ø) A$
423Ø PRINT B$
424Ø PRINT @64,"QUANTITY UNITS O
N HAND ";L
425Ø PRINT"TOTAL UNITS BOUGHT ";
C
426Ø PRINT"UNIT COST ";D
427Ø PRINT"UNIT RETAIL ";E
4275 PRINT"NUMBER UNITS SOLD";S
429Ø PRINT" ":PRINT" "
43ØØ ON VAL(Z$) GOTO 431Ø,438Ø,4
47Ø,456Ø,466Ø,469Ø
431Ø INPUT"ENTER NUMBER UNITS BO
UGHT ";N
432Ø PRINT"ARE YOU SURE? Y/N"
433Ø Y$=INKEY$:IFY$=""THEN433Ø
434Ø IF Y$="N"THEN431ØELSEIFY$="
Y"THEN435ØELSE432Ø
435Ø C=C+N:L=L+N:N=Ø
436Ø LSET CC$=MKN$(C):LSET LL$=M
KN$(L)
437Ø GOTO 465Ø
438Ø INPUT"ENTER NUMBER UNITS SO
LD ";N1
439Ø PRINT"ENTER ACTUAL SALES PR
ICE PER "
44ØØ INPUT "UNIT ";N2
441Ø PRINT"ARE YOU SURE? Y/N"
442Ø Y$=INKEY$:IFY$=""THEN442Ø
443Ø IF Y$="N"THEN438ØELSEIFY$="
Y"THEN4435ELSE441Ø
4435 H=H+(N1*N2): LSET HH$=MKN$(
H)
444Ø L=L-N1:S=S+N1:P1=(N1*N2)-(D
*N1):P=P+P1:P1=Ø:N1=Ø:N2=Ø
445Ø LSET LL$=MKN$(L):LSETPP$=MK
N$(P):LSET SS$=MKN$(S)
446Ø GOTO 465Ø
447Ø INPUT"ENTER NUMBER UNITS RE
TURNED FOR REFUND";N3
4475 INPUT"HOW MANY CAN BE RESOL
D?";N4
448Ø PRINT"ENTER AMOUNT YOU REFU
NDED"
4485 INPUT N5
449Ø PRINT"ARE YOU SURE? Y/N"
45ØØ Y$=INKEY$:IFY$=""THEN45ØØ
451Ø IFY$="N"THEN447ØELSEIFY$="Y
"THEN452ØELSE449Ø
452Ø L=L+N4 : R=R+N4 : J=J+N5 :
S=S-N4: N4=Ø: N5=Ø
4525 LSET LL$=MKN$(L): LSET RR$=
MKN$(R) : LSET JJ$=MKN$(J) : LSE
T SS$=MKN$(S)
453Ø GOTO 465Ø
456Ø PRINT"ENTER NUMBER UNITS YO
U/YOUR     FAMILY USED OR YOU GA
VE AWAY"
457Ø INPUT N6
458Ø PRINT"ARE YOU SURE?  Y/N"
459Ø Y$=INKEY$:IFY$=""THEN459Ø
46ØØ IF Y$="N"THEN456ØELSEIFY$="
Y"THEN462ØELSE458Ø
462Ø L=L-N6:K=K+(N6*D):G=G+N6:N6
=Ø
463Ø LSET LL$=MKN$(L):LSETKK$=MK
N$(K):LSET GG$=MKN$(G)
464Ø GOTO 465Ø
465Ø PUT #1,RN
4655 N=Ø:N1=Ø:N2=Ø:N3=Ø:N4=Ø:N5=
Ø:N6=Ø
466Ø PRINT @ 448,"DO YOU HAVE AN
OTHER ACTIVITY?"
467Ø Y$=INKEY$:IFY$=""THEN467Ø
468Ø IF Y$="Y"THEN4Ø3ØELSEIFY$="
N"THEN469ØELSE466Ø
469Ø RETURN
5ØØØ '*************************
5Ø1Ø '***** OPEN FILES ********
5Ø2Ø '*************************
5Ø3Ø OPEN "D",#1,"INV",116
5Ø4Ø FIELD 1, 11 AS AA$,32 AS BB
$,5 AS CC$,8 AS DD$,5 AS SS$,5 A
S RR$,5 AS GG$,8 AS EE$,8 AS JJ$
,8 AS KK$,8 AS HH$,8 AS PP$,5 AS
 LL$
5Ø5Ø RETURN
6ØØØ '*************************
6Ø1Ø '*** PRINT REPORT ***
6Ø2Ø '*************************
6Ø3Ø CLS:PRINT"ENTER TODAY'S DAT
E"
6Ø4Ø PRINT"EXAMPLE:  JANUARY 1Ø,
 1988"
6Ø5Ø LINE INPUT W$
6Ø55 W$="INVENTORY REPORT FOR PE
RIOD ENDING "+W$
6Ø6Ø W=LEN(W$):W1=INT((133-W)/2)
6Ø7Ø CLS:PRINT"I'M WORKING ON YO
UR REPORT"
6Ø8Ø PRINT#-2,TAB(W1)W$
6Ø9Ø PRINT#-2," "
61ØØ PRINT#-2,TAB(73)F1$
61Ø5 BI=BI+(L*D)
611Ø PRINT#-2,TAB(46)F2$
612Ø PRINT#-2,F3$
613Ø PRINT#-2," "
```

The Biggest
The Best
The Indispensable

The RAINBOW
THE COLOR COMPUTER MONTHLY MAGAZINE

THE RAINBOW is the biggest, best, brightest and most comprehensive publication a happy CoCo ever had! **THE RAINBOW** features more programs, more information and more in-depth treatment of the Tandy Color Computer than any other source.

A monthly issue contains nearly 200 pages and up to two dozen programs, 14 regular columns and as many as 12 new product reviews. And advertisements: **THE RAINBOW** is known as *the* medium for advertisers — which means every month it has a wealth of information unavailable anywhere else about new products! Hundreds of programs are advertised in its pages each month.

Every single issue of **THE RAINBOW** covers the wide spectrum of interests in the Tandy Color Computer — from beginners' tutorials and arcade games to telecommunications and business and finance programs. Helpful utilities and do-it-yourself hardware projects make it easy and fun to expand your CoCo's capabilities. And, monthly reviews by independent reader reviewers take the guesswork out of buying new software and hardware products.

Join the tens of thousands who have found **THE RAINBOW** to be an absolute necessity for their CoCo. With all this going for it, is it surprising that more than 90 percent of **THE RAINBOW** subscribers renew their subscriptions? We're willing to bet that, a year from now, you'll be doing the same.

Rainbow On Tape & Rainbow On Disk!

— great ways to bring **THE RAINBOW** into your life. Each month, all you do is pop the tape into your cassette player or the disk into your drive. No more lost weekends. As soon as you read an article about a program in **THE RAINBOW**, it's ready to load and run. No work. No wait.

Just think how your software library will grow. With your first year's subscription, you'll get almost 250 new programs: games, utilities, business programs, home applications. And, with **RAINBOW ON DISK**, you'll also get all the OS-9 programs.

RAINBOW ON TAPE and **RAINBOW ON DISK** — they're the "meat" of **THE RAINBOW** at a price that's "small potatoes." And now you even have a choice about how it should be served up to you.

To get your first heaping helping, just fill out and return the attached reply card. No postage necessary.

NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES

BUSINESS REPLY CARD
FIRST CLASS PERMIT NO. 1 PROSPECT, KY

POSTAGE WILL BE PAID BY ADDRESSEE

The RAINBOW
THE COLOR COMPUTER MONTHLY MAGAZINE
The Falsoft Building
P.O. Box 385
Prospect, KY 40059-0385

NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES

BUSINESS REPLY CARD
FIRST CLASS PERMIT NO. 1 PROSPECT, KY

POSTAGE WILL BE PAID BY ADDRESSEE

The RAINBOW
THE COLOR COMPUTER MONTHLY MAGAZINE
The Falsoft Building
P.O. Box 385
Prospect, KY 40059-0385

Use our 800 number!

For credit card orders, you may want to phone in your subscription. Our *credit card order* number is (800) 847-0309, 8 a.m. to 5 p.m. EST. All other inquiries please call (502) 228-4492.
We accept VISA, MasterCard and American Express.
Subscriptions to **THE RAINBOW** are $31 a year in the United States. Canadian rate is $38 (U.S. funds only). Surface rate elsewhere is $68 (U.S.). Airmail is $103 (U.S.). All subscriptions begin with the current issue. Please allow 6 to 8 weeks for the first copy. Kentucky residents add 5% sales tax.
In order to hold down non-editorial costs, we do not bill.

Our 800 number is also good for ordering RAINBOW ON TAPE or RAINBOW ON DISK!

Just call (800) 847-0309 anytime from 8 a.m. to 5 p.m. EST. *Credit card orders only.*
Subscriptions to **RAINBOW ON TAPE** are $80 a year in the United States, $90 (U.S. funds) in Canada and $105 (U.S.) in all other countries.
RAINBOW ON DISK is $99 a year in the United States, $115 (U.S.) in Canada and $130 (U.S.) in all other countries.
Individual issues of **RAINBOW ON TAPE** are $10 in the U.S., $12 (U.S.) in Canada and all other countries. Individual issues of **RAINBOW ON DISK** are $12 in the U.S., $14 (U.S.) in Canada, and $16 (U.S.) in all other countries. Kentucky residents please add 5% sales tax.
RAINBOW ON TAPE and **RAINBOW ON DISK** are not stand-alone products; you need the magazine for loading and operating instructions and the necessary documentation. **THE RAINBOW** magazine is a separate purchase.

Send Me Rainbow Magazine!

Here's your chance to have a Pot O' Gold full of programs, articles and information about CoCo every month of the year!
As the premier magazine for the Tandy Color Computer, **THE RAINBOW** has more of everything — and greater variety, too. Do yourself and your CoCo a favor and subscribe to **THE RAINBOW** today!

YES! Sign me up for a year (12 issues) of **THE RAINBOW.**

☐ *NEW* ☐ *RENEW (attach label)*

Name _____

Address _____

City _____ *State* _____ *ZIP* _____

☐ Payment Enclosed (payment must accompany order)

Charge: ☐ VISA ☐ MasterCard ☐ American Express

Account Number _____

Signature _____ Card Expiration Date _____

Give Your Fingers A Break!

YES! Sign me up: ☐ *NEW* ☐ *RENEW (attach label)*

☐ *RAINBOW ON TAPE* ☐ *RAINBOW ON DISK (Available beginning with the October 1986 issue)*

☐ *A Full Year* ☐ *Single Issue (specify month & year)* _____

Name _____

Address _____

City _____ State _____ ZIP _____

☐ Payment Enclosed (payment must accompany order)

Charge: ☐ VISA ☐ MasterCard ☐ American Express

Account Number _____

Signature _____ Card Expiration Date _____

VIP Writer III

WORD PROCESSOR • SPELLING CHECKER • PRINT SPOOLER

"...Nearly every feature and option possible to implement on the Color Computer. The design of the program is excellent; the programming is flawless." **--The RAINBOW OCTOBER 1983**
That's what they said about VIP Writer. Wait until they review VIP Writer III! We've added even more features and options to make the VIP Writer III the BEST word processor for the CoCo 3!

SCREEN DISPLAY OPTIONS

VIP Writer III has a screen of 32, 40, 64 or 80 characters wide by 24 lines using the CoCo 3's hardware display with actual lower case letters. You can choose foreground and background colors from up to 64 different hues. Color can be turned ON or OFF for the best possible display using a color or monochrome monitor or TV set. VIP Writer III has a built in on-line context sensitive help facility which displays command usage in easy to read colored windows. VIP Writer III also runs at double clock speed!

TEXT FILE STORAGE

There is a 48K text buffer and disk or cassette file linking allowing virtually unlimited text space. In addition, there is a 48K print spooler to allow you to print one document while editing another.

EDITING FEATURES

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

TEXT FORMATTING

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

TEXT FILE COMPATIBILITY

VIP Writer III creates ASCII text files which are compatible with all other VIP Programs as well as other programs which use ASCII file format. You can use VIP Writer III to create BASIC, assembly, PASCAL or C files. VIP Writer III also allows you to save and load files using DISK or CASSETTE in the case of an emergency. You can even read disk directories, display free space on a disk and kill disk files.

PREVIEW PRINT WINDOW

The VIP Writer III features an EXCLUSIVE format window which allows you to preview your document BEFORE SENDING IT TO YOUR PRINTER! You are able to see margins, page breaks, orphan lines etc. This feature makes hyphenation a snap!

PRINTING

VIP Writer III supports most any printer serial or parallel using the parallel interface described in Nov-Dec. '87 RAINBOW magazine, or an external serial to parallel interface, and gives you the ability to select baud rates from 110 to 9600. You are able to imbed printer control codes anywhere in your text file EVEN WITHIN JUSTIFIED TEXT! VIP Writer III also has twenty PROGRAMMABLE PRINTER SEQUENCES which allow you to easily control all of your printers capabilities such as underline, bold, italics, superscript and subscript using simple keystrokes. Additional printer features include: single sheet pause, print pause, word length and line feed selection.

PRINT SPOOLING

VIP Writer III incorporates a built in print spooler which allows you to print one document WHILE you are editing another. You no longer have to wait until your printer is done printing before starting another job!

DOCUMENTATION

VIP Writer III is supplied with a 125 page instruction manual which includes a tutorial, glossary of terms and a complete index. The manual is well written and includes many examples to aid in understanding and application.

SPELLING CHECKER

VIP Writer III includes VIP Speller for NO ADDITIONAL COST! VIP Speller automatically checks text files for words to be corrected, marked for special attention or even added to the dictionary. You can even view the misspelled word in context! VIP Speller comes with a specially edited 50,000 word dictionary, and words can be added to or deleted from the dictionary or you can create one of your own.

THE ORIGINAL VIP WRITER

VIP Writer is also available for CoCo 1 and 2 owners and has all the features found in the VIP Writer III including VIP Speller except for the following: The screen display is 32, 51, 64 or 85 columns by 21 or 24 rows. Colors other than green, black or white are not supported. Help is not presented in colored windows. Double clock speed is not supported. Parallel printer interface is not supported. Printer spooler is not available. Even so, the VIP Writer is a CoCo 1 or 2 owners best choice in word processors.

VIP Writer III	**Disk**	**$79.95**
VIP Writer	**Disk**	**$69.95**
VIP Speller	**Disk**	**$34.95**

Please add $3.00 for shipping and handling. COD orders add an additional $2.00. Personal checks allow 3 weeks for delivery. All orders shipped the same day.

SD Enterprises
P.O Box 1233. Gresham, OR. 97030
Ph. (503) 663-2865

Mission Interchangeable

By Joseph Kolar
Rainbow Contributing Editor

Every time you flip through the pages of THE RAINBOW and are inspired to park yourself in front of the beloved CoCo, you should expect to discover something new. New in the sense that, after tossing aside THE RAINBOW and turning off panting CoCo for the night, you have added some new insights to your ever-expanding core of CoCo lore.

As a newcomer to BASIC, you may be awed and overwhelmed by its vast complexity. It can be intimidating! CoCo is so powerful that when you discover a routine or technique you are comfortable with, you have a tendency to use it exclusively and rest on your laurels.

One of the features of the DRAW (as well as the PLAY) statement I have never mentioned is the X option, which executes sub-strings and returns. I was so enamored with concatenation that I saw no need for this feature. It appeared as an alternate method to perform a particular task. Everyone knows that CoCo has more than one way to accomplish a mission.

In last month's tutorial, we studied Ann B. Mayeux's delightful children's program, *ABC* (September 1987, Page 58).

Instead of using my sacred concatenation technique of displaying lettering on the Hi-Res screen (on CoCos 1 and 2 — Lo-Res in CoCo 3), she used the DRAW X option.

In the process of copying her listing, I noted three facts. It's easier to type XB$; than +B$. Why? In the all-caps mode, the SHIFT key is used only once in the four keystrokes. In the comparable concatenation sequence, SHIFT is used twice in three keystrokes. This constant shifting bodes evil for the average, non-expert typist. Personally, in long, concatenated lines, I am apt to strike a '4' for a '$', or a ';' for a '+', in my "shift-no-shift-shift" sequence.

In Line 480 of Ann Mayeux's listing, I noticed that she had managed to get the entire word into one DRAW statement line. I suspect that I would have reached CoCo's limit had I used concatenation — somewhere in the middle of the word ALLIGATOR I would probably have gotten an LS Error message, signifying that the string was too long (more than 255 characters) . . . not to mention the OS Error message, even earlier on, warning that CoCo was sulking because not enough string space was cleared.

These observations made me recall that I hadn't seen or used a CLEAR statement in the program.

Noticing things is OK. If you fail to study and learn from your observations, you may be missing an opportunity to add to your growing storehouse of CoCo facts.

The best way for a beginner to proceed is to experiment. How? By making a small program to compare the two techniques. Refer to listing COMPARE.

Stoke up CoCo and key in Lines 10 and 100. We want a PMODE 4 panel and a perpetual loop to hold our creation on the screen.

We need some string variable material to put into our DRAW lines. Lines 20 and 30 create the letters A and B, respectively.

Key them in. Key in Line 50. Within quote marks, we size and locate the first letter, A, hidden in variable A$. Consider the data inside the quote mark as a choo-choo locomotive. Each concatenated (+) string variable can be likened to a freight car, and each freight car is connected to the one before it. Our sequence is one 'A' car and one 'B' car, repeated until CoCo squirms in protest.

Run our mini-program of lines 10 through 100 (Listing 1). Three sets of ABs appear on the screen. Press BREAK. Enter EDIT50, press X to jump to the end of the line, type +A$, press ENTER again and run. Oops! OS Error!

Press BREAK, enter 5 CLEAR500 and run. CoCo breathes a sigh of relief. Add as many freight cars as CoCo can stand. Run again. Nine more freight cars can be added to the freight train before CoCo throws up its hands in despair and hollers, "LS Error!"

Count the letters within the quote marks in lines 20 and 30 (14 and 19, respectively). Count the number of freight cars in Line 50 — first the A$ and then B$ (8 and 7, respectively).

Perform these calculations with the PRINT command, pressing ENTER after each (and make sure your answer matches mine):

Enter	Answer
PRINT14*8	112
PRINT19*7	133
PRINT112+133	245
PRINT245+9	254

Edit Line 50 to Size 12, adding one space to Line 50. Run. 255 is OK. Ignore the runaway lettering that is slipping off the screen. Now, press BREAK, enter EDIT50 and press the space bar until the cursor is over the 0 in 10. Press I to go into the Insert mode. Type 0 to turn the 10 into 100. Press ENTER and run. No good. To get rid of the extra 0 and return Line 50 to its earlier state, enter EDIT50 and press the space bar until the cursor is over either 0 in 100. Press D (for delete), then press ENTER and run.

Observe that we used CoCo as a calculator to do necessary arithmetic. There is no need to resort to pencil and paper. This calculator feature is often overlooked by the novice, but it is very useful. For instance, if we did a series of PRINT@ relocations, we could wind up with a line like this:

```
110 CLS:PRINT@ 190+64+16,"
```

etc.

Execute by entering RUN110. But by doing the necessary calculations on CoCo in the command mode, we get the same result: Entering PRINT190+64+16 yields the result of 270. With a one, two, three, we have a more meaningful, compact line.

Edit Line 110 by entering EDIT110. Press the space bar until the cursor is over the 1 of 190, type 3C and then 270 (to change 190 to 270 — you change three characters). Then type 6D to delete six characters, press ENTER, and enter RUN110. By entering RUN110 we get around the graphics mode into the text

Florida-based Joseph Kolar is a veteran writer and programmer who specializes in introducing beginners to the powers of the Color Computer.

mode without disturbing either program. Line 100 keeps the graphics page from spilling over into the text page.

Back to work! Change the value in Line 50 to S8. Key in Line 60. Note that every sub-string is a part of the DRAW statement. Thus, unlike concatenation, which adds, executing sub-strings stuffs the string variables within the quote marks of DRAW statements. The closing quote is optional. Run. Note that CoCo happily romped off the screen.

Do we need CLEAR? Not to execute sub-strings.

Press BREAK and enter EDIT50. Press X to jump to the end of Line 50. Use the left arrow key to eliminate the fourth +A$, press ENTER, and run. Press BREAK, enter 5 CLEAR0 and run. No good. Mask Line 50 with REM. Run again. No, we do not require CLEAR. Change the value in Line 50 to SX4 and run again.

Find out how many As and Bs you can display in Line 60 before CoCo drops over the edge.

Remember to remove the final quote, stuff away and add the closing quote. You will find that CoCo is getting so bloated that he drunkenly staggers off the right side of the screen.

Now, we know for sure concatenation is fine, but executing sub-strings with the X option gives us a bigger bang for our typing efforts; it's simpler to use, and the keystrokes are more manageable. We need not clear string space and, as a bonus, we save memory.

Enter 5 CLEAR 500 and unmask Line 50. To see the minimum amount of memory you must reserve for the scoop in Line 50, enter 5 CLEAR and find the lowest value required. Do it the trial-and-error way. Try other values. When you get the lowest value that will allow CoCo to operate Line 50 — congratulations!

Now enter 5 CLEAR 200 and EDIT50. Type B4, press the space bar, then press H and ENTER. Enter DEL5 and run.

You may want to save your work as COMPARE at this time. Enter NEW.

Our second project for today's consideration is a routine to label PMODE 4 graphics pages I want to save to disk. I wanted to create a graphics page filename that I could use as the title when I saved the display. A single-code character would identify the particular graphics routine utilized. A three-numeral value would be assigned to the first variable, and a two-numeral value would identify the second variable.

This identifying label would read T000-00 through T999-99 and appear in the upper left-hand corner. On the input of a single digit, it is necessary that the blank tens and hundreds columns house zeros (so that 003 or 3 give the same result). These completed codes become the title of the graphic.

What does this have to do with you? This tutorial explains one way to accomplish the mission. Between lines 110 and 700 you can put some sort of graphics routine that has one or two inputted numbers. You can adjust this program by deleting unnecessary lines or unwanted multiple-line statements to suit your requirements.

There are two parallel constructions between lines 10 and 100. Key in the INDEX listing. Line 10 calls for a variable consisting of from one to three digits — or none, if you choose N. The first statement in Line 30 creates a string variable by converting N into X$.

Each of the three digits will be plucked out of X$ and assigned a separate string variable in lines 40 through 60. Line 60 contains A$, the hundreds column digit. Line 40 fingers B$, the tens column digit, and Line 50 picks out C$, the units column digit. MID$ and RIGHT$ were used to pinpoint the desired digit.

CoCo has to be told what to do in the event of a single-digit number being called. The hundreds column contains a zero rather than the contents of MID$(X$,2,1). It also has to check the same status of the other variable, Z, in the tens column.

If N is between 0 and 99, Line 80 determines that the hundreds column digit is zero and the tens column digit is whatever a MID$(X$,2,1) turns up.

If you add the command :GOTO100 to the end of Line 60 and input various values, you will see that lines 70 through 90 are needed. Can you figure out why? What if you changed the value of B$=MID$(X$,2,1) to 0? Why would this maneuver present problems?

Chew on this: If the hundreds column is null or empty, then surely A$ equals 0 in all instances. The digit in the tens column might, or might not, be a zero. B$=MID$(X$,2,1) or B$=LEFT$(X$,2) will pull out whatever is in the tens column.

Why doesn't LEFT$(X$,1) work? Put on your thinking cap and try some variables — you can use your direct mode to see what number was selected. Press BREAK and enter PRINT LEFT$(X$,2). Lop off :GOTO100 from Line 60.

A parallel construction was used for the second variable, Z. See the second statement in lines 30 through 50 and Line 90.

The next step (GOSUB1000) involves a jump to the routine in Lines 1000 through 1140 to allow CoCo to memorize the variables that create the numerals 0 through 9 and the letters A, B and T and a dash (—). It returns and sets up the PMODE 4 screen.

Line 110 is what it is all about. We draw Size 8 at location 3,15 (horizontal, vertical) using concatenation; T$ designates the series. Then we draw whatever values were in the three-digit input, a dash, and whatever values were in the two-digit input. To save our work, enter CSAVE"INDEX".

A two-line graphics routine illustrates an imperfect use of this program. Insert these lines:

```
200 DRAW"BM=N;,=Z;R5F7R5"
210 CIRCLE(N+17,Z+8),6,1
```

Try various combinations of N and Z inputs ranging from N=0 to 221 and Z=16 to 99.

For the intrepid CoConaut: If you want to refine this program, change lines 10 and 20 to read allowed input values. Include a couple of IF lines to reject out-of-bounds entries.

Better yet, revise Z values to allow for a three-digit number, so you can hop all over the entire screen vertically, from 16 to the highest allowable value without drifting down off the screen. This should be an exciting, fun challenge for you.

Listing SAVELOAD may now be keyed into your working program. It was condensed and revised from "Demonstration in Art" by Ricky Sutphin (Page 80, October '87). His program, COCO-ART, allows you to save, load, view and draw PMODE 4 graphics screens with a disk system.

We're now finished with the file number creating program, the short demo graphic and the utility to save, load, view and draw more graphics into a larger program. You might want to save the whole thing as "TOTAL" to have it handy. You never know when you might need it.

This listing can be used with any suitable graphics program. Merely change Line 780 to an appropriate line number to link up with your revised TOTAL.

TOTAL is a combination of INDEX, the two-line graphic demo and SAVELOAD. TOTAL contains Line 1, not found in INDEX, and deletes Line 999 as redundant.

If you want to save SAVELOAD as a

separate program, enter DEL-210. Then enter DEL999-. You will be able to save, load and view any existing graphics you have squirreled away. You will not be able to draw a new graphic but that is life . . . and why we saved TOTAL.

If you want to use SAVELOAD or TOTAL with a cassette-based system, revise lines 820 and 880 to the following:

```
820 CSAVEM N$,1536,7679,1536
880 CLOADM N$
```

Position your tape and you are in business.

There is no better way to get the maximum utility from your CoCo than to read THE RAINBOW, get intrigued by something and experiment. If you find something useful or potentially valuable in the distant future, save the listing and write it up, in words that have significance to you, in your personal reference notebook.

You have two stand-alone programs you can adjust to use in any manner your creative urge beckons. These routines may suggest other areas to investigate and projects to attempt. You are encouraged to explore and find uses for these utility programs. It always generates satisfaction when you learn something new or are dimly reminded of facts once learned but tucked into the dark reaches of your unconscious. Bring them out into the open and let them flower. □

Listing 1: COMPARE

```
Ø '<COMPARE> CONCATENATION WITH
SUB-STRING EXECUTION
1Ø PMODE4,1:PCLS:SCREEN1,Ø
2Ø A$="U6R4D3NL4D3BR3"
3Ø B$="U6R3FDGNL3FDGNL3BR4"
5Ø DRAW"S8BM1Ø,2Ø"+A$+B$+A$+B$+A
$+B$
6Ø DRAW"BM1Ø,5ØXA$;XB$;XA$;XB$;X
A$;XB$;XA$;XB$;XA$;XB$;XA$;XB$;X
A$;XB$;XA$;XB$;XA$;XB$;"
1ØØ GOTO1ØØ
```

Listing 2: INDEX

```
Ø '<INDEX> IDENTIFYING NUMBERS
FOR SAVED GRAPHIC SCREENS
1Ø CLS:FORX=1TO4:PRINT:NEXT:INPU
T"     ENTER NUMBER OF DESIGN
          ØØØ THRU 999";N
2Ø PRINT:INPUT"                TIM
ER                          ØØ THRU
 99";Z
3Ø X$=STR$(N):Y$=STR$(Z)
4Ø B$=MID$(X$,3,1):J$=MID$(Y$,2,
1)
5Ø C$=RIGHT$(X$,1):K$=RIGHT$(Y$,
1)
6Ø A$=MID$(X$,2,1)
7Ø IF N<1Ø THEN A$="Ø":GOTO9Ø
8Ø IF N<1ØØ AND N>9 THEN A$="Ø":
B$=MID$(X$,2,1)
9Ø IF Z<1Ø THEN J$="Ø"
1ØØ GOSUB1ØØØ:PMODE4,1:PCLS:SCRE
EN1,Ø
11Ø DRAW"S8BM3,15"+T$+N$(VAL(A$)
)+N$(VAL(B$))+N$(VAL(C$)):DRAWQ$
+N$(VAL(J$))+N$(VAL(K$))
999 GOTO999
1ØØØ N$(1)="BR4NU4BR"
1Ø1Ø N$(2)="BR2U2R3U2NL3BD4NL3"
1Ø2Ø N$(3)="BR2R3U2NL2U2NL3BD4"
1Ø3Ø N$(4)="BE2NU2R3U2D4"
1Ø4Ø N$(5)="BR2R3U2L3U2R3BD4"
1Ø5Ø N$(6)="BR2U4NR3D2R3D2NL3"
1Ø6Ø N$(7)="BR2BU3UR3D4"
1Ø7Ø N$(8)="BR2U4R3D2NL3D2NL3"
1Ø8Ø N$(9)="BE2NR3U2R3D4"
1Ø9Ø N$(Ø)="BR2U4R3D4NL3"
11ØØ D$="BR2U4R3D2NL3D2"'A
111Ø E$="BR2U4R2FGNL2FGNL2BR"'B
112Ø Q$="BE2R3BD2"'DASH
113Ø T$="BR4U4NL2R2BD4"'T
114Ø RETURN
```

Listing 3: SAVELOAD

```
26Ø CLS:PRINT:PRINT"        COCO
GRAPHICS DEMO","              ME
NU"
27Ø PRINT,,,,"   [1] SAVE IT","
[2] LOAD IT",,,"          [3] VI
EW IT",,,,,,,"      ENTER OPTION
 NUMBER"
28Ø A$=INKEY$:IFA$=""THEN28Ø
29Ø IF A$="1"THENGOSUB38Ø
3ØØ IF A$="2"THENGOSUB45Ø
31Ø IF A$="3"THENGOSUB49Ø
37Ø GOTO26Ø
38Ø CLS:FORX=1TO5:PRINT:NEXT:INP
UT"  GIVE IT A NAME";N$
39Ø IF N$=""THEN38Ø
4ØØ IF LEN(N$)>12THENPRINT"  THA
T'S TOO LONG":FORX=1TO5ØØ:NEXT:G
OTO38Ø
41Ø SAVEM N$,3584,9727,3584
42Ø PRINT"      ITS DISK FILE NAM
E IS:                ";N$
43Ø FOR X=1TO4ØØØ:NEXT
44Ø GOTO26Ø
45Ø CLS:FORX=1TO5:PRINT:NEXT:INP
UT"       NAME AND EXTENTION....
.....";N1$
46Ø IF N1$=""THEN45Ø
47Ø LOADM N1$
48Ø GOTO26Ø
49Ø PMODE4,1:SCREEN1,1
5ØØ A$=INKEY$:IFA$=""THEN5ØØELSE
26Ø
```

Listing 4: TOTAL

```
Ø '<TOTAL> (<INDEX>, TWO LINE
GRAPHIC ROUTINE, <SAVELOAD> COM-
BINED)
1 'OMIT LINES 2ØØ-93Ø
1Ø CLS:FORX=1TO4:PRINT:NEXT:INPU
T"     ENTER NUMBER OF DESIGN
          ØØØ THRU 999";N
2Ø PRINT:INPUT"                TIM
ER                        ØØ THRU
 99";Z
3Ø X$=STR$(N):Y$=STR$(Z)
4Ø B$=MID$(X$,3,1):J$=MID$(Y$,2,
1)
5Ø C$=RIGHT$(X$,1):K$=RIGHT$(Y$,
1)
6Ø A$=MID$(X$,2,1)
7Ø IF N<1Ø THEN A$="Ø":GOTO9Ø
8Ø IF N<1ØØ AND N>9 THEN A$="Ø":
B$=MID$(X$,2,1)
9Ø IF Z<1Ø THEN J$="Ø"
1ØØ GOSUB1ØØØ:PMODE4,1:PCLS:SCRE
EN1,Ø
11Ø DRAW"S8BM3,15"+T$+N$(VAL(A$)
)+N$(VAL(B$))+N$(VAL(C$)):DRAWQ$
+N$(VAL(J$))+N$(VAL(K$))
2ØØ DRAW"BM=N;,=Z;R5F7R5"
21Ø CIRCLE(N+17,Z+8),6,1
7ØØ '<SAVELOAD> VIEW
71Ø A$=INKEY$:IFA$=""THEN71Ø
72Ø CLS:PRINT:PRINT"         COCO
 GRAPHICS DEMO","              M
ENU"
73Ø PRINT,,,,"  [1] SAVE IT","[2
] LOAD IT",,,"  [3] VIEW IT","[4
] DRAW IT",,,,,"      ENTER OPTI
ON NUMBER"
74Ø A$=INKEY$:IF A$="" THEN74Ø
75Ø IF A$="1" THEN GOSUB8ØØ
76Ø IF A$="2" THEN GOSUB86Ø
77Ø IF A$="3" THEN GOSUB9ØØ
78Ø IF A$="4" THEN GOTO1Ø
79Ø GOTO72Ø
8ØØ GOSUB92Ø
81Ø IF N$=""THEN8ØØ
82Ø SAVEM N$,3584,9727,3584
83Ø PRINT"     ITS DISK FILE NAM
E IS:              ";N$
84Ø FOR X=1TO 4ØØØ:NEXT
85Ø GOTO72Ø
86Ø GOSUB92Ø
87Ø IF N$=""THEN86Ø
88Ø LOADM N$
89Ø GOTO72Ø
9ØØ PMODE4,1:SCREEN1,1
91Ø A$=INKEY$:IF A$=""THEN91ØELS
E72Ø
92Ø CLS:PRINT@2Ø2,"":INPUT"
NAME / EXTENSION.............
..";N$
93Ø RETURN
1ØØØ N$(1)="BR4NU4BR"
1Ø1Ø N$(2)="BR2U2R3U2NL3BD4NL3"
1Ø2Ø N$(3)="BR2R3U2NL2U2NL3BD4"
1Ø3Ø N$(4)="BE2NU2R3U2D4"
1Ø4Ø N$(5)="BR2R3U2L3U2R3BD4"
1Ø5Ø N$(6)="BR2U4NR3D2R3D2NL3"
1Ø6Ø N$(7)="BR2BU3UR3D4"
1Ø7Ø N$(8)="BR2U4R3D2NL3D2NL3"
1Ø8Ø N$(9)="BE2NR3U2R3D4"
1Ø9Ø N$(Ø)="BR2U4R3D4NL3"
11ØØ D$="BR2U4R3D2NL3D2"'A
111Ø E$="BR2U4R2FGNL2FGNL2BR"'B
112Ø Q$="BE2R3BD2"'DASH
113Ø T$="BR4U4NL2R2BD4"'T
114Ø RETURN
```


PRINTERS!

NEW! Okidata 192+ (Par. or Ser.)	$370
NEW! Okidata 193 (Parallel)	$540
NEW! Okidata 193+ (Serial)	$610
Okimate 20 Color Printer	$135
Fujitsu 2100 (80 col.)	$410
Fujitsu 2200 (132 col.)	$520
Toshiba 321 (Par. or Ser.)	$510
Qume Letterpro 20 (Letter Qual.)	$445
Silver Reed 420 (Daisy Wheel)	$240
Silver Reed 600 (Daisy Wheel)	$575

(Add $10 Shipping for Printers)

ACCESSORIES!

Taxan 12" Green Monitor	$125
Taxan 12" Amber Monitor	$135
Table Top Printer Stand w/Slot (80 col.)	$30
Table Top Printer Stand w/Slot (132 col.)	$45
Stand w/Diskette Storage (80 col.)	$47
Stand w/Diskette Storage (132 col.)	$57

Other Printers, Monitors, and Accessories for CoCo and IBM upon request.

$15 off interface with purchase of printer.

Find your cheapest published price and we'll beat it!!!

DISK DRIVE SYSTEMS!

ALL ½ HEIGHT DOUBLE SIDED

Drive 0 (addressed as 2 drives!)	$235
Drive 0,1 (addressed as 4 drives!)	$350

All above complete with HDS controller, cable, & drive in case with power supply

Bare Double Sided Drives	$109
Dual ½ Height Case w/Power Supply	$49
Double Sided Adapter	$25
HDS Controller, RS ROM & Instructions	$99
25 CDC DS/DD Diskettes	$32 & $3 s/h

We use the HDS controller exclusively. Can use 2 different DOS ROM's.
Shipping Costs: $5/drive or power supply, $10 max.
Co Co Serial Cables 15 ft.—$10. Co Co/RS-232 Cables 15 ft.—$20.
Other cables on request. (Add $3.00 shipping)

CLOSEOUT* $29.95

SP-2 INTERFACE for EPSON PRINTERS:
- 300-19,200 BAUD rates
- Fits inside printer — No AC Plugs
- Optional external switch ($5.00 extra) frees parallel port for use with other computers

While Supplies Last

SP-3 INTERFACE for MOST OTHER PRINTERS:
- 300-19,200 BAUD rates
- External to printer — No AC Plugs
- Built in modem/printer switch—no need for Y-cables or plugging/unplugging cables

CNR ENGINEERING
P.O. Box 293
Raritan, NJ 08869
(201) 722-1055

NOVICES NICHE

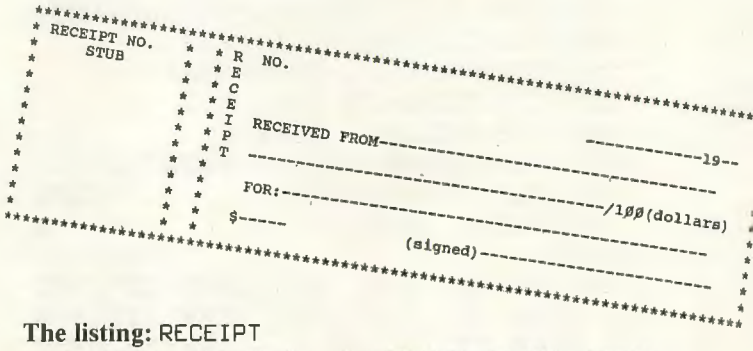
THE RAINBOW is a teaching environment and we realize that the majority of our readers will always be beginners. In our continuing effort to always keep the new user in mind, and in addition to the many beginner feature articles and programs published in every issue, "Novices Niche" contains shorter BASIC program listings that entertain as well as help the new user gain expertise in all aspects of the Color Computer: graphics, music, games, utilities, education, programming, etc.

Business

In Good Form

16K
ECB

By E.C. Thompson



With *Receipt* you can print out personalized receipts, four to a page. What are the advantages of using your computer and printer for this? Well, there are three big ones: durability — when you use quality paper; convenience — with your hardware and this program, you'll never run out of receipts; and economy — personalized forms at less than one-fourth the cost of commercial equivalents.

On running the program, you are prompted for your printer's baud rate. Then you are asked if you would like normal printing or double strike (bold type). Finally, you are prompted for how many pages of receipts you want (remember — four to a page). After you answer these three questions, your forms will begin printing out.

The printed form has two parts, the receipt itself and a stub for your records. On both the stub and the receipt, there is room for an identifying number.

After cutting out the receipts, you may want to punch holes in the left margin and store the forms in a loose-leaf binder. To facilitate detaching the receipt from the stub, you can make perforations along the border with a sewing machine.

To personalize your receipt, edit Line 200 by typing in your street address. Count the number of spaces it takes up and delete that number of spaces immediately after the address — this keeps the right margin properly aligned. Edit Line 210, adding your city and state, counting spaces and deleting as before. Similarly, your name can be added in Line 310 to fit below the "signed" space.

In addition, the baud rate selector can be detached from the program and added to any other program you want to work with the printer.

The listing: RECEIPT

```
5 CLS3:PRINT@4,"**BAUD RATE SELE
CTØR**";
1Ø PRINT@72,"1). BAUD 6ØØ";
15 PRINT@136,"2). BAUD 12ØØ";
2Ø PRINT@196+4,"3). BAUD 24ØØ";
25 PRINT@2ØØ+95,"ENTER 1, 2, OR
3";:INPUT D
3Ø ON D GOTO 35, 4Ø, 45
35 D=87:GOTO5Ø
4Ø D=41:GOTO5Ø
45 D=18:GOTO 5Ø
5Ø POKE15Ø,(D)
8Ø CLS(3):PRINT@196,"DOUBLE STRI
KE (Y OR N)";:INPUT F$
9Ø IF F$="Y"THEN GOTO11Ø
1ØØ IF F$="N" THEN GOTO 12Ø
11Ø O=31:GOTO 13Ø
12Ø O=19:GOTO 13Ø
13Ø PRINT#-2,CHR$(27);CHR$(O)
14Ø CLS3
15Ø PRINT@194,"HOW MANY PAGES WI
LL I PRINT";:INPUT C
16Ø FOR P=1 TO C
17Ø CLS6:PRINT@168,"P R I N T I
N G";
18Ø FOR X=1 TO 4
```

```
19Ø PRINT#-2,STRING$(77,42)
2ØØ PRINT#-2,"* RECEIPT NO.    *
 * R  NO.
                              *"
21Ø PRINT#-2,"*      STUB      *
 * E
                              *"
22Ø PRINT#-2,"*                *
 * C
        ------------19--    *"
23Ø PRINT#-2,"*                *
 * E
                              *"
24Ø PRINT#-2,"*                *
 * I  RECEIVED FROM-------------
---------------------      *"
25Ø PRINT#-2,"*                *
 * P
                              *"
26Ø PRINT#-2,"*                *
 * T  -------------------------
----------/1ØØ(dollars)   *"
27Ø PRINT#-2,"*                *
 *
                              *"
28Ø PRINT#-2,"*                *
 *    FOR:---------------------
---------------------     *"
29Ø PRINT#-2,"*                *
 *
                              *"
3ØØ PRINT#-2,"*                *
 *   $-----              (signed)-
----------------------    *"
31Ø PRINT#-2,"*                *
 *
                              *"
32Ø PRINT#-2,STRING$(77,42)
33Ø PRINT#-2,STRING$(77,46)
34Ø NEXT X
35Ø PRINT#-2,STRING$(4,13)
36Ø NEXT P
37Ø PRINT@325,"* * * FINISHED *
* *";
38Ø PRINT@388+2,"CONTINUE?<any k
ey>";
39Ø EXEC44539:GOTO1ØØ
```

Worksheet Printer

16K ECB

By Don Hitko

Have you ever wanted to make a quickie spreadsheet, but you didn't feel like fooling with the "cells" of a computerized 'sheet? And even with a straightedge your handmade charts come out crooked? Well, *Worksheet Printer* is here! Whether you're filling in a seating chart or roughing out assignments for your sales crew, this program provides a quick means to see what goes where and how much.

Worksheet Printer uses printer graphics characters to draw a sheet (to be used horizontally) with 19 rows and 10 columns. It is configured for a DMP-200, but should work as is on the entire line of DMP printers. For those with other printers, these are the codes that should be changed:

Line Number	Printer Code	Description
320	27 28	Half forward line feed
440	241	Horizontal Bar (-)
440	250	Cross (+)
480	245	Vertical Bar (|)

For those with 132-column printers, the number of repetitions of the loops starting in lines 430 and 470 can be increased to allow for more rows. If you are using fanfold paper and want a sheet with more columns, increase the number of repetitions in the loop beginning in Line 330.

Now you can sit in front of your spreadsheet program, brimming with confidence, knowing exactly what you're going to do before you start!

The listing: SHEET

```
1Ø CLS
2Ø PRINT" SPREAD-SHEET WORKSHEET
 PRINTER"
3Ø PRINTTAB(1Ø);"BY DON HITKO"
4Ø PRINT:PRINT
5Ø PRINTTAB(12);"<1> 6ØØ"
6Ø PRINTTAB(12);"<2> 12ØØ"
7Ø PRINTTAB(12);"<3> 24ØØ"
8Ø PRINTTAB(12);"<4> 48ØØ"
9Ø PRINTTAB(12);"<5> 96ØØ"
1ØØ PRINT:PRINTTAB(6);"PLEASE SE
LECT PRINTER"
11Ø PRINTTAB(12);"BAUD RATE"
12Ø I$=INKEY$:IF I$="" THEN 12Ø
13Ø IF I$<"1" OR I$>"5" THEN 12Ø
14Ø ON VAL(I$) GOTO 15Ø,16Ø,17Ø,
18Ø,19Ø
15Ø POKE &H96,&H57:GOTO 2ØØ
16Ø POKE &H96,&H29:GOTO 2ØØ
17Ø POKE &H96,&H12:GOTO 2ØØ
18Ø POKE &H96,&HØ7:GOTO 2ØØ
19Ø POKE &H96,&HØ1
2ØØ CLS
21Ø PRINT" SPREAD-SHEET WORKSHEE
T PRINTER"
22Ø PRINTTAB(1Ø);"BY DON HITKO"
23Ø PRINT@32Ø,"HOW MANY COPIES W
OULD YOU LIKE  PRINTED?"
24Ø PRINT"->";:LINE INPUT C$
25Ø CLS
26Ø PRINT" SPREAD-SHEET WORKSHEE
T PRINTER"
27Ø PRINTTAB(1Ø);"BY DON HITKO"
28Ø PRINT@329,"PRINTING COPY:"
29Ø IF VAL(C$)<1 THEN 2ØØ
3ØØ FOR C=1 TO VAL(C$)
31Ø PRINT@366,C
32Ø PRINT #-2,CHR$(27);CHR$(28)
33Ø FOR A=1 TO 11
34Ø GOSUB 43Ø
```

```
35Ø FOR B=1 TO 1Ø
36Ø GOSUB 47Ø
37Ø NEXT B,A
38Ø FOR D=1 TO 11
39Ø PRINT#-2
4ØØ NEXT D
41Ø NEXT C
42Ø END
43Ø FOR X=1 TO 2Ø
44Ø PRINT #-2,STRING$(3,241);CHR
$(25Ø);
45Ø NEXT X
46Ø RETURN
47Ø FOR Y=1 TO 2Ø
48Ø PRINT #-2,STRING$(3,32);CHR$
(245);
49Ø NEXT Y
5ØØ RETURN
```

Utilities

Creating Data Files

16K Disk

By Raymond Doss

Filedata can be used to produce a single-dimensioned alphanumeric string file. What good is that? Programming economy! If a file is produced in this fashion, the program's DATA statements do not have to be in the program. DATA statements use memory; if there are no DATA statements, there's more memory for the program.

Filedata allows the user to set two internal dimensions from the first input. The first structures the input strings and the second loads the file and displays it back onscreen. The routine is designed for disk use, but modifications could be made for use on tape systems.

Type in the program and run it. At the first prompt (for strings), type in the number of strings to be entered. This sets both internal dimensions. Don't be shocked at the string input stage — the absence of a question mark is a feature of the LINE INPUT command. The up arrow key can be used at any time to exit, produce and display the file onscreen. More string space can be cleared in Line 10 if needed.

What are the rules for input? Simple! If you see it on the keyboard and it can be displayed on the screen, it'll work.

The listing: FILEDATA

```
1 '****************************
2 'DATA-FILES: BY RAYMOND DOSS
3 'CONSTRUCT SINGLE DIMENSIONED
4 'ALPHA-NUMERIC FILES -RGD*87-
5 '(PS: COMMAS WORK TOO!)
6 '****************************
1Ø CLS:CLEAR2ØØØ:GOSUB9Ø
2Ø INPUT"HOW MANY STRINGS";NS:DI
M AN$(NS),BN$(NS):GOSUB9Ø
3Ø FORN=1 TO NS:PRINT"STRING#"N,
"BYTES="BY
4Ø PRINT:PRINT"ENTER STRINGS BEL
OW. COMMAS CAN BE USED. USE '^'
FOR FAST FILE."
5Ø PRINT:LINEINPUT"";AN$(N)
6Ø B=LEN(AN$(N)):BY=BY+B
7Ø IF AN$(N)=CHR$(94)THEN1ØØ
8Ø GOSUB9Ø:NEXTN:N=N-1:GOTO1ØØ
9Ø CLS:PRINTSTRING$(32,42);:PRIN
T"**********DATA-FILES********
**";:PRINTSTRING$(32,42);:RETURN
1ØØ NN=N:CLS:GOSUB9Ø:INPUT"FILEN
AME/EXT";F$:OPEN"O",#1,F$
11Ø FOR N=1 TO NN:PRINT#1,AN$(N)
12Ø NEXTN:CLOSE#1
13Ø CLS:PRINT"**LOADING FILE**:
";F$
14Ø OPEN"I",#1,F$:N=1
15Ø LINEINPUT#1,BN$(N)
16Ø IF EOF(1)=-1THEN18Ø
17Ø N=N+1:GOTO15Ø
18Ø CLOSE#1:M=N
19Ø FORN=1 TO M:PRINTBN$(N):NEXT
N
2ØØ END
```

Reading Data Files

16K Disk

By Bill Bernico

A pen pal recently sent me a disk with a bunch of data files containing the solutions to several games. Well, not knowing too much about the structure of data files or how to see what's inside them, I sat down with my CoCo manual and figured out how to get at the contents and display them. This easy-to-use program, *File Reader*, resulted.

File Reader asks you only three questions — the first is the name and extension of the file to be displayed. The second asks whether you want the contents of the file output to the screen or to the printer. If you choose output to the printer, the contents are immediately printed out. If you choose to have the file output to the screen, you must press the space bar to advance every line of data in that file — this is to prevent the contents from scrolling by too fast. (You don't have to sit with your fingers poised to press the SHIFT-@ combination in order to pause the scroll.) The third and final prompt merely asks if you want to read another file.

The listing: FILEREAD

```
1Ø 'FILE READER
2Ø 'FROM KROMICO SOFTWARE
3Ø 'BY BILL BERNICO
4Ø '
5Ø CLS:CLEAR 5ØØØ
6Ø INPUT"FILENAME/EXT";A$
```

```
7Ø PRINT"OUTPUT TO sCREEN OR pRI
NTER?
8Ø B$=INKEY$:IF B$=""THEN 8Ø
9Ø IF B$="S"THEN Q=Ø:GOTO 12Ø
1ØØ IF B$="P"THEN Q=-2:GOTO 12Ø
11Ø GOTO 8Ø
12Ø CLS:OPEN"I",#1,A$
13Ø IF B$="S"THEN GOSUB 32Ø
14Ø IF B$="P"THEN GOSUB 33Ø
15Ø FORX=1Ø24 TO 1Ø55
16Ø POKE X,PEEK(X)-64
17Ø NEXT X
18Ø PRINT@42,A$
19Ø IF EOF(1)=-1 THEN CLOSE:GOTO
 25Ø
2ØØ INPUT#1,A$
21Ø PRINT #Q,A$
22Ø IF B$="P"THEN 24Ø
23Ø IF B$="S"THEN GOSUB 3ØØ
24Ø GOTO 19Ø
25Ø PRINT:PRINT:PRINT"ANOTHER RU
N (Y/N)
26Ø I$=INKEY$:IF I$=""THEN 26Ø
27Ø IF I$="Y"THEN RUN
28Ø IF I$="N"THEN CLS:END
29Ø GOTO 26Ø
3ØØ IF INKEY$<>CHR$(32) THEN 3ØØ
31Ø RETURN
32Ø PRINT@Ø,"  HIT SPACEBAR TO S
EE MORE OF..":RETURN
33Ø PRINT@Ø,"   PRINTING OUT CON
TENTS OF...":RETURN
```

CoCo 3 Graphics

A Star Like a Wheel

CoCo 3

By Jim Pruyne

Stars uses CoCo 3's advanced capabilities to animate a spinning star. The program starts by prompting for input of the number of points the star will have. It asks if you want the star outlined, how fast the animation should be, whether you want an inner star inscribed, and how accurate the animation should be. The higher the number you select (up to 15), the smoother the animation.

The animation is accomplished by drawing a number of images of the star in various degrees of rotation, as determined by the accuracy level input. Each image is drawn in a different color, using the PALETTE command set to the background color in order to be invisible. After all images are drawn, the program uses the PALETTE command to display each image in sequence by changing it from the neutral background color to a visible color.

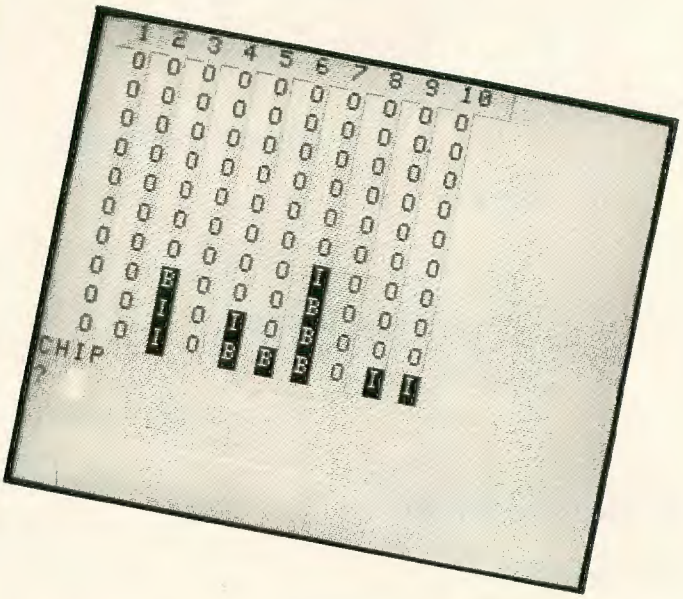
The listing: STARS

```
1Ø 'ROTATING STAR.   BY JIM PRUY
NE JR.
2Ø '2Ø1 W. SUMMIT, NORMAL IL.
3Ø 'WITH ENCOURAGEMENT FROM MELI
SSA RODRIGO & RICHARD NEWTON
4Ø POKE 65497,Ø
5Ø ON ERR GOTO 41Ø
6Ø ON BRK GOTO 41Ø
7Ø PALETTE RGB
8Ø HSCREEN Ø
9Ø INPUT"POINTS";X
1ØØ INPUT"OUTLINE (Y/N)";O$:O$=L
EFT$(O$,1)
11Ø INPUT"ROTATE <F>AST OR <S>LO
W";D$:D$=LEFT$(D$,1):IF D$="S" T
HEN D$="P16" ELSE D$=""
12Ø INPUT"INNER STAR (Y/N)";C$:C
$=LEFT$(C$,1):IF C$="Y" THEN CS=
64 ELSE CS=7Ø
13Ø INPUT"ACCUARACY (1-15)";AC
14Ø DIMA(2,X)
15Ø PI=3.14159265
16Ø S=2*PI/X
17Ø F=Ø
18Ø PALETTE Ø,Ø
19Ø HSCREEN 2
2ØØ CD=2/X/AC*PI
21Ø FOR F1=1 TO AC
22Ø HCOLOR F1
23Ø F=F+CD
24Ø FOR BB=8Ø TO 15 STEP -CS
25Ø FOR R=Ø TO 2*PI STEP S
26Ø A(1,R/S)=COS(R+F)*BB+16Ø
27Ø A(2,R/S)=SIN(R+F)*BB+96
28Ø NEXT
29Ø FOR R=Ø TO X-1
3ØØ W=R+INT(X/2)+1
31Ø IF W>X-1 THEN W=W-X
32Ø HLINE(A(1,R),A(2,R))-(A(1,W)
,A(2,W)),PSET
33Ø NEXT
34Ø IF O$<>"Y" THEN 38Ø ELSE FOR
 R=Ø TO X-2
35Ø HLINE(A(1,R),A(2,R))-(A(1,R+
1),A(2,R+1)),PSET
36Ø NEXT
37Ø HLINE(A(1,Ø),A(2,Ø))-(A(1,X-
1),A(2,X-1)),PSET
38Ø NEXT:PALETTE F1,63:NEXT
39Ø FOR F=1 TO AC:PALETTE F,63:P
LAY D$:PALETTE F,Ø:IF INKEY$<>""
 THEN 4ØØ ELSE NEXT:GOTO 39Ø
4ØØ PALETTE F,23:A$=INKEY$:IF A$
=" " THEN 39Ø ELSE IF A$="" THEN
 4ØØ ELSE CLEAR:RUN
41Ø POKE 65496,Ø:PALETTE RGB:STO
P
```

Five in a Row

4K

By John James



In *ConFive*, two players take turns dropping letters down one of 10 columns, attempting to get five in a row horizontally, vertically or diagonally. Play continues until a player succeeds in doing so, or until there are no possible moves left.

The listing: CONNECT5

```
2 CLS
3 PRINT"THIS IS CONNECT 5 IN A R
OW FOR  TWO PLAYERS. TRY TO BE T
HE FIRSTTO GET 5 IN A ROW TO WIN
 THE    GAME"
3Ø FOR X=1 TO1ØØØ:NEXT X
4Ø CLS3
5Ø DIM A$(1Ø,1Ø)
6Ø PRINT"JOYSTICK OR KEYBOARD (J
 OR K)";:INPUT K$
7Ø C=5
8Ø INPUT"NAMES OF PLAYERS "; NA$
(1),NA$(2)
9Ø CLS3
1ØØ FOR Y=1 TO 1Ø:PRINT@Y*2-1,Y;
:NEXTY
11Ø FOR X=1 TO 1Ø
12Ø FOR Y=1 TO 1Ø
13Ø A$(X,Y)="O"
14Ø NEXT Y
15Ø NEXT X
16Ø FOR X=1 TO 1Ø
17Ø FOR Y=1 TO 1Ø
18Ø PRINT @X*32+Y*2,A$(X,Y);
19Ø NEXT Y
21Ø NEXT X
22Ø PRINT@Y*32,"      ";:PRINT@Y
*32,"";
23Ø IF C=5 THEN PRINTNA$(1) ELSE
 PRINTNA$(2)
24Ø IF C=5 THEN C=1 ELSE C=5
25Ø IF C=5 THEN B$="i" ELSE B$="
b"
26Ø IF K$="K" THEN 35Ø
27Ø H=JOYSTK(Ø):V=JOYSTK(2)
28Ø IF H<7 OR V<7 THEN 27Ø
29Ø IF C=1 THEN PRINT@2*INT(H/6.
3),B$;
3ØØ IF C=5 THEN PRINT@2*INT(V/6.
3),B$;
31Ø TS=PEEK(6528Ø)
32Ø IF C=5 THEN PRINT@2*INT(V/6.
3)-1,INT(V/6.3);
33Ø IF C=1 THEN PRINT@2*INT(H/6.
3)-1,INT(H/6.3);
34Ø IF TS=127 OR TS=255 THEN 27Ø
 ELSE IF C=1 THEN X=H/6.3 ELSE X
=V/6.3
35Ø IF K$="K" THEN INPUT X
36Ø IF X>1Ø OR X<1 THEN PRINT:GO
TO 22Ø
37Ø FOR G=1Ø TO 1 STEP -1
38Ø IF A$(G,X)<>"O" THEN NEXT G
39Ø IF A$(G,X)="O" THEN A$(G,X)=
B$
4ØØ GOTO 16Ø
```

Submissions to "Novices Niche" are welcome from everyone. We like to run a variety of short programs that can be typed in at one sitting and are useful, educational and fun. Keep in mind, although the short programs are limited in scope, many novice programmers find it enjoyable and quite educational to improve the software written by others.

Program submissions must be on tape or disk. We're sorry, but we cannot key in program listings. All programs should be supported by some editorial commentary, explaining how the program works. If your submission is accepted for publication, the payment rate will be established and agreed upon prior to publication.

Color Connection

by BJ Chambless

This is the most comprehensive modem package for the Color Computer!

All are Protocols Supported including CompuServe Protocol B, XMODEM protocol, and XON/XOFF. **Auto dial** feature for both Hayes compatible and some Radio Shack modems. You can use **all baud rates** when using the Radio Shack Deluxe RS232 program pack! Printer baud rates are selectable.

You can **print from the buffer** and files bigger than the buffer can be uploaded and downloaded. **Download direct to disk** with automatic XON/XOFF protocol! **Single key macros** allow easy entry of often-used passwords and ID's.

Hi-Res screens with a choice of colors are used. All printable characters available and all control characters are supported.

RSDOS Version includes two sets, one for CoCo I and CoCo II, the other for CoCo 3.

OS-9 Connection 3.0:

The package includes all of the features of the RSDOS version plus runs on OS-9! Versions for both Level I and Level II are included. RS232 pak is required.

RSDOS Disk **$49.95**
OS-9 Disk **$49.95**

Also available from Radio Shack through Express Order Software

Data Master

by BJ Chambless

Simplify with pull-down menus

All options are available from anywhere in the program. To make it even simpler, each menu option can be invoked by a single character!

Dialog boxes

Pop-up windows display current settings and available choices.

Unique LIST display format

You view data in easy-to-read rows & columns. From this easy-to-read screen you may edit your data, without having to exit. Mass changes are a snap!

For even more power, use an access key to selectively display a subset of records and can change them right on the screen!

Compatibility with OS-9 Profile & Data Bank

You won't lose any of your valuable data!

Easy Expansion

with re-definition of records and transfer of files.

Elements & Records:

Each record can contain up to 512 characters used within 35 elements. Elements are defined as: alphanumeric (descriptive data), math (real numbers including dollars & cents), date, and derived (formulas calculated from other elements in the same record). You can store any type of data using these field types!

Display & Entry Screens

Design up to 9 different screen formats for data display and data entry for each data base. This is helpful for accessing your data for different purposes.

Sorts & Selections:

Up to 9 different access keys can be defined. These are used for displaying data on the screen or selecting data for printing. You may use several levels of sorts as well as logical operators to select just the right data. A powerful generic search is also available.

Reports:

See your data any way you want by designing your own reports! Data Master offers easy-to-use tools to design professional reports including report headings, titles, column headings, automatic page numbers, column totals, and more. Store up to 9 report formats for each data base.

File Management

Built-in file management capabilities allow easy file manipulation for transferring data files, renaming data files, expanding data files, and more.

Upload/Download

Data Master can read and write standard sequential files which aids in data transfer between DynaCalc and many others.

Full keyboard ease

taking full advantage of the CoCo 3's cursor and function keys.

OS-9 accessible

Even while operating within *Data Master*.

Requires OS-9 Level II,
CoCo 3, 512K **$64.95**

Screen Star

by Scott Cabit

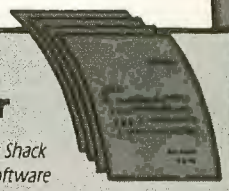
Also available from Radio Shack through Express Order Software

Screen Star implements the popular **WordStar** editing capabilities. If you know WordStar you already know how to use **Screen Star!**

- **Edit files larger than memory** since Screen Star uses the disk as an extension of memory.
- **Block Commands** – with a keystroke you can mark the start and end of a block, then move, copy, or delete the block.
- **Cursor Movement** is easy with an array of commands to move left or right one character, or one word, or one line; scroll forward or back one line, one screen, one block; jump to the start or end of the line or the screen, block, or file.
- **Find & Find/Replace Commands** make mass changes and searches a snap.
- **Pop-Up Help Menus** are as close as a keystroke.
- **Closing Commands** let you exit the editor with or without save, and can import or export files whenever you need them.
- **Smart Speller** is included.
- **Parameter commands** personalize your environment.
- **Access the OS-9 Shell.**
- **Up to 10 functions keys** can be defined by CoCo 3 users for fast, repetitive functions.
- **Use with the Text Formatter** for a full word processing team. Simply imbed the Text Formatter commands in your Screen Star file and it will be printed in style!
- **Level 1 & Level 2** are supported and both versions are included.

Requires OS-9 Disk **$49.95**
With Text Formatter **$74.95**

OS-9 Text Formatter



Also available from Radio Shack through Express Order Software

An easy way to get beautiful documents and letters with OS-9, Text Formatter interfaces with any editor that produces standard ASCII text files.

Features include left and right **justification,** page breaks, special spacing, automatic **pagination,** automatic **page numbering, centering, indenting, tabs,** and sending **escape and control codes** to your printer as well as sophisticated **headers and footers.** Special functions include **macros** for often used sequences, relative arguments, upper and lower case modes, nonprintable remarks, and more!

Requires OS-9 **$34.95**

call or write today for

FREE Catalog

512K COMBO Package

We've put together a combination package of everything you need to expand to 512K and priced it special to make it impossible to resist! The package includes:

- **512K Memory Board** with prime, 120 ns memory chips and easy instructions.
- **512K Ramdisk & Diagnostics** Software package for RSDOS.
- **Specifications** on the important GIME chip (plus a number of additional pages of CoCo 3 technical details that we think you'll find interesting.)

512K Combo Package **$114.95**
0K Combo Package **$ 54.95**
(no chips in board)

Call or Write to:

COMPUTERWARE **(619) 436-3512**
Box 668 • Encinitas, CA • 92024

Name _____
Address _____
City _____ State _____ Zip _____
Yes! Send me your FREE catalog! **CoCo** ☐
VISA MasterCard
Card # _____ Exp. _____
Signature _____

Item	Format	Price

Shipping
Surface — $2 minimum
2% for orders over $100
Air or Canada — $5 minimum
5% for orders over $100
Checks are delayed for bank clearance

6% Calif. Sales Tax _____
COD Add $5 _____
Shipping* _____
TOTAL _____

If you have an idea for the "Wishing Well," submit it to Fred c/o THE RAINBOW. Remember, keep your ideas specific, and don't forget this is BASIC. All programs resulting from your wishes are for your use, but remain the property of the author.

Sentence Savvy

By Fred B. Scerbo
Rainbow Contributing Editor

Hello, readers. Welcome back to another month's effort in meeting your needs and wishes. As usual, you, the reader, serve as the inspiration for these pages by writing in with your ideas. If there is one common thread that runs through nearly all of my mail, it is this one request: "Keep writing more software for the Speech/Sound Pak!"

This is perfectly understandable. When you invest in something like the Speech/Sound Pak, you want it to be more than just a novelty. Therefore, this month's program will be another valuable educational program that uses speech as an option. The program does not need the Speech Pak to be effective, however. Speech is just an extra option, especially nice for use with younger students.

Some of you have written and asked why I do not make these programs work with other speech packs for other dealers. There are two reasons for this. First, I believe that Tandy products for the CoCo have the widest distribution simply by being sold side-by-side with the CoCo. Second, I cannot afford to go out and buy every other dealer's product. If other dealers were to supply me with the hardware, I would gladly make some of my programs compatible with other voice packs. Unless that happens, however, these programs will be designed to work specifically with the Tandy version.

The Program

This month's program is *Sentence Structure: Recognizing Simple Subjects and Predicates*. The purpose of the program is very simple: to familiarize students with simple subjects and predicates while introducing them to sentence diagramming. The program has some features found in other educational programs I have written for "Wishing Well." Other parts are totally new.

One of the nice features of the program is that you can easily add up to 50 of your own sentences (in DATA statements). You might even want to save different versions of the program with sentences of varying difficulty, building up a small software library.

Most of my other programs have used multiple-choice selection for user responses. This is one of the few programs that has the user actually input the correct answer. The sentence is directly in front of the student, so he or she should be able to input an answer without making a mistake in spelling, in which case the response would be wrong even on a written test.

Sentence Structure shares features found in other "Wishing Well" programs. You can go to the score card any time by pressing the @ key, and you still have the option of continuing once you check the score. You also have the familiar title screen that graces my programs.

Running the Program

On running the program you will see the title screen. Press T or N for the options of Talking or Not Talking. (Make sure your CoCo is turned off before you try to insert the Speech/Sound Pak.)

One nice feature of *Sentence Structure* is that it requires you to read each screen. The program presents a sentence and asks you to type in the simple subject or simple predicate. Sometimes it asks for the sentence's subject first; other times it asks for the predicate first; this helps keep the program from becoming too routine.

After both simple subject and simple predicate have been entered, the program diagrams the sentence onscreen for you. You advance to the next screen by pressing ENTER.

No other instructions are needed for the program to run.

Adding Your Own Information

If you want to delete my DATA statements, enter DEL 1000-4999. You could also choose to add to my data rather than dump it, placing your new DATA statements between lines 1080 and 5000. Line 5000 reads 5000 DATA END,END,END; you must include this line or the program will not work. If you want to add your own data, follow this format:

```
1000 DATA sentence, simple
subject,simple predicate
```

Here's an example:

```
1000 DATA JOHN LEFT THE
HOUSE,JOHN,LEFT
```

Be sure to place commas between each piece of information. If you need to use a comma as part of the punctuation, surround each piece of information with quotes:

```
1000 DATA "JOHN, MARY AND BILL
ALL LOVE APPLES.","JOHN, MARY
AND BILL","LOVE"
```

An OD Error means you left out a comma somewhere. Be sure not to delete Line 5000.

After you enter your data, run the program to test it and then save your new program under a different filename, such as SENT2.

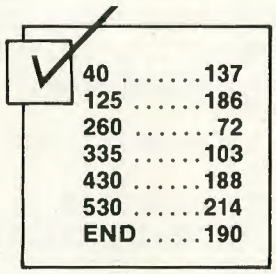
CoCo 3 Problems

A few of you have written to say that some of my graphics programs do not work properly with the CoCo 3. Now

---

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.

that I have a CoCo 3, I know what you mean. Some of my programs that require a press of the reset button to change the screen color do not work as they should. It seems that the CoCo 3 has a standard color set that does not change with reset. I'll publish some fixes to these problems shortly (please do not ask me for copies in advance by mail). Just be patient — the fix is coming! And keep your cards and letters coming, too! □



The listing: SENTENCE

```
1 REM ************************
2 REM *  RECOGNIZING SIMPLE   *
3 REM * SUBJECTS & PREDICATES*
4 REM *    BY FRED B.SCERBO   *
5 REM *     6Ø HARDING AVE.   *
6 REM * NORTH ADAMS,MA Ø1247 *
7 REM *  COPYRIGHT (C) 1987   *
8 REM ************************
9 CLEAR3ØØØ
1Ø CLSØ:FORI=1TO64:PRINTCHR$(156
);:NEXT
15 FORI=1TO192:READA:PRINTCHR$(A
+128);:NEXT
2Ø DATA126,124,124,12Ø,53,6Ø,6Ø,
53,6Ø,56,59,48,58,6Ø,61,6Ø,56,62
,6Ø,53,5Ø,53,53,6Ø,6Ø,53,6Ø,56,1
12,126,124,124
25 DATA122,,,,52,6Ø,61,53,56,,58
,57,58,,53,,48,62,48,53,52,55,53
,,,53,56,,112,122,,
3Ø DATA123,115,115,114,52,6Ø,6Ø,
52,6Ø,56,56,,56,,52,,48,6Ø,6Ø,52
,48,52,52,6Ø,6Ø,52,6Ø,56,112,123
,115,115
35 DATA8Ø,,8Ø,122,124,125,124,12
Ø,126,124,122,122,8Ø,117,117,124
,124,124,116,124,126,124,117,8Ø,
8Ø,122,126,124,122,122,112,112
4Ø DATA8Ø,8Ø,8Ø,122,8Ø,117,8Ø,8Ø
,126,126,12Ø,122,8Ø,117,117,8Ø,8
Ø,8Ø,8Ø,8Ø,122,8Ø,117,8Ø,,122,12
6,126,12Ø,122,,8Ø
45 DATA123,115,115,122,8Ø,117,11
2,,122,116,114,123,115,119,117,1
15,115,115,112,8Ø,122,,117,115,1
15,122,122,116,114,123,115,115
5Ø FORI=1TO64:PRINTCHR$(147);:NE
XT
55 PRINT@357,"  RECOGNIZING SIMP
LE   ";:PRINT@389," SUBJECTS & P
REDICATES ";:PRINT@421," (T)ALKI
NG OR (N)OT ?  ";
6Ø PRINT@453,"   BY FRED B.SCERB
O    ";
65 PRINT@485,"  COPYRIGHT (C) 19
87   ";
7Ø X$=INKEY$:XX=RND(-TIMER):IFX$
="T"THEN9Ø
75 IFX$="N"THEN85
8Ø GOTO7Ø
85 NT=1:GOTO15Ø
9Ø CLSØ
95 XX=&HFFØØ:YY=&HFF7E
1ØØ POKEXX+1,52:POKEXX+3,63
1Ø5 POKEXX+35,6Ø:GOTO15Ø
11Ø IFNT=1THENRETURN
115 FORII=1TOLEN(AA$)
12Ø IF PEEK(YY)AND 128=Ø THEN12Ø
125 POKEYY,ASC(MID$(AA$,II,1))
13Ø NEXTII
135 IFPEEK(YY)AND128=ØTHEN135
14Ø POKEYY,13
145 FORI=1TO1ØØØ:NEXT:RETURN
15Ø SW=31
155 CLSØ
16Ø DIMAO(5Ø),A$(5Ø),SS$(5Ø),SP$
(5Ø),NP(5Ø)
165 CLSØ:GOTO2Ø5
17Ø AA$=JK$:GOSUB11Ø
175 IF LEN(JK$)<=SW THEN195
18Ø FOR T=SW TO ØSTEP-1:IF MID$(
JK$,T,1)=" "THEN19Ø
185 NEXT T:GOTO195
19Ø L$=LEFT$(JK$,T):W$=L$:GOSUB2
ØØ:JK$="   "+RIGHT$(JK$,(LEN(JK$
))-T):GOTO175
195 W$=JK$:PRINTW$:RETURN
2ØØ PRINTW$:RETURN
2Ø5 FORJ=1TO5Ø:READ A$(J),SS$(J)
,SP$(J):IF A$(J)="END" THEN215
21Ø NEXTJ
215 REM START QUIZ
22Ø J=J-1:FORI=1 TO J
225 AO(I)=RND(J)
23Ø IF NP(AO(I))=1 THEN 225
235 NP(AO(I))=1:NEXTI
24Ø FOR Y=1TO1ØØØ:NEXTY
245 GOTO395
25Ø CLS
255 PRINT@35,"HERE IS EXAMPLE NU
MBER";P
26Ø RETURN
265 AA$="   WHAT IS THE SIMPLE S
UBJECT      OF THIS SENTENCE ?":
:GOSUB11Ø:PRINT@96,AA$
27Ø PRINT@192,"";:JK$="   "+A$(A
O(P)):GOSUB17Ø
275 PRINT:PRINT"   => ";:LINEINP
```

