

June 1985

CND 34.25

U.S. \$3.95

Just for your
TANDY
COLOR COMPUTER

The

RAINBOW®

THE COLOR COMPUTER MONTHLY MAGAZINE

MICRONOME!

Our Sounds and Music Issue

Learn the Ivory Keyboard
Store Your Voice in RAM,
and
Play It Again, SAM Chip

Games!

Launch a Chopper Assault
Make the Martian Dance
Name that Song, and
Play Hi-Q

Projects!

Wireless Joysticks and
A CoCo Chronograph

Page 6 MOCAL

Graphics!

Get Serious with Animatic, then
Send in the Clowns



More Than Two Dozen Software
and Hardware Reviews Inside

G. BLUMEN

P51 Mustang Attack Flight Simulator

THE LATEST IN SIMULATION



Coco through Modem
through
Modem to CoCo
Modem or Hard Wired via
Cable Available Separately



JUST IMAGINE! Your movements are shown at any remote CoCo across town or across the country. It's hard to believe it's simulation.

Experience the ultimate video experience.

For the first time ever, two computers can be linked together with action and reaction at either location, or play alone.

The P-51 Mustang was the attack workhorse during WWII. To experience the flight of this beautiful plane in actual combat

situation will give many hours of excitement. You can test your skill against the computer to defend

your position or try your hand competing against your opponent at any remote location. Two CoCo's can be linked

by cable for **TRUE** two players adventure. With the use of a modem you can test your skill across town or across the country!! This program is another first from Tom Mix Software. Order your excitement today. Direct connect cable available separately when two computers are used at the same location.



From Takeoff to Landing



Actual Attack Screen View

32K Machine Language

Tape \$29.95

Disk \$34.95

Cable \$10.95



TOM MIX SOFTWARE

4285 BRADFORD N.E.
GRAND RAPIDS, MI 49506

• ADD \$2.50 POSTAGE & HANDLING • (CANADA ADD \$3.00) •

• MICHIGAN RESIDENTS ADD 4% SALES TAX •

LOOKING FOR NEW SOFTWARE

TOP ROALITIES PAID

(616) 957-0444



WRITE FOR FREE CATALOGUE - MOST OF OUR INVENTORY IS NOT SHOWN HERE!

From Computer Plus to YOU...

PLUS after PLUS after PLUS



Tandy 200 24K \$ 739.00
Model 100 8K \$ 339
Model 100 24K \$ 510



Color Computer II
w/16K Ext. Basic \$ 135
w/64K Ext. Basic \$ 179



Tandy 1000 \$999
Tandy 1200 \$2195



Smith Corona L-1000
\$ 259



Color Computer Disk Drive
Drive 0 \$ 279 Drive 1 \$ 169



DMP105 \$ 160

BIG SAVINGS ON A FULL COMPLEMENT OF RADIO SHACK COMPUTER PRODUCTS

COMPUTERS

Tandy 1000 1 Drive 128K	999.00
Tandy 1200 10 Meg. 256K	2195.00
Tandy 2000 2 Drive 256K	2100.00
Model IV Portable 64K	970.00
Model IV Desktop 64K	970.00

PRINTERS

Radio Shack DWP-105	160.00
Radio Shack DMP-110	299.00
Radio Shack DMP-430	660.00
Radio Shack CGP-220	545.00
Silver Reed EXP-550 Daisy Wheel	430.00
Star SG-10	245.00
Star Powertype Daisy Wheel	345.00
Panasonic P-1091	295.00
CITOH Prowriter 8510AP	320.00
CITOH 7500	230.00
Okidata and Epson	CALL

MODEMS

Radio Shack DCM-3 Modem	52.00
Radio Shack DC Modem IB	89.00
Radio Shack DC Modem II	160.00
Radio Shack DC Modem 2212	315.00
Hayes Smartmodem II	215.00

COLOR COMPUTER MISC.

Radio Shack Drive Controller	119.00
Extended Basic Rom Kit	39.95
64K Ram Upgrade Kit	49.00
Radio Shack Deluxe Keyboard Kit	35.95
HJL Keyboard Upgrade Kit	79.95
Botek Serial to Parallel Conv.	69.95
Radio Shack CCR-81 Recorder	52.00
Radio Shack Joysticks (pair)	22.00
Amdek Color 300 Monitor	265.00
Amdek Video 300 Green Monitor	145.00
Amdek Video 300 Amber Monitor	159.00
Taxan Color 220 Monitor	245.00
Taxan 115 Green Monitor	125.00
Taxan 116 Amber Monitor	129.00
Radio Shack VM-2 Green Monitor	139.00
Computerware Video Plus IIC	34.95
Mark Data Universal Video Driver	29.95

COLOR COMPUTER SOFTWARE

	TAPE	DISK
The Sailor Man	29.95	34.95
Worlds Of Flight	29.95	32.95
Mustang P-51 Flight Simul.	29.95	34.95
Spectral Space Pack	49.95	53.95
Spectral Adventure Pack	24.95	27.95

Spectral Typing Tutor	19.95	22.95
Major Istar	24.95	27.95
Sam Slueth Private Eye	24.95	27.95
Mark Data Graphic Adven.	24.95	27.95
Graphicom (disk only)		29.95
COCO Max by Colorware	69.95	69.95
Color ComE (rom)	49.95	49.95
AutoTerm by PXE Computing	39.95	49.95
Key-264K by Key Color	39.95	44.95
TeleWriter 64	49.95	59.95
Delft Pascal Workbench		119.00
Pro Color File Enhanced 2.0		59.95
Elite Calc	69.95	69.95
Elite Word	69.95	69.95
Elite File (disk only)		74.50
DynaCalc (disk only)		99.95
VIP Writer (tape & disk)		69.95
VIP Calc (tape & disk)		69.95
VIP Terminal (tape & disk)		49.95
VIP Integrated Library (disk)		149.95

Order any 2 software pieces listed and take 10% off their listed price. All Radio Shack software 10% off list. Send for complete list.

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

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



computer plus

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

SINCE 1973

IN MASSACHUSETTS CALL (617) 486-3193

Under The RAINBOW



28



113



130

Cover art by Jerry McKiernan
copyright© 1985 by Falsoft Inc.

— The small cassette tape symbols beside features and regular columns indicate that the program listings with those articles are on this month's RAINBOW ON TAPE, ready to CLORD and RUN. For full details, check our RAINBOW ON TAPE ad on Page 248.

FEATURES

- **Multo Of Mars/Richard Ramella** _____ 18
GAME *Learn your multiplication*
- **Chopper Assault/Jens Petersen** _____ 28
GAME *Prevent enemy agents from spying on you*
- **Analog-To-Digital And Back Again/Jeremy Spiller** _____ 36
SOUND SYNTHESIS *Program your voice into memory*
- **Simplifying The SOUND Command/William R. White** _____ 42
TUTORIAL *Saving keystrokes and memory*
- **Animatic: Automatic Animation/Rita Sabo** _____ 58
GRAPHICS *Ease the unwieldy task of writing animated graphics*
- **Send In The Clowns/Daryl Judd** _____ 80
GRAPHICS *A simple program with a tune to match*
- **CoCo Chronograph/Colin J. Stearman** _____ 83
HARDWARE PROJECT *Add a real-time clock to CoCo*
- **Piano Note Tutor/Ron Mix** _____ 92
MUSIC *Learn the ivory keyboard*
- **Hi-Q/Daryl Judd** _____ 99
GAME *Granny's peg-game challenge*
- **Wireless Joysticks/J.O. Shaver** _____ 105
HARDWARE PROJECT *Play games with no wires attached*
- **Super-Disk Charger/Dennis Bironas** _____ 113
DISK UTILITY *Puts the "turbo" in your drives*
- **More Patches For EDTASM/W.C. Clements, Jr.** _____ 124
DISK UTILITY *Modifications for fixing the FCC bug*
- **Chopin's Minute Waltz/Eugene Vasconi** _____ 130
MUSIC *Chopin makes the CoCo top 10*
- **Name That Song/Mel Richardson** _____ 163
MUSIC GAME *Test your music and memory skills*

NEXT MONTH: A red-letter issue! Join us in July for our Fourth Anniversary Jubilee. We'll spark some fireworks with "The Ultimate Program" — a tribute to some superlatives of humankind by the talented Bob Tyson. Our birthday issue will also include Bob and Dan Delbourgo with graphics, Dennis Weide with a BASIC program for loading ML listings without an editor/assembler, and Jorge Mir will present a helpful tutorial on using the ECB statement INSTR. Colin Stearman will put you "on the right track" by showing how to make use of all 40 or 80 tracks on your disk drive, and make CoCo use both sides of a double-sided drive. Pace yourself with a rapid reading program, learn the rules of soccer with Soccer Instructor, and for the Fourth of July, we'll celebrate with a Musicfest program of traditional patriotic songs.

Along with other useful features, including a complete index to the past year of RAINBOW, there'll be our usual array of games, reviews and other anniversary surprises. Don't miss THE RAINBOW for more information on the CoCo than is available anywhere else!

COLUMNS

[-] BASIC Training/Joseph Kolar _____	158
<i>Getting better acquainted with the DRAW statement</i>	
Bits And Bytes Of BASIC/Richard White _____	238
<i>Spreadsheet application for home economics</i>	
Building June's Rainbow/Jim Reed _____	16
<i>Managing Editor's comments</i>	
[-] Byte Master/R. Bartly Betts _____	138
<i>Some antidote for the assembly language blues</i>	
Earth To Ed/Ed Ellers _____	156
<i>Beam up those "tech" questions</i>	
[-] Education Notes/Steve Blyn _____	45
<i>A serendipitous learning experience</i>	
Education Overview/Michael Plog, Ph.D. _____	55
<i>News items on educational computing</i>	
GameMaster's Apprentice/George Firedrake and Karl Albrecht _____	148
<i>Role playing games are effective learning tools</i>	
PRINT#-2/Lawrence C. Falk _____	12
<i>Editor's notes</i>	
[-] School Is In The Heart Of A Child/Bob Albrecht and Ramon Zamora _____	229
<i>Wandering Star learns to PEEK</i>	
Turn Of The Screw/Tony DiStefano _____	144
<i>How to follow a memory map</i>	
[-] Wishing Well/Fred Scerbo _____	152
<i>The world's easiest database</i>	

RAINBOWTECH

Downloads/Dan Downard _____	246
<i>Answers to your technical questions</i>	
KISSable OS-9/Dale L. Puckett _____	252
<i>News, hints and answers</i>	
MAIL09/Timothy A. Harris _____	249
<i>A database for keeping track of personal and business mailing lists</i>	

Dan Eastham's "Personable Pascal" will return next month.

DEPARTMENTS

Advertiser Index _____	272	Reviewing Reviews _____	190
Back Issue Information _____	267	Scoreboard _____	180
CoCo Gallery _____	178	Scoreboard Pointers _____	182
Corrections _____	226	Submitting Material	
Letters To Rainbow _____	6	To Rainbow _____	204
The Pipeline _____	120	Subscription Information _____	207
Rainbow Info _____	129	These Fine Stores _____	270
Received And Certified _____	188		

PRODUCT REVIEWS

Product Review Contents _____	185
--------------------------------------	-----

RAINBOW

June 1985

Vol. IV No. 11

Editor and Publisher
Lawrence C. Falk

Managing Editor James E. Reed
Senior Editor Courtney Noe
Technical Editor Dan Downard
Submissions Editor Jutta Kapfhammer
Copy Editor Tamara Dunn

Reviews Editor Monica Dorth
Editorial Assistants Jody Doyle, Wendy Falk, Debbie Hartley, Judi Hutchinson, Angela Kapfhammer, Belinda Kirby, Suzanne Benish Kurowsky, Shirley Morgan, Kevin Nickols

Technical Assistant Ed Ellers

Contributing Editors Bob Albrecht, R. Bartly Betts, Steve Blyn, R. Wayne Day, Tony DiStefano, Dan Eastham, Frank Hogg, Joseph Kolar, Michael Plog, Dale Puckett, Paul Searby, Fred Scerbo, Richard White

Art Director Sally Gellhaus

Assistant Art Director Jerry McKiernan

Designers Heidi Maxadon, Eileen O'Malley, Kevin Quiggins

Advertising Coordinator Doris Taylor

Advertising Representative Kate Tucci

Advertising Assistant Debbie Baxter
(502) 228-4492

General Manager Patricia H. Hirsch

Asst. General Manager for Finance Donna Shuck

Bookkeeper Diane Moore

Advertising Accounts Beverly Taylor

Dealer Accounts Judy Quashnock

Administrative Assistant to the Publisher
Marianne Booth

Manager of Public Relations

Charles L. Springer

RAINBOWest Site Management Willo Falk

Director of Fulfillment Services Bonnie Shepard

Asst. Customer Service Manager Deldra Henry

Customer Service Representative Sandy Apple

Word Processor Manager Lynda Wilson

RAINBOW ON TAPE Subscriptions Monica Wheat

Research Assistants Laurie Falk, Debbie Leake, Loretta Varda

Dispatch Janice Eastburn

Production Assistant Melba Smith

For RAINBOW Advertising and Marketing Office information, see Page 272

THE RAINBOW is published every month of the year by FALSOFT, Inc., 9529 U.S. Highway 42, P.O. Box 385, Prospect, KY, 40059. Phone (502) 228-4492. THE RAINBOW and THE RAINBOW logotypes are ® 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 © by FALSOFT, Inc., 1985. 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.

TRS-80, Color BASIC, Extended Color BASIC, Scriptit and Program Pak are ® trademarks of the Tandy Corp. CompuServe is a ® trademark of CompuServe Inc.

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 which are in print and costs. Payment accepted by VISA, MasterCard, American Express, Cash, Check or Money Order in U.S. currency only.

LETTERS TO THE RAINBOW

'Return' Envelope

Editor:

First, a quick note to Dale Reed ("Letters To Rainbow," March 1985) . . . Instead of retyping a program like his *No Ghosts* (or if he just wants to run it before *CSAVE*ing it to check it out), just type `POKE 65494,0` in direct mode to return CoCo to normal speed.

I am a beginning "CoCo-nut" and feel good that I can pass on some of my self-taught knowledge. RAINBOW has been a blessing in my quest for CoCo knowledge!

Second, I am saving to buy a printer. I'd love to hear from anyone with comments on printers — advice on which ones to consider, which ones to avoid, best deals, etc. Also, does anyone have any old, unobtainable issues of RAINBOW they would like to share or sell? Please write to me at 964 Rt. 518, 08558.

Finally, I cannot resist commenting on Mr. Bungay's winning sexist "Envelope Of The Month" [March 1985, Page 9]. Since his envelope was a "winner" am I to assume RAINBOW's attitude as a whole is also sexist? Please take note of my envelope in response to this. I do not claim to be an artist, however, I think my point is well made. I resisted the temptation to portray an angry-looking husband while his wife paid more attention to THE RAINBOW than to him!

Judy Leo
Skillman, NJ

Editor's Note: See the article by Ed Eilers in the May 1985 Printers Issue of THE RAINBOW, Page 178 for a comparison on printers. Also the May 1984 issue has an article by Tom Nelson, "A Primer On Printers," Page 288.



HINTS AND TIPS

Editor:

I notice a disclaimer concerning the Dragon computer on the RAINBOW ON TAPE order form. Mark Randall, in California, has a program that used to be sold by Tano that will convert about 95 percent of THE RAINBOW programs for Dragon use. You will find Mark listed from time to time in your BBS section under Color America in Covina, Calif. Since I have three CoCos and three Dragons, I find it very useful.

Ray Chase
Studio City, CA

DEFAULT DEFLECTION

Editor:

CoCo Max is by far the best graphics program on the market for the Color Computer, but I found that its exclusive use of the default extension /MAX limited the use of graphics pictures developed on other programs such as *Graphicom*, *Micropainter*, etc.

By using the following pokes, you can change the default extension to /BIN. Before using the pokes, it is recommended that a backup be made. Add these pokes to the BASIC loader.

```
POKE &H570B,&H42:
POKE &H570C,&H49:
POKE &H6900,&H49:
POKE &H6901,&H4E:
POKE &H6989,&H42
```

R.S. Gilmer
Miami, FL

TWO POKES TO COMPATIBILITY

Editor:

I thought some of your readers might be interested in a couple of pokes to make the older *Teletwriter-64* compatible with Disk 1.1 BASIC.

I recently had to replace my Disk 1.0 ROM with Disk 1.1 ROM and found my version of *Teletwriter* would no longer work. I disassembled the program and found where it called Disk 1.0 BASIC. I then found the proper address it should call with Disk 1.1 BASIC. Here are two pokes which will modify *Teletwriter* to call the correct routine for Disk 1.1 BASIC.

```
POKE &H22E1,&HCA:
POKE &H22E2,&H67
```

These could be included in the BASIC loader program after it loads the *TW64/BIN* file or the binary file could be permanently modified by loading it, typing in the pokes directly and saving it. The start, end and execute addresses are &H1E28, &H40EB and &H1E28, respectively.

R.D. Smith
Eugene, OR

THE '?' IS THE ANSWER

Editor:

I entered the *MoCalc* spreadsheet program from the April 1984 [Page 186] issue of RAINBOW, and found it a valuable addition to my software library. Mr. Whitton's addition to it in the April 1985 issue ["Letters To Rainbow," Page 6] prompted me to write you with my enhancement.

I have found it annoying, after not using a particular program for a period of time, to forget the commands needed to utilize the program. The result is to frantically search for the article in past issues.

I have attempted to remedy this situation in *MoCalc*. By pressing '?', the function keys will be displayed on the screen for viewing. By pressing 'U' (update), the original spreadsheet is returned to the screen.

```
255 IFL$=CHR$(63) THEN 1500
1500 PRINT@99,"CELL ENTRY <G>
      X,Y
1510 PRINT@131,"FUNCTION ENTRY
      <F> X,Y
1520 PRINT@163,"FUNCTION VIEW
      <V>
1530 PRINT@195,"MOVE ML,
      MR,MU,MD
1540 PRINT@259,"SAVE-LOAD <S>
      <L>
1550 PRINT@291,"PRINT <P>
1560 PRINT@452,"PRESS <ENTER>
      TO CONTINUE";:EXEC&HA171
1570 GOTO 170
```

I hope this addition will be of use to other *MoCalc* users.

Michael S. Kovach
Lakeview, NY

FIRST CHARACTERS FIRST

Editor:

Here is a short program to correct the printer routine in 1.1 BASIC, which causes

the first character in a line to be missed occasionally.

```
10 DATA 52,4,214,111,43,3,53,4,
57,246,255,34,84,37,250,53,4,57
20 L=2H01DA "STORED IN CASSETTE
BUFFER
30 FOR I=1TO10:READ A:POKE
L,A:L=L+1:NEXT
40 POKE 360,1:POKE 361,210
```

This routine checks to see if the printer is ready before a character is sent. Just add this routine to the beginning of your programs that use printer output, and those first characters will be in front.

*Jerry Graham
Clovis, NM*

BEATING THE SOCKS OFF PRINTER CONTROL CODES

Editor:

Please pass along a big *thank you* to Roland Portillo, March 1985 RAINBOW ["Home Financial Statement," Page 87]. His article gave me something no other author has done: He included what his printer control codes were for and where in the program they could be found. This beats the socks off the rest of the programs I have tried to figure out; in fact, unless you have access to many printer manuals, it's impossible!

Recently I acquired an Olivetti Jet Ink Printer — it's good so far, but if anyone else out there has one and is having as much fun as I did pulling the control codes out of its manual, I sympathize. It took me two days of solid digging and a royal flash of intuition to get them (I think).

If anyone wants those control codes, please write me at 3123 - 138 Street SE, 98012.

*Christine Terrio
Bothell, WA*

INFORMATION PLEASE

Editor:

If I upgrade to 128K, will I be able to get more memory for games such as *The Trip* (August 1984 RAINBOW)? If I play it for more than an hour I end up with an OM Error and a ?MEM reveals 300 + - 100.

*Jay Thomas
Great Falls, MT*

Editor's Note: We haven't seen any software for expanding BASIC with 128K as of this time, but expect something to show up in the near future. As 128K modes are fairly recent, it will take a little time for software to evolve.

MACHINE LANGUAGE TRANSFORMER?

Editor:

I have been receiving your magazine for about a year now and I, like so many others, think it is the best.

I was wondering if there was a compiler for the CoCo that, instead of turning BASIC into machine language, would turn machine language into BASIC, either in BASIC code or in data. Is there such a thing? Anyone with an answer can reach me at 5473 Cardinal Road, 54124.

*Paul MacArthur
Gillett, WI*

Editor's Note: We know of no such program, other than a disassembler, which converts machine code to assembly language.

Editor:

I have just recently subscribed to your magazine. I love it! But there is one problem. I don't understand the double-check listing before each program. I was wondering if it might help me in correcting my programs. Thanks for the help.

*David Brown
Joplin, MO*

Editor's Note: See "Rainbow Info" on Page 129 of this issue for an explanation of the Rainbow Check Plus.

PMODE 4 SCREEN DUMP

Editor:

I have a 64K CoCo 2 and a DMP-110 printer. I want to know if you know of a short graphics screen dump for the PMODE 4.

*Brad Williams
Springfield, IL*

Editor's Note: Radio Shack sells a screen dump program called *BWDUMP* (Cat. No. 26-3121).

COMMUNITY CHOICE

Editor:

I am an avid RAINBOW fan. Recently, RAINBOW has carried a number of advertisers marketing video digitizers that convert TV camera signals to a Hi-Res CoCo screen. Considering the three versions carried in January: DS-69 by Micro Works, *Graphicom* by Computize and *VIDX* by GRAFX, which of these have been endorsed by the CoCo community? Have you seen any in operation? Are they easy to connect to a standard video camera?

*James McDermott
Tyler, TX*

Editor's Note: All of the digitizers you mentioned were on display at RAINBOWfest-Irvine and, as they are reviewed, we will try to distinguish between them. The DS-69 by Micro Works is used by several other programs, but since these devices are of recent design we'll have to see which stands the test of time with the community.

ROM PAK SWITCHER

Editor:

I have been an avid reader of THE RAINBOW for several years now and eagerly

await each month's issue. There is one problem I have that someone may be able to help with.

Some of my programs are incompatible with Disk BASIC (especially Radio Shack's programs for kids). But with two young children that I want to have hands-on experience, removing and inserting the disk ROM Pak is a bit of a chore for them. It would seem to me that a switch could be wired into the ROM Pak that could enable/disable the Disk BASIC ROM. Maybe one of my fellow readers can come up with a way to do this.

*David B. Lamon
Yuba City, CA*

Editor's Note: Sounds like a job for Clay Howe. For starters, check his "Color BASIC ROM Switcher" article in the April 1985 RAINBOW, Page 98.

Editor:

I am a subscriber to RAINBOW and RAINBOW ON TAPE. I have a 64K Color Computer with two disk drives.

I am looking for a financial statement program that will list stocks and bonds, IRAs, mutual funds, savings account, check book balances, real estate holdings, cars, etc.

I am looking for something I could enter all of my assets and liabilities, keep them updated and print results on my DMP-200 printer.

*Sam Cerami
Fort Lee, NJ*

Editor's Note: We suggest you see our Business and Finance issues of RAINBOW, March 1984 and 1985.

SEPARATING THE AMATEURS FROM THE PROFESSIONALS

Editor:

Your Simulation contest grand prize winner, Christopher Pfeifer, is indeed a winner! I read his article on the program *Surface* and was thoroughly impressed with the detail and clarity in which it was written. I feel he is no longer in a class of amateurs but now rivals the professionals.

Is it possible to purchase the game *Surface* on tape?

*Val Buncich
Cloquet, MN*

Editor's Note: *Surface* is available on RAINBOW ON TAPE. You can use the order form on the insert card between pages 34 and 35 of this issue.

16K ADVENTURE GENERATOR

Editor:

I was wondering if anyone knows where I can get an Adventure generator for a 16K standard BASIC computer. If anyone can help me, write to 560 Adamsville Road, 16134.

*Adam Benedict
Jamestown, PA*

Editor:

My wife and I have been reading your magazine for two years and we love it. Our only complaint is we don't have enough time to do everything in THE RAINBOW. We recently started receiving RAINBOW ON TAPE so we have more time to use each program.

We would like to know if anyone has adapted the "CoCo Season's Greeting Cards" program, by Francis Kalinowski in the December 1984 issue to run on a Radio Shack DMP-200 printer. You can write to us at 1433 S. 78th Street, 53214.

My wife just entered the talking math program from the February 1985 issue ["Let CoCo Talk You Into A Better Education," Page 118]; we both enjoyed it a lot and would like to see more talking programs.

Has RAINBOW a BBS or are you thinking of starting one? We think it would be a good idea to transfer media.

Thanks very much for a great magazine.
*Pat and Rob Brick
West Allis, WI*

Editor's Note: While we have no BBS, nor any immediate plans to create one, that prospect is under consideration.

COMMENTS, PLEASE

Editor:

I am a new subscriber to THE RAINBOW, but rest assured that as long as I have my CoCo, I shall remain on your subscription list. RAINBOW is the best Color Computer magazine around. Keep up the good work!

I would appreciate any comments from readers who got a firsthand look at the CoCo Max at the RAINBOWfest. Write me at 1706 Lakewood Road S., Edmonton, T6K 3H5.

*Azim Premji
Alberta, Canada*

BOUQUETS

Editor:

I would like to publicly thank Custom Software Engineering Inc. for their patience and good service. They cleared my confusion about one of their ads and they gladly helped me get what I wanted. I hope all CoCo product companies follow their example. Thanks, guys!

*Jorge E. Montes
Oklahoma City, OK*

NOW THAT'S SERVICE!

Editor:

I'd like to present one perfect rose to Michael Norman of KRT Software.

I purchased a used copy of their F-16 instrument flight simulator through a classified ad from a third party as a present for my son. The tape sent to me was physically damaged and wouldn't load.

Although it was no fault of KRT, and in spite of giving birth to a 10 pound baby

boy, Mrs. Norman still replaced the tape at no cost to me.

*Allan B. Klar
Summer, WA*

PRINTER PROBLEM

Editor:

I have owned and used a Gemini printer for some time and recently purchased a new one, called the 10X PC. Upon hooking the new printer up and using it, I discovered that Gemini had deleted the italics set from the printer's character set!

To some, this may seem to be a petty complaint but, when you already have so many files set up with a word processing program (such as *Telewriter-64* or *VIP-Writer*) that contain the italics, it is *real* disappointing to purchase a new printer only to find that it does not do what the *old* printer did!

Otherwise, the Gemini-10X PC is as capable and great as anyone could ask for.

*Mark Hardee
Memphis, TN*

Editor's Note: The Gemini-10X PC was a special version of the 10X made for use with IBM PC. The regular 10X continues to have italics.

CONTEST GROUPE

Editor:

Being the novice CoCo user that I am, I would like to say that I am very excited again this year about RAINBOW's Adventure contest. The best part is that it gives novices and intermediates like me a chance not only to get a program published, but possibly to earn a prize. Keep the contest coming every year, please!

*Tim Lehmann
Manhattan, KS*

KUDOS

Editor:

You guys do it to me every time — or am I doing it to myself? I let my subscription lapse because I got tired of your writers forgetting that some of us are not interested in becoming Ph.D.s of programming. There are those of us who are very happy just working with BASIC. Not everyone is interested in moving on to machine language, PASCAL, OS-9, etc.

What I am trying to say is some of us are just having fun at a lower level. This doesn't mean we don't have a good grasp of computer technology, so please don't forget us.

Your magazine is really super. I promise not to let my subscription expire again.

My system is used for tax record keeping for my job (airline pilot) and management

of rental properties. Also, it is tied into my ham radio for RTTY, CW, etc. The article in February 1985, WEFAX [Page 42] was very interesting. I hope you are going to print the changes to it for Radio Shack printers.

Again, thanks for a very good magazine for the CoCo.

*Alfred R. Genola
Pittsburgh, PA*

Editor's Note: If you have access to CompuServe, GO PCS 126 to enter the Color SIG and check the various help files to see how to download for the Radio Shack printers.

CLUBS, CLUBS, CLUBS

Editor:

If anyone is looking for a new CoCo club just for ages 5-16, here is the place to look. We won't have meetings, but will have a newsletter that will go out about every month. In it we'll have contests, programs and helpful hints on Adventures. You, the members, can submit these things. For more information please send a SASE to The CoCo Club, 11 Regal Drive, 07067.

*Derrick Kardos
Colonia, NJ*

Editor:

There is a new CoCo users group that meets at the Mercer County Main Branch Library on Rt. 1 in Lawrenceville. We meet on the first Wednesday of each month at 7 p.m. We discuss anything and everything from CoCo programming to communications with the CoCo, graphics to music, operating systems to hardware. We also try to arrange guest speakers each month.

For more information call The CoCo Enterprise BBS System at (609) 448-7768 or The Tardis BBS at (609) 448-1361 and leave messages with the Sysop. If you don't have a modem, call Rachel Sieverts at (609) 443-4032.

*Michael Barclay
East Windsor, NJ*

Editor:

I am starting a CoCo users group and would like to reach some prospective members through your magazine. Interested CoCo nuts can reach me at Box 407, RD 1, 13021, or call (315) 253-4054.

*David Sullivan
Auburn, NY*

Editor:

I am pleased to announce our new Dragon computer users group, called Dragonet. We are a nonprofit organization in support of the orphan Dragon 32 and Dragon 64 computers, with interests in OS-9, FLEX and other features of this fine personal computer. We have made numerous connections with Dragon user groups in Great Britain, and will be publishing a monthly newsletter to all subscribers.

All interested CoCo or Dragon users should write: Dragonet, 1011 Louisa Street, 70117.

Wayne H. Schnell
New Orleans, LA

Editor:

I am attempting to start a CoCo users group in the Green River-Rock Springs area. Anyone owning a CoCo (or thinking about buying one), please contact me at (307) 875-2106 or write me at 2025 Iowa Circle, 82935.

Stephen R. Slaton
Green River, WY

Editor:

Thank you for your help. We are corresponding worldwide with other CoCo clubs. Because of THE RAINBOW, we have friends in the U.S., Australia, West Germany, Belgium and Great Britain! Our club grew up. Our new address is: First CoCo Club of Hamburg, 2000 Hamburg 65, Op de Solt 53 a, West Germany.

Theis Klauberg
Hamburg, West Germany

BULLETIN BOARD SERVICE

Editor:

Are you an active shortwave radio listener? Would you like to talk to other shortwave radio listeners by way of computer? Contact me via FIDO BBS, No. 77 or via the UBIX BBS in Ohio or write to Colorado Shortwave Radio Listeners, P.O. Box 3434, 80161.

Rob Harrington
Littleton, CO

Editor:

I would like to inform your readers of the opening of a BBS in Orange County. The BBS will be online 24 hours a day, seven days a week. The board will be run by two-drive, 64K CoCo, with a 300 Baud Mark 10. Those who are interested may call (714) 847-5368 for the BBS, 847-2368 for voice.

Eric Wilson
Huntington Beach, CA

ARTS AND LETTERS



Envelope Of The Month Suzanne Stuckled-George
Sacramento, CA

NOUVEAU COULEUR BBS

Editor:

I would like to announce a new BBS (in French) called L80C, which is dedicated to TRS-80 CoCo. Features include message base, electronic shopping, downloading, uploading, games and graphics. Readers may call the BBS anytime at (418) 872-8347.

Welly Denoncourt
Ancienne-Lorette, Quebec

Editor:

I would like to inform you of a few changes concerning my BBS, formerly the Pony Express BBS, (816) 232-2320. It has been named the Dragon's Lair. The BBS number is now (816) 232-4932. It has been updated to a Colorama Version 2.6. I plan on modifying it to take on a similarity of a dungeon Adventure. It is currently running only in the evenings.

Rick Drozd
St. Joseph, MO

Editor:

Please announce our BBS in the Watertown area. The system supports up- and downloading, games, and many other features. The Durant Club Bulletin Board is online 24 hours a day, seven days a week. The phone number is (414) 699-3214.

Durant Computer Club
Watertown, WI

Editor:

Fort Worth has a dedicated CoCo BBS. Call TBBS Fort Worth, 300/1200 Baud, 24 hours daily, (817) 232-2087. It will even handle full speed dumps from MIKEY-TERM's buffer!

Wayne Day
Fort Worth, TX

THE RAINBOW welcomes letters to the editors. 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 space.



PARENTS! GET A KID HOOKED ON COMPUTERS

Send for our unique LOGO STARTER program. Use it with your 16K Color Computer and Color LOGO from Radio Shack (Cat. No. 26-2722).

Teachers agree. LOGO is the best way to introduce children to computers. Now, with LOGO STARTER you won't have to read a book or instruction manual. Just load the LOGO STARTER tape.

Your child will draw exciting designs right from the start. You won't waste your time on a lot of tedious typing. And your child will be on the way to computer literacy.

\$13.95

LEAD A CHILD FROM LOGO TO BASIC

Our two QUIZ KIDS programs let you lead a child from LOGO to BASIC. Using LOGO, the child types answers to the computer's questions, just like BASIC.

LOGO SHAPES use simple shapes such as circles and squares. LOGO STARS displays five constellations from the northern sky and is an exciting introduction to the stars. Reviewed Rainbow May '85. Requires Color LOGO.

LOGO SHAPES \$14.95 LOGO STARS \$14.95

Both programs on one cassette \$22.50

SPEED READING

Busy executives! Student! Increase reading speed dramatically. Best available speed reading program for the CoCo. Reading material appears on the TV screen at the speed you select, training you to read faster. You can even change speed while reading. Complete with 6 different text selections and a quiz for comprehension, plus a drill to improve visual span & perception.

\$17.95

WILD PARTY

A naughty, sexy computer game for 2 to 6 couples. (Write us - we'll send a copy of the Review.)

"Would definitely liven up most parties."

-Rainbow Magazine

\$27.95

DO SOME REAL ENGINEERING ON YOUR CoCo

BOILER SIMULATION is a detailed tutorial on the dynamic simulation of industrial processes, a must for Control Engineers.

STEAM TABLE gives steam properties in superheat, saturated and subcooled regions.

Both programs available Sept. '85. Write for information and a 20% early-bird discount coupon.

All programs on cassette tape for 16K Color Computer. Ext'd BASIC not required. Prices include postage (PA resid. add 6%). Send check to P.O. Box 210, Jenkintown, PA 19046.

b & b software

Prices Change
Every Day.
Please Call
1-800-343-8841
For Lower Prices.

PRICE BREAKTHROUGH

Prices Change
Every Day.
Please Call
1-800-343-8841
For Lower Prices.

DEALER INQUIRIES INVITED

MEGADISK™ HARD DISK DRIVE SYSTEMS

TOLL FREE ORDERING 1-800-343-8841

For the { IBM/PC, Tandy 1000, TRS/80 Models I/III/IV/4P, Compaq, Eagle, Sanyo,
Tava, PC Workalikes, Color Computers, Apple/Franklin, Heath/Zenith, Max/80
Complete with Hardware, Cables, Software and Quikfit Installation

5 Megabytes Internal Mount	.....	starting at	\$299.95
10 Megabytes Internal Mount	.....	starting at	\$449.95
20 Megabytes Internal Mount	.....	starting at	\$799.95
5 Megabytes External System	.....	starting at	\$499.95
10 Megabytes External System	.....	starting at	\$699.95
20 Megabytes External System	.....	starting at	\$999.95
Streaming Tape Backup System — Internal Or External	.....	starting at	\$499.95

WOW! NEW LOW PRICES

DOS Systems Available: { IBM/Heath — DOS, 1.0, 2.0, 2.1, 3.0, or later — Apple Franklin — DOS 3.3, Prodos
TRS/80-LDOS, TRSDOS 6.x, Newdos/80, Dosplus 3.5, CP/M, COCO DOS, Max/80 LDOS, OS9

FULLY WARRANTIED — PARTS AND LABOR — 24 HOUR SERVICE — CALL TOLL FREE — 1-800-343-8841

FLOPPY DISK DRIVES, POWER SUPPLIES AND CABINETS

Our Disk Drives are UL approved — Our Floppies Drive Cabinets and Power Supplies are Underwriters Laboratory Listed and have passed the required Federal Communications Part 15 Section B-EMI/RFI tests.

Warranty on all disk drives is one full year parts and labor. Warranty on floppy disk drive power supplies is five (5) years. In warranty or out of warranty service is 24 hour turn-a-round on all disk drives and power supplies.

Tandon — Full Height Drives	
100-1 Single Sided 40 tk Bare	\$125.00
In Case with Power Supply	166.95
Dual Drives in One Cabinet	326.95
100-2 Dual Sided 40 tk Bare	162.00
In Case with Power Supply	206.95
Dual Drives in One Cabinet	381.95
Half High Drives	
65-1 Single Sided 40 tk Bare	122.00
In Case with Power Supply	156.95
Dual Drives in One Cabinet	306.95
65-2 Dual Sided 40 tk Bare	142.00
In Case with Power Supply	176.95
Dual Drives in One Cabinet	346.95
65-4 Dual Sided 80 tk Bare	162.00
In Case with Power Supply	196.95
Dual Drives in One Cabinet	356.95
TEAC Half High Drives	
55A Single Sided 40 tk Bare	125.00
In Case with Power Supply	166.95
Dual Drives in One Cabinet	316.95
55B Dual Sided 40 tk Bare	157.00
In Case with Power Supply	196.95
Dual Drives in One Cabinet	356.95
55F Dual Sided 80 tk Bare	177.00
In Case with Power Supply	216.95
Dual Drives in One Cabinet	388.95
Apple/Franklin Disk Drives	
35/40 Track in Case with Cable and Software	174.95
Controller Card for Two Disk Drives	49.95
Combination Price for Disk Drive and Controller	199.95
Commodore Disk Drives	239.95
Power Supplies and Cabinets 5 1/4" and Hard Drive Systems	starting at 45.00

COLOR COMPUTER DISK DRIVE SYSTEMS AND ADD IN PRODUCTS

35 Track Single Head Drive with Case, Power Supply, Cable	
Controller, Instruction Booklet, Diskettes	\$ 239.95
Above with Dual Drives in One Cabinet	369.95
40 Track Dual Head with Case, Power Supply, Cable,	
Controller, Instruction Booklet, Diskettes	289.95
Above with Dual Drives in One Cabinet	429.95
128 Memory Upgrade Kit	129.95
Dual DOS Switch	19.95
With Second DOS System — JDOS, RSDOS, Micro DOS, and Booklet	59.95

TRS-80 HARDWARE

Model I Starter System — Delivered by UPS	
One Single Sided Disk Drive, Case, Cable, Power Supply,	
TRSDOS 1.3 and Manual	\$195.00
Model III/IV Easy to Install Disk Drive Systems	299.95
Memory Upgrades — 4116 and 4164	starting at 1.50 ea.

ALL IN-STOCK ITEMS SHIPPED WITHIN 24 HOURS. SAME DAY SHIPPING PROVIDED BY REQUEST WITHOUT ANY EXTRA HANDLING CHARGES.

IBM - PC/XT WORKALIKE

All of our computers have: 8 slot motherboard, 640K, monochrome adapter, 2 parallel printer ports, 130 watt power supply, free software — all with our full warranty.

/PC-2 Floppy Drives - Monochrome Monitor, MS-DOS Monitor	\$1,895.00
Color system resolution - 720h x 240v, MS-DOS	\$2,295.00
3meg/XTtra - 1 Floppy Drive - Monochrome Monitor, MS-DOS	\$2,045.00
Color system resolution - 720h x 240v, MS-DOS	2,445.00
10meg/XTtra - 1 Floppy Drive - Monochrome Monitor, MS-DOS	2,395.00
XTtra - Color system resolution - 720h x 240v, MS-DOS	2,795.00
20meg/XTtra - 1 Floppy Drive - Monochrome Monitor, MS-DOS	2,695.00
XTtra - Color system, MS-DOS	3,095.00
Internal Tape Backup For Any Of Above systems Add	\$449.95

PRINTERS

Dot Matrix	
Citizen	\$ Call
Star Micronics	
Gemini X-Series Parallel 120 CPS Near letter quality	starting at \$259.95
Delta 10/15 160 CPS	starting at 424.95
Radius 10/15 200 CPS	starting at 649.95
Panasonic 1090	249.95
Daisy Wheel	
Silver Reed 440 80 Column 12 CPS	315.95
550 132 Column 19 CPS	439.95
770 132 Column 36 CPS	895.00
Olympia 132 Column 14 CPS with Form and Tractor	399.95
Apple/Franklin Printer Interface w/Graphics and Cable	84.95
Printer Cables	starting at 19.95
Printer Paper — Microperf Edge 1000 Sheets	16.95

ELECTRICAL

Surge Protectors — Line Filters — 5L Wafer — 6 Outlets with Switch	\$ 39.95
Uninterruptable Power Supplies	399.95

MODEMS

Volkswagen 300 Baud	\$ 69.95
Signalman Mark X Autodial	123.95
Mark XII 1200/300 Baud Autodial	284.95

ADD IN BOARDS FOR THE IBM

Multi Function Board Clock 256K, Parallel Port, Serial Port,	
Special Software	\$399.95
Floppy Disk Controller	\$145.00
STB — Rio Plus 128K	299.95
Graphics Plus	283.00
Graphics Plus II	355.00
Serial Port	84.95
Monochrome Board with Parallel Printer Port	210.00
Quadram — Quadboard w/128K	289.95
Quadcolor I	215.95
Quadcolor II	439.95

MISCELLANEOUS

Diskettes in 10 Pack	from 59.95
Twoport Switches	from 99.95
Disk Drive Cables	from 16.00
Maintenance Cleaning Kits	12.00
Parallel Printer Buffers 8K	149.95
Floppy Disk Drive Cables	
1 Drive	16.00
2 Drives	18.95
Heath/Zenith 2 Drive Cables — Shielded	24.95

© 1985 SOFTWARE SUPPORT, INC.

1 Edgell Road, Framingham, MA 01701 (617) 872-9090 Telex-383425

Hours: Mon. thru Fri. 9:30 am to 5:30 pm (E.S.T.) Sat. 10 am to 3:30 pm

SERVICE POLICY — Our Professional Technical Staff Is Available To Assist You Monday Through Saturday.

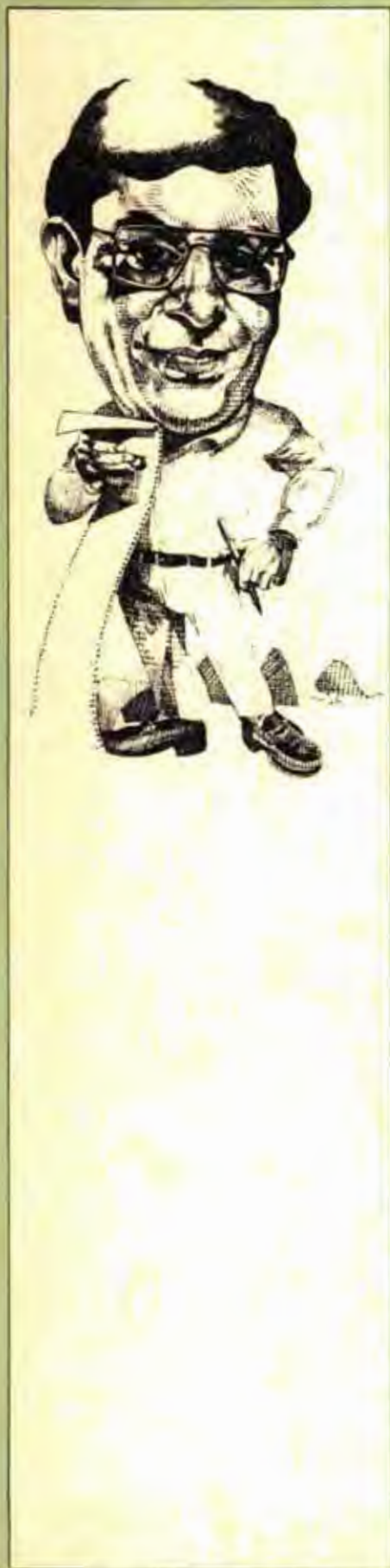
WARRANTIES — Up To One Full Year Parts And Labor. Floppy Disk Drive Power Supplies — Five (5) Years.

SERVICE — 24 Hour Turn-A-Round On All In-Stock Parts. Dealer Inquiries Invited. Call 617-872-9090

Toll Free 1-800-343-8841

Please Call For Shipping,
Handling And Insurance.

Not Responsible for Typographical Errors.
Prices and Specifications May Change
Without Notice.



The daffodils are poking their heads out of the ground here in Kentucky this week, which means spring has finally sprung in these parts and by the time you read this, they will probably all have given way to the tulips, roses and other early summer flowers.

I like winter a lot because of the weather, but, like most everyone else, I love spring most of all. The willow tree in the back yard is getting green, the pin oaks are starting to bud and it is time for my annual hunt for someone to cut the grass (for now, at least) on a weekly basis.

Dr. Perry, who taught me more than a little bit of Greek and Roman mythology at the University of Alabama many years ago, would have some interesting observations on why human beings like spring so much. The rebirth of the world; the resurgence in spirit; the times when the gods frolicked atop Mount Olympus. Something like that — or all of those things. No doubt.

I'm sure all of this has a lot to do with it. But, after all, even though the electronic pulses in our CoCos could outrace Mercury (and certainly are less tiring than the runner on the Plain of Marathon), mythology, rebirth and the like are far from the computer world of binary and hexadecimal digits, FOR/NEXT loops and so on.

Or are they? You have read here before that I consider the computer in general — and the CoCo in particular — to be among the ultimate in many ways. And so, what would happen if we (as we really do do so often in our businesses and in our homes) applied our CoCos to some of the ultimate questions of the world and universe. What if we developed the "Ultimate Program"?

All of this is by way of saying that we're working on our big surprise for next month's anniversary issue. No, I will not say what it is. Those who know me best know how much I love surprises. But the code name for this one is "The Ultimate Program" and it involves a lot of ultimates — love and hate, war and peace — all of humankind's passions. And all on a grand scale. At least I hope so. Keep tuned.

Our "Ultimate Program" is both serious and fun. When the surprise is over, I'll have some more to say about it — and will certainly welcome your comments, too.

* * *

I have yielded to pressure. I often do. For years now, people have been asking me why we don't make up some binders to keep THE RAINBOW in.

I don't know. Because we *did* have some made up, and as soon as they came in, I grabbed six of them and started using them. Very nice. Very neat. And very organized (maybe that is why I never got any made before).

Our hard-cover binders for THE RAINBOW are red with gold lettering

Telewriter-64™

the Color Computer Word Processor

- 3 display formats: 51/64/85 columns × 24 lines
- True lower case characters
- User-friendly full-screen editor
- Right justification
- Easy hyphenation
- Drives any printer
- Embedded format and control codes
- Runs in 16K, 32K, or 64K
- Menu-driven disk and cassette I/O
- No hardware modifications required

THE ORIGINAL

Simply stated, Telewriter is the most powerful word processor you can buy for the TRS-80 Color Computer. The original Telewriter has received rave reviews in every major Color Computer and TRS-80 magazine, as well as enthusiastic praise from thousands of satisfied owners. And rightly so.

The standard Color Computer display of 32 characters by 16 lines without lower case is simply inadequate for serious word processing. The checkerboard letters and tiny lines give you no feel for how your writing looks or reads. Telewriter gives the Color Computer a 51 column by 24 line screen display with *true lower case characters*. So a Telewriter screen looks like a printed page, with a good chunk of text on screen at one time. In fact, more on screen text than you'd get with Apple II, Atari, TI, Vic or TRS-80 Model III.

On top of that, the sophisticated Telewriter full-screen editor is so simple to use, it makes writing fun. With single-letter mnemonic commands, and menu-driven I/O and formatting, Telewriter surpasses all others for user friendliness and pure power.

Telewriter's chain printing feature means that the size of your text is never limited by the amount of memory you have, and Telewriter's advanced cassette handler gives you a powerful word processor without the major additional cost of a disk.

...one of the best programs for the Color Computer I have seen...

— Color Computer News, Jan. 1982

TELEWRITER-64

But now we've added more power to Telewriter. Not just bells and whistles, but major features that give you total control over your writing. We call this new supercharged version Telewriter-64. For two reasons.

64K COMPATIBLE

Telewriter-64 runs fully in any Color Computer — 16K, 32K, or 64K, with or without Extended Basic, with disk or cassette or both. It automatically configures itself to take optimum advantage of all available memory. That means that when you upgrade your memory, the Telewriter-64 text buffer grows accordingly. In a 64K cassette based system, for example, you get about 40K of memory to store text. So you don't need disk or FLEX to put all your 64K to work immediately.

64 COLUMNS (AND 85!)

Besides the original 51 column screen, Telewriter-64 now gives you 2 additional high-density displays: 64 × 24 and 85 × 24! Both high density modes provide all the standard Telewriter editing capabilities, and you can switch instantly to any of the 3 formats with a single control key command.

The 51 × 24 display is clear and crisp on the screen. The two high density modes are more crowded and less easily readable, but they are perfect for showing you the exact layout of your printed page, *all on the screen at one time*. Compare this with cumbersome "windows" that show you only fragments at a time and don't even allow editing.

RIGHT JUSTIFICATION & HYPHENATION

One outstanding advantage of the full-width screen display is that you can now set the screen width to match the width of your printed page, so that "what you see is what you get." This makes exact alignment of columns possible and it makes hyphenation simple.

Since short lines are the reason for the large spaces often found in standard right justified text, and since hyphenation is the most effective way to eliminate short lines, Telewriter-64 can now promise you some of the best looking right justification you can get on the Color Computer.

FEATURES & SPECIFICATIONS:

Printing and formatting: Drives any printer (LPVII/VIII, DMP-100/200, Epson, Okidata, Centronics, NEC, C. Itoh, Smith-Corona, Terminus, etc).

Embedded control codes give full dynamic access to intelligent printer features like: underlining, subscript, superscript, variable font and type size, dot graphics, etc.

Dynamic (embedded) format controls for: top, bottom, and left margins; line length, lines per page, line spacing, new page, change page numbering, conditional new page, enable/disable justification.

Menu-driven control of these parameters, as well as: pause at page bottom, page numbering, baud rate (so you can run your printer at top speed), and Epson font. "Typewriter" feature sends typed lines directly to your printer, and Direct mode sends control codes right from the keyboard. Special Epson driver simplifies use with MX-80.

Supports single and multi-line headers and automatic centering. Print or save all or any section of the text buffer. Chain print any number of files from cassette or disk.

File and I/O Features: ASCII format files — create and edit BASIC, Assembly, Pascal, and C programs, Smart Terminal files (for uploading or downloading), even text files from other word processors. Compatible with spelling checkers (like Spell 'n Fix).

Cassette verify command for sure saves. Cassette auto-retry means you type a load command only once no matter where you are in the tape.

Read in, save, partial save, and append files with disk and/or cassette. For disk: print directory with free space to screen or printer, kill and rename files, set default drive. Easily customized to the number of drives in the system.

Editing features: Fast, full-screen editor with wordwrap, block copy, block move, block delete, line delete, global search and replace (or delete), wild card search, fast auto-repeat cursor, fast scrolling, cursor up, down, right, left, begin line, end line, top of text, bottom of text; page forward, page backward, align text, tabs, choice of buff or green background, complete error protection, line counter, word counter, space left, current file name, default drive in effect, set line length on screen.

Insert or delete text anywhere on the screen without changing "modes." This fast "free-form" editor provides maximum ease of use. Everything you do appears immediately on the screen in front of you. Commands require only a single key or a single key plus CLEAR.

...truly a state of the art word processor...
outstanding in every respect.

— The RAINBOW, Jan. 1982

PROFESSIONAL WORD PROCESSING

You can no longer afford to be without the power and efficiency word processing brings to everything you write. The TRS-80 Color Computer is the lowest priced micro with the capability for serious word processing. And only Telewriter-64 fully unleashes that capability.

Telewriter-64 costs \$49.95 on cassette, \$59.95 on disk, and comes complete with over 70 pages of well-written documentation. (The step-by-step tutorial will have your writing with Telewriter-64 in a matter of minutes.)

To order, send check or money order to:

Cognitec
704 Nob Street
Del Mar, CA 92014

Or check your local software store. If you have questions, or would like to order by Visa or Mastercard, call us at (619) 755-1258 (weekdays, 8AM-4PM PST). Dealer inquiries invited.

(Add \$2 for shipping. Californians add 6% state tax.)

Now available at
Radio Shack stores
via express order

Apple II is a trademark of Apple Computer, Inc.; Atari is a trademark of Atari, Inc.; TRS-80 is a trademark of Tandy Corp; MX-80 is a trademark of Epson America, Inc.



Metric Industries



MODEL 101 INTERFACE 54.95 49.50

The Model 101 is a serial to parallel interface intended for use with a COCO and any Centronics compatible parallel input printer. The 101 has 6 switch selectable baud rates (300-9600) It comes with a "UL" listed power supply that can be unplugged from the interface if your printer supplies power (Most do). The 101 is only 4" x 2" x 1" and comes with all cables and connectors for your computer and printer.



MODEL 102 SWITCHER 35.95

The Model 102 has 3 switch positions that allow you to switch your computer's serial output between 3 different devices (modem, printers or another computer). The 102 has color coded lights that indicate the switch position. These lights also act as power indicators to let you know your computer is on. Supplied with the 102 are color coded labels that can be applied to your accessories. The 102 has a heavy gauge anodized aluminum cabinet with non-slip rubber feet.



MODEL 103 COMBO 85.95 73.50

With the turn of a knob the model 103 switches your computer's RS232C serial port to any one of 3 outputs — 2 serial and 1 parallel. The serial ports may be used for modems, serial printers or even another computer. The parallel port can be used with any Centronics compatible printer. The 103 has the best features from the 101 and 102, color coded position indicator lights, 6 switch selectable baud rates, heavy anodized aluminum cabinet, "UL" listed power supply and many more.



The Model 101, 102 and 103 will work with any level COCO basic, any memory size 4K-64K and are covered by a 180 day warranty.

The Model 101 and 103 work with any standard parallel input printer including Gemini, Epson, Radio Shack, Gorilla, C/loth, Okidata and many others. They support basic print commands, word processors and graphic commands.

CASSETTE LABEL PROGRAM 6.95

This fancy printing utility prints 5 lines of information on pinfeed cassette labels. "Cassette Label" is menu driven and is very easy to use. It uses the special features of your printer for standard, extended or condensed characters. Each line of text is automatically centered. Before the label is printed, it is shown on your CRT — enabling you to make changes if you like — then print 1, 2 or 100 labels. The program comes on tape and it is supplied with 24 labels to get you started. 16K ECB required.



OTHER ITEMS

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

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

Pin lead cassette labels **\$3.00/100**



To order call our 24 hour order line 513-677-0796 and use your VISA or MASTERCARD or request C.O.D.

Or send check or money order to:
METRIC INDUSTRIES
P.O. BOX 42396
CINCINNATI, OH 45242

Free shipping on orders over \$40.00. Ohio residents add 5.5% sales tax.

Orders under \$40.00 please add \$3.00 for shipping

We manufacture these products. Dealer inquiries are invited.

NEW LOW PRICES

on both the front and spine. They are extra-thick and we're selling them in a set of two for \$13.50 (plus \$2.50 for shipping and handling). Because THE RAINBOW is so big, you need two binders to hold a whole year's worth of magazines.

But they look real nice, keep things organized and stand up on a shelf or desk without any trouble. If you're interested in them, see the ad in this month's issue on Page 47.

While on the subject of things we sell, we are really overwhelmed at the positive response to *The Rainbow Guide To OS-9*. Ken Kaplan, whose staff at Microware wrote OS-9, sent a most complimentary letter. And, interestingly, almost every other order we have received has been for the two-disk set of programs as well as the book. It is a resource you'll really want to have, especially in the years ahead.

* * *

I received a letter just the other day from an officer of a Color Computer club out West who had just received a letter from another club suggesting swapping software. The letter writer said that he and other members of his club resented the letter and that he wished I would take some steps to prevent it as much as possible.

We have been trying to do our part, but the bottom line is that *you* have to be the ones who stop software theft. It hurts every faction of the CoCo Community — including the users who end up having to spend more money than necessary to "cover" losses from piracy and the development of protection schemes.

I hope you will do your part to help us stop software theft. And, for the record, we do ask each club which is certified by us to agree to not allow "swapping" of software as a part of its bylaws. Incidentally, the bigger and better clubs are the ones which do not allow theft. Perhaps it is because they get into helping other members — and their communities — rather than having as a prime motive the ripping off of things for which they should be paying.

— Lonnie Falk

TOP RATINGS
HOT COCO MAGAZINE
SEPTEMBER 1984



YOU COULD FALL IN LOVE WITH
AUTOTERM!
IT TURNS YOUR COLOR COMPUTER INTO THE
**WORLD'S
SMARTEST
TERMINAL**

AND
MOST
LOVABLE

GOOD LOOKIN'

AUTOTERM shows true upper/lower case in screen widths of 32, 40, 42, 51, or 64 characters with no split words. The width of 32 has extra large letters. Scrolling is forward, backward, and fast. Block graphics pictures are displayed automatically and can be scrolled.

The screen's top line shows operating mode, unused memory size, memory on/off, and caps-lock on/off. It also gives helpful prompts.

SWEET TALKIN'

KEY-BEEP can be on/off. Unacceptable keystrokes cause a lower pitched BOP! This ERROR-BEEBOP can be on/off.

Talks to other computers with Full or Half Duplex; Baud Rate of 110, 150, 300, 600, 1200; Parity as even, odd, mark, space, none; 7 or 8 bit Word; any Stop Bits; all 128 ASCII characters; true line Break; XON/XOFF protocol; and optional line-at-a-time transmission. Able to send and receive text, block graphics, BASIC and ML programs. A 64K machine holds up to 46,600 characters (34,900 in HI-RES).

DUAL PROCESSING lets you review & edit while more data is coming in.

Fully supports D.C. Hayes and other intelligent modems.

Talks to your printer with any page size, margins, line spacing, split word avoidance. Embed your printer's control sequences for boldface, underlining, etc. Narrow text can be automatically spread out.

You'll also use Autoterm for simple word processing and record keeping

You can display directories, delete files, transmit directly from disk, and work with files larger than memory. Easily maintain a disk copy of an entire session.

Compatible with TELEWRITER (ASCII) & other word processors.

SMOOTH WALKIN'

AUTOTERM moves smoothly and quickly between word processing and intelligent terminal action. Create text, correct your typing errors; then connect to the other computer, upload your text, download information, file it, and sign-off; then edit the received data, print it in an attractive format, and/or save it on file.

Editing is super simple with the cursor. Find strings instantly, too! Any operating parameter, such as screen width, can be altered at any time. Uncompleted commands can be cancelled.

PUTTY IN YOUR HANDS

The word processor can be used to create, print, and/or save on file your personal KSMs. They let AUTOTERM act like you. For example, it can dial through your modem, sign-on, interact, perform file operations, & sign-off; an entire session without your help. KSMs can answer the phone, prompt the caller, take messages, save them, hang-up, and wait for the next call. The KSM potential is unbelievable!

**NO OTHER COMPUTER IN
THE WORLD CAN MATCH
YOUR COCO'S AUTOMATIC
TERMINAL CAPABILITIES!!!**

WHAT THE REVIEWERS SAY

"AUTOTERM is the Best of Class."

Graham, *RAINBOW*, 6/83

"The AUTOTERM buffer system is the most sophisticated — and one of the easiest to use..."

Banta, *HOT CoCo*, 8/84

"Almost a full featured word processor..."

Eilers, *RAINBOW*, 11/84

**RECOMMEND 32K to 64K
Tape-to-Disk Upgrade \$23
You Keep the Cassette**

**CASSETTE \$39.95
DISKETTE \$49.95**
Add \$3 shipping and handling
MC/VISA/C.O.D.

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

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

WHITE HOUSE COMPUTER

P.O. Box 4025
Williamsport, PA 17701
(717) 322-7700

ASK ABOUT PHONE REBATES!

HOURS Monday thru Friday
9:00 am till 6:00 pm

PRINTERS		EPSON	
STAR MICRONICS		RX 80	219.00
SG 10	225.00	RX 80FT	269.00
SG 15	389.00	RX 100	379.00
SD 10	355.00	FX 80	399.00
SD 15	465.00	FX 100	565.00
SR10	495.00	JK 80	539.00
SR 15	590.00	LQ 1500P	1089.00
PowerType	309.00	LQ 1500S	1749.00
LEGEND		PANASONIC	
880	220.00	1090	199.00
1080	240.00	1091	285.00
1380	275.00	1092	399.00
1385	315.00	1093	599.00
C. ITOH		3151	475.00
8510A	285.00	MANNSEMAN	
8510BC2	389.00	TALLY	
8510BP1	379.00	Sprnt 80	269.00
8510SP	389.00	MT160L	549.00
8510SF	429.00	MT180L	749.00
8510SCP	459.00	OKIDATA	
8510BCR	489.00	182	229.00
1550BCD	629.00	80	545.00
1550P	485.00	84	645.00
A10-20P	485.00	92	349.95
F10-40P-S	875.00	93	565.00
F10-55P-S	1059.00	93	565.00
F10-Tractor	169.00	Image Writer	425.00
F10-Sheet Feeder	349.00	Gxmate 10	179.00

PRINTER PAPER		
9" x 11"	500 sheets white	11.95
9" x 11"	500 sheets greenbar	11.95
9" x 11"	1000 sheets white (Lazer 20#)	19.95
9" x 11"	200 sheets white	8.99
9" x 11"	150 sheets rag white	10.99
9" x 11"	250 sheets ivory	10.99
9" x 11"	3000 sheets white	42.75
14" x 11"	1000 sheets greenbar	24.75
1"	Mailing labels (qty. 1000)	9.75

SAKATA MONITOR		PRINTER RIBBONS DUST COVERS	
SC 100 Color	195.95		
SC 1000 Green	99.95		
SA 1000 Amber	105.95		

ZENITH MONITOR		TEAC DISK DRIVE	
ZVM 122 Amber	85.95	FD 55V 320K/Half Height	
ZVM 123 Green	75.95	DS-DD	149.00
ZVM 131 Color/Mid res	239.95	FD 55V 320K/Half Height	169.00
ZVM 133 Color/Hi res	239.95	96T P1	169.00
ZVM 135 Color/Hi res	459.95	Software for	
ZVM 136 RGB/Hi res	599.95	FD 55V	09.95

NEC		DISKETTES	
1201 Green/Hi res.		SKC	
w/speaker	139.95	SS/DD	11.95
1205 Amber/Hi res.		SS/DD	14.95
w/speaker	139.95	DS/DD	16.95
1260 Green	97.95	MAXELL	

AMDEK		ELEPHANT	
300 Green	135.95	SS-SD	14.95
300 Amber	145.95	SS-DD	16.95
300 Color	249.95	DS-DD	21.95

TEKNIKA		INNOVATIVE CONCEPTS	
MJ-10 Composite		Flip-N-File (110)	3.50
Separate Video	235.00	Flip-N-File (151)	8.50
MJ-22 RGB Composite		Flip-N-File w/lock	
Separate Video	289.00	Flip-N-File (25)	18.50

MODEMS		INTERFACES	
Volkamodem		6P-3 Serial to Parallel	59.95
cable	55.95		
Volkamodem			
1200	249.95		
Hayes 300	199.00		
Hayes 1200	399.95		
CompuServe Starter Kit	24.95		

* Dealers Inquiries Invited *

POLICY: No deposit on COD orders. Free freight on all prepaid cash orders over \$300.00 in the continental U.S. AFD & FPO add \$5.00 per hundred. For priority mail add \$8.00 per hundred. PA. residents add 6% sales tax. Defective products must have Prior RA number. Schools call 15.

VISA and MC Accepted 4%

BUILDING JUNE'S RAINBOW

Jerry Does Our Cover . . .

Lonnie Sees the Light . . .

And, Bob Accepts the Challenge . . .

Our change of tempo this month begins with our cover. It's the creation of Jerry McKiernan, a Beatles and blues, steel-stringed Harmony guitar picker, who's also RAINBOW's chief illustrator. The work of our resident gnome should be quite familiar to RAINBOW readers, as much of the artwork on our pages each month reflects his elfish qualities. He's produced so much for our inside pages as well as several covers for RAINBOW's sister publication, PCM, that I found it difficult to believe he hasn't previously done a cover for us. Jerry and I both had to double-check to confirm that, yes, this is his first for RAINBOW. It's an auspicious beginning, so, even though widely-acclaimed Fred Crawford, our regular cover artist returns next month, expect to see Jerry dipping his talented hand into all sorts of things, from his "CoCo Cat" cartoon feature to designing new additions to our Rainbow Bookshelf series.

While the rhythm is far-ranging in this our Sound and Music issue, with a little bit of everything from Chopin to sound synthesis, we're reserving some special fanfares for next month's Fourth Anniversary issue. After all, we're going to have the "Ultimate Program."

Did Lonnie Falk have the light of the enlightened in his eyes when he handed me the Ultimate Program memo? It seemed so to me. Maybe it was the gleam of recognition. You see, he had "that look." No, there was no light bulb visible above his head when he summoned me into his inner sanctum, but he'd clearly had a vision, and you could almost make it out if you peered deeply into his pupils. After reading his three-page, single-spaced memo, I still regarded his "latest" with a large measure of disbelief. As usual, though, he was not to be dissuaded.

While his immodest proposal for the Ultimate Program would seem to tax even the capabilities of that great computer room in the sky, Lonnie saw no reason whatsoever not to use the CoCo. His reasoning went along the lines that, given enough cassettes, everything that has ever happened could be saved to tape — or something like that. Just take it in byte-sized chunks, so to speak. He also saw no reason why we couldn't have it done in a month! That's when I called Bob Tyson.

Much to my surprise, Bob Tyson accepted the Anniversary Special assignment in stride. He was so matter of fact about it, I decided he must have seen the same light that shone in Lonnie's eyes. Write the Great American Program? Why not? Have it done in a month? No problem. Do it in under 32K? Probably wouldn't take that much. An assignment like that would fluster Clint Eastwood, but apparently not Cool Hand Bob. So, stay with us; there's a new genre of computer program in the making and it'll be one of our fourth anniversary gifts to the CoCo Community.

In the meantime, let's celebrate the sounds of CoCo and add to our musical skills as we explore this issue of THE RAINBOW. I'll conclude by breaking into my usual refrain: why not take note that a subscription to THE RAINBOW not only ensures that the beat goes on, but also saves you some 35 percent off the newsstand price. And, that's the name of that tune.

— Jim Reed

DEFT Pascal Workbench

R.S. Cat.# 90-5002
\$89.95

A MUST FOR:

High School Students

The College Entrance Examination Board (CEEB) has chosen Pascal for its college advanced placement computer science test. **DEFT Pascal Workbench** provides all the Pascal programming tools you need to prepare for this test on your Color Computer.

College Students

The **DEFT Pascal Workbench** gives you the software you need to do your Pascal programming homework at home on your Color Computer.

Professionals

Most of the programming features found on the mainframes and minis used in business and science are available on the Color Computer with **DEFT Pascal Workbench**.

Hobbyists

Has the extensions necessary to quickly do any Color Computer programming job without giving up execution speed. **DEFT Pascal Workbench** helps you get the job done. Directly access assembler language routines and hardware registers from Pascal.



\$39.95
RS#90-5001



\$59.95
RS#90-5000



S.E. - San Diego, CA
"In the three months since the purchase of DEFT's Workbench, I have become increasingly pleased and impressed with the quality and professional performance of your software, which prompts me to write this letter."
"As a professional computer scientist and educator (I teach Pascal at the University of Southern California, San Diego), DEFT Pascal has provided me with an opportunity to develop my own Pascal programs at home."

HOT CoCo Magazine - (March 1985)

"While not the DEFT product apart is the extent of its coverage. It provides the CoCo user with a very complete implementation of standard Pascal, along with many useful extensions for string handling, absolute memory access, and the compilation of separate program modules. That's quite a feat for a system that can run on a 128 computer. DEFT's Pascal supports real time, floating point variables. Many CoCo assembler languages handle only integers; this Pascal gives you full base computation capability."

RAINBOW Magazine - (November 1984)

"The DEFT Systems people have put together a package which is a complete Pascal and/or assembly programming environment that is reasonably priced and works like a champ."
"DEFT Bench and DEFT Pascal remain an excellent example of what can be accomplished in the CoCo world. The entire package gives you all the necessary tools to learn Pascal. If you already know Pascal, then it gives you a total development environment. Nothing is missing, there is nothing else to buy."
"Any college applicant attempting to obtain advanced credit will be required to know Pascal in order to complete the course. DEFT Bench and DEFT Pascal provide an excellent learning environment. The entire package is impressive. It is very well-written and extremely easy to use. In all the years I have been looking at software packages, never have I seen so much offered for so little."

DEFT Extra Only \$39.95

The perfect addition to your DEFT Pascal or DEFT Pascal Workbench. DEFT Extra is a library of gaming and direct file I/O routines with graphics routines that provide Extended Basic's graphics capabilities in all 8 graphics modes. Full DEFT quality documentation and sample Paint program included. (requires 64K)

Available
By Express Order
At Your Local
Radio Shack Store!

Also Available in Canadian Radio Shack Stores!

All DEFT software and programs developed with DEFT software are BASIC ROM independent and use all of the memory in your Color Computer without OS-9. All you need is DEFT software and a Tandy Color Computer with Extended Disk BASIC, at least 32K of RAM and One Disk Drive. With DEFT Pascal (\$59.95) you will also need a text editor to write your programs. **PBJ WORD-PAK** compatible upgrades and Educational discounts available. Dealer inquiries welcome.

Orders and Sales Information 1-800-992-DEFT
Technical Assistance 1-301-253-1300

3-D Graphics Sampler Only \$29.95

Do 3 Dimensional Imaging from Pascal. Define an object by specifying points and lines. Then, with 3-D graphics library procedure calls, Rotate, Zoom and Move your 3-D Skeletal Object(s). All Source Files Included



DEFT is a registered trademark of DEFT Systems, Inc.
OS-9 is a trademark of Microsoft.

DEFT
SYSTEMS, INC.

P.O. Box 359
Damascus, MD 20872

Quantity of Each: — DEFT Pascal — DEFT Bench
— DEFT Extra — DEFT Pascal Workbench — 3-D Graphics

Method of Payment (check one) Check Enclosed
 VISA Master Card COD

Account Number

Card Expiration Date /

Signature _____

Name _____

Street _____

City _____ State Zip

All orders are shipped UPS within 24 hours of receipt. Add 4% for shipping and handling; Maryland residents add 5% for State Sales Tax; add \$2.00 for COD.

GAME

Laughing, dancing, lightning and stars . . .



Learn Your Multiplication With

MULTO OF MARS

By Richard Ramella

“I don’t have to learn the multiplication tables,” my 9-year-old announced.

“Yes, you do,” I said.

“No, I don’t!”

“DO!”

“DON’T!”

My son and I often have such philosophical discussions.

“Don’t you want to know why?” he asked between rounds five and six.

“OK, tell my why.”

“Because when I grow up, they’ll have wrist computers. If I want to know how much something times something is, I’ll just punch it into the computer.”

“That hasn’t happened yet,” I said. But in my heart I knew I was fibbing. There are already cheap digital watches with full calculator functions. Some of the newer ones are rumored to have spreadsheets that run up your arm.

“Besides,” my son went on, “when I’m grown I’ll probably be living on Mars.” He paused, savoring the idea. “And my wrist computer’ll have

(Richard Ramella has written two books and numerous articles on TRS-80 topics. He is a writer for a California hospital.)

word processing so I won't have to write. And it'll have a full-color screen that picks up any TV program I want."

"But what if you run into a Martian slime bunny and it vaporizes your wrist computer?" I said. "Then you won't be able to figure the coordinates to return to Mars Base One. You'll be lost out there! And all because you never learned the times tables!"

"Oh, get serious, Dad!"

I am a stern father. I sent my son to bed with only four peanut butter sandwiches and a quart of milk.

That night I wrote *Multo of Mars*. Multo is a computer character that makes a game of multiplication drills.

I remember learning the times tables in a kind of group agony called choral recitation. Thirty of us squirming fourth-graders droned answers as meaningless as telephone numbers we'd never call. I'm sure most of us managed to lapse into fantasies while mouthing the numbers. Like my son, I usually took a rocket ship to Mars, arriving well before "two times two is four."

The next afternoon, I introduced Multo to the pre-adolescent Earthling at my house. Multo helped but didn't do the entire job alone. Young Earthlings must write, recite and think about concepts they are learning, not just punch the answers into a computer.

Multo of Mars is a 16K Extended Color BASIC program. It uses Extended graphics and animation to teach fundamental multiplication skills ranging

from "1 x 1" to "9 x 9." The times table is an educational must which is presented at about third grade level and should be mastered by about fifth grade.

Multo is a comic creature with tousled red hair, a huge head and big blue feet. Its mouth moves rapidly, then becomes a rectangle with a multiplication problem. Multo responds to correct answers in random, cheerful ways: dancing, smiling, crossing or blinking its eyes, and lifting an ear to emit colorful lightning bolts.

Play is simple. When a problem is presented, the player types the number answer and presses ENTER. A correct answer produces positive visual cues, and that particular problem is erased from the system. It may seem the same problem is presented more than once, but consider that "4 x 8" and "8 x 4" are a different sequence, and that "3 x 4" and "2 x 6" have the same answer.

A wrong answer offers non-judgmental correction. The mouth becomes a green rectangle, the correct answer is shown in white, and the problem is once again presented for the player to enter the answer just seen.

This problem is not taken out of the system. It returns in its random turn until the player gets it right. In this way, the pool of problems narrows to those which the learner needs to study.

Multo of Mars keeps score inwardly. About every seventh correct answer, a new letter of a building message appears on the screen. The encouraging message isn't completed until the 81st problem

is answered correctly. When this happens, Multo springs its last surprise: a huge smile and an endless series of dancing, eye-crossing and blinking, and fireworks from the ear. The program must be broken into to stop the run.

If your computer does not accept the "speed poke" (POKE 65495,0.), this command should be taken out of Line 110.

If a run of *Multo of Mars* is stopped before the entire series of problems is worked, the problems not yet solved may be seen by typing FOR X=1 TO 81: PRINT A\$(X);: NEXT and pressing ENTER.

My advice to adults is to merely tell the young player how to play and leave the rest as a series of surprises. The building message, especially, tends to sustain interest even after the player has seen through the facade of what is after all a math drill.

The program has no sound. I removed the "boops" and "beeps" after a classroom test showed they tended to interfere with the work of students not at the computer.

Finally, I am not a teacher, but I know these things: Telling the answers to a computer, no matter how much fun it can be, is no substitute for writing the answers on paper. There is a learning connection between seeing, saying and writing, and learning the times tables is only the first step to learning how to multiply large numbers by each other — a process that requires pencil, paper and mind.

(Any inquiries regarding this program may be directed to Mr. Ramella at 1493 Mt. View Ave., Chico, CA 95926. Please include a SASE.)



240	.....64	800	.....212
390	.....11	950	.....197
530	.....36	END	.....115
680	.....17		

The listing: MULTO

100 REM * MULTO OF MARS * TRS-80
EXTENDED COLOR BASIC / 16K / RI
CHARD RAMELLA

110 POKE 65495,0: CLEAR 900: DIM
Z(1,21): ZL\$="UBE5F5D2L10R10D6"
: GOTO 250

120 Z\$="6020010829697871": RETUR

THE BIG 3



THE LOGICAL CHOICES

DYNACALC[®]

42 Four Seasons Center #122
Chesterfield, MO 63017
Ph: 314/576-5020

Telewriter-64[™]

COGNITEC
704 NOB ST.
DEL MAR, CA 92014
(619) 755-1258

Pro-Color-Series[™]

DERRINGER SOFTWARE, INC.
PO BOX 5300
FLORENCE, SC 29502-2300
(803) 665-5676

SEE ADS FOR THESE PROGRAMS IN THIS ISSUE. REFER TO THE ADVERTISER'S INDEX.

Derringer Software, Inc.

Introduces The

Pro-Color-Series™

Of Ready To Run Data Bases

Get the features of the most flexible data management software package in a single application program for half the cost!

\$29.95 Plus \$3.00
S/H

Each database is completely set up and can be used as soon as you get it. The documentation that comes with **PRO-COLOR-FILE** is included so you can change report formats, label formats and math equations. You get all the file management features of the **PRO-COLOR-FILE** program such as summary reporting, field totals and averages, fast ML sorting, multiple indexing, custom tailored menus, file-wide recalculation of equations, auto key repeat and keyboard "click" just to name a few.

After you use the single application program and see how flexible the **PRO-COLOR-FILE** program is, you'll want to get the Master Version so you can start creating your own database formats. In this case, you'll only have to pay the difference in price!

READY TO RUN FORMATS INCLUDE

- MAILING #1** — Standard mailing list with a capacity of 1200 + names on a single disk. Sort 1200 names in less than 15 minutes!
- MAILING #2** — Standard mailing list with the addition of dues owed, date of last payment and note field for a membership roster.
- MAILING #3** — Standard mailing list with 8 category fields for specific mail out selections and a note field.
- MAILING #4** — Standard mailing list with added fields for a Church (or family oriented) application.
- INVENTORY #1** — A home inventory format that offers date of purchase, cost, current value, insurance # and more. Obtain reports by category and totals for present value.
- INVENTORY #2** — Retail inventory format offering stock level reports, Purchase Orders outstanding, cost, retail, profit and descriptions.
- FINANCE #1** — Maintains a listing of expenses and generates summary reports by category or month. Reports can be merged with DYNACALC.
- FINANCE #2** — A stock portfolio designed to help maintain stock holdings with detailed reports and current value updating.

Format disks can be purchased separately for \$15.95 + \$2.00 S&H — These are the formats only and don't include the manual or the program modules.

You can also use our other **PRO-COLOR-SERIES** programs, **PRO-COLOR-FORMS** and **PRO-COLOR-DIR**, with any of the above formats. See their descriptions for features and prices!

All programs require a 32/64K Color Computer with at least one disk drive. Upgrading to the Master Version of **PRO-COLOR-FILE** can be obtained at any time for \$30.00 + \$2.00 S/H.

Call or send a SASE for more details of each format and what it has to offer!
Derringer Software, Inc. • P.O. Box 5300 • Florence, S.C. 29502 • (803) 665-5676

Pro-Color-Series™

© 1984 by Derringer Software, Inc.

Now there's a series of programs that offers integration between the five major uses of a computer — Database, Word Processing, Spread Sheet, Communications and Graphics!

PRO-COLOR FILE *Enhanced* 2.0 \$59.95

An all new version of PRO-COLOR-FILE will once again leave its mark as the most flexible database in its price range for the Color Computer.

- 60 Data Fields • 1020 BYTE RECORDS • TRUE MULTI DRIVE SUPPORT
- 4000+ RECORD CAPACITY • 4 USER DEFINED DATA ENTRY SCREENS • 28 MATH EQUATIONS • IF-THEN-ELSE FUNCTIONS IN EQUATIONS • FILE-WIDE RECALCULATION • 6 USER DEFINED REPORT FORMATS • 6 USER DEFINED LABEL FORMATS • TOTAL FIELDS ON REPORTS • SUMMARIZE FIELDS • SEND REPORTS TO PRINTER, SCREEN OR TEXT FILE • FAST ML SORT (750 RECORDS IN LESS THAN 5 MINUTES) • CREATE UP TO 16 INDEXES FOR SORTING OR REPORTING RECORDS • AUTO KEY REPEAT • KEYBOARD CLICK • STORES FORMATS FOR REPEATED USE • CUSTOM SELECTION MENUS • PASSWORD PROTECTION • CREATES FILES COMPATIBLE WITH DYNACALC®

Because of PRO-COLOR-FILE's ability to send reports to a text file, this means you can use your favorite communications program to transmit reports to other computers or read them in with your favorite word processor for creating customized reports. You can also convert ASCII files from your favorite spread sheet program into data files that can be accessed for further reporting and analyzing. PRO-COLOR-FILE is also supported by the PRO-COLOR-FILE National Users Group with quarterly newsletters. Join the rest of the world and discover for yourself what you've been missing.

PRO-COLOR-DIR \$21.95

Need to organize all your diskettes so you know where each program is? PRO-COLOR-DIR will read your directories and create a master data file that can be accessed by PRO-COLOR-FILE for sorting and reporting. 1000+ records can be stored on one diskette with valuable information about each program.

- DISK ID NAME • FILENAME/EXT • TYPE OF FILE • DATE CREATED • DATE UPDATED • NUMBER OF GRANS ALLOCATED • NUMBER OF SECTORS ALLOCATED AND USED • MACHINE LANGUAGE ADDRESSES

A diskettes directory can be re-stored in the data file with old entries deleted and new ones appended automatically. You can obtain hard copies of the information and create labels of the filenames for placing on the diskette itself.

MASTER DESIGN \$29.95

This graphics program does more for you than just hi-res graphic editing. It will generate lettering in hi-res graphics that can be different sizes, skinny, bold, textured, drop shadowed, raise shadowed or tall. It will also interface with the Telewriter-64 word processor for printing hi-res displays with your letters.

As a graphics editor, it takes full advantage of all the extended BASIC hi-res graphic commands. Create boxes, circles, lines, copy displays and utilize GET and PUT features. Some added commands include mirror reflection, turn displays backwards or upside down, Squish displays, create dot patterns for shading, or diagonal lines for creative backgrounds.

Special text files created with the Letter Head Utility allow you to access hi-res graphics from Telewriter-64, your own BASIC programs or PRO-COLOR-FORMS.

MASTER DESIGN comes with its own screen dump routine which interfaces with all popular dot matrix printers that have dot addressable graphic ability.

See reviews in:

July '84 Rainbow, Oct. '84 Hot CoCo Telewriter-64 © 1983 by Cognitac

PRO-COLOR-FORMS 2.0 \$29.95

PRO-COLOR-FORMS will access data files you create with PRO-COLOR-FILE and merge them with a letter or place them on pre-printed forms such as statements. Any field of information from your data file can be placed anywhere and repeated as many times in the letter or on the form. You can use the built in ML text editor for creating the form or use your favorite word processor.

- DESIGN UP TO 6 FORMATS AT ONE TIME • USER DEFINED PAGE SIZE
- SUPPORTS SPECIAL PRINTER CONTROL CODES • RIGHT JUSTIFICATION • PASSWORD PROTECTION • MERGES WITH GRAPHICS FROM MASTER DESIGN

If you use our graphics program MASTER DESIGN, you can merge graphics with your forms for added enhancements. Have your graphic letter head printed at the top of each letter or incorporate designs, bar graphs or any display created within the form itself.

Buy any 3 and deduct 10% — Buy all 4 and deduct 15%

Shipping: Include \$3.00 for UPS shipping, \$6.00 postal, \$12.00 overseas
Send orders to: Derringer Software, Inc. P.O. Box 5300, Florence, SC 29502-2300
VISA/MasterCard customers call: (803) 665-5676 10:00 am to 5:00 pm EDT

NEW

DYNACALC

THE BEST SPREAD SHEET PROGRAM ON THE MARKET* \$99.95 (Includes DYNAGRAPH®)
\$89.95 IF PURCHASED WITH ANY OF THE ABOVE PROGRAMS.

MORE FROM DERRINGER SOFTWARE

TELEGRAPHICS

© 1985 by Derringer Software, Inc.

PRINT HI-RES GRAPHICS WHILE USING TELEWRITER-64!

Use your CoCo Max, Graphicom or any other graphics editing program to create your own letter heads or sales charts and then print them while you're using Telewriter-64. It's the perfect way to add that personal touch to your correspondence.

Telegraphics comes with a hi-res screen print routine that interfaces with Radio Shack, Epson, Gemini, C-Itoh and Okidata printers having dot-addressable graphics. A simple modification to Telewriter-64 will allow you to exit Telewriter via the DISK I/O MENU and print out the graphic without affecting any of your text in the buffer. Using Telewriter's partial print option you could have a sales chart or any other graphic printed right in the middle of your document.

This is the same feature that is included in our MASTER DESIGN program. Since we felt you don't need to buy two graphics editing programs, we have made this feature available at a reduced price.

SPECIAL INTRODUCTORY OFFERS!

TELEGRAPHICS — \$19.95

TELEWRITER-64 + TELEGRAPHICS — \$64.95 (SAVE \$15.00)

COCO MAX + TELEGRAPHICS — \$74.95 (SAVE \$15.00)

ALL 3 PROGRAMS — \$129.90 (SAVE \$19.95)

(Available Only On Disk)

(No Other Discounts Applicable)

DYNAGRAPH

© 1984 by Derringer Software, Inc.

A utility program for owners of DYNACALC®

DYNAGRAPH will transfer graphic files from DYNACALC to standard graphic files for further enhancing and labeling by graphic editing programs such as MASTER DESIGN.

DYNACALC stores its graphic displays in a way that is not accessible by the standard LOADM command. DYNAGRAPH will convert these to files that can be LOADMed by most any graphics editing program such as MASTER DESIGN. DYNAGRAPH will also convert a standard hi-res display into the format that is needed by DYNACALC. DYNAGRAPH can also reduce a graph vertically and horizontally so that multiple displays can be combined into one.

DYNAGRAPH — \$19.95

MASTER DESIGN — \$29.95

DYNAGRAPH + MASTER DESIGN — \$44.95

DYNACALC — \$99.95 (DYNAGRAPH INCLUDED!)

ALL 3 PROGRAMS — \$119.95

SIMON

© 1984 by Derringer Software, Inc.

Wouldn't it be nice if you could run through a BASIC program, answer prompt after prompt, and then have the same responses generated again with the touch of one key? You can with **SIMON**!

SIMON will "watch" you run through any BASIC program and keep track of every keystroke you make. The keystrokes can be saved in a disk file so the next time you want to perform the same procedure, **SIMON** will do it for you.

SIMON can remember 6000 keystrokes (including mistakes) and will faithfully repeat them for you at anytime. A custom menu can be created so that the press of one key will have **SIMON** run your BASIC program(s) and select the appropriate command file to use. You can even have **SIMON** pause at any input so that you can enter information that won't be the same each time.

SIMON is perfect for any type of reporting, file maintenance or any other program that requires a sequence of prompts to be answered each time it's used. This works especially well with our PRO-COLOR-SERIES programs.

Requirements: 64K Color Computer with Disk.

\$24.95 (Disk Only)

SIDE WISE™

© 1984 by Derringer Software, Inc.

SIDE WISE makes your printer do something you never thought possible — **print side ways!** Print out an ASCII spread sheet file that has up to 255 characters per row for easier viewing. No more hassles with trying to hold sheets together!

SIDE WISE will read in any ASCII text file and print it out side ways using a Radio Shack, Epson, Okidata, C-Itoh or Gemini printer. The only requirement is that your printer has dot-graphics ability. **SIDE WISE** reads any ASCII file including BASIC programs and word processor files.

Add a new "twist" to your printer's capabilities!

\$19.95 (Disk Only)

Include \$3.00 for UPS Shipping — \$5.00 U.S. Mail — \$9.00 Air Mail
Checks, Money Order, VISA or MasterCard

Derringer Software, Inc.
P. O. Box 5300 — Florence, S. C. 29502-5300
(803) 665-5676


```

N
130 Z$="234040482959": RETURN
140 Z$="022020606073737575070709
0979": RETURN
150 Z$="022020606073737575357578
786969292908": RETURN
160 Z$="000606765059": RETURN
170 Z$="700000040464647575777759
59191908": RETURN
180 Z$="702020020207072929797978
78757515": RETURN
190 Z$="00707009": RETURN
200 Z$="011010606071717373646414
14030301140505080819196969787875
7564": RETURN
210 Z$="741414030301011010606071
7178786969191908": RETURN
220 Z$="12721575": RETURN
230 Z$="00790970": RETURN
240 FOR H=1 TO LEN(Z$) STEP 4: L
INE(X+VAL(MID$(Z$,H,1)),Y+VAL(MI
D$(Z$,H+1,1)))-(X+VAL(MID$(Z$,H+
2,1)),Y+VAL(MID$(Z$,H+3,1))),PSE
T: NEXT: RETURN
250 PMODE 3,1: PCLS1: SCREEN 1,1
260 COLOR 3,1: LINE(0,0)-(255,20
),PSET,BF: COLOR 1,1
270 M$="U16R5F7E7R5D16L5U1107H7D
11L5": DRAW"BM5,18;" +M$: PAINT(7
,15),4,1
280 DRAW"BM33,18;U16R5D11R8U11R5
D16L18": PAINT(35,15),4,1
290 DRAW"BM55,18;U16R5D11R13D5L1
8": PAINT(57,15),4,1
300 DRAW"BM77,18;U11L7U5R19D5L7D
11L5": PAINT(79,15),4,1
310 DRAW"BM93,18;U16R18D16L18E1C
3E4C1U6R8D6L8": PAINT(95,15),4,1
320 CIRCLE(125,11),8
330 DRAW"BM137,18;U10R3L6R3U3E3R
3F3"
340 DRAW"BM153,18;" +M$: PAINT(15
5,15),4,1
350 DRAW"BM183,18;U16R18D16L5U6L
7D6L5": DRAW"BM189,5;R5D4L5U4":
PAINT(185,15),4,1
360 DRAW"BM205,18;U16R17D10L6F6L
5H6L2D6L5": DRAW"BM211,5;R5D4L5U
4": PAINT(207,15),4,1
370 DRAW"BM227,18;U3R13U3L13U10R
18D4L13D3R15D9L18": PAINT(229,17
),4,1
380 DIM A$(81): C=1: D=81: FOR A
=1 TO 9: FOR B=1 TO 9
390 A$(C)=STR$(A)+"X"+STR$(B): C
=C+1: NEXT B,A
400 COLOR 2,1: CIRCLE(128,96),80
,,.7,.96,.55
410 DRAW"BM50,80;H25R35C1R135C2R
35G25": COLOR 4,1
420 R=75: FOR A=-R+10 TO R-10 ST
EP 2: B=R*R-A*A: Y=INT(SQR(B))
430 LINE(A+128,96-Y)-(A+128-(RND
(20)-10),96-Y+RND(25)),PSET: NEX
T: COLOR 2,1
440 FOR X=100 TO 156 STEP 56: CI
RCLE(X,70),20,,.6: CIRCLE(X,73),
5: NEXT
450 DRAW"BM117,85;F12E12": DRAW"
BM115,178;U27R30D27"
460 FOR X=100 TO 160 STEP 60: CI
RCLE(X,183),20,,.5: PAINT(X,185)
,3,2: NEXT
470 LINE(80,188)-(180,192),PRESE
T,BF: DRAW"BM85,188;R32C1R30C2R3
1"
480 FOR U=1 TO 5+RND(15): ER=1+R
ND(3)
490 Q1=Q: P1=P: P=RND(26): Q=RND
(8): CIRCLE(128,125),P,ER,Q: CIR
CLE(128,125),P1,1,Q1
500 NEXT U: CIRCLE(128,125),P,1,
Q
510 COLOR 2,1: R1=0: C$="": E=RN
D(81): IF D=0 THEN 730
520 IF A$(E)="" THEN 510
530 F=VAL(LEFT$(A$(E),2)): G=VAL
(RIGHT$(A$(E),1))
540 LINE(91,115)-(169,135),PSET,
B: X=95: Y=120: A$=A$(E)+"=": GO
SUB 750
550 W$=INKEY$: IF W$=CHR$(13) TH
EN 570 ELSE IF W$="" OR INSTR("1
234567890",W$)=0 OR R1=2 THEN 55
0 ELSE A$=W$: C$=C$+W$: H1=VAL(C
$): GOSUB 750: R1=R1+1
560 GOTO 550
570 IF H1=F*8 THEN FOR T=1 TO 50
0: NEXT T: GOTO 590
580 GOSUB 810: R1=0: E1=1: C$=""
: GOTO 530
590 LINE(91,115)-(169,135),PRESE
T,BF: KL=20+RND(30): CIRCLE(128,
115),KL,2,.5,0,.5
600 GH=RND(10): ON GH GOSUB 840,
860,910,970: IF GH>4 THEN FOR T=
1 TO 600: NEXT T
610 CIRCLE(128,115),KL,1,.5,0,.5
620 IF D=74 THEN DRAW"BM15,85;D5
F5E5U5D585D6"
630 IF D=67 THEN DRAW"BM15,103;R
10D12L10U12"
640 IF D=60 THEN DRAW"BM15,118;D
12R10U12"
650 IF D=53 THEN DRAW"BM15,151;"
+ZL$
660 IF D=46 THEN DRAW"BM15,166;U
12R10D6L10R3F6"

```

```

670 IF D=39 THEN DRAW"BM25,181;L
10U6R5L5U6R10"
680 IF D=32 THEN DRAW"BM235,101;
"+ZL$
690 IF D=25 THEN DRAW"BM235,123;
R10L10U12R10"
700 IF D=18 THEN DRAW"BM235,139;
U12D6R10U6D12"
710 IF D=11 THEN DRAW"BM235,154;
"+ZL$
720 IF D=4 THEN DRAW"BM235,169;U
12F6E6D12"
730 IF D=0 THEN DRAW"BM235,185;U
12R10D6L10": GOTO 990
740 IF E1=1 THEN E1=0: GOTO 480
ELSE A$(E)="" : D=D-1: GOTO 480
750 FOR P=1 TO LEN(A$): Q$=MID$(
A$,P,1)
760 K=ASC(Q$): IF K=61 OR K=88 O
R K>47 AND K<58 THEN 770 ELSE 80
0
770 IF K=61 THEN GOSUB 220 ELSE
IF K=88 THEN GOSUB 230 ELSE IF K
=48 THEN GOSUB 120 ELSE IF K=49
THEN GOSUB 130 ELSE IF K=50 THEN
GOSUB 140 ELSE IF K=51 THEN GOS
UB 150 ELSE IF K=52 THEN GOSUB 1
60 ELSE IF K=53 THEN GOSUB 170

```

```

780 IF K=54 THEN GOSUB 180 ELSE
IF K=55 THEN GOSUB 190 ELSE IF K
=56 THEN GOSUB 200 ELSE IF K=57
THEN GOSUB 210
790 GOSUB 240: X=X+12: NEXT P: R
ETURN
800 NEXT P: RETURN
810 LINE(91,115)-(169,135),PSET,
BF
820 COLOR 1,1: X=95: Y=120: A$=A
$(E)+"="+RIGHT$(STR$(F*6),2): GO
SUB 750
830 FOR T=1 TO 1000: NEXT T: LIN
E(91,115)-(169,135),PRESET,BF: C
OLOR 2,1: RETURN
840 FOR U1=1 TO 5+RND(10): FOR X
1=100 TO 156 STEP 56: PAINT(X1,6
6),RND(2)+2,2: NEXT X1,U1
850 PAINT(100,66),1,2: PAINT(156
,66),1,2: RETURN
860 FOR HG=1 TO 3+RND(5): C1=RND
(2): IF C1=1 THEN L1=79 ELSE L1=
139
870 GET(L1,170)-(L1+56,192),Z
880 FOR J1=170 TO 170-(RND(8)*2)
STEP -2: GOSUB 900: NEXT J1
890 FOR J1=J1 TO 170 STEP 2: GOS
UB 900: NEXT J1,HG: RETURN
900 PUT(L1,J1)-(L1+56,J1+22),Z:
RETURN
910 GET(205,50)-(230,80),Z
920 FOR J1=50 TO 30 STEP -1: GOS
UB 960: NEXT J1
930 FOR T=1 TO 5+RND(10): P=3+RN
D(10): P$=RIGHT$(STR$(P),1): PL$
="E"+P$+"F"+P$: PL$=PL$+PL$+PL$:
CO$=STR$(1+RND(3))
940 F$="":BM217,52;": DRAW "C"+CO
$+F$+PL$: FOR T1=1 TO 100: NEXT
T1: DRAW"C1"+F$+PL$: NEXT T
950 FOR J1=30 TO 50: GOSUB 960:
NEXT J1: COLOR 2,1: RETURN
960 PUT(205,J1)-(230,J1+30),Z: R
ETURN
970 FOR WR=1 TO RND(5)*2: IF WR/
2=INT(WR/2) THEN T1=1: T2=2 ELSE
T1=2: T2=1
980 CIRCLE(100,73),5,T2: CIRCLE(
113,70),5,T1: CIRCLE(156,73),5,T
2: CIRCLE(145,70),5,T1: FOR YT=1
TO 10: NEXT YT,WR: RETURN
990 FOR X=85 TO 115: CIRCLE(128,
X),40,4,-.5,0,-.5: NEXT X
1000 FOR X=105 TO 113: CIRCLE(12
8,X),32,1,.4,0,-.5: NEXT X
1010 GH=RND(4): ON GH GOSUB 840,
860,910,970: GOTO 1010
1020 END

```

LOWEST PRICES

EDITTRON

EDITTRON is a Machine-Language, Full-Screen BASIC Program Editor. More powerful than any word processor for editing your BASIC programs. EDITTRON allows you to RUN and debug your programs without having to SAVE them in ASCII. 20 simple commands plus Auto-Numbering make EDITTRON an extremely powerful and time-saving BASIC programming aid. Requires 16K Extended Color BASIC.

GOLDKEYS

GOLDKEYS is a 64K Machine-Language Keyboard Enhancement which adds these powerful new features to your Color Computer: Function Keys, Type-Ahead Buffer, Non-Destructive Cursor, Auto-Repeating Keys, Key Click, Enhanced Line Editor, and these Powerful Commands: BREAKON, BREAKOFF, ONBREAKGOTO, ONRESETGOTO, INPUTUSING, and much more! Requires 64K Extended Color BASIC.

Buy Either Program for \$20⁰⁰ on Cassette or \$22⁰⁰ on Disk
Buy Both Programs for \$35⁰⁰ on Cassette or \$39⁰⁰ on Disk

SPECIALS

Color BASIC ROM 1.2 \$30⁰⁰
Disk Extended Color BASIC ROM 1.1 \$30⁰⁰
64K/128K RAM Buttons \$3⁰⁰

TERMS: Cashier's checks and Money Orders for immediate delivery • Personal checks allow 2 weeks • Orders over \$100 save 10% • California residents add 6% Sales Tax • Orders under \$25 add \$2 shipping • U.S. C.O.D. orders add \$4

4416 E. Chapman Ave., Suite 284
Orange, CA 92669
(714) 639-4070

VIDTRON

FREE
CATALOG

The HJL-57 Keyboard

Now available for all models,
including CoCo 2.



Compare it with the rest. Then, buy the best.

If you've been thinking about spending good money on a new keyboard for your Color Computer, why not get a good keyboard for your money?

Designed from scratch, the HJL-57 Professional Keyboard is built to unlock ALL the potential performance of your Color Computer. Now, you can do real word processing and sail through lengthy listings...with maximum speed; minimum errors.

At \$79.95, the HJL-57 is reasonably priced, but you can find other CoCo keyboards for a few dollars less. So, before you buy, we suggest that you compare.

Compare Design.

The ergonomically-superior HJL-57 has sculptured, low profile keycaps, and the three-color layout is identical to the original CoCo keyboard.

Compare Construction.

The HJL-57 has a rigidized aluminum baseplate for solid, no-flex mounting. Switch contacts are rated for 100 million cycles minimum, and covered by a spill-proof membrane.

Compare Performance.

Offering more than full-travel, bounce-proof keyswitches, the HJL-57 has RFI/EMI shielding that eliminates irritating noise on displays; and four user-definable function keys (one latching), specially-positioned to avoid inadvertent actuation.

Free Function Key Program

Your HJL-57 kit includes usage instructions and decimal codes produced by the function keys, plus a free sample program that defines the function keys as follows: F1 = Screen dump to printer, F2 = Repeat key (latching), F3 = Lower case upper case flip (if you have lower case capability), F4 = Control key; subtracts 64 from the ASCII value of any key pressed. Runs on disc or tape; extended or standard Basic.

Compare Installation.

Carefully engineered for easy installation, the HJL-57 requires no soldering, drilling or gluing. Simply plug it in and drop it right on the original CoCo mounting posts. Kit includes a

new bezel for a totally finished conversion.

Compare Warranties.

The HJL-57 is built so well, it carries a full, one-year warranty. And, it is sold with an exclusive 15-day money-back guarantee.

Compare Value.

You know that a bargain is a bargain only so long as it lasts. If you shop carefully, we think you will agree...The HJL-57 is the last keyboard your CoCo will ever need. And that's real value.

Order Today.

Only \$79.95, the HJL-57 is available for immediate shipment for either the original Color Computer (sold prior to October, 1982) or the F-version and TDP-100 (introduced in October, 1982), and the new 84K CoCo. Now also available for CoCo 2.

Call Toll Free
1-800-828-6968

In New York 1-800-462-4891



PRODUCTS

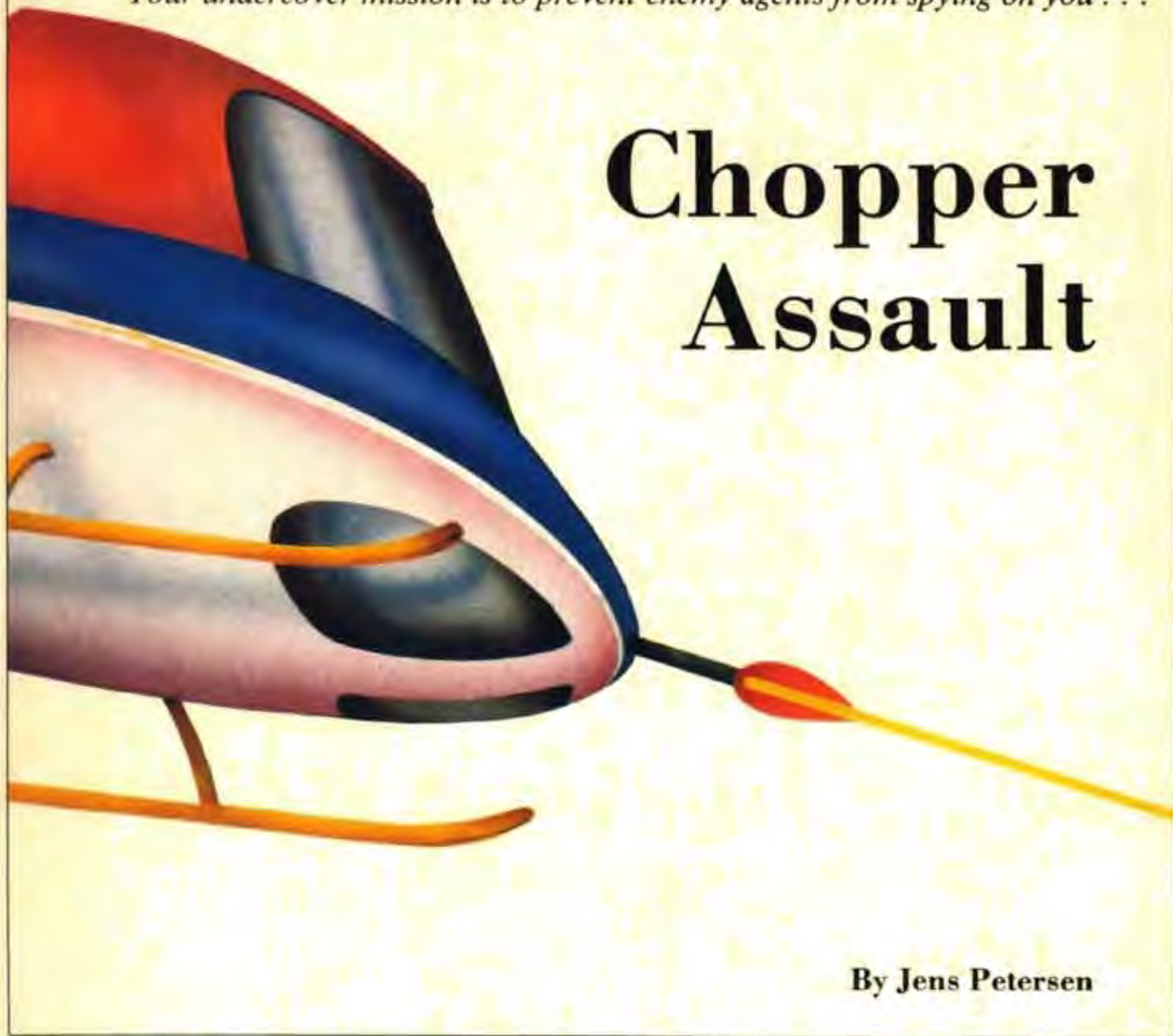
Div. of Touchstone Technology Inc.
955 Buffalo Road • P.O. Box 34884
Rochester, New York 14624

Telephone: (716) 235-6558

Ordering Information: Specify model (Original, F-version, or CoCo 2); Payment by C.O.D., check, MasterCard or Visa. Credit card customers include complete card number and expiration date. Add \$2.00 for shipping (\$3.50 for Canada); New York state residents add 7% sales tax. Dealer inquiries invited.