```
UTA$
28Ø IFA$="@"THENGOSUB48Ø
285 IF FX=1 THEN RETURN
29Ø IF A$<>SS$(AO(P))THEN3Ø5
295 PRINT:JK$="   YOU ARE CORREC
T! THE SIMPLE SUBJECT IS: "+SS$(
AO(P)):GOSUB17Ø
3ØØ CR=CR+1:GOTO315
3Ø5 PRINT:JK$="   WRONG! THE COR
RECT SIMPLE SUBJECT IS: "+SS$(AO
(P)):GOSUB17Ø
31Ø IR=IR+1
315 GOSUB475
32Ø X$=INKEY$:IFX$<>CHR$(13)THEN
32Ø
325 RETURN
33Ø AA$="   WHAT IS THE SIMPLE
            PREDICATE OF THIS SE
NTENCE ?":GOSUB11Ø:PRINT@96,AA$
335 PRINT@192,"";:JK$="   "+A$(A
O(P)):GOSUB17Ø
34Ø PRINT:PRINT"   => ";:LINEINP
UTA$
345 IFA$="@"THENGOSUB48Ø
35Ø IF FX=1 THEN RETURN
355 IF A$<>SP$(AO(P))THEN37Ø
36Ø PRINT:JK$="   YOU ARE CORREC
T! THE SIMPLE PREDICATE IS: "+SP
$(AO(P)):GOSUB17Ø
365 CR=CR+1:GOTO38Ø
37Ø PRINT:JK$="   SORRY! THE COR
RECT SIMPLE PREDICATE IS: "+SP$(
AO(P)):GOSUB17Ø
375 IR=IR+1
38Ø GOSUB475
385 X$=INKEY$:IFX$<>CHR$(13)THEN
385
39Ø RETURN
395 FORP=1TOJ
4ØØ WW=RND(2):IFWW=1THEN41Ø
4Ø5 FX=Ø:GOSUB25Ø:GOSUB265:GOSUB
25Ø:GOSUB33Ø:GOTO415
41Ø FX=Ø:GOSUB25Ø:GOSUB33Ø:GOSUB
25Ø:GOSUB265
415 CLS:JK$="   HERE IS HOW WE W
OULD DIAGRAM THE SIMPLE SUBJECT
AND THE SIMPLE PREDICATE.":PRINT
@32,"";:GOSUB17Ø
42Ø PRINT:JJ=LEN(SS$(AO(P))):PRI
NTSTRING$(JJ+6,32);CHR$(133)
425 PRINT"     "SS$(AO(P));" "CH
R$(133)" ";SP$(AO(P))
43Ø PRINT"   "STRING$(26,131)
435 PRINT@23Ø+JJ,CHR$(129);
44Ø PRINT@262+JJ,CHR$(133)
445 PRINT@32Ø,"  SIMPLE       SI
MPLE"
45Ø PRINT"  SUBJECT      PREDICA
TE"
455 GOSUB475
46Ø X$=INKEY$:IFX$<>CHR$(13)THEN
46Ø
465 NEXT P
47Ø GOSUB48Ø:RUN
475 PRINT@483," PRESS <ENTER> TO
 CONTINUE";:RETURN
48Ø CLS:PRINT:PRINT:PRINT
485 PQ=CR+IR:IF PQ=ØTHEN PQ=1
49Ø PRINT"    NUMBER CORRECT = "
CR
495 PRINT
5ØØ PRINT"    NUMBER WRONG   = "
IR
5Ø5 PRINT:PRINT"    STUDENT SCOR
E  = ";INT(CR*1ØØ/PQ);"%"
51Ø PRINT:PRINT"    ANOTHER TRY
(Y/N/C)";
515 W$=INKEY$:IF W$=""THEN515
52Ø IF W$="C" THEN FX=1:RETURN
525 IF W$="Y" THEN RUN
53Ø IF W$="N" THEN CLS:END
535 GOTO515
99Ø REM ENTER DATA AT LINE 1ØØØ
1ØØØ DATA AROUND HER HEAD SHE WO
RE A YELLOW RIBBON.,SHE,WORE
1Ø1Ø DATA IT LOOKS LIKE IT IS GO
ING TO RAIN.,IT,LOOKS
1Ø2Ø DATA I WILL BE LEAVING WHEN
 THE SUN COMES OUT.,I,WILL BE LE
AVING
1Ø3Ø DATA GET ME A PLATE OF THAT
 PASTA WITH MEATBALLS.,YOU,GET
1Ø4Ø FIVE TIRED MEN PLODDED ACRO
SS THE MUDDY FIELD.,MEN,PLODDED
1Ø5Ø DATA THE SIGHT OF THE TOWN
IN THE DISTANCE GAVE THEM HOPE.,
SIGHT,GAVE
1Ø6Ø DATA HE WAS WEARING A PINK
SHIRT.,HE,WAS WEARING
1Ø7Ø DATA WE SAW HER DANCING ALL
 NIGHT LONG.,WE,SAW
1Ø8Ø DATA MUCH FRUIT GROWS RAPID
LY IN THE SUNNY VALLEY DOWN SOUT
H.,FRUIT,GROWS
1Ø9Ø DATA THOSE EXPENSIVE JEWELS
 IN THE WINDOW ARE NOT FOR YOU.,
JEWELS,ARE
5ØØØ DATA END,END,END
```

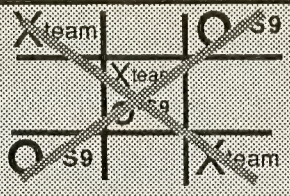
Hint . . .

Revving Up Your Tape System

Are you running a tape-based CoCo 3 system? Would you like to speed things up? I thought so. It is possible to use the high-speed poke with a tape-based CoCo 3. Just enter `POKE 65497,0` before saving your program to, and loading from, tape. If you do this, make sure you are using the highest quality tape you can find. The increased speed during I/O can cause problems if you don't.

George Ellenburg
Edgewood, FL

XTEAM & OS-9



BOTH WINNERS

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

XTERM

OS-9 Communications program

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

$49.95 with source **$89.95**

XDIR & XCAL

Hierarchial directory
- Full sorting
- Complete pattern matching

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

$24.95 with source **$49.95**

XDIS

OS-9 disassembler

$34.95 with source **$54.95**

HARDWARE

512k memory upgrade $80.00

Ram Software
- Ram Disk
- Print Spooler
- Quick Backup

All three for only $19.95

*Software by ColorVenture

XWORD
OS-9 word processing system

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

$69.95 with source **$124.95**

XMERGE

Mail merge capabilities for XWORD

$24.95 with source **$49.95**

XSPELL

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

$39.95

XTRIO

XWORD/XMERGE/XSPELL

$114.95 with source **$199.95**

XED

OS-9 full screen editor

$39.95 with source **$79.95**

AND FOR RS DOS ...

SMALL BUSINESS ACCOUTING

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

$79.95

INVENTORY CONTROL/SALES ANALYSIS

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

$59.95

Call for package price

PAYROLL

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

$59.95

PERSONAL BOOKKEEPING 2000

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

$39.95

ACCOUNTS RECEIVABLE

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

$59.95

ACCOUNTS PAYABLE

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

$59.95

MICROTECH CONSULTANTS INC.
1906 Jerrold Avenue
St. Paul, MN 55112

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

VISA MasterCard

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

(612) 633-6161

The final installment of a four-part programming tutorial

BASIC for Beginners

Lesson IV

By David W. Ostler

In "BASIC for Beginners: Lesson III"[February 1988, Page 20], I left you with a programming exercise. There are many solutions. Those of you who want to see what one possible solution looks like, just examine the listing of DATABASE, which accompanied "Lesson III."

Well, this is the final installment in the series. I hope I've helped you to develop your programming skills, or have helped you to better understand how commands work. Again I stress that we have not covered all the commands the Color Computer uses, but we have touched on many of the more common commands. To learn more about programming, keep reading THE RAINBOW and studying the manuals that accompany your computer.

This month we put the finishing touches on our database program, adding disk and tape I/O and enhancing some of the program's features.

Because the program has become rather intricate, I've included a line-by-line breakdown of this month's additions. (For a line-by-line description of the rest of the program, see Page 24 of February's "Lesson III.")

The best way to understand and plan a complicated program is to break it into blocks, identifying them by REM statements. Or you can mark the blocks' functions on a hard copy of the program. Use these methods to write your programs and keep the program functions straight in your mind.

OPEN

The OPEN command opens up a file on disk, tape or RAM memory for input/output (I/O) operations. This command can also name the file, establish length and define the device to be used.

Proper syntax for this command is OPEN"X$",Y,A$, where X$ is either I

Dave Ostler is an IC layout designer and the systems manager for a CAD mainframe system. He teaches CAD and electronics at Guilford Technical Community College. Dave is married and has three children, Avis, Chuck and Erik.

VISA

<<< GIMMESOFT >>>

MasterCard

A new generation of Color Computer products

MULTI-LABEL III

(CoCo III only)

An easy to use, versatile label creating program including many new CoCo III features. Even if you already own a label program, this one's a must for the 3!
(See July '87 review) Disk..... $16.95

Custom Palette Designer

(CoCo III only)

Easily alter the contents of any palette without having to remember numbers or colors! Once configured, all sixteen palettes can be saved to disk as a single subroutine which may then be used in a basic program.
(See Aug. '87 review) Disk..... $14.95

CoCo Max III

(CoCo III only)

More resolution, power, color, speed, tools, & type styles!!! Built in Animation! / Amazing Color Sequencing!!! Comes with HI-RES INTERFACE, MINILOAD/BAS, DEMO DISK, COCO SHOW PGM, Plus choice of FREE FONT DISK or FREE CGP-220 COLOR DRIVER $79.95

MPI-CoCo Locking Plate

(CoCo III only)

Protects your CoCo III and Multi Pak Interface from destroying each other! Installs in seconds. MPI 26-3124 & CoCo III 26-3334 only. Just..... $9.95

FKEYS III

(CoCo I/II/III)

A user friendly, user programmable function key utility that creates up to 20 function keys. Other features include an EDITOR, DOS mods, and DISABLE. Comes with an enhanced CoCo III version and it's EPROMable.
(See April '87 review) Disk (latest version)..... $19.95

SIXDRIVE

(CoCo I/II/III)

This machine language utility modifies DECB 1.0, 1.1, FKEYS III, or ADOS to allow the use of 3 double-sided drives (or 2 D/S drives and **J&R's RAMDISKS**) as 6 single-sided drives without ANY hardware mods. Includes 2 selectable drive assignments and it's EPROMable.

Disk..... $16.95
With purchase of FKEYS III..... $12.95
With purchase of any JramR..... $ 9.95

JramR 512K Upgrade

(CoCo III only)

#1010 JramR bare board, connectors, and software..... $39.95
#1014 JramR assembled and tested with software, without memory chips..... $49.95
#1012 JramR assembled and tested with software, 512K memory..... $99.95
(See June '87 review)

AUTO DIM

<<< NEW >>>

(CoCo III only)

This hardware device protects your RGB or composite monitor, or your TV from IMAGE BURN after a few minutes of inactivity from your keyboard. Illustrated instructions and easy to install. Just..... $29.95
(See January '88 review)

MAXSOUND

Call for Demo

(128k or 512k CoCo III only)

Turn your CoCo III into a REAL digital audio sampler with HIGH quality audio reproduction. Exotic effects, stuttering, speed shifting, sequencing, reverse audio, plus free digital oscilloscope program! You have got to hear MAXSOUND to believe it!!! Disk & Hdwe..... $79.95

NEW >>> **V-Term Terminal Emulator** <<< NEW

(128k or 512k CoCo III only)

V-Term is one of the most advanced terminal programs for the CoCo III ever!!!

FEATURES: VT-100, VT-52, and standard CRT emulations. Full use of 512K, 80X28 text or graphics characters, Windows & Multi-tasking(Disk Basic!), RAMDISK like buffer, Xmodem, Xon/Xoff, Monochrome monitor support, Capture buffer, Snapshot, Conference mode, and much much more! Complete with documentation. Disk..... $39.95

PYRAMIX

(CoCo III only)

This 100% machine language arcade game was written exclusively to take advantage of your CoCo 3. The colors are brilliant, the graphics are sharp, and the action is hot!
(See Dec. '87 review) Disk..... $19.95

CHAMPION

(CoCo I/II/III)

Become a superhero in your fight to rid the world of the evil forces of Mr. Bigg in this action adventure. The combat is hot and heavy and requires a fast joystick!
(See May '87 review) Disk..... $19.95

Kung-Fu Dude

(CoCo I/II/III)

This is the long-awaited response to the huge demand for a Kung-Fu program for the CoCo. Destroy opponents and evade obstacles as you grow even closer to your ultimate objective! (See Feb. '88 review) Disk..... $24.95

White Fire of Eternity

(CoCo I/II/III)

Enter the age of monsters, magic, and adventure. Here you will search for the legendary power of White Fire throughout the Forbidden Wood and dark caverns.
(See Dec. '86 review) Disk..... $19.95

10% Off! Gimmesoft Anniversary Sale 10% Off!

That's right! Take 10% off of ANYTHING in this ad! Just our way of saying thanks for the past 12 months and helping us to become one of the major suppliers of Color Computer products. Sale ends March 31st. -Gimmesoft

Technical assistance: 7pm to 9pm
Orders: 9am to 9pm Eastern time
On-line orders and up to date information: Delphi's CoCo Sig

GIMMESOFT
P.O. Box 421
Perry Hall, MD 21128
301-256-7558 or 301-256-2953

Add $2.50 for shipping and handling
Add $2.00 for COD's
MD residents add 5% sales tax
VISA/MC/Check/Money Order/COD

or O, for input or output, respectively. Y is the device to be opened, and A$ is the filename of the file to be accessed. An example of the use of the OPEN command is OPEN"I",1,DATA/PRG, which opens a file named DATA/PRG for loading of data into the computer. The device used for "input from" is the disk drive. Note that I represents *input from* and O represents *output to*.

The following are device specifiers, which should be used in place of the Y for determining the device for I/O "to" or "from":

Device	Specifier
Disk	1
Tape	-1
Printer	-2
Keyboard	0

EOF

The EOF command detects when an "End Of File" has been reached, and is always used in an IF/THEN format.

The proper syntax for this command is IF EOF (*x*) THEN *xxxx*, or IF EOF (*x*) THEN CLOSE, where *x* is the End Of File indicator and *xxxx* is the line number in the program where the program should go if an End Of File has been detected. Note that the command line reads, "If End Of File is *x* then go to *xxxx*, or if End Of File is *x* then close file." The End Of File indicators are listed as follows. These numbers indi-

Line	Description
500	sets N equal to zero, clears the screen and allows the input of string variable A$, which is the name of the file to be used for data I/O.
502	tests to see if there has been an entry for string variable A$; if there has been no entry then the program will return to Line 2000.
505-520	test the value of variable A to see whether the system is tape or disk.
540	a remarked line.
545	opens an input file to the cassette with the name found in A$, which was entered in Line 500.
550	checks to see if the End Of File has been reached. If it detects an EOF condition, it will jump to Line 560. If no EOF condition has been detected, the program will then go to the next line, which is Line 552.
552	inputs data from the cassette drive. Please note that this data has dimensioned variable labels, each variable related to the dimension variable label N.
553	adds one count to the dimension variable label N. The computer does not care whether the data comes from the keyboard, tape drive or disk drive — it treats all the data the same way.
554	forces a jump to Line 550 to test for an EOF condition.
555	properly closes the file that was opened in Line 545.
560	forces a jump to Line 900.
565	a remarked line.
567	opens an input file to the disk drive with the name found in A$.
568	checks to see if the End Of File has been reached. If it detects an EOF condition, it will jump to Line 580. If no EOF condition has been detected, the program will then go to the next line, which is Line 572.
572	inputs data from the disk drive. This data has dimensioned variable labels, each variable related to the dimension variable label N.
573	adds one count to the dimension variable label N.
579	forces a jump to Line 568 to test for an EOF condition.
580	properly closes the file that was opened in Line 567.
590	forces a jump to Line 900.
600	clears the screen and allows the entry of string variable A$.
602	sets a new value for A$ equal to the old value of A$ entered in Line 600. This is done to avoid any file errors that may occur due to too many characters being used in the filename. Remember that your computer recognizes only filenames of a maximum eight characters long with a three-character extension. The extension is a label placed on the program name that tells the computer what type of program is being loaded or saved. See your manuals for more information on filenames and extensions.
605-620	test the value of variable A to see whether the system is tape or disk.
650	a remarked line.
655	opens an output file to the cassette drive with the name found in A$.
660	sets a FOR/NEXT command with the value of variable Z to be set from zero to the value of N-1. (The reason for this is that if we left the value for zero to N, we would have a blank file left at the end of the data file when we saved the data file to disk or tape. This would use up data space and not allow us to make the most of our data space available.
661	prints data to the cassette drive. These variables are printed as they relate to the variable label Z. The program then adds 1 to the value of Z and causes the program to go back to Line 660 to start the next count of the FOR/NEXT loop set up in Line 660. When the count conditions are satisfied for the FOR/NEXT loop, the line will then properly close the file opened in Line 655 and force a jump to Line 2000, which is the menu selection area.
675	a remarked line.
680	opens an output file to the disk drive with the name found in A$.
682	sets a FOR/NEXT command with the value of Z to be set from 0 to the value of N-1.
684	prints data to the disk drive.

cate that an End Of File condition has been detected:

Device	Indicator
Disk	1
Tape	-1

CLOSE

The CLOSE command properly terminates any file that was previously opened. Failure to properly terminate open files will result in an FD Error (bad file data). These files may or may not be recoverable; usually they are lost and all data contained in them is lost, as well. Sometimes you can recover it by repairing the files or by using a disk repair utility to look at the data and print it out.

If for any reason you interrupt a program that has previously opened a file, or you suspect a file has been left open, type CLOSE and press ENTER. This command will then properly terminate any file that might have been left open. This can be done after a break or error; be sure to enter the command *before* a reset, cold poke or warm start has occurred.

Proper syntax for this command is CLOSE, CLOSE*x*, where *x* is the proper device specifier or any other form that adds the proper device specifier on the end of the command.

Line	Description
685	adds 1 to the value of Z and causes the program to go back to Line 682 to start the next count of the FOR/NEXT loop set up in Line 682. When the count conditions are satisfied for the FOR/NEXT loop, it goes on to Line 686.
686	properly closes the file opened in Line 680.
687	forces a jump to Line 2000.
700-770	print out the string variables B$, C$, D$ and E$, and allow you to select which one to correct.
880	clears the screen and allows the entry of B$ as it is related to Z. It will be used for a new value for B$ as related to N.
801	sets B$(N) equal to the same character values as B$(Z); forces a jump to Line 700.
810-831	perform the same operations for entering and changing variables C$, D$ and E$, and then force a jump to Line 700.
900	sets up a FOR/NEXT value for B. (As explained for lines 660 and 682, when displaying or printing variables entered in arrays, you must use the variable used in counting the array, which, in this case, is N minus 1. This counts down the variable. To fail to do so will cause a blank file to be displayed.
910-940	display text with associated variables as they relate to B.
950	prints text at the specified location.
960	sets I$ to an INKEY$ function and will continue to Line 970 if any key is pressed.

Still keeping the books the way Grandpa did?

Then you need CoCo-Accountant

Tired of scrounging through old shoeboxes full of receipts, canceled checks and bills? Looking for an easy way to organize your finances when the tax man calls? Then you need **CoCo-Accountant,** the best-selling home and small business accounting program for the Color Computer. All you have to do is set up a chart of accounts and begin entering transactions. Checks, credit card expenses, income. In any order. **Just toss it in and CoCo-Accountant sorts it out.** No fuss, no muss, no mess.

When you're through, Coco-Accountant will dazzle you with an array of reports that will answer the three basic questions we all ask about our finances: **Where did it come from? Where did it go? And what can I deduct from my taxes?**

Here's what it can do for you:

- List and total expenses and income by **month.**
- List and total expenses and income by **account,** for any month or the whole year.
- List and total expenses or income by **payee or income source** for any month or the whole year.
- Track, list and summarize **tax-deductible expenses.**
- Track, list and summarize expenses subject to **sales tax.** Even calculates total sales tax you paid!
- Produce **a printed spreadsheet** showing activity by month and account for the whole year!
- **Balance your checkbook,** of course!
- Sort entries by date and store files on tape or disk.
- Up to 900 entries in a single file.
- **Requires 64K CoCo or Coco 3.**

Coco-Accountant is $34.95 on tape or disk. Be sure to specify which you want when you order. We accept VISA and MasterCard. COD orders, add $3.00. Send check or money order to the address below or call our toll-free order line. For information, call 301-521-4886.

Federal Hill Software 8134 Scotts Level Rd. Baltimore, Md. 21208. Toll-free orders 800-628-2828 Ext. 850

PRINT#

The PRINT#*x* command prints the characters following this command to the device specified. The device specifiers used for the PRINT#*x* command are the same ones used for the OPEN command.

Proper syntax for this command is PRINT#-1 for the cassette drive, PRINT#-2 for the printer, PRINT#1 for the disk drive, or PRINTA$, where A$ is the proper device specifier as determined in the program.

LEFT$

This command allows you to select the left string of characters within a specified string of characters. It is useful in various text data manipulations.

The proper syntax for this command is B$ = LEFT$(A$,*x*), where B$ is the new character string to be defined, A$ is the text string to be manipulated and *x* equals the number of characters to use in the length of the string manipulation (a number from 1 to 255). A common practice is to use the same string variable for the manipulation. This can be accomplished by the command A$ = LEFT$(A$,8), which reads, "String variable A$ has a new value of the old value of A$, but only the first eight characters on the left of the old value of A$."

Block	Lines	Label
1	0-85	Setup
3	95-220	Data Input
3A	300-330	Entry Error Correction
5	500-520	Output Device Setup
5A	540-560	Cassette Input
5B	565-590	Disk Input
6	600-620	Input Device Setup
6A	650-661	Cassette Output
6B	675-687	Disk Output
4A	700-831	Editor
4	900-980	Text Display
1A	1000-1200	System Type Display
2	2000-2010	Main Menu
7	5000	Program End Routine
3B	6000	Maximum File Size Routine

Figure 1

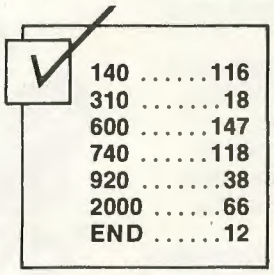
We will not go into the other string manipulation commands.

The Program

I mentioned earlier the method of "blocking off" your program, in which you take a hard copy of it and physically draw lines between distinct routines. You then label each routine, explaining its function. This makes the program much more understandable to you and to anyone else who looks at the listing. I blocked off the final version of DATABASE as shown in Figure 1.

Well, I guess this is it. We have covered many of BASIC's commands and have developed a small database program. The database is rather crude; I left it that way so you could practice the skills you have learned in this series. You can use what you have learned to enhance the database program, perhaps adding a feature that allows adding more data to an existing database, increasing the array sizes, etc.

(Questions or comments regarding this tutorial may be directed to the author at 901 Ferndale Blvd., High Point, NC 27260. Please enclose an SASE when writing for a reply.) □



The listing: DATABASE

```
Ø 'BASIC NAME DATABASE PROGRAM.
THIS PROGRAM IS TO BE USED WITH
THE BASIC PROGRAMMING COURSE
WRITTEN BY DAVID W. OSTLER, COPY
RIGHT 1987
1Ø CLEAR1ØØØ:T=1ØØ:N=Ø:DIMB$(1Ø)
:DIMC$(1Ø):DIMD$(1Ø):DIME$(1Ø)
2Ø 'CHECK FOR TAPE OR DISK SYSTE
M
3Ø A=PEEK(188)
4Ø 'CHECK FOR 16K OR 64K SYSTEM
5Ø B=PEEK(116)
6Ø IF(A=14 AND B=127) THEN GOSUB
1ØØØ
7Ø IF(A=6 AND B=127) THEN GOSUB1
Ø1Ø
8Ø IF(A=6 AND B=63) THEN GOSUB1Ø
2Ø
85 GOTO2ØØØ
95 'FILES ENTERED HERE
1ØØ CLS:PRINT"ADDRESS DATABASE #
 OF FILES";N:PRINT:LINEINPUT"ENT
ER NAME
      ";B$(N)
11Ø PRINT:LINEINPUT"ENTER ADDRES
S
";C$(N)
12Ø PRINT:LINEINPUT"ENTER CITY,
ST, &ZIP                    ";D$(N)
13Ø PRINT:LINEINPUT"ENTER TELEPH
ONE NO.
";E$(N)
14Ø CLS:PRINT:PRINT"1. NAME- ";B
$(N)
15Ø PRINT:PRINT"2. STREET-";C$(N
)
16Ø PRINT:PRINT"3. STATE- ";D$(N
)
```

```
17Ø PRINT:PRINT"4. PHONE- ";E$(N
)
18Ø PRINT@357,"PRESS <C> TO CONT
INUE":PRINT@399,"OR":PRINT@416,"
  PRESS THE NUMBER TO CORRECT"
19Ø I$=INKEY$:IFI$=""THEN19ØELSE
IFI$="1"THEN3ØØELSEIFI$="2"THEN3
1ØELSEIFI$="3"THEN32ØELSEIFI$="4
"THEN33ØELSEIFI$="C"THEN2ØØELSE1
9Ø
2ØØ N=N+1:IFN=11GOTO6ØØØ
21Ø CLS:PRINT@456,"ANOTHER ENTRY
 (Y/N)"
22Ø I$=INKEY$:IFI$=""THEN22ØELSE
IFI$="Y"THEN1ØØELSEIFI$="N"THEN9
ØØELSE22Ø
3ØØ CLS:PRINT:PRINT:LINEINPUT"EN
TER NAME
      ";B$(N):GOTO14Ø
31Ø CLS:PRINT:PRINT:LINEINPUT"EN
TER ADDRESS
          ";C$(N):GOTO14Ø
32Ø CLS:PRINT:LINEINPUT"3. STATE
- ";D$(N):GOTO14Ø
33Ø CLS:PRINT:PRINT:LINEINPUT"EN
TER TELEPHONE NO.
          ";E$(N):GOTO14Ø
5ØØ N=Ø:CLS:INPUT"ENTER NAME OF
FILE TO BE LOADED";A$
5Ø2 IFA$=""THEN2ØØØ
5Ø5 'CHECK FOR DISK OR TAPE
51Ø IFA=6THEN545
52Ø IFA=14THEN565
54Ø 'CASSETTE TAPE READ IN
545 OPEN"I",-1,A$
55Ø IF EOF (-1) THEN 56Ø
552 INPUT#-1,B$(N),C$(N),D$(N),E
$(N)
553 N=N+1
554 GOTO55Ø
555 CLOSE
56Ø GOTO9ØØ
565 'DISK SYSTEM READ IN
567 OPEN"I",1,A$
568 IF EOF (1) THEN 58Ø
572 INPUT#1,B$(N),C$(N),D$(N),E$
(N)
573 N=N+1
579 GOTO568
58Ø CLOSE
59Ø GOTO9ØØ
6ØØ CLS:INPUT"ENTER NAME OF FILE
 TO BE SAVED";A$
6Ø2 A$=LEFT$(A$,8)
6Ø5 'CHECK FOR DISK OR TAPE
61Ø IFA=6THEN65Ø
62Ø IFA=14THEN675
65Ø 'CASSETTE TAPE SAVE
655 OPEN"O",-1,A$
66Ø FORZ=Ø TO N-1
661 PRINT#-1,B$(Z);",";C$(Z);","
;D$(Z);",";E$(Z);",";
662 NEXTZ
```

Coco Graphics Designer

Only $29.95

The Coco Graphics Designer produces beautiful Greeting Cards, Banners, and Signs for holidays, birthdays and other occasions.

The program features picture, border, and character font editors, so that you can modify or expand the already built in libraries. Plus a special "grabber" utility is included to capture areas of high resolution screens for your picture library.

Requirements: a Coco I, II or III with at least 32K, one disk drive, BASIC 1.0/1.1,ADOS 1.0/1.1 or JDOS. Printers supported include: Epson RX/FX, Gemini 10X, SG10, NX10, C-Itoh 8510, DMP 100/105/110/130/430 CGP220, many Okidata (check with Zebra), Seikosha GP100/250, Gorilla Banana, Legend 808.

#C323 Coco Graphics Designer

Picture Disk #1

This supplementary picture library diskette contains over one hundred additional pictures.

#C333 Picture Disk #1 $14.95

Colored Paper Packs

150 sheets (50 each red, yellow, blue) with 60 matching envelopes. Perfect for making your productions outstanding.

#C274 Paper Pack $19.95

It's fun making your own Greeting Cards, Signs, and Banners with Zebra's Coco Graphics Designer.

WICO TRACKBALL

Only $29.95

Order Cat#TBCC

WICO designed these trackballs specifically for the Radio Shack Color Computer joystick port. Features 360-degree movement and quick-action fire button for smooth, arcade response and feel. Works great with Coco joystick and mouse software.

The **Car Sign Designer** program enables you to easily create distinctive bright yellow diamond shaped car signs. Everything you need is provided including two reusable clear plastic sign holders with suction cups, 50 sheets of bright yellow fanfold paper, and the **Car Sign Designer** program disk and instructions. ••• Hardware, DOS, and printer requirements are the same as for our CoCo Graphics Designer above. Order Cat#CSCC, $29.95. For six additional sign holders, order Cat#CS6PK $9.95.

Ordering Instructions: All orders add $3.00 Shipping & Handling. UPS COD add $3.00. VISA/MC Accepted. NY residents add sales tax.

Zebra Systems, Inc.
78-06 Jamaica Avenue
Woodhaven, NY 11421
(718) 296-2385

```
663 CLOSE
664 GOTO2ØØØ
675 'DISK SYSTEM SAVE
68Ø OPEN"O",1,A$
682 FORZ=Ø TO N-1
684 PRINT#1,B$(Z);",";C$(Z);",";
D$(Z);",";E$(Z);",";
685 NEXTZ
686 CLOSE
687 GOTO2ØØØ
7ØØ CLS:PRINT:PRINT"1. NAME- ";B
$(Z)
71Ø PRINT:PRINT"2. STREET-";C$(Z
)
72Ø PRINT:PRINT"3. STATE- ";D$(Z
)
74Ø PRINT:PRINT"4. PHONE- ";E$(Z
)
75Ø PRINT@357,"PRESS <C> TO CONT
INUE":PRINT@399,"OR":PRINT@416,"
  PRESS THE NUMBER TO CORRECT"
77Ø I$=INKEY$:IFI$=""THEN77ØELSE
IFI$="1"THEN8ØØELSEIFI$="2"THEN8
1ØELSEIFI$="3"THEN82ØELSEIFI$="4
"THEN83ØELSEIFI$="C"THEN97ØELSE7
7Ø
8ØØ CLS:PRINT:PRINT:LINEINPUT"EN
TER NAME
        ";B$(Z)
8Ø1 B$(N)=B$(Z):GOTO7ØØ
81Ø CLS:PRINT:PRINT:LINEINPUT"EN
TER ADDRESS
        ";C$(Z)
811 C$(N)=C$(Z):GOTO7ØØ
82Ø CLS:PRINT:LINEINPUT"3. STATE
- ";D$(Z)
821 D$(N)=D$(Z):GOTO7ØØ
83Ø CLS:PRINT:PRINT:LINEINPUT"EN
TER TELEPHONE NO.
        ";E$(Z)
831 E$(N)=E$(Z):GOTO7ØØ
9ØØ FORZ=ØTO N-1
91Ø CLS:PRINT:PRINT"1. NAME- ";B
$(Z)
92Ø PRINT:PRINT"2. STREET-";C$(Z
)
93Ø PRINT:PRINT"3. STATE- ";D$(Z
)
94Ø PRINT:PRINT"4. PHONE- ";E$(Z
)
95Ø PRINT@32Ø,"    PRESS [C] TO
CONTINUE,       [R] TO RETURN T
O MAIN MENU,":PRINT@399,"OR":PRI
NT@422,"[E] TO EDIT ENTRY"
96Ø I$=INKEY$:IFI$=""THEN96ØELSE
IFI$="C"THEN97ØELSEIFI$="R"THEN2
ØØØELSEIFI$="E"THEN7ØØELSE96Ø
97Ø NEXTZ
98Ø GOTO2ØØØ
1ØØØ CLSØ:PRINT@23Ø,"32/64K DISK
 SYSTEM";:FORX=1TO1ØØØSTEP1:NEXT
X:RETURN
1Ø1Ø CLSØ:PRINT@228,"32/64K CASS
ETTE SYSTEM";:FORX=1TØ1ØØØSTEP1:
NEXTX:RETURN
1Ø2Ø CLSØ:PRINT@229,"16K CASSETT
E SYSTEM";:FORX=1TO1ØØØSTEP1:NEX
TX:RETURN
2ØØØ CLSØ:PRINT@32," WELCOME TO
THE BASIC DATABASE ";:PRINT@71,"
WOULD YOU LIKE TO:";:PRINT@133,"
B)EGIN A NEW DATABASE";:PRINT@19
7,"A)BORT THIS PROGRAM";
2ØØ5 PRINT@261,"L)OAD A NEW DATA
BASE";:PRINT@325,"S)AVE THIS DAT
ABASE";:PRINT@389,"V)IEW THE DAT
ABASE";:PRINT@458,"[SELECT ONE]"
;
2Ø1Ø I$=INKEY$:IFI$=""THEN2Ø1ØEL
SEIFI$="B"THEN95ELSEIFI$="A"THEN
5ØØØELSEIFI$="L"THEN5ØØELSEIFI$=
"S"THEN6ØØELSEIFI$="V"THEN9ØØELS
E2Ø1Ø
5ØØØ CLS3:PRINT@224,"       REBO
OTING TO BASIC":SOUND2ØØ,2:SOUND
1ØØ,3:FORX=1TO1ØØØSTEP1:NEXTX:CL
S:END
6ØØØ CLSØ:PRINT@224,"   MAXIMUM
FILE SIZE REACHED":SOUND2ØØ,2:SO
UND1ØØ,3:FORX=1TO1ØØØSTEP1:NEXTX
:GOTO9ØØ
```


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

YOU could WIN BIG with LOT-PRO!

HANDICAPS ANY LOTTO!

Any Country, Any State

LOT-PRO is specifically designed for the Color Computer and features:

-A choice of SIX wheeling systems for increased winning probabilities

-Unique LOT-PRO SYSTEM 60 number selection routine

ONLY $25.95 (disk or tape)

CJN ENTERPRISES
P.O. Box 40487
Bakersfield, CA. 93384
(805)-836-1323

California residents must add 6% sales tax.

Invest in LOT-PRO!

It could make YOU RICH!

RAINBOW CERTIFICATION SEAL

Fun With Phonics

By Steve Blyn
Rainbow Contributing Editor

This month's program is for the younger set, specifically for children who are just beginning to read words. To them we present *Phonics*, our version of a phonics wheel.

When a child begins to read, initial consonant sounds that represent familiar objects are learned first — "B is for boy" and "C is for Cat," for example. Next, final consonants are taught. For example, the word *bed* ends in D and *car* ends in R.

The short vowel sounds are taught next, and with them, children can practice and learn a great variety of three-letter words. Our program generates an endless variety of three-letter words for children to practice reading.

Supervision by an adult is needed with *Phonics* to first help and later reinforce a child's reading of the words. A child should not be left alone with this program until he or she becomes quite familiar with the material.

Words are chosen randomly and without any regard as to whether they are indeed real words, which is in keeping with our philosophy of teaching reading. We feel it is important to learn to read nonsensical three-letter words because they often form the beginning, middle or end of larger real words. For example, although *til* is not a real word, it is the beginning of *tilt*, the middle of *still* and the end of *until*, which are all common words that will be learned in the near future.

Adults may also ask the child whether a three-letter word is a real word, part of a longer word or just nonsense. At this age, children are often very happy with a little nonsense. It adds some fun to the hard work of learning to read.

We felt that the program should go one step further in the reading process, and so included as an option the "Magic E." The Magic E is a final E, which makes the preceding vowel sound long instead of short: Four-letter words ending in E are the next step in the reading process. Words such as *bit* and *mat* become *bite* and *mate* when the E is added. The rule taught here is that the long sound of the vowel is said but the E at the end is silent.

Each time a child presses 3 on the keyboard, the letter wheels "spin" and the child will be shown a three-letter word. Pressing 4 instead produces a four-letter word with a silent E at the end. No other regular key will operate except the 9 key, which ends the program.

The program is very short and straightforward. Lines 40 through 70 dimension and read the letters. You may choose to leave these as they are or adjust the letter choice for your child. For example, you may choose to stress certain beginning consonant sounds only or the family of words ending in *at* or *et*. The choice of letters used can easily be altered as the child progresses.

Lines 90 through 120 draw a box to surround the word. Lines 180 through 210 print a random word inside the box. After each word is printed, the child may press either the ENTER key for another word or the 9 key to end the program.

Our youngest child, Shari, is 6 years old. We recently bought her a plastic phonics wheel to reinforce her word-reading skills. She enjoys it but often finds it hard to manipulate the wheels. My wife, Cheryl, challenged me to create a similar wheel on the computer. The result is the program presented this month. Shari loves to think of the larger words the nonsense words are part of (she is very smart), and she enjoys the computer wheels more than she does the plastic ones. We hope your youngsters enjoy the program, too. □

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

The listing: PHONICS

```
10 REM"PHONICS WHEELS"
20 REM"STEVE BLYN,COMPUTER ISLAN
D,STATEN ISLAND,NY,1988"
30 CLS5:R=17:R1=5:R2=17
40 DIM A$(R),B$(R1),C$(R2)
50 FOR X=1 TO 17:READ A$(X):NEXT
 X
60 FOR Y=1 TO 5:READ B$(Y):NEXT
Y
70 FOR Z= 1 TO 17:READ C$(Z):NEX
T Z
80 CLS RND(5)+1
90 FOR T=1160 TO 1175:POKE T,255
:NEXT T
100 POKE 1207,255:POKE1239,255:P
OKE 1271,255
110 FOR T=1288 TO 1303:POKE T,25
5:NEXT T
120 POKE 1256,255:POKE 1224,255:
POKE 1192,255
130 EN$=INKEY$
140 IF EN$="3" THEN 150 ELSE IF
EN$="4" THEN 150 ELSE 130
150 FOR T= 1 TO 10
160 A=RND(R):B=RND(R1):C=RND(R2)
170 PLAY"O3L50;C"
180 PRINT@204,A$(A);
190 PRINT@206,B$(B);
200 PRINT@208,C$(C);:NEXT T
210 IF EN$="4" THEN PRINT@210,"E
";
220 EN$=INKEY$
230 IF EN$="9" THEN END ELSE IF
EN$=CHR$(13) THEN 80 ELSE 220
240 DATA B,D,F,G,H,J,K,L,M,N,P,R
,S,T,V,W,Z,A,E,I,O,U
250 DATA B,D,F,G,H,J,K,L,M,N,P,R
,S,T,V,W,Z
```

RAINBOW

Give us your best: Join the ranks of these courageous CoCoists in showing the Color Computer world your high score at your favorite micro-diversion. We want to put your best effort on record in THE RAINBOW's "Scoreboard" column. All entries must be received 60 days prior to publication. Entries should be printed — legibly — and must include your *full* name, address, game title, company name and, of course, your high score. Each individual is limited to three score entries per month. Send your entries to Scoreboard, c/o THE RAINBOW.

For greater convenience, your high scores may also be sent to us through the MAIL section of our Delphi CoCo SIG. From the CoCo SIG> prompt, pick MAIL, then type SEND and address to: EDITORS.

★ Current Record Holder • Shutout

ADVANCED STAR*TRENCH (THE RAINBOW, 7/86)
4,750 ★Stephane Martel, Laval, Quebec
4,300 Jeffrey Warren, Waynesville, NC
3,975 David Schaller, Clarkston, WA
3,960 Maurice MacGarvey, Dawson Creek, British Columbia
3,960 Robbi Smith, Helena, HI

ALPINE SLOPES (THE RAINBOW, 12/85)
13,140 ★Ron Silvestro, Lindenwold, NJ
9,880 Walter Schilling, Lindenwold, NJ
7,340 Gary Demerest, Lindenwold, NJ
6,110 Rick McElroy, Lindenwold, NJ

BEE ZAPPER (THE RAINBOW, 9/87)
9,650 ★Benoit Landry, Drummondville, Quebec
9,450 Phillip Holsten, Modesto, CA

BUZZARD BAIT *(Tom Mix)*
22,931,850 ★Skip Taday, East Lyme, CT
763,550 Geran Stalker, Rivordalo, GA
187,750 Keith Janas, Kitwanga, British Columbia

CANYON CLIMBER *(Radio Shack)*
1,627,500 ★Matthew Fumich, Munford, TN
202,000 David Brown, New Waterford, Nova Scotia
178,200 Darren King, Yorkton, Saskatchewan
169,000 Gregory Speer, Emporia, KS
165,500 Sara Mittelstaedt, Kiel, WI
159,200 Upton Thomas, Arnold, MD
150,200 Brian Lewis, Baltimore, MD
141,400 Michael Petry, Kansas, AL
135,600 Eric Rose, Grand Coulee, WA
130,400 Joanna Wanagel, Freeville, NY

CLOWNS & BALLOONS *(Radio Shack)*
688,960 ★Faye Keefer, Augusta, GA
70,180 Charles Andrews, Delta Jct, AK
36,650 Melody Webb, Lakeport, CA
15,950 Matthew Smith, Courtenay, British Columbia

COLOR POKER (THE RAINBOW, 4/83)
21,504,600 ★Earl Foster, Lynchburg, VA

CRYSTLE CASTLES *(ThunderVision)*
554,979 ★Patrick Martel, Laval, Quebec
60,107 Alphonse Brown, Houston, TX

DALLAS QUEST *(Radio Shack)*
81 ★Brad Wilson, Lithia Springs, GA
85 David and Shirley Johnson, Leicester, NC
86 Roy Grant, Toledo, OH
86 Melanie Moor, Florence, AL
86 Paul Summers, Orange Park, FL
87 Douglas Bell, Duncan, OK
89 Chris Piche, White Rock, British Columbia
89 Milan Parekh, Fullerton, CA
89 Andrew Urquhart, Metairie, LA
89 Steve Zemaitis, Howell, MI
91 John Semonin, Akron, OH

DECATHALON *(Spectral Associates)*
10,400 ★Tom DiVittorio, Glassboro, NJ
7,440 Wayne Hufford, Kincardine, Ontario
7,216 Martin Parada, Arcadia, CA

DEFENSE *(Spectral Associates)*
16,305 ★Patrick Martel, Laval, Quebec

DEF MOV (THE RAINBOW, 1/87)
30,253 ★Benoit Landry, Drummondville, Quebec
25,739 John Weaver, Amsterdam, NY

DEMOLITION DERBY *(Radio Shack)*
100,100 ★Gary Budzak, Westerville, OH
32,000 Darren Lowe, White Rock, British Columbia

DEMON ATTACK *(Imagic)*
72,410 ★Glenn Hodgson, Aberdeenshire, Scotland
40,435 Upton Thomas, Arnold, MD
28,780 Daniel Streidt, Cairo, Egypt
16,995 Todd VanNatta, Isle of Palms, SC
4,960 Laundre Clemon, Sacramento, CA

DESERT PATROL *(Arcade Animation)*
377,050 ★Jason Lakes, Franklin, OH

DESERT RIDER *(Radio Shack)*
50,797 ★Patrick Devitt, Lombard, IL
26,125 Ryan Grady, Newbury Park, CA
24,355 Roby Janssen, Clear Lake, IA

DEVIL ASSAULT *(Tom Mix)*
1,866,100 ★Stephane Martel, Laval, Quebec
623,550 Dale Krueger, Maple Ridge, British Columbia
75,000 Blake Cadmus, Reading, PA
40,800 Benoit Landry, Drummondville, Quebec

DISCRIMINATION (THE RAINBOW, 1/87)
15 ★Patrick Martel, Laval, Quebec

DONPAN *(Radio Shack)*
52,600 ★Eric Olson, Wheaton, IL

DOUBLE BACK *(Radio Shack)*
172,320 ★Richard Winkelbauer, Bronx, NY
136,510 Don Mullis, Delavan, WI
51,470 Betty Mullis, Delavan, WI
50,700 Tristan Terkuc, Richmond, Ontario
34,990 Darren Lowe, White Rock, British Columbia

DOWNLAND *(Radio Shack)*
99,980 ★Danny Wimett, Rome, NY
98,985 Karl Gulliford, Summerville, SC
97,740 Stephane Deshaies, Beloeil, Quebec
89,490 Neil Edge, Williston, FL
77,254 Tom Audas, Fremont, CA
73,346 Jean-Francois Morin, Loretteville, Quebec
70,142 Chris Goodman, Baltimore, MD
68,142 Cooper Valentin, Vavenby, British Columbia
67,721 Keith Yampanis, Jaffrey, NH
62,442 Eddie Lawrence, Pasadena, Newfoundland
55,300 Patrico Gonzalez, Buenos Aires, Argentina
49,500 Danny Perkins, Clifton Forge, VA
49,441 Kevin Pater, Port Alberni, British Columbia
49,254 David Brown, New Waterford, Nova Scotia
43,502 Mike Ells, Charlotte, MI
41,896 Antonio Hidalgo, San Jose, Costa Rica
40,360 Jesse Binns, Phoenix, AZ
34,424 Andrea Mayfield, Melbourne, FL
25,147 Timothy O'Neal, Commerce, TX
21,527 Scott Godfrey, Nashua, NH
19,835 Christopher Heston, Louisville, KY
18,251 Sam DiCerce, Willowich, OH
18,103 Sarah Van Oteghem, Taylor Ridge, IL
17,120 Kay McCluskey, Remsen, NY

DRAGON FIRE *(Radio Shack)*
160,835 ★Eric Olson, Wheaton, IL
146,325 Stephane Martel, Laval, Quebec
5,561 Chris Lorenz, Kiester, MN

DRAC *(Tom Mix)*
104,850 ★Don Mullis, Delavan, WI

ESCAPE 2012 *(Computerware)*
202 ★Roy Grant, Toledo, OH

FIRESTORM (THE RAINBOW, 1/86)
22,505 ★Chad Presley, Luseland, Saskatchewan
11,250 Stephane Martel, Laval, Quebec
5,680 Kathy Rumpel, Arcadia, WI
3,760 Rick Beevers, Bloomfield, MN
3,505 Blake Cadmus, Reading, PA

FRACTION FEVER *(Spinnaker)*
10,480 ★Shawn Riggins, Orangevale, CA

GALACTIC ATTACK *(Radio Shack)*
26,370 ★Jeff Remick, Warren, MI
10,600 Brian Crabtree, College Park, WA
9,930 Daniel Streidt, Cairo, Egypt

GALAGON *(Spectral Associates)*
357,890 ★Jason Clough, Houston, TX
328,820 Bernard Burke, Lee's Summit, MO
249,960 Matthew Fumich, Munford, TN
169,410 Danny Dunne, Pittsfield, NH
149,520 Vernon Johnson III, Parkville, MD
138,500 Darren Brown, New Waterford, Nova Scotia
116,280 Scott Jamison, Billerica, MA
116,000 Micah Clough, Houston, TX
105,000 David Brown, New Waterford, Nova Scotia

GALAX ATTACK *(Spectral Associates)*
236,350 ★Corey Leopold, Nada, TX
28,300 Augusto Voysest, Lima, Peru

GANTELET *(Diecom Products)*
23,643,720 ★Geran Stalker, Rivordalo, GA
20,921,490 Randall Edwards, Dunlap, KS
10,222,940 Clinton Morell, Sacramento, CA
10,020,500 Ken Hubbard, Madison, WI
7,493,340 Stirling Dell, Dundalk, Ontario
2,626,950 Jonathon Ross, Pocomoke City, MD
2,512,620 Jason Steele, Pensacola, FL
2,312,640 Rory Kostman, Hershey, NE
2,115,790 Jerry Honigman, Waggoner, IL
2,011,200 Jerry Colbert, Bakersfield, CA
1,224,190 Jonathan Wanagel, Freeville, NY
1,108,750 Robert Fox, Dover, OH
1,094,280 Donnie Pearson, Arvada, CO
1,081,530 Michael Wallace, Bronx, NY
1,025,900 John Hotaling, Duanesburg, NY
1,016,050 Edward Swatek, Chicago, IL
933,740 Yvan Langlois, Laval, Quebec
932,660 Brian Hunter, South Berwick, ME
787,780 Brad Wilson, Lithia Springs, GA
685,840 Karen Jessen, Cleveland, OH

SCOREBOARD

667,390 Robbie Smith, Helena, HI
555,230 Larry Shelton, Marion, IL
456,220 Scott Jamison, Billerica, MA
410,868 Billy Helmick, Independence, KY
132,800 Lance Orner, Chico, CA

HALLOWEEN (THE RAINBOW, 10/86)
625 ★Clara Smith, Courtenay, British Columbia

HITCHHIKER'S GUIDE TO THE GALAXY *(Infocom)*
400/422 ★Jeff Holtham, Waterloo, Ontario
400/510 Brad Wilson, Lithia Springs, GA

JOKER POKER (THE RAINBOW, 3/87)
2,793,285 ★Blain Jamieson, Kingston, Ontario
205,239 Paul Dykes, Baton Rouge, LA
13,377 Jason Ebbeling, Berkshire, MA
11,000 Frankie DiGiovanni, Olney, MD

JUNIOR'S REVENGE *(Computerware)*
2,503,000 ★Stephane Martel, Laval, Quebec
257,600 Keith Cohen, Rocky Mount, NC

JUNKFOOD (THE RAINBOW, 11/84)
25,670 ★John Guptill, Columbia, MO
18,650 Daniel Streidt, Cairo, Egypt

KARATE *(Diecom Products)*
31,000 ★Wayne Hufford, Kincardine, Ontario
11,600 Jonathon Ross, Pocomoke City, MD
6,300 David Darling, Longlac, Ontario

THE KING *(Tom Mix)*
3,824,280 ★Andre Grenier, Quebec, Canada
49,400 Benoit Landry, Drummondville, Quebec
22,400 Spencer Metcalf, Longview, TX

KORONIS RIFT *(Epyx)*
186,710 ★Tony Harbin, Cullman, AL
184,180 Russell Johnson, Sarnia, Ontario
184,120 John Farrar, Lebanon, TN
133,990 Paul Blessing, Spring, TX
96,540 Doug Lute, Clymer, PA

KUNG-FU DUDE *(Sundog Systems)*
32,000 ★Tony Geitgey, University Park, PA

LUNAR RESCUE (THE RAINBOW 8/87)
260,427 ★Tom Beeker, Gracey, KY
246,668 Phillip Holsten, Modesto, CA
113,579 Jeff Remick, Warren, MI

MEGA-BUG *(Radio Shack)*
9,016 ★Heather Richwalski, Medford, WI
5,172 Jason Ebbeling, Berkshire, MA

MISSION: F-16 ASSAULT *(Diecom Products)*
468,750 ★Karen Jessen, Cleveland, OH
355,570 Stirling Dell, Dundalk, Ontario
318,160 Jeremy Pruski, Sandwich, IL
137,920 Mike Grant, Fresno, CA
127,550 Michael Heitz, Chicago, IL
120,670 Vernon Johnson III, Parkville, MD
58,530 Chris Wright, New Albany, IN

MUNCHKIN BLASTER (THE RAINBOW, 8/87)
10,420 ★Gabe Emerson, Baraboo, WI
9,760 Tom Beeker, Gracey, KY
9,080 John Weaver, Amsterdam, NY
9,000 Benoit Landry, Drummondville, Quebec
7,240 Jeff Remick, Warren, MI

ONE-ON-ONE *(Radio Shack)*
1,276-0 ★●Jonathan Dorris, Indianapolis, IN
1,210-0 ●Gregg Thompson, Chesterfield, VA
1,204-0 ●Chad Johnson, Benton, AR
1,160-0 ●Mark Lang, Downieville, CA
1,132-23 Dan Liffmann, Andover, MA

PANIC BUTTON *(Radio Shack)*
2,192 ★Eric Olson, Wheaton, IL
190 Roby Janssen, Clear Lake, IA

PEGASUS AND THE PHANTOM RIDERS *(Radio Shack)*
303,100 ★Mike Grant, Fresno, CA
244,100 Martinez Domingo, Miami, FL
67,100 Ryan Grady, Newbury Park, CA

PINBALL *(Radio Shack)*
399,350 ★Troy Stoll, Washington, IN
213,300 Patrick Martel, Laval, Quebec
142,400 Thomas Payton, Anderson, SC

PITSTOP II *(Epyx)*
54 ★Rusty Breitbach, Rickardsville, IA
54 ★Jeff Coburn, Easton, PA
54 ★Walter Hearne, Pensacola, FL
54 ★Jeff Szczerba, Sturtevant, WI
54 ★Sean Noonan, Green Bay, WI
54 ★Brad Wilson, Lithia Springs, GA
51 Christian Grenier, Valleyfield, Quebec
49 Randy Venable, Coal City, WV
9 Laundre Clemon, Sacramento, CA

PLANETFALL *(Infocom)*
400/210 ★Brad Wilson, Lithia Springs, GA

POLTERGEIST *(Radio Shack)*
4,855 ★Darren Lowe, White Rock, British Columbia

POPCORN *(Radio Shack)*
94,470 ★Patrick Martel, Laval, Quebec
44,010 Kevin Pater, Port Alberni, British Columbia
25,850 Matthew Leitman, Beaconsfield, Quebec

PYRAMID *(Radio Shack)*
220 ★Jason Ebbeling, Berkshire, MA

PYRAMID 2000 *(Radio Shack)*
220 ★Darren King, Yorkton, Saskatchewan
100 Peter Antonacopoulos, Toa Baja, Puerto Rico

PYRAMIX *(ColorVenture)*
17,170 ★Janet Kim, Pinckneyville, IL

QUIX *(Tom Mix)*
8,407,772 ★John Haldane, Tempe, AZ
1,404,000 Curtis Goodson, Sao Paulo, Brazil
1,003,104 Elisa Goodson, Sao Paulo, Brazil
326,192 Martin Parada, Arcadia, CA
205,335 John Hotaling, Duanesburg, NY
104,034 Christopher Conley, North Attleboro, MA

RESCUE ON FRACTALUS *(Epyx)*
270,000 ★Russell Johnson, Sarnia, Ontario
190,915 Leon Beggs, Bellingham, WA
167,947 Roger Smith, High Prairie, Alberta
133,661 James Andrews, Kissimmee, FL
99,967 Gary Sebastian, Hazel Park, MI

RETURN OF JUNIOR'S REVENGE *(Colorware)*
1,792,800 ★Chad Presley, Luseland, Saskatchewan

RETURN OF THE JET-I *(ThunderVision)*
309,250 ★Melody Webb, Lakeport, CA

ROGUE *(Epyx)*
27,542 ★Melanie Lapoint, Fitchburg, MA
21,682 Paul Blessing, Spring, TX
17,851 Yvan Langlois, Laval, Quebec
8,812 Allen Houk, San Diego, CA
6,576 Kirk Marshall, Westport, MA
6,204 Scot Drew, Ottawa, OH
5,679 David Spalding, Galena Park, TX
5,369 John Moore, Ottawa, OH
5,274 Reland Brumfield, LaJolla, CA
4,719 Mary Calcott, LaJolla, CA

SAILOR MAN *(Tom Mix)*
1,019,200 ★Gabriel Assal, Cameron, MO
341,800 Jason Clough, Houston, TX
332,600 Jeremy Carter, Spring Lake Park, MN
287,200 Patrick Devitt, Lombard, IL

SANDS OF EGYPT *(Radio Shack)*
67 ★Tristan Terkuc, Richmond, Ontario
82 Edward Rocha, Cobleskill, NY
86 Roy Grant, Toledo, OH
87 Neil Haupt, Elyria, OH
117 John Lente, Austin, TX

SANDWORM (THE RAINBOW, 8/86)
995 ★Matthew Smith, Courtenay, British Columbia

SHOOTING GALLERY *(Radio Shack)*
23,100 ★Richard Winkelbauer, Bronx, NY

SHOOT'N RANGE (THE RAINBOW, 8/87)
13,794 ★Phillip Holsten, Modesto, CA
5,998 Richard Winkelbauer, Bronx, NY
5,433 Benoit Landry, Drummondville, Quebec

SHORT-TERM MEMORY TEST (THE RAINBOW, 12/85)
20 ★Brian and Harold Matherne, Gretna, LA

SPACE ASSAULT *(Radio Shack)*
6,200 ★John Weaver, Amsterdam, NY

SPEED RACER *(MichTron)*
81,020 ★Wayne Hufford, Kincardine, Ontario

SPEEDSTER (THE RAINBOW 8/87)
22,750 ★Benoit Landry, Drummondville, Quebec
10,500 Sara Mittelstaedt, Kiel, WI
4,710 Andrea Reelitz, Greenville, IL
3,380 Kevin Hilton, Gurdon, AR
3,350 Jamie Stoner, Mt. Union, PA

STELLAR LIFE-LINE *(Radio Shack)*
629,000 ★Steven Smith, Matthews, NC
114,620 Martinez Domingo, Miami, FL

SUCCESS MANSION (THE RAINBOW, 1/87)
13/13 ★Dave Allessi, Iselin, NJ

SUPER ROOTER (THE RAINBOW, 5/86)
15,180 ★Richard Donnell, Penns Grove, NJ
11,090 Frederick Lajoie, Nova Scotia, Canada
3,910 Daniel Bradford, Birmingham, AL

TEMPLE OF ROM *(Radio Shack)*
303,600 ★Tim Hennon, Highland, IN
138,400 Gary Budzak, Westerville, OH

TREASURE QUEST (THE RAINBOW, 11/86)
29,340 ★Matthew Smith, Courtenay, British Columbia

TREKBOER *(Mark Data)*
132 ★Matthew Fumich, Munford, TN
123 Roy Grant, Toledo, OH

TUT'S TUMB *(Mark Data)*
118,720 ★Reina Roy, Carleton, Quebec
74,780 Mack Haynes, Nice, CA
72,000 Chad Presley, Luseland, Saskatchewan
60,020 Don Siler, Muncie, IN
45,000 Blake Cadmus, Reading, PA

VARLOC *(Radio Shack)*
2,032 ★Tony Harbin, Cullman, AL
2,032 ★Edward Rocha, Cobleskill, NY
2,008 Philip Puffinburger, Winchester, VA
1,995 Denise Rowan, Minneapolis, MN
1,991 Ryan Grady, Newbury Park, CA
1,988 Randall Edwards, Dunlap, KS
1,975 Bernard Florence, Croydon, Australia

VICIOUS VIC (THE RAINBOW, 7/86)
18,813 ★Talib Khan, Bronx, NY
11,902 Martha James, Swarthmore, PA
10,489 Karl Gulliford, Summerville, SC
6,294 Pat O'Neill, Nepean, Ontario
4,643 Martha James, Swarthmore, PA
3,285 Richard Donnell, Penns Grove, NJ

THE VORTEX FACTOR *(Mark Data)*
100/276 ★Tommy Crouser, Dunbar, WV
100/483 Rick & Brenda Stump, Laureldale, PA
210 Paul Maxwell, Vancouver, British Columbia

WARP FACTOR X *(Prickly-Pear)*
10,577,051 ★Doug Lute, Clymer, PA

WISHBRINGER *(Infocom)*
400/201 ★Brad Wilson, Lithia Springs, GA

WRESTLE MANIAC *(Diecom)*
956,971 ★Marc Reiter, Cincinnati, OH
546,315 Louis Bouchard, Gatineau, Quebec
45,483 Tony Bacon, Mt. Vernon, IN
42,105 David Brown, New Waterford, Nova Scotia
39,086 Billy Helmick, Independence, KY

ZAKSUND *(Elite Software)*
357,550 ★Martin Parada, Arcadia, CA
39,950 Walter Hearne, Pensacola, FL

ZAXXON *(Datasoft)*
2,061,000 ★Byron Alford, Raytown, MO
1,950,000 Blake Cadmus, Reading, PA
1,300,500 Dan Brown, Pittsford, NY
1,100,600 Andrew Urquhart, Metairie, LA
253,400 Bob Dewitt, Blue Island, IL
170,600 Matthew Yarrows, East Hampton, MA
163,700 Daniel Bradford, Birmingham, AL
127,600 Larry Shelton, Marion, IL
119,600 Daniel Straidt, Cairo, Egypt
118,100 Upton Thomas, Arnold, MD
111,400 Jeff Miller, Bronson, MI
87,200 Tim Lang, Downieville, CA
83,700 David Darling, Longlac, Ontario
81,000 David Anderson, Midlothian, VA
50,500 Andrew Rhodes, Atlanta, GA

ZONX (THE RAINBOW, 10/85)
6,500 ★Daniel Streidt, Cairo, Egypt

ZORK I *(Infocom)*
400/720 ★Brad Wilson, Lithia Springs, GA

ZUES *(Aardvark)*
3,380 ★Martin Kertz, Forrest City, AR

— Jody Doyle

SCOREBOARD POINTERS

In conjunction with THE RAINBOW's Scoreboard, we offer this column of pointers for our game-playing readers' benefit. If you have some interesting hints, tips or responses to questions, or want help yourself, we encourage you to write to the Scoreboard, c/o THE RAINBOW.

Feedback

In response to questions from:

• William Grace: In *Halls of Dungeon Death*, you need a mace to attack any golems — it's good to enchant the mace before the sword.

• Marc Prudhommeaux: You do need the 3-D glasses to escape the fuzzy room in *Wishbringer*. They're under the theater seat. Give the coin to Miss Voss to enter the theater.

In *Wishbringer*, move the joystick in the direction you walk. Press the button when you're done.

In *The Witness*, Phong can be pressured into revealing the truth through shown evidence, but the real evidence is found by hiding behind the office lounge and waiting until both Monica and Phong are in the room together.

John Hotaling
Duanesburg, NY

• Matt Swift: In *Pyramid 2000*, use the pillow to drop the delicate vase on.

• Eddie Baker: In *Sands of Egypt*, oil the scepter and go back to the pool. Then hook the scepter to the drain cover and drain the pool.

• Duane Fair: The container is east from the snake in *Sands of Egypt*. Be sure to get the oil. You will need it.

Lisa LaRiviere
Bellingham, WA

Scoreboard:

How do you kill the Dungeon Death in *Halls of Dungeon Death*? I have been to the dungeon seven times, amassed a maximum of 564 hit points and a combination of 11 potions and still get blown away. Is there any way to save the game up to a level?

Has anyone ever made it past Level 30 in *Gold Runner*? I have scored over 594,000 points but cannot get past that level.

Michael Mealey
Bushell Park, Saskatchewan

Scoreboard:

In *Dungeons of Daggorath*, I can kill the wizard's image, and when I do, he lays down a scroll. Why can't the scroll be picked up? Is there a third ring? If so, who has it and what level is it on?

James Green
Virginia Beach, VA

Scoreboard:

You can get water in your canteen from a pool in the desert in *Sands of Egypt*. To get there from the base of the cliff, go west then south and east. If you ride the camel any odd number of consecutive times, you will go from your origin to your destination. An even number of consecutive rides keeps you at your point of origin. After you go into the treasure room, take the ladder and get back to civilization to complete the game.

When you get to the spider the first time in *Trekboer*, save the game. After you give him the capsule, it takes three turns for him to pass out and become harmless. The second place you see the spider, just before you leave, type DROP ALL and GET ALL or you may be eaten by him.

Roy Grant
Toledo, OH

Scoreboard:

In *Dallas Quest*, I can get to the dinghy in Africa, bribe the monkey to stop the water from coming in, but I can't do anything after that.

Jason Ebbeling
Berkshire, MA

Scoreboard:

In *Sea Quest*, I have the anchor, pearl, silver and the statue. I need 20 more points to win. What else do I need and where is it?

In *Trekboer*, I cannot move the ship and I cannot operate anything. Please help.

Sean Noonan
Green Bay, WI

Scoreboard:

In *Sea Search*, how do I get the mermaid, the shark repellent and the object I keep stumbling over in the hold behind the falls? How do I get the key to open the trap door in the bungalow?

In *Shenanigans*, how do I stop falling off the rainbow? Does the pole help? How do I get it through the hole?

Jimmy Munroe
Sussex, New Brunswick

Scoreboard:

In *Pyramid*, how do you get past the snake in the pharaoh's chamber? How do you pick up the bird statue?

In *Raaka-Tu*, how do you get past the gargoyle?

Kurt Heiss
Glens Falls, NY

Scoreboard:

In *Pyramid 2000*, once you climb the plant and get the key and the egg, what do you do then? How do you get to the snake?

Kevin Pereira
Corsicana, TX

Scoreboard:

In *Pyramid 2000*, in order to kill the fierce green serpent, you must have the bird statue. But in order to get that, you must drop the scepter.

How do I get the flashlight so I can go down the ladder at Chugalug's trading post?

Robert Sherman
Fords, NJ

Scoreboard:

I just seem to be spinning my wheels in *The Andrea CoCo*. I can get into the Volks but I just wind up driving around in circles. Help!

Erick Molnar
Reno, NV

Scoreboard:

In *One-On-One*, smashing the backboard and making three-point shots are just luck. There's no sure way to do it.

In *Raaka-Tu*, you can't cross the rug.

In *Zaxxon*, in order to kill Zaxxon, you must destroy the missile before it is launched.

In *Black Sanctum*, when you open the

casket, type LISTEN. The corpse will tell you what you need to make the altar.

In *Sands of Egypt*, you can't get the scepter if you can't oil it first.

In *Forest Adventure*, how do you kill the troll?

In *Syzygy*, what do you do?

In *Fighter Pilot*, when you shoot down a big plane, shoot the parachutes, too. You will get two escort planes or you will start shooting five shots instead of two.

Matthew Fumich
Munford, TN

Scoreboard:

In *Caladuril Flame of Light*, how do I get by the sharp blades in the cavern?

John Peavy
Salem, OR

Scoreboard:

How do I open the sonic lock in the skyways in *Robot Odyssey I*?

In *Bedlam*, how do I get Napoleon to open the secret door?

Joseph Mangretta
Oklawaha, FL

Scoreboard:

In *Zork I*, typing VERBOS makes the computer give a room description each time you enter. To exorcise the entrance to Hades, you require the bell, candles, a source of flame and the black book. The problem is, when I get killed, I can't figure out how to become a physical being again. How do you get the platinum bar? What is the way through the maze? I can't map it because the thief keeps moving things around. Where is the pump to inflate the raft?

Patrick Cormier
Petrolia, Ontario

Scoreboard:

In *Hitchhiker's Guide to the Galaxy*, how do you get past the Bugblatter Beast of Traal? Where is the fluff and the key on Damogran?

In *Robot Odyssey*, how do you push the nine buttons on the 5th level? When a robot pushes the third button it starts all over again.

In *Bedlam*, how do you get the red key? How do you get to the blue doors? How do you stop the doctor from giving you shots?

In *Sands of Egypt*, where is the scepter?

Duncan Cameron
Chippewa Falls, WI

Scoreboard:

I am stuck on the last screen of *Ghana Bwana*. I have read the instructions on how to get the bow and continue to the altar to get the other bow, but after that I do not know how to kill the guardians on the altar.

David Kauffman
South Haven, MI

Scoreboard:

What is the Adventurer needed for in *Enchanter*? What do you do in the translucent rooms? Also, what do you do in the library with the rat hole? What do you do with the Kulcad scroll?

Use the turtle to get the Kulcad scroll. Use the sacrificial dagger from the altar to open the jeweled box. Also, use the Krebf spell to fix the scroll in the jeweled egg.

Adam Swiderski
Lexington, KY

Scoreboard:

In *Wishbringer*, I have everything except the glasses and the broomstick. I made it in the tower, but when I tried to go up the steps, I got trapped in "fuzziness."

Matt Smith
Spotsylvania, VA

Scoreboard:

There is a useful object in the Crevice of Nickelpedes in *The Magic of Zanth*, but it is hidden. You must examine things to find it. When you open the bottle, make sure you're in the cabin. When you come to the lake, keep your friends' safety in mind.

Lawrence Littlejohn
Gaffney, SC

Scoreboard:

To get through all the levels in *Dragon Slayer* with only three men is very frustrating due to the way the game save feature works. One way around this is to duplicate the original disk using *Spit-N-Image* by Computize.

Mark the copied disk 'A' and put the original away. Play the game on Disk A. After Level 1 is completed, press S as indicated in the instructions. Turn off the computer and copy Disk A using *Spit-N-Image* and label the second copy 'B'. When you want to resume playing, reinsert Disk A and you will then be on Level 2. After your men get killed, turn off the computer and copy Disk B onto Disk A. When you play again, you will start at the beginning of Level 2, whereas if you had not done all this copying, you would have started once again at the beginning of Level 1.

Edward Smith
New Castle, DE

Scoreboard:

Do not kill any car and you will receive 50,000 points after the pattern is completed in *Color Car Action*.

Louis-Serge Bouchard
Gatineau, Quebec

Scoreboard:

What do I have to do when I see the diamond appear in *Mr. Dig*? It happens often and I do not know what to do.

Also, where can I get the explanations for the game?

Gisele Duval
Sainte-Anne Des Plaines, Quebec

Scoreboard:

In *Strange Odyssey*, try pulling the rod, pushing it, then touching the plastic.

In *Trekboer*, the amulet is found on the ice planet. Remember not to enter the room where the plant is if you have pressed the button.

In *Shenanigans*, how do I get out of the town?

David Brown
New Waterford, Nova Scotia

Scoreboard:

In *Lansford Mansion*, to make the guard leave, type YELL FIRE. I have gotten up to the part where the piranhas are. I can't get the box out of the fish tank or pick up the piranha to feed to the dying man. Please help.

Ray Walsh
West Warwick, RI

Scoreboard:

In *Sir Randolf of the Moors*, how do you get out of the pit?

John Anderson
Baton Rouge, LA

To respond to other readers' inquiries and requests for assistance, reply to "Scoreboard Pointers," c/o THE RAINBOW, P.O. Box 385, Prospect, KY 40059. We will immediately forward your letter to the original respondent and, just as importantly, we'll share your reply with all "Scoreboard" readers in an upcoming issue.

For greater convenience, "Scoreboard Pointers" and requests for assistance may also be sent to us through the MAIL section of our Delphi CoCo SIG. From the CoCo SIG> prompt, pick MAIL, then type SEND and address to: EDITORS. Be sure to include your complete name and address.

Timing your investment decisions

Stock Analysis

By James E. Franz

The question investors most often ask is, "When is the right time to buy or sell a particular stock?" In times of market stability, efficient market timing techniques are often used to estimate when it's best to buy stocks (when they are at their lowest market value) and when to sell stocks (when at their peak value).

One market timing technique makes use of moving averages. In this technique, the average market value of a stock is computed over a time interval sufficiently long to minimize the effect of unusual fluctuations (weekly values are generally for a 30- or 39-week period). If the current market value of the stock is higher than its average value, this method signals for you to buy; conversely, values that are lower signal you to sell. Of course, prudent investors consider many additional factors before actually deciding whether to buy, sell or hold.

Investment Trends is written for a 64K ECB CoCo, single disk drive or cassette, and a DMP-100 printer. It will track general market indicators (e.g., Dow Jones Industrial Average, S&P 500 index, etc.), present investments and potential investments.

The program develops a 30-week moving average and computes the most recent six-week performance. It handles a maximum of 60 entities and has deletion, addition and correction capabilities for each entity. Also, there is a special correction feature for mutual funds.

The program asks you if the fund has a cash/capital gain distribution and then adjusts the NAV for the total distribution for all entries in the database. If a disk drive is plugged in, enter PCLEAR1 before loading the program or you will get an OM Error.

Input data can be obtained from the financial section of local newspapers. A fair amount of time is required initially to put historical data into the database. Once the database is established, however, less than 30 minutes a week is required for updating 60 entities.

Since retiring from Bell of Pennsylvania, Jim Franz has completed courses of study in electronics, microprocessor technology and fundamentals of investing. He enjoys electronics, the CoCo and his 12 grandchildren.

Table 1

Trend Analyses of Market Indicators and Present/Potential Investments

```
MARKET INDICATOR

S&P5ØØ INDEX
11/3Ø- 2Ø9.6 12/7- 2Ø9.6 12/14- 2Ø9.6 12/21- 2Ø9.6 12/28- 2Ø9.61 1/4- 21Ø.88 1/1
1- 2Ø5.96 1/18- 2Ø8.43 1/25- 2Ø6.43 2/1- 211.78 2/8- 214.56 2/15- 219.76 2/22- 2
24.62 3/1- 225 3/8- 225.57 3/15- 236.55 3/22- 233.34 3/29- 238.97 4/5- 228.69 4/
12- 235.97 4/19- 242.38 4/26- 242.29 5/3- 234.79 5/1Ø- 237.85 5/17- 232.76 5/24-
 241.35 5/31- 247.35 6/7- 245.67 6/14- 245.73 6/21- 247.58

6-WEEK TREND          5/17      5/24      5/31      6/7       6/14      6/21

3Ø-WEEK AVG         22Ø.42    221.48    222.74    223.94    225.14    226.41
DEV FROM AVG         12.34     19.87     24.61     21.73     2Ø.59     21.17
% DEVIATION           5.6Ø      8.97     11.Ø5      9.7Ø      9.14      9.35


PRESENT INVESTMENT

MUTUAL FUND
11/3Ø- 19.7 12/7- 19.7 12/14- 19.7 12/21- 19.7 12/28- 19.67 1/4- 19.81 1/11- 21.
29 1/18- 21.55 1/25- 21.33 2/1- 21.93 2/8- 22.28 2/15- 22.87 2/22- 23.41 3/1- 23
.47 3/8- 23.54 3/15- 24.75 3/22- 24.59 3/29- 25.Ø4 4/5- 23.94 4/12- 24.73 4/19-
25.43 4/26- 25.42 5/3- 25.6 5/1Ø- 25.98 5/17- 25.45 5/24- 26.4 5/31- 27.Ø7 6/7-
26.91 6/14- 26.93 6/21- 27.13

6-WEEK TREND          5/17      5/24      5/31      6/7       6/14      6/21

3Ø-WEEK AVG           22.31     22.54     22.78     23.Ø2     23.26     23.51
DEV FROM AVG           3.14      3.86      4.29      3.89      3.67      3.62
% DEVIATION           14.Ø6     17.15     18.82     16.89     15.76     15.39


POTENTIAL INVESTMENT

STOCK
11/3Ø- 42 12/7- 42 12/14- 42 12/21- 42 12/28- 42.125 1/4- 43.125 1/11- 43.25 1/1
8- 43.375 1/25- 42.375 2/1- 42.375 2/8- 43.125 2/15- 44.375 2/22- 44.25 3/1- 44.
5 3/8- 44.875 3/15- 47 3/22- 45.25 3/29- 45 4/5- 43.625 4/12- 44.125 4/19- 44.25
 4/26- 43.875 5/3- 41.125 5/1Ø- 41.375 5/17- 4Ø.75 5/24- 4Ø.5 5/31- 42.5 6/7- 41
 6/14- 43.25 6/21- 44.25

6-WEEK TREND          5/17      5/24      5/31      6/7       6/14      6/21

3Ø-WEEK AVG           43.Ø7     43.Ø2     43.Ø4     43.ØØ     43.Ø5     43.12
DEV FROM AVG          -2.32     -2.52     -Ø.54     -2.ØØ      Ø.2Ø      1.13
% DEVIATION           -5.39     -5.86     -1.25     -4.66      Ø.47      2.62
```

The output report provides the actual 30-week values and the most recent six-week comparisons. By examining the trends, you can see whether this market timing technique is signaling to buy, sell or hold and whether the trend is favorable or unfavorable. In addition, you can compare percentage deviation to general market deviations to see how well your investment is doing in comparison to the market.

To see how the program works, load and run INVTREND. Use the sample data in Table 1 for your input data. The program will create a data file (TRNDDATA/DAT for disk, TRNDDATA for tape).

If you input data from the table, your report will show only the most recent week in the six-week trend. This system has to be online for six weeks to develop trends in the database.

(Questions or comments about this program may be directed to the author at 136 Country Lane, Pittsburgh, PA 15229. Please include an SASE when writing for a reply.) □

70	113	605	119
170	64	677	247
310	119	830	183
371	15	1100	54
522	118	END	5

The listing: INVTREND

```
1 CLS:PRINT@138,"INVTREND":PRINT
@138+3Ø,"BY JIM FRANZ":FORX=1TO2
ØØØ:NEXT
2 CLS:PRINT@96,"THIS PROGRAM PRO
VIDES ONLY ONE  OF MANY AIDS THA
T INVESTORS     SHOULD USE FOR T
IMING INVESTMENTDECISIONS. THE A
UTHOR IS NOT RE-SPONSIBLE FOR AN
Y DECISIONS MADETHROUGH USE OF T
HIS TIMING      METHOD OR USE OF
 THIS PROGRAM;";
3 PRINT"  FURTHER, THE AUTHOR IS
 NOT RE-  SPONSIBLE FOR ANY ERRO
NEOUS CAL-CULATIONS IN THE PROGR
AM ITSELF."
4 FORX=1TO15ØØØ:NEXT
5 CLEAR15ØØ
1Ø DIMA(6Ø,3Ø),AV(6Ø,6),PC(6Ø,6)
,DF(6Ø,6),T(6Ø)
15 DIMA$(6Ø),D$(3Ø)
16 CLS:PRINT"PROGRAM DESCRIPTION
"
17 PRINT"THIS PROGRAM COMPUTES A
VERAGE   VALUES FOR A 3Ø WEEK PE
RIOD."
18 PRINT"IT ALSO COMPUTES % CURR
ENT VALUEOF AVG VAL ";
19 PRINT"AND SHOWS 6 WEEK     TR
ENDS.":PRINT"IT CAN TRACK 6Ø ENT
ITIES.":FORK=1TO9ØØØ:NEXTK
```


WIN THE LOTTO

WITH YOUR HOME COMPUTER!

Use your home computer and Soft-Byte's amazing new **"Lotto Program"** to get more winning tickets.

In just seconds this software analyzes past winners and produces a powerful probability study on easy-to-read charts. With a single press of a key, you'll see trends, patterns, odds/evens, sum totals, number frequencies, and much more. It also includes automatic number wheeling, instant updating, and a built-in tutorial.

Ask your software dealer.

APPLE, IBM, and Commodore.....$24.95
Atari, Radio Shack.....$21.95
MacIntosh (requires M/S basic).....$29.95
Back-up Copies.....$3.00

Add $2.00 shipping and handling. Credit card orders approved by phone and shipped same day.

Make checks payable to **SOFT-BYTE** and mail to:

P.O. Box 556 Forest Park
Dayton, Ohio 45405

Soft-Byte **513-278-1110**

VISA MasterCard

THE SOFTWARE HOUSE

CELEBRATING OUR 4TH YEAR WITH RAINBOW!

DS/DD DISKS $45/100 10/$4.95

FLIPPY DISKS 10/$7.95
FACTORY PUNCHED-USE BOTH SIDES. $75/100
CERTIFIED ERROR FREE. W/SLEEVES, LABELS, W.P.

3 1/2"DISKS DS/DD 10/$14.95

PRINTER RIBBONS

EPSON MX/RX/FX 70/80	$5.00 EA.	6/$28.00
GEMINI 10/10X/SG	$2.00 EA.	12/$22.00
COLORS R-BR-BL-GR-PUR	$3.00 EA.	5/$12.00
R.S. DMP 130 BLACK	$6.95 EA.	
COLORS RED-BLUE-GRN	$7.95 EA.	

OTHER RIBBONS IN STOCK-CALL OR WRITE FOR QUOTE

ALL ITEMS 100% GUARANTEED. OFFER ENDS IN 30 DAYS

Add $2.50 S/H in U.S.A. - Canada Add $3.50 + $1.00/LB
Michigan Residents Add 4% Sales Tax
Send Check/Money Order Payable to:

THE SOFTWARE HOUSE
9020 Hemingway, Redford, MI 48239
(313) 937-1313

VISA MasterCard

Send Card Number & Exp. Date Min. Charge Order $20.00

```
2Ø CLS:PRINT"INVESTMENT TREND AN
ALYSIS"
3Ø PRINT" DO YOU WANT TO:"
31 PRINT"  (1)SET UP A NEW FILE"
32 PRINT"  (2)ADD INV/IND"
33 PRINT"  (3)DELETE INV/IND"
34 PRINT"  (4)CORRECT PAST DATA"
35 PRINT"  (5)UPDATE DATA"
36 PRINT"  (6)GET A PRINTOUT"
37 PRINT"  (7)QUIT"
38 INPUTC
39 IFP=1THENGOTO45
4Ø IFC>1ANDC<7THENGOSUB91Ø:P=1
45 Y=I
5Ø ON C GOTO7Ø,8Ø,2ØØ,3ØØ,43Ø,59
Ø,6Ø
6Ø END
7Ø I=Ø
8Ø I=I+1
9Ø CLS:INPUT"NAME OF INDICATOR/I
NVESTMENT";A$(I)
1ØØ PRINT"IS THIS A:"
1Ø1 PRINT"  (1)MARKET INDICATOR"
1Ø2 PRINT"  (2)PRESENT INVESTMEN
T"
1Ø3 PRINT"  (3)POTENTIAL INVESTM
ENT"
1Ø4 INPUTT(I)
11Ø AV=Ø
12Ø FOR J=1TO3Ø
125 IFC=5ORC=4THEN145
127 IFC=2THENPRINT"VALUE WEEK EN
DING "D$(J):INPUTA(I,J):GOTO145
13Ø INPUT"DATE(WEEK ENDING-MM/DD
)";D$(J)
14Ø INPUT"VALUE";A(I,J)
145 AV=AV+A(I,J)
15Ø NEXTJ
16Ø AV(I,1)=AV/3Ø:DF(I,1)=A(I,1)
-AV(I,1):PC(I,1)=DF(I,1)/AV(I,1)
*1ØØ
165 IFC=4ORC=5THENRETURN
17Ø CLS:INPUT"TYPE'N'FOR NEXT IN
VESTMENT/     INDICATOR OR 'D'FO
R DONE";B$
175 Y=I
18Ø IFB$="N"THENGOTO8Ø
185 INPUT"DO YOU WANT TO SAVE TH
IS DATA   NOW(Y/N)";R$
186 IFR$="Y"THENGOSUB75Ø
19Ø GOTO2Ø
2ØØ INPUT"TYPE NAME YOU WANT TO
DROP-IF   DONE TYPE 'D'";N$
21Ø IFN$="D"THENPRINT"DO YOU WAN
T TO SAVE THIS DATA NOW(Y/N)":IN
PUTR$
211 IFN$="D"ANDR$="Y"THENGOSUB75
Ø:GOTO2Ø
212 IFN$="D"THEN2Ø
22Ø K=Ø
23Ø FORI=1TOY
26Ø IFN$=A$(I)THENK=1
265 IFK=ØTHEN29Ø
27Ø IFK=1THENT(I)=T(I+1):FORJ=1T
O3Ø:A(I,J)=A(I+1,J):NEXTJ
28Ø IFK=1THENA$(I)=A$(I+1):FORJ=
1TO6:AV(I,J)=AV(I+1,J):DF(I,J)=D
F(I+1,J):PC(I,J)=PC(I+1,J):NEXTJ
284 CLS:PRINT"PLEASE WAIT"
29Ø NEXTI
291 IFK=ØTHEN PRINTN$"IS NOT IN
FILE"
292 IF K=Ø GOTO2ØØ
293 Y=Y-1:PRINTN$" HAS BEEN DELE
TED":GOTO2ØØ
3ØØ K=Ø:D1=Ø:D=Ø
31Ø CLS:INPUT"NAME TO CORRECT (I
F DONE TYPE   'D')";N$
32Ø IFN$="D"THENPRINT"DO YOU WAN
T TO SAVE THIS DATA   NOW(Y/N)?"
:INPUTR$
321 IFN$="D"ANDR$="Y"THENGOSUB75
Ø
322 IFN$="D"THEN2Ø
323 PRINT:PRINT:INPUT"IS THIS AN
 NAV ADJUSTMENT CAUSEDBY MUTUAL
FUND DISTRIBUTION(Y/N)";R$
324 IFR$="Y"THEND1=1:PRINT
325 IFD1=1THEN INPUT"AMT OF DIST
RIBUTION/SHARE";D
326 PRINT:PRINT"PLEASE WAIT"
327 FORI=1TOY
33Ø IFK=1THEND1=Ø
331 K=Ø
34Ø IFN$=A$(I)THENK=1:M=1:CLS:PR
INTA$(I)
341 IF D1=1 AND K=1 THEN38Ø
345 IFK=ØTHEN42Ø
35Ø INPUT"CHANGE NAME Y/N";R$
36Ø IFR$="Y"THEN PRINT"ENTER COR
RECT NAME":INPUTA$(I)
37Ø PRINT"IS"T(I)"THE CORRECT TY
PE INV/IND  (Y/N)?":INPUTR$
371 IFR$="N"THENINPUT"TYPE CORRE
CTION";T(I)
38Ø FOR J=1TO3Ø
381 IFD1=1THENA(I,J)=A(I,J)-D
382 IFD1=1THEN CLS:PRINT"NOW COR
RECTING THE DATA":GOTO41Ø
39Ø PRINT"WANT TO CHANGE THIS VA
LUE?"
391 PRINTD$(J)"-"A(I,J)
392 INPUTR$
4ØØ IFR$="Y"THENINPUT"TYPE NEW V
ALUE";A(I,J)
41Ø NEXTJ
415 GOSUB11Ø
42Ø NEXTI
421 IFM=ØTHENPRINT"INV/IND NOT I
N FILE"ELSEPRINT"CORRECTION COMP
LETED"
422 FORK=1TO5ØØØ:NEXT:GOTO3ØØ
```

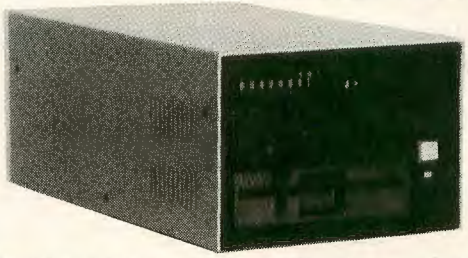
```
43Ø FORJ=3ØTO2STEP-1:D$(J)=D$(J-
1):NEXTJ
44Ø FORI=1TOY
45Ø CLS:PRINT"PLEASE WAIT"
46Ø A(I,3Ø)=Ø:AV(I,6)=Ø:DF(I,6)=
Ø:PC(I,6)=Ø
47Ø FORJ=3ØTO2STEP-1
48Ø A(I,J)=A(I,J-1)
49Ø NEXTJ
5ØØ FORJ=6TO2STEP-1:AV(I,J)=AV(I
,J-1):DF(I,J)=DF(I,J-1):PC(I,J)=
PC(I,J-1)
51Ø NEXTJ
52Ø NEXTI
522 INPUT"CURRENT DATE(WEEK ENDI
NG MM/DD)";D$(1)
523 FORI=1TOY
54Ø PRINTA$(I)
541 IFA$(I)=""THEN57Ø
56Ø INPUT"PRES VALUE";A(I,1):GOS
UB11Ø
57Ø NEXTI
575 GOSUB75Ø:GOTO3Ø
59Ø CLS:INPUT"WHEN PRINTER IS TU
RNED ON AND   PAPER IS SET, PRES
S <ENTER>";R$
591 PRINT#-2,"":PRINT#-2,"":PRIN
T#-2,"TREND ANALYSIS OF MARKET I
NDICATORS AND PRESENT/POTENTIAL
INVESTMENTS"
592 INPUT"DO YOU WANT TO INCLUDE
 DETAILED 3Ø WEEK DATA(Y/N)";F$
6ØØ G=Ø:PRINT"DO YOU WANT A PRIN
TOUT OF:"
6Ø1 PRINT"   (1)MARKET INDICATORS
 ONLY"
6Ø2 PRINT"   (2)PRESENT INVESTMEN
TS ONLY"
6Ø3 PRINT"   (3)POTENTIAL INVESTM
ENTS ONLY"
6Ø4 PRINT"   (4)ALL OF THE ABOVE"
6Ø5 PRINT"   (5)RETURN TO MAIN ME
NU":INPUTC1
6Ø6 FORK=1TO4:PRINT#-2,"":NEXTK:
IFC1=1THENPRINT#-2,"MARKET INDIC
ATOR"
6Ø7 IFC1=2THENPRINT#-2,"PRESENT
INVESTMENT"
6Ø8 IFC1=3THENPRINT#-2,"POTENTIA
L INVESTMENT"
6Ø9 IFC1=4THENC1=1:G=1:GOSUB6Ø6:
C1=2:GOSUB6Ø6:C1=3:GOSUB6Ø6:GOTO
2Ø
61Ø IFC1=5THEN2Ø
611 FORI=1TOY
62Ø IFC1=1ANDT(I)=1THENGOSUB67Ø
63Ø IFC1=2ANDT(I)=2THENGOSUB67Ø
64Ø IFC1=3ANDT(I)=3THENGOSUB67Ø
```


ARE YOU TIRED OF BEING TOLD
THAT YOU NEED OS-9 TO RUN A

HARD DISK

ON YOUR COLOR COMPUTER?

WELL, THE SEARCH IS OVER!
ANNOUNCING THE BEST HARD DISK
SYSTEM FOR THE COCO 1, 2 AND 3
THAT FULLY SUPPORTS DISK BASIC



TOP QUALITY COMPONENTS, ALL GOLD
CONTACTS, PROFESSIONAL SOFTWARE

STEP UP TO A LIGHTENING FAST
HARD DISK - CALL NOW!

RGB COMPUTER SYSTEMS

294 STILLWELL AVE
KENMORE, N Y 14217

(716) 876-7538

MLBASIC 2.0 - BASIC Compiler

The wait is over. WASATCHWARE announces the latest version of MLBASIC designed to allow more compatibility with existing BASIC programs than ever available before for the Color Computer. This version also allows full use of the capabilities and memory of the CoCo 3. Written in machine language, MLBASIC can compile programs as large as 64K bytes. Standard floating point (9 digit precision), INTEGER, and String type variables and arrays supported.

COMMANDS SUPPORTED:

1. I/O commands
   CLOSE CLOADM CSAVEM DIR DRIVE DSKI$ DSKO$ FIELD
   FILES GET INPUT KILL LSET OPEN PRINT PUT
   RSET USING LINEINPUT
2. Program control commands
   CALL DEFUSR END EXEC FOR NEXT GOSUB GOTO
   IF THEN ELSE ERROR ON RETURN STOP USR
3. Functions
   ABS ASC ATN COS CVN EOF EXP FIX
   HPOINT INSTR INT LEN LOG LPEEK LOC LOF
   PEEK POINT PPOINT RND SGN SIN SQR TAN
   TIMER VAL VARPTR
4. String functions
   CHR$ INKEY$ LEFT$ MID$ MKN$ RIGHT$ STR$ STRING$
5. Graphic/Screen commands
   ATTR COLOR CLS CIRCLE DRAW HCOLOR HSCREEN HDRAW
   HLINE HPAINT HPRINT HRESET HCIRCLE HCLS HSET JOYSTK
   LINE LOCATE PALETTE PAINT PCLEAR PCLS PLAY PMODE
   PRESET PSET RESET SCREEN SET SOUND WIDTH
6. Other commands
   DATA DIM MOTOR POKE LPOKE RESTORE READ REM
   TRON TROFF TAB VERIFY

Plus many more commands not available with regular BASIC which allow interfacing with hardware registers and machine language programs.

<<<<< **ONLY $59.95** >>>>>

COCO 3 WITH DISK REQUIRED -Add $4.00 Postage.
CHECK or MONEY ORDERS only. No C.O.D. or Bank cards.
Foreign orders use U.S. MONEY ORDERS only.

WASATCHWARE
7350 Nutree Drive
Salt Lake City, Utah 84121
Phone (801) 943-1546