Your undercover mission is to prevent enemy agents from spying on you . . .

Chopper Assault



By Jens Petersen

A 16K ECB Color Computer game, *Chopper Assault* requires a joystick to play. The object is to stop enemy spies from gathering too much information; if they do, you die!

First CLOAD and RUN the program, then you will be asked for either levels 1, 2 or 3, depending on your level of play. Type in your name and press ENTER, which will then show the title

screen. Press the firebutton to start the game.

You will see from inside your own helicopter your four cannon sites, with a box in the center of the sites showing where the cannon will shoot. Your timer is at the top, indicated by a line or bar. Your score is there too, in the middle. You move the box, or center site, around the screen with the joystick.

You have five shots at the enemy; when he gathers enough information to leave, another comes to take his place. If you shoot one, your score increments by the amount of time left. If your score is above the high score, the program

displays some graphics to show you this, but it can only happen once in your game.

You die if your time runs out, meaning that the enemies have gathered enough information to destroy you. If you're dead, the program goes into text and you see your name and score, and the top three names and scores. Press the firebutton to play again or press 'Q' to quit. (*Chopper Assault* does not work on a disk-based system.)

If you have any questions about this program, Jens may be reached at 6180 Baffin, Brossard, Quebec, Canada J4Z 2H8, phone (514) 678-4205.

(Jens Petersen is 14 years old and goes to Centennial Regional High School in Brossard, Quebec. He likes to hike, swim, fish and compute on his CoCo.)

The CoCo Calligrapher

Use your CoCo, your 8-bit dot addressable graphics printer and the **CoCo Calligrapher** to create beautiful signs, invitations, flyers, greeting cards, diplomas, certificates, awards and love letters.

The original **Calligrapher** letters are 36 points (1/2 inch) high and variably spaced. It includes an easy-to-use, menu-oriented program and these three typestyles:

Old English Cartoon
Old English Cartoon

Gay Nineties
Gay Nineties
The CoCo Calligrapher requires 32K ECB.
Tape \$24.95/Disk \$29.95

ADDITIONAL TYPESTYLES

These tapes of additional typestyles are available for **\$19.95 each**. They can be easily moved to disk. *The original Calligrapher program is required.*

Tape 1 - Reduced, Reversed, and Reduced-Reversed versions

Old English Gay Nineties Cartoon

u v w x y n o l d s b a b e d e

All typestyles on Tapes 2, 3, 4, 5, and 6 include Standard (1/2 inch), Reversed, Reduced, and Reduced-Reversed unless otherwise noted.

Tape 2: Broadway/Old Style

Broadway Oldstyle

Tape 3: Business/Antique

Business Antique

These disks of additional typestyles are available for \$49.95 each.

Disk 1 - all type styles on Tapes 1, 2 and 3.
Disk 2 - all type styles on Tapes 4, 5 and 6.

Tape 4: Wild West/Checkers

Wild West Checkers

Tape 5: Star

Hebrew

Stars ם ן ן ן ן ן ן ן ן

Victorian (Standard and Reverse only)

Victorian

Tape 6: Block/Computer

**Block
COMPUTER**

The OS-9 Calligrapher

\$39.95

Requires OS-9 Version 01.01.00 and a dot matrix printer. The **OS-9 Calligrapher** reads a standard input text file which contains text and formatting directives to produce standard output for printer or disk. You can specify which font to use; centering; left, right or full justification; line fill; narrow mode; margin; line width; page size; page break and indentation.

These disks of additional typestyles are available for \$49.95 each. They are not compatible with the CoCo Calligrapher typestyles or program. OS-9 typestyle disk must be used with the OS-9 Calligrapher.

Disk 1 - OS-9 version of all type styles on Tapes 1, 2 and 3.

Disk 2 - OS-9 version of all type styles on Tapes 4, 5 and 6.

Dealer and author inquiries are always welcome. Canadian dealers should contact Kelly Software Distributors, Ltd., P.O. Box 11932, Edmonton, Alberta T5J-3L1, (403) 421-8003.

Disk software compatible with Radio Shack DOS only.

SUGAR SOFTWARE

2153 Leah Lane
Reynoldsburg, Ohio 43068
(614) 861-0565

A complete catalog of other sweet Sugar Software products is available.

Add \$1.50 per tape for postage and handling. Ohioans add 5.5% sales tax. COD orders are welcome. CIS orders EMAIL to 70405, 1374. No refunds or exchanges.

MasterCard

VISA

210	.....	250
310	.....	16
520	.....	125
640	.....	73
740	.....	206
900	.....	123
END	.....	98

The listing: CHOPPER

```

10 *****CHOPPER ASSAULT*****
20 JENS PETERSEN JANUARY14/84*
30 *****
40 POKE65495,0
50 CLEAR300: DIMH(18),J(18),EX(10)
60 A$(0)="BDER2FD4GL2HU4": A$(1)="BD6BR2RNRU6G": A$(2)="BDER2FDGL2GD2R4": A$(3)="BDER2FDGNLFDGL2H": A$(4)="BR4ND6G3R4": A$(5)="BRNR4D3ER2FD2GL2H": A$(6)="BRNR3GD4FR2EUHL2": A$(7)="R4G3D3"
70 A$(8)="BRR2FDGFDGL2HUEHUE": A$(9)="BD6R2EU4HL2GDFR2"
80 GOSUB780: SC=0
90 GOTO210
100 T$=STR$(SC)
110 COLOR5,0: LINE(104,3)-(D,13),PSET,BF
120 D=106
130 FORT=2TOLN(T$)
140 E$=MID$(T$,T,1)
150 E=VAL(E$)
160 DRAW"C0BM"+STR$(D)+" ,5"+A$(E)
170 D=D+7
180 NEXT
190 COLOR5,0
200 RETURN
210 PMODE2,1: COLOR0,5: PCLS: SCREEN1,1
220 D$="NR5D10R5BU10BR3D10U5R5NU5D5BU10BR3D10R5U10L5BR8ND10R5D5L5BR8BU5ND10R5D5L5BR8BU5NR5D5NR3D5R5BU10BR3ND10R5D5L5RF4D": DRAW"BM92,30"+D$
230 DR$="ND10R5D5NL5D5BR8BU10L5D5R5D5L5BR12BU10L3D5R3D5L3BR8U10R3D5NL3D5BR4NU10R5U10BR4D10R3BR6U10NL2R2": DRAW"BM92,44"+DR$
240 DRAW"BM20,120D10R5U5L5BR8D5R5NU5D5BR12R5D10G2L3H2BR11BU10NR4D6NR3D6R4BU12BR4ND12F6ND6U6BR4NR4D6R4D6NL4BR12BU12ND12R4D6NL4BU6

```

```

BR4NR4D6NR3D6R4BU12BR4R2NR2ND12BR6NR4D6NR2D6R4BU12BR4ND12R4D6L4R1F3D3BU12BR4NR4D6R4D6NL4BU12BR4NR4D6NR2D6R4BU12BR4ND12F6ND6U6
250 DRAW"BM160,150D2BR4BU2R4D12L4U6NR4U6BR8D6R4NU4D6"
260 P=PEEK(65280): IFP=2540RP=126 THEN270ELSE260
270 PMODE4,1: PCLS: SCREEN1,1: COLOR5,0: FORCF=1T02: Q1=127: Q2=96: Q3=96: FORT=127T00STEP-3: Q1=Q1+3: Q2=Q2+2.2: Q3=Q3-2.2: LINE(T,Q3)-(Q1,Q2),PSET,B: NEXT: COLOR0,0: NEXT: COLORS,0
280 PMODE0,1: SCREEN1,1
290 PMODE4,1: PCLS
300 DRAW"BM50,50R4NR4D2LG2FR4EH2": PAINT(53,54),5,5
310 GET(50,50)-(58,55),H,G: GET(100,100)-(108,105),J,G: PCLS: FORX=1T020: PSET(RND(10)+100,RND(10)+150,5): NEXT: GET(100,150)-(110,160),EX,G
320 PCLS: SCREEN1,1
330 V1=RND(191): V=RND(255): O1=100: O2=100: EM=200: AS=127: SD=96: DS=96
340 LINE(0,0)-(255,16),PSET,BF
350 COLOR0,1
360 A=0: B=0
370 FORT=1T02
380 A=A+1: B=B+1
390 DRAW"BM"+STR$(A)+" ,"+STR$(B)+D$
400 NEXT
410 A=200: B=0: FORT=1T02: A=A+1: B=B+1: DRAW"BM"+STR$(A)+" ,"+STR$(B)+DR$: NEXT
420 D=104: GOSUB100
430 SCREEN1,1
440 X=RND(5)+2: X1=RND(5)+2
450 EM=EM-F3
460 IFEM<5THEN760ELSELINE(200,14)-(EM,14),PRESET
470 JH=JOYSTK(0): JV=JOYSTK(1)
480 WE=JH*255/63
490 EW=JV*191/63+16+5
500 IFWE<5THENWE=5ELSEIFWE>250THENWE=250
510 IFEW>191THENEW=191ELSEIFEW<19+5THENEW=19+5
520 LINE(AS-5,SD-5)-(AS+5,SD+5),PRESET,B
530 LINE(0,SD)-(8,SD),PRESET: LINE(255,DS)-(247,DS),PRESET: LINE(0,EW)-(8,EW),PSET: SD=EW: LINE(255,EW)-(247,EW),PSET: DS=EW
540 LINE(AS,17)-(AS,22),PRESET: L

```

WHY ARE WE GIVING OUT TOP PROGRAMMING SECRETS — FOR A SONG?

'cause you are #1 with us. We strive hard to give you the best to succeed.

UTILITY ROUTINES FOR THE TANDY & TRS-80 COLOR COMPUTER (VOL. I)

This powerful book, written for BASIC and ML Programmers includes almost all the utility routines essential for programming. Each routine includes program explanation, memory requirements, and an annotated listing. These routines if bought individually will cost you HUNDREDS OF DOLLARS. At the price of this book, you can't go wrong.

These are 100% Position Independent ML Utilities. NO ML PROGRAMMING KNOWLEDGE REQUIRED. Routines for:

COMMAND KEYS: Access Basic/ECB Commands / Functions with two keystrokes.

CURSOR STYLES: Create OVER 65000 different cursor styles.

ERROR SKIP: Skip and handle errors for your programs.

FULL LENGTH ERRORS: Get full length error messages instead of abbreviated ones.

KEY CLICKER: Ensure key input accuracy.

LINE AUTO INCREMENT: Use Computer Generated Line Numbers.

PAUSE CONTROL: Put ANY Basic program (and most ML Programs) "on hold."

REPEAT KEY: Repeat any key. 5 different repeat speeds.

REVERSE VIDEO (GREEN and RED): Eliminate eye-strain.

SPOOLER (16K, 32K, 64K): Don't wait for those long printouts. 32K Spooling Buffer in 64K.

SUPER SCROLLER (For 64K Only): Save everything that scrolls off your screen and view it later.

TAPE INDEX SYSTEM: Get a listing of tape programs.

TAPE-TO-DISK: Move Basic and ML programs from tape to disk.

TEXT SCREEN SCROLL PROTECT: Disable text screen scroll.

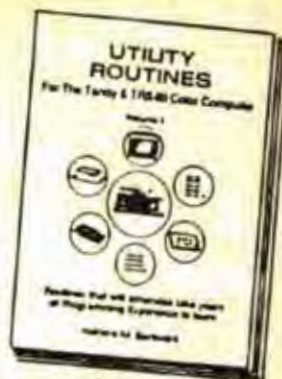
AND MUCH, MUCH MORE!!!

COMPATIBLE WITH 16K/32K/64K ECB/Disk Basic Cassette and Disk Systems
CoCo I and CoCo II.

ONLY \$19.95

These Routines (Ready-To-Run) On Cassette/Disk Only \$24.95

Both Book & Cassette/Disk \$36.95

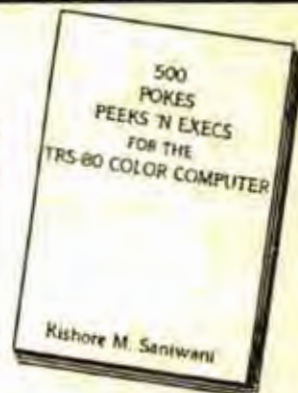


500 POKES, PEEKS 'N EXECS for the TRS-80 COLOR COMPUTER

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 programs, SO WHY WAIT?

This 80-page book includes POKEs, PEEKs and EXECS to:

- Autostart your Basic programs.
- Disable most Color Basic/ECB/Disk Basic Commands.
- Disable BREAK KEY, CLEAR KEY and RESET BUTTON.
- Generate a Repeat-Key.
- Merge two Basic programs.
- Transfer Rompaks to tape (for 64K only).
- Speed up your programs.
- RESET, MOTOR ON/OFF from keyboard.
- Restart your Basic program thru the RESET BUTTON.
- Produce Key-Clicks and Error-Beeps.
- Recover Basic programs lost by NEW, ?10 ERRORS and faulty RESET.
- Set 23 different GRAPHIC/SEMIGRAPHIC modes.
- Set 15 of the most commonly used Baud Rates.
- Allow you more plays in 23 of your favorite arcade games.
- And much, much more.



COMMANDS COMPATIBLE WITH 16K/32K/64K
COLOR BASIC/ECB/DISK
BASIC CASSETTE and DISK SYSTEMS
and CoCo I and CoCo II.

ONLY \$16.95

Basic Programming
Tricks Revealed **\$14.95**



**MICROCOM
SOFTWARE**

P.O. BOX 214, FAIRPORT, N.Y. 14450

See us at
RAINBOW FEST-Chicago



To Order: VISA, MC, CHECK, MO, COD (\$2.50 extra). Please add \$2.00 shipping and handling (Foreign \$5.00). NYS Residents, please add Sales Tax. • Immediate shipment • Order by phone and get a \$2.00 refund for your phone call • Call for discounts on bulk quantities • Dealer inquiries invited

24-HOUR ORDER HOT LINE:(716) 223-1477

```

INE (AS,191)-(AS,185),PRESET:LINE
(WE,17)-(WE,22),PSET:LINE(WE,191)
)-(WE,185),PSET:AS=WE
550 LINE(WE-5,EW-5)-(WE+5,EW+5),
PSET,B
560 P=PEEK(65280):IFP=126ORP=254
GOSUB640
570 RN=RND(20):IFRN=1THENX1=-X1:
PLAY"L255V3101:CD" ELSE IF RN=2T
HENX=-X:PLAY"L255V3101:CD"
580 IFX4=>5THENFORT=1T07STEP2:CI
RCLE(V+4,V1+3),T:NEXT:FORT=1T07S
TEP2:CIRCLE(V+4,V1+3),T,0:NEXT:V
=RND(255):V1=RND(191):PLAY"L5005
DGDGDGDGD":X4=0
590 V=V+X:IFV>247THENV=7ELSEIFV<
7THENV=247
600 V1=V1+X1:IFV1>185THENV1=24EL
SEIFV1<24THENV1=185
610 PUT(O1,O2)-(O1+8,O2+5),J,PSE
T:PUT(V,V1)-(V+8,V1+5),H,PSET:O1
=V:O2=V1
620 IFINKEY$="Q"THEN910
630 GOTO450
640 PRESET(WE,EW):PUT(V,V1)-(V+8
,V1+5),H,PSET:PH=POINT(WE,EW):L
INE(WE,22)-(WE,185),PSET:LINE(10
,EW)-(245,EW),PSET:LINE(WE,22)-(

```

```

WE,185),PRESET:LINE(10,EW)-(245,
EW),PRESET:PLAY"L255V3101:12:11:
10:9:8"
650 IFPH<>0THEN660ELSEEM=EM-5:X4
=X4+1:RETURN
660 PUT(WE-5,EW-5)-(WE+5,EW+5),E
X,PSET
670 DRAW"C0BM72,3D4ND4R4NU4D4BR3
NU8BR4UBNL2R2BR3D5BD2D"
680 PLAY"L30V3101:12:1:12:1:12:1
:12:1:L255O1:4:3:2:1:4:3:2:1:4:3
:2:1:4:3:2:1:4:3:2:1:4:3:2:1:4:3
:2:1:4:3:2:1":PUT(WE-5,EW-5)-(WE
+5,EW+5),J,PSET
690 SC=SC+EM:GOSUB100:EM=200
700 LINE(200,14)-(0,14),PSET
710 V=RND(255):V1=RND(191):IFSGN
(X)=-1THENX=RND(5)+2ELSEX=(RND(5
)+2)*-1
720 IFSGN(X1)=-1THENX1=RND(5)+2E
LSEX1=(RND(5)+2)*-1
730 IFSC>SC(1) THENIFGP<>1THENC0
LOR5,0:FORCF=1T02:Q1=127:Q2=104:
Q3=104:FORT=127T00STEP-3:Q1=Q1+3
:Q2=Q2+2:Q3=Q3-2:LINE(T,Q3)-(Q1,
Q2),PSET,B:NEXTT:COLOR0,0:NEXT:C
OLOR5,0:GP=1
740 DRAW"C5BM72,3D4ND4R4NU4D4BR3

```

Parents! Want to stimulate your child's learning?

TCE'S EARLY LEARNING SERIES



ABC'S In Color

Speed your child's learning of the Alphabet!
CoCo 16K ECB Tape \$19.95 Disk \$25.95

Mr. Bear Count

A counting program that will tantalize the youngest member of your family!
CoCo 16K Tape \$15.95 Disk \$19.95

Alpha Memory

Your child can master the lower and upper case letters of the alphabet while having fun!
CoCo 16K Tape \$16.95 Disk \$20.95

Mr. Bear Math

Add & subtract with Mr. Bear. Your child will gain Mr. Bear's wink of praise & approval!
CoCo 16K Tape \$15.95 Disk \$19.95

Over 75
Titles!

Basic Math

Learn to add & subtract through counting!
CoCo 16K ECB Tape \$12.95 Disk \$16.95

Mr. Bear Flash Card

After your child has mastered Mr. Bear Math, continue his/her learning experience with Mr. Bear's multiplication & division flash card.
CoCo 16K Tape \$15.95 Disk \$19.95

See & Spell

Let your computer aid your child in learning to spell!
CoCo 16K ECB Tape \$14.95 Disk \$18.95

Mix & Match

A brilliantly colored constantly moving computer version of concentration!
CoCo 16K Tape \$12.95 Disk \$16.95

Mr. Piggy

Program will aid your child in learning the value of money!
CoCo 32K ECB Tape \$19.95 Disk \$24.95

Teaching Clock

Learn to tell time with the aid of a special teaching clock!
CoCo 16K ECB Tape \$16.95 Disk \$19.95



Programs Have Been Child, Parent, & Educator Tested!

Send for
FREE Catalog

TCE EDUCATION DIVISION
P.O. BOX 2477
GAITHERSBURG, MD 20879

1-800-4TC-4TCE




```

NU8BR4U8NL2R2BR3D5BD2D"
750 GOTO450
760 PLAY"L20V3101;6;5;4;3;2;1;L3
0;6;5;4;3;2;1;L50;6;5;4;3;2;1;L7
0;6;5;4;3;2;1;L90;6;5;4;3;2;1;L1
30;6;5;4;3;2;1;L200;6;5;4;3;2;1"
:FORT=1T050:LINE(RND(255),RND(19
1))- (AS,SD),PSET:NEXT
770 GOTO910
780 CLS
790 PRINT@11,"CHOPPER":PRINT@32+
11,"ASSAULT":PRINT@32*2+7,"BY JE
NS PETERSEN"
800 PRINT@32*3,"PRESS LEVEL OF D
IFFICULTY"
810 PRINT@32*4,"1- BEGINNER":PRI
NT@32*5,"2- EXPERT":PRINT@32*6,"
3- PRO"
820 PLAY"L255V3101":FORT=1024T01
535:Z=PEEK(T):IFZ>63THENPOKET,Z-
64:PLAY"1"
830 NEXT
840 A$=INKEY$:IFA$=""THEN840ELSE
IFVAL(A$)<10RVAL(A$)>3THEN840
850 PLAY"L255V3101;1;2;3;4;5;6;7
;8;9;10;11;12"
860 PRINT@256,"name";
870 POKE282,0

```

```

880 INPUTNA$:IFNA$=""THEN860
890 POKE282,1
900 U7=VAL(A$)+2:F3=VAL(A$):RETU
RN
910 CLS
920 PRINT@64+11,"GAME OVER"
930 PRINT@0,"";:PRINTTAB(8)"CHOP
PER ASSAULT"
940 IFSC>SC(1)THENSC(3)=SC(2):NA
$(3)=NA$(2):SC(2)=SC(1):NA$(2)=N
A$(1):SC(1)=SC:NA$(1)=NA$
950 IFSC<SC(1)ANDSC>SC(2)THENSC(
3)=SC(2):NA$(3)=NA$(2):SC(2)=SC:
NA$(2)=NA$
960 IFSC<SC(2)ANDSC>SC(3)THENSC(
3)=SC:NA$(3)=NA$
970 PRINT@128+11,SC:NA$:
980 PRINT@192+10,"HIGH SCORES"
990 PRINT@256+10,SC(1);NA$(1);
1000 PRINT@288+10,SC(2);NA$(2);
1010 PRINT@320+10,SC(3);NA$(3);
1020 FORT=1024T01535:Z=PEEK(T):I
FZ>63THENPOKET,Z-64
1030 PLAY"L255V3104;D":NEXT
1040 P=PEEK(65280):IFP=1260RP=25
4THEN80ELSEIFINKEY$="Q"THEN1050E
LSE1040
1050 CLS:CLEAR:POKE65494,0

```

PAYROL/BAS™ PAYROLL PROGRAM

From Howard Medical

By Bernie Litton

Increase the power of your Color Computer with useful business programs from Howard Medical

A dynamic tool for businesses and accountants, PAYROL/BAS™ cuts checks and keeps records for companies up to 100 employees. All you need is a computer with 64K Extended Basic, one disk drive and a printer, and PAYROL/BAS™ lets you:

- **Enter employee data** (name, address, SS#, FICA, taxes, deductions, profit sharing, insurance).
- **Cut checks.** (The program works with both pin-feed and friction-feed printers, and we can even supply the checks if you need them.)
- **Automatically calculates and stores** seven deductions, including federal, FICA, state, three of your choosing (such as city, profit sharing or insurance) and one miscellaneous.
- **Will calculate tax** and print to screen for approval before printing check.
- **Keep ledgers** (including monthly listings of all checks, gross income, FICA, taxes, profit sharing, insurance).
- **Error correcting routine** lets you change data if you have made a mistake.
- **Handles weekly, bi-weekly, semi-monthly and monthly pay periods.**

Only **\$79.95** (\$2 shpg)



WITH PAYROL/BAS™ YOU'LL ALSO WANT...

941 Program: Gives individual summaries and totals of check information to prepare 941 and state unemployment forms. **\$29.95** (\$2 shpg)

W-2 Program: To cut year-end W-2's. **\$29.95** (\$2 shpg)

New! VIP SERIES
VIP WRITER: Powerful word processing program has all standard word-processing features PLUS automatic justification, pagination, centering options, as well as Error Detection and Undo Mistake features. A "flawless" program, according to Rainbow. **\$68.88** (includes VIP Speller) (\$2 shpg)

VIP CALC: Create business spread sheets, get up to 33K of work space in 64K. Calculation functions include trigonometry and sorting. **\$68.88** (\$2 shpg)

VIP DATABASE: Stores data and files of all kinds and allows you to combine VIP Writer files as well. Do mailing lists, inventories, menus and recipes, and more! **\$58.88** (\$2 shpg)

OTHER PROGRAMS FROM HOWARD

SAP II STOCK ANALYSIS PROGRAM: Stores and tracks your stock portfolio's performance. A Howard exclusive. **\$19.95** (\$2 shpg)

EPSON PRINTER TUTORIAL: Menu driven program that teaches you how to use the different commands to unleash the full potential of your Epson printer. **\$24.95** (\$2 shpg)

Illinois residents add 8% tax. American Express, MasterCard, VISA accepted.



Howard Medical Computers

Box 2 Chicago, IL 60690

Phone 312/278-1440

Computer Bulletin Board 312/278-9513

Retail Store: 1690 Elston, Chicago

The All-New Epson LX-80 Dual Mode Printer and J&M Controller



New Dual Mode Printer

The new Epson LX-80 offers printing flexibility in two modes: one mode allows you to print in a quick (100 cps) dot-matrix style for programming and graphics, and the Near Letter Quality mode (16 cps) produces precise (240 dots per inch), beautiful type for correspondence, reports, and similar purposes. The LX-80 offers 160 different type-style combinations, including Pica, Elite, Enlarged, Emphasized, Condensed, Subscripts and Superscripts, and type-styles can be selected quickly from the top control panel or from program control. Comes standard in friction feed, tractor option is also available.

LX-P package includes LX-80 with a serial interface with 2K buffer, a Color Computer to Epson cable, and Printer Tutorial that teaches you how to program the different type styles (\$299.95 value).

LX-P: LX-80 package \$317 (\$7 shpg)

ET-1 tractor option for LX-80. \$29.50.

SF-1 Single-sheet feeder for the LX-80. \$145 (\$7 shpg)

RX-80F/T+CLOSEOUT

RX-P package includes Epson RX-80F/T+ printer, Epson serial interface, a serial Color Computer to Epson cable, and free Printer Tutorial. **\$317** (\$7 shpg)

MONITORS

123 Zenith 12" Green Screen, 640 dots x 200 dots resolution, 15 MHz band width. **\$114** (\$7 shpg)

122 Zenith 12" Amber Screen, 640 dots x 200 dots resolution, 15 MHz band width. **\$134** (\$7 shpg)

131 Zenith 13" Color Monitor with speaker, composite & RGB jack, 240 dots x 200 dots resolution, 2.5 MHz band width. **\$334** (\$14 shpg)

NEW: 141 Roland 13" Color Monitor with speaker, 270 dots x 200 dots resolution, 4 MHz band width. **\$247** (\$12 shpg)

All monitors require video controller. Reverse video free with monitor order.

MEMORY

64K Upgrades—1 Year Warranty

64-E1 for E Boards with complete instructions. Remove old chips and replace with preassembled package—no soldering or trace cuts. **\$52.45** (\$2 shpg)

64-F1 for F Boards. No soldering needed. Capacitor leads must be cut. **\$48.45** (\$2 shpg)

64-2 for COCO 2. Kit requires one solder point, no trace cuts. **\$48.45** (\$2 shpg)

SURGE SUPPRESSOR

SS-1 protects your data and equipment against power surges and transients. **\$16.25** (\$2 shpg)

CONTROLLERS

New Controller from J&M: Has switch that allows either JDOS or RS DOS to be the disk operating system; eliminates software compatibility problems, while preserving the advantages of J&M's gold contacts and data separator. Also added to the DC-2 is a parallel port, which means a serial interface is no longer needed to make a parallel printer (like the Epson) work.

DC-2 Disk Controller with JDOS. \$138 (\$2 shpg)

RS-1: RS DOS ROM Chip. \$20.00 (\$2 shpg)

DC-1 Disk Controller reads and writes to 35 and 40 track single and double-sided drives for all models of the Color Computer w/ JDOS. **\$128** (\$2 shpg)

VC-1 Video Interface mounts inside Color Computer by piggy-backing IC on top of interface—no soldering, no trace cuts. All models give composite video & sound. **\$24.45** (\$2 shpg)

VC-2 for COCO 2—mono only. \$26.45 (\$2 shpg)

VC-3 for COCO 2—both color and monochrome. \$39.45 (\$2 shpg)

VC-4 for new Color Computer (no sockets, chips are soldered to mother board). Attaches with spring-loaded clips. Color & mono. **\$39.45** (\$2 shpg)

DRIVE O PACKAGE

359,424 byte package includes half-height, double-sided double-density TEAC drive with slim-line case and heavy-duty power supply, DC-2 J&M Controller, and a gold-plated connecting cable. Accesses both 35 and 40 track disks.

D0-P package \$354 (\$7 shpg)

HOWARD QUALITY STANDS



New TS-1X Monitor Stand: Designer-beautiful stand with clear corner posts, easy side access to ROM port, reset and on/off buttons. **\$39.50** (\$3 shpg)

TS-1: Standard 13" monitor stand for the original Color Computer. Specify black, ivory or clear 15" x 11" x 4". **\$29.50** (\$3 shpg)

TS-2: Same as above for the COCO 2. \$29.50 (\$3 shpg)

PS-1X Printer Stand features new noise-suppressing foam top and cork base. 15" x 11" x 2 1/2". **\$24.95** (\$3 shpg)

EPSON AND J&M

The EJ-P Package

The Epson LX-80 Printer teamed with our new J&M DC-2 Controller gives you top printing capabilities plus built-in switch gives JDOS or Radio Shack DOS so all software can run on your Color Computer. Package includes: Epson LX-80 Printer with ET-1 tractor option; DC-2 controller; parallel Color Computer to J&M cable; Epson Printer Tutorial (\$299.95 value).

Complete EJ-P package \$425.00 (\$7 shpg)

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—no questions asked.



Howard Medical Computers

1690 Elston, Chicago 60622



Telephone (312) 278-1440

Computer Bulletin Board (312) 278-9513

Cat. No.	Quantity	Description	Unit cost	Cost
			\$	\$
<input type="checkbox"/> Bill to me <input type="checkbox"/> My check or money order is enclosed <input type="checkbox"/> Send COD			Total Cost	
Name _____			Shipping	
Address _____			Ill. res. add 8%	
City, State, Zip _____			COD (add 1.90)	
			Total order	\$ _____



The Biggest

The Best



The Indispensable

The RAINBOW

It's called the premier Color Computer magazine for good reason. **The Rainbow** is the biggest, best, brightest and most comprehensive publication a happy CoCo ever had! Is there any wonder we get letters daily which praise **the Rainbow**, the magazine our reader calls "A Pot Of Gold" for his Color Computer?

The Rainbow features more programs, more information and more in-depth treatment of the TRS-80 Color, TDP System-100, MC-10 and Dragon-32 and 64 computers than anyone else.

Each monthly issue has as many as 340 pages and contains as many as two dozen programs, some 15 regular columns and 30 or more 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! More than 200 companies advertise in its pages every month!

But what makes **the Rainbow** its people? People like Bob Albrecht, the master teacher of computer programming. People like Don Imman, one of the world's best computer graphics authors. Experts like Dick White, one of the most knowledgeable writers about BASIC. Or Dan Downard, **Rainbow**'s technical editor who answers our readers' technical questions. Educators like award-winning **Rainbow** columnist Steve Blyn. Advanced programs like Gale Puckett, who guides you through Radio Shack's OS-9 operating system. Electronics specialists like Tony DiStefano, who explains the "insides" of the CoCo. These people and many others, visit you monthly through columns available only in **the Rainbow**.

Innovative ideas, like our Scratch and Sniff Adventure or our Anniversary special "soundbytes" with recorded programs, are ready to fold right into your computer! Complete Adventure games and Simulations. **The Rainbow**'s unique Scoreboard of arcade games. And games — lots of them — super graphics and utilities, the world's first four-color computer magazine center fold! And much, much more.

Join the tens of thousands who have found **the Rainbow** to be the absolute necessity for their CoCo. With all this going for it, it's surprising that more than 95 percent of **the Rainbow** subscribers renew their subscriptions!

We're willing to bet that a year from now, you'll be doing the same. For more information call (502) 228-4492.

Rainbow On Tape Tops Typing

Tired of spending all your valuable computer time typing in those long, but wonderful, **RAINBOW** programs each month? Now there is **RAINBOW ON TAPE** to help ease the pain.

Each month all the lengthy programs (over 20 lines) in **THE RAINBOW** can come to you ready-to-run, thanks to **RAINBOW ON TAPE**. At \$80* per year — or \$10 a tape ** — it is the biggest bargain going. (*Note: RAINBOW ON TAPE will not run on Dragon or MC-10 computers.*)

Back issues are available beginning with April 1982. (except May 1983). Each month's tape will arrive at approximately the same time as that month's issue of **THE RAINBOW**.

YES! Sign me up for the biggest bargain going . . . **RAINBOW ON TAPE!**

- NEW RENEW (Attach Label)
 A Full Year A Month (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 _____

*Subscriptions to **RAINBOW ON TAPE** are \$80 in the United States, \$90 U.S. funds in Canada and \$105 U.S. funds in all other countries.

** Back issues of the tapes are \$10 in the United States, \$12 U.S. funds for Canada and all other countries.

In order to hold down non-editorial cost, we do not bill.



Kentucky residents add 5% sales tax.

Get Your Very Own Pot O' Gold!

Here's your chance to have a Pot O' Gold full of programs, articles and information about CoCo every month of the year! A subscription to **THE RAINBOW** is only \$31* and you won't miss a single chock-full issue.

As the premier magazine for the TRS-80 Color and TDP-100 computers, **THE RAINBOW** has more of everything — and greater variety, too. Do yourself and your CoCo a favor and subscribe to **THE RAINBOW** today!

We accept VISA, MasterCard and American Express. Non-U.S. rates higher. U.S. currency only, please.

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 _____

*Subscriptions to **THE RAINBOW** are \$31 a year in the United States; Canadian rate is \$36 U.S. funds; Surface rate elsewhere is \$66 U.S. funds. Air mail is \$103 dollars U.S. funds. All subscriptions begin with the current issue. Please allow 5-6 weeks for the first copy.

In order to hold down non-editorial cost, we do not bill.



Kentucky residents add 5% sales tax.

What goes well with the *Rainbow*?



Rainbow On Tape!

We call it the other side of *THE RAINBOW* and we may have to raise the price just to call your attention to it. With as many as two dozen programs every month, *Rainbow On Tape* is a luxury service at a bargain basement price.

What is it? *Rainbow On Tape* is a monthly, cassette tape adjunct to *THE RAINBOW* and it's brimming with all the programs (those over 20 lines long) that fill the pages of the magazine. All you do is pop the cassette in your tape recorder and they're ready to run. No more lost weekends—or weeknights—typing, typing, typing. With *Rainbow On Tape*, you can read the article in the magazine then, in seconds, you load it up and run it.

Yes, *Rainbow On Tape* is brimming with the programs that fill *THE RAINBOW*'s pages each month. And, yes, you could type them in yourself, as many people do. But all of them? Every month? There simply isn't enough time.

Isn't it time your CoCo became a fulltime computer instead of a typewriter. Think how your software library will grow. With your first year's subscription, you'll get almost 300 new programs: games, utilities, business programs, home applications—the full spectrum of *THE RAINBOW*'s offerings without the specter of keying in page after page and then debugging.

Rainbow On Tape—the "meat" of *THE RAINBOW* at a price that's "small potatoes." Food for thought. To get your first hearing helping, just fill out and return the attached reply card. No postage necessary.

Discover the other side of *THE RAINBOW*. It's not only a time-saver, it's the key to a whole new outlook!

BUSINESS REPLY CARD

First Class

PERMIT No. 1

Prospect, KY

POSTAGE WILL BE PAID BY ADDRESSEE

RAINBOW

P.O. Box 385

Prospect, KY 40059



NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES



BUSINESS REPLY CARD

First Class

PERMIT No. 1

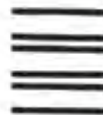
Prospect, KY

POSTAGE WILL BE PAID BY ADDRESSEE

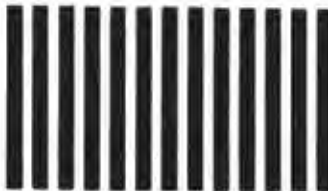
RAINBOW

P.O. Box 385

Prospect, KY 40059



NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES



SPEED RACER

SPEED RACER is a super car race game written in the POLE POSITION™ type of arcade game. It has unbelievable scrolling 3D graphics! Unconditionally guaranteed to be the finest car race game ever written for the COCO. \$34.95
Disk or Tape 32K.



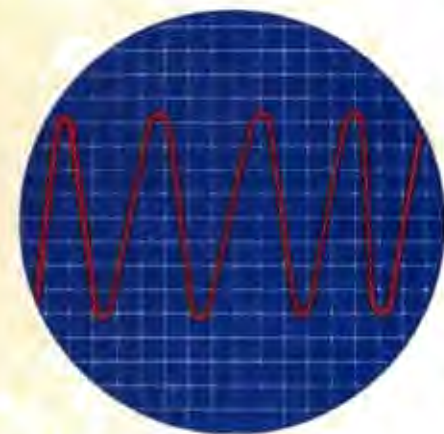
MichTron

576 S. Telegraph Road
Pontiac, Michigan 48053
Orders & Info: (313) 334-6576

Program your voice into memory

Analog-To-Digital And Back Again

By Jeremy Spiller



One of the most interesting aspects of the Color Computer is its ability to synthesize sounds, and perhaps the most interesting sound of all is the human voice. This very simple machine language program will digitalize your voice or any other sound that is input through the cassette recorder port, then store the data as a linear array of bits in memory. These bits can then be used to re-create the original sound.

All sounds are simply "vibrations" of the air, or more precisely, variations in air pressure. They amount to "peaks" of high pressure followed by "valleys" of low pressure. How closely the peaks are spaced (frequency), and how high the peaks are (amplitude) determine the nature of the sound.

A loudspeaker makes sounds by re-creating the same variations in air pressure as the voice or instrument that created them in the first place. The original sound is first translated to electrical voltage vibrations. The loudspeaker responds to higher voltages by pushing its diaphragm farther out, and to lower voltages by allowing the diaphragm to fall back inward again. As the diaphragm vibrates, it pushes on the surrounding air reproducing the original sound. Of course, these vibrations are extremely fast, but your CoCo is even faster.

The Color Computer is able to synthesize sounds because it can manipulate the voltage output to the loudspeaker about as quickly as the original sound produced its vibrations in the air. It does this by manipulating numbers with lightning speed, and those numbers are simply ones and zeros. The high pressure "peaks" can be thought of as ones, and the low pressure "valleys" correspond

(Jeremy Spiller is a 13-year-old student who has been an avid computer programmer since receiving a TRS-80 CoCo three years ago. He started assembly language programming about a year ago, and plans to start writing his own machine language games soon.)

to zeros. While this is an oversimplification of the physics of sound, it is still a fairly accurate assessment, and one can begin to see how a computer can create sounds from simple data.

With the right combination of ones and zeros, you can fabricate any sound you want to, including the sound of your own voice. But first, you must somehow change your voice into the correct series of ones and zeros. This process is called "digitalizing," and the program that does it is called an "analog-to-digital converter." It converts your voice, which is an analog (continuous) signal, into digital data by sampling it at regular intervals.

This data may then be stored in the computer's memory, and using a different program, it may then be retrieved and used to re-create the original sound. While BASIC may appear fast, it is not fast enough to sample the analog signal with any precision. On the other hand, the CoCo's 6809 microprocessor can move fast enough to do the job, but you must talk to it directly — through a machine language program.

A complete listing of the assembled program is provided. Note that it is composed of three separate programs strung together. The first program digitalizes the tape recorder input and stores the input in memory as a continuous string of bits. The second program retrieves these bits and outputs them to the television loudspeaker. The third program is actually executed first and allows the user to adjust the recorder volume for the best fidelity possible. By using this option you are assured of the clearest possible digital array of stored bits.

How to Use the Program

First, key in and run the basic driver. The data statements contain the assembled object code that comprises the ML program. (Note that each number corresponds to a two-digit Hex number in the second and third columns of the assembly.)

Next, prepare a tape for digitalizing by speaking in a normal voice into the microphone. Speak slowly, loudly and enunciate clearly. Next, be sure the correct jack is connected to the earphone plug of the recorder, and that the other end of the cord is connected to the cassette port on the back of the recorder.

Press '1' at the menu and press Play on the recorder. Turn up the volume on your TV. The sound you hear is

being processed in a way similar to the way it will be processed during digitalization and playback. Adjust the volume on your recorder so your words are as clear as they can be, and the space between them as dead as possible. In order to break out of this mode, you must press the Reset button. You will have to rerun the basic driver once you break out of the volume check mode.

Now you are ready to digitalize your voice. Prepare the tape so it is at the exact beginning of the sounds you wish to store in memory. Only the first 13 or so seconds of input will be stored, so be sure your tape is within one or two seconds of the signal you prepared earlier. Press the Play button on the recorder. If the remote pause jack is in place, the motor will not start until you are ready to begin. Press '2' and

"With the right combination of ones and zeros, you can fabricate any sound you want to, including the sound of your own voice."

ENTER at the menu. Press ENTER again and the digitalizing routine will begin. The motor starts and stops automatically. When the analog to digital program is finished, the basic driver tells you so.

Now, to reassemble the data into sound, press '3' at the menu. A prompt will request a delay number. The default value is six. By varying this number, you may vary the speed and pitch of the playback. You may play it back as many times as you wish by pressing '3' again and again.

The quality of the data is affected by the volume of the recorder during the digitalization segment, so you may be able to improve on the quality of the sound by going back and re-digitalizing at a different volume.

How the Program Works

If you wish to understand the workings of the program, please consult the assembly listing. While the purpose of this article is not to teach assembly language programming, I will try to give a reasonable explanation of how the data is input into the machine, how it is stored in memory, and how it is then

utilized to reproduce the sound. In order to understand computer sound synthesis, you first must understand the mysteries of magic memory-location FF20.

FF20 is located in the last 256 bytes at the top of ROM which is reserved for input/output functions. While it looks to the microprocessor like any other memory byte, it is in reality "superbyte." While disguised as a mild-mannered ordinary byte, it is really responsible for communication with the cassette port, the printer and the loudspeaker of our TV. (And that's only while the computer is operating. Who knows what it does at night while we're asleep!)

FF20 has eight bits (numbered '0' to '7') like any other byte. Bit zero, located farthest to the right, is solely responsible for all input and output to and from the cassette port. Its main function is to send and receive binary information to and from the computer from cassette tape. It was designed for use with signals that are already digitalized (i.e., tape saves of programs), however, it does respond to any other noises that come through the cassette port, including voices.

If the volume on the cassette recorder is correct, it produces a reasonable representation of most sounds in ones and zeros. The analog-to-digital converter collects the ones and zeros and stores them, one by one, in memory. It begins by defining the first memory location designated for storage of data as &H2500 in Line 110.

Line 120 resets all bits in FF20 to zeros. Line 130 sets the count to eight, the number of bits in each byte. Lines 150 to 170 are simply a timing loop. They make the computer count to six between bits. Location &H790B contains the number six. By poking other numbers into this location, you can get the computer to wait for a longer or shorter time between storing bits. Changing this number changes both the length of tape digitalized and the quality of the sound in the reproduction.

Remember that while all this is going on, bit zero is changing back and forth between zeros and ones in response to the input from the tape recorder. Lines 172 and 174 are the real "meat" in this program — 172 does an LSR (Logical Shift Right) of Location FF20. This shifts all the bits in FF20 one place to the right. In other words, bit seven is moved over into the position of bit six, bit six is moved over to the position



VIP Integrated Library™

VIP Desktop Magic!

Finally, you can have the power and integration of Lotus Symphony™, 1-2-3™ or Open Access™ for the larger micros on your Color Computer! The convenience of instant changes to a new application and effortless transfer of files is at the tip of your finger.

With VIP Desktop, the six applications of VIP Library are integrated into one program, on one disk. You have instant access to word processing with a spelling checker always in attendance, data management with mail merge, spreadsheet financial analysis, telecommunications and disk maintenance. Just move the hand to point to the volume, and the new application is there. And VIP Integrated Library has been made to work well with one disk drive, or all four, so be ready to push your Color Computer to the limit!

Elegance!

VIP Integrated Library is a product with finesse, inside and out. Inside is one awesome but very elegant program. On the outside, it comes handsomely bound in two cloth covered, gold embossed binders with slipcases like those you get with software for the Tandy 2000™. And remember, to get software of this quality for the Tandy 2000 you would have to pay hundreds more!

Stand-Alone Power

VIP Integrated Library is not one of those slipshod, all-in-one slicer-dicer machines, good for one day and then you throw it away. It fully integrates the six top-of-the-line stand-alone programs described in the following pages: VIP Writer, VIP Speller, VIP Calc, VIP Database, VIP Terminal & VIP Disk-Zap. You can buy the entire integrated library at once, or you can buy one or two programs that you need now and upgrade to the integrated library later!

Shared Files, Shared Features

All VIP Integrated Library applications share common features, such as ease of use, built-in help, the same commands, full printer control, full use of your 64K of memory, and step-by-step tutorials. Most important, all essential applications feature professional high resolution lowercase displays to give you a choice of 51, 66, or 85 characters per line, with 21 or 24 lines per screen. You get a professional display on your Color Computer without any hardware modification!

Buy the Integrated Library for

\$149.95

Radio Shack Catalog No. 90-0213

Or buy the individual volumes separately, as shown on the following pages!

Requires 64K and one or more disk drives.

VIP Integrated Library comes on one disk. Tape versions of programs are also available.

These are the only genuine VIP products. Except for VIP Speller, they purchase the Integrated Library by sending in the VIP program with a check or money order for \$149.95. This upgrade offer is limited to one library per person. It will end 1/31/85 for programs for one VIP program, regardless of how many you owned. This upgrade offer is available ONLY through SoftLaw, and not through Radio Shack stores or dealers. Be sure to include \$6.00 for shipping & handling.

VIP Writer™

RATED TOPS IN RAINBOW
COLOR COMPUTER MAGAZINE & COMPUTER USER

Including
VIP Speller
at no
additional
cost!

The most powerful and easy-to-use word processor is available in the showpiece and workhorse of the Library: The VIP Writer™.

The result of two years of research, the VIP Writer™ offer every feature you could desire from a word processor. It is the most powerful, fastest, most dependable and most versatile. With the hires display, workspace and compatibility features built into the Library the Writer is also the most usable.

... Nearly every feature and option possible to implement on the Color Computer. The design of the program is excellent; the programming is flawless. October 1981 "Rainbow"

Among word processors for the CoCo, VIP Writer stands alone as the most versatile most professional program available. May 1984 "Computer User"

The Writer will work with you and your printer to do things you always wanted to do. Every feature of your printer can be put to use, every character set, every graphics capability at any baud rate, EVEN PROPORTIONAL SPACING. All this with simplicity and elegance.

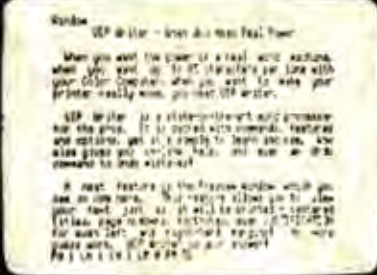
Professional features of particular note:

- Memory Sense with **BANK SWITCHING** to fully utilize 64K, giving not just 24 or 30K, but up to 53K of workspace with the tape version and 50K with the disk version.
- **TRUE FORMAT WINDOW** allowing you to preview the printed page ON THE SCREEN BEFORE PRINTING, showing centered lines, headers, FOOTNOTES, page breaks, page numbers, & margins in line lengths of up to 240 characters. It makes **HYPHENATION** a snap.
- A **TRUE EDITING WINDOW** in all 9 display modes for those extra wide reports and graphs (up to 240 columns!).
- **FREEDOM** to embed any number of **PRINTER CONTROL CODES** anywhere, **EVEN JUSTIFIED TEXT**.
- Full 4-way cursor control, sophisticated edit commands, the ability to edit any BASIC program or ASCII textfile, **SEVEN DELETE FUNCTIONS**, **LINE INSERT, LOCATE AND CHANGE**, wild card locate up to **TEN SIMULTANEOUS** block manipulations, word wrap around, programmable tabs, display memory used and left, non-breakable space, and headers, footers and **FOOTNOTES**.
- Automatic justification, automatic pagination, automatic centering, automatic flush-right, underlining, superscripts, subscripts, pause print, single-sheet pause, and print comments.
- Type-ahead, typematic key repeat and key beep for the pro, **ERROR DETECTION** and **UNDO MISTAKE** features, **1 PROGRAMMABLE** functions auto column creation, and instant on-screen **HELP**.

Radio Shack Catalog No. 90-0141

32K (Comes with tape & disk) \$69.95

VIP Writer-VIP Speller Combo comes in VIP Writer Binder.



VIP Speller™

VIP Speller™ is the fastest and most user-friendly speller for your CoCo. It can be used to correct any ASCII file—including VIP Library™ files and files from Scripsit™ and Telewriter™. It automatically checks files for words to be corrected, marked for special attention or even added to the dictionary. You can even view the word in context, with upper and lowercase. 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.

Radio Shack Catalog No. 90-0142

32K DISK ONLY \$49.95

Radio Shack is a registered trademark of Tandy Corp.
Tandy 2000 is a trademark of Tandy Corp.
Scripsit and Telewriter are trademarks of Lotus Development Corp.
Open Access is a trademark of Software Products International.

VIP Programs do not work with JDOS.

VIP Database™

"ONE OF THE BEST" JULY 1984 "RAINBOW"

This high speed MACHINE LANGUAGE program fills all your information management needs, be they for your business or home. And it does it better than any other database program for the Color Computer, featuring machine code, lowercase screens and mail-merge capabilities. Inventory, accounts, mailing lists, family histories, you name it, **VIP Database™** will keep track of all your data, and it will merge **VIP Writer™** files.

The **VIP Database™** features selectable lowercase displays for maximum utility. It will handle as many records as fit on your disks. It is structured in a simple and easy to understand menu system with full prompting for easy operation. Your data is stored in records of your own design. All files are fully indexed for speed and efficiency. Full sort of records is provided for easy listing of names, figures, addresses, etc., in ascending or descending alphabetic or numerical order. Records can be searched for specific entries, using multiple search criteria. With database form merge you may also combine files, sort and print mailing lists, print "boiler plate" documents, address envelopes - the list is endless. The math package even performs arithmetic operations and updates other fields. Unlimited print format and report generation with the ability to embed control codes for use with all printers.

Radio Shack Catalog No. 90-0140

32K DISK \$59.95

64K Required for math package & mail merge

Date	Name	Amount
12/18	12/18	100.00
12/19	12/19	200.00
12/20	12/20	300.00
12/21	12/21	400.00
12/22	12/22	500.00
12/23	12/23	600.00
12/24	12/24	700.00
12/25	12/25	800.00
12/26	12/26	900.00
12/27	12/27	1000.00

VIP Calc™

"MORE USABLE FEATURES" FEB 1985 "RAINBOW"

VIP Calc™ is truly the finest and easily the most powerful electronic worksheet and financial modeling program available for the Color Computer. Now every Color Computer owner has access to a calculating and planning tool better than VisiCalc™, containing all its features and commands and then some, WITH USABLE DISPLAYS.

There's nothing left out of **VIP Calc™**. Every feature you've come to rely on with VisiCalc™ is there, and then some. You get up to 5 TIMES the screen display area of other spreadsheets for the Color Computer and Memory-Sense with **BANK SWITCHING** to give not just 24, or 30, but **UP TO 33K of WORKSPACE IN 64K!!!** This display and memory allow you the **FULL SIZE, USABLE WORKSHEETS** you require. You also get: User definable worksheet size, up to 512 columns by 1024 rows! Up to **SIXTEEN VIDEO DISPLAY WINDOWS** to compare and contrast results of changes * **16 DIGIT PRECISION** * Sine, Cosine and other Trigonometric functions; Averaging, Exponents, Algebraic functions, Column and Row Ascending and Descending **SORTS** for comparison of results * **LOCATE FORMULAS OR TILES IN CELLS** * Easy entry, replication and block moving of frames * Global or local column width control up to 78 characters per cell * Create titles (up to 255 characters per cell) * Limitless programmable functions * Typematic Key Repeat * Key Repeat * Typehead * Print up to 255 column worksheet * Prints at any baud rate from 310 to 9600 * Print formats savable along with worksheet * Enter **PRINTER CONTROL CODES** for customized printing with letter quality or dot matrix printer * Combine spreadsheet tables with **VIP Writer™** documents to create ledgers, projections, statistical and financial reports and budgets.

Radio Shack Catalog No. 90-0143

64K (Comes with tape & disk) \$69.95

VIP Programs do not work with DOS

VIP Terminal™

RATED BEST IN JANUARY 1984 "RAINBOW"

For your important communication needs you've got to go beyond software that only lets you chat. You need a smart terminal so that you can send and receive programs, messages, even other **VIP Library™** files. **VIP Terminal™** has "more features than communications software for CP/M, IBM and CP/M 86 computers." Herb Friedman, Radio Electronics, February 1984.

FEATURES: Choice of 8 lines lowercase displays * Memory-Sense with **BANK SWITCHING** for full use of workspace * Selectively print data at baud rates from 310 to 9600 * Full 128 character ASCII keyboard * Automatic graphic mode * Word mode (word wrap) for unbroken words * Send and receive **Library** files, Machine Language & BASIC programs, Duplex, Half/Full/Echo, Word lengths 7 or 8, Parity, Odd/Even or None, Stop Bits 1-9 * Local linefeeds to screen * Save and load ASCII files, Machine Code & BASIC programs * Lowercase masking * 10 Keystroke Multiplier (MACRO) buffers to perform repetitive pre-entry log-on tasks and send short messages * Programmable prompt or delay for send next line * Selectable character trapping * Send up to ten short messages (KSMs), each up to 255 characters long, automatically, to save money when calling long distance. Recommended baud rates are 310 and 300.

Radio Shack Catalog No. 90-0139

32K (Comes with tape & disk) \$49.95

(Tape works in T-6 but without hires displays)

VIP Disk-ZAP™

RAVED ABOUT IN THE APRIL 1983 "RAINBOW!"

Your database file disk, form letter disk, or BASIC program disk goes bad! An I/O error stops loading, or even backing up of the disk. Weeks, even months of work sit on the disk, irretrievable. Now catastrophic disk errors are repairable, quickly and with confidence, using the **VIP Disk-ZAP™**. It is the ultimate repair utility for simple and quick repair of all disk errors. Designed with the non-programmer in mind, the **VIP Disk-ZAP™** will let you retrieve all types of bashed files, BASIC, and Machine Code programs. The 50 page tutorial makes the novice an expert.

Radio Shack Catalog No. 90-0144

16K DISK \$49.95

Available By Express Order
At

Radio Shack

Ask to see the demonstration diskette.



To Order Direct Call

1-800-328-2737



Order Status and Software Questions call (805) 968-4364

MAIL ORDER: \$3.00 U.S. Shipping per purchase (Minimum \$100 purchase for \$1.56 U.S. ANATA \$20.00 OVERSEAS) Payment for disks allows 4 weeks.



132 Aero Camino
Goleta,
California 93117

of bit five and so on, right down to bit zero, which appears to fall off the right end into oblivion.

Actually, this bit is saved in a special location called "the carry" which is one bit in a special register called the "condition codes." This is most fortunate because bit zero, now saved in the carry, contains the information we are interested in storing in memory.

Now that we have the bit stored in the carry, we want to store it some place in memory. Line 174 does this with an ROLA. A register is a memory location within the microprocessor itself used for the temporary storage of numbers. The 'A' register is an eight-bit register, just like any memory location. "ROLA" means Rotate the 'A' register one bit to the left. This is something like a Logical Shift Left, except that all bits are shifted to the left, the leftmost bit (bit seven) goes into the carry, and the bit that was in the carry before now becomes the new bit zero in the 'A' register.

If this process were repeated continuously, you would see the bits marching to the left, circling around through the carry and back again into register 'A' from right to left. A single cycle of this has now put the contents of the carry into the 'A' register in the position of bit zero.

This process will be repeated a total of eight times, each repetition shifting the important bit zero out of FF20 into the carry, and then rotating it into register 'A.' Each rotation carries the previously rotated bits in register 'A' one more place to the left until the first one rotated in now occupies the position of bit seven.

Line 190 subtracts one from the "8 count" (remember Line 130), and Line 200 sends the microprocessor back to Line 150 for another rotation if it has not filled the 'A' register with eight bits of data from FF20. If Register 'A' is now full of the input data, Line 210 then stores it in the memory location &H2500 (The 'X' register still is "pointing to" &H2500 from Line 110), then increments the pointer by one (the 'X' register now holds the number &H2501).

The entire cycle is repeated until all memory locations from &H2500 to &H7900 are filled with data. Line 220 checks to see if the data has reached the top of RAM. If it has not, Line 230 sends the microprocessor back to Line 130, otherwise Line 240 returns control to BASIC.

Lines 280 to 480 work in a similar

way to retrieve the stored data. In order to hook FF20 to the TV loudspeaker, a few other "adjustments" must be made in other ROM locations. These adjustments are made in a subroutine named "sound" and that subroutine is called in Line 280. The microprocessor then follows the instructions in lines 600 to 680 and then returns to Line 365.

The mechanics of the sound routine are not important to an understanding of this program. What is important is an understanding of how FF20 controls the output voltage to the loudspeaker. Once enabled by the sound routine, the six most significant (i.e., leftmost) bits in FF20 are now available to hold binary numbers from zero to 63. Each number represents a voltage between zero (represented by zeros in all six bits) and -5 volts (represented by ones in all six bits [63 decimal]).

Any number stored in these six bits is immediately translated into a voltage at the loudspeaker. The trick is now to get the bits out of memory and into the left end of FF20. This is accomplished by once again loading the pointer with the location of the first byte in memory (Line 365) and loading register 'A' with the contents of SH2500 (Line 370).

(Note that the pointer is incremented at this point instead of later on as was the case in the digitalizing program.)

Line 380 again sets the count to eight. This time, however, the 'A' register is shifted left instead of to the right. This pushes the most significant bit into the carry. Line 400 now rotates FF20 to the right which pushes our data bit from the carry into position seven in FF20. This causes an immediate change in the voltage output to the loudspeaker. Again, the process is carried out eight times until all eight bits from memory have been rotated into FF20.

Line 470 now sends us back to Line 370 where register 'A' picks up the next byte and rotates that into FF20, and so on until all the data to the top of RAM is used up.

The Volume Check Routine is easy to understand. It also makes use of the sound enable subroutine and then simply rotates bit zero of FF20 through the carry and into bit seven which controls the loudspeaker.

Playing with the Binary Program

Once you have loaded the machine language program in high RAM, you can discard the BASIC program that

poked it in by typing NEW and then fabricate your own programs that manipulate the timing loops or change the origin of the data array.

Remember that &H790B contains a six, but that you can speed up or slow down the program by poking different numbers here. Smaller numbers will give a higher quality sound, but a shorter real-time recording. The playback segment also has a timing loop, and location &H792F also contains a six. The basic driver has a provision to manipulate this number, but you can do the same thing by poking any number into &H792F.

Since the machine language programs can stand alone, it is possible to include them as a "talking subroutine" in your BASIC programs. Patch 1, or the digitalizing routine, is a complete program and will stand alone without Patch 2 or Patch 3. Patch 2 is the playback routine; it requires that Patch 3, which includes the sound enable subroutine, be included with it.

These programs are not relocatable, but if you want to use the playback routine alone without the A/D converter, you can do it as long as you remember to poke Patch 2 beginning at &H791F, followed by Patch 3 ending at &H795C. Remember to protect these routines along with your digitalized data with CLEAR 200,&H****. The asterisks, of course, stand for a number. This number should be one lower than the first byte used to store your digital data. To set this address, consult the summary of key pokes.

Summary of POKES and EXEC Addresses

&H7900	— EXEC address of A/D converter
&H791F	— EXEC address of playback segment
&H793D	— EXEC address of volume check routine
&H7901:&H7902 and &H7922:&H7923	— Contain the address of first byte of data array
&H790B	— A/D converter timing loop. Default=6
&H792F	— Playback timing loop. Default=6

(Anyone having questions about these programs may contact Jeremy at RFD #1, Shirley, MA 01464, phone (617) 448-2681.)

Listing 1: A/D, DRV R

```

0 CLS:PMODE0:GOTO 350
10 CLEAR200,&H24FF
15 'PATCH 1
20 DATA 8E,25,00,7F,FF,20,C6,08,
10,8E,00,06,31,3F,26,FC,74,FF,20
,49,5A,26,F1,A7,80,8C,79,00,25,E
8,39
25 'PATCH 2
30 DATA 8D,23,8E,25,00,A6,80,C6,
00,48,76,FF,20,10,8E,00,04,31,3F
,26,FC,5A,26,F1,8C,79,00,25,E8,3
9
35 'PATCH 3
40 DATA 8D,05,76,FF,20,20,FB,B6,
FF,01,84,F7,B7,FF,01,B6,FF,03,84
,F7,B7,FF,03,B6,FF,23,8A,08,B7,F
F,23,39
50 FOR X=&H7900 TO &H791E:READ A
#:A=VAL("&H"+A#):P1=P1+A:POKE X,
A:NEXT
60 FOR X=&H791F TO &H793C:READ A
#:A=VAL("&H"+A#):P2=P2+A:POKE X,
A:NEXT
70 FOR X=&H793D TO &H795C:READ A
#:A=VAL("&H"+A#):P3=P3+A:POKE X,
A:NEXT
80 IF P1<>3092THENPRINT"ERROR IN
PATCH 1":E=1
90 IF P2<>2852THENPRINT"ERROR IN
PATCH 2":E=1
100 IF P3<>4498THENPRINT"ERROR I
N PATCH 3":E=1
110 IF E=1 THEN STOP
120 CLS
130 PRINT" ANALOG TO DIGITAL CO
NVERTER"
140 PRINT" BY JEREMY SPILLE
R"
150 PRINT
160 PRINT"1. TEST VOLUME OF TAPE
RECORDER"
170 PRINT"2. READ TAPE (DIGITALI
ZE)"
180 PRINT"3. SAY DATA (PLAYBACK)
"
190 PRINT
200 INPUT" PICK A NUMBER":A
210 ON A GOTO 230,280,310
220 GOTO 120
230 CLS
240 PRINT"TO GET BACK TO MENU PR
ESS RESET THEN RUN THIS PROGRAM.
"
250 PRINT
260 PRINT"SET YOUR TAPE RECORDER
TO THE CORRECT VOLUME"
    
```

130224
END12

```

270 MOTORON:EXEC &H793D
280 CLS:INPUT"ENTER TO RECORD":A
:MOTORON:CLS
290 PRINT"READING TAPE":EXEC &H7
900:MOTOROFF
300 GOTO 120
310 CLS:INPUT"TYPE A NUMBER 1-15
TO CONTROL THE SPEED. ENTER
OR 6 = DE- FAULT":S:IF S=0 TH
EN S=6
320 IF S>15 THEN 310
330 CLS:PRINT"SAYING":POKE &H792
F,S:EXEC &H791F
340 GOTO 120
350 PCLEAR1:GOTO10
    
```

Listing 2: A/D PRGM

```

00010 *****
00020 * SIMPLE A/D CONVERTER *
00030 * BY JEREMY SPILLER *
00040 * 1985 *
00050 *****
7900 00100 ORC $7900
7900 8E 2500 00110 START LDX #$2500
7903 7F FF20 00120 CLR $FF20
7906 C6 08 00130 ST010 LDB #$8
7908 108E 0006 00150 TIME LDY #6
790C 31 3F 00160 TIME2 LEAY -1,Y
790E 26 FC 00170 BNE TIME2
7910 74 FF20 00172 LSR $FF20
7913 49 00174 ROLA
7914 5A 00190 DECB
7915 26 F1 00200 BNE TIME
7917 A7 80 00210 STA ,X+
7919 8C 7900 00220 CMPX #$7900
791C 25 E8 00230 BLO ST010
791E 39 00240 RTS
00250 *****
00260 * RECONSTRUCTS SOUNDS *
00270 *****
791F 8D 23 00280 BSR SOUND
7921 8E 2500 00365 LDX #$2500
7924 A6 80 00370 SOUND1 LDA ,X+
7926 C6 08 00380 LDB #8
7928 48 00390 SOUND2 LSLA
7929 76 FF20 00400 ROR $FF20
792C 108E 0006 00410 TIMER LDY #6
7930 31 3F 00420 TIMER2 LEAY -1,Y
7932 26 FC 00430 BNE TIMER2
7934 5A 00440 DECB
7935 26 F1 00450 BNE SOUND2
7937 8C 7900 00460 CMPX #$7900
793A 25 E8 00470 BLO SOUND1
793C 39 00480 RTS
00490 *****
00500 * VOLUME CHECK ROUTINE *
00510 *****
793D 8D 05 00520 BSR SOUND
793F 76 FF20 00530 VOLUME ROR $FF20
7942 20 FB 00540 BRA VOLUME
7944 B6 FF01 00600 SOUND LDA $FF01
7947 84 F7 00610 ANDA #$F7
7949 B7 FF01 00620 STA $FF01
794C B6 FF03 00630 LDA $FF03
794F 84 F7 00640 ANDA #$F7
7951 B7 FF03 00650 STA $FF03
7954 B6 FF23 00660 LDA $FF23
7957 8A 08 00670 ORA #8
7959 B7 FF23 00680 STA $FF23
795C 39 00690 RTS
0000 00700 END
00000 TOTAL ERRORS
    
```

Simplifying
Use of the

SOUND

Command

By William R. White





Do you love computer music, but hate entering long command lines? Frustrated because you can't use your hard-learned music lessons? Still using your 4K or non-extended machine?

If so, cheer up fellow programmers, this article is for you! If adding music to enliven a program appeals to you, read on.

When you first got your CoCo and excitedly began *Getting Started With Color BASIC*, one of the first places you probably "stalled" was the SOUND chapter. Admit it! We all did. Creating sounds (music, if you prefer) is fun! But soon the drudgery of SOUND, "tone" and "duration" wore out the fingers and the SOUND command was put on the back shelf.

Listing 1 is the BASIC program for "Happy Birthday." It contains the traditional SOUND commands. Listing 1 works very well, if you don't mind entering individual command lines and constantly referring to the musical tones appendix. However, I suspect that none of us wants the extra effort of repeatedly turning to a reference page.

Let's put some of the RAM memory power to work! Listing 2 contains the same program, this time with the tone values given as simple numeric variables and neatly tucked away in memory.

(William White has taught junior high school science for 20 years. His hobbies include amateur radio, photography and "CoCo-ing." This is his first year of teaching computer literacy and his first published article.)

Once they have been defined (lines 100-110) the tone value can be called by use of its label (a letter). Time values are stored (Line 120) and called to use by their proper label (letter). Using this method, the note lengths in the entire song can be quickly changed by reassigning values of time variables. Try *that* with your PLAY command!

Once these numeric variables have been defined, a valid command line is "SOUND letter, letter" (i.e., SOUND C,Z). You have already saved keystrokes, your memory and there are no numbers to remember! Now you are free to concentrate on the music, not on a reference page.

Another method of accomplishing the same end is shown in Listing 3. DATA statements are composed of note values followed by the time value. When this information has been written into DATA, it is read in the same sequence and executed by one (that's right, just one) SOUND statement. Again our efforts are



conserved by using the power and efforts of the mighty CoCo.

Entering either listing 1 or 2 requires the use of 25 SOUND statements. By using Listing 3, SOUND is entered just once and made to repeat by the FOR/NEXT loop. This saves keystrokes, memory and needless repetition.

Our objective at the outset was to simplify the use of the SOUND command. One method shown does this by defining tone numbers as variables. The other eliminates the need to repeatedly enter the SOUND statement.

For you who have worn out (or thrown out) the "Appendix of Musical

Tones," the octave of Middle C is as follows: Middle C=89, D=108, E=125, F=133, F#=140, G=147, A=159, B=170, B=165 and C1=176.

There you have it! Dust off the old music books, do your thing, call in the family and have a sing-a-long. After all, computers *are* fun!

Listing 1: BRTHDAY1

```

10 * PROGRAM LISTING 1
20 * *****
30 * 'HAPPY BIRTHDAY
40 * USING SOUND TONE, DURATION
50 * NOV., 1984 W. WHITE
60 * *****
70 *
80 CLS
90 PRINT" PLAYING HAPPY BIRTHDAY"
100 SOUND 89,4
110 SOUND 89,4
120 SOUND 108,8
130 SOUND 89,8
140 SOUND 133,8
150 SOUND 125,16
160 SOUND 89,4
170 SOUND 89,4
180 SOUND 108,8
190 SOUND 89,8
200 SOUND 147,8
210 SOUND 133,16
220 SOUND 89,4
230 SOUND 89,4
240 SOUND 176,8
250 SOUND 159,8
260 SOUND 133,8
270 SOUND 125,8
280 SOUND 108,8
290 SOUND 165,4
300 SOUND 165,4
310 SOUND 159,8
320 SOUND 133,8
330 SOUND 147,8
340 SOUND 133,8
350 END

```

Listing 2: BRTHDAY2

```

10 * PROGRAM LISTING 2
20 * *****
30 * 'HAPPY BIRTHDAY'
40 * USING DEFINED VARIABLES
50 * NOV., 1984 W. WHITE
60 * *****

```

```

70 *
80 CLS (3)
90 PRINT" PLAYING HAPPY BIRTHDAY"
100 C=89:D=108:E=125:F=133:G=147
110 A=159:B=170: B1=165: C1=176
120 X=4: Y=8: Z=16
130 SOUND C,X : SOUND C,X : SOUND
D D,Y : SOUND C,Y : SOUND F,Y :
SOUND E,Z
140 SOUND C,X : SOUND C,X : SOUND
D D,Y : SOUND C,Y : SOUND G,Y :
SOUND F,Z
150 SOUND C,X : SOUND C,X : SOUND
D C1,Y : SOUND A,Y : SOUND F,Y :
SOUND E,Y : SOUND D,Y : SOUND B
1,X : SOUND B1,X
160 SOUND A,Y : SOUND F,Y : SOUND
D G,Y : SOUND F,Y
170 END

```

Listing 3: BRTHDAY3

```

10 * PROGRAM LISTING 3
20 * *****
30 * 'HAPPY BIRTHDAY'
40 * PLAY USING DATA STATEMENTS
50 * NOV., 1984 W. WHITE
60 * *****
70 *
80 CLS (3)
90 PRINT" PLAYING HAPPY BIRTHDAY"
100 DATA 89,4,89,4,108,8,89,8,13
3,8,125,16
110 DATA 89,4,89,4,108,8,89,8,14
7,8,133,16
120 DATA 89,4,89,4,176,8,159,8,1
33,8,125,8,108,8
130 DATA 165,4,165,4,159,8,133,8
,147,8,133,8
140 FOR R=1 TO 25
150 READ S,T
160 SOUND S,T
170 NEXT
180 END

```



A Serendipitous Learning Experience

By Steve Blyn
Rainbow Contributing Editor

Sometimes it is important to present students with an educational program that is mostly for fun. Entertainment remains one of the primary reasons many of us bought computers in the first place. This month's program attempts to combine learning with fun.

Although it is loosely intended as a language arts program, there is really no definite learning that is expected from this program. Many incidental learnings, however, may occur that we are not always aware of at the moment.

Incidental learning is learning that is not necessarily designed to happen, but rather occurs as a side effect of the experience. Typing in computer programs from magazines, for example, often produces the incidental learning of the keyboard. Another example might be shopping with your family in a department store. This may produce incidental learning about using money, travel training, reading signs and a host of others.

(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 and his wife, Cheryl, own Computer Island.)

The game we are doing this month is a code breaker. The alphabet is written on the screen with a number next to each letter. Next to the letter 'A' is a '1,' next to 'B' is a '2,' and so on down to the letter 'Z' with a "26" next to it. This represents a simple code. Each letter may be associated with a different number. The numbers, of course, range from 1 to 26 to represent each of the letters.

A word should be entered by someone other than the player; this is a good two-player game. The computer will show the child the word in code and the child's job is to decode the secret word. For example, if someone types in the word COCO, the program will convert it into "3 - 15 - 3 - 15." The player must use the chart or his/her memory of the alphabetical order to decode the word back again to its original form.

This game may be played on two levels. You may either choose to have the code visible or invisible while you are decoding. If you choose to hide the code, you will have to review the alphabetical order mentally several times to figure out the word. This is much more difficult, of course, than leaving the code in view.

Younger players will most probably

need the code visible at all times. Older players will no doubt hide the code each round. Middle-of-the-road learners will probably combine the two and benefit the most from this program; they can constantly be learning and reviewing the alphabetical order while playing the game.

Lines 400-430 draw the code. Line 450 will hide the code if that option is selected. Lines 120-140 present the option of hiding the code.

An easy possibility for altering this program is to present the letters and numbers in reverse order. The letter 'A' could be equivalent to 26, 'B' to 25, and so on to 'Z' equal to one. This would make the code slightly more difficult and the program more challenging. Two lines must be altered to accomplish this switch.

First, change Line 250 from
PRINT ASC(L\$)-64;
to
PRINT ASC(L\$)-91;

Secondly, change the portion of Line 410 which reads
A\$(R)
to
A\$(27-R)

These two changes will reverse the

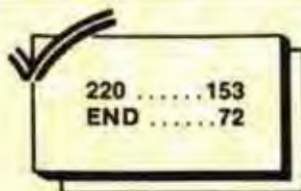
position of the numbers. You may get more daring and devise your own schemes to further mix up the numbers, if you desire.

The partner types in the letters of the mystery word on lines 160-210. The computer converts these letters into

numbers on lines 220-270. The player then guesses the secret word. If incorrect, the right answer will be displayed by Line 320.

We meant no pressure to be on the student in this program. For this reason, we included no time limit or

report card. The game can be ended after each round by pressing 'E' or continued with more examples by pressing 'M.' The game can be played as long as the interest remains. We hope your children have fun as well as incidentally learn at the same time.



The listing: CODEWRDS

```

10 REM"SECRET CODE WORDS"
20 REM"STEVE BLYN,COMPUTER ISLAN
D,NY,1985"
30 DIM N(26),A$(26)
40 CLS
50 C$=""
60 PRINT@10,"SECRET CODES"
70 PRINT@32,STRING$(32,191);
80 FOR A=1TO 26: N(A)=A:NEXTA
90 FORB=1TO 26:A$(B)=CHR$(64+B):
NEXT B
100 GOSUB 390
110 SOUND 200,3
120 PRINT@64," DO YOU WANT TO HI
DE THE CODE?"
130 EN$=INKEY$
140 IF EN$="Y" THEN GOSUB 450 EL
SE IF EN$="N" THEN 150 ELSE 130
150 SOUND 220,3
160 PRINT@64," TYPE IN YOUR MYST
ERY WORD NOW."
170 B$=INKEY$
180 IF B$=CHR$(13) THEN 220
190 C$=C$+B$
200 IF B$="" THEN 170
210 GOTO 170

```

```

220 REM"PRINT OUT THE WORD USING
NUMBERS"
230 FOR T=1 TO LEN(C$)
240 L$=MID$(C$,T,1)
250 PRINT ASC(L$)-64;
260 PRINTCHR$(8);:PRINT"-";
270 NEXT T
280 PRINT:PRINT" WHAT DO YOU THI
NK THE WORD IS ";
290 INPUT M$
300 PRINTSTRING$(32,".");
310 IF M$=C$ THEN PRINT"
CORRECT":SOUND100,5
320 IF M$<>C$ THEN PRINT"SORRY,T
HE ANSWER IS ";C$:SOUND10,3
330 PRINTSTRING$(32,".");
340 PRINT"PRESS 'M' FOR MORE OR
'E' TO END";
350 EN$=INKEY$
360 IF EN$="E" THEN CLS:END
370 IF EN$="M" THEN 40
380 GOTO 350
390 PRINT@321,STRING$(30,236);
400 REM"PRINT THE CODE"
410 FOR R=1 TO 26:PRINTN(R);CHR$
(8);"=";A$(R);:NEXT R
420 PRINT@481,STRING$(30,227);
430 RETURN
440 REM"HIDE THE CODE"
450 PRINT@352,STRING$(128,143);:
RETURN

```

Robotize Your Co Co with EMC

Our unique expansion hardware enables you to create a versatile automated control system. All EMC boards come fully assembled and computer tested.

Model 100 Parallel Port (PIA) **\$39.95**
Features: Two 8 Bit Bi-Directional Ports, 4 Control Lines, Sample Software Provided

Model 200 Buss Driver **\$89.95**
Features: TTL, Fanout of 10, 2 Card Slots and Flexible Ribbon Buss Provided. Additional Connectors Available.

Model 400 Mother Board **\$44.95**
Features: 4 Slots, 5 Gold Pin Connectors, PC Board, for all Addr. Decoded Boards.

Model 500 Motor Control Amp **\$29.95**
Features: TTL Compatible, LED Direction Indicators, Drives DC Motors 500 MA Max at 12 VDC.



MODEL 200

MODEL 100



MODEL 500



MODEL 400

ELECTRONIC MOTION CONTROL
P.O. Box 27271 • ARPT Station
Clearwater, Florida 33516

Dealer Inquiries Welcome

Purchases Add \$3.00 Shipping & Handling with Check • Shipping is FREE with Money Orders • Florida residents add 5% sales tax • Send for FREE Brochure • For information Call (813) 896-8295

Protect Your Valuable Magazine Collection With . . .



DISTINCTIVE AND DURABLE RAINBOW BINDERS

Every single issue of THE RAINBOW is a vital resource that you will refer to again and again for new insights, to explore new areas of interest or simply to refresh your memory. So, you need to keep your copies of THE RAINBOW safe — in high-quality, vinyl binders that provide complete protection.

These distinctive red binders not only ensure that your RAINBOWs stay in mint condition, but they showcase your collection as well. Each binder is clearly embossed with the magazine's name in gold lettering on both the front

and the spine. They're a handsome addition to any decor.

They also make it possible for you to organize your workspace and eliminate the clutter on a permanent basis. You will spend more time on your CoCo and eliminate those frustrating searches for misplaced magazines.

A set of two handsome binders, which hold a full 12 issues of THE RAINBOW is only \$13.50 (please add \$2.50 for shipping and handling).

Special Discounts On Past Issues With This Offer

To help you complete your collection of THE RAINBOW, we're offering a special discount on past issues with the purchase of one or more sets of binders.

When you place an order for six or more back issues of THE RAINBOW at the same time you order your binders, you are entitled to \$1 off each magazine, which normally sells for the single issue cover price. For an order form, please refer to our "Back Issue Information" page (check

Table of Contents under departmental listings). Also with this offer, copies of the "Official And Compleat Index To THE RAINBOW" (a comprehensive index of Rainbow's first three years, July 1981 through June 1984), usually priced at \$2.50, may be purchased for only \$1 with a set of binders.

Due to heavy demand, we suggest you order the back issues that you want now while supplies last.

.....
_____ **YES.** Please send me _____ sets of binder(s) at \$13.50 each (plus \$2.50 for shipping and handling. If your order is to be sent via U.S. Mail to a post office box or to another country, please add \$2. Kentucky residents add 5% sales tax).

_____ I also want to take advantage of the special savings of \$1 off single issue cover price for back issues with the purchase of a set of binders. (Minimum order of 6 magazines. An order form from a recent issue indicating the back issues you wish to receive should accompany this order.)

_____ I want to purchase the comprehensive index to THE RAINBOW (July 1981 through June 1984) at the special price of \$1 (regular price \$2.50) with my purchase of one or more sets of binders.

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  _____ Cards Welcome

Account Number _____ Expiration Date _____

Signature _____

Mail to: Falsoft, Inc., The Falsoft Building, Prospect, KY 40059.

To order by phone, call: (502) 228-4492



EARS



Electronic Audio Recognition System

EARS™

Electronic
Audio
Recognition
System

\$99.95

Now Your
Computer
Can Listen
To You!

- 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 truly 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). For example, you can control your TV by saying "TV ON" or "TV OFF". \$24.95



Dealer Inquiries
Invited



Speech Systems

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

1 MEGABYTE COLORAMA (312) 879-6811 (24 HR. BBS)

CALL ANY DAY TO ORDER. ALSO ORDER BY MAIL OF BBS.

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 6% sales tax

'TALKING SOFTWARE'

FOR THE VOICE, SUPER VOICE™, RS SPEECH & SOUND PAK

RADIO SHACK® SPEECH & SOUND TRANSLATOR



We believe that no COCO speech synthesizer gives you the power and flexibility of the SUPER VOICE. Nevertheless, some have decided to go with the Radio Shack SPEECH & SOUND PAK. For those we've decided to open our TALKING LIBRARY by offering the SPEECH & SOUND TRANSLATOR. Just load this program and our entire library is open to you.

But that's not all, this program adds features. You get increased intelligibility, the power of an exception table to specify specific pronunciations, \$12.81 is spoken in dollars and cents, 1,234,567 is spoken in millions, thousands, and hundreds, and much more. **\$24.95**

TERMTALK All the features of an intelligent telecommunications program plus what appears on the TV is spoken.
● Upload and Download programs ● Control Xmit Protocols
● Full or Split Screen ● Buffer Editing
● Normal or Reverse Video ● It talks
Please specify version (VOICE or RS SPEECH & SOUND PAK)
Tape **\$39.95** Disk **\$49.95**

TALKING BINGO BINGO was never like this. The VOICE or SUPER VOICE makes all the calls while you sit back and play. Comes with 20 playing cards and 200 markers. High Resolution graphic screen, 3 timing level, ball count and pause control. **\$24.95**

ESTHER the talking psychoanalyst. An excellent example of artificial intelligence. She may not solve all your problems, but her insight will amaze you. Just like the original Eliza. **\$24.95**

SCORE E-Z A yahtzee type game. Up to six can play. **\$24.95**

ADVENTURES

CULT OF THE CAVE BEAR You're a stranded time traveler 50,000 years in the past. Can you fix your time machine while still surviving in this alien environ, and make it back? **\$29.95**

SHIP HUNT Play Battleship with your CoCo. All status reports are spoken. Ready battery, aim, fire at will! **\$24.95**

FINAL COUNTDOWN You must stop the mad general from launching a missile at Moscow and causing WW III. Has multiple voices for added realism. **\$24.95**

STAR TALK You're the Star Fleet Captain. Your mission...destroy the enemies' Dragon Star Ships. All status reports are spoken! **\$24.95**

ADVENTURE GENERATOR Create talking adventure games that are 100% Machine Language. Up to 99 rooms, 255 objects, 70 command words and 255 conditional flags. 64K Disk **\$39.95**

EDUCATION



ANIMATED SENTENCES The child builds complete sentences from a graphic menu using keyboard or joystick. The action is then spoken and acted out graphically. It's a great way to learn the parts of speech (ie. verb, subject, noun, etc.) **\$24.95**



PRE-SCHOOL

TALKING COUNT TO ONE HUNDRED A program designed to teach the child counting to 100 by 1, 2, 5, and 10 forwards and backwards. **\$29.95**

TALKING ALPHABET A program designed to help the pre-schooler master the alphabet. **\$29.95**

TALKING NUMBERS & COLORS A must program for the very young. High Resolution graphics to insure attention and concentration. **\$29.95**

TALKING NUMBER SKILLS The child becomes familiar with the shape and meaning of numbers. **\$29.95**

TALKING CLOCK In these days of the digital clock, children miss an important education. This program aids the student in mastering the traditional analog clock. High Resolution graphics. **\$29.95**

GRADES 2 - 6

TALKING SUBTRACTION A program specifically designed to help the student learn subtraction. **\$29.95**

KING AUTHOR'S TALES A creative writing tool to allow a child to write compositions, or short stories. Q & A option is also included. **\$29.95**

COLOR MATH Addition, Subtraction, Multiplication, and Division are mastered. Student may specify difficulty level. **\$24.95**

SPELL-A-TRON Student builds a dictionary of words to be quizzed on. Perfect for Spelling B. **\$24.95**

SPELLING TESTER A graphic spelling game. The student is shown objects to be spelled. **\$9.95**

POETRY CREATOR The VOICE speech unit is used to speak poetry that is created. **\$9.95**

SHORT STORY MAKER A program to create and speak stories created by the child. **\$9.95**

FOREIGN LANGUAGE Learn a foreign language. French dictionary is included. **\$9.95**

PRESIDENTS The student is able to master the Presidents of the US. **\$9.95**

STATES A program designed to aid the student in learning correct spelling of the states. **\$9.95**

CAPITALS Learning the State's Capitals is made more interesting using speech. **\$9.95**

HANGMAN A word guessing game. You must guess the word before you hang. **\$9.95**

MATH DRILL A program to help teach arithmetic. **\$9.95**

All software, except as noted, shipped on tape but may be moved to disk

'HOME COMMANDER'

The HOME COMMANDER easily connects to the cassette port of your Color Computer and lets you control appliances in your home.

\$59.95



NO WIRES NECESSARY

The HOME COMMANDER uses your home's existing electrical wiring to control virtually anything. Appliances are controlled via small control modules available at your local SEARS or Radio Shack store.

ON FRIDAY 7:42 PM, OFF SUNDAY 1:26 AM

Included FREE is a program to allow you to control up to 256 devices and specify the time and date they are to be activated. That's right, the software has its own built in accurate clock.



Imagine controlling a light or TV with your voice. When used with our Electronic Audio Recognition System, EARS, you can literally control any appliance.

PLUG'N POWER USERS

If you were disappointed in the software that came with the Radio Shack PLUG'N POWER unit, and you probably were, we'll offer you our powerful software separately. An early version is described in the Feb., April, June, and August 1983 issues of RAINBOW. Our current version is even better. **\$19.95**
PLUG'N POWER is a trademark of Radio Shack®

PRECISION TIME MODULE \$59.95

— INCLUDES OS9 DRIVER —



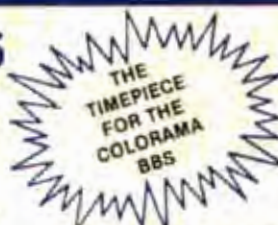
Now your computer will always know the correct time and date. This amazing precision time module is calibrated to the National Bureau of Standards (WWV) atomic clock and you should never have to change it.

Use the PRECISION TIME MODULE to add the time element to your games or use on BBS. If you like, purchase separately our BBS.

COLORAMA BBS (64 K, 1 drive minimum) **\$99.95**

BATTERY BACKUP

Even when your computer is off, the clock keeps correct time by operating using the internal battery backup system.



FREE TALKING CLOCK PROGRAM requires VOICE, SUPER VOICE, or SPEECH & SOUND PAK

MONTHS, LEAP YEARS & DST

The PRECISION TIME MODULE automatically adjusts for the different number of days in each month as well as leap years. And believe it or not, it adjusts for DST so you don't have to remember if it's SPRING FORWARD or FALL FORWARD.

Y-CABLE \$28.95

Why pay \$100 to \$200 for a multi-pak. With the Y-CABLE, you can connect your disk system to your computer along with either our STEREO PAK music synthesizer, our VOICE, SUPER VOICE speech synthesizers, or our PRECISION TIME MODULE. All connectors gold plated.

TRIPLE Y \$34.95

We developed the Triple Y-Cable specifically for those interested in both speech synthesis and speech recognition. The Triple Y-Cable lets you connect EARS and SUPER VOICE to your color computer along with your disk system.



NEW! ATTENTION EXPERIMENTERS!



Interested in building your own project? Our oversized board gives plenty of room for construction while the sturdy aluminum case with black satin finish assures protection and a professional appearance.

Prototype Board only **\$19.95**
Prototype Enclosure only **\$19.95**
Buy both for **\$29.95**

Need an SC-01? **\$29.00**

- Disks (any quantity) **\$1.49**
- Tape C-10, C-20 **\$0.69**
- Hard Tape Box **\$0.29**
- 6821 **\$2.95**
- 74LS138 **\$0.79**
- 7407 **\$0.79**
- IC sockets 14, 16, 22 pin **\$0.29**
- IC sockets 24, 28, 40 **\$0.39**

Advanced Speech Chip SSI-263 (SC-02) **\$34.95**



Dealer Inquiries Invited



Speech Systems

**38W 255 DEERPATH ROAD
BATAVIA, ILLINOIS 60510
(312) 879-6880 (VOICE)**

1 MEGABYTE (312) 879-6811 (24 HR. BBS)
COLORAMA
CALL ANY DAY TO ORDER. ALSO ORDER BY MAIL OF BBS.

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 6% sales tax

MUSIC THEORY

Speech Systems is dedicated to bringing you the finest in music products. We are now proud to introduce MUSIC THEORY Courses 1 and 2. Each supports: drill and practice sessions, a scorecard to measure your progress, graphics and sound output for complete illustration of the concepts being introduced, and a reviewing session. Each course is a collection of programs emphasizing a particular subject area.

COURSE 1

This course covers all the basics from music notation & duration, key signatures, tempo, to an introduction of the keyboard. This is an entry level course recommended as a prerequisite for Course 2.

32K Disk only\$29.95

COURSE 2

A more advanced course that deals with: Major and Harmonic Minor scales, interval spelling, Triad (Chord) theory, Inversions, Dominant 7th chords, and ear training of the intervals.

32K Disk only\$49.95

NEW!

MUSICA 2



NEW
LOW
PRICE

\$29.95

Tape or Disk

Now shipping
Version 2.6
Previous users call
for update info



- When in stereo mode, music is played through our STEREO PAK (purchased separately).

- Loudness of each voice may be individually specified.
- Memory available is constantly displayed.
- Voice waveshapes may be exchanged between voices at any point.
- Tempo may be specified and may even be altered as the music plays.
- Flats and sharps supported.
- Billions of timbre combinations.
- High resolution graphic display, looks just like sheet music.
- MUSICA 2 is 100% software, no need for hardware unless you want music produced in STEREO. In that case, the STEREO PAK may be purchased separately. It's a must for the audiophile!
- Durations include: whole, half, quarter, eighth, sixteenth, thirty second, sixty-fourth, and triplet.
- 30 page manual describes all.
- Requires minimum of 32K.



- Repeat bars allow repeating of music without re-inserting music a second or third time.



- Voice timbre (waveshape) may be altered by specifying harmonic content just like stops on an organ.
- During editing, voice being inserted is displayed.
- Each measure is numbered for easy reading of music.
- Measure bars aid in reading and developing music.
- Each voice may be visually highlighted for easy identification.
- 4 Voices produced simultaneously.
- Input notes from keyboard or joystick.

- Play music from your own BASIC program.
- Block copy music for easy music development.
- 100% machine language so it is lightning fast.
- Vibrato effect easily produced.
- With STEREO PAK, voices may be switched between left and right speakers as music plays.

Output music to your printer (Gemini 10X, Epson, R.S. printers, Okidata).

NEW! STEREO PAK™ \$39.95

Plug this gem into your computer, connect to your home stereo system and sit back and enjoy music realism. The STEREO PAK is a hardware music synthesizer that plays our MUSIC LIBRARY and MUSICA 2 music in stereo. Because it was designed specifically with music reproduction in mind, the sound is superb. The highs are crisp and clear while the bass notes will rattle your walls.

The STEREO PAK is all hardware. It is intended as an enhancement for MUSICA 2 and our MUSIC LIBRARY. Disk owners may use the STEREO PAK with the R.S. Multi-Pak or our Y-CABLE (\$28.95)

Now!
NOW "PLAY"
AND "SOUND"
COMMANDS COME
THRU THE
STEREO PAK
Requires 64K



NEW! MUSIC LIBRARY™ — 3 VOLUMES

You get over 100 four voice songs with a combined playing time of 3 hours. That's right, 3 hours of music. You won't believe your CoCo could sound so good. To fit over 100 songs required both sides of 5 C-20 tapes and the disk version uses 5 full disks (that's a half box of disks).

A JUKE BOX selection program is included to allow you to select specific songs or automatically play each. These songs are ready to go, you don't need MUSICA 2 or a knowledge of music.

These songs were developed using the best music program available for the CoCo; MUSICA 2. The tunes may be used as source files for MUSICA 2 and changed by the user. When coupled with the STEREO PAK the songs are reproduced in stereo with unsurpassed realism.

MUSIC LIBRARY 100 categories:

Stage, Screen, and TV	Classical
Music of the 70's	Christmas (popular)
Music of the 60's	Christmas (traditional)
Music of the 50's	Patriotic
Old Time Favorites	Polka Party

MUSIC LIBRARY 200

Our second volume of 100 tunes, 3½ hours of music.

MUSIC LIBRARY 300

Our third volume of 100 tunes, 3 more hours of music.

MUSIC LIBRARY (Each Volume) .. (32K Tape) ... \$34.95
(Specify 100, 200, or 300) (32K Disk) \$39.95

10 HOURS
OF
MUSIC
BUY 2
GET 3rd
FREE

SPEECH SYSTEMS DATAPEN \$29.95

Two programs are provided free with each DATAPEN. SKETCH is a superb high resolution color drawing program allowing precise drawing and freehand sketching, painting and much more. SHAPE CREATE is a high resolution library shape drawing program. You can even save your work to tape or disk for later display or editing.

The software is shipped on tape and may easily be moved to disk. Included is complete documentation to allow you to integrate the DATAPEN into your own BASIC program.

Requires 32K.



EASY TO
USE!

EDUCATIONAL SOFTWARE

An easy and fun way for kids to enter answers.

Vol. 1 — grades 1, 2, and special education.

Includes these five programs:

- Basic Addition
- Basic Multiplication
- Match the Shapes
- Match the Numbers
- Rhyme the Words

32K disk \$29.95

Vol. 2 — grades 3 to 6 and special education

Includes these five programs:

- Men of Science
- Mixed Math
- World Capitals
- Computer Terms
- 20th Century Events

32K disk \$29.95



Dealer Inquiries
Invited



Speech Systems

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

1 MEGABYTE COLONAMA (312) 879-6811 (24 HR. BBS)

CALL ANY DAY TO ORDER. ALSO ORDER BY MAIL OF BBS.

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 6½% sales tax

SOFTMART

JUNE SALES

SALE PRICES GOOD UNTIL JUNE 26.

HARDWARE

ROTEK PARALLEL INTERFACE — SAVE 15.00 IF ORDERED WITH ANY PRINTERS	69.95
VIDEO PLUS	22.45
HIL 57 PROFESSIONAL	79.95
16M DISK CONTROLLER (WHILE SUPPLIES LAST)	115.00
64K UPGRADE KIT	35.95
SPECTRUM LIGHT PEN	17.95
PHELAN SWITCH BOX (FOR CONNECTING PRINTER AND MODEM AT THE SAME TIME/DATA TRANSFER LIGHT)	39.95
PHELAN 10 FT. EXT. CORD FOR PRINTER: MALE TO MALE	15.00
FEMALE TO MALE	15.00
PHELAN 10FT COCO JOYSTICK CABLE	15.00
FEELS AND POKES CAT. FOR COCO	8.00
VIDEO CLEAR	15.95
VIDEO IIC	35.00
PRINTERS ALL TYPES	CALL
DISK CABLES	29.95
DISK CONTROLLER EXTENDED CABLE	21.95
BOX 10 5DD MEMOEX DISKETTES	15.00
NEW COCO UNIVERSAL DRIVER (SOFTMART) (MONOCHROME/COLOR MONITOR DRIVER-ALL BOARDS)	29.95
DISK DRIVE (MF)	120.00
(WHILE SUPPLIES LAST)	
MONOCHROME MONITOR	99.00
WICO JOYSTICK ADAPTER	19.95
RADIO SHACK JOYSTICK	29.95

SOFTWARE

CANDY CO. (INTRACOLOR)	30.50 (C/D)
WILLY'S WAREHOUSE (INTRACOLOR)	30.05 (C/D)
NINJA WARRIOR (PROGRAMMER'S GUILD) (GET SNOWFLOW FREE)	25.50 (C)
GRAPHCOM	26.95 (C/D)
GRAPHCOM PICTURE DISK I-V	17.25 ea. (D)
ELITE FILE	69.00 (D)
NEW WORLDS OF FLIGHT (TOM MIX)	27.95 (C)/30.95 (D)
SALVAGE (PROPER PROGRAMS)	8.95
COCO CALLIGRAPHER (SUGAR)	20.95 (C)/25.95 (D)
TUT'S TOMB (MARK DATA)	21.95 (C)/25.95 (D)
THE NORTH CAROLINA CARTOGRAPHER MAJOR ISTAR (COMPUTERWARE)	24.95 (D) 32K EXT. 21.95 (C)/24.95 (D)
STAR TRADER (COMPUTERWARE)	21.95 (C)/24.95 (D)
SAM SLEUTH (COMPUTERWARE)	21.95 (C)/24.95 (D)
MIDDLE KINGDOM (COMPUTERWARE)	21.95 (C)/24.95 (D)
TELEWRITER-64 (COMPUTERWARE)	49.95 (C)/54.95 (D)
JUNIOR'S REVENGE (COMPUTERWARE)	23.50 (C)/25.50 (D)
TIME BANDIT (MICHTRON)	22.50 (C)/24.95 (D)
OUTHOUSE (MICHTRON)	22.50 (C)/24.95 (D)
RAINBOW SCREEN MACHINE (RAINBOW)	25.46 (C)/28.00 (D)
SUPER SCREEN MACHINE (RAINBOW)	38.20 (C)/40.40 (D)
MATHS - TREK	15.95 (C)
COLORBOWL FOOTBALL (COMPUTERWARE)	21.95 (C)/24.95 (D)
ICE HOCKEY (COMPUTERWARE)	21.95 (C)/25.95 (D)
BJORK BLOCKS (MORETON BAY)	29.95 (C)
VEDIT-05-9 EDITOR (SOFTMART)	49.95
TREKBOER (MARK DATA)	21.95 (C)/25.95 (D)
SEA SEARCH (MARK DATA)	21.95 (C)/25.95 (D)
SAILORMAN (TOM MIX)	27.95 (C)/31.95 (D)
SPEED RACER (MICHTRON)	31.45 (C/D)
SAM DIAMOND (MORETON BAY)	29.95 (D)
NEW: RETAIL BUSINESS GAME (SOFTMART)	24.95 (C)/27.95 (D)
AUTOMATERM (PIXE COMPUTING)	35.00 (C)/45.95 (D)
COCO-ACCOUNTANT II (FEDERAL HILL)	29.95 (C/D)
RAM DISK DRIVER (FOR DSL 128 K BOARD — BASIC OR OS-9)	34.95
INTEGRATED LIBRARY (SOFTLAW)	145.00 (D)
COCO MAX (COLORWARE)	65.95 (C/D)
SPECTRUM ADVENTURE GENERATOR (SPECTRUM PROJECTS)	37.95 (D)
MUSICA II (SPEECH SYSTEMS)	26.95 (C/D)
GRAPHCOM II (COMPUTIZE)	21.95 (D)
P51 FLIGHT SIMULATOR (TOM MIX)	27.95 (C)/31.95 (D)
FRANCHISE (COMPUTERWARE)	21.95 (C)/24.95 (D)
STRATEGY (COMPUTERWARE)	21.95 (C)/24.95 (D)

AND MORE!

SALES IN ALL CATEGORIES: ARCADE, ADULT, BUSINESS APPLICATION, UTILITY, FLEX, OS-9, ADVENTURE, DATABASE, LANGUAGES, SPREADSHEETS, EDUCATION, HARDWARE, BIBLE STUDY, INVESTMENT, SCIENCE/ENGINEERING, HAM RADIO, MUSIC, WORD PROCESSING, HOME, COMMUNICATION, AND BOOKS. SALVAGE PROGRAM FREE WITH PURCHASE OF ANY PROGRAM. CALL FOR SPECIAL LOW PRICES ON DISCONTINUED PROGRAMS.

WE ARE ACTIVELY LOOKING FOR GOOD PROGRAMS TO DISTRIBUTE. WRITE FOR AUTHORITY/DISTRIBUTORSHIP PACKAGE.

DESCRIPTIVE CATALOG — \$14.95 (C)/17.95 (D)

- MONTHLY SALES SHEET • ACCEPTANCE OF CHECKS WITH NO DELAY
- RALEIGH, NC STORE LOCATION COMPLETE WITH LIBRARY AND COMPUTER DISPLAYS

MAIL ORDERS: \$3.00 - 1ST CLASS / \$3.00 - UPS GROUND / \$4.00 2ND DAY AIR \$2.00 - C.O.D. / NC SALES TAX 4%

MC & VISA WELCOMED

SOFTMART

5024E Departure Drive - Raleigh, NC 27604

ORDER ONLY
1-800-334-0854, EXT. 879

INFORMATION
(919) 876-6124

WE PROUDLY PRESENT THE FOLLOWING
NEW PRODUCTS

DISTRIBUTED BY SOFTMART

RAM DISK DRIVER FOR DSL 128K BOARD

Allows use of your EXTRA 64K of RAM as a SUPER FAST DISK DRIVE.

*OS-9 VERSION

- 256K Sector Disk Emulator
- Able to Load Basic OS-9 in one second
- Use as your system disk

*RS-DOS VERSION

- Version 1.0 and 1.1
- 26 Granules change program together in visible
- for 96K virtual program; or use for data.

Unique BONUS PROGRAM includes for use under RS-DOS

INTRODUCTORY PRICE — \$34.95

VEDIT (EDITOR FOR OS-9)

VEDIT is a screen editor for writing programs.

SOME OF ITS FEATURES:

- *Cursor Control using the arrow keys
- *Block Processing of large data block
- *Inserting from other files
- *Processing file that is larger than data buffer
- *Display on 3 different screens
FHL O/PAK
PEJ's Workpak
RS-DOS
- *5 HELP screens available
- *Insert or Overplay mode
- *Auto Indent mode for structured programs
- *Tab Set from command line or a file.

INTRODUCTORY PRICE — \$45.95

RETAIL BUSINESS GAME

This game will allow one player to make business decisions for a retail store for a period of eight years. The store sells one product **WIDGETS**. Other compete in prices, advertising and supply of Widgets to consumers.

The player must make the following decisions at the beginning of each year:

1. Dividends for shareholders
2. Purchase Widgets
3. Advertising Expenses
4. Sale Price of Widgets
5. Set Fixed Asset Capital Expense Account

The program automatically relates the above decisions to a variety of variables factors which include funds available, industrial growth rate, competition pricing and shareholder expectations.

INTRODUCTORY PRICE — \$24.95 (C) 27.95 (D)

BRIDGE FOR ONE

This game is a 16K program that offers a singular the opportunity to play, practice, and experience with the complex game of bridge. Excellent learning for beginners and advanced bridge players. Bridge For One is fun for all member of the family. For ages 10 up. & Requires 16K memory ECB.

INTRODUCTORY PRICE — \$24.95 (C) 27.95 (D)

New Trends In Educational Computing

By Michael Plog, Ph.D.
Rainbow Contributing Editor

Back in April 1982, the Tandy Corporation began a program called "Tandy Educational Grants." The company provides sums of money to educational institutions for research and development of educational uses of computers. Since its beginning, the Tandy Educational Grants program has awarded over \$885,000 worth of hardware and software.

The current "cycle" of awards was made for proposals based on "Using Microcomputers to Develop Thinking Skills." Tandy, of course, has several models of computers in its product line. Four awards were given during the current cycle; one involved the Color Computer.

This award went to Mrs. Margaret Perry of Safety Harbor Middle School, Safety Harbor, Fla. Her project is to establish a model program using computers to aid gifted students in improving their thinking and creative skills. Mrs.

(Michael Plog received his Ph.D. degree from the University of Illinois. He has taught social studies in high school, worked in a central office of a school district, and currently is employed at the Illinois State Board of Education.)

Perry (and the Safety Harbor school system) received 11 64K Color Computers with monitors and disk drives, a DMP-110 printer, color graphics printer, touch pad and several software packages. (Does that sound like a dream come true?)

At present, we do not know exactly how the hardware and software will be used, or what the curriculum will look like. In the future, we hope to be able to report on the results of this project. The materials and procedures developed in Safety Harbor might be worthwhile to adapt to your local school system.

Possibly, curriculum materials may be developed that you can use at home. Whatever the outcome of the Safety Harbor experience, you should be aware that the Tandy Corporation is taking education seriously, and even providing funds for innovative programs in schools.

If you are interested in preparing a proposal of your own, write to Tandy Educational Grants Program, Radio Shack Education Division, 1400 One Tandy Center, Fort Worth, TX 76102. The educational community needs to experiment with different uses of computers, and we need quality products

and procedures to use in schools. Since schools are often short of money, outside sources of funds are important to continue development of curriculum to benefit all students in the country.

Even with the reduction of funds for education from the federal government, there are still some programs which help development of educational experiences. The National Diffusion Network is one such program. This program provides funds for innovative programs, then goes the next step. Funds are also provided to help school systems implement the projects that have been judged successful. Several Diffusion projects in past years have dealt with computers in the classroom.

One of the most recent such projects is the Asbury Park Computer Math Program. The goal of this project is to integrate computers into the entire curriculum of grades 9-12, with 18 hours of instruction in each of six subject areas: general mathematics, algebra I and II, geometry, trigonometry and calculus. The emphasis of this project is on mathematics, but other projects have stressed different aspects of the educational arena. You can find out what National Diffusion Network

projects exist by contacting the administration of your local school district.

Another sign of federal involvement in computers for schools is from the National Institute of Education (NIE). This organization has set as one of its priorities for 1986 an investigation into the effective uses of education software and technology. We hope NIE officials are aware of projects similar to the one in Safety Harbor. The report from NIE should be completed in 1986, but interim reports may be released earlier.

One study NIE will probably examine has been conducted by the Office of Bilingual Education and Minority Languages Affairs (of the Department of Education). The Office recently released a report on the use of educational technologies in programs dealing with limited English-proficient students. The study was limited to students with a native language other than English.

Computer assistance has long been thought to be helpful for such students, because some students may be in school districts where no one else (teacher, aide, principal) speaks the same language as the student. Computer assisted instruction could help such students

learn English, as well as basic skills in their native language. The study conducted by the Office has several findings. Many of the findings apply to all students, not just those with limited English proficiency.

As might be expected, funding for a computer assisted instruction increased from 1982 to 1984, while funding for audio-visual technologies

"As the nation moves from an industrial to an information economy, schools must ensure that all children have access to computers."

decreased. This is not to imply that schools dealing with limited English proficient (LEP) students are no longer interested in audio-visual technology. Many schools have already purchased this type of equipment, and have no need for more equipment. In a few years, we will probably see less money spent for hardware and more resources used for software.

The study also found that educational technologies can increase the effectiveness of instruction for LEP students. In addition, the study concluded that computer assisted instruction holds a greater educational potential than other technologies, such as audio-visual techniques.

The study also pointed out some concerns for users of computers in the classroom. One finding relates to staff dealing with computer assisted instruction. A lack of planning and staff training have compromised the effectiveness of many CAI programs. As with any educational program, poor staff preparation and poor planning will result in a "hit or miss" outcome.

Positive results are due more to chance than conscious effort. And, many educational computer programs depend on one key person; without that person (the study founder), the project would most likely fail. Again, as with any program, a single individual has difficulty institutionalizing a set of educational experiences.

Two other findings are important from this study, and should be

PARALLEL PRINTER INTERFACE

FOR THE RADIO SHACK COLOR COMPUTER

- * Runs any parallel printer from the Color Computer serial I/O port.
- * No hardware modifications or software patches needed. Works with all standard Color Computer commands including graphics.
- * Switch selectable baud rates from 300 to 9600.
- * All cables and connectors included.
- * 1 year warranty.
- * Most printers supply power at the parallel port. With these printers you may order your interface without the power module.
(Printers known to require the power module are: Epson, Panasonic, and Mannesman Tally.)
- * PRICE: Model CCP-2 with modem connector & switch-----\$84.
Model CCP-1 without modem connector & switch----\$69.
Either model without power module deduct-----\$3.
Shipping costs included in price.
Michigan residents add 4% sales tax.



CCP-1 OWNERS

UPGRADE YOUR CCP-1 TO A CCP-2 !!

Send us your CCP-1 plus \$17 (includes shipping)
we will add the necessary cable and switch.

BOTEK INSTRUMENTS

313-739-2910

4949 HAMPSHIRE, UTICA, MICH., 48087

Dealer inquiries invited

recognized by anyone trying to implement computers in schools. The people initiating the computer assisted instruction program often had objectives that were not specific enough for success. We all know people who are so enamored with the equipment that they do not realize its use.

Finally, the study found what most educators have been saying: A lack of instructionally and technically sound software has reduced the effectiveness of CAI for limited English-proficient students. Naturally, the lack of good software is not limited to students with a native language other than English.

This study, while limited in scope and intent, is worthy of study by people interested in computer assisted instruction. While computer assisted instruction is only one component of computer use in schools, it is an important component.

The federal government may even take a more active role in computer education, if Representative Timothy Wirth, a Democrat from Colorado, gets his way. Congressman Wirth will introduce a computer literacy bill in the House of Representatives this year. The

purpose of his bill is to help schools buy microcomputers, train teachers, establish a federal information bank and create a computer consulting service. The proposed legislation covers a broad area of assistance to educational computing.

Last year, Congressman Wirth introduced a similar bill, but it was not passed. He is trying again. Wirth is interested in equity of access. As the nation moves from an industrial to an information economy, Wirth claims, schools must ensure that all children — regardless of wealth — have access to computers.

The issue of equity of access of computers is a priority topic for many people. A coalition of Washington computer educators has established SLICE (Support for Leadership in Computer Education). This group is organizing in-service training for local computer instructors with emphasis on equity. This group is working without any government funds, but has a localized area of interest and effect.

Some efforts for computer literacy are state oriented. After this summer

vacation, all schools in Texas will have to begin teaching seventh and eighth graders computer literacy according to standard, state-mandated curriculum. Other states are implementing computer literacy programs, but none that I know of has a state-mandated curriculum.

The column this month has been a collection of news items, notices of happenings and events. If you learn of an event that could benefit other people interested in educational computing, please pass it along to me and I will insert it in the column. Please mail notices to me at 829 Evergreen, Chatham, IL 62629.

Before ending the column for this month, there is one other piece of news it is my personal privilege to share with you. My wife and I were honored with the birth of a daughter. As this is being written, my baby girl is less than one week old. She even helped me write part of the article, lying in my lap, with little fingers reaching for the keyboard.

She does not have her own Color Computer yet, but that will just be a matter of time. She is beautiful, and I even forgave the nurse in the hospital, who thought I was the grandfather. ☺



KEEP YOUR CHILDREN'S SUMMER FUN AND EDUCATIONAL WITH QUALITY SOFTWARE!

MATHWAB

Exciting graphics and sound capture your 1st - 3rd grader's attention while he/she practices addition and subtraction.

16K tape/32K disk/Ext Bas - \$15.95

MATCH - SPELL

A "concentration" game for two players that tests memory and spelling. Word lists can be saved.

16K tape or disk - \$15.95

QUIZ ALL

Study into on any subject then take the test or print it. Tests can be Multiple choice, short essay, or true false. Quiz All can even generate multiple choice answers!

16K tape/32K disk/Ext Bas - \$20.95



Puzzler

See your own list of words incredibly transformed into **CROSSWORDS**, **WORD-SEARCHES**, and **WORDSCRAMBLES**. Then print the puzzle and key with a dot-addressable or Okidata printer and save the words to use later for a different puzzle. 100% machine lang.

(see our May 85 ad for more info)

32K tape or disk - \$25.95

DIET-ADE

Not satisfied with your physique? Let DIET-ADE help track your calorie intake, tell you how many calories you need for a given weight, and suggest how much exercise you need to burn up the extra.

32K tape or disk / Ext Basic - \$29.95

STATE TO WIN

Two people compete at different skill levels in this familiar game. You must answer a math problem before you can mark your square! (add, subtract, mult. & div.)

16K tape or disk - \$15.95

STRATEGY

Compete against another player for the most completed boxes. Answer a question and draw a side. Questions and answer can be saved.

16K tape/disk/Ext Bas - \$15.95

NUMERICAL FILE

Counting and letter recognition are reinforced by these two colorful programs.

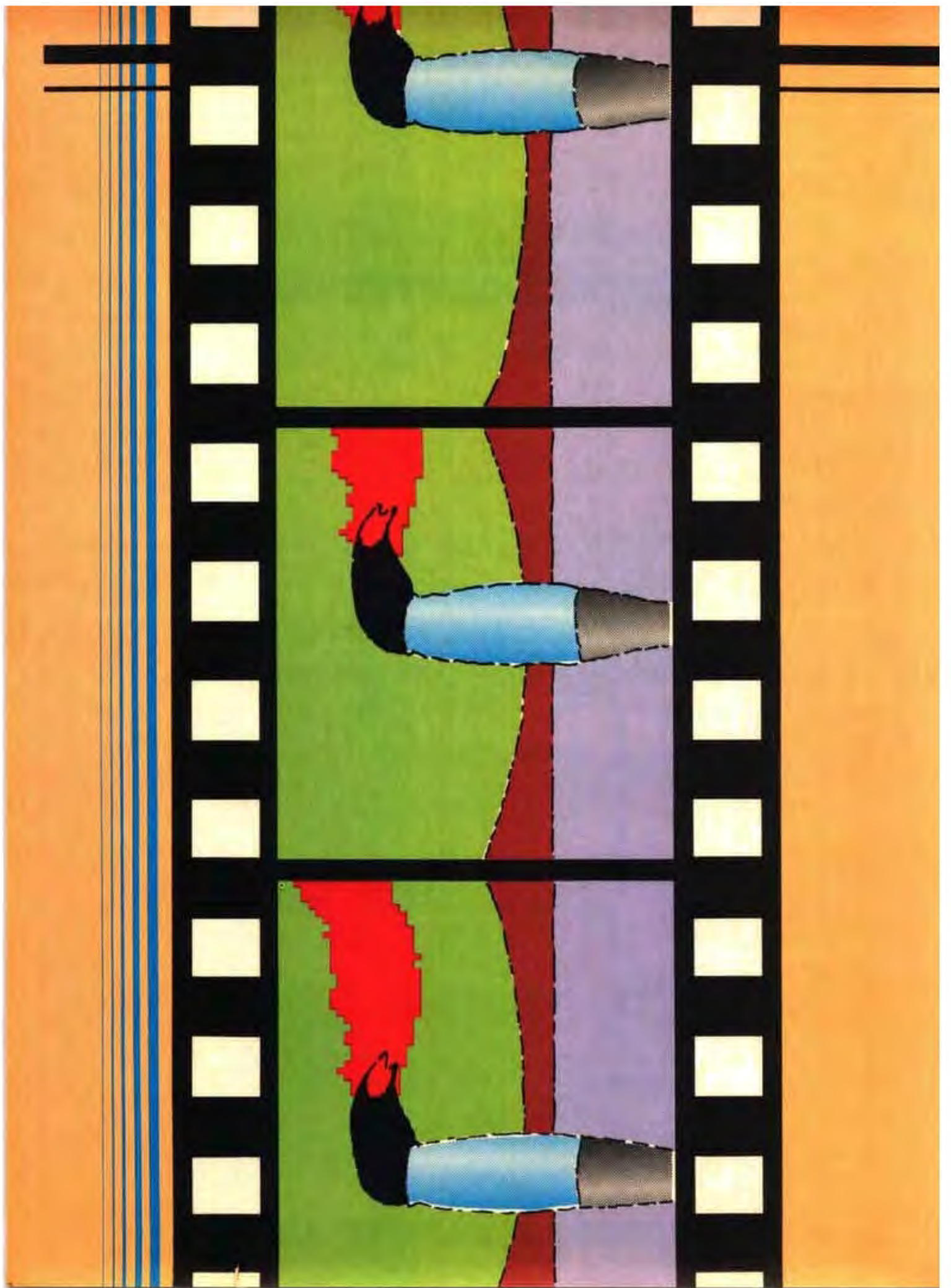
16K tape/Ext. Basic - \$15.95



Specify tape or disk • Add \$2.00 shipping • COD \$2.00 extra • Utah residents add 5%
Call / write for our free catalog/newsletter • Dealer inquires encouraged • For technical info call 7pm - 10pm MT

COLOR CONNECTION SOFTWARE

1060 Buddlee Drive - Sandy, Utah 84070 - 801-571-5023



Ease the unwieldy task of writing animated graphics

Animatic: Automatic Animation

By Rita Sabo

Automatic animation (*Animatic*) is a set of graphics animation subroutines that can be called from BASIC or Assembler. With *Animatic*, the cumbersome process of writing animated graphics is minimized. In addition, when written in Assembler, *Animatic* will provide smoother and faster animation.

Animatic takes advantage of the fact that most animation programs follow roughly the same logic (save previous screen contents, get object from old position, put object in new position, etc.) and it automatically performs many of these steps.

To access *Animatic* from BASIC, you will make use of a "new" function called ANIM. The syntax for ANIM is:

$$X = \text{ANIM}(P0, P1, \dots, P7)$$

'X' is a numeric variable, and P0-P7 are the parameters described in Table I. The variable 'Y' will contain return codes and status information relevant to the selected function.

Depending on the selected function (value of P0), you may not need to specify all of the parameters. Zero is assumed when a parameter value is omitted: $Y = \text{ANIM}(P0, \dots, P2)$, but if you omit coding double-commas, then the last used value for the missing parameter is used. Example: $Y = \text{ANIM}(P0, P1, \dots, P3)$ is the same as $Y = \text{ANIM}(P0, P1, 0, P3)$, and $Y = \text{ANIM}(P0, P1)$ will use the last used values for P2 . . . P7 (if applicable to the function indicated by P0).

(Rita Sabo holds a degree in literature. She enjoys reading the classics and working with the CoCo.)

To access *Animatic* from an Assembler program, you must first obtain the address of the Parameter Area by doing JSR INFO. There you should do a JSR ANIM with the proper parameters in this area. Upon exit, ANIM will set the 'D' register with the relevant operation status.

Description of Functions

Following find the description for each of the functions shown in Table 1. For an example of a program using these functions, refer to program listings 1 and 2. Compare program Listing 1 with the "do-it-yourself #8-1" program of Radio Shack's *Going Ahead with Extended BASIC*.

DEFINE (P0=0)

It must be the first used ANIM function. It defines in P1 the maximum number of figures (a.k.a. objects) to be created in your program.

CREATE (P0=1)

A CREATE is required for each of the figures to be moved in your program. The figure will behave according to the values of P2 and P7.

You don't have to specify anything in P1. A sequential number (starting with 1) is assigned to each object as it is being created. Any further reference to this object will use this "object I D" instead of the traditional XY coordinates.

If P2 equals zero, the object will be placed on the screen exactly as it was created. If P2 is not zero, the object will be MIXed with the screen background. MIX is similar to the DR function for PMODEs 0, 2 and 4. See pictures 1 and 2 for a description of MIX effects in several PMODEs.

P3 and P4 indicate the XY coordinates of the object's upper-left corner. P5 and P6 indicate the width and height of the figure. P5 and P6 should not exceed 100.

P7 represents the action to be taken in the event that this object is moved to an XY position unfit for the size of the object. (For example: attempting to move an object 20 pixels wide to positions X=244, Y=14.) This condition will, from now on, be referred to as "overflow." With P7 = 0, *Animatic* will signal an error in overflow.

When P7 = 1, the object will be "frozen" on the nearest possible position on the border of the screen. In our example: X=235, Y=14.

If P7 = 2 the object would disappear in overflow. You can make it reappear by moving it to a legal position.

With P7 = 3, the object will "wrap-around," henceforth appearing on the extreme side of the screen (in our example: X=0, Y=14).

Regardless of the P7 selection, you will receive notice of overflows through the status of the operation.

MOVE (P0=2)

In P1, specify the number of the object to be moved. P2 represents the criteria for obtaining the new XY coordinates.

P2=0: The object will move to the absolute X-Y values specified in P3 and P4.

P2=1: The movement will be relative to the actual position. The P3 and P4 values will be added to the actual XY coordinates to obtain the destination. P3 and P4 can be negative.

P2=2: The object will move to the absolute XY coordinates pointed out by the left joystick. Because the joystick readings cover a 0-63 range, the 'X'

reading is multiplied by four and the 'Y' reading by three.

P2=3: Same as in P2=2, but using the right joystick.

P2=4: The object has a relative movement with the displacements calculated from the left joystick readings.

The 'X' and 'Y' coordinates are calculated as follows:

$$X=X0+[(XJ-32)*P3]/8$$

$$Y=Y0+[(YJ-32)*P4]/8$$

Where X0 and Y0 = actual coordinates.

XJ and YJ = X-Y joystick readings.

P3 and P4 = Values given for parameters 3 and 4. These values can be negative. However, the ANIM instruction will only accept negative values in Hex form, i.e., specify &HFF instead of -1.

Using this option, you can move the object with the direction and acceleration represented by the position of the joystick (i.e., P3 = 3 will give the effect of greater accelerations than P3 = 2).

P2=5: Same as in P2=4, but using the right joystick.

P2=6: *Animatic* will select XY values at random. P3 and P4 represent the maximum random value for 'X' and 'Y.' P5 and P6 will be added to the generated 'X' and 'Y' values, respectively.

If you specify P3 and P4 = 0, *Animatic* will use P3=255; P4=191; P5=0; P6=0 as a default.

The random sequence has a period of 256, but *Animatic* reseeds itself once the period is exhausted by taking the timer value as a seed number. If you are calling *Animatic* from ML, write an interrupt routine to modify storage addresses \$112-\$113 accordingly.

P3=7: Keyboard controlled movement can be obtained by selecting this option.



Picture 1: MIX option in PMODEs 0, 2 and 4. Top using PUT (with and without DR). Bottom using *Animatic*.



Picture 2: MIX option in PMODEs 1 and 3. Top using PUT. Bottom using *Animatic* with several MIX color combinations.

The left/right arrows will generate a relative movement from the value in P4 and the up/down arrows from P5. The values in P4 and P5 should be positive since *Animatic* already knows the left/up arrows represent a negative displacement.

P2>7: Selecting P2 with a value greater than seven will redisplay the object in the current X-Y location.

P3-P6 as discussed above have different meanings depending on the value of P2.

P7 is used only if the object was CREATED with MIX. P7 indicates the color to be omitted when the object is being mixed with the screen. P7=0 removes buff/green, P7=1 removes cyan/yellow, P7=2 magenta/blue, and P7=3 orange/red. Refer to Picture 2 for results with different P7 values.

As a result of the MOVE function, the variable at the left of the ANIM instruction will be set as follows:

- 0 = No screen overflow
- 1 = Upper screen overflow
- 2 = Bottom screen overflow

- 4 = Left overflow
- 5 = Upper left corner
- 6 = Bottom left corner
- 8 = Right screen overflow
- 9 = Upper right corner
- 10 = Bottom right corner

ML programs can get these values from 'B' register.

PLACE (P0=4)

Unlike MOVE, PLACE does not assume that the object being moved is already on the screen. PLACE is more like PUT as it limits itself to copying object from storage onto the screen. The options for PLACE are exactly the same as these of MOVE.

REMOVE (P0=4)

With REMOVE, you simply "swap" the contents of the screen with the contents of storage. This function differs from MOVE (P2>7) in that the object in storage is displayed "as is," whereas MOVE performs internal pixel and mix adjustments. REMOVE is fast and it can be used to simulate blinking.

The figure to be removed is specified in P1.

COPY OBJECT (P0=5)

Sometimes you may want to perform a "tricky" effect or simply substitute one object for another. COPY duplicates an object. COPY does not like it when the new object has not been CREATED, and when the size of the new object is less than the size of the object being copied. Both the object being copied and the new object must have the same MIX or NO-MIX definition.

In P1, specify the destination object. In P2, specify the object being copied.

OPERATE (P0=6)

Used to directly modify an object. In P2, specify the operation to be performed upon the object defined in P1.

P2=0: Clear the object to the value specified in P3.

P2=1: Perform a logical "NOT" operation on the object. If in a two-color PMODE, this will convert the object into its reverse colors.

P2=2: Make an "AND" operation

ANIMATIC
TABLE #1

FUNCTION	P0	P1	P2	P3	P4	P5	P6	P7		
DEFINE	0	# FIGS	.	.	.	.	.	.
CREATE	1	.	0=NOMIX	X COORD	Y COORD	# COLS	# ROWS	0=ERROR		
			80 MIX					1=FREEZE		
MOVE	2	# FIG	0=ABS	X	Y	.	.	IF TYPE MIX COLOR CODE (0-3)		
			1=REL	+X	+Y					
			2=LJOYSK	-	-					
			3=RJOYSK	-	.					
			4=LJOYSK	(X)	(Y)					
			5=RJOYSK	(X)	(Y)					
			6=RANDOM	- X	Y				+X	-Y
			7=KEYBRD	+X	+Y				.	.
8=REDISP	.	.	.	.	.	.	.
PLACE	3	◀.....	SAME	AS	MOVE▶				
REMOVE	4	# FIG	.	.	.	.	.	.
COPY	5	TO FIG	FROM FIG	.	.	.	.	.
OPERATE	6	# FIG	0=CLEAR	OPERATION BYTE	.	.	.	.
			1=NOT							
			2=AND							
			3=OR							
DOMAIN	7	# FIG	0	X -	Y |	- X	| Y	.		
			# FIG	.	.	.	.	.
INFO	8	A	B							

against the value specified in P3.

P3=3: Make an "OR" against the value in P3.

For NO-MIX objects, the changes will immediately be represented on the screen, but for MIX objects the changes will not appear until the next time you move your object.

CHECK DOMAIN (P0=7)

With DOMAIN you can test if an object "touches" a specific screen area. This function is used in program Listing 2 to check for asteroids crashing with the spaceship.

Specify the object to be tested in P1. If P2 is not zero, this number will represent an object whose coordinates will be used to define the screen area. For example, to know if object 2 "touches" object 5, code P1=2, P2=5. If P2=0, then P3 through P6 define the X-Y coordinates of the area's corners. If the object touches a point within this square, a '1' value is returned.

GENERAL INFO (P0=8)

To call this function from ML programs, make a JSR INFO. The arguments should be given in registers 'A' and 'B.'

With INFO you can obtain information about *Animatic* depending upon the P1 and P2 values. "NZ" represents a value other than zero in the table below.

P1 P2	Result
=0 =0	Address of an internal parameter table (required by ML programs). Also clears to zero the parameter table.
=0 NZ	XY coordinates for the NZ object. The result of the XY coordinates has the format &HXXYY.
=1 NZ	Address of internal Figure Definitions for object NZ. (Do not expect to use this function too often.)

Error Messages

Animatic returns error codes with the following format:

"WW ERROR ON FIGURE YYY ACTION Z"

YYY is the number of the object you were using when the error occurred and 'Z' is the number of the attempted function. If in BASIC, you'll also get an ?FC Error. When calling *Animatic* from Assembler, the error will be displayed and control returns to your program. You will be notified through a non-zero value in the 'A' register. (This does not apply for calls to INFO.)

What about WW? Following find its meaning:

XOS= Out of Screen. You selected P7=0 during function P0=1 for this object and have attempted to move the object to an overflow position.

XOM= There is not enough memory to create the object. If possible, relocate *Animatic* to a lower address. The program in Listing 3 will help you to determine an appropriate offset for *Animatic*.

XOF= You are trying to CREATE more objects than specified in DEFINE.

XIO= Invalid option. The requested function does not exist (valid options are 0-8 for BASIC and 0-7 for ML programs).

XEX= You are trying to CREATE an object more than 100 pixels wide or with a width of zero pixels.

KEY= You are trying to CREATE an object more than 100 pixels high or with a height of zero.

XNC= Object not created. The object you are trying to use has not been CREATED.

XNI= You forgot to DEFINE (P0=0) *Animatic*.

XIC= Can't copy object. See description for the COPY function and see if you are violating some of the restrictions.

Some Things to Know

Animatic takes about 2.5K of storage, plus the required storage to keep the objects. It is written in PIC code and

works on any CoCo with at least 16K and Extended BASIC. Disk is not required.

Although *Animatic* runs in 16K systems, you will need a 32K system and *EDTASM+* to enter and assemble the program. RAINBOW ON TAPE is an excellent alternative. You may also send me a SASE with a formatted diskette plus \$4 (U.S. currency).

Listing 4 contains the source code. The program is so large that I do not recommend typing all the comments.

Program 3 will estimate the required size for your figures, and it suggests a load address for *Animatic*. After assembling the code, make a CLEAR 200,LOAD ADDRESS-1.

If using *Animatic* from BASIC, type in EXEC after loading it. Nothing should happen after typing EXEC and the cursor must continue blinking as normal. At this point, BASIC already recognizes the ANIM instruction. Because of this new instruction, avoid the use of USR0 and USR1 while in BASIC.

For a start, you may try sample programs 1 and 2. If after running a BASIC-*Animatic* program and you get ?SN Errors or you see '!' instead of ANIM when listing your program, this means you forgot to type EXEC after loading *Animatic*.

With *Animatic*, I have tried to provide a lot of functions and an easy interface for animation purposes. However, when used in complex animation environments, several considerations and restrictions inherent in its design have to be taken into account.

The potential for combinations in the animation functions here provided is such that it would require a more lengthy article to describe all possible effects, restrictions and techniques. I do encourage you to experiment whenever you have doubts. Of course, I would like to hear from you if you have questions, comments or problems regarding *Animatic*. You may contact me at 20819 Via Valencia, Boca Raton, FL 33433.

Listing 1: ROCKET

```
10 'THIS PROGRAMS MOVES A ROCKET
    FROM LEFT TO RIGHT OF THE SCREE
    N
20 'PREPARE GRAPHICS AND DRAW RO
    CKET
30 PCLEAR 4
40 PMODE 4,1
```

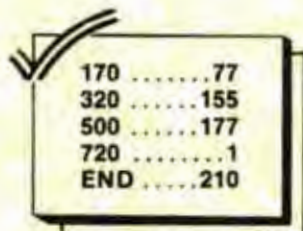
```
50 PCLS
60 SCREEN 1,1
70 X=10:Y=10
80 DRAW "BM10,10; S2;H10;R15;F10
    ;R20;F10;G10;L20;G10;L15;E10;U20
    ;D4;NL8;D4;NL12;D4NL16;D4;NL12;D
    4;NL8"
90 'DEFINE ANIMATIC. MAX 1 FIGUR
    E
```



```

100 A=ANIM(0,1)
110 'CREATE FIGURE: NO MIX, FROM
X=0 Y=0, X SIZE=35, Y SIZE=35,
IF OUT OF SCREEN WRAP AROUND
120 A=ANIM(1,,0,0,0,X*3.5,Y*3.5,
3)
130 A$=INKEY$:IF A$="" THEN 130
140 PCLS
150 'MOVE FIGURE #1. RELATIVE MO
VEMENT OF +5 IN X AND 0 IN Y
160 X=ANIM(2,1,1,5,0)
170 GOTO 160

```



170	.....77
320	.....155
500	.....177
720	.....1
END	.....210

Listing 2: PROMNADE

```

10 'SPACE PROMENADE WITH ANIMATI
C
20 GOTO 420
30 'DEFINE ANIMATIC. #FIGS=D+SPA
CESHIP+BOMB (D=#ASTEROIDS)
40 A=ANIM(0,D+2)
50 'CREATE SPACESHIP. NO MIX. PO
SITIONS X=0/Y=0, SIZE=35/20. IF
OUT OF SCREEN FREEZE
60 A=ANIM(1,,0,0,5,X*3.5,Y*2,1)
70 'CREATE ASTEROIDS. NO MIX. FR
OM POSITION 95,95. SIZE 11/11. I
F OUT OF SCREEN WRAP-AROUND
80 FOR I=1 TO D
90 A=ANIM(1,,0,95,95,11,11,3)
100 NEXT
110 'CREATE BOMB. NO MIX. FROM P
OSITION 200,184. SIZE=6 X 6. IF
OUT OF SCREEN WRAP
120 A=ANIM(1,,0,200,184,6,6,3)
130 'PREPARE SCREEN'S BACKGROUND
(PLANET + STARS)
140 PCLS:CIRCLE(255,191),10:PAIN
T(250,189),1,1
150 FOR I=1 TO 60:PSET(RND(255),
RND(191),1):NEXT:SCREEN 1,1
160 ' SET ORIGINAL ASTEROIDS POS
ITIONS.
170 FOR I=2 TO D+1:S=INT(240/D)*
(I-1):X=ANIM(2,I,0,S,0):NEXT
180 'MAIN LOOP. MOVE SPACESHIP (
OBJECT#1). F2 CAN BE 4 IF JOYSTI
CK OR 7 IF KEYBOARD. F3 AND F4 A
RE X AND Y INCREMENTS
190 R=ANIM(2,1,F2,F3,F4):GOSUB31
0:'GO TO CHECK FOR CRASH
200 'MOVE ASTEROIDS. RELATIVE WI
TH X AND Y INCREMENTS DEPENDING

```

```

ON THE NUMBER OF THE OBJECT
210 FOR I=2 TO D+1:XA=ANIM(2,I,1
,&HFE,8+I*2):NEXT
220 'MOVE BOMB. RANDOM X=RND(30)
+150, Y=RND(151)+20
230 RA=ANIM(2,D+2,6,30,151,150,2
0)
240 'CHECK FOR CRASH
250 GOSUB 310
260 'REMOVE BOMB TO PREVENT OVER
LAPS WITH ASTEROIDS
270 RA=ANIM(4,D+2)
280 'IF R=10 THEN SPACESHIP REAC
HED BOTTOM/RIGHT CORNER
290 IF R<>10 THEN 190 ELSE 370
300 'CHECK IF SPACESHIP IS IN SA
ME DOMAIN THAT ANY OF THE ASTERO
IDS OR BOMB
310 FOR I=2 TO D+2:XA=ANIM(7,I,1
):IF XA<>0 THEN GOTO 360 ELSE NE
XT:RETURN
320 'OPERATE THE CRASHING ASTERO
ID BY CLEARING IT TO RED (TO SIM
ULATE FIRING)
330 A=ANIM(6,I,0,&HAA)
340 'MAKE SOUNDS AND FLASH SCREE
N
350 'ALMOST ALL THE CODE FROM HE
RE TO THE END IS COSMETIC
360 FOR I=1 TO 3:PLAY"T100;01;F#
C":SCREEN 1,0:FOR J=1 TO20:NEXT:
SCREEN 1,1:NEXT:W=0:GOTO 380
370 FOR I=1 TO 2:PLAY"T250CDEFG"
:NEXT:PLAY "03;L4;C;L2;D;A":W=8
380 CLS(W):PRINT@290,"":INPUT "
ANOTHER GAME (Y/N)":A$
390 IF A$="N" THEN CLS:PRINT"I'L
L SEE YOU LATER":END
400 FL=1:GOTO 440
410 'INITIALIZE
420 PCLEAR 4
430 PMODE 4,1
440 PCLS
450 X=10:Y=10
460 DRAW "BM10,10; S2;H10;R15;F1
0;R20;F10;G10;L20;G10;L15;E10;U2
0;D4;NL8;D4;NL12;D4NL16;D4;NL12;
D4;NL8"
470 PAINT (12,12),1,1
480 CIRCLE (100,100),5
490 LINE (200,180)-(205,185),PSE
T,BF
500 'IF NOT FIRST TIME CONTINUE
510 IF FL=1 THEN 40
520 'SHOW PRESENTATION SCREEN
530 CLS(0)
540 'PRINTPEEK(&HFF00):A$=INKEY$
:IF A$="" THEN 301 ELSE POKE &HF

```

```

F02,&H00:PRINTPEEK(&HFF00):END
550 PRINT@B,"space";:PRINT@14,"p
romenade";
560 PRINT@64,"a";:PRINT@66,"grap
hics";:PRINT@75,"ANIMATIC";:PRIN
T@84,"program";
570 PRINT@106,"by";:PRINT@109,"r
ita";:PRINT@114,"sabo";
580 FOR I=0 TO 63:SET(I,10,7):SE
T(I,31,7):NEXT
590 FOR I=10 TO 31:SET(0,I,7):SE
T(63,I,7):NEXT
600 PRINT@230,"INSTRUCTIONS (Y/N
)?";
610 A$=INKEY$:IF A$="" THEN 610
620 IF A$<>"Y" THEN GOTO 770
630 'PRESENT INSTRUCTIONS
640 PRINT@230,STRING$(20,CHR$(12
B));
650 TX$(0)="your mission is to m
aneuver "
660 TX$(1)="the spaceship thru t
he meteors"
670 TX$(2)="rain and successfully
cross the"
680 TX$(3)="contact bomb barrier
to safely"
690 TX$(4)="arrive on the planet

```

```

earth in"
700 TX$(5)="the bottom right--go
od luck!!"
710 TX$(6)=" press ENTER to con
tinue "
720 PO=225:FOR I=0 TO 6:FOR J=1 T
O 30:A$=MID$(TX$(I),J,1):IF A$="
" THEN A$="":PLAY"T25004D" ELS
E PLAY"T250L101C"
730 PRINT@PO,A$;:FORH=1TO10:NEXT
:PO=PO+1:GOSUB860:FOR K=1 TO 50:
NEXT:NEXT:PO=PO+2:IF I=5 THEN PO
=PO+32
740 NEXT
750 A$=INKEY$:IF A$="" THEN GOSU
B 860:GOTO 750
760 'PRESENT GAME OPTIONS
770 CLS(5):PRINT@290,"";:INPUT "
HOW MANY ASTEROIDS";D
780 IF D<1 THEN 770 ELSE IF D>6
THEN SOUND 1,1:PRINT@362,"MASOCH
ISTIC?!";:PRINT@384,"above 6 is
too much even for you":FORI=1 T
O 1500:NEXT:GOTO770
790 PRINT@360,"JOYSTICK/KEYBOARD
";
800 PRINT@389,"(WITH JOYSTICK IS
EASIER)";
810 A$=INKEY$:IF A$="" THEN 810
820 IF A$<>"K" AND A$<>"J" THEN
SOUND 1,1:GOTO 790
830 SOUND 200,1
840 IF A$="K" THEN F2=7:F3=8:F4=
8 ELSE F2=4:F3=4:F4=4
850 GOTO 40
860 IF SW=0 THEN PRINT@75,"ANIMA
TIC"; ELSE PRINT@75,STRING$(8,CH
R$(12B));
870 SW=NOT SW:RETURN

```

THE SOFTWARE HOUSE

SENTINEL DISKETTES



10/\$11.95 SS / DD 100/\$110.
10/\$13.95 DS / DD 100/\$120.

w/ Tyvek Sleeves & Labels
100% Certified Error Free
Lifetime Warranty

Media Mate Disk Bank \$13.95
(\$12.95 w/disk order)

Head Cleaner Kit \$7.95
(\$6.95 w/disk order)

Tyvek Sleeves \$9.00/100

Add \$2.50 S/H in U.S.A. - Canada Add \$3.50
Michigan Residents Add 4% Sales Tax

Check/Money Order Payable To:

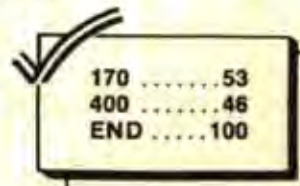
Dallas Cox

9020 Hemingway, Redford, MI 48239



(313) 937-3442

Send card # & exp. date
Min. chg. order \$20.00



Listing 3: ANIMCALC

```

10 'THIS PROGRAM WILL CALCULATE
THE REQUIRED SIZES FOR ANIMATIC'
S OBJECTS.
20 'IT WILL ALSO SUGGEST A START
ADDRESS FOR ANIMATIC'S CODE
30 CLS:PRINT"ANIMATIC'S WORK ARE
AS SIZES"
40 INPUT"NUMBER OF OBJECTS";OB
50 IF OB<1 OR OB>255 THEN 40
60 DIM OB(OB),PM(OB),X(OB),Y(OB)
,MX$(OB)
70 FOR I=1 TO OB
80 CLS(5)

```

Elite Software

NOW AT:

Radio Shack®

Available Via Express Order

What to look for when buying application software . . .

EASE OF USE—At Elite Software we know you want programs that are easy to use. You want software that has a simple command structure with commands that are easy to remember. We've had *NINE* magazine reviews that acknowledge the ease-of-use of our programs. • **FEATURES**—Elite Software has powerful features. Why buy an island (one program that does only one job)? Remember, when you buy one program from our system, you also get *EXPANDABILITY*. • **PERFORMANCE SPEED**—Some application programs run disappointingly slow. At Elite Software we pay careful attention to things like Sorting, Screen Re-write, Calculation, and Output processing times. Not all software "plays" the same. Elite Software *DOES* make a difference.

Elite-Word

Elite-Spel™

Elite-Calc

Elite-File

All of our Software Features:

- ★ Superior Ease of Use
- ★ Cross-file Compatibility
- ★ Printer Compatibility
- ★ Comprehensive Manual
- ★ Nationwide User-group Support
- ★ Handsome Vinyl Binder
- ★ Revision Upgrade Program

Radio Shack is a trademark of Tandy Corporation

Now Available For: WORD-PAK

Elite-Calc

Elite-Word

Elite-Spel™

NEW!

SAME POWERFUL FEATURES + 80 COLUMN DISPLAY
Specify Disk or Tape, \$79.95 each + \$3.00 Shipping/Handling
These versions not available at Radio Shack

SAME POWERFUL FEATURES + 80 COLUMN DISPLAY
Specify Disk or Tape, \$39.95 each or \$20.00 when purchased
with Elite-Word + \$3.00 Shipping/Handling.

WORD - PAK I

Hardware - List \$119.95
Our Price \$105.00 + \$3.00 Shipping/Handling
"Y" Cable Connector \$25.00

WORD - PAK II

Hardware - List \$149.95
Our Price \$125.00 + \$3.00 Shipping/Handling
"Y" Cable Connector \$25.00

SPECIAL - BUY

Elite-Calc or Elite-Word
with WORD -PAK
and deduct 10%
from total price.

SEE NEXT PAGE FOR ORDER INFO . . .

Elite Software 201 Penn Center Blvd., Suite 301, • Pittsburgh, PA 15235 • (412)795-8492

NEW!

Elite·Calc™/3.0

How do you improve a widely acclaimed worksheet program that's already powerful, fast, and easy to use? We've added new features, more commands, four screen displays, while maintaining excellent

ease of use and full compatibility with all existing Elite·Calc worksheets. You have more power and flexibility than ever before! Elite·Calc/3.0 is your best choice, and it's waiting to work for you.



WINDOW - TITLE LOCK

Holds Column and/or Row Titles



IMPROVED STORAGE

Stores 30% More Information



FOUR SCREEN DISPLAYS

Features 2 Hi-Res Screens



ZAP COMMAND

wipes out numbers...leaves text & formulas



Elite·Calc/3.0 offers TWO 51 character displays

Special Elite·Calc/PBJ version for Word-PAK

Existing Elite·Calc users — contact us for upgrade pricing
CALC-LIST is a separate, machine language, utility that works independently of Elite·Calc. It can read either tape or disk worksheet files, and will give you additional information that was previously "hidden" within your worksheet. With CALC-LIST, you can list on the screen (or print) the actual contents of your worksheet cells, including FORMULAS. **CALC-LIST.....\$24.95**

SPECIFY TAPE OR DISK ELITE CALC/3.0 \$69.95

Elite·Calc/3.0 Tape Radio Shack # 900-187
 Elite·Calc/3.0 Disk Radio Shack # 900-188

PACKAGES ONLY FROM ELITE SOFTWARE

Specify Disk or Tape
 Elite·Calc/3.0 & Calc-List - \$79.95
 Elite·Calc/PBJ for Word-Pak - \$79.95
 The "Original" Elite·Calc (Ver. 1.2) NOW - \$34.50

★ COLOR COMPUTER COMMUNICATIONS ★

★ COLOR COMPUTER DICTIONARY ★

Elite·Comm™

Elite·Comm turns your Color Computer into a powerful 300 Baud terminal. With Elite·Comm you can access large main-frame computers, local computer bulletin boards, and national computer database services. Elite·Comm is fully compatible with Elite·Word and will work with ASCII files from other programs. If you want a terminal communications package that is smooth and easy to use, Elite·Comm is for you.

Elite·Comm is **SMOOTH** operation that's **EASY TO USE!**

Specify Tape or Disk

\$29.95

Not presently available at Radio Shack

Elite·Spel™

Elite·Spel is an excellent spelling checker for your Color Computer, and its **VERY FAST**... that's the key. Why wait while a spelling checker does its job? Elite·Spel identifies all potentially misspelled words with a single pass through its perfectly adequate 24,000 word dictionary. Elite·Spel lets you Add or Delete Dictionary words **EASILY**. Elite·Spel is fully compatible with Elite·Word and will work with ASCII files from other programs.

Speed is the key... Elite·Spel has it!

Available on Disk only **\$29.95**

Radio Shack® Catalog # 900-185

When purchased with ELITE·WORD... **ONLY \$15.00**

• COLOR COMPUTER WORD PROCESSOR •

with
FREE
Mail Merge

Elite-Word™

Also Available On OS-9

THE SECOND GENERATION WORD PROCESSOR IS HERE! ELITE-WORD is a high performance, all machine language, Full Screen Editor which offers an ease-of-use that is simply incredible. ELITE-WORD has many powerful features not found in other word processors for the Color Computer. ELITE-WORD also offers a printed output flexibility that can handle your sophisticated home and business applications.

LOOK at these features:

Very easy to use • Top screen line reserved for HELP display/Command prompts • Excellent for BOTH program editing and word processing • TWO text entry modes; Insert or Exchange • Auto Key-Repeat • Smooth display scroll for easier proof reading • True Upper/Lower case display with lower case descenders • Hi-Res text "View" mode displays text exactly as it will be printed; including text Justification, Auto Line Centering, dynamic Margin changes, Top and Bottom Margins, Page Numbering, and Page Breaks • Include feature (disk only) permits including several file names within one output document; total document will have sequential page numbering if desired • Fast Disk I/O; no loading of overlay files to slow down operation • Variable Text (Mail Merge) capability for Form Letter generation included FREE!

32K Extended Basic Required for ROM routine calls • Variable TAB stops • User definable Headers and Footers • Smooth cursor movement over text; in any direction (including vertical) • Page Forward or Backward through text • Jump to beginning or end of text • Automatic text centering • Automatic text Word-Wrap if desired • True Block text Move, Delete, or Copy • Delete entire screen line • Backspace and Delete Character • Delete character above cursor • Find a string of characters • Global Replace character string • Two Hi-Res screen displays; 32 x 19 for text entry/editing, 64 x 19 for formatted text viewing • Continuous Memory display • Over 22K file size in 64K machines • Easy generation of ASCII files • Save/Load text files (in ASCII if desired) • Program remembers last File Name loaded or saved, and will write to it by default if desired • All I/O errors trapped and recoverable • Disk commands for Change Drive, Directory and Free Space • Print Format features allow user to specify Left Margin, Line Length, Line Spacing, Top and Bottom Margin, Duplicate Copies, Right-Side text Justification, Page Pause, Page Numbering, and more • Dynamically change any print Format features within text • Imbed Hex codes and printer Font changes within text.

Additional OS-9 version features:

Edit two files simultaneously • Save or Print only a portion of the text buffer • Edit files larger than memory (uses disk as buffer) • Block Copy from one file to another • Execute any OS-9 command from Editor

If you want powerful features AND a program that's EASY TO USE, Elite-Word is for you . . .

Elite-Word TAPE RS# 900-183
Elite-Word DISK RS# 900-184
Elite-Word/OS-9 RS# 900-185

THE BEST FOR ONLY
Specify Tape \$ 69.95
RS Disk \$ 69.95
OS-9 Disk \$ 79.95
OS-9 & RS Disk \$115.95

"Elite-Word is a terrific word processor with an impressive list of features, yet it's easy to learn and use."

—Stuart Hawkinson, HOT COCO

"I was more than satisfied with Elite-Word . . . After the review, I would not hesitate to compare it with the two best selling word processors. And my comparison places it at the top of the list."

—A. Buddy Hogan, RAINBOW

• COLOR COMPUTER DATA BASE MANAGER •

Elite-File™

THIS IS IT! ELITE-FILE is the Data Base Manager that Color Computer users have been waiting for. ELITE-FILE is for everyone who needs to store and retrieve information. ELITE-FILE is a full-featured relational Data Base Manager with all the editing and report formatting features that are typically found on much larger computer systems. COMPARE the others for record structure flexibility, total record capacity, information processing ability, speed of program response, printed output flexibility, and you'll agree that ELITE-FILE may very well be the most powerful/useful program ever written for the Color Computer.

"I like Elite-File and would readily recommend it to anyone...Its power and speed have to be seen to be appreciated."

—Ed Lowe, RAINBOW

"Elite-File is a very decent program and you can learn to do alot with it in a hurry."

—Scott L. Norman, HOT COCO

No other File Manager gives you these features:

All machine language for speed • Flexible, user defined, data record structures • Up to 255 characters per record field • Up to 255 fields per record • Up to 2000 characters per record • Up to 4000 records per file • Up to 18 files can be open at the same time for information processing • Edit, Scan, Sort, Select Record information; all done FAST • Output reports to Screen, Printer, or ASCII Disk file • Place output data by Field Name, with Custom Text anywhere on the printed page • Perform math operations (+, -, *, /) between Field contents • Produce tabulated reports from multiple record contents • Generate column totals across record field contents.

Compatible with Elite-Calc and Elite-Word files • User friendly combination of Menu driven input, and single key commands • Supports up to 4 drives • Minimum 32K RAM. Disk required • Nested sub-field definitions • Up to 8 fields in Primary Key • Copy record definition from file to file • View/Print record definition • Input/Add records with easy to use field name format display • Edit records with full screen "type over" editor • Copy records to repeat identical data • Load Elite-Calc worksheets into random access data files • Scan mode for quick data retrieval

Radio Shack® catalog # 900-189

COMPARE features and performance speed . . . you'll agree that Elite-File is the one to buy.

THE BEST
FOR ONLY

\$74.50

Disk Only

Elite Software

Productive Programs for Serious Users

Add \$3.00 shipping and handling

PA Residents add 6% Sales Tax

OS-9 is a trademark of Microware and Motorola

Dealer inquiries invited

Box 11224 • Pittsburgh, PA 15238 • (412) 795-8492



```

90 PRINTTAB(20);"object #";:PRIN
TUSING"###";I
100 INPUT "OBJECT TO BE MIXED (Y
/N)";MX$
110 IF MX$<>"Y" AND MX$<>"N" THE
N 100
120 INPUT "PMODE (0-4)";PM
130 IF PM<0 OR PM>4 THEN 120
140 INPUT "WIDTH IN PIXELS (1-10
0)";X
150 IF X<1 OR X>100 THEN 140
160 INPUT "HEIGHT IN PIXELS (1-1
00)";Y
170 IF MX$="Y" THEN MX=1 ELSE MX
=0
180 PM(I)=PM:X(I)=X:Y(I)=Y:MX$(I
)=MX$
190 IF Y<1 OR Y>100 THEN 160
200 IF INT(X/2)<>X/2 AND PM<>4 T
HEN X=X+1
210 IF PM=0 OR PM=2 THEN X=INT(X
/2)
220 X=INT(X/8)
230 RM=7-X
240 X=X+1:IF RM>1 THEN X=X+1
250 IF (Y/2 <> INT(Y/2)) AND PM<
2 THEN Y=Y+1
260 IF PM<2 THEN Y=INT(Y/2)

```

```

270 T=X*Y
280 IF MX=1 THEN T=T*2
290 OB(I)=T
300 TT=TT+T
310 NEXT
320 CLS(7)
330 INPUT "ACTUAL OFFSET OF ANIM
ATIC";OF
340 INPUT"OUTPUT TO PRINTER";DV$
350 IF DV$="Y" THEN DV=-2 ELSE D
V=0
360 CLS
370 PRINT"OBJ# PMODE MIX X
Y BYTES"
380 FOR I=1 TO OB
390 PRINT#DV,USING"### ";I;:PR
INT#DV,USING" # ";PM(I);:PRINT
#DV," ";MX$;" ";:PRINT#DV,USING
### ";X(I);:PRINT#DV,USING" ###
";Y(I);:PRINT#DV,USING" ####";O
B(I)
400 NEXT
410 PRINT#DV:PRINT#DV,TAB(11),"S
WAPS==>";:PRINT#DV,USING" ####";
TT
420 PRINT#DV:PRINT#DV," RE
QUIRED FDTS ==>";:PRINT#DV,USING
" ####";OB*24
430 TX=TT+OB*24
440 PRINT#DV:PRINT#DV,TAB(10),"T
OTAL ==>";:PRINT#DV,USING"####";
TX
450 PRINT#DV," ";:PRINT#DV,"YOU C
AN RELOCATE ANIMATIC AT"
460 SZ=PEEK(&H74)*256+PEEK(&H75)
:AD=SZ-TX-2800
470 PRINT#DV,"ADDRESS: *";AD;" (H
EX=";HEX$(AD);") *"
480 AJ=AD-OF:IF AJ<0 THEN AJ=&HF
FFF+AJ+1
490 PRINT#DV,"MAKE: ";:PRINT#DV,"
LOADM 'ANIMATIC',";"&H"+HEX$(AJ)
+", "+"&H"+HEX$(AJ+2800)+" , "+"&H"
+HEX$(AJ)
500 GOTO 500

```

TAKE A BYTE

Finally! A Nutritional Content Program For The Health Conscious.

The Program:

- Calculates ideal weight and calorie requirements based on your personal data.
- Calculates calorie, carbohydrate, fat, protein, vitamin and mineral intake.
- Graphic plotting of your weight and comparison to medical standards.
- Create your own recipes from foods on file and enter recipes into food file for future reference.
- Allows addition of new food items to food file.

Requires 64K Coco w/Disc Drive

Ages 25-50 Women 4'8" - 5'10"

Men 5'1" - 6'3"

Homesoft



ONLY \$24.95 until Aug., then \$29.95

Please send me _____ NUTRIGUIDES(S) at \$24.95 each (if mailed by Aug. 1, 1985).

VISA MC # _____

Ex. Date _____ Bank # _____ (MC)

Name (print) _____

Address _____

City _____ State _____ Zip _____

Signed _____

Mail to Homesoft, P. O. Box 607, Baker, LA 70704-0607
Allow 4 to 6 weeks for delivery



Listing 4: ANIMATIC

```

0010 *-- ANIMATIC. (C) 1985 BY EIZA SANO ***
0020 * SAS IS THE ROUTINE THAT HANDLES ANIM INST. *
0030 SAS EQU *
0040 LJM #138
0050 LJM 0
0060 CDEA #2
0070 BLT MDSK
0080 LJM 10,0
0090 CLR -5,0
0100 LDX #0277
0110 SEX -2,0
0120 LJM #1
0130 STA ,04
0140 LEAX BANIH,PCB
0150 STX ,044
0160 LEAX DUMSK,PCB
0170 SEX ,044
0180 LDX #0277
0190 STX 3,0
0200 STX 8,0
0210 CLR 0,0
0220 CLR 5,0
0230 RTE

```

DYNACALC[®]

CoCo's Best & Fastest Spreadsheet System

ACCLAIMED BY THE EXPERTS

"DYNACALC is my choice for a CoCo spreadsheet."

Dan Downard, RAINBOW, September, 1984.

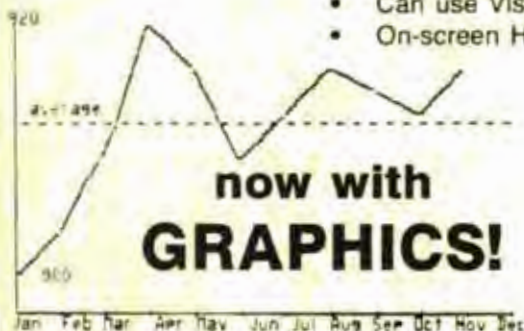
"Eat your heart out, Lotus 1-2-3!"

Scott Norman, HOT CoCo, October, 1984.

Built-in Features:

- 51 x 24 Display with Lower Case
- Super-fast Smart Screen Refresh
- Auto-Repeat Keyboard Driver
- Keysaver (TM) repeats last command x times
- Disk Operating System (works just like ROM DOS)
- Easy communication with BASIC/DOS programs
- Two-way communications with PRO-COLOR-FILE ★ Enhanced ★
- Outputs to ASCII Word Processors like Telewriter-64
- Fast 16-Digit Arithmetic with Scientific Functions
- Summation, Mean, and Standard Deviation Functions
- Logical Functions with String & Numeric Comparison
- String locate command to navigate large worksheets
- Sort full or partial worksheet by columns or rows
- Line, Bar, Hi/Low/Close, Circle Graphs
- Full Graphics captioning and overlay facility
- Graphics Drivers for all popular Printers
- Joystick/Mouse Driver for Cursor Movement
- Works with any ROM versions, even JDOS
- 33k Available Worksheet Space
- Up to 256 Columns or 256 Rows
- Can use VisiCalc worksheets & training materials
- On-screen Help Messages

**NOW
ONLY
\$99⁹⁵**



FOR 64K DISK SYSTEMS

available from

COMPUTER SYSTEMS CENTER

42 Four Seasons Center #122
Chesterfield, MO 63017 USA
(314) 576-5020

10 to 6 Mon.-Fri.

or your local DYNACALC dealer

Price US\$99.95

Outside North America add \$10 postage

DYNACALC Reg. U. S. Pat. Off.

Lotus and 1-2-3 are trademarks of Lotus Development Corp.

PRO-COLOR-FILE is a trademark of Derringer Software

Telewriter-64 is a trademark of Cognitac

VisiCalc is a trademark of VisiCorp.

CANADA-CDN \$129.95
DATAMAN INTERNATIONAL
420 FERGUSON AVE. N.
HAMILTON, ONT. L8L 4Y9
(416) 529-1319



AUSTRALIA
PARIS RADIO
161 BUNNERONG RD.
KINGSFORD 2032 NSW
(612) 344-9111

```

002E C0 002E 00140 DINDEX EQU *
0030 B6 0139 00260 SUBR #08 (00 IF DISK)
0033 01 01 00270 CIFA #1
0035 27 02 00280 BEQ 00102
0037 C0 0C 00290 SUBR #12
0039 34 04 00300 TRND #
003B 80 025A 00310 JSR 0026A
003E 35 04 00320 PULS #
0040 80 0730 00330 JSR 00730
0043 1F 10 00340 TFR X,D
0045 31 80 0709 00350 LEAY FARMS,PCB
0048 27 A0 00360 STB X+
004B 06 07 00370 LDA #7
004D 34 22 00380 BRKE #5,Y
004F 80 026D 00390 JSR 00260
0052 88 9F 00A6 00400 LDR >[5AB]
0054 C1 2C 00410 CHFR #7
0058 27 2C 00420 #02 02000
005A C1 29 00430 CHFR #7
005C 26 06 00440 BRK #2
005E 06 01 00450 LDA #1
0060 A7 04 00460 STA ,5
0062 20 22 00470 BRK 02000
0064 8E 00A6 00480 EQU *
0067 06 08 00490 LDR >[5AB]
0069 06 80 00510 BL12
006B C1 2C 00520 CHFR #7
006D 27 10 00530 BRK #12
006F C1 29 00540 CHFR #7
0071 26 06 00550 BRK #12
0073 06 01 00560 LDA #1
0075 A7 04 00570 STA ,5
0077 20 06 00580 BRK #12
0079 4A 0090 00590 BL12
007A 26 80 00600 BRK #12
007C 7E 0277 00610 JMP 00277
007F 80 0730 00620 BL1 JSR 00730
0082 1F 10 00630 TFR X,D
0084 20 01 00640 BRK #0010
0086 5F 00650 BRK0 CLR#
0087 35 22 00660 BRNDL PULS #,Y
0089 27 A0 00670 STB X+
008B 4A 00680 DECA
008C 28 8F 00690 BRK 00000
008E 80 0267 00700 JSR 00267
0091 06 01 00710 LDA #1
0093 A7 80 0709 00720 STA 5+PCFAR,PCB
0097 31 80 0387 00730 LEAY FARMS,PCB
009B A0 A0 00740 LDA X+
009D 01 08 00750 CHFR #8
009F 1028 00A7 00760 LANE ARDH
00A3 0C A4 00770 LDR ,7
00A5 16 0008 00780 LRHA INPO

```

```

00A8 41 00790 BARIN FCC /ANI/
00AB CD 00800 YCR /CU/
00AC 00810 BRK #4 TO MAKE INFO=0AD+0B0
00820 *****
00830 * INFO
00840 * ON ENTRY: D REGISTER WITH 0P100NS
00850 * ON EXIT: D WITH ADDRESS OF PDI, FARMS OR IF
00860 *****
00870 INPO EQU *
00880 STB SAVSTK,PCB
00890 LEAY FARMS,PCB
00900 TFR FARMS ADDR#
00910 BRK ASPI FDI ADDR
00920 PULS #
00930 LDA #8 CLEAR FARMS
00940 HCLFA CLR X+
00950 DECA
00960 BRK HCLFA
00970 PULS #
00980 BRK EXINF
00990 ARBI PULS #
01000 LDA 1,X
01010 PULS #
01020 STB 1,X
01030 LANE GRIFDI
01040 PULS #
01050 STA 1,X
01060 PULS #
01070 IATA XT-COORD.
01080 BRK ADDR#
01090 LDA CAIOT,U Y-COORD
01100 LDA CAIOT,U Y-COORD
01110 BRK #12
01120 ARBZ TFR 0,D RESULT
01130 EXINF STB 5+PCFAR,PCB RETURN TO BLT
01140 BRK #12
01150 BRK #12
01160 BRK #12
01170 BRK #12
01180 *****
01190 * ANIATIC, ASSUMBLE ENTRY POINT*
01200 * ON ENTRY: FARMS SET
01210 * ON EXIT: X= ADDR. OF FARMS *
01220 *****
01230 ARDH EQU *
01240 STB SAVSTK,PCB SAVE STACK ADDRESS
01250 LEAY 5+STACE,PCB NEW STACK ADDRESS
01260 CLR STATUS,PCB CLEAR STATUS AREA
01270 CLR 1+STATUS,PCB
01280 LEAY FARMS,PCB LOAD FARMS ADDR.
01290 LDA X GET REQUESTED FUNCTION
01300 STA ACTION,PCB SAVE REQUESTED ACTION
01310 LDR #8 CHECK FOR ACTION
01320 CHFR X
01330 BRK #12 IF OK CONTINUE
01340 LDR #10 ELSE ERROR
01350 BRK0 ERROR
01360 BRK #3 GET DISPLACEMENT
01370 MUL
01380 LEAY CALLS,PCB ADDR. OF CALL LIST
01390 JMP #,Y GO TO APPROPRIATE CALL
01400 CALLS EQU *
01410 BRK #12 INITIALIZE
01420 BRK #12 CREATE CREATE FIGURE
01430 BRK #12 MOVE MOVE FIGUR#
01440 BRK #12 PLACE PLACE FIG. ON SCREEN
01450 BRK #12 REMOVE REMOVE FIG. FROM SCREEN
01460 BRK #12 COPY COPY FIGURE
01470 BRK #12 OPERATE OPERATE SWAP AREA WITH FUNCTION
01480 BRK #12 DOMAIN FIND IN A DOMAIN
01490 *****
01500 * INITIALIZE PCT (FIGURE)
01510 * CONTROL TABLE ACT. 0
01520 * ON ENTRY: X= ADDR. OF
01530 * FARMS
01540 *****
01550 BRK #12
01560 BRK #12
01570 BRK #12
01580 BRK #12
01590 BRK #12
01600 BRK #12
01610 BRK #12
01620 BRK #12
01630 BRK #12
01640 BRK #12
01650 BRK #12
01660 BRK #12
01670 BRK #12
01680 BRK #12
01690 BRK #12
01700 BRK #12
01710 BRK #12
01720 BRK #12
01730 BRK #12
01740 BRK #12
01750 BRK #12
01760 BRK #12
01770 BRK #12
01780 BRK #12
01790 BRK #12
01800 BRK #12
01810 BRK #12
01820 BRK #12
01830 BRK #12
01840 BRK #12
01850 BRK #12
01860 BRK #12
01870 BRK #12
01880 BRK #12
01890 BRK #12
01900 BRK #12
01910 BRK #12
01920 BRK #12
01930 BRK #12
01940 BRK #12
01950 BRK #12
01960 BRK #12
01970 BRK #12
01980 BRK #12
01990 BRK #12
02000 BRK #12

```

NO MORE GAMES

EZ PROFILER — counts how many times each line of a basic program is executed when it is run. Extended basic. 32K, one disk drive required. On a disk. **\$20.00**

EZ CASSETTE ENCRYPT — encrypts cassette files through use of a password. Encrypted files are unreadable until decrypted with the same password. All machine language. On a cassette. **\$25.00**

EZ DISK ENCRYPT — encrypts disk files. All machine language. Comes on a disk. **\$29.00**

EZ RAM DISK — use upper memory as if it were a disk drive. All machine language. Accesses all available memory. For 16, 32 and 64K computers. On a cassette. **\$25.00**

EZ CASSETTE PILOT — run Pilot language programs on your CoCo. This preprocessor translates Pilot programs into Basic programs. For cassette systems. **\$15.00**

EZ DISK PILOT — translate Pilot programs on disk systems. On a disk. **\$19.00**

Both encryption programs for \$35.00. Both Pilot programs for \$25.00.

LANDWARE
6 Larchmont Rd.
Edison, NJ 08817
(201) 738-4213



No shipping charges. No handling charges.
NJ residents add 6% tax

0194 18	0796	01900	LBR	ERRR
0197 27	08 04	01980 CRA	STR	<WIDTH,U
019A 1F	98	01970	TR	3,A USE A REG.
019C 8A	01	01980	ANDA	#1 TO SEE IF OLD NUMBER
019E 27	0A	01990	NOZ	CR1 IF EVEN CONTINUE
01A0 9A	80	02000	LDA	<SMB ELAS GET PHOSE
01A2 81	04	02010	CPFA	F4 IF PHOSE 4
01A5 27	04	02020	NOZ	CR1 DO NOTHING
01A8 6C	08 04	02030	INC	<WIDTH,U ELSE ROUND-UP WIDTH
01A9 5C		02040	INCR	
01AA 17	0668	02050 CR1	LBR	CMXWY FIND MAX. # OF BYTES
01AD A6	06	02060	LDA	6,X #ROWS
01AF 27	04	02070	NOZ	CR2 *OF
01B1 81	65	02080	CPFA	#101 MAX. NUMBER OF Y PIXELS
01B3 23	05	02090	NOZ	CR8 OK
01B5 06	05	02100 CR2	LBR	F3CY ELSE ERRCR
01B7 18	0773	02110	LBR	ERRR
01BA 47	08 05	02120 CRB	STA	<HEIGHT,U
01BD 84	01	02130	ANDA	#1 TO SEE IF OLD NUMBER
01BF 27	09	02140	NOZ	CR2 IF EVEN CONTINUE
01C1 36	36	02150	LDA	<SMB ELAS GET PHOSE
01C3 81	01	02160	CPFA	#1 IF PHOSE 3,3,4
01C5 23	02	02170	NOZ	CR2 DO NOTHING
01C7 6C	08 05	02180	INC	<HEIGHT,U ELSE ROUND-UP HEIGHT
01CA 17	0664	02190 CR2	LBR	SORNY FIND #BYTES FOR ROWS
01CD 30		02200	NOZ	CR1 TOTAL BYTES FOR FIGURE
01CE 50	C9 0012	02210	STR	F3CYW,U
01D2 60	02	02220	TR	3,X NIXANLEZ
01D4 27	0C	02230	NOZ	CR3 NO
01D6 A6	A8 03	02240	LDA	<XOXTW,Y
01D9 30	88	02250	LEAT	D,X POINT TO SWAP FOR MIX.
01DB AF	08 02	02260	STX	<XREIAG,U
01DE 58		02270	ASLB	MULTIPLY BYTES BY 2
01DF A9	02280	02280	NOZ	
01E0 20	03	02290	NOZ	CR32
01E2 6F	08 02	02300 CR3	CLR	<XREIAG,U NO-MIX
01E5 AC	A8 03	02310 CR32	LDA	<XOXTW,Y
01E8 6F	80	02320 CRA	CLR	3,X CLEAR TO ZERO
01EA 83	0001	02330	SUBD	#1 NUMBER OF BYTES FOR ROW SWAP
01ED 26	F9	02340	NOZ	CR4 NOT DONE YET
01EF AF	A8 03	02350	STR	<XOXTW,Y TO NEXT SWAP AREA
01F1 9C	74	02360	CPFX	374 EXCEEDS AVAILABLE MEMORY?
01F4 23	05	02370	NOZ	CR4 NO, OK
01F6 06	01	02380	LBR	F3CY ELSE REZRE
01F8 16	0732	02390	LBR	ERRR
01FA 0F	02400	02400	NOZ	
01FB 17	03BA	02410	LBR	HUGH
01FD 4F	02420	02420	CLRA	
01FF 17	04FE	02430	LBR	SWAPZ GET FIGURE
0202 60	08 02	02440	TR	<XREIAG,U DE-ABLET
0205 27	13	02450	NOZ	ERRR ...NO EXIT
0207 A6	08 0A	02460	LDA	<XREIAG,U
020A A7	08 0C	02470	STA	<XREIAG,U
020D A6	08 08	02480	LDA	<XREIAG,U
0210 A7	08 00	02490	STR	<XREIAG,U

0213 A8	08 0E	02500	LDA	<WIDTH,U	
0214 A7	C9 0014	02510	STA	<WIDTH,U	
021A 8A	01	02520	NOZ	CR1 FLAG AS NEW	
021C A7	C9 0011	02530	STA	FLAGZ,U	
0220 18	0760	02540	LBR	EXIT	
		02550			
		02560		* MOVE FIGURE (ACT. 2) *	
		02570		* ON ENTRY: 1= ADDR. OF	
		02580		* PARILIST *	
		02590			
		0223	02600	NOZ	EQU *
		0223	02610	PLACE	EQU *
					* PLACE ALSO BEGINS HERE
0223 6F	80 077C	02620	CLR	CACZ,PCR	
0227 6F	80 077A	02630	CLR	CACZ,PCR	
0228 17	0619	02640	LBR	GETFIG	
022E 60	C9 0011	02650	STR	FLAGZ,U	FIG. JUST CREATED?
0232 27	0A	02660	NOZ	CR1 NO GO AHEAD	
0234 06	03	02670	LDA	#3	FORCE ACTION 3 (PLACE)
0236 A7	80 076E	02680	STA	ACTION,PCR	
023A 6F	C9 0011	02690	CLR	FLAGZ,U	DELETE JUST CREATED FLAG
		023E	02700	NOZ	EQU *
023E A6	82	02710	LDA	2,X	
0240 26	0F	02720	NOZ	SPENZY	
0242 60	03	02730	LBR	3,X	
0244 67	80 075C	02740	STR	CACZ,PCR	X-BEST
0248 66	04	02750	LBR	4,X	
024A 67	80 0758	02760	STR	CACZ,PCR	T-BEST
024E 16	0140	02770	LBR	ENOVE	
0251 81	01	02780	CPFA	#1	
0253 20	25	02790	NOZ	CR4	
0255 4F		02800	CLRA		
0256 66	08 08	02810	LBR	CANTOR,U	RELATIVE MOVEMENT
0259 34	06	02820	PSHO	D	
025B 66	03	02830	LBR	3,X	GET INCR. IN Y
025D 2A	01	02840	RFL	CR4	NEGATIVE?
025F 43		02850	CR4		
0260 83	81	02860	CONY	ADDD	,3++ ADD IT
0262 80	80 0730	02870	STR	CACZ,PCR	X-BEST.
0266 4F		02880	CLRA		
0267 88	08 09	02890	LBR	CANTOR,U	UPDATE Y
026A 34	06	02900	PSHO	D	
026C 80	04	02910	LBR	4,X	GET INCR. IN Y
026E 2A	01	02920	RFL	CONY	NEGATIVE?
0270 43		02930	CR4		
0271 83	81	02940	CONY	ADDD	,3++ ADD IT
0273 80	80 072E	02950	STR	CACZ,PCR	Y-BEST.
0277 16	0124	02960	LBR	XNOVE	
027A 81	06	02970	NOZ	CR4	#6 IS X-Y RANDOM REQUESTED?
027C 26	25	02980	NOZ	CR4	
027E A6	03	02990	LDA	3,X	GET MAX. ALLOWED COLUMN
0280 26	04	03000	NOZ	CR4	NOZEX IF NOT ZERO CONTINUE
0282 86	FF	03010	LDA	#235	ELSE PUT DEFAULT
0284 6F	05	03020	CLR	5,X	
0286 17	05F4	03030	NOZ	LBR	RANDON GET RANDON VALUE
0289 88	05	03040	ADDD	3,X	

THE BEST JUST GOT BETTER

(With New Low Prices)

THE BEST HARDWARE

- WORD-PAK II** \$134.95
80 column video cartridge with soft video switch and smooth scroll.
- C-C BUS** \$129.95
8 slot software selectable expansion bus.
- P-C PAK (P)** \$ 49.95
Fully buffered Centronics compatible parallel port cartridge.
- P-C PAK (R)** \$ 59.95
Battery backed real time clock cartridge.
- P-C PAK (C)** \$ 99.95
Parallel port and real time clock in one cartridge.
- 2SP-PAK** \$ 79.95
Dual RS232 cartridge.

THE BEST SOFTWARE

- Support Drivers** \$ 17.95
Patches and drivers for OS-9 or Flex for Word-Pak, P-C Pak and 2SP-Pak.
- Cbreeze** \$ 29.95
Full screen editor for OS-9 Word-Pak with "windows" capability.
- (OS-9) *Stylo III wordprocessor** \$ 99.95
- (OS-9) *Stylo Pak (includes stylo, mailmerge and spell checker)** \$199.95
- (OS-9) *X-Word wordprocessor** \$ 79.95
- (OS-9) *X-Merge mail merge for X-Word** \$ 29.95
- (OS-9) *X-Term terminal package** \$ 59.95
- (BAS) *EliteWord wordprocessor** \$ 79.95
- (BAS) *EliteCalc spreadsheet** \$ 79.95
- (BAS) *Deft Pascal software development system** \$ 89.95
- (BAS) *DataPak II terminal package** \$ 44.95

* COMBO PRICE *

Take 15% off the list price of any of these software packages when ordered with the Word-Pak II.

and THE BEST SUPPORT, all from



"Innovative Products for the CoCo User"

Call or write today for our **FREE** Catalog
P.O. Box 813 • North Bergen, N.J. 07047 • 201-330-1898

OS-9 is a trademark of Microware.

It's time we put our chips on the table



and showed you our best deals on computer hardware.

HARDWARE SPECIALS

Extended Basic w/bk	\$ 39.95	26-1276 DMP-105 Printer 80 cps	\$179.95
64k (DE) Memory Upg	\$ 49.95	C-Icon 8510 BPI Printer 120 cps	\$399.95
26-3129 CoCo Drive	\$309.95	C-Icon 7500 Printer	\$249.95
26-1161 CoCo Drive 1	\$229.95	NAP Video Monitor (Grn Amber)	\$109.95
H.L. Keyboard (D.E.F. 2)	\$ 79.95	Video Monitor Adapters	\$ 29.95
26-3127 64K Extended CoCo2	\$179.95	26-3 124 Multi-Pac Interface	\$ 89.95
26-3134 16K Standard CoCo2	\$ 89.95	Batek Ser/Pat Interface	\$ 69.95
26-3136 16K Extended CoCo2	\$129.95	26-1278 DWP 220 Printer	\$539.95
26-3802 Model 100 24K	\$449.95	26-3860 Model 200	\$899.95
26-3816P 8K Upgrade Mode 100	\$ 55.95		

ACCESSORIES

Volkmodem 1200	\$299.95	Match II Joystick	\$ 39.95
RS D.C. Modem IB	\$ 89.95	26-3030 OS-9 (64k)	\$ 64.95 (disk)
Revolution J-Cal Modem	\$129.95	Basic OS (req. OS-9)	\$ 87.95 (disk)
USR Password 300	\$179.95	C-Compress (OS-9)	\$ 87.95 (disk)
Hayes SM 300 Modem	\$239.95	FHL D-Pak (req. OS-9)	\$ 34.95 (disk)
USR Password 1200	\$399.95	Elite Word	\$59.95 (d/c)
USR Password 2400	\$599.95	Elite Calc	\$59.95 (d/c)
CoCo Switcher	\$ 39.95	Color Term Plus	\$29.95 (cass)
Elephant Disks 55dd	\$ 18.95	Deft Pascal	\$ 79.95
		26-3012 Deluxe Joystick	\$ 34.95

NEW! Dual Double Sided Drives including case, power supply & cable \$375.95

NEW! 26-3128 64K Direct Video CoCo2 \$219.95

OS-9 is a trademark of Microware

MSI SOFTWARE

MSI DISKUTIL NEW	\$ 19.95	MSI NAMEFILE	\$ 24.95
COLOR FINANCE IV	\$ 69.95	MSI CALENDAR NEW	\$ 19.95
COLOR FINANCE II NEW	\$ 69.95	MSI COLOR PAYROLL NEW	\$ 99.95

Call for prices and availability of your favorite software and hardware. All advertised items subject to availability. Prices do not include shipping and handling. All of the above units are covered by our 120 day carry-in warranty.

TRS-80 Trademark Tandy Corporation. Prices subject to change without notice. Write for our FREE newsletter.



DELKER ELECTRONICS, INC.

P.O. Box 897
408C Nissan Blvd. Smyrna, TN 37167

Call Toll Free:
800-251-5008
800-548-2502 (TENNESSEE)
615-459-2636 (TENNESSEE)
615-264-0088 (NASHVILLE)



0288 E7	80 0715	07C50	STR	CADY,PCB	AND STORE NEW X-COORD.
028F A6	04	07C60	LDA	A,X	MAX. ALLOWED BOM
0291 26	04	03070	SBC	NOOPT	IF NOT EXIST CONTINUE
0293 86	8F	03080	LDA	#191	ELSE PUT DEFAULT
0295 6F	06	03090	CLA	%,X	
0297 17	05E3	03100	RNDW	RANDON	GET RANDON VALUE
029A E8	06	03110	ADDB	%,X	
029C E7	80 070A	03120	STR	CADY,PCB	NEW Y-COORD.
02A0 16	00F0	03130	LRMA	MOVE	CONTINUE
02A3 102D	0090	03140	LNLT	LNLT	
02A7 81	07	03150	CHFA	#7	
02A9 26	68	03160	SBC	STAY	
02AB 84	8F	03170	LDA	#58P	KEYBOARD CONTRL.
02AD 87	FF02	03180	STA	\$FF02	
02B0 4F		03190	CLA		
02B1 8A	CB 00	03200	LDB	-CAUTX,U	
02B4 34	06	03210	PSIB	0	
02B6 E6	03	03220	LDB	%,X	
02B8 86	FF00	03230	LDB	\$FF00	
02BB 81	F7	03240	CHFA	#247	
02B0 2A	07	03250	SBC	EXEEX	
02B7 4F		03260	CLA		
02C0 E3	EA	03270	ADDD	,S	
02C2 60	EA	03280	STU	,S	
02C4 80	03	03290	LDB	%,X	
02C6 77	FF02	03300	ASR	\$FF02	
02C9 86	FF00	03310	LDA	\$FF00	
02CC 81	F7	03320	CHFA	#247	
02CE 28	0A	03330	SBC	EXEEX	
02D0 4F		03340	CLA		
02D1 50		03350	MOVB		
02D2 27	02	03360	RNI	EXTE	
02D4 86	FF	03370	LDA	\$5FF	
02D6 E3	EA	03380	ADDD	,S	
02D8 F0	EA	03390	STU	,S	
02DA 80	01	03400	LNLT	%,X	
02DC E9	80 06C3	03410	STR	CADY,PCB	
02E0 4F		03420	CLA		
02E1 86	CB 09	03430	LDB	-CAUTX,U	
02E4 34	06	03440	PSIB	0	
02E6 E6	04	03450	LDB	%,X	
02E8 77	FF02	03460	ASR	\$FF02	
02E9 86	FF00	03470	LDA	\$FF00	
02E8 01	F7	03480	CHFA	#247	
0290 26	07	03490	SBC	EXEEX	
02E2 4F		03500	CLA		
02F3 E3	EA	03510	ADDB	,S	
02F5 ED	EA	03520	STU	,S	
02F7 E5	04	03530	LDB	%,X	
02F9 77	FF02	03540	ASR	\$FF02	
02FC 86	FF00	03550	LDA	\$FF00	
02FF 81	F7	03560	CHFA	#247	
0301 26	0A	03570	SBC	EXEEX	
0303 4F		03580	CLA		
0304 50		03590	MOVB		
0305 27	02	03600	STU	EXTE	
0307 86	FF	03610	LDA	\$5FF	
0309 E3	EA	03620	ADDD	,S	
030B ED	EA	03630	STU	,S	
030D 8C	E1	03640	LNLT	%,X	
030F ED	80 0692	03650	STR	CADY,PCB	
0313 16	008A	03660	LRMA	MOVE	
0316 A6	CB 08	03670	LDA	-CAUTX,U	
0319 A7	80 0667	03680	STA	CADY,PCB	
031D A6	CB 09	03690	LDA	-CAUTX,U	
0320 A7	80 0662	03700	STA	CADY,PCB	
0324 16	008B	03710	LRMA	MOJ	
0327 34	32	03720	PSIB	U,X,A	
0329 AD	9F A0DA	03730	NR	[SADDA] READ JOYSTICK	
032B 35	32	03740	PULS	U,X,A	RESTORE
032F 108B	015A	03750	LDT	\$015A	ADDRESS OF VALUES
0330 81	02	03760	CHFA	#2	IF LEFT JOYST.
0333 27	06	03770	REQ	EXPAND	
0337 81	04	03780	CHFA	#6	LEFT JOYSTICK
0339 27	02	03790	REQ	EXPAND	YES
033B 31	32	03800	LRAY	I,Y	POINTS TO RIGHT JOYS VALDES
033D 80	04	03810	EXPAND	SIBA	EX Y INDICATOR=4
033F 2A	10	03820	SPL	INCRTY	JOYSTK. INCREMENT
0341 88	AA	03830	LST	,Y	MULTIPLY X-READING BY 4
0343 88	AA	03840	LST	,Y	
0345 A8	AA	03850	LST	,Y	
0347 88	AA	03860	LST	,Y	
0349 88	21	03870	LST	1,7	MULTIPLY Y READING BY 3
034B 88	21	03880	LST	1,7	
034D 88	21	03890	LST	1,7	
034F 88	AA	03900	LDB	,Y	GET Y-COORD
0351 E7	80 064F	03910	STR	CADY,PCB	STORE IT
0353 E8	21	03920	LDB	I,T	GET Y-COORD
0357 E7	80 0648	03930	STR	CADY,PCB	STORE IT
035B 20	A1	03940	RMA	MOVE	
	035D	03950	INCRTY	STU	*
035D 86	AA	03960	LDA	,Y	GET X READING
035F 80	20	03970	SUBA	#32	MINUS 32
0361 A7	AA	03980	STA	,Y	
0363 A6	21	03990	LDA	1,Y	NEW Y-READING
0365 80	20	04000	SUBA	#32	
0367 A7	21	04010	STA	1,Y	
0369 86	03	04020	LDA	#3	NEW DIVIDE BY 8
036B 87	84	04030	ASR	,Y	
036D 87	23	04040	ASR	1,Y	
036F AA		04050	DECA		
0370 28	89	04060	RMC	DIVCH	
0372 A6	03	04070	LDA	%,X	GET X MULTIPLIER
0374 E8	AA	04080	LDB	,Y	AND X READING
0376 3D		04090	HL		
0377 40		04100	TSTA		CHECK IF RESULT SHOULD BE NEG.
0378 27	02	04110	REQ	DIV1	POSITIVE
037A 86	FF	04120	LDA	\$5FF	MAKE IT NEG.
037C 34	06	04130	PSIB	0	
037E 4F		04140	CLA		
037F E6	CB 08	04150	LDB	-CAUTX,U	ACTUAL X LOCATION
0382 E3	E1	04160	ADDD	,S++	NEW LOCATION

0384	09	0D	0618	04170	STW	CACX,PCB	STORE IT	0473	AB	08	05	05320	ASDX	<HEIGHT,U	BOTTOM ROW OF DOMAIN			
0388	06	0A	04180	LDA	4,X	T-MULTIPLIER		047C	A7	09		05330	STA	8,X				
0388	08	21	04190	LDR	1,Y	T-READING				047E	17	05340	DOMI	FRD	* VERIFY IF IN DOMAIN			
038C	3D		04200	MOV						047F	0E	05350	LBRF	GETPDT FOR REQUESTED FIG.				
038D	4D		04210	INFA		IS RESULT NEGATIVE?				0481	1F	05360	CLRD					
038E	27	02	04220	MOV	DIVE	NO				0482	A6	05370	LNA	<AUTO,U	LEFT COL IS			
0390	06	FF	04230	LMA	#FFF	MAKE IT NEGATIVE				0483	A1	05380	CYFA	3,X				
0392	3A	06	04240	DIRD	D					0487	22	17	05390	BUI	OUTDOM DOMAIN?			
0394	4F		04250	CJRA						0489	AB	08	04	05400	ADDA	<WIDTH,U		
0395	06	08	09	04260	LDR	<AUTO,U	ACTUAL Y LOCATION			048C	A1	1D	05410	CYFA	3,X			
0398	03	01		04270	ADNO	,5+4	NEW Y POSITION			048E	23	10	05420	BLD	OUTDOM			
039A	ED	0D	D007	04280	STD	CACX,PCB	STORE IT			0490	A6	08	09	05430	LMA	<AUTO,U	IS TOP ROW BELOW BOTTOM	
		039E		04290	DSH	*				0493	A1	06		05440	CYFA	4,X	ROW OF DOMAIN?	
039E	0F	0D	0608	04300	CLR	FIG,PCB				0495	22	09		05450	BUI	OUTDOM		
03A2	0F	0D	0608	04310	CLR	1+FIG,PCB	MARK FLAG TO CHECK X			0497	AB	08	05	05460	ADDA	<HEIGHT,U	IS BOTTOM ROW ABOVE TOP	
03A6	31	0D	03F9	04320	LEAF	CACX,PCB	ADDM. OF TENTATIVE X			049A	A1	04		05470	CYFA	4,X	ROW OF DOMAIN?	
03AA	17	0524	04330	LBRF	ACTCOS VERIFY KCD OR K-232					049C	23	02		05480	BLD	OUTDOM		
03AB	08	0D	0608	04340	LSL	1+STATUS,PCB	PREPARE FOR Y STATUS FLAG			049E	06	01		05490	LDR	#1	WELL, INDEXED IT TOUCHES DOMAIN	
03AF	08	0D	0604	04350	LSL	1+STATUS,PCB				04A0	4F			05500	OUTDOM	CLRA		
03B5	06	40		04360	LRA	#A				04A1	ED	0D	0513	05510	STD	STATUS,PCB	LET IT BE KNOWN	
03B7	A7	0D	03F3	04370	STA	1+FIG,PCB	FLAG TO CHECK Y			04A3	18	04E8		05520	LBRF	EXIT		
03B8	21	0D	038A	04380	LEAF	CACX,PCB	ADDM. OF TENTATIVE Y							05530	*	OPERATE FIGURE(ACT. 6) *		
03BF	17	056F	04390	LBRF	ACTCOS VERIFY YCD OR Y-191									05530	*	ON ENTRY: X= ADDR. OF *		
03C2	0D	08	02	04400	TRT	<ORFLAG,U	MOVE WITH HILT							05540	*	FAMILYLIST *		
03C5	27	18		04410	MOV	NO												
03C7	A6	07		04420	LMA	7,X	IF MOVE WITH HEX											
03CA	A7	0D	03E5	04430	STA	8000,PCB	STORE THE VALUE											
03CC	08	02		04440	LDR	#3	COUNTER											
		03CF		04450	MOV	*												
03CF	08	0D	050F	04460	ASL	80010,PCB	TO CONVERT			04A8	17	029C	05580	OPERAT	EQU	*		
03D3	48	0D	050F	04470	ASL	80010,PCB	COLOR CODE			04AB	0D	08	02	05600	LBRF	GETPDT GET ADDR. OF PBT		
03D7	AA	0D	0507	04480	ORA	80010,PCB	TO \$00,\$55,\$AA OR \$FF			04AE	27	05		05610	TSI	<ORFLAG,U	HIXABLE?	
03D8	5A			04490	DECB					04B0	0C	08	02	05620	MOV	MOVIX		
03DC	26	FF		04500	RNE	NO2				04B3	20	16		05630	BRA	HIXC		
03DE	A7	0D	0500	04510	STA	80010,PCB				04B5	6D	CY	0011	05640	MOVIX	TST	FLAGC,U	
03E2	17	01A1	04520	MO3	LBRF	MOVCON GO TO MOVE FIG.				04B9	26	0D		05650	BNE	MOVIX		
03E5	18	05A8	04530	LBRF	EXIT					04BB	86	04		05660	LDA	#6		
				04540	LBRF	MOVCON GO TO MOVE FIG.				04BD	A7	8D	04E7	05670	STA	ACTION,PCB		
				04550	LBRF	EXIT				04C1	34	19		05680	PSHQ	X		
				04560	*	REMOVE FIGURE(ACT. 6) *				04C3	17	023A		05690	LBRF	SWAPT		
				04580	*	ON ENTRY: X= ADDR. OF *				04C5	35	10		05700	FILE	X		
				04590	*	FAMILYLIST *				04C8	10AE	CY	0017	05720	MOVIX	LDR	CADW,U	GET ADDR. OF SWAP AREA
				04600	*	FAMILYLIST *				04CC	2B	08	09	05730	MOVIX	LDR	FIGRT,U	NUMBER OF BYTES IN FIG.
				04610	*	FAMILYLIST *				04D0	34	46		05740	PSND	U,D		
03E8	17	03E8	04590	REMOVE	MOV	*				04D2	1F	03		05750	TRF	D,U	COORDIN. ADDR. OF PBT	
03E8	17	045C	04600	LBRF	GETPDT	CNT PBT ADDRESS				04D4	09	02		05760	LBRF	3,X	OPERATOR	IT'D EASIER TO EVALUATE OPERATOR
		03E8	04610	REMOVE	MOV	*				04D6	5A			05780	DECB			
				04620	LBRF	SWAPT	GO AND REMOVE											
03E8	17	0311	04630	LMA	#A	HANK AS NEW				04D7	AB	CA		05790	DAD7	05770	DFLOP	
02E8	06	01	04630	LMA	#A	HANK AS NEW				04D9	5D			05800	LMA	#U	BYTE FROM SWAP	
03F0	A7	CY	0011	04640	STA	FLAGC,U				04DA	7A	04		05810	TSTN		OPERATOR IS:	
03FA	16	0399	04650	LBRF	EXIT					04DC	06	03		05820	RFL	WOCLE	NOT CLEAR	
				04660	*	COPY FIGURE(ACT. 3) *				04DE	20	0F		05830	LDA	3,X	ELSE LOAD CLEAR BYTE	
				04670	*	ON ENTRY: X= ADDR. OF *				04E0	20	0F		05840	BRA	OPOLO	TO COMP. EXECUTION	
				04690	*	FAMILYLIST *				04E2	A3	03		05850	BNE	MOVIX	NOT A NOT OPERATION	
				04700	*	FAMILYLIST *				04E3	20	0A		05860	CYFA	ELSE MAKE A NOT		
				04710	COPYFL	MOV	*			04E5	01	01		05880	BRA	OPOLO	AND GET NEXT BYTE	
03F7	06	01	04720	LDR	1,X					04E6	C1	01		05890	CYFB	#1	IF 1 IS AND	
03F9	34	04	04730	PSHQ	D					04E8	26	04		05900	BNE	NOAND	ELSE IS AND	
03FA	08	02	04740	LDR	2,X	GET ADDR. OF PBT FOR FROM-FIG.				04E9	A4	03		05910	ANDA	3,X	AND WITH AND	
03FB	07	01	04750	STR	1,X					04EB	20	02		05920	BRA	OPOLO	AND CONTINUE	
03FF	17	0445	04760	LBRF	GETPDT					04ED	AA	03		05930	ORA	3,X	OR WITH MARK	
0402	1F	32	04770	TRF	U,Y	ADDR. OF FROM				04EF		04EF		05940	MOV	*	HIRE COND. ALL OPTIONS	
0404	55	04	04780	PSHQ	8	GET TO-FIG				04F7	A7	CD		05950	STA	U,-	STORE NEW VALUE	
0406	E7	01	04790	STR	1,X	AND RESTORE				04F1	31	3F		05960	LEAF	1,X	NUMBER OF BYTES REACHED?	
0408	17	043C	04800	LBRF	GETPDT	ADDR. OF FROM TO-FIG				04F3	26	E2		05970	BNE	DFLOP	NO, CONTINUE	
0408	1F	21	04810	TRF	Y,T	FROM FIG FROM-FIG				04F5	35	46		05980	FILE	U,X	RESTORE ADDR. OF PBT	
040C	06	08	04820	LDI	#IC	IF ERROR PREPARE ERROR CODE				04F7	1F	01		05990	TRF	D,X		
040F	10AE	09	0011	04830	LDT	FIGRT,X	NUMBER OF BYTES IN FIG.			04F9	6D	08	02	05990	TST	<ORFLAG,U	HIXABLE?	
0414	10AC	09	0011	04840	CYPT	FIGRT,U	IF MORE THAN DESTINATION			04FC	27	1A		05980	MOV	<ORFLAG,U	NO	
0419	1023	0510	04850	LHJ	8000					04FE	A6	08	14	05990	LMA	<OVID,U		
041D	A5	08	02	04860	LDA	<ORFLAG,X	IS FROM-FIG. UNABLE?			0501	A7	8D	049F	06000	STA	CADW,PCB		
0420	A1	08	02	04870	CYFA	<ORFLAG,U	THEY MUST BE SAME CLASS			0505	A6	08	0C	06010	LDA	<ORFLAG,U	GET ORIG. IMAGE	
0423	1028	0509	04880	LBRF	DECR					0508	08	08	0D	06020	LBR	<ORFLAG,U	ORIG. IMAGE	
0427	34	30	04890	PSHQ	M,X					050A	6D	CY	0014	06030	TST	OVID,U		
0429	4D		04900	TST	A	IF FIGS ARE HIXABLE				050F	26	16		06040	BNE	OPAD0A		
042A	27	08	04910	MOV	COJ	NO				0511	3F			06050	CLRD			
042C	0E	08	02	04920	LDR	<ORFLAG,U	DEST.			0512	2D	13		06060	BRA	OPAD0A		
042F	AE	88	02	04930	LDR	<ORFLAG,X	ORIGIN			0514	AA	08	0E	06070	DFAD0	LDA	<VIDT,U	
0432	20	06	04940	BRA	CO22					0517	A7	8D	04B9	06080	STA	CADW,PCB		
0434	EE	08	09	04950	LDR	<ADW,U	DESTINATION SWAP AREA			0518	A6	08	0A	06090	LDA	<ORFLAG,U		
0437	AE	88	0D	04960	LDR	<ADW,X	ORIGIN SWAP AREA			051E	08	08	08	06100	LBR	<ORFLAG,U		
043A	17	0488	04970	CO22	LBRF	COPYFL	COPY AREAS			0521	0D	09	0E	06110	TST	<VIDT,U		
043D	35	50	04980	PSHQ	U,X	RESTORE PBT ADDRESSES				0524	26	91		06120	BNE	OPAD0A		
043F	37	7C	04990	LEAS	-4,-5	NOT KEEP IN STACK				0525	3F			06130	CLRD			
0441	06	14	05000	LMA	#20	WE'LL KEEP PBT NOW				0527	A3			06140	CYFA	3,X		
0443	33	4A	05010	LEAV	4,U	EXCEPT FOR SWAP AREA ADDRESS				0528	A7	8D	04B8	06150	STA	AUX2,PCB		
0445	30	04	05020	LEAF	4,X					052C	53			06160	COFR		INVERT IT	
0447	10AE	01	05030	LDI	,0+4	COPYING PBT				052D	07	8D	047E	06170	STR	AUX3,PCB		
044A	10AF	01	05040	STR	,0+4					0531	17	02FD		06180	LBRF	MOVIX	GET FROMS IN FIG.	
044D	4A		05050	DECA						0534	1F	12		06190	TRF	X,Y		
044E	28	FF	05060	BNE	COJ	IF NOT FINISHED CONTINUE				0536	08	08	0F	06200	LBR	<ORFLAG,U	MAX. WIDTH IN BYTES	
0450	35	50	05070	PSHQ	U,X	RESTORE PBT ADDRESSES				0539	3A			06210	ARI	AUX4,PCB		
0452	0F	CY	0011	05080	CLF	FLAGC,U	FLAG AS NEW			053A	AF	8D	0472	06220	STR	X,X	RESTORE ADDR. OF LEFT BYTE OF LINE	
		0456		05090	EXOP	EQU	*			053E	1F	21		06230	TRF	X,X	RESTORE ADDR. OF LEFT BYTE OF LINE	
		0510		05100	LBRF	EXIT	THAT'S IT			0540	A6	84		06240	LDA	,X		

```

0562 17 0003 06470 LDRS MOVCON
0563 14 0408 06480 LSR4 EXIT NO, TERMINATE
06490
06500 *SUBROUTINE TO MOVE AN OBJECT IN THE SCREEN
06510 *
0568 96 0398 06520 MOVCON EQU *
0569 80 80 06530 LDR <R0 GET X COORD.
058A 1098 AF 06540 LDY <R1F GET Y COORD.
058D 09 80 06550 CLR <R0 CLR A
058F 0F 8F 06560 CLR <R1F CLEAR X,Y
0591 34 30 06570 PSWS #0
0593 A6 80 0400 06580 LDA CASW,PCB GET COORD X OF DESTINATION
0597 86 80 0408 06590 LDR CASW,PCB GET COORD. Y OF DESTINATION
0599 17 008A 06600 LDR CONVER GET ADDR. OF TOP CORNER
059E 34 02 06610 PSWS A
05A0 A6 CB CA 06620 LDA <LHASK,U
05A3 8D CB CE 06630 TST <LDRBT,U
05A6 24 02 06640 BNE #0
05A8 A6 CB CA 06650 LDA <RHASK,U
05AB AF 8D 0400 06660 STA AUTJ,PCB
05AD 35 02 06670 PULS A
05B1 10A6 82 03F1 06680 LDY ACTI03,PCB
05B6 108C 0002 06690 DINT #2
05BA 26 08 06700 RNE SKI
05BC 34 16 06710 PSUB X,A,#
05BE 17 013F 06720 LRRW SWAP2 SWAP FROM BLOCK
05C1 35 16 06730 PULS X,A,# FIRST DRT
05C3 108E 0000 06740 LDY #0
05C7 AF 05C7 06750 SKI *
05CA AF CB 06 06760 STX <FIC0AD,U
05CB AF CB 0A 06770 STA <LHASK,U
05CC 07 CB 08 06780 STB <RHASK,U
05CD 08 8D 0308 06790 LDR AUY,PCB NEW WIDTH
05DA 07 CB 0E 06800 STX <LDRBT,U
05DB C1 00 06810 DINT #0
05DB 24 03 06820 RNE SKIP2
05DB A6 CB 08 06830 LDA <RHASK,U
05DE 108C 0001 06840 SKI2 CHPT #1
05E2 27 3A 06850 BEQ RTNDEM
05E4 1F 8F 06860 TFR A,#
05E6 4F 06870 CLRA
05E7 30 06880 TSTB SEE IF #=0
05E8 26 04 06890 BNE COUNTL NO
05EA 8A 8F 06900 LDA #=0
05EC 20 06 06910 BRA DORNL COUNT IS NOT NECESSARY
05EE 34 06920 COUNTL LSRB LOOP UNTIL
05EF 23 03 06930 RCL DORNL IT FINDS
05F1 4A 06940 BITCA FIRST 1
05F2 20 FA 06950 BRA COUNTI
05F4 06 80 03B7 06960 DORNL LDR AUY,PCB GET OLD MASK
05F6 30 06970 TSTB SEE IF #=0
05F7 24 04 06980 BNE COUNT2 NO
05F8 08 08 06990 ADDA #B
05F9 20 06 07000 BRA DORNL2
05FF 34 07010 COUNT2 LSRB LOOP UNTIL

```

```

0600 25 03 07020 ACY DORNL IT FINDS
0602 4C 07030 INCA FIRST 1
0603 20 FA 07040 BRA COUNT2
0605 07050 DORNL EQU *
0606 4D 07060 TSTA IF NO SHIFT REQUIRED
0608 27 03 07070 BEQ DORNL2 GO TO SWAP
0609 17 018E 07080 LDRS SHIFT GO TO SHIFT AS REQUIRED
060B 17 0080 07090 GOSWAP LDRS SWAP PLACE FIGURE IN DEST.
060E 35 30 07100 RETGEN PULS X,Y RESTORE
0610 8F 8D 0398 07110 CLR AUY,PCB
0614 A6 8D 038C 07120 LDA CASW,PCB NEW X-COORD
0618 A7 CB 08 07130 STA CASW,U
061A A6 8D 0387 07140 LDA CASW,PCB NEW Y-COORD
061F A7 CB 08 07150 STA CASW,U
0622 9F 8D 07160 STI <R0 ORIGINAL COLUMN
0624 109F 8F 07170 STT <R1F AND ROW
0627 39 07180 RTI RETURN
07190 *** SUBROUTINE TO GET ADDRESS OF A SPECIFIC XY COORD.
07200 ENTRY: U= ADDRESS OF FIG. DESCRIPTOR BLOCK
07210 *** A= X COORDINATE OF FIGURE
07220 *** B= Y COORDINATE OF FIGURE
07230 *** X= ADDRESS OF USER/LEFT CORNER
07240 *** A= BITS MASK TO ADJUST LEFT BORDER
07250 *** B= BITS MASK TO ADJUST RIGHT BORDER
07260 *** AUY=WIDTH IN BYTES
0628 34 40 07270 CONVER PSUB #
062A 17 008D 07280 LDRS NORM GET ADDRESS
062D 35 40 07290 PULS # RESTORE U
062F 3F 07300 CLAR GET LEFT MASK
0630 8D 3E 07310 ROR SETBND
0632 34 02 07320 PSWS A
0634 A6 8D 03AC 07330 LDA CASW,PCB GET COLUMN
0638 AB CB 0A 07340 ANDA <WIDTH,U PLUS NUMBER OF COLS
063B 34 52 07350 PSWS A,X,U
063D E6 8D 0365 07360 LDR CASW,PCB GET ROW
0641 17 00A8 07370 NORM GET ADDRESS OF EIGHT COL.
0644 1F 10 07380 TFR X,D PREPARE TO SUBTRACT
0646 A3 61 07390 SUBD 1,S #BYTES BETWEEN RIGHT AND LEFT COLS
0648 35 52 07400 PULS A,X,U RESTORE
064A E7 8D 035E 07410 STB ANX,PCB SAVE WIDTH IN BYTES
064E C6 01 07420 LDR #1 PREPARE TO OBTAIN RIGHT MASK
0650 8D 11 07430 ROR SETBND GET MASK
0652 6D 8D 0356 07440 TST AUY,PCB IF WIDTH NO MORE THAN 1 BYTE
0656 26 08 07450 BNE OUTCON
0658 2A 8A 07460 ORB #,S ONLY ONE MASK
065A 1F 98 07470 TFR S,A
065C 35 04 07480 PULS S
065E 20 02 07490 BRA EXCON
0660 35 02 07500 OUTCON PULS A GET LEFT MASK
0662 39 07510 EXCON RTS
0663 07520 ***RIZE THE BYTE BOUNDARY IS ADJUSTED TO BIT BOUNDARY
0663 96 86 07530 SETBND EQU *
0665 84 01 07540 LDA <CBU GET PHOSE
0667 27 02 07550 ANDA #1 IF NOT PHOSE 1 OR 3
0669 08 8E 07560 BEQ SKI2 DO NOTHING
066B 96 8E 07570 LSL <CBU ELSE MULTIPLY END COL. BY 2
066D 96 8E 07580 BEQ SKI2 GET COLUMN
066F 44 07 07590 ANDA #07 NUMBER OF BITS
0671 21 8D 0015 07600 LEAY <NASTAB,PCB CONVERSION TABLE
0673 A6 A6 07610 LDA A,Y DISPLACEMENT
0675 50 07620 TFR CHPT FLAG ON7
0676 26 01 07630 RNE ALSIDE YES. RIGHT BORDER
0678 39 07640 RTS
0679 07650 RIRIDE EQU *
0679 4D 07660 TSTA IF <MASK=FF
067A 26 06 07670 BNE RIZ YES
067C 86 0F 07680 LDA #FFF
067E 0A 8D 032A 07690 DEC AUX,PCB WIDTH IS ONE BYTE LESS
0682 43 07700 KII CMA
0683 1F 8F 07710 TFR A,#
0685 2F 07720 RTS
0686 00 07730 NASTAB PCB #00
0687 8D 07740 VCB #80
0688 CD 07750 PCB #C0
0689 8D 07760 PCB #E0
068A F0 07770 PCB #F0
068B F8 07780 PCB #F8
068C FC 07790 PCB #FC
068D FE 07800 PCB #FF
07810 * SWAP
07820 *** MOVE A FIGURE FROM SCREEN TO A RESERVED AREA AND
07830 *** THE FIGURE FROM THE RESERVED AREA TO SCREEN
07840 * ON ENTRY: U= ADDRESS OF FIG
07850 * ON EXIT: SWAP PERFORMED
07860 * EXCEPT FOR U NO REGS ARE PRESERVED
068E 10A6 CB 00 07870 SWAP EQU *
068F 8E CB 06 07880 LDR CASW,U ADDR. OF SWAP AREA
0692 AE CB 06 07890 LDR <FIC0AD,U ADDRESS IN SCREEN
0695 17 019F 07900 LDRS NORM
0698 4F 07910 DORNL CLR A
0699 8D 8A 07920 LDR A,X FIRST BYTE FROM ROW
069B 34 04 07930 PSWS #
069D 0A CB 0A 07940 ANDB <LHASK,U PREPARE IT TO MIX
06A0 6A A6 07950 ORB A,Y
06A2 20 06 07960 BRA HERCON CONTINUE SWAPING ROW
06A4 86 86 07970 HERBZ LDR A,X INTERMEDIATE ROW BYTE
06A6 34 04 07980 PSWS #
06A8 2A A6 07990 LDR A,Y BTE FROM SWAP
06AA 0800 0800 0800 EQU *
06AA 24 02 08010 PSWS #
06AC 4D CB 02 08020 TST <ORFLAG,U MIXABLE?
06AF 27 0F 08030 BQZ NOOK NO
06B1 76 86 08040 LDA <CBU 16 PHOSE 1 OR 3?
06B3 84 01 08050 ANDA #1
06B5 27 07 08060 BEQ ORTWO NO
06B7 A6 41 08070 LDA 1,S BYTE FROM SCREEN
06B9 17 00C8 08080 LDRS ORTWO PERFORM "OR"
06BC 20 02 08090 BRA NOOK RESUME
06BE 5A 51 08100 ORTWO ORB 1,S NORMAL OR OPERATION
06C0 35 02 08110 NORM PULS A RESTORE A
06C2 07 86 08120 STB A,X STORE ON SCREEN
06C4 35 04 08130 PULS # GET BYTE FROM SCREEN
06C6 07 A6 08140 STB A,X STORE IT IN SWAP
06C8 4C 06 08150 INCA A#+1
06C9 41 CB 0E 08160 ORTA <WIDTH,U A=WIDTH IN BYTES?
06CC 22 00 08170 BEI ENDCIL

```

Check Us Out!

✓ Flexible: Synergetic's ten folders filled with 1000 money-back-guaranteed, checkbook binder and envelope packages available for purchase use at the home. You can't get continuous checks like these anywhere in the world.

✓ Service: Special package - including software - is sent you 1000 checks, 100 envelopes and binder - \$59.95. 500 checks, 500 envelopes and binder - \$79.95. Both with our valuable "Checkbook-Checkwriter II" program that will save you writing your checks the day you receive them.

SPECIAL BONUS

- Each 50th customer - 50% off your order.
- Each 300th customer - your order free.
- Each 1000th customer - your order free and free check rolls for life.

✓ Guarantee: Our checks and software are guaranteed to please you and guaranteed compatible with your bank. In fact, if you order a 1000 package and aren't satisfied for any reason, simply return it for a full refund (including postage) and you can keep the "Checkbook-Checkwriter II" program.

Now CHECK WITH US. Order a special package with money-back guarantee today! Our envelope is padded check for enclosing information with your order. Or send today for our free information package. We guarantee you'll be pleased. Visa, M.C., AMEX orders welcome. Shipping: \$8.00 USA, \$5.00 Outside USA.