```
66Ø NEXTI
661 IFG=1THENRETURNELSEGOTO6ØØ
67Ø PRINT#-2,"":PRINT#-2,"":PRIN
T#-2,"":PRINT#-2,A$(I)
671 IFF$<>"Y"THEN673
672 FORJ=3ØTO1STEP-1:PRINT#-2,D$
(J)"-"A(I,J);:PRINT#-2,"";:NEXTJ
673 PRINT#-2,"":PRINT#-2,"":PRIN
T#-2,"6-WEEK TREND          ";D$(6
);"        "D$(5);"         ";D$(4)
;"        ";D$(3);"          ";D$(2
);"        "D$(1)
675 PRINT#-2,"":PRINT#-2,"3Ø-WEE
K AVG  ";:GOSUB7ØØ
676 PRINT#-2,"":PRINT#-2,"DEV FR
OM AVG ";:GOSUB71Ø
677 PRINT#-2,"":PRINT#-2,"% DEVI
ATION  ";:GOSUB72Ø:PRINT#-2,"":R
ETURN
7ØØ FORJ=6TO1STEP-1:PRINT#-2,USI
NG"    ####.##";AV(I,J);:NEXTJ:R
ETURN
71Ø FORJ=6TO1STEP-1:PRINT#-2,USI
NG"    ####.##";DF(I,J);:NEXTJ:R
ETURN
72Ø FORJ=6TO1STEP-1:PRINT#-2,USI
NG"    ####.##";PC(I,J);:NEXTJ:R
ETURN
75Ø PRINT"NOW WE'LL SAVE THIS DA
TA."
751 INPUT"DATAFILE:(D)DISK OR (T
)TAPE";S$
752 IF S$="T"THEN11ØØ
753 IFS$<>"T" AND S$<>"D"THEN75Ø
755 CLS:PRINT"NOW WE'LL SAVE THI
S DATA ON DISK.WHEN READY PRESS
<ENTER>":INPUTR$
782 OPEN"O",#2,"TRNDDATA/NEW"
79Ø FORI=1TOY
8ØØ WRITE#2,A$(I)
8Ø5 WRITE#2,T(I)
81Ø FOR J=1TO3Ø
82Ø WRITE#2,A(I,J)
825 IFI=1THENWRITE#2,D$(J)
83Ø NEXTJ
84Ø FORJ=1TO6
85Ø WRITE#2,AV(I,J),DF(I,J),PC(I
,J)
86Ø NEXTJ
88Ø NEXTI
889 CLOSE#2
89Ø IFC=1THEN892
891 KILL"TRNDDATA/DAT"
892 RENAME"TRNDDATA/NEW"TO"TRNDD
ATA/DAT"
9ØØ RETURN
91Ø INPUT"IS YOUR DATAFILE (D)DI
SK OR     (T)TAPE";S$
911 IFS$="T"THEN12ØØ
912 IFS$<>"T" AND S$<>"D" THEN91
Ø
915 CLS:PRINT"NOW WE'LL LOAD PAS
T DATA. WHEN  THE DISK IS READY
PRESS <ENTER>":INPUTR$
92Ø I=Ø
93Ø OPEN"I",#1,"TRNDDATA/DAT"
94Ø IFEOF(1)=-1THEN1Ø4Ø
95Ø I=I+1
96Ø INPUT#1,A$(I),T(I)
97Ø FORJ=1TO3Ø
98Ø INPUT#1,A(I,J)
985 IFI=1THENINPUT#1,D$(J)
99Ø NEXTJ
1ØØØ FORJ=1TO6
1Ø1Ø INPUT#1,AV(I,J),DF(I,J),PC(
I,J)
1Ø2Ø NEXTJ
1Ø3Ø GOTO94Ø
1Ø4Ø CLOSE#1
1Ø5Ø RETURN
11ØØ CLS:PRINT:PRINT:PRINT:PRINT
:PRINT"TO SAVE THIS DATA":PRINT"
PLACE A CLEAN TAPE IN THE":PRINT
"CASSETTE AND PRESS PLAY":PRINT"
AND RECORD"
111Ø INPUT"WHEN READY PRESS <ENT
ER>";R$
112Ø OPEN"O",#-1,"TRNDDATA"
113Ø FORI=1TOY
114Ø PRINT#-1,A$(I),T(I)
115Ø FORJ=1TO3Ø
116Ø PRINT#-1,A(I,J)
1165 IFI=1THENPRINT#-1,D$(J)
117Ø NEXTJ
1175 FORJ=1TO6
118Ø PRINT#-1,AV(I,J),DF(I,J),PC
(I,J)
1185 NEXTJ
119Ø NEXTI
1191 CLOSE#-1
1192 RETURN
12ØØ CLS:PRINT"INSERT <TRNDDATA>
 TAPE IN":PRINT"THE CASSETTE AND
 PRESS PLAY"
12Ø1 INPUT"WHEN READY PRESS <ENT
ER>";R$
12Ø5 I=Ø
121Ø OPEN"I",#-1,"TRNDDATA"
1215 IFEOF(-1)=-1THEN1297
122Ø I=I+1
123Ø INPUT#-1,A$(I),T(I)
124Ø FORJ=1TO3Ø
125Ø INPUT#-1,A(I,J)
126Ø IFI=1THENINPUT#-1,D$(J)
127Ø NEXTJ
128Ø FORJ=1TO6
1285 INPUT#-1,AV(I,J),DF(I,J),PC
(I,J)
129Ø NEXTJ
1295 GOTO1215
1297 CLOSE#-1
1299 RETURN
```

Still pounding away at that keyboard?

Save Time and Money with a Combination Subscription!

SAVE up to 19%

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

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

RAINBOW ON TAPE For No-Fuss Fun

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

RAINBOW ON DISK Offers OS-9 Programs

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

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

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

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

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

Name _____

Address _____

City _____ **State** _____ **ZIP** _____

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

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

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

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

Determine whether you save or lose by paying off a loan early

Rule of 78's

By Jack W. Eizenga

Every month, as you mail the checks to pay off your loans, it may cross your mind that you could save money by paying off the loans ahead of time. Don't go digging into your savings account right away, however — sometimes you are penalized by early payoffs.

Check your loan documents carefully. If you find that a payoff is subject to the Rule of 78's, you could pay more than the balance due if you pay it off early.

The program, *Rule of 78's*, compares simple interest against the loan repayment Rule of 78's and shows the penalty for paying off a loan early. Bankers and finance companies aren't out to do you any favors, and the IRS will not allow the excess interest. This program compares those costs month-for-month prior to the end of the loan term.

Interest and the Rule of 78's

Bankers and finance companies don't want to recalculate loans that are paid off early. In fact, they will do as little calculating as absolutely necessary. They would rather use charts prepared at the main office by one of the newer (read "low paid") employees. When a loan is paid off early, they have to recalculate the entire loan using the shorter period — and this doesn't work too well because the tables are usually set up for six-month to one-year periods.

Some genius found that simple interest could be approximated by applying interest equally to each month of the loan term. As you pay interest for 12 months in a year, you add the months together, i.e., 12+11+10+. . .2+1=78. Each payment due is a numerator of that fraction in a decreasing sequence.

The first month you pay $^{12}/_{78}$ of the interest, the next month $^{11}/_{78}$, and so forth. If the loan is paid off two months early, the rebate of interest is 1+2=3/78ths of the total finance charge for the year. Thus, the rule of 78's. Expressed as a mathematical equation, it would look like this:

$$I=(m)(m+1)/2$$

Because one of the terms (m) or (m+1) is always an even number, this can be done mentally. For a 12-month loan, (m) is 12 and (m+1) is 13; dividing 12 by 2 equals 6, and 6 times 13 equals 78 (78=12*13/2). Suppose you pay off a loan in six months; the result is 21:

$$6*7/2 = 3*7 = 21$$

Therefore, your rebate is 21/78 of the total for the year.

Now, take your four-year car loan: The dealer writes x dollars finance charge on the loan application and tells you that you hit the lottery and will be able to pay it off in 15 months. Here's the calculation: 48*49/2=24*49=2,352 parts of our Rule of 78's. Your rebate would be 5.1 percent (15*16/2=15*8=120/2,352=5.1%) of the total interest. That's not nice, you say. You're right, it's not. CoCo to the rescue.

The Program

Rule of 78's can be used on any CoCo. For use on CoCos 1 and 2, delete Line 100. However, for full effect, an 80-column display is best. I kept the CoCo 3 commands limited to a single line (Line 100) for this versatility. If you are limited to a 32-column screen, you will especially want a hard copy printout. A printer is not required, but it is highly recommended.

The real comparison necessary is the difference between the simple interest per month and the Rule of 78's per month. The printouts do that for you. When you run *Rule of 78's* you are given the choice of printer, screen, or both. Then you are asked the amount of the loan, the term of the loan in months and the interest rate entered as a percentage (8.9% = 8.9). *Rule* calculates the monthly interest, principal and balance by both simple interest and the Rule of 78's.

The sample printout shows the actual output for an automobile loan of $7,231.30 for 48 months at an annual percentage rate of 10.3 percent. You are able to readily observe the differences in the payoff calculations. As you approach the end of the term, the interest calculations tend to equalize. However,

Jack Eizenga holds a degree in accounting and is a retired IRS agent. In addition to being an enrolled agent and tax consultant, he also is currently disk librarian and treasurer of the Color America Users Group in California.

the finance company is always ahead for the first year and a half. That's why the Rule of 78's is used. Experience has shown that the first year is when most defaults and/or payoffs occur.

The totals at the bottom of the page show that the total interest and principal are the same under either method if you pay according to the contract. The balance remaining is due to rounding errors and can and will be ignored.

Monthly payments are calculated in Line 240. The sum of principal and interest is equal to the monthly payment under either method. The loop in lines 300 through 410 calculates the principal and interest for each month. The formula in Line 120 rounds all payments to the nearest cent.

The interest according to the simple interest formula (I) is the principal balance remaining (B) times the monthly interest rate (R). According to the Rule of 78's, the interest (I7) is the finance charge (F) times the units assigned to the month in question (T-N+1) divided by the total number of units for the loan (U=T*(T+1)/2). The finance charge is the total of payments minus the loan amount (F=M*T-B) in Line 250.

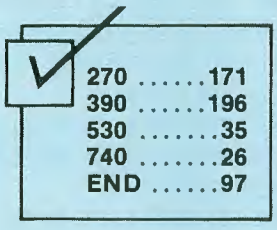
Comparison of Simple Interest and Rule of 78's

```
LOAN = 7231.3
TERM = 48 MONTHS
INTEREST = 1Ø.3 PERCENT PER YEAR
MONTHLY PAYMENT = $ 184.45
```

	SIMPLE INTEREST			RULE OF 78'S			78'S EXCESS
	MONTHS INTEREST	MONTHS PRINCIPAL	BALANCE REMAINING	MONTHS INTEREST	MONTHS PRINCIPAL	BALANCE REMAINING	INTEREST TO-DATE
1	62.Ø7	122.38	71Ø8.92	66.21	118.24	7113.Ø6	4.14
2	61.Ø2	123.43	6985.49	64.83	119.62	6993.44	7.95
3	59.96	124.49	6861.ØØ	63.45	121.ØØ	6872.44	11.44
4	58.89	125.56	6735.44	62.Ø7	122.38	675Ø.Ø6	14.62
5	57.81	126.64	66Ø8.8Ø	6Ø.69	123.76	6626.3Ø	17.5Ø
6	56.73	127.72	6481.Ø8	59.32	125.13	65Ø1.17	2Ø.Ø9
7	55.63	128.82	6352.26	57.94	126.51	6374.66	22.4Ø
8	54.52	129.93	6222.33	56.56	127.89	6246.77	24.44
9	53.41	131.Ø4	6Ø91.29	55.18	129.27	6117.5Ø	26.21
1Ø	52.28	132.17	5959.12	53.8Ø	13Ø.65	5986.85	27.73
11	51.15	133.3Ø	5825.82	52.42	132.Ø3	5854.82	29.ØØ
12	5Ø.ØØ	134.45	5691.37	51.Ø4	133.41	5721.41	3Ø.Ø4
13	48.85	135.6Ø	5555.77	49.66	134.79	5586.62	3Ø.85
14	47.69	136.76	5419.Ø1	48.28	136.17	545Ø.45	31.44
15	46.51	137.94	5281.Ø7	46.9Ø	137.55	5312.9Ø	31.83
16	45.33	139.12	5141.95	45.52	138.93	5173.97	32.Ø2
17	44.14	14Ø.31	5ØØ1.64	44.14	14Ø.31	5Ø33.66	32.Ø2
18	42.93	141.52	486Ø.12	42.76	141.69	4891.97	31.85
19	41.72	142.73	4717.39	41.38	143.Ø7	4748.9Ø	31.51

Calculating the Rule of 78's won't keep you from having the penalty assessed, but it can help you avoid the crushing feeling that comes when you pay off a loan and find you owe more money than you thought you did.

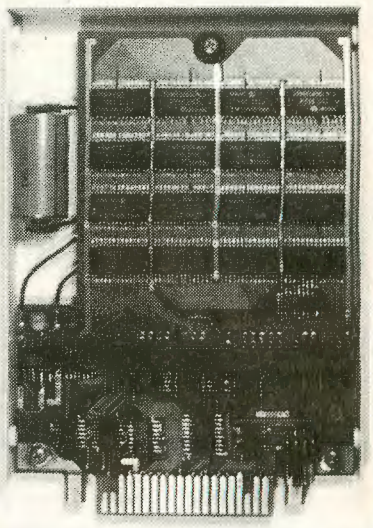
(Questions or comments may be directed to the author at 3811 N. Foster Ave., Baldwin Park, CA 91706. Please enclose an SASE when writing for a response.) □



The listing: RULEOF78

```
1ØØ PALETTEØ,Ø:WIDTH8Ø:CLS1:ATTR
3,Ø:POKE15Ø,1
1Ø5 CLEAR3ØØØ
11Ø 'SIMPLE INTEREST VS RULE OF
78'S
12Ø DEF FNR(X)=INT(1ØØ*X+.5)/1ØØ
:'ROUND TO NEAREST WHOLE CENT
13Ø F$="#######.##":I$="###":I1=
Ø:IØ=Ø
14Ø PRINT TAB(6):INPUT"OUTPUT TO
 SCREEN <1>, PRINTER <2> OR BOTH
 <3>";Z
15Ø PRINT TAB(6);"PRESS THE SPAC
EBAR TO HOLD SCREEN PRINTING"
16Ø PRINT TAB(6);"AND PRESS <ENT
ER> TØ CONTINUE"
2ØØ PRINT TAB(6):INPUT"ENTER THE
 LOAN AMOUNT";B:B7=B
21Ø PRINT TAB(6):INPUT"ENTER THE
 TERM OF THE LOAN IN MONTHS";T
```


SolidDrive™ by Vidicom Corp



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

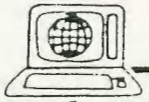
SolidDrive™ by Vidicom Corp
512K (524,288 bytes) $395.00
1 Meg (1,048,576 bytes) $695.00
Please add $4.00 shipping
Arizona Residents add 5.5% Sales tax
Visa MasterCard orders welcome

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

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

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

```
22Ø PRINT TAB(6):INPUT"ENTER THE
 ANNUAL INTEREST RATE AS A PERCE
NT";R
23Ø R=R/12ØØ:'MONTHLY INTEREST A
S A DECIMAL
24Ø M=B*R/(1-(1+R)^(-T)):'MONTHL
Y PAYMENT
25Ø F=M*T-B:'FINANCE CHARGE
26Ø M=FNR(M):'WHOLE CENT PAYMENT
27Ø U=T*(T+1)/2:'UNITS FOR THIS
TERM
275 IF Z=2THEN 29Ø
28Ø GOSUB5ØØ:'PRINT HEADER ON SC
REEN
285 IFZ=1THEN3ØØ
29Ø GOSUB7ØØ:'PRINT HEADER ON PR
INTER
3ØØ FORN=1TOT:'<<<<LOOP<<<<<<<<<
<<<<<<<<<<<<
31Ø I=FNR(B*R):'MONTH'S INTEREST
 PAYMENT
32Ø P=M-I:'MONTH'S PRINCIPAL PAY
MENT
33Ø B=B-P:'BALANCE REMAINING AFT
ER PAYMENT
34Ø I7=FNR(F*(T-N+1)/U):'78'S MO
NTHLY INTEREST
35Ø P7=M-I7:'78'S MONTHLY PRINCI
PAL
36Ø B7=B7-P7:'78'S BALANCE REMAI
NING
37Ø I1=I1+I:I8=I8+I7:'RUNNING TO
TALS OF INT. PMNTS.
38Ø P1=P1+P:P8=P8+P7:'RUNNING TO
TALS OF PRINC. PMNTS.
385 IFZ=2THEN4ØØ:'
386 Z$=INKEY$:IFZ$<>CHR$(32)THEN
39ØELSE387
387 Z$=INKEY$:IFZ$=CHR$(13)THEN
39ØELSE387
39Ø PRINT TAB(6):PRINTUSINGI$;N;
:PRINTUSINGF$;I;P;B;I7;P7;B7;I8-
I1:'
395 IFZ=1THEN41Ø
4ØØ PRINT#-2,USING I$;N;:PRINT#-
2,USING F$;I;P;B;I7;P7;B7;I8-I1:
'
41Ø NEXTN:'>>>>>>>>>>>>>>>>>>>>>
>>>>>>>>>>>
415 IFZ=2 THEN 45Ø
42Ø GOSUB6ØØ:'PRINT UNDERLINES O
N SCREEN
43Ø PRINT TAB(6);"SUM";:PRINT US
ING F$;I1;P1;B;I8;P8;B7;I8-I1
435 IF Z=1 THEN 46Ø
44Ø GOSUB 8ØØ:'PRINT UNDERLINE O
N PRINTER
45Ø PRINT#-2,"SUM";:PRINT#-2,USI
NG F$;I1;P1;B;I8;P8;B7;I8-I1
455 IF Z=2 THEN 82Ø
46Ø END
5ØØ CLS: PRINT TAB(25);"COMPARIS
ON OF SIMPLE INTEREST"
51Ø PRINT TAB(3Ø);"AND RULE OF 7
8'S":PRINT
52Ø PRINT TAB(3Ø);"LOAN =";B
53Ø PRINT TAB(3Ø);"TERM =";T;"MO
NTHS"
54Ø PRINT TAB(3Ø);"INTEREST =";1
2ØØ*R;"PERCENT PER YEAR"
55Ø PRINT TAB(3Ø);"MONTHLY PAYME
NT = $";M: PRINT:PRINT
56Ø PRINT TAB(19);"SIMPLE INTERE
ST";TAB(15);"RULE OF 78'S";TAB(1
2);"78'S"
57Ø L$=STRING$(28,"-"):PRINT TAB
(6);"     ";L$;"  ";L$"   EXCESS
"
58Ø PRINT TAB(6);"      MONTHS
  MONTHS     BALANCE   MONTHS
MONTHS     BALANCE  INTEREST"
59Ø PRINT TAB(6);"     INTEREST
 PRINCIPAL REMAINING INTEREST  P
RINCIPAL REMAINING  TO-DATE"
6ØØ PRINT TAB(6);"   ";:FORI=1TO
7:PRINT"  --------";:NEXT I:PRIN
T
61Ø RETURN
7ØØ PRINT#-2:PRINT#-2:PRINT#-2,T
AB(2Ø);"COMPARISON OF SIMPLE INT
EREST AND RULE OF 78'S"
71Ø PRINT#-2
72Ø PRINT#-2,TAB(3Ø);"LOAN =";B
73Ø PRINT#-2,TAB(3Ø);"TERM =";T;
"MONTHS"
74Ø PRINT#-2,TAB(3Ø);"INTEREST =
";12ØØ*R;"PERCENT PER YEAR"
75Ø PRINT#-2,TAB(3Ø);"MONTHLY PA
YMENT = $";M:PRINT#-2:PRINT#-2
76Ø PRINT#-2, TAB(13);"SIMPLE IN
TEREST";TAB(44);"RULE OF 78'S";T
AB(68);"78'S"
77Ø L$=STRING$(28,"-"):PRINT#-2,
 "     ";L$;"  ";L$;"   EXCESS"
78Ø PRINT#-2,"      MONTHS    MO
NTHS     BALANCE   MONTHS    MONT
HS     BALANCE  INTEREST"
79Ø PRINT#-2,"     INTEREST  PRI
NCIPAL REMAINING INTEREST  PRINC
IPAL REMAINING  TO-DATE"
8ØØ PRINT#-2,"   ";:FOR I=1 TO 7
:PRINT#-2,"  --------";:NEXT I:P
RINT#-2
81Ø RETURN
82Ø END
```



Making the MicroWorld of

CoCo's AFFORDABLE. . . .

CoCo II	$ 87
CoCo III	$145
Drive 0	$175
Drive 0 (NEW)	$199
CM-8 Monitor	$248
Deluxe Joystick	$ 24
Joysticks (pair)	$ 13
Mouse	$40
MultiPak	$75
Disk storage box (50)	$12.50
CCR-81 Cass. Rec.	$42

Disks (SS)	$7.50/box
Disks (DS)	$8.00/box
*Includes free library case	
DMP-106	$159
DMP-130A (120 CPS)	$265
DMP-440	$545
Tandy 1000 SX	$625
Tandy 1000 HX	$555
Tandy 1000 TX	$899
VM-4 Monitor	$ 99
CM-5 Monitor	$240
CM-11 Monitor	$325

CoCo 3 512K Upgrade	$130
MultiPak Upgrade (26-3024)	$ 10
MultiPak Upgrade (26-3124)	$ 10
OS-9 Level 2	$ 63.95

Minimum Order $15.00

* Please Note - Our ads are submitted early, so prices are subject to change!!! We appreciate your cooperation & understanding in this matter.

Method of Payment:
MC, Visa, Am.Ex. - Sorry, No Citiline!
Certified Check or Money Order.
Personal Checks - Allow 1 week to clear!

FREE PRICE LIST AVAILABLE

20 % OFF ALL TANDY SOFTWARE
MIN. 15% OFF ALL TANDY HARDWARE

* Full TANDY Warranty
* 100% TANDY PRODUCTS
* FREE UPS Shipping †on orders over $50.00 under $50 add $2.00

==> CALL <==
In Pa:
215 863-8911
In N.J.:
201 735-6138

230 Moorestown Road, Wind Gap, PA 18091

Laneco Plaza, Clinton, N.J. 08809

C.O.D. ADD $5.00

ALL PRICES INCLUDE SHIPPING†!!!

(In Continental US)

100% TANDY EQUIPMENT WITH FULL RADIO SHACK WARRANTY

A mailing list program that holds more than 900 addresses

The Post Office

By Orman Cyril Beckles II

The Post Office just may be the best mailing list program ever for the CoCo 3. How can I claim this? Because after looking at all the rest, I designed one with more features. This program was over five months in the making and one month in the testing. It is easy to use because it's totally menu-driven and user-prompting. Here are a few things *The Post Office* can do:

- hold more than 900 addresses
- look up ZIP codes automatically
- double-check with you before printing and deleting
- work in 40 or 80 columns, as you choose
- print form letters
- allow advanced cursor editing in the Add and Edit modes
- operate in a very user-friendly fashion
- work with most RAM disk programs

Orman Beckles works for an engineering firm outside Boston. He writes programs for the IBM as well as for the Color Computer.

Running the Program

After typing in and saving the program, enter RUN "POST". The main menu will appear, and look like this:

<A> Add Addresses
<D> Delete Addresses
<E> Edit Addresses
<F> Form Letters
<P> Print Routines
<X> Exit From Program

The main menu screen also displays the present number of records and an *estimated* number of free records. To return to the main menu from within any option, press BREAK.

Adding and Deleting Addresses

Select menu Option A. There is no need to press ENTER. You will see nine fields awaiting your entry of data. Code, the first field, is a non-printable field used for categorizing records. Some examples might be the following: Xmas, Regular, Pen Pal, Mother's, Father's, Active, Inactive and Overdue.

For the second field, Name, type in the person's name just as you want it to appear on the label. You may use the left arrow key to erase the last printed character. When you have finished with Name, press either ENTER or the down arrow key. Do the same for the Address, City and State fields.

When you get to the ZIP code field, the disk drive will activate for a second. If you are using a new disk, there will be no ZIP codes on file. Enter the ZIP code. Since *PO* will not allow you to alter a ZIP code once it has been placed in the ZIP codes file, be sure that it is correct before going to the next record. The ZIP codes file is updated each time a new ZIP code is introduced.

PO will use the ZIP code you entered whenever both the city and state match a record in the ZIP code file. It will allow you to interchange the abbreviation and full name of a state. However, the city must be exact. For example:

Mass — Ma = Match
Bedford — New Bedford = No Match

Enter the person's phone number in the Telephone # field. In the F, L Name field, type in the person's first name

followed by a comma, and then type the last name, e.g., Orman, Beckles.

The F/L Name field is used with the Form Letter module; the comma is used so that the program can distinguish between the first and last names. The names can be typed in uppercase if you like, since *PO* will convert them to the proper mixture of upper-/lowercase.

When you reach the Country field, look at the record — if you want to change any field, use the up arrow key to move up to it. Make the change, and use either the down arrow key or ENTER to get back to the Country field. Change the country or simply press ENTER. The drive will activate and the record will be saved. In addition to saving the record, *PO* will save the ZIP code you entered.

The next record then appears. It will look like the last record. You may change any field you want by using the up and down arrow keys to move to that field and then typing in the new information. To exit, simply press BREAK. The record on the screen will *not* be saved, and the main menu will appear.

Select D for Delete. The screen will display all the fields you saw in the Add Address option numbered 1 through 9, plus an option to default to any of the nine. You are prompted to select the field (press the appropriate number) "where deletion can be found." Pressing ENTER is the same as pressing 0.

You are then prompted to "Enter string to delete." Enter the string you are searching for, but type only what you need:

Bost	Match = Boston
BO	Match = Boston, Boulton
B	Match = Boston, Boulton Bedford

As you can see, the more of the string you type, the more selective the records pulled. Entering an empty carriage return will result in all the records being selected. The first record will be displayed. Press Y (yes) to delete the record, and N (no) to not delete the record. Press A to automatically select all the records that meet the match you specified. When the whole file has been checked, *PO* will give you a quick double-check by displaying key information about each record. In the 40-column mode, the field will always be the Code and Name fields. In the 80-column mode, the field being searched and a randomly chosen field will be displayed. You are shown the number of fields marked for deletions and asked, "Do you really want to erase these?" Pressing N will abort the process. Pressing Y will delete the records forever. When *PO* is finished, the main menu will appear.

Editing Addresses

Select E for Edit. The screen will display the familiar nine fields (numbered) and the default ("any of the above"). You are prompted to select field "where edit string can be found."

Specify the field you want to search by pressing the appropriate number. (Pressing ENTER is the same as pressing 0.) The screen will ask you to enter the string to edit. Entering an empty line will select all the records; each record will be displayed and changes may be made. As in the Add option, after the Country field the record will be put back in the file.

Form Letters

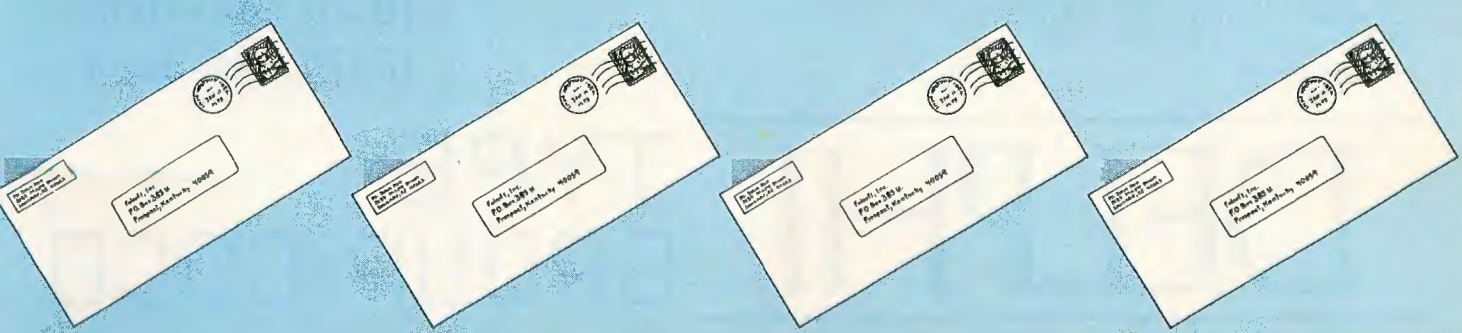
Select F for Form. Again, the screen displays the nine fields and the default. Specify the field you want to search by pressing the appropriate number. You are asked to enter the string to print and to enter the name of the letter file.

Again, the more of a string you type, the more selective the records pulled. Merely pressing ENTER will result in all the records being selected. The "Letter File" is the ASCII-saved letter where the variable `.FN.` is used wherever you want the first name to be printed, and `.LN.` wherever the last name is to be printed. For example:

Dear `.FN.`*,*

I see by my own records that you are eligible for a special discount. If I can be of any service to you Mr. `.LN.`*, please let me know.*

Your friend,
John Q. Public



WE'RE BRINGING THE COCO

RAINBOW'S BROADENING ITS SPECTRUM

THE RAINBOW and the Delphi Information Utility have joined together to allow CoCo owners all over the world to connect with one another!

Delphi is a full-service information utility. It offers everything from up-to-the-minute news stories from The Associated Press to electronic mail services. But, *best of all*, it now has **a special forum for Color Computer owners, and it's operated by the people who bring you THE RAINBOW each month.**

The CoCo Special Interest Group (SIG) features a variety of services, including an open forum where you can send and receive messages from Color Computer owners all over the world. It also has several databases to which you can upload your favorite programs and from which you can download programs written by other CoCo enthusiasts. Some of these databases are BASIC programming, OS-9 and home applications.

When setting up your account with Delphi, if you do not have a credit card or prefer not to use it, Delphi requires that you send $25 to give your account a positive balance. This will be refunded after your first free hour if you choose to no longer use the system or it will be applied to future connect charges. If you do not maintain a positive balance, you will be charged $3.50 each month for direct billing.

PEEK INTO THE RAINBOW

The CoCo SIG's conference feature allows you to meet electronically with other members of the CoCo Community. You can join conferences with notables such as Dale Puckett, Cray Augsburg, Marty Goodman, Don Hutchison, Jim Reed, Lonnie Falk and others — on a regular basis. Conference schedules will appear in THE RAINBOW each month. Be sure to check online announcements for changes and additions.

THE OTHER SIDE OF THE RAINBOW

On Delphi, you also are able to buy RAINBOW ON TAPE — order a whole set, or download an individual program immediately. You can also renew your RAINBOW subscription, make a fast and easy order for software or hardware from a multitude of vendors, or inquire about products on the CoCo SIG.

We also have a number of **programs that you can download** and use, just for the cost of the time you spend transferring them. There'll also be **corrections for RAINBOW articles**, helpful hints and many other useful features.

FREE LIFETIME MEMBERSHIP

THE RAINBOW is offering subscribers a free lifetime subscription to Delphi — a $24.95 value — and a free hour of connect time — a $7.20 value at either 300, 1200 or 2400 Baud — so you can sample Delphi and the RAINBOW CoCo SIG. That's right. Your subscription to THE RAINBOW entitles you to this $32.15 value as a ***free bonus!***

If you're not a RAINBOW subscriber, just enter your order when you sign on with Delphi and you'll get the same great deal! For our $31 subscription fee, you'll get the finest Color Computer magazine ever, a free lifetime subscription to Delphi and a free hour of connect time.

SAVE EVEN MORE

Want to save even more? While you're online you can order, for only $29.95, a deluxe package which includes the Delphi membership, the *Delphi Handbook and Command Card* ($21.95) and a total of three hours of connect time ($21.60).

Delphi provides us all with **Immediate CoCo Community.** Check it out today. After all, you can sample it for free!

Problems? Call Delphi:

(800) 544-4005

(617) 491-3393

DELPHI

TYPE: GROUP COCO

COMMUNITY TOGETHER

How to reach RAINBOW's Color Computer SIG . . .

There are several ways to connect to Delphi and THE RAINBOW's CoCo SIG. In most cities you will not even have to pay long distance charges; you can use special data communications networks like Telenet, Tymnet and the Canadian Datapac network.

First, set your terminal program to operate at either 300 or 1200 Baud (depending on the modem you have), and also select either 7 bits with even parity or 8 bits with no parity, and one stop bit. (If one combination doesn't work, try another.)

Decide which network you should use. There is no surcharge for Telenet or Tymnet. Canadian residents using Datapac will be charged an additional $10.80 (U.S.) per hour.

On Telenet: Uninet network has merged with Telenet. To get the Telenet number for your area, call (800) 336-0437. After you call the local access number and make connection, press ENTER twice. When the "TERMINAL=" prompt appears, press ENTER again. When the "@" prompt appears, type C DELPHI and press ENTER.

On Tymnet: Call (800) 336-0149 to get the Tymnet number for your area. After you dial your designated number and connect, you will see either "garbage" or a message saying "please type your terminal identifier." At this point, even if the screen is garbled, simply press 'A'. When "please log in:" appears, type DELPHI and press ENTER.

From Canada (on Datapac): Call Delphi Customer Service at (617) 491-3393 to get the Datapac number for your area. After you connect, press the period key (.) and ENTER (use two periods if you're using 1200 Baud). Type SET 2:1, 3:126 and press ENTER. Now type p 1 3106, DELPHI; and press ENTER. Delphi's new rates indicate an additional $10.80 hourly surcharge for evening use of Datapac, which means a total of $18 (U.S.) for connect time.

From other countries: Many countries have their own data networks that can connect to either Telenet or Tymnet. Check with the telephone authorities in your country for details on how to sign up for this service. When you have an account set up, you can reach Delphi with a "host code" of 3110 6170 3088 through Telenet, or 3106 90 6015 through Tymnet. (You'll have to pay the toll charges for this connection.)

Type in Your Username

If you're already a subscriber to THE RAINBOW, at the "USERNAME:" prompt, type JOINDELPHI and press ENTER. At the "PASSWORD:" prompt, type RAINBOW. Then, at the "NUMBER:" prompt, type your individual subscription number from the mailing label of your latest issue of THE RAINBOW. (If there are one or more zeros at the beginning of this number, include them.)

If you don't already have a subscription, at the "USERNAME:" prompt, type JOINDELPHI and press ENTER. At the "PASSWORD:" prompt, type SENDRAINBOW and press ENTER. Have your MasterCard, VISA or American Express card ready, because you'll be led through a series of questions that will enable us to put your RAINBOW and Delphi subscriptions into effect. In an effort to hold down non-editorial costs, we do not bill for subscriptions.

If you make a typing error, just use Control-X and start over. Remember that at any point, when you're on Delphi, you can type HELP to get help on how to use the system. To get off the system just type BYE.

If you find that you're unable to log on to Delphi and enter the CoCo SIG after following these instructions, call us during afternoon business hours at (502) 228-4492. We'll be glad to offer assistance.

Come Visit Us! Type: GROUP COCO

After you sign in, you'll be prompted to set up your own, personal "user name" — Delphi is a friendly service, no numbers to remember — and you'll be asked a number of questions so Delphi can set up your account. You'll also be assigned a temporary password.

Delphi will tell you that your account will be ready after 6 p.m. the same day if you sign up before noon (Eastern time zone.) If not, your account will be ready at 6 p.m. the next day. Once an account is verified and opened, *each RAINBOW subscriber will be credited with an hour of free time!*

When you log back in, use your chosen username and your temporary password to access the system. At that point, you will meet Max, who will help you configure things and will change your temporary password into your own *personal* password. This is the password you will use for subsequent sessions — or until you change it.

After Max bids you goodbye, you'll wind up at the Delphi Main Menu; type in GROUP COCO and **join us on the CoCo SIG!**

The first record will be displayed. Pressing Y prints the record; N does not print the record. Pressing A automatically selects all of the records that meet the match you specified. When the whole file has been checked, *PO* will give you a quick double-check by displaying key information about each record.

In the 40-column mode, the field will always be the Code and Name fields. In the 80-column mode, the field being searched and a randomly chosen field will be displayed. The screen asks, "Are you sure you wish to print these?"

Pressing N aborts the process. Press Y, and *PO* will write the letters to the printer substituting the proper names for .FN. and .LN.. For example:

Dear Orman,

I see by my own records that you are eligible for a special discount. If I can be of any service to you Mr. Beckles, please let me know.

After the last letter is printed, the main menu will appear.

Printing Routines

Select P for Print. The screen displays our familiar nine fields and the default. Specify the field you want to search by pressing its number.

Enter the string you are searching for when prompted. The more you type, the more selective the records pulled. Pressing ENTER causes all the records to be selected. The first record will be displayed. Pressing Y prints the record; pressing N does not print the record. Press A to automatically select all the records that meet the match you specified.

When the whole file has been checked, the program will give you a quick double-check by displaying key information about each record. Again, in the 40-column mode, the field will always be the Code and Name fields. In the 80-column mode, the field being searched and a randomly chosen field will be displayed. The screen then shows you the number of fields marked for printing and asks if you are sure you want to print them.

Pressing N aborts the process. Pressing Y causes *PO* to print out mailing labels. When *PO* is finished, the main menu will appear.

Error Trapping

PO can cope with almost any error and will display a message to help solve the problem.

RAM Disk

I use *PO* on my RAM disks. I wrote a little program that copies the information onto the RAM disk, starts the program and copies it back onto a floppy when I'm done.

Parameters

Line 12 contains the speed-up poke. Change this line to '0' if you do not want the high speed mode. *PO* automatically slows down the machine whenever disk I/O Errors occur.

Line 13 sets the default screen width. You may select either the 40- or 80-column mode.

Line 14 sets the default tab width. If you are using the 80-column mode, set this to 20. If you are using the 40-column mode, set this to 0. If you are using a TV, which cuts off the first two columns, set this to 2.

Line 15 sets the printer baud rate. Enter POKE 150,1 for 9600 baud, POKE 150,87 for 600 baud, etc.

Line 16 sets the number of lines between labels. For most labels, this should be set to 2. Increase the number for larger labels.

Line 17 prints the country. Select whether you want the Country field to print (0=no, 1=yes).

Line 18 sets the default column start, and this should never be changed.

The Post Office has applications for both personal and business uses. Its ability to hold more than 900 addresses should make it more than adequate for most small business owners.

(Questions or comments regarding this program may be directed to the author at 45 Meridian St., Malden, MA 02148. Please enclose an SASE when writing for a response.) □

```
17 .....57   4160 .....46   6410 .....132
50 .....68   4245 .....6    6480 .....29
110 .....192 4330 .....160  6565 .....97
2060 .....186 4425 .....156 6645 .....106
2160 .....142 5045 .....237 7000 .....161
2250 .....236 5150 .....128 7090 .....215
2325 .....154 5235 .....90  7205 .....10
2425 .....153 5325 .....157 END .....58
3105 .....145 6025 .....77
4055 .....159 6235 .....221
```

The listing: POST

```
1 '*******************************
*******
2 '**          The Post Office
    **
3 '**     By Orman Cyril Beckles
II   **
4 '**
    **
5 '**         (C) Copyright 1987
    **
6 '**
    **
7 '*******************************
*******
8 '
9 '
10 GOTO 6730:'
          <-- DOES A PCLEAR 1

11 RGB:CLEAR 2000:FILES 2,332:DI
M S(949):TZ=5:ON ERR GOTO 7210
12 HI=65497:'
          <-- HI SPEED POKE
13 W=80    :'
          <-- DEFAULT WIDTH
14 TB=20   :'
          <-- DEFAULT TAB
15 POKE 150,1:'
          <-- BAUD RATE
16 EL=2:'
          <-- # OF LINES BETWEEN
LABELS
17 PC=0:'
          <-- PRINT COUNTRY 0=NO
```

```
1=YES
18 DC=TB+13:'
        <-- DEFAULT COLUMN STAR
T
19 KK=1:'
        <-- KEY CLICK
2Ø WIDTH W:PALETTE Ø,Ø:ON BRK GO
TO 2Ø:CLS1:ATTR 1,Ø:CLS:GOSUB 61
ØØ
25 LOCATE TB+6,6:PRINT"Number Of
 Free Records =";INT(FREE(Ø)*13)
3Ø GOSUB 6ØØØ:NF=LOF(1):LOCATE Ø
,2Ø:PRINT:CLOSE #1:LOCATE Ø,7:PR
INTTAB(TB+6)"Number Of Used Reco
rds =";NF
35 LOCATE Ø,12
4Ø PRINTTAB(TB+9)"<";:ATTR 3,Ø:P
RINT"A";:ATTR 1,Ø:PRINT">";:ATTR
 3,Ø:PRINT" ADD    Address(s)";:
ATTR 1,Ø:PRINT
45 PRINTTAB(TB+9)"<";:ATTR 3,Ø:P
RINT"D";:ATTR 1,Ø:PRINT"> ";:ATT
R 3,Ø:PRINT"DELETE Address(s)";:
ATTR 1,Ø:PRINT
5Ø PRINTTAB(TB+9)"<";:ATTR 3,Ø:P
RINT"E";:ATTR 1,Ø:PRINT">";:ATTR
 3,Ø:PRINT" EDIT   Address(s)";:
ATTR 1,Ø:PRINT
55 PRINTTAB(TB+9)"<";:ATTR 3,Ø:P
RINT"F";:ATTR 1,Ø:PRINT">";:ATTR
 3,Ø:PRINT" FORM   Letter (s)";:
ATTR 1,Ø:PRINT
6Ø PRINTTAB(TB+9)"<";:ATTR 3,Ø:P
RINT"P";:ATTR 1,Ø:PRINT">";:ATTR
 3,Ø:PRINT" PRINT  Routine(s)";:
ATTR 1,Ø:PRINT
65 PRINTTAB(TB+9)"<";:ATTR 3,Ø:P
RINT"X";:ATTR 1,Ø:PRINT">";:ATTR
 3,Ø:PRINT" EXIT FROM PROGRAM";:
ATTR 1,Ø:PRINT
7Ø LOCATE Ø,22:ATTR 3,2:PRINTTAB
(TB+3)"By Orman Cyril Beckles II
  (C) 1987":ATTR 1,Ø:PRINTCHR$(8
)
75 GOSUB 719Ø
8Ø IF IK$="A" THEN 1ØØØ:' <-- "A
DD" MODULE
85 IF IK$="D" THEN 2ØØØ:' <-- "D
EL" MODULE
9Ø IF IK$="E" THEN 3ØØØ:' <-- "E
DT" MODULE
95 IF IK$="F" THEN 4ØØØ:' <-- "F
OM" MODULE
1ØØ IF IK$="P" THEN 5ØØØ:' <-- "
PRT" MODULE
1Ø5 IF IK$="X" THEN 6725:' <-- "
XIT"
11Ø GOTO 75
```


NEW FROM K-SOFT
FOR THE COCO 3 ONLY
"ZANDAR"

You may never reach the 9th planet! Drones from Zandar will try to stop you and sloppy shooting will not save you. **A GAME OF REAL JOYSTICK SKILL.**

- ★ 3 LEVELS OF PLAY
- ★ NOT COPY PROTECTED
- ★ SELECT TV OR RGB
- ★ HIGH SCORES SAVED TO DISK
- ★ DISK ONLY $24.95
  WA STATE RESIDENTS ADD 7.5% SALES TAX

CHECK - MONEY ORDER - C.O.D.
PHONE (509) 884-0338

K-SOFT
300 13th N.E.
E. Wenatchee, WA 98801

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

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

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

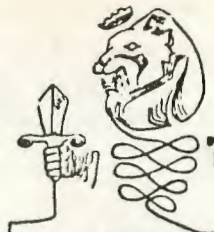
THE PEEPER
ML program tracer that multitasks with the target program. An excellent learning tool for the ML novice; an invaluable debugging aid for the expert. CoCo 1, 2, or 3 compatible.
Disk . . . $23.95 Assembler source listing . . . Add $3.00

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

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

```
1000 ON BRK GOTO 12:'
  <-- START OF ADD MODULE
1005 GOSUB 6100
1010 GOSUB 6500
1015 GOSUB 6000:GOSUB 6015
1020 IF AD(1)=1 AND LEN(V$(4))>1
 AND LEN(V$(5))>1 THEN  AD(1)=0:
FL(3)=1:GOSUB 7150:GOSUB 7110
1025 GOTO 1000
2000 ON BRK GOTO 12:FL(1)=1:'
 <-- START OF DELETE MODULE
2005 GOSUB 6100:GOSUB 6200
2010 LOCATE 0,21
2015 PRINTTAB(TB+11)"PLEASE SELE
CT FIELD"
2020 PRINTTAB(TB+2)"-> Where del
etetion can be found <-"
2025 GOSUB 7190
2030 A=VAL(IK$)
2035 GOSUB 6100
2040 PRINTTAB(TB+8)"ENTER STRING
 TO DELETE"
2045 PRINT
2050 PRINTTAB(TB+10)"->";:LINEIN
PUT SD$:GOSUB 6100
2055 GOSUB 6000
2060 FOR T=1 TO LOF(1)
2065 POKE (HI-1),0:GET #1,T:POKE
 HI,0
2070 S(T)=0
2075 GOSUB 6400
2080 IF FL(2)=1 THEN FL(2)=0:GOS
UB 2100:GOTO 2085
2085 NEXT T
2090 POKE (HI-1),0:CLOSE #1:POKE
 HI,0
2095 GOTO 2190
2100 LOCATE 0,9
2105 PRINTTAB(TB)"        CODE:";
DC$
2110 PRINTTAB(TB)"        NAME:";
DN$
2115 PRINTTAB(TB)"     ADDRESS:";
DA$
2120 PRINTTAB(TB)"        CITY:";
DY$
2125 PRINTTAB(TB)"       STATE:";
DS$
2130 PRINTTAB(TB)"         ZIP:";
DZ$
2135 PRINTTAB(TB)"TELEPHONE #:";
DT$
2140 PRINTTAB(TB)"    F,L NAME:";
DF$
2145 PRINTTAB(TB)"     COUNTRY:";
DO$
2150 IF FL(1)=1 THEN GOTO 2165
2155 S(T)=1
2160 RETURN
2165 GOSUB 7190
2170 IF IK$="Y" OR IK$="y" THEN
2155
2175 IF IK$="N" OR IK$="n" THEN
2160
2180 IF IK$="A" OR IK$="a" THEN
FL(1)=0:GOTO 2150
2185 GOTO 2165
2190 'DOUBLE CHECK OF DELETES
2195 GOSUB 6100
2200 LOCATE 0,6:PRINTTAB(TB+14)"
 DELETIONS"
2205 CV=9:C=1
2210 GOSUB 6000
2215 FOR T=1 TO LOF(1)
2220 IF S(T)=1 THEN 2225 ELSE 22
90
2225 POKE (HI-1),0:GET #1,T:POKE
 HI,0
2230 CV=CV+1
2235 IF CV>21 THEN CV=9
2240 LOCATE 0,7:PRINTTAB(TB+8)"M
ARKED FOR DELETIONS=";C:C=C+1:LO
CATE 1,CV
2245 IF A=1  OR A=0 THEN PRINT T
AB(TB+5)A$;" ";B$
2250 IF A=2 THEN PRINT TAB(TB+5)
 DN$;" ";DC$
2255 IF A=3 AND W=80 THEN PRINTT
AB(18) DA$;" ";DN$ ELSE IF A=3 T
HEN PRINTTAB(2)C$;" "; DC$
2260 IF A=4 AND W=80 THEN PRINT
DY$;" "; DN$ ELSE IF A=4 THEN PR
INT DY$;" ";DC$
2265 IF A=5 THEN PRINT DS$;" ";D
N$
2270 IF A=6 THEN PRINT DZ$;" ";D
N$
2275 IF A=7  AND W=80 THEN PRINT
 DT$;" "; DN$ ELSE IF A=7 THEN P
RINT DT$;" "; DC$
2280 IF A=8 AND W=80 THEN PRINT
DF$;" "; DN$ ELSE IF A=8 THEN PR
INT DF$;" "; DC$
2285 IF A=9 AND W=80 THEN PRINT
DO$;" "; DN$ ELSE IF A=9 THEN PR
INT DO$;" "; DC$
2290 NEXT T
2295 POKE(HI-1),0:CLOSE#1:POKE H
I,0
2300 T=21-CV:FOR Y=1 TO T:LOCATE
 1,CV+T:PRINT:NEXT Y:PRINTTAB(TB
+4)"DO YOU REALY WANT TO ERASE T
HESE";
2305 GOSUB 7190
2310 IF IK$="Y" THEN 2325
2315 IF IK$="N" THEN STOP
2320 GOTO 2305
2325 GOSUB 6100:PRINTTAB(TB+8)"*
 Busy Deleting Records *":GOSUB
6000
2330 POKE (HI-1),0:OPEN "D",#2,"
TEMP.FIL",166:POKE HI,1
```

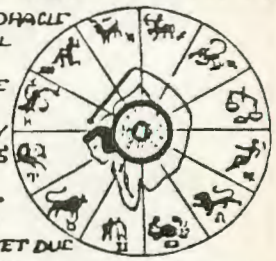
```
2335 FIELD #2, 1Ø AS J$,25 AS K$
,25 AS L$,25 AS M$,1Ø AS N$,7 AS
 O$,14 AS P$,25 AS Q$,25 AS R$
234Ø FOR T=1 TO LOF(1)
2345 IF S(T)=1 THEN 24Ø5
235Ø F=F+1:POKE (HI-1),Ø:GET #1,
T:POKE HI,Ø
2355 LSET J$=DC$
236Ø LSET K$=DN$
2365 LSET L$=DA$
237Ø LSET M$=DY$
2375 LSET N$=DS$
238Ø LSET O$=DZ$
2385 LSET P$=DT$
239Ø LSET Q$=DF$
2395 LSET R$=DO$
24ØØ POKE (HI-1),Ø:PUT #2,F:POKE
 HI,Ø
24Ø5 S(T)=Ø:NEXT T
241Ø CLOSE #1
2415 CLOSE #2
242Ø POKE (HI-1),Ø:KILL"MAILER.F
IL":POKE HI,Ø
2425 POKE (HI-1),Ø:RENAME "TEMP.
FIL" TO "MAILER.FIL":POKE HI,Ø
243Ø GOTO 12
3ØØØ ON BRK GOTO 12:FL(2)=Ø:' ED
IT MODULE
3ØØ5 GOSUB 61ØØ:GOSUB 62ØØ
3Ø1Ø LOCATE Ø,21
3Ø15 PRINTTAB(TB+11)"PLEASE SELE
CT FIELD"
3Ø2Ø PRINTTAB(TB+2)"-> Where edi
t string can be found <-"
3Ø25 GOSUB 719Ø
3Ø3Ø A=VAL(IK$)
3Ø35 GOSUB 61ØØ
3Ø4Ø PRINTTAB(TB+1Ø)"ENTER STRIN
G TO EDIT"
3Ø45 PRINT
3Ø5Ø PRINTTAB(TB+12)"->";:LINEIN
PUT SD$:IF SD$="" THEN SD$=" "
3Ø55 GOSUB 6ØØØ:'OUTPUT ROUTINE
3Ø6Ø FOR NR=1 TO LOF(1)
3Ø65 POKE (HI-1),Ø:GET #1,NR:POK
E HI,Ø
3Ø7Ø S(T)=Ø
3Ø75 GOSUB 64ØØ
3Ø8Ø IF FL(2)=1 THEN FL(2)=Ø:GOT
O 31Ø5
3Ø85 GOTO 3125
3Ø9Ø POKE (HI-1),Ø:CLOSE #1:POKE
 HI,Ø
3Ø95 GOTO 12
31ØØ GOTO 528Ø
31Ø5 GOSUB 61ØØ
311Ø V$(1)=DC$:V$(2)=DN$:V$(3)=D
A$:V$(4)=DY$:V$(5)=DS$:V$(6)=DZ$
:V$(7)=DT$:V$(8)=DF$:V$(9)=DO$
3115 GOSUB 65ØØ
312Ø LSET DC$=V$(1):LSET DN$=V$(
```

The Saint John Gallery
Presents:

THE ASTRO FORTUNE TELLER

A VERITABLE ORACLE BASED UPON YOUR PERSONAL PLANETARY CONFIGURATIONS AFTER ENTERING YOUR GIVEN NAME YOUR BIRTHDATE & THE PRESENT DAY YOU RECEIVE THE ANSWER TO ANY OF 3Ø PREDEFINED QUESTIONS THOSE QUESTIONS OF LIFE • LOVE • SUCCESS • MARRIAGE • FORTUNE • MOST OFT ASKED BY MEN & WOMEN THIS PROGRAM IS OVER 15ØK YET DUE TO MODULAR APPROACH WILL RUN ON 32K-512K SYSTEMS FOR THE SERIOUS INQUIRER OR GREAT FOR PARTIES !!



The Astro Fortune Teller ÷ DISK $21.95

THE BEST BBS

WILL WORK WITH COCO'S OWN SERIAL PORT & ANY AUTO-ANSWER MODEM • 1-4 DRIVES • 32K-512K DISK $18.00

Temple Of Lost Ark + ADV. 32K (TEXT) DISK $12.00

DISK EDITOR II INNOVATIVE TECHNIQUE LETS YOU EDIT YOUR DISKS LIKE LARGE WORD PROCESSING FILES • DISK $ 18.00

EASTWORLD KARATE

THE ULTIMATE KARATE GAME. (64K)
DOZENS OF FULL COLOUR SMOOTHLY ANIMATED ASSASSINS & NINJAS & HI-RES SCREENS BATTLE SOLO OR ANOTHER PLAYER $21.95

CITY BOMBER ÷ PILOT 9 DIFFERENT FLYERS DESTROY 12 DIFFERENT CITIES
9 SCREENS • 9 SCENARIOS • 3 SPEEDS • 3 LEVELS
100% ML PROGRAMING 32K CoCo 1-2-OR 3 DISK $18.00

THE SOUND MACHINE

HAVE YOUR COCO DIGITIZE AND SAVE YOUR SPEECH DOZENS OF SAMPLES INCLUDED • OUTSOUND MAX. HEADROOM THE FIRST & BEST SOUND DIGITIZER PLAY IT BACK • PLAY IT BACKWARDS "CHIP-MONK" RE-SEQ. ETC. • COMES WITH BASIC INTERFACE • MIN REQ 32K DISK $19.95

Printer Lightning

FROM COLORVENTURE PRINT SPOOLER 4K-398K BUFFER WORK OR PLAY GAMES WHILE YOU PRINT - FAST-DISK $10.00

Backup Lightning 512K

FROM COLORVENTURE • FASTEST DISK DUPLICATOR OUT COPYS IN ONE PASS • 35/40/80 TAK'S & 05-9 TIME TO FORMAT & WRITE EACH COPY - 6MS RATE - 40 SEC. NO MORE DISK SWITCHING - EASY TO USE - DISK $10.00

SEND CHEQUE OR M.O. + $1.25 P&H (CANADA $2.25) TO:
ST. JOHN GALLERY, P.O. BOX 613 MT. SINAI N.Y. 11766

```
2):LSET DA$=V$(3):LSET DY$=V$(4)
:LSET DS$=V$(5):LSET DZ$=V$(6):L
SET DT$=V$(7):LSET DF$=V$(8):LSE
T DO$=V$(9):PUT #1,NR
3125 NEXT NR
313Ø GOTO 3Ø9Ø
4ØØØ ON BRK GOTO 12:FL(1)=1:' <-
- START OF FORM MODULE
4ØØ5 GOSUB 61ØØ:GOSUB 62ØØ
4Ø1Ø LOCATE Ø,19
4Ø15 PRINTTAB(TB+11)"PLEASE SELE
CT FIELD"
4Ø2Ø PRINTTAB(TB+2)" Where print
-out string can be found "
4Ø25 GOSUB 719Ø
4Ø3Ø A=VAL(IK$)
4Ø35 GOSUB 61ØØ:LOCATE Ø,7
4Ø4Ø PRINTTAB(TB+1Ø)"ENTER STRIN
G TO PRINT"
4Ø45 PRINT
4Ø5Ø PRINTTAB(TB+12)"->";:LINEIN
PUT SD$:IF SD$="" THEN SD$=" "
4Ø55 LOCATE Ø,11:PRINTTAB(TB+8)"
ENTER NAME OF LETTER FILE"
4Ø6Ø PRINT:PRINTTAB(TB+12)"->";:
LINEINPUT LF$
4Ø65 IF LF$="" THEN 4Ø55
4Ø7Ø GOSUB 6ØØØ:'  <-- OUTPUT RO
UTINE
4Ø75 FOR T=1 TO LOF(1)
4Ø8Ø POKE (HI-1),Ø:GET #1,T:POKE
 HI,Ø
4Ø85 S(T)=Ø
4Ø9Ø GOSUB 64ØØ
4Ø95 IF FL(2)=1 THEN FL(2)=Ø:GOS
UB 4115:GOTO 41ØØ
41ØØ NEXT T
41Ø5 POKE (HI-1),Ø:CLOSE #1:POKE
 HI,Ø
411Ø GOTO 416Ø
4115 LOCATE Ø,7:GOSUB 6255
412Ø IF FL(1)=1 THEN GOTO 4135
4125 S(T)=1
413Ø RETURN
4135 GOSUB 719Ø
414Ø IF IK$="Y" OR IK$="y" THEN
4125
4145 IF IK$="A" OR IK$="a" THEN
FL(1)=Ø:GOTO 412Ø
415Ø IF IK$="N" OR IK$="n" THEN
413Ø
4155 GOTO 4135
416Ø '  <-- DOUBLE CHECK OF DELE
TES
4165 GOSUB 61ØØ
417Ø LOCATE Ø,6:PRINTTAB(TB+13)"
 PRINT-OUT"
4175 CV=9:C=1
418Ø GOSUB 6ØØØ
4185 FOR T=1 TO LOF(1)
419Ø IF S(T)=1 THEN 4195 ELSE 42
6Ø
4195 POKE (HI-1),Ø:GET #1,T:POKE
 HI,Ø
42ØØ CV=CV+1
42Ø5 IF CV>21 THEN CV=9
421Ø LOCATE Ø,7:PRINTTAB(TB+8)"M
ARKED FOR PRINTING=";C:C=C+1:LOC
ATE 1,CV
4215 IF A=1  OR A=Ø THEN PRINT T
AB(TB+5) DC$;" ";DN$
422Ø IF A=2 THEN PRINT TAB(TB+5)
 DN$;" ";DC$
4225 IF A=3 AND W=8Ø THEN PRINTT
AB(18) DA$;" "; DN$ ELSE IF A=3
THEN PRINTTAB(2)DA$;" ";DC$
423Ø IF A=4 AND W=8Ø THEN PRINT
DY$;" "; DN$ ELSE IF A=4 THEN PR
INT DY$;" "; DC$
4235 IF A=5 THEN PRINT DS$;" ";D
N$
424Ø IF A=6 THEN PRINT DZ$;" ";D
N$
4245 IF A=7  AND W=8Ø THEN PRINT
 DT$;" "; DN$ ELSE IF A=7 THEN P
RINT DT$;" "; DC$
425Ø IF A=8 AND W=8Ø THEN PRINT
DF$;" "; DN$ ELSE IF A=8 THEN PR
INT DF$;" "; DC$
4255 IF A=9 AND W=8Ø THEN PRINT
DO$;" "; DN$ ELSE IF A=9 THEN PR
INT DO$;" "; DC$
426Ø NEXT T
4265 POKE (HI-1),Ø:CLOSE#1:POKE
HI,Ø
427Ø T=21-CV:FOR Y=1 TO T:LOCATE
 1,CV+T:PRINT:NEXT Y:PRINTTAB(TB
+Ø)"ARE YOU SURE YOU WISH TO PRI
NT THESE";
4275 GOSUB 719Ø
428Ø IF IK$="Y" THEN 4295
4285 IF IK$="N" THEN 4ØØØ
429Ø GOTO 4275
4295 CLS
43ØØ GOSUB 61ØØ:PRINTTAB(TB+1Ø)"
Working..."
43Ø5 GOSUB 6ØØØ
431Ø FOR T=1 TO LOF(1)
4315 IF S(T)=1 THEN 432Ø ELSE 44
8Ø
432Ø POKE (HI-1),Ø:GET #1,T:POKE
 HI,Ø
4325 GOSUB 4345
433Ø POKE HI-1,Ø:PRINT#-2,CHR$(1
2):POKE HI,Ø:'<-- EJECTS A PAGE
4335 NEXT T
434Ø CLOSE #1:GOTO 12
4345 P=INSTR(DF$,","):RF$=LEFT$(
DF$,P-1):FOR TF=P TO 25:IF MID$(
DF$,TF,1)<>CHR$(32) THEN FC=FC+1
:NEXT TF
435Ø RL$=MID$(DF$,P+1,FC-1)
```

```
4355 L=LEN(RF$):R1$=RF$:GOSUB 44
3Ø:RF$=R1$:L=LEN(RL$):R1$=RL$:GO
SUB 443Ø:RL$=R1$
436Ø OPEN "I",#2,LF$
4365 IF EOF(2)=-1 THEN CLOSE #2:
RETURN
437Ø LINE INPUT #2,IL$
4375 P=INSTR(IL$,".FN."):IF P>Ø
THEN 4395
438Ø P=INSTR(IL$,".LN."):IF P>Ø
THEN 4425
4385 POKE HI-1,Ø:PRINT #-2, IL$:
POKE HI,Ø
439Ø GOTO 4365
4395 ' FOUND .FN.
44ØØ MID$(IL$,P,4)="    "
44Ø5 P1$=MID$(IL$,1,P-1)
441Ø P2$=MID$(IL$,P+4,LEN(IL$))
4415 IL$=P1$+RF$+P2$
442Ø GOTO 4375
4425 MID$(IL$,P,4)="    ":P1$=MI
D$(IL$,1,P-1):P2$=MID$(IL$,P+4,L
EN(IL$)):IL$=P1$+RL$+P2$:GOTO 43
8Ø
443Ø FOR U=1 TO LEN(R1$)
4435 C$=MID$(R1$,U,1)
444Ø IF U=1 THEN 4465
4445 IF ASC(C$)<91 AND ASC(C$)>6
4 THEN C=ASC(C$)+32:C$=CHR$(C)
445Ø MID$(R1$,U,1)=C$
4455 NEXT U
446Ø RETURN
4465 'FIRST LETTER
447Ø IF ASC(C$)>96 THEN C=ASC(C$
)-32:C$=CHR$(C)
4475 GOTO 445Ø
448Ø NEXT T
4485 POKE (HI-1),Ø:CLOSE #1:POKE
 HI,Ø
449Ø GOTO 12
5ØØØ ON BRK GOTO 12:FL(1)=1:' <-
- START OF PRINT MODULE
5Ø05 GOSUB 61ØØ:GOSUB 62ØØ
5Ø1Ø LOCATE Ø,19
5Ø15 PRINTTAB(TB+11)"PLEASE SELE
CT FIELD"
5Ø2Ø PRINTTAB(TB+2)" Where print
-out string can be found "
5Ø25 GOSUB 719Ø
5Ø3Ø A=VAL(IK$)
5Ø35 GOSUB 61ØØ:LOCATE Ø,7
5Ø4Ø PRINTTAB(TB+1Ø)"ENTER STRIN
G TO PRINT"
5Ø45 PRINT
5Ø5Ø PRINTTAB(TB+12)"->";:LINEIN
PUT SD$:IF SD$="" THEN SD$=" "
5Ø55 GOSUB 6ØØØ
5Ø6Ø FOR T=1 TO LOF(1)
```


CoCo 3
ADDRESS FILE
&
ENVELOPE & LABEL ADDRESSING

Automatically addresses all standard envelopes or labels using a choice of size options for either!!

THESE FILES MAY BE USED FOR RECORDS OTHER THAN ADDRESSES!!! IMAGINATION IS ALL THAT'S NEEDED!!! There are 15 files that hold 18 records per file! This TOTALS 270 ADDRESSES, or records that can be stored per disk!! They are divided alpabetically into the 15 files where they are alphabetically arranged! Each record can hold 8 lines of 64 characters per line!!

WELL DOCUMENTED WHILE RUNNING + INSTRUCTION BOOKLET!
10 MENU DRIVEN ROUTINES TO FULLY MANIPULATE FILES AND RECORDS INCLUDING;SEARCH;UPDATE AND DELETE!!
UNLIMITED STORAGE CAPACITY WITH BACKUP DISKS YOU MAKE!
REQUIRES: CoCo 3; Disk Drive; Printer; Monitor OR TV!

R.J.F. SOFTWARE; R.R. #2; WHITE LAKE,ONTARIO; K0A 3L0 PHONE (613) 623-7824

This program has been sealed and certified by RAINBOW MAGAZINE! SEE PRODUCT REVIEW IN THIS ISSUE!!

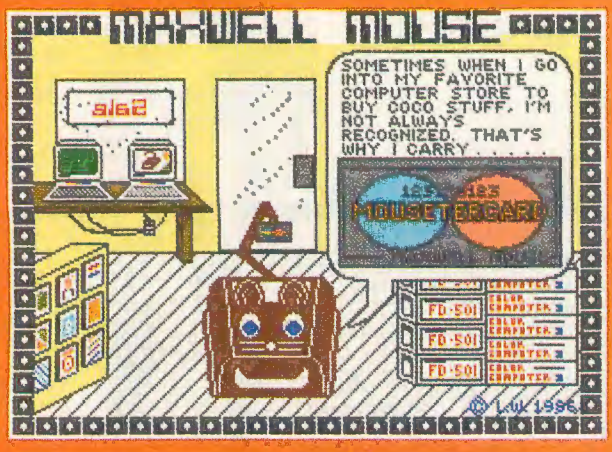
$14.95 U.S. FUNDS plus $3.00 Shipping and Handling. Visa; Money Order or Personalized Check accepted! Ontario Residents add 7% Provincial Sales Tax.

CoCo 3 WORD PROCESSOR for a DMP105 or DMP106 PRINTER and DISK DRIVE. Can be used with a monitor OR TV!!! Underlining, bold and all font styles + much more!!!!! A SUPER WORD PROCESSOR ON A 64 COLUMN SCREEN!!!
$19.95 U.S. FUNDS plus $3.00 Shipping and Handling. Ontario residents add 7% Provincial Sales Tax.