100% MONEY-BACK GUARANTEE

SYNERGETIC SOLUTIONS

4712 GUYTON RD • 4422 BERRY, N. 33860 • PHONE (912) 648-6557

```

082C 25 04 08160 BLC MOVEZ
082D 18 06 08160 LDR A,X PROCESS & RIGHTMOST BYTE
082E 34 04 08160 PSHB #
082F 1A CR 08 08210 ANDB CRASH,V MIX IT WITH BYTE FROM SWAP
0830 1A A6 08220 UEB A,Y
0831 20 CF 08230 BEA MCONV TO NORMAL PROCES
0832 16 B7 08240 RNDCOL LDR CLR NUMBER OF BYTE FOR ROW
0833 2A 08250 AXE ADD TO X
0834 08 CR UF 08260 LDR CHARACT,V BYTES FOR ROW
0835 11 A5 08270 LEAT X,T ADD TO Y
0836 04 80 02CA 08280 DBC ROWS,PCB #ROWS-1
0837 22 AF 08290 BHI MOVEZ IF NOT ZERO CONTINUE
0838 39 08300 RTS
0839 08110 *** NORMALIZE X,Y COORDINATES
083A 08120 *** ON ENTRY: A=X ISROW, B=Y COORD.
083B 08130 NORM STA <X-1 X-COORD.
083C 08140 STB <Y-1 Y-COORD.
083D 08150 LDB CLR GET FROM
083E 08160 CHFA #A FROM A OUT
083F 08170 DEQ RNDROW
0840 08180 LSR <X-1 DIVIDE X BY 2
0841 08190 CHFA #1 FROM >1
0842 08200 BHI MCONV
0843 08210 LSR <Y-1 DIVIDE Y BY 2
0844 08220 RNDROW JBR $1298 TO ROW GET ADDRESS
0845 08230 RTS
0846 * SWAP2
0847 *** MOVE A FIGURE FROM SCREEN TO A RESERVED AREA AND
0848 *** THE FIGURE FROM THE RESERVED AREA TO SCREEN
0849 * DOES NOT CHECK FOR OE OPERATIONS. (FAST MOVE)
084A * ON ENTRY: U= ADDRESS OF FDT
084B * ON EXIT: SWAP PRESERVED
084C * EXCEPT FOR U NO REGS ARE PRESERVED
084D SWAP2 #
084E 0700 10AE CR 00 08720 MOV #
084F 0704 AE CR 06 08730 LIT CASM,U ADDR. OF SWAP AREA
0850 0707 17 0127 08740 LDR <FICGAD,U ADDRESS IN SCREEN
0851 070A 63 CR 0A 08750 LDBE NORMY
0852 070D 63 CR 0A 08760 CON CLASH,U
0853 0710 4F CR 0E 08770 CON CRASH,U
0854 0711 28 86 08780 MOVEZ LDR A,X FIRST BYTE FROM ROW
0855 0712 18 CR 0A 08790 ANDB <L/ASK,U CUR BITS AT LEFT
0856 0713 20 02 08800 BKA MOVEZ CONTINUE SWAPPING ROW
0857 0714 26 86 08810 MOVEZ LDR A,X INTERMEDIATE ROW BYTE
0858 071A 34 04 08820 RNDROW FDIS #
0859 071C 18 80 0288 08830 LDR ACTION,PCB CREATE FIC?
0860 0720 C1 01 08840 CHFB #1 YES
0861 0722 27 04 08850 BEQ COME
0862 0724 16 A6 08860 LDR A,Y GET BYTE IN SWAP
0863 0726 17 86 08870 STB A,X PUT IN SCREEN
0864 0728 35 04 08880 CONE PULS #
0865 072A 17 A6 08890 STB A,Y SAVE IN SWAP
0866 072C 4C 08900 INCA A*+1
0867 072D A1 CR 08 08910 CHFA <X/ROWT,U A*WIDTH IN BYTES?
0868 0730 22 09 08920 BHI RNDCOL

```

```

0732 25 84 08730 MLD MOVEZ
0733 18 86 08740 LDR A,X PROCESS RIGHTMOST BYTE
0734 18 CR 08 08750 ANDB CRASH,U MIX IT WITH BYTE FROM SWAP
0735 20 0F 08760 BKA MCONV TO NORMAL PROCES
0736 08 80 08770 RNDROW LDR CLR NUMBER OF BYTE FOR ROW
0737 30 85 08780 LEAT X,X ADD TO X
0738 08 CR 0F 08790 LDR CHARACT,V BYTES FOR ROW
0739 31 A5 08800 LEAT X,T ADD TO Y
0740 08 CR 0283 08810 DBC ROWS,PCB #ROWS-1
0741 22 CR 0A 08820 BHI MOVEZ IF NOT ZERO CONTINUE
0742 08 CR 0A 08830 CON CLASH,U
0743 08 CR 0A 08840 CON CRASH,U
0744 08 CR 02 08850 ISZ RNDROW ...NO GET OUT
0745 27 24 08860 WEQ RNDROW
0746 08 CR 02 08870 LDR CRFLAC,U
0747 08 CR 02AC 08880 LDR ACTION,PCB CREATE FIGURAT
0748 01 01 08890 CHFA #1 IF YES GET-OUT
0749 27 10 08900 BEQ RNDROW
0750 08 CR 0C 08910 LDR CRFLAC,U RESTORE ORIG. I/ASK
0751 08 CR 0014 08920 TEST U/CD,U
0752 24 03 08930 BNE MOVE
0753 08 CR 00 08940 LDR CRASH,U
0754 A7 80 023F 08950 MOVE STA A/RT,PCB
0755 0770 0770 CR 0012 08960 RNDROW EQI #
0756 3A 40 08970 LDR FICWRT,U
0757 18 CR 00 08980 LDR CASM,U GET TO-ADDRESS
0758 08 CR 022A 08990 LDR ACTION,PCB CURRENT OPTION
0759 08 01 09000 CHFA #1 IF NOT CREATE
0760 26 02 09010 BNE RNDROW GO AHEAD
0761 18 31 09020 BEQ U,X ELSE COPY FROM FIRST AREA TO SECOND
0762 17 0141 09030 RNDROW LDR U/PTW COPY AREAS
0763 33 40 09040 PULS # RESTORE U
0764 0700 09050 RNDROW EQU #
0765 39 09060 RNDROW EQU #
0766 09070 RNDROW EQU #
0767 * ORFIC, DETERMINING IF PIECE OF FIGURE ON
0768 * SCREEN SHOULD BE LEFT
0769 * ON ENTRY: A= BYTE FROM SCREEN
0770 * B= BYTE FROM SWAP
0771 * U= ADDR. OF FDT
0772 * ON EXIT: B= ADJUSTED SWAP BYTE
0773 * REGS A AND B ARE NOT PRESERVED
0774 078A 34 06 09160 FERS A,B
0775 078C 86 CR 09170 LDR PCB FIRST TWO BITS TO CHECK
0776 078E AF 80 0217 09180 CLR RESO,PCB CLEAR RESULT BYTE
0777 0792 17 80 021A 09190 STA BITAN,PCB
0778 0796 AA 61 09200 ORI LDR J,S GET BYTE FROM SWAP
0779 0798 AA 80 0208 09210 ANDB BITAN,PCB SUPPRESS UNWANTED BITS
0780 079C 98 80 0212 09220 LDR BECOLO,PCB GET COLOR TO BE 'ORED'
0781 07A0 9A 80 0206 09230 ANDB BITAN,PCB REMOVE UNWANTED BITS
0782 07A4 34 04 09240 FDIS #
0783 07A8 A1 80 09250 CHFA ,S+ BACKGROUND COLOR IN SWAP
0784 07AC 28 06 09260 BDB CR2 NO
0785 07AA A8 84 09270 LDR ,S GET BYTE FROM SCREEN
0786 07AC A4 80 01FA 09280 ANDB BITAN,PCB SUPPRESS UNWANTED BITS

```

NEW

XPNDR2™ for the CoCo DISK SYSTEM



XPNDR2 \$39.95 each or 2/576
This prototype card features a 40 pin connector for projects requiring an on-line disk system or ROM paks. The CoCo signals are brought out to wire-wrap pins. Special gold plated spring clips provide reliable and noise-free disk operation plus solid support for vertical mounting of the controller. The entire 4.3 x 7 inch card is drilled for ICs. Assembled, tested and ready to run.

XPNDR1 \$19.95 each or 2/536
A rugged 4.3 x 6.2 inch bare breadboard that brings the CoCo signals out to labeled pads. Both XPNDR cards are double-sided glass/epoxy, have gold plated edge connectors, thru-hole plating and are designed with heavy power and ground buses. They're drilled for standard 0.3 and 0.6 inch wide dual in-line wirewrap sockets, with a 0.1 inch grid on the outboard end for connectors.

SuperGuide \$3.95 each
Here is a unique plastic insert that aligns and supports printed circuit cards in the CoCo cartridge port. Don't forget to **ORDER ONE FOR YOUR XPNDR CARDS.**

Included with each XPNDR card are 8 pages of APPLICATION NOTES to help you learn about chips and how to connect them to your CoCo.

To order or for technical information call:

(206) 782-6809
weekdays 8 a.m. to noon

We pay shipping on prepaid orders. For immediate shipment send check, money order or the number and expiration date of your VISA or MASTERCARD to:

ROBOTIC MICROSYSTEMS
BOX 30807 SEATTLE, WA 98103

Formaker

the fastest, most complete office package yet!

Totally Menu Driven
Customize with company information
Complete "on screen" instructions

FORMS	STORES	FIGURES
letter	complete forms	quantity
invoice	item list	list
quote	subquotes	net
purchase order	letters	discount
mail order	footnotes	subtotals
confirm order	customer info	tax
receipt		freight, etc.

SEPARATE CONFIGURE PROGRAM
for company info
printer options
quote & inv. #
w/auto sequencing
auto date

PRINTS
form feed
letterhead
envelope
multiple copy
emphasized

WATCH FOR OUR NEW SOFTWARE

Challenger Software **\$49** 32K disk
42 4th Street
Pennsburg, PA 18073
Or Call (215) 679-8792 (Evenings)
send for more information!

COLOR DISK MANAGER

Color Disk Manager will do selective initializations, verifies, backups, repairs and much more!

- will initialize single tracks, a range of tracks, or the entire disk to more than 35 tracks
- allows you to make a backup of the directory out of reach of basic and put it back if a directory crash occurs; has a recover file command which will load entire files off the disk if the directory crashes and the allocation table is good; will repair or salvage crashed disk several ways
- is 64K compatible allowing a 64K backup; does backups by track, a range of tracks, or the whole disk (will do more than 35 tracks)
- gives an allocation table map with granules x-referenced to tracks and sectors, and showing which granules are used; displays a file granule map showing which granules, tracks, and sectors the file uses, and the length
- will do a directory displaying file names in two columns, the number of free granules, and the free bytes if below 65535; has a kill file command
- loads and saves, sectors, tracks or files; loads files two ways, as done by basic, or with header bytes left in, which helps in studying how files are saved on disk; has an append sector command
- verifies tracks or the entire disk showing the track and sector if an error occurs, with the option of continue or stop
- is multiple drive compatible
- allows you to save a block of memory to disk; transfers programs from tape to disk
- has a rapid scan feature which allows you to scan the disk by tracks and sectors using the arrow keys
- will dump memory to the screen in ascii, good for listing basic programs or source files; has a move memory block command, and a transfer control command
- converts decimal to hex or hex to decimal
- allows you to examine memory using the arrow keys with displays in hex (or decimal) and ascii
- will load and execute rompac's saved on disk; has a move rom to ram command
- allows you to change origin (start addr.) of ML programs; displays the start, end, and execute addresses of ML programs
- 32K - 64K ECB \$34.95 Disk

RAINBOW SCREEN MACHINE

- Add these features to your computer/program; ML extension of Basic loads on top of 16, 32, or 64K machines to enable easy mixture of **hi-res graphics and text** in your programs. Dense text or large lettering for children, visually impaired or VCR title screens with no programming!
- User definable 224 character set featuring lower case descenders, Greek, cars, tank, planes, etc., completely interfaced with **all keys, commands, and PMODES**. 12 sizes (most colored) from 16 x 8 to 64 x 24. **PRINT @, TAB and comma fields are fully supported.**
- 2 distinct character sets automatically switch for sharpest lettering featuring **underline, subscript, superscript, reverse video, top and bottom scroll protect, double width, colored characters in PMODE 4, and help screen.**
- Simple 2-letter abbreviated commands inside your program or **control key** entry from keyboard, even during program execution!
- Includes demo program, **character generator** program and manual. 16K Basic required — 32K recommended. **\$29.95 Tape; \$32.95 Disk.**

Dealer and author inquiries are always welcome. Canadian dealers should contact Kelly Software Distributors, Ltd., P.O. Box 11932, Edmonton, Alberta T5J-3L1, (403) 421-8003.

Disk software compatible with Radio Shack DOS only.

SUGAR SOFTWARE

2153 Leah Lane
Reynoldsburg, Ohio 43068
(614) 861-0565

A complete catalog of other sweet Sugar Software products is available.

COLOR TAPE MANAGER

- merges multiple basic programs into one; appends multiple machine language programs into one; appends machine language to basic (example included)
- converts numbers from hex to decimal or decimal to hex, allows input in hex or decimal
- rapidly scans memory using the arrow keys with auto-key repeat
- displays memory in hex (or decimal) and ascii; allows the changing of memory in decimal or hex
- deals with missing end of file blocks; loads and saves data with or without a filename block
- handles programs with varying block lengths
- displays the start, end, and execute addresses of ML programs; displays the buffer start, end and top addresses
- converts ML programs into basic data statements which can be loaded as, or merged with, a basic program
- turns the audio and cassette motor on and off with one key commands; has inverted displays which lessen eye fatigue
- finds the end of programs on tape even from within a program with a skip file command; allows the transferring of control to other programs with a go command
- moves blocks of memory from start through end address to new start address; allows the changing of the origin (start addr) of ML programs
- has an 8,380 byte loading buffer with 16K systems and 24,760 byte loading buffer with 32K systems
- 16K ECB minimum \$19.95 Tape \$22.95 Disk

SUPER SCREEN MACHINE

All of the features of Screen Machine and more:

- Variable **SMOOTH Scroll** for professional displays, listings, business use
- Variable volume **KEY Click** (tactile feedback)
- **EDTASM** command for instant compatibility with cartridge EDTASM.
- **Superpatch** - command for instant compatibility with the Superpatch - Editor - Assembler.
- True **Break key** disable and recognition.
- 10 User Definable commands used to activate your special drivers or subroutine.
- Dynamic **Screen Dump** command for use with Custom Software, Engineering's Graphic Screen Print program for simple printer "Snapshots" of your screen even during program execution!
- Super Screen Machine - **\$44.95 Tape; \$47.95 Disk.**

Screen Machine can be used in games, word processors, utilities, etc. In addition, the custom graphics characters can be used to develop easy, effective hi-res character-graphics programs. The potential is truly unlimited.

Screen Machine is fully interfaced with all keys and commands. Although some Basic programming knowledge is recommended just a few minutes spent studying and referencing your computer's Basic manuals will turn you on to the power of computing with Screen Machine.

Screen Machine can be used to directly create video recorder title screens or large lettering for children or the visually impaired simply by typing.

Add \$1.50 per tape for postage and handling. Ohioans add 5.5% sales tax. COD orders are welcome. CIS orders EMAIL to 70305, 1374. No refunds or exchanges.

MasterCard

VISA

SPORTS STATISTICS PACKAGES

Statistics programs for the coach, team manager, or avid fan who wants to keep accurate team and opponent records. Menu-driven and easy to use. Put your team in the CoCo with Sugar Software's Sports Statistic Packages!



Soccer will provide:

- Mid-season entry, update and additions
- Correct and review all stats in file
- Correction on all input screens
- Raw dump of data to the

printer — for the player, goalie, and opposing team's files

- Summary of the player, goalie, and opposing team's stats
- Track 20 individual player stats
- Summarizes 16 individual player stats
- Track 14 goalie stats
- Summarize 10 goalie stats
- Track 19 opposing team stats



Baseball will provide:

- Mid-season entry, update and additions
- Correct and review all stats in file
- Correction on all input screens
- Raw dump of data to the

printer — for the player, pitcher, and opposing team's files

- Summary of the player, pitcher and opposing team's stats
- Track 21 individual player stats with 18 cum stats per player
- Track 15 individual pitcher stats with 11 cum totals per pitcher
- Compile total team summary of 16 separate stats
- Compile total pitching summary of 11 stats
- Track 15 opposing team stats with 14 cummed stats

Rental Property Income and Expense Management Package



Disk - \$34.95
32K Required

- Keeps track of all your rental properties
- Provides instant screen or printer summary of all your properties
- Maintains and prints a detailed, itemized listing of each of 28 expense categories
- Gives you a schedule of the Accelerated Cost Recovery System depreciation allowed for each tax year for 3, 5, 10 and 15 year property

Dealer and author inquiries are always welcome. Canadian dealers should contact Kelly Software Distributors, Ltd., P.O. Box 11932, Edmonton, Alberta T5J-3L1, (403) 421-8003.

Disk software compatible with Radio Shack DOS only.

SUGAR SOFTWARE

2153 Leah Lane
Reynoldsburg, Ohio 43068
(614) 861-0565

A complete catalog of other sweet Sugar Software products is available.



Football will provide:

- Mid-season entry, update and additions
- Correct and review all stats in file
- Correction on all input screens
- Raw dump of data to the

printer — for the player and opposing team's files

- Summary of the player and opposing team's stats
- Track 90 individual player stats
- Summarizes 63 individual cum stats per player
- Summarize 17 cum team stats
- Summarize 28 cum opposing team stats
- Team summaries of 87 stats
- Comparative summary printouts 63 stats for your team
- Comparative summary printouts 62 stats for opposing team
- Over 350 possible stats!



Basketball will provide:

- Mid-season entry, update and additions
- Correct and review all stats in file
- Correction on all input screens
- Raw dump of data to the

printer — for the player and opposing team's files

- Summary of the player and opposing team's stats
- Track 22 individual player stats with 18 cum stats per player
- Summarizes 17 individual player team stats
- Compile opposing team summary of 19 separate stats

SEMIGRAF Graphics Editor

- Graphics editor to create and modify your own pictures
- Pictures can be used as a title screen for a program
- Create a series of pictures to make a slide show
- Both Extended and non-Extended Basic versions on the same tape
- High Resolution
- Semigraphic modes 8, 12, and 24 (64 x 64, 64 x 96 and 64 x 128)
- 8 colors
- Combine text with graphics
- Auto-repeat and "magic" delete
- Requires 16K



Tape - \$19.95
Disk - \$24.95

Add \$1.50 per tape for postage and handling. Ohioans add 5.5% sales tax. COD orders are welcome. CIS orders EMAIL to 70405, 1374. No refunds or exchanges.

MasterCard

VISA

```

0780 AA 80 01F5 09290 OKI OKA R858,PCB PUT SELECTED COLOR.
0784 A7 80 01F1 09300 STA R858,PCB
0788 64 80 01EE 09310 LDR BITAN,PCB ANALYZE NEXT TWO BITS
078C 64 80 01EA 09320 LSR BITAN,PCB
0790 28 04 09330 RNE OKI NOT FINISHED TEST
079C 32 82 09340 LKAS 2,5 ADJUST STACK
079E 86 80 01E1 09350 LDR R858,PCB BYTE TO PUT IN SCREEN
079F 39 09360 RTS
09370 * SHLFT. SUBROUTINE TO SHIFT A MATRIX AN SPECIFIED
09380 * NUMBER OF BITS
09390 * ON ENTRY:
09400 * D= ADDRESS OF FIG. DESC. TABLE
09410 * A=BITS TO SHIFT.
09420 * IF A<0 SHIFT LEFT
09430 * IF A>0 SHIFT RIGHT
09440 * ON EXIT: THE SWAP AREA FOR FIGURE IS SHIFTED.
09450 * EXCEPT FOR U, NO REGISTERS ARE PRESERVED
07C9 09460 SHLFT EQU *
09470 *PUT BITS TO SHIFT IN X
09480 TFR A,B
09490 TSTA
09500 RFL POSIT
09510 NEG8
07CF 09520 POSIT EQU *
07D1 09530 PSIB A
07D4 09540 CLRA
07D7 09550 TFR D,X PUT IN X.
07D9 10AE CB 00 09560 LRSR WORDY TO NORMALIZE Y
07DB 09570 PULS A
07DD 10AE CB 00 09580 LDR CHAXBT,U
07DF 09590 PSIB X,Y
07E1 10AE 82 09600 TSTA SHIFT RIGHT?
07E3 28 09 09610 RMI SH2A NO, LEFT
07E5 1C FE 09620 ANDCC #3FE
07E7 86 A0 09630 ROR ,Y+
07E9 3A 09640 DECB
07EB 28 FB 09650 RNE SH1
07ED 20 09 09660 BEA NEXTST
07EF 31 A5 09670 SH2A LEAY B,Y
07F1 1C FE 09680 ANDCC #3FE
07F3 87 A2 09690 ROL ,Y-
07F5 3A 09700 DECB
07F7 28 FB 09710 RNE SH2B
07F9 30 1F 09720 NEXTST LEAX -1,X MORE BITS TO SHIFTF
07FB 28 EB 09730 RNE SHD YES
07FD 6A 80 01A7 09740 DRC R808,PCB MORE BOWS?
07FF 27 0F 09750 RND EXEMPL NO
0801 86 CB 0F 09760 LDR CHAXBT,U ADJUST TO FIRST COL.
0803 10AE 82 09770 LUY 2,5
0805 31 A3 09780 LEAY X,Y
0807 10AF 82 09790 STV 2,5
0809 AE 84 09800 LDV ,5
0811 20 02 09810 RRA SHUB

```

```

0813 35 80 09840 ENSHIF PULS Y,X,PC
09850 * CALCULATES MAXIMUM NUMBER OF BYTES PER ROW
09860 * FOR A FIGURE.
09870 * ON ENTRY: D= ADDRESS OF FIGURE DESCRIPTOR TABLE
09880 * B= WIDTH IN PIXELS
09890 * ON EXIT: MAXMT WITH VALUE
09900 * U,X,Y ARE PRESERVED
09910 *
0815 09910 CHARY EQU *
0817 96 86 09920 LDA <C86 GET PHODG
0819 81 04 09930 CMPA #4 IS PHODG 4?
0821 27 05 09940 BEQ CHAXI YES
0823 84 01 09950 ANDA #1 IF PHODG 1 OR 3
0825 28 01 09960 RNE CHAXI DO NOTHING
0827 54 01 09970 LSR8 NO, DIVIDE BY 2
0829 0620 09980 CHAXI TFR *
082B 1F 98 09990 TFR R,A SAVE TO OBTAIN
082D 84 07 10000 ANDA #607 REMAINDER OF 0/8
082F 54 10010 LSR8 DIVIDE BY 8
0831 54 10020 LSR8
0833 54 10030 LSR8
0835 5C 10040 INCB ADD 1 TO THE RESULT
0837 81 02 10050 CMPA #2 IF REMAINDER<2
0839 20 01 10060 RLT CHAX2 GO OUT
083B 5C 10070 INCB IF NOT ADD 1 OF RESULT
083D 87 08 0F 10080 CHAX2 STB CHAXBT,U
083F 39 10090 RTS
10100 * FIND REQUIRED NUMBER OF
10110 * BYTES FOR A GIVEN NUMBER
10120 * OF ROWS.
10130 * ON ENTRY: D= ADDR. OF FIG
10140 * ON EXIT: A AND R8 WITH VALUE
10150 * EXCEPT FOR A ALL REGS. ARE PRESERVED
0841 86 CB 05 10160 ROR8Y LDA CHIGHT,U GET ROWS
0843 A7 80 01F3 10170 STA R808,PCB
0845 96 86 10180 LDA <C86 GET PHODG
0847 81 01 10190 CMPA #1 NORMALIZE?
0849 22 04 10200 RMI NO
084B 84 80 01A7 10210 LSR R808,PCB YES, DIVIDE.
084D 86 80 01A5 10220 RSTBY LDA R808,PCB
084F 39 10230 RTS
10240 * GET ADDRESS OF FIGURE
10250 * DESCRIPTOR TABLE (FDT)
10260 * ON ENTRY: X= ADDR. OF PARMLIST
10270 * ON EXIT: U=ADDR. OF FDT
10280 * X AND Y ARE PRESERVED
0847 86 AA 10290 GETFDT COB *
0849 A1 80 01D9 10300 LDA #8AA SYSTEM INITIALIZED?
084B 27 05 10310 CMPA J+FCIAR,PCB
084D 28 07 10320 RND GET YES, OR
084F 16 000F 10330 LDR #F01 ELSE ERROR
0851 33 80 01D8 10340 LBR8 SRF08
0853 34 40 10350 GE2 LEAY FFDI,PCB ADDR. OF FIRST FDT
0855 A6 01 10360 PSIB U
0857 27 06 10370 LDA 1,X FIGURE NUMBER
0859 A1 80 01C9 10380 RND GE2 FIGURE CAN'T BE ZERO
085B 23 05 10390 RLS CEA NO, DE
085D 06 02 10400 LDR #F0F ELSE ERROR
085F 18 00CA 10410 LBR8 SRF08
0861 A1 80 01BE 10420 CIVA I+FCIAR,PCB GREATER THAN CREATED FIG
0863 23 05 10430 RLS CEA NO, DE
0865 06 06 10440 LDR #F0C ELSE ERROR
0867 16 00B9 10450 LBR8 SRF08
0869 06 18 10460 CES LDR #24 SIZE IN BYTES OF A FDT
0871 16 00B9 10470 DECA TO OFFSET
0873 30 10480 WDL DISPLACEMENT
0875 83 E1 10490 ADDD ,5+ BSAL ADDRESS
0877 1F 03 10500 TFR B,U LEAVE IN U
0879 39 10510 RTS
10520 * RANDOM. FIND A RANDOM NUMBER
10530 * ON ENTRY: A= MAX. VALUE OF NUMBER TO GENERATE
10540 * ON EXIT: B=RANDOM NUMBER. ALL REGS. PRESERVED BUT B
087D 35 087D 10550 RANRNDI EQU *
087F 35 02 10560 PSIB A SAVE MAX. VALUE OF RANDOM NUMBER
0881 60 80 0134 10570 TET FPK10,PCB SEQUENCE EXHAUSTED?
0883 26 07 10580 RNE RAZ NO
0885 2C 0112 10590 LDD #112 GET VALUE OF TIMER
0887 28 80 0129 10600 STB SEED,PCB AND USE IT AS NEW SEED
0889 06 088C 10610 EQU *
0891 2C 80 0125 10620 LDD SEED,PCB GET SEED NUMBER
0893 38 06 10630 PSIB B
0895 86 02 10640 LDA #2 WILL MULTIPLY SEED BY 4
0897 68 80 011E 10650 LSL I+SEED,PCB TWO TIMES 2
0899 69 80 0119 10660 ROL SEED,PCB
089B 4A 10670 DECA
089D 26 F5 10680 RNE RAZ IF NOT DONE CONTINUE
089F 35 06 10690 FOLD B GET OLD SEED
0901 83 80 0110 10700 ADDD SEED,PCB THIS OLD SEED BY 3
0903 C3 0035 10710 ASOD #3 PLUS 3
0905 ED 80 0109 10720 STB SEED,PCB NEW SEED
0907 C6 FF 10730 LDR #FFF MAKE TO REDUCE RANDOM
0909 E7 80 0102 10740 STB AXI,PCB
090B A1 X4 10750 CHAX CIVA ,5 IS NUMBER LESS OR EQUAL THAN MAX?
090D 23 0A 10760 RLE CHA YES, GET OUT
090F 64 80 00FA 10770 LSR AUX,PCB GET RID OF LEFT BIT
0911 A4 80 00F6 10780 ANGA AUX,PCB
0913 20 Y2 10790 RRA RHA1 AND COMPARE AGAIN
0915 08C0 10800 EQU * NUMBER FOUND
0917 89 10810 TFR A,B LEAVE IN B
0919 4C 80 00F1 10820 INC FPK10,PCB PERIOD COUNTER
0921 35 E2 10830 PULS A,PC ADJUST STACK AND RETURN
10840 * COPY ONE SWAP AREA INTO ANOTHER
10850 * ON ENTRY: X= ADDR. OF FROM AREA
10860 * U= ADDR. OF TO AREA
10870 * T=# OF BYTES TO COPY
10880 * T=# OF BYTES TO COPY
10890 * ON EXIT: AREA COPIED. ONLY A IS PRESERVED
08CB 86 80 10900 COPYSW EQU *
08CD 87 C0 10910 LDD ,X GET BYTES
08CF 31 3F 10920 STB ,D STORE IN TO-AREA
08D1 26 FB 10930 LEAY -1,Y DECREMENT COUNTER
08D3 29 10940 RNE COPYSW MOVE TO COPYF
08D5 39 10950 RTS
10960 * VERIFY IF ACTION ON OUT
10970 * OF SCREEN IS REQUIRED
10980 * ON ENTRY: T= ADDR. OF VALUE FOR X/Y
10990 * #10 WITH 0 FOR X OR 64 FOR Y

```

One-Liner Contest Winner . . .

This program takes machine code and automatically puts it into BASIC DATA statements. Just load the machine language code, RUN the program, set up a blank cassette to record and input the start and end addresses of the code. When you CLOAD the resulting tape, your DATA lines are all complete.

The listing:

```

10 CLS:PRINT"RECORDER ON?":INPUT
"START":B:INPUT"END":E:OPEN"O",#
-1,"DATA":Q=10:FORK=B TO E STEP8
:Q=Q+10:A$=STR$(Q)+" DATA ":FORJ
=0TO7:X$=STR$(PEEK(J+K)):A$=A$+
RIGHT$(X$,LEN(X$)-1)+",":NEXTJ:P
RINT#-1,LEFT$(A$,LEN(A$)-1):NEXT
K:CLOSE#-1:STOP

```

Dan Tandberg, M.D.
Albuquerque, NM

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

0901 00	0901	11000	* ON EXIT: CACN/CACY WITH X/Y DESTINATIONS	0981	00	12100	XXXXLO	FCB	0	
0902 00	0902	11010	* EXCEPT FOR D ALL REGISTERS ARE PRESERVED	0982	00	12110	XXXXHI	FCB	0	
0903 00	0903	11020	AUTOSC END *	0983	00	12120	XXXX	FCB	0	
0904 00	0904	11030	IST 1+FLG,FCB TESTING 1-COMBSF	0984	0000	12130	XXXX	FCB	0	SEED VALUE FOR RANDOM ROUTINE
0905 00	0905	11040	ISG 10	0985	00	12140	XXXX	FCB	0	PERIOD COUNTER OF RANDOM SEQUENCE
0906 00	0906	11050	LBN CHECKN,U GET VERTICAL SIZE	0986	0000	12150	XXXX	FCB	0	STATUS
0907 00	0907	11060	MBA 11	0987	00	12160	XXXX	FCB	0	SKIP LINE
0908 00	0908	11070	LDB CWIDTH,U GET HORIZONTAL SIZE	0988	58	12170	XXXX	FCB	0	1/800000 /
0909 00	0909	11080	STN AXI1,FCB	0989	4F	12180	XXXX	FCB	0	/ON FIGURE ### /
0910 00	0910	11090	LDB ,Y GET X/Y VALUE	0990	41	12190	XXXX	FCB	0	/ACTION #/
0911 00	0911	11100	TSTA NEGATIVE?	0991	00	12200	XXXX	FCB	0	SKIP LINE
0912 00	0912	11110	NLT L18	0992	4F	12210	XXXX	FCB	0	/OSOMEFIGUREX/
0913 00	0913	11120	ADDD FLG,FCB ADD IT WITH FLAG (54 IF Y)	0993	0000	12220	XXXX	FCB	0	
0914 00	0914	11130	ADDD AXI2,FCB ADD TO SUBTOTAL	0994	0000	12230	XXXX	FCB	0	
0915 00	0915	11140	TSTA GREATER THAN 255?	0995	0000	12240	XXXX	FCB	0	
0916 00	0916	11150	BNQ LXX ...NO GET-OUT	0996	0001	12250	XXXX	FCB	0	OUT OF SCREEN
0917 00	0917	11160	LDB #2	0997	0002	12260	XXXX	FCB	0	OUT OF MEMORY
0918 00	0918	11170	MBA L1A	0998	0003	12270	XXXX	FCB	0	INVALID FIG. NUMBER
0919 00	0919	11180	LDB #1	0999	0004	12280	XXXX	FCB	0	INVALID OPTION
0920 00	0920	11190	L1A STATUS,FCB	1000	0005	12290	XXXX	FCB	0	EXCEEDS MAX. X PIXELS
0921 00	0921	11200	STB L1A STATUS,FCB	1001	0006	12300	XXXX	FCB	0	EXCEEDS MAX. Y PIXELS
0922 00	0922	11210	LDB COUTSCL,U WHAT TO DO?	1002	0007	12310	XXXX	FCB	0	FIG. NOT CREATED
0923 00	0923	11220	BNQ LARK MARK ERROR	1003	0008	12320	XXXX	FCB	0	ANIMATIC NOT INITIALIZED
0924 00	0924	11230	BNQ #2	1004	0000	12330	XXXX	FCB	0	CAN'T COPY FIGS.
0925 00	0925	11240	BNQ LARK REMOVE FIGURE	1005	0000	12340	XXXX	FCB	0	
0926 00	0926	11250	TSTA OUT-OF-SCREEN LEFT OR OFF	1006	0000	12350	XXXX	FCB	0	
0927 00	0927	11260	NPL L2 ...NO	1007	0000	12360	XXXX	FCB	0	
0928 00	0928	11270	BNQ CUMH	1008	0000	12370	XXXX	FCB	0	
0929 00	0929	11280	TSTA WHAT TO DO?	1009	0000	12380	XXXX	FCB	0	
0930 00	0930	11290	BNQ L4 ADJUST TO ZERO	1010	0000	12390	XXXX	FCB	0	
0931 00	0931	11300	CLRA FREEZE IN BOUNDS	1011	0001	12400	XXXX	FCB	0	
0932 00	0932	11310	LDB #235	1012	0003	12410	XXXX	FCB	0	
0933 00	0933	11320	SUBB 1+FLG,FCB 191 IF Y	1013	0000	12420	XXXX	FCB	0	
0934 00	0934	11330	SUBB AXI2,FCB	1014	0000	12430	XXXX	FCB	0	
0935 00	0935	11340	MBA LFX GET OUT	1015	0002	12440	XXXX	FCB	0	
0936 00	0936	11350	CLRA ADJUST TO ZERO	1016	0004	12450	XXXX	FCB	0	
0937 00	0937	11360	CLRA	1017	0005	12460	XXXX	FCB	0	
0938 00	0938	11370	STD ,Y STORE ROW DIST. COORD.	1018	0006	12470	XXXX	FCB	0	
0939 00	0939	11380	RTS END ROUTINE	1019	0009	12480	XXXX	FCB	0	
0940 00	0940	11390	LARK #FOS DRAWN INDICATOR	1020	0009	12490	XXXX	FCB	0	
0941 00	0941	11400	LARK LARK ERROR	1021	000A	12500	XXXX	FCB	0	
0942 00	0942	11410	LARK LKAS 2,5 ADJUST STACK	1022	0009	12510	XXXX	FCB	0	
0943 00	0943	11420	LARK REMOVE TO REMOVE FIGURE	1023	000C	12520	XXXX	FCB	0	
0944 00	0944	11430	* ERROR, THIS ROUTINE WILL SIGNAL ERRORS AND EXIT	1024	000D	12530	XXXX	FCB	0	
0945 00	0945	11440	* ON ENTRY: * CODE OF ERROR TO BE ISSUED	1025	000E	12540	XXXX	FCB	0	
0946 00	0946	11450	* ON EXIT: DRAW MESSAGE PLUS PROGRAM TERMINATION	1026	000F	12550	XXXX	FCB	0	
0947 00	0947	11460	ERROR BNQ *	1027	000E	12560	XXXX	FCB	0	
0948 00	0948	11470	LKAY MARK,FCB ADDR. OF PRINT MASK	1028	000F	12570	XXXX	FCB	0	
0949 00	0949	11480	LKAY ERMSG,FCB TABLE OF ERRORS	1029	0010	12580	XXXX	FCB	0	
0950 00	0950	11490	ASLB MULTIPLY CODE BY 2	1030	0011	12590	XXXX	FCB	0	
0951 00	0951	11500	ARR OFFSET	1031	0012	12600	XXXX	FCB	0	
0952 00	0952	11510	LDB ,Y+ GET FIRST CHAR OF ERROR TYPE	1032	0014	12610	XXXX	FCB	0	
0953 00	0953	11520	STA 2,Y ON MASK	1033	0000	12620	XXXX	FCB	0	
0954 00	0954	11530	LDB ,I SHOW CHAR	1034	0000	12630	XXXX	FCB	0	
0955 00	0955	11540	STA ,Y	1035	0000	12640	XXXX	FCB	0	
0956 00	0956	11550	LDB ACTION,FCB ACTION	1036	0000	12650	XXXX	FCB	0	
0957 00	0957	11560	ORA #130 TO ASCII FORMAT	1037	0000	12660	XXXX	FCB	0	
0958 00	0958	11570	STA ,Y+ PUT IN PRINT MASK	1038	0000	12670	XXXX	FCB	0	
0959 00	0959	11580	CLRA	1039	0000	12680	XXXX	FCB	0	
0960 00	0960	11590	LDB 1+MARK,FCB FIGURE NUMBER	1040	0000	12690	XXXX	FCB	0	
0961 00	0961	11600	LKAY 21,Y POINT TO MASK AREA FOR FIG. NUMBER	1041	0000	12700	XXXX	FCB	0	
0962 00	0962	11610	BNQ #100 HOW WE WILL CONVERT	1042	0000	12710	XXXX	FCB	0	
0963 00	0963	11620	NLT ERROR FIG. NONE. TO ASCII	1043	0000	12720	XXXX	FCB	0	
0964 00	0964	11630	SUBB #100 NUMBER OF HUNDREDS	1044	0000	12730	XXXX	FCB	0	
0965 00	0965	11640	INCA	1045	0000	12740	XXXX	FCB	0	
0966 00	0966	11650	MBA ERMSG	1046	0000	12750	XXXX	FCB	0	
0967 00	0967	11660	ORA #130 HUNDREDS IN ASCII	1047	0000	12760	XXXX	FCB	0	
0968 00	0968	11670	STA ,Y+ PUT IN PRINT MASK	1048	0000	12770	XXXX	FCB	0	
0969 00	0969	11680	CLRA	1049	0000	12780	XXXX	FCB	0	
0970 00	0970	11690	BNQ #10 TENS	1050	0000	12790	XXXX	FCB	0	
0971 00	0971	11700	NLT ERMSG	1051	0000	12800	XXXX	FCB	0	
0972 00	0972	11710	SUBB #10	1052	0000	12810	XXXX	FCB	0	
0973 00	0973	11720	INCA	1053	0000	12820	XXXX	FCB	0	
0974 00	0974	11730	MBA ERMSG	1054	0000	12830	XXXX	FCB	0	
0975 00	0975	11740	ORA #130 AND UNITS IN ASCII TOO	1055	0000	12840	XXXX	FCB	0	
0976 00	0976	11750	STA ,Y+	1056	0000	12850	XXXX	FCB	0	
0977 00	0977	11760	LDB ,Y NUMBER OF CHAR IN MASK	1057	0000	12860	XXXX	FCB	0	
0978 00	0978	11770	STB ERMSG,FCB TO BEGINNING OF MASK	1058	0000	12870	XXXX	FCB	0	
0979 00	0979	11780	LDB ,Y+ GET CHAR FROM BYTE	1059	0000	12880	XXXX	FCB	0	
0980 00	0980	11790	LKAY [ASCII] WRITE CHAR ON SCREEN	1060	0000	12890	XXXX	FCB	0	
0981 00	0981	11800	DECR DECREMENT COUNTER	1061	0000	12900	XXXX	FCB	0	
0982 00	0982	11810	BNQ ERMSG PRINT MASK CHARS	1062	0000	12910	XXXX	FCB	0	
0983 00	0983	11820	INC STATUS,FCB FLAG STATUS WITH ERROR	1063	0000	12920	XXXX	FCB	0	
0984 00	0984	11830	TST 3+FCR,FCB IF CALLED FROM ASSEMBLER	1064	0000	12930	XXXX	FCB	0	
0985 00	0985	11840	BNQ EXIT USE NORMAL EXIT	1065	0000	12940	XXXX	FCB	0	
0986 00	0986	11850	LDB 3+FCR,FCB RESTORE STACK POINTER	1066	0000	12950	XXXX	FCB	0	
0987 00	0987	11860	BNQ 3B44 MAKE A FC ERROR	1067	0000	12960	XXXX	FCB	0	
0988 00	0988	11870	*	1068	0000	12970	XXXX	FCB	0	
0989 00	0989	11880	LDB 3+FCR,FCB RESTORE STACK ADDR.	1069	0000	12980	XXXX	FCB	0	
0990 00	0990	11890	LDB STATUS,FCB TO PRESENT STATUS	1070	0000	12990	XXXX	FCB	0	
0991 00	0991	11900	TST 3+FCR,FCB IF CALLED FROM ASSEMBLER	1071	0000	13000	XXXX	FCB	0	
0992 00	0992	11910	BNQ EXITA GET-OUT	1072	0000	13010	XXXX	FCB	0	
0993 00	0993	11920	JMP 3B44 OTHERWISE RETURN TO BASIC	1073	0000	13020	XXXX	FCB	0	
0994 00	0994	11930	EXITA KES	1074	0000	13030	XXXX	FCB	0	
0995 00	0995	11940	*** DATA REFERENCES	1075	0000	13040	XXXX	FCB	0	
0996 00	0996	11950	GACT FCB 0	1076	0000	13050	XXXX	FCB	0	
0997 00	0997	11960	GACT FCB 0	1077	0000	13060	XXXX	FCB	0	TOP-LEFT COLUMN DEST. CHANGES
0998 00	0998	11970	GACT FCB 0	1078	0000	13070	XXXX	FCB	0	
0999 00	0999	12000	CAIT FCB 0	1079	0000	13080	XXXX	FCB	0	TOP-LEFT ROW DEST. CHANGES
1000 00	1000	12010	ACTION FCB 0	1080	0000	13090	XXXX	FCB	0	
1001 00	1001	12020	ACTION FCB 0	1081	0000	13100	XXXX	FCB	0	CURRENT OPTION
1002 00	1002	12030	K8N FCB 0	1082	0000	13110	XXXX	FCB	0	
1003 00	1003	12040	K1AN FCB 0	1083	0000	13120	XXXX	FCB	0	
1004 00	1004	12050	BONS FCB 0	1084	0000	13130	XXXX	FCB	0	
1005 00	1005	12060	AUX FCB 0	1085	0000	13140	XXXX	FCB	0	
1006 00	1006	12070	FLU FCB 0	1086	0000	13150	XXXX	FCB	0	
1007 00	1007	12080	AUX FCB 0	1087	0000	13160	XXXX	FCB	0	
1008 00	1008	12090	AUX FCB 0	1088	0000	13170	XXXX	FCB	0	

96K EXPANDERS
 Permanent Software in a ROM that allows full use of both 32K memory banks in 64K or larger computers. 96KX-M module \$59.95 Cartridge. \$49.95

VIDEO REVERSERS
 Provide (

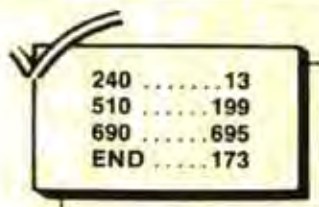
Send In The Clowns

By Daryl Judd



This simple program, called *The Clown*, represents an initial experiment with graphics by the author. His idea for *The Clown* was inspired on a cold day in an attempt to turn thoughts to fair weather. The program also plays a refrain from the well-known tune, "Send in the Clowns." It requires 16K ECB and uses regular BASIC program commands.

(Daryl Judd directs the news at KIVI-TV channel six in Nampa, Idaho. He works on his computer in his spare time.)



The listing: CLOWN

```

10 CLS:PCLEAR8
20 A$="L4CL4DL4GL1GP2":B$="L4AL4
BL4GL4AL4BL4BL2BP4"
30 C$="L4BO4L4DO3L4DL1EP4":D$="L
4EL4GL4CL1DP4"
40 E$="L4EL4EL4GL4CL1D":F$="P1L4
DL4EL4GL4G-L1G"
50 PRINT"the clown":PRINT@498,"B
Y DARYL JUDD";
60 FORX=1TO500:NEXTX
70 PMODE 3,1:PCLS:COLOR 2,2
80 REM*BALLOONS*
90 CIRCLE (50,50),20,2
100 PAINT(35,53),2,2
110 CIRCLE(50,50),21,3,1,0,.27
120 CIRCLE(70,70),20,3,1,.72,.49
130 PAINT(70,70),3,3
140 LINE(48,70)-(52,70),PSET
150 LINE(48,71)-(52,71),PSET
160 LINE(46,72)-(54,72),PSET
170 COLOR 3,3
180 LINE(50,70)-(50,180),PSET
190 LINE(69,90)-(71,90),PSET
200 LINE(68,91)-(72,91),PSET
210 LINE(66,92)-(74,92),PSET
    
```

```

220 LINE(70,90)-(70,190),PSET
230 CIRCLE(85,30),20,4
240 PAINT(85,32),4,4
250 COLOR 4,4
260 LINE(84,50)-(86,50),PSET
270 LINE(83,51)-(87,51),PSET
280 LINE(81,52)-(89,52),PSET
290 COLOR 3,3
300 LINE(85,50)-(85,184),PSET
310 SCREEN 1,0
320 PMODE 3,5
330 PCLS(2)
340 REM*DRAW HEAD*
350 CIRCLE(127,80),60,3,1,.5,0
360 COLOR 3,1

```



```

370 LINE(68,80)-(68,100),PSET
380 LINE(185,80)-(185,100),PSET
390 CIRCLE(68,133),65,3,.5,.2,.75
400 CIRCLE(185,133),65,3,.5,.75,.3
410 CIRCLE(129,100),74,3,1,.16,.355
420 PAINT(127,21),1,3
430 REM*DRAW NOSE*
440 CIRCLE(130,110),15,2
450 PAINT(130,103),3,2
460 COLOR 1,1
470 CIRCLE(130,110),7,1,1,.45,.79
480 REM*DRAW LEFT EYE*
490 CIRCLE(106,80),15,2,2,.42,.1
500 CIRCLE(106,70),25,2,1,.6,.79
510 CIRCLE(106,93),10,2,.5,.6,.93
520 CIRCLE(96,80),15,2,1.2,.75,.14

```

```

530 PAINT(97,81),2,2
540 LINE(99,70)-(99,80),PSET
550 CIRCLE(96,80),16,3,1.2,.77,.1
560 REM*DRAW RIGHT EYE*
570 CIRCLE(150,80),15,2,2,.42,.1
580 CIRCLE(150,70),25,2,1,.71,.9
590 CIRCLE(150,93),10,2,.5,.6,.93
600 CIRCLE(140,80),15,2,1.2,.75,.14
610 PAINT(141,81),2,2
620 LINE(143,70)-(143,80),PSET
630 CIRCLE(140,80),16,3,1.2,.77,.1
640 REM*DRAW MOUTH*
650 CIRCLE(126,77),74,2,1,.13,.37
660 CIRCLE(129,65),74,3,1,.13,.37
670 CIRCLE(129,95),74,3,.9,.1,.4
680 CIRCLE(77,128),10,3,1,.4,.83
690 CIRCLE(183,126),10,3,1,.72,.2
700 REM*DRAW HAIR*
710 CIRCLE(50,90),15,4
720 CIRCLE(199,90),15,4
730 CIRCLE(30,90),20,4
740 CIRCLE(218,90),20,4
750 CIRCLE(18,100),10,4
760 CIRCLE(232,100),10,4
770 CIRCLE(30,75),12,4,1.8
780 CIRCLE(220,75),12,4,1.8
790 CIRCLE(50,69),18,4
800 CIRCLE(201,69),18,4
810 CIRCLE(34,63),22,4
820 CIRCLE(213,63),22,4
830 CIRCLE(52,48),20,4,.6
840 CIRCLE(198,48),20,4,.6
850 CIRCLE(54,46),16,4
860 CIRCLE(195,46),16,4
870 CIRCLE(69,40),10,4
880 CIRCLE(180,40),10,4
890 CIRCLE(79,35),8,4
900 CIRCLE(174,35),8,4
910 CIRCLE(88,28),4,4
920 CIRCLE(162,29),4,4
930 X$="XA$;XA$;XB$;XC$;XD$;XE$;"
940 PLAY X$
950 SCREEN 1,1:PLAY F$
960 GOTO 960

```

DISK
\$44.95

NEW

Introducing The "Super Smart"
DATA PACK II
TERMINAL COMMUNICATIONS SOFTWARE

Also Supports The PBJ 80 Column "Word Pak", Deluxe RS-232 Pak,
Parallel Printer Card and PBJ 2SP Pak

"FEATURES"

- No Lost Information When Using Hi-Resolution Display On Line
- ASCII Compatible File Format
- Full Text Buffering
- Terminal Based Rates: 20 to 9600
- Automatic Word Wrap Eliminates Soft Words
- Full-Half Duples
- Automatic File Capture
- Programmable Word Length, Parity and Stop Bits
- Save and Load Text Buffer and Program Key Buffers to Tape or Disk
- 9 Hi-Resolution Display Formats: 28 to 255 x 24
- True Upper/Lower Case Display
- KB Graphics Option for an Extra 6K
- Supports Line Break

- Erase Display and Review Information On Line
- Send Files Directly from Buffer or Disk
- Full Disk Support for Disk Version
- Send Control Codes from Keyboard
- Separate Printer Band Rates: 110-9600
- Display on Screen or Output Contents of Buffer to Printer
- Automatic Memory Sense 16-64K
- 9 Programmable Function Key Variable Length Macro Buffer
- Programmable Prompt Character or Delay to Send Next Line
- Programmable Control Character Trapping
- Programmable Open/Close Buffer Characters
- Automatic Key Repeat For Editing
- Program and Memory Status Displays

TAPE
\$34.95

NEW

9 Unlimited
Variable Length
Macro Key Buffers

**BUFFER
EDITOR**
Insert, Delete
or Add
To Buffer

NEW!!!

"The Wait is Finally Over"
ANNOUNCING
The CBASIC COMPILER

Now anyone can create fast efficient Machine Language Programs
without the Drudgery of using an Assembler.

NEW!!!

CBASIC is a fast Machine Language integer Basic Compiler that can convert Color Basic programs into fast machine language programs. CBASIC features over 100 Basic Commands and functions that fully support Disk, Tape, Screen and Printer I/O, Hi & Low Resolution Graphics, Sound, Play and String Operations just like Color Basic. CBASIC also includes a powerful full featured Basic program Editor using a 51, 64 or 85 by 24 line display. The Hi-Resolution display can be automatically included in your compiled program for enhanced display capability and allow mixed text and graphic displays.

- Graphics Commands:** CIRCLE, COLOR, CLS, DRAW, GET, LINE, PAINT, PCIS, PCOPY, PMODE, PRESET, PSET, PLUT, RESET, SCREEN, SET, POINT, PPOINT
- Sound Commands:** PLAY, SOUND
- String Functions:** CHR\$, LEFT\$, MID\$, RIGHT\$, LEN, INSTR, LSET, RSET, TRIM\$, STR\$, STRING\$, INKEY\$, MKNS
- Numeric Functions:** ABS, POS, TIMER, RND, ASC, TAB, CAL, JOYSTK, PEEK, POKE, LOC, LOF, EOF, FREE, CVN, ERR, VARPTR, SWAP
- I/O Commands:** OPEN, CLOSE, INPUT, LINEINPUT, PRINT WRITE, PRINT @, GET, PLUT, KILL, CHAINM, FIELD, DATA, READ, RESTORE

- Program Control:** FOR/NEXT, STEP, GOTO/GOSUB, IF/THEN/ELSE, RETURN, STOP, RETL, ON, GOTO/GOSUB, ON ERROR, ON RESET, ON IRQ/IRQ/NMI, ON OVR/NOVR, EXEC, LET
- Directives:** ORG, REM OR', END, DIM, END, BASE, RAM, ON/OFF, RAM64K, HIRRES, GENERATE, DPSET, STACK
- Editor Commands:** LINE EDIT, AUTO EDIT, COPY, MOVE, RENUMBER, AUTO LINE*, PRINTER, LIST, DELETE, SEARCH, REPLACE, BAUD RATE, PRINTER, CBASIC, TAPPEND, SKIP, SIZE, LOAD, SAVE, APPEND, KILL, DIR, and much, much more.

REQUIRES 32K and Disk, 64K recommended

Introductory Price \$119.00
Regularly \$149.00

HI - RES II
SCREEN UTILITY

NEW IMPROVED VERSION

- UP TO 85 CHARACTERS PER LINE READABILITY
- ADJUSTABLE AUTOMATIC KEY REPEAT
- PROTECT 1-23 SCREEN LINES
- CONTROL CODE KEYBOARD



- FULLY BASIC COMPATIBLE
- DISPLAY FORMATS OF 28 to 255 CHARACTERS PER LINE
- FULL 96 UPPER/LOWER CASE CHARACTERS
- MIXED GRAPHICS & TEXT OR SEPARATE GRAPHIC & TEXT SCREENS
- INDIVIDUAL CHARACTER HIGHLIGHTING
- REVERSE CHARACTER HIGHLIGHT MODE
- WRITTEN IN FAST MACHINE LANGUAGE
- AUTOMATIC RELOCATES TO TOP OF 16/32K
- AUTOMATICALLY SUPPORTS MIX of RAM WITH RESET CONTROL
- REVERSE SCREEN
- ON SCREEN UNDERLINE
- DOUBLE SIZE CHARACTERS
- ERASE TO END OF LINE
- ERASE TO END OF SCREEN
- HOME CURSOR
- BELL TONE CHARACTER
- HOME CURSOR & CLEAR SCREEN
- REQUIRES ONLY 2K of RAM
- COMPATIBLE WITH ALL TAPE & DISK SYSTEMS

\$24.95 TAPE **\$29.95** DISK

ALL ORDERS SHIPPED FROM STOCK
ADD \$2.50 POSTAGE

**CER
COMP**

5566 Ricochet Avenue Las Vegas, Nevada 89110

(702) 452-0632

PROGRAM FEATURES	Screen Enhancement Program Comparison Chart		
	HI-RES II NEW	HI-RES I OLD	BRAND X
Upper/Lower case characters	Yes	Yes	Yes
Mixed Text and Graphics	Yes	Yes	Yes
Separate Text & Graphics	Yes	Yes	No
Print @ fully implemented	Yes	Yes	Yes
Print @ on all line lengths	Yes	Yes	Yes
Different line lengths	28 to 255 (128 to 255) (9)	28 to 255 (9)	28 to 255 (11)
Automatic Key Repeat	Yes	Yes	Yes
Adjustable Key Repeat	Yes	No	No
Auto Repeat Disable	Yes	No	No
Erase to end of line/screen	Yes	Yes	Yes
Home Cursor	Yes	Yes	Yes
Scroll or Blinking Cursor	Yes	No	Yes
CLS command supported	Yes	Yes	Yes
%V Coordinate Cursor	Full/Back	Full/Back	Full/Back
Photocopy	Yes	Yes	No
Double Size Characters	Yes	Yes	No
Individual/Continuous	Yes	Yes	No
Highlighting	Yes	Yes	No
On-Screen Underline	Yes	Yes	No
Clear Key functional	Clear, key, Clear key	Clear	No
In 32 & 64K Supported	Yes	Yes	Yes
Green or Black Background	Yes	No	No
Color	Yes	No	No
Dual Character sets for Enhanced 64 and 85	Yes	No	No
Character per line display	Yes	No	No
Protect Screen Lines (programmable)	1 to 23	No	No
Full Control Code Keyboard for Screen control (direct)	Yes	No	No
Programmable Tab Character	Yes	No	No
Spacing	Yes	No	No
Full Screen Reverse Function	Yes	Yes	No
Search to & from the Standard	Yes	Yes	No
In by 32 Screen for full compatibility	Yes	No	No
On Error Goto Function	No	No	Yes
Extended Basic Required	No	Yes	Yes
Alt Machine Language Program	Yes	Yes	Yes
RAM Required in addition to Screen RAM	2K	2K	2K
Program Price (Tape)	\$24.95	\$29.95	\$29.95



VISA, MASTERCARD AND C.O.D. ACCEPTED

Make your computer a piece of precision machinery with these blueprints for adding a real-time clock



CoCo Chronograph

By Colin J. Stearman

"Time is money" so they say, and going by the cost of the commercial real-time clocks available for the CoCo, they must be right! A real-time clock is simply a clock chip similar to one in a digital watch which can be read by the computer to find out the "real" time, date and day of the week. The clock should run

(Colin J. Stearman is an electronics engineer educated in the U.K. He has worked with all kinds of computers and has been a CoCo enthusiast for over three years.)

independently of the computer and continue to keep time when the computer is off. With this in mind, let's design and build a real-time clock for CoCo.

Design Goals

The clock should be out of sight inside CoCo so it does not use up a valuable cartridge slot. CoCo should charge the clock batteries while you're computing. Also, the clock chip should be inexpensive and accurate.

To meet these goals, the *CoCo Chronograph* will be installed inside CoCo and use the OKI MSM5832 clock/calendar chip. It meets all the requirements and I have seen it advertised for as little as \$3.95! It is also very

simple to interface as the schematic in Figure 1 shows. The block diagram for this chip is shown in Figure 2.

Construction

The object of the construction is to mount a new 6821 PIA (Peripheral Interface Adapter) inside the computer without making irreversible modifications to the circuit board. I did this by "piggybacking" the new PIA onto U4 in the gray CoCo (U7 in the CoCo 2). U4 (U7) is an existing PIA used to drive the D/A converter and control the VDG chip.

To construct the unit, first gather the components listed in Figure 1. JDR Microdevices (800-538-5000 or 800-995-5430 in California) is a good source for all the chips and transistors. Parts should run in the price range of \$12-\$15. By the time you add the board (Radio Shack #276-158 or similar) and the other miscellaneous resistors, capacitors and wire, the total cost should be under \$25. (That satisfies goal #3!)

To assemble the parts, first remove the cover from CoCo and also the RF shield lid inside if yours has one. Locate U4 (U7 in CoCo 2) and the 6821 (6822 in CoCo 2). Gently pry the IC out of its socket using a small screwdriver or IC puller. Be careful not to damage the pins. Put CoCo to one side as we will now construct the piggyback board assembly.

Mount the 40-pin socket to the printed circuit board anywhere convenient, but remember it will be positioned directly over the PIA we just removed from CoCo and must not interfere with any nearby components. Also mount the socket toward the edge of the board to leave room for the other chips and components. Solder all pins on the socket to the PCB, but *do not* cut off the excess.

Take the new 6821 and gently bend pin 24 outward a little so when the IC is put into the socket, this pin will not enter it. Put the IC in the socket and press it home.

Mount the CD4011 along side the 6821 near pin 24. Solder all pins to the board. Using the hook-up wire, connect pins 7, 8, 9, 12 and 13 together, and also to pin 1 of the 40-pin socket. Connect pin 14 of the CD4011 to pin 20 on the 40-pin socket. Connect pins

1 and 2 to pin 24 of the 6821. This is the bent pin not inserted into the socket. Also connect this pin to a length of wire about nine inches long; the other end will be connected later. Connect pin 3 of the CD4011 to pin 24 of the 40-pin socket.

Now mount the remainder of the components. The layout is not critical, but try to keep the crystal XT and the capacitors C1 and C2 close to pins 16 and 17 of the MSM5832. The batteries should not be mounted on the board. Use two AA size NiCads (Radio Shack #23-125) in a holder (Radio Shack #270-382). Connect to the holder with a battery snap (Radio Shack #270-325).

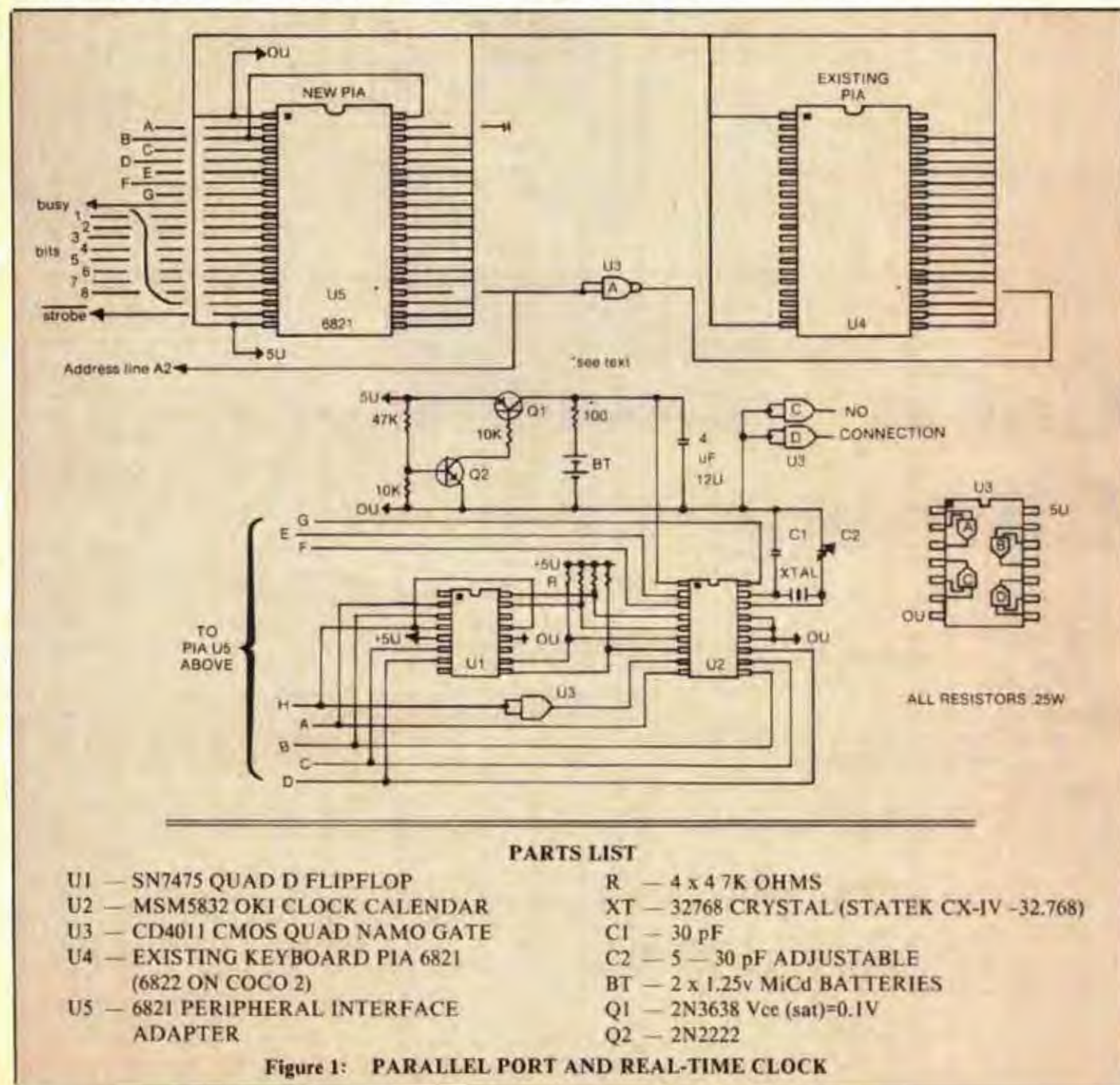
The entire battery assembly can be mounted anywhere convenient in the case. (I put mine under the keyboard.)

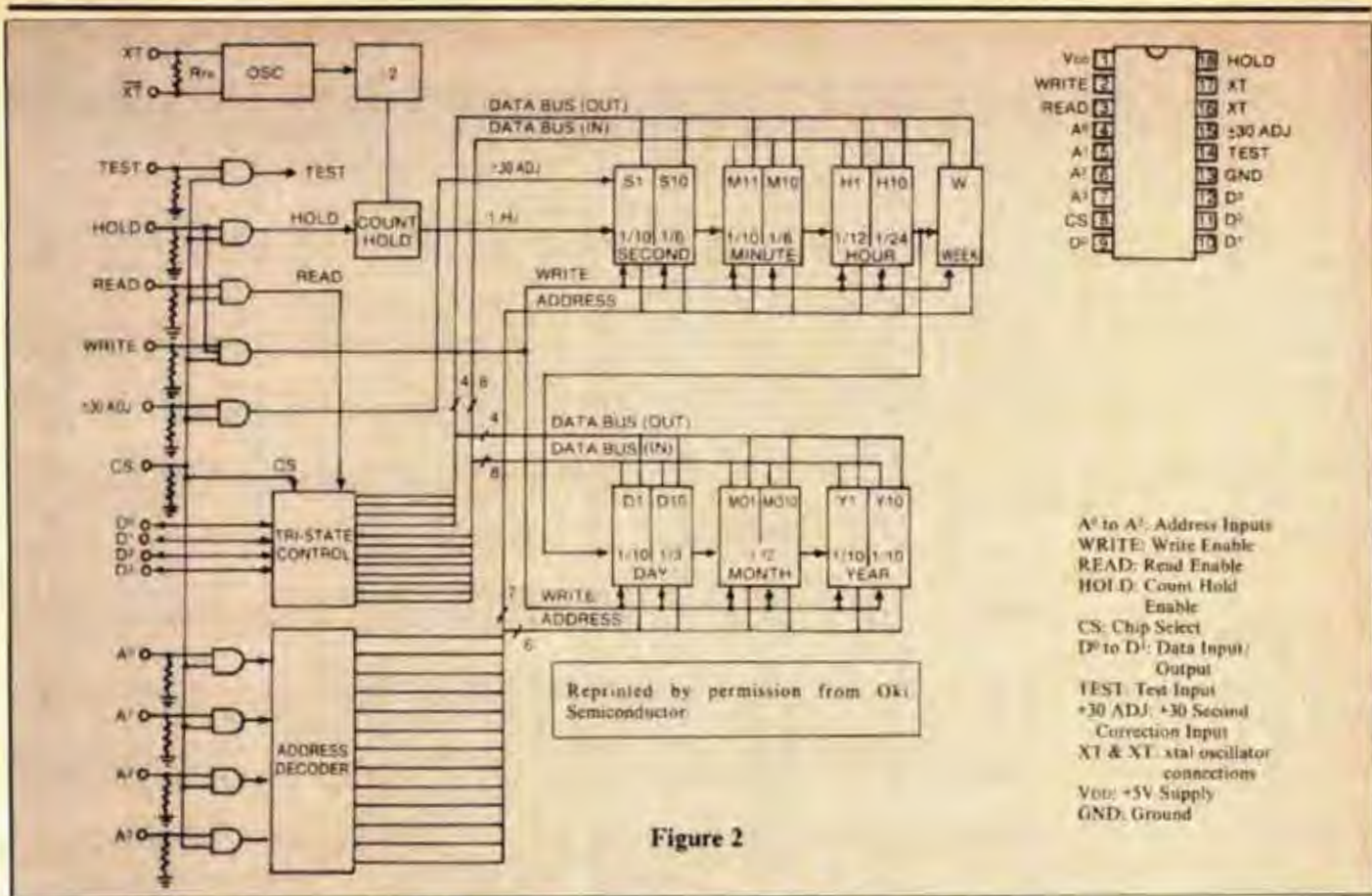
Wire up the components as shown in Figure 1. All connections between the new PIA and the existing PIA are achieved later by the piggyback technique. Letters 'A' through 'H' show the connections between the clock circuit and the new PIA. Don't forget that connection between pin 3 and 40 on U5! All references to +5V can be picked up from pin 20 of U5. Similarly the 0V connections can be connected to pin 1 of U5.

When all wiring is complete, turn the PCB upside down and cut off the wire-

wrap pins from pins 2 through 19, and pins 39 and 40 only. Cut them as close as possible to the board. The next task is to mount the assembly on top of the 6821 (6822) removed previously from CoCo.

Locate this PIA and carefully bend pin 24 so it points vertically upward. Position the circuit assembly on top of this IC to test for fit. It may be necessary to splay the wire-wrap pins out a little. In order for the finished assembly to fit under the RF shield lid if you have one, the remaining wire-wrap pins must be trimmed as short as possible. Gauge how much you can cut from each pin and then trim all to this height.





SELECTED SOFTWARE

SALE! 20% OFF OUR 64K UPGRADE KIT

COMPLETE SOLDERLESS KITS WITH EASY-TO-FOLLOW INSTRUCTIONS

4K-16K FOR ALL BOARDS	\$19.95
4K-32K FOR ALL BOARDS	\$54.95
16K-32K FOR ALL BOARDS	\$39.95
64K FOR E, F OR COCO 2*	\$59.95

*NEW COCO 2 MODEL 26-3134/36 REQUIRES ONE SOLDER JOINT

PLEASE SPECIFY BOARD REVISION OR MODEL NO.

NOTE: All ICs used in our kits are first quality 200NS Prime Chips and carry one full year warranty

MONITORS

Zenith ZVM - 123 Green	\$119.95
Zenith ZVM - 122 Amber	\$129.95
Zenith ZVM - 131 Color	\$345.95

20% off any VIDEO PLUS with monitor purchased

MONITOR INTERFACE

VIDEO PLUS Color or monochrome for COCO 1	\$24.95
VIDEO PLUS II C Color or monochrome for COCO 2	\$34.95
VIDEO PLUS II U Color or monochrome for COCO 2 model 26-3134/newer	\$34.95

COCO MAX®

COMPLETE SYSTEM WITH SOFTWARE ON TAPE OR DISK REQUIRES 64K

\$69.95

Y branching cable for disk systems

\$27.95

BUY BOTH & SAVE 10% \$149.95

PRINTER SPECIAL

SG-10	\$259.95
MODEL 101 INTERFACE (METRIC INDUSTRIES)	\$54.95
PACKAGE PRICE	\$299.95
CASH PRICE	\$289.95

(Certified check, money order or C.O.D.)

DS-69 DIGISECTOR™

THIS FINE DEVICE MAY ALSO BE LINKED TO COCO MAX FOR MAGIC RESULTS. COMES WITH C-SEE SOFTWARE ON TAPE OR DISK. REQUIRES 64K.

\$149.95

THE HJL-57 KEYBOARD

WITH FREE SOFTWARE FOR FOUR FUNCTION KEYS.

REG. \$79.95 SALE \$74.95

*Please specify model (original, F version or COCO 2)

DATARASE®

ERASES MOST EPROMS IN 3 MINUTES

\$39.95

EPROMS

2764	\$9.95
27128	\$17.95
ROM PAK P.C. BOARD WITH CASE FOR 27XX	\$9.95

OPTIONAL CABLE FOR P51 MUSTANG

\$9.95

ROMPAK SPECIAL

8-BALL \$17.95

20% OFF ANY SOFTWARE ORDER

	tape	disk
DYNACALC (64K)	—	99.95
PRO-COLOR-FILE 2.0	—	59.95
MASTER DESIGN	—	29.95
TELEWRITER-64	49.95	59.95
SUPER SCREEN	44.95	47.95
COLORCOM/E	—	49.95
(Rompak or Disk)		
THE PEEPER	24.95	26.95

(with source)

32K GAMES

P51 MUSTANG	29.95	34.95
SAILOR MAN (64K)	29.95	34.95
WORLDS OF FLIGHT	29.95	32.95
DRACONIAN	27.95	30.95
SR-71 (ext.)	28.95	31.95
BUZZARD BAIT	27.95	30.95
GALAGON	24.95	27.95
INTRA. GRAND PRIX	34.95	34.95
CANDY COMPANY	34.95	34.95
SEA DRAGON	34.95	—

BOOKS

COLOR BASIC UNRAVELLED	\$19.95
EXTENDED BASIC UNRAVELLED	\$19.95
DISK BASIC UNRAVELLED	\$19.95
ALL 3 BOOKS	ONLY \$49.95

WE PAY SHIPPING in the United States, Canada & Mexico. Overseas please add 10. (MN Residents add 5% sales tax.) We accept Visa, Mastercard, check or money order. U.S. funds only for foreign orders. C.O.D. please add \$2.00

SELECTED SOFTWARE

P.O. Box 32228 Fridley, MN 55432
 24 Hour Order Line 612 757 2439
 Information 11 a.m. - 2 p.m. C.S.T.
 612 757 1026

Now solder the wire-wrap pins to the original PIA, soldering each pin to its respective pin on the PIA. You should be connecting to pins 1, 20 and 21 through 38. The wire-wrap pin 24 will connect to the up-turned pin 24 on the PIA. This pin will not connect to the CoCo socket when the PIA is returned to the CoCo motherboard. When soldering the assembly to the back of the PIA, minimize the amount of solder used so the IC will still fit into its socket. Also position the solder joint high on the pins so the lower part will still fit the socket.

Now mount the finished assembly into CoCo. Press the lower PIA gently but firmly into the CoCo socket. All pins of the lower PIA must enter the socket, except for pin 24 which was bent upwards. Make sure pin 1 is returning to the same place it came from. If you can't remember, all chips are oriented the same way in both style CoCos. It's not easy to see that all pins enter the socket, so inspect the results carefully. The assembly should be firm and quite rigid when installed.

The wire still left unattached must be soldered to pin 10 of the 6809 CPU. Cut this wire to a suitable length and attach it either directly to pin 10 of the 6809 or to a convenient solder point connected to this pin. You'll have to trace one out. Probably soldering lightly to the chip is best as the CPU can more easily be replaced than the board if things go wrong! This wire picks up address line 2 to allow the software to distinguish between the two PIAs.

If you followed my recent series, "Cooking with CoCo," you may notice something familiar about the circuit in Figure 1. In Part six of that series (December 1984 RAINBOW, Page 154), we constructed a parallel port by adding a new 6821 PIA chip. This had some unused ports and it is these which are used to access the real-time clock.

If you do not want the parallel port, simply make no connections to pins 9 through 19 of the U5 chip. If you do, then check the "Cooking with CoCo" article previously mentioned on how to drive the port. If you built the port then, you'll have to modify it to accommodate the real-time clock. (The SN7404 used in "Cooking with CoCo" *must* be replaced with a CD4011 and this does not have the same pinout. If you don't change it, the clock will not work! Also, you may need a larger board on which to mount the additional components.)

Listing 1: REAL TIME

```

0001      TTL      CoCo Chronograph
0002 *****
0003 *          REAL TIME CLOCK PROGRAM          *
0004 *          C.J. STEARHAN (C) 1985          *
0005 *****
0006 *
0007 *
0008 * THIS ROUTINE IS CALLED FROM BASIC TO
0009 * SET OR READ THE NSH5832 CLOCK. THE
0010 * CALL IS:
0011 *
0012 * A=USR(VARPTR(AS))
0013
0014 * IF A IS ZERO CALL WAS OK. NOT ZERO PROBABLY
0015 * MEANS A$ NOT AT LEAST 14 CHARACTERS LONG
0016 *
0017 * WHERE AS IS A 14 CHARACTER STRING AS FOLLOWS:
0018 *
0019 * BYTE #      MEANING
0020 * 1          YEARS TENS
0021 * 2          YEARS UNITS
0022 * 3          MONTH TENS
0023 * 4          MONTH UNITS
0024 * 5          DAY TENS
0025 * 6          DAYS UNITS
0026 * 7          DAY OF THE WEEK
0027 * 8          HOURS TENS
0028 * 9          HOURS UNITS
0029 * 10         MINS TENS
0030 * 11         MINS UNITS
0031 * 12         SECONDS TENS
0032 * 13         SECONDS UNITS
0033 * 14         READ/WRITE FLAG
0034 *
0035 * ALL VALUES ARE GIVEN AND RETURNED AS ASCII
0036 * CHARACTERS. THE CLOCK IS IN 24 HOUR FORMAT.
0037 * THE READ/WRITE FLAG IS "0" TO READ THE CLOCK
0038 * AND SET TO "1" TO WRITE THE CLOCK.
0039 *
0040 * THE LEAP YEAR FLAG IS SET TO CAUSE FEBRUARY
0041 * TO HAVE 29 DAYS IN A LEAP YEAR. THIS OCCURS
0042 * WHENEVER THE THE CLOCK IS READ IN JANUARY
0043 * OR FEBRUARY OF THE LEAP YEAR. THIS MAKES THE
0044 * LEAP YEAR CORRECTION AUTOMATIC AND TRANSPARENT
0045 * TO THE USER, ASSUMING THE CLOCK IS READ AT
0046 * LEAST ONCE DURING JANUARY/FEBRUARY OF THE
0047 * LEAP YEAR.
0048 *
0049 * A TYPICAL WRITE CALL TO SET THE DATE TO
0050 * SEPTEMBER 19 1984 WEDNESDAY
0051 * 14:52 (SECONDS ARE NOT WRITTEN):
0052 *
0053 * A$="84091941452001"
0054 *
0055 * WHEN CALL IS MADE DATA IS WRITTEN AND SECONDS
0056 * SET TO ZERO
0057 *
0058 * TO READ THE CLOCK CALL WITH:
0059 *
0060 * A$=STRING$(14,"0")
0061 *
0062 * THE DATA IS RETURNED IN THE STRING IN THE
0063 * SAME FORMAT AS ABOVE, INCLUDING SECONDS
0064 *
0065 * EACH CALL LEAVES THE CLOCK SET UP WITH
0066 * A0-A3 HIGH, READ HIGH, WRITE AND HOLD LOW, AND
0067 * CS HIGH TO ENABLE THE 1 SECOND INTERRUPT
0068 * THIS INTERRUPT COMES IN ON CA1 AT $FF25
0069 *
0070 *****
0071 *
0072      ORG      $7E00
0073 PWRCLK BSR TEST VERIFY CALL
0074 *****
0075 *THIS ROUTINE READ/WRITE A BLOCK OF 13 BYTES
0076 *TO THE CLOCK. THE 14TH BYTE IS 0 TO READ
0077 *DATA AND 1 TO WRITE DATA. ALL VALUES ARE ASCII
0078 *REG X POINTS TO THE FIRST BYTE TO GO AT CLOCK

```


Double-Check

When all wiring and construction has been checked and double-checked, the assembly must be given the "smoke test." You may not be aware that all electronic components work by using smoke, but once the smoke gets out, they no longer work. How many chips have you had smoke come out of and they still work afterwards?

Turn CoCo on and watch for any smoke leaks! If the normal banner comes up and all the smoke stays in the chips, things are looking good. Use your meter to measure the voltage between an OV point and pin 1 of the MSM5832. It should be around 4.8 volts.

Also measure across the emitter and collector of TR1; this is the same as measuring between pin 1 of the MSM5832 and pin 20 of the new PIA. This voltage should be about 0.1V and not more than 0.2V. This is the VCE(sat) of TR1, or the voltage from collector to emitter when the transistor is saturated. If it's too high, the MSM5832 will have insufficient drive voltage. Try another 2N3638 if it is too high. Turn CoCo off and measure pin 1 of the MSM5832 against an OV point again. It should be around 2.5V if your batteries are charged.

Calibration

The crystal oscillator for the clock runs at 32.768kHz and is trimmed with C2. However, you cannot measure this frequency directly with either an oscilloscope or frequency meter because either one will load the oscillator and change the very thing you're trying to measure. If you do have access to either of these test instruments, you can measure the square wave on pin 9 of the MSM5832. It should have a period of 976.5625uS (micro-seconds) plus or minus 0.0015uS. Use C2 to set it exactly.

If you do not have such equipment, the only alternative method is to compare your *CoCo Chronograph* time with a quartz watch or other accurate clock and adjust over several days. The adjustment of C2 is not very sensitive, so make reasonable size adjustments each time. Remember that C2 is a capacitor without stops and the adjusting screw will revolve a full 360 degrees, so at one point the capacitance change will reverse direction for the same direction turn of the screw adjustment.

```

0079 *ADDRESS 0. SEE ABOVE FOR FORMAT
0080 *
0081 LDB #12 BYTE COUNTER
0082 LDA 13,X GET READ/WRITE FLAG
0083 SUBA #0 ZERO IF READ/NOT IF WRITE
0084 PSHS A SAVE FLAG
0085 NXTVAL TST ,S CHECK READ/WRITE FLAG
0086 BEQ CLK BRANCH IF READING
0087 LDA ,X+ GET VALUE, WE'RE WRITING
0088 SUBA #0 MAKE INTO A BINARY VALUE
0089 *
0090 * GET DATA IN "A", ADDRESS IS IN "B"
0091 * MSB OF "A" SET FOR WRITE. MSB OF PIA IS
0092 * AN INPUT (PRINTER BUSY) SO IS IGNORED BY PIA
0093 *
0094 ORA #580 SET HIGH BIT FOR WRITE
0095 CMPB #5 WRITING H10?
0096 BNE CLK NO
0097 ORA #8 SET 24 HOURS CLOCK FLAG
0098 CLK BSR CLOCK
0099 TST ,S CHECK READ/WRITE FLAG
0100 BNE NOTRD NOT READING
0101 * see if we just read month. If it is 1 or 2
0102 * go to leapyear flag set routine
0103 CMPB #9 JUST READ H1?
0104 BNE NTWNTH NOT READING MONTHS
0105 BSR LEAP CHECK FOR LEAP YEAR
0106 NTWNTH CMPB #5 READING H10?
0107 BNE NOTH10 NO
0108 BTB BIT ANDA #3 KEEP ONLY LOW 2 BITS
0109 BRA SVEKIT
0110 NOTH10 CMPB #8 READING D10?
0111 BEQ BTB BIT
0112 SVEKIT ORA #0 MAKE INTO ASCII #
0113 STA ,X+ PUT READ VALUE IN ARRAY
0114 NOTLD DECB NEXT ADDRESS
0115 RPL NXTVAL DO NEXT ADDRESS
0116 LEAS 1,S RESTORE FLAG
0117 *
0118 * SET UP CLOCK TO ENABLE INTERRUPT
0119 LDB #5F A0-A3 HIGH
0120 BSR WRTADD
0121 LDB #520 READ HI, WRITE/HOLD LOW
0122 STB DR
0123 CLRA RETURN ZERO ERROR
0124 CRRB
0125 JMP $B4F4 EXIT
0126 *****
0127 * THIS VERIFIES CALL FROM BASIC
0128 * IF IT RETURNS PASSED STRING HAS
0129 * AT LEAST 14 CHARACTERS. X POINTS
0130 * TO FIRST CHARACTER
0131 *
0132 TEST JSR $B3ED GET VARPTR VALUE IN D.
0133 TFR D,X SAVE VALUE
0134 LDA ,X GET CHARACTER COUNT
0135 CMPA #14 must be at least 14
0136 BBS OK
0137 LEAS 2,S CLEAN STACK
0138 CLRA
0139 LDB #-1 RETURN -1 AS ERROR CODE
0140 JMP $B4F4
0141 OK LDB 2,X GET STRING ADDRESS
0142 TFR D,X PUT IT IN X
0143 RTS
0144 *
0145 *****LEAP YEAR FLAG SET*****
0146 * JUST READ MONTH AND IT WAS JAN OR FEB. X IS
0147 * POINTING AT H1. CHECK YEAR FOR LEAP YEAR
0148 * AND SET FLAG IN D10 IF SO.
0149 *
0150 LEAP PSHS A,B SAVE VALUES
0151 LDB -1,X SEE IF TENS ARE ZERO
0152 CMPB #0
0153 BNE NTLEAP NOT A ZERO
0154 CMPA #2 IS MONTH 2 OR 1?
0155 BHI NTLEAP AFTER FEBRUARY
0156 LDA -3,X GET Y10
0157 SUBA #0 MAKE INTO A VALUE
0158 LDB #10
0159 MUL
0160 ADDR -2,X B NOW HAS YEAR VALUE

```

Software

The primary driver software is a machine code program shown in Listing 1. It is designed to be called from BASIC and will both read or set the clock, depending upon the parameters in the call. I don't propose to talk much here about the assembly code as it is fully commented.

One interesting feature is the handling of leap year. If the clock is read and the month is January or February of a leap year, the leap year flag is set in the clock. This causes February to have 29 days instead of 28. So as long as the clock is read at least once during that period, adjustment for leap year will be automatic.

Listing 2 is the complete chronograph program containing all the necessary calls to the driver routine to both read or set the clock. The driver routine from Listing 1 is contained in the data statements and is POKEd into memory each time. This is for ease of entry if you do not have an assembler. However, it's not the fastest method and you may wish to save the driver to its own binary file and have the BASIC program load it automatically, or perhaps append it

7E76 C030	0161	SUBB #0	REMOVE ASCII PART OF YI
7E78 C004	0162	SUBLP SUBB #4	DECREASE BY 4
7E7A 2EFC	0163	BGT SUBLP	NOT ZERO KEEP REDUCING
7E7C 2D09	0164	BLT NLEAP	WENT NEGATIVE
	0165 *		
	0166 *	IS A LEAP YEAR, READ D10 AND SET FLAG AND WRITE	
7E7E C608	0167	LOB #98	ADDRESS OF D10
7E80 4F	0168	CLEA	PREPARE A FOR READ
7E81 8D06	0169	BSR CLOCK	READ D10
7E83 8AB4	0170	ORA #984	SET BIT AND WRITE FLAG
7E85 8D02	0171	BSR CLOCK	WRITE IT BACK
	0172 *		
7E87 3506	0173	NLEAP PULS A,B,PC	
	0174	*****	
	0175	*****CLOCK READ/WRITE*****	
	0176	*****	
	0177 *		
	0178 *	"A" CONTAINS DATA IN LOWER 4 BITS. IF MSB=1	
	0179 *	THEN WRITES DATA TO CLOCK, 0 READS FROM CLOCK	
	0180 *		
	0181 *	"B" CONTAINS ADDRESS TO READ/WRITE FROM	
	0182 *		
	0183 *	ALL REGISTERS ARE RETURNED UNCHANGED EXCEPT	
	0184 *	A WHEN READING. THEN A HAS ONLY 4 LSBITS SET	
	0185 *		
	0186	*****	
	0187 *		
FF24	0188	DR EQU \$FF24	
FF25	0189	CR EQU DR+1	
0030	0190	EXPDIR EQU \$30	EXPOSE DATA DIRECTION REG
0034	0191	EXPDR EQU \$34	EXPOSE DATA REGISTER
007F	0192	DATOUT EQU \$7F	SET LS 4 BITS AS OUTPUTS
0070	0193	DATIN EQU \$70	SET LS 4 BITS AS INPUTS
003C	0194	STROBE EQU \$3C	LET LATCH FOLLOW DATA
	0195 *		
7E99 3406	0196	CLOCK PSHS A,B	PRESERVE REGISTERS
7E9B 8000	0197	BSR WRADD	WRITE ADDRESS TO LATCH
7E9D 6DE4	0198	TST .5	TEST FOR READ OR WRITE



CINSOFT



PROGRAMS • PERIPHERALS • SUPPLIES • SERVICE

Free gift with any order placed on our exclusive "Electronic Shopping Service."

• Call •

513-396-SOFT



• Write •

2235 Losantiville, Cincinnati, OH 45237

SHIPPING will be charged at our ACTUAL COST.
Ohio residents add 5.5% Sales Tax COD add 2.00

• Shop by Modem •

513-396-SHOP



COD

NEW for 85...



\$289

SG-10

- 120 cps draft quality
- 30 cps NEAR LETTER QUALITY
- 2K buffer
- Proportional spacing

star

Authorized
STAR MICRONICS
Service Center

10% off any interface with printer

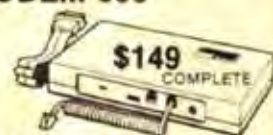
File Edit Goodies Font Style



Communications System...

VOLKSMODEM 300

plus
Your
choice
of



\$149

COMPLETE

- VIP Terminal
- Autolarm

\$177.80 Value

plus Comuserve Starter Kit (5 Free Hours)

plus "How to Get the Most Out of Comuserve"
GET ON LINE TODAY!

BUY 1 or 2 or 3
programs

Software Sale

SAVE 10 • 15 • 20%

VIP Library*	149.95
VIP Writer	89.95
VIP Calc.	89.95
VIP Database	59.95
VIP Terminal	49.95

*Maximum discount 10%

Elite Word	89.95
Elite Calc 3.0 (NEW!)	89.95
Elite File	74.50
Deft Pascal	
Workbench (NEW PRICE!)	89.95

Dynacalc	99.95
Musica 2	29.95
Graphicom	29.95
Worlds of Flight	29.95
P&S Mustang Attack	29.00

All the best from
Tom Mix, Mark Data,
Michtron, B5, TCE,
Sugar Software

to the end of the BASIC program with one of the previously documented techniques.

If you read the comments at the beginning of Listing 1, you will see exactly how to call the driver and make it read or set the chronograph. The important points to note are that byte 14 of the passed string is either a '1' to set the clock or '0' to read it. Those are ASCII characters.

Also note that when setting the chronograph, the seconds cannot be written and are always set to zero. Therefore, enter in the time at the end of the current minute as prompted and execute the write when this exact time is reached. Seconds are returned accurately when the clock is read.

Also, the day of the week is stored in the chronograph as a number from zero to six. Listing 2 arbitrarily sets zero to equal Monday. Of course, you can set this up however you wish, just remember the relationship you used.

Finally, that wire from pin 3 to pin 40 on the new PIA provides a one second interrupt to the PIA. This interrupt is connected to the FIRQ line, but the PIA is set up to prevent the

```

7E9F 2804      0199      BHI   DOWRT      WRITING DATA TO CLOCK
7E91 8D58      0200      BSR   READ       READ DATA FROM CLOCK
7E93 2002      0201      BRA   EXIT
7E95 8D3C      0202 DOWRT BSR   WRITE      WRITE DATA TO CLOCK
7E97 3506      0203 EXIT PULS A,B   RECOVER REGISTERS
7E99 39        0204      RTS
0205 *****
0206 *****SET UP ADDRESS IN LATCH*****
0207 *****
7E9A 8D10      0208 WR1ADD BSR   OUT          SET 4 PIA DATA LINES TO OUT
7E9C F7FF24    0209      STR   DR          PUT ADDRESS OUT OF PIA
7E9F 863C      0210      LDA   #STROBE    LET LATCH SEE IT
7EA1 87FF25    0211      STA   CR
7EA4 8634      0212      LDA   #EXPDR     AND THEN LOCK IT IN
7EA6 87FF25    0213      STA   CR
0214 *** ADDRESS DATA IS NOW LOCKED INTO THE LATCH
7EA9 8011      0215      BSR   IN          SET 4 BITS TO DATA IN
7EAB 39        0216      RTS
0217 *****
0218 * SET 4 PIA DATA LINES TO OUTPUT
7EAC 8630      0219 OUT   LDA   #EXPDR
7EAE 87FF25    0220      STA   CR          BIT 4 LOW EXPOSES DOR
7EB1 867F      0221      LDA   #DATOUT    DATA OUTPUT
7EB3 87FF24    0222      STA   DR
7EB6 8634      0223      LDA   #EXPDR     EXPOSE DATA REGISTER
7EB8 87FF25    0224      STA   CR
7EBB 39        0225      RTS
0226 *****
0227 * SET 4 PIA DATA LINES TO INPUT
7EBC 8630      0228 IN    LDA   #EXPDR
7EBE 87FF25    0229      STA   CR          BIT 4 LOW EXPOSES DOR
7EC1 8670      0230      LDA   #DATIN    DATA INPUT
7EC3 87FF24    0231      STA   DR
7EC6 8634      0232      LDA   #EXPDR     EXPOSE DATA REGISTER
7EC8 87FF25    0233      STA   CR
7ECB 39        0234      RTS
0235 *****
0236 ** 1 CLOCK =1.117US

```

FLY THE COCO-150 \$59.95



GREATLY ENHANCES SIMULATION OF AILERON, ELEVATOR AND THROTTLE - WORKS INTO JOYSTICK PORTS.

OR

THE ALBAH-152 -- OUR UNIT SIMILAR TO THE ABOVE BUT FOR USE WITH THE INTERNATIONAL BUSINESS MACHINES CORP. IBM-PC(XT) OR CLONES (WORKS GREAT WITH GUBLOGIC CORP. FLIGHT SIMULATOR II (FM).) ALBAH-152 (UNIT ONLY) \$ 73.95

ASI-1FR - REAL WORLD, REAL TIME, USER UPDATABLE AIRCRAFT INSTRUMENT FLIGHT PROCEDURES TRAINER PROGRAM (CAN BE USED TO PARTIALLY SATISFY FAA PART 41 INSTRUMENT CURRENTCY REQUIREMENTS.) COCO-150 OR JOYSTICKS REQUIRED + 32/84K EXT. COLOR BASIC. ASI-1FR \$29.95 (TAPE ONLY)

COCO JOYSTICK EXTENSION CABLE (18 FT.) - MAY BE USED WITH THE COCO-150 BUT YOU WILL NEED THO. \$ 3.95 EACH

FOR THE COCO-150 OR THE ALBAH-152 ADD \$3.50 POSTAGE AND HANDLING. IF ORDERING ONLY THE ASI-1FR OR THE EXTEN. CABLES ADD \$1.50. FLA. RESIDENTS ADD 5% FLA. SALES TAX.

ALBAH SCIENTIFIC, INC.
P.O. BOX 15226
DAYTONA BEACH, FLORIDA 32014

DEALER INQUIRES INVITED 384-252-5382

OS-9

USERS GROUP

- Information exchange — BBS or CompuServe
- Software Library — over 30 diskettes planned
- Periodic newsletter — MOTD (Message Of The Day)

Write for information
or
GO PCS18 on CompuServe

OS-9 USERS GROUP
P.O. BOX 7586
DES MOINES, IA
50322

OS-9 Trademark of Microware

CPU from seeing it. However, the flag bit in the PIA will indicate each time a second is counted and this can be used.

For example, the following BASIC program will cause a "beep" once a second. It will only work if you have read or set the time at least once by the program in Listing 2, as this sets up the new PIA and the chronograph for this feature.

```
10 A=PEEK(&HFF24):'TO CLEAR THE INTERRUPT FLAG
20 IF PEEK(&HFF25)AND &H80 THEN SOUND 160,1:GOTO10 ELSE 20
```

The flag which tells if there has been an interrupt from the chronograph is the most significant bit at SFF25. If this is one, then a beep is issued and the flag is reset by reading SFF24. If not, then Line 20 is re-executed until it is.

Wrapping it up

I have deliberately left some of the possible uses of the *CoCo Chronograph* to you. If you followed the "Cooking with CoCo" series, you could incorporate the clock set and read operations as BASIC commands and have the DATE\$ function automatically set on power up from a read of the clock. You could add a TIME\$ function which would return the time of day to BASIC without having to do a direct call to the driver in Listing 1.

If you didn't follow the series, there are many applications within your BASIC programs where knowing the real time, date or day of the week could be very useful. The techniques employed in Listing 2 can be used in these cases.

```
0237 ** 30 * 5 * 1.117 = 167.55 US DELAY
7EDC C61E 0238 DELAY LDB #30 DELAY 13005
7ECE 12 0239 WAIT NOP
7EDF 5A 0240 DECB COUNT DOWN
7ED0 26FC 0241 BNE WAIT 7 CLOCK PULSE LOOP
7ED2 39 0242 RTS
0243 *****
0244 *****
0245 *****WRITE DATA TO CLOCK*****
0246 *****
0247 * ASSUMES ADDRESS IS SET, DATA DIRECTION IS IN,
0248 * HOLD, READ, WRITE ALL LOW
0249 *
0250 WRITE BSR OUT SET DATA TO OUT
0251 LDA #540 HOLD HIGH
0252 ORA 2,S ADD IN DATA
0253 STA DR SEND IT TO PIA
0254 BSR DELAY
0255 *
0256 * EVERYTHING NOW SET UP TO WRITE
0257 ORA #510 WRITE HIGH
0258 STA DR
0259 ANDA #80F WRITE LOW,HOLD LOW
0260 STA DR
0261 BSR IN REST TO DATA IN
0262 RTS
0263 *****
0264 *****
0265 *****READ DATA FROM CLOCK*****
0266 *****
0267 * ASSUMES ADDRESS IS SET, DATA DIRECTION IS IN,
0268 * HOLD, READ, WRITE ALL LOW
0269 *
0270 READ LDA #540 HOLD HIGH
0271 STA DR SEND IT TO PIA
0272 BSR DELAY
0273 *
0274 * EVERYTHING NOW SET UP TO READ
0275 ORA #520 READ HIGH
0276 STA DR
0277 LDR DR GET DATA IN B
0278 ANDB #80F MASK LSB 4 BITS
0279 STB 2,S PUT RESULT ON STACK
0280 CLR DR READ LOW,HOLD LOW
0281 RTS
0282 *****
7E00 0283 END PWCLK
NO ERROR(S) DETECTED
```

You will find the *CoCo Chronograph* to be very accurate and the rechargeable batteries will keep the clock running for

months if you don't use your CoCo. But it's unlikely your CoCo will remain unused for that long!

Listing 2: CRNOGRPH

```
1 CLEAR 200,&H7DFF
2 DEF FNB(X)=VAL("&H"+BYTE$)
3 DIM DOW$(6),DAYS(12)
4 DATA MONDAY,TUESDAY,WEDNESDAY,
THURSDAY,FRIDAY,SATURDAY,SUNDAY
5 FOR I=0TO6:READDOW$(I):NEXT
6 DATA 31,28,31,30,31,30,31,31,3
0,31,30,31
7 FOR I=1 TO 12
8 READ DAYS(I)
```

```
9 NEXT
10 GOSUB 89 'INPUT MACHINE CODE
IF NECESSARY
11 CLS
12 IN$=STRING$(14,"0")
13 MID$(IN$,14,1)="1" 'TO SET WR
ITE FLAG
14 OUT$=STRING$(14,"0")
15 INPUT"READ OR SET TIME (R/S)"
;A$
16 IF LEFT$(A$,1)="S" THEN 24
17 GOSUB 76
18 IF RIGHT$(TIME$,2)="00" THEN
SOUND 140,1
19 PRINT@0, USING"TIME: % %
";TIME$
20 PRINTUSING"DAY OF WEEK: %
%";DOW$(VAL(WEEK$))
```

```

21 PRINT USING "DATE: %      %";DT
   $
22 PRINT "PRESS <BREAK> TO END"
23 GOTO 17
24 GOSUB 76
25 A$=LEFT$(TIME$,5)
26 PRINT "ENTER TIME (";A$;
27 LINEINPUT") ";K$
28 IF LEN(K$)>0 THEN A$=K$
29 IF LEN(A$)<>5 THEN 34
30 IF MID$(A$,3,1)<>":" THEN 34
31 IF VAL(LEFT$(A$,2))<0 OR VAL(
LEFT$(A$,2))>23 THEN 34
32 IF VAL(RIGHT$(A$,2))<0 OR VAL
(RIGHT$(A$,2))>59 THEN 34
33 GOTO 35
34 SOUND 80,1:GOTO 24
35 B$=DOW$(VAL(WEEK$))
36 PRINT "ENTER DAY OF WEEK (";B$
   ;
37 LINE INPUT") ";K$
38 IF LEN(K$)>0 THEN B$=K$
39 FOR I=0 TO 6
40 IF B$=LEFT$(DOW$(I),LEN(B$))
THEN 42
41 NEXT: SOUND 80,1:GOTO 35
42 DOW=I
43 'DATE LOADER
44 C$=DT$
45 PRINT "ENTER DATE (";C$;
46 LINEINPUT") ";K$
47 IF LEN(K$)>0 THEN C$=K$
48 IF LEN(C$)<>8 THEN 61
49 D=VAL(MID$(C$,4,2))
50 Y=VAL(RIGHT$(C$,2))
51 M=VAL(LEFT$(C$,2))
52 IF M<0 OR M>12 THEN 61
53 IF Y<0 THEN 61
54 IF D<1 THEN 61
55 IF M=2 THEN 58
56 IF D>DAYS(M) THEN 61 ELSE 62
57 ' DO FEBRUARY
58 IF (INT(Y/4)<>Y/4) AND (D>DAYS(M
)) THEN 61
59 ' LEAP YEAR
60 IF D>29 THEN 61 ELSE 62
61 SOUND 80,1:GOTO 44
62 D$=STR$(D): IF LEN(D$)=2 THEN
MID$(D$,1,1)="0" ELSE D$=RIGHT$(
D$,2)
63 M$=STR$(M): IF LEN(M$)=2 THEN
MID$(M$,1,1)="0" ELSE M$=RIGHT$(
M$,2)
64 Y$=STR$(Y): IF LEN(Y$)=2 THEN
MID$(Y$,1,1)="0" ELSE Y$=RIGHT$(
Y$,2)
65 MID$(IN$,1,2)=Y$
66 MID$(IN$,3,2)=M$
67 MID$(IN$,5,2)=D$
68 MID$(IN$,7,1)=RIGHT$(STR$(DOW
),1)
69 MID$(IN$,8,2)=LEFT$(A$,2)
70 MID$(IN$,10,2)=MID$(A$,4,2)
71 MID$(IN$,12,2)="00"
72 INPUT "PRESS <ENTER> TO SET CL
OCK";A$
73 A=USR(VARPTR(IN$))
74 IF A<>0 THEN PRINT "ERROR": STO
P
75 CLS:GOTO 17
76 ' READ TIME ROUTINE
77 T$=MID$(OUT$,12,2)
78 A=USR(VARPTR(OUT$))
79 IF A<>0 THEN PRINT "ERROR": STO
P
80 IF MID$(OUT$,12,2)=T$ THEN 78
81 TIME$ = MID$(OUT$,8,2)+": "+MI
D$(OUT$,10,2)+": "+MID$(OUT$,12,2
)
82 WEEK$ =MID$(OUT$,7,1)
83 DT$ = MID$(OUT$,3,2)+"/"+MID$(
OUT$,5,2)+"/"+MID$(OUT$,1,2)
84 RETURN
85 DATA 8D,47,C6,0C,A6,0D,80,30,3
4,02,6D,E4,27,0C,A6,80,80,30,8A,
80,C1,05,26,02,8A,08,8D,6D,6D,E4
,26,16,C1,09,26,02,8D,3B,C1,05,2
6,04,84,03,20,04,C1,08,27,F8,8A,
30,A7,80,5A,2A,D1,32,61,C6,0F,8D
,5B,C6,20,F7,FF,24,4F,5F,7E,B4,F
4,8D,B3,ED,1F,01,A6,84
86 DATA 81,0E,24,08,32,62,4F,C6,F
F,7E,B4,F4,EC,02,1F,01,39,34,06,
E6,1F,C1,30,26,1E,81,02,22,1A,A6
,1D,80,30,C6,0A,3D,EB,1E,C0,30,C
0,04,2E,FC,2D,09,C6,08,4F,8D,06,
8A,84,8D,02,35,86,34,06,8D,0D,6D
,E4,2B,04,8D,58,20,02,8D,3C,35,0
6,39,8D,10,F7,FF,24,86
87 DATA 3C,B7,FF,25,86,34,B7,FF,2
5,8D,11,39,86,30,B7,FF,25,86,7F,
B7,FF,24,86,34,B7,FF,25,39,86,30
,B7,FF,25,86,70,B7,FF,24,86,34,B
7,FF,25,39,C6,1E,12,5A,26,FC,39,
8D,D7,86,40,AA,62,B7,FF,24,8D,EE
,8A,10,B7,FF,24,84,0F,B7,FF,24,8
D,D2,39,86,40,B7,FF,24
88 DATA 8D,DA,8A,20,B7,FF,24,F6,F
F,24,C4,0F,E7,62,7F,FF,24,39
89 'LOAD MACHINE CODE ROUTINE
90 FOR I=&H7E00 TO &H7F01: READ B
YTE$: POKE I,FNB(0): TTL=TTL+FNB(0)
: NEXT
91 IF TTL<>28319 THEN PRINT "ERROR
IN DATA STATEMENTS": STOP
92 DEF USR=&H7E00
93 RETURN

```

Your very own music teacher . . .