```
5Ø65 POKE (HI-1),Ø:GET #1,T:POKE
 HI,Ø
5Ø7Ø S(T)=Ø
5Ø75 GOSUB 64ØØ
5Ø8Ø IF FL(2)=1 THEN FL(2)=Ø:GOS
UB 51ØØ:GOTO 5Ø85
5Ø85 NEXT T
5Ø9Ø POKE (HI-1),Ø:CLOSE #1:POKE
 HI,Ø
5Ø95 GOTO 5145
51ØØ LOCATE Ø,7:GOSUB 6255
51Ø5 IF FL(1)=1 THEN GOTO 512Ø
511Ø S(T)=1
5115 RETURN
512Ø GOSUB 719Ø
5125 IF IK$="Y" OR IK$="y" THEN
511Ø
513Ø IF IK$="A" OR IK$="a" THEN
FL(1)=Ø:GOTO 51Ø5
5135 IF IK$="N" OR IK$="n" THEN
5115
514Ø GOTO 512Ø
5145 'DOUBLE CHECK OF DELETES
515Ø GOSUB 61ØØ
5155 LOCATE Ø,6:PRINTTAB(TB+13)"
 PRINT-OUT"
516Ø CV=9:C=1
5165 GOSUB 6ØØØ
517Ø FOR T=1 TO LOF(1)
5175 IF S(T)=1 THEN 518Ø ELSE 52
45
518Ø POKE (HI-1),Ø:GET #1,T:POKE
 HI,Ø
5185 CV=CV+1
519Ø IF CV>21 THEN CV=9
```

Mouse Tales

By Logan Ward




```
5195 LOCATE Ø,7:PRINTTAB(TB+8)"M
ARKED FOR PRINTING=";C:C=C+1:LOC
ATE 1,CV
52ØØ IF A=1  OR A=Ø THEN PRINT T
AB(TB+5) DC$;" "; DN$
52Ø5 IF A=2 THEN PRINT TAB(TB+5)
 DN$;" ";DC$
521Ø IF A=3 AND W=8Ø THEN PRINTT
AB(18) DA$;" ";DN$ ELSE IF A=3 T
HEN PRINTTAB(2) DA$;" "; DC$
5215 IF A=4 AND W=8Ø THEN PRINT
DY$;" ";DN$ ELSE IF A=4 THEN PRI
NT DY$;" ";DC$
522Ø IF A=5 THEN PRINT DS$;" ";D
N$
5225 IF A=6 THEN PRINT DZ$;" ";D
N$
523Ø IF A=7 AND W=8Ø THEN PRINT
DT$;" ";DN$ELSE IF A=7 THEN PRIN
T DT$;" ";DC$
5235 IF A=8 AND W=8Ø THEN PRINT
DF$;" ";DN$ ELSE IF A=8 THEN PRI
NT DF$;" ";DC$
524Ø IF A=9 AND W=8Ø THEN PRINT
DO$;" ";DN$ ELSE IF A=9 THEN PRI
NT DO$;" ";DC$
5245 NEXT T
525Ø POKE (HI-1),Ø:CLOSE#1:POKE
HI,Ø
5255 T=21-CV:FOR Y=1 TO T:LOCATE
 1,CV+T:PRINT:NEXT Y:PRINTTAB(TB
+Ø)"ARE YOU SURE YOU WISH TO PRI
NT THESE"
526Ø GOSUB 719Ø
5265 IF IK$="Y" THEN 528Ø
527Ø IF IK$="N" THEN GOTO 5ØØØ
5275 GOTO 526Ø
528Ø CLS
5285 PRINT"WORKING .";
529Ø GOSUB 6ØØØ
5295 FOR T=1 TO LOF(1)
53ØØ IF S(T)=1 THEN 53Ø5 ELSE 53
65
53Ø5 POKE (HI-1),Ø:GET #1,T
531Ø F=Ø:TF=Ø:POKE (HI-1),Ø
5315 TF=TF+1:CC$=MID$(DY$,TF,1):
IF CC$=CHR$(32) THEN F=F+1
532Ø IF TF=25 OR F=2 THEN 533Ø
5325 GOTO 5315
533Ø IF TF=25 THEN T$=DY$ :GOTO
5335 ELSE T$=LEFT$(DY$,TF)
5335 PRINT#-2,DN$
534Ø PRINT#-2,DA$
5345 PRINT#-2,T$;", ";DS$
535Ø PRINT#-2,DZ$
5355 IF PC=1 THEN EL=EL-1:PRINT#
-2,DO$
536Ø FOR TT=1 TO EL:PRINT#-2," "
:NEXT TT
5365 NEXT T
537Ø POKE (HI-1),Ø:CLOSE #1:POKE
```

```
 HI,Ø
5375 GOTO 12
538Ø '
5385 '
539Ø '-- END OF PRINT ROUTINE --
6ØØØ '-- START OUTPUT ROUTINE --
6ØØ5 CLOSE#1:POKE (HI-1),Ø:LOCAT
E Ø,2Ø:ATTR 3,Ø,B:PRINTTAB(TB+6)
"PLEASE WAIT - ACCESSING DISK";:
ATTR 1,Ø:OPEN "D",#1,"MAILER.FIL
:Ø",166
6Ø1Ø FIELD #1, 1Ø AS DC$,25 AS D
N$,25 AS DA$,25 AS DY$,1Ø AS DS$
,7 AS DZ$,14 AS DT$,25 AS DF$,25
 AS DO$:LOCATE Ø,2Ø:PRINT:RETURN
6Ø15 LSET DC$=V$(1):LSET DN$=V$(
2):LSET DA$=V$(3):LSET DY$=V$(4)
:LSET DS$=V$(5)
6Ø2Ø LSET DZ$=V$(6):LSET DT$=V$(
7):LSET DF$=V$(8):LSET DO$=V$(9)
6Ø25 NR=LOF(1)+1
6Ø3Ø POKE (HI-1),Ø:PUT #1,NR:POK
E HI,Ø
6Ø35 POKE (HI-1),Ø:CLOSE #1:POKE
 HI,Ø
6Ø4Ø LOCATE Ø,2Ø:PRINT
6Ø45 RETURN
61ØØ '-- HEADER SUBROUTINE --
61Ø5 CLS:ATTR 1,Ø:PRINTSTRING$(4
Ø+TB+TB,"*"):PRINTTAB(TB+12);:AT
TR 3,3:PRINT" The Post Office ";
:ATTR 1,Ø:PRINT:PRINT:PRINTSTRIN
G$(4Ø+TB+TB,"*"):LOCATE Ø,9:RETU
RN
62ØØ '-- HEADERS SUB-ROUTINE --
62Ø5 LOCATE Ø,7
621Ø PRINTTAB(TB+1Ø)"<1>. Code
          ONLY"
6215 PRINTTAB(TB+1Ø)"<2>. Name
          ONLY"
622Ø PRINTTAB(TB+1Ø)"<3>. Addres
s         ONLY"
6225 PRINTTAB(TB+1Ø)"<4>. City
          ONLY"
623Ø PRINTTAB(TB+1Ø)"<5>. State
          ONLY"
6235 PRINTTAB(TB+1Ø)"<6>. Zip
          ONLY"
624Ø PRINTTAB(TB+1Ø)"<7>. Teleph
one       ONLY"
6245 PRINTTAB(TB+1Ø)"<8>. First/
Last      ONLY"
625Ø PRINTTAB(TB+1Ø)"<9>. Countr
y         ONLY":PRINT:PRINTTAB(
TB)"Default-> <Ø>. ANY OF THE AB
OVE":RETURN
6255 'SUB ROUTINE 2
626Ø PRINTTAB(TB+TZ)"       CODE
:";DC$
6265 PRINTTAB(TB+TZ)"       NAME
```


R.A.D. Products
194 Hotchkiss Street
Jamestown, NY 14701
(716) 665-2124

R.A.D. Products Presents TEXTFORM

Finally, a versitile text formatter is available for the Color Computer. TEXTFORM is compatible with all models with at least 64K, even the Color Computer III. This machine language program will format ASCII text files into two column pages quickly and easily. Text may be left unmodified, or simply insert special formatter commands for added control. TEXTFORM is a versitile enhancement to any word processing system whether you are a casual or professional user.

Software supports:
- Output to printer or disk
- Most popular printers
- Adjustable format parameters
- Columnar data
- Multiple page titles
- Optional page numbering
- Large files (up to a full disk)

TEXTFORM comes with complete documentation as well as sample format examples. Onscreen parameter display takes the guesswork out of format settings. Customized parameters may be saved to disk and reloaded for future use, thus eliminating mistakes and configuration time. Special printer codes and baud rate settings are software selectable. TEXTFORM is programmed in a high resolution environment which incorporates pull-down menus for ease of use. The software also supports auxiliary peripheral input from joysticks, mouse, touchpad, and high resolution input pack for added program control.

This is not another word processor. There are many fine word processors on the market for the Color Computer. TEXTFORM is a user defineable two column text formatter. If you are looking for a program which will allow your Color Computer to create professional looking documents without hours of tedious work, then TEXTFORM is the answer.

Ideal for:
- School newspapers
- Club newsletters
- Business reports
- Bulletins
- Advertisements
- Program listings
- And much more...

System requirements:
- Color Computer (64K minimum)
- Disk drive
- Printer

TEXTFORM.....$34.95

RAINBOW CERTIFICATION SEAL

R.A.D. Products
194 Hotchkiss St.
Jamestown, NY 14701
(716) 665-2124

Terms: Check, Money Order, C.O.D.
NY residents add 7% sales tax
C.O.D. orders add $3.00
All orders add $3.00 for shipping
All orders shipped within 24-48 hours
Express shipping available by request

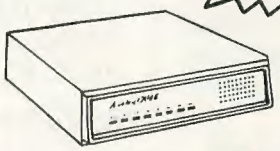
CINSOFT
PROGRAMS • PERIPHERALS • SUPPLIES • SERVICE

Fast Delivery...
Friendly Service

Now in our 6th year!

Avatex 1200e

NEW FOR '88



- *FULLY* Hayes compatible
- Internal speaker
- New compact size
- 2-year Warranty

Avatex 1200e with Coco Cable $99 109

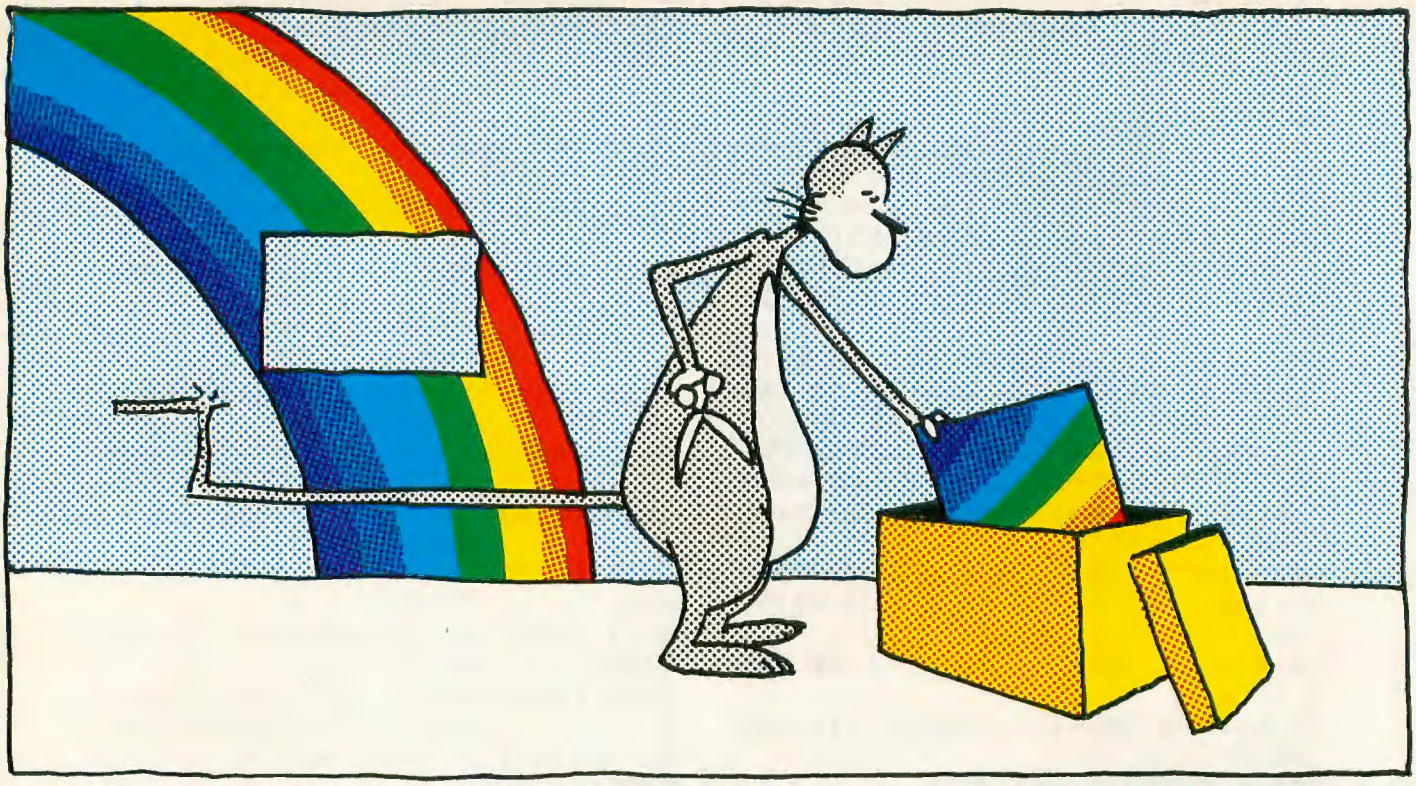
Avatex 1200e, cable AUTOTERM $139

• Call •
513-396-SOFT

• Shop by Modem •
513-396-SHOP

VISA MasterCard AMERICAN EXPRESS

2235 Losantiville, Cincinnati, OH 45237
SHIPPING will be charged at our ACTUAL COST
Ohio residents add 5.5% Sales Tax COD add 2.00



HOW DO YOU GIVE A RAINBOW?

It's simple — Give a RAINBOW gift certificate . . .

Let a gift subscription to THE RAINBOW carry the premier Color Computer magazine right to your friends' doorsteps. THE RAINBOW is *the* information source for the Tandy Color Computer.

Each month, your friends will enjoy the intelligent programs, reviews and articles written exclusively for their CoCo.

First, your gift will be announced in a handsome card. Then, all year 'round, they'll remember you and your thoughtfulness when they get each edition of THE RAINBOW — more than 200 pages loaded with as many as 24 programs, 15 regular columns and lots of helpful hints and tips.

Generosity benefits the giver, too. There'll be no more tracking down borrowed copies of THE RAINBOW. Your collection will be safe at home.

Give a RAINBOW gift certificate and let your friends in on the fun. THE RAINBOW is the perfect companion for the Color Computer!

Get your order to us by March 25 and we'll begin your friends' subscriptions with the May issue of RAINBOW.

Please begin a one-year (12 issues) gift subscription to THE RAINBOW for:

Name _____

Address _____

City _____ State _____ ZIP _____

From:

Name _____

Address _____

City _____ State _____ ZIP _____

☐ My payment is enclosed.

Bill to: ☐ VISA ☐ MasterCard ☐ American Express

Acct. # _____ Exp. date _____

Signature _____

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

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

Subscriptions to THE RAINBOW are $31 in the United States; U.S. $38 in Canada. The surface rate to other countries is U.S. $68; the air rate, U.S. $103. Kentucky residents add 5% sales tax. **U.S. currency *only*, please.** All subscriptions begin with the current issue. Please allow 6 to 8 weeks for delivery. In order to hold down non-editorial costs, we do not bill.

DIGISECTOR DS-69B

NEW

VIDEO DIGITIZER FOR THE COCO 3

(AND ALL OTHER COCOS . . .)

SUPER RESOLUTION !!!

COCO 3 SCREEN

USE YOUR COCO 3 TO ITS FULL POTENTIAL!
Use The Micro Works' DIGISECTOR™ DS-69 or DS-69B and your COCO 3's high resolution graphics to capture and display television pictures from your VCR or video camera. The DIGISECTOR™ systems are the only COCO video digitizers available that accurately capture and reproduce the subtle shades of gray in TV pictures!

- **COLOR:** Add color to your screen for dramatic special effects.
- **HIGH RESOLUTION:** 256 by 256 spatial resolution.
- **PRECISION:** 64 levels of grey scale.
- **SPEED!** 8 images per second on DS-69B, 2 images per second DS-69.
- **COMPACTNESS:** Self contained in a plug-in Rompack.
- **EASY TO USE:** Software on disk will get you up and running fast!
- **COMPATIBLE:** Use with a black and white or color camera, a VCR or tuner.
- **INEXPENSIVE:** Our low price puts this within everyone's reach.

POWERFUL C-SEE 3.3 SOFTWARE

This menu-driven software will provide 5 and 16 shades of gray to the screen and to the printer with simple joystick control of brightness and contrast. Pictures taken by the DIGISECTOR™ may be saved on disk by C-SEE 3.3 and then edited by our optional MAGIGRAPH, or by COCO MAX or GRAPHICOM. This versatile new software is included in both DIGISECTORS™

DS-69B and C-SEE 3.3	**$149.95**
DS-69 and C-SEE 3.3	**$ 99.95**

TRADE IN YOUR OLD DIGISECTOR™
If you already have one of The Micro Works' DS-69 or DS-69A DIGISECTORS™, you may return it to us and we will upgrade your unit to a DS-69B.

UPGRADE DS-69A to DS-69B	**$49.95**
UPGRADE DS-69 to DS-69B	**$69.95**

The DS-69B comes with a one year warranty. Cameras and other accessories are available from The Micro Works.

NO RISK GUARANTEE
If you are not completely satisfied with the performance of your new DS-69B, you may return it, undamaged, within ten days for a full refund of the purchase price. We'll even pay the return shipping. If you can get any of our competitors to give you the same guarantee, buy both and return the one you don't like. We know which one you'll keep.

THE MICRO WORKS

Purveyors of Fine Video Digitizers Since 1977.

Terms: Visa, Mastercard, Check or C.O.D.

P.O. Box 1110 Del Mar, CA 92014 (619) 942-2400

```
:";DN$
627Ø PRINTTAB(TB+TZ)"    ADDRESS
:";DA$
6275 PRINTTAB(TB+TZ)"       CITY
:";DY$
628Ø PRINTTAB(TB+TZ)"      STATE
:";DS$
6285 PRINTTAB(TB+TZ)"        ZIP
:";DZ$
629Ø PRINTTAB(TB+TZ)"TELEPHONE #
:";DT$
6295 PRINTTAB(TB+TZ)"   F,L NAME
:";DF$
63ØØ PRINTTAB(TB+TZ)"    COUNTRY
:";DO$
63Ø5 RETURN
64ØØ '-- SEARCH SUB-ROUTINE --
64Ø5 IF A=1 AND INSTR(DC$,SD$)>Ø
 THEN FL(2)=1:RETURN
641Ø IF A=2 AND INSTR(DN$,SD$)>Ø
 THEN FL(2)=1:RETURN
6415 IF A=3 AND INSTR(DA$,SD$)>Ø
 THEN FL(2)=1:RETURN
642Ø IF A=4 AND INSTR(DY$,SD$)>Ø
 THEN FL(2)=1:RETURN
6425 IF A=5 AND INSTR(DS$,SD$)>Ø
 THEN FL(2)=1:RETURN
643Ø IF A=6 AND INSTR(DZ$,SD$)>Ø
 THEN FL(2)=1:RETURN
6435 IF A=7 AND INSTR(DT$,SD$)>Ø
 THEN FL(2)=1:RETURN
644Ø IF A=8 AND INSTR(DF$,SD$)>Ø
 THEN FL(2)=1:RETURN
6445 IF A=9 AND INSTR(DO$,SD$)>Ø
 THEN FL(2)=1:RETURN
645Ø IF A=Ø AND INSTR(DC$,SD$)>Ø
 THEN FL(2)=1:RETURN
6455 IF A=Ø AND INSTR(DN$,SD$)>Ø
 THEN FL(2)=1:RETURN
646Ø IF A=Ø AND INSTR(DA$,SD$)>Ø
 THEN FL(2)=1:RETURN
6465 IF A=Ø AND INSTR(DY$,SD$)>Ø
 THEN FL(2)=1:RETURN
647Ø IF A=Ø AND INSTR(DS$,SD$)>Ø
 THEN FL(2)=1:RETURN
6475 IF A=Ø AND INSTR(DZ$,SD$)>Ø
 THEN FL(2)=1:RETURN
648Ø IF A=Ø AND INSTR(DT$,SD$)>Ø
S$=MID$(S$,1,LEN(S$)-1):GOTO 663
Ø
665Ø IF IK$=CHR$(13) OR IK$=CHR$
(1Ø)  THEN GOTO 668Ø
6655 IF P=M-1 THEN 663Ø
666Ø P=P+1
6665 S$=S$+IK$:LOCATE P,R:ATTR 3
,Ø:PRINT IK$;:ATTR 1,Ø
667Ø IF P=M-1 THEN LOCATE P+1,R:
PRINT"  ";:SOUND 1,1:GOTO 663Ø
6675 GOTO 663Ø
668Ø IF S$<>"" THEN P=P+1:LOCATE
 P,R:PRINT
6685 RETURN
669Ø GOSUB 719Ø
6695 GOSUB 6ØØØ
67ØØ DC$=CO$:LSET B$=NA$:LSET C$
=AD$:LSET D$=CI$:LSET E$=ST$:LSE
T F$=ZI$:LSET G$=TE$:LSET H$=FL$
:LSET I$=CN$
67Ø5 NR=LOF(1)+1
671Ø POKE (HI-1),Ø:PUT #1,NR:POK
E HI,Ø
6715 POKE (HI-1),Ø:CLOSE #1:POKE
 HI,Ø
672Ø RETURN
6725 POKE (HI-1),Ø:POKE 113,Ø:EX
EC 4Ø999:'<-- BREAK OUT FROM MAI
N MENU
673Ø PCLEAR 1:RUN 11
7ØØØ '-- BEGINNING OF INPUT LOOP
 --
7Ø05 LOCATE C,R:PRINTV$(VN):LOCA
TE C+L,R:PRINT:GOSUB 66Ø5
7Ø1Ø IF S$<>"" THEN V$(VN)=S$
7Ø15 IF UA=1 THEN 7Ø25
7Ø2Ø RETURN
7Ø25 UA=Ø
7Ø3Ø IF S$<>"" THEN V$(VN)=S$
7Ø35 GU=1:RETURN
7Ø4Ø IF FL(3)=2 THEN FL(3)=Ø:RET
URN:'<-- ZIP CODE LOOKUP MODULE
7Ø5Ø POKE (HI-1),Ø:OPEN "D",#2,"
ZIPCODES.FIL",42
7Ø55 FIELD #2, 25 AS ZC$,1Ø AS Z
S$,7 AS ZZ$:IF LOF(2)=Ø THEN CLO
SE #2:LOCATE Ø,2Ø:PRINT:GOTO 7Ø9
5
7Ø6Ø FOR T=1 TO LOF(2)
7Ø65 POKE (HI-1),Ø:GET #2,T:POKE
 HI,Ø
7Ø7Ø BS=25-LEN(T1$):T$=STRING$(B
S," ")
7Ø75 T1$=T1$+T$
7Ø8Ø IF ZC$=T1$ AND INSTR(ZS$,T2
$)>Ø THEN V$(6)=ZZ$:POKE (HI-1),
Ø:LOCATE Ø,2Ø:PRINT:CLOSE #2:POK
E HI,Ø:RETURN
7Ø85 NEXT T
7Ø9Ø CLOSE #2
7Ø95 V$(6)=""
71ØØ AD(1)=1
71Ø5 RETURN
711Ø '-- ADD ZIP CODE TO FILE --
7115 POKE HI-1,Ø:OPEN "D",#2,"ZI
PCODES.FIL",42
712Ø FIELD #2,25 AS ZC$,1Ø AS ZS
$,7 AS ZZ$
7125 NR=LOF(2)+1
713Ø LSET ZC$=T1$:LSET ZS$=T2$:L
SET ZZ$=V$(6)
7135 PUT #2,NR
714Ø CLOSE #2:POKE HI,Ø
7145 RETURN
```

See p. 130, APPLE PB for missing ASM lines 6485 - 6645.

```
715Ø '
7155 IF FL(3)=1 AND LEN(V$(4))=Ø
 OR LEN(V$(5))=Ø THEN FL(3)=2:RE
TURN
716Ø IF FL(3)=1 THEN CV$=V$(4):G
OSUB 7165:T1$=CV$:CV$=V$(5):GOSU
B 7165:T2$=CV$:FL(3)=Ø:RETURN
7165 FOR L=1 TO LEN(CV$)
717Ø LX$=MID$(CV$,L,1):LX=ASC(LX
$)
7175 IF LX>9Ø AND LX<123 THEN LX
=LX-32:MID$(CV$,L,1)=CHR$(LX)
718Ø NEXT L
7185 RETURN
719Ø '-- INKEY STRING SUB-ROUTIN
E --
7195 IK$=INKEY$:IF IK$="" THEN 7
195
72ØØ IF KK=1 THEN SOUND 2ØØ,1
72Ø5 RETURN
721Ø IF ERNO=26 AND ERLIN=434Ø T
HEN CLS:GOSUB 61ØØ:LOCATE Ø,12:P
RINTTAB(TB)"** LETTER FILE REQUE
STED  NOT PRESENT **":LOCATE Ø,2
Ø:PRINTTAB(TB+5)"** PRESS ANY KE
Y TO CONTINUE **":GOSUB 719Ø:GOT
O 12
7215 IF ERNO=2Ø AND ERLIN=6ØØ5 T
HEN GOSUB 61ØØ:LOCATE Ø,12:PRINT
TAB(TB+Ø)"** FILE: MAILER.FIL  H
AS AN I/O ERROR **":LOCATE Ø,2Ø:
PRINTTAB(TB+5)"** PRESS ANY KEY
TO CONTINUE **";:GOSUB 719Ø:GOTO
 12
722Ø IF ERNO=2Ø AND ERLIN=12 THE
N GOSUB 61ØØ:LOCATE Ø,12 :PRINTT
AB(TB+Ø)"** IO ERROR ON DATA DIS
K PLEASE CHECK **":LOCATE Ø,2Ø:P
RINTTAB(TB+5)"** PRESS ANY KEY T
O CONTINUE **";:GOSUB 719Ø:GOTO
12
7225 IF ERNO=2Ø AND ERLIN=9545 T
HEN GOSUB 61ØØ:LOCATE Ø,12:PRINT
TAB(TB)  "** IO ERROR IN FILE ZI
PCODES  PLZ CHK **":LOCATE Ø,2Ø:
PRINTTAB(TB+5)"** PRESS ANY KEY
TO CONTINUE **";:GOSUB 719Ø:GOTO
 12
723Ø IF ERNO=26 AND ERLIN=4355 T
HEN GOSUB 61ØØ:LOCATE Ø,12:PRINT
TAB(TB+2)"* NO LETTER FILE PRESE
NT ON DISK * ";:GOSUB 719Ø:GOTO
12
7231 IF ERNO=26 AND ERLIN=436Ø T
HEN 2Ø
7235 STOP
724Ø A$=INKEY$:IF A$="" THEN 724
Ø
```


Clearbrook Software Group

ERINA – Symbolic User-mode Debugger for OS9 is a must for serious assembler and C programers. ERINA helps to find bugs quickly by displaying the machine state and the instruction being executed. Set address and register break points, assemble and disassemble code, dump, search, and change memory, and much more! This program pays for itself over and over!

SERINA – System-mode Debugger for OS9 Level 2 is invaluable when developing OS9 System Modules (device drivers, file managers, etc.). Trace execution, set break points, assemble and disassemble code, examine/change memory and much more. SERINA has special provisions for debugging code with critical timing loops. A must for system programmers!

MSF – MS-DOS File Manager for CoCo3/OS9L2 allows you to read/write MS-DOS format diskettes while running OS9. No need for complex data conversions!

ERINA (requires 80 col. display, OS9 L1/2 .....$69.00
SERINA (call for requirements) $139.00
MSF (requires CoCo3, OS9L2, SDISK3 driver) $45.00
MSF with SDISK3 driver $65.00

CSG IMS Information Management System
Full-featured database manager for CoCo/OS9 .....$169.95
Shipping – N. America: $5, Overseas: $10.

Clearbrook Software Group, Inc.
U.S.: P.O. Box 8000-499, Sumas, WA 98295
CANADA: P.O. Box 8000-499, Abbotsford, B.C. V2S 6H1
Phone: (604)853-9118

OS9 is a trademark of Microware Systems Corp.,
MS-DOS is a trademark of Microsoft Corp.

MasterCard VISA

$UPER $ALE!

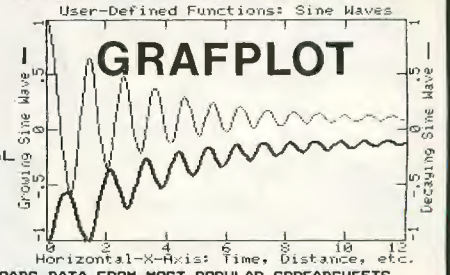
40% TO 33% OFF!!

GREAT VALUES
ORDER NOW!!

COMPATIBLE
WITH COCO 3

30 DAY
UNCONDITIONAL
MONEY-BACK
GUARANTEE!!

RAINBOW CERTIFICATION SEAL



* AUTOMATICALLY LOADS DATA FROM MOST POPULAR SPREADSHEETS.
* 291 GRAPHING SYMBOLS AND UNLIMITED OVERLAY OF DATA.
* AUTOMATICALLY SCALES AND LABELS ALL THREE OF THE AXES.
* CALCULATES MATH FUNCTIONS, INTEGRALS AND MOVING AVERAGES.
* FULLY AUTOMATIC, MENU DRIVEN W/ COMPLETE ERROR TRAPPING.
* FULL-PAGE SCREENPRINTS ON ANY PRINTER: SPECIFY WITH ORDER.

REQUIRES 32K EXT. BASIC: TAPE - ~~$40.00~~ $25.00 DISK - ~~$45.00~~ $30.00

NEW!! PRINTER *Picture Perfect* NEW!! UTILITY

UNIVERSAL SCREENPRINT PROGRAM

* COMPATIBLE WITH COCO III!!
* "PERFECTLY SIMPLE" TO OPERATE - "SIMPLY PERFECT" RESULTS!
* "PERFECTLY COMPATIBLE" WITH ALL DOT MATRIX PRINTERS!
* GET "PERFECT CONTROL" OF: HEIGHT, WIDTH, POSITION, BAUD RATE, DOT DENSITY, NEGATIVE IMAGES, ETC.
* THE "PERFECT SOLUTION" TO YOUR GRAPHICS PRINTING NEEDS!
* COMPATIBLE WITH GRAPHICOM AND COCO MAX PICTURES!

ONLY ~~$20.00~~ $15.00 ON DISK OR TAPE

SEND CHECK OR MONEY ORDER TO:
HAWKES RESEARCH SERVICES: 859 STANFORD AVE, OAKLAND, CA 94608
FOR FREE INFORMATION IN THE MAIL, CALL: (415) 547-7557
YOUR PERSONAL CHECK IS WELCOME! SHIPMENT WITHIN 48 HOURS!
ADD $3.00 SHIPPING ON ALL ORDERS. CA. RESIDENTS ADD SALES TAX

We Cannot Tell A Lie

Lonnie's gone nuts!! He's chopped down prices on Rainbow Bookshelf items!

The Complete Rainbow Guide to OS-9

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

SAVE 38%! Book and disks only $29.95

The Rainbow Book of Simulations

20 award-winning entries from THE RAINBOW's first Simulations contest. You are a Civil War Commander, an air traffic controller, a civil defense coordinator, or a scientist on Mars . . . your wits are on the line.
Book $3.50, Tape $3.50 — a savings of 65%!

SAVE 70%! Book and tape only $6

The Second Rainbow Book of Simulations

The 16 winners from our second Simulations contest. Fly through dense African jungle, bull your way down Wall Street, lead a bomb squad, or try your hand at Olympic events. Test your skills and talents.
Book $4.95, Tape or Disk $4.95 — a 50% savings!

SAVE 55%! Book and tape only $8.95
SAVE 57%! Book and disk only $8.95

SAVE UP TO 70%

The First Rainbow Book of Adventures

Contains 14 winning programs from our first Adventure contest. Includes *Sir Randolph of the Moors, Horror House, One Room, Dr. Avaloe* and more. Plus hints, tips on solving Adventures.
Book $2, Tape $2 — a 43% savings!

SAVE 50%! Book and tape only $3.50

The Second Rainbow Book of Adventures

Featuring 24 of the most challenging Adventure games ever compiled. Meet the Beatles and battle the Blue Meanies, find a hidden fortune, or win the heart of a mysterious princess. *Ring Quest, Secret Agent Man, Dark Castle, Curse of Karos* and more!
Book $6.95, Tape $6.95 — a 50% savings!

SAVE 57%! Book and tape only $11.95

The Third Rainbow Book of Adventures

The excitement continues with 19 new Adventures. Discover backstage intrigue at the London Theatre, attempt a daring space rescue, or defeat evil in the year 2091 as a genetic android. *Evil Crypt, Spymaster, Time Machine, The Amulet*, and that's only the beginning!
Book $6.95, Tape $6.95, Two-Disk Set $7.95 — a savings of up to 47%!

SAVE 45%! Book and tape only $11.95
SAVE 52%! Book and disk only $12.95

The Rainbow Introductory Guide to Statistics

Dr. Michael Plog and Dr. Norman Stenzel give a solid introduction to the realm of statistical processes and thinking for both the beginner and the professional. (80-column printer required.)
Book $2.95, Tape or Disk $2.95 — a savings of 54%!

SAVE 62%! Book and tape or disk only $4.95

Name _____
Address _____
City _____
State _____ ZIP _____
☐ Payment Enclosed, or ☐ Charge to:
☐ VISA ☐ MasterCard ☐ American Express
Account Number _____
Card Expiration Date _____
Signature _____

Please send me:

☐ **The Rainbow Book of Simulations** (first)	~~$ 9.95~~ $ 3.50	
☐ Rainbow Simulations Tape(first)	~~$ 9.95~~ $ 3.50	
☐ First Simulations Package	~~$19.90~~ ~~$11.95~~ $ 6.00	
☐ **The Second Rainbow Book of Simulations**	~~$ 9.95~~ $ 4.95	
☐ Second Rainbow Simulations Tape	~~$ 9.95~~ $ 4.95	
☐ Second Rainbow Simulations Disk	~~$10.95~~ $ 4.95	
☐ Second Simulations Package with Tape	~~$19.90~~ ~~$12.95~~ $ 8.95	
☐ Second Simulations Package with Disk	~~$20.90~~ ~~$13.95~~ $ 8.95	
☐ **The Complete Rainbow Guide to OS-9**	~~$19.95~~ ~~$16.95~~ $12.95	
☐ Rainbow Guide to OS-9 Disk Set (2 disks)	~~$31.00~~ $19.95	
☐ Rainbow Guide to OS-9 Package	~~$47.95~~ ~~$36.95~~ $29.95	
☐ **The Windows & Applications Disk for** The Complete Rainbow Guide to OS-9 Level II, Vol. I	$19.95	
☐ **The Rainbow Book of Adventures** (first)	~~$ 7.95~~ ~~$ 3.50~~ $ 2.00	
☐ Rainbow Adventures Tape (first)	~~$ 7.95~~ ~~$ 3.50~~ $ 2.00	
☐ First Adventure Package	~~$15.90~~ ~~$ 7.00~~ $ 3.50	
☐ **The Second Rainbow Book of Adventures**	~~$13.95~~ $ 6.95	
☐ Second Rainbow Adventures Tape	~~$13.95~~ $ 6.95	
☐ Second Adventure Package	~~$27.90~~ ~~$17.95~~ $11.95	
☐ **The Third Rainbow Book of Adventures**	~~$11.95~~ $ 6.95	
☐ Third Adventures Tape	~~$ 9.95~~ $ 6.95	
☐ Third Adventures Disk Set (2 disks)	~~$14.95~~ $ 7.95	
☐ Third Adventure Package with Tape	~~$21.90~~ ~~$15.95~~ $11.95	
☐ Third Adventure Package with Disk	~~$26.90~~ ~~$16.95~~ $12.95	
☐ **Introductory Guide to Statistics**	~~$ 6.95~~ $ 2.95	
☐ Guide to Statistics Tape or Disk (indicate choice)	~~$ 5.95~~ $ 2.95	
☐ Guide to Statistics Package (indicate choice of tape or disk)	~~$12.90~~ ~~$ 8.95~~ $ 4.95	
Add $1.50 per book Shipping and Handling in U.S.		
Outside U.S., add $4 per book		
Kentucky residents add 5% sales tax		
(Allow 6 to 8 weeks for delivery)	Total	

Mail to: Rainbow Bookshelf, The Falsoft Building, P.O. Box 385, Prospect, KY 40059. To order by phone (*credit card orders only*) call (800) 847-0309, 8 a.m. to 5 p.m. EST. For other inquiries call (502) 228-4492.

Please note: The tapes and disks offered by The Rainbow Bookshelf are not stand-alone products. That is, they are intended to be an adjunct and complement to the books. Even if you buy the tape or disk, you will still need the appropriate book for loading and operating instructions. OS-9® is a registered trademark of the Microware Systems Corporation.

War under the waves

Sub Search

By Steven Sward

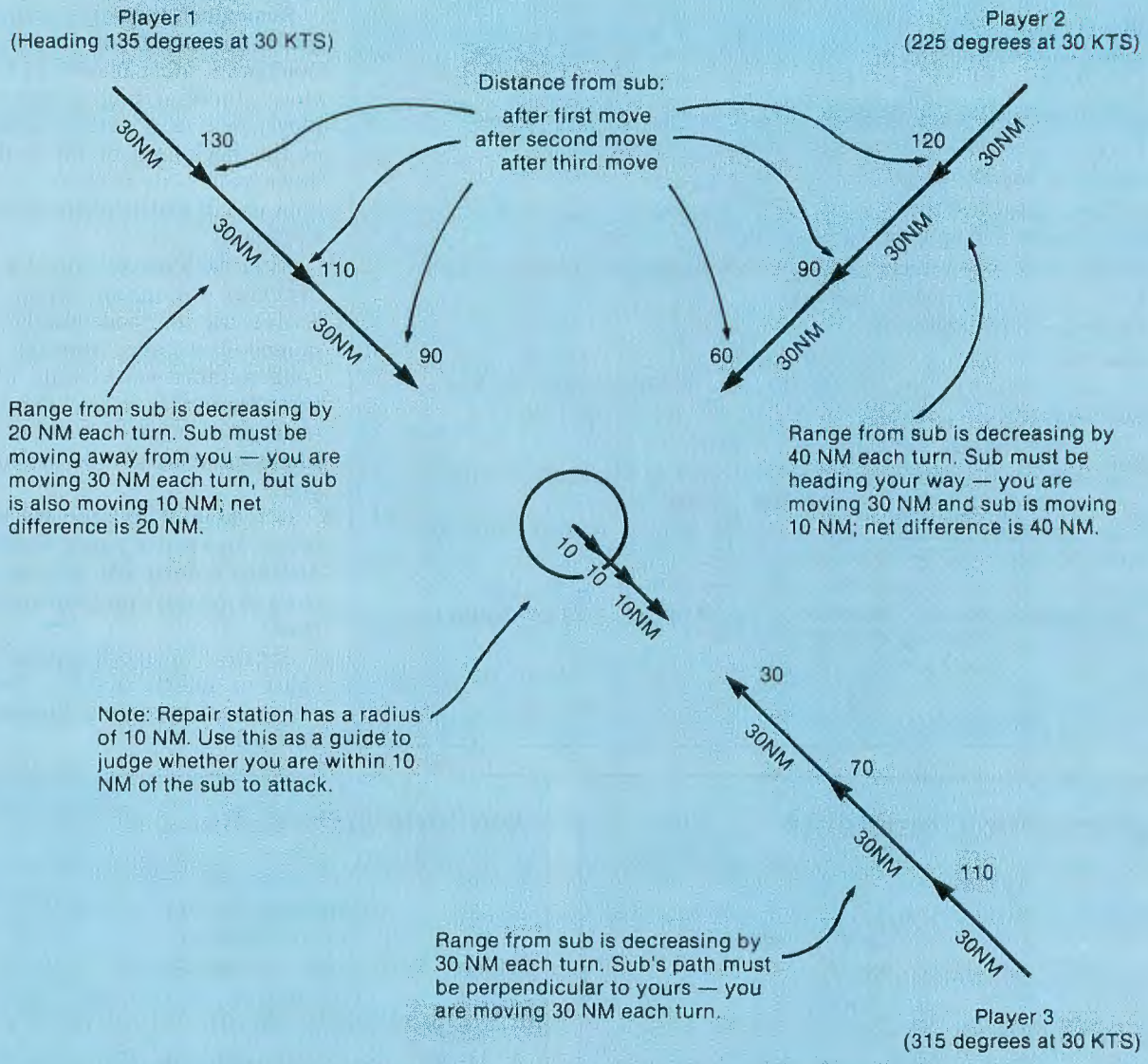
Sub Search is a challenging game of strategy for one to four players. Each player is the captain of a SPRUANCE class destroyer equipped with ASROCs (anti-submarine rockets). Your mission is to track down the enemy sub, approach to within 10 nautical miles (NM) and fire an ASROC set to the correct depth.

Your destroyer receives "Distance Only" information on the enemy sub. You must use this information to determine the sub's track and depth. The sub travels at 10 nautical miles per hour (10 knots) with a randomly selected depth (speed and depth remain constant throughout the game). The sub changes its course every seven to nine moves or any time it hits the reef (boundary) surrounding the playing area.

You select your destroyer's course (001 to 360 degrees) and speed (0 to 30 knots). Each ship has four ASROCs and two launchers. ASROCs have an effective range of 10 NM and a depth "kill zone" of plus or minus 25 feet.

Steve Sward is a major in the U.S. Air Force and is currently stationed at Castle AFB. He has been a Color Computer enthusiast since 1980. Steve, his wife, Carla, and their three children live in Merced, California.

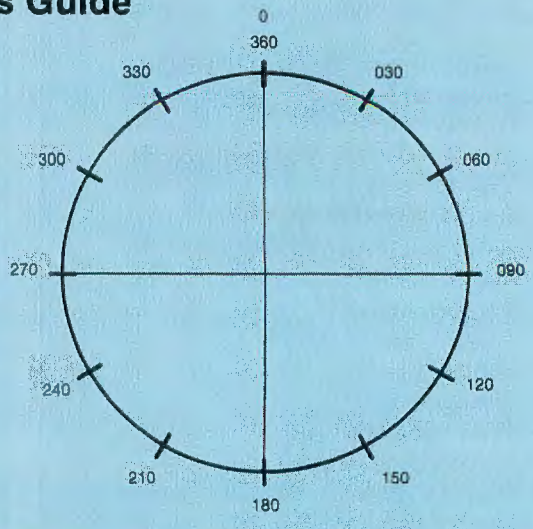
Sample Situation After Three Moves



If your ship is within 10 NM of the sub, and the sub is either 25 feet above or below the depth setting of your ASROC — you win! However, if you attack the sub within 10 NM but miss with the depth setting, the sub will reattack with a torpedo. To repair damage caused by torpedoes or to restock your supply of ASROCs, head for the red repair station in the center. Should you attack the sub farther than 10 NM away, nothing will happen; the sub will not retaliate — you will simply have wasted one or two missiles.

There are two difficulty options. The first option displays the sub's path, which is useful in becoming familiar with the game. The second option is the same except that the sub's path is concealed. When the sub is finally destroyed under Option 2, its path will

Compass Guide



Up and Running

1) Run program
2) Title page/instructions
3) Input number of players (1 to 4)
4) Select game difficulty (1=easy; 2=hard)
5) Copy your secret distance code number
6) Copy sub "depth range"
7) Status of your destroyer
8) Playing screen (repair station in center)
9) Press ENTER when ready to enter ship's course and speed
10) Enter course (001 to 360 degrees)
11) Enter speed (0 to 30 KTS)
12) Your new position is now >>>flickering<<<
13) Decide whether to attack sub (Y or N). (Must be within 10 NM to succeed)
14) If you didn't attack, write down your distance report
15) If you attacked, choose number of rockets and set depth — ASROC has kill zone of plus or minus 25 feet (50 feet total)
16) If you attacked and your distance codes appear, you missed! (You were not within 10 NM of the sub.)
17) If the sub fires a torpedo, you were close enough (10 NM) but your depth setting was off. (Remember, sub does not change depth, so don't duplicate that depth setting again!)

be displayed for the curious. For the frustrated, there is an "I Give Up" feature, which will also display the sub's depth and path.

Remember, the only information you get is distance from the sub. As you don't want other players to know how close you're getting to the sub, each player receives a distance code number at the beginning of the game. Copy down your code number (1 to 10) on your pad of paper, and don't let anyone else see it!

After each player's turn, a list of 10 distances will appear. When your turn is over, use your code number to determine your distance from the sub. Your code number works only after your turn. *Do not* try to use the information from another player's list of 10 codes (these numbers will be meaningless to you).

It is helpful to keep track of your moves on a pad of paper. Analysis of the distance reports will provide valuable clues to the sub's position and heading/track.

See the "Up and Running" reference chart to quickly step you through the motions of becoming captain of your destroyer. □

Program Line Comments

10-30	Title page
40-110	Instructions
120-170	Game setup/initialize variables
180	Begin new turn
190	"I GIVE UP" option
200-220	Control sub path
240	Next player's turn begins
250-310	Display ship position and input new course and speed
320-800	Determine ship position given course and speed
750-760	End of turn
840-900	Check to see if you hit reef or repair station
910-960	Display ship status
980-1010	Figure distance between attacking ship and sub
1020-1040	Sound of missile launching
1050-1100	Ask if you want to attack sub
1110-1210	Attack sequence
1220-1300	Torpedo attack
1320-1350	Assign each player a "code number"
1430-1440	Win sequence
1450-1480	Draw sub path
1520	End of game loop
1530	Designs screen

Variable Descriptions

A3	= Game difficulty level
D	= Max depth for sub
DD	= Actual sub depth
DR	= Course in degrees
DS	= Direction of sub (degrees)
KE(4)	= "Code number" for each player
MD(2)	= ASROC depth setting
ML(4)	= Missile launchers operational (2 max)
MS(4)	= Missiles left (4 max)
MR	= Moves before sub changes course (7 to 9)
MV	= Counts sub moves
P	= Current player number
P4	= Number of players in game
PR(4)	= Speed available (30 KTS max)
SD	= Distance between sub and ship
SP	= Speed
T	= Turn
TT	= Total turns (100 max)
X(4,5)	
Y(4,5)	= Stores ship's last 4 moves
XS(102)	
YS(102)	= Stores sub's entire route

Frank Hogg Laboratory

12 Years of Service, Support, and Friendly Help!

DISCOUNT PRICE LIST

SOFTWARE

CoCo OS9 Level II w/512K *

The Wiz	$79.95	69.95
Communications software for CoCo 3		
Sculptor (BIG SALE!!!)	$450.00	**149.00**
Database - 4th generation language		
DynaStar	$150.00	100.00
The easiest to use word processor for the CoCo 3 with OS9!		
DynaSpell spelling checker	$94.50	45.00
by Dale Puckett		
Font Editor	$29.95	25.00
Super Sleuth disassembler	$50.00	40.00
Utilix utilities set	$49.95	40.00
UniCharger Unix like utilities	$150.00	75.00
Level I OS9 (Limited quan.)	$69.95	40.00
Basic09 (Limited quan.)	$100.00	50.00
DYNACALC Spreadsheet	$99.95	85.00
FBU Fast Hard disk Back Up	$150.00	75.00
Ramdisk	$29.95	27.00

BOOKS

Inside OS9 Level II	$39.95	29.95
Basic09 Tour Guide (Limited)	$18.95	15.00
Starting Forth (Limited)	$18.95	15.00

HARDWARE

COCO HARD DRIVE SYSTEMS

20 Meg High Speed System Complete	**$799.00**
40 Meg High Speed System Complete	**$899.00**

HARD DRIVES (5.25" HALF HEIGHT)

MiniScribe High Quality Drives - 1 Year Warr.			
M3425+	21.4MB 53MS	$395.00	281.00
M3438	32.7MB RLL 55MS	$415.00	291.00
M3650	41.9MB 61MS	$455.00	376.00
M3053	44.6MB 25MS	----	711.00
M6085	71.3MB 28MS Full Height	----	975.00

Hard Drive Controllers

Western Digital WD 1002-05	$289.00	210.00
(For FHL High Speed Hard Disk Interface)		
Adaptec 4000 SCSI/SASI	---	162.00
Adaptec 4070 SCSI/SASI RLL	---	162.00
(For Owl and Disto interfaces)		

CoCo Hard Drive Interfaces

FHL HCA/WD High Speed Interface	$160.00	119.00
(Uses WD 1002-05 above, with software)		
L&R Interface for SASI	---	119.00
(Uses Adaptec 4000 or 4070 above, with software)		
Disto (Uses Adaptec 4000 above, with software)		199.00

DISK DRIVES (5.25" and 3.5" FLOPPY DISKS)

TEAC High Quality Drives - 1 Year Warr.		
FD55B 360K 40 Track DS 5.25"	---	118.00
FD55F 720K 80 Track DS 5.25:	---	151.00
FD35F 720K 80 Track DS 3.5"	---	147.00

DISK DRIVE CASES

Dual Half Height Floppy Case w/PS	---	75.00
XT with AT aspect with 150 Watt PS	---	125.00
Hard Drive case with PS and Fan	100.00	to 170.00

CABLES

ST506 Hard disk to controller, set 2	---	28.00
SASI 3' Inline to Inline	---	25.00
FHL HCA/WD 40 Pin Card edge 4'	---	25.00
FHL HCA/WD 34 Pin Card edge 4'	---	25.00

PRINTERS

Star micronics		
ND10 10" carriage 180CPS Draft	$499.00	332.00
NX15 15" carriage 120CPS Draft	$499.00	374.00
NB15 15" carriage 300CPS Draft	$1399.00	945.00
Panasonic		
P1080i 144CPS Draft	$269.00	198.00
P1092i 240CPS Draft	$499.00	392.00
Canon Laser Beam	$2750.00	1943.00

MODEMS

Packard Bell		
PB1200+ 300/1200	$199.00	129.00
PB2400EM 2400 baud	$595.00	256.00
US Robotics		
Courier 2400 auto error correction	$699.00	544.00

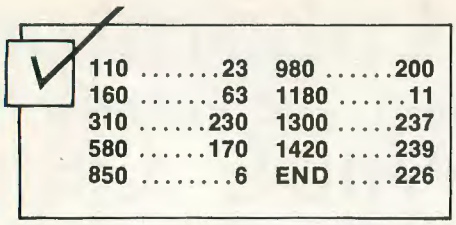
TERMINALS

QUME		
QVT 101G	---	384.00
QVT 101 Plus	---	396.00
QVT 119 Plus	---	540.00
Wyse		
WY-30	---	390.00
WY-50	---	482.00
WY-350 Color	---	968.00
WY-60 with keyboard	---	529.00

ORDERING INFORMATION VISA, M/C and AMEX. NY residents add 7% sales tax. US shipping add $3.50. Please call for Air Express shipping. Send for FREE FHL NewsLetter and catalog.

*** Most of our software requires OS9 LII and 512K.**

Frank Hogg Laboratory, Inc.
770 James Street - Syracuse, NY 13203
Telex 646740 - FAX 315/474-8225
Call 315/474-7856



110	23	980	200
160	63	1180	11
310	230	1300	237
580	170	1420	239
850	6	END	226

The listing: SUBSERCH

```
1Ø R=RND(-TIMER):CLEAR1ØØ:DIMX(4
,5),Y(4,5),MS(4),ML(4),PR(4),XS(
1Ø2),YS(1Ø2):CL$=CHR$(128)+CHR$(
128)+CHR$(128)
2Ø CLS(Ø):PRINT@74," 'SUB SEARCH
' ";:PRINT@112,"BY";:PRINT@138,"
 STEVE SWARD ";:PLAY"T1P1":PRINT
@76,CL$;
3Ø FORW=1TO2Ø:R=RND(5ØØ):PRINT@R
,"sub";:PLAY"T17ØV15O1;A;A#;A-;O
5;A;A#;A-;T2P6":PRINT@R,CL$;:NEX
T
4Ø CLS(3):PRINT"MISSION: DESTROY
 ENEMY SUBMARINE";:PRINT@4Ø,"*SP
EED: 1ØKTS  ";:PRINT@72,"*DEPTH:
 UNKNOWN";
5Ø PRINT@128,"FORCE:1 SPRUANCE C
LASS DESTROYER";:PRINT"*EQUIP  :
 SONAR (DISTANCE ONLY)":PRINT"*S
PEED  : Ø TO 3Ø KTS":PRINT"*HEAD
ING: ØØ1 TO 36Ø DEGREES"
6Ø PRINT"*WEAPONS: 4 ASROCS":PRI
NT@296,"*RANGE: 1ØNM":PRINT@328,
"*DEPTH SETTING: MUST BE":PRINT@
36Ø," WITHIN 25 FT OF SUB"
7Ø PRINT@48Ø,"...HIT <ENTER>";:L
INEINPUTA$
1ØØ CLS(4):PRINT"SUB STARTS IN C
ENTER...COURSE  CHANGES EVERY 7
-9 TURNS.":PRINT:PRINT"EACH PLAY
ER STARTS IN A CORNER.":PRINT:PR
INT"TO REPAIR AND REARM SHIP, HE
AD  FOR RED REPAIR DOCK IN CENTE
R.";
11Ø PRINT@256,"TO ENTER SHIP'S C
OURSE AND SPEED...HIT <ENTER>.
 NEW SHIP TRACK";:PRINT"WILL THE
N  >>FLICKER<<":PRINT:PRINT"YOU
THEN HAVE THE OPTION OF  ATTA
CKING... HIT <Y> OR <N>";:PRINT@
48Ø,"...HIT <ENTER>";:LINEINPUTN
$
12Ø CLS(3):PRINT@64," INPUT NUMB
ER OF PLAYERS";:INPUTP4:GOSUB81Ø
:IFP4>2THENMR=7ELSEMR=RND(3)+7
13Ø PRINT@16Ø," SELECT DIFFICULT
Y...":PRINT:PRINT"1. LANDLUBBER-
DISPLAYS SUB PATH 2. OLD SALT":I
NPUTA3:GOSUB132Ø
14Ø FORP=1TOP4:PR(P)=3Ø:MS(P)=4:
ML(P)=2:NEXTP
15Ø PMODE3,1:PCLS(6):COLOR8,6:TT
=1:T=1:D=P4*3ØØ:DD=RND(D):GOSUB1
53Ø
16Ø CLS(Ø):PRINT@64,"SUB DEPTH I
S 1 TO"D"FEET";:PLAY"T1P1P1"
17Ø DS=RND(36)*1Ø:GOTO2ØØ
18Ø FORB=1TOP4:FORC=1TO4:X(B,C)=
X(B,C+1):Y(B,C)=Y(B,C+1):NEXTC,B
19Ø CLS(Ø):IFTT=1Ø1THEN149ØELSEP
RINT@64," YOU ARE ON TURN #"TT".
.GIVE UP??";:PRINT@416,"TO CONTI
NUE GAME, HIT <ENTER>":PRINT@96,
"":LINEINPUT" ENTER <I GIVE UP>.
..";G$:IFG$="I GIVE UP"THEN149Ø
2ØØ MV=MV+1:IFMV=MR THENMV=Ø:GOT
O17Ø
21Ø T=T+1:TH=T:T=2:X(Ø,1)=XS(TH-
1):Y(Ø,1)=YS(TH-1):DR=DS:SP=1Ø:P
=Ø:GOTO32Ø
22Ø XS(T)=X(Ø,2):YS(T)=Y(Ø,2):IF
A3=1THEN145Ø
23Ø P=1
24Ø GOSUB91Ø:SCREEN1,1
25Ø FORN=1TO3:LINE(X(P,N),Y(P,N)
)-(X(P,N+1),Y(P,N+1)),PSET:NEXTN
26Ø FORN=1TO1ØØ:A$=INKEY$:IFA$<>
""THEN28ØELSENEXTN
27Ø FORN=1TO3:LINE(X(P,N),Y(P,N)
)-(X(P,N+1),Y(P,N+1)),PRESET:NEX
TN:GOTO25Ø
28Ø LINE(X(P,1),Y(P,1))-(X(P,2),
Y(P,2)),PRESET:CLS(4):PRINT@64,"
SKIPPER..WHAT COURSE (ØØ1-36Ø)";
:INPUTDR:IFDR>36ØORDR=ØTHEN28Ø
29Ø PRINT@16Ø,".";:INPUT"..WHAT
SPEED";SP
3ØØ IFSP>PR(P)THENPRINT@228,"HEY
! WE CAN'T GO THAT FAST !":PRINT
:PRINT"TOP SPEED IS"PR(P)"KTS":G
OTO29Ø
31Ø TH=T:T=5:SCREEN1,1
32Ø 'DIRECTIONS
33Ø IF DR=36ØTHEN34ØELSE37Ø
34Ø X(P,T)=X(P,(T-1))
35Ø Y(P,T)=Y(P,(T-1))-SP
36Ø GOTO71Ø
37Ø IF DR<>Ø9ØTHEN41Ø
38Ø X(P,T)=X(P,(T-1))+SP
39Ø Y(P,T)=Y(P,(T-1))
4ØØ GOTO71Ø
41Ø IF DR<>18ØTHEN45Ø
42Ø X(P,T)=X(P,(T-1))
43Ø Y(P,T)=Y(P,(T-1))+SP
44Ø GOTO71Ø
45Ø IF DR<>27ØTHEN49Ø
46Ø X(P,T)=X(P,(T-1))-SP
47Ø Y(P,T)=Y(P,(T-1))
48Ø GOTO71Ø
49Ø IF DR>9ØTHEN55Ø
5ØØ AA=9Ø-DR:AB=DR
51Ø GOSUB77Ø
52Ø X(P,T)=X(P,(T-1))+INT(SB)
```

```
53Ø Y(P,T)=Y(P,(T-1))-INT(SA)
54Ø GOTO71Ø
55Ø IF DR>18ØTHEN61Ø
56Ø AA=DR-9Ø:AB=9Ø-AA
57Ø GOSUB77Ø
58Ø X(P,T)=X(P,(T-1))+INT(SB)
59Ø Y(P,T)=Y(P,(T-1))+INT(SA)
6ØØ GOTO71Ø
61Ø IF DR>27ØTHEN67Ø
62Ø AA=DR-18Ø:AB=9Ø-AA
63Ø GOSUB77Ø
64Ø X(P,T)=X(P,(T-1))-SA
65Ø Y(P,T)=Y(P,(T-1))+SB
66Ø GOTO71Ø
67Ø AA=DR-27Ø:AB=9Ø-AA
68Ø GOSUB77Ø
69Ø X(P,T)=X(P,(T-1))-SB
7ØØ Y(P,T)=Y(P,(T-1))-SA
71Ø GOSUB84Ø
72Ø T=TH:IFP=ØTHEN22Ø
73Ø GOSUB98Ø:GOTO1Ø5Ø
74Ø GOSUB136Ø
75Ø P=P+1:IFP<=P4 THEN24Ø
76Ø TT=TT+1:GOTO18Ø
77Ø R5=57.29577951:AC=9Ø
78Ø AA=AA/R5:AB=AB/R5:AC=AC/R5
79Ø SA=(SIN(AA)/SIN(AC))*SP
8ØØ SB=(SIN(AB)/SIN(AC))*SP:RETU
RN
81Ø DATA Ø,Ø,5,5,255,Ø,25Ø,5,255
,191,25Ø,186,Ø,191,5,186
82Ø FORP=1TOP4:READX,Y,X1,Y1:FOR
N=1TO4:IFN=3THENX(P,N)=X1:Y(P,N)
=Y1 ELSEX(P,N)=X:Y(P,N)=Y
83Ø NEXTN,P:XS(1)=128:YS(1)=96:R
ETURN
84Ø IFX(P,T)<ØORX(P,T)>255ORY(P,
T)<ØORY(P,T)>191THEN88Ø
85Ø IFP=ØTHEN RETURN
86Ø IFX(P,T)<118ORX(P,T)>138ORY(
P,T)<86ORY(P,T)>1Ø6THENRETURN
87Ø CLS(2):PRINT@64,"YOU HAVE RE
ACHED THE REPAIR DOCK":PR(P)=3Ø:
MS(P)=4:ML(P)=2:PLAY"T1P1P2":GOS
UB98Ø:T=TH:GOTO75Ø
88Ø IFP=ØTHENT=TH-1:MV=Ø:GOTO17Ø
89Ø CLS(8):PRINT@96,"SKIPPER!  W
E HIT THE REEF !!!":PR(P)=PR(P)-
1Ø:PLAY"T2P1":IFPR(P)<2ØTHENPR(P
)=15
9ØØ PRINT:PRINT"WE HAVE PROP DAM
AGE !":PRINT:PLAY"P1":PRINT"TOP
SPEED IS NOW"PR(P)"KTS.":PRINT:P
RINT"TRY AGAIN...":GOSUB142Ø:T=T
H:GOTO24Ø
91Ø CLS(3)
92Ø PRINT@32," STATUS OF DESTROY
ER #"P
```


Hardware Special

Communications Package

300/1200 baud Fully Hayes compatible
Modem - 2 Year Warranty

$129.00
[Modem & Cable]

300/1200/2400 baud
Fully Hayes
Compatible Modem - CCITT
2 Year Warranty

$249.00
[Modem & Cable]

Software

'KEEP-TRAK' General Ledger Reg. $69.95—Only $39.95

"Double-Entry" General Ledger Accounting System for home or business: 16k, 32k, 64k. User-friendly, menu-driven. Program features: balance sheet, income & expense statement [current & 'YTD'], journal, ledger, 899 accounts [2350 entries on 32k & 64k [710 accounts & entries on 16k] [disk only]. Version 1.2 has screen printouts.
Rainbow Review 1.1 - 9/84 : 1.2-4/85

"OMEGA FILE" Reg. $69.95—ONLY $24.95

Filing data base. File any information with Omega File. Records can have up to 16 fields with 255 characters per field [4080 characters/record]. Sort, match & print any field. User friendly menu driven. Manual included [32k/64k disk only].
Rainbow Review 3/85. Hot CoCo 10/85

BOB'S MAGIC GRAPHIC MACHINE

Can generate BASIC code to use in your programs. Easy drawing and manipulation of circles, elipses, boxes, lines and ARCS. Single joystick operation with on line HELPS at all times. Allows text on the graphics screen & movement of objects on the screen. Can be used as a stand-alone graphics editor. Instruction Manual. **GRAPHICS EDITOR. REG. $39.95—ONLY $24.95** for disk or tape. 64k ECB.
Rainbow Review 7/85, Hot CoCo 9/85 **"The graphics bargain of the year"**

'KEEP-TRAK' Accounts Receivable.

Features: auto interest calculation, auto ageing of accounts, installment sales, total due sales, explanation space as long as you need, detailed statements, 'KEEP-TRAK' General Ledger tie in, account number checking, credit limit checking & more. User friendly/menu driven. Includes manual. **$39.95** or **$49.95** General Ledger & Accounts Receivables. [Disk Only].

'COCO WINDOWS'

With hi-res character display and window generator. Features an enhanced key board [klicks] and 10 programmable function keys. Allows the user to create multiple windows from basic. Includes menu driven printer setup and auto line numbering. Four function calculator, with memory. The above options can be called anytime while running or writing in BASIC. APPLE PULL YOUR DRAPES. YOU DON'T WANT TO SEE THIS. **$24.95** [disk or tape] includes manual.

THE OTHER GUYS CoCo
55 North Main Street
Suite 301-D
PO Box H
Logan Utah 84321

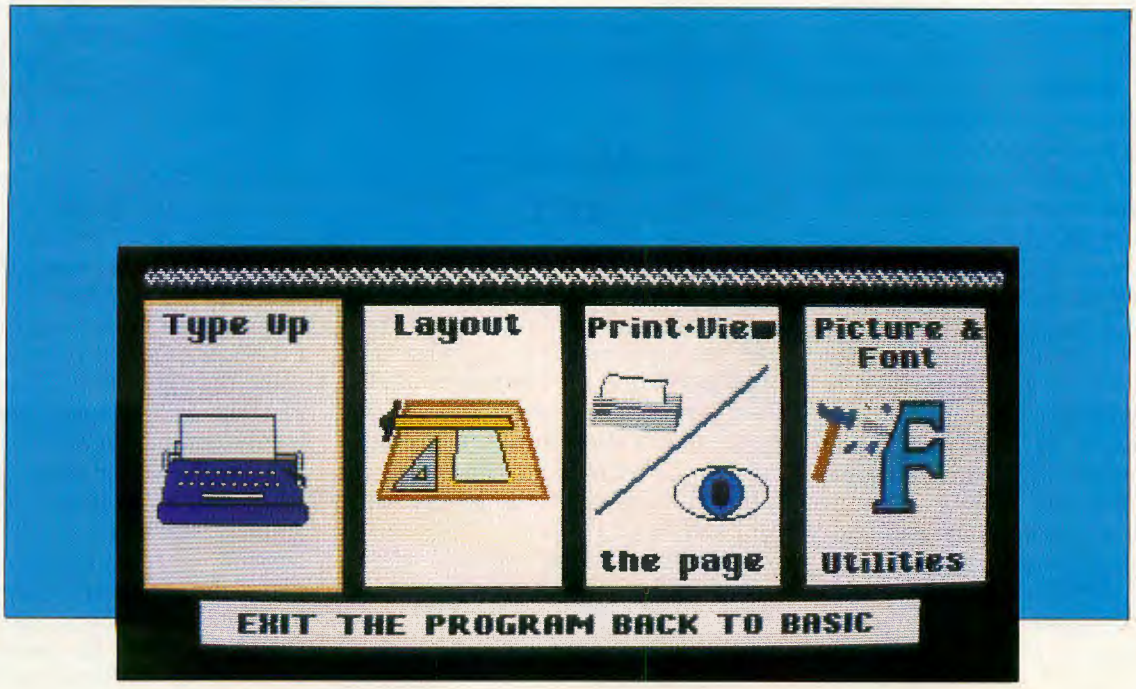
MasterCard VISA

(801) 753-7620
(800) 942-9402

NEW FREE CATALOG

[Add $3.00 for postage & handling]
C.O.D., Money Order, Check in U.S. Funds [Please specify if J&M controller]