Learn The Ivory Keyboard With Piano Note Tutor

By Ron Mix

Usually, the first problem encountered when trying to learn how to play the piano is to learn what note on the music staff goes with what key on the piano keyboard. The *Piano Note Tutor* is designed to assist in learning the notes and the piano keyboard in a game-type format.

The tutor has been tested by the piano students who are privately taught by my wife in individual lessons, group lessons and by students alone. (Note to piano teachers: The tutor is a great game to use while one student is waiting to be picked up or while waiting for his or her lesson.)

Game Summary

The *Piano Note Tutor* gives a note on either the treble or bass staff and asks you to find the correct key on a shortened 54-note piano keyboard. The program gives you 15 seconds in which to position a pointer at the correct keyboard key using the up, down, right and left arrows. The 15 seconds are counted off in one second intervals by the program through the SOUND command. Of course, the faster you are, the more points you get.

The game also has three levels of play

(Ron Mix is the industrial engineering manager for Switches, Inc. He is in the process of developing educational software for his wife, Robbin, who teaches private piano lessons and religion in the public schools.)

which include major notes only, sharp and flat notes only, and combined play. The more difficult the play, the higher the points for each correct answer, and in the combined play, more points are taken off for an incorrect answer.

Program Play

After loading the program into the computer, type RUN. A title screen will appear for a few seconds while the character generator data is read into the program. The main menu appears and a short description is given about the game, then the levels of play menu is displayed. After entering your levels of play selection, the game graphics will start to be drawn on the screen. The *Piano Note Tutor* should display a buff background, white and black piano keyboard keys with a red 'C' marking the Middle C keyboard key, and a red pointer. If these colors are not being displayed correctly, press the Reset button on your computer and retype RUN after the OK prompt.

My computer usually starts up with the correct colors but can be finicky at times.

After the graphics are drawn, the program will give you your note to be placed using the various arrow keys. The program then waits for your move and/or answer while counting the seconds for you. To end a game or to return to the main menu, press the SHIFT and CLEAR keys at the same time. If your answer is wrong, the program

MOVE UP TO THE NEW STANDARD IN COMMUNICATIONS SOFTWARE... COLOR CONNECTION III!

Are you frustrated because

- You don't have a 42K buffer?
 - You can't upload & download files bigger than the buffer?
 - Your hi-res screen drops characters?
 - You can't print directly from your buffer?
 - You don't have selectable printer baud rates?
 - You can't use baud rates to 9600 baud using the Radio Shack Deluxe RS232 program pack?
 - Your dumb software won't work with a smart modem?
 - You don't have XMODEM protocol?
 - Or Automatic XON/XOFF protocol that downloads direct to disk?
 - Your software does not support auto answer/auto dial with both Hayes compatible and the Radio Shack modems?
- RSDOS disk only \$49.95**
Requires 32K, 64K yields maximum buffer size.

COLOR CONNECTION III CAN!!!

In addition to all of these new capabilities, it still has all of those neat features of Color Connection II like single key macros for often-used numbers, a 51 x 24 screen, "Introduction to Communications," and more.



P.O. Box 668 • Encinitas, CA 92024
(619) 436-3512

SPECIAL OFFER...

We at Computerware® understand how you could have purchased some other communications package before Color Connection III, but we're going to help you correct your mistake.

Send us the original disk of your current modem software and we'll give you **\$15 OFF** your purchase of Color Connection III!

Color Connection owners, send your original tape or disk to us for **\$25 OFF** your purchase of our new Color Connection III!

Offer expires June 30, 1985

CompuServe Starter Kit

The CompuServe Information Service is the world's largest and fastest growing videotext service in North America.

The introductory starter kit includes:

- 5 free hours of connect time
- Personal ID and password
- CIS user's guide, phone list, & log-on instructions
- Introductory subscription of Today magazine.

\$39.95

Computerware is a federally registered trademark of Computerware.

MODEMS



VOLKS MODEM

It is direct connect, bell 103 compatible, full or half duplex, and has a voice/data switch. It runs on a 9 volt battery so no plug is required! The special CoCo cable is included. (Required battery not included.)

\$84.95



SIGNALMAN MARK X MODEM

- Auto Answer
- Auto Dial
- Direct Connect
- Bell 103 compatible
- 110 to 300 baud
- Hayes Smart-modem compatible
- Full or Half Duplex
- CoCo cable included

\$159.00

will flash the right answer and wait for any key to be pressed while you examine the correct answer before continuing with another question.

Game Play Hints and Notes

- 1) The program assumes that it will take two seconds to move the pointer to the correct answer.
- 2) If an answer is not entered by pressing the space bar within 20 seconds, the program assumes the answer is wrong and will show you the correct answer.
- 3) To return at any time to the main menu, press the SHIFT and CLEAR keys together.
- 4) The minimum and maximum number of points given for an answer in either game is given below:

	Correct Answer		Incorrect Answer	
	Min.	Max.	Min.	Max.
Game Level 1	+1	+10	0	0
Game Level 2	+2	+20	0	0
Game Level 3	+5	+50	-5	-50

The maximum correct points will be scored if the answer is correct and entered before two seconds elapse, while the minimum correct points are scored if entered after 17 seconds elapse. Likewise, the minimum number of Level 3 incorrect points are scored after 17 seconds while the minimum number of points are scored if entered before two seconds elapse. Points between the minimum and maximum are dependent upon the time elapsed between two and 17 seconds.

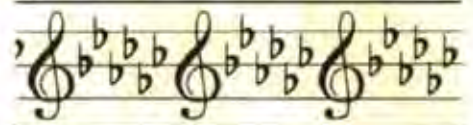
System Requirements

Piano Note Tutor requires 16K Extended Color BASIC and was programmed using a silver/gray 64K Color Computer with a Color BASIC 1.1 ROM and an Extended BASIC 1.0 ROM. The tutor was tested on a 16K Color Computer 2 with a Color BASIC 1.2 ROM and an Extended BASIC 1.1 ROM with no problems. Since the seconds counter (lines 260 through 290, and 690 through 715) was based on the TIMER function instead of a FOR statement

loop, the ROM compatibility can be maintained.

The high speed poke (POKE65495,0) is used in Line 9000 with the return to low speed poke (POKE65494,0) used in Line 9020. The high speed is used only to speed up the program graphics character generator. Therefore, if your Color Computer cannot handle the high speed pokes, remove these pokes from their respective lines without fear of ruining the program.

(Mr. Mix has also developed a *Staff Note Tutor* which is similar to *Piano Note Tutor*, however, it gives you a key on the piano keyboard and you must place the correct note on the grand staff. For a copy of *Staff Note Tutor*, send \$5 and a blank cassette tape to 2020 Chieftain Row, Logansport, IN 46947.)



The Final Answer in Data Base Managers... **DATA BANK** FOR 64K USERS



If you want a data base that does it your way, then Data Bank is for you! With Data Bank, you are the boss. You define your own display screen, record formats, calculated fields, sort sequences, selection criteria, and report formats.

Each record can contain up to 512 characters in up to 35 fields, ample for any application. Data types include alphanumeric, math (for real numbers), date, and "derived" (values calculated by your own defined formulas!) The size of your data base is limited only by your disk space. To aid in sorting and selecting, you can define up to 9 different "access keys," each with up to 3 levels. Using logical operators (less than, greater than, equal, or, and) you can select any subset of your data base for printing. Data Bank lets you design customized reports to fit your individual needs and can save up to 9 defined formats for repeated use. You may include page headings, titles, automatic page numbers, column headings, totals for numeric fields, and more.

Even with all its power, Data Bank is very easy to use! It goes far beyond the average data base by adding features like calculated fields, three level sorts, easy interface with Dynacalc, powerful file manipulation utilities, access to all OS-9 commands, Word-Pak compatibility, easy access to user programs, easy expansion of record files, and more! There is no other data base system as comprehensive as Data Bank!

Requires 64K & Disk Drive \$79.95
(OS-9 not required, Will run with OS-9)

SPECIAL OFFER: We at Computerware understand how you could have purchased some other data base software before Data Bank, but we're going to help you correct your mistake. Send us the original disk of your current data base software and we'll give you \$20 OFF your purchase of Data Bank!

Offers expires June 30, 1985



P.O. Box 668 • Encinitas, CA 92024
(619) 436-3512

Disk Fix & OS-9 Utilities



Use your drives to the fullest and unleash the real power of OS-9! Now when you boot OS-9, your drives will be configured to their maximum capacity - double or single sided, up to 40 or 80 tracks, and step rates of up to 6 ms. These utilities make it easy to inspect and modify any disk file, change drive descriptors, display or compare disk files along with mass copying of all or part of a disk.

Requires 64K & OS-9 \$29.95

This impressive set of utilities includes every tool you need for manipulating text files. Several utilities help with searching and replacing text strings; customized compression and uncompression techniques; complete formatting of your listings with file name, page number, date, and time; conversions between upper and lower case; easy listings for benchmarking; character counts for quick size estimates; and more! You won't be able to work with OS-9 text files without your Textools!

Requires 64K & OS-9 \$29.95

Textools
for OS-9



Synther 77



Turn your Color Computer into a musical instrument with this complete digital synthesizer software! Collect a whole music library by saving your creations on disk or tape. For the novice, play the keyboard like a piano. For the musician, control vibrato, bend, boing, volume, and attack. By modifying attack, sustain, decay and release rates, you can create nearly any ASDR envelope! It is a solo synthesizer, optimized for one voice just like most instruments and the Moog synthesizer. Synther 77 can be fine-tuned to match other instruments or Color Computers. You can start a band! Synther 77 is as easy or complete as your desires!

Requires 32K Cass \$24.95 Disk \$27.95

The 64K Color Computer can have a 64 x 24 or 51 x 24 upper and lower case display without hardware modification! Use it with BASIC and assembly language programs that use text displays. Included is a character editor so you can change any of the characters. It does not affect your software, stays even after resetting, and looks great even on a TV. Special features include mixing of text & hires graphics, auto repeat keys, type ahead, two PRINT commands, ON ERROR auto line numbering, and an enhanced PMODE that allows you to specify page 0 the start page. You'll wonder how you ever worked without it!

Requires 64K Cass \$24.95 Disk \$27.95

**64K
SCREEN
EXPANDER**

Computerware is a federally registered trademark of Computerware.

OS-9 is a trademark of Microsoft.

```

180 DRAW"BM105,80":FORX=1TORA:DR
AW"BM-0,-3":NEXTX:IF RB=1 THEN D
RAW FS# ELSE DRAW SS#
190 IF RB=1 THEN LT=-4 ELSE LT=4
200 LT=LT+(8*RA)+(96*R)-96:FORX=
12TO236STEP56:IF LT=X THEN 250 E
LSE NEXTX
220 FORX=36TO204STEP56:IF LT=X T
HEN 250 ELSE NEXTX
240 GOTO260
250 IF RB=1 THEN LT=LT-4 ELSE LT
=LT+4
260 TA=0:SOUND90,1:TIMER=0
270 I$=INKEY$:IF I$="" THEN 280
ELSE 310
280 IF TIMER>60 THEN TA=TA+INT(T
IMER/60):SOUND90,1:TIMER=0:IF TA
>19 THEN 430 ELSE 270
290 GOTO270
310 IF I$=CHR$(92) THEN 30
320 IF I$=CHR$(32) THEN 430
330 IF I$=CHR$(8) THEN PUT(LX-4,
LY)-(LX+5,LY+15),B,PSET:LX=LX-B:
GOTO380
340 IF I$=CHR$(9) THEN PUT(LX-4,
LY)-(LX+5,LY+15),B,PSET:LX=LX+B:
GOTO380
350 IF I$=CHR$(94) AND LY=172 TH

```

```

EN PUT(LX-4,LY)-(LX+5,LY+15),B,P
SET:LY=102:LX=LX+4:GOTO380
360 IF I$=CHR$(10) AND LY=102 TH
EN PUT(LX-4,LY)-(LX+5,LY+15),B,P
SET:LY=172:LX=LX-4:GOTO380
370 GOTO270
380 IF LX<8 AND LY=172 THEN LX=8
:GOTO420
390 IF LX>248 AND LY=172 THEN LX
=248:GOTO420
400 IF LX<4 AND LY=102 THEN LX=4
:GOTO420
410 IF LX>252 AND LY=102 THEN L
X=252:PUT(LX-4,LY)-(LX+3,LY+15),
W,PSET:GOTO270
420 PUT(LX-4,LY)-(LX+5,LY+15),U,
PSET:GOTO270
430 TA=17-TA:IF TA<0 THEN TA=0 E
LSE IF TA>15 THEN TA=15
440 IF LT=LX THEN COLOR4:LINE(19
0,16)-(255,28),PSET,BF:DRAW"C180
BM50,100":A$="GOOD WORK":GOSUB90
00:SC=SC+(T(I-1)/10)+INT((TA/15)
*.9*T(I-1)):DRAW"BM190,28" ELSE
450
441 IF SC>9999 THEN SC=SC-9999
445 A$=STR$(SC):GOSUB9000:FORX=1
TO600:NEXTX:COLOR4:LINE(0,84)-(2
55,100),PSET,BF:LINE(68,15)-(146
,84),PSET,BF:COLOR1:GOTO150
450 IF I=3 THEN COLOR4:LINE(190,
16)-(255,28),PSET,BF:COLOR1:SC=8
C-50+(TA*3):DRAW"88BM190,28":IF
SC<-9999 THEN SC=SC+9999:A$=STR$
(SC):GOSUB9000 ELSE A$=STR$(SC):
GOSUB9000
460 DRAW"88BM5,100":A$="NICE TRY
-ANSWER IS":GOSUB9000
465 IF LT=252 THEN PUT(LT-4,102)
-(LT+3,117),W,PSET:LZ=102:GOTO48
0
470 IF LT/8=INT(LT/8) THEN PUT(L
T-4,172)-(LT+5,187),U,PSET:LZ=17
2 ELSE PUT(LT-4,102)-(LT+5,117),
U,PSET:LZ=102
480 I$=INKEY$:IF I$="" THEN FORX
=1TO45:NEXTX:PUT(LT-4,LZ)-(LT+5
,LZ+15),B,PSET:FORX=1TO15:NEXTX:
GOTO465
490 IF I$=CHR$(92) THEN 30 ELSE
COLOR4:LINE(0,84)-(256,100),PSET
,BF:LINE(68,15)-(146,84),PSET,BF
:COLOR1:PUT(LT-4,LZ)-(LT+5,LZ+15
),B,PSET:GOTO150
8000 DIM L$(29),M$(29):FORX=0TO2
9:READ L$(X),M$(X):NEXTX
8010 ND$="R6DL4DR4DL4DR4DL4DR4L6
U6D18":NU$="R4DL4DR4DL4DR4DL4DR6
U18":SS$="NL4NU4NR8NDBD4R4NL8NU

```



MicroWorld II

Laneca Plaza Clinton, NJ 08809

(201) 735-9560

Call or write for Price List

LOW PRICES ON 100% Radio Shack Equipment

(with full warranty)

New Slimline Drive 0 \$270.00
 New Slimline Drive 1 \$165.00
 Both \$435.00, installed \$445.00

Prices include shipping!

16K Standard \$107.00
 16K Extended \$134.00
 64K \$178.00
 Diskettes \$1.50 each
 Flip N Files \$19.96
 Library Cases \$3.00

10% off Computerware

15% off Radio Shack Hardware

NAP Monochrome Monitors

The great 12" monochrome monitor is the perfect match for the CoCo. The 20 mhz band width, 800 line resolution, and 60 x 25 display insure a crisp picture for word processing, programming, or just fun. Plus - it has audio input!

NAP 12" Green \$104.95
 NAP 12" Amber \$114.95



SANYO COLOR MONITOR

This monitor has everything! It includes COLOR composite video, MONOCHROME COLOR, and RGB (for IBM and other computer systems). The display is excellent and audio is included.

\$249.95
 plus \$15 shipping

MONITORS

Put a Monitor on Your CoCo with Video Plus

You can enjoy the crisp display of a composite video monitor using our Video Plus interface. Each is fully assembled and tested. Installation is quick, easy, and requires **no soldering**. Your TV output is **not** disabled by the Video Plus. Audio output is also provided.

Video Plus I \$24.95
 interfaces the original model of Color Computer to any composite video monitor (color or monochrome).

Video Plus IIC \$34.95
 interfaces the Color Computer II with either a color or monochrome composite video monitor. Computer must have video chip in socket.

Video Plus III \$34.95
 interfaces the newest Color Computer II (model 26-3134 & newer) with either a color or monochrome composite video monitor. Specially designed for those computers with video chips soldered rather than socketed.

PROWRITER™ 7500 At only \$249 plus \$12 shipping, (we've yet to find a competitor.)

This lightweight printer zips along at 54 full lines per minute. It gives you bidirectional printing, and high resolution graphics in the blink of an eye. Comes with a full year's warranty, backed by C. Itoh's nationwide service centers.



DISK SYSTEMS

Includes J & M controller, DOS manual, cabinet, power supply, half-size double density drive, & all cables. Prices are quoted for JDOS. Add \$10 for RSDOS. Add \$30 for HDS switchable controller or add \$45 for J & M switchable controller with printer port.

Single drive, Single sided \$299.00
 Single drive, Double sided \$359.00
 Dual drives, Single sided \$419.00
 Dual drives, Double sided \$499.00

Adding On

Each includes half-sized drive(s) in cabinet with extender.

Single drive, Single sided \$219.00
 Single drive, Double sided \$249.00
 Dual drives, Single sided \$329.00
 Dual drives, Double sided \$399.00
 J & M controller w/JDOS \$124.95
 J & M controller w/RSDOS \$134.95
 (J & M w/printer port add \$10)
 Switchable controller w/JDOS & RSDOS \$154.95
 HDS \$154.95
 J & M w/printer port \$169.95

Supplies

Diskettes, (hi-quality double density with hub rings) 5-pak \$ 10.95
 10-pak \$ 19.95
 Disk head cleaner kit \$ 9.95
 Amdisk cartridge Each \$ 5.00
 10-pak \$ 40.00

Computerware is a federally registered trademark of Computerware.



Kraft Joystick

Dual-axis trim control, linear potentiometers for more precise control, toggle switch selection between spring center or free floating modes, and trimmer adjustments. It is plug-in compatible.

Reg. \$39.95 Now \$24.95

WICO Joystick Adapter

Allows use of any two Atari compatible joysticks. \$19.95



CCP-1 Serial/Parallel Printer Interface from Botek \$59.95

CCP-2 Printer & Modem Interface from Botek \$74.00



Call or Write to:



(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: 6% Calif. Sales Tax
 Surface — \$2 minimum. COD Add \$5
 2% for orders over \$100 Shipping*
 Air or Canada — \$5 minimum. TOTAL
 5% for orders over \$100
 Checks are delayed for bank clearance

```

NR4ND4":FS$="R4DLDLDLDLU12"
8011 AU$="C3NG3RNF3LDNG3RNF3LD13
NH3RNE3LUNH3RNE3"
8020 CT$="U2L2D2F3R2E3U6HU2HU2HU
2HU2HU2HU4E3F3D4LDLDDLDDLDDL
LDL6LU5RD6F2R6URURURURU4H3L2G3D
3F2":CB$="U2R2D3L3ULULURURUR6D
RDRDRD6LD2LD2LD2LD2LD2D2BU20BR
12R3DL3DR3BD6L3UR3UL3":RETURN
8030 LINE(0,KT)-(256,KT),PSET:LI
NE(0,KT+52)-(256,KT+52),PSET:FOR
X=4TO252STEP8:LINE(X,KT)-(X,KT+5
2),PSET:NEXTX
8040 LINE(2,KT)-(7,KT+33),PSET,B
F:FORX=18TO242STEP56:LINE(X,KT)-
(X+5,KT+33),PSET,BF:LINE(X+8,KT)
-(X+13,KT+33),PSET,BF:NEXTX:FORX
=42TO210STEP56:FORY=0TO16STEP8:L
INE(X+Y,KT)-(X+Y+5,KT+33),PSET,B
F:NEXTY:NEXTX:RETURN
8050 CLS:PRINT" LEVELS OF GAME P
LAY SELECTIONS -----
----- 1-MAJOR NOTES ON
LY <MAX +10 POINTS IF COR
RECT AND QUICK ENOUGH TO BEA
T THE CLOCK> 2-SHARP AND FLAT
NOTES ONLY"
8060 PRINT" <MAX +20 POINTS I
F CORRECT AND QUICK TO BEAT
THE CLOCK> 3-ALL NOTES <MAX +5
0 POINTS IF CORRECT AND VE
RY QUICK TO BEAT THE CLOCK, M
AX -50 IF WRONG AND SLOW>":
PRINT@450,"ENTER YOUR SELECTION
NUMBER"
8070 I$=INKEY$:IFI$=""THEN8070
8080 IFI$=CHR$(92)THEN30
8090 IF VAL(I$)<1 THEN8070
8100 IF VAL(I$)>3 THEN8070
8110 I=VAL(I$):T(0)=10:T(1)=20:T
(2)=50:RETURN
9000 POKE65495,0'CHR.GEN.FROMTRS
-80NEWS4/82
9010 DRAWB$:FOR X=1 TO LEN(A$):F
OR Y=0 TO 29:IF MID$(A$,X,1)=L$(
Y) THEN DRAW M$(Y)
9020 NEXTY:NEXTX:POKE65494,0:RET
URN
9030 DATA " ", "BM+7,0"
9040 DATA "A", "U4E2F2D2NL4D2; BM+
3,0"
9060 DATA "C", "BM+1,-0; H1U4E1R2F
1; BM+0,+4; G1L2; BM+6,0"
9070 DATA "D", "U6R3F1D4G1L3; BM+7
,0"
9080 DATA "E", "NR4U3NR2U3R4; BM+3
,+6"
9090 DATA "F", "U3NR2U3R4; BM+3,+6
"

```

```

9100 DATA "G", "BM+1,-0; H1U4E1R2F
1; BM+0,+2; NL1D2G1L2; BM+6,0"
9110 DATA "H", "U3NU3R4NU3D3; BM+3
,0"
9120 DATA "I", "BM+1,0; R1NR1U6NL1
R1; BM+4,+6"
9140 DATA "K", "U3NU3R1NE3F3; BM+3
,0"
9150 DATA "L", "NU6R4U1; BM+3,+1"
9170 DATA "N", "U6F1D1F2D1F1NU6; B
M+3,0"
9180 DATA "O", "BM+1,0; H1U4E1R2F1
D4G1L2; BM+6,0"
9190 DATA "P", "U6R3F1D1G1L3; BM+7
,3"
9210 DATA "R", "U6R3F1D1G1L2NL1F3
; BM+3,0"
9220 DATA "S", "BM+0,-1; F1R2E1U1H
1L2H1U1E1R2F1; BM+3,+5"
9230 DATA "T", "BM+2,+0; U6NL2R2; B
M+3,+6"
9260 DATA "W", "NU6E2NU1F2U6; BM+3
,6"
9280 DATA "Y", "BM+0,-6; D2F2ND2E2
U2; BM+3,6"
9300 DATA "1", "BM+1,0; R1NR1U6G1;
BM+6,+5"
9310 DATA "2", "NR4U1E1R1E2U1H1L2
G1; BM+7,+5"
9320 DATA "3", "BM+0,-1; F1R2E1H2E
2H1L3; BM+7,6"
9330 DATA "4", "BM+3,0; U2NR1L3U1E
3D3; BM+4,3"
9340 DATA "5", "BM+0,-1; F1R2E1U2H
1L3U2R4; BM+3,+6"
9350 DATA "6", "BM+4,-5; H1L2G1D4F
1R2E1U1H1L3; BM+7,+3"
9360 DATA "7", "U1E4U1L4; BM+7,+6"
9370 DATA "8", "BM+1,-0; H1U1E1H1U
1E1R2F1D1G1NL2F1D1G1L2; BM+6,0"
9380 DATA "9", "BM+0,-1; F1R2E1U4H
1L2G1D1F1R2; BM+4,+3"
9390 DATA "0", "BM+1,0; H1U4E1R2F1
D4G1L2; BM+6,0"
9480 DATA "-", "BM+0,-3; R4; BM+3,+
3"

```



FLORIDA SEARCH NO LONGER!

The Software Connection at Fort Lauderdale is your one stop source for your Color Computer Software Peripherals Books Magazines & Repairs.

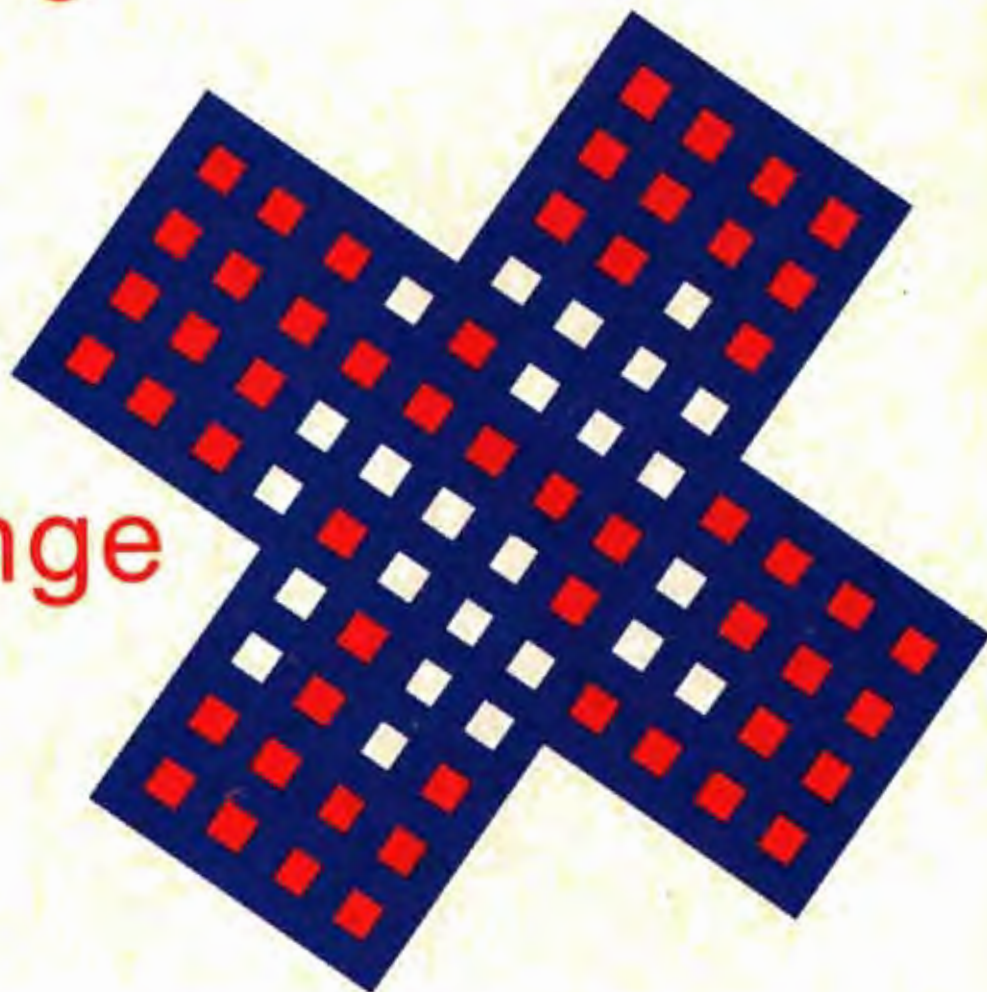
Software Connection



4301 N. STATE RD. #7
LAUDERDALE LAKES, FL 33319
305-484-7547

Granny's Peg- Game Challenge

By Daryl Judd



One of the memories of going to my grandmother's house is playing the puzzle-type game called *Hi-Q*. It's a small, white board with 44 red pegs that are jumped back and forth in checker-type moves. The object (which I could never seem to master) is to end up with only one peg in the middle.

I recently found out that my wife's grandmother also has the game. Is it possible this game is a requirement of some grandmothers' union? Perplexed,

(Daryl Judd directs the news at KIVI TV channel six in Nampa, Idaho. He works on his computer in his spare time.)

I pondered over this thought for several days. Then, I realized my mission: to bring the CoCo world the game of *Hi-Q* — for those whose grandmothers didn't belong to the union.

I added sight and sound and in completing my mission, I had to call on several tactics I have picked up in the past (past issues of *RAINBOW*, that is) such as the false colors of `PMODE`, `∃` and `GET` and `PUT` statements.

The variables are as follows:

- 'A' is the array used to draw the pegs
- 'B' is the array used to erase the pegs
- Num is the number of pegs left
- 'M' is the x starting point of the cursor square
- 'L' is the y starting point of the cursor square

2069
 40179
 73.....8
 104191
 130117
 156157
 END33

The listing: HI-Q

```

1 'H-Q BY DARYL JUDD
2 PMODE3,1:PCLS:SCREEN1,0:COLOR2
,2
3 DRAW"BM0,30;D120;R30;U50;R50;D
50;R30;U120;L30;D50;L50;U50;L30"
4 PAINT(2,32),3,2
5 CIRCLE(190,89),56,2,1.15,.1705
,.11
6 CIRCLE(190,89),36,2,1.15,.2,.1
7 DRAW"BM217,111;H10;G15;F10"
8 DRAW"BM219,142;F10;E15;H11"
9 PAINT(190,28),3,2
10 FORX=1T0400:NEXTX
11 PLAY"T3;L8D;G;P8G;A;P8;A;B;O4
D;O3B;G;P8"
12 PLAY"D;G;P8;G;A;P8;A;L4.D;L6G
;P8"
13 PLAY"L8;D;G;P8;G;A;P8;A;B;O4D
;O3B;G;P4"
  
```

```

14 SCREEN1,1
15 PLAY"L8;O2E;P4;L8.;O1A;P16;L8
;O2C;L4;O1B;P8;L8G"
16 FORX=1T0700:NEXTX
17 CLS:PRINT@7,"**INSTRUCTIONS**
"
18 PRINT" THE OBJECT OF THIS GAM
E IS TO"
19 PRINT" END UP WITH ONE PEG I
N THE"
20 PRINT"CENTER HOLE. PEGS ARE S
UBTRACTED";
21 PRINT" FROM THE BOARD BY JUMP
ING, LIKE";
22 PRINT" IN THE GAME OF CHECKE
RS. TO"
23 PRINT" MOVE THE SQUARE WHERE
YOU WANT"
24 PRINT" IT, PRESS THE ARROW KE
YS. TO"
25 PRINT" JUMP, PRESS THE 'J' K
EY. AND"
26 PRINT" THEN THE ARROW KEY IN
THE"
27 PRINT" DIRECTION YOU WANT TO
MOVE."
28 PRINT" WHEN THERE ARE NO MORE
MOVES,"
29 PRINT" PRESS THE 'N' FOR YOUR
RATING."
30 PRINT" AND IF WANT TO QUIT, P
RESS THE"
31 PRINT" 'Q' KEY AND YOU WI
LL."
32 PRINT" **ANY KEY**";
33 I$=INKEY$:IFI$=" "THEN33
34 PMODE3,1:PCLS0
35 CIRCLE(10,10),7,3,.9
36 PAINT(10,10),3,3
37 DIMA(14,10),B(14,10)
38 GET(3,5)-(17,15),A,G
39 GET(33,5)-(47,15),B,G
40 CLS3:PMODE4,1:PCLS:SCREEN1,1:
PMODE3
41 PCLS0:NUM=44
42 COLOR1,1
43 LINE(10,0)-(246,185),PSET,B
44 LINE(10,0)-(88,62),PSET,BF
45 LINE(166,0)-(244,62),PSET,BF
46 LINE(10,123)-(88,185),PSET,BF
47 LINE(166,123)-(246,185),PSET,
BF
48 FORX=96T0146STEP25
49 FORY=8T048STEP20
50 PUT(X,Y)-(X+14,Y+10),A,PSET
51 NEXTY:NEXTX
52 FORX=21T0221STEP25
53 FORY=68T0108STEP20
54 IFX=121ANDY=88THEN56
  
```



KEEP-TRAK "DOUBLE-ENTRY" General Ledger Accounting System Reg. \$60.95 — ONLY \$19.95

"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 with screen printouts. For upgrade return original disk & \$5.00. Rainbow Reviews 1.1 - 9/84 - 1.2-4/85

"OMEGA FILE" Reg. \$60.95 — ONLY \$14.95

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

BOB'S MAGIC GRAPHIC MACHINE

Turns 2 weeks of graphic programming into 2 hours with rubber band type graphics. Generate BASIC code to use in your programs. Easy drawing and manipulation of circles, ellipses, boxes, lines and ARCS. Single joystick operation with on line HELP at all times. Allows text on the graphics screen and movement of objects on the screen. Can be used as a stand-alone graphics editor. Great for programmers and LOTS OF FUN for the novice. Reg. \$30.95 — ONLY \$14.95 for cassette and \$14.95 for disk. 64k with ECB required. Includes instruction manual. GRAPHICS EDITOR

AMT Amortization Schedule (Rainbow Review 10/84) \$14.95

PERSONAL INFORMATION FILE—\$14.95 disk HOME INVENTORY—\$14.95 disk

CASH-IN (billing)—\$14.95 disk MEMO WRITER—\$14.95 disk

GRADE EASY (teacher data base)—\$14.95 32/64k disk

64 K UPGRADE	\$35.00	CARRYING CASES COCO 1,11935.00	
8809 PROCESSOR	\$25.00	VOLKS MODEM	\$59.95
FLIP & FILE 50	\$12.95	RITEMAN PLUS PRINTERS	\$275.00
FUJI-MAXELL 8500	\$17.95	GENERIC DISKS 8500	\$14.95

COMPARE FEATURES AND PRICE, then buy "THE OTHER GUY'S Software!"

(add \$2.50 for postage and handling) *Please specify if JAM controlled

Send check, money order or C.O.D., U.S. funds to:

THE OTHER GUY'S SOFTWARE • 875 S. Main • Logan, UT 84321

PHONE (801) 753-7620 or WRITE for a FREE CATALOG

```

55 PUT(X,Y)-(X+14,Y+10),A,PSET
56 NEXTY:NEXTX
57 FORX=96TO146STEP25
58 FORY=128TO168STEP20
59 PUT(X,Y)-(X+14,Y+10),A,PSET
60 NEXTY:NEXTX
61 COLOR1,1
62 M=119:L=86
63 GOSUB106
64 'WAIT FOR COMMAND
65 I$=INKEY$:IFI$=""THEN65
66 IFI$=CHR$(94)THEN74
67 IFI$=CHR$(10)THEN82
68 IFI$=CHR$(8)THEN90
69 IFI$=CHR$(9)THEN98
70 IFI$="J"THEN108
71 IFI$="N"THEN163
72 IFI$="Q"THEN175
73 GOTO64
74 'MOVE UP
75 IFL=66ANDM<94THEN78
76 IFL=66ANDM>144THEN78
77 IFL>6THEN79
78 SOUND10,2:GOTO64
79 COLOR4,4:GOSUB106
80 COLOR1,1:L=L-20:GOSUB106
81 GOTO64
82 'MOVE DOWN
83 IFL=106ANDM<94THEN86
84 IFL=106ANDM>144THEN86
85 IFL<166THEN87
86 SOUND10,2:GOTO64
87 COLOR4,4:GOSUB106
88 COLOR1,1:L=L+20:GOSUB106
89 GOTO64
90 'MOVE LEFT
91 IFM=94ANDL<66THEN94
92 IFM=94ANDL>106THEN94
93 IFM>19THEN95
94 SOUND10,2:GOTO64
95 COLOR4,4:GOSUB106
96 COLOR1,1:M=M-25:GOSUB106
97 GOTO64
98 'MOVE RIGHT
99 IFM=144ANDL<66THEN102
100 IFM=144ANDL>106THEN102
101 IFM<219THEN103
102 SOUND10,2:GOTO64
103 COLOR4,4:GOSUB106
104 COLOR1,1:M=M+25:GOSUB106
105 GOTO64
106 LINE(M,L)-(M+18,L+14),PSET,B
107 RETURN
108 'JUMP
109 IFPOINT(M+9,L+7)<>7THEN64
110 I$=INKEY$:IFI$=""THEN110

```



Drive 1 **139⁹⁵**

Your Choice
Silver or White

239⁹⁵ Drive 0

SUPER DRIVE SALE

Special prices on new first quality disk drives. They even have GOLD connectors on the back... Some other places charge 279.00 for dr. 1 and 349.00 for dr. 0, not us! Drive 1 is for mod I, Second Color Computer drive, or external mod III, IV. Drive 0 is your first Color Computer drive and comes complete with controller, cable and manual. Bare drives for internal mod III, IV, only 89.95! For double-sided, add 45.00 (only for those who have DS-DOS, boards and knowledge)

Bustout game cart. 5.95 • 64K upgrade kit 39.95 • CoCo II Keyboards for CoCo I, 34.95 • 2 drive cable 29.95

THE COMPUTER CENTER

901-761-4565, 5512 Poplar, Memphis, TN 38119

Add \$3.90 for shipping & handling—Visa, M/C accepted—Dealer inquiries welcome

NEW DISK DRIVES

STARTING AT
\$129.00

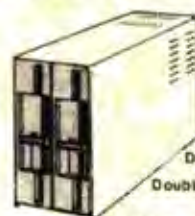
WITH CASE &
POWER SUPPLY
\$169.95



TANDON MPI TEAC

Speed 6 ms tk to tk and up
Capacity 250k unformatted
Tracks 40
Warranty **now 1 YEAR**

New Low Price!



40Tks 5Ms
Double Sided
Double Density
40 or 80 Tracks
1/2 Hght. Teac/Panasonic



We carry only the finest quality disk drives • no seconds • no surplus

SATISFACTION GUARANTEED!!

ALL DRIVES FULLY TESTED & WARRANTEED

- Complete Disk Drive with Power Supply & Case Teac **\$169.95**
- Two Drives in Dual Case & Power Supply Teac **\$279.95**
- 1/2 ht double sided double density Disk Drives (Panasonic/Teac) **\$159.00**
- 1/2 ht double sided double density Disk Drive with ps & case **\$199.95**



How to use your new drive system on audio cassette

Single ps & case \$44.95 Dual 1/2 ht ps & case ..\$54.95 Dual ps & case Call

Color Computer Controller (J&M)



\$129.95

DRIVE 0 FOR RADIO SHACK COLOR COMPUTER

TANDON, MPI OR TEAC DRIVE (SINGLE SIDED 40 TRACKS SPEED 5 MS TRK TO TRK & UP)
POWER SUPPLY and CASE, TWO DRIVE CABLE WITH ALL GOLD CONNECTORS

J&M CONTROLLER, MANUAL and DOCUMENTATION ~~\$329.95~~ **\$ SALE!**

BUY THE BEST
FOR LESS!
CALL!

DRIVE 0 FOR RADIO SHACK COLOR COMPUTER

PANASONIC 1/2 HEIGHT DOUBLE SIDED DOUBLE DENSITY DRIVE 500K unformatted
POWER SUPPLY and CASE, 2 DRIVE CABLE WITH ALL GOLD CONNECTORS

J&M CONTROLLER, MANUAL and DOCUMENTATION ~~\$399.95~~ **Super!! SALE!**

TAKE ADDED SAVINGS ON TWO DRIVE SYSTEMS

DISKETTES with free library case **\$17.95**

Unadvertised Specials **\$Call**

Drives cleaned, aligned & tested **\$29.95**



TECHNICAL STAFF ON DUTY, PLEASE CALL FOR ASSISTANCE.



**CALL US TODAY!!
ORDER TOLL FREE**

**(617)234-7047
1-800-635-0300**

• DEALER INQUIRIES INVITED.
(617) 234-7047



TRUE DATA PRODUCTS

195 Linwood Street, P.O. Box 546
Linwood, Massachusetts 01525
(617) 234-7047

HOURS MON-SAT 9-6 (EST)

We welcome

- Visa / Master Charge
- Checks (allow 2 weeks for clearing)
- C.O.D. Add \$2.00

New Hard Drives

----- COMPLETE SYSTEM ----- JUST PLUG IN -----

Call For
BEST PRICE



Warranty - One Full Year

5 to 20 Megabyte, ready to run on the TRS
80 Model I/III/IV/4P, color computer,

64K UPGRADES \$39⁹⁵

NEW QUALITY VIDEO MONITORS

Starting at \$79.⁹⁵

MONOCHROME
COLOR MONITORS



VIDEO DRIVER

ENABLES YOUR COCO TO OPERATE WITH A
VIDEO MONITOR INSTEAD OF A TELEVISION!

SCREEN DUMP PROGRAM

The best screen dump program for the Epson & Gemini
printers ever!! Have the option of standard images
or reverse w/regular or double sized pictures \$19⁹⁵

star

PRINTER CABLES AND
INTERFACES AVAILABLE
Call for current pricing

PRINTERS

- * 100 - 120 - 160 CPS
- * Bidirectional Logic Seeking
- * Friction and Tractor
- * 9X9 Dot Matrix
- * True Decenders
- * High Res-Bit Image Block Graphics

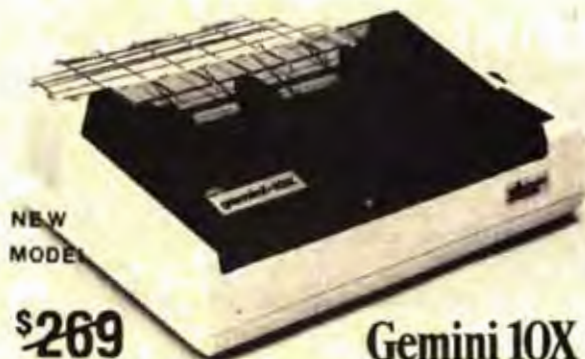
- * Super Script-Subscript
- * Underlining
- * Backspacing Doublestrike
- * 5, 6, 8 1/2, 10, 12 and 17 Pitch
- * Programmable Line Spacing
- * SIX (6) MONTH WARRANTY

GEMINI 10X (9 Inch Carriage, 120cps) Friction and Tractor... \$CALL

GEMINI 15X (15 Inch Carriage, 120cps) Friction and Tractor... \$CALL

DELTA 10 (10 Inch Carriage, 160cps) Friction and Tractor... \$CALL

POWER TYPE Letter quality



NEW
MODEL

\$269

Gemini 10X

SP-3 INTERFACE for Color Computer

- 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:

\$59.95



COMPLETE SYSTEM

ONLY ~~319⁹⁵~~

NEW
LOW
PRICE

now
with
screen
dump

Nothing more to buy!

Dealer inquiries invited



TRUE DATA PRODUCTS

195 Linwood Street, P.O. Box 546
Linwood, Massachusetts 01525



CALL US TODAY!!
ORDER TOLL FREE

(617)234-7047
1-800-635-0300

```

111 IFI$=CHR$(94) THEN116
112 IFI$=CHR$(10) THEN127
113 IFI$=CHR$(8) THEN138
114 IFI$=CHR$(9) THEN149
115 SOUND10,2:GOTO110
116 'JUMP UP
117 IFL<46 THEN160
118 IFPPPOINT(M+12,L-13)<>7 THEN160
119 IFPPPOINT(M+12,L-33)<>8 THEN160
120 COLOR4,4:GOSUB106
121 PUT(M+2,L+2)-(M+16,L+12),B,P
SET
122 PUT(M+2,L-18)-(M+16,L-8),B,P
SET
123 PUT(M+2,L-38)-(M+16,L-28),A,
PSET
124 COLOR1,1:L=L-40:GOSUB106
125 NUM=NUM-1
126 GOTO64
127 'JUMP DOWN
128 IFL>130 THEN160
129 IFPPPOINT(M+12,L+27)<>7 THEN160
130 IFPPPOINT(M+12,L+47)<>8 THEN160
131 COLOR4,4:GOSUB106
132 PUT(M+2,L+2)-(M+16,L+12),B,P
SET
133 PUT(M+2,L+22)-(M+16,L+32),B,
PSET
134 PUT(M+2,L+42)-(M+16,L+52),A,
PSET
135 COLOR1,1:L=L+40:GOSUB106
136 NUM=NUM-1
137 GOTO64
138 'JUMP LEFT
139 IFM<69 THEN160
140 IFPPPOINT(M-14,L+7)<>7 THEN160
141 IFPPPOINT(M-39,L+7)<>8 THEN160
142 COLOR4,4:GOSUB106
143 PUT(M+2,L+2)-(M+16,L+12),B,P
SET
144 PUT(M-23,L+2)-(M-9,L+12),B,P
SET
145 PUT(M-48,L+2)-(M-34,L+12),A,

```

```

PSET
146 COLOR1,1:M=M-50:GOSUB106
147 NUM=NUM-1
148 GOTO64
149 'JUMP RIGHT
150 IFM>169 THEN160
151 IFPPPOINT(M+35,L+7)<>7 THEN160
152 IFPPPOINT(M+60,L+7)<>8 THEN160
153 COLOR4,4:GOSUB106
154 PUT(M+2,L+2)-(M+16,L+12),B,P
SET
155 PUT(M+27,L+2)-(M+41,L+12),B,
PSET
156 PUT(M+52,L+2)-(M+66,L+12),A,
PSET
157 COLOR1,1:M=M+50:GOSUB106
158 NUM=NUM-1
159 GOTO64
160 'REJECT MOVE
161 SOUND10,2
162 GOTO64
163 'NO MORE MOVES
164 CLS:PRINT@36,"YOU FINISHED W
ITH";NUM"PEGS"
165 IFNUM>7 THENR$="IT'S ONLY A G
AME"
166 IFNUM<8 ANDNUM>5 THENR$="KEEP
TRYING"
167 IFNUM<6 ANDNUM>3 THENR$="GOOD
SCORE!"
168 IFNUM<4 ANDNUM>1 THENR$="VERY
GOOD!"
169 IFNUM=1 THENR$="OLYMPIC HOPEF
UL"
170 IFNUM=1 ANDPPPOINT(128,93)=7 TH
ENR$="YOUR PERFECT!"
171 PRINT@105,R$
172 PRINT@294,"ANOTHER ROUND (Y/
N)"
173 I$=INKEY$:IFI$="" THEN173
174 IFI$="Y" THEN40
175 'QUIT
176 CLS:SCREEN 0,1
177 PLAY"T4;O3;L4E-;L3E;G;O4;C;P
4"
178 CLS(4)
179 PLAY"O3;L4E;L3D;G;B;P4"
180 CLS(2)
181 PLAY"L5G;L2G-;L5G;L3A;L8A-;L
5A;O4;C;O3;L2B;L8B-;A;A-;L2G;P4"
182 CLS(3)
183 PLAY"L4E-;L3E;G;O4;C;P4"
184 CLS(5)
185 PLAY"O3;L4E;L3D;G;B;P4"
186 CLS(8)
187 PLAY"L5G;L2G-;L5G;B;L3A;L4G-
;L2.G;O4;L8;T12;D;E;G-;L2G"
188 CLS(1)

```

See You At
RAINBOWfest
New Brunswick
October 18-20

Play Your Favorite Games With No Wires Attached

By J.O. Shaver



For some time I had noticed that wireless joysticks were available for the Atari and Commodore computers, but, as usual, nothing for CoCo. It seemed it would be nice to have joysticks without wires so I could move back from the CoCo and TV to play a game and not have to sit shoulder to shoulder with the person I might be playing the game with.

Since I had an Atari-to-CoCo joystick adapter, I thought just maybe the wireless receiver could be plugged into this adapter and I would have it made. Finally, the urge overtook me and I purchased the wireless joysticks.

I rushed home and quickly set up the wireless joysticks, plugged them into the Atari adapter and the adapter into my CoCo. Turning the CoCo on, nothing happened. What a disappointment! I couldn't even get the keyboard to respond. At first, I thought I had even damaged my CoCo.

Being an electronic hobbyist and experimenter, and a hardware-type person for the last 30 years, this presented me with a real challenge. I decided to design and make an interface for the wireless joysticks for the CoCo.

To start, I needed to know what the output section of the wireless receiver looked like and how it worked. By

(Jim Shaver is an electrical engineer and works in field service for Westinghouse Electric Corp. His favorite hobby is experimenting with hardware projects for the CoCo.)

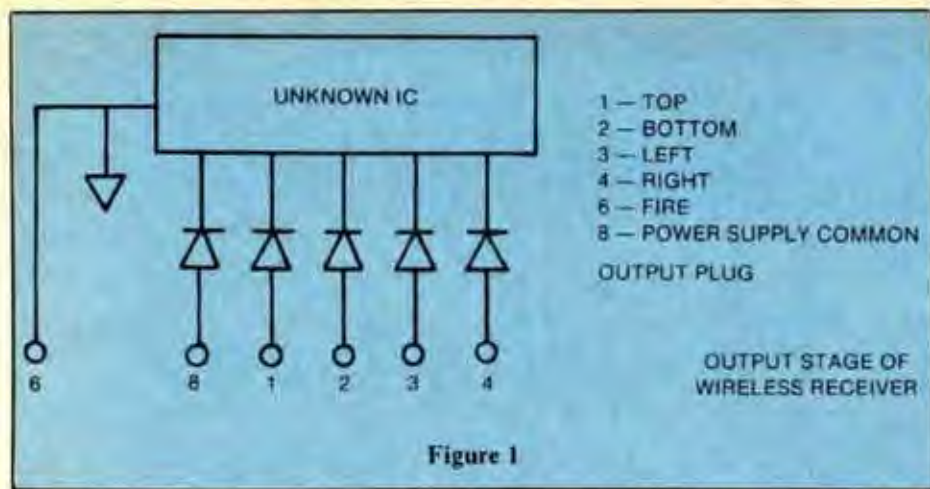


Figure 1

opening up the unit and following out the circuit, I found the circuit as shown in Figure 1.

By using an ohmmeter, I found a high resistance between pins with a diode and common. This value dropped to approximately 900 ohms when the joystick was operated for that particular direction. By seeing that change, I was also able to find which pin went with which direction. It came out as shown in Figure 1.

With this information, I proceeded with the interface.

About the Circuit

Refer to figures 2a and 2b. I will describe the left joystick side only since both left and right are identical, except for IC pin numbers in some cases.

IC1 is an Octal Inverting Buffer with control gates for each of two groups of four buffers. See Figure 3 for its internal diagram. Resistors R1-R5 are pull-up resistors for the inputs.

With the wireless joystick in the center position, the wireless receiver has a high resistance between its pins 1, 2, 3, 4, 6 and ground pin 8. This allows

a +5 volt (a logical one) on the inputs of IC1 which gives a zero on the output, provided the control gates are enabled (more on this later).

If the joystick is moved to the top position, pins 1 to 8 drop to approximately 900 ohms. This causes a voltage drop across resistor R5, which produces a logical zero on pin 2 of IC1 which, in turn, produces a logical one on pin 18. In the same manner, other positions of the joystick will do the same.

While experimenting with the wireless joystick, I found some conditions would cause random outputs of the wireless receiver. Left and right, top and bottom, or any combination could occur. This usually happened when the receiver was on without the joysticks being turned on, or when the joysticks were turned off without turning off the receiver.

Since the CoCo cannot tolerate this condition, I added IC2 and used IC1's control gate. IC2 is a quad 2 input NOR gate. Each section looks at opposites (top-bottom or left-right) and if opposites try to occur, it disables IC1's control gate which results in a zero output from IC1.

If, for example, wireless receiver pins 1 and 2 both go low (top and bottom

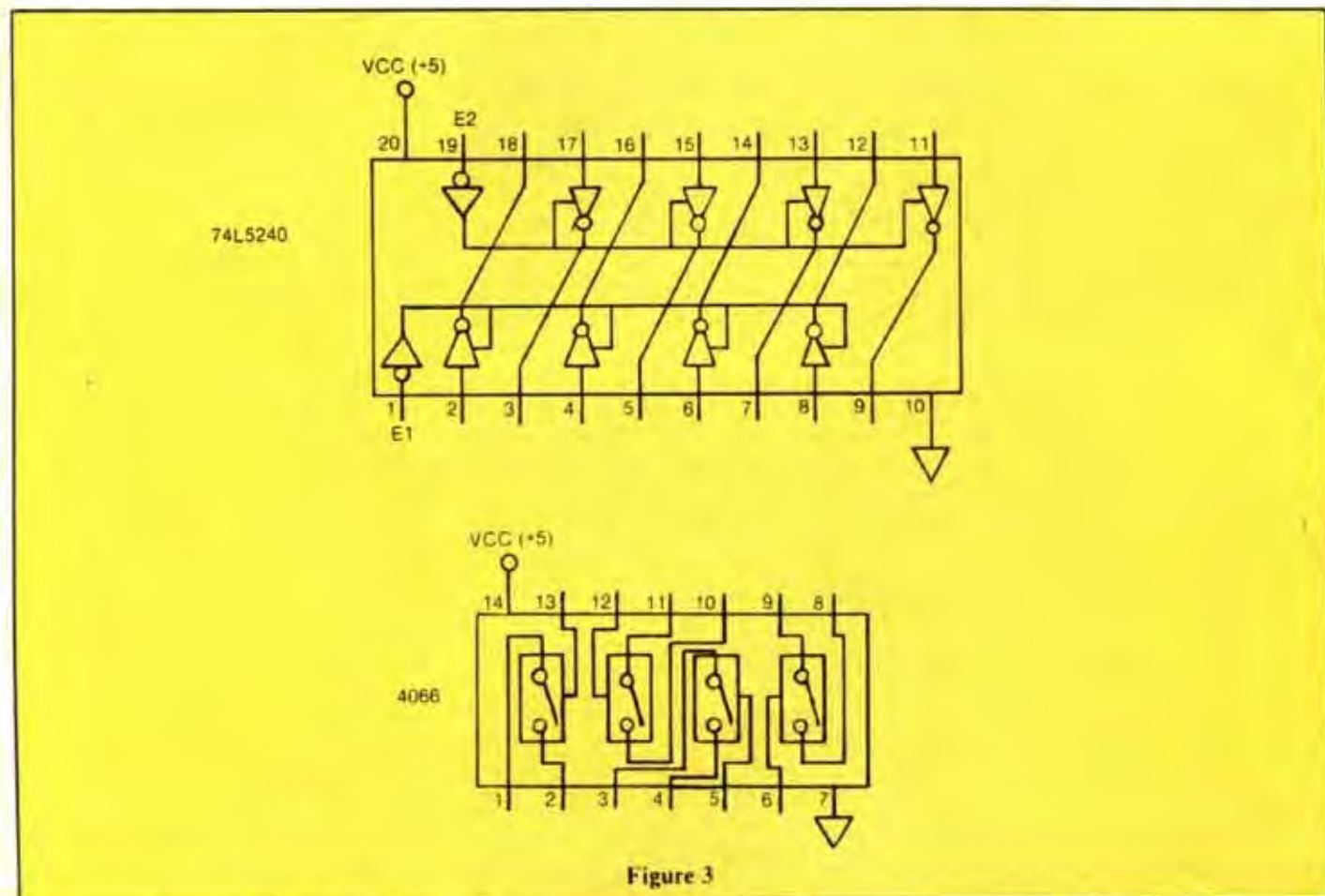


Figure 3

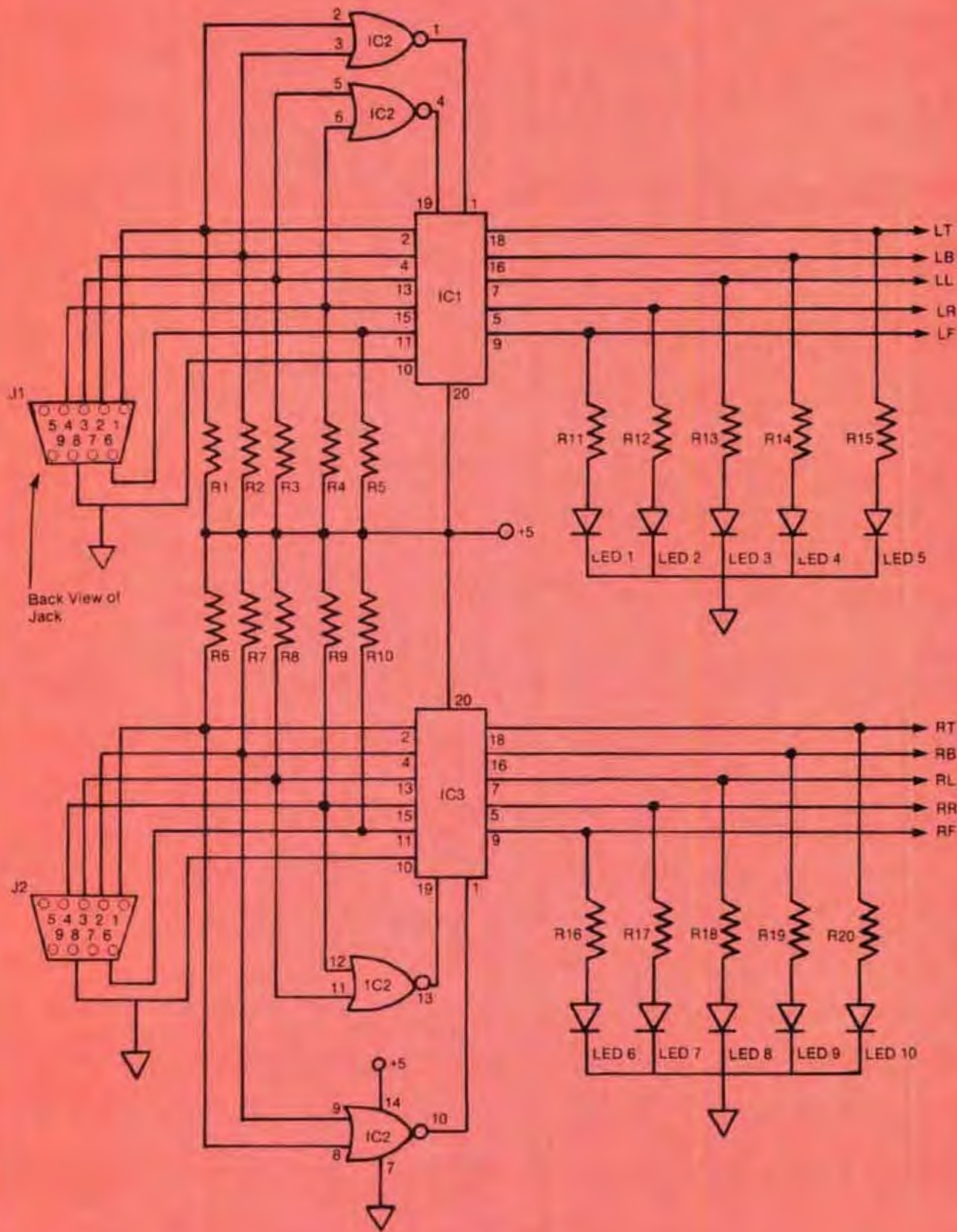


Figure 2a

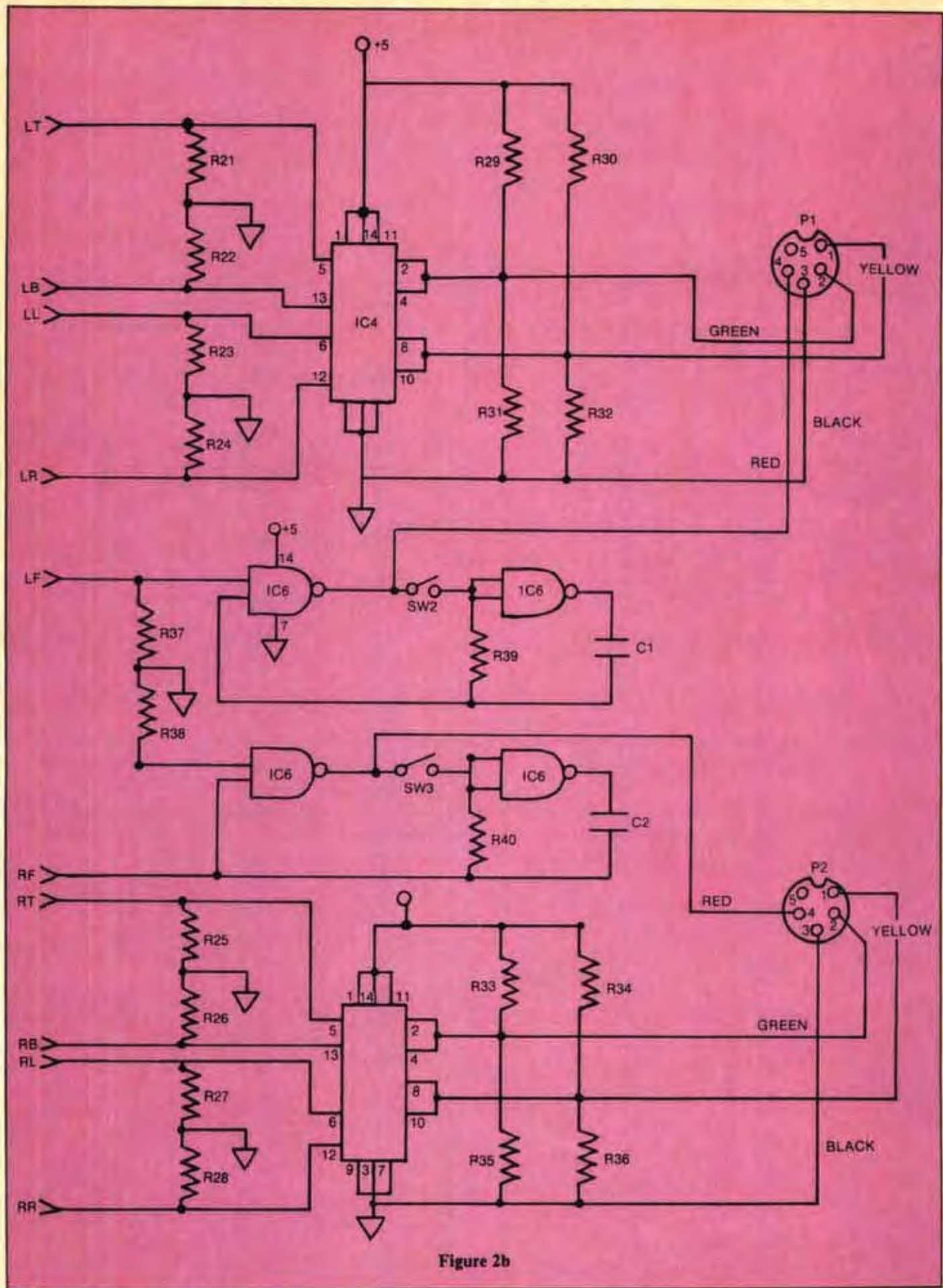


Figure 2b

at the same time), pin 1 of IC2 goes high (logical one) putting a one on pin 1 on IC1, which disables IC1's gate for these inputs. The left and right inputs are handled in the same manner.

As an added frill, I put LEDs on the output of IC1 and arranged them physically to represent the positions of the joystick with "fire" in the center. (These LEDs are really not necessary, but I like a lot of lights.)

The position outputs of IC1 feed into IC4 which is a Quad Bilateral switch. This is where the logical ones and zeros will be converted to the analog voltages the CoCo needs. Refer to Figure 4.

With zero inputs on IC4, both electronic switches are open; therefore, since $R29 = R31$, they equally divide the +5 volts and this results in 2.5 volts to the CoCo joystick input. This is the center position.

When S1 receives a logical one, it closes, shorting out R29 which sends the +5 volts to the CoCo. This is the bottom or right position on the screen.

When S2 receives a logical one, it closes, shorting out R31, resulting in zero volts to the CoCo. This is the top or left position on the screen.

IC2 prevents a logical one from reaching both S1 and S2 at the same time. As you can see, this would result in a short between the +5 and ground. Resistors R21-R28 are there as pull-down resistors to hold IC4's gate at zero with no input. Since R29-R39 form voltage dividers, they should be matched as closely as possible or your center position may be off a little.

For those of you who want centering, you could use a 100K "pot" with its wiper tied to pins 2 and 4, and its ends tied to +5 and ground, respectively, in place of R29 and R31, and the other voltage divider resistors in the circuit.

For the "fire" function, the CoCo wants a zero for a "fire" command and +5 volts for "no fire." Since I had to use another IC to invert the fire signal anyway, I thought that I would just as soon use the other two sections of the IC and add an "auto-fire" circuit.

IC6 is a quad 2 input NAND. Each half is used as a gated oscillator. Logical signal LF coming from IC1 is a logical one when you press the firebutton on the joystick. If SW2 is open, then this signal is inverted and sent to the CoCo. If SW2 is closed, the circuit oscillates and sends pulses to the CoCo, simulating pressing the firebutton rapidly.

Power from the CoCo is not used in this interface. The wireless joysticks you buy assume you already have an

Atari CX2600 game computer. The wall mounted transformer/power supply plugs into the wireless receiver and the wireless receiver has a plug made to plug into the CX2600. This is a nine-volt power supply (center positive). I took the nine-volt DC out of the wireless receiver, brought it into the interface and regulated it down to +5 volts with a 7805 voltage regulator. Refer to Figure 5.

Construction

Layout and wiring are not critical. Wire wrapping or point-to-point wiring and soldering is OK. I mounted the IC sockets on a perf board with solder pads and used point-to-point wiring. The circuit board was mounted in a small cabinet purchased at Radio Shack and the LEDs were mounted on the left and right sides and arranged to represent the positions of the joystick.

SW1, the power switch, was placed

on the front center and the left and right auto-fire switches, SW2 and SW3 on each side of the power switch. Input jacks to accept the wireless receiver output plugs were placed on the back of the cabinet.

The part number specified for the Radio Shack joystick plugs includes a three-foot cable attached to the plug. The cable end was brought in through grommets in the rear panel. The power supply input jack was located in the rear.

Testing and Checkout

Before installing any of the ICs, double-check your wiring against the schematic. Make sure you brought the +5 and common to all the required points. Install IC1, IC2 and IC3 only at this time.

Get out your wireless joystick and receiver and plug the output of the receiver into the interface. Plug the

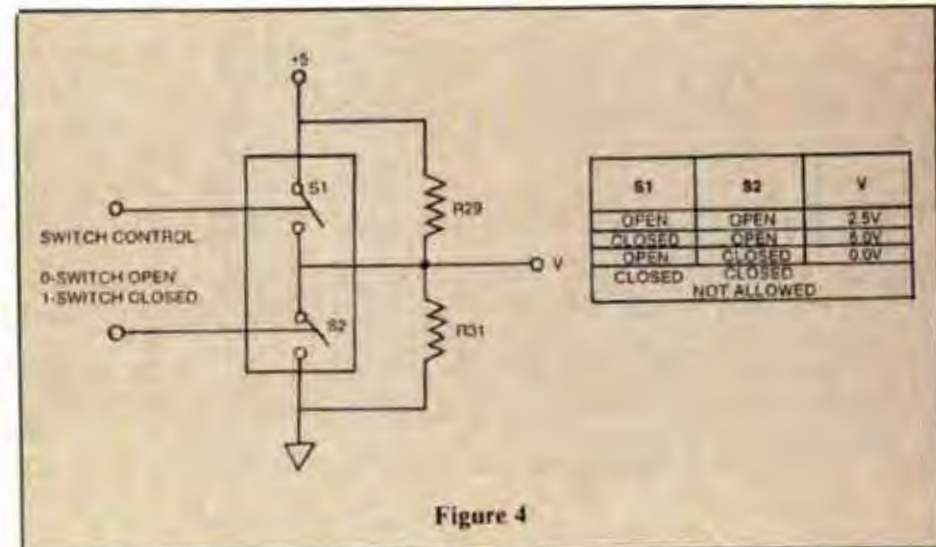


Figure 4

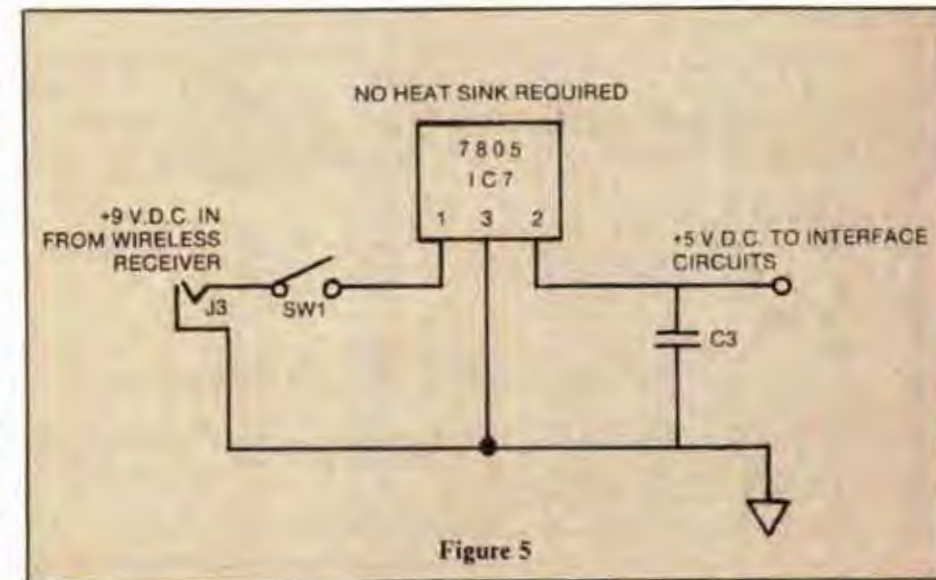


Figure 5

Atari CX2600 power supply into the receiver and the power plug coming out of the receiver into the interface. Do not plug the interface output plug into the CoCo at this time. Turn on the joysticks and plug in the CX2600 power supply.

Now operate the joysticks and the LEDs that correspond to the joystick position should light up. Opposing LEDs (top-bottom or left-right) should not light up at the same time. Turning off either or both joysticks may cause random LED indication, but opposing lights should never come on.

Now turn off the interface and install IC4, 5 and 6. Care should be taken when handling these integrated circuits since they are of the CMOS type. Plug the output plugs from the interface into the CoCo. Turn on the CoCo and type in the program listing in Figure 6.

Now turn on the interface and run the program. When you operate the left

RIGHT JOYSTICK	LEFT	CENTER	RIGHT
X RIGHT	0	1F	03
RIGHT JOYSTICK	TOP	CENTER	BOTTOM
Y RIGHT	0	1F	03

LEFT JOYSTICK	LEFT	CENTER	RIGHT
X LEFT	0	21	03
LEFT JOYSTICK	TOP	CENTER	BOTTOM
Y LEFT	0	1F	03

Figure 6

and right joysticks, you should get the numbers for the various positions of the joystick as shown in the table in Figure 6. Pushing the left or right firebutton will give an indication of "fire right" or "fire left."

This completes the checkout of the

interface. If everything went as outlined above, you are ready to load one of your favorite games and start playing.

There are at least two wireless joysticks for the Atari and Commodore available. One is the RGA Model No. RGA-118, which sells for \$34.95. There is also another type made by Cynex Manufacturing Corporation which is called the Game Mate 2. I have the Game Mate 2 and it has a range of approximately 40 feet with reliable operation. Most of the popular games will work with these joysticks; however, some games that require a continuously variable analog input will not function properly.

The listing: JSTKTEST

```

2 REM JOYSTK TEST
5 CLS (1)
10 XR=JOYSTK(0)
20 YR=JOYSTK(1)
30 XL=JOYSTK(2)
40 YL=JOYSTK(3)
50 PRINT @ 256, "X RIGHT="; XR
60 PRINT @ 320, "Y RIGHT="; YR
70 PRINT @ 384, "X LEFT="; XL
80 PRINT @ 448, "Y LEFT="; YL
90 F=PEEK(65280)

```

```

100 IF F=126 THEN GOTO 140
110 IF F=254 THEN GOTO 140
120 IF F=125 THEN GOTO 160
130 IF F=253 THEN GOTO 160
131 IF F=127 THEN GOTO 134
132 IF F=255 THEN GOTO 134
134 PRINT @ 192, "PUSH TO FIRE"
135 GOTO 10
140 PRINT @ 192, "FIRE RIGHT"
150 GOTO 10
160 PRINT @ 192, "FIRE LEFT"
170 GOTO 10

```

TRS-80 COLOR COMPUTER USERS NEWSPAPER

SELL OR TRADE YOUR UNWANTED PROGRAMS OR HARDWARE IN THIS MONTHLY NEWSPAPER. FIND GREAT BUYS. CIRCULATION - OVER 18,000 COCO OWNERS. LIST YOUR CLUB OR BBS. FULL OF TIPS, ARTICLES, REVIEWS AND PROGRAMS FOR YOUR COCO. DON'T DELAY, SUBSCRIPTION STARTS AT ONLY \$5.00 PER 12 ISSUES(1 YEAR) CLASSIFIED AD'S ONLY \$.15 A WORD, USE SEPERATE SHEET OF PAPER FOR CLASSIFIED AD'S



YES - I WOULD LIKE A SUBSCRIPTION TO COCO ADS
 ___ 1 YEAR THIRD CLASS MAIL \$5.00
 ___ 1 YEAR FIRST CLASS & CANADA \$10.00

NAME _____

ADDRESS _____

CITY STATE _____ ZIP _____

PLEASE HAVE CHECKS PAYABLE TO - P D SOFTWARE
 P O BOX 13124 HOUSTON, TEXAS 77219

From Computer Plus to YOU...

PLUS after PLUS after PLUS

**A SPECTACULAR
OFFER!**



**A
VERY
AFFORDABLE
DAISY WHEEL PRINTER**

SMITH-CORONA L-1000

ONLY

\$259.00

The Smith-Corona L-1000 text printer delivers fully formed executive quality daisy wheel print at a speed of 12 characters per second. It features bi-directional printing, triple pitch — 10, 12, 15 cpi, logic seeking, underlining, 570 character buffer, and has both a serial and parallel interface for easy connection to any computer. It takes single sheets of paper up to 13 inches wide, and an optional continuous forms feed can be added at any time.

The Smith-Corona L-1000 is a simple, low cost and reliable text printer backed by the quality workmanship of Smith-Corona. The L-1000 is compatible with most word processors, and even if you own a dot matrix printer this is a great opportunity to obtain professional looking results at an affordable price.

Take advantage of this one time offer from Computer Plus while supplies last.

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

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



**computer
plus**

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

SINCE 1973

IN MASSACHUSETTS CALL (617) 486-3193

DATA MAN INTERNATIONAL



1-416-529-1319



PLEASE INCLUDE \$2.50 SHIPPING

PRINTMASTER

A full featured screen print program that will work with any printer capable of dot addressable graphics is now available for the color computer. This value packed program should be on everyone's "must have" list. Just look at these powerful specifications:-

Automatic P/MODE recognition..

Menu driven or called from Basic

Vertical and horizontal stretching (zoom)

Full or partial screen rotation

8 color recognition & separation

Vertical & horizontal concatenation

Inverse printing.

All of the above will work on the full screen or on any portion that you specify.



\$13.95US

\$39.95Cdn



\$37.95US

\$33.95Cdn

ROMMASTER

Rommaster is a circuit board with a rotary switch and sockets for three EPROM's (24 or 28 pin) that can be individually selected. You can now have up to three versions of Basic and three versions of Extended Basic in your Cooc at the same time.

If you wish you can burn your own EPROM's and have them available on power up at the flick of a switch. If you develop software for sale it is essential that your programs be tested on all versions and configurations of ROM's before you release them.



\$39.95US 2/875

\$49.95Cdn 2/895

Double sided prototype boards



\$9.95US \$12.95Cdn

Blank keyboard overlays

\$0.75US

\$0.99Cdn

DATA MAN
INTERNATIONAL

125 SOUTH FIFTH STREET
LEWISTON, N.Y. 14092

DATA MAN
INTERNATIONAL

420 FERGUSON AVE. N.
HAMILTON, ONT., L8L 4Y9

Super-Disk Charger Puts The 'Turbo' In Your Drives

Two years ago disk drives were outrageously expensive. Consequently, most CoCo owners were using cassette recorders. I, too, wasn't in a position to shell out the more than \$600 for two single-sided drives and an interface. Radio Shack's drives couldn't even get past track 35.

The story is different today. I have seen new double-sided, double-density 40-track disk drives for under \$100, less the controller which is around \$80, from the Radio Shack warehouse as a replacement part. There are at least other interfaces from other companies available.

Hence the problem: Only a single side will be accessed if double-sided drives are used. Also, track-to-track access time, with the Disk BASIC, will be an incredibly slow 30 milliseconds.

Here is a solution to the problem! This program will allow you to buy any type of plug compatible 40-track disk drive and tailor the Disk BASIC to your needs. All that is required is for your computer to have 64K of RAM, or for you to burn your own EPROM and use it in the disk controller.

(Dennis Bironas holds a bachelor's degree in electrical engineering technology and has taught in the E.E.T. Department at Indiana University at Kokomo. He works for Delco Electronics in advanced development as a project engineer. Dennis and his wife own Micro-Connection and sell peripherals for the CoCo.)

By Dennis Bironas



The modification requires you to run the BASIC program called *CHARGER*. You will then be prompted for answers. You will be able to change the Baud

rate and to use either single- or double-sided disk drives at a six or 12 millisecond step rate.

Not included in the options of my

RAINBOWfestSM

New Brunswick *Oct. 18-20*

Where but at **RAINBOWfest** could you meet so many CoCo enthusiasts, see so many new products, and attend seminars that are of immediate assistance? It's the next best thing to receiving the latest issue of **THE RAINBOW** in your mailbox.

Many of the people who write for **THE RAINBOW** — and those who are written about — are there to meet you and answer your questions, technical and otherwise. **RAINBOWfest** is CoCo's very own show, and it's a people-to-people event as well as a valuable learning experience.

To make it easier for you to attend, we schedule **RAINBOWfest** in three parts of the country. If you missed the fun in Irvine,

Calif., and Chicago, why don't you make plans now to be with us in New Brunswick, N.J.? Each show is unique, offering fun, new acquaintances, and great sharing experiences. For members of the family who don't share your affinity for CoCo, you'll be comfortable knowing that each **RAINBOWfest** is located in an area that will provide fun and enjoyment for all.

The Hyatt Regency offers special rates (\$62, single or double room) for **RAINBOWfest**. The show opens Friday evening with a 7 p.m. to 10 p.m. session. It's a daytime-only show Saturday — the CoCo Community Breakfast is at 8 a.m., then the exhibit hall opens promptly at 10 a.m. and runs continuously until 6 p.m. There will

be no exhibition hours or seminars Saturday evening. On Sunday, the exhibit hall opens at 11 a.m. and closes at 4 p.m.

A well-known speaker will again keynote the highly popular CoCo Community Breakfast. And you can set your own pace in the exhibit hall interspersed with a number of seminar sessions on all aspects of CoCo — from improving your BASIC skills to working with the OS-9 system.

But most of all, there will be exhibitors. Lots of them. All ready to demonstrate

products of every kind. It's a time for unveiling brand new products. Many have special buys for **RAINBOWfest**. If you've been eyeing something in THE RAINBOW, you can try it out and take it home that very day.

Tickets may be obtained directly from THE RAINBOW. We'll also send you a special reservation form so you can get your special room rate.

Come to **RAINBOWfest**. Let's all celebrate the CoCo Community!

RAINBOWfest — New Brunswick, N.J.

Dates: October 18-20, 1985

Hotel: Hyatt Regency

Rooms: \$62 per night, single or double

Advance Ticket Deadline: October 11, 1985

Show Schedule:

Friday evening — Exhibit hall open from 7 p.m. to 10 p.m.

Saturday — CoCo Community Breakfast at 8 a.m.

Exhibit Hall opens at 10 a.m. and closes at 6 p.m.

Sunday — Exhibit Hall open from 11 a.m. to 4 p.m.

FREE Rainbow poster
for first 500 ticket orders received.

FREE T-Shirt to first five ticket
orders received from each state.

Make checks payable to:
THE RAINBOW

MAIL TO:

RAINBOWfest
P.O. BOX 385
Prospect, KY 40059
(502) 228-4492

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

Please send me:

_____ Three day tickets at \$9 each	total _____
_____ One day tickets at \$7 each	total _____
_____ Circle one: Friday / Saturday / Sunday	
_____ Saturday breakfast tickets at \$12 each	total _____
_____ Handling Charge \$1	_____ 1 00

TOTAL ENCLOSED (U.S. FUNDS ONLY, PLEASE) \$ _____

Also send me a hotel reservation card.

NAME (please print) _____

STREET & NUMBER _____

CITY & STATE _____

TELEPHONE _____ ZIP CODE _____

COMPANY _____

Orders received less than two weeks prior to show opening will be held for you at the door.

VISA, MasterCard, American Express accepted.

My Account # _____ Ex. Date: _____

If MasterCard, include interbank number _____

Signature _____

program is the ability to use Disk BASIC for 40 tracks. If you want 40 tracks instead of 35, add these lines:

The listings are included so you may type them in and add, delete, and generally modify them to suit your

needs. You will have to input the machine language programs either with pokes or by assembling them and saving them on disk as follows:

```
POKE&HD1B0,40:POKE&HD572,40:POKE&HD595,40
POKE&HD35F,7B:POKE&HC70B,7B:POKE&HC78B,7B
POKE&HC7A0,7B:POKE&HC7BF,7B:POKE&HCC4C,7B
POKE&HCDD9,7B:POKE&HD446,39:POKE&HC72A,1
```

Program Name	Used As
BOOT6	DS 6 ms
BOOT	DS 12 ms
SSDC6	SS 6 ms
SSDC	SS 12 ms

Listing 1: CHARGER

```
10 DEFUSR1=&HE00
20 CLS
30 PRINT"DO YOU WISH TO CHANGE P
RINTER
40 INPUT"BAUD RATE (Y,N)" ;Q$
50 IF Q$="Y" THEN 80
60 IF Q$="N" THEN 250
70 GOTO 20
80 CLS
90 PRINT"PICK YOUR PRINTER BAUD"
100 PRINT"1) 300"
110 PRINT"2) 600"
120 PRINT"3) 1200"
130 PRINT"4) 2400"
140 PRINT"5) 4800"
150 INPUT"6) 9600" ;B
160 IF B=0 THEN 80
170 IF B=1 THEN POKE150,180
180 IF B=2 THEN POKE150,87
190 IF B=3 THEN POKE 150,41
200 IF B=4 THEN POKE150,18
210 IF B=5 THEN POKE150,7
220 IF B=6 THEN POKE150,1
230 IF B>6 THEN 80
240 DEFUSR1=&HE00
250 CLS
260 PRINT"INPUT YOUR CHOICE"
270 PRINT"1) DS 6MS DRIVES
280 PRINT"2) DS 12 MS DRIVES
290 PRINT"3) SS 6MS DRIVES
300 INPUT"4) SS 12 MS DRIVES" ;K
310 IF K=0 THEN 250
320 IF K>4 THEN 250
330 ON K GOTO 340,350,360,370
340 LOADM"BOOT6":GOTO380
350 LOADM"BOOT":GOTO 380
360 LOADM"SSDC6":GOTO380
370 LOADM"SSDC":GOTO380
380 X=USR1 (0)
```

The data starting at locations E3A and E50 should be changed to \$0115 if a 12 ms step is required.

The data starting at locations E42 and E59 should be changed to \$121212 if single-sided drives are used.

This program at least allows you to buy the kind of disk drive you want, or as your economics dictate. Today you can buy a double-sided drive as inexpensively as you can a single-sided. I am sure you will learn that with the CoCo, you are not bound to Tandy's disk drives. CoCo users are indeed a fortunate breed!

Super-Disk Charger automatically checks to see which version of DOS you have. This means new users and old-timers alike will be able to use the *CHARGER* with no modifications to your machines. (I understand that Version 1.2 DOS will be available soon.)

Type in (with the *CHARGER* in Drive0) RUN "CHARGER". The program is menu driven. You may select your Baud rate and disk step rate from the menu. DS means double-sided; SS means single-sided. Therefore, you may select double-sided or single-sided disk drives for a six or 12 ms step rate. Normal power-up step rate is 30 ms. Wow! That's an increase of 2.5 to 6 times faster.

In a bad case calculation with the head resting on Track 35, the head would have to move to Track 17 to find where the program resides on the disk, then go there. If it had to go back to Track 35, it would take 1.08 seconds for the head to get where it had to go and to pull off the program.

This doesn't sound like a lot of time, does it? When you're in a hurry, one second can seem like a century. Another example is the track-to-track time. If you initialize a new disk or try to make a backup, you might wait an extra three or four seconds.

One side of the diskette in Drive 0 becomes Drive 0, while the other side of the same diskette becomes Drive 2. One side of the diskette in Drive 1 becomes Drive 1, while the other side

Listing 2: SDC

```
0E00          00100      ORG      $0E00
0E00 CC 0E00      00110      LDD      #$E00
0E03 00 72      00140      STD      $72
0E05 7F DFFF     00150 START CLR      $DFFF TEST IF IN ALL RAM MODE
0E08 86 AA      00160      LDA      #$AA
0E0A 87 DFFF     00170      STA      $DFFF
0E0D B1 DFFF     00180      CHPA    $DFFF
0E10 27 17      00190      BEQ     RAM00B ALREADY IN RAM MODE
```

```

0E12 1A 50 00200 DRCC #550 DISABLE FIRQ+IR
0E14 8E 8000 00210 LDX #8000 POINT TO EXTENDED BASIC
0E17 8C 84 00220 LOOP LDD ,X GET ROM DATA
0E19 7F FFDF 00230 CLR $FFDF SET TO MAP TYPE 1
0E1C 8D 81 00240 STD ,X++ SAVE ROM DATA TO RAM MIRROR
0E1E 7F FFDE 00250 CLR $FFDE SELECT ROM MAP TYPE 0
0E21 8C DEFF 00260 CMPX #DEFF END OF ROM ?
0E24 25 F1 00270 BCS LOOP
0E26 7F FFDF 00280 CLR $FFDF YES..CHANGE TO ALL RAM MODE
0E29 CC 2828 00290 RAMODE LDD #5282B NEW PROMPT SYMNOI
0E2C FD ABEE 00300 STD $ABEE MODIFY BASIC 'OK'
0E2F 86 30 00310 LDA #530
0E31 81 C142 00320 CHPA $C142 DOS VERSION 1.0
0E34 27 17 00330 BEQ DOS
0E36 8D 4C 00340 BSR CLEAR CLEAR SCREEN
0E38 CC 0014 00350 LDD #50014 6 MS. RESTORE AND HOME
0E3B 87 D7C0 00360 STA $D7C0 $0015 FOR 12 MS.
0E3E F7 D816 00370 STB $D816
0E41 CC 4142 00380 LDD #54142 FOR DOUBLE SIDED DRIVES
0E44 FD D89F 00390 STD $D89F
0E47 108E C139 00400 LDY #C139
0E48 20 11 00410 BRA MOD
0E4D 8D 35 00420 DOS BSR CLEAR CLEAR SCREEN
0E4F CC 0014 00430 LDD #50014 6 MS. RESTORE
0E52 B7 D6CD 00440 STA $D6CD
0E55 F7 D723 00450 STB $D723 FOR DOS VERSION 1.0
0E58 CC 4142 00460 LDD #54142 DOUBLE SIDED DRIVES
0E5H FD D7AC 00470 STD $D7AC
0E5E 30 8D 0033 00480 MOD LEAX TABLE,PCB GET MESSAGE BEG. ADDR.
0E62 86 0D 00490 LDA #50D CARRIGE RETURN CODE
0E64 8D 2B 00500 MODA BSR OUTCH OUTPUT CR
0E66 A6 80 00510 MOD1 LDA ,X+ OUIPUT MESSAGE
0E68 81 04 00520 CHPA #4 END OF MESSAGE ?
0E6A 27 02 00530 BEQ END YES
0E6C 20 F6 00540 BRA MODA NO
0E6E 0F E3 00550 END CLR $E3 SETUP FOR AUTO RESTART
0E70 0F E4 00560 CLR $E4 AFTER RESET IS PUSHED
0E72 86 FF03 00570 LDA $FF03
0E75 8A 01 00580 ORA #1
0E77 87 FF03 00590 STA $FF03
0E7A 0F 6F 00600 CLR $6F IRQ DISABLE
0E7C 8D AD33 00610 JSR $AD33 RESET STACK
0E7F 1C AF 00620 ANDCC #5AF
0E81 7E AC73 00630 JMP $AC73 RESTART BASIC
0E84 8E 0400 00640 CLEAR LDX #5400 BEGINNING OF DISPLAY
0E87 86 60 00650 LDA #560 SPACE CODE
0E89 A7 80 00660 CLEAR1 STA ,X+ PUT SPACES IN THE DISPLAY
0E8B 8C 0600 00670 CMPX #5600 END OF DISPLAY ?
0E8E 26 F9 00680 BNE CLEAR1 NO
0E90 39 00690 RTS RETURN
0E91 6E 7F A002 00700 OUTCH JHP [$A002] BASIC OUTPUT
0E95 4D 00710 TABLE FCC "MICRO-CONNECTION "
0EA6 20 00720 FCC " 1985 "
0EAD 0D 00730 FCB $0D
0EAE 42 00740 FCC "BY D.K.BIRONAS "
0EBD 0D 00750 FCB $0D
0EBE 52 00760 FCC "RR# 2 "
0EC4 0D 00770 FCB $0D
0EC5 46 00780 FCC "FRANKFORT, INDIANA"
0ED7 20 00790 FCC " 46041 "
0EDE 0D 00800 FCB $0D
0EDF 0D 00810 FCB $0D
0EE0 53 00820 FCC "SUPER-DISK"
0EEA 0D 00830 FCB $0D
0EEB 43 00840 FCC "CHARGER 1.3"
0EF6 0D 00850 FCB $0D
0EF7 04 00860 FCB 4
0000 00870 END
00000 TOTAL ERRORS

```

of the same diskette becomes Drive 3. Try this: Put a diskette with programs on it in Drive 0 and type in DSKIN12. After the formatting is complete, type in BACKUP 0 TO 2. Now, do a DIR0 THEN DIR2. Got the idea? The bottom line is that the other side of the diskette becomes another drive number.

One last thought to consider: You should realize a marked decrease in disk drive mechanically generated noise; most of the noise is generated from the head drive mechanism. You should use your disk drive at or near its speed capability — they will last longer.

By the way, you can permanently change your step rate by comparing the old DOS with the *CHARGED* DOS and making the changes in EPROM. That is perfectly legal for you to do, but not for me to do for you.

My system has none of the original ROMs, as I have changed each ROM so my system is automatically configured on "power up." It really gets to be a pain when you have to do several PEEKs and POKEs every time you power down.

Let me know how useful this program is to you. Drop me a line and let me know what else you are interested in. I will only consider serious software suggestions.

I also have a double-sided, plated through holes, gold plated edge connector EPROM programmer circuit board with software for \$30 plus postage. It will cost you about another \$30 for the parts to build it. For information on the programmer, send \$2 to:

Dennis Bironas
R.R. #2
Frankfort, IN 46041

The programmers can be built (cutting runners) to program 2764s. With no modifications, it will program 2716s, 2732s, 2532s and 2564s. The programmer will work with all models of CoCos when nine volt batteries are used as the programming supply.

See You At
RAINBOWfest New Brunswick
October 18-20



DRACONIAN

You brace yourself as your ship materializes in the enemy sector. Your engine roars to life, and you consult the long-range scanner for the position of the nearest enemy base. As you head for the base, blasting asteroids and space-mines in your path, you suddenly notice a monstrous space-dragon looming before you. Reacting quickly, you dodge his deadly fire-breath and blast him out of existence.

This is it — the single most impressive, awe-inspiring arcade game you can buy for your Color Computer. High-resolution graphics, awesome sound effects, four-voice music, and quality you have to see to believe! Experience the realism of DRACONIAN today!

JOYSTICKS REQUIRED

32K MACHINE LANGUAGE

TAPE \$27.95 DISK \$30.95



SR-71

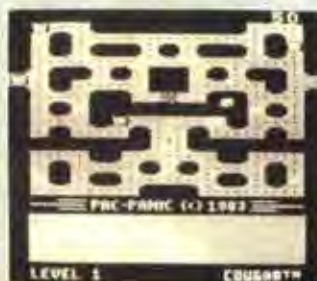
SR-71 is a fast action game in which you are the pilot on a mission to take photographs of missile sites in Russia and deliver them to our processing laboratory in Japan. So real you will feel as if you are in the cockpit on a real spy mission. Elude Russian missiles as well as their detection devices. Another Tom Mix exclusive. A must for the adventurous. Fantastic graphics, color and sound. 32K Ext. Basic.

TAPE \$28.95 DISK \$31.95

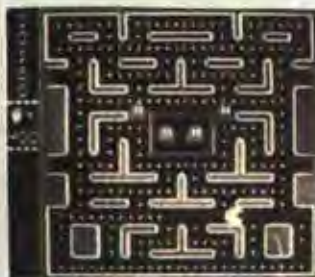
PAK-PANIC

Pakman is steered thru a maze eating dots and powerpills. Pakman is pursued by four monsters who try to catch and kill him. If Pakman eats a powerpill he becomes powerful and can eat monsters. Monsters try to avoid a powerful Pakman. As monsters are eaten their ghosts appear on the top of the screen. When seven ghosts have appeared one will fly across the screen or they will link together forming a centipede that will travel thru the maze. Pakman has no power against ghosts and centipedes and must avoid them or be killed. **JOYSTICKS REQUIRED**

32K MACHINE LANGUAGE
TAPE \$24.95 DISK \$27.95



BOTH MS. MAZE & PAK PANIC ONLY 44.90 TAPE, 50.90 DISK



MS. MAZE

MS. MAZE is remarkable in that it combines brilliant color, high resolution, detailed graphics, and music with a very playable game. Anything that could be done to make the Color Computer look and play like the arcade version has been done. MS. MAZE is without question the closest thing to the arcade Pac games that I have seen for the Coco.

JOYSTICKS REQUIRED

32K MACHINE LANGUAGE
TAPE \$24.95 DISK \$27.95

New From Tom Mix Worlds of Flight

Not A Game — A Very Realistic Flight Simulation

WORLDS OF FLIGHT (WOF) is a "view" oriented flight simulation for the TBS-80 Color Computer, written entirely in Machine Language. "View" oriented means that the pilot may determine his or her position by actually viewing the surrounding landmarks as opposed to using instruments which sense navigational references. This is a major departure from "instrument only" simulations which can be achieved through BASIC programs. Most instrument maneuvers and procedures may be practiced. The craft is a light-weight, single-engine airplane with low wings. A nose wheel which is both steerable and retractable is also modeled. Some aerobatics are possible including sustained inverted flight, aileron rolls, spins and stalls.

JOYSTICKS REQUIRED

32K MACHINE LANGUAGE

TAPE \$29.95 DISK \$32.95



ANNOUNCING!

The SAILOR MAN

The First
64K Arcade Game
For the Color Computer

3 Screens-Plus "INVISIO SCREEN"

The first screen objective is to catch enough of those wacky Red Meats (Shrimp) to fill in the squares on the Captain's Route. If you can time your punch just as you can send the puffing bird one to knock the bucket down and, with a little bit of luck, right into Bigbadog's head. This will give you a little (but not much) time to catch up those fish.

You must avoid contact with Bigbadog who, a cunning butting you, will also be careful of Orshy's wacky swimmer who will appear at higher difficulty levels to chuck empty at you. (Only avoid the flying coffee, or punch them (with the fire button) to keep from being knocked into the water.

The second screen objective is to collect enough rules to stay free of the line song. You may jump off and onto the other end of Red Meats (Shrimp) and/or a swimmer to try to stay out of the water. If you manage to collect a lot of money, you'll get a good handle. Time to fight and swim you go.

The third screen objective is to collect enough when thrown by even one to 100-UP to complete a ladder on the way to the coast. (You'll have a cooling you, however, if the crew members who throw you are after the again.) On all screens, using a pair of colored glasses (colored "C" to collect and glasses by punching the coin slot) will give you amazing speed, strength and agility and allow you to send Bigbadog into the air with a single punch.

REQUIRES 64K
DISK \$34.95 TAPE \$29.95



TOM MIX SOFTWARE

4285 BRADFORD N.E.
GRAND RAPIDS, MI 49506

• ADD \$2.50 POSTAGE & HANDLING • (CANADA ADD \$3.00) •

• MICHIGAN RESIDENTS ADD 4% SALES TAX •

LOOKING FOR NEW SOFTWARE

TOP ROALITIES PAID

(616) 957-0444



WRITE FOR FREE CATALOGUE - MOST OF OUR INVENTORY IS NOT SHOWN HERE!

QUALITY EDUCATIONAL SOFTWARE VOCABULARY MANAGEMENT SYSTEM

16K Extended basic/32K for printer output

The Vocabulary Management System (VMS) is a series of programs designed to aid a parent or teacher in helping children to learn and practice using vocabulary and spelling words. The 11 programs that comprise the VMS include a full feature data entry/edit program, three printer output programs and 5 vocabulary/spelling game programs. The system's many outstanding features include:

- As many as 300 vocabulary words and definitions may be in the computer's memory at one time.
- Words and definitions may be saved on disk or tape.
- Remarks and/or comments can be saved with word files.
- A disk loading menu allows students to load disk files without typing file names.
- Word lists may be quickly alphabetized.
- The three printer segments allow you to create and print individualized tests, puzzles, word-searches and worksheets.
- The printer segments allow full use of your printer's special features.
- The 5 game programs are based on sound educational principles and provide practice in identifying words and matching them with their definitions in a fast-paced set of activities.

TAPE \$39.95 DISK \$42.95

FRACTIONS - A Three Program Package - 32 K EXT. BASIC TAPE \$30.95 DISK \$35.95

MIXED & IMPROPER

1. Review converting mixed numerals and improper fractions.
2. Practice converting mixed numerals to improper fractions.
3. Practice converting improper fractions to mixed numerals.
4. Practice of both types. (Mixed to improper & improper to mixed)
5. Review converting mixed numerals to mixed numerals (User in reproducing in abstract)
6. Practice converting mixed numerals to mixed numerals.

EQUIVALENCE

1. Definitions of terms and review of finding equivalent fractions.
2. Practice finding equivalent fractions.
3. Practice finding sets of equivalent fractions.
4. Review of finding if one fraction is equal to, not equal to, less than or greater than another.
5. Practice finding if one fraction is equal to, not equal to, less than or greater than another.

LOWEST TERMS

1. Review of placing fractions into lowest terms by finding the greatest common factor (GCF) of the numerator and denominator.
2. Practice finding the GCF of pairs of numbers.
3. Practice placing fractions into lowest terms by finding the GCF of the numerator and denominator.

TEACHER'S DATABASE

TEACHER'S DATABASE is a program designed to allow a teacher to keep a computerized file of information about his/her students. There are many features that make this program particularly attractive:

- Information on as many as 100 students (or more) may be in the computer at one time.
- Each student may have as many as 20 (or more) individual items of data in his/her record.
- The program will run from cassette or disk.
- Cassette and disk files are completely compatible.
- The program is menu driven.
- Records may be easily changed, deleted, combined or added.
- Information about students may be numerical or text.
- Records may be quickly alphabetized.
- Records may be sorted by various criteria.
- Records may be reordered (ranked) based on test scores or other data.
- Data displayed during a sort may be printed on a printer or saved on disk or cassette as a new file.
- A full statistical analysis of data may be done and sent to the printer.
- Student test scores may be weighted.

**REQUIRES 32K EXT. BASIC
TAPE \$39.95 DISK \$42.95**

ESTIMATE

ESTIMATE is a program designed to help children to practice estimating the answers to addition, subtraction, multiplication and division problems on the Color Computer. It has many features that make it use particularly attractive:

- Up to 5 students may use the program at the same time.
- There are 5, user modifiable, skill levels.
- The acceptable percent error may be changed as a student's skill improves.
- A timer measures the number of seconds used to answer each problem and the total time used for a series of problems.
- If a problem has been answered incorrectly, the student is told the percent error and asked to try again.
- If a problem is answered incorrectly a second time, the student is told the correct answer and the range of acceptable answers is displayed.
- A report is given at the end of each set of problems that includes the number of problems done, the number of problems answered correctly on the first try and the average percent error.
- The (BREAK) key has been disabled so that child will not inadvertently stop the program from running. **REQUIRES 16K EXT. BASIC**

TAPE \$19.95 DISK \$22.95

PRE-ALGEBRA I INTEGERS

INTEGERS is a series of four programs designed to give students practice in working with addition, subtraction, multiplication, division and the comparison of integers. It has many features that make a very valuable tool for introducing and/or maintaining skills.

- Up to 4 students may use the program at the same time.
- There are 9, user modifiable, skill levels.
- Students are given two opportunities to answer a problem.
- A detailed report of student performance, including number correct on first try, number wrong, total time used and percentage score, is presented at the end of a series of problems.
- The programs will run on a 16K TRS-80 Color Computer with or without disk drive.

Four distinct problem formats are presented. The first presents problems in this format: $-12 + -9 = ?$ The second program presents a problem with missing numerals in this format: $-7 - ? = 18$. The third program presents a problem with a missing sign: $8 - ? = 14$. The last program asks the student to determine the relationship ($=$, $<$ or $>$) between two statements $3 - 9 (??) - 4 - 5$.

**32K EXT. BASIC
TAPE \$28.95 DISK \$33.95**

MATH DUEL

MATH DUEL is a challenging mathematics game that pits you against the computer in a game of wits. You must use all of your knowledge of factors, multiples and prime numbers to develop a strategy that allows you to gather more numbers and thus more points than the computer.

The game is deceptively simple. You select the size of the playing field that is composed of from 8 to 100 numbers. You must then choose numbers that will give you the maximum number of points and the computer the least number of points. There are only 6 rules.

1. Any number that you chose must have at least one factor still on the playing field.
2. You receive points equal to the face value of the number that you chose.
3. The computer receives points equal to the face value of all of the remaining factors of the number that you chose.
4. All of the numbers that were awarded to you or to the computer are removed from the field.
5. The game continues until there are no numbers with factors remaining.
6. At the end the computer receives points equal to the value of all of the remaining numbers.

32K EXT. BASIC TAPE \$24.95 DISK \$29.95

PRE-ALGEBRA II

The second **PRE-ALGEBRA PACK** is composed of two programs, **EQUATION SOLVER AND EQUATION DUEL**, that are designed to give students practice in using and solving equations. It has many features that make a very valuable tool for introducing and/or maintaining skills:

- In both programs students may choose the range of numerical values that will be included in the equations so that the difficulty may change as their skill increases.
- In **EQUATION SOLVER** the computer secretly generates a random equation, shows the numbers that it used in the equation and the answer and challenges the student to create his/her own equation that uses the same numbers and results in the same answer.
- In **EQUATION DUEL** the student and the computer race to see who will be the first to create an equation from the same set of random numbers.
- Both programs give detailed reports of the student's and the computer's performance in creating and solving equations including time used, score and percentage correct.

**32K EXT. BASIC
TAPE \$28.95 DISK \$33.95**



TOM MIX SOFTWARE

4285 BRADFORD N.E.
GRAND RAPIDS, MI 49506

• ADD \$2.50 POSTAGE & HANDLING • (CANADA ADD \$3.00) •

• MICHIGAN RESIDENTS ADD 4% SALES TAX •
LOOKING FOR NEW SOFTWARE

TOP ROYALTIES PAID

(616) 957-0444



WRITE FOR FREE CATALOGUE - MOST OF OUR INVENTORY IS NOT SHOWN HERE!

PIPELINE

COMPUTER EXECES? — The technology of artificial intelligence has taken computers "beyond sophisticated number crunching to participation in management decisions," according to a spokesman for Litton, a California-based company that develops electronics and defense systems.

Appearing before the Houston Society of Financial Analysts, Sy Schoen, the manager of Litton's artificial intelligence program, said that he foresees applications in marketing, planning, production management, customer service, and in further automating a company's facilities.

Currently under development at Litton are programs in image analysis to aid experts in studying surveillance photographs, and the enhancement of radar identification of multiple aircraft.

FLEXING AGAIN — Frank Hogg Laboratory (FHL) and Technical Systems Consultants (TSC) have entered into an agreement making FHL a nationwide distributor of TSC's FLEX-based software.

Now available through FHL dealers are such programs as: *68000 Cross Assembler*, *Text Editor*, *Pascal*, *X-BASIC* and *Diagnostics* for 6809.

SOFTWARE ON VIDEO TAPE — Creative Technical Consultants (CTC) has introduced a catalog/video tape of CoCo products for teachers which make it possible for them to preview educational software. The tape takes the instructor through each program as a student would see it — from the title screen, through the menu, over some sample problems, and finally to the scoring and reward displays.