```
93Ø PRINT@128," TOP SPEED ="PR(P
)"KTS"
94Ø PRINT:PRINT" ASROCS ="MS(P)
95Ø PRINT:PRINT" LAUNCHERS ="ML(
P)
96Ø PRINT@48Ø,"...HIT <ENTER>";:
LINEINPUTF$:RETURN
98Ø SX=ABS(XS(T)-X(P,5))
99Ø SY=ABS(YS(T)-Y(P,5))
1ØØØ SD=INT(SQR(SX*SX+SY*SY))
1Ø1Ø RETURN
1Ø2Ø FOR H=1TO MS
1Ø3Ø PLAY"T15V1Ø3CC#DD#EFF#GG#A
A#B;P1T4Ø1V31ECBP2ECBP2ECBP2ECB
P2ECBP2ECBP1P1P1"
1Ø4Ø NEXT H:RETURN
1Ø5Ø A$=INKEY$
1Ø6Ø LINE(X(P,5),Y(P,5))-(X(P,4)
,Y(P,4)),PRESET
1Ø7Ø PLAY"L2Ø4V5T15CE"
1Ø8Ø LINE(X(P,5),Y(P,5))-(X(P,4)
,Y(P,4)),PSET
1Ø9Ø IFA$="Y"THEN111Ø
11ØØ IFA$="N"THEN74ØELSE1Ø5Ø
111Ø FOR W=1TO5
112Ø FOR WT=ØTO8:CLS(WT):PRINT@1
6Ø,"^ ^ ^ ^ BATTLE STATIONS ^ ^
^ ^ "
113Ø PLAY"T17ØV31O1;A;A#;A-;O5;A
;A#;A-P2":NEXTWT,W
114Ø IFMS(P)=ØORML(P)=ØTHENPRINT
@64," HEY SKIPPER...HOW ABOUT HE
ADING FOR THE REPAIR DOCK ? ? ?"
:PLAY"T1P1P1":GOTO74Ø
115Ø PRINT@64," HOW MANY ROCKETS
";:INPUTMS:IFMS<1THEN115Ø
116Ø IFMS>MS(P)ORMS>ML(P)THENPRI
NT@256," SKIPPER...WE CAN'T DO T
HAT ! !":PLAY"P1P1":GOTO114Ø
117Ø MS(P)=MS(P)-MS:FORWT=1TOMS
118Ø PRINT@(128*WT+128),"WHAT DE
PTH FOR ROCKET #"WT;:INPUT MD(WT
)
119Ø NEXTWT:SCREEN1,1:GOSUB1Ø2Ø:
PLAY"T1P1P1"
12ØØ IF SD>1ØTHENPLAY"P1":GOTO74
Ø
121Ø FORWT=1TO MS:IFABS(MD(WT)-D
D)<26THEN143ØELSENEXTWT
122Ø PLAY"L4V1O4T1"
123Ø FORE=1TO3Ø:FORF=1TO7:PLAY"C
P4T+":NEXTF:PLAY"V+":NEXTE
124Ø PLAY"T38P1V31O1ECDP2ØECDP2Ø
ECDP2ØECDP2ØECD"
125Ø CLS(8):ONRND(2)GOTO126Ø,129
Ø
126Ø PRINT@96," SKIPPER! WE TOOK
 A HIT IN THE   ENGINE ROOM !":P
RINT:PLAY"T1P1"
127Ø IFPR(P)<21THENPR(P)=25
128Ø PR(P)=PR(P)-1Ø:PRINT@192,"
TOP SPEED IS NOW"PR(P)"KTS.":GOS
UB142Ø:GOTO74Ø
129Ø PRINT@96," SKIPPER!!  WE TO
OK A HIT AFT!!":PLAY"T1P1"
13ØØ ML(P)=ML(P)-1:PRINT@16Ø," W
E LOST A ROCKET LAUNCHER !!!":PL
AY"P1":PRINT@32Ø," LAUNCHERS NOW
 OPERATIONAL="ML(P):GOSUB142Ø:GO
TO74Ø
132Ø CLS(Ø):PRINT@96,"GET READY
TO COPY DISTANCE CODE.":PRINT"DO
N'T LET ANYONE SEE YOUR CODE!!";
:PLAY"T1P1P1"
133Ø FORN=1TOP4:CLS(Ø)
134Ø PRINT@64," PLAYER #"N"YOUR
NUMBER IS.....":KE(N)=RND(1Ø):PR
INT:LINEINPUT"...READY?...HIT <E
NTER>";W$
135Ø PRINT@192,"........"KE(N):P
LAY"T5P1L5Ø5C1Ø":NEXTN:RETURN
136Ø CLS(2):PRINT" SKIPPER #"P".
..USE YOUR CODE #  TO DETERMINE
SUB'S DISTANCE.":PRINT:FORWT=1TO
1Ø
137Ø IFWT=KE(P)THENPRINTWT". "SD
:GOTO139Ø
138Ø RN=RND(2):ONRND(2)GOSUB14ØØ
,141Ø
139Ø NEXTWT:PRINT@48Ø,"...HIT <E
NTER>";:LINEINPUTF$:RETURN
14ØØ PRINTWT". "(ABS(SD+RND(RN*1
5))):RETURN
141Ø PRINTWT". "(ABS(SD-RND(RN*1
5))):RETURN
142Ø FORWT=1TO4ØØØ:NEXTWT:RETURN
143Ø FORC=1TO25Ø:PLAY"T4Ø5C":CI
RCLE(XS(T),YS(T)),C,8:NEXTC:PLAY
"T1P1"
144Ø CLS(8):PRINT@37,"---MISSION
 COMPLETE---";:PRINT@99,"SUB DES
TROYED AT"DD"FEET.";:PLAY"P1P1":
GOTO15ØØ
145Ø DRAW"BM128,96"
146Ø FORD=2TO(TT+1)
147Ø LINE-(XS(D),YS(D)),PSET
148Ø IFCN=1THEN151ØELSENEXTD:GOT
O23Ø
149Ø TT=TT-1:CLS(8):PRINT@64,"BE
TTER LUCK NEXT TIME.....":
PLAY"T1P1":PRINT"SUB WAS AT"DD"F
EET.":PLAY"P1P1"
15ØØ CN=1:PCLS(6):SCREEN1,1:GOSU
B153Ø:GOTO145Ø
151Ø FORWY=1TO2:PLAY"T17ØV31O1;A
;A#;A-;O5;A;A#;A-":NEXTWY:PLAY"T
2P1P3":NEXTD
152Ø GOTO152Ø
153Ø CIRCLE(128,96),1Ø,7,.95:PAI
NT(128,96),7,7:LINE(Ø,Ø)-(255,19
1),PSET,B:LINE(1,1)-(254,19Ø),PS
ET,B:RETURN
```



Software CoCo 3

CoCo Newsroom — Desktop Publishing for the CoCo 3

CoCo Newsroom is a full-featured desktop publishing package for the CoCo 3. The program is supplied on three disks and comes with 16 pages of typewritten instructions. The disks are not copy-protected, and making backups for your own protection is encouraged.

CoCo Newsroom provides the CoCo 3 user with a valuable tool previously reserved for the more expensive PC machines. This program is very easy-to-use, and excellent step-by-step menu selections help you turn out an impressive small newspaper. All you have to do is select one of four options at the main menu: Type Up, Layout, Print-View the page, and Picture and Font utilities.

To construct your publication, select Type Up first to compose the various articles or subject matter. Then use Layout to arrange the articles in blocks that fit on the page in two-column format. Next, add appropriate pictures from the picture disk, and select the various fonts from the font disk to complete your publication.

In the Type Up mode, the screen displays a large work area with icons, or pictures, representing the various commands available. The arrow keys control the cursor, and selection is made with the space bar.

The commands available in Type Up are: PICTURE STAMP, for stamping a picture loaded from memory onto the work sheet; TRASH, for throwing away the screen if you are not satisfied or want to start over; UNDO, for undoing mistakes; and PENCIL, a submenu that allows you to select Line, Box, Circle, Fill, Erase, Text, Dot or Invert.

Actual composition is done in the Text mode. Other options are available to enhance the overall appearance and layout of the article or story: GRAB PICTURE allows you to grab a picture from the screen and store it in memory for later recall using the stamp picture icon; DISK MENU provides a submenu for use with the other two disks; and LOAD A FONT SET loads a font (type) set from the font disk. There are over 20

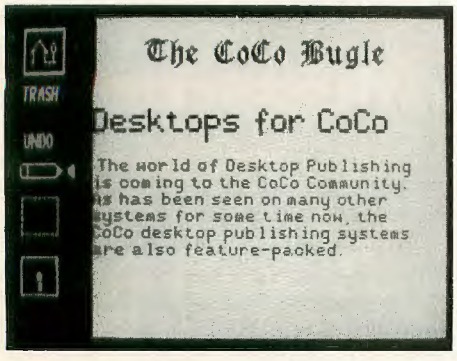
CoCo Newsroom fonts to choose from, or you can use *Color Max 3* fonts.

To load a fill pattern set as generated by the fill pattern editor, select LOAD FILL PATTERN SET. Three fill patterns are available on the font disk. These are handy graphics patterns of lines, dots, crosshatches, diamonds, etc. Once selected, type the drive number to load the fill set from, then select the filename.

LOAD/SAVE A GRAPHIC PANEL loads or saves a complete article or graphics panel from disk for later editing or printout; LOAD/SAVE NEWS ART selects the picture of your choice from the assortment of 50 on the picture disk or from one of your own creations. You won't see the pictures until you stamp them onto the worksheet. This is the same for the font disk and is a minor inconvenience, since you are shown a word list of available fonts and pictures.

The package also comes with a Picture Grabber program that is designed to allow the user to grab pictures from any standard PMODE 4 picture or *Color Max* file. This is a very handy utility and can be used effectively to produce some outstanding pictures.

A Configure program is also provided that lets you set up *CoCo Newsroom* to fit your individual needs with monitor and printer type, number of disk drives, etc.



I found *CoCo Newsroom* to be an excellent program. It was easy to use and required minimal reading of the instructions to acquire a working knowledge. I was able to create some pretty neat pages in short order.

I believe *CoCo Newsroom* will be a smash for the CoCo 3. It provides the average CoCo 3 user with some very sophisticated features and options. CoCo users with club or social responsibilities can use it to publish their own newsletters; schools and CoCo Users Groups will love it, too. They will be able to publish monthly newsletters and bulletins made with the very machine that is the object of their affection.

Eric Wolf is to be congratulated for this CoCo 3 programming achievement.

(Microcom Software, P.O. Box 214, Fairport, NY 14450, 716-223-1477; or Spectrum Projects, Inc., P.O. Box 264, Howard Beach, NY 11414: $49.95 plus $3 S/H)

— Jerry Semones

Software CoCo 1, 2 & 3

CoCo Base I — Refined and Improved

Over the past year and a half, I have had the opportunity to review two products from JTJ Enterprises. The first was *CoCo Solver*; the second, *CoCo Base I.* Both products are powerful and interesting, especially for those who are able to do a little BASIC programming.

Since my last review of *CoCo Base I*, it has undergone a major revision. *CoCo Base I* is a relational database management system that consists of 13 BASIC programs and one machine language program for data entry editing. All programs except *Util*, a directory saving utility, are accessed from the main program menu. Several of the programs perform normal database management functions. Fields are named, titled and assigned a data type and length using Create. Eight fields are included on each page of field descriptions. Several pages can be used for field assignments, allowing for a great deal of flexibility. Put is used to add data to the database. Records can be edited after entry and all records are available for viewing and editing. Records can also be edited using the Edit option from the main menu. Using Edit, you can edit one field while viewing another. Files are indexed using Index, which allows you to save named index files. This type of flexibility is evident throughout the use of *CoCo Base I.* A single structure file made with Create can be used for many database files, each of which can have many index files.

At first, it is annoying having to specify the name and extension of each structure and data file for menu options, but the effort is necessary for the extra options to work as they do.

Up to this point, *CoCo Base I* looks like a normal, but slightly awkward, database manager. However, there are other options. *CoCo Base I* allows the user to operate on data files using lines of BASIC code without having to keep track of file manipulation commands. This is a real boon to novices and experts alike. Novices need only master a few BASIC instructions to perform fancy feats of data manipulation and presentation. Experts can concentrate on manipulating data in a file without the distraction of file handling routines. This helps produce working procedures in a minimum of time with a minimum of effort.

Using *CoCo Base I* terminology, templates are created to operate on data. Each template is built and tested using the Action program. Templates can then be combined into a schedule of operation using Schedule. Schedule produces job files that are executed using the Jobs option. Since templates and jobs can be saved, many types of operations on data files can be available at one time as different jobs, each of which can be built of many templates. Again, nearly complete freedom is possible. Jobs can be as simple or as complex as the user desires. And nearly any data operation is possible with the right templates. The more you know about programming in BASIC, the more you can do with templates and jobs.

CoCo Base I claims to be a relational database management system. This generally means that data files can be linked together by a common data field, allowing multiple files to be manipulated together. In the strictest sense, *CoCo Base I* lives up to the claim. It does this in an unusual way, however. Multiple files are not accessed at once. Instead, files are accessed one at a time as a new file is built. The end result is the same as that achieved by other relational database managers, but the method is somewhat slower. The resulting file remains after the operation, though. This means that multiple operations could be used on many files to produce many new files that could be manipulated by *CoCo Base I.* The possibilities seem endless, limited only by imagination, computer memory and disk space.

Since I am comfortable programming in BASIC, I found *CoCo Base I* interesting, powerful and reasonably simple to learn. Beginners should expect to spend some time experimenting with templates to get the full power of *CoCo Base I.* This is a very powerful

tool capable of performing amazing feats if it is given a chance.

I did find a few annoyances with *CoCo Base I*. The first complaint is with the screen displays. Maybe I'm too sensitive, but I found the flashing options on the main menu annoying. Also, some of the programs scroll the screen display as they display file access information. I found it disconcerting to see a screen disappearing as I was watching the status report at the bottom of the screen. Finally, I don't like programs that make noises. Luckily, the sound prompts are not necessary for proper program operation, so I could turn the volume down. None of these are really problems, just my own preferences.

I did have a couple of minor problems using *CoCo Base I* on a CoCo 3. There seems to be some problem with memory allocation. Since it wasn't written for the CoCo 3, I guess that a few minor problems are to be expected. This leads to the first part of my *CoCo Base I* wish list. I've gotten addicted to the 80-by-24 text screen available on the CoCo 3. I sure wish that a version of *CoCo Base I* were available that could take advantage of it. I also wish there were some way for the programs to trap and report errors. When there is a program error, *CoCo Base I* bombs. Instructions are given for recovery, but if Tandy had been kind enough to include error trapping commands in BASIC, *CoCo Base I* would be a smoother operator.

My last problem is with the program's manual. While it is well-written, the manual could use some improvement. I had to try everything a couple of times before I understood the printed instructions. A tutorial with lots and lots of examples would help more than anything else. Detailed, step-by-step directions for building a common application would have been warmly received and would go a long way toward making *CoCo Base I* a general-purpose tool easily understood by all levels of users.

Complaints aside, this is really an amazing package. It has a good feel about it. I am also amazed at its flexible power. I am often frustrated by programs that won't let me do some odd thing that I want to do. I never ran into a problem with *CoCo Base I* that I couldn't solve one way or another. I find it encouraging to have this much freedom when using a program. I recommend *CoCo Base I* to anyone willing to give it a chance, forgive its quirks, and enjoy its power.

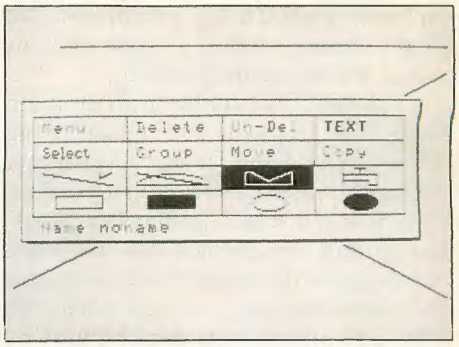
(JTJ Enterprises, P.O. Box 110841, Nashville, TN 37211, 615-793-0450; $34.95)

— Don McGarry

Software CoCo 3

Color Computer Artist — OS-9 Level II Graphics

Tandy's recent entry into the world of graphics for the CoCo 3 is *Color Computer Artist*. This unprotected software is supplied on disk and is in OS-9 Level II format. It's booted up by simply typing DOS on a CoCo 3 with at least 128K of RAM. After booting up, the program prompts the user for the specific kind of monitor and joystick being used (the two-button deluxe version is recommended) and asks whether or not



you are using the Tandy Hi-Res Joystick Interface.

Color Computer Artist was written by Steve Bjork for Tandy and comes with a colorful 14-page instruction booklet.

After the program loads, you are presented with a plus sign (+) cursor on a blank screen. Getting to the main menu requires either pressing the second button on the deluxe joystick or ALT-3 on the keyboard.

The main menu displays, in icon style, various words and symbols representing the functions available at that level. You can delete, undelete, add text, move, copy or fill (paint) from this menu. If you choose Select, a blinking circular cursor is displayed and you can move, copy or delete any object on the drawing screen. Another option, Group, allows you to select more than one object to move, copy or delete. The program features the customary rubber band line, box, circle and polygon, but also offers something that is a little different, called Free Hand. In this mode, you control the movement of the cursor totally as it moves around on the screen. In this way, you can draw to your heart's content without having to move a cursor from one point to another point or worry about having to match up connecting lines. What you get in this mode is very much like the

Check Account Information System

Manage your checking account(s) with CAIS. Keep track of deposits, checks, ATM withdrawals and other account transactions. Define up to 36 categories to monitor expenses. Set up automatic transactions for such items as direct deposits or pre-authorized deductions. Balance your account(s) in minutes! Other features include multi-drive capability, display and print options, history purge and more.

Requires 1 disk drive
Printer is optional
CoCo 3 compatible

RAINBOW CERTIFICATION SEAL

After Five Software
P.O. Box 210975
Columbia, SC 29221-0975
(803) 788-5995

Send check or M.O. for $34.95 plus $3.00 S/H.
COD orders: add $1.00.
(SC res. add 5% sales tax)

See review in February '88 issue of RAINBOW!

old Etch-A-Sketch toy except you can fill the design with the color of your choice when you are finished.

A submenu is available from the main menu that lets you do housekeeping chores like saving, loading, printing, setting colors, etc. There is also a Color/Pattern Menu, which displays the colors and pattern designs you can use when creating your drawings. Sixteen squares are displayed and you can select the color and pattern you want by moving the square cursor with your joystick. A similar Text/Color Menu provides a way to add text of various sizes and colors to your pictures.

While *Color Computer Artist* is a smoothly operating program, I wouldn't compare it with the heavyweights like *Color Max 3* and *CoCo Max 3*, which offer added features like fat-bits, zooming, line erase, animation and other popular commands. *Color Computer Artist* is, however, written in OS-9 Level II and is capable of providing some interesting ideas with the `windows` command in OS-9. This is a good program and will provide most CoCo users with the necessary tools to make neat drawings.

(Tandy Corporation, 1700 One Tandy Center, Fort Worth, TX 76102; $29.95. Available in Radio Shack stores nationwide.)

— David Gerald

Software CoCo 1, 2 & 3

Address — Computer Address Book

At least once a year I get fed up with all the pieces of note paper, parts of envelopes and such, falling out of my address book — all of those temporary changes that never get posted. Then it's cross-out-and-hope-there's-room-on-the-page time. Eventually the page gets filled and you have to buy a new address book.

Address, by R.J.F. Software, makes those infernal postings ridiculously simple. Not only that, but this disk-based program also prints out the envelopes for you. Its base is a set of 15 files, some of which are devoted to only one letter, others to several letters. The authors supposedly did a study of last-name beginning letters and assigned the files accordingly.

Not to worry, though. If you have a lot of friends and relatives whose last names begin with 'Z', the program allows you to stash them in another letter's files if need be.

The five-page instruction booklet is clear and helpful, although the primary menu and prompts would probably be enough.

The "search" capability is rather amazing to me: Not only can you search for records by last name, you can search by ZIP code, area code, state, city, and so on. This leads me to surmise that, even though it is primarily designed to hold up to 270 different name/address sets, you can set up your own database that depends partially on sorting by letters: business accounts, small household inventories, etc.

You can set the program to print anything from $^{15}/_{16}$-inch mailing labels to 9½-inch envelopes. The only catch is you have to store your own name and address in the file to answer the Return Address prompt.

As mentioned, the prompts for each of eight possible functions (e.g., Add a file, Change a file, Search, Delete, Print, etc.) are easy to follow. It took me about 10 minutes to start transposing our paper-cluttered address book into the disk as I tested its capabilities. You can store two separate telephone numbers, enter the country (if applicable), and make a tricky job easy. Record review can be done on the full-sized screen, sent to the printer, or both.

The only minor omission, in my opinion, is an option to set printer baud rates. You can, of course, do that with a poke before loading, but my recommendation to R.J.F. is to add that as a future enhancement.

All in all, I found *Address* to be an excellent program which, with a little imagination, could be used to establish a small database for any number of categories.

(R.J.F. Software, R.R. 2, White Lake, Ontario, Canada K0A 3L0, (613) 623-7824; $14.95 plus $3 S/H)

— John M. Hebert

Software CoCo 1, 2 & 3

Autoterm 6.1 — Vast CoCo 3 Improvements

Today, the CoCo community is faced with a bewildering array of terminal programs. This is largely a function of the simple fact that there is no perfect terminal package — one which will meet every need or suit every personality. The choice of a terminal package is simply a matter of preference. Polish and sophistication are totally unrelated to basic functionality. Fine attention to detail and the development of a truly user-friendly interface require an immense investment in time and effort. The product must spend time in public view, allowing for substantial feedback to develop, for wish lists to be submitted to the author, and for the author to respond to these inputs. *Autoterm 6.1* is a striking example of just how productive this type of development can be.

Autoterm 6.1 is, in many respects, a totally new product and is still supplied as a collection of programs. Versions are included to support the CoCo 1 and 2 in either 32 or 64K configurations. New to Ver. 6.1 are programs to fully support either a 128 or 512K CoCo 3.

The heart of *Autoterm* is formed by the interaction of three basic functions: intelligent terminal operation, text processing and the use of keyboard macros. By interweaving these capabilities, the author has largely succeeded in his attempt to build an automated terminal that blends extraordinary power into a truly user-friendly interface.

As an intelligent terminal, *Autoterm* supports standard buffer capture via Xon/Xoff (DC1/DC3), as well as Xmodem, an error checking protocol that allows for the error-free transmission and reception of data, an absolute must where binary program downloads are involved. While *Autoterm* downloads may not be written directly to disk, all other disk I/O operations are smoothly implemented. Directories may be read, and files saved, loaded, transmitted or erased while online. *Autoterm* suspends the reception of incoming data during disk access, so disk operations must be timed for execution when data is not being received. Information that has been captured may be scanned, saved, edited, or printed while online, with the capture buffer still receiving new information.

A display at the top of the terminal

screen indicates the available memory, whether the buffer is in the capture or scan (open or closed) mode, and whether lowercase has been toggled on or off. A total of 27 individual parameters such as communications baud rate, parity, screen width, and printer configuration commands (page length, etc.) are user-definable via a terminal status screen. As is the case with most CoCo 3 terminal packages, communications at 2400 baud is smoothly implemented through the serial (bit-banger) port. The addition of a Radio Shack RS-232 pack, while not required, provides the additional flexibility of printing the buffer contents while online.

As receiving or transmitting data is only a part of the process involved in information exchange, immediate access to a text processor can become habit-forming. Without loading another program, new or received text may be viewed, edited, searched, and printed, all from within *Autoterm*. While the text processor does not possess the broad capabilities of a dedicated word processor, it is quite powerful in its own right. Word wrap, block operations, search and find commands, and printer control are all fully implemented. As the text processor and the terminal share the same buffer, the user is greeted with a screen that is identical to the one in the terminal mode. This "seamless" transition has a very comfortable feel about it, and adds to the overall ease of use, especially for those new to the telecommunications environment.

As most online time accrues some sort of cost, either in long distance charges, connect charges, or both, the ability to fully automate a computer to computer dialogue can result in substantial savings. *Autoterm* uses a "language" which allows the user to build keystroke multipliers (KSMs) that can recognize and respond to the prompts of a host system. While there are many names for this sort of dialogue capability, the KSM scheme in *Autoterm* provides for every conceivable keystroke sequence, and in that sense may be the most powerful automated dialogue language (often called "autolog") currently available for the CoCo. The author uses "wedge notation" to designate multiple key-press operations, i.e., <SCL> represents a shift/clear sequence, while <DAR> stands for down/arrow. The full integration of virtually all system commands into the KSM scheme allows the user to program conditional operations into an automated scheme, allowing for the total automation of many computer dialogue sessions. Indeed, *Autoterm* may be programmed to log on at a given time (a clock program is included), dial an information service, read (and save) your waiting mail, and then log off — all faster than you could type the necessary commands to a host system. The result is less "connect time" on pay services and, thus, lower cost.

With the release of Version 5.0, support of the RS-232 pack, Radio Shack Direct Connect Modem Pak, and the J&M parallel printer port were added. Also, printer baud rate was implemented as a user-definable parameter and printing while online was enabled. The core program was also modified to automatically load a KSM file as part of the start-up procedure, effectively allowing for automatic self-configuration of the program. Version 6.1 has added a split-screen "chat" or packet radio mode. This feature allows the user to view (and edit) several lines of text prior to transmitting them to a host system, while still viewing the "live action" on the upper part of a split screen, vastly improving user control (and comfort) during "real time" online conferences.

The features mentioned to this point are common to *all* the programs released on Version 6.1, but *Autoterm* has been vastly improved for the CoCo 3.

For all its apparent power, previous versions of *Autoterm* failed to support any form of 80-column display. With the advent of the CoCo 3, *Autoterm* has come of age. The 80-column display of the CoCo 3 is a true joy to view on a Magnavox 8CM515 monitor. The author has added a downright sensuous scroll routine to the CoCo 3 screen, and complemented this with full paging ability — both of which may be accelerated to almost any rate. These enhancements are topped off with a "jump" command that instantly relocates your position within the capture buffer. Screen colors are controlled by the contents of four palette registers, and are configured via BASIC.

The available buffer is approximately 90K for a standard CoCo 3, and 475K for machines with a 512K upgrade. *Autoterm* takes advantage of the entire RAM, overwriting BASIC, creating a buffer that *appears* continuous to the user. Because of this structure, the return to BASIC may be faulty when the user exits *Autoterm*. To ensure proper operation, a cold reboot must be performed after using *Autoterm* in the CoCo 3 mode. While the error-trapping within *Autoterm* is superb, the ability to return the CoCo 3 versions to BASIC via a software command creates the potential for the faulty operation of subsequent programs. But disabling of the software Exit command (shift/break) from the main menu, creating an absolute requirement for a cold reboot, would certainly remove any potential for error.

*** ASSEMBLY LANGUAGE PROGRAMMING TRS-80 COLOR COMPUTER

THE BOOK

This hands-on guide for the CoCo 1 & 2 begins with the basics and progresses to the expert level. Written as a tutorial, it takes you each step to assembly language programming. Programming guidelines cover subroutines, stack use, and interrupt handlers. All the internal secrets of the SAM, PIA, MPU, memory, graphic display, joysticks, serial port, cassette, disk, keyboard, ROM, and sound are revealed. All this presented in a clear and understandable fashion. The best - excellent reference book - Be a CoCo expert - 289 pages - $18.00 + $1.50 s/h

THE ADDENDUM

This picks up where The Book left off. It describes all the CoCo 3 enhancements and how to use them with assembly language. Wow - what features and many are not explained any place else. Super-Res Graphics - Virtual Memory - New Interrupts - $12.00 + $1.00 s/h

COCO 3 SPECIAL

Both Books for $27.00 + $2.00 s/h

Online orders + free advice on Delphi

US check or money order
RI orders add 6% sales tax

TEPCO
68 James Court
Portsmouth, RI 02871

During the time in which this review was prepared, talk of a 512K bug in *Autoterm* began to appear on the Delphi CoCo SIG.

As *Autoterm 6.1* ran perfectly with all Radio Shack 512K installations, suspicion was directed to the construction of the third party boards and the installation procedure for those boards. As the 512K board is straightforward in its design, it seemed that the installation procedure might be the culprit. Indeed, when Phil Zwart (*Autoterm* author) called the folks at the Fort Worth Service Center, he was informed that *Tandy varies its 512K installation procedure* depending on the revision level of the CoCo 3 motherboard. It appears that the "crashes" reported on Delphi may well be a function of some previously undocumented variability in the construction of the CoCo 3.

Within a week, Phil Zwart had identified this "bug" and modified *Autoterm* to accommodate these production differences. For the record, the third party 512K boards appear to be sensitive to how the screen address can be positioned in memory on *some* CoCo 3s. Technically, the fix involved changing any screen address at an eight-byte boundary to a 64-byte boundary. New disks containing the fix (Ver. 6.2), were prepared and shipped to his 512K users within a week, demonstrating PXE Computing's dedication to customers in providing a level of support and concern seldom seen.

The documentation for *Autoterm* is supplied as a bound manual, consisting of 85 thorough and well-written pages. Sample KSMs and automated computer dialogues are provided, all with excellent annotation. As the program is copy-protected, two complete diskettes are furnished to guard against media failure. As some version of *Autoterm* will run on virtually every CoCo system with at least 32K, there are no practical minimum system requirements. However, the use of a CoCo 3 and at least one disk drive are necessary for the enhanced A128 and A512 revisions. An 80-column RGB or monochrome monitor and an RS-232 pack are also very desirable complements to this terminal package.

Perhaps PXE's Phil Zwart will continue his tradition of support by considering part of this wish list for his next revision: a character trap/filter, the ability to download directly to disk, *and*, perhaps, support for Ymodem, Kermit, and CompuServe B transfer protocols. But, *Autoterm 6.1* certainly represents one of the very best values in CoCo software.

(PXE Computing, 11 Vicksburg Lane, Richardson, TX, 75080, 214-699-7273; disk, $39.95; tape, $29.95 plus $3 S/H)

— Henry Holzgrefe

Hardware CoCo 1, 2 & 3

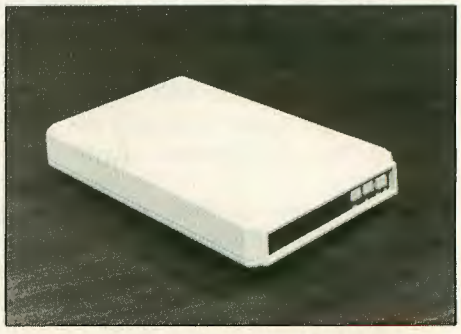
Avatex 2400 Modem — Inexpensive Hayes-Compatibility

The Avatex 2400 modem has recently been introduced as a high speed, bargain-priced modem offering full Hayes compatibility. While the current thinking seems to indicate that all modems offering full Hayes compatibility will function in an equivalent fashion, such is not the case. An old caveat, "You get what you pay for," still applies.

Compared to several other low-end 2400 baud modems, the Avatex 2400 acquits itself quite well. It does, in fact, support the entire, extended Hayes command set. The modem is housed in a beige plastic case and comes with an external power supply and a null modem cable (supplied by the vendor) to facilitate connection to the serial port of the CoCo. The front panel contains a bank of eight LEDs, which report line status, terminal operation and call progress. Three push/push switches toggle the data/voice, originate/answer, and synchronous/asynchronous modes. A power switch, RS-232C port (female, D-type, 25-pin), and two modular phone jacks (female, RJ11-C) are located on the rear panel. The dual phone jacks allow for the simultaneous connection of the modem and telephone with immediate user access to either one. Gone, however, are the DIP switches present on some earlier Avatex modems.

The documentation is extremely well-done. Indeed, the 98-page manual is a virtual short course in telecommunications via the Hayes command set. And, the entire package has a two-year warranty. Given all of these adequate to occasionally excellent characteristics, why did I open this review with a cautionary statement?

The gold standard by which all modems are compared is their ability to resist line noise, expressed as a signal-to-noise ratio (in decibels). Unlike most electronic devices, where high S/N ratios are deemed "good," the modem that can operate with the least separation between signal and noise wins the race. In the world of telecommunications, two types of noise prevail: garden variety white line noise, and perturbations due to phase shift when the signal makes a transition from one medium, such as wire, to another, such as a fiber optic cable. Phase shift, in particular, affects 2400 baud transmission due to the protocol used for high speed operations (CCITT V.22bis). In a side-by-side comparison, the Avatex 2400 was outperformed by its more expensive competition. In particular, at 2400 baud, the Avatex 2400 dropped characters, inserted "garbage," or (worst case) failed to connect, while a more expensive 2400 baud modem continued to function smoothly. These observations, while subjective, highlight the problems of line noise and intrinsic differences in the modems' construction. Hayes-compatible does not mean Hayes-equivalent. But neither does it mean that you should buy the most expensive modem you can find.



I called the folks at Elec & Eltek (USA) Corporation (importers of the Avatex modems) and asked their technical representative for any benchmark signal-to-noise values that he might have, or be willing to share, pertaining to the Avatex 2400. While these values were not available, the representative remarked that the Avatex 2400 was "about average." He did, however, confirm a suspicion that many people have mentioned: a 2400 baud modem operating at 1200 baud will outperform a 1200 baud modem of similar manufacture. Indeed, at 1200 baud, the Avatex 2400 ran circles around my Avatex 1200. When queried as to why this might be, the representative replied that the chip set necessary to support the 2400 baud protocol was necessarily

of higher quality than that found in a dedicated 1200 baud machine.

The implications of this situation are very important. The best buy for routine 1200 baud communication may well be an inexpensive 2400 baud modem, operating at 1200 baud. For those who demand excellence in 2400 baud performance, modem quality and line noise become primary considerations. For local-links over quiet lines, the Avatex 2400 is indistinguishable from a Hayes 2400. If, however, you live at "trails end," and your telephone service is one step above a string and tin can, the Avatex 2400 operating at 1200 baud may be the best value.

(Cinsoft, 2235 Losantiville, Cincinnati, OH 45237, 513-396-7638; $239)

— Henry Holzgrefe

Software CoCo 3

Printer Lightning — Easy, Reliable Print Spooler

Printer Lightning is a memory-resident print spooler for the CoCo 3. The program stores information going to your printer, then prints it out in the background while you go on using your CoCo 3 for work (or play!). Owl-Ware is the distributor of this handy little utility from ColorVenture, the creators of *Pyramix*.

The program is loaded into memory and executed. The disk can then be removed from the drive. *Printer Lightning* then prompts the user for several pieces of information. First, a Hi-Res memory option for a bigger buffer is offered. Pressing 'Y' (yes) gives you more storage space but prevents use of the graphics screens. Baud rate is then optionally selected, a query is made as to whether your printer requires line feeds after carriage returns, and the program is ready to use.

Once installed in memory, the program remains active until the machine is turned off or reset. There are a few programs that conflict with memory used by *Printer Lightning*, but they are the exception rather than the rule.

Use of the program is automatic, in that anything that would normally be handled by the standard print vector (PRINT#-2 command, LLIST command, or machine language equivalents) is automatically sent to *Printer Lightning*.

I tried *Printer Lightning* with a number of programs, including *Telewriter*, and found it very practical. It also works perfectly well with LLIST from BASIC, allowing you to continue working on a program while the long code is printed out. The buffer space is determined by the amount of memory your CoCo 3 has and the elections you have taken at program installation. A CoCo 3 with 128K gives you a 44K buffer, while 512K machines can have up to 437K available for print spooling.

Utility programs that work effortlessly and correctly, and that also add to the usefulness of your CoCo 3, are always nice to have. *Printer Lightning* certainly meets those criteria and must be considered a real software bargain. ColorVenture has a winner in this one!

(Owl-Ware, P.O. Box 116-D, Mertztown, PA 19539, 800-245-6228; $19.95)

— Leonard Hyre

Software CoCo 1, 2 & 3 OS-9

T/S Spell — A Dictionary and More

I recently remarked to some fellow computer users that if I had a dollar for every sort of spell checker around, I would be a rich man. There must be literally hundreds of spell checking programs for all the many types of computers in existence. But with the release of *T/S Spell* for the Tandy Color Computer line, I am firmly convinced CoCo users now have the best.

Now that may seem to be a pretty tall boast, so let me lay out the evidence.

In an overview of *T/S Spell*, Tandy seems to have taken the best features from all the various spell checkers around and put them into one program.

In publishing *T/S Spell*, Tandy has done two things. First, they have fulfilled their implied promise in providing a menu selection of the existence of a spell checker; and secondly, they have upheld their commitment to continue to present high-quality software for the Color Computer 3, while still supporting the CoCo 1 and 2. *T/S Spell* contains versions to work on all CoCos.

When spell checking programs were first introduced, a 10,000-word dictionary was considered fantastic. When the 20-, 30- and 40-thousand word dictionaries were released, it became unbelievable that one's personal computer could be capable of checking that many words for spelling. Well, hold on to your hats. *T/S Spell* has a master dictionary of over 100,000 words!

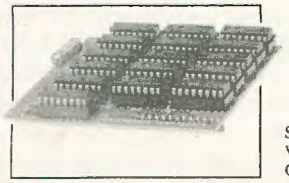
In confirming this with the guys in the Tandy Towers here in Fort Worth, I was

LOWEST PRICES EVER FOR COCO 3 PRODUCTS!

TURBO RAM BOARD

512K BOARD **$89.95** 0K BOARD **$29.95**

Includes RAM Board Utilities



- ❑ Fast 120 nsec RAM Chips
- ❑ Easy-to-Follow Instructions
- ❑ No Soldering

RAM BOARD UTILITIES

All 3 for only ***$19.95***

- ❑ RAM Disk for RSDOS*
- ❑ Print Spooler*
- ❑ Sophisticated Memory Test Program

PAL UPGRADE — ONLY $7.95
for your gray or white MULTI-PACK (26-3024)

COCO 3 UTILITES

$14.95 *each*

- ❑ Disk Duplicator*
- ❑ 640x640 Joystick Driver*
- ❑ Coco Max 2 to Coco 3 Patch Routines*

All 3 for only $39.95!

PYRAMIX Arcade Game*—$19.95

*Products developed by ColorVenture

Shipping & Handling:
Within the U.S. & Canada: add $3.00
Outside the U.S. & Canada: add $5.00
COD Orders: add $2.00
(Calif. Residents: add 6% sales tax)
(VISA or MC orders accepted)

RAINBOW CERTIFICATION SEAL

Send Check or Money Order to:
Performance Peripherals
11432 Pena Way
Mira Loma, CA 91752
Or Call (714) 681-3007

New! ***$99.95***
No-Halt DMC Floppy Disk Controller for your Coco1, 2, or 3 (not currently certified)

☛30 DAY MONEY-BACK GUARANTEE PLUS FULL 1 YEAR WARRANTY!
Prices subject to change without notice.

told that these are real words, too, not *just root words.* Furthermore, *T/S Spell* uses the most advanced compression techniques around to place all of this on a 35-track floppy disk.

Not only is there a 100,000+ word Master Dictionary on the disk, there is also a 6,271-byte Quick Dictionary file on the same disk which contains the most common misspelled words. And that's not all, folks — there is still room for a user-created Personal Dictionary on the same disk. Here you can store words that do not appear in the Master Dictionary. The size of the Personal Dictionary is limited only by the amount of storage space. What this means to the user is that with the 100,000+ word Master Dictionary and the unlimited Personal Dictionary, dictionary size is no longer limited by number of words, but simply by storage capabilities. The instruction manual tells the user how to put all of this on a hard disk. Think about that for dictionary size!

T/S Spell comes on a "flippy" disk, with one side containing the programs and a minimal OS-9 Level I Version 2.0 operating system, and the other an OS-9 data disk with the dictionary files on it. It is presented on an OS-9 Level I disk so that CoCo 1 and 2 users can use it, but it does contain a version that can be used under Level II with windows.

The two versions in the CMDS directory are TSSPELL, for use under Level I and with *T/S Word*, and TSSPELLW, for use under Level II with windows.

T/S Word, the Tandy file format program, and its companion, *T/S Edit*, the Tandy file editor program, which together make a primitive word processor, were written to operate under OS-9 Level I, which does not support windows. And while they can both be run on the CoCo 3 under OS-9 Level II, they will still not support windows. So no matter what model CoCo or operating version of OS-9, if you want to access *T/S Spell* through the menu icons in *T/S Word*, you must use the TSSPELL version of the program.

I ran *T/S Spell, T/S Word* and *T/S Edit* on my CoCo 3 under OS-9 Level II. Now, there is a trick to this. It must be done on a non-graphics, non-window screen. It must be done in the 32-column screen mode available under VDG/INIT. In other words, the system configuration you get from OS-9 Level II — right out of the box. I merely copied all the *T/S Spell, T/S Word* and *T/S Edit* programs over to my system disk. The only drawback with using these on the CoCo 3 is that they do not and cannot take advantage of the better looking 80-column mode available under Level II. Instead, you are limited to using the awkward 80-column graphic screen that the OS-9 Level I system provides for the CoCos 1 and 2.

But there is some partial relief. As mentioned before, *T/S Spell* comes with two main programs, TSSPELL and TSSPELLW. The latter is the OS-9 Level II version (you guessed it, 'W' stands for windows). Now, while you can't use TSSPELLW in the *T/S Word* program, either TSSPELL or TSSPELLW can be used as a stand-alone program to spell check any ASCII file. Therefore, you can, on the CoCo 3 under OS-9 Level II, get the benefit of the better 80-column text screens by spell checking the file created with *T/S Word* outside of *T/S Word.*

The font characters are much easier to read and better looking, too.

T/S Spell has a number of unique features in its operation. When in the default CHECK/CORRECT mode, if it does not find your word in one of its dictionaries, it highlights that word and then provides you with several options. At this time you can choose to go one of four routes with the suspect word. You can OK the word and the program will proceed to the next suspect word. You can tell *T/S*

star micronics

MULTI-FONT PRINTER
NX-1000
NEW

7 Color Printer
NX-1000 RAINBOW

The NX-1000 gives you plenty of print options for attractive printing. Four typestyles. Four pitch sizes, in standard and italics for a total of 32 NLQ modes. The NX-1000 Rainbow gives you all these features plus online access to 7 color printing and graphics. Black, blue, red, yellow, green, violet, and orange. Both models have a 1 year warranty, nationwide depot service from Honeywell and a 30 day online trial.

NX-1000 SPECS: 144 cps Draft, 36 cps NLQ (18 x 23 dot matrix), 4 NLQ Fonts, Italics, Sub & Superscripts, Emphasized, Doublestrike, Proportional, Condensed, International, Downloadable, Quad Tall, Double Tall, Underline, 9+ Pitchs, Forward and Reverse n/216" Line Feeds, Absolute or Relative Vert. & Horz. Tabs, Left, Center or Right Justification, 8 Graphics Modes to 1920 dpi, Macro Instruction, Bidirection, 200+ Printable Characters, Semi Auto Sheet Feed, Front Panel Soft Touch Control, Epson and IBM Emulate, 4k Data Buffer, Hex Dump.
Rainbow: Same plus color.

NX-1000 SYSTEM INCLUDES:
- Star NX-1000 Printer
- Blue Streak Ultima
- Software Support Trio

$199.95 +$10 Shipping and Insurance
COMPLETE

NX-1000 RAINBOW SYSTEM INCLUDES:
- Star NX-1000 Colour Printer
- Blue Streak Ultima
- Software Trio
- Color Imaging Software

$299.95 +$10 Shipping and Insurance
COMPLETE

Software Support Trio

TYPE SELECTION/ TUTORIAL
Online instructional program that will select 24 special features of your printer or display methods to incorporate them into your programs.

SUPER GEMPRINT
Will transfer a Pmode 0, 1, 2, 3, or 4 picture screen to printer 8"x11" hardcopy. Black/white, white/black or grey level shading for color.

HI-RES SUPER GEMPRINT
Disk software that will transfer a Hscreen 1,2,3 or 4 picture screen to printer. Grey level shading for color.

Software Trio $19.95

Price, availability and specifications subject to change without notice.

DAYTON ASSOCIATES of W.R. HALL, INC.
7201 CLAIRCREST, BLDG. D
DAYTON, OHIO 45424
OHIO RESIDENTS ADD 6% SALES TAX • C.O.D. ADD $2.00

PERSONAL SERVICE
(513) 236-1454
Visa & MasterCard
within the continental U.S.

Spell to LOOKUP a suggested list of possible replacements for the suspect word, in which case it will scan its Master Dictionary for a list of the six most similar words to your spelling, displaying them for your consideration and selection or rejection. You may choose one of the suggested words and have it substituted into your text by merely highlighting it and pressing ENTER.

You can RETYPE the suspect word. Or, you can approve the spelling of the word as it exists and ADD it to your Personal Dictionary. If you ADD the word, all further occurrences of the word will be considered valid.

After having run through all the suspect words in the text file, the program asks you if you want to save the corrections or ignore them. If you choose to save them, the program creates a new corrected text file under your original name and renames the old un-corrected text file by adding the extension .BU to it.

Next, if you did any adding, the program asks if you really want to add the new words to your Personal Dictionary. If you do and you have not already created a Personal Dictionary, the program creates one for you under the filename TSPersonal.

I'd like to pause here to say a few things about Personal Dictionaries. Notice, I said dictionaries because you can have more than one. You can create any number of special function Personal Dictionaries. The trade-off with using many Personal Dictionaries lies between all-inclusiveness versus search time, but only one Personal Dictionary may be utilized at a time in a command line.

Aside from having a Personal Dictionary created automatically with the use of the ADD function, you can also use a text editor to create one following the rules set down in the user's manual for the Quick Dictionary. If you would like TSSPELL or TSSPELLW to check your Personal Dictionary for words and it's also on Drive /D1, you must indicate its location by adding, P /D1/PERSONAL.DICTIONARY.NAME, to the command line.

Additionally, you may modify WORD.ICONS, as illustrated above, to have *T/S Spell* through *T/S Word* check your Personal Dictionary for words in your text file. However, there seems to be a little quirk in WORD.ICONS that you should be aware of when making the aforementioned modifications to include your Personal Dictionary. It seems that WORD.ICONS wants every command line to fit on one line, and if you stick with the name TSPersonal as the name of your Personal Dictionary, it is too long of a name to place on one line with all the other modifiers. What I suggest is that you adopt the same scheme of dictionary naming that *T/S Spell* uses and rename your Personal Dictionary TSP. That way the command modification for WORD.ICONS would read:

```
TSSPELL % M /D1/TSM Q /D1/TSQ P
/D1/TSP #16K.
```

T/S Spell also provides command options to change the screen colors. For TSSPELL you are limited to either a black-on-green screen (the default), or black-on-white. On the other hand, TSSPELLW provides for a number of color combinations for both its primary window and its secondary windows.

But wait! That's not the end of *T/S Spell*'s many features. We have discussed only the default CHECK/CORRECT mode. There are still two more modes of operation. If the program had stopped here with only the ability to check and correct spelling, it would still have been well worth its price, but there are two other modes: DIRECT MODE and the FILTER MODE.

Suppose you just want to look up how to spell a word as you would with any dictionary. *T/S Spell* can do that,

Brawn of a Cable with the Brains of an Interface!

The Ultimate Serial to Parallel Converter!

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. Try it on your system for 30 days RISK FREE. One year warranty. Dealer inquiries on quantity 3+.

BLUE STREAK ULTIMA
$39.95 +$2 Shipping

Color Imaging System

Print In Color on your Star NX-10 or DMP-130

Super Gemprint Color Imaging System

Use your favorite program to create a pmode or hi-res graphic image, but don't stop there! Run our color graphics software and print a color image using a pallette of 81+ colors on your NX-10 or DMP-130 from a CoCo 1, 2, or 3. This system superimposes 4 graphic screen dumps (black, blue, yellow & red) while prompting you to change ribbon cartriges after each page. The colors mix and add to give you your own color masterpiece.

Includes: Software disk, 1 blue, 1 red & 1 yellow ribbon cartridge.

System Requirements: 32k ECB Disk, Blue Streak 1, 2, 3 or Ultima

Price, specifications subject to change without notice.

$39.95 +$3 Shipping

DAYTON ASSOCIATES of W.R. HALL, **INC.**
7201 CLAIRCREST, BLDG. D
DAYTON, OHIO 45424
OHIO RESIDENTS ADD 6% SALES TAX • C.O.D. ADD $2.00

PERSONAL SERVICE
(513) 236-1454
Visa & MasterCard
within the continental U.S.

too. Simply enter TSSPELL D or TSSPELLW D (if you relocated the dictionaries to Drive /D1, don't forget to tell the program in the command line, or simpler yet, just CHD /D1). The program then displays the message ENTER WORD TO LOOKUP :. Merely type in your word as you think it is spelled and the program goes to work. If the word is located in the dictionary, it displays the message OK. If it is not, it displays NOT FOUND, CLOSEST MATCHES, and then lists six words that come the closest to your spelling. You exit the DIRECT MODE by simply pressing ENTER without entering a word to lookup.

Since TSSPELLW works with windows, you can type out a text file in one window and, when you need to look up the spelling of a word, jump to another window and run TSSPELLW in the DIRECT MODE. Neat, huh?

The last mode is the FILTER MODE. The basic premise of this mode is to scan a text file and then list out all the words that do not appear in the dictionary. The list can be redirected from the normal screen output to a printer or disk file. To send the list to the printer, merely enter TSSPELL (or TSSPELLW) F MYFILENAME >/P.

If you don't include a filename, the program takes its input from the keyboard until an EOF (CTRL-BREAK) is entered as the first character on a line.

This brings another scenario to mind. Suppose you have one of those "high-tech" kids, who needs to practice his spelling words. Let him type them on the keyboard in the FILTER MODE. The misspelled words could then be output to the screen or listed out to the printer. Pounding a CoCo keyboard is so much more fun than the old-fashioned paper and pencil method.

I have saved one surprise about *T/S Spell* for last. With all the many features Tandy has included in *T/S Spell*, they could have charged big bucks for the program and no one would have looked twice. A plain vanilla spell checker for some of their other computers, offering about a tenth of the features that *T/S Spell* has, goes for $100 or more (and they don't have the dictionary size, either). But Tandy kept the price down, along the same lines of its other excellent programs for the CoCos. *T/S Spell* is well worth every penny and should be on everyone's must-have list.

(Tandy Corporation, 1700 One Tandy Center, Fort Worth, TX 76102; $39.95. Available in Radio Shack stores nationwide.)

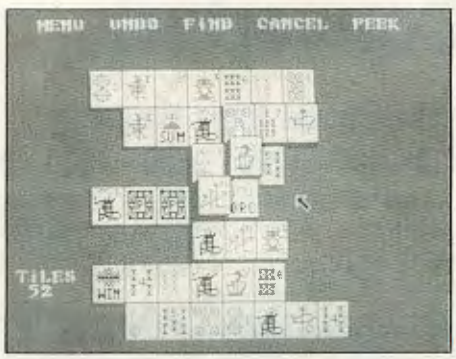
— Kerry M. Armstrong

Software CoCo 3

Shanghai — Fast-Paced Fun

Shanghai is based on an ancient Chinese game called Mah-Jongg. The origins of Mah-Jongg are as mysterious as the game itself, but it is believed to have started about 500 B.C. and is still played today in many parts of the world. It is similar to many card games but is played with small rectangular tiles engraved with Chinese drawings and symbols. There are 144 Shanghai tiles used on the CoCo 3 version of this ancient game. Of these, 108 are divided into suits much like playing cards. But in *Shanghai*, there are also 12 Dragon tiles, 16 Winds, four Seasons and four Flowers.

The object of *Shanghai* is to dismantle the pile of tiles shown on the screen. The pile is randomly generated for each



game and is five layers deep. The dismantling process is done with the joystick by selecting matching tiles with an arrow. Tiles can only be moved in a left or right direction. Tiles between other tiles cannot be moved — only the top tiles that are free on the left or right side. If you are successful in removing all the tiles, you uncover the colorful fire-breathing dragon and win the game.

Shanghai is supplied on a ROM Pak and runs on a 128K or higher Color Computer 3. It can plug directly into the side of the CoCo 3 or, if you have a Multi-Pak Interface, just plug it into any unused slot.

The graphics on *Shanghai* are exceptional and have to be seen to be believed. The program, written by Rick Adams and designed by Brodie Lockard, is an Activision product that is simply outstanding on the CoCo 3. Since the stack of tiles is viewed from above, you can well imagine the difficulty in trying to show depth perception. The authors have taken care of this by using gray shading and black borders at strategic edges of the tiles. The result is an amazing 3-D effect that displays all five layers of the tiles with ease. As tiles are removed, the shading continues so that you still see distinct layers throughout the game.

After the game auto-starts on your computer, you are given the opportunity to select either RGB or Color Composite monitors. A main menu then appears with these options: Play Solitaire, Begin Again, Select a Dragon, Tournament Play, Challenge Match and Return to Game.

When playing, you always have the opportunity to cancel a move or to peek ahead. If you select a tile that cannot be moved, the computer beeps and displays a message that tells you the tile cannot be moved. If the tile is movable, it flashes when you tap the joystick button. After matching tiles have been selected, a final tap removes them from the screen and a countdown score is displayed in the lower-left corner of the screen. A nice touch is the use of a Chinese-style font for the text on each screen.

Tournament Shanghai can be played with multiple players and provides scores for each player. A five- or 10-minute time limit can be set and a countdown clock is displayed.

Challenge Shanghai is a no-holds-barred competition between two players, each using his own joystick. A predetermined time limit of up to 60 seconds can be selected and each successful move of two tiles nets 1 point.

I really liked *Shanghai*. It provides hours of quiet challenge or fast-paced fun if played with a friend. It is well-done, has outstanding graphics and makes your CoCo 3 really shine.

(Activision, Inc., 2350 Bayshore Frontage Road, Mountain View, CA 94043; $34.95. Available in Radio Shack stores nationwide.)

— David Gerald

Received and Certified

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.*

◆F **Cartoonamator**, a 64K disk-based animation program that displays up to one minute of animation with 20 characters and four settings that you design. For the CoCo 2 and 3. *Cocotronics Software, 29 Southbrook, Irvine, CA 92714, (714) 651-0283; $17.95 plus $2 S/H.*

CoCo Address Book, a 32K program designed to assist in maintaining a mailing list, telephone list and address file. For the CoCo 1, 2 and 3. *Bob's Software, P.O. Box 391, Cleveland, OH 44107, (216) 871-8858; $20 plus $2.50 S/H.*

Domination, a 128K board game for two to six players. The computer generates the game board (a map) and keeps track of all playing pieces. The object is to take control of the planet YCNAB by using your armies to conquer all provinces controlled by other players. For the CoCo 3. *HAWKSoft, 307 Sexauer Avenue, Elgin, IL 60123, (312) 742-3084; $18.*

SuperDisk +3, a utility that makes a spare copy of the disk directory. For the CoCo 1, 2 and 3. *Sunrise Software, 8901 NW 26 Street, Sunrise, FL 33322, (800) 628-2828; $19.95.*

Thexder, a 128K arcade game. Pilot a robot through multiple attack scenarios. The battlefields include caves, cargo holds and spaceship interiors. For the CoCo 3. *Tandy Corporation, 1700 One Tandy Center, Ft. Worth, TX 76102; $24.95. Available in Radio Shack stores nationwide.*

◆F **Tomb of T'ien**, a 64K animated graphics Adventure. Your village has been burned and its sacred shrine stolen by the mythical dragon. You have been chosen to conquer the dragon and retrieve the shrine so that the village may live in peace. For the CoCo 1, 2 and 3. *Valkyrie, 37 Peter Bush Drive, Monroe, NY 10950, (914) 783-0191; $19.95.*

Try-O-Tax, a program to assist with federal income tax returns. This fifth edition includes tax changes for 1987. For the CoCo 1, 2 and 3. *Try-O-Byte, 1008 Alton Circle, Florence, SC 29501, (803) 662-9500; $44.99 plus $3 S/H.*

◆F **Zandar**, a space game that lets you maneuver through three levels of play. The object is to leave your home planet and land safely on the farthest planet. Drone ships are between you and every planet, and it takes practice to aim your laser. For the CoCo 3. *K-Soft, 300 13th NE, East Wenatchee, WA 98801, (509) 662-9365; $24.95.*

◆F **First product received from this company**

The *Seal of Certification* program is open to all manufacturers of products for the Tandy Color Computer, regardless of whether they advertise in THE RAINBOW.

By awarding a *Seal*, the magazine certifies the product does *exist* — that we have examined it and have a sample copy — but this *does not* constitute any guarantee of satisfaction. As soon as possible, these hardware or software items will be forwarded to THE RAINBOW reviewers for evaluation.

— Judi Hutchinson

Reach Out and Touch Someone

By Cray Augsburg
Rainbow Technical Editor

It has been some time since we have discussed the "simple" things that can be done on our CoCo SIG. Those of us who have used the system for a while have no problem performing tasks such as sending mail or posting a Forum message, and we take these things in stride and go about them without even thinking.

The new user, however, doesn't have the experience necessary to use Delphi's features "without thinking." Even discounting all the fancy things that can be done in Mail, it can be very frustrating to send that first electronic letter. And when you don't know how to do that, it becomes difficult to ask for online assistance.

Sending Your First Letter

After becoming familiar with the CoCo SIG, you might decide it is time to reach out and interact with other users. A useful way to do this is with electronic mail. You can send "letters" to other people on the system. But how do you do this?

At the CoCo SIG prompt, you can enter the Mail section of Delphi by typing MAIL (or MA, for short) and pressing ENTER. After a short wait, the MAIL> prompt will appear on your screen. At this point, you can do many things. The easiest, of course, is sending a simple letter.

To begin your letter, first enter SEND. Delphi will prompt you with TO:, asking for the username of the person to whom you are sending your letter. Simply enter the appropriate username. If you want your letter to go to more than one person, type in the usernames of all the people you want to write to, separating each with a comma. When you are finished entering the usernames, press ENTER. (Delphi takes care of the hard part for you.)

At this point, Delphi will respond with SUBJECT:. You are given the opportunity to enter a brief description of the contents of the letter (this tag helps mail recipients when the time comes to file letters away in their Mail files). Just enter your description (up to about 40 or 50 characters) and press ENTER.

Now, Delphi will tell you to enter your letter. It also tells you that to finalize ("transmit") your letter you must press CONTROL-Z. You can abort the letter at any point by pressing CONTROL-C.

The system has one quirk that can be very maddening at times. If you put enough text on one line so that the computer must go down to the next line, the system inserts a blank line between the two lines. Or it might put a few words on each of many different lines and shift these words increasingly farther to the right.

The moral of this story is simple: As you enter your text in a letter (or anywhere on the SIG, for that matter) and get near the right-hand side of the screen, go ahead and press ENTER to send that line. If you don't have room for the next word on the same line, press ENTER and use another line. This is quite easy to do and becomes second nature after a short while.

When you have finished the body of your letter, please "sign" it (we prefer that you sign all correspondence with your real name) and press CONTROL-Z. It will then be sent to the people you have indicated.

That's all there is to sending a letter! If you don't believe me, try it. Send one to yourself. To do this, all you need to do is answer the TO: prompt with your

Cray Augsburg is RAINBOW's technical editor and has an associate's degree in electrical engineering. He and his wife, Ruth Ann, have two children and live in Louisville, Kentucky. His username on Delphi is CRAY.

Database Report

Activity on both OS-9 Online and the CoCo SIG has been lively in spite of the recent holiday season. Many users received new CoCos or software as Christmas presents and are now using them to produce utilities, pictures and other programs they want to share with the CoCo population.

Joe Carney (JOECARNEY) helped us to do some testing in early November to determine the speed of downloading from Delphi using Xmodem versus Ymodem at 300, 1200 and 2400 bits per second. As it turns out, Ymodem is roughly 10 percent faster than Xmodem at 300 bps, 20 percent faster at 1200 bps, and 30 percent faster at 2400 bps.

Few CoCo terminal programs support Ymodem at present, although we expect that to change shortly. If you have a terminal program that supports Ymodem, you may want to use it online for faster downloads. (A Ymodem patch for Version 2.0 of *Rickeyterm* and the CoCo 3 is available in the Data Communications topic of the CoCo SIG's database.)

OS-9 Online

In the General topic area, **Rix Seacord** (RIX) uploaded his review of the Burke & Burke interface. **Chris Burke** (COCOXT) uploaded a very informative description of the hard drive system available from Burke & Burke detailing what is included, what is needed, and where to obtain all the hardware. Chris also furnished the Burke & Burke application notes #1 and #2. **Kevin Darling** (KDARLING) uploaded a text file that gives a brief description of *Multi-Vue*. **Paul Kacprowicz** (PAK) uploaded an article that gives his impressions of the *Flight Simulator II* program from Sub-Logic. **Jonathan Guthrie** (SCIGUY) uploaded a documentation file for the Ymodem protocol. **Greg Law** (GREGL) provided a documentation file for the calling syntax for all of the functions in the CGFX.L library in the Developer's System. **Bill Brady** (WBRADY) uploaded several text articles dealing with starting up OS-9/68K on an Atari system.

In the Patches topic area, **Ken Scales** (KSCALES) uploaded *CC3PAK*, which will

TEXTPRO-IV

"The ULTIMATE Color Computer III Word Processing System"

*** 9 Hi-Res Displays from 58 to 212 columns by 24 lines in 225 Res.**
*** Screen Display of Bold, Italic, Underline & Double Width print.**
*** 9 Proportional Character Sets Supported with full Justification.**
*** 80 Programmable Function Keys & Loadable Function key sets.**
*** Three Programmable Headers and One Programmable Footer.**
*** Automatic Footnote System places lines at the bottom of a page.**
*** 7 Tab Commands, with: Center, Left, Right and Decimal align.**
*** Autoexecute Startup files for easy printer & system setup.**
*** 8 Pre-Defined & 10 Programmable printer function commands.**
*** Supports Library files for unlimited printing & configurations.**
*** Disk file record access for Mail Merge & Boiler Plate printing.**
*** Complete Automatic Justification, Centering, Flush left & right.**
*** Change indents, margins, line length, etc. anytime in the text.**
*** Create and Edit files larger than memory, up to a full disk.**
*** Easily imbed any number of printer format and control codes.**
*** Compatible with all printers including Laser printers.**
*** Built in Ultra Fast 2 drive RAMDISK for 512K support.**

TEXTPRO IV is the most Powerful Word Processing System available for the COCO-3, designed for speed, flexability and extensive document processing. It is not like most of the other word processing programs available for the Color Computer. If you are looking for a simple word processor to write letters or other short documents, and never expect to use multiple fonts or proportional printing, then most likely you'll be better off with one of the other simple word processors. But, if you want a powerful word processor with extensive document formatting features to handle large documents, term papers, manuals, complex formatting problems and letter writing, then TEXTPRO IV is the answer. It works in a totally different way than most word processing programs. It uses simple 2 character abbreviations of words or phrases for commands and formatting information that you imbed directly in your text. There are over 70 different formatting commands you can use without ever leaving the text your working on. There are no time comsuming and frustrating menu chases, you are in total control at all times. You can display the formatted document on the screen before a single word is ever printed on your printer. Including margins, headers, footers, page numbers, page breaks, column formatting, justification, and Bold, Italic, Underline, Double Width, Superscript and Subscript characters.

TEXTPRO IV can even support LASER PRINTERS with proportional fonts, take a good look at this AD? It was done with TEXTPRO IV on an OKIDATA LASERLINE-6 laser printer!!! All of the character sets used on this AD are proportional, all centering, justification, font selection, and text printing was performed automatically by TEXTPRO IV.

What you see is what you get!

TEXTPRO IV has 9 Hi-Resolution screen fonts to choose from, with 58 to 212 characters per line in 225 Resolution, for the best display possible. You can easily match the width of your printed page to the screen and you can have it automatically change display widths as you change printer fonts so you can even display the "fine print". All of the screen fonts can display, Bold, Italic, Underline, Superscript, Subscript and Double Width characters. When you you want to see what your printed document will look like, TEXTPRO IV will let you see it on the screen in all its glory, so that, "What you see is what you get".

Standard Commands

TEXTPRO IV has all the document formatting commands you expect in a word processor and then some. The setup commands include: line length, top margin, bottom margin, page length, page numbering on/off, page format on/off, automatic word fill on/off and justification left, center, right or full. Some of the Vertical control features include: Test for a number of lines left on a page, skip to next page, set page number, page pause, single and multiple line spacing.

TEXTPRO IV features 3 programmable Header lines that can be centered, left or right justified and one programmable Footer line. There are 3 commands for continious, single and paragraph indenting, Center Text, Center Line and Right Justify text with character fill.

Printer & Special Commands

TEXTPRO IV has 8 pre-defined printer & screen commands for Bold, Italic, Double Width, Underline, Subscript, Superscript, Condensed and Double Strike print. It also has 10 programmable functions that you can use to access intelligent printer features like: Graphics, variable line spacing, half line feed, horizontal & vertical positioning. There are also 3 other printer commands that allow you to imbed control code sequences anywhere in the text.

There is a Footnote command that will automatically place footnotes at the bottom of the page. Another command allows you to display a message on the screen and input text from the keyboard, to be included in your printed document. There is also a repeat command that allows you to repeat an entire document or part of one, up to 255 times.

Tab Functions

TEXTPRO IV features an elaborate system of tab commands for complete control over column formatting. There are 10 programmable tab stops that can be defined and re-defined at any time. They can be used to: Center over Tab column, Right Justify to Tab column, Decimal Align over Tab column, Left Justify to Tab column (Normal Tab) and Horizontal Tab. They can also be used with a numeric column position for maximum flexibility.

Proportional Fonts & Printing

TEXTPRO IV is the only Color Computer III Word Processing system that gives you Justified Proportion Printing, which can give your documents and letters that professional touch that just isn't obtainable with fixed or mono spaced printing. And just about all printers today support proportional fonts, and with Laser Printers you can get typesetting quality output for just pennies a page. TEXTPRO IV supports up to 9 proportional fonts, with full justification. And, you can even mix mono spaced and proportional fonts for maximum flexability. Even if you don't use proportional printing, you can select between Pica, Elite and Condensed fixed width fonts to get fully justified printing.

Mail Merge and Text Processing Disk Functions

TEXTPRO IV supports several commands that allow you to import data or text from other disk files. They allow you to include information like names and addresses for Mail Merge capability, Import standard paragraphs or other information for Boiler Plate type functions and more. Some of the commands include: Open a file, Field a Record, Read a Record into fielded variables, Read single or multiple lines and Trim spaces from the trailing end of fielded variables.

Another powerful disk function not to be overlooked is the "LIBRARY" command that allows you to include the entire contents of a file in your text. This can be very useful for a great many applications. You can use a Library command to automatically include a standard or optional printer setup command file, or to include standard paragraphs, headers or information created from a spread sheet or any other program. And, for printing very large documents that consist of several files linked together.

Autoexec Startup Files

TEXTPRO IV will automatically load and execute a command text file when it first executes. This allows you to customize the program configuration for your system and printer whenever you startup TEXTPRO IV. You can setup the screen display format, colors, adjust automatic key repeat, printer baud rate, load a set of function keys, load your printers control codes and more.

80 Programmable Function Keys

TEXTPRO IV allows you to have up to 80 function keys with just about any kind of information or command sequences you can imagine. Once programmed, you can have a command sequence execute using a single function key. You can also Save and Load function key sets at any time. So, you can have several sets for different writing tasks or projects, the possibilities are endless. Just think, with a single function key you could, load a disk file, search for and replace all the occurances of a phrase, save the file back to disk, have it processed and printed!

Text Editing

TEXTPRO IV has a powerful, full featured, line oriented screen editor that is faster and more efficient then most editors you've ever worked with. It supports single or multiple line copy and move, global or local search and replace, word and character insert/delete, block delete and much more. It features adjustable automatic key repeat, selectable display foreground and background colors, screen line width and more.

TEXTPRO IV uses fully compatible ASCII formatted files. You can even direct formatted output files to a standard ASCII disk file. It will Load, Save, Append, Kill, Text Process files from disk, Roll part of a file to disk, Get next portion of a file, display a Directory and Backup Ramdisk to & from Floppy disks.

TEXTPRO IV's files are also compatible with spelling checker programs like Spell 'n Fix from Star Kits, a shareware program, available with TEXTPRO IV for your evaluation, just for the asking.

Fully Buffered Keyboard

While many word processing programs are slow and often lose keystrokes. TEXTPRO IV has a fully buffered keyboard that is virtually impossible to out type. Even when it's busy, it will still remember the keystrokes entered. You can enter in commands or whatever, even during insert mode you'll never lose a key.

Professional Word Processing Power

TEXTPRO IV is a powerful tool for both the Casual and Professional Word Processing user. It offers a wide range of features and functions that can satisfy even the most demanding writer. Even though you may not need all of TEXTPRO IV's power and flexability right now, its not a program that you can easily outgrow. As your needs and skills improve, you'll discover that you won't need to go out and buy another word processing program, TEXTPRO IV will already be ready and waiting. No Text Processing program available for the Color Computer III gives you more Text Processing Power than TEXTPRO IV. It can make your writing appear more professional than you ever thought possible. Check around, see what other word processing programs have to offer in terms of power, speed and flexability. When your finished comparing them against TEXTPRO IV, you'll see that it's the only real choice for the Color Computer III.

Requires 128K & Disk $89.95

To order TEXTPRO IV by mail, send check or money order for the amount of purchase, plus $3.00 for shipping & handling to the address below.
To Order by VISA, MASTERCARD or COD call us at (702) 452-0632
(Monday thru Saturday, 8am to 5pm PST)

CER-COMP LTD.
5566 Ricochet Avenue
Las Vegas, Nevada 89110
(702) 452-0632

Coming Soon: CoCo 1 & 2 versions of *TEXTPRO* IV

own username, respond to the SUBJECT: prompt, type a message, and press CONTROL-Z.

Now, to see the message you have just sent, type READ/NEW at the MAIL> prompt and it will be displayed. (Each time you enter Mail, the system will default to READ/NEW in order for you to see any messages entered.) When you are satisfied that electronic mail works, send a few letters to other people. You might want to learn more about Mail while you are there, too. Just enter HELP at the MAIL> prompt and let Delphi teach you. To leave the Mail area and return to the CoCo SIG prompt, just press CONTROL-Z.

On to Forum

Posting a Forum message is almost as simple as sending electronic mail. And, if privacy isn't necessary, using the Forum for asking questions and posting ideas is preferred. By keeping such communication in public view, others can follow our thoughts. They might be able to back up our suggestions. And we also stand a much better chance of having our questions answered quickly. It isn't uncommon to ask a question in Forum on a Saturday night, log off for an hour and come back to find two or three responses.

To get to the Forum area from the CoCo SIG prompt, simply type FORUM, or use the abbreviation FO, and press ENTER. Once there, you might want to scroll through some existing messages to get a feel for the layout. To do this, just press ENTER. Every time you press ENTER, you will continue forward. If you come across a MORE? prompt, press ENTER.

If you come across a message you would like to respond to, enter REPLY. Delphi prompts you with TO:. Now look up at the top of the message to which you are replying, get the username and type it in. Or you can simply press ENTER. If you choose the latter method, you will be taken immediately to the text entry mode. This mode works just as it did in Mail. Do remember to cut your lines short on the right side of the screen.

If you type in the username (after all, you might also want to "reply" to someone else), you are prompted with SUBJECT:. Again, just like in Mail, enter a short description here. The last prompt before getting to text entry is TOPIC?. You can pick one of the Delphi topics presented in Figure 1 for entry at

Topics

General Information
Info on Rainbow
CoCo 3 Graphics
Archives
Source for 6809 Assemblers
HELP
Utilities & Applications
Product Reviews & Announcements
Hardware Hacking
Rainbow On Tape
Games
Data Communications
Classic Graphics
Music & Sound

Figure 1

patch *CC310* to allow the Level I version of *DynaStar* to work with Level II. He also uploaded KEYTAB01.AR, which patches *CC310* (Level II) to provide the capability of selecting an alternate mapping for up to 23 of the non-alpha key codes. The two key maps may be toggled independently on a window basis. The alternate key map included allows the arrow and function keys to be used under *DynaStar*. Chris Burke uploaded a short text file that describes a fix to Version 1.3 of the Burke & Burke drivers, which have a problem with masking the interrupts. **Bruce Isted** (BRUCEISTED) uploaded SSCLK.AR, a Level II clock module patch for Speech Systems' *RTC*; PCPAK.AR, a file describing the hardware modification to allow the PBJ P-C Pak to work with a CoCo 3 running OS-9 Level II; *PCPAK.AR Update*, a revision that includes CoCo 3 clock patches and printer drivers for the PBJ P-C Pak; and SSPAK.AR, a file that describes the hardware modification for the Speech & Sound Pak to enable it to run on a CoCo 3 at 1.78MHz. **Denny Skala** (DENNYSKALA) uploaded a one-byte *ACIAPAK* module patch that extends the character "cushion" between its sending an XOFF signal to the host and the end of its input buffer.

In the Graphics and Music topic area, **Steve Clark** (STEVECLARK) uploaded a program to display *McPaint* graphics pictures from the Macintosh into the CoCo 3 screens under OS-9. **Gene Loefer** (GLOEFER) gave us a very nice program that generates graphics images based on the Mandelbrot functions. Several RLE pictures have been posted by Steve Clark. Steve also uploaded the source and binary versions for the VDG and window screens and a printer dump for the Tandy DMP series printers. **Steve H. Fravel** (OS9FANATIC) uploaded the humorous 1988 Andy Capp Calendar, which features Andy doing his favorite thing.

In the Device Drivers topic area, **Craig Aarseth** (CRAIGAA) uploaded a file that describes the changes to the hardware and software to allow the PC-Pak to function under OS-9 Level II. **Brian Stretch** (BRIANSTRETCH) uploaded the source and object code for a driver for the JFD-CP Parallel Port under Level II. **Tim Sirianni** (TDS) uploaded a device driver and descriptor for a RAM disk driver for the Disto RAM disk card. **Dennis Weldy** (OS9ER) uploaded WINDOWS.AR, which contains binary copies of window descriptors w8-w15.

In the Programmers Den topic area, **Jim Johnson** (REINDEER) uploaded a PIA definitions file that defines the PIA registers and bits for the two PIAs in the CoCo 3. Jim also uploaded a "Floppy Disk Defs File" to the Programmers Den database topic area. This is a complete breakdown of the registers and commands of the WD1773/MB8877A floppy disk controller chip used by the Tandy Disk Controller. SIGop Greg Law updated his stand-alone program that allows a user to execute system calls from the command line. This version allows system calls returning packets of data to be executed and dumps the packets to disk files, which can then be examined with the *DUMP* utility. **Ray McCoppin** (RAYMCCOPPIN) sent us three C programs called *Frame, PI* and *Cmouse*.

In the Users Group topic area, over 40 files were added as we continue to bring more and more of these valuable files online.

In the Applications topic area, **Joel Sherman** (JSHERMAN) uploaded an address database program written in BASIC09. **Pat Abramovitch** (HUBBS) uploaded *Check09* to the Applications database topic area. This is a mouse-driven checkbook program that works on graphics screens. Dennis Weldy uploaded DS.INIT, which redefines (among other things) the cursor movement commands available through the arrow keys.

In the Utilities topic area, **Michael Washburn** (COMPZAP) uploaded *PSET*, a printer setup and menu program, and *DOWN*, a utility for Gemini and Star printers with character download capability, to allow the user to design his or her own printer fonts or use the Level II screen fonts. Greg Law published *Code*, a program that translates an input character into an output string of the form: character, hexadecimal, decimal and octal values. Greg also provided *Merror*, which is a self-contained program similar to *Error*, which keeps the errmsg file in memory along with some descriptive text of the error (helpful for those who make lots of errors). **Warren Moore** (WJMOORE) uploaded *SELECT16*, which displays 16 colors of the user's choice on the 320-by-192 screen, and *SPLIT*, which will split an ASCII file into several smaller files as specified by the number of records or the number of bytes.

CBASIC III EDITOR/COMPILER

The ULTIMATE Color Computer III BASIC COMPILER!!!

If you want to write fast efficient machine language programs and you don't want to spend the next few years trying to learn how to write them in Assembly language or with a cheap compiler, then CBASIC III is the answer!!!

CBASIC III is the only fully integrated Basic Compiler and Program Editing System available for the Color Computer 3. It will allow you to take full advantage of all the capabilities available in your CoCo-3 including 512K RAM, without having to spend years trying to learn assembly language programming. CBASIC III allows you to create, edit and convert programs from a language you are already familiar with Enhanced Disk Color Basic, into fast efficient machine language programs easily and quickly. CBASIC III supports all the enhanced hardware available in the CoCo-3, including Hi-Res Graphics, & Screen displays, Extended Memory and Interrupts (Keyboard, Timer, Serial & Clock). We even added advanced commands not available in Basic to give you a level of control only avialable to very advanced Machine Language Programmers. Plus we made it exceptionally easy to use, not like some other compilers. CBASIC III is the friendliest and easiest compiler available for the Color Computer III.

CBASIC III is a powerful tool for the Beginner as well as the Advanced Basic or Machine Language programmer. You can write programs without having to worry about the Stack, DP Register, memory allocations and so on, because CBASIC III will handle it for you automatically. For Advanced users, CBASIC III will let you control every aspect of your program, even generating machine code directly in a program easily.

CBASIC III features well over 150 Compiled Basic Commands and Functions that fully support Disk Sequential and Direct access files, Tape, Printer and Screen I/O. It supports ALL the High and Low Resolution Graphics, Sound, Play and String Operations available in Enhanced Color Basic, including Graphics H/GET, H/Put, H/Play and H/DRAW, all with 99.9% syntax compatibility. CBASIC III also supports the built in Serial I/O port with separate programmable printer & serial I/O baud rates. You can send and receive data with easy to use PRINT, INPUT, INKEY, GETCHAR and PUTCHAR commands.

CBASIC makes full use of the powerful and flexible GIMI chip in the Color Computer 3. It will fully utilize the 128K of RAM available and install 2 Ultra Fast Ramdisks if 512K is available, for program Creation, Editing and Compilation. You can easily access all 512K of memory in a Compiled program thru several extended memory commands that can access it in 32K or 8K blocks and single or double bytes.

CBASIC has its own completely integrated Basic Program Editor which allows you to load, edit or create programs for the compiler. It is a full featured editor designed specifically for writing Basic programs. It has block move and copy, program renumbering, automatic line number generation, screen editing, printer control and much more.

The documentation provided with CBASIC III is an 8 1/2 by 11 Spiral Bound book which contains approximatly 120 pages of real information. We went to great lengths to provide a manual that is not only easy to use and understand, but complete and comprehensive enough for even the most sophisticated user.

CBASIC III is the most expensive Color Basic Compiler on the market, and well worth the investment. You can buy a less expensive compiler for your CoCo-3, and then find out how difficult it is to use, or how limited its features are. Then you'll wish you had bought CBASIC III in the first place. Dollar for dollar, CBASIC III gives you more than any other compiler available. If you can find a better CoCo-3 Basic Compiler then buy it!!!

Requires 128K & Disk $149.00

DATAPACK III PLUS V1.1

SUPER SMART TERMINAL PROGRAM

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

- No lost data even at 2400 Baud on the COCO-3 Serial I/O port.
- 8 Display Formats, 32/40/64/80 columns at 192 or 225 Res.
- 50K Text Buffer when using the Hi-Res Text Display & Disk.
- ASCII & BINARY disk file transfer support via XMODEM.
- Directly record receive data to a disk file (Data Logging).
- VT-100 terminal emulation for VAX, UNIX and other systems.
- VT-100/52 cursor keys, position, insert/delete, PF & Alt. keys.
- Programmable Word Length, Parity, Stop Bits and baud rates.
- Complete Full and Half Duplex operation, with no garbled data.
- 9 Variable length, Programmable Macro Key buffers.
- Programmable Printer rates from 110 to 9600 baud.
- Send Files directly from the Buffer, Macro Keys or Disk.
- Display on Screen or Print the contents of the Buffer.
- Freeze Display & Review information On Line with no data loss.
- Built in Command Menu (Help) Display.
- Built in 2 Drive Ramdisk for 512K RAM support and much more.

Supports: R.S. Modem-Pak & Deluxe RS-232 Pak, even with Disk.

Requires 128K & Disk, $59.95

EDT/ASM III

128/512K DISK EDITOR ASSEMBLER

EDT/ASM III is a Disk based co-resident Text Editor & Assembler. It is designed to take advantage of the new features available in the CoCo-3 with either 128K or 512K of memory. It has 8 display formats from 32/40/64/80 columns by 24 lines in 192 or 225 Resolution, so you use the best display mode whether you are using an RGB or Composite monitor or even a TV for your display. Plus you can select any foreground or background colors or even monochrome display modes. It will even support 512K by adding an automatic 2 drive Ultra Fast Ramdisk for lightning fast assembly of program source code larger than memory. There is also a free standing ML Debug Monitor, to help you debug your assembled programs. EDT/ASM III has the most powerful, easy to use Text Editor available in any Editor/Assembler package for the Color Computer.

- Supports Local and Global string search and/or replace.
- Full Screen line editing with immediate line update.
- Easy to use Single keystroke editing commands.
- Load & Save standard ASCII formatted file formats.
- Block Move & Copy, Insert, Delete, Overtype.
- Create and Edit files larger than memory.

The Assembler portion of EDT/ASM III features include:

- Supports the full 6809 instruction set & cross assembles 6800 code.
- Supports Conditional IF/THEN/ELSE assembly.
- Supports Disk Library file (include) up to 9 levels deep.
- Supports standard Motorola assembler directives.
- Allows multiple values for FCB & FDB directives (unlike R.S. EDT/ASM)
- Allows assembly from the Editor Buffer, Disk or both.

Requires 128K & Disk $59.95

TEXTPRO IV

"The ADVANCED COCO-3 Word Processing System"

- 9 Hi-Res Displays from 58 to 212 columns by 24 lines in 225 Res.
- On Screen Display of Bold, Italic, Underline & Double Width print.
- Up to 8 Proportional Character Sets Supported with Justification.
- Up to 80 Programmable Function Keys & Loadable Function key sets.
- Fully Buffered keyboard accepts data even duiring disk access.
- Autoexecute Startup files for easy printer & system configuration.
- 8 Pre-Defined Printer function commands & 10 Programmable ones.
- Supports Library files for unlimited printing & configurations.
- Disk file record access for Mail Merge & Boiler Plate printing.
- Completely Automatic Justification, Centering, Flush left & right.
- Change indents, margins, line length, etc. anytime in the text.
- Create and Edit files larger than memory, up to a full disk.
- Easily imbed any number of printer format and control codes.
- Built in Ultra Fast 2 drive RAMDISK for 512K support.

TEXTPRO IV is the most advanced word processing system available for the COCO-3, designed for speed, flexability and extensive document processing. It is not like most of the other word processing programs available for the Color Computer. If you are looking for a simple word processor to write letters or other short documents, and never expect to use multiple fonts or proportional spacing, then most likely you'll be better off with one of the other simpler word processors. But, if you want a powerful word processor with extensive document formatting features to handle large documents, term papers, manuals, complex formatting problems and letter writing, then TEXTPRO IV is what your looking for. It works in a totally different way than most word processing programs. It uses simple 2 character abbreviations of words or phrases for commands and formatting information that you imbed directly in your text. There are over 70 different formatting commands you can use without ever leaving the text your working on. There are no time comsuming, and often frustrating menu chases, you are in total control at all times. You can see what the formatted document will look like before a single word is ever printed on your printer. Including margins, headers, footers, page numbers, page breaks, column formatting, justification, and Bold, Italic, Underline, Double Width, Superscript and Subscript characters right on the screen.

TEXTPRO IV can even support LASER PRINTERS with proportional fonts, take a good look at this AD? It was done with TEXTPRO IV on an OKIDATA LASERLINE-6 laser printer!!! All the character sets used on this AD are proportional spaced characters, all centering, justification, and text printing was performed automatically by TEXTPRO IV.

Requires 128K & Disk $89.95

HI-RES III Screen Commander

The DISPLAY you wanted but didn't get on your CoCo-3

- 54 Different Character Sizes available from 14 to 212 cpl.
- Bold, Italic, Underline, Subscript, Superscript and Plain character styles.
- Double Width, Double Height and Quad width characters.
- Scroll Protect form 1 to 23 lines on the screen.
- Mixed Text & Graphics in HSCREEN 3 mode.
- PRINT @ is available in all character sizes & styles.
- Programmable Automatic Key repeat for fast editing.
- Full Control Code Keyboard supported.
- Selectable Character & Background color.
- Uses only 4K of Extended (2nd 64K) or Basic RAM.
- Written in Ultra Fast Machine Language.

HI-RES III will improve the standard display capabilities of the Color Computer 3, even the 40 and 80 column displays have several features missing. For example, you can't use PRINT @ or have different character sizes on the same screen, even when mixing text and graphics with the HPRINT command. Hi-RES III can give you the kind of display you always dreamed about having on your CoCo-3, with a wide variety of display options that you can easily use with your Basic or ML programs.

HI-RES III is totally compatible with Enhanced Color Basic and its operation is invisible to Basic. It simply replaces the normal screen display with an extremely versatile display package. With the full control code keyboard, you can control many of HI-RES III extended functions with just a couple of simple keystrokes.

Requires 128K Tape or Disk $34.95

512K RAMDISK & MEMORY TESTER

RAMDISK is an ALL Machine Language program that will give you 2 ULTRA High Speed Ram Disks in you CoCo-3. It does not need or require the OS-9 operating system. It works with R.S. DOS V1.0 or V1.1 and it is completely compatible with Enhanced Color Disk Basic! Plus it allows your CoCo-3 to run at double speed all the time even for floppy disk access!!! It will not disappear when you press reset like some other ramdisk programs. The MEMORY tester is a fast ML program to test the 512K ram. It performs several bit tests as well as an address test so you know that your 512K of memory is working perfectly.

Requires 512K & Disk $19.95

"The SOURCE III"

DISASSEMBLER & SOURCE CODE GENERATOR

The SOURCE III will allow you to easily Disassemble Color Computer machine language programs Directly from Disk and generate beautiful, Assembler compatible Source code.

- Automatic label generation and allows specifying FCB, FDB and FCC areas.
- Disassemble programs Directly from disk, unlike other disassemblers.
- Automatically locates Begin, End and Execution address.
- Output Disassembled listing with labels to the Printer, Screen or both.
- Generates Assembler source files directly to disk or printer.
- Built in Hex/Ascii dump/display to locate FCB, FCC & FDB areas.
- 8 Selectable Display formats 32/40/64/80 columns in 192 or 225 Res.
- Selectable Foreground & Background colors & Printer Baud rates.
- Built in Disk Directory an Kill file commands.
- Menu display with single key commands for smooth, Easy operation.
- Written in Ultra Fast Machine Language.

Requires 128K & Disk $49.95

To order products by mail, send check or money order for the amount of purchase, plus $3.00 for shipping & handling to the address below.
To Order by VISA, MASTERCARD or COD call us at (702) 452-0632
(Monday thru Saturday, 8am to 5pm PST)

CER-COMP LTD.
5566 Ricochet Avenue
Las Vegas, Nevada 89110
(702) 452-0632

this prompt. Most people enter GEN (General Information) whether or not their message is general in nature.

When you are finished typing your message (be sure to sign it), use CONTROL-Z to "post" the message for others to see. If you want to abort the message at any point, use CONTROL-C just as you did in Mail.

If there isn't a specific message to which you want to reply, but you do want to leave a message for others to see, enter the ADD command at the FORUM>prompt. You will be asked for the same information as in REPLY.

Many times, we don't want to ask a question of just a single user. Instead, we want to leave the message for all SIG members to see. If this is the case, when Delphi sends the TO: prompt, enter ALL instead of a single username. □

Jason Forbes (COCO3KID) provided C source code for *Modbuster*, a program to split merged executable files and BASIC09 procedure files into their individual files. Dennis Weldy uploaded the C source code for *FILESTAT*, which reads the file descriptor sector for a given list of files and then prints its contents (except for the cluster list). Files may be given on the command line or accepted from standard input. **Bert Challenor** (BERTAC) updated his OS-9 spooler program.

In the 68K-OS9 topic area, Bill Brady uploaded *BIGT-ST*, a BASIC09 terminal program similar to *BigT* for the CoCo.

In the Telecommunications topic area, Greg Law published an autobaud version of *TsGo/Tsmon*. **Simmule Turner** (SIMMY) uploaded *CTALK*, a demonstration version of a terminal program that features VT52 emulation, and its associated documentation. **Ernest Fielder** (DOUGAL) uploaded *Remote*, a program to link two devices for communication.

CoCo SIG

In the General Information topic area, **Kevin Nickols** (NICKOLS) posted the Tandy newsletters for November and December. **Michael Fischer** (MIKE88) posted two very humorous files, one called "UnixWars" and the other being a "jived" version of the Gettysburg address. **Brian Wright** (POLTERGEIST) posted some inside news about Tandy's sales practices in a file called "Tandy Secrets Revealed."

In the CoCo 3 Graphics topic area, **Gregory Clark** (GNOME) uploaded *DUMPCI6*, a screen dump program for a CoCo 3 and a DMP-120 printer. It uses Greg Miller's *GALLERY* program to view the pictures. **Bob Wharton** (BOBWHARTON) posted many more of his very popular renditions of the logos for various rock groups. Bob also posted an MGE picture of Sun Bowl '87. I (DONHUTCHISON) posted a Macintosh picture of the lovely Samantha Fox. **Greg Miller** (GREGMILLER) posted HOLIDAY.MGE, a holiday scene that he drew with *Color Max Deluxe*. Greg also provided us with new versions of his very popular *BSCTOOL* and *GALLERY* utilities. **Richard Trasborg** (TRAS) was this month's most prolific uploader, providing us with memorable pictures of the new year '88, several female movie stars, Linda Ronstadt and Hyapatia Lee, a humorous cartoon involving the Fuller brush man, and GIRLNUD2/CM3. Richard also posted several popular nude *CoCo Max III* drawings by Mike Trammell, including those called Tahiti, Geisha2, Windyday, Joselene, Sally Field and other assorted nudes. In addition, Richard uploaded a Madonna collage drawn by his friend Stephen Knell using *CoCo Max III*. **David Mills** (DAVIDMILLS) posted a nicely colored map of the USA in MGE format. **Brian McElroy** (RFITZHUGH) sent us several pictures and zodiac signs drawn with *The Rat*, a new CoCo 3 drawing program. **Michael Talcott** (MIKETALCOTT) sent us his picture color editor, which allows one to redefine the palette used in an MGE picture while viewing it, and **Mike Andrews** (MANDREWS) uploaded an MGE picture displaying a CoCo 3. Jason Forbes sent us a "Money For Nothing" picture and a digitized picture of Michael J. Fox. **Bob Tarburton** (BOBTARBURTON) furnished us with his color separation programs, and **Chris W. Brown** (CRISPWILLIAM) sent us several pictures that he drew with *CoCo Max III*. I posted the "CoCo Gallery" files from RAINBOW for the months of February, April, June, July, August and September. **Jim Shoop** (BAZAR) sent us his utility program for converting *CoCo Max II* fonts into a format usable by *CoCo Max III*. Brian Stretch sent us a *CoCo Max III* viewer utility and a picture of his Falcon's Lair BBS. **Ken Schunk** (KENSCHUNK) sent us a *QuickBASIC* program that will let IBM PC owners display all of our great MGE pictures on an IBM PC or clone equipped with an Enhanced Graphics Adapter. **Christian Erickson** (CE) sent us a picture from the game *Tron*.

In the Source for 6809 Assemblers topic area, **Roger Krupski** (HARDWAREHACK) posted the source code for a 512K RAM disk for the CoCo 3.

In the Utilities & Applications topic area, Bob Wharton published a disk directory label maker and some utilities for making calendars using *CoCo Max III*. **Laurence Tepolt** (TEPCO) uploaded a binary tree tutorial that includes a sample program. **Jim Sanford** (WB4GCS) sent us his fine RTTY utility, *Smarty*, for the CoCo 3. **Ray Dutton** (GEMINI06) sent us his *EDTASM+* source code conversion program, and **Ezra Story** (EZY) uploaded *CC3WRITE*, a first-run word processor for the CoCo 3. Brian Stretch sent us a line editor called *CoCoWord*, and **Roy Cosby** (UNCLE) gave us a bowling game and his *NewBoot* program. **David Mills** (DAVIDMILLS) sent us DOSTAMER.BIN, a program that will automatically load and run a program when a user enters the DOS command. Jason Forbes sent us a real-time clock program, and Brian Wright sent us *The DiskPlumber* repair utility. Roger Krupski provided his Disk *EDTASM* patches for operation on the CoCo 3.

Hint . . .

Nailing It Down

If you're into some minor hardware hacking and want to offer your CoCo and Multi-Pak a little more protection, consider the following option. The particular approach is up to you, but many have found it advantageous to bolt the CoCo and MPI together to one piece of plywood. This will keep those "minor" bumps from destroying the valuable electronics inside. If you are a little queasy about opening the units (this will void the warranty), ask your local hardware hacker for a little help.

Hint . . .

Locked Out

Have you ever been typing in a program listing, gone to get a cup of coffee and come back only to find that your CoCo is locked up and won't accept any characters from the keyboard? Of course! It must have been the kids! But is the CoCo really "locked up"? Any time your CoCo decides it doesn't want any characters, check the joysticks. If a firebutton is pushed in, the keyboard becomes inactive. And it is easy to accidentally bump a joystick so that the firebutton presses against something.

Ned M. Taggart
Navarre, OH

In the Hardware Hacking topic of the database, **Marty Goodman** (MARTYGOODMAN) published his EPROM and Static RAM Pinout charts. This group contains three files, each file being a table of pinouts for EPROM and/or static RAM chips. Marty has donated these charts to the Public Domain. Marty also provided us with the driver fix for the hard drive system from Burke & Burke. (This file will be made available to all registered owners, but was published online so that users could receive it faster.) **John Malon** (JOHNLM) published a file describing a modification to the Avatex 1200 modem to provide external carrier detection. **Logan Ward** (LOGANWARD) sent us a CM3 picture describing how to add a switch to a Radio Shack Hi-Res adapter so that a single adapter may be used with both *Color Max 3*, *Color Max Deluxe* and *CoCo Max III*. **Stan Stephenson** (MINSTREL) sent us his humorous interpretations of the specifications for both the RS-422 standard and the electronic specifications for the RS-232 standard.

In the Games topic of the database, **Colin McKay** (COLINMCKAY) posted a description of how to put *The Interbank Incident* onto a 512K Disto RAM disk. **Kyle Petree** (KYLE) uploaded a "Dungeon Master Helper" and a "Dungeons & Dragons" character sheet generator. **Fred McDonald** (FREDMCD) sent us his fine PROPERTY.BAS program, a BASIC utility for use with the game of Monopoly. **Michael Schneider** (MSCHNEIDER) sent us two archived (compressed) files with two shareware games from Ark Royal.

In the Classic Graphics topic area, **Tom Bedwell** (REBECCA) uploaded a two-disk set that tells "The Christmas Story" using graphics, music and text. **Emery Mandel** (EMANDEL) uploaded Mike Ward's popular RLE-to-binary convertor program with Mike's permission. I posted the "CoCo Gallery" winners for the months of February, April, June, August and September.

In the Music & Sound topic of the database, **James Predinger** (JIMBOPREDIG) uploaded his renditions of several of Willie Nelson's greatest hits.

In the Archives topic of the database, Greg Miller posted the Forum messages and the Conference from the first Battle-Line. **Dick White** (DICKWHITE), the SIG's polls manager, posted 108 archived polls from the Polls section of the SIG.

In the Product Reviews & Announcements topic of the database, Roger Krupski posted a description of his hard drive system at the request of several SIG members. This 25K file is actually most of the documentation for the product, and should be interesting reading for those considering upgrading to a hard disk system. Marty Goodman posted his review of the Disto "No Halt" floppy disk controller and another review of the No Halt disk controller and the 512K RAM upgrade board from Performance Peripherals. Christopher Burke posted Burke & Burke Application Note #1, and Michael Schneider posted his review of *Flight Simulator II*.

In the Data Communications topic area, **Steve Lamb** (STRINGFELLOW) posted the 11/16/87 version of the popular *Ultimaterm* terminal program. **Billy Douglas** (BILLYDOUGLAS) posted the documentation for the *CoBBS* systems. **Mike Ward** (MIKEWARD) uploaded Version 4.7 of his always-popular *MikeyTerm* terminal program. Fred McDonald posted a collection of several letters from Ken Johnston (the author of *Ultimaterm*) to the Delphi users, and *Ultimaterm 3.0* with supporting utilities.

As you can see, we have a lot of new and very good material online for our CoCo users. See all of you online on Delphi!

— Don Hutchison
Rainbow CoCo SIG
Database Manager

TOTHIAN SOFTWARE

DID YOU HEAR ABOUT THE COCO GRAPHICS PROGRAM THAT CAN MAKE PICTURES UP TO 456 PIXELS WIDE AND 565 PIXELS HIGH ??

?!? YOU DIDN'T ?!?

THEN WE'LL BET YOU ARE MISSING QUITE A FEW OTHER NEW PRODUCTS TOO. SOLUTION: WRITE US AND HAVE YOUR NAME ADDED TO OUR FREE MAILING LIST !! NO OBLIGATION.

TOTHIAN SOFTWARE, INC.
BOX 663
RIMERSBURG, PA. 16248

(SINCE 1985)

CY-BURNET-ICS
SOFTWARE FOR KIDS
3 x 4

—Dual Program Specials—

- TIME/MONEY $39.95
- ADDITION/SUBTRACTION $39.95
- MULTIPLICATION/ BEAT THE COMPUTER $21.95

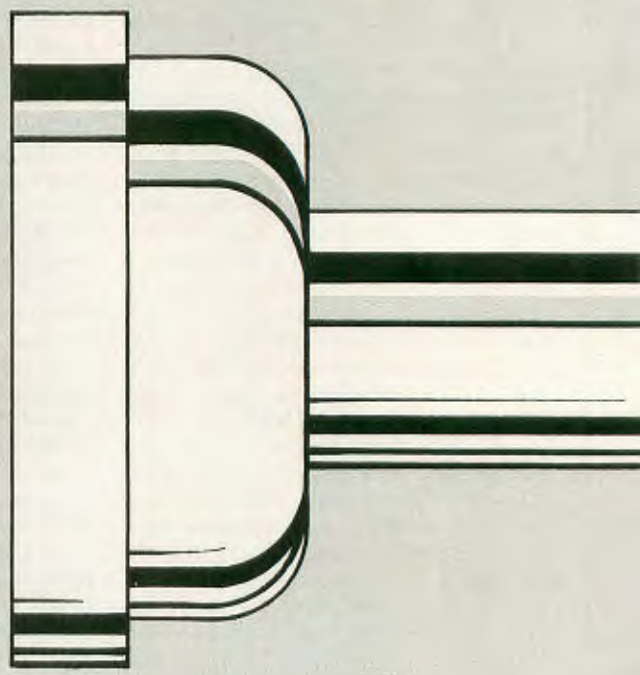
supports CoCo 1, 2, & 3
specify cass/disk/Network II
school P.O.s welcome
add $2.00 shipping and handling
Network orders add $10.00 per disk
Write for Free Catalog

CYBURNETICS
CYBURNETICS
5705 CHESSWOOD DR.
KNOXVILLE, TN 37912
615-688-4865

3 x 8 = 24
3 x 5 = 15

A scrolling spreadsheet for the CoCo 3, plus hints on the GIME chip

CoCo 3 Number Cruncher



By David Archer

Sum128 is a simple spreadsheet that demonstrates some relatively unknown text screen modes on the CoCo 3.

The program uses a 128-column (80 at one time) by 28-row screen to display a 12-month by 20-category spreadsheet that adds the columns and rows and displays the results along the bottom and right sides, respectively. Keep in mind that only 80 columns are displayed at one time in the "window."

Some monitors and most TV sets will not be able to display this program properly. *Sum128* uses an expanded screen display, some of which may not fit onto your screen. But if you're using Tandy's CM-8 monitor or something similar, you won't have any problems.

If your monitor or TV will display the normal 80-by-24 screen, you won't have any trouble with the horizontal display from *Sum128* — but you may have problems with the increased vertical display, 28 rows compared to the normal 24 rows.

On my TV set, the top and bottom rows, as well as the right side, are for the most part cut off. The set just wasn't designed for displaying that much. My BMC monochrome monitor does much better but is still barely able to contain the entire screen. My CM-8 monitor handles it quite easily, as do similar RGB analog monitors.

I've included a short program (MONTEST) that outlines an 80-column by 28-row text screen. With it you can judge for yourself whether your monitor is suited for use with *Sum128*. That may

Dave Archer is a grain farmer and CoCo programmer. He and his wife, Jodi, a registered nurse, live on a farm near Finley, North Dakota.

Getting Text In 128x28

Enabling the 128-column by 28-row text screen is simply a matter of setting the proper registers within the CoCo 3 GIME chip. This can be accomplished by poking the GIME register's memory address with the proper value (see lines 420 and 430 of *Sum128*). Refer to Table 1 for a more detailed look at the three GIME registers used in this program. These are not *all* the GIME registers, just the ones used in *Sum128*.

What follows is perhaps a bit technical, but I feel it's necessary to explain exactly how this unusual screen mode works. If you're not interested in this part, skip on to another.

Exploring the GIME

Numbers with the prefix &H are hexadecimal numbers. Numbers with no prefix are decimal. And numbers like 00000011 are eight-bit binary representations. Eight-bit binary numbers are formatted with Bit 7 as the leftmost bit and Bit 0 as the rightmost bit.

The first GIME register set is at &HFF98. You'll see that by storing &H03, we set bits 1 and 0 (&H03 = 00000011). If you look at Table 1, you'll see that means we've set the register for text mode with eight lines per character row. (This is also accomplished by the BASIC command WIDTH 80.)

Next is the video resolution register at &HFF99. By storing &H75 there we set bits 6,5,4,2 and 0 (&H75 = 01110101). Again, if you refer to Table 1, you'll note that by setting bits 6 and 5 we set the lines per field to 225 lines (225 lines of screen). That means that if we have 225 lines and eight lines per row, we can display 28 rows on the text screen! Actually, 28 * 8 = 224 lines, so we have one extra line displayed at the very bottom of the screen. More about that extra line later.

Bits 4 and 2 set the horizontal resolution bits, and Bit 0 sets CRES0. That allows the use of attribute bytes with the text (underline, blinking and color). BASIC normally stores &H15 in this register when the command WIDTH 80 is executed (&H15 = 00010101). So, you can see that the only thing we did differently from BASIC was to increase the lines per field from 192 to 225.

The most extensively used register in this program is the horizontal offset register,

Item	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Store No. 120	6354.21	7234.32	4325.23	3214.43	5436.54	4325.34	6545.42	5784.87	6547.56	7654.34	8765.34	9875.91	76063.51
Store No. 121	6545.23	8764.43	8764.23	5345.87	6545.87	5436.34	9874.20	7234.92	7384.82	7365.47	8293.93	9912.61	91467.92
Store No. 122	3648.27	3734.23	4958.18	2958.64	3874.54	3986.37	2748.75	4348.30	3396.79	5007.87	5298.19	7350.34	51310.47
Store No. 123	8532.43	7354.78	6475.98	5897.23	6235.54	6453.12	7984.65	4765.98	7129.54	8653.41	8954.96	9346.54	87784.16
Store No. 124	6432.76	5463.83	5498.23	7002.94	6572.79	6453.76	6250.56	6395.87	7409.54	6547.23	7231.40	7389.04	78647.95
Store No. 125	2965.56	2465.62	3956.21	3194.34	3216.45	2349.05	4325.66	4487.23	3997.70	3566.08	2777.45	3665.92	40967.27
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	34478.5	35017.2	33978.1	27613.5	31881.7	29004.0	37729.2	33017.2	35866.0	38794.4	41321.3	47540.4	426241.28

save the agony of typing in all the code only to be unable to display the results properly. Also, you can use MONTEST as a basis for developing your own applications using the expanded screen area. I've added quite a few comment lines to both MONTEST and SUM128 for just that purpose as well as for additional explanation.

Running *Sum128*

When you first run *Sum128* you'll be asked whether you are using a tape or disk system. Simply press the T or D key. Then you will see the entire screen with a blank worksheet (all values are zero). You are now at the main menu. On the fourth row is the command line, which always has the available commands on it. You'll note that by pressing the left or right arrows you're able to scroll the entire worksheet across the screen.

Pressing the F1 key brings you to the command mode, where most of the commands are used. Again, the fourth row is the command line showing the available commands.

which is located at &HFF9F. This is the register that enables the 128-column wide screen. It also controls where the 80-column "window" is located within the 128-column virtual screen. Use this formula:

```
POKE &HFF9F,128 = X
```

X is the column number (0 through 127) you want to be displayed leftmost within the 80-column window.

The reason we must add 128 to the column number is that the value 128 decimal, &H80 in hex (10000000 in binary), sets Bit 7 of the register, which is the 128-column enable bit. Bits 6 through 0 specify the offset column number. Refer to Table 1. Some examples are shown below. * These examples show how to display the right columns of the 128-column screen as the left portion of the window and show the left columns of the 128-column screen as the right portion of the window.

I hope you now have an idea of how we can use this register to scroll or switch the 80-column window to anywhere within the 128-column screen.

Fixing BASIC

The problem with using this screen mode is that it's not supported by BASIC. Luckily, the CoCo 3 BASIC interpreter is in RAM, so with a few careful pokes we can fix that, too. These are done in lines 450 through 520 of *Sum128*.

BASIC Vectors

BASIC vectors are used by BASIC when writing the text screen. &HFE00 and &HFE01 is the cursor address. Set to &H2000 (top of screen memory). &HFE04 is the number of characters per row on the text screen; set to 128. &HFE05 is the number of rows on the text screen; set to 28. &HFE06 and &HFE07 is the end address of text screen memory; set to &H3E00.

Command	Columns displayed in 80-column window
POKE &HFF9F,128 (10000000)	0 through 79 (like normal 80-column)
POKE &HFF9F,168 (10101000)	40 through 119
POKE &HFF9F,192 (11000000)	64 through 127 and 0 through 15 *
POKE &HFF9F,255 (11111111)	127 and 0 through 78 *

Each row of text is 128 characters long and each character needs two bytes — one for the actual character and the other for attributes. The attribute byte contains the color, blinking or underline information. That means we need 256 bytes of memory for each row of text displayed. So, with 28 rows of 256 bytes (28 * 256 = 7,168), we need 7,168 (1C00 in Hex) bytes of screen memory.

The beginning of Hi-Res text screen memory for BASIC is at &H2000. Adding &H1C00 to &H2000, we come up with &H3C00. So why did I set the end address to &H3E00? Well, by adding the extra memory we can print over that one line (not row) of screen at the very bottom, as I mentioned earlier. Also, this keeps BASIC from trying to scroll when we do print over that line. BASIC's scroll routine will destroy the 128-column format.

Fixing BASIC's LOCATE command was a little more tricky. This involved patching the machine code instructions that execute the LOCATE command, and is accomplished in lines 500 through 520.

Note that not every BASIC command was patched for use with this screen mode. If you develop your own applications, some commands may not behave as they normally do. One such example is trying to print more than 29 rows on the screen. BASIC's scroll routine still thinks that each line is only 80 columns wide, so when the scroll executes, the result is a mess. □

(F)ile I/O	allows saving or loading of worksheet files, which can also be edited with an ASCII word processor.
(M)ain menu	jumps back to the main menu.
(P)rint	allows printing of entire worksheet.
Arrow keys	allow you to move to any cell (except the totals and category areas) within the worksheet for entry of new value.
(ALT)	moves cursor back to upper-left cell of worksheet. Pressing the @ key gives the same result.

When you have the cursor (highlighted area) over the cell you want to edit, simply type the number you want to store there and press ENTER (do not use commas in your entries — 5000, not 5,000, for example). The number must be lower than 10,000 or you'll hear a beep and the old value will be restored in the cell.

Please note that the first number key you press will be the first number of the cell. That is, when a number key is pressed, the program jumps to a LINE-INPUT routine. The input string is tacked on to the string containing the number key first pressed. The entire string is then evaluated as one number and stored in the current cell (see lines 1640 through 1710). The columns and rows are totaled after each cell is changed.

The best way to learn how to use *Sum128* is to run it. Try out the various features until you feel comfortable with the program.

Hard Copying Your Spreadsheet

The printer routine (lines 2240 through 2430) is set up to print in a condensed format of 17 characters per inch. The default is for Gemini 10X printers, but the code for most Radio Shack printers is included in a REM statement. Consult your printer manual for the specific codes for your printer.

If your printer doesn't support a condensed print mode, you might want to modify the routine to divide the sheet into two pages for printing. If your printer has a wide mode (132 columns), then you should not need condensed print — you can remove Line 2300.

Line 160 sets the printer speed to 9600 baud. If your printer requires a slower baud rate, you can change it there. Lines

```
GIME Register Table  (Courtesy of Kevin Darling)

This is by no means a complete table of GIME registers.  Only the
registers used are shown.  For more information you may wish to
purchase the Color Computer 3 Technical Manual.

Address
                  Contents
-------------------------------------------------------------------------
FF98  Text/graphics video mode, and lines per row.
      Bit 7 = vidmode  Ø is text, 1 is graphics
      Bit 6 = na
      Bit 5 = DESCEN   1 = extra DESCender ENable
      Bit 4 = MOCH     MOnochrome bit (1=monochrome) (composite only)
      Bit 3 = H5Ø      5Øhz vs 6Øhz bit
      Bit 2 = LPR2     Lines per character row
      Bit 1 = LPR1       (Bits 2-1-Ø below)
      Bit Ø = LPRØ

                        ØØØ - 1 line/char row    1ØØ - 9  lines/char row
                        ØØ1 - 2                  1Ø1 - 1Ø
                        Ø1Ø - 3                  11Ø - 11 (??)
                        Ø11 - 8                  111 - 12 (??)
-------------------------------------------------------------------------
FF99  Video Resolution Register
      Bit 7 = na
      Bit 6 = LPF1        Lines Per Field bits
      Bit 5 = LPFØ          "    "    "
      Bit 4 = HR2         Horizontal Resoloution bits

                    ØØ = 192 lines      1Ø = 21Ø lines
                    Ø1 = 2ØØ lines      11 = 225 lines
-------------------------------------------------------------------
TEXT MODES
                    HR2  HR1  HRØ      (HR1 don't care for text)
   8Ø Char/line      1    x    1
   64     "          1    x    Ø       CRESØ = 1 for attribute
   4Ø     "          Ø    x    1               bytes used
   32     "          Ø    x    Ø
-------------------------------------------------------------------
GRAPHICS MODES    ( Horizontal Resoulution )
   X    Colors      HR2  HR1  HRØ     CRES1   CRESØ    Bytes/line
  64Ø     4         1    1    1       Ø       1        16Ø
  64Ø     2         1    Ø    1       Ø       Ø         8Ø

  512     4         1    1    Ø       Ø       Ø        128
  512     2         1    Ø    Ø       Ø       Ø         64

  32Ø    16         1    1    1       1       Ø        16Ø
  32Ø     4         1    Ø    1       Ø       1         8Ø
  32Ø     2         Ø    1    1       Ø       Ø         4Ø

  256    16         1    1    Ø       1       Ø        128
  256     4         1    Ø    Ø       Ø       1         64
  256     2         Ø    1    Ø       Ø       Ø         32

  16Ø    16         1    Ø    1       1       Ø         4Ø

Note the correspondence of HR2 & HRØ to the text mode's bytes/line.
-------------------------------------------------------------------
FF9F  Horizontal Offset Register
      Bit 7 = Horizontal offset enable bit  ( 128 char width always )
      Bit 6 =  -----I
      Bit 5 =       I
      Bit 4 =       I
      Bit 3 =       -->  Bits 6 - Ø specify the column offset (Ø - 127)
      Bit 2 =       I
      Bit 1 =       I
      Bit Ø = ------I

If Bit 7 is set & in text mode, then there are 128 chars (only 8Ø seen)/line.
This allows an offset to be specified into a virtual 128 char/line screen.
Useful for horizontal hardware srolling on wide text or spreadsheets.

* Note that not all bits of each register are applicable to the program.
They are included only for continuity and reference.
```

Table 1

TOM MIX COMPANIES

FLIGHT 16*† - This is the very finest flight simulation program on the market today. Flight 16 will work with all color computers. Flies very much like a Cessna 150. Is a full instrument aircraft with sound effects and out-the-window graphics. As a REAL bonus feature, you may design your own airports and flight areas.

$34.95

WORLDS OF FLIGHT*† - A real-time flight simulation of a sophisticated ultra-light aircraft which generates panoramic 3-D views of ground features as you fly in any of nine different "worlds." The manual included explains the instrument panel, the basis of flight control, etc. For the serious simulation buff!

$30.95 **32K**

P51 MUSTANG ATTACK/FLIGHT SIMULATION*† - The ultimate video experience! For the first time ever, two CoCo's can be linked together via cable modem. (If playing via modem, both computers require a copy of the program.) Or play alone and sharpen your skills against a non-combatant computer drone.

$30.95 **32K**

APPROACH CONTROL SIMULATION* - "Caught in a blinding snowstorm, two jet airliners are on a collision course. Hundreds of lives are at stake! A high-speed disaster is inevitable unless you act fast . . ." This and many other scenarios await you as the Air Traffic Controller. Experience firsthand challenges, frustrations and pressures felt by all Air Traffic Controllers!

$25.95 **32K**

THE KING*† - This is a color computer classic! Looks and plays like the popular arcade game. Contains the same four screens as the original: barrels, pins, jacks, and conveyors. Super graphics!

$25.95 **32K**

TRAPFALL*† - The "pitfalls" in this game are many. Fight your way through the jungle collecting hidden treasures as you go.

$20.95 **16K**

KATERPILLAR II*† - The CoCo has needed a perfect centipede-type game since day one. You will throw all imitations aside when you see this.

$20.95 **16K**

BUZZARD BAIT*† - We've done it again. Outstanding high resolution graphics and sound make this "joust" type game a must for your software collection. One or two players.

$20.95 **32K**

MS. MAZE*† - Ms. Maze combines brilliant color, high resolution, detailed graphics and music to make it look and play like the arcade version. It is the closest thing to the arcade Pac games that we've seen for the CoCo! Arcade Aces — this one's for you!

$20.95 **32K**

CUBER*† - The hazards faced by Cuber are many! Help him change the colors of the pyramid while avoiding the many dangers always present.

$20.95 **32K**

VEGAS GAME PAK*† - Now you can bring Las Vegas home with you! This package contains six different games: Video Keno, Video Poker, and Video Blackjack, plus three slot machine lookalikes, Bar 5, 3 Line, and Right/Left.

$24.95 **16K**

GOLD FINDER*† - Here's the quality you have come to expect from TOM MIX! While avoiding enemies, pick up all the pieces of gold along the way; then ride, the elevator to the top to solve each level. Sixty-nine levels. PLUS now you can create your own levels.

$20.95 **32K Disk only**

THE SAILOR MAN*† - Avoid the punches of the Bigfat-badguy and the flying bottles thrown by the Olduglysea-woman to rescue Elsie and win her heart! One or two players. More great sound and graphics from the author of "The King!"

$25.95 **64K**

SPECIAL OFFER:

Order two, take $5.00 off total

Three or more, take $8.00 off total

MONEYOPOLY*† - Now you can play the popular board game on your color computer! Probably the most realistic computer board game simulation ever. Contains **all** the features of the original game. Two to four players.

$20.95 **32K**

DRACONIAN*† - Your mission is to destroy all of the enemy bases within each sector, rescue as many astronauts as possible and dock with the friendly base at the top of the sector. Your spaceship can move in eight different directions. An exciting program with outstanding graphics and sound!

$20.95 **32K**

elec*TRON*† - Patterned after the popular arcade game, there are four men on your team and four subgames to complete.

$20.95 **16K**

THE WILD WEST - CoCo III Only - The notorious desperado Black Bart has escaped from jail and is on his way to Dry Gulch to recover his hidden fortune. Can you capture him? Four voice music and sound effects and a vocabulary of over 100 words!

$20.95 **Disk only**

WIZARD'S DEN* - Another of our outstanding graphic adventures! You must recover the Gem of Damocles, stolen by the Evil Wizard. His magic is strong and he can make you see things that don't exist!

$20.95 **64K Disk only**

LUNCHTIME*† - Your chef, Peter Pepper, is surrounded! Dodge pickles, hot dogs and eggs while building hamburgers. Fast paced action for either one or two players.

$19.95 **32K**

BREWMASTER*† - Move along the end of the bars serving beers to your thirsty customers, but watch out for falling glasses and rowdy customers!

$15.95 **32K**

MAUI VICE*† - Step into the shoes of Crock and Bubbs in this graphic adventure and gather evidence. A new story generated each time you play!

$20.95 **64K extended basic, Disk only**

CHAMBERS*† - Loosely based on Cosmic Chasm, in each level you must destroy all of the evil creatures. In all there are 20 series of chambers with 20–35 interconnected rooms.

$15.95 **32K**

DRAGON SLAYER* - Save the villagers of Pendor from Icarus, the bloodthirsty dragon! He lives in a cave way up in the mountains, which is a treasure chest full of gems and cashbags. Be on the lookout for enemies and barriers at all times! Ten levels with sixteen rooms per level; over 160 exciting screens.

$20.95 **32K Disk only**

VEGAS SLOTS - CoCo III Only - Seven of the most popular slot machine games found in Vegas are yours for the price of one: MultiBars, Fruit MultiBars, Right-Left/Left-Right, Lucky Dollar, Melons and Bars, Fruit and Bar 5. Designed to be as real as being there. One of the most outstanding programs we have ever offered.

$29.95 **Disk only**

VIDEO CARDS & KENO - CoCo III Only - Play Video Poker, Jokers Wild, Blackjack, and Keno. These games are so real you expect to see Wayne Newton walk by! Outstanding graphics and movement. Wanna Bet?

$29.95 **Disk only**

TEACHERS DATABASE II* - Allows teachers to keep computerized files of students. • Up to 100 students, 24 items per student • Statistical analysis of scores • Grades can be weighed, averaged, percentaged • Test result graphs/grade distribution charts

$59.95 **64K TDBII Disk Only**
$42.95 **32K TDB**

More educational software available.

ARCADE GAME SALE

NOW! Here's your chance to have your own collection of Arcade favorites:

Package #1	Package #2	Package #3
Donkey Kong	Popeye	Pacman
Centipede	Ms. Pacman	Frogger
Pitfall	Tron	Quix
Donut Dilemma	Burger Time	Bartender
Joust	Q*bert	Loderunner
$49.95	$49.95	$49.95

OR: 2 packages only $94.95; 3 packages only $139.95

Each package contained on more than one unprotected diskette (Sorry, disk only). This is high quality software that formerly sold for as high $34.95 each.

Please add $4.00 shipping on this special offer only.

TOM MIX SOFTWARE

P.O. Box 201
Ada, Michigan 49301
616/676-8172

- Specify tape or disk when ordering
- Add $3.00 postage/handling
- MI residents add 4% sales tax

master charge VISA

* CoCo 1, 2, 3 compatible
† Joystick required

Write for free catalog

163 through 167 have some alternate values. If you're unsure, check your printer manual for the proper baud rate setting.

File Input/Output

The files you save or load are automatically given the extension .SUM — so don't add an extension when asked for the filename. Also, filenames are restricted to eight characters or less. (That is, eight characters plus the extension.) If you enter more than eight, you'll hear a beep and you'll be asked to reenter the filename. If you're using a tape system, you'll be prompted with "Prepare tape and press <ENTER>" before any load or save operation.

You can edit the worksheet files you've saved to tape or disk by use of an ASCII word processor, or you can use the files in other programs.

The file format is this: Category string, 12 values (one for each month), and dummy separation string. For example:

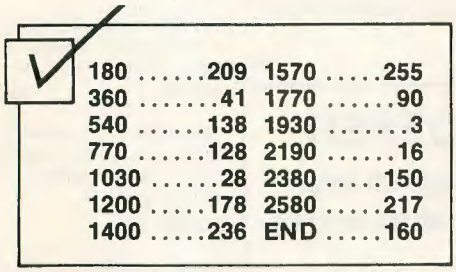
Category 1	category
0000	January value
0000	February value
———	March through November values
0000	December value
*****	dummy string inserted for category separation
Category 2	
———	
Category 20.	

Final Notes

There are quite a few comments within the program listing, so if I've forgotten to explain something here, I hope you can figure it out from looking at the listing. If not, write to me and I'll try to figure it out.

Feel free to modify this program or develop your own applications using some of the things shown here. Customizing can be done by changing strings in the DATA statements in lines 2590 through 2780 to whatever best suits your needs. Remember that these strings cannot be more or less than 15 characters. Pad with spaces if less than 15 characters. This will allow you to rename the categories to something more meaningful than "Category."

(Questions or comments about this program may be directed to the author at Box 504, Finley, ND 58230. Please enclose an SASE when writing for a reply.) □



Listing 1: SUM128

```
1Ø ' Sum 128
2Ø ' By Dave Archer
3Ø '
4Ø ' Special thanks to Roger Bou
chard for the fix to BASIC's LOC
ATE command
5Ø ' and to Dick White for his v
aluable suggestions.
6Ø ' Also to Kevin Darling for p
roviding GIME specs.
7Ø '
8Ø ' Palette colors set for RGB
analog monitor
9Ø '
1ØØ RGB : 'Change to CMP for com
posite color monitor
11Ø PALETTE Ø,8:PALETTE 1,18
12Ø PALETTE 2,63:PALETTE 3,Ø
13Ø PALETTE 4,Ø
14Ø PALETTE 8,63
15Ø X=1 :' 96ØØ baud
16Ø POKE 15Ø,X :'set printer bau
d rate
161 'Baud          X =
162 '----          -----
163 '96ØØ            1
164 '48ØØ            7
165 '24ØØ           18
166 '12ØØ           41
167 ' 6ØØ           87
168 '
17Ø GOTO 24Ø: ' if using monochr
ome then delete this line
18Ø '
19Ø ' * For monochrome *
2ØØ FORX=Ø TO 7 STEP 2:PALETTE X
,Ø:PALETTE X+1,63:NEXT
21Ø PALETTE 4,63:PALETTE 3,Ø:PAL
ETTE 2,63
22Ø 'Change all "ATTR (1,3)" to
"ATTR (Ø,Ø)" for monochrome
23Ø '
24Ø CLEAR 2ØØØ
25Ø DIM MO(13,21),A$(21),B$(12),
M$(4)
26Ø ON BRK GOTO 118Ø
27Ø ON ERR GOTO 128Ø
28Ø CLS:POKE 65497,Ø:POKE 282,25
5: ' fast speed & upper case
29Ø WIDTH8Ø:CLS1:PRINT:PRINT
3ØØ PRINT TAB(7),"-< Sum 128 >-"
31Ø PRINT:PRINT
32Ø PRINT TAB(21)" By  Dave Arch
er"
33Ø PRINT:PRINT:PRINT
34Ø PRINT TAB(16)"(T)ape      or
   (D)isk  ?"
35Ø I$=INKEY$
36Ø IF I$="T" THEN DEV=-1:GOTO 4
ØØ:' TAPE
37Ø IF I$="D" THEN DEV=1:GOTO 4Ø
Ø:' DISK
38Ø GOTO 35Ø
39Ø '  Set 128 by 28 screen
4ØØ ONBRK GOTO 117Ø
41Ø CLS
42Ø POKE&HFF98,&HØ3:POKE&HFF99,&
```

OWL-WARE

Proven Technology
New CoCo 3 Utilities

Great for 512K Systems! From Color Venture and OWL-WARE

PRINTER LIGHTNING

A great print spooler which gives you 44K print buffer from a 128K CoCo and up to 438K (200 pages!) from a 512K CoCo. With this spooler you can run a program while you are printing a file. The spooler does not slow down the computer to any noticeable extent while you are running a second program and no lost characters arise. Baud rates selectable. ***Printer Lightning*** can reside in memory along with ***RAMDISK***!

RAMDISK

Using 512K CoCo 3 you have access to 2 additional disk drives in RAM. All disk commands are supported, and the data are Reset button protected. You can now have up to 5 disk drive capacities on line at once and can assign the ram disks to any drive number. By making the ramdisk Drive 0, all programs which require a lot of drive access will run much faster. You can have the ***RAMDISK*** in memory at the same time as the ***Printer Lightning***!

BACKUP LIGHTNING

This program is the fastest way to make backup copies of your files using a 512K CoCo. You can backup 35, 40, or 80 track disks single or double sided. Both RS and OS-9 disks may be backed up. The original disk is saved to memory and a copy can be made on an ***unformatted disk*** every 45 seconds! The lightning read, write, format, and verify routines that were developed make this program much quicker that RSDOS or OS-9 for backups. This will become one of your most used programs!

·NEW· NEW·

Only $19.95 each. 3 for $49.95.

SPECIAL With our 512K Upgrade (Next page) only $2. each or 3 for $5!

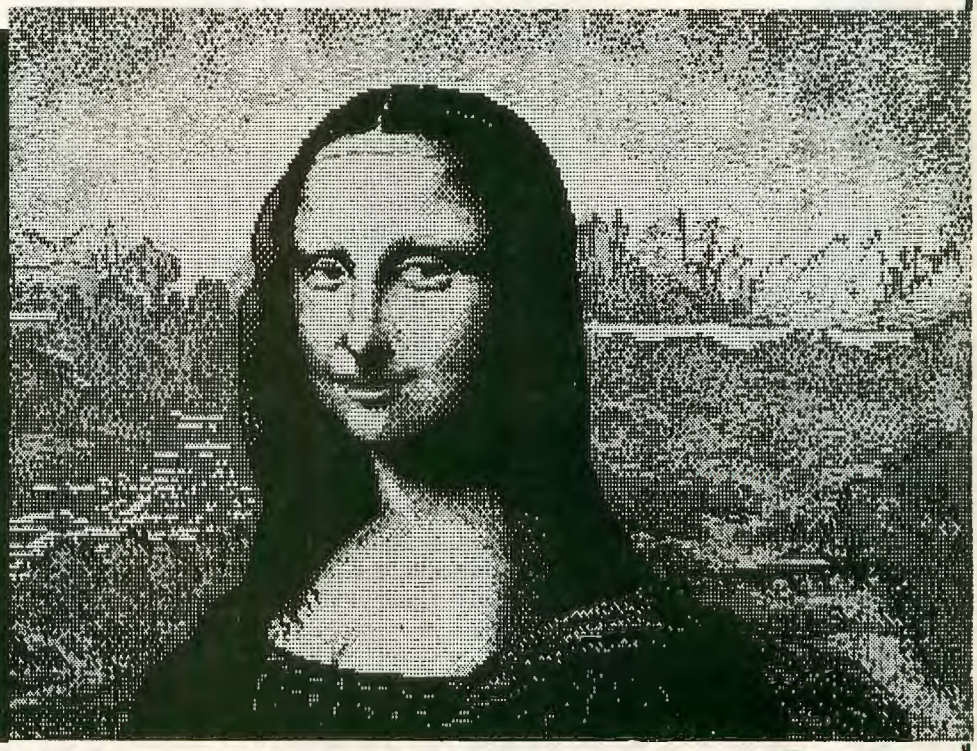
Announcing:

The finest graphics/drawing program for the COCO 3!

Da Vinci 3

- 16 colors on screen at one time
- Modify each color from 64 available colors
- Use composite or RGB monitor
- Draw with custom paintbrushes
- Full resolution 320 X 192
- Picture converter for conversion of COCO 2 pictures to COCO 3
- Multiple text fonts
- Accepts input from joystick, X-pad, mouse, or touch-pad
- Boxes, circles, line, paint generation
- Screen dump for Tandy mono and color ink-jet printers, (NX-10 and others pending)
- Sensible price
- No additional hardware required because of course/fine joystick movement modes
- Zoom mode for individual pixel editing
- Great on screen menu which is removable at the touch of a key to allow full screen edit

128K or 512K COCO 3 $37.95



Super I/O Board for OS-9

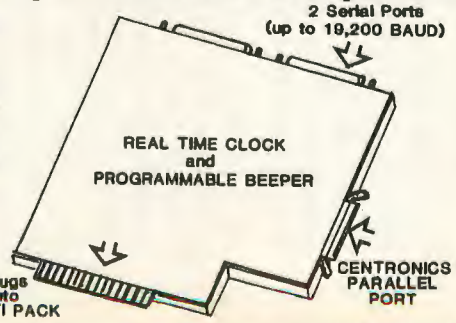
Each Board Provides 2 Serial Ports and Centronics Parallel Port

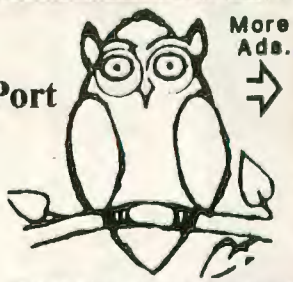
First Board has Real Time Clock and Beeper... With Second Board up to 5 Users

The serial ports are usable **up to 19,200 Baud**, and the parallel port is a **true Centronics standard**. Plug into your multi-pak. **On CoCo 3, multi-pak must be upgraded**. You will have a multi-user system with additional computers or terminals plugged into the serial ports. An OWL hard drive and 512K upgrade are strongly recommended for multi-user systems.

Intro Price... **$165.**

BOARD 2... $139.





More Ads...

OWL-WARE

P.O. Box 116-A
Mertztown, PA 19539
— ORDER LINES (only) —
(800) 245-6228
(215) 682-6855 (PA)

Proven Technology

On the Razor's Edge of the Color Computer Frontier

OS-9 Hard Drive Systems

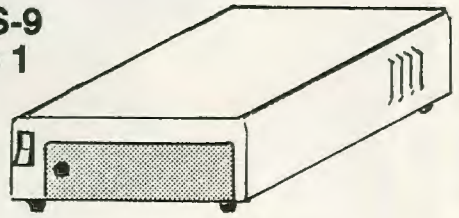
Proven Performance for Demanding Home or Business Use
Drive Access is at *Least 8 Times Faster* than Floppy Drives
Control up to 2 Drives per Controller each as Continuous Storage

Every hard drive system is **complete** with software, hard drive, controller, heavy-duty power supply, and LR Tech Interface. When a complete drive system is ordered, the drive is fully **assembled**, **tested**, and **burned in** for 3 full days. This ensures dependability and optimum performance.

We have now been supplying CoCo hard drive systems and parts for systems for more than 2 years. This is the longest history in the CoCo market of any available drive system. About ¾ of all hard drive systems currently in use in the CoCo market use the LR Tech/OWL-WARE system. We have reached this position in the CoCo hard drive market by providing our customers with a quality product that they (and we) can be proud to own and use.

A number of drive systems were in the market place when the LR Tech Interface was introduced and 2 have been introduced since. Most of these are no longer available. We provide the only system which provides a combination of standard interface (SASI), rugged unit construction (not hacked to a floppy drive controller), high speed, and reasonable price. **These systems are even several times faster than the standard XT hard drive system.** Ideal for multi-user system because processor does not stop for hard drive access.

For OS-9 Levels 1 and 2



System Prices:

New!		
$469.	**$629.**	**$759.**
10 MEG	20 MEG	40 MEG

Dealer's Inquires Invited!

Hard Drive Interface (Includes Software)

For those who want to put together their own system, we have an exclusive arrangement to distribute the LR Tech Interface. Please note that an interface is not a controller. **A Xebec, WD, or Adaptec SASI controller are required for a drive system.**

To assemble a hard drive system yourself requires some reasonable knowledge of OS-9 and electronic construction and **a hard drive that works**. CoCo 3 users will have to upgrade their Multi-pak.

Only $119.

Xebec Controller $139.

CoCo 3 512K Upgrade

The LR Tech 512K upgrade uses all **gold contacts** and **120 nanosecond 256K chips**. Provides large system memory from OS-9 Level 2.

Without Mem Chips $59. **With Chips $112.**

Special! See software offer on previous page.

Hard Drive Basic

New For the CoCo 3!
In Answer for the Many Reqests to Run BASIC from a Hard Drive

With the development of the CoCo 3, OWL Ware has been able to provide a truly professional Hard Drive System using OS-9. There has not, however, been a method of running your programs from the standard BASIC. With this latest development of the CoCo software aces, it is now possible to partition your hard drive into RSDOS and OS-9 sections. The OS-9 partition runs your OS-9 normally. The RSDOS section is further divided into a number of floppy sized units to run RSDOS programs. The familiar RS disk commands work normally. There is little more that must be learned.

All of these RS drive sections are available at all times. It is not necessary to use assign commands and get access to only a few of these sections. Programs that use RS-BASIC should work as will all programs which do not force their own disk drivers.

Call about prices. This should be availabile by the time you read this ad!

DISK DRIVES

OWL-WARE PHONES
ORDERS
(800) 245-6228
PA (215) 682-6855
TECHNICAL HELP
(215) 433-8695
Call for advice

Ask for the WHISPER DRIVE for the finest, quietest drive available!

Drive 0 Systems (Full Hgt) **$169.** (Half Hgt - DS) **$229.**
Drive 0 systems complete with drive, controller, legal DOS, cable, case & power supply, and manual.

Drive 1 Systems (Full Hgt) **$95.** (Half Hgt - DS) **$135.**

New! New! (3.5" 720K Drive for OS-9) **$195.**
Drive 1 has drive, case & power supply, and instructions for use with your drive.

(Call for Special Prices on Drive 0, 1, 2, 3 Combos.)

HALF HEIGHT DRIVE UPGRADE KIT FOR RS HORIZONTAL CASES

Why only double the capacity of your system when you can triple in the same case? Kit includes: double sided drive to fit your case, chip to run both sides of new drive, hardware, and detailed instructions. Takes only 5 minutes.

Model 500 **$119.** Model 501 **$129.**

Our prices do not include shipping costs, but do include a discount for cash.

OWL-WARE has a liberal warranty policy. During the warranty period, all defective items will be repaired or replaced at our option and at no cost to the buyer except for shipping costs.

Call our technical help line for return authorization numbers. Return of non-defective items or unauthorized returns are subject to a service charge.

All drives are new and fully assembled. We ship only *FULLY TESTED and CERTIFIED DRIVES* at these low prices. Full height drives are unused surplus and not always available.

We use Fuji, Teac and Other Fine brands. We have *5 years experience* in the CoCo disk drive market! We are able to provide support when you have a problem.

NOW FOR CoCo 1, 2, 3!!

WARRANTIES
Full Hgt 90 days Half Hgt 1 Year

ORDER LINES (only)
(800) 245-6228
(215) 682-6855 (PA)

TECH HELP LINE
(215) 433-8695
Call for Latest Prices!

Bonus! Special Bundled Software with Disk Drive Purchase!

OWL-WARE
P.O. Box 116-A
Mertztown, PA 19539

OWL-WARE Software Bundle

Disk Tutorial - 3 Utilities - 2 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 intoduction. (This professionally written tutor is easily worth the bundle's total price.)

OWL DOS

An operating system that gives faster disk access and allows the use of double-sided drives. Corrects a floating point number error on early CoCo systems.

COPY-IT

Quickly copies selected programs between disks. A wild card option selects groups of programs for copy.

VERIFY

Verifies reading of each sector. Bad sectors are listed on the screen.

2 GAMES

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

If sold separately this is over $125 worth of software!!

Do not mistake this software with cheap, non-professional "Public Domain" software which is being offered by others. All of this software is copyrighted and professional in quality. The tutor is unique with us and has helped hundreds of new users learn their disk drive.

only **$27.95**
(or even better)
only **$6.95** *with any Disk Drive Purchase!!*

```
H75: ' Set for 28 rows of text
43Ø POKE&HFF9F,128: ' Set for 12
8 columns with column Ø as left
most column
435 ' BASIC vectors and patch pr
ovided by Roger Bouchard.
44Ø ' Tell BASIC new screen size

45Ø POKE&HFEØØ,&H2Ø:POKE&HFEØ1,Ø
: ' beginning cursor address
46Ø POKE&HFEØ4,128: ' # columns
on text screen
47Ø POKE&HFEØ5,28: ' # rows on t
ext screen
48Ø POKE&HFEØ6,&H3E:POKE&HFEØ7,&
HØØ: ' End of text screen
49Ø ' ***  Patch BASIC's LOCATE
command  ***
5ØØ POKE &HF9ØA,&H58: 'enable ne
w LOCATE positions
51Ø POKE &HF8EC,128:' Allows LOC
ATE from column Ø - 127
52Ø POKE &HF8F4,28: ' Allows LOC
ATE from row Ø - 27
53Ø CLS
54Ø ' Read DATA strings
55Ø FORX=1TO4:READ M$(X):NEXT
56Ø FORX=Ø TO 21:READ A$(X):NEXT
57Ø FORX=1TO12:READB$(X):NEXT
58Ø ' Main program begin
59Ø ATTR Ø,Ø:CLS
6ØØ POKE 65497,Ø
61Ø POKE &HFF9F,128
62Ø F$="#####.##":T$="    ######
#.## "
63Ø FORY=ØTO13:MO(Y,21)=Ø:NEXT
64Ø ATTR 1,3
65Ø FORX=1 TO 4
66Ø PRINT M$(X)
67Ø NEXT X
68Ø ATTR 2,1:PRINTA$(Ø):ATTR 2,3
69Ø PRINT
7ØØ T=Ø:C=Ø
71Ø FORX=1 TO 2Ø
72Ø A$(X)=LEFT$(A$(X)+STRING$(15
," "),15): ' Make sure string le
ngth is 15 chrs.
73Ø ATTR 2,3:PRINT" ";:ATTR 1,3
74Ø PRINT A$(X);
75Ø FORY=1 TO 12
76Ø T=T+MO(Y,X)
77Ø ATTR Ø,3
78Ø PRINTUSING F$;MO(Y,X);
79Ø MO(Y,21)=MO(Y,21)+MO(Y,X)
8ØØ NEXT Y
81Ø ATTR 1,3
82Ø MO(13,X)=T
83Ø MO(13,21)=MO(13,21)+T:PRINTU
SINGT$;T;:ATTR 2,3:PRINT" ";:T=Ø
84Ø NEXT X
85Ø ATTR 1,3
86Ø PRINT "                    ";STR
ING$(11Ø,"-")
87Ø PRINT" ";
88Ø ATTR 2,1
89Ø PRINTA$(21);:ATTR 1,3
9ØØ FORX=1TO12
91Ø GOSUB 99Ø
92Ø PRINTUSINGF$;MO(X,21);
93Ø NEXT
94Ø F$="#####.##"
95Ø ATTR 1,3
96Ø PRINTUSING T$;MO(13,21);:ATT
R 6,4:PRINT" ";
97Ø ATTR 2,3:PRINT:ATTR 1,3:GOTO
 1Ø8Ø
98Ø ' Check number and change US
ING string accordingly
99Ø IF MO(X,21)>9999 THEN F$="##
####.#" ELSE F$="#####.##"
1ØØØ IF MO(X,21)>99999 THEN F$="
########"
1Ø1Ø RETURN
1Ø2Ø ' Main Menu
1Ø3Ø ' scroll routine and check
for <F1> key or left & right arr
ow keys
1Ø4Ø ATTR 1,3:LOCATE Ø,Ø:FORX=1T
O4:PRINTM$(X):NEXT
1Ø5Ø ATTR 2,1
1Ø6Ø LOCATE Ø,4:PRINTA$(Ø);
1Ø7Ø ATTR 1,3
1Ø8Ø X=128
1Ø9Ø L=PEEK(343):' Check left ar
row
11ØØ R=PEEK(344):' Check right a
rrow
111Ø I$=INKEY$
112Ø IF I$="g" THEN 132Ø: 'Check
 for <F1> key
113Ø IF R=247 THEN X=X-1:IF X<=1
28 THEN X=128
114Ø IF L=247 THEN X=X+1:IF X>=1
76 THEN X=176
115Ø POKE &HFF9F,X
116Ø GOTO 1Ø9Ø
117Ø POKE &HFF9F,128
118Ø ATTR Ø,Ø:CLS:PRINT:PRINT:PR
INT " * BREAK key pressed *":PRI
NT
119Ø IF DEV=Ø THEN RUN
12ØØ PRINT:PRINT "  Press <M> fo
r Main"
121Ø PRINT "  Press <Q> to quit"
122Ø I$=INKEY$
123Ø IF I$="M" THEN 182Ø
124Ø IF I$="Q" THEN 126Ø
125Ø GOTO122Ø
126Ø ATTR Ø,Ø:CLS:WIDTH8Ø:POKE65
496,Ø
127Ø END : ' **** END ****
128Ø POKE &HFF9F,128:CLS:PRINT:P
```

```
RINT:PRINT"  An ERROR has occurr
ed ! "
129Ø PRINT:PRINT" Error number";
ERNO;"in line number";ERLIN
13ØØ PRINT:GOTO 119Ø
131Ø ' *** Command mode ***
132Ø POKE &HFF9F,128:X=1:Y=1
133Ø ATTR 1,3
134Ø T$="    #######.##"
135Ø IF X>=8 THEN LOCATE 47,3 EL
SE LOCATE Ø,3
136Ø PRINT " (F)ile i/o       (M
)ain menu       (P)rint       a
rrow keys        (ALT)     ";
137Ø A=MO(X,Y)
138Ø IF X=>8 THEN LOCATE Ø,Ø:ATT
R 1,3:PRINT:PRINT:LOCATE 64,Ø:GO
TO 14ØØ
139Ø ATTR 1,3:LOCATE 64,Ø:PRINT:
LOCATE Ø,Ø
14ØØ PRINT "Column/Row = ( ";B$(
X);CHR$(44);A$(Y);")     Value =
 ";
141Ø PRINT USING F$;A;
142Ø PRINT:PRINT:PRINT
143Ø ' locate on current cell
144Ø LOCATE 8+(X*8),Y+5
145Ø ATTR 4,2,U:PRINTUSINGF$;A;:
ATTR 2,3: ' Hi-lite current cell
146Ø I$=INKEY$
147Ø IF I$="" THEN 146Ø
148Ø ATTR 1,3
149Ø IF VAL(I$) > Ø THEN 164Ø
15ØØ IF I$="Ø" THEN 164Ø
151Ø XX=X:YY=Y: ' save current c
ell location to allow erase of h
i-lite
152Ø IF I$=CHR$(8) THEN X=X-1:IF
 X<1 THEN X=1: ' left arrow
153Ø IF I$=CHR$(9) THEN X=X+1:IF
 X>12 THEN X=12: ' right arrow
154Ø IF X<8 THEN POKE&HFF9F,128
ELSE POKE &HFF9F,192: ' shift wi
ndow
155Ø IF I$=CHR$(1Ø) THEN Y=Y+1:I
F Y>2Ø THEN Y=2Ø: ' down arrow
156Ø IF I$=CHR$(94) THEN Y=Y-1:I
F Y<1 THEN Y=1: ' up arrow
157Ø ATTR Ø,3:LOCATE 8+(XX*8),YY
+5:PRINTUSINGF$;A;:ATTR 2,3: ' e
rase hi-lite on previous cell
158Ø IF I$="F" THEN 183Ø: ' File
 save or load
159Ø IF I$="P" THEN 224Ø: ' Prin
ter out
16ØØ IF I$="M" THEN 1Ø4Ø: ' main
```


SUNDOG SYSTEMS

In Quest of the Star★Lord

A new animated graphic adventure for the Color Computer 3 from the author of the Hall of the King trilogy! Enjoy the mixture of science and fantasy as you quest for the Phoenix Crossbow, the only thing that can save you in the post-holocaust world. A full 4 disk sides of adventure! Outstanding 320x200 graphics will make this your favorite CoCo adventure! Req. 128K CoCo 3 and disk drive. Only $34.95.

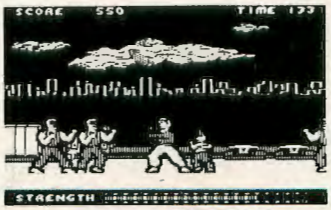
WHITE FIRE OF ETERNITY

64K Animated Graphic Adventure. See 12/86 Rainbow review. Only $19.95.

Kung-Fu Dude

An exciting new arcade game. This is the long-awaited response to the huge demand for a Kung-Fu program for the CoCo. The graphics, sound effects, and animation are spectacular! This is the BEST karate game ever available for the Color Computer. Req. 64K, disk drive, and joystick. Only $24.95.

"The CoCo karate gap has been filled and Kung-Fu Dude does it excellently. I highly recommend (it)!" –2/88 Rainbow review
"A definite 5 stars!" –12/87 Wizard's Castle review



CHAMPION

64K Superhero Action Adventure. See 5/87 Rainbow review. Only $19.95.

All programs CoCo 1, 2, 3 compatible unless stated otherwise.

Sundog Systems

Sundog Systems
21 Edinburg Drive
Pittsburgh, PA 15235
(412) 372-5674
Personal checks, money orders, and C.O.D. orders accepted.

Include $2.50 for S/H. $2.00 extra for C.O.D. orders. PA residents add 6% sales tax. Authorship and dealer inquiries welcome.

```
 menu
161Ø IF I$="@" THEN 132Ø:' <ALT>
 or <@> key returns to upper lef
t cell
162Ø SOUND 18Ø,1:' key click...
delete if annoying
163Ø GOTO 133Ø
164Ø IF X=>8 THEN LOCATE 64,1:PR
INT:LOCATE 64,1:GOTO 166Ø
165Ø LOCATE Ø,1:PRINT:LOCATE Ø,1
166Ø ATTR 1,3
167Ø T=MO(X,Y)
168Ø PRINT"   New value  : ";I$;
169Ø LINEINPUT RM$
17ØØ I$=I$+RM$:MO(X,Y)=VAL(I$)
171Ø IF MO(X,Y)>=1ØØØØ THEN MO(X
,Y)=T:SOUND 1ØØ,2:GOTO 133Ø
172Ø ATTR 1,3
173Ø MO(X,21)=Ø:MO(13,Y)=Ø:MO(13
,21)=Ø
174Ø FORV=1TO2Ø:MO(X,21)=MO(X,21
)+MO(X,V):NEXT
175Ø GOSUB 99Ø
176Ø LOCATE 8+(X*8),27:PRINTUSIN
GF$;MO(X,21);
177Ø FORV=1TO12:MO(13,Y)=MO(13,Y
)+MO(V,Y):MO(13,21)=MO(13,21)+MO
(V,21):NEXT
178Ø LOCATE 112,Y+5:PRINTUSINGT$
;MO(13,Y);
179Ø LOCATE 112,27:PRINTUSINGT$;
MO(13,21);
18ØØ F$="#####.##"
181Ø GOTO 133Ø
182Ø GOTO 59Ø
183Ø POKE &HFF9F,128:LOCATE Ø,Ø:
ATTR 1,3
184Ø PRINT:PRINT:PRINT:PRINT:LOC
ATE Ø,Ø
185Ø PRINT "  < FILE I/O >
  (S)ave   (L)oad  or  (Q)uit "
186Ø I$=INKEY$
187Ø IF I$="S" THEN LOCATE Ø,Ø:P
RINT:GOTO 192Ø
188Ø IF I$="L" THEN LOCATE Ø,Ø:P
RINT:GOTO 2Ø8Ø
189Ø IF I$="Q" THEN 132Ø: 'Retur
n to command mode
19ØØ GOTO 186Ø
191Ø '*****      SAVE
192Ø LINEINPUT "  Filename to sa
ve : ";F$
193Ø IF LEN(F$)>8 THEN SOUND 1ØØ
,2:GOTO 183Ø
194Ø F$=F$+"/SUM"
195Ø POKE 65496,Ø
196Ø IF DEV=-1 THEN LINEINPUT "
Prepare tape and press <ENTER> "
;I$
197Ø OPEN "O",DEV,F$
198Ø FOR Y=1TO2Ø
199Ø PRINT#DEV,A$(Y)
2ØØØ FORX=1TO12
2Ø1Ø PRINT#DEV,MO(X,Y)
2Ø2Ø NEXT X
2Ø3Ø PRINT#DEV,"*******":' dummy
 string
2Ø4Ø NEXT Y
2Ø5Ø CLOSE
2Ø6Ø GOTO 182Ø
2Ø7Ø '*****       LOAD
2Ø8Ø LINEINPUT "  Filename to lo
ad : ";F$
2Ø9Ø IF LEN(F$)>8 THEN SOUND 1ØØ
,2:GOTO 183Ø
21ØØ F$=F$+"/SUM"
211Ø POKE 65496,Ø
212Ø IF DEV=-1 THEN LINEINPUT "
Prepare tape and press <ENTER> "
;I$
213Ø OPEN "I",DEV,F$
214Ø FORY=1TO2Ø
215Ø INPUT#DEV,A$(Y)
216Ø FORX=1TO12
217Ø INPUT#DEV,MO(X,Y)
218Ø NEXT X
219Ø INPUT #DEV,I$:' ignore dumm
y string
22ØØ NEXT Y
221Ø CLOSE
222Ø GOTO 182Ø
223Ø ' PRINTER OUT
224Ø POKE &HFF9F,128:LOCATE Ø,Ø:
PRINT:LOCATE Ø,Ø:ATTR 1,3
225Ø LINEINPUT " Prepare printer
 and press <ENTER> or <BREAK> to
 quit ";I$
226Ø POKE 65496,Ø
227Ø ' Q$=CHR$(27)+CHR$(2Ø): ' F
OR RADIO SHACK PRINTER
228Ø Q$=CHR$(27)+CHR$(66)+CHR$(3
):' FOR GEMINI 1ØX
229Ø ' SET TO 17 CPI
23ØØ PRINT#-2,Q$
231Ø PRINT#-2,RIGHT$(A$(Ø),124)
232Ø PRINT#-2,STRING$(128,95)
233Ø FORX=1TO21
234Ø IF X=21 THEN PRINT#-2,STRIN
G$(128,95)
235Ø PRINT#-2,A$(X);
236Ø FORY=1TO12
237Ø IF MO(Y,X)>9999.99 THEN F$=
"######.#" ELSE F$="#####.##"
238Ø IF MO(Y,X)>99999 THEN F$="
###### "
239Ø PRINT#-2,USING F$;MO(Y,X);
24ØØ NEXT Y
241Ø PRINT#-2,USING T$;MO(13,X)
242Ø NEXT X
243Ø GOTO 182Ø
```

```
244Ø '
245Ø ' TEXT STRINGS
246Ø '
247Ø ' M$(1) -  M$(4)
248Ø DATA ""
249Ø DATA "
          -< Sum 128 >-"
25ØØ DATA ""
251Ø DATA " Press left or right
arrow keys to scroll        Pres
s F1 key for command mode "
252Ø ' A$ (Ø)
253Ø DATA "      Item          J
an     Feb     Mar     Apr     M
ay     Jun     Jul     Aug     S
ep     Oct     Nov     Dec
   Total"
254Ø '
255Ø '
256Ø ' Edit ->  Category 1  -  C
ategory 2Ø  to suit needs !
257Ø ' The length of the string
must remain the same !   15 chrs
. min/max !
258Ø '     A$(1) -  A$(2Ø)
259Ø DATA "Catagory 1     "
26ØØ DATA "Category 2     "
261Ø DATA "Category 3     "
262Ø DATA "Category 4     "
263Ø DATA "Category 5     "
264Ø DATA "Category 6     "
265Ø DATA "Category 7     "
266Ø DATA "Category 8     "
267Ø DATA "Category 9     "
268Ø DATA "Category 1Ø    "
269Ø DATA "Category 11    "
27ØØ DATA "Category 12    "
271Ø DATA "Category 13    "
272Ø DATA "Category 14    "
273Ø DATA "Category 15    "
274Ø DATA "Category 16    "
275Ø DATA "Category 17    "
276Ø DATA "Category 18    "
277Ø DATA "Category 19    "
278Ø DATA "Category 2Ø    "
279Ø '
28ØØ ' A$ (21)
281Ø DATA "  Total        "
282Ø '
283Ø ' B$(1) - B$(12)
284Ø DATA Jan,Feb,Mar,Apr,May,Ju
n,Jul,Aug,Sep,Oct,Nov,Dec
285Ø '
```

Listing 2: MONTEST

```
1Ø ' Montest
2Ø ' By Dave Archer
3Ø ' test monitor support for 12
8 (8Ø window) by 28 text screen
4Ø PALETTE 8,63:PALETTE Ø,Ø ' wh
ite text on black background
5Ø WIDTH8Ø:CLS1
6Ø ON BRK GOTO 34Ø
7Ø POKE&HFF98,&HØ3:POKE&HFF99,&H
75: ' Set for 28 rows of text
8Ø POKE&HFF9F,128: ' Set for 128
 columns with column Ø as left m
ost column
9Ø ' Tell BASIC new screen size
1ØØ POKE&HFEØØ,&H2Ø:POKE&HFEØ1,Ø
: ' beginning cursor address
11Ø POKE&HFEØ4,128: ' # columns
on text screen
12Ø POKE&HFEØ5,28: ' # rows on t
ext screen
13Ø POKE&HFEØ6,&H3E:POKE&HFEØ7,&
HØØ: ' End address of text scree
n
14Ø ' ***  Patch BASIC's LOCATE
command  ***
15Ø POKE &HF9ØA,&H58: 'enable ne
w LOCATE positions
16Ø POKE &HF8EC,128:' Allows LOC
ATE from column Ø - 127
17Ø POKE &HF8F4,28: ' Allows LOC
ATE from row Ø - 27
18Ø CLS
19Ø A$="<------    this is colum
ns 8Ø - 127    ------->x"
2ØØ FORX=Ø TO 27:LOCATE 79,X:PRI
NT"x";:LOCATE 127,X:PRINT"x";
21Ø LOCATE Ø,X: PRINT " Line num
ber ";X;
22Ø NEXT
23Ø LOCATE 2Ø,Ø:PRINTSTRING$(1Ø8
,"*");
24Ø LOCATE 2Ø,27:PRINTSTRING$(1Ø
8,"*");
25Ø LOCATE 8Ø,13:PRINTA$;
26Ø LOCATE 2Ø,23:PRINT "Press an
y key";
27Ø LOCATE 2Ø,1Ø:PRINT "This sho
ws columns Ø - 79 ";:LOCATE Ø,27
28Ø ON BRK GOTO 31Ø
29Ø I$=INKEY$:IF I$="" THEN 29Ø
3ØØ ' scrolls columns 8Ø-127 int
o display window
31Ø FORX=128 TO 176:POKE &HFF9F,
X:FORD=1TO1Ø:NEXTD:NEXTX
32Ø ON BRK GOTO 34Ø
33Ø FORX=1TO29ØØ:NEXT:'delay to
view
34Ø WIDTH8Ø:'restore to normal 8
Ø col. by 24 line screen
```

Bigger and Better Eproms

By Tony DiStefano
Rainbow Contributing Editor

A long time ago, when computers for the consumer were just starting to come on the market, large amounts of memory were unheard of. My first computer was a Sinclair ZX-80. It had only 1K of Random Access Memory, or RAM.

RAM is a temporary storage place for data — as long as the computer is on, RAM will remember what is put into it. When you first power up a computer, RAM has no set pattern. The data in it is not valid data. When you turn the computer off, all RAM data is lost.

Anyway, imagine only 1,024 bytes of memory, and half of that used for video display — a far cry from our present CoCos. BASIC was in Read-Only Memory, or ROM, and that was a whopping 4K ROM at that. Later, they came out with 8K of ROM, which was a big improvement.

ROM is memory that has been permanently etched into the chip at the factory. It cannot be changed or lost. When you power up with ROM, instant data (or a program) appears. Every computer needs a bit of ROM (no pun intended). How much is a "bit"? Well, that all depends on what that ROM has to do.

When a computer is first powered up, a hardware reset line delays the start of the CPU until the power supply is stable. Then, when the reset line lets go, the first thing the CPU does is load a starting address from a predetermined area of memory. It loads this address into its program counter and then starts to execute the code pointed to by this program counter. Now, what is wrong with this picture? If this area of memory is RAM, we're in trouble. On power-up, RAM has no definite pattern; the CPU would certainly get confused and hang up. But if ROM were there in place of RAM, then the CPU would see valid code and run merrily on its way. Hurray for ROM!

ROM is great — instant software, and no way to lose it. But for hackers like you and me, ROM is a downer. Why? For the same reason that makes ROM great — it locks us in. It cannot be changed. The code that is in a ROM is for keeps.

The manufacturer of ROMs saw a need for the user to be able to program his or her own ROM. From that need came the PROM. The PROM is a Programmable ROM. In other words, a PROM is a blank ROM. A special device lets you program your own data code into the PROM. That was great, but if you made an error in your code, you had to throw that chip away and start with a new one. The chip was fine for small runs of a proven code: It had all the advantages of ROM and none of the high costs of mask programming a ROM.

But there remained a need for a reusable chip that was easy to program. The EPROM was introduced — an erasable PROM. Just what the doctor ordered. Easy to use, inexpensive and able to be used over and over again. When I first started learning about computers, I wanted to customize mine. When I turned it on, I wanted it to say "HI TONY." It was that desire that made me want to learn more about EPROMs.

Back then, the most capacious EPROM I could find was only a 2K by 8-bit EPROM. Its part number was 2716. The "16" represents the number of bits in that chip. There are 16K (16 thousand) bits. Most microprocessors then were only eight bits wide, so EPROMs were also eight bits wide. Dividing 16,000 bits into 8-bit-wide bytes gave us 2K (2,000) bytes of memory. But that was then, and this is now. As technology improved, so did EPROM capacities. After the 2716 came the 2732. Yes, you guessed it, the 2732 has 32K bits or 4K by 8 bits — twice the capacity of the 2716.

Still improving, technology then allowed for a reasonably priced 2764. To me that was the breakthrough, a 64K bit EPROM and 8K to play with. This was great because it was the same size as the BASIC, Extended BASIC and the Disk BASIC ROMs to EPROMs. I was able to customize these ROMs with EPROMs.

Things didn't stop there. The prices for these EPROMs started very high, but soon dropped very fast. Again, the industry came out with another EPROM — another doubling of capacity. Yes, a 27128, a whole 16K of data in one chip. Impressive as it was, it did not stop there. Next came the 27256 and then the 27512. The 27256 is a 32K EPROM and the 27512 is a 64K EPROM. Just think of it. The 6809 CPU inside the CoCo can access 64K of memory — that is the whole 6809's memory address in one chip! If you think back to the 2716, it would take 32 of these memory chips to make up the capacity of one 27512. I know that manufacturers are making 231024s, which are 128K by 8-bit ROMs (but I don't think they have them in EPROMs — just yet, anyway).

The Project

What can you do with these bigger and better EPROMs? Well, I have a few ideas. The easiest place to put EPROMs

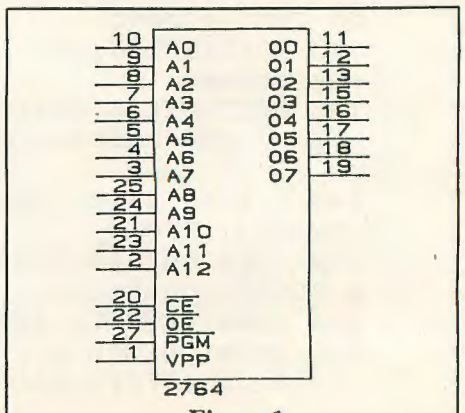


Figure 1

Tony DiStefano is a well-known early specialist in computer hardware projects. He lives in Laval Ouest, Quebec.

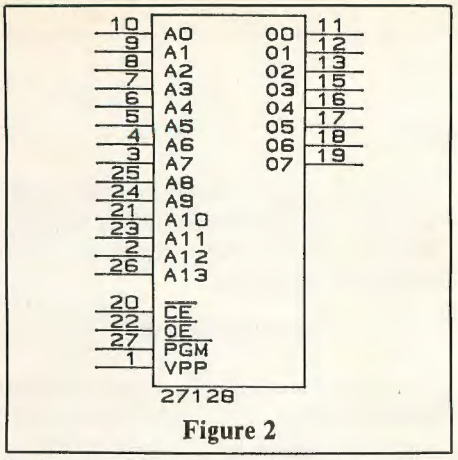


Figure 2

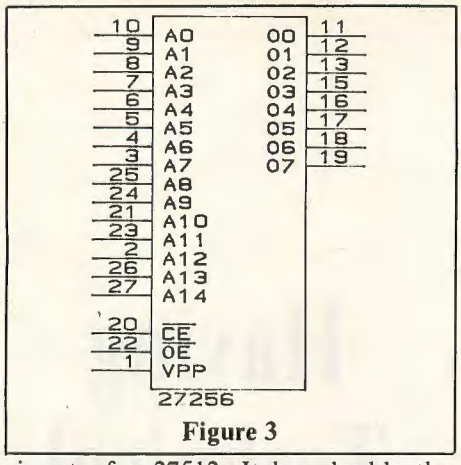


Figure 3

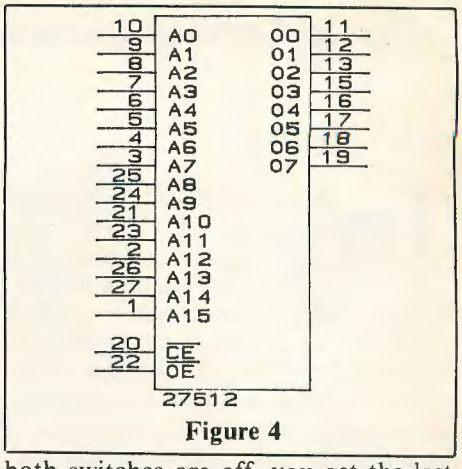


Figure 4

is in the Multi-Pak. And the easiest place to map them is in the Disk BASIC area, located from $C000 to $FEFF in the memory map of the CoCo 1 and CoCo 2. With the CoCo 3, you are a little bit more limited. The mapping is from $C000 to $FDFF, just one page less only 256 bytes at the top of the memory map. That is to accommodate the extra functions of the GIME chip. Anyway, for all intents and purposes, this area is 16K long. Just remember the top two pages are not usable.

Look at Figure 1, a pinout of a 2764. I started there because I figure it is the smallest memory chip (8K long) that is worthwhile hooking up. Accessing this amount of memory requires 13 address lines, A0 to A12. The CTS pin on the CoCo's bus accesses a total of 16K, requiring 14 address lines to properly decode. This leaves us with one address line left over. In this case, we can't use it. Leave it unconnected. This will cause a memory mirror. If the CPU accesses the first half of the 16K memory area, it gets the data. When it accesses the second half of the memory, it gets the same data. The only difference is that the last address line, A13, does not control anything. Such is the case of the Disk BASIC ROM in the Radio Shack Controller; it is only 8K long and is mirrored to the second half of the 16K area.

Now look at Figure 2, the pinout of a 27128. It has 14 address lines, making it 16K long. It is a perfect match for the CTS area of the CoCo. There are no leftover address lines. The CPU can access a full 16K of memory with no memory mirroring.

Figure 3 shows the pinout for a 27256. This one has one more address line than we can handle. That is the number of address lines it requires to access 32K. This presents a problem. The CTS cannot handle 32K, and we have one address line left over, with nowhere to connect. Figure 4 is the pinout of a 27512. It has double the problem, with yet another address line we don't know what to do with.

The 27256 represents 32K of data, but that is just one way of looking at it. Another way of looking at it is as two banks of 16K. For example, let's say you have two pieces of software that are each 16K long. You can put both of them on one 27256 and select which you want to use when you turn on the computer. This can be done quite simply.

Figure 5 shows a small (I mean *small*!) circuit that can select between the two banks of a 27256. It consists of a single pole, single throw switch and a resistor. The resistor acts as a "Pull Up." When the switch is in the off position, current is fed from the 5-volt supply to the address line via this resistor. The XX means whichever address line is connected to it, making the address line a logic level of 1, or HI. When the switch is on, the current is shorted to ground, making the address line in question a logic level of 0, or LO. The switch and resistor become your manual bank selector. When this circuit is connected to A14 on a 27256 and the switch is on, you get the first half of the EPROM. When the switch is off you get the second half. So, when you turn the computer on, it will see one or the other. If you happen to turn the switch when the computer is on, chances are the computer will get confused and hang up. However, this does not hurt the computer.

If you are thinking of using a 27512, you can have four banks of software, each bank 16K long. In that case, you have to build another circuit like the one in Figure 5. Connect the second switch to A15. When both switches are on, you get the first 16K bank of software. When the A14 switch is off and the A15 switch is on, you get the second. When the A14 switch is on and the A15 switch is off, you get the third bank. When both switches are off, you get the last bank of software.

So far, the switches have been switching 16K banks of data. If most of your software is in 8K blocks or less, you might want to switch these EPROMs in 8K banks instead of 16K banks. You will need yet another circuit like the one in Figure 5.

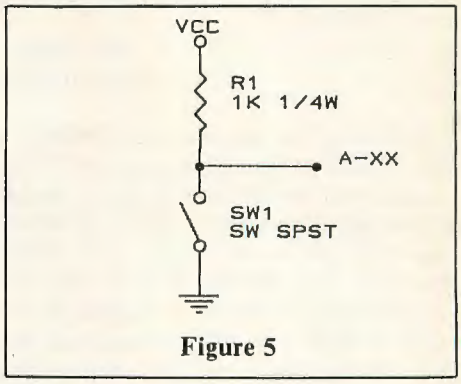


Figure 5

In either the 27128, 27256 or the 27512, disconnect A13 from the computer side. Connect A13 to the third switch. This switch now controls 8K banks. When the switch is off, you are seeing the first, or lower, 8K bank of data at $C000 to $DFFF. When this switch is on, you see the second, or upper, bank also mapped at $C000 to $DFFF. When you use a 27128, you get two 8K banks. A 27256 gets you four banks, and a 27512 gives you a whopping eight 8K banks of software. Remember, though, that each one of these banks starts at memory location $C000 and that for this software to work properly, they must be written for this area or be in complete relocatable code. Also remember that to autostart software that begins at $C000 you must short out Pin 7 and Pin 8 on the CoCo bus. Software that looks like a DOS must have the first two bytes the same as RS-DOS in order to function properly and be recognized by BASIC. DOS-like software must not have pins 7 and 8 shorted.

Having Technical Difficulties?

By Marty Goodman
Rainbow Contributing Editor

In this and in future "CoCo Consultations," I will be trying something new. In addition to the familiar Q & A column, I will also include tidbits of information contributed by various folks and, in some cases, comment on the information. Thus, even if you don't have a *question*, I invite you to send in any little hints or descriptions of experiences you have had with the CoCo that you think might be of interest to the CoCo-owning public in general.

Old Printers Should Retire

How can I hook up a Line Printer V (currently used on a TRS 80 Model 2) to a CoCo 2?

Jeff Causley
Bay City, MI

I believe the ancient Line Printer V has inputs for parallel data only. That means you would have to buy a serial-to-parallel converter ($50 to $110, advertised in RAINBOW) to get it working. The Line Printer V is so old, and so lacking in features accessible to the CoCo, that I would recommend not even bothering to try this (unless you can get such a converter for free). Instead, spend the $110, plus $70 more, on a more modern printer.

No Power to Spare

I need about an extra amp of power to run a Cir-pak 68008 board on my CoCo 3. How can I modify the CoCo 3 power supply to provide this? I've already replaced some of the TTL chips on the 68008 board with HCT-type chips, but I still need at least .6 amp more power than the CoCo 3 can provide. Also, I note that TS Edit *does not work with OS-9 Level II. Can you help with that?*

Doublas Streidt
Stillwater, OK

Do *not* under *any* circumstances attempt to power such a board from the CoCo 3! Instead, run it off a separate power supply. The CoCo 3 has *no* power to spare for such jobs. There are patches on the Delphi OS-9 Online SIG to allow using *TS Edit* under OS-9 Level II.

Parallel Port Communications

Can I use the Disto Parallel Port to talk to my modem?

Brandon Knight
(KNIGHTI)
Sulphur, OK

No. Essentially, all external modems communicate with the computer via an RS-232 serial protocol, not a parallel protocol. The differences between RS-232 serial and parallel port protocols are considerable. RS-232 serial lines use two wires plus ground to send data both to and from the computer, plus one or more handshake lines. The voltages on the serial lines vary between +12 and -12 volts. Parallel lines consist of at least eight data lines plus a strobe and one or more handshake lines. Parallel lines often support data transfer in only one direction (apart from busy signals). The voltage levels on them are TTL levels of 0 to 5 volts.

Versatile EPROM

Is there an easy way to use a 28-pin 2764 EPROM in a Radio Shack disk controller that takes a 24-pin ROM?

Mike Tolbert
(MIKEGT)

A long time ago, Dennis Kitsz, of Green Mountain Micro, designed an adapter to do just that. For a while, it was sold by Spectrum Projects. When Dennis disappeared from the CoCo world, his adapter disappeared also. Recently, however, a friend of Art Flexser developed an even better, cleaner, more clever adapter to do exactly what you ask. This item is currently available from SpectroSystems. It allows you to use either a 2764 or a 27128 EPROM in your Radio Shack controller.

64K Upgrades

Can I upgrade my cassette tape-based CoCo 2 to 64K, 128K or higher without getting a disk drive system?

Rob Caseholt
Aurora, MO

If you have a 16K CoCo 2, it is easy to upgrade to 64K. Kits for doing this are available from many folks who advertise in RAINBOW. If your CoCo already has more than 16K of memory in it, you already have a 64K CoCo. There are kits for adding extra memory to the CoCo 2 (J&R makes one such, called the Banker, and Disto makes another, called the Super Ram Disk) but, unless you have a particular application for them, they are not of much value because the only programs that can make good use of them are those that use disk I/O frequently. For nearly all practical purposes, 64K is the memory limit of the CoCo 2. If you need more power and flexibility, the next thing to spend money on would, without question, *not* be more memory, but rather a disk drive system. After that, if you still need more power, it might be wise to get a CoCo 3 before experimenting with add-on RAM disk cards.

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.

The Best Money Can Buy . . .
HDS Floppy Drive Controller Board

Features

- Gold Plated Edge Cards
- Dual Selectable ROM Sockets
- Compatible with COCO I & II
- 120 Day Warranty
- Double and Single Density

Reduce your I/O errors with the Hard Drive Specialist Floppy Drive Controller for the Color Computer. Gold edge card connectors, advanced design, and the absence of potentiometers make it the best available. Our newest version controller allows the use of either (two 24 pin ROMS), or (one 24 pin and one 28 pin ROM). Using this board with the standard Radio Shack ROM gives you 100% compatibility with all Radio Shack software.

Completed and Tested Board with Radio Shack ROM . . . . . $99.
(Includes Case, and DOS Instructions)
Completed and Tested Board without ROM . . . $79.
(Includes Case)
Bare Board with Instruction manual . . . . . $30.
Parts Kit For Bare Board without ROM . . . . . $30.
Radio Shack ROM (current version) . . . . . $20.
Radio Shack ROM 1.0 . . . . . $40.

DOUBLE SIDED!

Drive 0 Complete . . . . . $199.
Drive 1 Complete . . . . . $129.
Drive 0 & 1 Dual Drive . . . . . $319.

Ordering Information

Use our WATS line to place your order via Visa, MasterCard, or Wire Transfer. Or mail your payment directly to us. Any non-certified funds will be held until proper clearance is made. COD orders are accepted as well as purchase orders from government agencies. Most items are shipped off the shelf with the exception of hard drive products that are custom built. UPS ground is our standard means of shipping unless otherwise specified. Shipping costs are available upon request.

HARD DRIVE SPECIALIST

1-713-480-6000
Order Line 1-800-231-6671
16208 Hickory Knoll
Houston, Texas 77059

Foiled Again

Marty, you once mentioned to me that there are problems of one monitor interfering with another when the two are placed side by side. I had the same problem, and was successful in eliminating it by placing a piece of aluminum foil between the two monitors.

Dennis Skala
(DENNYSKALA)
Fairview, PA

Thanks very much, Dennis, for that tip. I am delighted that such an easy solution is available. I do note that as the amount of shielding in different brands of monitors varies *greatly*, your suggestion might not work with all combinations of monitors, but still should be tried first by anyone with such a problem.

Getting the Part

I've been trying to build that surge protector you described in the October 1986 issue of RAINBOW (Page 158), but am having problems getting a dual or single Zener diode rated at 220 volts. Where might I order them?

Tim Wright
Minerva, OH

I must confess that I received several notes asking where to get those Zener diodes. Frankly, I used parts I got at a local surplus store, and had little idea where one ordinarily gets them. But it turns out that a single direction 200-volt 10-watt Zener is available as a Sylvania ECG series replacement component: Sylvania Part No. ECG 5232A. You'll need to put two of them together, cathode to cathode, to make the dual Zener arrangement I described. The part is relatively expensive (as are all ECG series parts), but should be available at most stores that sell TV repair parts.

RS-232 Pack Failure Under OS-9

I notice that the 6551 chip in the RS-232 pack is rated at 1 MHz operation. Is it possible that this could cause problems when one attempts to use the RS-232 pack under OS-9 Level II, which runs the CoCo at 2 MHz cycle speed?

James McDaniel
(NEWKID)
Brooklyn, NY

I myself have not heard of any problems due to "slow" 6551 chips, but Greg Law (GREGL), SysOp of our OS-9 Online SIG, tells me he has heard occasional reports of RS-232 packs not working under OS-9 Level II, and of the problem being cured by replacing the 6551 chip with a 6551A chip (rated for 2 MHz operation). Such chips can be purchased from Jameco, of Belmont, California, for about $6 each.

There are a number of *other* things that can go wrong with the RS-232 pack, so if yours does not work, that does not necessarily *prove* the problem is a slow 6551 chip. But if your pack works perfectly under Disk Extended BASIC programs at 1 MHz and fails only when used with OS-9 Level II, you might well consider replacing the 6551 with a 6551A chip. There are other possible causes for failure at higher speeds, such as a defective 74LS133 or 74LS04 chip.

Bad Contacts

I have been having increasing problems that appear to be caused by poor contacts between my Multi-Pak and my disk controller. These problems were cured when I switched my controller to Slot 4 (the recommended slot for it, anyway). I'm curious, though: Why is Slot 4 recommended, and could the problems be related to my failure to buy a new PAL chip for use with my Multi-Pak and CoCo 3?

Richard Phillips
(RHP)
Snyder, NY

Sometimes the problems of bad contacts between CoCo and Multi-Pak, and Multi-Pak and the disk controller are cured merely by cleaning the edge card connector with a pencil eraser. These problems can occur *even* with disk controllers that have gold-plated contacts, though the gold *does* help considerably.

Sometimes the fix is considerably more difficult, for it will involve replacing the *female* edge card connector on the CoCo or the Multi-Pak. This can be quite tedious. Slot 4 is allocated for the disk controller by convention. For *most* Disk Extended BASIC programs, it does not matter where you put the controller in the Multi-Pak. But when you start to use OS-9 and programs that utilize the CART interrupt line, it will be important to observe the conventions about where things go in the Multi-Pak.

By convention, the RS-232 pack usually goes in Slot 1 of the Multi-Pak. *MikeyTerm, Greg-E-Term* and *Rickyterm* do *not* care where you put the disk controller or RS-232 pack, but OS-9 terminal software will most likely care a lot. I doubt the PAL chip was the source of your problem, but it is true that one symptom of a bad PAL chip can be that Disk BASIC boots up only when the disk controller is in one particular slot of the Multi-Pak.

The One and Only Terminator

I have heard that a terminator resistor needs to be in the drive at the end of a disk drive cable. Is this so? Does it matter if that drive is set up as some drive number other than the highest number in the system?

Jon Ruhnow
(RUHNOW)
Duncanville, TX

Each disk drive system should have one, and only one, terminator resistor in one of its drives. In theory, that terminator resistor should be in the drive that physically is farthest from the controller along the cable, regardless of what logical drive number that drive is defined as. In practice, as long as you are sure there is only *one* terminator resistor in the system, it should not matter which drive you put the terminator into. The terminator resistor can take many forms: On some drives it looks like a 14- or 16-pin integrated circuit, and on others it is a blob of epoxy with a single row of pins. On a few more recent drives (such as the Teac 54A), the terminator resistor is permanently soldered into the drive. But the manufacturers use a 1,000-ohm terminator in such drives (instead of the 150-ohm removable terminators), so with these you can have another drive in the system with a terminator of the same value.

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.

Sugar Software

☞ Get Smart, Have Fun and Save $50! ☜

Order the new *Educational Combo* package by April 31, 1988 at the introductory price of $48.50. The Combo includes these educational (and entertaining) games: **Silly Syntax** (with 2 stories), **Galactic Hangman** (700 word vocabulary), **The Presidents of the USA** (includes well over 35 presidents), **The Great USA** (even little-known states are covered) and **Trig Attack** (Zap those *Trigs*). For children ages 5-10 through adult. Disk only; **$48.50**; S&H $1.50.

CALLIGRAPHER

CoCo Calligrapher - (Hybrid BASIC/ML) Turn your CoCo and dot-matrix printer into a calligrapher's quill. Make beautiful invitations, flyers, certificates, labels and more. Includes 3 fonts: *Gay Nineties, Old English* and *Cartoon*. The letters are ½ inch high and variably spaced. Works with many printers including Epson, Gemini, Radio Shack, Okidata 92A, Banana and Prowriter. Additional fonts are available (see below). Tape/Disk; **$24.95**.

OS9 Calligrapher - (C) Although a different program from the CoCo Calligrapher, the OS9 Calligrapher prints all the same fonts. It reads a standard text file which contains text and formatting directives. You may specify the font to use, change fonts at any time, centering, left, right or full justification, line fill, margin, line width, page size, page break and indentation. Similar to *troff* on UNIX™ systems. Includes Gay Nineties, Old English and Cartoon fonts. Additional fonts are available (see below). Disk only; OS9 Level I or II; **$24.95**.

Calligrapher Fonts - Requires Calligrapher above. Each set on tape or disk; specify RSDOS or OS9 version; **$14.95** each. **Set #1** - (9 fonts) Reduced, reversed and reduced-reversed versions of Gay Nineties, Old English and Cartoon; **Set #2** - (8 fonts) Old Style and Broadway; **Set #3** - (8 fonts) Antique and Business; **Set #4** - (8 fonts) Wild West and Checkers; **Set #5** - (10 fonts) Stars, Hebrew and Victorian; **Set #6** - (8 fonts) Block and Computer;

Economy Font Packages on disk; specify RSDOS or OS9; **20.95**: **Font Package #1** - Above font sets 1, 2 and 3 (25 fonts) on one disk. **Font Package #2** - Above font sets 4, 5 and 6 (26 fonts) on one disk. Both Packages #1 and #2 (51 fonts) on one disk; **40.95**.

Calligrapher Combo Package - *Everything!*; specify RSDOS or OS9; Includes the Calligrapher and both Font Packages on two disks; **$60.95**.

UTILITIES

Piratector - (100%ML) Utility to allow your own *disk-based* BASIC or ML programs to display a graphics title screen and then self-start after loading. Adds copy protection to your programs but still allows users to create *non-executable* backups! Includes Semigraf. Disk only; CoCo 1, 2, 3 (except Semigraf); **$30.95**.

Super Screen Machine - (100% ML) Put your CoCo into high resolution mode for your own BASIC or ML programs. Smooth scroll, key click, lower case with colored characters. Tape/Disk; 32K CB; CoCo 1, 2, 3 (except 64K mode); **$19.95**.

Color Disk Manager - (100%ML) Disk utility with these features: Disk repair, selective track initialization, verify sectors, backups, tape to disk transfer, ROM Pak execution from disk, much more! Tape/Disk; CoCo 1, 2, 3 (except for 64K mode); **$24.95**.

Color Tape Manager - (100% ML) Tape utility with these features: display start, end and exec address of ML programs, convert ML programs into *DATA* statements, append ML to BASIC, much more! Tape/Disk; 16K ECB; CoCo 1, 2, 3 (except for 64K mode); **$19.95**.

OS9 Patcher - (C) Display and modify the contents of a file or memory module. Hexidecimal, decimal and ASCII modes. Search feature. Calculates module CRCs; Generates patch command files. Disk only; OS9 Level I or II; **$19.95**.

INFORMATION MGT.

TIMS (The Information Management System) - (Hybrid BASIC/ML) Tape or disk, fast and simple general data base program. Create *files* of *records* that can be quickly sorted, searched, deleted and updated. Powerful printer formatting. Up to 8 *user* fields, sort on up to 3 fields. Tape/Disk; **$19.95** (see combo pkg below).

TIMS Mail - (Hybrid BASIC/ML) Tape or Disk based mailing list management program. Files are compatible with TIMS. Fast and simple to use. Supports labels 1, 2 or 3 across, 2½ to 4 inches wide. Tape/Disk; **$19.95** (see combo pkg below).

TIMS Utility - (Hybrid BASIC/ML) Utility companion for TIMS and TIMS Mail to allow multi-term search (*AND* and *OR* logic), global change and delete, split large files and more! Tape/Disk; **$14.95** (see combo pkg below).

TIMS Combo Package - All three of the above programs: TIMS, TIMS Mail and TIMS Utility on one disk - **$34.95**.

SPORTS STATISTICS

Statistics programs for the coach, team manager or avid fan who wants to keep accurate team and opponent records. Printer output supported. The following are available: Baseball, Basketball, Football and Soccer. Disk only; **$19.95** each.

EDUCATIONAL

Trig Attack - (100%ML) Ages 9 and up. In this educational arcade game, enemy *trigs* travel along math curves. Players learn important mathematical concepts as they play. Sound effects, colorful graphics. Excellent manual includes an introduction to trigonometry. Tape 16K CB/Disk 32K ECB; CoCo 1, 2, 3; **$19.95**.

Silly Syntax - (Hybrid BASIC/ML) Ages 5 and up. Story creation game; output to screen or printer; includes 2 stories or create your own. Tape/Disk; **$19.95** or disk with 62 stories for **$29.95**. Sets of 10 stories on tape/disk for **$4.95**: Fairy Tales, Current Events, X-Rated, Sing-Along, Adventure, Potpourri.

Bible Stories Adventure - (Hybrid BASIC/ML) Ages 4 & up. A graphics adventure game for young children & their families. Old testament. Tape/Disk; **$19.95**.

The Presidents of the USA - (100% ML) Ages 10 and up. Two trivia games, user modifiable, printer output supported. Tape/Disk; 16K ECB; **$19.95**.

The Great USA - Ages 9 and up. Trivia game of the 50 states. Capitals, nicknames, abbreviations, flowers, trees and birds. Tape/Disk; 16K ECB; **$19.95**.

Galactic Hangman - Ages 7 and up. Exciting new twist to the popular word game. Outstanding graphics; 700 word vocabulary. Tape/Disk; 16K ECB; **$19.95**.

PreReader - (Hybrid BASIC/ML) Ages 3-5 (level I); Ages 5-7 (level 2); Great graphics and music. Level 1: match colors, shapes, letters and numbers; Level 2: match letters and consonant blends with their sounds. Tape/Disk; Joystick; **$19.95**.

Statgraf - High school and college level; Linear regression analysis program combined with a plotting and line graphing system. Up to 250 x/y pairs; data transformation; residuals; regression line; print graph with screen print program (not supplied); Tape/Disk; **$19.95**.

SPECIAL INTEREST

Rental Property Income and Expense Management Package - Maintain your rental property income and expense records. Print output supported. 28 expense categories. *This program may be tax deductible.* Disk only; **$29.95**.

Radio Systems Design Calculations - Performs 14 different calculations commonly used in design or evaluation of land mobile radio systems, satellite TV, etc. Tape/Disk; **$19.95**.

CoCo Knitter - Easy to use program to display or print instructions to knit a sweater: Cardigan or Pullover; Round or V-neck; Raglan or Set-in Sleeve; 3 weights or yarn; 8 sizes from baby to man. Tape/Disk; **$19.95**.

Flying Tigers - (100% ML) Fast *Defenders* style arcade game. 5 levels of difficulty; Outstanding graphics and sound effects. Tape/Disk; Joystick; **$19.95**.

RAINBOW CERTIFICATION SEAL

MasterCard

VISA

*TRS-80 is a trademark of Tandy Corp.

SUGAR SOFTWARE
P.O. Box 7446
Hollywood, Florida 33081
(305) 981-1241

All programs run on the CoCo 1, 2 and 3, 32K Extended Basic, unless otherwise noted. Add $1.50 per tape or disk for shipping and handling. Florida residents add 6% sales tax. COD orders add $5. Dealer inquiries invited. Orders generally shipped in 24-48 hours. No refunds or exchanges without prior authorization.

By Richard E. Esposito
Rainbow Contributing Editor
with Richard W. Libra

VIP CoCo 3 Fix

How can I fix VIP *software, such as* VIP Writer, *to run on the CoCo 3?*

Steve C. Munsell
Hermiston, OR

Rx To fix *VIP* software to run on the CoCo 3, you generally change the sequence of bytes $8C $FF $00 to $8C $FE $00.

80-Track or Hard Drive Dilemma

I have a CoCo 3 with 512K and OS-9 Level II, and I want to upgrade my disk drives to DSDD. Should I get 40- or 80-track drives, and who makes good ones? I also want a clock/calendar and a good type-ahead controller that I could attach a hard drive to. Also, I just bought the Avatex 2400 baud modem. At 2400 or 1200 baud, I can't get my printer to print right. Can I print while online at any speed?

Lawrence Myers
Silver Spring, MD

Rx A while ago, I would have said to go with 80-track floppies for OS-9, but with hard disk systems under $450 now, it makes little sense to upgrade your floppies. For example, I recently purchased an older white Multi-Pak for $20, a Burke & Burke (312-397-2898) CoCoXT-RTC hard disk interface for $99, a Hard Times (408-280-1969) Case and 65-watt Power Supply for $72, and a 20Mb Seagate ST225 Kit (includes cables and IBM PC/XT compatible Western Digital controller) for $269. The 10Mb drives are even cheaper.

If you still want floppies, consider the Teac 55F, an 80-track drive. On the newer drives, you can add a switch to toggle reading both 80- and 35/40-track drives under RS BASIC. The only problem with this setup is that normal 40-track drives may not reliably read a 40-track disk prepared in this fashion. For floppies, the Sardis (604-255-4485) "No Halt" controller for $150 has been lauded on Delphi. The latest CoCo drive, FD-502, is really a 40-track DSDD drive.

For your printing problem, you need to match the printer's baud rate and number of bits with the baud rate and number of bits coming from your telecommunications program.

A One-to-One Ratio

Is there a way to switch one disk drive between two computers when both of them are powered up? I have a CoCo 1 and 2 and only one drive.

Lowell James Welchman
Mountain View, WY

Rx Because of the expense of the multiple-gang switch required, it really wouldn't be practical.

BBSs: Disk Drives Required

I have a 64K CoCo 2 with Extended BASIC and a tape player. I'm trying to put up a BBS, but I can't find any programs to let my computer talk to my modem in BASIC. How do I do this? CoTerm *won't load!*

Christian J. Miller
Macedon, NY

Rx There was an excellent BBS by Michael Jorgenson in the November '87 issue of RAINBOW, but it, like all BBS programs, requires a disk drive. The reason for this is to provide for upload/download capability. The problem with a tape-based system is that you would have to manually switch between Record and Play and rewind the tape, which defeats the purpose of an automatic, unattended BBS.

Tape-Based Communications

Are there any tape-based communications programs for the CoCo using the RS-232 Deluxe Program Pak?

Luis A. Modesto
Miami, FL

Rx *MikeyTerm* is available for $10 from Michael D. Ward, 1807 Cortez, Coral Gables, FL 33134. Specify that you want the tape version.

Pak-to-Disk Transfers for New Cartridges

I've been a faithful reader of your column since its early days in HOT CoCo. *I've been using your* RomFix *program to put my old cartridges on disk, and in your September 1984 column you published patches for packs that did not work properly in the all-RAM mode. I was just wondering if you know the patches for the newer packs, particularly* Stellar Lifeline, Downland, Demon Attack *and* Dragon Fire. *The older patches came in quite handy and I'm hoping you can bring the list up-to-date.*

Paul Riddle
Linthicum, MD

Rx The original *RomFix* program was updated by David Dawson in the December '87 RAINBOW, Page 152. Add the appropriate line below to the PAKXFER program. The patches I have

---

Richard Esposito is a senior project engineer with Northrop Corp. He holds bachelor's, master's and doctorate degrees from Polytechnic Institute of Brooklyn. He has been writing about microcomputers since 1980.

Richard Libra is a simulator test operator for Singer Link Simulation Systems Division.

Education Breakthrough

New interactive CoCo software makes learning easy, fun. Kids love it!

PRICES SLASHED!

NEW LOW PRICE – 16 lessons for the price of 8! Educational Software for kids from 6 to 18.

Parents are depending more and more on supplemental education for their children. Educators know that the most effective teaching is done one-to-one. Through individual attention and self-paced progress, students learn more and retain more.

BETTER THAN A PRIVATE TUTOR

The Compass Education Software LOOK/LISTEN/LEARN approach is the next best thing to a private tutor. Unlike other educational software the Compass Library also *talks* to the student — not in synthesized speech, but in a real human voice. With on-screen textual information and attention-getting graphics, students of all ages actually enjoy learning!

SELF-PACED FOR BETTER RETENTION

The lessons advance only after the student has correctly answered the questions throughout the programs assuring that the material has been thoroughly absorbed.

SIMPLE EQUIPMENT REQUIREMENTS

All you need is the TRS-80* Color Computer (any model), computer cassette recorder and TV set. Once the cassette is loaded you need only enter two simple commands . . . and then press any key to start the lesson.

Of course you can stop the lesson at any point to study information on the screen. Just push the pause button on the cassette player. Push it again and lesson resumes.

To answer questions throughout the lesson simply press the appropriate number on the computer keyboard, type in the correct answer, or follow other easy instructions. And to go back and review, just rewind the cassette. It's that simple.

CHOOSE FROM 9 SUBJECTS

There is not sufficient space in this advertisement to list all lesson titles, but here is a sample:

MATHEMATICS

In today's advanced, HiTech world, understanding and working with numbers is essential. Compass has developed three comprehensive series of math programs. From basic numerals for the very young, to algebra and higher mathematics for the older child. In between, there are programs for everything from addition and subtraction to practical everyday percentage problems.

*TRS-80 is a registered trademark of The Tandy Corporation.

1 MATH/FRACTIONS
Grades 4 to 8

MF 1 — Numerator, denominator, bar
MF 2 — Multiplication of fractions
MF 3 — Factors and prime numbers
MF 4 — Reducing fractions, reciprocals
MF 5 — Reducing fractions, lowest terms
MF 6 — Proper fractions, mixed numbers
MF 7 — Multiplication-division of fractions
MF 8 — Addition-subtraction of fractions
MF 9 — Addition of mixed numbers
MF 10 — Changing fractions to decimals
MF 11 — Converting decimal numbers
MF 12 — Word problems using percents
MF 13 — Additional problems using percents
MF 14 — Word problems using percents
MF 15 — Finding circle area using pi
MF 16 — Using a ruler to measure fractions

2 MATH/BASIC ALGEBRA
For all grades
Sixteen lessons: MBA-1 to 16

3 MATH/NUMBERS
For grades 1 to 6
Sixteen lessons: MN-1 to 16

SELF DEVELOPMENT

Writing effectively means communicationg effectively. Through the writing series of lesson students of all ages will develop basic skills needed to turn thoughts and ideas into expressive words and phrases.

4 RULES OF WRITING
For all grades
Sixteen lessons: RW-1 to 16

LANGUAGE ARTS

A practical education begins with good reading skills and is continued with increased vocabulary comprehension and, of course, spelling. Your child will learn that reading is fun while they are also learning when to use "to," "too," and "two," and how to spell when building a vocabulary.

5 THE MAGIC OF SPELLING
Grades 4 to 8

MS 1 — Plurals: branches, rodeos, valleys
MS 2 — Plurals: houses, brushes, candies
MS 3 — Plurals: babies, pianos, leaves
MS 4 — Suffixes: boxed, referred, writing
MS 5 — Suffixes: paid, quickly, extremely
MS 6 — Suffixes: said, confusion, school's
MS 7 — Homonyms: two, too, to; their, there
MS 8 — Homonyms: our, are, hour; ate, eight
MS 9 — Homonyms: weight, wait; who's, whose
MS 10 — Homonyms: scent, cent; sell, cell
MS 11 — Homonyms: dew, due; course, coarse
MS 12 — Homonyms: cite, site, sight; by, buy
MS 13 — Homonyms: blue, blew, creek, creak
MS 14 — Homonyms: sale, sail; steel, steal
MS 15 — Spelling by Syllables: letter, color
MS 16 — Doubling Consonant Letters: hollow

6 VOCABULARY COMPREHENSION
Grades 3 to 5
Sixteen lessons: VC-1 to 16

7 READING COMPREHENSION
For all grades
Sixteen lessons: DRC-1 to 16

8 SCIENCE
SCIENCE/PHYSICS
For all grades
Sixteen lessons: SP-1 to 16

9 HISTORY
AMERICAN HISTORY
For grades 4 to 12
Sixteen lessons: AH-1 to 16

So there it is . . . no-nonsense subject matter presented in a way that maximizes understanding and retention.

SPECIAL PRICING

YORK 10 is now offering, for a limited time, a complete set in any subject, 16 cassettes, one lesson on each cassette, for only $49.95. We originally offered only 8 cassettes for the same amount so now it's twice the value. The same 16 cassettes are sold elsewhere for over $150.

To order, send your check or money order for **$49.95** (CA residents add sales tax) for each subject you wish, plus **$3.50** shipping and handling (any quantity). For immediate shipment, call collect the number below and charge your VISA or MASTERCARD.

YORK 10®
9525 VASSAR AVENUE
CHATSWORTH, CA 91311
1-818/700-0330

for problem RomPaks are the following:

Canyon Climber