CTC says the video tape solves the preview privilege vs. piracy software problem the company has encountered in the past since all of its educational programs are written in BASIC. Teachers may preview the programs at no charge;

the tape must be returned in 30 days. Write to 166 Sangre de Cristo, P.O. Box 652, Cedar Crest, NM 87008.

TESTING, TESTING — The International Bureau of Software Test has expanded its services to include "quality assurance services" for technical manuscripts. Their service is designed to accommodate publishers of computer books and manufacturers of software. The company is an affiliate of Prentice-Hall. Write to 165 Forest Street, Marlboro, MA 01752.

GETTING ORGANIZED — Buddy Systems has introduced Paper Catcher, a unique solution for handling continuous forms generated by computer printers. With the new product, printed pages stack neatly on top of the printer.

Paper Catcher requires no more space than the printer itself and will neatly refeed and stack checks, pages, labels and any continuous forms. It has vinyl "feet" for added stability, and does not interfere with the printer operation in any way.

Write to Buddy Products, 1350 South Leavitt Street, Chicago, IL 60608.

FREEBIES — Because of an advertising omission due to an oversight at RAINBOW, Ross Litton wants us to pass along a reminder that free printer tutorials are still available with the purchase of the Epson RX-80FT+ from Howard Medical Computers.

With the purchase of any monitor from Howard, you get free reverse video capabilities. The company recently expanded its line of monitors to include the 141 Roland 14-inch Color Monitor with sound and 270 x 270 dot resolution.

THE WORD — A new line of Biblical software for use with church groups has been introduced by Manna Computing Concepts. In its catalog, Manna notes that personal computers are becoming

major channels of information in society. "Already, we see many software programs with definite themes of witchcraft, violence and death," note the owners in their most recent catalog. Manna hopes to reinforce traditional values through fun, educational programs.

To provide encouragement to the developers of such software, Manna encloses a response card in each package asking the user to provide feedback. The responses will be published in Manna's next catalog. Write: P.O. Box 527, Woodstock, GA 30188.

ALL YOU EVER WANTED TO KNOW — Anchor Automation has published an eight-page *Guide to Modems*, which is available free to consumers through participating retail outlets.

The pamphlet includes definitions of terms, along with explanations of operation principles, how Baud rates are determined, various tips on increased efficiency, and advice on software, installation and troubleshooting.

Dealer requests should be addressed to: Anchor Automation, Inc., 6913 Valjean Avenue, Van Nuys, CA 91406.

FUNDING SOURCE — Need help funding computer education at your school? Career Publishing, Inc. is sponsoring a \$500,000 program to provide computer courseware and training for elementary, secondary and post-secondary teachers and administrators.

A grant entitles the recipient to offer qualified instructors a workshop in the methods and techniques required to effectively teach others to use computers as problem-solving tools, develop and enhance critical thinking skills, teach computer literacy applications and develop "Information Age" employment skills.

Write to Career Publishing, Inc., 910 North Main Street, Orange, CA 92667.

A SPECTRUM PROJECTS SHOPPING LIST

A CHIP OFF THE OLD...

6821 Standard PIA\$9.95
 6809E CPU Chip (NEW LOW PRICE) ...\$19.95
 27128 16K DOS Eprom (or 2 DOS's!)..\$19.95
 68766 (Fits Disk Basic Skt) Eprom.\$24.95
 New SAM Chip w/heatsink (74LS785)..\$29.95
 Ext Basic 1.1 ROM - NEW LOW PRICE.\$29.95
 28 pin Ext Basic-upgrade 26-3134A.\$34.95
 Basic ROM 1.2 Chip (30% FASTER) ..\$39.95
 Disk ROM 1.1 (New DOS Command) ..\$39.95
 Eprom Eraser - 3 min erasure time.\$49.95
 Lower Kit Bd - Specify CoCoI/II**.\$59.95
 CoCo First Aid Kit - includes 2 PIAs,
 6809E & SAM (Be Prepared!!!)\$59.95
 26-3134A & 26-3136A 64K Upgrade - 2 chip
 set (ONLY for new Korean CoCoIIA).\$69.95
 Eprom Prgmr (2ms speed/2K - 16K).\$139.95
 64K CoCo II - w/NEW keyboard\$169.95

COCO LIBRARY...

CoCo Memory Map\$12.00
 Rainbow Book & Tape of Adventures.\$14.95
 Basic Programming Tricks Revealed.\$14.95
 The FACTS - Inside "guts" of CoCo.\$14.95
 500 Pokes, Peeks 'N Execs\$16.95
 Basic 09 Tour Guide\$18.95
 Disk Basic (1.0/1.1) Unraveled ...\$19.95
 New! CoCo II Service Manual\$19.95
 The Complete Rainbow Guide to OS9.\$19.95
 W/Two Disk Package of demo pgms ..\$49.95
 Color/Extended/Disk Basic Unraveled -
 Complete 3 Book Set - Save \$10! ..\$49.95

MORE GOOD STUFF...

28pin/24pin Adapter - Plug-in 27128 &
 27256 Eproms in 24 pin sockets ...\$19.95
 CoCo Freeze Frame - Stop your CoCo dead
 in its tracks! Put games on "HOLD" \$19.95
 CoCo Light Pen with 6 programs ...\$24.95
 Spectrum Voice Pak - SAVE \$30!! ..\$39.95
 PBH Parallel Interface - Beats Botek!
 300-9600 baud w/ptr-modem switch . \$69.95
 PBJ WORD-PAK II - Hi-Res 80x24 display
 w/smooth scrolling & 8x10 matrix \$139.95
 Amdek Twin 3" Drive System\$199.95
 Amdek Drive System w/controller . \$299.95

All orders plus \$3.00 S/H (Foreign \$5.00)
 COD add \$2.00 extra
 NYS Residents add Sales Tax

COCO CABLES AND...

Printer/Modem 15' Extender Cable . \$14.95
 Tired of unplugging devices from your
 RS232 port? Try a RS232 "Y" Cable. \$19.95
 Joystick/Mouse 10' Extender Cable. \$19.95
 Null Modem Cable - 4 pin to DB25 . \$24.95
 Disk Interface/Rom Pak Extender - Move
 your disks & ROM Paks (3 feet) ..\$29.95
 Triple RS232 Switcher - Now select one
 of any three RS232 peripherals ...\$29.95
 40 Pin Dual "Y" Cable - Hook up a Disk
 w/Voice, Word Pak, CoCo Max, etc ..\$29.95
 Triple "Joyport" Switcher - Joystick,
 Mouse, Touch Pad and/or Light Pen \$39.95
 40 Pin Triple "Y" Cable - Hook up any 3-
 Voice/Word/RS232/Digitizer PAKs ..\$39.95
 Finally! 24" Multi-Pak Extender ..\$39.95

OTHER GOOD STUFF...

C-10 tapes in any quantity49 cents
 5 1/4" Diskettes in any quantity ..\$1.49
 Joystick, Cassette or Serial plug ..\$2.99
 32K, 64K or 128K RAM Button\$4.99
 Rompak w/Blank PC Brd-27xx series . \$9.95
 The Disk Doubler - Doubleside your 5 1/4
 diskettes for 160K more storage ..\$19.95
 Video Clear - This cable will reduce TV
 interference created by CoCo!\$19.95
 Video Reverser -Reduce eyestrain w/green
 letters on black background**\$24.95
 The Magic Box - Load Mod I/III Basic
 program tapes into the CoCo\$24.95
 DOS Switcher - Select from any two DOSs
 (Disk 1.0 1.1, JDOS) in J&M ctrlr . \$24.95
 Stereo Pak - Hardware synthesizer used
 w/Musica 2...superb stereo sound! \$39.95
 EARS-CoCo's first Voice Recognition unit
 w/95% accuracy & 64 Voice Prints! \$99.95
 ** N O T for 26-3134/36 CoCo II's

SPECTRUM PROJECTS
PO BOX 21272
83-15 88TH DRIVE
WOODHAVEN NY 11421

718-441-2807

SPECIAL 64K RAM CHIPS \$29.95



SPECTRUM PROJECTS

SOFT AND HARD WARES FOR COLORFUL COMPUTING



SPREADSHEET

	Competition	DYNACALC
Screen	32X16	51X24
Precision	9 digits	16 digits
Hi-Res Graphics	NO	YES
Visicalc cmd format	NO	YES
New low price! 64K Disk		\$79.95
Side Wise -Print DYNACALC files up to 255 chars-sideways!		\$19.95

SAVE \$60

BUY 'EM BOTH FOR \$99.95

DATA BASE MANAGER

PRO-COLOR FILE 2.0 - 60 Data Flds, 8 Report Fmts, 4 Screen Fmts, 1020 bytes/record, Sort 3 Fields, Global Search, FAST ML Sort, Create Files Compatible w/DYNACALC! - Disk \$59.95
PCF Forms 2.0- Merge DATA files from PCF to Letter/Forms, \$29.95

DISK DRIVES

DRIVE 0 System* - SS/DD, 6ms, 40 Tracks, Half Height . \$229.95
DRIVE 0 & 1 System* - \$349.95
Disk Drive 1, 2 or 3 - \$139.95
Two Drive Cable\$24.95
Disk Controller w/o ROM \$99.95
Controller w/1.1 ROM - \$119.95
* PLUS: controller-manual-cable



GAME CONTROLLERS

Graphicom Joystick - Has 2 Fire buttons (menu/pen), smooth and easy joystick control - \$24.95
Mach II Joystick - 360 Degree control with center return or analog positioning, - \$39.95
Wico Command Control - Hook up 2 Atari type joysticks - \$19.95

UTILITIES (DISK)

1. Graphicom Part II ...\$24.95
2. Spect'm Adv Generator \$29.95
3. CoCo Calligrapher ...\$29.95
4. Musica 2 (New price) \$29.95
5. Bjork Blocks\$34.95
6. FHL O-PAK\$34.95
7. CoCo Accountant II ..\$34.95
8. FULL Basic Compiler! \$69.95



256K CORNER

Thunder RAM - First 256K memory Bd for CoCo! Load 4 32K pgms at once, emulate a 40 trk Ramdisk, 20K Print Spooler, fast access! All orders 4 to 6 wks delivery*
Thunder RAM Bd w/o 256K ..\$59.95
Thunder RAM Bd w/256K ..\$149.95
256K CoCo w/Ext Basic ..\$299.95
* - NOT AVAILABLE YET FOR COCO 128

SPECTRUM PROJECTS
PO BOX 21272 93-15 86th DRIVE
WOODHAVEN NY 11421

All orders plus \$3.00 S/H (Foreign \$5.00) - COD add \$2.00 extra - NYS Residents add Sales Tax

☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆

SPECTRUM PROJECTS

SOFT AND HARD WARES FOR

COLORFUL COMPUTING

☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆

COMMUNICATION

COLORCOM/E - A complete smart terminal package! Upload, Download, Hi-Res (51X24) screen, 300/1200 Baud, Offline Printing, Rompak/Disk* - \$49.95
 * - Now with CoCo Sig & IBBS XMODEM support! Download MLI COMPUERVE 5hr Start Kit \$39.95

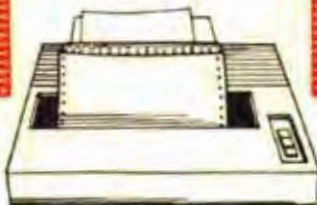


WORD PROCESSING

TELEWRITER-64 - Three Hi-Res screens, true lowercase char's right justify, full screen editor, plus menu-driven I/O & format. Tape \$49.95 Disk \$59.95
WIZ - New character set, true descenders & visible end of line markers for TW-64! \$19.95

MODEMS

MINI-MODEM - Direct connect, 300 Baud, Orig/Answer - \$64.95
J-CAT Modem - Lowest priced auto/answer modem - \$119.95
HAYES SM300 - "Programmable" auto-dial/auto answer - \$199.95
 300/1200 Baud Modem! - \$199.95
 Prices include Modem cable.



PRINTERS

GEMINI SG-10 - 120 cps w/true descenders, 2K buffer, tract-frict feed, Near Letter Quality mode, 1 Yr. warranty! - \$249.95
PBH CoCo Interface - Save \$40 w/SG-10 - \$49.95 (Reg. \$89.95)
 Beats Blue Streak & Botek, auto Baud rates & ptr-modem switch!!

KEYBOARDS

SUPER-PRO (Mark Data) \$59.95*
KEYTRONICS keyboard - \$69.95**
HJL57 PROFESSIONAL - \$79.95**
 Specify Model/Revision Board.
 * Add \$5 for "F" board adapter
 ** Free function key software
 CoCo II HJL version available!!
 15 key Numeric Keypad - \$79.95

MONITORS

MONOCHROME Monitors - 80x24 screens plus Hi-Res w/AUDIO!
 Green - \$99.95 Amber - \$119.95
 13" **COLOR** Monitor - \$249.95
TAXAN Tuner - Converts composite monitors into TV sets!!! \$99.95
Universal Video Driver - Works w/all monitors & CoCos! - \$29.95



SAVE \$10

OFF COLORCOM/E WITH ANY MODEM
 OFF TELEWRITER-64 WITH ANY PRINTER,
 KEYBOARD OR MONITOR

SAVE \$10

FOR EXPRESS ORDERING PLEASE CALL 718-441-2807

More Patches For EDTASM

By W.C. Clements, Jr.

Disk *EDTASM+* is an extremely powerful package. In some ways, it is a major improvement over the old cartridge program. The program disk holds two versions: regular *EDTASM*, which works much like the original program, and an overlay version that frees memory by reading in, or "overlaying," sections of the code as they are needed rather than keeping the whole thing in memory at once.

The overlay version is especially valuable to the serious machine language programmer because it allows the source file to be broken up into several separate units for editing and storage to disk. They can then be assembled together using the *INCLUDE* command. I have used this feature to assemble, in a single pass, source files

that total more than 2100 lines; try that with a run-of-the-mill editor/assembler!

Roger Schrag has written several articles in *THE RAINBOW* that presented some very useful patches for the original, cassette-based version of *EDTASM+*. Those modifications gave CoCo owners a fine disk-oriented, program-development tool even before Radio Shack brought out their Disk *EDTASM+*, and many readers, including myself, have benefited greatly from Schrag's work.

An irritating feature of all versions of *EDTASM+* has always been the relentless one-byte-per-line listing of the ASCII equivalents of each character in every FCC (Form Character Code) string. That listing wastes considerable paper when printing an assembly, and gives little or no useful information.

Big jobs especially tend to have lots of prompts or other titled output, for which the original operation of the FCC pseudo-op effectively discourages getting a printed listing at all. Schrag fixed this "FCC bug" in the original *EDTASM+* by poking an RTS op code into the routine that printed those bytes (see the March 1984 *RAINBOW* for his fix, Page 160).

Radio Shack and Microsoft didn't fix the "FCC bug" when they brought out the newer Disk *EDTASM+*, unfortunately. I'll give you the proper locations to insert Schrag's fix for the regular file (named *EDTASM*) and also for the overlay version (*EDTASMOV*), both of which are part of the Disk *EDTASM+* package from Radio Shack.

To fix the FCC bug, first place the program disk in your drive, type *LOADM "EDTASM"* and *ENTER*. Then type *POKE &H3C04, &H39*, *ENTER* and save the file back to another formatted disk using *SAVEM "EDTASM", &H1600, &H4A7F, &H1600* *ENTER*. The procedure to fix the overlay version is similar: *LOADM "EDTASMOV"* and *ENTER*; *POKE &H4040, &H39* and *ENTER*; *SAVEM "EDTASMOV", &H1600, &H517F, &H1600* and *ENTER*.

These modifications have made Disk *EDTASM+* a far greater pleasure to use for all sizes of jobs. Thanks to Roger Schrag for inspiring the fixes listed here. They've saved me a good half-box of paper over the last year.

(Any questions about these modifications may be directed to Mr. Clements at P.O. Box 2662, University, AL 35486, phone (205) 348-6450.)

(Dr. Bill Clements, a professor of chemical engineering at the University of Alabama, designs peripherals and programs for his department's student computer facility (all CoCos). His major interests are in process control and microcomputer applications.)

☆☆ FOURTH ANNIVERSARY SALE ☆☆



To help celebrate Spectrum Projects Fourth year in supporting the CoCo, we are offering a truly unbelievable once in a lifetime deal! Buy any software from our 2 page "Colorful Utilities" ad and get a set of (8) 64K CoCo chips for only \$14.95! Offer is limited to one set per customer and expires 07/10/85. Order now as quantities are limited!

Sorry, no rainchecks!

INSTRUCTIONS FOR BOTH COCO I & COCO II INCLUDED !

COCO MAX



FEATURE PACKED SYSTEM :

- Pull-Down Menus
- Undo your mistakes
- Full graphic editing
- "Point-and-Click"
- Fat Bits "Zoom"
- Hardware ROMPAK
- Icons & Font Styles
- Full Size Screen Dump
- 32 paintbrush shapes
- Use w/video digitizer
- 256x192 joystick input
- By **COLORWARE**

Requires Multi-Pak or Y-Cable
64K DISK \$69.95 Y-CABLE \$29.95

SHIPPING \$3.00 (FOREIGN \$5.00) - COD \$2.00 EXTRA - NY RES. ADD SALES TAX

SPECTRUM PROJECTS

PO BOX 21272 93-15 86TH DRIVE
WOODHAVEN NY 11421

COD ORDER HOT LINE 718-441-2807



COLORFUL UTILITIES



COCO CHECKER *

Something possibly wrong with your CoCo??? CoCo CHECKER is the answer! Will test your ROMs, RAMs, Disk Drives & Controller, Printer, Keyboard, Cassette, Joysticks, Sound, PIAs, VDG, Internal Clock Speed, and more!!-16K TAPE/DISK **\$19.95** (See Jan '85 Rainbow Review)

MULTI-PAK CRAK

Save ROMPAKs to your 64K Disk system using the RS Multi-Pak Interface. Eliminate constant plugging in of ROMPAKs now by keeping all your PAK software on disk. Includes POKEs for "PROBLEM" ROMPAKs. (Megabug, Micro Painter, Stellar Lifeline, etc.) DISK **\$24.95**

TAPE 'N IMAGE

Easily handles programs with auto loaders, no headers, no EOF markers, unusual size blocks and more! Now is the time to get your tape software collection protected ... against loss!!! TAPE **\$24.95**

SPIT 'N IMAGE

A super upgrade from Disk Omni Clone! Back everything up! This amazing program handles "non standard" disks with ease. We haven't found any disk yet that it can't handle. Don't ever be caught without a backup again! Lowest price too! Beats most "copy protection" programs! 32K DISK **\$29.95**

COCO SCREEN DUMP

The best screen dump program for the Epson & Gemini printers ever! Have the option of standard or reverse images w/regular or double sized pictures. 600-9600 Baud too! A must for Graphicom and Block Block users. 16K TAPE/DISK **\$19.95** (see Nov '84 Rainbow Review)

DISK UTILITY 2.1 *

A multi-featured tool for USER FRIENDLY disk handling. Utilize a directory window to selectively sort, move, rename and kill file entries. Lightning fast Disk I/O for format, copy and backup. Examine contents of files, the Granule Table, plus the size, load addresses and entry points of all programs. Single command execution of both Basic and ML programs. 32K/64K Disk **\$24.95** (see Oct '84 Rainbow Review)

MASTER DESIGN

A text designer/editor to generate graphics mode lettering with multiple font sizes, textures, shadowing and thicknesses, plus special patterns for creative backgrounds. Comes with a screen print routine and Letter Head Utility that interfaces with Telewriter-64 and BASIC. DISK **\$29.95** (see July '84 Rainbow Review)

SPECTRUM DOS

Add 24 NEW disk commands with 2 Hi-Res screens! Supports 40 track & Double-Sided drives, fast stepping rates, auto disk search, line numbering, error trapping & "EPROMABLE". 64K DISK **\$49.95**

SCHEMATIC DRAFTING PROCESSOR

Save time and design pro looking diagrams using a 480X540 pixel worksheet w/6 viewing windows. Over 30 electronic symbols w/10 definable symbols. Print hard copy and save to disk. 64K DISK ~~\$49.95~~ New LOW price!!! **\$29.95** (see Jan '84 Rainbow Review)

COLORAMA

A first-class Bulletin Board package... especially geared towards CoCo users... has an ordering section for those who want to run a mail-order business... supports Color Graphics... one nice piece of work. 64K DISK **\$99.95** July '84 Rainbow. NEW! COLORAMA BBS Time Module **\$59.95**

NEW!

COCO CHECKBOOK

Use your CoCo to keep track of your checking and savings accounts! Printout individual personal checks! 32K/64K TAPE **\$29.95** DISK **\$39.95** (see April '85 Rainbow Review)

*** NOW AVAILABLE BY EXPRESS ORDER
AT YOUR LOCAL Radio Shack STORE -**

**+90-0289 COCO CHECKER - +90-0290 DISK UTILITY 2.1
ASK TO SEE THE DEMO DISK !!!**

Some items are available in Radio Shack stores.



COLORFUL UTILITIES



FAST DUPE II

The fastest Disk copier ever! Will format and backup a diskette in only one pass and can make up to 4 Disk copies at once in 2 minutes! The must utility for every Disk owner. 32K/64K DISK **\$19.95** (see May '84 Rainbow Review)

NEW!

COCO VIDEO TITLER

Start your VCR tapes with dazzling title frames followed by professional countdown to black fade-outs! 16K TAPE **\$19.95**

NEW!

AUT-O-START

Autostart your Basic/ML programs with impressive title screens using a mixture of text and graphical! 16K TAPE **\$19.95** (see June '85 Rainbow Review)

64K DISK UTILITY PACKAGE

Take advantage of an expanded 64K machine. Make an additional 8K of RAM available. Copy ROM cartridges to disk and create a 32K SPOOL buffer for printing. DISK **\$21.95** (see July '83 Rainbow Review)

TAPE/DISK UTILITY

A powerful package that transfers tape to disk and disk to tape automatically. Does an automatic copy of an entire disk of programs to tape. Ideal for Rainbow On Tape to disk. TAPE/DISK **\$24.95** (see Sept '83 Rainbow Review)

FAST TAPE

Save and load cassette files at twice the speed! Now you can run tape and printer I/O operations in the high speed mode without a locked up system or I/O ERRORS! "If you are tired of waiting for those long tapes to load, I strongly recommend that you buy this fine utility." TAPE **\$21.95** July '83 Rainbow

GRAPHICOM

The ultimate CoCo graphics development tool with sophisticated editing, preview animation, telecommunications and printer support. Hi-Res graphics for only **\$24.95**. W/Spectrum's Menu Foot Switch **\$34.95** or W/Spectrum's Graphicom Joystick **\$49.95**. 64K DISK (see April '84 Rainbow Review)

EZ BASE

A truly user friendly data base program at an affordable price. Maintain inventories, hobby collections, recipes, greeting card lists and much, much more! Hi-Res screen, up to 500 records with 15 fields, record or field search, and a Mailing Labels option. 32K DISK **\$24.95** (see July '84 Rainbow Review)

BLACKJACK ROYALE

A Hi-Res graphics casino blackjack simulation and card counting tutor. Fully realistic play includes: double down, splits, surrender, insurance bets, 1-8 decks, burnt cards, shuffle frequency and more! "This fine program is a must for the CoCo Blackjack player." (Aug '83 Rainbow Review) 32K TAPE/DISK **\$24.95** (also see Dec '84 Rainbow Review)

All orders plus \$3.00 S/H (Foreign \$5.00) - COD add \$2.00 extra - NYS Residents add Sales Tax

SPECTRUM PROJECTS
PO BOX 21272 93-15 86TH DR.
WOODHAVEN NY 11421

EXPRESS ORDERING 718-441-2807

DEALER/CLUB INQUIRIES INVITED
SOFTWARE SUBMISSIONS WELCOMED

GRAPHICOM / VIDEO DIGITIZER

Input directly into Graphicom for easy enhancements, manipulation, stamping, and storage. Catalog at your favorite video stores, at your friends, family, movie & TV channels or diskette. Accepts composite video input in 1, 2, or 3:1 from video camera, VCR, video disc player, another computer, or other compatible video source. View all art on VCR digitized video at twice its real size. Snapshot video frames to the digitizer's internal memory. No slow, blurry, vertical/horizontal, just hit your joystick & fire but wait! It's that simple.

Use with your hard-disk or 5 1/4" floppy disk. External monitors for HORIZONTAL POSITION, VERTICAL POSITION, HORIZONTAL WIDTH, HORIZONTAL SCALING, and CONTRAST (FOCUS) settings.

Can't be fooled by anti-copiers. This is the GRAPHICOM NEWS DIGITIZER - the only digitizer that DIRECTLY inputs into Graphicom (the original design by Creative Lab, the folks that brought Graphicom to the COCO world).

REQUIRES 64K COCO, 1 DISK DRIVE, AND 2 ANALOG JOYSTICKS. FREE GRAPHICOM PROGRAM, PICTURE DISK, AND GRAPHICOM UTILITY SUPPLIED WITH PURCHASE OF NEWS DIGITIZER (A \$99 VALUE).

\$199.95



©1984 WHITESMITH V.1.0

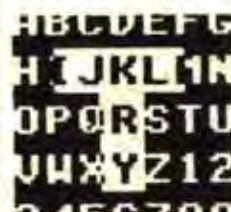
GRAPHICOM PART II is a menu-driven graphics utility that does not require the original GRAPHICOM to run. It includes many of the functions that are missing in GRAPHICOM and will load and save both STANDARD (binary) and GRAPHICOM format screens. GRAPHICOM PART II requires a 64K Color Computer or Color Computer II, and at least one disk drive. It supports 1 to 4 disk drives, keyboard or joystick input, COLOR or B/W (hi-res) operation, and 4 screen display modes. "DOPS" command provides recovery after mistakes, and allows experimenting. Supplied on disk with a 34 page manual.

GRAPHICOM PART II - \$24.95



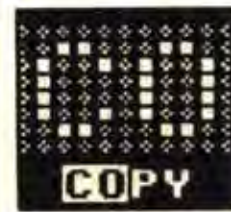
See your screens magnified 2x, 4x, or 8x! Draw or touch up in either color or B/W (hi-res) mode. Excellent for fine detail work.

Reposition graphics with precision and ease. WRAP-AROUND feature prevents graphics from scrolling off the edge of the screen.



Add type in 16 different sizes, over 90 copies of text. Characters may be rotated or mirrored to allow typing in almost any direction.

Enlarge or reduce any part of a screen by any amount, proportional or non-proportional. Rotation can be anything from 0 to 255 deg.



Reproduce and enlarge small areas of the screen with copies of patterns for backgrounds, logos, etc. Over 80 icons supplied on disk (also user-definable).

More than 50 different colored shades and patterns available (over 200 if you count the 4 display modes). Additional patterns may be user-defined.



Substitute colors, swap BLUE and RED, remove WHITE (removing all color widens lines for printing). (C/R/M/A color separations)

Load & save screens in either GRAPHICOM or STANDARD format. Copy screens from one format to another. Supports single or multiple (up to 4) disk drive system.

SUPER BACK-UP UTILITY

WITH 5.0 FROM COMPUTE! YOU'LL NEVER NEED ANOTHER BACK-UP UTILITY FOR YOUR COCO!!!

SUPER BACK-UP UTILITY WILL PERFORM ALL OF THE FOLLOWING FUNCTIONS:

1. TAPE TO TAPE (Regardless of most protection schemes!)
 2. TAPE TO DISK (Move Cassette Programs to Disk)
 3. AUTO RELOCATE (For those Diskette programs that corrupt WITH Disk operating systems)
 4. DISK TO TAPE (Place Disk programs onto Cassette)
 5. DISK TO DISK (convert Spin-N-Image Program Copies regardless of protection schemes!)
- MENU DRIVEN
 - REQUIRES 32K EXTENDED COCO
 - REQUIRES 1 OR 2 DRIVES (For Disk Functions)
 - ALL MACHINE LANGUAGE!!!

COMPARE WITH OTHER INDIVIDUAL PROGRAMS COSTING AN EXCESS OF \$100.00!!!

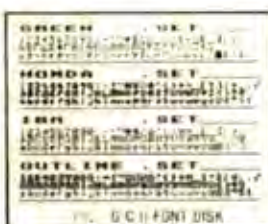
DISK \$49.95 Cat. No. 107CD



GRAPHICOM \$24.95

Simply stated - One of the finest graphic programs written for the Color Computer!

- FEATURES:
- U.S.A.R. & W.I.N.D.Y.
 - 4 Display modes (including hi-res) (2x, 4x, 8x)
 - Animate mode
 - Color Format with over 100 color patterns to use with hi-res output
 - Undo/Repeat actions over Standard Problem at 200, 800 or 1000 level
 - Supplies only empty capturing in this screen, not most COCO artists prefer direct access
 - Multiple hi-res characters into lines in alternate
 - Supplies ability for transferring graphics screens to Basic or other M.U. programs
 - Support utility for loading screens with Back in other sources
 - Built-in hi-res SCREEN PRINT (compatible with EPSON, C.I.P.M., GEMINI-10, IBM, plus Radio Shack's LP-VII, LP-VIII, GMP-210 and GCP-115 printers. (over 110 to 1600 lines)
 - Slow Scan (reversion 1650) MILLI/SEC options
 - Many additional buttons, operating hints, hand-wired mod's and suggestions, etc.
- EASY TO LEARN GRAPHIC MENU • REQUIRES 64K COCO, 1 DRIVE SYSTEM, AND 2 ANALOG JOYSTICKS



PICTURE DISKS \$9.95

- Available from COMPUTE!
- 4C - Artifact color palette
 - 5C - Large character sets drawn with master design (from Derringer Software)
 - 6C - Same as 5C but set up as stamp set
 - 7 - Miscellaneous Art Set #1
 - 8 - Miscellaneous Art Set #2
 - 9 - Miscellaneous Ads and Examples
 - 10 - Miscellaneous Fonts
 - 11C - Artifact color palette type fonts
 - 12C - Art demo from WHITESMITH
- Color images artworks from Whitesmith, the people that brought you Graphicom Part II, introduced by an animated marching band performing a Sousa march in 4-part harmony!
- 13C - GRAPHICOM PART II function demo
- ➔ GCI FONT DISKS
- Each disk contains 40 or more font files (10 or more GRAPHICOM PART II fonts, 4 versions of each, one for each display mode), and three "FONT INDEX" screens to make identification and selection easy.
- 14C - GCI Fonts Disk #1
 - 15C - GCI Fonts Disk #2
 - 16C - GCI Fonts Disk #3

SPIT-N-IMAGE

M/U Disk Back-Up Utility. There is no need to suffer the heartbreak of dashed disks any longer. Spit-N-Image will create a mirror image of your valuable disk programs, which do not respond to normal back-up functions. Will also initialize and back-up in one pass. Data processing experts always insist on having a back-up -- it's good practice -- don't wait!

REQUIRES 32K CC
DISK \$34.95 Cat. No. 101CD

TRIPLE TRANSFER UTILITY

Transfer contents of disk to tape • Transfer contents of tape to disk • Select in Air Option • Will automatically retrace those cassette programs that conflict with the disk operating system • Will retrace machine language program address • Custom ASCII, Basic, & Machine Language Programs • All contained in 1 menu driven program!

REQUIRES 32K CC EXT
Cassette \$19.95 Cat. No. 105CT
Disk \$24.95 Cat. No. 105CD

MASTER KEY ©1984

ONLY \$99.95

Cat. No. 135HR

CALL OR WRITE FOR YOUR SAMPLE DIGITIZED PICTURE CATALOG TODAY!

Computize INC.

(215) 946-7260 P.O. BOX 207 • LANGHORNE, PA 19047

Check or M.A.T. Add \$3.00 shipping • PA residents add 6% sales tax

MasterCard

ATTENTION COCO CLUBS CALL OR WRITE FOR INFORMATION ABOUT SOFTWARE DEMOS FOR CLUBS.

RAINBOW Info

How To Read Rainbow

Please note that all the BASIC program listings you will find in THE RAINBOW are formatted for a 32-character screen — so they will 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 cassette symbol on listings indicates that program is available through our RAINBOW ON TAPE service. An order form for this service is on the insert card bound in the magazine.

What's A CoCo

CoCo is an affectionate name which was first given to the TRS-80 Color Computer by its many fans, users and owners. As such, it is almost a generic term for three computers, all of which are very much alike.

When we use the term CoCo, we refer to the TRS-80 Color Computer, the TDP System-100 Computer and the Dragon-32 Computer. It is easier than using the three "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 TRS-80 Color are, for all purposes, the same computer in a different case, these terms are almost always interchangeable.

The Rainbow Check Plus



The small boxes that you see accompanying programs in the THE RAINBOW are the "Check system," which is designed to help you type in programs accurately.

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

Now, whenever you press the down arrow key, your CoCo will give you the checksum 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 that 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=Y+Y:PRINT Z,Y:W
60 POKE Z,Y:NEXT
70 IF W=7985THENB0ELSEPRINT
  "DATA ERROR":STOP
80 EXEC K:END
90 DATA 192, 1, 106, 167, 140, 60, 134
100 DATA 125, 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, 8
190 DATA 0, 135, 255, 134, 48, 55
200 DATA 51, 52, 41, 0
```

Using Machine Language

Machine Language programs are one of the features of THE RAINBOW. There are a number of ways to "get" these programs into memory so that you can operate them.

The easiest way is by using an Editor-Assembler, a program you can purchase from a number of sources.

An editor-assembler allows you to enter mnemonics into your CoCo and then have the editor-assembler assemble them into specific instructions that are understood by the 6809 chip that controls your computer.

When you use an editor-assembler, all you have to do, essentially, is copy the relevant instructions from THE RAINBOW's listing into CoCo.

Another method of getting an assembly language listing into CoCo is called "hand assembly." As the name implies, you do the assembly by hand. This can *sometimes* cause problems when you have to set up an **ORIGIN** statement or an **EQUATE**. In short, you have to know something about assembly to hand assemble some programs.

Use the following program if you wish to hand assemble machine language listings:

```
10 CLEAR200,&H3F00:1=&H3F00
20 PRINT "ADDRESS:";HEX$(1);
30 INPUT "BYTE:";B$
40 POKE 1,VAL("E"+B$)
50 I=I+1:GOTO 20
```

This program assumes you have a 16K CoCo. If you have 32K, change the &H3F00 in Line 10 to &H7F00.

The Rainbow 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 which carries the Seal has been physically seen by us and that it does, indeed, exist.

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. This lets you know that we have seen the product and that it does, indeed, exist.

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.

Chopin's Minute Waltz

By Eugene Vasconi

Who needs the stereo when you've got the CoCo? Here is a music program that brings a classical composer up to date. Frederic Chopin was born in 1810, composed mainly piano dance music, and certainly never figured he'd make the CoCo top 10, but we think he'd be pleased.

This is the *Minute Waltz* (it really takes about a minute and a half) and is a good example of how to make one sound generator seem like four. The transcription is, with a few computer-necessary adjustments, a faithful transcription of how Chopin intended it even to the dynamics.

The program uses the PLAY command and, by manipulating note lengths and voicing, gives the impression of harmony. A group of biographical pages sets the stage for Hi-Res graphics and the performance, which concludes in grand concert style. The final option is to have an encore or end.

Minute Waltz, requiring 16K ECB, is part of a 10-program series developed for educational or home entertainment

(Eugene Vasconi is a free-lance television producer in the Dallas area. Interested in the music and graphics aspects of the Color Computer, he received his undergraduate degree in music and holds a master's in telecommunications.)



PRICKLY-PEAR SOFTWARE

QUALITY PROGRAMS FOR YOUR COCO & TDP-100

PROGRAMS REQUIRE 16K EXTENDED BASIC FOR TAPE, AND 32K DISK UNLESS OTHERWISE NOTED.



MICROARTIST



Finally!!! a graphics program so easy to use anyone can create beautiful detailed pictures. Save your pictures to tape or disk and incorporate your artwork in your own programs or print it out on your graphics printer. **MICROARTIST** accommodates Gemini, Epson and Radio Shack DMP printers.

The easy menu selection provides **16** modes of operation. Besides the basic GEOMETRIC MODES you can ERASE all or part of the screen. ZOOM in on any portion of your picture and the enlarged screen allows you to edit your picture one pixel at a time. GET/PUT allows you to move one area of your picture to another part of the screen. SAVE and LOAD your pictures to tape or disk. Choose from **100** solid or stripe combination colors to PAINT your pictures. Add texture to your picture with SPRAY PAINT. Use the TEXT mode to sign or label your art work.

And that's not all! We've even included two utilities to make **MICROARTIST** even more fun. The first will display all 100 color combinations on the screen. Choose the ones you like best for your palette. The second utility will copy a picture in basic or assembly language into the **MICROARTIST** format. You can then edit and expand the picture to fit your own needs.

Take advantage of all the COLOR your COLOR computer has to offer. Order **MICROARTIST** now. Requires 32K Extended Basic and a mouse or joystick. **Tape - \$24.95; Disk - \$29.95**

SCEPTER OF URSEA



Explore the kingdom of Ursea in search of the elusive scepter. The country-side is represented by an elaborate graphics screen which harbors friend and foe alike. Or enter the dark dungeon, where unknown dangers and wealth await you. Roll up your character and set out on a great adventure.

SCEPTOR OF URSEA is a one player adventure game based in a fantasy world of feudal kings and lords. To become king of Ursea you must find the lost scepter and return it to Ursea. The extensive documentation will give you all the information you need to know to travel through Ursea. It is up to you, however, to use this information wisely. Are **YOU** wise enough to become King?

This adventure is unique in that you may travel through the countryside represented in a graphics screen or enter the dungeon and travel through its three levels. You may leave the dungeon to return to the outside at any time. And, of course, you can save the game in progress. Req. 32K EB. **Disk only \$29.95**

CITY WAR



Strategy and politics are the key to winning **CITY WAR**. This challenging simulation game requires both. The two great nuclear powers battle for world supremacy. The object is to eliminate the leader of the opposing country. The two leaders are hidden in one of eight major cities of their respective country. Fire your missiles at your chosen target or protect your city by firing an anti-ballistic missile.

This battle of the two great nuclear powers is a two-player game. But, better yet, form two teams and make **CITY WAR** even more realistic by putting your strategic and political decisions to a vote.

There are 14 commands accessed by a single key stroke. With your secret access code you are the only one that can command your army of missiles. You can even request a cease fire from your opponent. The "save the game" feature makes it easy to resume negotiations. Requires 16K. **Tape - \$24.95; Disk - \$29.95**

TO PRESERVE QUANDIC

If you have not been able **TO PRESERVE QUANDIC** you will be happy to hear that our hint sheets are now available. They are fully coded and will give you only the amount of information you wish to decode. **\$3.95**

1-800-223-5369 Extension 256

Send for our free Catalog of great Programs for your CoCo

POLICY ON PROTECTION

We believe our customers are honest — all of our software can be backed up using standard backup procedures.

Dealer and author inquiries are always welcome. Canadian dealers should contact Kelly Software Distributors, Ltd., P.O. Box 11932, Edmonton, Alberta T5J-3L1 (403) 421-8003

Stocked by Quality Dealers, or

Send Order To: **PRICKLY-PEAR SOFTWARE**

Your Personal check is welcome - no delay. Include \$1.50 shipping for each program ordered. (Shipping free on \$50.00 or larger orders). AZ residents add 5% sales tax. Orders shipped within two days.



2640 N. Conestoga Ave.
Tucson, Arizona 85749
(602) 749-2864



use featuring great classical composers. So, settle back and picture the young Chopin traveling the streets of Paris on his way to another concert of patrons who thrill to his musical acrobatics, and in his music case — a CoCo?

Line Description

1-2 Title page

3-11 Draw three-dimensional letters
 12 Biographical information
 13-39 Draw small letters
 40-49 Create piano keyboard
 50-55 Create border
 56-64 Additional biographical information
 65-78 Paint/repaint loop for 3-D letters

79-118 Wait for perform input
 Play commands for the waltz
 119-127 Close curtain sequence
 128-135 Print replay or end screen and wait for input

(Any questions regarding this program may be directed to Mr. Vasconi at 1907 Moser, Apt. 207, Dallas, TX 75206, phone (214) 826-6244.)

12	.....93
40	.....164
57	.....115
65	.....239
87	.....41
95	.....166
104	.....69
113	.....167
END	.....210

The listing: MNUTWALZ

```
1 CLS(3):PRINT@109,"waltz";:PRIN
T@174,"BY ";:PRINT@199,"FREDERIC
CHOPIN ";
2 PRINT@391,"TRANSCRIBED BY ";:P
RINT@423,"EUGENE VASCONI ";
3 PMODE3,1
4 PCLS(2)
5 COLOR5,3
```

```
6 DRAW"BM24,12;D40F20R32NU12H20N
L32U40NF12LBD32L4UBNF4LBD8L4U32N
F16LB"
7 DRAW"BM68,20;D32F20R8NU8H20NL8
UBNF20R16DBNR8F12NL8F8R8NU12H20U
32NF12H8L16GB;BM76,36;R12NH12R4U
12H4L8G4D12"
8 DRAW"BM112,12;D40NR32F20R32NU8
H20UBNF20L4NU12L20U32NF20LB"
9 DRAW"BM148,12;DBNF12R12D32NR8F
20R8NU32H20U32NF20R12NF16UBNF20L
32"
10 DRAW"BM192,12;DBNF11R20G20NL4
D12NR32F20R32NU8H20UBNF20L20U4NF
4E20F20NG12U8H20NDBL32"
11 PAINT(16,16),3,5
12 CLS(6):PRINT@98,"FREDERIC CHO
PIN WAS BORN IN ZELAZOWA WOL
```



**Mouse Technological Software
For The Color Computer!**

*Many Companies call their
Home and Business Software
User Friendly . . .*

ONLY ONE CALLS IT

Child's Play™

NOW AVAILABLE!



Send for **FREE Catalog**

TCE BUSINESS DIVISION
 P.O. BOX 2477
 GAITHERSBURG, MD 20879
 1-800-4TC-4TCE



A NEAR WARSAW, POLAND IN 18
 10. THE SON OF A FRENCH TEACH
 ER, HE TAUGHT HIMSELF PIAN
 O AND LATER WENT ON TO STUDY
 AT THE WARSAW CONSERVATORY

```

13 DRAW"BM84,80;G4D8F4"
14 DRAW"BM88,92;UBR4ND4R4DB"
15 DRAW"BM104,92;UB"
16 DRAW"BM112,92;UBF8UB"
17 DRAW"BM128,84;D8R8UB"
18 DRAW"BM144,84;R4ND8R4"
19 DRAW"BM168,92;L8U4NR4U4R8"
20 DRAW"BM172,80;F4D8G4"
21 EE$="NR8UBNR4UBR8"
22 RR$="U16R8D8L4NL4F4D4"
23 CC$="NR8U16R8"
24 DRAW"BM24,178;UBNR4UBR8"
25 DRAW"BM40,178;XRR$;"
26 DRAW"BM56,178;XEE$;"
27 DRAW"BM72,178;U16R4F4D8G4L4"
28 DRAW"BM88,178;XEE$;"
29 DRAW"BM104,178;XRR$;"
30 DRAW"BM120,178;U16"
31 DRAW"BM128,178;XCC$;"
32 DRAW"BM152,178;XCC$;"
33 DRAW"BM168,178;UBNU8R8NU8DB"
34 DRAW"BM184,178;U16R8D16LB"
35 DRAW"BM200,178;U16R8D8LB"
36 DRAW"BM216,178;U16"
37 DRAW"BM224,178;U16F4D8F4U16"
38 COLOR5,5
39 LINE(24,104)-(228,148),PSET,B
F
40 COLOR 3,5
41 FORX=36T0216STEP12
42 LINE(X,104)-(X,148),PSET
43 NEXTX
44 COLOR 2,2
45 FORX=32T0200 STEP82
46 LINE(X,104)-(X+8,132),PSET,BF
:LINE(X+12,104)-(X+20,132),PSET,
BF
47 NEXTX
48 FORX=68T0152STEP82
49 LINE(X,104)-(X+8,132),PSET,BF
:LINE(X+12,104)-(X+20,132),PSET,
BF:LINE(X+24,104)-(X+32,132),PSE
T,BF
50 NEXTX
51 FORX=4T0252STEP4
52 COLOR 4,3
53 CIRCLE(X,0),4:CIRCLE(X,198),4
: NEXT
54 FORX=4T0198STEP6
55 CIRCLE(2,X),4:CIRCLE(254,X),4

```

It's THE Place To Be...

4th ANNUAL OS-9 SEMINAR



**NOVEMBER
 1, 2, 3, 4
 Pre-Registration Only!**

- Exhibits
- Speakers



- Latest Hardware
- Newest Software
- Technical Sessions for 6809 & 68000



Meet people making it happen in OS-9. The movers and shakers who are helping OS-9 become the fastest growing operating system for the 6809 & 68000 in the world.

Lively and informative round-table discussions will cover the design and use of Microware Software. We'll also discuss OS-9's dynamic growth from where we are today to where we may be in the future.

The exhibit area will feature booths from many of the leading suppliers of OS-9 compatible hardware and software. It's a great opportunity to increase your skill and knowledge in the latest microcomputer software technology. Plan to attend — Register Today!

Seminar only \$150 Hotel Package* \$350

Location Marriott Hotel, Des Moines, IA

Don't Miss It — Pre-Register Now!

Call 515-224-1929 or Write

**MICROWARE SYSTEMS CORPORATION
 1866 N.W. 114th St. • Des Moines, IA 50322**

microware[®]

*Hotel package includes 3 nights, single occupancy at the Marriott Hotel and registration fee.
 OS-9 and BASIC09 are trademarks of Microware and Motorola

```

: NEXT
56 CLS(4):PRINT@98,"AFTER TOURIN
G GERMANY AND ITALY, HE MO
VED TO PARIS AS A PIANO TEACHE
R. ONCE THERE HE MET AND LIVE
D WITH WRITER AURORE DUDEV
ANT (PEN NAME GEORGE SAND)
. ";FORX=1TO6000:NEXTX
57 CLS(7):PRINT@98,"THE TEMPERME
NTAL CHOPIN ALWAYS PREFERRED SM
ALL AUDIENCES TO LARGER CONCE
RTS AND A HANDFUL OF ONLY 74 M
AJOR LISTINGS REFLECT THAT
DESIRE. THEY INCLUDE SCHE
RZOS, BALLADES, ";
58 PRINT@288," NOCTURNES, MAZUR
KAS, ETUDES, PRELUDES, AND WA
LTZES. ":FORX=1TO7000:NEXTX
59 CLS(5):PRINT@98,"IT IS AMAZIN
G THAT, IN THE SHADOW OF BE
ETHOVEN, CHOPIN COULD HAVE M
ADE SUCH A NAME BY WRITING M
AINLY PIANO DANCE MUSIC. THAT
HE DID IS A TRIBUTE TO H
IS TALENT WHICH STILL TAXES
MANY PIANISTS. ";
60 FORX=1TO6000:NEXTX
61 CLS(6):PRINT@98,"THE MINUTE W
ALTZ IS ONE OF HIS BEST KNOWN C
OMPOSITIONS; IT SHOWS THE EX
CITING ACROBATICS AND BROAD, F
LOWING MELODIES HE COULD CRE
ATE. IT REALLY DOESN'T TAKE
A MINUTE - MORE LIKE A MINUT
E AND A HALF! ";
62 FORX=1TO6500:NEXTX
63 CLS(8):PRINT@98,"CHOPIN ALWAY
S LONGED TO RETURN HOME AND IT
SHOWS IN HIS MUSICAL THE
MES. HE DIED OF TUBERCULOSI
S IN PARIS IN 1849. HE WA
S 39. ";FORX=1TO5000:NEXTX
64 PRINT@421,"PRESS <P> TO PERFO
RM ";FORX=1TO1000:NEXTX
65 PP=0
66 SCREEN1,1
67 R=RND(4)
68 PP$=INKEY$
69 IF PP$="P" THEN PP=1
70 IF PP=1 THEN R=4
71 IF R=1 THEN 67
72 PAINT(28,18),R,5
73 PAINT(72,24),R,5
74 PAINT(116,24),R,5
75 PAINT(164,24),R,5
76 PAINT(216,16),R,5
77 IF PP=1 THEN GOTO 79
78 GOTO67
79 A=0:B=0

```

```

80 A$="L3203G02D-P16L1603A-P16L6
404C02A-03D-FP16L16B-P16L64G02A-
03D-FP16L16A-P16"
81 B$="L3204C02FP16L1603B-P16L64
G02A-03D-FP16L16A-P16L6404C02A-0
3D-FP16L16B-P16"
82 C$="L3203B-02FP16L1604CP16L64
D-02A-03D-FP16L1604E-P16L64F02A-
03D-FP16L1604G-P16"
83 D$="L3201A-L8.04B-P32L6402A-0
3CG-P64P16L1604A-P16L64G-02A-03C
G-P16L1604FP16"
84 E$="L3204F02E-P16L1604E-P16L6
4E-02A-03CG-L3204FE-L16DP16L64E-
02A-03CG-P16PB"
85 F$="L3204A-03A-01A-P32P8L6402
G-A-03CP64P16P8E02G-A-03CP16PB"
86 PLAY"V23T6;L403A-L8GA-04C03B-
GA-B-A-04C03B-GA-04C03B-GA-04C03
B-GA-04C03B-"
87 PLAY"T6XA$;V25;XB$;V27;XA$;V2
9;XC$;V31;XD$;V23;XE$;V29;XD$;"
88 PLAY"V24L3204F02A-P16L1604E-L
32FE-L64D03CG-P64P16L1604E-P16L6
4F03CG-P64P16L1603B-P16;XA$;XB$;
XA$;V27;XC$;V31;XD$;V24;XE$;V20;
XD$;"
89 PLAY"L3204E-02A-P16L1604FP16L
64E-V2403CG-L3204FE-L16DP16L32E-
01A-P16L1604EP16"
90 PLAY"V20L2404F01AL1204G-FL64E
02F03CE-P16L1604FP16L64A-02F03CE
-P16L1604G-P16L32F01B-P16L1604G-
P16L64V22F02F03D-P64P16L1604EP16
L64F02F03D-P64P16L1604B-P16"
91 A=A+1:B=B+1
92 PLAY"V24L2404A-02CL1204B-A-L6
4G02A-03E-G-P16L1604A-P16L6405C0
2A-03E-G-P16L1604B-P16 V27L32A-0
2D-P16L1604B-P16L64A-02A-03FP64P
16L1604GP16A-P1605D-P16"
93 PLAY"V31L3205C02G-P16L1604B-P
16L64A-02B-03E-P64P16L1604G-P16F
P16E-P16 V25L32D-01A-P16L1604CP1
6L6403B-02FA-03D-P16L1603A-P16G-
P16FP16"
94 PLAY"V20L3203E-01A-P16L1603D-
P16L64C02G-A-P64P16L1603E-P16L64
B-02G-A-03CP16L16A-P16 V22L32G02
D-P16L1603A-P16L64B-02A-03D-FP16
V28L1604CP16D-P16E-P16"
95 PLAY"L2404F02AL1204B-FV30L64E
03E-FP64P16L1604FP16L64A-03E-FP6
4P16L1604G-P16 L32F02B-P16L1604G
-P16L64F03D-FP64P16L1604EP16L64F
03D-FP64P16L1604B-P16"
96 PLAY"L2404A-03CL1204B-A-L64G0
3G-A-P64P16L1604A-P16L6405C03G-F
P64P16L1604B-P16 L32A-03D-P16L16

```


Don't bang your head
against a brick wall looking
for that perfect gift!

the Rainbow The Falsoft Building
502/228-4492 Prospect, KY 40059

I would like to send a gift certificate for a one year (12 months)
subscription to:

Name _____
Address _____
City _____ State _____ Zip _____

+++++

From:

Name _____
Address _____
City _____ State _____ Zip _____

Payment Enclosed
Charge VISA MasterCard American Express
My Account# _____ Interbank# (MC only) _____
Signature _____ Card Expiration Date _____

GIVE 'EM THE RAINBOW!
THE SOLID MONTHLY
FOR COCO USERS!!

Subscriptions to THE RAINBOW are \$31 a year in the United States. Canadian rate is \$38 U.S. Surface rate to other countries \$68 U.S. air rate to other countries \$103 U.S. Kentucky residents add 5% sales tax. All subscriptions begin with the current issue. Please allow up to 5-6 weeks for first copy. U.S. FUNDS only. We do not bill in order to hold down costs.

Just for your
TRS-80™ COLOR
System 100
Model 32
10

```

04B-P16L64A-03FA-P64P16L1604GP16
A-P1605FP16"
97 IF B=4 THEN GOTO117
98 PLAY"L3205E-02G-P16L1605D-P16
L64C03D-E-B-P16L1604B-P16A-P16G-
P16 V27L32F01A-P16L1604E-P16L64D
-02FA-D-P16L1604CP1603B-P16A-P16
"
99 PLAY"V23L3203A01A-P16L1604CP1
6L64B-02G-A-P64P16L1603FP16L64G-
02G-A-P64P16L1603CP16 V20L32D-02
D-P16P803F02A-P16P8"
100 IF A=2 THEN GOTO 103
101 PLAY"L504F"
102 IF A=1 THEN GOTO 90
103 PLAY"V21L403A-L32A-01A-P16PB
L6402G-A-03CP64P16P803E-02G-A-03
CP16PB A-02G-A-03CP16P802G-A-03C
P64P16P8E02G-A-03CP16PB V24L32A-
02D-P16P8A-03D-P16P8L64F02A-03D-
P64P16PB"
104 PLAY"V28L3204F01A-P16P8L6402
A-03D-FP64P16P804F02A-03D-FP16PB
L1602E-P16P8L6402A-03CG-P64P16P
8B-02A-03CG-P16PB L3204F01A-P16P
8L6402A-03E-G-P64P16P804C02A-03E
-G-P16PB"
105 PLAY"L3204E-02D-P16P8L6402A-
03D-FP64P16P804D-02A-03D-FP16PB
L3204C02FP8L1604E-P64L6402A-03D-
FP64P16L1604D-P16L6402A-03D-FL16
B-P32PB L32A-01CP16P802G-A-P16PB
L6403E-02G-A-P64P16PB"
106 PLAY"V20L3203A-01A-P16P8L640
2G-A-03CP64P16P8E02G-A-03CP16PBV
24L32A-02D-P16P802A-03D-P16P8L64
F02A-03D-P64P16PB V28L3204F01BP1
6P8L6402A-03D-FP64P16P802A-03D-F
P64P16PB"
107 PLAY"L3204C02C04DC03B04CP16L
6403B02A-03CFP16P804C02A-03CFP16
PB L3204A-01CP16P8L6403B-02G03CE
P16PB L804GP8L3203A01FP16P8L8V24
04G-P8L6403A-02F03CP64P16PB"
108 PLAY"L8V2004FP803FP8B-PB"
109 PLAY"V22L3203A-02CP16P8G-A-P
16P8L6403E-02G-A-P64P16PB ;XF#;L
3204A-03A-02D-P32P8A-03D-P16P8L6
4F02A-03D-P64P16PB"
110 PLAY"L3204A-F01A-P32P8L6402A
-03D-FP64P16P804F02A-03D-FP16PB
L3204A-F02E-P32P8L6402A-03CE-P64
P16P8B-02A-03CG-P16PB L3204A-F01
A-P32P8L6402A-03E-G-P64P16P804C0
2A-03E-G-P16PB"
111 PLAY"L3204A-E-02D-P32P8L6404
D-02A-03D-FP16P804C02A-03D-FP16P
8 L3204A-E-02FP32P8L6404D-02A-03
D-FP16P802A-03D-FP64P16L8B- L320

```

```

4A-03A-02CP32P8G-A-P16P8L6403E-0
2G-A-P64P16PB;XF#;"
112 PLAY"L3204A-03A-01BP32P8L640
2FA-03E-P64P16P8F02FA-03E-P16PB
L3204F01B-P16P8L6402FA-03DP64P16
P802FA-03DP64P16PB L3204F02E-P16
P803D-GP16P8L64B-D-GP64P16PB L40
4E-L3203D-G-P16P8L64AD-G-P64P16P
B"
113 PLAY"L6402A-L804E-T5P64P32P1
6L6403CG-L8A-P32P16T3V24L804DP8
T2L4FE-T1L2V2904A-PB"
114 PLAY"V18"
115 FORX=1TO4:PLAY"V+T603L8A-B-A
-B-A-B-":NEXTX
116 PLAY"V22L803GA-04C03B-GA-04C
V2603B-GA-04C03B-GA-04C03B-GA-V2
804C03B-GA-04C03B-":A=0:GOTO87
117 PLAY"V30T5L2405E-01G-L1205D-
C04B-L6403D-E-B-L12V2605A-G-FE-D
-C04B-A-G-FE-V22T4D-C03B-T3L64A0
1AP32P8L1604CP8L6403B-02G-A-P64P
16T2L8V2503FL6402G-A-L8.03G-L4V2
8CL32T2V3001V28D-L203D-"
118 FORX=1TO15:PLAY"L12502FA-03F
":NEXTX
119 FORX=1TO900:NEXTX
120 COLORS,5
121 FORX=4TO184
122 LINE(6,X)-(250,X),PSET
123 PLAY"L25005B-B"
124 NEXTX
125 PLAY"L255V3101CC#CC#CC#CC#"
126 FORX=1TO400:NEXTX
127 PLAY"L18001D-FA-02D-FA-03D-F
A-04D-FA-05D-FA-"
128 SCREEN0,0
129 CLS(0):FORX=1TO600:NEXTX
130 PRINT@133,"FOR ENCORE PRESS
<P> ";:PRINT@391,"TO END PRESS <
Q> ";
131 PP#=INKEY#
132 IF PP#="P" THEN GOTO 1
133 IF PP#="Q" THEN GOTO 135
134 GOTO 131
135 CLS:PRINT@0,"BYE !":SOUND1,1
:END

```

See You At
RAINBOWfest
New Brunswick
October 18-20

THE COLORSOFT™ BUSINESS SYSTEM

INTEGRATED BUSINESS SOFTWARE DESIGNED FOR THE COLOR COMPUTER
WRITTEN FOR USE BY THE NON-ACCOUNTING ORIENTED BUSINESSMAN
CONCISE USERS MANUAL WITH SAMPLE TRANSACTIONS TUTORIAL
PROFESSIONALLY WRITTEN AND FULLY TESTED
HIGHLY USER FRIENDLY AND MENU DRIVEN
AFTER THE SALE SUPPORT

SMALL BUSINESS ACCOUNTING (Version 2.0) This sales-based accounting package is designed for the non-accounting 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. This package includes Sales Entry, transaction driven Accounts Receivable and Accounts Payable, Journal Entry, Payroll Disbursement, and Record Maintenance programs. Screen and hardcopy system outputs include Balance Sheet, Income Statement, Customer and Vendor Status Reports, Accounts Receivable and Payable Aging Reports, Check Register, Sales Reports, Account Status Lists, and a Journal Posting List. The number of accounts is limited only by the number of disk drives. \$89.95

ACCOUNTS RECEIVABLE (Version 2.0) This package is designed to meet the requirements of most small business users. The system includes detailed audit trails and history reports for each customer, prepares 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 Accounting package to build a complete accounting/receivables system. \$59.95

PAYROLL (Version 2.0) This integratable package is designed for maintaining personnel and payroll data for up to 200 hourly and salaried employees with 8 deductions each. This system calculates payroll and tax amounts, prints checks and maintains year-to-date totals. These amounts can be automatically transferred to the SBA package for financial reporting. It computes each pay period's totals for straight time, overtime, and bonus pay and determines taxes to be withheld. Additional outputs include mailing list, listing of employees, year-to-date federal and/or state tax listing, and a listing of current misc. deductions. This system is suited for use in all states except Oklahoma and Delaware. \$69.95

All programs require a minimum of 32K and 1 disk drive but will take advantage of 64K and multiple drives. Each package features a hi-res 51 x 24 black on green screen. 16K versions available without hi-res screen. Specify 16K or 32K versions when ordering. Future integrated packages will include: Inventory Control, Sales Analysis, Accounts Payable.

INCLUDE \$5.00 Shipping/Handling Per Order

Write for Free Catalog

BRANTEX, INC.

COLOR SOFTWARE SERVICES DIV.

BUSINESS SOFTWARE GROUP
P.O. BOX 1708
GREENVILLE, TEXAS 75401



TELEPHONE ORDERS
(214) 454-3674
COD/VISA/MASTERCARD

ATTENTION DEALERS: WE OFFER THE BEST DEALER PLANS AVAILABLE

The One Great Secret To Assembly Language

By R. Bartly Betts
Rainbow Contributing Editor
With Programs By Chris Bone

Last month I said I would use this column to provide answers to your questions and cut down on my correspondence load. It isn't working; I am only getting more letters! I appreciate hearing from you, but . . . ah well, there are penalties for being famous (or infamous).

In any case, if you don't hear from me soon after you write, it may be I have a pile of letters to answer before I come to yours, or it may be that I will try to answer your letter in the column, or it may be you didn't provide a self-addressed, stamped envelope. I haven't refused to answer a letter lacking return postage yet, but I may have to begin — four or five dollars a week can add up.

Following are the answers to this month's questions and comments:

1) Although no one has actually asked, "What is the one great secret of

(R. Bartly Betts is currently a technical writer for Tandy Corp. and is a former news reporter and magazine editor. As the father of 10 children, computers are his escape from reality.

Chris Bone is a college computer science major and has been programming for more than three years. He averages between six and nine hours a day on the CoCo.)

assembly language?" Chris said he feels many readers are searching for the answer to such a question. I agree with him, and so present the following great secret:

There is no secret to assembly language. Proficiency comes through hard work. If you apply yourself for several hours a day, you can probably be an adequate programmer in a year's time. In three to five years you can probably be a good programmer and begin to compete with some of the better software authors.

This column will not make you into a good programmer, no matter how long it continues. Its purpose is to get you started and over the rough spots.

Now that I have said that, let me encourage you a bit. It does not take a year to become familiar with assembly language; a few weeks will do. It does not take a year to learn to enter programs another person wrote; a few days will do.

But assembly language programming is a profession and, if you want to do it well, you must work at it in the same manner as any other profession.

2) I have received a letter from Shawn Jack. If you remember, he was one of the programmers who sent in an answer to the initial "Byte Master" challenge of changing 'A's to asterisks. It seems I misread his address; he lives in Goreville, Illinois, not Ooreville.

3) I have received several requests for back copies of my articles. I am afraid it is a request I cannot fill. The first time I was asked, my reaction was, "why not?" Then I realized that doing so is probably illegal. While I have copies of my articles, they have been sold to THE RAINBOW and I have no more right to copy and distribute them than anyone else.

I also do not have time. It would probably take a couple of hours to make copies of all my articles. If 10 people asked me for copies, that is 20 hours. My wife and family can think of lots of other things for me to do with 20 hours.

4) I also received a request for an "editor/assembler." This is a software product that is sold by Radio Shack and other companies. There are several editor/assembler packages on the market, but I am afraid I know of none that are available as "public domain" packages (programs available to anyone free of charge).

If you do not have an editor/

PARALLEL PRINTER INTERFACE

POWER SUPPLY
not needed with
Gemini and C-Itch
printers

WORKS WITH ALL STANDARD
PARALLEL PRINTERS

SWITCH SELECTABLE
BAUD RATES FROM
300 TO 9600



MODEL 1 49.95

WITH MODEM CONNECTOR
AND SWITCH

MODEL 2 39.95

WITHOUT MODEM CONNECTOR
AND SWITCH

ADD 3.00 FOR SHIPPING AND HANDLING

WITH POWER MODULE
ADD 5.00

DRIVE 0 DISK SYSTEMS



J&M DISK CONTROLLER
(JDOS or RSDOS)

DUAL DRIVE CASE & POWER
SUPPLY, CABLE, & MANUAL

PLUS YOUR CHOICE OF ONE
OF THE FOLLOWING DRIVES

TEAC FD54A---- \$ 259.

TEAC FD55A---- \$ 289.

TEAC FD55B---- \$ 309.

TEAC FD55F---- \$ 329.

plus shipping

DISK DRIVES & ACCESSORIES



TEAC FD54A----- \$ 95.
single sided, 40 track

TEAC FD55A----- \$ 115.
single sided, 40 track

TEAC FD55B----- \$ 130.
double sided, 40 track

TEAC FD55F----- \$ 155.
double sided, 80 track

J&M Disk Controller-- \$ 115.
(JDOS or RSDOS)

Dual Drive Case & Ps.--\$ 59.

Dual Drive Cable----- \$ 23.

C-ITOH PRINTERS

C-ITOH 8510AP Prowriter \$ 319.
120 c.p.s.

C-ITOH 7500AP Prowriter \$ 229.
105 c.p.s.

C-ITOH 8510BPI Prowriter \$ 359.
IBM Compatible

C-ITOH 8510SP Prowriter \$ 409.
180 c.p.s.

C-ITOH 8510SCP Prowriter \$ 469.
180 cps., 7 colors

plus shipping

DISK DRIVE SPECIAL

COMPLETE DRIVE 0 SYSTEM

TEAC FD54A DISK DRIVE

J&M DISK CONTROLLER
(JDOS or RSDOS)

DUAL DRIVE CASE &
POWER SUPPLY

DUAL DRIVE CABLE

COMPREHENSIVE MANUAL

\$249.

plus shipping

GEMINI PRINTERS

* Ultra High Resolution Graphics

* 16K Buffer on 15", 2K on 10"

* Draft Modes from 120-200 cps

* Near Letter Quality/ 30-50 cps

* 100% Compatibility with Apple,
Commodore, IBM-PC, and
all compatibles

* SG-10..\$ 249. * SG-15.\$409.

* SD-10..\$ 379. * SD-15.\$ 489.

* SR-10..\$ 509. * SR-15.\$ 639.

plus shipping

TRI-TECH ELECTRONICS

P.O. BOX 8100 ROCHESTER, MICH. 48308 (313) 254-4242

assembler and do not have the money to buy one, the best I can offer is the BASIC program from last month's article, and/or a monitor program from past issues of THE RAINBOW. I gave some pointers for using these methods in the last column.

5) As far as I know, the 51-column *Bytescreen* program will work with any Color Computer configuration. I have heard from readers who have used it on nearly all versions of computers, ROMs and accessories. If you have problems, let us know and we will either fix them or at least warn others.

6) Chris and I are extremely interested in any upgrades you make to the *Bytescreen* program. Chris is working on several upgrades to the program. If you have made, or do make improvements you would like to share with other readers, please submit them. We have already received one upgrade that, if the author is willing, will be included in the next column. I think it would be great to continue this until we develop a super program.

7) There do seem to be problems with the *Find* program introduced by this column. It doesn't seem to work on all

BASIC programs. If Chris or I ever get time, we will try to fix it. It seems to crash only after it has done its job, so perhaps it still helps.

Assembly Help

Last month's column mainly dealt with how to translate source code listings into machine language. Because of the trouble many readers seem to be having, I have decided to give equal time to those of you with editor/assemblers. I will try to not repeat what has already been said in previous columns, but expand on it to help those who are still having trouble.

The difficulties seem to be in the area of assembling, after listings have been typed, and knowing where to put in-memory assemblies. The information in this column will deal with the *ED-TASM+* program. This is for two reasons: *ED-TASM+* is what I use and, judging from the questions and letters I receive, it is what you are using. So far, I have not heard from anyone using another assembler.

Those Bad 'Bad' Errors

As you know from reading your

manual, the cartridge version of *ED-TASM+* resides between memory location SC000 and SDFFF. If you have a 16K computer, you have RAM memory from \$600 to \$3FFF for your program storage. If you have a 32K computer, you have RAM memory from \$600 to \$7FFF for storage.

However, in order to keep track of variables and labels, *ED-TASM+* must use some of that memory. First, it reserves \$200 bytes for variables buffers and stacks at the bottom of the available memory. Second, as you write programs, the edit buffer grows from the bottom of the memory upward. Third, storage space is allocated for all symbols in your program and their corresponding values.

As you can see, writing programs causes allocated memory to expand upward, decreasing the room you have available for in-memory assemblies. Depending on the RAM size of your computer, you can enter programs which use so much of that RAM, there is not sufficient room to assemble the program in memory. When this happens, you get the familiar "bad memory" error message. I have had

AVAILABLE NOW DRAGON USER



To make the most of your new Dragon microcomputer from Dragon-Tano, you need *Dragon User* — the international, independent magazine for Dragon owners.

- Each issue of *Dragon User* contains:
- reviews of the latest software
 - programming advice for beginners
 - hardware projects

- program listings covering games and utilities
- reviews of Dragon peripherals and add-ons
- technical advisory service
- programming articles for users

The Dragon microcomputer was launched in the UK last year. Since then we have developed a knowledge and mastery of the machine's abilities. You can benefit from our experience by subscribing to *Dragon User*, which is expanding its coverage to include all US developments.

To make sure that you receive a copy of *Dragon User* regularly, subscribe direct to us. This costs only \$29.95 for 12 issues airspeeded to you — or take advantage of our special offer to long-term subscribers. Individual copies of the magazine can be obtained from your Dragon dealer.

Subscription order form. Receive a free book and save money by taking out a long-term subscription — a two-year subscription saves 10%, a three-year subscription saves 20%. In addition, long-term subscribers will receive a free copy of either *The Working Dragon* or *Dragon Games Master*. Please send a check, made payable to *Dragon User*, with this form. Start my subscription from the following issue:

Name _____

Address _____

Signed _____

Date _____

Subscription rates US and Canada airspeeded: US\$29.95 for 12 issues/1 year
 US\$53.90 for 24 issues US\$71.80 for 36 issues. Send this form to
Dragon User, c/o Business Press International, 205 E. 42nd St., New York, NY 10017.

numerous complaints about this problem.

How can you tell if you have enough room to assemble a program in memory? Well, the easiest way is to try assembling it without an *ORG* line. This causes *EDTASM+* to begin assembling the program at the first available memory location. If you get a "bad memory" error with this procedure, there simply is not room.

When there is not room, or you must assemble a program in an area that is already used by *EDTASM+*, an alternative is to assemble the program to tape or disk. Exit *EDTASM+* and load the program using *CLOADM* and *EXEC*. However, be sure you save the source listing before doing this, then if it doesn't work the first time, you will not have to type the listing again.

It's Worse with Disk

If you have the disk version of *EDTASM+*, everything operates in the same manner as previously described except *EDTASM+* is not resident between *\$C000* and *\$DFFF*. In fact, it is resident in your RAM and this poses a special problem. You now have much less free RAM for buffers and storage. You are even more likely to get the "bad memory" error. You are sacrificing a great deal of memory for the advantage of disk speed.

There is little you can do to overcome the "bad memory" error other than what I have suggested. If you have a 16K computer, you can upgrade to 32K. You can also hope someone will write a 64K editor/assembler for those of us who have fully upgraded machines.

If you must assemble programs in *EDTASM+*'s buffer and stack area, *EDTASM+* provides a "MO" (manual origin) switch you can use to change the location of the buffer and the normal beginning of in-memory assemblies. This switch is described in the *EDTASM+* manual with step-by-step instructions.

While this process lets you change the automatic *ORG* location, it does not add more room for assemblies. If you were out of room before, you will be out of room after implementing *MO*.

The Assembly

The other most common problem seems to be with the assembly process itself. For that reason I have written a simple program (Listing 1), and will go through the entire typing, checking,

saving and executing process.

If you are familiar with all of this, have patience with those who are not. After hearing the trouble others were having, I went through the books I have and found there is no one place that explains the process. I also remember having similar problems when I first began.

Listing 1: BYTE 1

```
00090      ORG      $E00  *PROGRAM ASSEMBLY LOCATION
00100  START  LDX      $5400 *BEGINNING OF TEXT SCREEN MEMORY
00110  LOOP  LPD      ,X    *LOAD D WITH VALUE AT X
00120      EORA     #64    *EXCLUSIVE OR A
00130      EORA     #64    *EXCLUSIVE OR B
00140      STD      ,2++   *STORE D INTO LOCATION AT X
00150      CNPX     $2600  *CHECK FOR END OF TEXT SCREEN
00160      BNE     LOOP   *IF NOT END, DO AGAIN
00170      RTS      *END PROGRAM
00180      END
```

The purpose of this program is to reverse everything on the text screen. It does this by loading Register X with the beginning location of the text screen. The value pointed to by 'X' is then loaded into Register D (registers A and B). An exclusive *OR* operation is performed on registers A and B, then Register D is stored back into the screen location pointed to by 'X.' Register X is incremented, and this process is continued until the end of the screen is reached at *\$5FF*.

To type in the program, load *EDTASM+*; either plug in your ROM pack or load the program from diskette. When *EDTASM+* is operating, press *I90 ENTER*. The first line number 90 appears on the left of the screen. Because there is no label in the first column of this line, press the right-arrow key to skip one column to the right. Now type *ORG* and press the right arrow again and type *\$E00 ENTER*.

Notice that you do not need to type the comments (text that follows an asterisk). The comments are for your instruction only and have nothing to do with the operation of the assembler.

When you press *ENTER*, the cursor drops to the next screen line. Now type the label name *START* and press the right arrow. Type each column text and data as you did for Line 1.

After all of the lines are typed in, you are ready to assemble the program. However, it is a good idea to first make sure that if something goes wrong, you do not have to type in the program again. To do this, save the listing you have typed to disk or tape.

To save it to tape, type *W* and *ENTER*.

A prompt asks you for the filename; type *REVER* and *ENTER*. You are prompted to ready the tape recorder. Insert a tape, position it where you want, press the *Play* and *Record* keys, then press *ENTER*.

To save the listing on disk, type *W REVER* and *ENTER*. You have now saved the source code and can safely attempt

other processes without fear of losing what you have typed.

Program Checking

You may wish to check the program before you assemble the listing to tape or disk. You can do this by assembling it in memory. The *ORG* line of the listing directs the assembly to *\$E00*. To assemble the program in memory, type *A/IM/WE*. The 'A' is the command to assemble a listing, "IM" is a switch telling the assembler to assemble the listing in memory, and "WE" is a switch telling the assembler to stop if it encounters an error.

Assembly in memory tells you if there are any errors in the program that are incompatible with *EDTASM+*; it puts the program where it is meant to reside and from where you can give it a trial run. If any errors are encountered, the program stops after printing the offending line.

It also tells you what the error is so you can correct it. To correct a line, type *E* followed immediately by the line number, for instance *E120* (you do not need to include the preceding zeros in a line number). You can then space through the line with the space bar and use the normal Extended *BASIC* editing commands to fix the error and attempt another assembly.

When the listing is correct, the assembler lists the entire assembly to the screen, ending with a display indicating zero errors and the names of the labels used in the listing.

Zooming in ZBUG

You can now do further checks on

your program by using your editor/ assembler's ZBUG features. To enter ZBUG, type Z and ENTER.

One way to try out the program is to type GSTART and ENTER. The 'G' is a command telling ZBUG to execute a program. "START" is the label indicating the beginning line of your program and where to begin execution. If all works, the screen will be reversed in a twinkling of an eye.

If the program crashes or doesn't work properly, you can sometimes recover it by pressing BREAK or the Reset button. If neither of these actions bring EDTASM+ back, you will have to shut the computer off and reload EDTASM+, then reload the listing you have saved.

You reenter the edit mode from ZBUG by typing E and ENTER. If you had a total crash, reload EDTASM+ and then reload your listing by typing L ENTER REVER ENTER for the tape version, or L REVER ENTER for the disk version. You must now find the mistake and correct it before attempting execution again.

If you are having problems, you can also try your program from ZBUG by

single stepping. To begin single stepping, type START, (that's START followed by a comma). You execute each subsequent line by pressing the comma. Each line of the program is displayed on the screen before it is executed and, when a crash occurs, you can see exactly where it happens. You can enter other commands (such as R) to examine the registers between steps.

Note that START is used to point to the beginning of the assembled program. Other listings may have another label to indicate their beginning or no label at all. If there is no beginning label, you must use the beginning address of the program, such as GE00.

Making Progress

I realize there are also many of you who would like more "meat" in these columns. I promise to delve deeper in future columns. For now, I am trying to cover the bases for the beginners who are confused. Soon I hope we can all move forward together.

For those of you who do not have an editor/assembler, I am including the following listing of the previous program with the machine language code. I didn't include it earlier because I didn't wish to confuse anyone. Last month I explained how to enter machine language code. If you have forgotten, refer to last month's column.

Listing 2: BYTE 2

0E00		0009D	ORG	GE00	*PROGRAM ASSEMBLY LOCATION
0E00 8E	0400	00100 START	LDX	#1400	*BEGINNING OF TEXT SCREEN MEMORY
0E03 EC	84	00110 LOOP	LDD	,X	*LOAD D WITH VALUE AT X
0E05 88	40	00120	EDRA	#64	*EXCLUSIVE OR A
0E07 88	40	00130	EDRA	#64	*EXCLUSIVE OR B
0E09 ED	81	00140	STD	,X++	*STORE D INTO LOCATION AT X
0E0B 8C	0600	00150	CHPX	#5600	*CHECK FOR END OF TEXT SCREEN
0E0E 26	F3	00160	BNE	LOOP	*IF NOT END, DO AGAIN
0E10 39		00170	RTS		*END PROGRAM
	0000	00180	RND		
00000	TOTAL ERRORS				

The KEY-264K is here!!

DO YOU HAVE A 64K SYSTEM (OR 32K WITH 64K MEMORY CHIPS) ?? ARE YOU BEING TOLD YOU CAN ONLY USE 32K FROM BASIC ??

DON'T BELIEVE IT !! - KEY COLOR SOFTWARE brings you the KEY-264K. An exciting NEW SOFTWARE utility that allows any STANDARD 64K OR 32K COLOR COMPUTER TO ACCESS 64K RAM FROM BASIC, and with NO HARDWARE MODIFICATIONS REQUIRED!!

*** Works with CASSETTE based systems! ***

*** Works with DISK based systems! ***

The KEY-264K divides the 64K ram memory into two 32K banks or sides, each of which can be utilized independently by the BASIC interpreter, with the ability to switch instantly from one side to the other. IT'S LIKE HAVING TWO COMPUTERS IN ONE!! Have your BASIC program on one side and keep your variables on the other side, or have your main program on one side and your subroutines on the other side, or have your program on one side and use the other side for 4 additional HI-RES pages, or any combination you like. The possibilities are endless because the KEY-264K allows full communication between sides plus the ability to switch back and forth at will, all from within BASIC. You could also have different programs in each side and switch back and forth between them using simple keystrokes, even while the programs are running!! Or run them both at the same time in the FOREGROUND/BACKGROUND MULTI-TASKING mode. Don't buy that printer buffer yet! With the KEY-264K you can be printing in the background side while utilizing your computer normally in the foreground side AT THE SAME TIME!!! Debugging a program? Use either a BASIC command or simple keystrokes to instantly duplicate your program, in it's present status, on the opposite side. Switch to the opposite side later and pick up exactly where you were before!

For DISK users, the KEY-264K allows you to alternate between DISK and EXTENDED BASIC on the same side with simple keystrokes. No need to pull your controller or power down. You can be in EXTENDED BASIC on one side and in DISK BASIC on the other side and still switch back and forth and have full communications between the two sides.

The KEY-264K does this and MORE thru extensions to BASIC. No need to learn a new language! The KEY-264K adds 15 NEW COMMANDS and 1 function to BASIC, including powerful new BLOCK MEMORY MOVE and GRAPHICS VIEWING commands.

The KEY-264K works on the 64K COCO or 64K COCO-2 and on older 32K systems with *E*, *F*, or even modified *D* boards and requires EXTENDED or DISK BASIC with GOOD 64K MEMORY CHIPS!

ORDER YOUR KEY-264K TODAY by sending check or money order for \$39.95 (cassette) or \$44.95 (disk) plus \$2.00 postage U.S.A. (\$5.00 outside U.S.A.) Mass. residents add 5% sales tax.

MASTERCARD, VISA, OR COD
CALL (617) 779-5034

KEY COLOR SOFTWARE
P.O. BOX 360
HARVARD, MA. 01451



2nd Generation !!!! HDS Floppy Drive Controller Board

Features*

- * Gold Plated Edge Cards
- * Dual Selectable ROM Sockets
- * No POTS to adjust
- * Compatible with COCO I & II
- * 120 Day Warranty
- * Double and Single Density

So what's so new in our second generation? We had a lot of requests for the need to use the lesser expensive 28 pin Eproms. Our 2nd generation controller allows the usage of either (two 24pin ROMs) or (one 24pin ROM and one 28pin ROM). The second feature we added was a technical one and is not apparent to the average user. Western Digital was good enough to manufacture for us a far advanced drive controller chip, called the WD1773FDC. This chip integrates the data separation method within itself allowing the cleanest data transfer to date.

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 this the best board available to date.

Completed and Tested Board with Radio Shack ROM	\$139.
<small>(Includes Case and DOS Instructions)</small>	
Completed and Tested Board without ROM	\$119
<small>(Includes Case)</small>	
Bare Board with instruction manual	\$ 40.
Parts Kit For Bare Board without ROM	\$ 40.
Radio Shack ROM	\$ 20.

AS SEEN AT THE RADIO SHACK
COMPUTER SHOWCASES



New Low Prices!

DISK DRIVE SYSTEMS

SINGLE SIDED DOUBLE SIDED

Drive 0 Complete	\$249.	\$289.
Drive 1 Complete	\$169.	\$209.
Drive 0 & 1 Dual Drive	\$399.	\$479.

64K UPGRADE KIT

\$39.95

NEW ROM

HDS has licensed the ROM from Radio Shack to be able to offer alternative operating systems pre-written ready for installation. The first of what we hope to be a wide range of options is ADOS. ADOS is a product of SpectroSystems of Miami, Florida and is fully supported by the author. The HDS version of ADOS supports 2 drives, 40 track, firms 16-to-16 drives only, either Single Sided or Double Sided. The ADOS package comes complete with original documentation and disks from SpectroSystems and can be installed in our Drive Controller Board at purchase time for no additional charge.

ADOS/HDS 24 pin ROM	\$ 50.
<small>(Available in all drive controllers on the market)</small>	
ADOS/HDS 28 pin ROM	\$ 40.
<small>(Available in the HDS 2nd generation board only)</small>	

Keytronics Keyboard KB500

The Fantastic Keytronics Keyboard is now being manufactured only for Hard Drive Specialist. It is the only keyboard for the Color Computer known on the market that does not use mechanical switches. The KB500 uses a capacitance foam switch. This type of switch will never give keyboard bounce and last much longer than all other types. The KB500 is also the only keyboard that will fit all versions of the color computer whether it is A, B, C, D, E, F, ET, TD-F-100, COCO III, or COCO IIIB. One keyboard fits all with out risk of getting the wrong version, and there is no need to do any modifications to your case. Additional features include a higher spring force on the break and clear key to reduce the possibility of a disastrous key stroke; sculptured keys, low profile "pops" on home row keys; The "PF" function key comes with documentation and a sample program. The Keytronics/HDS keyboard list price was \$89, when it was offered through Keytronics. Our price on it is only \$69, plus \$3 for shipping.



HARD DRIVE SPECIALIST

Ordering Information
Use our VISA, MC or to place your order. We Visa, MasterCard or VISA. To place 24 Hour and payment directly to us. Any non-voided funds will be held until proper clearance is made. 1000 orders are accepted as well as purchase orders from government agencies. Most items are shipped out the next working day. We ship our products that are in stock. Void UPS insured. Void of product means of shipping unless otherwise specified. There is a \$3.00 shipping charge per order.

1-713-480-6000
Order Line 1-800-231-6671
16208 Hickory Knoll,
Houston, Texas 77059

How To Follow A Memory Map

By Tony DiStefano
Rainbow Contributing Editor

I feel like a broken record, but I still get a lot of questions and calls about memory mapping. Don't feel bad — it took me quite a while to get it right myself.

Let's go over it step by step. This time, I'll go into some hardware on how to memory map something to the CoCo *SCS area, which is the area mapped at 65344 (\$FF40) to 65375 (\$FF5F). This memory mapping technique will work on any version of the CoCo or CoCo 2 since the theory is the same. In fact, most of this theory will work on just about any computer.

A basic understanding of a CPU is a must when trying to understand mapping. By now everyone understands the importance of binary and Hex numbers; it has everything to do with mapping.

Let's start with binary: zero and one. That's it. A binary digit has only two values, zero and one. Two binary digits have four combinations: 00, 01, 10, 11. Three digits have eight and so on. Table 1 shows a four-bit number and the

(Tony DiStefano is well-known as an early specialist in computer hardware projects. He lives in Laval Ouest, Quebec.)

relation between decimal numbers, Hex numbers and binary.

Table 1

Decimal	Hex	Binary
0	0	1111
1	1	0001
2	2	0010
3	3	0011
4	4	0100
5	5	0101
6	6	0110
7	7	0111
8	8	1000
9	9	1001
10	A	1010
11	B	1011
12	C	1100
13	D	1101
14	E	1110
15	F	1111

As you can see, a number from zero to 15 in decimal can be represented by one character from '0' to 'F' which is four binary bits. This is called a nibble. Now, a number from zero to 255 in decimal can be represented in Hex from

'0' to "FF". This is called a byte. In binary, a byte takes up eight bits or two nibbles. The 6809 CPU (the CPU in the CoCo) has a data bus of eight bits, better known as an eight-bit CPU. (The internal structure is 16-bit, but I'll get into that story another day.)

Back to our nibble. This nibble represents 16 different combinations or discrete locations. Each different location becomes one memory location and each memory location has its own discrete address.

Address 0 (0000 in binary) is the first memory location (zero is a valid number). Address 1 (0001 in binary) is the second. But, that is only four bits; the 6809 has 16 bits used for memory locations which is a 16-bit address bus. Sixteen address lines means the CPU can access 65536 different locations. The first location is "0000000000000000" and the last location is "11111111 11111111," with 65534 combinations in between. For example, "10101000 01101010" is a valid location.

Writing out 16 zeros and ones every time we want to mention an address is silly. If we go back to our nibble, it can be represented by a single character. Sixteen bits would be four nibbles. Each nibble represents one-

fourth of the 16-bit address. So, going back to our first location, we can now write it as a four-digit number, \$0000.

The 'S' in front of the number means the number to follow is in Hex; it can also be represented by the letter 'h' at the end of the number. The last location would now be \$FFFF, and a number somewhere in between would be \$CD8A.

That is the basic memory map of a CPU. Let's go back to our nibble for now — it is a little easier to work with. If we were to spread out each of the 16 locations into individual outputs, there would be 16 of them.

Most computer peripheral devices such as PIAs and VDGs require that a logical zero be used to select that particular device. That means if you have several devices connected to the same computer and want to select one at a time, all the select lines would be at logical one, except the peripheral that is to be selected. If we were to map out our four-bit address to one of 16, the result would look like the results in Table 2.

Table 2

Binary Number	One of 16 Select Lines
0000	111111111111110
0001	111111111111101
0010	111111111111011
0011	111111111111011
0100	111111111110111
0101	111111111110111
0110	111111111011111
0111	111111111011111
1000	111111101111111
1001	111111101111111
1010	111110111111111
1011	111101111111111
1100	111011111111111
1101	110111111111111
1110	101111111111111
1111	011111111111111

In each of the 16 examples, only one of the 16 lines is low, therefore only one of the possible 16 devices is selected. This is known as decoding. Decoding means separating a binary input to its individual outputs.

That is only four bits. If we were to look at 16 bits (the amount of address lines the 6809 CPU has), the decoded output would be one of 65536. Listing a table of the outputs would require

several hundred pages (I think I'll pass on that one).

You can see the amount of components that goes into a chip. The amount of individual outputs doubles with every addition of one bit. Table 3 shows the relation between the amount of binary bits to the amount of individual select lines possible.

Table 3

Number of Bits	Number of Select Lines
1	2
2	4
3	8
4	16
5	32
6	64
7	128
8	256
9	512
10	1024
11	2048
12	4096
13	8192
14	16384
15	32768
16	65536

Do the numbers in the right-hand column look a bit familiar? They should: 1K, 2K, 4K, 8K, 16K, 32K and 64K. These are the real values people talk about when they say "K's." When you say your computer has "16K," it really has 16384 bytes of memory; 16K is just a rounded off number for the real thing.

OK, we now understand how a CPU can access all those bytes of memory. "How come I can't see thousands of wires and chip selects in my computer?" would be the next question. Well, there *are* thousands of wires and chip selects in your computer, but most of them occur inside the major chips of the computer.

Take, for instance, the Color BASIC chip. It is 8K, or 8192 bytes long. This is a good place to start. If you look back to Table 3, it takes 13 address lines (lines A0 through A12) to make up 8K of memory. The chip used for Color BASIC has 13 address lines. They connect to the first 13 address lines of the computer. That leaves us with a balance of three lines.

A typical Chip Enable line on a memory chip activates the whole chip. When *CE is activated, it works in conjunction with the other 13 lines. It

TIME BANDIT

Bill Dunlevy & Harry Lafnear

Tired of the same old screens? In TIME BANDIT, you pick from more than TWENTY places with over 15 levels in each place. That's over 300 screens! Visit FANTASY WORLD, WESTERN WORLD, & SPACE WORLD, Fight the Evil Guardians Killer Smurfs, the Looking Lurker, Angry Elms and more! Find the Keys and collect the treasures of time! Crisp Supergraphics, colorful SCROLLING landscapes, full animation, and over THREE HUNDRED SCREENS! The conquest of time and space awaits you!

32K Tape \$27.95/Disk \$29.95

CASHMAN

Bill Dunlevy & Doug Frayer

Explosive color, fast-moving animation and amazing sound make this non-violent game a classic! Different levels and more than FORTY screens offer as much challenge & good clean fun as you can take! Play solo or enjoy the challenge of two-player simultaneous competition. Scramble to get the loot first, but be careful: the KATS are prowling and your opponent is tossing eggs!

32K Tape \$27.95/Disk \$29.95



SUPER PAINT

by John Crane

Super Paint is an exciting new enhancement for your Graphicom drawing system. Break the chains restricting your creative freedom! Now you can draw and paint with every color your machine is capable of. Over 250 colors are available at all times! It's no longer impossible to find just the right shade or texture. Super Paint brings the COLOR back into your Color computer! Requires Graphicom system.

32K Disk \$19.95

Mitchtron

576 South Telegraph
Pontiac, Michigan 48053
(313) 334-6576

REAL TIME CLOCK

Full featured, yet very easy to use, RTC-10 is a quartz-based, Time/Date clock contained in a compact ROM case. Supplied with simple to use basic and machine code programs. A 2-year+ replaceable battery backup is included.



NOW ONLY \$49.95

Compatible with any Color Computer I or II with or without a Radio Shack or any other Multi-Slot unit. Compatible with all known plug-in packs. To use it with another plug-in pack without using a Multi-Slot, order the Y-cable below.

Completely assembled, tested and ready to plug-in and use, with programs included to set, read, and display the Time/Date on the screen. RTC-10 NOW \$49.95

ROM/PROJECT CASES

3 piece unit with hardware. ONLY \$5.50
PC BOARDS for 27XX type proms for above case, ONLY \$4.00

DISK CONTROLLER PACK

by HDS. For Coco I & II Gold contacts w/ROM ONLY \$119

COCO CABLES

All connectors have GOLD plated contacts.

MULTI-SLOT EXTENDER CABLE - 40 conductor, 6" to 15" (specify), 1 Male, 1 Female. - STOP THOSE LOST CONTACT BLUES. - ONLY \$21.95

Y-CABLE - 40 conductor, 1 ft. long, 1 Male, 2 Females. Lets you connect the RTC-10 to a disk, voice or any other plug-in pack. ONLY \$27.95

DISK PACK EXTENDER CABLE - 40 conductor, 2 ft. long, 1 Male, 1 Female. Not for use with Multi-Slot. ONLY \$22.95

DISK DRIVE EXTENDER CABLE - 34 conductor, 2 ft. long, 1 Male, 1 Female. ONLY \$21.95

CUSTOM FLAT CABLES - Call

Custom Computer Products
6 Dogwood Court
Goshen, N.Y. 10924

ccp

(516) 783-7426

ADD \$3.00 PER ORDER FOR SHIPPING & HANDLING FOR C.O.D. INCLUDE AN ADDITIONAL \$3.00 NY RESIDENTS MUST INCLUDE SALES TAX

is sort of a *master select*. The computer tells the chip that I want a byte of data. The other 13 lines tell the chip which of the 8192 bytes of data it wants.

Now, look back at Table 2. For the sake of theory, take the Color BASIC chip. Connect the first 13 lines (least significant) to the CPU. You are left with three unused lines (most significant). Look at the first three bits in Table 2. If you apply that theory to this situation, three bits can select eight devices.

Consider the Color BASIC chip as a device and connect one of the output lines of the three to eight decoders. A decoder such as this does exist; it has three inputs and has eight output lines. It also has other control lines, but we'll look into that a little later in this article. Connect the three binary input lines to the last three free address lines of the CPU. Depending on which output line we use, the CPU will select the Color BASIC chip on one of eight 8K borders.

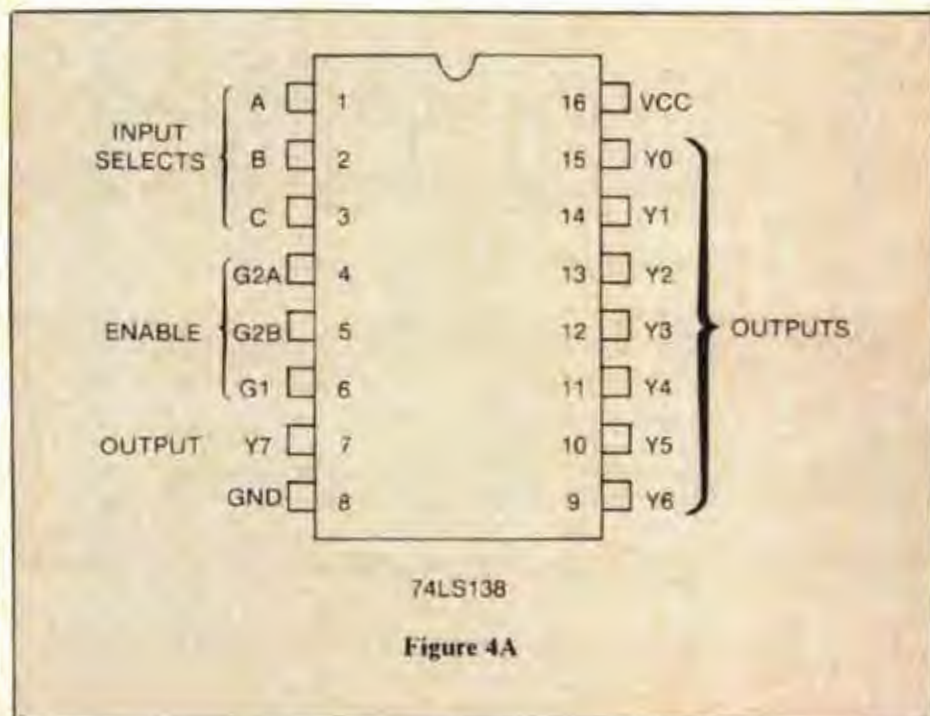
If we put the chip on the first line, the CPU will activate the chip from memory location 0000 to 8191. If the chip was hooked up to the second, it then would see the chip as being from 8192 to 16383, the third would be from 16384 to 24576 and so on and so on, increasing by 8K every time, until we reach 64K. This is known as memory mapping. What we have done is memory mapped an 8K chip to the CPU. Again, where this 8K is depends on what output line of our decoder we use.

We have used all of the address lines in this situation. There are times when not all of the lines need to be used. When memory mapping a device to a CPU and not all the address lines are used, a condition called memory "ghosting" or "mirroring" is formed.

Memory mirroring is produced when the same chip is activated in two or more areas of memory. The best way to explain this is to use an example. Take the previous example of the 8K Color BASIC chip. The chip itself has 13 address lines connected to the CPU and the remaining three (most significant) lines of the CPU are decoded to one of eight. That leaves no address line free or unused. If we were to use a 4K chip instead of the 8K, there would be one less address line. Table 3 reveals that.

Now, leave this address line free and not connected to anything. When the CPU reads the first 4K of the chip (the only 4K in this case) all is fine, but when the CPU reads the next 4K, the 13th address line will change state. Since it is not connected to anything, the CPU will read the same thing as the first 4K. That is because the only address line that changed for the second 4K of memory is that free address line.

Let's take this one further and use a 2K chip. Now we have two free address lines. The CPU will see the same repeated data every 2K for the duration of the 8K bank. Bank is a word used to describe an area of memory. It is



INPUTS				OUTPUTS								
ENABLE		SELECT										
G1	G2*	C	B	A	Y0	Y1	Y2	Y3	Y4	Y5	Y6	Y7
X	H	X	X	X	H	H	H	H	H	H	H	H
L	X	X	X	X	H	H	H	H	H	H	H	H
H	L	L	L	L	L	H	H	H	H	H	H	H
H	L	L	L	H	H	L	H	H	H	H	H	H
H	L	L	H	L	H	H	L	H	H	H	H	H
H	L	L	H	H	H	H	L	H	H	H	H	H
H	L	H	L	H	H	H	H	H	L	H	H	H
H	L	H	H	L	H	H	H	H	H	L	H	H
H	L	H	H	H	H	H	H	H	H	H	L	H

*G2=G2A+G2B
H=LOGIC 1, L=LOGIC 0, X=IRREVELANT

Figure 4B

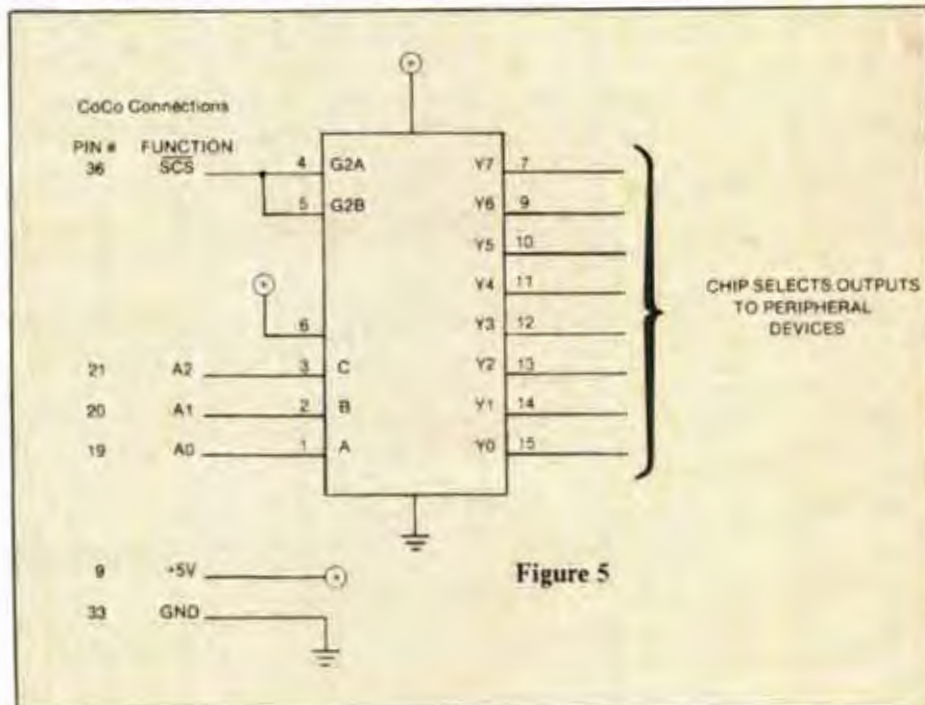
not any particular size, but referred to as an 8K bank or a 2K bank, whatever the size in question is.

It is not wrong to leave free lines when memory mapping, but it does make for inefficient use of memory. Take for instance the Disk Extended Color BASIC from Radio Shack. The chip itself is only 8K long, but is mirrored twice into 16K. It still works but renders the other 8K of memory unusable without more hardware to decode the free lines. This, however, does make for a less expensive parts count.

Now to get down to hardware. The area most frequently used by CoCo hardware hackers is *SCS: Spare Chip Select. It is already partially decoded by the SAM chip. It is sort of a mini "Master Select." The SAM chip decodes this area to be from 65344 (\$FF40) to 65375 (\$FF5F). It is only 32 bytes long, therefore also requires five address lines. These are A0 to A4. So the *SCS (Master Select), along with five address lines, makes up the 32 bytes of the memory map.

This area is great for I/O purposes such as the projects I presented in this column. Take, for example, my article "Lights! Camera! CoCo!" (December 1984, Page 24). It uses the *SCS pin.

This is just the sort of thing I am talking about. I used just the *SCS pin and none of the other address lines. That means the chip I used is memory mirrored throughout the 32 bytes (five address lines) and is only one byte wide. I saved adding some chips, but in this case, I didn't need the rest of the area.



Now, if we take the three to eight decoder I mentioned earlier, and integrate it into the *SCS circuit, we could access more chips. Figure 4A shows the functions of a chip called the 74LS128. This is a computer compatible chip that works well with the CoCo. In fact, there is already one of these chips inside the CoCo. If you have a schematic for the CoCo, look it up.

Figure 4B shows the Truth Table for this chip. When you examine this table, you will notice the similarity between this and Table 1, only it is only three bits wide. There is a four to 16 decoder chip available, called a 74LS154, but you'll have to look that one up yourself.

Now, the diagram in Figure 5 shows how this chip can be hooked up to the CoCo and the *SCS pin. This is hooked up as such: You have eight separate chip enables from 65344 (\$FF40) to 65351 (\$FF47) and it is memory mirrored four times to make a total of 32 bytes. If we were to replace A0 with A1, A1 with A2, A3 with A4 and left A0 not connected, we would have every second byte memory mirrored. If we moved the address lines up one more, it would be every four bytes memory mirrored.

If we added more 74LS138s, we could even have 32 bytes not mirrored at all. It all depends on the decoding technique and how many free address lines we want.

I hope all this decoding has helped you understand more on how the CoCo works. See you next time, and we'll say hi to LEDS.

Role Playing Games Are Effective Learning Tools

By George Firedrake and Karl Albrecht

Lots of young people (and some not-so-young) are playing role playing games. Kids who "can't read" are reading, understanding and using rule books for role playing games — rule books that make a computer reference manual seem simple by comparison. Kids who "can't do math" are successfully dealing with numerical information, probability tables, economics of fantasyland and polyhedral dice in ways beyond the ken of most adults.

Role playing games might be the most powerful learning tools existing in our culture, more powerful by far than

computers. Yet this incredible world of learning is virtually ignored by the educational establishment.

Role playing games can include anything possible in real life plus anything anyone can imagine. Perhaps the kids who create, explore and manage these "worlds of if" will be the creative managers, explorers, movers and shakers a few years from now.

Fortunately, everyone has the number one ingredient required to play a role playing game: imagination. Add paper and pencil, a few dice, a rule book or two, and you are ready to play. We will help. In "GameMaster's Apprentice," we will try to answer questions such as:

- What are role playing games?
- Why are they so popular?
- What are the most popular games?
- How are the games played?
- What can be learned while playing?
- What can be learned while preparing to play?
- Parent: How can I use knowledge about role playing games to relate better to my children?
- Teacher: How can I use knowledge of role playing games to relate better to my students?

Most role playing game players play one or more games from the following categories:

- Low-technology worlds where magic works. The culture is similar to medieval Earth plus magic that works. These are the worlds of swords and sorcery.

ROLE PLAYING GAMES

Millions of people play role playing games. A role playing game is a game in which one or more players create and play characters (adventurers) who live their imaginary lives in a specially made game world. The game world is created, managed and operated by a Game Master (GM), referee, or dungeon master (DM).

Most people who play role playing games use a formal rule system. Some of the best known are shown below.

Bushido. Fantasy Games Unlimited, P.O. Box 182, Roslyn, NY 11576.

Champions. Hero Games, 92A 21st Avenue, San Mateo, CA 94402.

Dungeons & Dragons (D&D). TSR, P.O. Box 756, Lake Geneva, WI 53147.

RuneQuest (RQ). Avalon Hill, 4317 Harford Road, Baltimore, MD 21214.

Star Trek. FASA, P.O. Box 6930, Chicago, IL 60680.

Tunnels & Trolls (T&T). Blade, P.O. Box 1467, Scottsdale, AZ 85252.

Beginners beware! The rule books are formidable. If you are a beginner, we suggest you start with one of the following books, both from Reson Publishing Company, 1480 Sunset Hills Road, Reston, VA 22090.

Adventurer's Handbook: A Guide to Role Playing Games by Bob Albrecht and Greg Stafford.

You will also need Adventurer's Handbook if you play our play-by-mail beginner's game. We call it Dragon Fun.

Copyright © 1985 by DragonQuest, P.O. Box 7627, Menlo Park, CA 94026.

Arthur and Merlin lived in such a world. Tolkien created this kind of world. *Bushido*, *Dungeons & Dragons*, *RuneQuest* and *Tunnels & Trolls* are in this category.

- Contemporary technology worlds, perhaps with the addition of superheroes. Examples are *Champions*, *SuperWorld*, *Marvel Superheroes* and *Mercenaries & Spies*.
- Future technology worlds. Explore our galaxy, or another galaxy, in games such as *Star Trek* or *Traveller*.

We know that some of you who read "GameMaster's Apprentice" are players. What games do you play? What are your favorite games?

We hope some of you are non-players who want to learn more about this incredible subculture. How can we help you learn? Would it help if we described a game system each time (for example, *Dungeons & Dragons*)?

Aloysious Continues on His Journey

Aloysious is traveling afoot from his village to the town of Baldvu on a warm, clear spring day. Here again are his characteristics and success percentages for the three skills described last time.

Characteristics		Skills	Percent
STR	10		45
CON	11	Spot Hidden Item	25
SIZ	10	Move Quietly	25
INT	12		
POW	10		
DEX	12		
CHA	9		

Last time, Aloysious spotted the hidden deer, but was unsuccessful in his attempt to quietly move closer to it. The deer bounded away; Aloysious sighed and resumed his journey.

HIDE — Success percentage: 55%

In a dangerous spot, perhaps Aloysious should hide instead of trying to sneak away. His chances of hiding are much better than his chances of moving quietly away.

Success: Roll 55 or less on the percentile dice
Failure: Roll 56 or more on the percentile dice

Aloysious hears a boisterous bunch of dwarves coming down the path. He hides. We roll 42; they don't see him. Whew!

Or use your CoCo to simulate the percentile roll.

A digit die (DD) is a 10- or 20-sided die whose faces are numbered 0, 1, 2, 3, 4, 5, 6, 7, 8, 9.

D100 is a percentile roll, with numbers 00 to 99. To make a percentile roll, use one DD (digit die) and roll it twice. The first roll is the tens digit; the second roll is the ones digit. If you roll a '3' the first time and a '7' the second time, the number is 37.

JUMP — Success percentage: 45%

Only 45 percent? Yes, we know everyone can jump. In this case, Aloysious has a 45 percent chance to jump:

- 1) Across a ditch about four meters wide.
- 2) Up, up and over something one meter high.
- 3) Down from a place four meters high without falling and possibly getting hurt.

If he fails, he falls into the ditch (let's hope it is shallow), trips over something and falls on his face, or lands in a heap while jumping down. He might get hurt doing this and take a few hit points.

Success: Roll 45 or less on the percentile dice
Failure: Roll 46 or more on the percentile dice

You guessed it. Aloysious is still meandering down that path through the forest. He comes to a somewhat deep and fast-moving stream about eight meters wide. There is a large rock showing in the middle of the stream. Aloysious doesn't feel like trying to swim across, so he tries to jump to the rock. He figures he can cross the stream in two jumps.

Roll the dice: 00. Oops! That's a fumble. Aloysious's foot hits the rock and slips off. He bangs his knee, scrapes his arm, bounces his chin off the rock and plunges into the cold, rushing water.

The GameMaster solemnly intones "1D6 hit points." We roll 1D6 and get three. His clothing absorbs one point, so we mark off two hit points on his character sheet.

SWIM — Success percentage: 20%

Aloysious will win no swimming medals. He is reasonably adept, however, in at least keeping his head above water. He has a 20 percent chance of swimming directly across the creek with only a little downstream drift.

Success: Roll 20 or less on the percentile dice
Failure: Roll 21 or more on the percentile dice

Like it or not, Aloysious has gone swimming. As he strikes out for the other side of the creek, we roll the dice and get 33. Looks like Aloysious will have to go with the flow.

A couple of hundred meters downstream, the creek deposits a watersoaked, bruised and exhausted Aloysious on (fortunately!) the far shore. Gratefully, he rests and dries out in the warm sunshine.

Again we leave Aloysious to dry out, rest and recover. Next time, he will continue his trek to Baldvu.

Play-By-Mail Games

If you have never played a role playing game and want to begin playing, try a play-by-mail (PBM) game. Anyone can learn to play by playing — no previous gaming experience is required.

Flying Buffalo, Inc. created the play-by-mail industry. We have played or are playing four of their games: *Nuclear Destruction*, *Heroic Fantasy*, *Starweb* and *Feudal Lords*. If you are a beginner, try *Nuclear Destruction* or *Heroic Fantasy* for starters. As you gain experience, move on to

Starweb and *Feudal Lords*. Begin by getting the rules from Flying Buffalo, Inc., Dept. GMA, P.O. Box 1467, Scottsdale, AZ 85252-1467. Here are the prices: *Nuclear Destruction* \$.25, *Starweb* \$2, *Heroic Fantasy* \$1 and *Feudal Lords* \$1. There is a set-up fee to enter a game and a turn fee each time you send in a move. It's all there in the rules.

Heroic Fantasy

We are playing *Heroic Fantasy* by mail and began reporting our progress in the January 1985 issue of THE RAINBOW. Here is our team of adventurers.

Name	Sex	Code	Kindred	Class*	STR	CON	Cost
Ai Khong	M	H	Hobbit	F	5	15	5
Frona	F	H	Hobbit	F	5	15	5
Mariko	F	H	Hobbit	M	4	15	7
Steffi	F	H	Hobbit	M	4	15	7
Sheri	F	P	Human	F	15	30	9
Zamora	M	P	Human	M	10	30	11
Tindil	M	E	Elf	F	25	25	15
Leiko	F	E	Elf	M	20	25	18
Jonjari	M	D	Dwarf	F	30	40	23
TOTALS					118	210	100

*Class: F=Fighter, M=Magic-User

Our characters are now in the Dusty Room.

Dusty Room

Doors: North 5, East 25, South 3, *West 3*

Monster: Brown Bear.

P204: Potion

KLICKER

KLICKER is a tremendous aid for those doing much keyboarding such as programmers, writers, and businesses. Makes your 64K TDP-100, CoCo I or II click through the TV speaker upon each keystroke. Add it to your programs to make typing easier.

- Very fast ML program
- Increase typing speed and accuracy
- Add to disk Telewriter-64(TM)
- No need to watch the screen
- Transparent to most BASIC progs
- Informs you of double hits
- KLICKER uses all-RAM mode
- KLICKER is a mod to POLCAT
- Assembly language listings
- May be added to other languages
- 64K and Color BASIC 1.1 or 1.2

\$6.00 US Check or money order.
R.I. residents please add 6% tax.
TEPCO, 30 Water St.
Portsmouth, R.I. 02781

Last time, Ai Khong and Frona picked up two potions which turned out to be healing potions. The Brown Bear attacked Frona and inflicted eight hit points of damage. Her CON is now down to seven. A character called Point Man has arrived from the South, wounded with 10 hit points. He is character number C214, a male human fighter.

We have decided to give the following orders.

- Sheri: X0N. Exit using strength zero through the North door.
- Zamora: T5P204. Take, using strength 5, the potion labeled P204.
- Tindil: G20C57. Guard, using strength 20, character C57, who happens to be Zamora.
- Leiko: X0N. Exit using strength zero through the North door.
- Ai Khong: UP186C214. Use potion P186 (healing) on character C214 who is Point Man, apparently from another team of adventurers. We are going to be as friendly as possible in the game!
- Frona: UP145 X0N. Use (on herself) healing potion P145, then exit using strength zero through the North door.
- Mariko: No orders. We are holding her "in reserve."
- Steffi: X0N. Exit using strength zero through North door.
- Jonjari: X0N. Exit using strength zero through North door.

We filled out an order sheet, adding some things for our characters to say, and sent it to Flying Buffalo's computer. Here are the results.

Character	ID	Orders
Sheri	C27	X0N
Zamora	C57	T5P204: Tindil, guard me as I get the potion.
Tindil	C139	G20C57: Back off, bear!
Leiko	C141	X0N: Our intentions are peaceful.
Ai Khong	C141	UP186C214: You are healed, friend.*
Frona	C146	UP145 X0N: Our aim is to explore.
Mariko	C153	: What do I do now?
Steffi	C163	X0N: Jonjari, you go first.
Jonjari	C191	X0N: Respect our peaceful intentions, or beware!

*Character C214 is Point Man, who entered the Dusty Room injured.

Wonder what will happen next. Will the Brown Bear attack? What is beyond the North door?

DragonSmoke and DragonFun

DragonSmoke is our monthly newsletter about new ways to learn, including computers, role playing games, play-by-mail games, COPY ME stuff, public domain instructional materials, software for beginners, and our own play-by-mail game, *DragonFun*.

DragonFun is a play-by-mail role playing game for beginners. It is nonviolent and features cooperation, exploration, problem-solving and story-telling. How to play is described in *DragonSmoke*. For a free copy, send a business-size, self-addressed envelope with 39 cents postage to *DragonSmoke*, P.O. Box 7627, Menlo Park, CA 94026.

DIGISECTOR™ DS-69 VIDEO DIGITIZER FOR THE COCO



Give your COCO the gift of sight!

The Micro Works is happy to introduce the newest member of our Digisector™ family — the DS-69 Video Digitizer for your COCO. It has all the standard features of its big brothers but comes with a price tag that's right for you.

- **High Resolution** 256 by 256 spatial resolution.
- **Precision** 64 levels of grey scale.
- **SPEED!** ½ second for a full screen of video.
- **Compactness** Self contained in a plug in Rompack.
- **Ease of Use** Software on disk will get you up and running fast!



The DS-69 Digisector opens up a whole new world for you and your COCO. Your computer can be a security system, take portraits, analyze signatures, inspect assembly work . . . the DS-69 is your COCO's

eyes. Use the DS-69 and a TV camera to get fast, precise conversion of video signals into digital data.

Powerful C-SEE™ software.

C-See is a menu-driven software package included with your DS-69. It provides high speed 5 level digitizing to the screen, high precision 16 level digitizing for superb hard copy printout, and simple software control of brightness and contrast. Or call our driver routines from your own Basic program for easy 64 level random access digitizing. Pictures taken by the DS-69 may be saved on disk by C-See and then edited by our optional MAGIGRAPH package for enhancements and special effects.



The DS-69 comes with a one year warranty. C-See supports both cassette and disk operation with the Multi-Pak adaptor and requires 64K. Cameras and other accessories are available from The Micro Works. Let your COCO see the World!

- DS-69 Digisector & C-See Software \$149.95
- MAGIGRAPH Graphics Package on disk \$ 39.95

Terms: Visa, Mastercard, Check or C.O.D.

Purveyors of Fine Video Digitizers Since 1977.

The **MICRO
WORKS** Established 1977

P.O. Box 1110 Del Mar, CA 92014 (619) 942-2400

The World's Easiest Database

By Fred B. Scerbo
Rainbow Contributing Editor

(Editor's Note: If you have an idea for the "Wishing Well," submit it to Fred, c/o THE RAINBOW. Remember, keep your ideas specific, but don't forget that this is BASIC. Sorry, no personal responses are possible. All programs resulting from your ideas are for your use, but remain the property of the author.)

This month's listing will be short and simple, but will have many uses for both home and school. I am sure many of you have seen listings for database programs many times in the past. Quite often, you will find ads for database programs that will require 64K and a disk drive. Too often, you must read pages and pages of instructions just to get your feet wet. Well, for those who thought using a database was only for the advanced programmer or user, we now have *MiniData*, a simple and short BASIC database that even a child could use.

The Wish

You have probably seen me mention that many readers and friends have always approached me or others with a very basic misconception about what a computer can do. How many times have I said that someone has made

a remark like, "I want to get a computer so I can dump all this information into it and then pull it out when I need it!" Some people really think a computer is a device which you can reason with in English by telling it, "Give me the names of all my friends who own Beta VCRs" or "How much money did I make in overtime in the last two weeks?"

Granted, a computer *can* answer those questions, but *only* if a program has been devised to arrive at those answers, provided it is given accurate information by the user. Too often, a person will buy a computer to keep track of something only to find the software available will not do that.

Radio Shack does have a very simple database called *Personafile* which does a nice job of keeping track of items under the heading of "subjects" and "tags," but this can only be used for the most general type of sorting by title. I happen to like *Personafile*, but unless you have a disk drive, you are out of luck.

Recently, several readers have written requesting a type of database which could be used with the MC-10. My first reaction was, "You've got to be kidding!" Although I have tried to make as many of my programs as possible work on the MC-10, this seemed like a little too much of a task to handle.

I started to rethink my position on that request just a few months ago. There are some things which cannot be done with an MC-10, such as high resolution graphics. I have been able to generate some Lo-Res graphics games for it, but handling information in a database just did not seem to be practical with the type of keyboard the MC-10 has. However, since more and more of my mail has

(Fred Scerbo is a special needs instructor for the North Adams Public Schools. He holds a master's in education and published some of the first software available for the Color Computer through his software firm, Illustrated Memory Banks.)

been thanking me for not forgetting our little "CoCo Jr.," I felt there just might be a way.

The Challenge

The final stimulus which led to creation of *MiniData* came from a couple of teachers who teach for our Chapter 1 Remedial Reading Program at the high school. Both Mickey and Jeri come into my Resource Room at least once a week with a debugging problem or a small request to help them with their Apple IIe computers.

Just a few weeks ago, they came to me with a new challenge. Since they run a reading program, they have obtained a large number of small books for their students to read, all at different reading levels. They were both looking for a quick way to get a program that would let them keep track of titles, but also select them by grade level or subject, or some other characteristic by which they could identify the book. This was to be nothing complex — they just wanted a quick way to keep track of this information.

Naturally, the old MC-10 and CoCo request came to mind. You can imagine their surprise when I came back with their completed program less than 20 minutes later! The most interesting thing about the listing I gave them was that it was only about 25 lines long. Even in Applesoft, which usually takes many more lines than Microsoft BASIC to complete a task, the program was very short. The big question is: Would it work?

Without getting into too great detail, the listing did everything they wanted it to do. They could enter book titles with subjects and characteristics, then pull any title by searching for a given subject or characteristic.

What made the program so easy to use was that I would let them enter the information in DATA statements, which can be edited much more easily than a file. (Besides, knowing I would probably translate the Apple version to our BASIC since the MC-10 does not have disk capability, an easy storage media would be needed. Saving the entire program with the DATA in it would be much more efficient than loading a tape file. MC-10 does not have a tape on and off relay as the CoCo does.)

Seeing how easily the program works on the Apple, I had no difficulty translating it to Color BASIC and MC-10 BASIC. Naturally, I added a few small frills so as to make the program look attractive on your CoCo or MC-10 screen.

I also included the option of making a hard copy to the line printer. (Those with the MC-10 will have to change the lines with PRINT#-2, to LPRINT in the few lines that it appears, such as lines 350 and 450.)

The actual CoCo and MC-10 version is only 49 lines long, excluding the REM statements. I have deliberately kept each line short, usually under two screen lines. This will be useful to those of you who wish to type it into the MC-10, which does not have a built-in EDIT command. (Please, do not suggest that I find a way to add this command to the MC-10!)

How it Works

Since I have arranged this program to READ from your DATA statements, it is necessary to understand what kind of information the computer will be looking for. The program will always search for two "flags." (A flag is a string or number which the program will recognize so as

to branch out of a READING loop before your get an ?OD Error.)

In this case, our flags are the words END and STOP. END will tell the program that you have completed a category. STOP will tell the program you have READ all the available DATA. You will notice that DATA STOP is found in the last line of the program, Line 9999. This will ensure that you always have at least the final flag in your program. (You could use a higher line number, but 9999 sounds good enough for now.)

Therefore, we must construct our DATA lines starting at Line 1000. We may put as many as 20 items in any given category we create. Any information we place prior to the word END will be included in our list for a given category.

Look at Line 1000 in our program. I have included examples using book titles and certain characteristics of those books. Our first book is *The Cat in the Hat*. The information I wish to keep on that book includes characteristics such as "Kids," "Illustrated" and "Fiction."

You will also notice that I have added the characteristic "All." This is included so you may easily scan through all the files you put in the database by searching for All.

The last piece of information in the DATA line is our flag, END. This tells the program that this is all the information under the book title or category *The Cat in the Hat*.

You will notice that the next DATA line includes similar information under the book title *The Little Train That Could*. If we were to search for titles based on the information found in these DATA lines, then the title which is our first piece of DATA would be listed for us.

Running the Program

Let's say you type in the program exactly as listed with my sample DATA. On running the program, the screen would ask:

WOULD YOU LIKE HARDCOPY? (Y/N)

Pressing 'Y' would dump the screen contents to your line printer, which must be turned on and loaded with paper. The next question will be:

ENTER ITEM TO SEARCH FOR:

Let's say we wish to search through our DATA for all the books which are for Kids. If we enter Kids, then the screen will clear and print:

THIS CATEGORY CONTAINS A MATCH:
> THE CAT IN THE HAT
PRESS <I>NFO OR <C>ONTINUE

If we press 'I' for info, the screen will then list all the information stored for that category or title. The screen would then say:

PRESS <ENTER> FOR MORE

Pressing ENTER would cause the program to search for the next category or title containing Kids in its information.

If you press 'C' for continue, the program will just list the titles and not the information stored. This can be helpful if all you want are the titles or categories containing a

specific match in the information. If you had continued to press only 'C,' the screen would print:

```
THE CAT IN THE HAT
THE LITTLE TRAIN THAT COULD
GREEN EGGS AND HAM
```

```
ANOTHER SORT (Y/N) ?
```

This means the program has found all the matches which were saved in this program for Kids.

Let's say you search for "history." The program would search the information and then print

```
NO MATCHES FOUND!
```

because we had not listed that as information in any case. If we searched for non-fiction, you would only get one match:

```
LIFE EXTENSION
```

because it is the only example in our DATA listing which has the category non-fiction.

You may also search for a given title or category in your DATA. You are not limited to only searching for the information stored in a category. Therefore, if you search for:

```
DUNE
```

the computer would find it listed as a title and allow you to list the information stored with that category.

To put it in the simplest terms, remember that your DATA is entered in this fashion:

```
1000 DATA "title or category",
"info","info","info","ALL".END
```

END indicates the end of a category. ALL allows you to search through all the information and categories you have stored. Remember, the comma (,) is used to separate our pieces of information. You may also use more than one DATA line, but always be sure to end a category's information with ALL and END.

One-Liner Contest Winner . . .

Protect is a program which, to a certain extent, keeps "nosy people" out of your programs. Just add it to the beginning of a program.

The listing:

```
10 A$(2)=CHR$(126):A$(3)=CHR$(96)
):FORX=1 TO480:Y=RND(2)+1:PRINTA$(
Y):POKE65314,248:NEXTX:FORL=1 T
0999999:NEXTL
```

Doug Hemphill
Agoura, CA

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

Many Uses

Once you understand the format explained, you can use *MiniData* to keep track of almost anything. One reader requested a program to save recipes. *MiniData* could do that. Have your category be the dish (i.e., banana creme pie) and in the data, list all the ingredients. Since you have 20 categories to work with, you could even include the instructions in the final lines. This way, you could store pages of recipes on tape or disk, and actually dump the instructions to paper with a line printer when you need it. (No one that I know of cooks with a computer screen near the stove.)

MiniData could be used to keep track of odd jobs completed, additional income, valuables and their serial numbers, and so on. No disk is needed, although you can save on disk just as easily as on tape. Just save the whole program, but be sure to use different program names for different information listings (such as recipes or income).

This program should offer many people a simple introduction to a database program. I hope with this listing its use is explained sufficiently. It just goes to show that simplicity can often be the best solution to a programming problem.

Quick Fix

Several months ago I listed a program called *HOMONYMS* which was a limited multiple choice-type quiz using only two choices. Some people have found this program useful for reviewing material other than homonyms. Therefore, for those who wish to use the program for math or history or some other subject, here are three DATA lines that will replace the word "homonym" in the title card with the word "practice" so the quiz title will appear as PRACTICE QUIZ. Just replace the three lines in the original with the three below and you will have the newer version.

```
150 DATA ,239,236,239,,239,236,2
39,,231,236,235,,239,236,236,,23
6,239,236,,228,239,232,,239,236,
236,,239,236,
160 DATA,239,236,236,,239,237,22
6,,239,236,239,,239,224,224,,224
,239,224,,224,239,224,,239,224,2
24,,239,236,
170 DATA,236,224,224,,236,224,23
6,,216,224,236,,236,236,236,,224
,236,224,,228,236,232,,236,236,2
36,,236,236,
```

Be sure to save this new version under the title *PRACTICE* after you make any other modifications, such as references to homonyms in the PRINT statements.

Some readers also wrote in regarding an error they believe they found in *Demon's Defiance*. It seems that some versions of the CoCo do not recognize the PEEK(339) as a joystick location. (My TDP does.) For those who have found difficulty using the joystick with *Demon*, substitute this line:

```
680 IFPEEK(65280) <> 255 AND PEEK(65280) <>
127 THEN780
```

or try:

```
680 PK=PEEK(65280):IF PK=254 OR PK=126 THEN 780
```

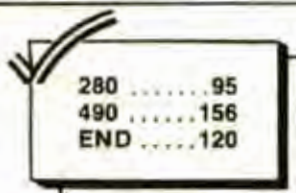
Both should work. I chose the location 339 because it involves fewer BASIC characters to be read, making a faster program. Again, these are not errors. Every now and then we find some differences between the Radio Shack ROMs. Thanks to all who wrote in on this.

On *Tri-Hang*, the space version of *Tri-Planetary*

Hangmenoids, those wishing to use the easy level may find it convenient to EDIT Line 1200 and insert:

1200 DL=7:

just before the IF/THEN statement. This seems to be a better place to put it.



The listing: MINIDATA

```

10 REM*****
20 REM*  MINI COLOR DATABASE *
30 REM*  BY FRED B. SCERBO *
40 REM*  149 BARBOUR ST. *
50 REM*  NORTH ADAMS, MA 01247 *
60 REM*  COPYRIGHT (C) 1985 *
70 REM*****
80 CLS
90 CLEAR500
100 FOR I=1 TO 16: BK$=BK$+CHR$(8)+C
HR$(8)+CHR$(8)+CHR$(8):NEXT I
110 PRINT@134,"MINI COLOR DATABA
SE"
120 PRINT@175,"BY"
130 PRINT@201,"FRED B. SCERBO"
140 PRINT:PRINT
150 PRINT" WOULD YOU LIKE HARDCO
PY? (Y/N)"
160 X$=INKEY$: IF X$="" THEN 160
170 IF X$="Y" THEN P=1: GOTO 200
180 IF X$="N" THEN P=0: GOTO 200
190 GOTO 160
200 PRINT:PRINT"   ENTER ITEM T
O SEARCH FOR:"
210 PRINT:PRINT"   =>";
220 LINEINPUT CT$
230 DIM T$(20): M=0
240 CLS
250 READ A$: I=1: T$(I)=A$: IF A$=""
STOP THEN 520
260 IF A$="END" THEN 510
270 IF A$=CT$ THEN T$(I)=A$: GOTO
320
280 FOR I=2 TO 20
290 READ SR$: IF SR$="END" THEN 510
300 T$(I)=SR$: IF SR$=CT$ THEN 320
310 NEXT I: GOTO 250
320 IF X$="C" THEN 340
330 CLS: M=1: PRINT"THIS CATEGORY
CONTAINS A MATCH:"
340 PRINT "> "T$(1)
350 IF P=1 THEN PRINT#-2,TAB(5)T
$(1)
360 PRINT
370 PRINT"===PRESS <I>NFO OR <C>
ONTINUE===";

```

```

380 X$=INKEY$: IF X$="" THEN 380
390 IF X$="C" THEN 500
400 IF X$="I" THEN 420
410 GOTO 380
420 FOR Z=I+1 TO 20: READ A$: IF A
$="END" THEN 440
430 T$(Z)=A$: NEXT Z
440 FOR K=1 TO Z-1: PRINT T$(K)
450 IF P=1 THEN PRINT#-2,TAB(10)
T$(K)
460 NEXT K
470 PRINT"====PRESS <ENTER> FOR
MORE===="
480 X$=INKEY$: IF X$<>CHR$(13) THEN
480
490 GOTO 510
500 PRINT BK$:
510 GOTO 250
520 IF M=0 THEN CLS: PRINT@135,"N
O MATCHES FOUND !"
530 PRINT:PRINT"   ANOTHER SO
RT (Y/N) ?"
540 X$=INKEY$: IF X$="" THEN 540
550 IF X$="Y" THEN RUN
560 IF X$="N" THEN CLS: END
570 GOTO 540
990 REM ENTER DATA AT LINE 1000
1000 DATA "THE CAT IN THE HAT", "
KIDS", "ILLUSTRATED", "FICTION", "A
LL", END
1010 DATA "THE LITTLE TRAIN THAT
COULD", "KIDS", "COLOR", "ILLUSTRA
TED", "FICTION", "ALL", END
1020 DATA "GREEN EGGS AND HAM", "
KIDS", "COLOR", "PAPERBACK", "FICTI
ON", "ALL", END
1030 DATA "RETURN OF THE JEDI", "
OLDER KIDS", "COLOR", "ILLUSTRATED
", "FICTION", "ALL", END
1040 DATA "STAR WARS", "OLDER KID
S", "COLOR", "ILLUSTRATED", "AVAILA
BLE ON TAPE", "FICTION", "ALL", END
1050 DATA "TARZAN OF THE APES", "
OLDER KIDS", "VIOLENT", "NON-ILLUS
TRATED", "FICTION", "ALL", END
1060 DATA "DUNE", "YOUNG ADULT", "
DIFFICULT", "NON-ILLUSTRATED", "FI
CTION", "ALL", END
1070 DATA "LIFE EXTENSION", "NON-
FICTION", "HEALTH", "ADULT", "ALL",
END
9999 DATA STOP

```



More On MIDI's

By Ed Ellers
Rainbow Technical Writer

That letter we ran from Gareth Jones back in April asking about the Musical Instrument Digital Interface system seems to have touched a nerve; I've gotten a couple of different responses to his question. (By some coincidence, this is our annual Music Issue. Will wonders never cease?) Here they are:

• *The major problem I can see is that a special hardware interface has to be built. I can only think of two sources that can give Gareth all he needs to design and build the MIDI interface for the CoCo: PAIA Electronics and Polymart, both in Oklahoma City. The addresses are:*

PAIA Electronics, Inc.
P.O. Box 14359
Oklahoma City, OK 73114

Polymart
P.O. Box 20305
Oklahoma City, OK 73156

Gareth might also be interested in Polyphony magazine, available through PAIA.

Rob Rosenbrock
Bluffton, IN

(Ed Ellers, a RAINBOW and PCM staff member, is a self-confessed electronics fanatic whose other interests include science fiction.)

• *I have waited since 1983 for the software and hardware to play my Roland JX3P synthesizer from my CoCo. I finally got tired of waiting and wrote my own software and built the interface myself. It is simple enough that anyone who has the skill to make his own RS-232 cable can build it. The software was written in C and runs under OS-9.*

Naturally, I think I have a very useful package for people like Mr. Jones and myself, so I am trying to interest a distributor, and for that reason I won't go into the details except to say that thanks to the speed of the CoCo's 6809 CPU, the project is 99.44 percent pure software. If no one seems willing to buy it, I'll make the package available somehow to interested computer musicians.

Dave McFadden
Tulsa, OK

For those of you whose hands-on experience with synthesizers is limited to those keyboards you see in the department stores, if you have any interest at all in making music you haven't lived until you've seen and heard what the new digital synthesizers can do using MIDI.

I went to a music store recently and heard several MIDI-linked systems in action, and it was a real eye-opener. The Apple II and Commodore 64 (in addition to Yamaha's new CX5M MSX computer) can be interfaced to MIDI now, and the upcoming Atari ST will

have a MIDI port, so when someone brings out a CoCo-MIDI interface, CoCo will be joining some fast company.

Poor Colors

• *I have an original CoCo with a 'D' Board. I have never been able to obtain the eight colors the computer is supposed to generate. When I first bought the computer, I hooked it to an old color TV and I thought that was the problem. However, I now have it hooked up to a monitor with the same results.*

The red is a dark shade of blue, for instance, and the magenta is also a shade of blue. None of the colors are what they should be. I replaced the VDG chip, thinking this might be the problem, but that did no good at all.

Herman L. Smith
Olean, NY

The problem is probably that the computer's master clock is out of adjustment. Adjusting it will be a bit tricky. First, you'll have to set up your TV or monitor for best reception on a local station's color bar pattern; the standard colors from left to right are white, yellow, cyan, green, magenta, red and blue. (When a monitor is involved you will need to arrange some way of feeding a local TV signal into it; a VCR's video output is a good source.)

Next, put up blocks of several colors on the CoCo and adjust the trimmer

capacitor (C4 on a 'C,' 'D' or 'E' Board) to get the correct colors. If you turn it too far you will lose all color; just turn it back.

RGB vs. NTSC

• I know that a monitor will improve the quality of displays on the CoCo, but how do I make an intelligent selection without "overbuying" for the capability of my CoCo?

- 1) What is the difference between RGB and composite video?
- 2) Can the CoCo output RGB signals?
- 3) Is RGB any better than composite, display-wise?
- 4) Could you explain screen pixels, bandwidth and dot pitch?
- 5) Would a good color monitor give you the same number of characters as a monochrome monitor?

Robert Jobin
Theodore, AL

1) Composite video is the term for a single signal that contains all the necessary information to reproduce a picture. RGB is a system that sends separate red, green and blue signals to the monitor (vertical and horizontal sync are often separate as well).

2) The CoCo was designed from the beginning to work with standard TV sets, and getting the necessary signals out is rather difficult.

3) RGB does provide much better resolution than composite color because all the information is transmitted in full. Composite color restricts the amount of color information transmitted.

4) Pixels (picture elements) are the dots that make up the picture. Bandwidth is a measure of how much information can be transmitted through the circuit; in monitors, bandwidth determines how sharp the picture will be. Dot pitch is the distance between adjacent dots or stripes on the face of a color picture tube; the narrower the pitch is, the sharper the resulting picture will be.

5) A really good color monitor with a fine dot pitch (like .31 mm) would show all the characters that most computers (and certainly the CoCo) can put out. Most composite color monitors, sadly, use the same picture tubes as home TV sets and don't have such good

resolution. One (very expensive) monitor that does is Sony's KX-1201HG, which sells for around \$800.

Printer Switcheroo

• Can I modify my Tandy/Radio Shack DMP-110 printer so I can switch select the various print fonts without having to send the specific control codes from the computer?

Richard C. Buescher
Madison, WI

From the schematic you sent, I don't see how, since there aren't any switches inside the printer to set up default settings. On many printers (like Epson),

you can wire switches across the DIP switch contacts, but you would have to turn the printer off and then back on after setting the switches in order for the printer to recognize the new settings.

Printer Graphics

• I have a DMP-110 printer and have no clue as to where I might find a screen dump program. Can you help me?

Beau Palmer
Costa Mesa, CA

Radio Shack's *Hi-Res Screen Print Program* should work fine.

Now Your Popular B5 Educational Programs are Available Through

Radio Shack

Express Order available at Radio Shack stores

PROGRAMS	RS Catalog No.	Computer	Retail
CLOCK	90-5181	CC 16K ECB Cass	\$24.95
	90-5182	CC 32K ECB Disk	\$26.95
MONEY	90-5183	CC 16K ECB Cass	\$18.95
	90-5184	CC 16K ECB Disk	\$21.95
BORROW	90-5185	CC 16K ECB Cass	\$19.95
	90-5186	CC 32K ECB Disk	\$21.95
CARRY	90-5187	CC 16K ECB Cass	\$19.95
	90-5188	CC 32K ECB Disk	\$21.95
MATHFACT	90-5189	CC 16K ECB Cass	\$16.95
	90-5190	CC 32K ECB Disk	\$18.95
SPELL	90-5191	CC 16K ECB Cass	\$19.95
	90-5192	CC 32K ECB Disk	\$21.95
HANGWORD/SCRAMBLE	90-5193	CC 16K ECB Cass	\$17.95
	90-5194	CC 32K ECB Disk	\$19.95
SKIP COUNTING	90-5195	CC 16K ECB Cass	\$16.95
	90-5196	CC 32K ECB Disk	\$18.95
KEYBOARD	90-5197	CC 16K ECB Cass	\$19.95
	90-5198	CC 32K ECB Cass	\$24.95
	90-5199	CC 32K ECB Disk	\$26.95
RECESS GAMES	90-5200	CC 16K ECB Cass	\$19.95
	90-5201	CC 32K ECB Disk	\$21.95
CONGRESS	90-5202	CC 32K ECB Cass	\$29.95
	90-5203	CC 32K ECB Disk	\$31.95
PRESIDENTIAL DECISIONS of Andrew Jackson	90-5204	CC 32K ECB Disk	\$31.95
BASKETBALL STATISTICS	90-5205	CC 32K ECB Disk	\$29.95
DATA FILES for use with Spell, Hangword Scramble, and Keyboard Programs			
Grade 2 Spelling	90-5206	Cassette	\$8.95
	90-5207	Disk	\$10.95
Grade 3 Spelling	90-5208	Cassette	\$8.95
	90-5209	Disk	\$10.95
Grade 4 Spelling	90-5210	Cassette	\$8.95
	90-5211	Disk	\$10.95
Grade 5 Spelling	90-5212	Cassette	\$8.95
	90-5213	Disk	\$10.95
Grade 6 Spelling	90-5214	Cassette	\$8.95
	90-5215	Disk	\$10.95
Space Word List	90-5216	Cassette	\$8.95
	90-5217	Disk	\$10.95
Most Misspelled Words	90-5218	Cassette	\$8.95
	90-5219	Disk	\$10.95
Dolch Words	90-5220	Cassette	\$8.95
	90-5221	Disk	\$10.95
Keyboard Phonic Drill	90-5222	Cassette	\$8.95
	90-5223	Disk	\$10.95

All programs listed are for the Radio Shack Color Computer and Color Computer II, in 16K, 32K, and 64K models with ECB

B5 Programs Maintain a Consistent Quality of Excellence

B5 Programs:

- Assist modern teachers in classrooms across the nation on a daily basis
- Help teachers motivate students and build enthusiasm for learning
- Written by experienced educators and skilled programmers
- Continuously revised and enhanced

- Easy to use and easy to view
- Appealing to students
- Sound educational content
- Long lasting value
- Self-paced with skill levels
- Creative and colorful screen designs
- Rewards to build confidence and self-esteem

B 5 Software Co.
1024 Bainbridge Place
Columbus, Ohio 43228
Phone (614) 276-2752

Refer to Radio Shack's Education Source Book, or write for a free catalog and complete information.

Clip for Easy Reference



Radio Shack is a trademark of Tandy Corporation

Getting Better Acquainted With The DRAW Statement

By Joseph Kolar
Rainbow Contributing Editor

You should have enjoyed getting acquainted with DRAW last month. Rather than making pointless boxes (R4D4L4H4) or equally meaningless diamonds (H4E4F4G4), you created useful letters of the alphabet.

As a follow-up, here is a puzzle for you to break the ice. Use the DRAW statement to make a square inside of a diamond. All units of both the square and the diamond must be of the same length and the square must touch the elements of the diamond. If you plot it out on a sheet of paper, you can work it out easily enough. If you try it as a mental exercise, you are apt to discover that several attempts are necessary before you succeed.

There is nothing a beginner can do wrong when s/he sits in front of the keyboard and bangs away. Even a mistake is not detrimental, provided something is learned from it. In fact, it is the best way to learn.

If you key in Listing 1, you will see that the program is geared to run in PMODE4. For purposes of experimental programs, where color is not an over-

riding factor, the finer detail of PMODE4 is ideal to observe the work in progress as you create.

A few words concerning Listing 1: Lines 20 and 30 place the letters 'A' through 'O' on the top screen line. Line 30 has no instructions to CoCo, such as size, color or starting location. CoCo reads this line as "keep going," since it has no new instructions that supercede the ones in Line 20 (S8BM20,70).

Note that the first letter created by Line 30 is 'I' and CoCo locates it right after the last letter, 'H,' in Line 20. Can you imagine the frustration of picking up the horizontal coordinate to determine where Line 30 should begin? For the heck of it, insert your guess in Line 30 (BMx,70) after the opening ", where 'x' is your guess. See how quickly you can pick up the location that CoCo has reserved to save you the bother. Line 40 centers the balance of the alphabet below the first line.

Notice these two rows of the alphabet have the vertical lines in either red or blue. The colors will vary from TV set to TV set or monitor.

Line 50 draws and centers the numerals on the bottom line. They should be in red if the letters of the alphabet are in blue or in blue if the letters of the alphabet are red. In all three rows

of text, the horizontal lines will be in the buff color of the screen. The diagonal lines are a repeating combination of red and blue or red and green.

If you press the Reset button and RUN, you may find that the alphabet swapped colors with the numerals. If they did not, repeat this procedure. Sometimes CoCo is cranky and doesn't cooperate immediately!

If you want to make all the lines the same color, change the horizontal coordinate in Line 50 from 65 to either 64 or 66. One unit more or less won't affect the centering significantly. Now RUN, then to get the other color, press Reset until CoCo cooperates.

Look over the letters of the alphabet. They were created on a 6 by 4 matrix, except for 'I,' 'M' and 'W,' to be as simple as possible. Each letter in the listing was separated by a space for your convenience. The only letter with rounded corners is 'D' to tell it apart from 'O.' You could round off parts of 'A,' 'B,' 'C,' 'D,' 'O,' 'P,' 'Q,' 'R' or 'S,' which are customarily cursive, to become more elegant.

The more elegant the alphabet, the more troublesome it is to create and utilize. The only elegant feature is the "tick" mark on numeral '1,' which makes it a 6 by 2 matrix.

(Joseph Kolar is a free-lance writer and programmer dedicated to proselytizing for computers in general, and the CoCo specifically.)

If you want to make all the vertical lines the same color in S8 or S16, use either all even or all odd numbers in every line that has a horizontal locating coordinate (e.g.: Line 20 <21>, Line 40 <61>, Line 50 <65>). Now, BREAK and remove the REM marker from Line 15 and RUN.

This sentence uses five additional spaces to separate words, BR8, instead of the usual BR3 used to separate letters.

You may want to copy lines 200 through 270, letter by letter, on graph paper to get the feel of how each letter "flows" from one to the next. The letters may connect at the top or the bottom, depending where the next letter begins, thus avoiding extra moves.

This is not to say that you should not return to the lower left-hand corner of the 6 by 4 matrix of the next letter. You may find it easier to do so. If so, try to recreate the sentence so every letter begins in the same spot of the matrix (lower left corner).

Observe Line 280 and BREAK. Now, change S8 to S12 and RUN. Both verticals of 'A,' 'N' and 'O,' and a small vertical of 'B' are the wrong color. We want all the vertical lines in "RAINBOW" to be the same color as the sentence.

Make the following changes in Line 280: BREAK and change the BR3 at the end of 'R' to BR4, then RUN and BREAK. Change the BR3 at the end of 'A' to BR4, then RUN and BREAK. Change the BR3 at end of 'I' to BR4, then RUN and BREAK. Change the BR3 at the end of 'N' to BR4 and RUN.

The 'B' must be redrawn to eliminate the mismatched color in the top part. This is a hard one! Again, a compromise must be made. Redraw 'B' to read U6R3FDGNL3FD2NL4BR4; RUN and BREAK. Change BR3 at the end of 'O' to BR4 and RUN. Now it is OK!

Remember, you must make one correction at a time and check to see where the next correction must be made. In the case where one side of a letter is one color and the other side is in the second color, you may correct this by making the letter one unit wider. (A 6 by 4 matrix letter is changed to a 6 by 5 matrix format.)

You can BREAK and change S12 back to S8 and discover that both sizes have become stable.

For practice, delete Line 280 and create your own word using S12 size and then adjust it so it will be the same

color as the sentence.

We found out some interesting things, didn't we? Since we are too new at computing to understand or worry about "why" something happens, we remain content to become familiar with "what" happens. Let us experiment together to see what we can determine about PMODE4 with SCREEN 1,1.

This is the sort of experimentation you are urged to try. You never know what insights you may gain or what avenues of exploration may be uncovered. Hopefully, we will know a bit more when we finish this study than we know now.

Type NEW and key in lines 0,10 and 100 of Listing 2. First, we will draw two diagonal lines to cover the screen. Key in Line 20 using the DRAW statement.

"This is the sort of experimentation you are urged to try. You never know what insights you may gain . . ."

We tell CoCo to draw a line in C1, beginning at locations BM0,0, moving diagonally down and to the right-hand corner (F255); next, to go to the lower left-hand corner without drawing a visible line, BL255; then draw a line diagonally up and to the right-hand corner, E255, and RUN. Examine the lines. You should see that the lines are composed of three different, repeating, colored dots.

Usually these lines are put on the screen using the LINE statement. You can check this out by putting a REM marker in front of DRAW in Line 20. Key in Line 30 without the REM marker and RUN. You have exactly the same thing. Comparing lines 20 and 30 of the listing proves that using DRAW is quicker and simpler than using LINE.

For the record, note that DRAW"C1BM0,0F255 is equal to LINE(0,0)-(255,191),PSET; and BL255 is equivalent to LINE-(0,191),PRESET; and E255 does the same as LINE-(255,0),PSET.

We decide to check out the vertical lines and picking one at random, we instruct CoCo to draw a line 50 units from the left margin at the top down to the bottom. Key in 40 DRAW"BM50,0D191 and RUN. We get a red line. If you get a blue or green line,

press Reset until it turns red for the purpose of our study, then BREAK, add BR1 (same as BR), and draw a line back to the top, smack dab next to the first line! Did you add U191? Now RUN.

This results in a nice blue line. Press BREAK and move two spaces or units to the right and draw a line to the bottom of the page, BR2D191, and RUN. We get a greenish line; now BREAK and move three units to the right and draw a line to the top, BR3U191, and RUN. Now we get a red line. Hit BREAK and let's move four units to the right and draw a line to the bottom, BR4D191, and RUN. This gives us a green line.

Continue to move right, incrementing "+1" each time and draw an appropriate line up or down. Run after each addition to Line 40 (refer to the listing).

When you are finished, can you draw some conclusions? When do you get red lines? Green lines? How can you change the last red line on the right to that nice blue color? How about that last green line? Hint: At the end of Line 40, add BL12U191, RUN, BREAK, then add BR13D191 and RUN. Did you expect that?

What do you suspect will happen when you tell CoCo to begin at either 49 or 51 units from the left margin? Try both and see! Does that tell you anything? Suppose you added a third line next to the last one (BR1U191), then what? You get the idea! Continue with these vertical lines until you run out of possibilities.

After your interest is exhausted in the vertical lines, let us go back to work and check out the horizontal lines. Tell CoCo where to begin. Key in 50 DRAW"BM0,80 to start at the left margin 80 units from the top and draw a line to the right margin: R255 and RUN. Aha! A buff line. Let us put a line just below it and see what happens: BD1L255 and RUN. Nothing much!

Continue with the balance of Line 50, adding one line at a time, making the space between units "+1" wider each time (refer to Line 50). When finished, what conclusions can you draw?

In Line 60, we decide to draw a box in an unused area of the screen. Key in Line 60. We decide to make a larger box surrounding the small box. Key in Line 70 and RUN. You should have a nested pair of boxes with red horizontal lines and buff vertical lines.

Suppose we painted it? Would color 1 (C1) stop at both the red and buff borders? And, what color would we get?

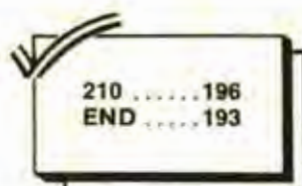
Let's paint the area between the big box and the small box. Key in Line 80 without the REM marker and RUN. We get the buff color. Now BREAK and insert the REM marker in front of Line 80.

Just to double-check, let us try to paint the triangle that encloses the boxes. Let us see if it butts up against

the hypotenuse (diagonal line). Key in Line 90 without the REM marker and RUN. When you are finished reinsert the REM marker.

Make any further tests that you can dream up. If you haven't gotten food for thought and discovered any new insights, RUN and consider the display as modern art.

You should have gained a lot of respect for DRAW. You should have gained some insights about experimenting; hardly a day at the keyboard should go by without learning something new about CoCo. We may never become experts, but let's have fun practicing and experimenting. Next month, we'll make some designs with DRAW.



Listing 1: LISTING 1

```

0 'LISTING1
10 PMODE4,1:PCLS:SCREEN1,1
15 'GOTO200
20 DRAW"SBM20,70U6R4D4NL4D2BR3
U6R3D3NL3RD3NL4BR3 NR4U6R4BR3 ND
6R3FD4GNL3BR4 NR4U3NR3U3R4BR3 NR
4D3NR3D3BR7 NR4U6R4BD4NL2D2BR3 U
4NU2R4NU2D4"
30 DRAW"BR3NU6BR3 NUR4NU6BR3 U3
NU3RNE3F3BR3 NU6R4BR3 U6F3E3D6BR
3 U6F4NU4D2BR3 NR4U6R4D6BR3 U6R4
D3L4"
40 DRAW"BM60,90NR2U6R4D6L2NUNDBR
5 U6R4D3L3NLF3BR3 R4U3L4U3R4BR3
R2ND6R2BR3 D6R4U6BR3 D4F2E2U4BR3
D6E3F3U6BR3 DF2B2DBR4UH2E2UBR3
D2F2ND2E2U2BR3 R4DG4DR4"
50 DRAW"BM65,110BRU6NGBR3 R4D4L4
D2R4BR3 R4U3NL3U3NL4BR3D4R3NRNU4
D2BR4 R4U4L4U2R4BR3 D6R4U3NL4BE3
R4D6BR3 NR4U4NR4U2R4D6BR7 U6L4D
3R4BF3 NR4U6R4D6"
100 GOTO100
200 DRAW"SBM20,60U6R4D4NL4D2BR3
R4U3L4U3R4BR3ND6BR3 ND6F3E3D6BR
3 U6R4D3NL4BE3 D6R4BR3 NR4U3NR3U

```

```

3R4BF6BR2"
210 DRAW"U6R4D4NL4D2BR3NU6R4BR3
U6R4D3NL4BF3 U3NU3R5NU3D3BR3 U6R
4D4NL4D2BR3 U6R3D2NL3RD4NL4BR3 N
R4U3NR3U3R4BR3 R2ND6R2"
220 DRAW"BM10,80U6BR3 NR4D3R4D3N
L4BR10U6NL2R2BR3 D3ND3R5ND3U3BR3
NR4D3NR3D3R4BR8 U6R3D2NL3RD4NL4
BR3 NR4U3NR3U3R4BR3 NR4D3R4D3NL4
BR6 U6NL2R2BR3"
230 DRAW"BR5ND6R4D4NL4D2BR3 NU6R
4BR3 U6R4D3NL4BR3 ND3NU3R4NU3D3B
R3 U6R4D4NL4D2BE3R3"
240 DRAW"BM10,100U6R3D2NL3RD4NL4
BR3 NR4U3NR3U3R4BR3 R2ND6R2BR8 R
2ND6R2BR2 NR4D6R4NU6BR8 NR4U6R4B
D4NL2D2BR3 NR4U3NR3U3R4BR3 R2ND6
R2BR8"
250 DRAW"D2F2ND2E2U2BR3 NR4D6R4U
6BR3 D6R4NU6BR3 U6R4D3L3NLF3"
260 DRAW"BM10,120U6F3E3D6BR3 NR4
U3NR3U3R4BR3 NR4D3R4D3NL4BR3 R4U
3L4U3R4BR3 ND6R4D4NL4D2BR3 NR4U6
R4BD4NL2D2BR3 NR4U3NR3U3R4BR8"
270 DRAW"ND6R4D4NL4D2BR3 NR4U6R4
BR3 ND6R4D3L3NLF3BR3 NR4U6R4D6BR
3 R4U3L4U3R4BR3 NR4D3R4D3NL4BR4
UBU2U3"
280 DRAW"SBM50,160U6R4D3L3NLF3B
R3 U6R4D4NL4D2BR3 NU6BR3 U5NUF4N
U5DBR3 U6R3D2NL3RD4NL4BR3 NR4U6R
4D6BR3 NU6E3F3U6"
1000 GOTO1000

```

MOORE COMPUTER SERVICES, INC.

1090 Country Club Circle
Plantation, FL 33317
(305) 584-1788



FOR THE
COLOR COMPUTER

VOLUME 1 NOW AVAILABLE!

- DISK (\$21.95) CASSETTE (\$19.95)
- DISK PACKAGE REQUIRES 32K
- 16K or 32K CASSETTE PACKAGING
- 500 QUESTIONS/ANSWERS
- 4 ONE or TWO PLAYER QUIZZES ON 4 DIFFERENT SUBJECTS
- 1 TWO PLAYER QUIZ WITH ALL 4 SUBJECTS MIXED

COMPLETE THE FOLLOWING AND SEND WITH A CHECK OR MONEY ORDER PAYABLE TO MOORE COMPUTER SERVICES, INC. ALLOW 2-3 WEEKS FOR PRE-PAID DELIVERY. FLORIDA RESIDENTS PLEASE ADD 5% SALES TAX.

NAME _____
ADDRESS _____
CITY/ST/ZIP _____

CHECK ONE: DISK CASSETTE
CHECK ONE: 32K 16K



NOTE: 16K CASSETTE DOESN'T INCLUDE THE MIXED SUBJECT QUIZ

WARNING - YOU MAY BECOME ADDICTED

Listing 2: LISTING 2

```

0 'LISTING2
10 PMODE4,1:PCLS:SCREEN1,1
20 'DRAW"C1BM0,0F255BL255E255"
30 LINE(0,0)-(255,191),PSET:LINE
-(0,191),PRESET:LINE-(255,0),PSE
T
40 DRAW"BM50,0D191 BR1U191BR2D19
1BR3U191BR4D191BR5U191BR6D191BR7
U191BR8D191BR8U191BR9D191BR10U19
1BR11D191BR12U191BR13D191BL12U19
1BR13D191BR1U191"
50 DRAW"BM0,80R255BD1L255BD2R255
BD3L255BD4R255BD5L255"
60 DRAW"SBM220,50R5D5L5U5"
70 DRAW"BM210,70R15U15L15D15"
80 'PAINT(213,68),1,1
90 'PAINT(240,77),1,1
100 GOTO100
    
```

Bonus listing: CLOVER

```

0 'CLOVER
10 '(C) 1984, J. KOLAR
30 PMODE3:PCLS:PMODE4
40 A=90:B=86:R=76:P=1.70
50 DIM S(7),T(7)
60 CIRCLE(8,8),8,1:CIRCLE(7,7),8
,1
61 DRAW"BM8,6NL3NR3NU3ND3NE3NF3N
G3H3"
70 GET(0,0)-(16,16),S,G
72 CIRCLE(38,8),6,1:PAINT(40,8),
1,1
73 GET(30,0)-(46,16),T,G
80 PCLS:SCREEN1,1
90 FOR Q=.15 TO .05 STEP -.1
100 FORZ=1TO7.16 STEPQ:C=Z
110 C=40+(C)+R*P*90
115 K=COS(R/2)*COS(C)*SIN(C)
120 X=INT(A-6+R*COS(C)):Y=INT(B-
B+R*SIN(K))
130 PUT(X+36,Y+10)-(X+52,Y+26),B
,OR
135 PUT(X+36,Y+10)-(X+52,Y+26),T
,AND:SOUND100,1
140 X=INT(A-6+R*SIN(K)):Y=INT(B-
B+R*COS(C))
150 PUT(X+36,Y+8)-(X+52,Y+23),S,
OR
155 PUT(X+36,Y+8)-(X+52,Y+23),T,
AND:SOUND100,1
160 NEXT Z,Q
170 PLAY"V2003L8C02AFAD3L16CAFAA
FACV15L8FAAFV10L4C":GOTO90
    
```

NEW!



MAROONED!

By Steve Hartford

Sitting on the back porch one after-noon, you see a strange flashing UFO descend from the clouds & land out in the corn field. Being the curious type, you run out to investigate and find a spaceship with it's hatch open. As you step inside, the hatch closes and the ship takes off! You must find a way to get back home. A great graphics adventure! 32K & one disk drive required.

Disk or Amdek \$29.95



Blackjack Dealer

Feeler Dealer

These two programs help you develop your Blackjack skill and strategy. In **Blackjack Dealer**, the computer deals the cards and plays the dealer's hand against you. **Feeler Dealer** enables you to test your strategy by playing the desired number of hands using your techniques & tendencies. A great teacher for new Blackjack players and a valuable tool for the veteran player. Both programs included. 32K extended.

Tape \$24.95 Disk \$29.95



EAGLE

A graphic-enhanced lunar simulator. The pilot breaks out of lunar orbit and attempts a soft landing on the lunar surface. Joystick controls thrust and craft attitude and information is continuously displayed in horizontal and vertical velocities, acceleration values, vertical and horizontal distances from target, fuel consumption and much more. Disk version allows choice of landing site between Mars and Earth's moon. A great tool for the future astronaut or physicist. 32K, 2 joysticks required.

Tape - \$24.95 Disk - \$29.95

Testmaker	\$29.95
Disk Only	
Maycode	\$24.95
Disassembler	
TDIR	\$24.95
Tape Directory	
Alphacopy	\$19.95
Disk Only - 32K	

P51 Mustang 32K	\$23.75
Worlds Of Flight	\$23.75
Sailor Man 24K	\$23.75
Trekboer 32K	\$19.75
Tut's Tomb 32K	\$19.75
Zookey Typing Tutor	\$19.75
To Preserve Quandic	\$29.75
Disk • 32K	
LIZPACK	\$145.00
Disk • Stat. Anal.	
Super Screen Machine	\$33.75

Add \$3.00 For Disk

This Month's Special!

Sketchpad

A graphics drawing program designed to provide the computer hobbyist with easy manipulation of the powerful graphics capabilities of the CoCo. Advanced programmers can design graphics screens and characters for basic and ML programs and games. 32K, 2 joysticks and disk drive required.

\$19.95

Reg. 329.95 - Expires 6/30/85



Amdek Dual 3 1/2" Disk Drive

NEW LOW PRICE! **\$269** LOW PRICE!
Includes 10 Diskettes & Cable
Amdek 3 1/2" Disks 1st for \$25

Monitors

Amdek Color 1+	\$199
Reconditioned - 90 Day Warranty	
Amdek Color 300	\$269
Amdek Color 500	\$399

Mark Data Video Driver

Works On All Cocos • No Soldering
\$27.95

With Monitor Purchase - \$25.95

Reverse Video Switch \$11.95

\$1.00 Shipping!

We'll Ship Your Order
To Anywhere In The USA
For \$1.00

Software Only - Hardware Shipped At Cost
Outside USA - \$10.00 Program (\$6.00 Max.)

Send For Our Free Catalog
Gift Certificates Available

Saguaro Software

NEW ORDER LINE

602-795-4159

C.O.D. Orders Add \$3.00



7331 E. Beverly • Tucson, Az. 85712

Az. Residents Add 7% Tax



The Complete Rainbow Guide To OS-9

Has Arrived!



The book you've been waiting for to take advantage of the full capacity of your Color Computer. Written by Dale L. Puckett and Peter Dibble, two of the foremost authorities on OS-9, this new publication is written with you in mind. Packed with practical applications, THE COMPLETE RAINBOW GUIDE TO OS-9 demystifies the system through a step-by-step process. For only \$19.95.

Also available is the RAINBOW GUIDE TO OS-9 DISK PACKAGE, which contains all of the programs and workshops in the book. You'll want the book for the tutorials, and the disk package to save the many hours of typing in the lengthy programs. A two-disk package for only \$31 (does not include book).

Other fine books in The Rainbow Bookshelf include:

— **The Rainbow Book of Simulations** features 20 award-winning programs from THE RAINBOW's very first Simulation contest.
Book \$9.95
Tape \$9.95

— **The Rainbow Book of Adventures** which includes all 13 winners from THE RAINBOW's first Adventure contest. A sure collector's item.
Book \$7.95
Tape \$7.95

Keep your library up to date. Order now!

I want to start my own Rainbow Bookshelf!

(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.)

Please send me:

<input type="checkbox"/>	The Rainbow Book of Simulations	\$ 9.95	_____
<input type="checkbox"/>	Rainbow Simulations Tape	\$ 9.95	_____
<input type="checkbox"/>	The Complete Rainbow Guide to OS-9(book only)	\$19.95	_____
<input type="checkbox"/>	Rainbow Guide to OS-9 Disk Package (2 disks)	\$31.00	_____
<input type="checkbox"/>	The Rainbow Book of Adventures	\$ 7.95	_____
<input type="checkbox"/>	Rainbow Adventures Tape	\$ 7.95	_____
Add \$1 per book Shipping and Handling in U.S. _____			
Canada and Mexico Add \$2.00 _____			
All Other Foreign Add \$4.00 _____			
			Total _____

Falsoft, Inc.
The Falsoft Building
Prospect, KY 40059

Name _____

Address _____

City _____ State _____ ZIP _____

Payment Enclosed VISA MasterCard American Express

Account Number _____ Interbank No. (MC Only) _____

Signature _____ Card Expiration Date _____

(Allow 4 weeks for delivery)

To order by phone, call: (502) 228-4492

Test your music and memory skills . . .



By Mel Richardson

(Editor's Note: This program has been submitted by Mel Richardson, Irene Erwin and the Gifted/Talented Class at Meadow Homes School in Concord, Calif. Under Mr. Richardson's guidance, it was developed by the 19 students of this class.)

Mel Richardson instructed the Gifted/Talented Class for eight and one-half months. He brought his own computer for the students to use and prepared lessons the entire time. He taught all the students BASIC computer language and instructed them in programming techniques. None of the students had previous experience in the use of the computer.

In eight and one-half months, the students progressed from the simplest operations to completing two games for use on the TRS-80. At first, many of the students were reluctant even to touch the computer, but as time progressed, many of them became quite proficient. The growth in their knowledge is very evident and extremely exciting. It is particularly refreshing to see students have a chance to develop some expertise in this field.

Program Instructions

The game, *Name That Song*, was developed over a period of about three months after the students had become comfortable with the use of the computer. Since none of us knew much about music, it was a learning experience

for all. We had to learn the names of notes, the value of each note and in which octave to place the notes. Students searched for music they felt would be recognized easily, then programmed the music.

Name That Song consists of an introduction which asks for player number one's name (seated on the left side of the computer using the up-arrow key), then asks for player number two's name (seated on the right side of the computer using the right-arrow key). After a moment's pause, the computer will play one note and give each of the two contestants an opportunity to name the song by pressing his or her respective arrow. If they cannot name the song after one note, an additional note is added after each try up to a total of 15 notes before the computer names the song.

Points are scored for a correct answer and deducted for a wrong answer. The game may be terminated at any time by pressing 'E.' Score and winner will be shown at the end of the game. The computer gives simple, easy-to-follow directions throughout the game.

Graphics were produced to highlight the game, then tried out on a class of students who had not participated in the program. It was an instant success; soon there was a room full of students who wanted a chance to try their skills. For many students, this was the first time they had even touched a computer, but the excitement was contagious. Hopefully, more students will have an opportunity to participate in computer education programs in the future.

(If you have any questions, please call or write Mr. Richardson, 2925 Monument Blvd., Apt. 115, Concord, CA 94520, phone (415) 671-7053.)

(Mel Richardson teaches BASIC to gifted and talented elementary school children. He attended San Francisco State University.)

200	.....103	2940	.....166
520	.....30	3160	.....149
780	.....121	3410	.....7
940	.....76	3650	.....228
1200	.....255	3870	.....65
1480	.....53	4130	.....171
1700	.....190	4440	.....247
1980	.....111	4700	.....209
2220	.....61	END	.....186
2480	.....26		

The listing: NAMESONG

10 POKE 65495,0
 20 CLEAR 1000
 30 CLS:Y=0:X=0
 40 NY\$="BR20D20L6H12D12L6U20R6F10U10R6"
 50 AY\$="R20D20L4U8L12DBL4U20D8BR4R12U4L12D4BL4U8R20"
 60 MY\$="R20D20L4U16L4D16L4U16L4D16L4U20R20"
 70 EY\$="R20D4L16D4R16D4L16D4R16D4L20U20R20"
 80 TY\$="R20D4L8D16L4U16L8U4R20"
 90 HY\$="BR20D20L4U8L12DBL4U20R4D8R12UBR4"
 100 BY\$="BR5"
 110 TX\$="R28D8L8D20L12U20L8UBR28

"
 120 UX\$="BR28D28L28U28R8D20R12U20R8"
 130 NX\$="BR28D28L8U4H12D16L8U28R8F12U12R8"
 140 EX\$="R28D8L20D4R20D4L20D4R20D8L28U28R28"
 150 MZ\$="D16U16R8D16U16R8D16U16"
 160 EZ\$="D16R16BU8L16UBR16"
 170 AZ\$="D16BR16U8L16UBR16D8UB"
 180 DZ\$="D16R12E4UBH4L12R12BR4"
 190 OZ\$="D16R16U16L16R16"
 200 WZ\$="D16R8U16D16R8U16"
 210 HZ\$="D16UBR16D8U16"
 220 SZ\$="D8R16DBL16BU16R16"
 230 CZ\$="D16R16BU16L16R16"
 240 LZ\$="D16R16BU16"
 250 CA\$="D12R12BU12L12R12"
 260 OA\$="D12R12U12L12R12"
 270 NA\$="D12BR12H12BR12D12U12"
 280 RA\$="D12U4R8D4U4R4U8L12R12"
 290 DA\$="D12R8E4U4H4L8R8"
 300 LA\$="D12R12BU12"
 310 AA\$="D12U6R12D6U12L12R12"
 320 IA\$="D12U12"
 330 FA\$="D12U6R8L8U6R12"

ONE MEGABYTE EXPANSION \$999



COLORBURST features:

- Six software selectable expansion ports.
- Disk controller cartridge connector in back.
- Parallel interface.
- 2K pages mapped anywhere.
- Programmable write protection by page.
- Programmable timer.
- Can access memory simultaneously at different addresses.
- Single stepping through ROM routines.
- Improved CoCo serial port performance.
- Memory mapping makes Disk Spooling, RAM Disk, and Disk Cache transparent to user programs.
- Plugs directly into CoCo cartridge port.
- OS/9 and RS DOS compatible.
- One year warranty.

DSR is a trademark of Microware.

COLORBURST One Meg \$999. COLORBURST 128K \$599.
 COLORBURST 512K \$799. COLORBURST 64K \$570.
 COLORBURST 256K \$640.

Please add \$14.00 for shipping. Shipping outside U.S. and Canada add \$30.00. All prices in U.S. dollars. Wisconsin residents add 5% tax. Dealer inquiries invited. Clubs call for quantity prices. Personal checks and COD's accepted.

COLORBURST™

MAXSYS Electronics & Software Co. • P.O. Box 25336 • Milwaukee, WI 53225 • (414) 281-2671

```

340 A$="02L8CCFFFEFFFGP2"
350 B$="CCGGGGGGFGAP2"
360 X$=A$+B$
370 R$="CEPBCEPBCEP4PB"
380 S$="CEFEDPBFP4PB"
390 PMODE 3,1
400 PCLS2
410 SCREEN 1,0
420 Y$=X$+R$+S$
430 DRAW "BM40,12;"+"NY$"
440 XY$="BM+6,0"
450 QY$="BM+4,0;"
460 DRAW XY$+AY$+QY$+MY$+QY$+EY$
+QY$+BY$+TY$+QY$+HY$+QY$+AY$
470 DRAW"BM212,12;"+"TY$"
480 DRAW"BM64,44;"+"TX$"
490 QX$="BM+4,0;"
500 DRAW QX$+UX$+QX$+NX$+QX$+EX$
510 DRAW"BM4,10B;"+"MZ$"
520 QZ$="BM+6,0;"
530 DRAW QZ$+EZ$+QZ$+AZ$+QZ$+DZ$
+QZ$+OZ$+QZ$+WZ$
540 DRAW"BM140,10B;"+"H$"
550 DRAW QZ$+HZ$+QZ$+OZ$+QZ$+MZ$
+QZ$+EZ$+QZ$+SZ$
560 DRAW"BM68,132;"+"SZ$"

```

```

570 QZ$="BM+6,0"
580 DRAW QZ$+CZ$+QZ$+HZ$+OZ$+QZ$
+OZ$+QZ$+LZ$
590 DRAW"BM28,172;"+"CA$"
600 QA$="BM+6,0"
610 DRAW QA$+OA$+QA$+NA$+QA$+CA$
+QA$+OA$+QA$+RA$+QA$+DA$
620 DRAW"BM164,172;"+"CA$"
630 DRAW QA$+AA$+QA$+LA$+QA$+IA$
+QA$+FA$
640 PAINT(42,14),0,0
650 X=66:Y=14:O=0
660 PAINT(42,14),0,0
670 PAINT(X,Y),0,0
680 P=P+1
690 X=X+24
700 IF P<3 THEN 670
710 IF P=3 THEN X=142:O=1
720 IF P<7 GOTO 670
730 X=66:Y=46
740 PAINT(X,Y),4,0
750 X=X+34
760 IF X>168 THEN 780
770 GOTO 740
780 PLAY X$
790 T$=INKEY$:IF T$="" THEN 790

```

NEED AN INEXPENSIVE SERIAL-PARALLEL INTERFACE?

SP-2 INTERFACE for EPSON PRINTERS:

- 300-19,200 BAUD rates
- Fits inside printer — No AC Plugs
- Optional external switch (\$5⁰⁰ extra) frees parallel port for use with other computers
- \$49⁹⁵ (plus \$3⁰⁰ shipping)

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
- \$64⁹⁵ (plus \$3⁰⁰ shipping)

Both also available for RS-232 and Apple IIC computers.
Co Co Serial Cables 15 ft.—\$10.

Co Co/RS-232 Cables 15 ft.—\$20. Other cables on request.

CNR ENGINEERING
DEALER INQUIRIES INVITED!

P.O. Box 492
Piscataway, NJ 08854
(201) 752-0144

The book you've been waiting for ...

THE ULTIMATE COLOR COMPUTER REFERENCE GUIDE AND TOOL-KIT

by David D. McLeod and Robert van der Poel

- * Complete details on every BASIC, Extended BASIC and Disk BASIC commands, plus syntax, parameters and potential errors.
- * An entire section (47 pages) deals with making your programs run faster and more efficiently.
- * Extensive subroutine library full of BASIC and Machine Language routines which can easily be incorporated into your own programs.
- * Over 350 - 8 1/2 by 11 pages.
- * Easy to read! A valuable asset for every Cocom owner!

\$27.95 (U.S.) or \$34.95 (CDN.) plus \$3.50 shipping.
Immediate shipment - Write or phone Today.
Visa, Mastercard, Money Order or Certified Cheque
Canadians - send \$2.00 for our Complete Price List.



CMD MICRO COMPUTER SERVICES LTD.
10447 - 124 STREET
EDMONTON, ALBERTA, CANADA
T5N 1R7
PHONE (403) 486-7109

DEALER INQUIRIES
WELCOME

```

800 WW$="D20F4U20H4R4F4D16R8H4L4
R4U16F4D16U16H4R4F4D16R8H4L4R4U1
6F4D16U16H4R4F4D20L2BR28U20H4"
810 RR$="D20F4U20H4R28F4L2BR28D1
2L4D8L8U8L4D4F4BL8L8R8U8R4L4BL4B
U4U4R20D4H4F4L20BR24U8H4"
820 OO$="D20F4U20H4R28F4L2BR28D2
0L2BR4BU4U12R20D12H4U8DBL16D4R20
BR4U16H4"
830 NN$="D20F4U20H4R8F4L8R8F12U1
2H4D12U12R8F4D20L8H16D16L4BR28U2
0L8R8H4"
840 GG$="D20F4U20H4R28F4D4L24D12
R20H4F4U4L20R8H4U4F4D4U4R16D12L2
8R28U12H4F4BU4U4L28R28H4"
850 TT$="D4F4U4H4R28F4L28D4R12BR
4R12U4D4L12D16L4U16L4D12F4U16BR4
R12U4H4"
860 EE$="D20F4U20H4R28F4L28D20R2
BU4L24U4R20F4H4R4U4L24U4R20F4H4R
4U4H4"
870 CC$="D20F4U20H4R28F4D4L24D12
U4R20F4L24R24D4L28R28BU16U4L28R2
8H4"
880 CLS:PRINT@ 225,"FIRST PLAYER
S NAME";
890 INPUT T$(2)
900 Q$(6)="T2"

```

```

910 CLS:PRINT@225,"NEXT PLAYERS
NAME";
920 INPUT U$(2)
930 PRINT@2,T$(2);T;"      ";U$(2)
;U
940 A$="L4T5CEFL1GP4L4EFL1G"
950 B$="P4L4CEFL2GECEL1D"
960 C$="P8L4EEDL2CL4CL2E"
970 D$="L4GGGL1FL4EF"
980 E$="L2GEL4CL8DD+EGL4AL103C"
990 Q$=A$+B$+C$+D$+E$
1000 Q$(1)="TBJOUT"
1010 Q$(8)="XIFO@UIF@TBJOUT@HP@N
BSDIJOH@JO"
1020 GOSUB 3780
1030 GOSUB 3240
1040 A$="T202L8BBL4BL8BBL4BL8B03
DL402GL16GL2B03L8CCCC"
1050 B$="L8C02BBL16BBL8BAAB02L4A
03D02L8BBL4B"
1060 C$="L8BBL4BL8B03D02L4GL16AL
2B03L8CCL4CL16C"
1070 D$="L8C02BBL16BBO3L8DDCO2AL
4G"
1080 Q$=A$+B$+C$+D$
1090 Q$(1)="CFMMT"
1100 Q$(8)="KJOHMF@CFMMT"
1110 GOSUB 3780

```

64K Extended Basic \$139.95 Color Computer II Sale



COLOR COMPUTERS*

64K Ext. Basic 139.95 ←

C
H
E
A
P
E
S
T

P
R
I
C
E

E
V
E
R

Videotex w/CompuServe
was 39.95 Now 24.95
Computer Recorder Panasonic 39.95

64K Chip Upgrade	\$ 49.95
Dust Cover CoCo I	1.99
Color Computer II Keyboards	
Fits CoCo I Reg.	39.95
Sanyo Monitor Hi-Res 9" Green	
Reg.	169.95
Now	99.95
Disk Drive 1	139.95
Disk Drive 0 w/controller & cable	239.95
Extended Basic w/book	39.95

THE COMPUTER CENTER

901-761-4565, 5512 Poplar, Memphis, TN 38119

Add \$5.90 for shipping & handling on Computers. \$2.80 on any other items-per order. Visa & M.C. Accepted


```

1120 GOSUB 3240
1130 A$="T303L4C02A03L2C"
1140 B$="L4DC02B-AGAL2B-"
1150 C$="03L4C02FL8FFL4FL8FGAB-L
103C"
1160 D$="03L4C02GG8-AGL2F"
1170 Q$=A$+B$+C$+D$
1180 Q$(1)="NBO"
1190 Q$(8)="UIJT@PME@NBO"
1200 GOSUB 3780
1210 GOSUB 3240
1220 A$="02L4GGAL2F#L8GL4A"
1230 B$="L4BBL403CL202BL8AL4G"
1240 C$="L4AGF#L2G"
1250 D$="03L4DDDL2DL8C02B"
1260 E$="03L4CCCL2C02L8BL4A"
1270 F$="L4B03L8C02L8BAGL4B03L8C
L4D"
1280 G$="L8EC02L4BAL2G"
1290 Q$=A$+B$+C$+D$+E$+F$+G$
1300 Q$(1)="BNFSJDB"
1310 Q$(8)="BNFSJDB"
1320 GOSUB 3780
1330 GOSUB 3240
1340 A$="02L8B-B-03C002B-03DL4C0
2L8B-B-03C002L4B-A"
1350 B$="L8B-B-03CDE-DC02B-AFGAL
4B-B-"
1360 C$="L8GAGFGAL4B-L8FGFE-L4DF
"
1370 D$="L8GAGFGAB-GFB-AD3C02L4B
-B-"
1380 Q$=A$+B$+C$+D$
1390 Q$(1)="ZBOLFF"
1400 Q$(8)="ZBOLFF@EPPMF"
1410 GOSUB 3780
1420 GOSUB 3240
1430 A$="02L8AGFGAAL4AL8GGL4GL8A
03L8CL4C"
1440 B$="02L8AGFGAAAAGGAGL2F"
1450 Q$=A$+B$
1460 Q$(1)="NBSZ"
1470 Q$(8)="NBSZ@IBE@B@MJUUMF@MB
NC"
1480 GOSUB 3780
1490 GOSUB 3240
1500 A$="02L2DDL4DL8EL2F#L4F#L8E
L4F#L8GL2AP8"
1510 B$="03L8DD02L8AAAF#F#F#DD
L4AL8GL4F#L8EL2D"
1520 Q$=A$+B$
1530 Q$(1)="SPX"
1540 Q$(8)="SPX@SPX@SPX@ZPVSECPB
U"
1550 GOSUB 3780
1560 GOSUB 3240
1570 A$="02L4GGGDEEL2DL4BBAAL2GP
4L4DGGGDEEL2DL4BBAAL2GP4"

```

cosmos
COMPUTER SERVICES, INC.

Authorized Star Micronics Service Center * Call for return authorization number.

620 Stuart St.
Green Bay, WI 54301
(414) 432-4635

SAME DAY SHIPPING BEFORE 2 PM

The SG-10 package includes:
COSMOS CONNECTION
SG-10 PRINTER
DELUXE MANUAL
PRINTER RIBBON
1/2 lb. OF TRACTOR PAPER

THE COSMOS CONNECTION
IS A COMPLETE SERIAL TO
PARALLEL INTERFACE FOR
THE COLOR COMPUTER TO
THE SG-10 PRINTER.

\$269.00
Printer Only



- NO AC REQUIRED
- SWITCHABLE BAUD RATE
- AT 600, 1200, 2400
- COMPACT
- ONE-YEAR WARRANTY



NO SURCHARGE FOR
CREDIT CARDS

FREE SHIPPING ON ALL U.S. ORDERS
Canadian Printer Orders - Add \$15.00



THE SG-10 PACKAGE
READY TO PLUG IN TO YOUR
COLOR COMPUTER ONLY

\$299.00
SG-10
PACKAGE

THE BEST

- ELITE CALC \$64.95
- ELITE WORD \$64.95
- ELITE FILE \$67.00

The SG-10
120 CPS
Tractor or Friction
Optional 4k buffer
\$89.00

star
MICRONICS, INC.

THE POWER BEHIND THE PRINTED WORD.

1580 B\$="L8DDL4GGGL8DDL4GGL2GL8G
 GL4GL8GGL4GL8GGGGGL4GGGGGDEEL2DL4
 BBAAL1G"
 1590 Q\$=A\$+B\$
 1600 Q\$(1)="GBSN"
 1610 Q\$(8)="PME@NBD@EPOBME@IBE@B
 @GBSN"
 1620 GOSUB 3780
 1630 GOSUB 3240
 1640 A\$="02L4FGAFFGAFAB-03L2C02L
 4AB-"
 1650 B\$="03L2CL8CDC02L8B-L4AF03L
 8CDC02L8B-"
 1660 C\$="L4AFFCL2FL4FCL2F"
 1670 Q\$=A\$+B\$+C\$
 1680 Q\$(1)="K8DRVFT"
 1690 Q\$(8)="GSFSF@K8DRVFT"
 1700 GOSUB 3780
 1710 GOSUB 3240
 1720 A\$="T302L4FGAL2B-L1B-L4B-FG
 L2AL1A"
 1730 B\$="L4CFAL2GL1GL8GGGL4FGL2AL
 1A"
 1740 C\$="L8FFL4GAL2B-L1B-L8B-B-L
 4FGL2AL1A"
 1750 D\$="L4GL2GL4GGL2EL8CL4EGL1F
 "
 1760 Q\$=A\$+B\$+C\$+D\$
 1770 Q\$(1)="MBOE"
 1780 Q\$(8)="UIJT@MBOE@JT@ZPVSEMB
 OE"
 1790 GOSUB 3780
 1800 GOSUB 3240
 1810 A\$="02L8CCL4DCFL2E"
 1820 B\$="L8CCL4DCGL2F"
 1830 C\$="L8CC03L4C02L4AFEL2D"
 1840 D\$="L8B-B-L4AFGL2F"
 1850 Q\$=A\$+B\$+C\$+D\$
 1860 Q\$(1)="CJSUIEBZ"
 1870 Q\$(8)="IBQQZ@CJSUIEBZ"
 1880 GOSUB 3780
 1890 GOSUB 3240
 1900 A\$="02L4CELB...GL8EL4GAL2G"
 1910 B\$="L4EGL1AL2G"
 1920 C\$="L4EGLB...GL8EL4FEL2D"
 1930 D\$="L4CDL2EDL4C"
 1940 Q\$=A\$+B\$+C\$+D\$
 1950 Q\$(1)="CPBU"
 1960 Q\$(8)="NJDIBFM@SPX@UIF@CPBU
 @BTIPSF"
 1970 GOSUB 3780
 1980 GOSUB 3240
 1990 A\$="02L4GLB...GL8EL4EGLB...
 GL8DL4DEFGAD2BL4...GL4G"
 2000 B\$="L8...GL8EL4EGLB...GL8DL
 4D03L4DC#DE02L4A03L4...D02L4G"
 2010 C\$="03LB...EL8EL4DL4CLB...C

02L8BL4B03L4CDO2L4BAG03L4...C"
 2020 D\$="L4CLB...CO2LBAL4A03CLB.
 ..CO2L8GL4GGA03L4C02G03DL4...C"
 2030 Q\$=A\$+B\$+C\$+D\$
 2040 Q\$(1)="BNFSJDB"
 2050 Q\$(8)="BNFSJDB@UIF@CFBVUJGV
 M"
 2060 GOSUB 3780
 2070 GOSUB 3240
 2080 A\$="01L8B-02L4E-L8E-L4FL8FG
 B-GL4E-"
 2090 B\$="01L8B-02L4E-L8E-L4FL8FL
 4,GE-"
 2100 C\$="L4E-L8E-L4FLB FGB-GL4.E
 -"
 2110 D\$="03L8CP202L4FL8A-L4.GE-"
 2120 Q\$=A\$+B\$+C\$+D\$
 2130 Q\$(1)="QPQ"
 2140 Q\$(8)="QPQ@HPFT@UIF@XFBTFM"
 2150 GOSUB 3780
 2160 GOSUB 3240
 2170 A\$="02LB...GL8AL4GL1E"
 2180 B\$="03L2DL4D02L1B"
 2190 W\$="03L2CL4C02L2.G"
 2200 C\$="L2AL4A03LB...CO2L8BL4AL
 B...GL8AL4GL2.E"
 2210 D\$="03L2DL4DLB...FL8D02L4B0
 3L1CL2E"
 2220 E\$="L8...CO2L8GL4ELB...GL8F
 L4DL1.C"
 2230 Q\$=A\$+A\$+B\$+W\$+C\$+C\$+D\$+E\$
 2240 Q\$(1)="OJHIU"
 2250 Q\$(8)="TJMFOU@OJHIU"
 2260 GOSUB 3780
 2270 GOSUB 3240
 2280 A\$="02L4.EDL2.C"
 2290 B\$="L4.GL4FL8FL2.E"
 2300 C\$="03L4CL8C02B8B03C02L8GL4
 GL8G"
 2310 D\$="03L8CCC02B8B03L4C02L8GL
 4GL8G"
 2320 F\$="03L8CCC02B8B03L8C02L8GG
 GAFL4.EDL2.C"
 2330 Q\$=A\$+A\$+B\$+B\$+C\$+D\$+F\$
 2340 Q\$(1)="UISFF"
 2350 Q\$(8)="UISFF@CMJDE@NJDF"
 2360 GOSUB 3780:GOSUB 3240
 2370 A\$="02LB...GL8AL4GFEFL2G"
 2380 B\$="L4DEL2FL4EFL2G"
 2390 C\$="L2DGL4EL2C"
 2400 Q\$=A\$+B\$+A\$+C\$
 2410 Q\$(1)="MPOEPO"
 2420 Q\$(8)="MPOEPO@CSJEHF@JT@GBM
 MJOH@EPXO"
 2430 GOSUB 3780:GOSUB3240
 2440 A\$="02L4CCEG03L2.CO2L1AL4AF
 GAL1G"

Why do more CoCo owners choose 'REAL TALKER'?

Sure it's priced right, but there's more...

Thousands of 'Real Talker' owners know 'Real Talker' beats ALL other CoCo voice synthesizers in ease of use and flexibility. And, NO other CoCo talker has a clearer, more intelligible voice. That's quite a lot of advantage when you consider Real Talker's unbeatable price. Yet, Real Talker has some important features that you simply will not find in other CoCo talkers:

'SAY' command - You'll have your computer talking brilliantly in just minutes thanks to this powerful new command. Type SAY "ANYTHING YOU WANT" and your words are instantly spoken. It's that simple. Think how easy this makes creating speaking Basic programs. Adding speech to your existing programs is a snap too.

'CONVERT' - This is a truly powerful command for the basic programmer. CONVERT automatically transforms a machine language dependent speaking program into a stand-alone Basic program. In other words, you can effortlessly write speaking Basic programs that do not require a machine language translator in memory. This is a unique feature of 'Real Talker'. No other voice synthesizer gives you anything even remotely approaching this type of capability - even synthesizers costing considerably more.

Other features include software controlled pitch, unlimited vocabulary text-to-speech, and even a program that will recite any ASCII file (such as from Telewriter-64 & other word processors). You also get Colorware's unique full-screen phoneme editor program that let's you experiment with and modify speech at it's most fundamental level.

'Real Talker' is compatible with any 16K, 32K, 64K Extended or non-extended Color Computer. It works with any cassette or disk system and comes complete and ready to talk through your T.V. or monitor speaker. Price includes the 'Real Talker' electronic voice synthesizer in a ROM pack, software on cassette (may be transferred to disk), and user manual.



'Real Talker' is a full-featured electronic voice synthesizer unit built into a compact cartridge case. You simply plug it into the side of your computer.

NOW INCLUDED WITH 'REAL TALKER'.....

1. **'DR. TALK'**-This interactive "Eliza" type psychoanalyst program will discuss your innermost problems at length.
2. **'TALKING BATTLESHIP'**-It's you vs. the computer in this speaking version of the classic game.
3. **'TALKING BLACKJACK'**- Play for big stakes against a rather talkative casino dealer.

ONLY
\$59.95

- 'REAL TALKER-1' (for the original Color Computer).....\$59.95
- 'REAL TALKER-2' (for the Color Computer-2).....\$64.95
- 'Y - BRANCHING CABLE' For disk systems. If you have a disk system but do not have a Radio Shack Multi-Slot unit, this economical cable will allow to connect and use your Real Talker and Disk system together.....27.95

TALKHEAD

If you have a 'Real Talker', do not deprive yourself of this absolutely incredible machine-language Talking Head simulation program. While other talking head simulations use a minimal cartoon-like face, TALKHEAD uses high resolution, full-screen, digitized images of an actual person's face to create a life-like animated effect.



SOFTWARE FOR THE 'REAL TALKER'

TALKHEAD can be easily commanded in Basic to appear on screen and say anything you want. Available on cassette or disk for only \$19.95. TALKHEAD requires 64K and a Colorware 'Real Talker'.

ONLY **\$19.95**

ACTUAL UNRETOUCHED PHOTO

COLORWARE COLORWARE INC.
78-03F Jamaica Ave.
Woodhaven, NY 11421
(718) 647-2864



*** ORDERING INFORMATION ***

ADD \$3.00 PER ORDER FOR SHIPPING AND HANDLING.
C.O.D.'S ADD \$3.00 EXTRA.
SHIPPING AND HANDLING FOR CANADA IS \$5.00
WE ACCEPT VISA, MASTER CARD, M.O.'S, CHECKS.
N.Y. RESIDENTS MUST ADD SALES TAX.

CoCo Max

This is one of those rare programs that will captivate everyone in your family.... No one can see CoCo Max and not want to try it!



We are all witnessing an exciting revolution in microcomputers: a radically new kind of computer and software that opens a whole new world of creative power to computer users.

It was inevitable that this exciting approach would be brought to the CoCo. With this in mind, Colorware chose to go all out and maximize this new concept for the color computer. That meant designing not just software but hardware too. It meant thousands of hours of pure machine language programming. Rarely has this much effort been applied to one product for the Color Computer.



UNMATCHED CAPABILITY...

Because we took the maximum approach: highly optimized machine code combined with hardware, CoCo Max truly stands above the rest as the ultimate creative tool for the Color Computer. It's unrivaled performance lets you create with more brilliance and more speed than any similar system — much more than you ever imagined possible. And, you can do it in black & white or color.



All the sophisticated power of the bigger systems is there: *Icons, Pull-Down Menus*, full *Graphic Editing, Font Styles*, and all kinds of handy tools and shortcuts.

Plug your joystick, mouse or touch pad into CoCo Max's Hi-Res Input Unit. Then use a delightfully simple *Point-and-Click* method to get any of CoCo Max's powerful graphic tools. It has them all:

You can *Brush, Spray* or *Fill* with any *Color, Shading* or *Pattern*. Use *Rubber Band Lines* and *Shapes* (square, rectangle, circle, ellipse, etc.) to create perfect illustrations with speed and ease. There's a *Pencil*, an *Eraser* and even a selection of *Calligraphy Brushes*. And, as you can see, CoCo Max can do a lot with text. All of the newest special effects are there: *Trace Edges, Flip, Invert, Brush Mirrors*, etc. And all of the very latest super-capabilities like: *Undo*, which automatically reverses your mistakes, and *Fat Bits* which zooms you way in on any part of your subject to allow dot-for-dot precision.



THE BIG PICTURE

The large image box in the middle of the CoCo Max screen is actually only a window on an even larger image. Use the Point-and-Click "Hand" to effortlessly move your window over any portion of the larger image. You have a working area of up to 3-1/2 times the area of the window itself.

FLEXIBLE PRINTING...

CoCo Max gives you many ways to print. Fill a whole page with your image or condense two full CoCo screens to less than 1/4 page for a finely detailed copy. "Dump" your CoCo Max screen full size or shrink it to 1/4 page size.

FREEDOM TO CREATE...

Anyone who wants to create anything at all on their CoCo screen or printer will certainly be very glad to meet CoCo Max. CoCo Max's friendly yet sophisticated graphic and text capabilities let you almost instantly produce illustrations, diagrams, charts,



graphs, and computer art — for serious use or just for creative fun.



tion by using software schemes such as sliding windows. Although clever, these schemes yield sluggish and awkward results. Only CoCo Max does it the right way. The CoCo Max Hi-Res Input Unit plugs into your ROM slot and adds an entirely new joystick input to your computer — a precision one with a 49,152 point resolution to match the CoCo screen exactly.

Plug your same joystick, mouse or touch

You may then use CoCo Max's graphic magic on it. The DS-69 is available as an option from Colorware from \$149.95 complete with its own software on disk or tape. Using the DS-69 with a disk requires an RS multi-pak adaptor.



COCO MAX REQUIREMENTS

The CoCo Max System includes the Hi-Res Input Unit, software on disk or cassette (please specify) and user manual. It will work on any 64K Extended or non-

THE COCO MAX SYSTEM

AN ABSOLUTE GUARANTEE

CoCo Max is a hardware/software system that no software-only system can match. Get CoCo Max and see your CoCo perform as it never could before. If you don't agree that CoCo Max is the ultimate creative tool for the Color Computer, simply return it within 20 days for a full, courteous refund from Colorware.

THE HARDWARE...

This is the key to CoCo Max's unmatched performance. Did you know the normal joystick input built into the Color Computer only allows access to 4,096 (64 x 64) points on the CoCo screen? Yet, the Color Computer's high resolution screen



has 49,152 (256 x 192) pixels. This means that a joystick, mouse or even a touch pad can, at best, only access about one tenth of the pixels on the CoCo screen. Most graphic programs ignore this hardware limitation of the Color Computer and give you only low-res control. Others attempt to overcome the limita-

tion by using software schemes such as sliding windows. Although clever, these schemes yield sluggish and awkward results. Only CoCo Max does it the right way. The CoCo Max Hi-Res Input Unit plugs into your ROM slot and adds an entirely new joystick input to your computer — a precision one with a 49,152 point resolution to match the CoCo screen exactly.



A DIGITIZER OPTION...

We studied all the video digitizers available and picked the best of them to link with CoCo Max. The DS-69 from Micro Works was our choice. This optional device lets you capture the image from any video source (video recorder, camera, etc.) on your Color Computer.



extended Color Computer. You'll need a Radio Shack or equivalent joystick, mouse or touch pad. Disk systems require a Multi-Slot Interface or Y-Branching Cable.

THE COMPLETE COCO MAX SYSTEM,
with software on **DISK**.....\$69.95
with software on **CASSETTE** (Available
Mar '85).....\$69.95

Y-BRANCHING CABLE—If you have a disk system but do not have a Multi-Slot Interface, use this economical 40-pin, 1 male, 2 female cable to connect the CoCo Max Hi-Res input unit and your disk controller to your CoCo.....\$27.95

Sorry, COCO MAX is not compatible with JDOS

COLORWARE

TOLL FREE ORDER LINE:
(800) 221-0916

Colorware Inc.
78-03F Jamaica Ave.
Woodhaven, NY 11421
(718) 647-2864



ORDERING INFORMATION

ADD \$3.00 PER ORDER FOR SHIPPING AND HANDLING.
C.O.D.'S ADD \$3.00 EXTRA.
SHIPPING AND HANDLING FOR CANADA IS \$5.00
WE ACCEPT VISA, MASTER CARD, M.O.'S, CHECKS.
N.Y. RESIDENTS MUST ADD SALES TAX.

2450 B\$="L4CCEGL2.GL1D"
 2460 C\$="L8DEL4FEDL1C"
 2470 D\$="L8DEL4FEDL1C"
 2480 Q\$=A\$+B\$+C\$+A\$+B\$+D\$
 2490 Q\$(1)="UPQ"
 2500 Q\$(8)="PQ@UPQ@PG@PME@TNPLZ"
 2510 GOSUB 3780:GOSUB 3240
 2520 A\$="02LB...GL8DL16...L16DL1
 6...GL16AL2BG"
 2530 B\$="03LB...CL8C02L4GAL1B"
 2540 C\$="LB...GL8DL16...GL16DL16
 ...GL16AL2BLB...G"
 2550 D\$="LBGLB...AL8AL4ABL1A"
 2560 E\$="LB...AL8AL16...G#L16AL1
 6...BL16AL2GD"
 2570 F\$="03LB...CL8C02L16...GL16
 GL16...AL16AL1B"
 2580 G\$="LB...EL8F#L16...GL16F#L
 16...GL16EL2DL8...GL8AL8...B03LB
 C02L4BL4AL2.G"
 2590 Q\$(6)=A\$+B\$+C\$+D\$
 2600 Q\$=E\$+F\$+G\$
 2610 Q\$(1)="SBJMSPBE"
 2620 Q\$(8)="JWF@CFFO@XPSLJQH@PO@
 UIF@SBJMSPBE"
 2630 GOSUB 3780:GOSUB 3240

2640 A\$="02LBAL4AL8AAGALB...B-L4
 AL8AL4GL8GGFGLB...AL4FL8G"
 2650 B\$="L4AL8AAGALB...B-03L4DL8
 DCCC02L8B-AGL8...F"
 2660 Q\$=A\$+B\$
 2670 Q\$(1)="KPMZ"
 2680 Q\$(8)="GPS@IFT@B@KPMZ@HPPE
 @GFMPX"
 2690 GOSUB 3780:GOSUB 3240
 2700 A\$="02L4CCFGL2AL8FEL4DB-B-L
 2B-L8B-B-"
 2710 B\$="03L2C02L8FFL4FEFL1GL4CC
 FGL2AL8FE"
 2720 C\$="L4DB-B-L2B-L8B-B-LB...A
 L8GL4FEFGL1F"
 2730 D\$="03L2.C02L2B-L8AGL1AL8CC
 L2FL8FF"
 2740 E\$="L4FEFL1GL4CCFGL2AL8FE"
 2750 F\$="L4DB-B-L2B-L8B-B-LB...A
 L8GL4FEFGL1F"
 2760 Q\$=A\$+B\$+C\$+D\$+E\$+F\$
 2770 Q\$(1)="IPNF"
 2780 Q\$(8)="IPNF@PO@UIF@SBOHF"
 2790 GOSUB 3780:GOSUB 3240
 2800 A\$="02L4DDAAL8BBBBL2A"
 2810 B\$="L4GGF#F#EEL2D"



from Canada's heartland to you
Dragonfly
 Writings
 presents



Just for you and your CoCo - DIGnews for CoCo.

DIGnews is a newsmagazine on tape (disk compatible). Includes industry and CoCo news, features, programs (geared to your needs through a unique 'modular' approach), computer art, cartoons, and much more - even crossword puzzles. Satisfaction guaranteed.

Pieter Van der Breggen,
 Dragonfly Writings.

***MODULAR** - As a subscriber you get the basic news section. Then you choose your module(s). First module is included free - Home & Family - Kids Only! - The Hobbyist - CoCo Business.

***RATES** are based on a single issue cost X10 for one year; X18 for two; X24 for

three years. You get two, six or twelve issues FREE depending on the length of your subscription to DIGnews for CoCo.

Single issue rate is \$6.95 for the basic news section PLUS one module. Second module, add \$1.25; third, add \$1.00; and all four, add 75 cents. Basic + 4, then would cost \$9.95.

***DISCOUNT** of 30% to April 30, 1985 (postmarked), 25% to May 31, 1985, 20% to June 30, 1985; 15% to July 31, 1985; 10% to August 31, 1985. Discount valid ONLY on orders accompanied by payment (cheque or money-order).

***GUARANTEE** - You may cancel your subscription at any time and receive the unused portion of your subscription back (basis: single rate; any discounts voided).

MINIMUM 16K REQUIRED. ECB RECOMMENDED FOR FULL IMPLEMENTATION

DIGnews
 for CoCo

TAKE DISCOUNT OFF TOTAL IF ORDER ACCOMPANIED BY PAYMENT! (Circle One Only)

MODULE	Single Issue	ONE Year	TWO Years	THREE Years
DIGnews + 1	\$6.95	\$69.50	\$125.10	\$166.80
DIGnews + 2	8.20	82.00	147.60	196.80
DIGnews + 3	9.20	92.00	165.60	220.80
DIGnews + 4	9.95	99.50	179.10	238.80

FREE Issues earned: — two six twelve

Rates in US funds (Canadians please pay in CDN funds). U.S., Canada, at show, Mexico, add \$10.00; all others add \$25.00.

I have taken my discount and enclosed my cheque/money order. Bill me (I understand this voids my discount).

Home & Family Kids Only! The Hobbyist CoCo Business

Name: _____

Address: _____

City: _____ State: _____ Zip: _____

Mail subscription to: DIGnews, P.O. Box 1340, Fort Qu'Appelle, Sask. CANADA S0G 1S0. Phone (306) 332-4301.

Color Computer and CoCo2 are Trade Marks of Tandy Corporation

```

2820 C$="L4DLBDDL4AABL8BBL8...A"
2830 D$="L8AL4GL8GGF#F#F#F#L4EL8
EEL2D"
2840 Q$=A$+B$+C$+D$
2850 Q$(1)="CMBDL"
2860 Q$(8)="CBB@CBB@CMBDL@TIFFQ"
2870 GOSUB 3780:GOSUB 3240
2880 PLAY"T202"
2890 A$="02L16...FL16D01L4B-02L4
DFL2B-03L16...DL16C02L4B-DEL2F"
2900 B$="L8FF03L8...DL8C02L4B-L2
AL8GAL4B-B-FD01B-"
2910 C$="03L8DDL4DE-FL2FL8E-DL4C
DE-L2E-"
2920 D$="L4E-L8...DL8C02L4B-L2AL
8GAL4B-DEL2F"
2930 E$="L4FB-B-L8B-AL4GGG03L4CL
8E-DC02B-L4B-A"
2940 F$="L8FFL8...B-03L8CDE-L2FD
2L8B-03CL8...DL8E-L4C02L2B-"
2950 Q$(6)=A$+B$+A$+B$+C$
2960 Q$=D$+E$+F$
2970 Q$(1)="CBOOFS"
2980 Q$(8)="UIF@TUBS@TQBOHMF@CB
DOFS"
2990 GOSUB 3780:GOSUB 3240
3000 A$="02L4FL8FFL4FL8FFL4A03L8
CC02L4AF"
3010 B$="L4GL8GG4GL8GG4GL8GG4
EL4C"
3020 C$="02L4FL8FFL4FL8FFL4A03L8
CC02L4AF"
3030 D$="03L4C02L8B-B-L4AGL4...F
"
3040 Q$=A$+B$+C$+D$
3050 Q$(1)="UFO"
3060 Q$(8)="UFO@MJUUMF@JOEJBOT"
3070 GOSUB 3780:GOSUB 3240
3080 A$="02L8AL8...AL8BL4AF#DF#L
B...AL8BL4AL2F#"
3090 B$="L8DF#L2.ABL4GF#GL2E"
3100 C$="L4EL8...EL8F#L4EEC#EL8.
.GL8GL4GL2.B"
3110 D$="L4AAAL2AL4GL8...F#L8EL4
F#D"
3120 Q$(1)="CMPX"
3130 Q$(8)="CMPX@UIF@NBQ@CPXQ"
3140 Q$=A$+B$+C$+D$
3150 GOSUB 3780:GOSUB 3240
3160 A$="01L16...B02L16DL8BL4AL8
B01L16...B02L16DL8GL8...F#"
3170 B$="L16...CL16D03L8C02L4BL8
AAGEL8...D"
3180 C$="L8EDG03C02BL4GL8AEF#L4G
"
3190 Q$=A$+B$+A$+C$
3200 Q$(1)="CBCZ"

```

```

3210 Q$(8)="SPDLBCZF@CBCZ"
3220 GOSUB 3780:GOSUB 3240
3230 GOTO 4810
3240 P=0:P=-1:H=0:YX=0
3250 P=P+1:H=H+1:O=0
3260 IF P<0 THEN P=0
3270 CLSP
3280 IF P=>8 THEN LET P=0:P=P-1
3290 X$=LEFT$(Q$,H)
3300 T$(1)=LEFT$(Q$,H+1)
3310 P$=MID$(T$(1),H+1)
3320 IF P$="#" OR P$="-" THEN PL
AY T$(1);YX=YX+1:GOTO 3460
3330 IF MID$(X$,H)<CHR$(65) THEN
P=P-1:GOTO 3250
3340 IF MID$(X$,H)>CHR$(72) THE
N P=P-1:GOTO 3250
3350 PRINT@2,T$(2);T" ";U$(2)
;U;
3360 IF P>0 THEN 3410
3370 CLS
3380 PRINT@230,T$(2);" USE UP AR
ROW";
3390 PRINT@294,U$(2);" USE RIGHT
ARROW";
3400 FOR X=1 TO 1800:NEXT X

```

GET ON LINE NOW!

\$45

For this low price you receive one:

Acoustic MODEM System

Featuring;

- >> 300bps org. mode (access all free BBS's and pay boards)
- >> Commercial Quality Construction
- >> COCO Serial Cable (installed, ready to plug in to your COCO)
- >> Cassette containing FREE Smart Terminal Software so you can; Download Programs, Music, Utilities, Pics, etc. and save them to Disk or Tape (you get both versions with documentation)
- >> View Color Graphic Screens Online (VIDTEX)
- >> Print File Buffer And More!!
- >> Fits round and new square handsets

These units are a special purchase from lease stock. They are supported by a 10 day no risk return policy and a 60 day warranty. Personal Checks Accepted. Send \$45+\$4 S&H, Money Order or Cashier's Check, Illinois residents must include \$3.60 sales tax,

for immediate shipment to:

CRANBERRY INDUSTRIES
7801 S. ST. LOUIS
CHICAGO IL. 60652

```

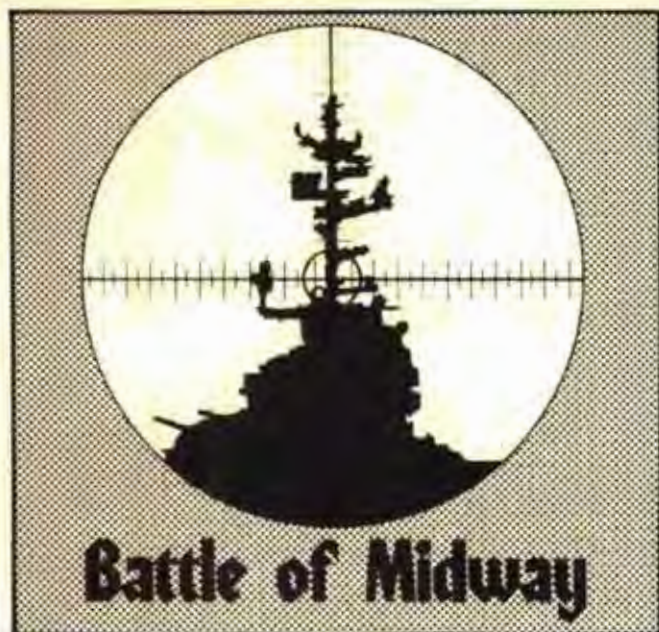
3410 YX=YX+1
3420 IF YX=>15 THEN 4620
3430 IF EX>7 THEN EX=0
3440 CLS:PRINT@235,"NOTE";YX;
3450 PLAY X$
3460 S$=INKEY$:O=O+1
3470 IF O=>20 THEN 3250
3480 PRINT@2,T$(2);T;" ";U$(2);U;
3490 PRINT@453,"TO END GAME PRESS (E)";
3500 IF S$="E" THEN 4810
3510 IF S$=CHR$(94) THEN W$=T$(2):GOTO 3550
3520 IF S$=CHR$(9) THEN W$=U$(2):GOTO 3550
3530 PRINT@2,T$(2);T;" ";U$(2);U;
3540 GOTO 3460
3550 PRINT@228," NAME THAT TUNE";W$;
3560 PRINT@288," ";
3570 LINE INPUT T$
3580 IF T$="E" THEN 4810
3590 P=1:F=0
3600 F=INSTR(P,T$,Q$(1))
3610 IF F>0 THEN T$=Q$(1):GOTO 3640
3620 IF P>N THEN 3640
3630 P=P+1:GOTO 3600
3640 IF S$=CHR$(94) AND T$=Q$(1) THEN LET LP=1/YX*1000:T=T+INT(LP)
3650 IF S$=CHR$(9) AND T$=Q$(1) THEN LET LP=1/YX*1000:U=U+INT(LP)
3660 IF T$=Q$(1) THEN 4350
3670 IF S$=CHR$(94) THEN LET LP=1/YX*1000:T=T-INT(LP)
3680 IF S$=CHR$(9) THEN LET LP=1/YX*1000:U=U-INT(LP)
3690 IF T<0 THEN T=0
3700 IF U<0 THEN U=0
3710 GOTO 3910
3720 PLAY Q$(6):PLAY Q$
3730 Q$(6)="T2"
3740 CLS:PRINT@232," PRESS ANY KEY";
3750 PRINT@2,T$(2);T;" ";U$(2);U;
3760 T$=INKEY$:IF T$="" THEN 3760
3770 CLS:RETURN
3780 B$="":M$="":VV=0:N=LEN(Q$(1))
3790 CLS:PRINT@230,"ONE MOMENT PLEASE"

```

```

3800 VV=VV+1
3810 IF VV=>N+1 THEN Q$(1)=M$:RETURN
3820 PRINT@2,T$(2);T;" ";U$(2);U;
3830 T$=LEFT$(Q$(1),VV)
3840 Z$=MID$(T$,VV)
3850 Z$=MID$(Z$,1)
3860 IF VV=>N+1 THEN 3880
3870 QQ=ASC(Z$)
3880 IF QQ=64 THEN Z$=CHR$(32):B$=Z$:M$=M$+B$:GOTO 3800
3890 Z$=CHR$(QQ-1):M$=M$+Z$:GOTO 3800
3900 GOTO 3800
3910 PMODE 3,1
3920 PCLS
3930 SCREEN 1,0
3940 DRAW"S5;C0;BM14,72"+WW$
3950 AA$="S5;C0;BM+B,0"
3960 DRAW AA$+RR$
3970 DRAW AA$+OO$
3980 DRAW AA$+NN$
3990 DRAW AA$+GG$
4000 B=50
4010 PAINT(B,80),2,0
4020 B=B+28
4030 IF B=106 THEN 4020
4040 IF B=>208 THEN 4070
4050 IF B=>190 THEN LET B=208:GOTO 4010
4060 GOTO 4010
4070 B=16
4080 PAINT(B,84),0,0
4090 IF B>177 THEN 4160
4100 IF B=211 THEN LET B=210:GOTO 4080
4110 IF B=177 THEN LET B=196:GOTO 4080
4120 IF B=152 THEN LET B=177:GOTO 4080
4130 IF B=107 THEN LET B=137:GOTO 4080
4140 IF B=61 THEN LET B=92:GOTO 4080
4150 B=B+15:GOTO 4080
4160 PAINT(210,86),0,0
4170 PAINT(82,74),3,0
4180 B=132
4190 PAINT(B,74),3,0
4200 IF B>200 THEN 4220
4210 B=B+24:GOTO 4190
4220 PAINT(81,95),0,0
4230 PAINT(81,85),3,0
4240 PAINT(122,95),3,0
4250 PAINT(222,84),3,0
4260 PAINT(222,95),3,0

```

CINC PAC — Battle of Midway 32K

Ark Royal's masterpiece game of naval strategy of perhaps the most important battle in the history of the United States Navy. Hi Res graphics, 75% machine language allows player to control as many as 41 separate units on the screen at one time. Command Task Forces 16 & 17 as they play out and mouse with the Japanese fleet. Maneuver the Hornet, Yorktown and Enterprise into the best position. Set courses and launch search and attack aircraft then hope for the best. Find the enemy fleet, then pick the targets: Akagi, Soryu, Kaga, Yamato and others in this historically accurate game. Relive history, Admiral, and it won't be any easier this time around. Anchors Aweigh.

Game save. Requires disk version to operate on disk. Cassette \$27.95.



COMPANY COMMANDER 32K

Game module 1 — **House to House**. Ark Royal's squad level WWII infantry combat game.

They said it couldn't be done — a SQUAD LEVEL wargame on a computer — but we've done it. The Line of Sight problem is licked — and the machine language routines really speed things up.

Game Module #1 comes with House to House map and 10+ scenarios involving infantry combat in Aachen, Caen, Arnheim, Stalingrad and other famous WWII city battlegrounds. Combat units include rifle squads, mortar teams, machine gun crews, engineers, and more (depending on the scenario chosen), leaders, vehicles and other weaponry of WWII. Unique design allows incorporation of future expansion modules.

Choose campaign play and put yourself on the battlefield, Corporal Smith or Jones; collect points toward promotion. Order up smoke from the mortar squad, HE for those dug in units. Take the objective and you might make Major someday. Just don't step on a land mine.

Comes with House to House game map, more than 10 scenarios, on 2 cassettes, or all on 1 disk...\$29.95. (Disk included.)



BATTLE OF THE BULGE 32K

Ark Royal's 1 or 2 player game by the author of Battle For Tunis. Bulge recreates operation **Wacht Am Rhein**, Hitler's last desperate gamble of WWII. In none of our games is the fog of war so apparent than in BULGE. You know the Germans have attacked in the Ardennes, but little else. What is their strength? Their objective? Who do you send to repair the huge gap in the American lines? What bridges do you blow? Can you protect the fuel depots? Where are all those Tigers coming from? When will the weather clear?

Historically accurate, and a real challenge whether it be against the computer or a friend. (Just don't humiliate him too badly.) A game you've been waiting for. Cassette \$25.95.

OTHER ARK ROYAL GAMES...
Some at reduced prices!

Across the Rubicon 32K (Feb '84)*	\$24.95	Waterloo 32K (Mar '84)*	\$22.95
Across the Rubicon 16K (Dec '82)*	\$14.95	Guadalcanal 32K	\$24.95
Mission: Empire 32K (Oct '82)*	\$22.95	Battle For Tunis	\$24.95
Mission: Empire 16K*	\$17.95	Kamikaze 32K (Apr '83)*	\$19.95
Galactic Taipan 32K (May '84)*	\$17.95	Kamikaze 16K	\$14.95
Starblazer 32K (Apr '84)*	\$17.95		
Bomber Command 16K (Jan '84)*	\$22.95		

* Denotes Rainbow review month

ARK ROYAL GAMES
P.O. Box 14806
Jacksonville, FL 32238
904-786-8603



Prices on all games include shipping. Florida Residents add 5% tax. All games available on disk, add \$3.00. All programs shipped within 24 hours regardless of check or money order. We pay shipping to U.S. and Canada. Others add 10%. Dealer inquiries invited. COD's accepted. All Programs require Color CompuTm (Tandy Corp) or TDP System 100 CompuTm (RCA).