```
235 POKE &H4424,&H12: POKE
&H4425,&H12
```

Colorterm

```
235 POKE &H404A,&H12: POKE
&H404B,&H12: POKE &H404C,
&H12: POKE &H4139,&H11
```

Cyrus

```
235 FOR I=&H484E TO &H4851:
POKE I,&H12: NEXT I
```

Demon Attack

```
235 FOR I=&H4027 TO &H402F:
POKE I,&H12: NEXT I
```

Dragon Fire

```
235 FOR I=&H401A TO &H4021:
POKE I,&H12: NEXT I: POKE
&H41B0,&H70
```

Megabug

```
235 POKE &H567D,&H12: POKE
&H567E,&H12: POKE &H567F,
&H12:POKE &H56B0,&H12
```

Micropainter

```
235 POKE &H4067,&H3E: POKE
&H4068,&H80
```

Microbes

```
235 POKE &H4588,&H12: POKE
&H458C,&H12
```

Reactoids

```
235 POKE &H4C09,&H39
```

Slay the Nerius

```
235 POKE &H5124,&H12: POKE
&H5125,&H12
```

Spectaculator (original release)

```
235 POKE &H519F,&H8E: POKE
&H51A0,&H9F: POKE &H51A1,
&HFE:POKE &H51A2,&H8F: POKE
&H51A3,&H00: POKE &H51A4,
&H60:POKE&H51A9,&H39
```

Stats, Analysis Programs Under FORTRAN

I have been looking for a reasonably priced statistical package for my CoCo 3 that will do a few ANOVAs, Pearson correlations, rank difference correlations, t-tests, etc. I am aware of Lig-Pack, *but seven disks and about $150 are a bit much. What about the analyses performed by* CoCo-Stat *included with* The Rainbow Introductory Guide to Statistics*?*

Roger Page
Elida, OH

Rx Check your local library for a copy of *The Funstat Package In FORTRAN IV* by John T. Roscoe, published by Holt, Rinehart, & Winston, 1973. It contains FORTRAN program listings for the statistical techniques you desire, which, with minimal effort, can be modified to run on a CoCo in BASIC or BASIC09. *The Rainbow Introductory Guide to Statistics* describes some of the tests you mention.

Vector Vexation

When I plug in the disk controller, some of the pokes that work fine without it stop working. Why? Does Disk BASIC rearrange the memory map? I am specifically interested in the "slow speed scroll" poke, POKE 359,60.

Paul R. Rondeau
Lowell, MA

Rx The slow speed poke that you identified is an ingenious little shortcut into the Extended BASIC code. BASIC uses the lower area of RAM for a series of jump vectors (more commonly called "hooks"). These hooks allow a machine language program to alter the function of a ROM routine or even totally bypass the ROM routine. Two of these vectors are located at addresses 359 and 362 (each is three bytes long). The first of these vectors is used every time a character is to be displayed on the screen or sent to the printer. The second calls the keyboard scanning routine. Here are the hexadecimal and assembler values for these vectors:

```
7E 82 73     JMP $8273
7E 8C F1     JMP $8CF1
39           RTS
39           RTS
39           RTS
```

Notice that both of these jump addresses are in the Extended BASIC ROM address space ($8000 to $9FFF). After POKE 359,60 is executed, the disassembly looks like this:

```
3C 82        CWAI #$82
73 7E 8C     COM $7E8C
F1 39 39     CMPB $3939
39           RTS
```

As you can see, this new code is quite different from the original code. The real meat and potatoes part of this patch is the CWAI instruction. It tells the 6809 to stop executing instructions until an interrupt occurs. On the CoCo, this will be 1/60th of a second at most, as the clock signal always interrupts BASIC 60 times each second. The net result is that BASIC will wait that long between each character, resulting in an effective baud rate of 600, or 60 characters per second.

You could add additional CWAIs to slow it down even more. The first glaring problem with this quick and dirty poke is that it doesn't preserve the vector's contents and do the jump after the interrupt. The second is that it depends on the contents of addresses 360 through 367 to have been initialized by Extended BASIC 1.1, not Disk BASIC.

The BASIC program shown below will enter a similar patch for any version of Extended or Disk BASIC. It has a further enhancement — it provides for four different speeds. In response to the Enter Speed prompt, you enter a number from 1 to 4. This is the number of interrupts the patch will wait between each character, resulting in speeds of 60, 30, 15 and 7.5 characters per second, respectively.

```
10 S = &HF3
20 INPUT "ENTER SPEED (1, 2, 3,
OR 4) ";I
30 FOR K = 1 TO I
40 POKE S, &H3C
50 POKE S+1, &HFF
60 S = S + 2
70 NEXT K
80 POKE S, PEEK(359)
90 POKE S+1, PEEK(360)
100 POKE S+2, PEEK(361)
110 POKE 360, &H00
120 POKE 361, &HF3
130 FOR X = 1 TO 10
140 PRINT "SEE IT WORKS"
150 NEXT X
160 NEW
```

Warning: Do not run this program more than once without either powering down the machine or restoring the original values for addresses 360 and 361.

For a quicker response, your questions may also be submitted through RAINBOW's CoCo SIG on Delphi. From the CoCo SIG> prompt, pick Rainbow Magazine Services, then, at the RAINBOW> prompt, type ASK for "Ask the Experts" to arrive at the EXPERTS> prompt, where you can select the "Doctor ASCII" online form which has complete instructions.

Barden's Buffer

Font Fascination

By William Barden, Jr.
Rainbow Contributing Editor

I am fascinated by fonts! In case you don't know this buzzword, a *font* is a typeface or character set, always containing the uppercase letters A through Z, the lowercase letters a through z, the digits 0 through 9, and special characters such as @ and #.

There are literally thousands of fonts in existence. Your typewriter probably uses a *Courier* font. Typewriters space in uniform increments, typically $^1/_{10}$-inch horizontally, rather than making the width of each character dependent on the size of the character, as does typesetting equipment.

Courier fonts tend to use characters that are padded out to fill up the $^1/_{10}$-inch space for narrow letters. Other fonts are *proportional fonts* — they allocate varying widths for each character based on the actual size of the letter. Take a look at the pages of RAINBOW and you'll see what I mean. The *Times Roman* type found here looks much better than type produced by a typical dot matrix printer. Times Roman type is often used for books and magazines, to increase readability. Bodoni, Century Schoolbook, Avant-Garde and thousands of other fonts are available to create type that is bold, sad, timid or heroic.

I don't know where I'd put CoCo type. It's not timid, but not heroic, either. It's just one of those typefaces that are used for equally spaced video characters. Want to play some games with the built-in font on your CoCo 3? It's easy to create your own characters and even steal other compatible fonts. The only catch is that you must have a CoCo 3 for these programs. The CoCo 3 has a high resolution graphics mode that allows text to be interspersed with graphics, and has a built-in character set for this purpose. The following programs will work on any CoCo 3. They use Extended BASIC rather than OS-9 BASIC09.

Bill Barden has written 27 books and over 100 magazine articles on various computer topics. His 20 years' experience in the industry covers a wide background: programming, systems analysis and managing projects for computers ranging from mainframes to micros.

CoCo 3 Hi-Res Text

Let's start first with the CoCo 3 high resolution mode. The CoCo 3 has capacity for these modes:

```
HSCREEN 1 (320-by-192, four colors)
HSCREEN 2 (320-by-192, 16 colors)
HSCREEN 3 (640-by-192, two colors)
HSCREEN 4 (640-by-192, four colors)
```

The numbers 320 and 640 refer to the number of dots across the screen in each row. The 192 refers to the number of rows up and down the screen. In 640-by-192 mode, there are a total of 122,880 dots on the screen, each of which can be programmed by high resolution graphics commands.

In high resolution graphics mode, you *must* use the 'H' commands. These are the high resolution modes that supplement the primary BASIC graphics commands. The format is very similar to the old graphics commands, however. Here's a recap of the commands available:

HCIRCLE	draws a circle like the Lo-Res CIRCLE
HCLS	clears the screen like the Lo-Res CLS
HCOLOR	sets graphics colors like Lo-Res COLOR
HDRAW	draws line segments like Lo-Res DRAW
HLINE	draws lines like Lo-Res LINE
HPAINT	fills an area with PAINT like Lo-Res PAINT
HRESET	resets a point like Lo-Res PRESET
HSET	sets a point like Lo-Res PSET
HPOINT	examines a point like Lo-Res POINT

CoCos 1 and 2 do not allow text to be displayed with graphics. If you set graphics mode, you have to construct your own character set and then display the characters at the proper point on the screen by pokes or DRAW statements, or some other method. This makes for a lot of tedious programming.

The CoCo 3, though, allows you to use a special command called HPRINT, which lets you print text anywhere on a high

resolution graphics screen. The format of HPRINT is the following:

```
HPRINT (cp, row), "text"; . . , . . .
```

The cp value is a text character position of 0 through 39 or 0 through 79, depending on the screen mode. The row value is a text row value of 0 through 23. The data following the cp and row is a text string, variable name or other information, just as in a Lo-Res PRINT statement. To print, "This is the middle of the screen," superimposed over a circle for Hi-Res 640-by-194 four-color mode, for example, you'd have:

```
100 HSCREEN 4
110 HCIRCLE (320, 96),20
120 HPRINT (24, 12), "This is the middle of the
screen"
130 GOTO 130
```

Actually, the text will be a little offset toward the bottom of the screen, because there are an even number of text rows on the screen. However, lowercase characters will be displayed in addition to uppercase characters and the text will be superimposed over the circle.

You can intermix text and graphics in this manner for any screens you want to draw. The text becomes an integral part of the graphics data and will be erased or overwritten by graphics and new text.

The HSCREEN command *is* a little picky, however. It will print a string such as "This is a string" + CHR$(32) + "and so is this" without problems. You can also use commands such as HPRINT (10,10), A$. However, items separated by commas or semicolons will give syntax errors. HPRINT (10,12), "This is "; "a string" is not handled by HPRINT, for example. Use a plus sign (+) to concatenate strings or CHR$ values.

Another thing to keep in mind with HPRINT is that characters HPRINTed in 640-by-192 resolution mode are one-half the width of the characters HPRINTed in 320-by-192 resolution mode. In 320-by-192 mode, 40 characters are allowed across the screen, while in 640-by-192 mode, 80 characters are allowed.

Where's That Character Set?

I knew the character set was in RAM somewhere. I was saved from having to search for it by Spectrum Projects' *CoCo 3 Secrets Revealed*, a handy 36-page document about CoCo 3 memory mapping and modes. It listed the character set at locations &HF09D through &HF39C, and that's where it was. The HPRINT character set looks like Figure 1. There are 96 characters, each represented by eight bytes, for a total of 96 * 8 = 768 bytes.

To see how the characters are generated, try the following program. It first prints all available HPRINT characters at the top of the screen. Next, it enlarges a character by printing an uppercase 'O' for each bit of the character. Since a character takes up 8-by-8 bits on a 640-by-192 screen, the character is enlarged 64 times. The proportions are off — the character appears elongated, but you can see the individual dots making up the character.

To use this short program, enter a character value from 32 through 127 and the character data from the character table will be displayed at screen center. The value corresponds to the ASCII code for the character. You won't be able to see the values you input, however. INPUT values are displayed only on a text screen. Just enter a two-digit value and watch the screen change for the corresponding character. To view a new character, enter another value.

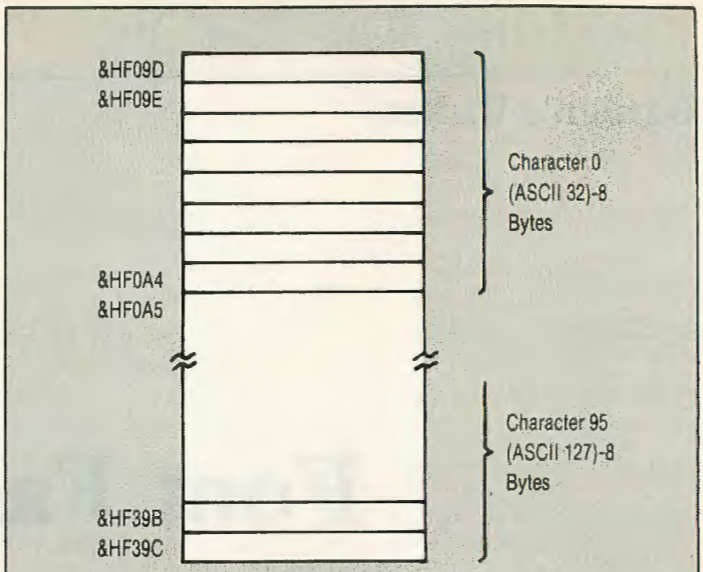


Figure 1: HPRINT Character Table

```
10Ø HSCREEN 4
11Ø HCLS
12Ø FOR I=32 TO 127
13Ø IF I<8Ø THEN HPRINT (I-16,Ø)
,CHR$(I) ELSE HPRINT (I-64,1),CH
R$(I)
14Ø NEXT I
15Ø INPUT CH
16Ø HLINE ( 28Ø, 6Ø ) - ( 36Ø, 1
4Ø ), PRESET, BF
17Ø CH = (CH - 32)*8 + &HØ9D
18Ø FOR I= Ø TO 7
19Ø CV = PEEK ( CH + I )
2ØØ FOR J=7 TO Ø STEP -1
21Ø IF (CV AND (INT(2^J))) <> Ø
THEN HPRINT ( 44 - J, 8 + I ), "
O"
22Ø NEXT J
23Ø NEXT I
24Ø GOTO 15Ø
```

How the Program Works

The program has two parts. The first part is a loop from I=32 to I=127. The values of I are the ASCII codes for the characters from a space to an escape. Two lines of characters are printed. If I is less then 80, the character is printed at I-16 and Line 0, which spreads the characters over character position 32–16=16 to 79–16=63. If I is greater than 79, the character is printed at I-64 and Row 1, which spreads the character over character position 80–64=16 to 127–64=63.

The second part of the program uses HLINE to draw a filled-in box, clearing any previous character in the center of the screen. (Remember that graphics will overwrite the HPRINT characters.) But, prior to that, a character value is input — a value of 32 to 127, which represents the ASCII code of the character. A value of 32 is then subtracted from this code to

find the position in the character table at &HF09D, starting from 0. The result is multiplied by eight because each character in the table is made up of eight bytes. The 34th character (ASCII code 65, an A) would start at &HF09D + 34*8.

Because each character is made up of eight bytes, control variable I sets up a loop of eight iterations. Each time through the loop, a new byte from the character table is read into CV. This byte is made up of eight bits, each bit defining a single dot for the character. The byte is scanned from left to right by means of a second control variable, J. Using J as an exponent for a power of 2 results in "mask values" of 128, 64, 32, 16, 8, 4, 2 and 1.

These values are ANDed with the byte value read from the table. If the AND is not 0, the bit representing a pixel is set in the value, and an 'O' is written to the screen center. The HPRINT statement prints the 'O' in one of the 64 positions (row, column) depending on the current I and J. This process is repeated 64 times to construct the entire character in enlarged format.

Defining Your Own Characters

Since the character table for HPRINT is in RAM (random access, or read-write memory) and not ROM (read-only memory), the character data can be changed. Memory locations in RAM can be changed by a poke function. Of course, you have to be careful to poke the right places, otherwise chaos can result. As long as we stick to changing the characters in the HPRINT character table, though, everything should be fine.

Try this code to see what I mean:

```
100 HSCREEN 4
110 HCLS
120 FOR I = &HF09D + 33*8 TO &HF09D + (33*8) + 7
130 POKE I,244
140 NEXT I
150 HPRINT (0,0),"AAAAAAAAAAAAAAAA"
160 GOTO 160
```

If you entered this code correctly, you will see a stripe pattern in the upper-left corner of the screen. This pattern replaces the 'A' character definition in the HPRINT character table. The decimal value 244 is 11001100 in binary. The bits in a byte represent horizontal pixels in 640-by-192 mode. Looking at the binary value, you can see how the ones and zeros alternate, producing a stripe.

Instead of a simple stripe pattern, though, we'd like to enter a series of dots that define a character. There are several ways to do this. First, you can simply load "over" the table with data defining a new character set. Where to get the character set? Any character set that uses an 8-by-8 pixel character can be used. Although it's probably heresy to suggest it in these pages, one of these is the Tandy 1000 character set.

The Tandy 1000 Character Set

The 1000's character set uses an 8-by-8 pixel character with a format different from that of the CoCo 3 HPRINT characters. There are 256 different characters defined for the Tandy 1000 set — 128 "standard" ASCII characters in codes 0 through 127, and 128 "extended" characters in codes 128 through 255.

The standard characters include upper- and lowercase alphabetic characters, digits and special characters. They also include the displayable control characters found on PC compatibles, codes in the 0 to 31 range that display happy faces, card suits, musical notes and others.

The RAINBOW
THE COLOR COMPUTER MONTHLY MAGAZINE

Back Issue Availability

For greater convenience, order RAINBOW Back Issues through the Rainbow Magazine Services area of our Delphi CoCo SIG.

BACK ISSUES STILL AVAILABLE

Have you explored the wealth of information in our past issues? From our very first, four-page issue to many with more than 300 pages of material, it's all just for CoCo users — a great way to expand your library!

A WORLD OF INFO AT A BARGAIN PRICE

All back issues sell for the single issue cover price. In addition, there is a $3.50 charge for the first issue, plus 50 cents for each additional issue for postage and handling if sent by United Parcel Service. There is a $5 charge for the first issue, plus a $1 charge for each additional issue on orders sent by U.S. Mail. UPS *will not* deliver to a post office box or to another country.

MOST ISSUES STILL AVAILABLE

Issues July 1981 through June 1982 are available on white paper in a reprint form. All others are in regular magazine form. VISA, MasterCard and American Express accepted. Kentucky residents please add 5 percent state sales tax. In order to hold down costs, we do not bill, and no C.O.D. orders are accepted.

Due to heavy demand, we suggest you order the back issues you want now while supplies last.

To check availability and order, review and fill out the form on the next page and mail it with your payment to:

THE RAINBOW
The Falsoft Building
P.O. Box 385
Prospect, KY 40059

BACK ISSUE ORDER FORM

(See overleaf for instructions.)

Please send me the following back issues:

MONTH/YEAR		PRICE		MONTH/YEAR		PRICE	
	VOLUME 1				**VOLUME 5**		
JUL '81	Premier Issue	$2.00	☐	AUG '85	Games	$3.95	☐
AUG '81		$2.00	☐	SEP '85	Education	$3.95	☐
SEP '81	Education	$2.00	☐	OCT '85	Graphics	$3.95	☐
OCT '81	Printer	$2.00	☐	NOV '85	Data Comm.	$3.95	☐
NOV '81		$2.00	☐	JAN '86	Beginners	$3.95	☐
DEC '81	Holiday	$2.00	☐	FEB '86	Utilities	$3.95	☐
JAN '82		$2.00	☐	MAR '86	Business	$3.95	☐
FEB '82		$2.00	☐	APR '86	Home Help	$3.95	☐
MAR '82		$2.50	☐	MAY '86	Printer	$3.95	☐
APR '82		$2.50	☐	JUN '86	Music	$3.95	☐
JUN '82		$2.50	☐	JUL '86	Anniversary	$3.95	☐
	VOLUME 2				**VOLUME 6**		
JUN '83	Printers	$2.95	☐	AUG '86	Games	$3.95	☐
JUL '83	Anniversary	$2.95	☐	SEP '86	Education	$3.95	☐
	VOLUME 3			OCT '86	Graphics	$3.95	☐
AUG '83	Games	$2.95	☐	NOV '86	Data Comm.	$3.95	☐
SEP '83	Education	$2.95	☐	DEC '86	Holiday	$3.95	☐
OCT '83	Graphics	$3.95	☐	JAN '87	Beginners	$3.95	☐
DEC '83	Holiday	$3.95	☐	FEB '87	Utilities	$3.95	☐
MAR '84	Business	$3.95	☐	MAR '87	Business	$3.95	☐
APR '84	Gaming	$3.95	☐	APR '87	Home Help	$3.95	☐
MAY '84	Printer	$3.95	☐	MAY '87	Printer	$3.95	☐
JUN '84	Music	$3.95	☐	JUN '87	Music	$3.95	☐
JUL '84	Anniversary	$3.95	☐	JUL '87	Anniversary	$3.95	☐
	VOLUME 4				**VOLUME 7**		
AUG '84	Games	$3.95	☐	AUG '87	Games	$3.95	☐
SEP '84	Education	$3.95	☐	SEP '87	Education	$3.95	☐
OCT '84	Graphics	$3.95	☐	OCT '87	Graphics	$3.95	☐
NOV '84	Data Comm.	$3.95	☐	NOV '87	Data Comm.	$3.95	☐
DEC '84	Holiday	$3.95	☐	DEC '87	Holiday	$3.95	☐
JAN '85	Beginners	$3.95	☐	JAN '88	Beginners	$3.95	☐
FEB '85	Utilities	$3.95	☐	FEB '88	Utilities	$3.95	☐
MAR '85	Business	$3.95	☐	MAR '88	Business	$3.95	☐
APR '85	Simulations	$3.95	☐				
MAY '85	Printer	$3.95	☐				
JUN '85	Music	$3.95	☐				
JUL '85	Anniversary	$3.95	☐				

RAINBOW INDEX A complete index to the first three years, July 1981 through June 1984, is printed in the July 1984 issue. Separate copies are available for $2.50 ☐

The Fourth and Fifth Year Indexes including RAINBOW ON TAPE are in the July 1985 and July 1986 issues, respectively. The Sixth Year Index is in the July 1987 issue.

TOTAL _____

KY RESIDENTS ADD 5% _____

U.S. MAIL CHARGE _____
SHIPPING & HANDLING
U.P.S. CHARGE _____
TOTAL AMOUNT ENCLOSED _____

Article Reprints

In instances where a given issue is now out of print and not available for purchase, we do provide photocopies of specific articles. The cost for this service is $1.50 plus 50 cents S/H per article. This service is provided *only* in the case of out-of-stock issues.

Name _____

Address _____

City _____ State _____ ZIP _____

☐ Payment Enclosed, or

Charge to my: ☐ VISA ☐ MC ☐ AE

CARD # _____

EXPIRATION DATE _____ PHONE ( ) _____

SIGNATURE _____

TO ORDER BY PHONE (credit card orders only) call (800) 847-0309, 8 a.m. to 5 p.m. EST. All other inquiries call (502) 228-4492.

The extended character set includes foreign characters such as an umlaut, texture characters (like newspaper halftones), block graphics, mathematical symbols and line segments. The line segments are especially nice, as they allow you to construct forms or simple diagrams without using graphics commands.

Listing 1, lines 10000 through 10255, shows a complete listing of the Tandy 1000 character set from codes 0 to 255. These codes were acquired by peeking into the Tandy 1000 character tables. There are two such tables, one for codes 0 through 127 and one for codes 128 through 255.

Each peek resulted in one byte of the eight bytes required for the character. An entire character is represented by eight bytes. The eight bytes for each character were converted to eight DATA values. For each of the 256 codes, a DATA line was generated consisting of a line number from 10000 through 10255, the word "DATA" and the eight code values with interspersed commas. These ASCII (text) lines were output to a sequential file on the Tandy 1000 MS-DOS disk. This file was copied onto a CoCo 3 disk using *CoCo Util II* (Mark Data Products). On the CoCo 3 side, the file was read in as a straight BASIC program. The character code, by the way, is contained in the line number. Line number 10044 holds the character definition for ASCII character 44, for example.

How do you make use of the Tandy 1000 characters? Only 96 characters can be displayed at one time in the HPRINT mode of the CoCo 3. However, once the characters have been read into the CoCo, it's a simple matter to switch back and forth among the 256 characters by reloading the character table. The remainder of the program in Listing 1 does this.

A Character Load/Switch Program

The middle part of the program, from Line 8000 on, is the Character Load/Switch code. It switches back and forth between selected character sets, either the original CoCo set or three segments of the Tandy 1000 set.

To save memory, the 352 characters of the original set and Tandy 1000 set (256 plus 96) are saved in a string array called

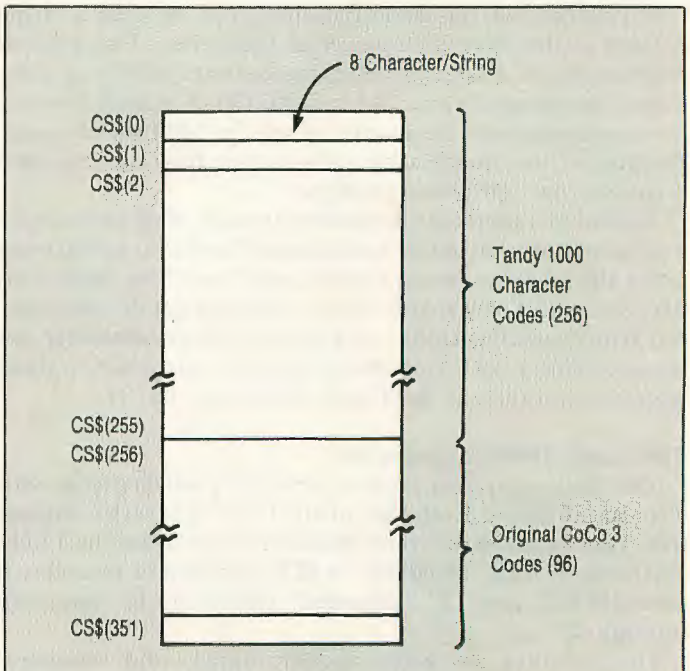


Figure 2: CS$ Character Array

CS$. It may seem a little strange to save character codes in a string array, but numeric variables take up six bytes each. With numeric variables, 6*8*352 = 16,896 bytes would be used to store the complete character set. With a string array, though, each byte can be put into a single character by using a CHR$ function. The result is about 8*352 = 2,816 bytes of storage. (I say "about" here because additional bytes are required to define the array and strings.)

CS$ is made up of 352 entries, with each entry holding the codes for one character, as shown in Figure 2. The first 256 entries hold the Tandy 1000 character set. The last 96 entries hold the character codes for the original CoCo characters. Once the character table is overwritten, the original codes are destroyed, and it's necessary to save the codes if you want to use them instead of the Tandy 1000 codes.

The code at 8000 first peeks at the 96 characters of the original set. An eight-byte string is built for each character, in A$. This string is stored in CS$(256) through CS$(351), depending on the code.

The code then reads the Tandy 1000 DATA values, eight at a time. For each eight, another string A$ is constructed, which is stored in CS$(0) through CS$(255), depending on the ASCII code. Once this task is done, arrays CS$(0) through CS$(351) contain 352 strings, each string of length eight and representing one character in CHR$() format.

The code starting at 9000 is used to switch between character sets. There are four subroutine calls, which bring in one of four character sets:

GOSUB 9100 — loads character codes 32 through 127 of the Tandy 1000 character set. These codes start with a space (32) and contain the upper- and lowercase alphabet, digits and special characters. They are displayed by simply using the text to be written in an HPRINT statement. Doing an HPRINT (10,16), "This is text 0123", for example, displays that text in Line 16, character position 16, but in Tandy 1000 format.

GOSUB 9200 — loads character codes 128 through 223 of the Tandy 1000 character set. These codes start with foreign characters such as umlaut and the yen sign. Fractions and "texture" characters follow. Line segments are next, followed by five block graphics characters. Doing an HPRINT (10,16), "ABCDEFG" displays Tandy 1000 character codes for 129 through 135 in place of the ABCDEFG.

GOSUB 9300 — loads character codes 0 through 31 and 224 through 255 of the Tandy 1000 into the first 64 characters of the character table. The codes from 0 through 31 are *control codes* that display as happy faces, card suits, musical notes, etc. The codes from 224 through 255 are the Greek alphabet, mathematical symbols, and others. Doing an HPRINT (10,16), "ABCDEFG" displays Tandy 1000 codes 1 through 7 — happy faces and others. Doing an HPRINT (10,16), "abcdefg" displays Tandy 1000 codes 225 through 231, seven Greek letters.

GOSUB 9400 — loads the original character codes back into the HSCREEN character table. The characters now display with HPRINT as before.

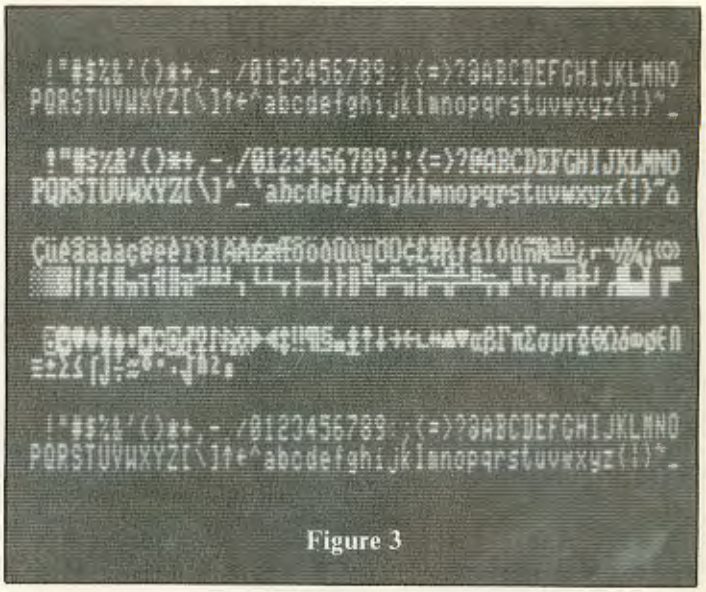


Figure 3

Character Set Display

Figure 3 shows an actual display of the character sets. The character set in the top two lines and the bottom two lines are the original CoCo characters. The bottom two lines were restored by a GOSUB 9400. Lines 3 and 4 are the 96 Tandy 1000 characters from space (32) to escape (127). Notice how bold they are in comparison to the CoCo character set. Most of the characters use a double-line thickness for vertical lines. These characters were written after a GOSUB 9100. Lines 5 and 6 are the 96 Tandy 1000 characters from a Serbo-Croatian 'C' (128) to the last block graphics character (223). Line segment characters are included here. Lines 7 and 8 are the 64 Tandy 1000 characters from a null (0) and cursor down (31) and from a Greek alpha (224) through blank FF (255).

The "driver" for this display is shown in the first part of the code of the listing, CHAR1000. This code gives you an example of how the Load/Switch program is called. The first part of the code constructs two 48-character strings, A$ and B$. A$ contains character codes from 32 to 79, while B$ contains character codes from 80 to 127. A$ and B$ are used in the HPRINT statements following to print the character set in force. There are four GOSUBs to select character sets 1, 2, 3 and a return to the original.

Designing Your Own Characters

The same method used in dumping the Tandy 1000 character set and in loading selected portions of it can be used in your own character definitions. Just substitute your own characters for any of the 256 characters in the Tandy character set defined by lines 10000 through 10255 in the code above.

A Bullet Example

Suppose you wanted to define a "bullet," which is a small filled-in circle used to highlight text. To design a bullet, you'd start with an 8-by-8 matrix, as shown in Figure 4. Each box in the matrix is 2 units wide by 1 unit high to compensate for the screen proportions of 640-by-192. (192 vertical pixels are held in 6 inches while 640 horizontal pixels are held in 10 inches. If the screen were square, 320 vertical pixels could be held in 10 inches. The ratio is therefore 2:1.) However, if you'll be using 320-by-192 mode, use a matrix with square boxes. We'll use the square (320-by-192) matrix here.

Draw the figure in the matrix. Some rough edges are necessary. Now convert to eight code values. The column "weights" of the matrix from left to right are 128, 64, 32, 16, 8, 4, 2 and 1. For each filled-in box, add the weight to the total weight. The first row is 16+8=24. The next row is 32+16+8+4=60. You'll have eight code values after you're done. These go into the DATA statement for the appropriate ASCII code. To replace an escape code with a bullet, for example, your DATA statement would look like this:

```
10127 DATA 24,60,126,255,255,126,60,24
```

Thereafter, any time an escape code (127) is used, you'd display a bullet. For example:

```
1000 HPRINT (10,16), CHR$(127)+" Preceding
Bullet"
```

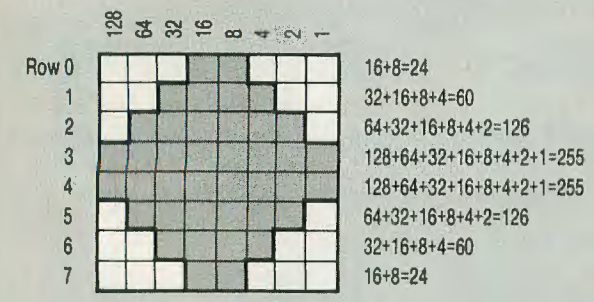


Figure 4: Designing a "Bullet"

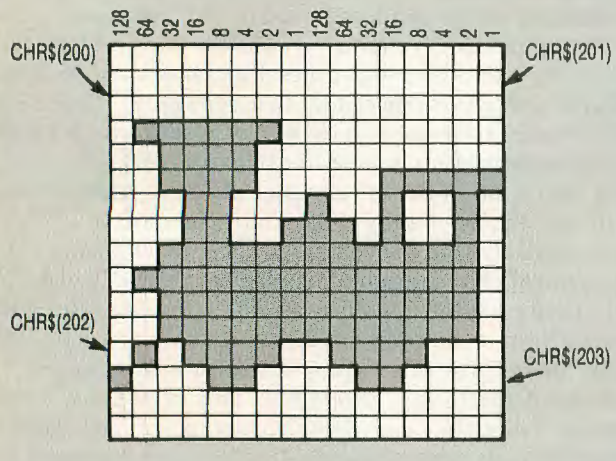


Figure 5: A Multiple-Character Symbol

Multiple Character Symbols

Another trick you might want to try is to define multi-part symbols. By dividing a symbol into quadrants, you can split up a symbol into four characters or more. The complete symbol can then be displayed by HPRINTing four or more characters. Suppose you had the symbol shown in Figure 5, split into four segments. The four sets of DATA values would be:

```
10200 DATA 0,0,0,126,60,60,24,24
10201 DATA 0,0,0,0,0,31,146,210
10202 DATA 63,127,63,63,94,140,0,0
10203 DATA 126,126,126,126,120,48,0,0
```

The symbol would be displayed by:

```
2000 HPRINT (10,11),CHR$(200)+CHR$(201)
2010 HPRINT (10,12),CHR$(202)+CHR$(203)
```

There are a lot more tricks and techniques that can be applied to the HPRINT character table — things like enlarging characters from table definitions and providing a font generator for easy character construction. We'll look at some of them in a future column. In the meantime, I hope you'll try the Tandy 1000 character set on your CoCo. It will save you a lot of work defining some interesting characters that you can use with your graphics. If you have your own fonts defined, pass them along and I'll include them in a future column. □

```
330 .....74    10123 ....177
8140 .....243  10141 .....86
10003 ....238  10155 ....173
10018 ....203  10173 ....236
10038 ....158  10187 .....89
10054 ....189  10216 .....20
10074 .....88  10232 .....96
10088 ....129  END .....135
10108 .....15
```

The listing: CHAR1000

```
100 ' Sample Driver for Characte
r Load/Switch Program
110 '-------------------------
-------------------------------
--------------
120 '
130 CLEAR 5000
140 GOSUB 8010
150 HSCREEN 4
160 HCOLOR 0,3
170 HCLS
180 A$ = "": B$ = ""
190 FOR I = 32 TO 79
200 A$ = A$ + CHR$( I )
210 NEXT I
220 FOR I = 80 TO 127
230 B$ = B$ + CHR$( I )
240 NEXT I
250 HPRINT ( 16, 5 ), A$
260 HPRINT ( 16, 6 ), B$
270 GOSUB 9000
          'CS 1
280 HPRINT ( 16, 8 ), A$
290 HPRINT ( 16, 9 ), B$
```

```
3ØØ GOSUB 92ØØ
          'CS 2
31Ø HPRINT ( 16, 11 ), A$
32Ø HPRINT ( 16, 12 ), B$
33Ø GOSUB 93ØØ
          'CS 3
34Ø HPRINT ( 16, 14 ), A$
35Ø HPRINT ( 16, 15 ), LEFT$( B$
, 16 )
36Ø GOSUB 94ØØ
          'original
37Ø HPRINT ( 16, 17 ), A$
38Ø HPRINT ( 16, 18 ), B$
39Ø GOTO 39Ø
4ØØ '
8ØØØ '-------------------------
-------------------------------
---------------
8Ø1Ø ' Character Load/Switch Pro
gram - Incorporate in your own c
ode
8Ø2Ø '
8Ø3Ø DIM CS$( 351 )
8Ø4Ø FOR I = Ø TO 95
8Ø5Ø A$ = ""
8Ø6Ø FOR J = Ø TO 7
8Ø7Ø A$ = A$ + CHR$( PEEK( &HFØ9
D + I*8 + J ))
8Ø8Ø NEXT J
8Ø9Ø CS$( 256 + I) = A$
81ØØ PRINT ".";
811Ø NEXT I
812Ø FOR I = Ø TO 255
813Ø A$ = ""
814Ø FOR J = Ø TO 7
815Ø READ A: A$ = A$ + CHR$( A )
816Ø NEXT J
817Ø CS$( I ) = A$
818Ø PRINT ".";
819Ø NEXT I
82ØØ RETURN
821Ø '
9ØØØ ' LOAD CSX
91ØØ ST = 32: EN = 127: OF = Ø
911Ø FOR ZI=ST TO EN: ZA$=CS$(ZI
):FOR ZJ=Ø TO 7: POKE &HFØ9D + (
OF+ZJ),ASC(MID$(ZA$,ZJ+1,1)): NE
XT ZJ: OF=OF + 8:  NEXT ZI
912Ø RETURN
92ØØ ST = 128: EN = 223: OF = Ø:
 GOTO 911Ø
93ØØ ST = Ø: EN = 31: OF = Ø: GO
SUB 911Ø: ST = 224: EN = 255: OF
 = 32*8:  GOTO 911Ø
94ØØ ST = 256: EN = 351: OF = Ø:
  GOTO 911Ø
9996 '
9997 '-------------------------
```


Burke & Burke

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

1988 -- The Year of the Hard Disk!

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

RAINBOW CERTIFICATION SEAL

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

CoCo XT (with anodized housing, 50 page user manual, hard disk back-up utility and new, Version 2.0 drivers for use with both OS9 & HYPER-I/O) -- $69.95.
CoCo XT-RTC (includes real-time clock / calendar with battery backup) -- $99.95

THE PROFESSIONAL TOUCH: XT-ROM -- Automatically boots OS9 from your hard disk. Installs in the BIOS ROM socket of your hard disk controller -- $19.95.

64K COCO OR COCO 3 & MULTI-PAK REQUIRED FOR ALL VERSIONS. HYPER-I/O REQUIRED FOR USE WITH RS-DOS.

Make Tracks . . .

Got the 35-track floppy disk blues? Burke & Burke's **Version 2.0** HYPER-I/O program modifies the RS-DOS Disk BASIC in your CoCo 1, 2, or 3 to provide a "Dynamic Disk Interface" that works with the CoCo XT hard disk and any mix of single-sided and double-sided floppy disk drives -- even those 720K floppies!

HYPER-I/O (64K, includes 50 page user manual and utilities) -- $29.95.
HYPER-III (RAM Disk and Print Spooler for CoCo 3 HYPER-I/O) --$19.95

Directory Assistants

Here are two real time savers for OS9 users. WILD lets you use wild cards with OS9's commands. MV rapidly moves files, and even entire directories, from place to place on your hard or floppy disks. **WILD & MV** -- one disk, two great utilities, only $19.95!

```
OS9: wild asm /d0/src/*.src o=/d1/abs/release/*.abs
OS9: mv /d1/abs/release /d1/release
```

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

MasterCard VISA

TANDY COMPUTER DISCOUNTS

COLOR COMPUTERS

26-3127 64k color comp	89.95
26-3334 CoCo 3	170.00
26-3215 CM-8 color monitor	259.95

PRINTERS

26-2802 DMP 106	179.95
26-1277 DMP-430	580.00
26-1280 DMP-130	279.00

Complete line of Tandy (Daisy Wheel) print wheels

MODEL 4 and MSDOS COMPUTERS

25-1050 Tandy 1000 EX	530.00
25-1052 Tandy 1000 SX	750.00
25-1053 TANDY 1000 HX	599.00
25-1600 TANDY 1000 TX	999.95
25-1023 CM-5 color monitor	249.95
25-1020 VM-4 Monochrome monitor	110.00

We Carry the Complete Line of Tandy Computer Products at Discount Prices

CALL FOR A FREE PRICE LIST 800-257-5556
IN N.J. CALL 609-769-0551

WOODSTOWN ELECTRONICS

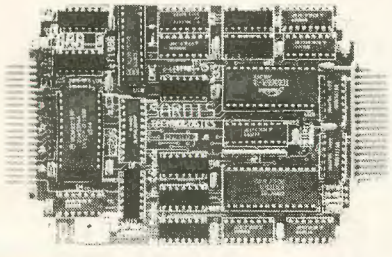
Rt. 40 E. WOODSTOWN, N.J. 08098

```
--------------------------------
---------------
9998 ' Table of T1ØØØ Characters
9999 '
1ØØØØ DATA Ø,Ø,Ø,Ø,Ø,Ø,Ø,Ø
1ØØØ1 DATA 126,129,165,129,189,1
53,129,126
1ØØØ2 DATA 126,255,219,255,195,2
31,255,126
1ØØØ3 DATA 54,127,127,127,62,28,
8,Ø
1ØØØ4 DATA 8,28,62,127,62,28,8,Ø
1ØØØ5 DATA 28,62,28,127,127,62,2
8,62
1ØØØ6 DATA 8,8,28,62,127,62,28,6
2
1ØØØ7 DATA Ø,Ø,24,6Ø,6Ø,24,Ø,Ø
1ØØØ8 DATA 255,255,231,195,195,2
31,255,255
1ØØØ9 DATA Ø,6Ø,1Ø2,66,66,1Ø2,6Ø
,Ø
1ØØ1Ø DATA 255,195,153,189,189,1
53,195,255
1ØØ11 DATA 15,7,15,125,2Ø4,2Ø4,2
Ø4,12Ø
1ØØ12 DATA 6Ø,1Ø2,1Ø2,1Ø2,6Ø,24,
126,24
1ØØ13 DATA 48,6Ø,51,49,49,112,11
2,Ø
1ØØ14 DATA 96,12Ø,1Ø2,115,111,22
7,231,7
1ØØ15 DATA 153,9Ø,6Ø,231,231,6Ø,
9Ø,153
1ØØ16 DATA 64,112,124,127,124,11
2,64,Ø
1ØØ17 DATA 1,7,31,127,31,7,1,Ø
1ØØ18 DATA 24,6Ø,126,24,24,126,6
Ø,24
1ØØ19 DATA 1Ø2,1Ø2,1Ø2,1Ø2,1Ø2,Ø
,1Ø2,Ø
1ØØ2Ø DATA 127,219,219,123,27,27
,27,Ø
1ØØ21 DATA 63,96,62,99,62,3,126,
Ø
1ØØ22 DATA Ø,Ø,Ø,Ø,126,126,126,Ø
1ØØ23 DATA 24,6Ø,126,24,126,6Ø,2
4,255
1ØØ24 DATA 24,6Ø,126,24,24,24,24
,Ø
1ØØ25 DATA 24,24,24,24,126,6Ø,24
,Ø
1ØØ26 DATA Ø,12,6,127,6,12,Ø,Ø
1ØØ27 DATA Ø,24,48,127,48,24,Ø,Ø
1ØØ28 DATA Ø,Ø,96,96,96,127,Ø,Ø
1ØØ29 DATA Ø,36,1Ø2,255,1Ø2,36,Ø
,Ø
1ØØ3Ø DATA Ø,24,6Ø,126,255,255,Ø
,Ø
1ØØ31 DATA Ø,255,255,126,6Ø,24,Ø
,Ø
1ØØ32 DATA Ø,Ø,Ø,Ø,Ø,Ø,Ø,Ø
1ØØ33 DATA 24,6Ø,6Ø,24,24,Ø,24,Ø
1ØØ34 DATA 54,54,54,Ø,Ø,Ø,Ø,Ø
1ØØ35 DATA 54,54,127,54,127,54,5
4,Ø
1ØØ36 DATA 24,62,96,6Ø,6,124,24,
Ø
1ØØ37 DATA Ø,99,1Ø2,12,24,51,99,
Ø
1ØØ38 DATA 28,54,28,59,11Ø,1Ø2,5
9,Ø
1ØØ39 DATA 24,24,48,Ø,Ø,Ø,Ø,Ø
1ØØ4Ø DATA 12,24,48,48,48,24,12,
Ø
1ØØ41 DATA 48,24,12,12,12,24,48,
Ø
1ØØ42 DATA Ø,1Ø2,6Ø,255,6Ø,1Ø2,Ø
,Ø
1ØØ43 DATA Ø,24,24,126,24,24,Ø,Ø
1ØØ44 DATA Ø,Ø,Ø,Ø,Ø,24,24,48
1ØØ45 DATA Ø,Ø,Ø,126,Ø,Ø,Ø,Ø
1ØØ46 DATA Ø,Ø,Ø,Ø,Ø,24,24,Ø
1ØØ47 DATA 3,6,12,24,48,96,192,Ø
1ØØ48 DATA 62,99,1Ø3,111,123,115
,62,Ø
1ØØ49 DATA 24,56,24,24,24,24,126
,Ø
1ØØ5Ø DATA 6Ø,1Ø2,6,28,48,1Ø2,12
6,Ø
1ØØ51 DATA 6Ø,1Ø2,6,28,6,1Ø2,6Ø,
Ø
1ØØ52 DATA 14,3Ø,54,1Ø2,127,6,15
,Ø
1ØØ53 DATA 126,96,124,6,6,1Ø2,6Ø
,Ø
1ØØ54 DATA 28,48,96,124,1Ø2,1Ø2,
6Ø,Ø
1ØØ55 DATA 126,1Ø2,6,12,24,24,24
,Ø
1ØØ56 DATA 6Ø,1Ø2,1Ø2,6Ø,1Ø2,1Ø2
,6Ø,Ø
1ØØ57 DATA 6Ø,1Ø2,1Ø2,62,6,12,56
,Ø
1ØØ58 DATA Ø,24,24,Ø,Ø,24,24,Ø
1ØØ59 DATA Ø,24,24,Ø,Ø,24,24,48
1ØØ6Ø DATA 6,12,24,48,24,12,6,Ø
1ØØ61 DATA Ø,Ø,126,Ø,126,Ø,Ø,Ø
1ØØ62 DATA 48,24,12,6,12,24,48,Ø
1ØØ63 DATA 6Ø,1Ø2,6,12,24,Ø,24,Ø
1ØØ64 DATA 62,99,111,111,111,96,
6Ø,Ø
1ØØ65 DATA 28,54,99,99,127,99,99
,Ø
1ØØ66 DATA 126,51,51,62,51,51,12
6,Ø
1ØØ67 DATA 3Ø,51,96,96,96,51,3Ø,
Ø
1ØØ68 DATA 124,54,51,51,51,54,12
4,Ø
1ØØ69 DATA 127,49,52,6Ø,52,49,12
7,Ø
1ØØ7Ø DATA 127,49,52,6Ø,52,48,12
```

```
Ø,Ø
1ØØ71 DATA 3Ø,51,96,96,1Ø3,51,31
,Ø
1ØØ72 DATA 1Ø2,1Ø2,1Ø2,126,1Ø2,1
Ø2,1Ø2,Ø
1ØØ73 DATA 6Ø,24,24,24,24,24,6Ø,
Ø
1ØØ74 DATA 15,6,6,6,1Ø2,1Ø2,6Ø,Ø
1ØØ75 DATA 115,51,54,6Ø,54,51,11
5,Ø
1ØØ76 DATA 12Ø,48,48,48,49,51,12
7,Ø
1ØØ77 DATA 99,119,127,127,1Ø7,99
,99,Ø
1ØØ78 DATA 99,115,123,111,1Ø3,99
,99,Ø
1ØØ79 DATA 62,99,99,99,99,99,62,
Ø
1ØØ8Ø DATA 126,51,51,62,48,48,12
Ø,Ø
1ØØ81 DATA 62,99,99,99,99,111,62
,3
1ØØ82 DATA 126,51,51,62,54,51,11
5,Ø
1ØØ83 DATA 6Ø,1Ø2,112,56,14,1Ø2,
6Ø,Ø
1ØØ84 DATA 126,9Ø,24,24,24,24,6Ø
,Ø
1ØØ85 DATA 99,99,99,99,99,99,62,
Ø
1ØØ86 DATA 1Ø2,1Ø2,1Ø2,1Ø2,1Ø2,6
Ø,24,Ø
1ØØ87 DATA 99,99,99,1Ø7,127,119,
99,Ø
1ØØ88 DATA 99,99,54,28,28,54,99,
Ø
1ØØ89 DATA 1Ø2,1Ø2,1Ø2,6Ø,24,24,
6Ø,Ø
1ØØ9Ø DATA 127,99,7Ø,12,25,51,12
7,Ø
1ØØ91 DATA 6Ø,48,48,48,48,48,6Ø,
Ø
1ØØ92 DATA 96,48,24,12,6,3,1,Ø
1ØØ93 DATA 6Ø,12,12,12,12,12,6Ø,
Ø
1ØØ94 DATA 8,28,54,Ø,Ø,Ø,Ø,Ø
1ØØ95 DATA Ø,Ø,Ø,Ø,Ø,Ø,Ø,255
1ØØ96 DATA 24,24,12,Ø,Ø,Ø,Ø,Ø
1ØØ97 DATA Ø,Ø,6Ø,6,62,1Ø2,59,Ø
1ØØ98 DATA 112,48,62,51,51,51,11
Ø,Ø
1ØØ99 DATA Ø,Ø,6Ø,1Ø2,96,1Ø2,6Ø,
Ø
1Ø1ØØ DATA 14,6,62,1Ø2,1Ø2,1Ø2,5
9,Ø
1Ø1Ø1 DATA Ø,Ø,6Ø,1Ø2,126,96,6Ø,
Ø
1Ø1Ø2 DATA 28,54,48,12Ø,48,48,12
Ø,Ø
1Ø1Ø3 DATA Ø,Ø,59,1Ø2,1Ø2,62,6,1
24
1Ø1Ø4 DATA 112,48,54,59,51,51,11
5,Ø
1Ø1Ø5 DATA 24,Ø,56,24,24,24,6Ø,Ø
1Ø1Ø6 DATA 6,Ø,14,6,6,1Ø2,1Ø2,6Ø
1Ø1Ø7 DATA 112,48,51,54,6Ø,54,11
5,Ø
1Ø1Ø8 DATA 56,24,24,24,24,24,6Ø,
Ø
1Ø1Ø9 DATA Ø,Ø,23Ø,127,127,1Ø7,9
9,Ø
1Ø11Ø DATA Ø,Ø,11Ø,51,51,51,51,Ø
1Ø111 DATA Ø,Ø,6Ø,1Ø2,1Ø2,1Ø2,6Ø
,Ø
1Ø112 DATA Ø,Ø,11Ø,51,51,62,48,1
2Ø
1Ø113 DATA Ø,Ø,59,1Ø2,1Ø2,62,6,1
5
1Ø114 DATA Ø,Ø,11Ø,59,51,48,12Ø,
Ø
1Ø115 DATA Ø,Ø,62,96,6Ø,6,124,Ø
1Ø116 DATA 16,48,124,48,48,54,28
,Ø
1Ø117 DATA Ø,Ø,1Ø2,1Ø2,1Ø2,1Ø2,5
9,Ø
1Ø118 DATA Ø,Ø,1Ø2,1Ø2,1Ø2,6Ø,24
,Ø
1Ø119 DATA Ø,Ø,99,1Ø7,127,127,54
,Ø
1Ø12Ø DATA Ø,Ø,99,54,28,54,99,Ø
```


NEW

DMC "No Halt" Disk Controller



Unleash your CoCo's potential!

Our new Dual Mode Controller (DMC) implements a new "no halt" mode of operation so it can read from or write to disk all by itself. The 6809 is freed to process other tasks and respond to interrupts. This is how OS-9 was meant to run! But the Radio Shack "halt" mode of operation is also retained to maintain full compatibility with existing non-OS-9 software.

Free! Disk caching software included can speed up OS-9 disk accesses.

Other DMC features:

- works with original CoCo, CoCo 2, or CoCo 3 (Multi-Pak required)
- no adjustments — all-digital data separator and write precompensation
- gold plated card-edge connectors for reliability
- ROM socket takes 24 pin or 28 pin chip; dual DOS capability
- Radio Shack DOS 1.1 ROM installed
- 8K bytes cache memory on board (32K optional)
- D.P. Johnson's SDISK package (specially modified for DMC) is included at no charge ($30 value)
- aluminum case
- fully assembled and tested; 120 day limited warranty

To order: DMC controller with RSDOS 1.1 and SDISK (specify OS-9 Level I or II) $149.50 plus $5 S/H ($12 overseas). Add $16 for 32K RAM option. Terms (prices in $US); check, money order, VISA. U.S.A. orders shipped via UPS from WA state.

Did you know?

...that all the older floppy disk controllers for the CoCo completely tie up (and even halt) the 6809 processor during disk reads and writes? No wonder your keyboard is constantly "losing" characters! Or that your serial port often gives you garbage.

SARDIS TECHNOLOGIES

2261 East 11th Ave., Vancouver, B.C., Canada V5N 1Z7

(Also ask about our ST-2900 6809 based expandable single board computer)

(604) 255-4485 (Pacific Time)

```
10121 DATA 0,0,102,102,102,62,6,
124
10122 DATA 0,0,126,76,24,50,126,
0
10123 DATA 14,24,24,112,24,24,14
,0
10124 DATA 24,24,24,0,24,24,24,0
10125 DATA 112,24,24,14,24,24,11
2,0
10126 DATA 59,110,0,0,0,0,0,0
10127 DATA 0,8,28,54,99,99,127,0
10128 DATA 30,51,96,96,96,51,30,
12
10129 DATA 102,0,102,102,102,102
,59,0
10130 DATA 12,24,60,102,126,96,6
0,0
10131 DATA 60,195,60,6,62,102,63
,0
10132 DATA 102,0,60,6,62,102,63,
0
10133 DATA 48,24,60,6,62,102,63,
0
10134 DATA 24,0,60,6,62,102,63,0
10135 DATA 0,0,60,102,96,102,60,
24
10136 DATA 60,195,60,102,126,96,
60,0
10137 DATA 102,0,60,102,126,96,6
0,0
10138 DATA 48,24,60,102,126,96,6
0,0
10139 DATA 102,0,56,24,24,24,60,
0
10140 DATA 56,198,56,24,24,24,60
,0
10141 DATA 48,24,56,24,24,24,60,
0
10142 DATA 99,28,54,99,127,99,99
,0
10143 DATA 28,28,62,99,127,99,99
,0
10144 DATA 6,12,127,49,60,49,127
,0
10145 DATA 0,0,126,27,126,216,12
6,0
10146 DATA 63,108,204,255,204,20
4,207,0
10147 DATA 60,195,60,102,102,102
,60,0
10148 DATA 102,0,60,102,102,102,
60,0
10149 DATA 48,24,60,102,102,102,
60,0
10150 DATA 60,195,102,102,102,10
2,59,0
10151 DATA 48,24,102,102,102,102
,59,0
10152 DATA 102,0,102,102,102,62,
6,124
10153 DATA 99,62,99,99,99,99,62,
0
10154 DATA 54,99,99,99,99,99,62,
0
10155 DATA 12,12,63,96,96,63,12,
12
10156 DATA 28,54,50,120,48,115,1
26,0
10157 DATA 102,102,60,126,24,126
,24,24
10158 DATA 248,204,204,250,198,2
07,198,199
10159 DATA 14,24,24,60,24,24,24,
112
10160 DATA 12,24,60,6,62,102,63,
0
10161 DATA 24,48,56,24,24,24,60,
0
10162 DATA 12,24,60,102,102,102,
60,0
10163 DATA 12,24,102,102,102,102
,59,0
10164 DATA 59,111,0,110,51,51,51
,0
10165 DATA 118,222,115,123,111,1
03,99,0
10166 DATA 60,6,62,102,59,0,255,
0
10167 DATA 60,102,102,102,60,0,2
55,0
10168 DATA 0,24,0,24,48,96,102,6
0
10169 DATA 0,0,0,126,96,96,0,0
10170 DATA 0,0,0,126,6,6,0,0
10171 DATA 195,198,204,222,51,10
2,204,15
10172 DATA 195,198,204,216,55,11
1,207,3
10173 DATA 0,24,0,24,24,60,60,24
10174 DATA 0,51,102,204,102,51,0
,0
10175 DATA 0,204,102,51,102,204,
0,0
10176 DATA 34,136,34,136,34,136,
34,136
10177 DATA 85,170,85,170,85,170,
85,170
10178 DATA 219,119,219,238,219,1
19,219,238
10179 DATA 24,24,24,24,24,24,24,
24
10180 DATA 24,24,24,24,248,24,24
,24
10181 DATA 24,24,248,24,248,24,2
4,24
10182 DATA 54,54,54,54,246,54,54
,54
10183 DATA 0,0,0,0,254,54,54,54
10184 DATA 0,0,248,24,248,24,24,
24
10185 DATA 54,54,246,6,246,54,54
,54
```

```
10186 DATA 54,54,54,54,54,54,54,
54
10187 DATA 0,0,254,6,246,54,54,5
4
10188 DATA 54,54,246,6,254,0,0,0
10189 DATA 54,54,54,54,254,0,0,0
10190 DATA 24,24,248,24,248,0,0,
0
10191 DATA 0,0,0,0,248,24,24,24
10192 DATA 24,24,24,24,31,0,0,0
10193 DATA 24,24,24,24,255,0,0,0
10194 DATA 0,0,0,0,255,24,24,24
10195 DATA 24,24,24,24,31,24,24,
24
10196 DATA 0,0,0,0,255,0,0,0
10197 DATA 24,24,24,24,255,24,24
,24
10198 DATA 24,24,31,24,31,24,24,
24
10199 DATA 54,54,54,54,55,54,54,
54
10200 DATA 54,54,55,48,63,0,0,0
10201 DATA 0,0,63,48,55,54,54,54
10202 DATA 54,54,247,0,255,0,0,0
10203 DATA 0,0,255,0,247,54,54,5
4
10204 DATA 54,54,55,48,55,54,54,
54
10205 DATA 0,0,255,0,255,0,0,0
10206 DATA 54,54,247,0,247,54,54
,54
10207 DATA 24,24,255,0,255,0,0,0
10208 DATA 54,54,54,54,255,0,0,0
10209 DATA 0,0,255,0,255,24,24,2
4
10210 DATA 0,0,0,0,255,54,54,54
10211 DATA 54,54,54,54,63,0,0,0
10212 DATA 24,24,31,24,31,0,0,0
10213 DATA 0,0,31,24,31,24,24,24
10214 DATA 0,0,0,0,63,54,54,54
10215 DATA 54,54,54,54,255,54,54
,54
10216 DATA 24,24,255,24,255,24,2
4,24
10217 DATA 24,24,24,24,248,0,0,0
10218 DATA 0,0,0,0,31,24,24,24
10219 DATA 255,255,255,255,255,2
55,255,255
10220 DATA 0,0,0,0,255,255,255,2
55
10221 DATA 240,240,240,240,240,2
40,240,240
10222 DATA 15,15,15,15,15,15,15,
15
10223 DATA 255,255,255,255,0,0,0
,0
10224 DATA 0,0,59,110,100,110,59
,0
10225 DATA 60,102,102,124,99,99,
110,96
10226 DATA 127,51,49,48,48,48,12
0,0
10227 DATA 0,0,127,54,54,54,51,0
10228 DATA 126,102,48,24,48,102,
126,0
10229 DATA 0,0,63,102,102,102,60
,0
10230 DATA 0,0,51,51,51,51,62,96
10231 DATA 0,0,126,152,24,24,24,
0
10232 DATA 126,24,60,102,102,60,
24,126
10233 DATA 28,54,99,127,99,54,28
,0
10234 DATA 60,102,195,195,195,10
2,231,0
10235 DATA 14,24,12,62,102,102,6
0,0
10236 DATA 0,0,126,219,219,126,0
,0
10237 DATA 0,3,62,103,107,115,62
,96
10238 DATA 28,48,96,124,96,48,28
,0
10239 DATA 60,102,102,102,102,10
2,102,0
10240 DATA 0,126,0,126,0,126,0,0
10241 DATA 0,24,126,24,0,126,0,0
10242 DATA 48,24,12,24,48,126,0,
0
10243 DATA 12,24,48,24,12,126,0,
0
10244 DATA 7,12,12,12,12,12,12,1
2
10245 DATA 12,12,12,12,12,108,10
8,56
10246 DATA 24,24,0,126,0,24,24,0
10247 DATA 0,59,110,0,59,110,0,0
10248 DATA 28,54,54,28,0,0,0,0
10249 DATA 0,28,28,0,0,0,0,0
10250 DATA 0,0,0,24,24,0,0,0
10251 DATA 15,12,12,12,236,108,6
0,28
10252 DATA 60,54,54,54,54,0,0,0
10253 DATA 56,12,24,48,60,0,0,0
10254 DATA 0,0,60,60,60,60,0,0
10255 DATA 0,0,0,0,0,0,0,0
10256 '-------------------------
-------------------------
---------------
```


GET IT ALL!!!

Excellent **38** Disk CoCo Software Library $135.00
includes Word Processor, Modems, Utilities, 124 Games, Graphics/Pics, Business, Languages, Music and More. Public Domain and Shareware. Over 350 Programs.

15% Discount to User Groups and Students. Major Credit Cards Welcomed. Call Lisa or Joe at 1-800-221-7372; in New York call 212-732-2565.

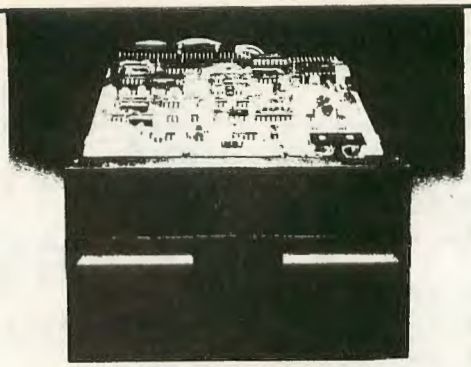
Public Domain Software Copying Company
33 Gold Street-Suite L3
New York, N.Y. 10038

NEW DISK DRIVES

Starting at

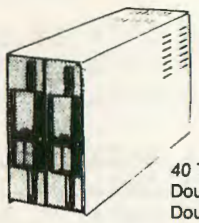
89.95

with case &
Power Supply
129.95



TANDON MPI TEAC
Speed 6ms tk to tk and up
Capacity 250k unformatted
Tracks 40
Warranty *now 1 Year*

New Low Price!



40 Tks 6Ms
Double Sided
Double Density

40 or 80 Tracks
½ Hght. Teac/Panasonic

1 YEAR Warranty!

SATISFACTION GUARANTEED!!
ALL DRIVES FULLY TESTED AND WARRANTEED
We carry only the finest quality disk drives
no seconds • no surplus

Free Software for Drive 0 Systems

CoCo Checker...Test roms, rams, disk drives and & controller printer, keyboard cassette & more.
Tape/Disk Utility...Transfers disk to tape and tape to disk.

169.95 Drive 0
- Full Ht Drive
- Single Case
- Heavy Duty Power Supply
- 2 Drive Cable
- Gold plated contacts
- Controller & manuals

189.95 Drive 0
- Double Sided Slim Line Drive
- Case holds 2 slim line drives
- Heavy Duty Power Supply
- 2 Drive Cable
- Gold plated contacts
- Controller & Manuals

289.95 Drive 0 & 1
- 2 Double Sided Slim Line Drive
- Case holds 2 slim line drives
- Heavy Duty Power Supply
- 2 Drive Cable
- Gold plated contacts
- Controller & Manuals

Other Drive Specials

Drives cleaned, aligned & tested, **29.95**

119.95
2nd Drive
for new Radio Shack
includes:
- Slim Line DS/DD Drive
- Cabling & Instructions
- Mounting Hardware

Full Ht Drive	89.95
Full Ht Drive Ps/Case	129.95
Slim Line Drive	99.95
Slim Line Drive Ps/Case	139.95
2 Slim Drives Ps/Case	239.95
Disk Controller	59.95

Single Ps & Case	44.95
Dual ½ht Ps & Case	54.95
Dual Full Ht. Ps & Case	79.95
Disk Controller	59.95
10 Diskettes with free library case	9.95

Dealer Inquiries Invited
617-278-6555

We welcome
- Visa/Mastercard
- Checks (allow 2 weeks for clearing)
- C.O.D. Add $2.

TRUE DATA PRODUCTS
9 South Main Street
Uxbridge, MA 01569
617-278-6555
Hours: Mon.-Sat., 9-6 (EST)

***Call us today!* 617-278-6555**
Order Toll Free 1-800-635-0300

Software Included

- Pc-Write word processor
- Pc-Calc Spreadsheet
- Pc-File Database
- Print Spooler
- Ram Disk
- Runs all popular software

IBM XT COMPATIBLE

Hardware Included

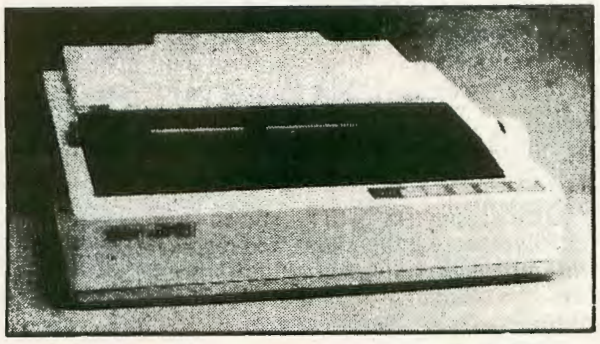
- 4.77 mhz and 8mhz Turbo
- 360k Floppy Disk Drive
- Monochrome or Color Card
- At style Case w/pwr light & key
- Game, Printer and Serial Port
- Real Time Clock
- 150 watt power supply
- 640k memory
- At keyboard optional expanded
- Monochrome Monitor
- Optional Hard Disk Drive

Complete system *only* **699.95**

---

star PRINTERS

PRINTER CABLES AND INTERFACES AVAILABLE
Call for current pricing



NX10 (New 120CPS NLQ 80 col.) **199.95**

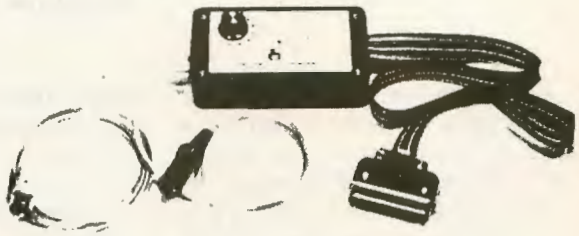
NX15 (New 120CPS NLQ 132 col.) **349.95**

PANASONIC PRINTER
1080I (New 120CPS NLQ 80 col.) **179.95**

Complete Packages

1080I **229.95**
includes:
- Panasonic 1080I Printer
- Interface
- Screen Dump Program

NX10 **259.95**
includes:
- Star NX10 Printer
- Interface
- Screen Dump Program



Serial to Parallel Interface for Color Computer I, II, III

- 300-19,200 BAUD rates
- External to printer — No AC plugs
- Built in modem/printer switch — No need for Y-cables or plugging/unplugging cables

only **54.95**
Power supply + 5.00

64K Upgrades 19.95

Video Driver 29.95

Enables your CoCo to operate with a video monitor instead of a television!

Screen Dump Program 19.95

The best screen dump program for the Epson & Star printers ever!! Have the option of standard images reverse w/regular or double sized pictures.

Dealer Inquiries invited
617-278-6555

TRUE DATA PRODUCTS
9 South Main Street
Uxbridge, MA 01569
617-278-6555

***Call us today!* 617-278-6555**
Order Toll Free 1-800-635-0300

KISSable OS-9

A View of *Multi-Vue*

By Dale L. Puckett
Rainbow Contributing Editor

Last month we reported that we had seen the future during a quick demonstration of *Multi-Vue* at RAINBOWfest Princeton. We were impressed then. Now, after a few hours of hands-on exercise, we are ready to pronounce the future *has arrived.* Indeed, it would not be an exaggeration to proclaim that if *Multi-Vue* had been around when OS-9 arrived in 1983, this column probably wouldn't have been needed.

Multi-Vue uses a visual metaphor to reduce the complexity of OS-9. Long OS-9 pathlists are often hard to remember — especially for a beginner. *Multi-Vue* replaces those pathlists with pictures. Instead of remembering a pathlist to a file on a disk drive or other hardware device must begin with a slash (/), you need only remember a disk drive is a rectangular box with an opening in the front.

Finding Files

If you want to find a file on a floppy or hard disk with *Multi-Vue*, you simply point to the icon or graphic symbol that represents that disk and click the button on your mouse. If you don't have a mouse, you can simulate it with the arrow and function keys on the Color Computer 3 keyboard.

After you click the mouse button, the name of the device selected is displayed in a title bar just below *Multi-Vue*'s main menu bar. In a few seconds, a number of icons that look like file folders appear in the window. The name of each folder — or OS-9 directory — appears below each folder. To find out what is stored in one of these folders, you must move the mouse pointer to the folder and click twice. After you click, icons that represent any additional folders, documents or application programs appear in the window. The complete OS-9 pathlist to that directory appears in the title bar at the top of the window.

Essentially, when you run your Color Computer 3 with *Multi-Vue*, you select an object by pointing to it and clicking the mouse button. Then, you act on the object you selected by picking a verb from one of the pull-down menus at the top of your screen.

For example, to list a text file to your screen, you point to its icon — a small picture that looks like a piece of paper with the top right-hand corner folded over. You then move the mouse until the pointer rests above the word *Files* and click the button. A shadowed box with a menu suddenly pops down from the menu bar and remains in place. You can then move the mouse until the pointer rests over the word *List* and click the button.

After you push the button, an overlay window will pop out of the bottom third of your screen and OS-9 will list your file. It will pause and wait for you to press a key every time it fills the window.

If you want to know more about the file you selected earlier, you can move the pointer and click over the word *Stat* in the file menu. Stat is similar to the `Get Info` command on the Macintosh. It shows you the name of the file and the number of the owner, and tells you when the file was first created and last modified. It also displays several additional file attributes. For example, it will tell you if you can read from or write to the file. It tells you if it contains executable code and also how many bytes are stored in the file.

After you select a document or file, you can use any of the commands in the menu that *Multi-Vue* has enabled. For example, if you have selected a text file, you will be able to list it, copy it, delete it, get information about it, print it or rename it. You will not be able to open it. On the other hand, if you have selected a file or document that contains executable object code, you will only be able to copy, delete, get information about or rename it. You will not be able to list or print it.

Multi-Vue knows what it can do with the file or document you select because it reads the OS-9 attributes set on the file when it was created. It tells you what it can do by highlighting the commands

---

Dale L. Puckett, who is author of The Official BASIC09 Tour Guide *and co-author, with Peter Dibble, of* The Complete Rainbow Guide to OS-9, *is a free-lance writer and programmer. He serves as director-at-large of the OS-9 Users Group and is a member of the Computer Press Association. Dale is a U.S. Coast Guard lieutenant and lives in Rockville, Maryland.*

you can select. For example, when you select a file that contains executable code, the list and print choices on the menu appear dim.

A Nice Shortcut

There are two ways to run an application program using *Multi-Vue*. First, if you see an icon that looks like an open window, the file contains executable program code. To run that program you must first select the document and then move the mouse to the files menu and click on the word *Open*.

If the application you want to run has its own icon, you will be able to take a nice shortcut. In this case, you simply point to the icon and click twice. *Multi-Vue* will run the program for you automatically. You will not have to go to the file menu and click Open. Unfortunately, it does not have command key shortcuts for common menu commands like Open, Print, etc.

This shortcut can also be used with a document that was created by an application program with its own icon. For example, after you have created an application information file and an icon for your word processor, any document you save with the same three-letter extension as the AIF file will also be displayed with the word processor's icon. If you "double click" on one of the documents with that icon, *Multi-Vue* automatically loads your word processor and then opens your document.

Other Choices

The file menu is only one of four *Multi-Vue* menus you may use while running your Color Computer 3. With the Disk menu, you can find out the amount of free space available on a floppy or hard disk, create a new folder — or OS-9 directory, format a new disk, back up an old disk, set your current execution directory or add new devices to your *Multi-Vue* desktop.

> ***"While* Multi-Vue *makes OS-9 power available to the masses, hackers won't need to worry about their elite status. There's plenty there for them, also."***

With the View menu, you can choose between an 80-column text display and eight folders displayed per row in the Hi-Res mode or 40-column text and four folders displayed in a row in the Lo-Res mode. With either choice you get three rows of documents or folders.

The 'X' Must Mean Multitasking

If you click over the 'X' on *Multi-Vue*'s menu bar, you open another window of opportunity. Remember what a hassle it used to be to set the attributes on your serial or printer port? Or even worse, how many times have you found yourself writing a BASIC09 program with `GetStat` or `SetStat` system calls to set the key-repeat delay or speed? These hassles are gone when you use *Multi-Vue*'s 'X' menu. Actually, the *Multi-Vue* manual calls this icon the "Tandy" menu and if you look closely you'll notice the top and bottom of the 'X' are closed.

From the Tandy menu you can also start a clock, use a decimal/hexadecimal calculator or work with a built-in calendar to keep track of your schedule. Later, OS-9 application programs will be released that make use of the clipboard standard built into *Multi-Vue*. This means that in the future you will be able to cut a selection of text or a drawing out of one document and paste it in another. With a little luck and additional standards, we may someday be able to paste drawings in our word processing documents and vice versa.

I strongly encourage the OS-9 Users Group to establish a standards committee and create a *Multi-Vue* clipboard standard immediately. If the Users Group doesn't act, I certainly hope that several major Color Computer OS-9 software developers will join forces long enough to publish a standard. Without a workable *Multi-Vue* clipboard standard, CoCo OS-9 users will never have the ability to cut and paste text data and graphics images between applications. We need this ability if OS-9 is to realize its potential in today's market. May the users force the issue!

***Multi-Vue* Manual Is Hacker's Heaven**

While *Multi-Vue* makes OS-9 power available to the masses, hackers won't need to worry about their elite status. There's plenty there for them, also. In fact, the information in the back of the *Multi-Vue* manual is a gold mine. With it, we can all learn what makes a windowing system like `WindInt.IO` tick.

We'll learn about window types and learn how to create framed windows with scroll bars, plain framed windows, windows with shadowed boxes, windows with a double box and windows with a plain box. We'll learn about "regions" and what to do with the information revealed by them. And we'll learn how to design our own menu bars and add pull-down menu support to our programs.

OS-9™ SOFTWARE/HARDWARE

L1 UTILITY PAK - Contains 40 useful utilities that run under both level I and II OS-9. Included are a complete set of "wild card" file handling utilities, a disassembler, a disk sector editor, and the MacGen command language compiler. MacGen will allow you to generate many useful command macros in minutes, much more useful than procedure files. Macro source is included for a macro to implement an archival backup type function. **$49.95**

L2 UTILITY PAK - Contains a Level II "printerr" function that also **shows the pathname being searched for** when "not found" or permission type errors occur. Also contains level II software ram disk driver. Ten other utilites included, some useful for level I also **$39.95**

L1+L2 COMBINATION PAK both of above together for **$75.00**

SDISK - Standard disk driver module replacement allows full use of 40 or 80 track double sided drives with OS-9 Level I. Full compatibility with CoCo 35 track format and access all other OS-9 non-CoCo formats. Easy installation. **$29.95**

SDISK+BOOTFIX - As above plus boot directly from a double sided diskette. **$35.95**

SDISK3 - Level II version of SDISK driver. Same features as level I (except bootfix not required to boot from double sided). **$29.95**

PC-XFER UTILITIES - Programs to format and transfer files to/from MS-DOS™ diskettes on CoCo under OS-9. (Requires either SDISK or SDISK3 to run depending on which level of OS-9 you are using) **$45.00**

MSF - MS-DOS disk format file manager. More complete file transfer capabiltites for level-II only. (Requires SDISK3 to operate). **$45.00**

CCRD 512K byte RAM DISK CARTRIDGE - Operates faster than similar device sold by others. Requires RS Multipak interface, two units may be used together for 1MB. OS-9 Level I & II drivers and test software included. **$169.00**

DISKMASTER HARD-DISK/IO INFORMATION: Free color brochure describing the Diskmaster Hard-disk, HD floppy, multi-I/O system and the Plus-100 CoCo-3 memory expansion is available when you send an S.A.S.E.. Nothing else for the CoCo can compare in quality or capability.

All diskettes are in CoCo OS-9 format; other OS-9 formats can be supplied for $2.00 additional charge. All orders must be prepaid or COD, VISA/MC accepted, add $1.50 S&H for software, $5.00 for CCRD, additional charge for COD.

D. P. Johnson, 7655 S.W. Cedarcrest St., Portland, OR 97223
(503) 244-8152 (For best service call between 9-11 AM Pacific Time, Mon.-Fri.)

OS-9 is a trademark of Microware and Motorola Inc., MS-DOS is a trademark of Microsoft, Inc.

Hint . . .

M/L Autostart

You can quickly make a machine language program autostart (and restart) by including the following statements at the appropriate place in your program:

```
ORG $0182
JMP execad
```

The execad is the execution address of the program. After this, the program will start itself after loading. It will also restart when the reset button is pressed.

David Mills
Huntington, WV

One-Liner Contest Winner . . .

Does your dungeon need cleaning? Make things a little more organized in your D&D games with this one-liner, which generates a printed chart to help you keep track of your character's qualities.

The listing:

```
6 Z$=STRING$(80,"-"):A$=CHR$(138
)+CHR$(138):INPUT"NAME";N$:PRINT
#-2,CHR$(&HE)N$A$Z$:PRINT#-2,"ST
R:"A$"INT:"A$"WIS:"A$"DEX:"A$"CO
N:"A$"CHA:"A$A$"HIT PTS:"A$"ARM
CLASS:"A$"MONEY:"A$Z$"EQUIPMENT
CARRIED":FORT=1TO5:PRINT#-2,A$:N
EXT:PRINT#-2,Z$"OTHER NOTES
```

Keith Schuler
Merritt Island, FL

(For this winning one-liner contest entry, the author has been sent copies of both *The Third Rainbow Book of Adventures* and its companion *The Third Rainbow Adventures Tape.*)

Also in the back of the *Multi-Vue* manual, C programmers will find the long-awaited documentation to the CGFX library that comes with the Program Development Package. In it, they'll find the definitions for the high-level windowing environment and the structure definitions needed to access it.

One note of caution is in order with *Multi-Vue*. As you build your first working disks, make sure you do not name any files with a period followed by a three-letter extension, e.g., .TXT or .BIN. GShell, the graphics shell in *Multi-Vue*, seems to suffer from a conflict between these files and *Multi-Vue*'s Application Information Files (AIF) and tends to hang up if it encounters them in a directory. Be careful.

When you install *Multi-Vue*, follow the directions in the manual carefully and you shouldn't have any trouble. Be sure you use the original OS-9 system disk and not one you have modified with non-standard modules when you generate your new *Multi-Vue* system. *Multi-Vue* will work with hard disks, RAM disks or just about any other RBF device that has the proper device descriptor and device driver installed. However, the script file provided on the *Multi-Vue* release disk expects to find the standard set of Tandy OS-9 modules.

If you are an OS-9 veteran, feel free to generate a *Multi-Vue* system start-up disk that works with your hardware. Just use the OS9Gen utility with your own bootlist file. That's the method I used to generate my system disk and it worked like a charm from the start.

PhantomGraph Appears Promising

Tandy released one of the most useful business tools available on the Color Computer last month. *PhantomGraph* is Fort Worth's answer to the old axiom, "One picture is worth a thousand words." With it, you can convert numerical data from your *DynaCalc* spreadsheet into a pictorial form that is easy to understand. If you don't have *DynaCalc*, you can still plot your data with *PhantomGraph*.

The type of chart you need depends on the data you want to explain. *PhantomGraph* lets you present line graphs, bar charts, pie charts and scatter charts. The program is easy to install — you simply copy it into your current execution directory, /D0/CMDS. Once it is in place, you run it by typing pg.

PhantomGraph uses pull-down menus to make your plotting easy. Its four menus include Files, Drawing, Graph and Utilities. Graph lets you pick the color of your charts, enter your data, draw the charts and add titles to your work. To enter data into *PhantomGraph*, you use the Data item under the Graph menu. You simply move an arrow into a blank area of the screen and type in the numbers. This method works quite well for simple charts but would be very tedious if you had a lot of data to handle. When large charts and graphs are required, the *DynaCalc*/*PhantomGraph* link is in order.

To link the data from *DynaCalc* into a *PhantomGraph* chart, you use a special utility program supplied with *PhantomGraph*. The program, called *Dyna*, converts the spreadsheet files into *PhantomGraph* files.

To make a chart this way, enter your data into a *DynaCalc* spreadsheet and save it using the *DynaCalc* S#S option. After this is done, call *Dyna* from the *PhantomGraph* Utility menu and let it make the conversion. When the data window appears, the conversion is complete.

Next, click the mouse button with the pointer off the data window to get back to *PhantomGraph* proper. At this point, you can call up the Graph menu, set your chart type and add your titles. This done, you open the converted file from the file menu, select Draw from the Graph menu and you'll soon be looking at your new chart.

If you have a few spreadsheets that were saved in the *Sylk* format on your MS-DOS machine at the office, you can also use *PhantomGraph* to display charts made from them. A special utility program supplied with *PhantomGraph* will convert your *Sylk* files to *DynaCalc* files. Once you have them in this familiar format you can make as many charts as you need.

OS-9 Users Group Active Again

Dave Kaleita, a long-time veteran of the OS-9 Users Group, has become the group's president following Bill Turner's resignation from that office. Turner must be thanked for his long hours and yeoman efforts to get the group back on its feet after administrative details had been neglected far too long by his predecessor.

Kaleita, who is noted for his managerial ability, seems to be getting the ball rolling again. As I was finishing this column, Bill Brady (*Wiz* author and

new *MOTD* editor) had just sent a new issue of the group's newsletter to the printer. He hopes to repeat that task every two months. The issue contains a ballot, and, for the first time, the OS-9 Users Group will elect its officers by mail. Those ballots must be returned to the Users Group's post office box in Tampa, Florida, by March 1. The names of the new officers will be announced in the May/June issue of *MOTD*.

The slate includes Kaleita for president, Pete Lyall for vice president, George Dorner for treasurer and Kevin Darling for secretary. I cannot praise Kaleita highly enough for the outstanding work he did when he served as the group's software librarian while I was president several years ago. The same goes for George Dorner, who is probably responsible for keeping me sane. Without his extremely hard work and outstanding help I never would have made it through the two terms. Kevin Darling and Pete Lyall are both extremely well-known — Pete for his hard work as an assistant SysOp on CompuServe's OS-9 SIG, and Kevin for his continuous and outstanding help to newcomers on RAINBOW's OS-9 Online SIG on Delphi. They will both serve the group well.

Again, let me go to bat for this new round of volunteers and encourage you to help them keep the group alive. Four officers alone do not a Users Group make. The group is yours. These guys are just trying to manage the group so it will be there to serve you. They cannot do the job alone — even though they will certainly try.

They need your articles for *MOTD*, your programs for the software exchange library and your support when they hold an event near you. If you buy only one or two disks from the software library in a year, you will have recouped the money you paid in dues.

The library archive now contains 11 80-track, double-sided disks, and you can buy the entire set from the group for $100. The software is also distributed on 56 individual disks and includes more than 300 programs. You can order individual disks in the Color Computer format for $6 each directly from the OS-9 Users Group at their Tampa address.

If you are in a hurry, you can get immediate service by ordering them by telephone from FHL in Syracuse, New York. FHL charges $10 for this service and pays a royalty to the Users Group for each disk sold. Consult the latest edition of *MOTD* for a listing of the group's library.

Kaleita also announced the names of several of the group's committees. He is asking George Dorner, Bill Turner, Steve Odneal and Bill Brady to join him on the finance committee. The membership committee will include Kevin Darling, Dave Kaleita, Pete Lyall, George Dorner and Bill Turner. Pete Lyall, Dave Kaleita, George Dorner, Kevin Darling and I will serve on the public relations committee. The newsletter committee will include Bill Brady, Kevin Darling, Pete Lyall, Greg Morse and Bert Schneider. The software exchange committee will include Carl Kreider, Dave Kaleita and Bert Schneider. And, finally, the communications committee will include George Dorner, Bill Brady, Pete Lyall and Greg Law.

The address for disk orders, renewals, or volunteers is OS-9 Users Group, Suite R-237, 1715 East Fowler Avenue, Tampa, FL 33612.

The UG Software Library, Part II

Last month we showed you how easy it is to use a fourth-generation database program like *Sculptor* to tackle a large database like the OS-9 Users Group's Software Exchange Library. These new database languages actually write their own programs after you tell them what the data looks like. However, large projects with dozens of databases can easily get out of hand. That's the topic of this month's discussion.

After years of working with *Sculptor*, Frank Hogg finds it takes him only a few minutes to write most programs. Yet, he sometimes spends weeks planning his databases. He told us if he had to write equivalent programs in C or BASIC, it would probably take him several months. The example programs we showed you last month took him less than 20 minutes.

The question, then, is how to go about planning a large database. The first step is a thorough examination of the problem and the data. When we left Hogg pondering the solution last month, he had a database that was already defined.

He started his enhancement by adding a new field where he could store the number of sectors required to hold each program. This additional field will make it easier to rearrange disks in the future. Then he asked another question. Is there anything else that might be needed in the database? If so, he wanted

PERRY COMPUTERS
The Ideal Buy
1-800-248-3823

TANDY COMPUTERS

1000-HX 256K 1-3 1/2" Drive.	535.00
1000-TX 640K 1-3 1/2" Drive	875.00
3000-HL 512K 1 5 1/4" Drive	1110.00
3000 640K 1 5 1/4" Drive	1500.00
4000 1 Meg 1 3 1/2" Drive	1930.00
1400LT Portable Computer	1215.00
102 Portable Computer 24K	375.00
Color Computer 3 128K	165.00

MONITORS & BOARDS

VM-4 Monochrome Green	95.00
CM-5 Color RGB	220.00
CM-11 Color RGB	335.00
EGM-1 Color RGB (EGA)	510.00
Tandy Dual Display Card	145.00
Tandy EGA Card	235.00
Zucker Mono Graphics Card	110.00

DRIVES

Color Computer Drive 0	220.00
Portable Drive 100/102/200	155.00
5 1/4" External Drive 1000EX	180.00
3 1/2" External Drive 1000EX	200.00
Tandy 20 Meg Hardcard	509.00
Zucker 30 Meg Hardcard	495.00
Seagate 20 Meg Hard Drive	265.00
AT HD/1.2M Controller	200.00

EXPANSION BOARDS

Zucker Serial Board	55.00
Zucker MFB 0K for 1000SX	130.00
Zucker MFB 0K for 1000	98.00
Zucker 1200 Baud Modem Card	83.00

PRINTERS

DMP-106 Dot-Matrix	165.00
DMP-130 Dot-Matrix	255.00
DWP-230 Daisy Wheel	335.00
DWP-520 Daisy Wheel	730.00
DMP-440 Dot-Matrix	595.00
DMP-2120 Dot-Matrix	1325.00
LP-1000 Laser Printer	1635.00
Epson LX-800 Dot-Matrix	195.00
Epson FX-86E Dot-Matrix	355.00
Epson FX-286E Dot-Matrix	520.00
Epson EX-800 Dot-Matrix	425.00
Epson EX-1000 Dot-Matrix	585.00
Epson LQ-500 Dot-Matrix	NEW CALL
Epson LQ-850 Dot-Matrix	520.00
Epson LQ-1050 Dot-Matrix	715.00
Epson LQ-2500 Dot-Matrix	940.00
Epson GQ-3500 Laser	1580.00

Price's Subject To Change

Send Stamped Self Addressed Evelope For Complete Catolog.

All prices and offers may be changed or withdrawn without notice. Advertised prices are cash prices. C.O.D. accepted add 2% (minimum charge $10.00). M.C., Visa add 2%. All non defective items require return merchandise authorization. Call for RMA Number before returning. Delivery is subject to product availability. Add 1½% for shipping and handling, $5.00 minimum charge.

TM - Registered Trademark of Tandy, Epson, and IBM

Monday thru Friday 9am-6pm EST.

PERRY COMPUTERS

124 South Main Street, Perry, MI 48872
CALL 1-517-625-4161 or TOLL-FREE
1-800-248-3823

to add the new fields immediately before writing a number of additional programs to manipulate the data.

Hogg wanted to include a way to find things in the database with a keyword search. For example, a communications program might have keywords like XModem, Kermit, Comm, etc. He added that ability quickly. But editing or deleting a record made maintaining the keyword database messy. He needed a cleaner method to maintain the keywords.

At first he thought he could limit the keywords to some fixed number — maybe five — and then add the keywords to the main database. If he did this, the keyword database could be made up of just the index without the data, which would make the program quicker. The only negative aspect about this approach was the predetermined limit. The file would get a little larger, but it's a small file, anyway.

Next, Hogg thought about a double keyword file — one with the keyword first and one with the title first. He could then find the keywords quickly by looking at the titles. It sounded like a kludge, but the idea wasn't that bad. The inserting, deleting and amending process would take twice as long, but if there were five keywords it would still take only one or two seconds. That wouldn't be a problem.

The size wouldn't be a problem either. In fact, the total disk space would be less because space would only be assigned to keyword records he needed. His first approach had required the keywords be assigned a space in the main database where the space would be reserved whether it was actually used or not.

These alternative solutions all pose interesting questions. Hopefully, they will give you some idea about what you should look at when you plan your next database. Remember, you must look at more than one aspect of the problem. You must consider speed, disk usage, database maintenance and the complexity of the programs — as well as the needs of the database application itself.

As it turned out, the way Hogg wrote the program originally was the best way for this application — although it was a very crude way to accomplish the goal. It was also more than fast enough. It squarely met two of the most important criteria.

The only slow area in the application was the part used to delete and amend the records. Since these actions are rarely used in this application, the slower speed of these functions does not present a problem. Additionally, the program is easy to understand and allows any number of keywords in each main database record. The only thing it lacks is a way to delete individual keywords that may have been entered accidentally. The code in Figure 1 takes care of the job.

Other Database Considerations

In 1983, Hogg created a *Sculptor* invoicing program for FHL that uses six different databases to create each invoice. The main file is the customer database. One handy field in Hogg's customer database is the most recent invoice number. When the program finds a customer, it can then find the most recent invoice and display it. At the same time, the description of each item on the invoice is retrieved from another database.

Hogg added a field in each invoice that holds the next most recent invoice. This lets him step back through invoices that refer to a customer and see what he has purchased over the years. His forethought came in handy recently when he offered an upgrade to *DynaStar*, the firm's popular word processing program. His customers did not have to send in their original disks to upgrade. He was able to verify the fact that they were eligible for an upgrade by looking at their records when they called.

Everything worked fine with Hogg's database until last year when, after four years of 24-hour, seven-days-a-week service, the disk drive failed on his 6809-based Gimix III. And, as luck would have it, he did not have the system fully backed up. He recovered most of the data, but some of the old invoices got lost in the process.

Many of Hogg's invoices were in the middle of a chain and his database design did not have a provision for this occurrence. He lived with the situation for several months while trying to figure out an easy way to find the missing links to thousands of invoices. He decided he needed a forward link in the invoices and an additional field in the customer file that pointed to the beginning of the chain. With these additions, he could get to an invoice from either direction.

He began to make the changes during a four-day Thanksgiving weekend. At the same time, he moved the data over to one of his QT 68000 systems. He used *Sculptor*'s Reformat utility to copy the data over to another file with extra blank fields. Then he wrote a *Sculptor* program that went down each linked list, created a backward link and set up the customer files to point to the beginning of the chain. It took the better part of a day to run this program, but when it was through, he had solved most of his problems.

Hogg then wrote a simple program to update the invoice database and search for any invoices that weren't flagged by the previous program. He relinked these missing links and the job was done. It didn't take as long as he thought it would, but, as he remarked recently, "It wouldn't have had to be done if I had planned the database correctly in the first place."

Group Library Database Revisited

Sculptor is a nice database program, but not everyone owns it. Hogg needed to find a way to allow anyone to use his new Users Group Software database. Hogg solved the problem with a program named *Grep*, which can be found on UG Disk #13.

Grep is a text string search utility. It looks through a text file and prints any line that contains the search string. He decided to format a straight text file with data from the UG database that non-*Sculptor* users could search with *Grep*.

First, Hogg studied *Grep*. He found it prints each line that matches the search string. He also realized most terminals, including the CoCo 3, have an 80-column display.

```
dk=delete keyword
check disk
message "Use BACKSPACE to finish inserting"
input k_keyword bs = END
k_title = u_title
find dkey
prompt "Are you sure" no = END
delete dkey
end
```

Figure 1

DISTO SUPER PRODUCTS

INTRODUCES
THE FANTASTIC SUPER CONTROLLER II

POWER BEYOND BELIEF

- **Radio Shack/Tandy controller compatible.**
- **Works on all COCOs! 1, 2 or 3, with or without Multi-pak interface.**
- **One 24/28 pin socket, for 8K ROM, 2764, 27128 or 27256.**
- **Internal Mini-Expansion-Bus Connector for one DISTO Super Adapter board.**
- **Low Power draw; Within COCO's power requirements.**
- **Gold Plated edge connectors.**
- **Under OS-9:**
  - Buffered Read/Write sector achieved without halting the CPU.
  - Continual use of keyboard even while Reading or Writing to disk.
  - System's Clock no longer looses time during Read & Write.
  - NMI is blocked and transferred to IRQ in software for low CPU overhead..
  - Completely Interrupt driven for fast and smooth Multi-Tasking operations..
  - Drivers (written by Keven Darling) for Level 1 and 2.

Suggested Retail Price $150 **Introductory Price $130**

DISTO SUPER CONTROLLER I $99.95

A superb controller. Along with the included C-DOS, plug-in three more software selectable 2764 or 27128 EPROMs burned to your liking.

The internal Mini Expansion Bus lets you add some incredible features to the controller. Disto Super Add-Ons were designed to fit neatly inside the Super Controller case.

DISTO SUPER RAM 3

Zero K	$ 29.95
Full 512K	89.95

Now is the time to upgrade your COCO 3 to 512K of memory. Available with or without memory chips, the **Super Ram 3** board is easily installed inside the COCO. It is fully compatible with OS-9 Level 2 and is delivered with a software package (for BASIC) that includes: a printer spooler, a ramdisk, a memory test and an install/configure program for your system.

DISTO SUPER ADD-ONS

REAL TIME CLOCK AND PARALLEL PRINTER INTERFACE
Have the Real Time, date and year displayed on your screen at a simple command. **$39.95**

MINI EPROM PROGRAMMER
A low cost EPROM programmer that attaches directly to your Disto Super Controller to program those often used utilities. **$54.95**

HARD DISK INTERFACE
A hard disk interface fully compatible with S.A.S.I.controller. Fits inside the Super Controllers, Ramdisk or MEB adapter. OS-9 Drivers are included. **$49.95**

SUPER RAMDISK 512K
Imagine having access to 512K of virtual disk memory in close to no time. Upgradable to One Megabyte **$119.95**

MEB ADAPTER
A Stand-Alone Mini-Expansion-Bus in which you can plug any other DISTO Adapter directly in a Multi-pak without the need for a Super Controller or Ramdisk **$24.95**

SEND FOR FREE 1988 WINTER CATALOG

CRC COMPUTERS inc.

10802 Lajeunesse, Montreal, Quebec, Canada, H3L 2E8

MASTER CARD AND VISA ACCEPTED

1-514-383-5293

We accept phone orders.
Call for Canadian prices.
Include S&H of $4 or $8 if order exceeds $75.

He decided to let *Sculptor* create a text file in which each line contained all the data from a record. The line could be many screen lines long, but it would look good on the screen if he padded it with the proper number of spaces. Figure 2 shows the *Sculptor* program that created the *Grep* file.

The variable `tabit` is an integer number used to calculate the tab offset when printing from one to three lines of text. Remember that the disk file can have some blank lines in it. The index used in loops in *Sculptor* is `scrline`. In BASIC, the code would look like this:

```
FOR I=1 TO 3
 PRINT U_FUNCTION(I)
NEXT I
```

The scroll function is different because it does not require the parentheses. The *Sculptor* code takes some getting used to, but it saves a lot of typing. The scroll function makes more sense in screen programs, but it is also used in report programs for continuity.

Seeing the `end` statement probably suggests to you that the program will stop after printing just one record, but in *Sculptor*, `exit` is used to stop a program and `end` is used to tell *Sculptor* to get the next record. Here is how we make the file for use by *Grep*:

```
OS9: sagerep disk pvdu >
diskgrep
```

`Sagerep` is the *Sculptor* report program, `disk` is the program above and `pvdu` is the printer driver for the terminal — Hogg didn't want any printer control codes in the file. He used the `>diskgrep` in the command line to redirect the output of `sagerep` to a disk file named `diskgrep`. Here's how you use the file `diskgrep`: `OS9: grep grep diskgrep` or `OS9: grep GREP diskgrep`.

Another nice addition would be a report that shows the disks in volume number order. Hogg used a simple utility called `reformat` to rearrange the database.

Here are the descriptors for `voldisk`:

```
KEY FIELDS
 1:u_volume,,a2,
 2:u_title,,a20,
```

Notice he used the same field names but only two of them. A new index file is created by the command line `OS9: reformat disk voldisk`. Hogg then changed the `u_` to `v_` with the *Sculptor* `describe` utility.

The program below lists a file in the new order. The `driving` file is `voldisk`. Each time a record is retrieved in `voldisk`, *Sculptor* automatically looks up a record in `disk` with the key from `voldisk`.

```
!file 1 voldisk !xfile 2
disk key = v_title

 print u_volume,u_title,u_
 from
```

Here are the first few lines of output:

```
0 ATTR_CHG     WAGGONER, ROLAND T.
0 BOOTSPLIT     KREIDER, CARL R.
0 DDIR      SEATON, WM. GLENN
0 DLIST      KREIDER, CARL R.
0 DOCGEN3   KALEITA, DAVID L.
```

Sculptor works with up to 16 databases per program. Six can be open at a time. Relationships can be set up between all of the different databases in any way you choose!

```
!file disk

!temp tabit,,i2

print "***** Title: ";u_title;" From: ";u_from;tab(8Ø);
print "Size: ";u_size;" Ver: ";u_ver;" Lang: ";u_language;
print " Format: ";u_format;tab(16Ø);
scroll 1 LOOP\
if u_function = "" then goto END_LOOP
tabit=16Ø+(scrline*8Ø)
print u_function;tab(tabit);
scroll
if scrline < 4 then goto LOOP END_LOOP\
print "Program Type: ";u_type;" Vol: ";u_volume;
print " Used? ";u_used
end
```

Figure 2

The listing: `Dsort`

```
*******************************************************
*
* DSORT  -  COPYRIGHT (c) 1987 by S.B.GOLDBERG
*
* Use: dsort [directory]
*      Omit directory name for current directory
*
* Produces sorted disk directories of up to 25Ø
* filenames.
*
         ifp1
         use   /dØ/defs/os9defs
         endc
*
         mod   len,name,prgrm+objct,reent+1,entry,dsiz
*
```

Goldberg's Dsort

This month we feature some more of Stephen Goldberg's fine assembly language code. *Dsort* will sort your directories in alphabetical order. It is a short program that will quickly sort and consolidate up to 250 filenames in a directory.

Since *Dsort* is an ASCII sort, if you maintain the OS-9 convention of using uppercase for subdirectories and lowercase for filenames, the sorted directory will list all the subdirectories at the top. To use this program, type `Dsort` followed by the name or pathlist of the directory you want to sort. If you omit the directory name, the program will sort your current working directory.

That's it for March. Enjoy *Multi-Vue* and we'll see you next month with more tips and code. □

NRI Hands-On Training With an IBM PC Compatible Plus 20 Meg Hard Disk

GET THE KNOW-HOW TO SERVICE EVERY COMPUTER ON THIS PAGE

IBM is a Registered Trademark of IBM Corporation.

Epson is a Registered Trademark of Epson America, Inc.

Apple and the Apple logo are Registered Trademarks of Apple Computer, Inc.

Compac is a Registered Trademark of COMPAQ Computer Corporation.

©1985 AT&T Technologies, Inc.

Learn the Basics the NRI Way—and Earn Good Money Troubleshooting Any Brand of Computer

The Department of Labor ranks computer service high on its list of top growth fields, with accelerated demand creating more than 30,000 *new* jobs within the next 10 years.

You can cash in on this opportunity—either as a full-time corporate technician or an independent service-person —once you've learned all the basics of computers the NRI way. NRI's practical combination of "reason-why" theory and "hands-on" building skills starts you with the fundamentals of electronics, then guides you through advanced electronic circuitry and on into computer electronics. You also learn to program in BASIC and machine language, the essential languages for troubleshooting and repair.

Total Computer Systems Training, Only From NRI

No computer stands alone . . . it's part of a total system. To really service computers, you have to understand computer *systems.* And only NRI includes a powerful computer system as part of your training, centered around the new, fully IBM-compatible Sanyo 880 Series computer.

You start with the step-by-step assembly of your Sanyo 880 computer. You build and test the "intelligent" keyboard, install the power supply and 5¼" floppy disk drive, and interface the high-resolution monitor. But that's not all. You go on to install a powerful 20 megabyte hard disk drive—today's most-wanted computer peripheral, now included as part of your total systems training.

With your computer now up and running, you're ready to use the valuable software that completes your total computer system.

No Experience Needed, NRI Builds It In

You get practical, hands-on experience that gives you the skills you need for success. You learn in your own home. No classroom pressures, no night school, no need to quit your present job until you're ready to make your move.

Your training is backed up by your personal NRI instructor and the NRI technical staff, ready to help you when you need it. You get it all from NRI!

Free 100-Page Catalog Tells More

Send the coupon today for NRI's big, 100-page, color catalog on NRI's electronics training, which gives you all the facts about NRI courses in Microcomputers, Robotics, Data Communications, TV/Video/Audio Servicing, and other growing high-tech career fields. If the reply coupon is missing, write to the address below.

NRI Schools, McGraw-Hill Continuing Education Center, 3939 Wisconsin Avenue, Washington, D.C. 20016.

AND MORE!

Your NRI course includes: the IBM PC compatible Sanyo 880 computer with 256K RAM • high-resolution monitor • 360K, 5¼" floppy disk drive • 20 meg hard disk drive • "intelligent" keyboard • NRI Discovery Lab for circuit design, tests • digital multimeter • digital logic probe • GW-BASIC, MS-DOS, WordStar, CalcStar software—and more.

SEND COUPON TODAY FOR FREE NRI CATALOG!

NRI SCHOOLS
McGraw-Hill Continuing Education Center
3939 Wisconsin Avenue, NW, Washington, DC 20016

205-038

For Career courses approved under GI Bill ☐ check for details.

☑ CHECK ONE FREE CATALOG ONLY

- ☐ Computer Electronics
- ☐ TV/Video/Audio Servicing
- ☐ Robotics
- ☐ Electronic Music Technology
- ☐ Satellite Electronics
- ☐ Digital Electronic Servicing
- ☐ Electronic Design Technology
- ☐ Industrial Electronics
- ☐ Communications Electronics
- ☐ Basic Electronics
- ☐ Bookkeeping and Accounting
- ☐ Building Construction
- ☐ Automotive Servicing
- ☐ Air Conditioning, Heating & Refrigeration
- ☐ Small Engine Repair
- ☐ Electrician
- ☐ Locksmithing & Electronic Security
- ☐ Travel Careers
- ☐ Telephone Servicing
- ☐ Paralegal

Name (Please print) Age

Street

City/State/Zip **We'll give you tomorrow.** Accredited by the National Home Study Council 000-000

Submitting Material To Rainbow

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

WHAT TO WRITE: We are interested in what you may wish to tell our readers. We accept for consideration anything that is well-written and has a practical application for the Tandy Color Computer. If it interests you, it will probably interest lots of others. However, we vastly prefer articles with accompanying programs which can be entered and run. The more unique the idea, the more the appeal. We have a continuing need for short articles with short listings. These are especially appealing to our many beginners.

FORMAT: Program submissions must be on tape or disk, and it is best to make several saves, at least one of them in ASCII format. We're sorry, but we do not have time to key in programs and debug our typing errors. All programs should be supported by some editorial commentary explaining how the program works. We also prefer that editorial copy be included on the tape or disk using any of the word processors currently available for the Color Computer. Also, please include a double-spaced printout of your editorial material and program listing. Do not send text in all capital letters; use upper- and lowercase.

COMPENSATION: We do pay for submissions, based on a number of criteria. Those wishing renumeration should *so state* when making submissions.

For the benefit of those who wish more detailed information on making submissions, please send a self-addressed, stamped envelope (SASE) to: Submission Guidelines, THE RAINBOW, The Falsoft Building, P.O. Box 385, Prospect, KY 40059. We will send you comprehensive guidelines.

Please do not submit material currently submitted to another publication.

```
path      rmb   1    I/O path number
pointer   rmb   2    filename pointer
pointer2  rmb   2    comparison pointer
buffer    rmb   8ØØØ   directory buffer
          rmb   2ØØ    stack
          rmb   2ØØ    parameter
dsiz      equ   .
*
name      fcs   /dsort/
          fcb   1    edition number
          fcc   /(c)1987 S.B.Goldberg/
current   fcs   /./    current directory
**********************************
*
* OPEN DIRECTORY
*
entry     decb  parameter?
          bne   open    yes, open directory
          leax  <current,pcr    no, current directory
open      lda   #updat.+dir.    update directory mode
          os9   i$open    open directory
          bcs   pass    exit with error
          sta   path    save path number
          bsr   skipdots    omit directory and parent
**********************************
*
* GET DIRECTORY ENTRIES
*
          leax  buffer,u    directory buffer
getentry  clr   ,x    end of buffer marker
          ldy   #32    length of entry
reread    os9   i$read    get entry
          bcs   error    branch on error
          tst   ,x    deleted file?
          beq   reread    yes, get next entry
          tfr   x,y    buffer pointer
endloop   ldb   ,y+    end of name?
          bpl   endloop    no, look some more
          andb  #%Ø1111111    clear ms bit
          stb   -1,y    return to filename
          clr   ,y    end of name marker
          leax  32,x    bump pointer
          bra   getentry    get next entry
*
skipdots  pshs  u    save 'U' register
          ldx   #Ø
          ldu   #64
          os9   i$seek    skip first 2 entries
pass      bcs   out    exit with error
          puls  u    retrieve 'U' register
          rts   return
*
error     cmpb  #e$eof    end of file?
          bne   out    exit with other error
          bsr   skipdots    reset directory pointer
**********************************
*
* SORT DIRECTORY ENTRIES
*
```

```
sort     leax  buffer,u   buffer address
sort1    stx   pointer    save filename pointer
         leay  32,x    comparison filename
sort2    lda   ,x    first filename character
         beq   setend    end of sort
         bpl   sort4    not sorted, continue
sort3    tfr   y,x    already sorted
         bra   sort1    try again
sort4    tst   ,y    end of buffer?
         beq   output    yes, put in directory
         cmpa  ,y    compare
         bhi   sort3    no match, continue sort
         blo   lower2    no match, continue sort
         sty   pointer2    save comparison pointer
compare  lda   ,x+    filename character
         beq   lower    end of filename
         cmpa  ,y+    compare
         beq   compare    same look again
         blo   lower    no match, continue sort
         ldx   pointer2    new filename pointer
         bra   sort1    continue sort
lower    ldx   pointer    retrieve pointers
         ldy   pointer2
lower2   leay  32,y    new comparison
         bra   sort2    try again
**********************************
*
* OUTPUT SORTED ENTRIES
*
output   tfr   x,y    filename pointer
fixloop  ldd   ,y+    filename characters
         tstb   end of name?
         bne   fixloop    no, look some more
         ora   #%10000000    set ms bit
         sta   -1,y    return to filename
         lda   path    path number
         ldy   #32    length of entry
         os9   i$write    entry to directory
         bcs   out    exit with error
com      com   ,x    set sorted indicator
         bpl   com    do again if not set
         bra   sort    continue sort
**********************************
*
* TERMINATE DIRECTORY
*
setend   lda   path    path number
         ldb   #ss.pos    file pointer function
         os9   i$getstt    get pointer position
         bcs   out    exit with error
         ldb   #ss.size    file size function
         os9   i$setstt    set eof at pointer
         bcs   out    exit with error
         clrb   clear error
out      os9   f$exit    quit
*
         emod
len      equ   *
         end
```

About The One-Liner Contest . . .

THE RAINBOW's One-Liner Contest has now been expanded to include programs of either one or two lines. This means a new dimension and new opportunity for those who have "really neat" programs that simply just won't fit in one line.

Here are the guidelines: The program *must* work in Extended BASIC, have only one or two line numbers and be entirely self-contained — no loading other programs, no calling ROM routines, no poked-in machine language code. The program has to run when typed in directly (since that's how our readers will use it). Make sure your line, or lines, aren't packed so tightly that the program won't list completely. Finally, any instructions needed should be *very* short.

Send your entry (preferably on cassette or disk) to:

THE RAINBOW
One-Liner Contest
P.O. Box 385
Prospect, KY 40059

Racksellers

The retail stores listed below carry THE RAINBOW on a regular basis and may have other products of interest to Tandy Color Computer users. We suggest you patronize those in your area.

ALABAMA
- Birmingham — Jefferson News Co.
- Brewton — McDowell Electronics
- Florence — Anderson News Co.
- Greenville — M & B Electronics
- Madison — Madison Books
- Montgomery — Trade 'N' Books
- Tuscaloosa — Injun John's, Inc.

ALASKA
- Fairbanks — Electronic World

ARIZONA
- Cottonwood — A & W Graphics Co.
- Lake Havasu City — Book Nook
- Phoenix — TRI-TEK Computers
- Sierra Vista — Livingston's Books
- Tempe — Books, Etc.
- Tempe — Computer Library
- Tucson — Anderson News Co.

ARKANSAS
- Fayetteville — Vaughn Electronics/Radio Shack
- Ft. Smith — Hot Off the Press Newsstand
- Little Rock — Anderson News Co.

CALIFORNIA
- Berkeley — Lyon Enterprises
- Citrus Heights — Software Plus
- Grass Valley — Advance Radio, Inc.
- Half Moon Bay — Strawflower Electronics
- Hollywood — Levity Distributors
- Hollywood — Stef-Jen, Inc.
- La Jolla — Butler & Mayes Booksellers
- Los Angeles — Circus of Books (2 Locations)
- Marysville — Bookland
- Napa — Bookends Bookstore
- Oakland — DeLauer's News Agency
- Sacramento — Deibert's Readerama
- Sacramento — Tower Magazine
- San Francisco — Booksmith
- San Francisco — Bookworks
- San Francisco — Castro Kiosk
- Santa Monica — Midnight Special Bookstore
- San Jose — Computer Literacy Bookshops
- Santa Rosa — Sawyer's News, Inc.
- Stockton — Harding Way News
- Stockton — Paperbacks Unlimited
- Sunnyvale — Computer Literacy
- Torrance — El Camino College Bookstore

COLORADO
- Aurora — Aurora Newsstand
- Colorado Springs — Hathaway's
- Denver — News Gallery
- Glenwood Springs — The Book Train
- Grand Junction — Readmore Book & Magazine
- Longmont — City Newsstand

DELAWARE
- Middletown — Delmar Co.
- Milford — Milford News Stand
- Newark — Newark Newsstand
- Wilmington — Normar, Inc.—The Smoke Shop

DISTRICT OF COLUMBIA
- Washington, DC — Chronichles
- Washington, DC — News Room
- Washington, DC — World News, Inc.

FLORIDA
- Boca Raton — Great American Book Co.
- Boca Raton — Software, Software, Inc.
- Clearwater — The Avid Reader
- Cocoa — The Open Door
- Dania — Dania News & Books
- Davie — Software Plus More
- Ft. Lauderdale — Bob's News & Book-Store
- Ft. Lauderdale — Clarks Out of Town News
- Ft. Lauderdale — Mike's Electronics Distributor
- Gainesville — Paper Chase
- Jacksonville — Book Co.
- Jacksonville — The Book Nook
- Jacksonville — White's of Downtown Bookstore
- North Miami Beach — Almar Bookstore
- Panama City — Boyd-Ebert Corp.
- Pensacola — Anderson News Co.
- Pinellas Park — Wolf's Newsstand
- South Pasadena — Poling Place Bookstore
- Starke — Record Junction, Inc.
- Starke — Radio Shack Dealer
- Sunrise — Sunny's at Sunset

FLORIDA (cont'd)
- Tallahassee — Anderson News Co.
- Tallahassee — DuBey's News Center
- Titusville — Computrac

GEORGIA
- Atlanta — Border's
- Bremen — Bremen Electronics/Radio Shack
- Forest Park — Ellers News Center
- Jesup — Radio Shack
- Marietta — Act One Video
- Thomasville — Smokehouse Newsstand
- Toccoa — Martin Music Radio Shack

IDAHO
- Boise — Book Shelf, Inc.
- Moscow — Johnson News Agency

ILLINOIS
- Belleville — Software or Systems
- Champaign — Bookmark
- Chicago — B. Dalton Booksellers
- Decatur — Book Emporium
- Decatur — K-Mart Plaza
- Decatur — Northgate Mall
- East Moline — Book Emporium
- Evanston — Norris Center Bookstore
- Kewanee — Book Emporium
- Lisle — Book Nook
- Lombard — Empire Periodicals
- Newton — Bill's TV Radio Shack
- Paris — Book Emporium
- Peoria — Book Emporium
- Peoria — Sheridan Village
- Peoria — Westlake Shopping Center
- Peoria — Illinois News Service
- Springfield — Book Emporium
- Springfield — Sangamon Center North
- Springfield — Town & Country Shopping Ctr.
- Sunnyland — Book Emporium
- West Frankfort — Paper Place
- Wheeling — North Shore Distributors

INDIANA
- Angola — D & D Electronics
- Angola — Radio Shack
- Berne — White Cottage Electronics
- Bloomington — Book Corner
- Columbus — Micro Computer Systems, Inc.
- Crawfordsville — Koch's Books
- Dyer — Miles Books
- Franklin — Gallery Book Shop
- Garrett — Finn News Agency, Inc.
- Indianapolis — Bookland, Inc.
- Indianapolis — Borders Bookshop
- Indianapolis — Delmar News
- Indianapolis — Indiana News
- Indianapolis — Southside News
- Lebanon — Gallery Book Shop
- Martinsville — Radio Shack
- Wabash — Mitting's Electronics

IOWA
- Davenport — Interstate Book Store
- Des Moines — Thackery's Books, Inc.
- Fairfield — Kramers Books & Gifts
- Ottumwa — Southside Drug

KANSAS
- Hutchinson — Crossroads, Inc.
- Topeka — Palmer News, Inc.
- Topeka — Town Crier of Topeka, Inc.
- Wellington — Dandy's/Radio Shack Dealer
- Wichita — Amateur Radio Equipment Co.
- Wichita — Lloyd's Radio

KENTUCKY
- Hazard — Daniel Boone Gulf Mart
- Henderson — Matt's News & Gifts
- Hopkinsville — Hobby Shop
- Louisville — Hawley-Cooke Booksellers (2 Locations)
- Paducah — Radio Shack

LOUISIANA
- Baton Rouge — City News Stand
- New Orleans — Sidney's News Stand Uptown
- Monroe — The Book Rack

MAINE
- Bangor — Magazines, Inc.
- Brockton — Voyager Bookstore
- Caribou — Radio Shack
- Oxford — Books-N-Things
- Sanford — Radio Shack

MARYLAND
- College Park — University Bookstore

MASSACHUSETTS
- Boston — Eastern Newsstand

MASSACHUSETTS (cont'd)
- Brockton — Voyager Bookstore
- Cambridge — Out Of Town News
- Ipswich — Ipswich News
- Littleton — Computer Plus
- Lynn — North Shore News Co.
- Swansea — Newsbreak, Inc.

MICHIGAN
- Allen Park — Book Nook, Inc.
- Birmingham — Border's Book Shop
- Durand — Robbins Electronics
- E. Detroit — Merit Book Center
- Harrison — Harrison Radio Shack
- Hillsdale — Electronics Express/Radio Shack
- Holland — Fris News Company
- Howell — Howell Auto Parts
- Lowell — Curt's Sound & Home Arcade Center
- Muskegon — The Eight Bit Corner
- Perry — Perry Computers
- Riverview — Riverview Book Store
- Roseville — New Horizons Book Shop

MINNESOTA
- Burnsville — Shinder's Burnsville
- Crystal — Shinder's Crystal Gallery
- Duluth — Carlson Books
- Edina — Shinder's Leisure Lane
- Minneapolis — Shinder's (2 Locations)
- Minnetonka — Shinder's Ridge Square
- Roseville — Shinder's Roseville
- St. Paul — Shinder's Annex
- St. Paul — Shinder's Maplewood
- St. Paul — Shinder's St. Pauls
- Willmar — The Photo Shop

MISSOURI
- Farmington — Ray's TV & Radio Shack
- Flat River — Ray's TV & Radio Shack
- Florissant — Book Brokers Unlimited
- Jefferson City — Cowley Distributing
- Kirksville — T&R Electronics
- Moberly — Audio Hut
- St. Louis — Book Emporium
- St. Robert — Bailey's TV & Radio

MONTANA
- Butte — Plaza Books
- Whitefish — Consumer Electronics of Whitefish

NEBRASKA
- Lincoln — Nebraska Bookstore
- Omaha — Nelson News

NEVADA
- Carson City — Bookcellar
- Las Vegas — Hurley Electronics
- Las Vegas — Steve's Books & Magazines

NEW HAMPSHIRE
- Keene — Radio Shack Associate Store
- Manchester — Bookwrights
- West Lebanon — Verham News Corp.

NEW JERSEY
- Atlantic City — Atlantic City News Agency
- Cedar Knolls — Village Computer & Software
- Clinton — Micro World II
- Marmora — Outpost Radio Shack
- Pennsville — Dave's Elect. Radio Shack
- Rockaway — Software Station

NEW MEXICO
- Alamogordo — New Horizons Computer Systems
- Albuquerque — Front Page Newsstand
- Albuquerque — Page One Newsstand
- Santa Fe — Downtown Subscription

NEW YORK
- Amherst — Village Green-Buffalo Books
- Brockport — Lift Bridge Book Shop, Inc.
- Brooklyn — Cromland, Inc.
- Elmira Heights — Southern Tier News Co., Inc.
- Fredonia — On Line: Computer Access Center
- Hudson Falls — G.A. West & Co.
- Huntington — Oscar's Bookshop
- Johnson City — Unicorn Electronics
- New York — Barnes & Noble—Sales Annex
- New York — Coliseum Books
- New York — Eastern Newsstand
- New York — Grand Central Station, Track 37
- New York — 200 Park Ave., (Pan Am #1)
- New York — 55 Water Street
- New York — World Trade Center #2
- New York — First Stop News
- New York — Idle Hours Bookstore
- New York — International Smoke Shop
- New York — Jonil Smoke
- New York — Penn Book
- New York — Software City

NEW YORK (cont'd)

	State News
	Walden Books
	World Wide Media Services
Pawling	Universal Computer Service
Rochester	Village Green
	World Wide News
Woodhaven	Spectrum Projects

NORTH CAROLINA

Cary	News Center in Cary Village
Chapel Hill	University News & Sundry
Charlotte	Newsstand Int'l
	Papers & Paperback
Havlock	Computer Plus
Hickory	C^2 Books & Comics
Jacksonville	Michele's, Inc.
Kernersville	K & S Newsstand
Marion	Boomers Rhythm Center
Winston-Salem	K & S Newsstand (3 Locations)
	Rainbow News Ltd.

OHIO

Akron	Churchill News & Tobacco
Blanchester	JR Computer Control
Canton	Little Professor Book Center
Chardon	Thrasher Radio & TV
Cincinnati	Cinsoft
Cleveland	Erieview News
Columbiana	Fidelity Sound & Electronics
Columbus	B5 Software
	Micro Center
	The Newsstand
Dayton	Books & Co.
	Huber Heights Book & Card
	Wilke News
	Wright News & Books
Dublin	Book Barn
Fairborn	News-Readers
	Wilke's University Shoppe
Findley	Open Book
Kent	The News Shop
Lakewood	Lakewood International News
Lima	Edu-Caterers
Miamisburg	Wilke News
Parma	Bookmark Newscenter
Toledo	Leo's Book & Wine Shop
Warren	Book Nook, Inc.
Xenia	Fine Print Books
Youngstown	Plaza Book & Smoke Shop

OKLAHOMA

Oklahoma City	Merit Micro Software
Taklequah	Thomas Sales, Inc. dba Radio Shack
Tulsa	Steve's Book Store

OREGON

Eugene	Libra Books — Book Mark
Portland	Fifth Avenue News
	Rich Cigar Store, Inc.
	Sixth & Washington News
Salem	Capitol News Center
	Checkmate Book

PENNSYLVANIA

Allentown	Owl Services
Altoona	Newborn Enterprises
Bryn Mawr	Bryn Mawr News
Feasterville	Global Books
King of Prussia	Gene's Books
Malvern	Personal Software
Phoenixville	Stevens Radio Shack
Reading	Smith's News & Card Center
Temple	Software Corner
West Chester	Chester County Book Co.
Wind Gap	Micro World
York	The Computer Center of York
	Tollgate Bookstore

RHODE ISLAND

Newport	Bellevue News
Warwick	Software Connection

SOUTH CAROLINA

Charleston Hts.	Software Haus, Inc.
Clemson	Clemson Newsstand
Florence	Ray's #1
Greenville	Palmetto News Co.
Spartanburg	Software City
Union	Fleming's Electronics

TENNESSEE

Brentwood	Bookworld #5
Chattanooga	Anderson News Co.
	Guild Books & Periodicals
Dickson	Highland Electronics
Knoxville	Anderson News Co.
	Davis-Kidd Bookseller
Memphis	Computer Center

TENNESSEE (cont'd)

Nashville	Davis-Kidd Booksellers
	Mosko's Place
	R.M. Mills Bookstore
Smyrna	Delker Electronics

TEXAS

Big Spring	Poncho's News
Brenham	Moore's Electronics
Desoto	Maxwell Books
Elgin	The Homing Pigeon
Harlington	Book Mark

UTAH

Provo	Valley Book Center

VIRGINIA

Danville	K & S Newsstand
Hampton	Benders
Norfolk	I-O Computers
	Turn The Page
Richmond	Volume I Bookstore

WASHINGTON

Port Angeles	Port Book & News
Seattle	Adams News Co., Inc.
	Bulldog News
Tacoma	B & I Magazines & Books
	Nybbles 'N Bytes

WEST VIRGINIA

Huntington	Nick's News
Logan	Stan's Electronics & Radio Shack
Madison	Communications, LTD
Parkersburg	Valley News Service
South Charleston	Spring Hill News

WISCONSIN

Appleton	Badger Periodicals
Cudahy	Cudahy News & Hobby
Kenosha	R.K. News, Inc.
Madison	Pic A Book
	University Bookstore
Milwaukee	Juneau Village Reader
Racine	Little Professor Book Center
Waukesha	Holt Variety

ARGENTINA

Cordoba	Information Telecommunicationes

AUSTRALIA

Blaxland	Blaxland Computers
Kingsford	Paris Radio Electronics

CANADA:

ALBERTA

Banff	Banff Radio Shack
Blairmore	L & K Sports & Music
Bonnyville	Paul Tercier
Brooks	Double "D" A.S.C. Radio Shack
Calgary	Billy's News
Claresholm	Radio Shack Associated Stores
Drayton Valley	Langard Electronics
Edmonton	CMD Micro
Edson	Radio Shack, asd
Fairview	D.N.R. Furniture & TV
Fox Creek	Fox City Color & Sound
	A.S.C. Radio Shack
Ft. Saskatchewan	Ft. Mall Radio Shack, ASC
Grande Cache	The Stereo Hut
Grande Centre	The Book Nook
Hinton	Jim Cooper
Innisfail	L & S Stereo
Lecombe	Brian's Electronics
Leduc	Radio Shack Associated Stores
Lethbridge	Datatron
Lloydminster	Lloyd Radio Shack
Okotoks	Okotoks Radio Shack
Peace River	Radio Shack Associated Stores
	Tavener Software
St. Paul	Walter's Electronics
Stettler	Stettler Radio Shack

ALBERTA (cont'd)

Strathmore	Wheatland Electronics
Taber	Pynewood Sight & Sound
Westlock	Westlock Stereo
Wetaskiwin	Radio Shack

BRITISH COLUMBIA

Burnaby	Compulit
Burns Lake	VT. Video Works
Campbell River	TRS Electronics
Chilliwack	Charles Parker
Coortenay	Rick's Music & Stereo
Dawson Creek	Bell Radio & TV
Golden	Taks Home Furnishings
Kelowna	Telesoft Marketing
Langley	Langley Radio Shack
N. Vancouver	Microwest Distributors
Nelson	Oliver's Books
Parksville	Parksville TV
Penticton	D.J.'s
	Four Corner Grocery
Sidney	Sidney Electronics
Smithers	Wall's Home Furniture
Squamish	Kotyk Electronics
100 Mile House	Tip Top Radio & TV

MANITOBA

Altona	L.A. Wiebr Ltd.
Lundar	Goranson Elec.
Morden	Central Sound
The Pas	Jodi's Sight & Sound
Selkirk	G.L. Enns Elec.
Virden	Archer Enterprises
Winnipeg	J & J Electronics Ltd.

NEW BRUNSWICK

Moncton	Jeffries Enterprises
Sussex	Dewitt Elec.

NEWFOUNDLAND

Botwood	Seaport Elec.
Carbonear	Slade Realties

NOVA SCOTIA

Halifax	Atlantic News

ONTARIO

Angus	Micro Computer Services
Aurora	Compu Vision
Concord	Ingram Software
Exceter	J. Macleane & Sons
Hanover	Modern Appliance Centre
Huntsville	Huntsville Elec.
Kenora	Donny "B"
Kingston	T.M. Computers
Listowel	Modern Appliance Centre
South River	Max TV
	Dennis TV

QUEBEC

LaSalle	Messageries de Presse Benjamin Enr.
Pont. Rouge	Boutique Bruno Laroche
Ville St. Gabriel	Gilles Corneau Enr/Radio Shack

SASKATCHEWAN

Assiniboia	Telstar News
Estevan	Kotyk Electronics
Moose Jaw	D&S Computer Place
Nipiwan	Cornerstone Sound
Regina	Regina CoCo Club
	Software Supermarket
Saskatoon	Everybody's Software Library
Shellbrooke	Gec. Laberge Radio Shack
Tisdale	Paul's Service
Unity	Grant's House of Sound

YUKON

Whitehorse	H & O Holdings

JAPAN

Tokyo	America Ado, Inc.

PUERTO RICO

San Juan	Software City

Also available at all B. Dalton Booksellers, and selected Coles — in Canada, Waldenbooks, Pickwick Books, Encore Books, Barnes & Noble, Little Professors, Tower Book & Records, Kroch's & Brentano's, and Community Newscenters.

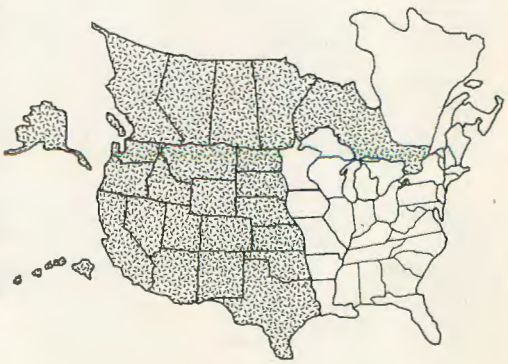
Advertisers Index

We encourage you to patronize our advertisers — all of whom support the Tandy Color Computer. We will appreciate your mentioning* THE RAINBOW *when you contact these firms.

After Five Software.....131
Alpha Products 21
Burke & Burke 173
Cer-Comp 141, 143
Cinsoft 115
CJN Enterprises 88
Clearbrook Software Group.....119
CNR Engineering 71
CoCo Cat Anti-drug 65
Cognitec 29
Colorware.....22, 23
Computer Center 39
Computer Island 193
Computer Plus.....3
Computerware.....77
CY-BURNET-ICS 145
D.P. Johnson 181
Dayton Associates of W. R. Hall, Inc. 136, 137
Delphi 106, 107
Diecom.....IFC, IBC
Disto/CRC 185
Dorsett.....17
E.Ż. Friendly Software.....45
Federal Hill Software 85
Frank Hogg Laboratory 63, 125
Gimmesoft 83
Glenn Calafati 113
Hard Drive Specialists.....161
Hawkes Research Services.....119
Howard Medical 66, 194
ICR Futuresoft.....41
K—SOFT.....109
Metric Industries 57
Micro Works, The 117
Microcom Software ...9, 11, 13, 15
Microtech Consultants Inc. 81
MicroWorld.....103
NRI 187
Other Guys CoCo, The 127
Owl-Ware 151, 152, 153
Performance Peripherals 135
Perry Computers.....183
Preble's Programs, Dr.....BC
Public Domain 177
PXE Computing 7
R.A.D. Products.....115
R.G.B. Computer Systems 97
R.J.F. Software 113
Rainbow Binder.....56
Rainbow Bookshelf 120, 121
Rainbow Gift Subscription.....116
Rainbow on Tape and Disk 99
RAINBOWfest 34, 35
Saint Johns Gallery 111
Sardis Technologies 175
SD Enterprises 46, 67
Soft-Byte 95
Software House, The 95
SpectroSystems 109
Speech Systems 50, 51, 52, 53
Sugar Software 163
Sundog Systems.....155
T & D Software.....30, 31, 47
Tandy/Radio Shack 58, 59
Tepco 133
Three C's Projects 62
Tom Mix Software 149
Tothian Software, Inc.....145
True Data Products 178, 179
Vidicom Corporation 101
Wasatchware 97
Woodstown Electronics 173
York 10.....165
Zebra Systems.....87

☒ **Call:**
Belinda Kirby
Advertising Representative
The Falsoft Building
9509 U.S. Highway 42
P.O. Box 385
Prospect, KY 40059
(502) 228-4497

☐ **Call:**
Kim Vincent
Advertising Representative
The Falsoft Building
9509 U.S. Highway 42
P.O. Box 385
Prospect, KY 40059
(502) 228-4492



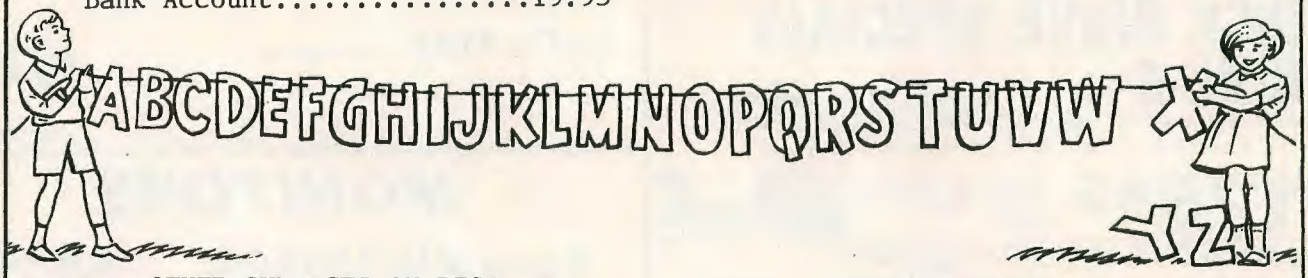
Computer Island BULLETIN BOARD

MATH ON DISK

Add Fractions	$19.95
Subtract Fractions	19.95
Multiply Fractions	19.95
Trigonometry Tutor	19.95
Linear Equations	19.95
Quadratic Equations	19.95
Number Sequences	19.95
Signed Numbers	19.95
Binary Dice Game	19.95
Moneypack	19.95
Distance Problems	19.95
Comparison Shopping	19.95
Sales & Bargains	19.95
Bank Account	19.95

LANGUAGE ARTS ON DISK

Beyond Words 1	$19.95
Beyond Words 2	19.95
Beyond Words 3	19.95
Vocabulary Builders 1	19.95
Vocabulary Builders 2	19.95
Vocabulary Builders 3	19.95
Cloze Exercises 3,4,5,6,or 7	19.95
Punctuation Practice	19.95
Story Details 2-3 or 4-5	19.95
Drawing Conclusions 3-4	19.95
Drawing Conclusions 5-6	19.95
Context Clues Gr. 2-3	19.95
Context Clues Gr. 4,5,6,or 7	19.95



OTHER SUBJECTS ON DISK

Explorers & Settlers	$19.95
Famous American Women	19.95
Street Map Game	19.95
States & Capitals	19.95
Know Your States	19.95
History Game	19.95
Chemistry Tutor	24.95
Science Game	24.95
Color Computer Literacy	19.95
French Baseball	19.95
Spanish Baseball	19.95

GAMES ON DISK

The Pond	$29.95
The Factory	29.95
Teasers By Tobbs	29.95
Wheel of Fortune	19.95
Wheel (Coco3/RGB)	19.95
Pegs (Coco3/RGB)	19.95
Name Flag (Coco3/RGB)	19.95
First Games	24.95
Arrow Games	21.95
Mr. Cocohead	19.95
Preschool 1,2, & 3	24.95

TAKE ADVANTAGE OF MOST DISKS AT TAPE PRICES.
LIMITED TIME ONLY. GOOD UNTIL APRIL 15,1988

RAINBOW CERTIFICATION SEAL

Computer Island

(718) 948-2748 Evenings after 7:00 PM EST

VISA

Dept. R,227 Hampton Green, Staten Island, N.Y. 10312

MasterCard

Send for catalog with complete descriptions.

Please add $1.00 per order for postage. N.Y. residents, please add proper tax. FREE set of BINARY DICE, including full directions, with orders of 2 or more items.

Dealer Inquiries Invited. TRS-80 Color Computer **All Payments in U.S. Funds.**

Corporate/School: FAX Order Number (312) 278-9513

DISK CONTROLLER — NEW FROM J&M

The DC-4 is a scaled-down version of the popular DC-2 without a parallel port. It includes a switch with 2 ROM sockets, JDOS, manual and such features as gold connectors and metal box. It accesses double sided drives and accepts RSDOS 1.1 for Radio Shack compatability.

$65 DC-4 with memory minder ($2 shipping)

RS DOS ROM CHIP

ROM chip fits inside disk controller. 24 pin fits both J&M and RS controller Release 1.1. For CoCo 3 Compatability.

$25 each Reg. $40 ($2 shipping)

DISK DRIVE SPECIALS

DRIVE 0 +

Howards Drive 0 gives you a DD-3 MPI drive, a CA-1 cable and a J&M DC-4 Disk Controller for only. Add $34 for a Disto DC-3 replacement. ($5 shipping)

$178.45 DOUBLE SIDED DOUBLE DENSITY 360K

Separate Disk Drive Components

DD-3 An MPI 52 double-sided, double density, 360K disk drive in a full height case and heavy-duty power supply.

$98 ($2 shipping) **DRIVE ONE**

TEAC T-3 ½ height, double sided, double density, 720K bare drive, includes all mounting hardware.

NEW $159 ($2 shipping)

TEAC 55B bare drive, ½ height, double-sided, double density with all mounting hardware, needs CA-2 below to fit R.S. 501.

$118 ($2 shipping) **BARE**

SP-C

Serial to parallel converter converts the CoCo 4 pin serial output to run a parallel printer like Star or Epson. Includes all cables. Add $10 for modem attachment.

($2 shipping) **$68.45**

CA-1 Cable that connects the disk controller to the drive.

$24.95 One Drive

CA-2 $29.95 Two Drive

GUARANTEE — Howard Medical's 30-day guarantee is meant to eliminate the uncertainty of dealing with a company through the mail. Once you receive our hardware, try it out, test it for compatibility. If you're not happy with it for any reason, return it in 30 days and we'll give you your money back (less shipping).

EPSON

LX-800 $239

Friction and tractor feed included
160 CPS
3K Buffer
NLQ on front buttons
Package includes free SP-C serial to parallel converter and Epson tutorial on disk.

Star NX-10 Only $238

FREE SP-C serial to parallel converter while supplies last ($5 shipping)

WORD PACK RS — $49

BASIC SCREEN EDITOR — $19.95

- Full documentation
- Works on CoCo 1, 2 & 3
- Add lines without renumbering

MYDOS by Chris Hawks — $15

- Simplify your directory
- Accesses double sided drives
- Use J&M on CoCo 3

CoCo MAX by Colorware — $78.45

- Specify II or III
- Includes high res interface
- Animation
- Printers supported include, R.S. 105, 106, 130: Star: & Epson

($2 shipping on software)

MONITORS

Sony KV-1311CR — $449

Regular $625 ($15 shipping)

- Vivid Color
- Vertically flat 13" screen
- Monitor/Trinitron TV with remote control
- 640 X 240 resolution at 15MHZ .37 mm Dot pitch
- RGB analog & digital; TTL; and composite inputs
- VCR inputs
- Cable to CoCo 3 $36

MAGNAVOX 7622 — $88

12" Amber Screen offers 900 dots x 350 lines resolution at 20 MHz on a dark glass anti-glare CRT with built-in audio and 1 year warranty.

7652 Green Screen • Same Specs • Same Price

HARD DRIVE

- 20,000,000 Bytes
- equivalent to 125 R.S. 501's on line
- micro stepping heads have 15 position per track
- automatic temperature compensation realigns head every five minutes for trouble free reads and writes
- will also work with IBM & clones
- complete package includes 20 meg drive, case & power supply, controller, and interface that plugs into slot #3 of multipack interface.
- 1 year warranty

$699.00 (5 ship)

BASIC driver lets you access this hard drive without need for OS-9 $49.95.

Howard Medical Computers 1690 N. Elston Chicago, IL 60622

ORDERS (800) 443-1444

INQUIRIES AND ORDER STATUS (312) 278-1440

Showroom Hours:
8:00 5:00 Mon Fri.
10:00 3:00 Sat.

WE ACCEPT VISA • MASTERCARD • AMERICAN EXPRESS
C.O.D. OR CHECKS • SCHOOL P.O.'S

Shipping charges are for 48 states. APO and Canada order slightly higher.

DIECOM PRODUCTS INC.

MISSION: RUSH'N ASSAULT

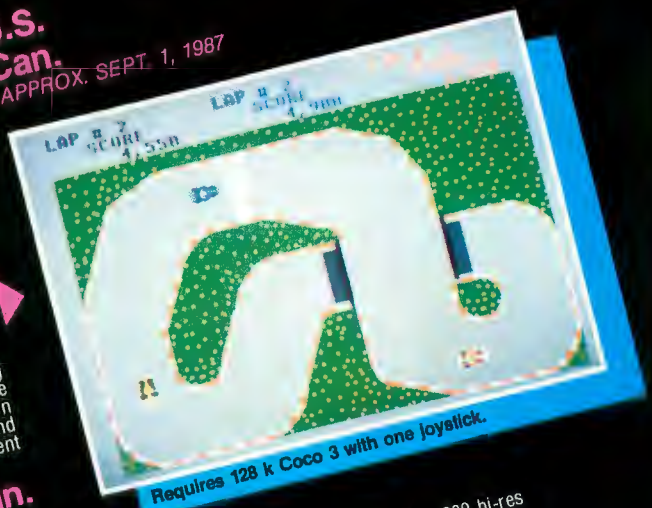
Requires 64 k and one joystick. For the Coco 1, 2 or 3

One or two players can take on the mission to rescue POW'S hidden deep inside enemy territory. Watch out for enemy soldiers, snipers, grenade launchers and many other hazards as you journey farther over enemy lines. Forge your way through jungles and swamps and other hazardous terrain as you search for the missing soldiers. Pick up grenades, extra ammo and more powerful weapons as you continue farther into your mission. The enemy is out in great force to stop your mission. Dozens of screens will keep you playing for hours. Can you succeed and rescue the prisoners? Only time will tell!

Tape or Disk **$28.95 U.S.** **$38.95 Can.**

AVAILABLE APPROX. SEPT. 1, 1987

GRANDPRIX CHALLENGE



Requires 128 k Coco 3 with one joystick.

Race alone against the computer, or with a friend against the computer in this high speed racing game. You compete in 5 lap races around twisting and turning race courses. Finish the race ahead of all the computer cars and you will progress to a more challenging course. Collect repair tools as you race around the track and you will be able to increase the speed and handling of your race car. But watch out for oil slicks and water puddles on the track or you might find your car crashing into a wall. Detailed 320 × 200 graphics and realistic driving conditions make this a must for your Coco 3 collection. Many different race tracks will keep you challenged.

Tape or Disk **$28.95 U.S** **$38.95 Can.**

AVAILABLE APPROX. SEPT. 1, 1987

GANTELET II

Requires 128 k Coco 3

It's back and better than ever. It's Gantelet II for your Coco 3. Using 320 × 200 hi-res graphics with 16 colors, we have created one of the best arcade style games you will ever see for your Coco. Four people can now play simultaneously in one game. Dozens of new levels with new monsters will challenge even the best players. Collect keys to open doors and chests, treasures, and many new magic potions to help you battle more powerful monsters. Watch out for hidden traps as you search for the exit to next level.

Tape or Disk **$28.95 U.S.** **$38.95 Can.** AVAILABLE APPROX. SEPT. 1, 1987

CALADURIL FLAME OF LIGHT ▼ LANSFORD MANSION

For the Coco 1, 2 or 3

NEW LOW PRICE ON CALADURIL FLAME OF LIGHT & LANSFORD MANSION, AVAILABLE ON DISK ONLY **$28.95 U.S.** **$38.95 Can.**

ALSO AVAILABLE: MISSION: F-16 ASSAULT • PAPER ROUTE • KNOCK OUT • KARATE • MARBLE MAZE

$28.95 U.S.
$38.95 CAN.
AVAILABLE ON TAPE OR DISK
64K REQUIRED

DIECOM PRODUCTS INC.
6715 FIFTH LINE, MILTON, ONT., CANADA L9T 2X8

We accept: VISA MasterCard
cheque or money order

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

Please add $2 for shipping & handling. Ontario residents add 7% sales tax. C.O.D. Canada only. Dealer inquiries invited. Looking for new software.

SEE FRONT COVER FOR OTHER DIECOM GAMES

New from DR. PREBLE'S PROGRAMS

Introducing PYRAMIX

For your Color Computer 3 !

Product of ColorVenture

PYRAMIX is a 100% machine language game written exclusively to take advantage of all the power in your 128K CoCo 3. The colors are brilliant, the graphics sharp, the action hot.

PYRAMIX features the finest in animation, graphics, sound effects and game play available today. It has all the extras you want, too, such as a pause option, RGB and CMP modes, keyboard or joystick play, help screen, multiple skill level, and the ability to backup your disk.

Best of all is the low price! Available today, for only **$24.95 on disk + s/h!**

. . . And Lightning Strikes!

LIGHTNING RAM DISK is the most versatile RAM disk for your **512K** Color Computer 3! LIGHTNING RAM DISK will allow you to use up to 4 mechanical drives and 2 RAM drives simultaneously for a total of 6 Drives! This RAM DISK will also work simultaneously with our amazing LIGHTNING PRINTER SPOOLER! **$19.95 on disk + s/h.**

LIGHTNING PRINTER SPOOLER for the **128K or 512K** Color Computer 3. Multitask your computer! Dump more than 400K of text to the spooler "instantly." Then, continue your keyboard work while it all prints out! Also compatible with our LIGHTNING RAM DISK above. **$14.95 on disk + s/h.**

LIGHTNING BACKUP utility for your **512K** Color Computer 3 reads your master disk once and then makes superfast multiple disk backups on all your drives! No need to format blank disks. Supports 35, 40 or 80 tracks, double or single sided disks and adjustable step rate. **$14.95 on disk + s/h.**

Order all 3 for only $44.95 · s/h

DR. PREBLE'S PROGRAMS SINCE 1983

Dr. Preble's Prescriptions

BASIC FREEDOM! No one wants to be chained down. And yet, if you type in BASIC programs, you have been subject to involuntary servitude! The culprit? BASIC's limited EDIT command.

Demand Your BASIC FREEDOM! Programmed by Chris BabCock for ColorVenture, this software gives you a **full screen editor** for typing in and editing BASIC programs! Move the cursor anywhere on the screen. Insert, delete or add text. It's the same concept as in a word processor, except you never have to leave BASIC! BASIC FREEDOM is an invisible machine language program which you can turn on and off at will. Even pressing RESET will not hurt your BASIC FREEDDOM! Simple, yet powerful with an easy to read manual. Many extra "nice touches" included, like KEY REPEAT and LOWERCASE INTERPRETER which lets you type BASIC commands in upper or lower case for ease of programming. Translation to uppercase is automatic for commands. Text in quotes is not affected.

For CoCo 1, 2, or 3!

SPECIAL COCO 3 VERSION lets you work in 32, 40, or 80 column display modes. A separate version is available for the CoCo 1 and 2. Available on disk for $24.95 + s/h.

MENTAL FREEDOM by Dr. Preble! IMAGINE! Some day, a computer so advanced that it responds to your very thoughts and emotions. Imagine, some day, **thought-controlled** graphics: levitation and materialization! **PLUG IN YOUR MIND and UNHOOK YOUR JOYSTICKS**—that day is now! The Radio Shack Color Computer has many advanced capabilities, just waiting to be tapped. Dr. Preble's Programs combines the advanced technology of the CoCo with the amazing **Radio Shack Biofeedback Monitor** to bring you **"Mental Freedom."**

For CoCo 2 or 3

THOUGHT-CONTROLLED VIDEO CHALLENGE? Unlike any video game you have ever played, our Thoughtware tests your ability to handle stress, to remain calm under adverse circumstances. **LIGHTNING FAST** reflexes will do you no good here, unless you first tame the fickle dragon of your mind. **Are you the secretely nervous type?** Many people can keep a "Poker Face" even when they are worried so that others may not notice; but can you really stop the worry itself? Find out with **Mental Freedom!**

AND IT TALKS! Did you know that the CoCo can produce incredibly realistic digital speech without a special speech synthesizer? The voice quality is so good, it sounds human! Honest. Best of all, no extra hardware is needed for speech, just some clever programming by Dr. Preble.

MENTAL FREEDOM – Next time your friends ask what your computer can do, show them **Dr Preble's Thoughtware!** Requires Radio Shack's Biofeedback Monitor Catalogue #63-675. **Mental Freedom** – DISK only $24.95 + s/h

New!

Vocal Freedom!

512K Digital Voice Recorder for your CoCo 1, 2, or 3!

High Quality Voice Without Synthesizer!

Vocal Freedom lets you . . .

* Record voice or any sound into RAM
* Record and playback at 2 speeds
* Save and Load voice to disk
* Select normal or high fidelity
* Record more than 2 minutes of speech if you have a 512K CoCo 3
* Fully compatible with CoCo 1 and 2
* Features **Sound Activated Playback.** Messages will playback automatically for your family when any noise is made. Could also scare off prowlers.

Vocal Freedom includes special cable. Requires only a low cost amplifier (RS cat. #277-1008) and any microphone.

On Disk, only **$39.95 + s/h**

Extra . . . Hacker's Pac!

Incorporate digitally recorded voices or sound into your own programs. Requires **Vocal Freedom**, above.

On disk, only **$14.95 + s/h**

VDOS, the UnDISK: Save multiple programs in memory. Or save multiple graphic pictures in memory. Works with or without a disk. Let's you SAVE, LOAD and KILL stored programs or graphics. DIRECTORY function lists files, gives the start, end and execution addresses of machine language programs and number of free bytes remaining. Own a RAM disk without buying a disk drive! Requires 64K CoCo 1 or 2. Available on tape or disk for $24.95 + shipping/handling.

For CoCo 1 or 2

VDUMP, for the UnDISK: Backup all your UnDISK files to a single tape file for easy reloading A must for VDOS users! On tape for $14.95 + shipping/handling.

VPRINT, for the UnDISK: Paper printout for UnDISK Directory. On tape, $9.95 + shipping/handling.

Disk Directory Dazzler

Dress up your Disk Directory with colorful messages and borders. Create useful help messages. Add that professional touch to your creations! Only $9.95

For CoCo 1, 2 or 3!

CoCoBraille

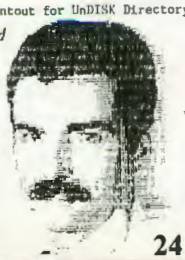
Emboss Grade 1 or Grade 2 Braille using your CoCo 1, 2 or 3 and a Brother Daisy Wheel printer! Fast Print to Braille conversion algorithm converts word processor files, program listings and data files into **touch readable Braille.** For use by the blind or the sighted. **No knowledge of the Braille code is necessary.** Just send print to the program and out comes Braille! Note: The complex Grade 2 conversion is very good and though not always perfect, quite readable. Requires 64K or more. Brother HR series printer or the IF-50 interface series required. Low Cost! Similar software costs 3 times as much. Only

$19.95 + s/h

Check, money order, Mastercard Visa or C.O.D. For Shipping in U.S.A. or Canada add $2.50, to other Countries, add $5.00.

VISA MasterCard

Check. Money Order or COD



Order From
Dr. Preble's Programs
6540 Outer Loop
Louisville, KY 40228
(502) 969-1818
24 HOUR ORDER LINE

℞ For Intellectual Stimulation CoCo Programs, T.I.D.