```

4270 PAINT(28,95),3,0
4280 PAINT(44,95),3,0
4290 SS$="T102L8F#F#L8...AL8F#L4
F#AL8F#A03L4DL8...C#02L8BL4BA"
4300 PLAY SS$
4310 PLAY"T2"
4320 CLS:PRINT@235,"NEXT NOTE"
4330 FOR X=1 TO 550:NEXT X
4340 GOTO 3250
4350 PMODE 3,1
4360 PCLS
4370 SCREEN 1,0
4380 DRAW"S4;BM4,68;" +CC$
4390 BB$="BM+8,0;"
4400 DRAW BB$+00$
4410 DRAW BB$+RR$
4420 DRAW BB$+RR$
4430 DRAW BB$+EE$
4440 DRAW BB$+CC$
4450 DRAW BB$+TT$
4460 YY=0;X=0;BB=36
4470 GOSUB 4520
4480 PAINT (B,C),X(1),0
4490 X=X+1;B=B+BB
4500 IF X=XX THEN YY=YY+1;X=0:ON
YY GOTO 4530,4540,4550,4560,457
0,4580,4590,4600,4610
4510 GOTO 4480
4520 B=20;C=70;XX=7;X(1)=3:RETUR
N
4530 B=6;C=71;X(1)=0:GOTO 4480
4540 B=20;C=74;X(1)=2:GOTO 4480
4550 B=66;XX=3;C=78;X(1)=0:GOTO
4480
4560 B=92;X(1)=3:GOTO 4480
4570 B=164;XX=2;C=86:GOTO 4480
4580 B=24:GOTO 4480
4590 B=94;X(1)=0:GOTO 4480
4600 XX=1;B=234:GOTO 4480
4610 GOTO 3720
4620 PRINT
4630 PRINT@230,"ONE MOMENT PLEAS
E";
4640 B$=" ";M$=" ";VV=0;M=LEN(Q$(B
))
4650 VV=VV+1
4660 IF VV=>M+1 THEN Q$(B)=M$:GO
TO 4710
4670 T$=LEFT$(Q$(B),VV);Z$=MID$(
T$,VV);Z$=MID$(Z$,1)
4680 QQ=ASC(Z$)
4690 IF QQ=64 THEN Z$=CHR$(32):B
$=Z$:M$=M$+B$:GOTO 4650
4700 Z$=CHR$(QQ-1):M$=M$+Z$:GOTO
4650
4710 CLS:PRINT@200,"T I M E U
P"

```

```

4720 PRINT@297,"THE TUNE IS"
4730 PRINT
4740 PRINTQ$(B)
4750 PLAY Q$
4760 CLS
4770 T$=INKEY$
4780 PRINT@227,"PRESS ENTER FOR
NEXT SONG"
4790 IF T$=CHR$(13) THEN RETURN
4800 GOTO 4770
4810 CLS
4820 PRINT@72,"GAME FINISHED"
4830 PRINT@136,"final score"
4840 PRINT@200,T$(2);" ";T
4850 PRINT@232,U$(2);" ";U
4860 C$="CONGRADULATIONS"
4870 FOR X=1 TO 3000:NEXT X
4880 IF U>T THEN 4920
4890 IF T>U THEN 4950
4900 CLS:PRINT@236,"TIE GAME"
4910 GOTO 4970
4920 CLS:PRINT@228,C$;" ";U$(2)
4930 PRINT@300,"YOU WIN"
4940 GOTO 4970
4950 CLS:PRINT@228,C$;" ";T$(2)
4960 PRINT@300,"YOU WIN"
4970 PLAY Q$
4980 T$=INKEY$
4990 PRINT@418,"WANT TO PLAY AGA
IN (Y)/(N)?"
5000 IF T$="Y" THEN 20
5010 IF T$="N" THEN CLS:END
5020 GOTO 4980

```

One-Liner Contest Winner . . .

Little Brown Jug draws the object and plays the song. Need we say more?

The listing:

```

10 PCLS:PMODE3,1:SCREEN1,1:DRAW"
BM110,50;S8R9D2NL9G1D9F10D28L27U
28E10U9H1U3":PAINT(115,60),3,0:A
$="O3L8EGL4GL8FAL4AL10BBL8BAB":P
LAY"L4O3DL8O2BO3DDDCPE35E;L10EEF
#;F#;L8F#EF#GO3AL4BL8O2BO3DDDCEL
4E;L8F#F#EF#O3AGL4G;XA$;O4CDL4E;
XA$;O4DL4CC"

```

C. MacKenzie
Tofield, Alberta

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

CALL FOR LATEST PRICES — 1-800-245-6228 or 1-215-682-6855



DISK DRIVES

ALL PRICES INCLUDE CASE & POWER SUPPLY

- DRIVE 0** **\$225** CANON DOUBLE-SIDED, TEAC OR SANYO S.S.
- DRIVE 1** **\$129** CANON DOUBLE-SIDED, TEAC OR SANYO S.S.
- \$179** TEAC D.SIDED

All drives are new, direct drive, 40 track and 6 ms. We ship **FULLY TESTED AND CERTIFIED** drives at **NO ADDED CHARGE**. SANYO and TEAC are known as the highest quality name. **State-of-the-art technology**, not full-height belt-driven drives.

DOUBLE YOUR OWLS! OWL DOUBLERS allow you to use two double-sided drives as DRIVES 0 through 3 -- 4 sides with only 2 drives. **\$39.95** (only \$20 with purchase of a drive)

6 MONTH WARRANTY ON CANON

12 MONTH WARRANTY ON TEAC OR SANYO

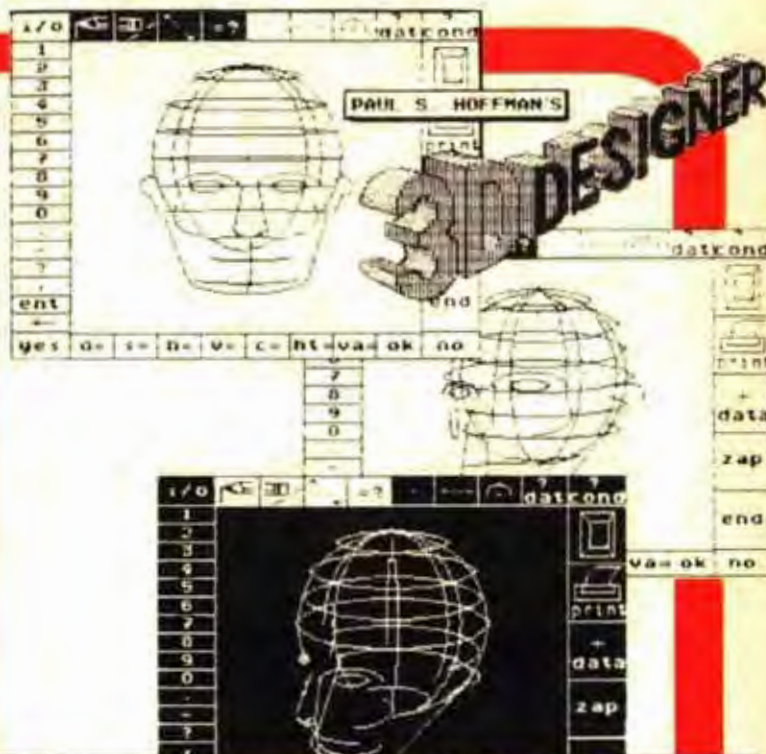


M.C. AND VISA ACCEPTED
OWL-WARE

P.O. BOX 116-F
MERTZTOWN, PA
19639

CPA residents include 6% tax

call TOLL-FREE: 800-245-6228
in Pennsylvania: 215-682-6855



THE 3D Graphics program for the Cocom

- ACCURATELY DEPICTS CIRCLES & ARCS.
- NUMBER OF LINES OR ARCS LIMITED ONLY BY DISK SPACE.
- "POINT & CLICK" SELECTION FROM ON-SCREEN MENU.
- FREE-HAND SKETCHING MODE.
- INPUTS FROM TOUCHPAD, MOUSE, JOYSTICK OR XPAD.
- BUILT-IN SCREEN DUMP TO TANDY PRINTERS.

and in addition to all this:

"3D DESIGNER" WILL ACTUALLY HELP YOU CREATE A 3-D DATABASE FROM A FREE-HAND SKETCH!

64K EXTENDED BASIC, DISC **\$29.95**

Don't miss Paul Hoffman's other graphics programs:
MASTER ARTIST (V.2.4) ... 64K DISK: \$29.95
ANIMATOR'S TOOLBOX ... 32K DISK: \$24.95

2 PROGRAM DISCOUNT: 10%
3 PROGRAM DISCOUNT: 15%

The CoCo Gallery



Glenn Thibert
Picture

Glenn used BASIC with techniques found in the January 1985 issue of RAINBOW's "Wishing Well" by Fred Scerbo.



Ana Landa Hutchison
Gremlin

Ana drew this portrait of "Stripe" using Graphicom.



David Casuscelli

Crue

David drew this using BASIC's DRAW and LINE commands. He is a freshman at Drury Senior High School in North Adams, Mass.

Greg Juby
Spaceface

Greg drew this in BASIC using DRAW commands and has been programming on his CoCo for three years.



Send your entry on either tape or disk to:

CoCo Gallery
THE RAINBOW
P.O. Box 385
Prospect, KY 40059
Attn: Monica Dorth

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.), how to display it and a few facts about yourself.

Please 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.

We will award a first prize of \$25, a second prize of \$15 and a third prize of \$10. Honorable mentions also will be given.

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.

★ Current Record Holder

ANDROME (Radio Shack) 51,600 *John Beeler, Columbia, MD 60,710 Philippe Vallee, St. Raymond, Quebec 57,410 Daphnie Phillips, Evansville, WI 41,355 Ryan Devlin, Louisville, KY 40,030 Matthew W. Swadling, North Vancouver, British Columbia	COLOR BLAST (Challenger) 200,250 *Richard Fiore, Clemson, SC COLOR CAR (NOVASOFT) 154,600 *Scott Cunningham, East Lyme, CT 130,483 Dan Bouges, Nantico, CT COLORFEDE (Intracolor) 10,001,051 *Mark Smith, Santa Ana, CA 5,756,896 Scott Oberholtzer, Lexington, MA 3,355,248 Scott Draks, Pine City, NY 2,874,230 Jerry Pelkash, Warren, MI 2,547,299 Rich McGervey, Morgantown, WY	191,280 Mario Pelletier, Ste-Foy, Quebec 132,200 Dennis Martin, Chalmers, LA 113,700 Bernd Pruetting, Scheibershardt, West Germany 107,780 Chris Della, Danbury, CT GALAGON (Spectra/Associates) 135,180 *Mario Asselin, Baie-Comeau, Quebec 75,830 Tom Neal, Wabash, IN	GRABBER (Tom Mix) 149,350 *Craig Webster, Argyle, NY 142,300 Paul MacArthur, Gillett, WI 130,450 Daniel Bellise, Montreal, Quebec 109,100 Stephen Zamoski, Ewing, NJ
ASTRO BLAST (Mark Data) 20,575 *Tom Neal, Wabash, IN 15,000 Joseph Dehn, Tucson, AZ	COSMIC CLONES (Mark Data) 19,850 *Darren Talbot, Hawkesbury, Nova Scotia	GRABBER (Tom Mix) 149,350 *Craig Webster, Argyle, NY 142,300 Paul MacArthur, Gillett, WI 130,450 Daniel Bellise, Montreal, Quebec 109,100 Stephen Zamoski, Ewing, NJ	GRAN PRIX (Computerware) 3,336 *Paschal Wilson, Kentwood, LA 2,810 Jocko Valentino, Timonium, MD
BASEBALL (Radio Shack) 1,409-0 *Brad Wildup, Dundas, Ontario 740-0 Daniel Bellise, Montreal, Quebec 543-0 Kevin Cornell, Greentown, IN 464-0 Dave Fisher, St. Downey, CA 480-0 Walter Trainlips, Jonesville, WI	CRASH (Tom Mix) 13,300 *David Craft, Rosnoke, VA	GRAN PRIX (Computerware) 3,336 *Paschal Wilson, Kentwood, LA 2,810 Jocko Valentino, Timonium, MD	GUARDIAN (Quasar) 1,605 *Mike Dodge, Jackson, MI
BATS AND BUGS (THE RAINBOW) 24,800 *Michael Rosenberg, Prestonburg, KY 8,450 Bill Martin, Myrtle Beach, SC 7,300 Lazlie Bishop, Salt Lake City, UT 5,220 Brian Cook, Dixon, IL 3,600 Apollo Latham, Rich Square, NC	CRUISING (Sunshine) 3,082 *Laura Hotz, Herzlia, Israel	GUARDIAN (Quasar) 1,605 *Mike Dodge, Jackson, MI	HEIST (THE RAINBOW) 2,100 *Chris Reynolds, Richmond, KY 2,100 *Sergio Waisner, Mexico City, Mexico 1,500 Susan Ballinger, Uxbridge, Ontario 1,500 Julio Comello, Scarborough, Ontario 1,500 Kirstie Compton, Suffield, CT 1,500 Gary Greaser, Argyle, NY 1,500 Andy Deter, Medford, OR 1,500 David Figel, Sardinia, OH 1,500 Diego Galina, Summit, NJ 1,500 Tim Hovsen, Eickville, Alberta 1,500 Joel Lombardi, Newark, DE 1,500 Jeff Roberg, Winfield, KS 1,500 Brendan Smith, Coral Springs, FL 1,500 Kevin Speight, Bridgewater, Nova Scotia 1,500 Rupert Young, Sheffield, MA
BIRDS (Tom Mix) 147,200 *Scott Burns, Columbia, SC 103,925 Luc Soucy, Baker-Brook, New Brunswick	DALLAS QUEST (Radio Shack) 91 *Maggie Budewitz, St. Paul, MN 99 John Alrocca, Yorkers, FL 125 Herbert Patterson, Largo, FL	HEIST (THE RAINBOW) 2,100 *Chris Reynolds, Richmond, KY 2,100 *Sergio Waisner, Mexico City, Mexico 1,500 Susan Ballinger, Uxbridge, Ontario 1,500 Julio Comello, Scarborough, Ontario 1,500 Kirstie Compton, Suffield, CT 1,500 Gary Greaser, Argyle, NY 1,500 Andy Deter, Medford, OR 1,500 David Figel, Sardinia, OH 1,500 Diego Galina, Summit, NJ 1,500 Tim Hovsen, Eickville, Alberta 1,500 Joel Lombardi, Newark, DE 1,500 Jeff Roberg, Winfield, KS 1,500 Brendan Smith, Coral Springs, FL 1,500 Kevin Speight, Bridgewater, Nova Scotia 1,500 Rupert Young, Sheffield, MA	THE INTERPLANETARY FRUIT FLY (THE RAINBOW) 37,000 *Scott Perkins, Port Orange, FL 27,800 Les Dorn, Eau Claire, WI 26,000 Eric Foss, Cochrane, Alberta 25,500 Michele Gaboriault, Foxboro, MA 25,000 Andrew Bartels, Sulphur, OK 20,000 Joe Calciatera, Ridgewood, NY 17,000 Susan Ballinger, Uxbridge, Ontario 12,500 Michael Sileo Jr., Glendale, NY 10,000 Kirk Carter, Cooper City, FL
BLACKBEARD'S ISLAND (Tom Mix) 64 *Chris Cope, Central, SC 65 Mikal Rice, Panama City, FL	DEMOLITION DERBY (Radio Shack) 108,400 *David Onthaupt, Calgary, Alberta 78,100 David Close, Springfield, VA 44,000 Joseph Dehn, Tucson, AZ 32,900 Les Dorn, Eau Claire, WI	THE INTERPLANETARY FRUIT FLY (THE RAINBOW) 37,000 *Scott Perkins, Port Orange, FL 27,800 Les Dorn, Eau Claire, WI 26,000 Eric Foss, Cochrane, Alberta 25,500 Michele Gaboriault, Foxboro, MA 25,000 Andrew Bartels, Sulphur, OK 20,000 Joe Calciatera, Ridgewood, NY 17,000 Susan Ballinger, Uxbridge, Ontario 12,500 Michael Sileo Jr., Glendale, NY 10,000 Kirk Carter, Cooper City, FL	THE JUNGLE (THE RAINBOW) 608,880,000 *Jeff Lawrenok, Cambridge, Ontario 459,551,041 Denise Morin, Hudson, MA 4,560,144 Jon Hobson, Plainfield, WI 4,134,000 Brandon Duncan, Benton, KS 29,452 Scott Bellman, Davenport, IA
BLACKJACK (Radio Shack) 12,501 *Steven Allen, Sharpsburg, MD	DEMON II (THE RAINBOW) 12,475 *Rhett Bagnall, Saskatoon, Saskatchewan 10,075 Frank Carlota III, Santurce, Puerto Rico 1,600 Bryan Eckler, Lusby, MD	THE JUNGLE (THE RAINBOW) 608,880,000 *Jeff Lawrenok, Cambridge, Ontario 459,551,041 Denise Morin, Hudson, MA 4,560,144 Jon Hobson, Plainfield, WI 4,134,000 Brandon Duncan, Benton, KS 29,452 Scott Bellman, Davenport, IA	JUNIOR'S REVENGE (Computerware) 6,020,000 *Ian Stewart, Lynwood, Perth-Australia 786,300 Richard Wiseman, Marion, OH 36,200 Stephane Asselin, Baie-Comeau, Quebec
BLACK SANCTUM (Mark Data) 485 *Phil & Alison Biltoni, Lancaster, PA	DEVIL ASSAULT (Tom Mix) 4,773,140 *Huzak Le Gault, Argyle, NY	JUNIOR'S REVENGE (Computerware) 6,020,000 *Ian Stewart, Lynwood, Perth-Australia 786,300 Richard Wiseman, Marion, OH 36,200 Stephane Asselin, Baie-Comeau, Quebec	JUNKFOOD (THE RAINBOW) 1,079,600 *Jean-Francois Morin, Loretteville, Quebec 357,940 Larry Thomson, Menominee, MI 309,460 Shirley Black, Quantan, AL 308,940 Rhett Bagnall, Saskatoon, Saskatchewan 186,300 Shelia Bigel, Massapeque, NY 72,640 Michael Chamberlin, Dawson Creek, British Columbia 40,750 Vernon Johnson, Parkville, MD
BLOC HEAD (Computerware) 41,975 *Michael Hebb, Victoria, Australia 23,500 Paschal Wilson, Kentwood, LA	DOODLEBUG (Computerware) 825,370 *Susan Ballinger, Uxbridge, Ontario	JUNKFOOD (THE RAINBOW) 1,079,600 *Jean-Francois Morin, Loretteville, Quebec 357,940 Larry Thomson, Menominee, MI 309,460 Shirley Black, Quantan, AL 308,940 Rhett Bagnall, Saskatoon, Saskatchewan 186,300 Shelia Bigel, Massapeque, NY 72,640 Michael Chamberlin, Dawson Creek, British Columbia 40,750 Vernon Johnson, Parkville, MD	KEY BOMBER (THE RAINBOW) 29,052 *Tony Borling, Armagh, PA
BUSTOUT (Radio Shack) 42,885 *Steven Roth, Fannystelle, Manitoba 14,704 Amir Ijaz, Winnipeg, Manitoba 13,000 Ken Dewitt, Blue Island, IL	DOUBLE BACK (Radio Shack) 235,110 *Les Dorn, Eau Claire, WI 211,790 Rachel Soldan, Gresham, OR 43,100 Laurence Zafran, New York, NY 19,850 Luc Soucy, Baker-Brook, New Brunswick	KEY BOMBER (THE RAINBOW) 29,052 *Tony Borling, Armagh, PA	THE KING (Tom Mix) 1,670,900 *Yolande Farr, Sayre, PA 1,003,400 Tim Rubb, Atlanta, GA 337,800 Kirk Carter, Cooper City, FL 300,000 Larry Cowles, Westport, WA 241,200 Chris McKernan, Chateauguay, Quebec 76,800 Craig Crowe, Summerville, SC
CANYON CLIMBER (Radio Shack) 182,500 *Michael Sileo Jr., Glendale, NY	DOWNLAND (Radio Shack) 20,900,400 *Adam Petersen, Portland, OR 68,345 Alain Cyr, Valcourt, Quebec 66,145 Jeanine McCuen, Rutland, MA 47,632 Laurence Zafran, New York, NY 46,031 Shannon Blakey, Columbia, MO 44,143 Tom Audas, Fremont, CA 40,712 Thomas Audas II, Fremont, CA 17,580 Anos Goldie	THE KING (Tom Mix) 1,670,900 *Yolande Farr, Sayre, PA 1,003,400 Tim Rubb, Atlanta, GA 337,800 Kirk Carter, Cooper City, FL 300,000 Larry Cowles, Westport, WA 241,200 Chris McKernan, Chateauguay, Quebec 76,800 Craig Crowe, Summerville, SC	
CAVERN COPTER (THE RAINBOW) 1,245 *Sean Connor, Summit, NJ 1,213 Doug Schwartz, Glendale, AZ 965 Michael Moffard, Wren, OH 963 Joseph Calciatera, Ridgewood, NY 790 John Rivers, North Adams, MA	DRACONIAN (Tom Mix) 480,540 *Lane Dewhurst, Courtenay, British Columbia		
CHAMBERS (Tom Mix) 69,100 *Blossom Mayor, East Greenbush, NY	ELEC-TRON (Tom Mix) 35,225 *Vernon Johnson, Parkville, MD 24,715 Daniel Bee, Flint, MI		
CHAMELEON (Computerware) 56,800 *Brian Wolgram, Freeland, MI	FANGMAN (Tom Mix) 155,225 *Daniel Thompson, St. Louis, MO		
CHOPPER STRIKE (MichTron) 252,900 *Dan Hopper, Omaha, NE 194,800 Andrew Norris, Mississauga, Ontario 167,600 Michael Hebb, Victoria, Australia 162,400 Andrew Figel, Sardinia, OH 130,200 Benny Pachke, Lloydminster, Saskatchewan	FOODWAR (Arcade Animation) 151,070 *Mathieu Paquin, Brossard, Quebec 147,845 Matt Griffiths, Stillwell, KS 118,000 Chris Cape, Central, SC 104,075 Mike Scharf, Fremont, OH 94,905 Stephane Asselin, Baie-Comeau, Quebec		
CHUCKIE EGG (A&F) 381,670 *Paul Hotz, Herzlia, Israel 255,140 Laura Hotz, Herzlia, Israel	FOOTBALL (Radio Shack) 78-0 *Steven Allen, Sharpsburg, MD		
CLIMB (Chronosette) 20,050 *Neil Haupt, Grafton, OH	THE FROG (Tom Mix) 6,890 *Mike Dodge, Jackson, MI		
CLOWNS & BALLOONS (Radio Shack) 125,010 *Karen Tracy, Coventry, RI	FROGGER (Corissoft) 12,000 *Nicole Freedman, Wellesley, MA		
COLOR BASEBALL (Radio Shack) 666-0 *Christian Roch, Granby, Quebec 254-0 Chris Reynolds, Richmond, KY 250-0 Rob Mowery, Robinson, PA 156-0 Bart Anxrom, Atlanta, KS 135-0 Chuck Carroll, Sullivan City, CA 70-0 Jeffery Chubey, Roseau River, Manitoba 93-1 Craig Dunne, Windsor, Ontario 92-1 Jonathon Baker, Harmony, NC 78-3 Rhett Bagnall, Saskatoon, Saskatchewan	FROGGIE (Spectra/Associates) 112,120 *David Oelhaupl, Calgary, Alberta 108,490 Bill Ide, Newark, DE		
	FURY (MichTron) 408,700 *Russell Lapaz, New Orleans, LA		

SCOREBOARD

KLONDATHU (Radio Shack)	925	Andy Green, Whitesell, PA	35	Joel Flaugher, Hamilton, OH
937,675	483	Susan Ballinger, Uxbridge, Ontario	25	Patric Flaugher, Hamilton, OH
927,727	405	Joe Bronas, Crestwood, KY	30	Ruas Auld, St. Petersburg, FL
902,516		PLANET INVASION (Spectral Associates)		RACER (THE RAINBOW)
726,076	59,800	*Terry Steele, Summerfield, NC	159.9	*Frank Canepa III, Sarrance, Puerto Rico
312,980	32,350	Susan Ballinger, Uxbridge, Ontario		39.2
LANCER (Spectral Associates)	10,750	Saul Kirson, Ra'anana, Israel		30.2
155,750	8,950	Michael Derman, Tel-Aviv, Israel		RADIO BALL (Radio Shack)
162,300		POLARIS (Radio Shack)		4,510,740
152,250	171,862	*Thomas Levasseur, Rockland, ME		3,708,810
144,000	133,728	Ed Meyer, Vancouver, British Columbia		1,738,150
138,500	112,528	Brett Ankrum, Atlanta, KS		1,511,640
117,150	87,310	Ron Sujkowski, Bay City, MI		
111,950	62,588	Bart Ankrum, Atlanta, KS		1,230,300
56,900		POLTERGEIST (Radio Shack)		1,207,240
55,800	4,885	*Frank Canepa III, Sarrance, Puerto Rico		RETURN OF THE JET-4 (ThunderVision)
LASERWORM & FIREFLY (THE RAINBOW)		4,890		538,432
13,834	4,200	Lisa Ballinger, Uxbridge, Ontario		429,160
LUNAR ROVER PATROL (Spectral Associates)	3,740	Bryan Ecker, Lusby, MD		
185,950		Tina Hurst, Lake City, FL		ROAD RACE (THE RAINBOW)
179,350		POOYAN (Datasoft)		91.7
170,900	1,548,000	*Jeff Connell, Winona, MN		576.6
	1,250,350	Richard Hawkins, Cleveland, TN		709.1
79,900	900,250	Daniel Balise, Montreal, Quebec		1212.4
76,960	194,800	Helene Gilbert, Rouyn-Noranda, Quebec		2158.5
MADNESS & THE MINOTAUR (Radio Shack)		106,100		ROBOTACK (Intracolor)
220	97,900	Tom Neal, Wabash, IN		7,528,100
MAZELAND (Chromasette)	80,100	Ellen Ballinger, Uxbridge, Ontario		4,646,489
6,550	79,000	Steven Nudelman, Brooklyn, NY		
MEGA-BUG (Radio Shack)	71,900	Jamie Carlson, Glenco, MN		3,364,100
1,055	71,900	Laura Hotz, Herzlia, Israel		
METEORS (Spectral Associates)		POPCORN (Radio Shack)		2,516,000
33,200	45,210	*Mike Norris, Columbia, SC		2,216,950
MICROBES (Radio Shack)	47,310	Nicole Friedman, Wellesley, MA		SAILOR MAN (Tom Mix)
237,960	36,500	Barry Stanton, North East, PA		535,900
178,550	30,160	Craig Gordon, Philadelphia, PA		488,500
144,355	28,610	Steven Roth, Farmyville, Manitoba		435,700
88,450	24,810	Mark Carpentier, Dunfermline, IL		418,000
77,300	21,130	Abby Gordon, Philadelphia, PA		399,300
MISSILE BARRAGE (THE RAINBOW)		PROJECT NEBULA (Radio Shack)		369,700
2-1	2,010	*Dan Hester, Cortland, OH		328,000
MONSTER MAZE (Radio Shack)	1,795	Ken Krnjic, Chicago, IL		188,500
205,180	1,540	Tim Rueb, Atlanta, GA		SANDS OF EGYPT (Radio Shack)
200,020	535	Joseph Dehn, Tucson, AZ		80
200,000	485	Jeff Kilsdonk, Milwaukee, WI		82
115,130		Q-NERD (THE RAINBOW)		98
32,470	1,958,950	*Bruce Baltzer, Henover, Ontario		158
MR. DIG (Computers)	61,290	Sean Conner, Summit, NJ		SCARFMAN (Comsoft)
3,259,750		QUEST (Ardvark)		260,200
3,100,650	5,770,875	*Mike Cook, Phoenix, AZ		SEA DRAGON (Adventure International)
3,001,100		QUIX (Tom Mix)		69,900
	907,320	*Andrew Norris, Mississauga, Ontario		21,060
2,675,670	323,373	Jean-Francois Lauzier, Asbestos, Quebec		4,770
	271,965	Nicole Friedman, Wellesley, MA		4,760
2,520,650	157,553	Stephane Asselin, Baie-Comeau, Quebec		4,040
2,038,250		RAAKA-TU (Radio Shack)		SEA QUEST (Mark Data)
MUOPIES (MichTron)		50		146
285,600		*Ellen Ballinger, Uxbridge, Ontario		SEA SEARCH (Mark Data)
249,000		*Faith Barnett, Syracuse, NY		140
137,000		*Scott Bellman, Davenport, IA		SHENANIGANS (Mark Data)
114,800		*Jeff Brock, Ft. Lauderdale, FL		65
NINJA WARRIOR (Programmer's Guild)		*Mike Bubbs, Grafton, OH		SHOOTING GALLERY (Radio Shack)
421,900		*Mike Camden, Follansbee, WV		399,400
OFFENDER (American Business Computers)		*Brett Castiel, Russell, PA		46,960
288,300		*Chris Chamberlin, Dawson Creek, British Columbia		SKIING (Radio Shack)
127,500		*Chris Cope, Central, SC		01,000
OUTHOUSE (MichTron)		*Jeff Diggs, St. Louis, MO		01,100
7,001		*Aaron Flaugher, Hamilton, OH		01,12
PENGUIN (THE RAINBOW)		*Richard Galin, Tyler, TX		05,85
48,250		*Jerome Galt, Rochester, MI		05,37
13,920		*John Kidd, Clarkboro, NJ		SLAY THE HERES (Radio Shack)
		*Berny Lavetty, Gaulty Bridge, WV		84,714
11,660		*Jason Morrison, Spruce Grove, Alberta		74,078
11,620		*David Oelhaup, Calgary, Alberta		52,581
10,190		*Robbie Sabicyn, Mt. Zion, IL		
10,320		*Michael Thomas, Flint, MI		24,681
PHANTOM SLAYER (Med Systems)		*Bart Ankrum, Atlanta, KS		SNAKER (THE RAINBOW)
1,326		David Bryan, Kentwood, LA		124
PINBALL (Radio Shack)		40		126
300,712		Jeff Dampsey, Eatonville, WA		137
PIPELINE (THE RAINBOW)		Bryan Carterbury, N. Ridgeville, OH		150
1,332		Ryan Davlin, Louisville, KY		159
1,102				SPACE AMBUSH (Computers)
				24,150
				*Mario Asselin, Baie-Comeau, Quebec

SPACE RACE (Spectral Associates)	11,600	*Mario Asselin, Baie-Comeau, Quebec
SPEED RACER (MichTron)	106,700	*Jack Marzullo, Gagnaw, MI
	121,260	*Paul Kenyon, Phoenix, AZ
	111,200	*Mike Rebecchi, Somersdale, NJ
	109,440	*Dan Bouges, Niantic, CT
	99,550	*Scott Cunningham, East Lyme, CT
STAR BLAZE (Radio Shack)	7,950	*Matthew Daley, Binghamton, NY
	7,950	*Mike Marcol, River Grove, IL
	4,500	*Ted Barkley, Whitehall, NY
STAR TALK (Speech Systems)	130,400	*Michael Scott, Johnstown, NY
STELLAR LIFE-LINE (Radio Shack)	119,030	*Brian Steber, Boise, ID
	73,950	*Lori McCuller, Brazil, IN
	62,390	*Andrew Lawrence, Cambridge, Ontario
	39,210	*Alfred Silva, Cranston, RI
	35,550	*James Fox, Midlothian, VA
	25,970	*Sue Hull, Brazil, IN
STORM ARROWS (Spectral Associates)	320,100	*Thomas Tiggelbeck, Essen, West Germany
	231,100	*Uwe Steingens, Essen, West Germany
	221,300	*Arnold Sritzer, Los Angeles, CA
	203,050	*Rob Layden, Rochester, NY
	164,150	*Jen Keeling

TEMPLE OF ROM (Radio Shack)	620,300	*Rhea Jarrard, Olympia, WA
	463,400	*Glenn Alfrey, Olympia, WA
	235,600	*Jim Issel, Cotati, CA
	224,000	*Sonya Hurst, Richmond, CA
	137,400	*David Oelthaupt, Calgary, Alberta
TIME BANDIT (MichTron)	23,020	*Joel Lange, Windsor, CT
TO PRESERVE QUANDIC (Prickly-Pear)	87	*Neil Haupt, Grafton, OH
TRAILIN' TAIL (THE RAINBOW)	119,705	*Dingo Gallina, Summit, NJ
	105,300	*Jerry Dill, Frankfort, MI
	102,930	*Philip Parent, Smiths Falls, Ontario
	94,810	*Jean-Marc Parent, Smiths Falls, Ontario
	76,275	*Michael Rosenberg, Prestonburg, KY
TRAPFALL (Tom Mix)	70,392	*Paul Hotz, Hatfield, Israel
TREKBOER (Mark Data)	139	*N. Wakelin, Mt. Lebanon, PA
	139	*Jim Cockrum, Martinsville, IN
TUT'S TOMB (Mark Data)	184,380	*Biagio Di Lorenzo, Montreal, Quebec
	163,980	*Michael McCallerty, Occochee, CA
	158,000	*Chris Russo, Miami, FL
	146,300	*Mike Rebecchi, Somersdale, NJ
	134,580	*Judy Smith, Graham, OH
	120,380	*Cynthia Coors, Mobile, AL

WACKY FOOD (Arcade Animation)	112,500	*Daryl Givens, Tallahassee, FL
WHIRLEYBIRD RUN (Spectral Associates)	30,100	*Dan Durgo, Flint, MI
	16,900	*Stephane Asselin, Baie-Comeau, Quebec
WILLY'S WAREHOUSE (Intracolor)	183,900	*Alan Morris, Chicopee, MA
	93,700	*Craig Kluger, Miami, FL
	29,300	*Stephane Asselin, Baie-Comeau, Quebec
ZAKSUND (Elite)	480,200	*Angel Zuriga, Miami, FL
ZAXXON (Datasoft)	2,057,800	*Chris Oberholzer, Lexington, MA
	1,700,000	*Biagio Di Lorenzo, Montreal, Quebec
	1,510,000	*James Guadrella, Brooklyn, NY
	986,000	*Andy Green, Whitehall, PA
	535,400	*Chris McKernan, Chateauguay, Quebec
	132,000	*Larry Cowles, Westport, WA
	127,360	*Vernon Johnson, Parkville, MD
	107,200	*Paul Hotz, Hatfield, Israel
	79,800	*Tim Paulus, Utica, MI
	69,600	*Tod Paulus, Utica, MI
	43,500	*Craig Gordon, Philadelphia, PA
	13,900	*Abby Gordon, Philadelphia, PA

— Debbie Hartley

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 and tips, we encourage you to share them by sending them to the Scoreboard, c/o THE RAINBOW.

TAKING A POLE

Scoreboard:

In response to Lane Shelton's letter [April 1985, Page 160] concerning *Shenanigans*, in order to get the pole into the cave you must first find the trap door in the ceiling of the lower level of the cave. You will rise through the floor of the cabin, then get the pole and take it down with you.

One last thing — ever heard of sliding down a Rainbow? In this game, it's fatal.

If anyone can help me once I'm on the mystery-coordinate planet in *Trekboer*, I'd appreciate it. My address is 141 Lovers Lane, 43952.

George Caleodis
Steubenville, OH

SOLUTIONS FOR HIRE

Scoreboard:

Attention Adventurers! Many of you have read Ryan Elam's letter in the November 1984 issue of THE RAINBOW and have written for solutions. Well, for those of you who are interested, Ryan Elam has moved and can no longer continue to offer solutions. Instead, I am making the same type of offer, but with a few more Adventures.

I have several Adventures solved and available for \$1 per solution. They are encoded and come with a decoder program and instructions. These solutions are available: *Blackbeard's Island*, *Black Sanc-*

tum, *Calixto Island*, *Dallas Quest*, *Major Isar*, *Mystic Mansion*, *Sands of Egypt*, *Sea Quest*, *Shenanigans*, *Trekboer*, *Bedlam*, *Pyramid* and *Raaka-Tu*.

Please include one stamp for return postage or two stamps if ordering three or more solutions. Write to 539 S. Berthe Ave., 32404.

Mikel Rice
Panama City, FL

TIPS FOR TREKBOER

Scoreboard:

I solved the Adventure game *Trekboer* and found the most difficult part of the game to be past the bridge on Alton.

Once you have found the amulet and have the capsule and a beaker full of acid, you are ready to cross the bridge. Once past it, type FIELD. Be sure, however, that you have tied the rope to the tree east of the bridge before crossing.

For additional tips on *Trekboer* write to me at 939 S. Harriet, 46151. Please include a SASE.

Jim Cockrum
Martinsville, IN

BOARD WITH BUGS?

Scoreboard:

For Radio Shack's *Klendathu*, my brother and I would like to give bug-killers these tips.

If you're looking for Queen's Boards, stay in the corners of the grid. Also, when you push the space bar to start your jump, if the board immediately under your trooper says "bug," then wait. The square you are on will light up as a Queen's Board. Finally, if you wait for time to run out while you are on the scoreboard, you will make a tremendous amount of money. I have made as much as \$340,000,000.

We need help with *Pyramid*, *Raaka-Tu* and *Madness and the Minotaur*. Anyone with information please write to me at 1010 Montclair Circle, 44145.

Dan Franzen
Westlake, OH

SPELL IT

Scoreboard:

In *Madness and the Minotaur*, if your lamp runs out of oil, find the urn and type FILL LAMP. This will solve your problem. When you are in the room with the Narcissus plants, type OPEN CURTRINS. Sometimes they will open, sometimes not. When they do, you'll find there's a passage you can "jump" into. Whenever you start a new game, go upstairs immediately. Sometimes you will find the dagger there and sometimes food. If you have food, no more will appear until you eat what you have.

How do you know when you have gotten a spell and how do you use it?

I have solved *Calixto Island* and *Bedlam*. I need help with *Madness and the Minotaur*.

Pyramid, Raaka-Tu and *Black Sanctum*. If anybody can help me with these or if anyone needs help with *Bedlam, Calixto Island* or other neat things in *Madness and the Minotaur*, write to me at 474 Montague Ave., R3L 1T7.

Ric Miller
Winnipeg, Manitoba

FADING AWAY

Scoreboard:

Yes, the Minotaur is driving me to madness. I must know before it is too late: Where is the lamp oil? Why are the walls a strange color? And what is the eerie glow from behind the rocks? I'm slipping away fast. Please help! Send the answers, or the name of a good institution, to 1137-A Pebble Creek Pkwy., 35208.

Doug Miles
Birmingham, AL

Scoreboard:

I have a suggestion to anyone who writes a letter to be printed in the "Scoreboard" section of THE RAINBOW. If you expect to have a written response to your letter from other readers, please include your street address (and ZIP code) in your letter. It is quite difficult to respond to a letter without all of the necessary information.

Randolph L. Harrison
Wilmington, OH

SHARK REPELLENT

Scoreboard:

To get past the sharks in *Sea Quest*, get the metal detector, go to the bottom of the stairs and go east once. PUSH BUTTON, DIG and GET MIRROR. Give the mirror to the mermaid to get a key to the trap door in the beach house. In the attic (through the trap door) you will find a bottle. Go to the sharks and OPEN BOTTLE and the sharks will leave.

If you would like the solutions to either *Sea Quest* or *Sands of Egypt*, or if you have a few questions about them, send a SASE to 30994, Bedford Dr., 92373.

This week I finally purchased *Pyramid*. From reading all the letters in this section, I was expecting a lot. I didn't even think about the fact that there might not be graphics. I expected there would be. I still

think it's a great Adventure, but without graphics it is not quite as good. What I would like to know is do the other Radio Shack Adventures (*Bedlam, Raaka-Tu* and *Madness and the Minotaur*) have graphics? If anyone writes to me concerning the above Adventures, please tell me (if you know) whether or not any of the Radio Shack Adventures have graphics.

Brett Noble
Redlands, CA

Scoreboard:

I am in a position to offer comprehensible, step-by-step help sheets on the following: *Black Sanctum, Calixto Island, Trekboer* and *Sands of Egypt*. They are printouts of all the necessary inputs to get you through the game.

I also might be able to help with these: *Alpha II, Bedlam, Head of the Beast, Karrak, Lurkley Manor* and *Raaka-Tu*. And I've had many good landings with *Worlds of Flight* and *Flight Simulator* and may have some tips.

If you feel I can help, please send a SASE to me and I'll be happy to respond to your request. My address is 11403 48th Dr., N.E., 98270.

James K. Knight
Marysville, WA

Scoreboard:

I have solved the games *Head of the Beast* and *Lurkley Manor*. I have the maps for both of these and if anyone needs help, please write. My address is 146 Woodward Ave., P.O. Box 1312, P0R 1B0.

Martin Steinke
Blind River, Ontario

Scoreboard:

I have solved *Sands of Egypt*. If anyone needs help, call (813) 251-6117 after 5 p.m., or send a SASE to me at 2801 Sitios Ave., 33629. I need help or clues for *Sea Quest, Trekboer, Shenanigans* and *Calixto Island*.

William Triplett
Tampa, FL

LET THERE BE LIGHT

Scoreboard:

Does anyone know how to open the crypt

in *Madness and the Minotaur*, or how to light the lantern in *Black Sanctum*?

If anyone needs help with *Pyramid, Raaka-Tu, Dungeons of Daggorath, Bedlam* or *Calixto Island*, feel free to write to me at 1605 Fleetwood Ct., 62549.

Robbie Sablotny
Mt. Zion, IL

SLITHERING PAST THE SERPENT

Scoreboard:

I have had the Adventure game *Pyramid 2000* for about a year. I have never been able to get by the serpent in the pharaoh's chamber. Could someone please write to me and tell me how? My address is 11351 St. Laurent Dr., S9A 3P6.

Erik Nickel
North Battleford, Saskatchewan

NEEDY NEOPHYTE

Scoreboard:

Help! I am a reader in need. I need help with *Pyramid*. You see, I am new at all text Adventures and I mainly need help with the snake and the maze. I heard that a bird will kill the snake. Is this true? I have found the vase, but what do you do with it; you can't set it down. If anyone can help me, please send me the answers or clues at 6212 Glenhaven Dr., 79762. Help, please!

Nathan Sykes
Odessa, TX

CAVE CANEM

Scoreboard:

In the game *Bedlam*, I can't get past the dog in the kennel. It's driving me crazy! Do any of your readers have an idea that would help me?

Also, in the game *Black Sanctum*, how do you sprinkle the ash into the circle at the end of the game? My brother and I spent days getting to the end, only to find we can't "sprinkle" the ash. We dropped it and were killed instantly. If you have a solution send it to 1441 Kearney Drive, 08902. Please help us!

Judd Rossman
North Brunswick, NJ

THE NEW GENERATION

COMPLETE SG-10 PRINTER SYSTEM



All the performance, features, and compatibility of the Star Micronics GEMINI-10X PLUS:

- 120 CPS with true descenders.
- NLQ 17 x 11 (Near Letter Quality).
- 2K BUFFER accessible.
- HEX DUMP for Machine Language listings.
- ULTRA HI bit image graphics.
- 20% INCREASE in throughput.
- 1 YEAR STAR WARRANTY
Servicable at over 4000 locations.


COMPLETE SYSTEM
NOTHING MORE TO BUY

- SG-10 PRINTER
 - BLUE STREAK II INTERFACE W/MODEM SWITCH
 - SUPER GEMPRINT
 - TYPE SELECTION/TUTORIAL
- \$289⁹⁵** + \$10 Shipping and Insurance
SG-15-439⁹⁵



BLUE STREAK II SERIAL TO PARALLEL INTERFACE

- RUN COCO I or II to PARALLEL PRINTER
- HIGH QUALITY TOGGLE SWITCH ELIMINATES CABLE SWITCHING
- 300, 600, 1200, 2400, 4800, 9600 SWITCHABLE BAUD RATES
- AC POWER OPTIONAL-NOT NEEDED WITH SG-10 PRINTER
- COMPLETE WITH ALL CABLES AND CONNECTORS
- 180 DAY WARRANTY

 **54⁹⁵** SHIPPING (SPECIFY PRINTER)
PAID!



SUPER GEMPRINT CUSTOM SOFTWARE



"Overall, Super Gemprint is very well-written and documented."
- Rainbow December 84 review.

BONUS! TYPE SELECTION/TUTORIAL PROGRAM FREE WITH SUPER GEMPRINT

Menu driven program for the CoCo. Teaches and shows the new user the numerous features of the SG-10.

SUPER GEMPRINT AND TYPE SELECTION/TUTORIAL PROGRAM **\$17⁹⁵** + \$2 Shipping and Handling

DAYTON ASSOCIATES, INC.



DUN & BRADSTREET LISTED
7201 CLAIRCREST BLDG. C
DAYTON, OHIO 45424
OHIO RESIDENTS ADD 6% SALES TAX
C.O.D. ADD \$2.00

AUTO-ORDER LINE
1-800-251 STAR
Personal Service
(513) 236-1454

RAINBOW REVIEWS

Adventurus Supremus 4.6B	A Departure From The Usual/ <i>Bacchus Computer Software</i>	221
Aul-O-Start	Your Cassette Program's Best Friend/ <i>Spectrum Projects, Inc.</i>	220
Centipede ABC's And 123's	Provide Unpressured Learning For Children/ <i>Triad Pictures Corp.</i>	205
CoCo Grey	Greatly Enhances The VIEW II Package/ <i>SoftCircuits</i>	197
CoCo Max	Delivers An Outstanding Performance/ <i>Colorware, Inc.</i>	217
CoCo Professional Tax Preparer	An Excellent Tax Aid/ <i>Micro Data Systems</i>	199
CoCo Tuner	Fine Tuning With The CoCo/ <i>Real-Time Specialties, Inc.</i>	203
ColorStat	A Good Statistical Program For Beginners/ <i>Radio Shack</i>	198
Congress	Takes You On A Presidential Quest/ <i>B-5 Software</i>	195
Dan Tucker's Mine	A Gold Mine Of An Adventure/ <i>Pal Creations</i>	206
Data Line Switch Box	Double CoCo's Serial Port/ <i>Phelan Enterprises</i>	224
Debacle	Test Your Command Strategies/ <i>Picosoft Games</i>	209
DESIGNER	Create Your Own Fashions/ <i>Cognitive Development Company</i>	202
Electra-Guard	Clip Surge Spikes/ <i>Howard Medical</i>	210
Galactic Fighter	Release Earth From Alien Invasion/ <i>Four Star Software</i>	192
LINER	Go On An 'Eeblewalker' Hunt/ <i>Michael Stuller</i>	216
ME-128-64K 128K Upgrade	Expands CoCo's Memory/ <i>Dynamic Electronics, Inc.</i>	211
Metabot	Destroy The Enemy And Don't Get Caught/ <i>HARMONYCS</i>	207
P51 Mustang Attack Flight Simulator	Takes You On A WW II Aerial Battle/ <i>Tom Mix Software</i>	222
PANZERS EAST!	Gives Many Hours Of War Game Competition/ <i>The Avalon Hill Game Company</i>	214
Recess Games	Encourages Logical Thought Processes/ <i>B-5 Software</i>	208
SBASIC	BASIC With A Foreign Accent/ <i>Tandar Software</i>	223
Sam Sleuth, P.I.	An Extraordinary Case/ <i>Computerware</i>	201
Shamus	The Shadow Lurks In This Action-Packed Game/ <i>Radio Shack</i>	212
Tic-Tac-Toe	An Enjoyable Game For Youngsters/ <i>Draco Software</i>	215
Triple Joyport Switcher	Saves Wear And Tear On Your CoCo/ <i>Spectrum Projects, Inc.</i>	216
VIEW II	Slow Scan TV At A Price That Can't Be Beat/ <i>SoftCircuits</i>	197
YACHTSEE	Can Make Dice-Rolling Addictive/ <i>Bear Grip Software</i>	211
Zookey	A Fun And Helpful Typing Tutor/ <i>Mark Data Products</i>	204

Radio Shack Has Want for Your

Save Time and Effort at Home

Color File.** An easy-to-use home filing system to alphabetize, select, examine, revise and store household records. Comes pre-set with seven files—or create your own. #26-3103 **24⁹⁵**



Spectaculator®. Do home planning and budgeting with this electronic spreadsheet. Just enter numbers and formulas—results are displayed on command. Ideal for home financial forecasting. #26-3104 **34⁹⁵**



Color SCRIPSIT®. A powerful home word processing system for correction-free letters. Text can be saved on optional cassette recorder or printed with optional printer. #26-3105 **34⁹⁵**



Personal Finance II. Includes 26 expense categories, including auto, gas, food and more. Review spending on year-to-date or category basis. #26-3106 **34⁹⁵**



COLORSTAT.** Use your Color Computer to turn complicated home or business data into statistics for easy analysis, or print them on an optional printer for your records. #26-3107 **24⁹⁵**



* Joysticks required.
** Cassette recorder required.
*** Joysticks and recorder required.

Educational Software from Walt Disney

Your Choice

34⁹⁵
Each

Telling Time with Donald.**

Teaching your children to tell time is easy with a little help from Donald Duck. For ages 5-8. #26-2530



Mickey's World of Writing.**

An exciting way to build important writing skills! Youngsters learn the basics of sentence structure and fundamental writing skills with Mickey Mouse. For ages 8-11. #26-2532



Mickey's Alpine Adventure.**

A frosty exploration of spelling and reading concepts. Learn important spelling rules and the sounds of vowels and consonants with Mickey Mouse and Donald Duck. #26-2534



Space Probe: Math.** An exciting interstellar study of mathematical word problems.

Youngsters learn the concepts of area and perimeter during outer space adventure. For ages 7-14. #26-2537



Downland.* You're alone in a secret cave, traveling from chamber to chamber collecting keys, gold and diamonds. But can you jump, climb and run to safety? #26-3046 **24⁹⁵**



Canyon Climber.* Your climbing skills are under test when you find kicking goats, falling rocks, zinging arrows and more on your way to the summit. #26-3089 **34⁹⁵**



the Software You Color Computer

Learning Programs from Spinnaker

Your Choice
2995
Each

Facemaker. An exciting game to help your kids learn computer basics while they create an animated face. #26-3166



Kindercomp. Introduce your children to computer graphics! Even the youngest in your family will enjoy creating vivid color pictures and exciting sound effects by pressing a few keys. #26-3168



Kids on Keys. Your kids will enjoy learning with the computer as they identify numbers, letters and words. It's fun and your kids will learn important math and spelling skills. #26-3167



Fraction Fever. An exciting math contest! Your kids will develop a real understanding of fractional relationships as they guide their graphic "pogo stick" through this colorful game. #26-3169



Dungeons of Daggorath.

You're pitted against a succession of awesome beasts in the fearful dungeon. Each victory brings you closer to your ultimate foe—the wizard. #26-3093



2995

Baseball.* This exciting game

plays just like the big leagues! You are the coach—it's up to you to control the pitching, defense, and running for extra excitement. #26-3095



2495

More Learning Fun for Your Kids

Vocabulary Tutor 1.**

Give your children a head start in school. Start building their vocabulary at home with an exciting word and description matching game they'll love to play. For grades 3-5. #26-2568



895

Vocabulary Tutor 2.** More

practice matching words and definitions and placing words in appropriate sentences. Great for helping young students get ahead. For grades 3-5. #26-2569



895

Color Math.** Make learning fun.

Supplement your children's study with problems in addition and subtraction. For ages 6-14. #26-3201



1995

Radio Shack®
The Technology Store™

A DIVISION OF TANDY CORPORATION

Find out more about
Radio Shack's Color Computer.
Send for a free catalog.

Mail To: Radio Shack, Dept. 85-A-351
300 One Tandy Center
Fort Worth, Texas 76102

Name _____
Address _____
City _____ State _____ Zip _____
Telephone _____

Prices apply at Radio Shack Computer Centers and at participating Radio Shack stores and dealers. Disney, Mickey Mouse and Donald Duck are registered trademarks of Walt Disney Productions. Facemaker, Kids on Keys, Kindercomp, Fraction Fever and Spinnaker are registered trademarks of Spinnaker, Inc.



RECEIVED & CERTIFIED

The following products recently have been received by THE RAINBOW, examined by our magazine staff and approved for the *Rainbow Seal of Certification*, your assurance that we have seen the product and have ascertained that it is what it purports to be. This month the *Seal of Certification* has been issued to:

The Ultimate Color Computer Reference Guide And Toolkit, a book by David D. McLeod and Robert van der Poel which provides a comprehensive BASIC reference manual with command references, techniques to write more efficient programs and BASIC and machine language subroutines for incorporation into the user's programs. CMD Micro, Computer Services Ltd., 10447-124 Street, Edmonton, Alberta, Canada T5N 1R7, \$27.95 U.S. plus \$3.50 S/H, \$34.95 CND. plus \$3.50 S/H

The Software Kit For The Ultimate Color Computer Reference Guide And Toolkit, the tape or disk companion to CMD Micro's book, *The Ultimate Color Computer Reference Guide And Toolkit*, containing executable code for all subroutines discussed in the text. CMD Micro, Computer Services Ltd., 10447-124 Street, Edmonton, Alberta, Canada T5N 1R7, cassette \$12.95 U.S. plus \$1.50 S/H, \$14.95 CND. plus \$1.50 S/H, disk \$14.95 U.S. plus \$1.50 S/H, \$17.95 CND. plus \$1.50 S/H

Full Character Set Board, allowing CoCo to display the full 96-character ASCII set on the video screen by replacing the character set contained within the 6847 VDG chip in the computer. Also featured are true descenders on lowercase characters, braces and vertical bar characters and slashed zeros. CoCo Devices, Box 677, Seabrook, TX 77586, \$38 plus \$2 S/H

Look 'N' Listen, a 64K set of OS-9 utilities featuring 1) Screen, for Hi-Res display that is compatible with *O-Pak* but 27 percent faster; 2) stand-alone sound utilities that allow you to make sound through OS-9 independent of any additional hardware; 3) three boot routines: cold reboot, return to Disk BASIC, warm reboot, reboots OS-9 from drive /DO, make RS.Boot, makes an OS-9 diskette bootable even with Disk BASIC 1.0. Computerware, P.O. Box 668, Encinitas, CA 92024, disk \$29.95 plus \$2 S/H

DUDUL, a 64K ECB graphics doodling program requiring a joystick or mouse with screen services such as memory save, memory restore, memory exchange and file. Comes on cassette capable of being transferred to disk with a *Diskshow* program as well as a *Tapeshow* program. Doug Dugan, 4514 Wichita, St. Louis, MO 63310, cassette \$22 plus \$2 S/H

Remote Plus 1.1, a 64K host communications program requiring RS-232 or similar for use as both a stand-alone host routine or as a terminal driver routine within a BBS program. Featured are the recognition of all Extended BASIC and disk commands and the addition of 20 other commands. E.D.C. Industries, P.O. Box 42718, Los Angeles, CA 90050, \$24.95 plus \$2.50 S/H

ViziDraw, a 64K graphics utility requiring joysticks or a mouse to create graphics and text for output to printer such as camera ready layouts for advertising, article illustration and/or cover art. *ViziDraw* can be used to edit a printed page of text or standard full-screen, two-color Hi-Res graphics screens. Also, multicolor graphics is supported with GET/PUT and fill operations. GRAFX, P.O. Box 254, West Mifflin, PA 15122, cassette or disk \$49.95 plus \$2 S/H

Fast Food Math, a 32K ECB educational game designed to aid students, grades two through eight, in learning to handle money. There are four levels of difficulty ranging from the amount of change (calculated and displayed by the computer) to totaling the entire order, finding the sales tax, adding the two totals, computing the change and returning the correct change to the customer. MESA, Middletown High School, Valley Road, Middletown, RI 02840, cassette \$24, disk \$26 plus \$2.50 S/H

Magic Lessons 1-3 and/or 4-6, two 32K ECB programs requiring a disk drive to teach six different magic tricks. Each set comes with the necessary props to achieve the different effects. The text screen is Hi-Res with graphics illustrations to aid in mastering the tricks. Merlin's Software, 11515 Casey Rd., Tampa, FL 33624, cassettes \$19.95 each

C Language Instant Reference Card, an 8 1/2" by 11" plastic reference card providing a concise summary of C language for those using or learning C to avoid breaking concentration to go on a manual hunt while programming. Micro Logic Corp., P.O. Box 174, Dept. F, Hackensack, NJ 07602, \$5.95 plus \$1 S/H

More Keys, a 15-key numeric keypad to plug inside CoCo for the convenience of rapid numeric data entry. Comes with cable and connector; you must specify computer model. Moreton Bay, 316 Castillo Street, Santa Barbara, CA 93101, \$69.95 plus \$2 S/H

ALCATRAZ, a 32K ECB text Adventure. The scenario: You find yourself imprisoned unjustly and sentenced to death. You must escape to prove your innocence. Featured are many logic problems to test the skills of experienced players. Owls Nest Software, P.O. Box 579, Ooltewah, TN 37363, cassette \$17.95, disk \$20.95

Doomsday At 2100, a 32K ECB text Adventure which casts you as the secret agent who must escape captivity, locate and prevent a madman from launching a missile that will trigger global destruction. Pal Creations, 10456 Amantha Ave., San Diego, CA 92126 or CoCoNut Software, R.R. #2, Site 9 Box 1, Tofield, Alberta, Canada T0B 4J0, cassette \$14.95

Cook Book, a 32K home utility requiring a disk drive that provides a database of approximately 320 recipes and features recipes according to compatibility with other foods and beverages, ease of preparation and cost, scaling of recipes either up or down to serve two to 99 people, creation of shopping list ingredients, printout of recipes and shopping lists, provides a Help screen of glossary terms and a timer to assist in meal preparation. Radio Shack stores nationwide, disk \$39.95

CoCo Echo, a 16K printer utility that allows the user to dump a text screen to the printer. Tothian Software, P.O. Box 663, Rimersburg, PA 16248, cassette \$9.95

Solar Explorer, a 32K ECB electronic book providing an introductory course in astronomy. Featured are basic facts about the planets in our solar system, Earth's moon, the planets' distance from the sun, length of years for planets, temperature, diameter, gravity, density, mass and atmosphere for each "wanderer." Radio Shack stores nationwide, \$19.95

Guide To Super Software for the TRS-80 Color Computer, a book by Scott L. Norman which discusses most of the major applications software for the CoCo, including word processing software, spelling checkers, mail-merge packages, spreadsheets and database managers. Scott, Foresman and Company, Professional Publishing Group, 1900 East Lake Avenue, Glenview, IL 60026, \$18.95

Aut-O-Start, a 16K utility to autostart your BASIC or ML programs with title screens using a mixture of text and graphics. Spectrum Projects, Inc., P.O. Box 21272, Woodhaven, NY 11421, cassette \$19.95 plus \$3 S/H

Datarase, a compact EPROM eraser that will accept either 24- or 28-pin devices. Provided are two slots into which the user slides the EPROMs to be erased. Each slot has a thin metal shutter to prevent UV light from escaping when not in use, allowing the EPROM to be placed close to the lamp which reduces erase time. Spectrum Projects, Inc., P.O. Box 21272, Woodhaven, NY 11421, \$49.95 plus \$3 S/H

Triple Joypoint Switcher, an accessory that allows switching back and forth of joysticks, mouse, touch pad and/or light pen. Spectrum Projects, Inc., P.O. Box 21272, Woodhaven, NY 11421, \$39.95 plus \$3 S/H

Super Voice, a 32-64K speech synthesizer allowing the user to write talking BASIC programs, specifying inflection, intonation, articulation and filtration. Also possible are music, singing over a six octave range and sound effects. Speech Systems, 38W 255 Deerpath Road, Batavia, IL 60510, \$79.95 plus \$2 S/H

CoCo Testem, a 32K ECB education utility requiring an 80-column printer with underline function to create and print tests. Possible are the creation of multiple choice, fill in the blank, short answer, true/false and matching tests. Tothian Software, P.O. Box 663, Rimersburg, PA 16248, cassette \$19.95

Graphic Physics, a 16K ECB educational aid allowing the exploration of concepts in physics. Tothian Software, P.O. Box 663, Rimersburg, PA 16248, cassette \$19.95

Lissajous Art, a 16K ECB graphics program requiring a dot matrix printer such as the DMP-110 or LP VIII to create and print out intricate Lissajous figures. Tothian Software, P.O. Box 663, Rimersburg, PA 16248, cassette \$19.95

School Days, a 32K ECB game which presents true to life teaching experiences and challenges you to make the choice that will benefit the students, impress the administration and preserve your sanity. Tothian Software, P.O. Box 663, Rimersburg, PA 16248, cassette \$19.95

Screen Inverter, a 16K BASIC utility that allows the user to write BASIC programs on a dark text screen with light letters. Tothian Software, P.O. Box 663, Rimersburg, PA 16248, cassette \$9.95

Sound Generator, a 16K ECB program that will draw sound waves as you hear them and make machine language sound that can be EXECUTED by BASIC. Tothian Software, P.O. Box 663, Rimersburg, PA 16248, cassette \$19.95

Ledger One, a 32-64K ECB financial utility for single entry bookkeeping and accounting requiring a disk drive for random access data storage and processing. Possible are the recording of several hundred transactions and the selection of any two dates for *Ledger One* to display all transactions made in that interval. The same data may be sent to the printer at any time, as well as viewed on the screen. West Bay Company, Route 1, Box 666, White Stone, VA 22578, cassette or disk \$20

The *Seal of Certification* program is open to all manufacturers of products for the TRS-80 Color Computer, the TDP-100, or the Dragon-32, regardless of whether they advertise in THE RAINBOW.

By awarding a *Seal*, the magazine certifies the program *does exist*, but this *does not* constitute any guarantee of satisfaction. As soon as possible, these hardware or software items will be forwarded to THE RAINBOW'S reviewers for evaluation.

— Monica Dorth

16K Tape — Extended Color BASIC
32K Disk convertible from tape*

DO YOU KNOW HOW MUCH CASH YOU REALLY HAVE?

Do you know if you will run short of cash any time in the next year? If you know you won't, do you know the minimum cash surplus you'll have in the next year?

Either way, you'll gain from using the

CASH PROPHECY

available from Everyone's Computer Co.

The CASH PROPHECY is an easy-to-use, high quality, menu-driven, household budget system that eliminates the hassle of recording every penny spent. No double-entry bookkeeping here!

It prophesies your future checking account balances and two interest-bearing savings accounts.

It's dynamic: it can re-forecast the next 52 weeks any time your household's income or spending plans change or you "bust" the budget.

It's the lazy man's budget system: it saves your regular expenses on tape or disk for recall. You can enter repetitive weekly, bi-weekly, and monthly income with a single record.

Your expenses vary from month to month. You have bi-monthly, quarterly, semi-annual, and annual expenses — some of them large. You can't possibly remember them all. The CASH PROPHECY reminds you when each is due.

If you are paid weekly or bi-weekly you will appreciate how the CASH PROPHECY recognizes that some months have more paychecks than others. You will applaud when it automatically compensates for the differences.

It was designed to report on the screen but will print out on demand.

It can schedule thousands of transactions under 73 different headings!

The CASH PROPHECY runs from tapes on CoCos with as little as 16K (Extended Color BASIC)! It is only sold on cassettes and comes with complete instructions that even novice CoCo users will understand!

** Instructions are included to easily convert operations from tape to 32K disk. You may personally use the CASH PROPHECY for only (U.S.) \$39.95! Shipping and handling charges are included in the continental U.S.; \$5 extra in Canada; \$15 extra otherwise.*

To order, send your check or money order to:

Everyone's Computer Co.,
P.O. Box 771-R,
Chesterfield, MO 63017.

Your money back if the CASH PROPHECY can't handle your household budget.

Dealer inquiries invited

REVIEWING REVIEWS

LIBRARY I

Editor:

I was disappointed by the review of *Library I* in the April 1985 issue of *RAINBOW* [Page 195]. The review does not provide enough information for the potential buyer to decide whether or not *Library I* is worth owning.

Library I is a productivity tool specifically for use on a CoCo with *Color Disk EDTASM*, and at least 32K and one disk drive. This is a package for the assembly language programmer, from novice to expert, who is using *Color Disk EDTASM*.

Perhaps the simplest way to demonstrate the ease of using this package is to show the code necessary to define, open, read and close a disk file in assembly language using *Library I*. For this example, assume an assembly language program in which the *Library* source files have been included. The section of code needed to define, open, read and close a disk file would be:

```
DCB      F1, "NAME", "EXT",
          PBUF, LBUF, 25, 4
DOPEN    F1
DREAD    F1
DCLOSE   F1
```

The review states that "the package does well what it sets out to do." What Sadare Software set out to do with *Library I* was increase the productivity of assembly language programmers by removing the tedium of coding mundane tasks. This was accomplished by providing macros calls that use a clear and consistent syntax. We did the mundane tasks so the assembly language programmer can concentrate on the creative. We feel that we did well what we set out to do.

Craig Hunt
Sadare Software

Editor:

The package, as I said before, does its job well, and its documentation is admirable. Given that I have indicated what that job is and who might be expected to find it useful, what more, within the confines of a brief notice, need be said?

R.W. Odlin
Sedro-Woolley, WA

LIZPACK

Editor:

I enjoyed the review of *LIZPACK* in the March 1985 issue [Page 212]. The address at the end of the review, however, was the author's and not that of Prickly-Pear Software; 2640 N. Conestoga Avenue, Tucson, AZ 85749. Also, *LIZPACK* retails for \$195 instead of \$200.

Joanne Chintis
Prickly-Pear Software

QUIZ KIDS

Editor:

We would like to thank the reviewer of *QUIZ KIDS* for his detailed and thoughtful review.

The intention of *QUIZ KIDS* is to introduce the child to a learning environment similar to BASIC, so that the eventual transition from LOGO to BASIC will be easier. The brisk sales of *QUIZ KIDS* confirm that this program fills a long-standing void in the educational software available for the CoCo.

Bernice Klein
B & B Software

MAZE RUNNER

Editor:

Thank you for reviewing *Maze Runner* (April 1985, Page 217) and the kind words of Bruce Rothmel. I can appreciate Bruce's problems with being a perpetual trainee. I wrote the program, but it is my children who occasionally make it through the inner circle and on to a treat Bruce and I may never experience, the Mother Maze. For those of you contemplating the challenge, you may not be aware that *Harmonyes* and *Color Connection* merged. *Maze Runner* (and my other programs: *Amortization*, *Match & Spell*, *TIC-TAC-TOE MATH* and *DIET-ADE*) can now be purchased from *Color Connection Software*, 1060 Buddlea Drive, Sandy, Utah 84070. The price is the same.

Dennis O. Dorrity
Color Connection Software

DATALIST

Editor:

We would like to thank *RAINBOW* and Gary Smith for the complimentary review of *DATALIST* in the March 1985 issue [Page 218].

The latest version of *DATALIST* provides the additional capability of totaling any or all fields for report purposes. There is now a disk version of *DATALIST* with the added feature of allowing tape files to be loaded by the disk version.

We hope these comments will be helpful to your readers and we commend Gary Smith for his fine review.

Arlin Karger
Computer Associates, Inc.

BURNER+

Editor:

I would like to thank *RAINBOW* and Mr. Ellers for reviewing our product, the *Burner+*, in the February 1985 issue [Page 228]. Overall, the review was very complimentary with only two minor errors.

Mr. Ellers pointed out that the *Burner+* will program the 2708 EPROM. The 2708 is an old 1K EPROM that is very rarely used today. The reason for this is that the 2708 requires three separate power supplies (+5V, -5V, and +12V). The *Burner+* will only program single supply (+5V) EPROMs. Luckily, multi-supply EPROMs are not used in modern systems.

In regard to 16K EPROMs (27128), Mr. Ellers stated that the last few hundred addresses of these cannot be programmed. This is not true. The entire 16K of these EPROMs can be programmed by the *Burner+*. The only restriction is in reading the last 256 addresses when you deselect Disk BASIC. This means you could have Disk 1.0 in one half of the 27128 for compatibility's sake, and some Super DOS in the other half for all those special features. This EPROM could then either stay in the *Burner+* or it could be mounted inside the controller to free up the *Burner+*.

Once again, thanks to Ed Ellers and *THE RAINBOW*.

Peter Pollak
Pollak Electronics

Custom Software Engineering, Inc.

807 Minutemen Causeway (D-2), Cocoa Beach, Florida 32931

(305) 783-1083

For information or technical support, please call between 9:30 and 8:30 P.M. Eastern time.

GET YOUR LIFE ORGANIZED

DATE-O-BASE CALENDAR

puts YOU in charge of your schedule!

- Graphically displays any monthly calendar between 1700 and 2099. You put in up to twelve 28 character memos per day... calendar shows where the memos are... call up of day shows details.
- Use for appointments or a log of past activity.
- Search capability allows you to list or print all memos between two specified dates or only ones meeting key-word criteria.
- Date computation shows elapsed time between two dates in days, weeks, months and years.
- Printed graphic calendar available with optional Screen Print Program.
- Requires 32K in BASIC

TAPE DATE-O-BASE CALENDAR - \$16.95 (max. 400 memos/tape file)

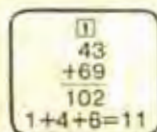
DISK DATE-O-BASE CALENDAR - \$19.95 (over 4000 memos/disk... max. 300 memos/month)



GRAPHIC SCREEN PRINT PROGRAM

Works in all PMODES and lets you shift screen image anywhere on the printed page.

- Relocatable code lets you use all of your 16K or 32K machine.
 - Available in Color Basic 1.0 and 1.1/1.2. Use EXEC 41175 to see which you have and SPECIFY WITH ORDER.
 - SPECIFY PRINTER TYPE... in Machine Language.
- \$7.95** - TRS-80[®] LP-VII/VIII & DMP 100/105/200/400/420
\$9.95 - Epson GRAFTRAX[®], NEC[®] PC 8023 A-C, IDS 440/445, Paper Tiger[®] 460/560, Micro Prism[®] 480, Prism[®] 80/132 (with dot plotting), TRS-80[®] DMP-120, DMP-110, TDP-1, PROWRITER[®] Centronics 739, Microline[®] 82A/83A (with Okigraph 1) /84/92/93, Star Micronics, Inc. GEMINI 10/10x/15 and Gorilla Banana (Trademarks of Tandy Corp., Epson America, Inc., C-Itch, NEC America, Okidata Corp., Integral Data Systems, Inc.)



HELP YOUR CHILDREN HELP THEMSELVES

MATH TUTOR

- 5 Programs in 1... ranges from simple addition through long division with 4 levels of difficulty.
- Requires regrouping to be shown... provides for trial quotients in long division.
- Shows how to correct errors... step by step approach stresses accuracy.

\$13.95 in BASIC

SPELLING TEACHER

- Teaches students their own word list... tape or disk files hold up to 200 words each.
- Suitable for any level from kindergarten to college.
- Misspelled words are retaught to reinforce correct spelling.
- Words presented in 4 lively formats - study, scrambled word game, trial test, final test.

\$12.95 in BASIC

PUT YOUR FINANCES IN ORDER

DISK DOUBLE ENTRY

If you have spent hours trying to balance your Debits and Credits, DISK DOUBLE ENTRY is for you!

- Designed for small business, club and personal use.
- Enter transactions in a journal type format. Program will maintain current account balances, produce Trial Balance, Income, and Balance Sheet reports and complete Account Ledgers.
- Will handle up to 300 accounts including report headings and totals.
- Up to 1400 average transactions on a diskette.
- Summary reports and four levels of subtotals available.
- Requires 32K and an understanding of standard double entry accounting concepts.

\$44.95 in BASIC with Machine Language subroutines

STATEMENT WRITER

For use with (and requires) Disk Double Entry

- Produces statements suitable for billing from your Receivables accounts.
- Provides account summaries and mailing labels to use with your statements.
- Designed and documented to allow you to change formats to accommodate your own special needs.

\$34.95 in BASIC

That's INTEREST-ing

Let your computer do some REAL computation!

- Helps you solve problems dealing with time, money, and INTEREST!
- AMORTIZATION TABLES any way YOU want them... even lets you change any terms mid-schedule!
- Calculate Present Value, Future Value, Capital Recovery for any combination of payments you specify.
- Rate of Return computation predicts how hard your money will be working for you!
- Computes Bond yields... current and to redemption.
- All answers available on screen or printer.

\$29.95 in BASIC

ALPHA-DRAW

Works great with GRAPHIC SCREEN PRINT PROGRAM!

- Subroutine designed to let you add any keyboard character to your graphic displays.
- You define X and Y coordinates and a string variable of one or more characters... ALPHA-DRAW does the rest!
- BONUS - includes instructions for a true line-numbered merge of tape files.

\$8.95 in BASIC

ALL PROGRAMS require Extended Color Basic and are delivered on cassette. All, except Tape Date-O-Base Calendar, are DISK System compatible.

U.S. and CANADA add \$1.00 per order for shipping. Overseas \$2.50 per order. All prices in U.S. dollars. Florida residents add 5% sales tax. Return within two weeks if not completely satisfied.



For VISA and Master Card orders: Include type, account number, expiration date, signature and phone number. Sorry! No COD's.



RAINBOW
CERTIFICATION
SEAL
ALL LISTED
PROGRAMS

Release Earth From Alien Invasion In *Galactic Fighter*

Earth has been invaded by aliens who have been forced to leave the planet Dracoz because of an agricultural shortage and overpopulation. You, as the pilot of the secretly developed ultimate spacecraft, are humankind's only hope for survival.

That's the theme of *Galactic Fighter*, an arcade-quality space game developed and marketed by Four Star Software. And while neither the theme nor the action within the game are completely original, the graphics are good, the action is fast and the challenge is continuous.

The invaders have used fusion bombs to destroy most of the earth. Cities have been obliterated to make room for fields. And survivors are being herded by the millions into prisons. Your mission is to deliver a device to Dracoz that will end the assault on Earth.

Obviously, that's easier said than done because in order to get to the other planet, you're going to have to survive wave upon wave of flying objects — some of them natural debris that you'd expect to encounter in space, such as asteroids and meteors. Others take the shape of guided missiles, alien fighters and enemy transporters.

As the game begins, you are given the option of setting the level of play — easy, medium and hard. You probably should start at the lowest level since all three levels are

fairly difficult. You receive five turns per game, with an opportunity to earn an extra turn for every 25,000 points you put on the scoreboard. Points are allocated as follows: asteroids, 25; meteors, 50; missiles, 200; fighters, 250; transporters, 500. When you reach 25,000 points, you enter a laser trench. There's no relief there because the aliens have already arrived.

Meteors and asteroids flow toward you continuously from the left side of the screen during your mission. Fighters usually appear first at the upper right-hand corner, cross the screen and then attempt to knock you out of the atmosphere — either with bullets or by bumping into you. From below missiles are launched, sometimes by the dozens.

If things get too far out of control, you have an option of pressing the space bar to destroy all enemy objects on the screen. You can only use this option twice, however. There is a pause feature, but if you wait until an object is right upon you, it's going to get you sooner or later.

The only thing working against *Galactic Fighter* is that it's the latest in a long, long line of space games. If that doesn't bother you, you will enjoy this challenging and nicely done effort. You may even spend hours trying to save the Earth like this reviewer did.

(Four Star Software, P.O. Box 730, Streetsville, Ontario, Canada L5M 2C2, tape \$19.95 U.S., \$24.95 CDN., disk \$24.95 U.S., \$29.95 CDN.)

— Charles Springer

128K THE EASY WAY AS SEEN IN DECEMBER '84 RAINBOW

Fully compatible with Models
'D', 'E', 'F', & CoCo II (USA)
FULLY POPULATED LOGIC BOARD

\$39.95

with instructions

Logic Board with 64K Socketed Ram

\$109.00

64K socketed memory required
PLEASE SPECIFY BOARD WHEN ORDERING.

SPECIAL

10 SS/DD DISKS \$10.00 PER BOX

128K SOFTWARE

FHL XEX	99.95
STAR DOS 128K	59.95
PRO COLOR FILE	59.95
128K DRIVE 3	24.95
BASIC MEMORY MGMT.	39.95
128K OS-9 IN MEMORY DRIVE	34.95

DEALER ORDERS WELCOME

SEND FOR FREE CATALOG

DSL COMPUTER PRODUCTS INC.



P.O. Box 1176, Dearborn, Mi. 48121 Phone: 313-582-8930

Michigan Residents add 4% Sales Tax to Order. Please include \$2.00 for S. & H.



Detroit Metropolitan Area

Vist Us at 4950 Schaefer near Michigna Ave. Dearborn

In Canada you can order these items from
R&R COMPUTER PRODUCTS
P.O. BOX 7105 SANDWICH
WINDSOR, ONT. N9C 3Z1
519-255-9113

Now from Falsoft, The RAINBOW MAKER, comes . . .



The monthly magazine that's reader-friendly

PCM has gone through quite a number of changes lately! We've extended our coverage to include the newest Tandy computers, increased our number of pages, and because our old name sounded a bit stuffy (" — The Magazine for Professional Computing Management"), we changed it to the more reflective and friendlier "PCM — The Personal Computing Magazine for Tandy Users."

Now, we cover five of the most exciting computers on the market, as well as the most productive — the highly popular Model 100; a brand new portable, the Tandy 200; and Tandy's new MS-DOS computers, the Tandy 2000, Tandy 1200 and Tandy 1000.

FREE PROGRAMS!

We learned from THE RAINBOW that readers want programs to type in, so, each month we bring you an assortment of them, including games, utilities, business applications and graphics.

BAR CODE, TOO!

Also, PCM is the only computer publication in the world (that we know of) that brings you programs in bar code, ready to scan into memory with the sweep of a wand!

TUTORIALS GALORE

Add to this our regular tutorials on telecommunicating, hardware and machine language, as well as BASIC programming tips and product reviews, and we think you'll find we're one of the most informative and fun magazines on the market today.

So if you're ready to add portability or step up to MS-DOS, stay with Tandy and THE RAINBOW family through PCM.

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

Name _____

Address _____

City _____ State _____ ZIP _____

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

My check in the amount of _____ is enclosed.

Charge to my: VISA MasterCard American Express

Acct. # _____ Expiration Date _____

Signature _____

*Canadian subscribers add U.S. \$7. Surface rate elsewhere \$85. Allow 5-6 weeks for first copy. Kentucky residents add 5% sales tax.

Mail to: PCM, The Falsoft Building, Prospect, KY 40059

Help Us Battle the High Cost of Disk Drives



**NOW . . .
V-PRINT**
A utility to print
directory on paper
\$9.95



New Lower Price Un-DISK Drives ~~\$49.95?~~ **\$34.95**

You Bet! There are empty spaces in your 32K and 64K CoCo. The Preble VDOS Un-DISK helps you fill them up with PROGRAMS!

- Un-DISK uses your computer's extra memory like a fast disk drive.
- Un-DISK can store BASIC and MACHINE LANGUAGE programs.
- Un-DISK is INVISIBLE. Yup! Un-DISK does not interfere with normal Color Computer Operation.
- Un-DISK appears only when you type the magic word VDOS.
- Un-DISK comes with comprehensive instructions which you may not need because:
- Un-DISK is self-prompting and easy to use!
- Un-DISK is provided on cassette.
- Un-DISK is faster than a slow clumsy DISK DRIVE and best of all . . .
- Un-DISK is CHEAPER than a DISK DRIVE!
- Un-DISK will work even if you already own a disk but WHY BUY A DISK AT ALL?
- Un-DISK should be in the library of every serious CoCo user even if you own a disk says Frank J. Esser, independent reviewer for RAINBOW Magazine!

OK sure, disk drives ARE NICE. I own one. But if your finances are limited, the Un-DISK can give you much of the power of the mechanical drive. Even if you already own a disk the Un-DISK can work like a super fast extra disk.

**EXTRA . . . EXTRA . . . EXTRA . . . EXTRA . . .
Additional Power For \$14.95**

Only with VDUMP for the Un-DISK!

- VDUMP lets you make a cassette backup copy of everything stored in the Un-DISK.
- VDUMP lets you save 5, 10, 15 or more programs on a single cassette tape file.
- VDUMP lets you switch Un-DISks. With a single load operation replace a group of financial programs with a set of children's programs. (The new VDUMP tape overwrites the old.)
- VDUMP can allow you to save a whole lot of RAINBOW ON TAPE in a SINGLE file.
- VDUMP is the perfect companion to the Preble VDOS Un-DISK.

Available from Doctor Preble's Programs, naturally! Bringing you fine Color Computer Products Since 1983!

The Preble VDOS Un-DISK **\$34.95**
The Preble VDUMP \$14.95
Shipping & handling
U.S. and Canada \$1.50
or \$5.00 to other foreign points

VISA and MasterCard accepted



Order From:
Dr. Preble's Programs
6540 Outer Loop
Louisville, KY 40228
(502) 966-8281

Canadians may order from Kelly Software

Congress Takes You On A Presidential Quest

By Theodore S. Arrington

Leadership of Congress is one of the most challenging and important tasks of the American presidency. Yet many citizens have little understanding of the nature of this relationship. One way to learn about this part of the political world is to be elected to office and get on-the-job training. If that is more commitment than you can manage right now, a computer Simulation, such as the one written by Jeff Stevens of B-5 Software, is the next best thing.

His program, appropriately called *Congress*, is not just a game or merely a teaching program. It is a true Simulation. When a computer program copies something from the real world with careful attention to the accurate reproduction of essential parts and their interrelationships, this is called a "Simulation."

Congress requires 32K and Extended BASIC. I reviewed the disk version which loaded without any problems and can be backed up with normal procedures. The documentation is adequate, clearly written and includes hints on the use of the software as a teaching aid.

The Simulation first gives the user a Hi-Res picture of the Capitol and some music; then comes an application form to apply for the presidency. This gives the computer information on the user and sets some variables in the Simulation, such as the president's party. The application has a place for the user to give his/her name, which allows the computer's responses to be personalized.

The computer then asks the new president/user to choose between two possible policies on each of a number of prominent political issues. These issues are current, but may seem dated to students in two or three years. In most cases, one of the choices offered on each issue is conservative and one is liberal, but these choices are not strategic. That is, if the Congress is overwhelmingly Democratic, then a president would find it easier to push liberal measures through than conservative ones. This is not the case here, as this element of strategy has been simplified away. The policy choices are merely to give the user the feeling of pushing policies he/she believes in.

The user also chooses which party to join. This is an important choice, because the computer will determine the party lineup in each house of Congress by a random function at the beginning of each game, and the proportion in the president's party in each house largely (but not totally) determines success. The user has to choose a party before knowing the outcome of the election.

All this is true to life in that party is the most important variable in presidential success in Congress and a president's party may do relatively well or badly in congressional elections. It would be nice if the program had a version in which one could pre-set the party proportions. Because the party division changes for each game, it is hard to tell which strategies are most effective. For example, in one round my party might be the minority in each house. I might make all the right strategic decisions and still get a very low score. In the next round I might make wrong choices, but win because my party dominated both houses. While this is very realistic, it might not aid learning as

much as a separate version which allows the setting of this important variable.

The president/player also gets to choose which of several states he/she wishes to bless with pork barrel benefits to help win support for the rest of the president's program. I assume that it is best to choose the most populous states, but I can't tell because the effect of party realistically wipes out the effect of pork barrel choices. This means I would have to play hundreds of games and record the results to detect the proper strategy — or sneak a look at the code.

Then the game starts. Simple Y/N or numerical choices from a menu allow the president/user to make choices. The program is interesting visually and includes good error trapping. For example, if the choices are '1' to '6' and one types anything else, it sounds a musical note and prompts one to try again. The only annoying feature is that between parts of the game and at the end the computer draws a Hi-Res picture of the American flag and plays one of several patriotic songs. One should be able to cut these musical interludes short by pressing ENTER.

In play, the user must choose which policy to push first. There is no sign that this is a strategic choice, except that one might run out of time before everything is passed. Thus, the player might first push the policy he/she most favors. This would not yield more points, but might make a psychological difference. The Simulation realistically places time limits on the player, but this is not "real time." Rather there is a 24-month counter in the game to reflect the two-year term of Congress. As one tries to push pieces of legislation through the various parts of the legislature, this counter slowly ticks away.

During the play, the computer tells you where your

One-Liner Contest Winner . . .

1LineZap is a one-line disk zap program that will allow users to look directly at all sectors on a disk to see what they contain. At the bottom of the screen are two numbers; the first is the track number (between zero and 34) and the second is the sector number (between one and 18). You can change tracks and sectors using the four arrow keys. If you get an ?FC Error message, it means you are trying to read a track or sector that is not on the disk. If this happens, simply run the program again.

The listing:

```
Ø CLS: CLEARØØ: T=17: S=1: FORC=Ø TO
1STEPØ: DSKI$D, T, S, A$, B$: PRINTØØ:
PRINTA$; B$: PRINT@384, T, S: I$=INKE
Y$: IF I$="^" THEN T=T-1: CLS: NEXTELS
EIF I$=CHR$(8) THEN S=S-1: CLS: NEXTE
LSE IF I$=CHR$(9) THEN S=S+1: CLS: NEX
TELSE IF I$=CHR$(1Ø) THEN T=T+1: CLS:
NEXTELSNEXT
```

Eric Tilenius
Huntington Station, NY

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

legislation is in the congressional process. Thus, with repeated usage the player will learn the complicated procedures of the Congress. The programmer has, in part, simplified these procedures. One example is that most legislation can originate in either house, and most bills are introduced into both houses at the same time, but in *Congress* it is described as if a bill starts in the House of Representatives and then goes to the Senate. However, sometimes action in committee is so fast that the player cannot really tell what is going on and appreciate the process. (Subcommittees and the Rules Committee in the House of Representatives are simplified out of existence.)

Occasionally, the process stops and the computer asks whether the player wants to use one of the favors that members of Congress owe to reduce the number of amendments to a bill, discourage new amendments, or help passage. These prerogatives or tools for persuasion are limited in number. Thus, the president/user learns the value of conserving resources to gain maximum advantage. If the president's party has sufficient support in both houses and he/she uses these resources properly, then some bills will get through Congress with few amendments.

This success determines the score. The rate is 100 points per bill for a maximum of 500 points. Less than 100 points is awarded if Congress attached more than five amendments to a bill. After 10 amendments, one actually loses points if the bill is signed or passed over a veto. Deciding whether to sign a bill with five to ten amendments or veto it is realistically tricky, but the Simulation could be better if the threat of veto could be applied earlier.

For example: "The committee tells me that they can pass your bill with six amendments. Will you sign such a bill?" The player would then have to decide whether to take this "half a loaf" or threaten veto and try to get a better deal by using some owed favor. This illustrates my main criticism of the program: that the president is too much of a bystander to the process. He/she makes decisions to affect the outcome only sporadically. This feature is true to life, but it serves to teach the frustrations of the presidency at the expense of greater learning about how presidents persuade members of Congress, and other political actors, to go along.

When the president/player gets all of his/her legislation passed or runs out of time, the computer tallies up the score. It then compares the performance to that of other presidents. If you do very poorly, it compares you to Jimmy Carter and suggests that your popularity is comparable to that of Nixon during Watergate or Johnson during the Vietnam War. If you do somewhat better, you may be compared to Jefferson or Truman.

My suggestions for improvement should not imply that this is a bad piece of software. On the contrary, *Congress* is a super program. It simulates and teaches some very important political concepts: Congressional procedures, conservation of political resources, importance of party support, allocation of resources, the importance of big states, the feeling of helplessness as Congress works over programs, and the fact that the opportunity for presidential influence is sporadic. Moreover, it is interesting and fun to play, at least for a while.

It should be used, however, in the manner suggested in the documentation. It is of limited use if a teacher just gives it to a student and says "Here, go play with this and be quiet." The student needs to talk the strategies over with other students and be led by a knowledgeable instructor. When used in this way, I think *Congress* is appropriate, as the manufacturer suggests, in any grade from junior high school and up. It would even work at the state university where I teach. If I could only get Congress to approve more money to buy additional CoCos!

(B-5 Software, 1024 Bainbridge Place, Columbus, OH 43228, cassette \$29.95, disk \$31.95)

BASIC COMPILER

WLBASIC 1.0 - BASIC COMPILER

WASATCHWARE is pleased to introduce what we feel is the most comprehensive BASIC Compiler available for the Color Computer. This BASIC Compiler, called WLBASIC, is for programmers who want to create machine language from BASIC programs. Written in machine language, WLBASIC will prove to be the most powerful utility on your shelf.

COMMANDS SUPPORTED

- I/O -Commands**

CLOSE	CLOADM	CSAVEN	DIR	DRIVE	DSKIS
DSKOS	FIELD	FILES	GET	INPUT	KILL
LSET	OPEN	PRINT	PUT	RSET	
- Program Control Commands**

CALL	END	EXEC	FOR	STEP	NEXT
GOSUB	GOTO	IF	THEN	ELSE	ERROR
ON..GO	RETURN	STOP	SUBROUTINE		
- Math Functions**

ABS	ASC	ATH	COS	CVY	EOF
EXP	FIX	INSTR	INT	LEN	LOG
LOC	LOP	PEEK	POINT	PPRINT	RND
SGN	SIN	SQR	TAN	TIMER	VAL
- String Functions**

CHR\$	INKEY\$	LEFT\$	MID\$	NRK\$	RIGHT\$
STR\$	STRINGS				
- Graphic/Sound Commands**

COLOR	CLS	CIRCLE	DRAW	LINE	PAINT
PCLEAR	PCLS	PLAY	PWIDE	PRESET	PSET
RESET	SCREEN	SET	SOUND		
- Other/Special Commands**

DATA	DIM	LLIST	MOTOR	POKE	READ
REM	RESTORE	RUN	TAB	VERIFY	OLD
DOT	ISHFT	LREG	PCOPY	PWDD	PTY
REAL	SREG	SWP	VECTD	VECTI	

WASATCHWARE believes that the 8008 based microcomputer is powerful enough to warrant such a compiler. WLBASIC is a BASIC compiler that allows structured programs (using SUBROUTINE), full floating point arithmetic and other features not available with interpreter Basic programs.

Tape- \$69.95
Disk- \$69.95
Both- \$74.95

64K Required



WasatchWare

7350 Nutree Drive
Salt Lake City, Utah
84121

Call (801) 943-6263

Add \$4.00 Postage and Handling
Send check or Money order.
No C.O.D.. Utah res. add 5% tax.

One-Liner Contest Winner . . .

This one-liner will, whenever you input a command, produce what looks like a cold start. It will run on any CoCo, but you should modify it to match the computer you use.

The listing:

```
1 CLS:PRINT"DISK EXTENDED COLOR
BASIC 1.0 COPYRIGHT (C) 1981 B
Y TANDY UNDER LICENSE FROM M
ICROSOFT":PRINT"OK":LINEIN
PUT"";L$:CLS:FOR T=1TO1500:NEXT
T:GOTO1
```

Jeff White
Tampa, FL

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



VIEW II: Slow Scan TV At A Price That Can't Be Beat

If the true reason were known for my interest in computers, especially the CoCo, I would have to use ham radio as a starting point. I have said all along that in addition to having one of the most advanced microprocessors, the CoCo's peripheral ports are there, limited only by the programmer's ingenuity. Needless to say, when I received the *VIEW II* package for review, I was elated at the prospect of transmitting and receiving SSTV (Slow Scan Television) just by a direct connection between my ham transceiver and my cassette port.

Actually, this review covers two separate products. *VIEW II* is the software necessary to convert your CoCo into an 8.5 second black-and-white slow scan transceiver. The *Coco Grey* is a hardware modification to the CoCo that allows a Hi-Res screen of 128 by 128 pixels with 16 gray levels.

Another product, called *View-Edit*, consists of a package of image generation and enhancement utilities that allows editing of all types of graphics information. *View-Edit* will be reviewed at a later date.

To use *VIEW II*, you must have a 64K CoCo and at least one disk drive. A monitor is necessary for the *Coco Grey* as it provides composite video out.

As you may know, there are a few packages on the market for the reception of SSTV with the CoCo. They all require extensive modification to the CoCo in the way of external hardware. With the *VIEW II* software, you just input SSTV audio onto your cassette port and watch the picture appear on your screen. Sending a picture is just as easy; just plug the output of your CoCo into your transmitter.

There are several utilities for storing and retrieving pictures from disk. If a picture is received that you really like, saving it to disk is a snap. Conversely, the pictures you wish to send can be loaded from a menu-driven routine that allows picture selection by the touch of one key. All of the features of *VIEW II* can be accessed by either the keyboard or a joystick.

One nice feature of *VIEW II* is a digital zoom feature. Upon selecting zoom, a one-quarter size rectangle appears allowing you the choice of which part of the picture you wish to enlarge. It is fun to watch the process as it is accomplished on the screen.

Another utility allows screen dumps of the image in memory. Drivers are included for Epson, PMC and DMP printers. We used the Epson driver for a Gemini-10X and it worked fine.

With *VIEW II* you are given the software to convert images produced by the Micro Works DS-69 Digisector to a *VIEW II* format. This is nice for live pictures, or maybe snatching screens from TV or video tapes. The images can then be stored in the *VIEW II* format.

The standard Hi-Res screen of the CoCo can only produce five levels of gray. This is OK, but not acceptable for most video information. To remedy this situation,

SoftCircuits has designed a hardware board using advanced real-time video enhancements to provide 16 gray levels.

The board measures 2.5 by 2.9 inches and fits on a piggyback socket arrangement on top of the 6847 VDG chip. I have an 'E' Board and had to permanently remove part of the top shield for the connection to the VDG. Elaborate instructions are given on installation on the various CoCo boards.

The *VIEW II* software is the actual SSTV package, but it is greatly enhanced by the *Coco Grey*. Pictures were actually sent and received with this combination. Several demo pictures are provided on the disk which attest to the quality of video that is possible. I am not trying to say this is the best SSTV receiver I have seen, since obviously the filtering on some commercial units is far superior to the zero crossing detector used in the CoCo. At the same time, from an economic standpoint, it can't be beat. I'm on slow scan now for less than \$150 and can do things with pictures that people with 10 times that amount invested can't do!

(SoftCircuits, 401 S.W. 75th Terrace, North Lauderdale, FL 33068, *VIEW II* disks \$24.95 each, *VIEW-EDIT* disks \$24.95 each, *Coco Grey* \$100)

— Dan Downard

UNDERCOLOR

Finally, a newsletter that will keep you up to date on the latest Color Computer Developments.

SUBSCRIBE TODAY!

- Yes, enter my subscription to UNDERCOLOR
- 1 year \$33.00 2 years \$66.00
Canada/Mexico
- 1 year \$47.00 2 years \$94.00
Overseas
- 1 year \$53 US dollars
 Airmail \$65 US dollars

Name _____

Address _____

City _____ State _____ Zip _____

Mail to: ColorPlus, Box 6809,
Roxbury, VT 05669 or
call (802)485-6440

ColorStat — A Good Statistical Program For Beginners

By J.B. Garner

I have taught, researched and consulted in statistics since 1961, and for the last 12 months I have been using my CoCo to perform statistical calculations on small data sets. Color BASIC contains good mathematical subroutines and is an easy, flexible language with which to program (especially when enhanced by the J&M DOS). With CoCo, I have been able to perform logistic regression and other routines which some well-known mainframe statistical packages, such as SPSS (Version 8) are unable to do.

ColorStat is a small program on tape which enables the user to construct a data file of limited size and then perform various limited statistical calculations on the data it contains.

The uses of the program are very clearly explained in a well-produced 49-page manual. This manual is about the clearest and best produced I have seen. However, it explains how to use the program, not how to understand the program's output.

The first menu offers data file maintenance, descriptive statistics, frequency distribution and histogram, correlation/linear regression (and the paired sample t-test), prediction from this regression equation, multiple regression (with two independent variables), and analysis of variance for the

one-way experimental design. The data file maintenance section guides the user on how to prepare a new file, rename the present file, rename a variable, add records to a file, display, update, print a file, read a file from tape and to write a file to tape.

Files are produced in the usual statistical layout by placing the data into a rectangular array with rows representing subjects, such as people or animals, and columns representing the variables, such as age, weight, height measured on each subject. The program describes each row as a "record," and carefully guides the user to make an appropriate data file.

In the 16K version of the program, a DIM statement in the first line limits the user to 75 records of six variable values each. On the reverse side of the tape, a 32K version of the program appears identical, apart from lines 1 and 9500, allowing 500 records of six variables each. With some tenacity, these limits may be altered by the user.

The program is written in BASIC and may be placed on disk, listed, copied or altered without any problems. The only time a POKE statement is used is to determine whether the printer is ready. The use of BASIC allowed me to see exactly how each calculation was performed and to be able to make this review more helpful to the reader.

If you wish to use a disk, you should change the device number of certain input and output statements; if you wish to print the histogram or scatterdiagram on the CGP-115, you must remember to switch to the 80-column mode (as these diagrams are printed by means of X's and zeros). All program output may be switched to a printer to give a permanent version, as may a copy of each record.

In trying to use the program without reading the manual the only difficulties I had were the abbreviations "DV" for the dependent or outcome variable, and "IV" for the independent or input variable.

The output for descriptive statistics gives the mean (average), sum, sum of squares (not the more usual sum of squared deviations!), standard deviation (divisor N), standard deviation (divisor N-1), the minimum and the maximum, for any selected variable.

The output does not give the sample size, the standard error of the mean or the name (or number) of the relevant variable. The distribution/histogram choice gives a frequency distribution in, at most, five (equally spaced) cells and a corresponding block diagram in attractive colors. The axes of the block diagram do not contain any labeling. The manual advises this may be added by means of the GRAPHIC package (Cat. No. 26-3157/Cat. No. 26-3251).

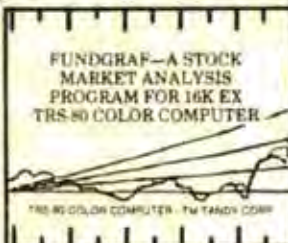
The correlation/linear regression selection gives the means of the two variables, the correlation between them and the slope and y-intercept of the regression of 'y' (the DV) on 'x' (the IV). It does not give the t-test value for the correlation (slope), the sample size, the standard error of the slope or the standard deviation of the scatter about the regression line. On the other hand, if 'y' and 'x' were paired samples (such as scores on the same people before and after treatment), the program does print out the value of the relevant paired t-test and its degrees of freedom. A Lo-Res scattergram with or without a plot of the regression line is available. The prediction selection, made after the correlation selection, prints out the predicted 'y' value for any 'x' value you may wish to input. The standard errors of these predictions are not given.

Choosing multiple regression enables you to regress one variable on two others. In this section the printout is

STOCK & FUND INVESTING with the TRS-80* COLOR COMPUTER USE FUNDGRAF AND FUNDFILE

FUNDGRAF is a stock market analysis program that not only graphs and analyzes funds or stocks, but also makes decisions on when to BUY and SELL. Improve market timing using your COCO.

GRAPHS fund's progress (up to 200 weeks); SUPERIMPOSES for comparison: a line of constant percent growth or a graph of any other fund (or stock). CALCULATES over any time span: the percent price change and the moving average (any span); INDICATES BUY and SELL signals. FUNDGRAF requires 16 K ECB min.
16:32 K Tape \$49.95
16:32 K 5 in. Disk \$69.95
ADD \$2 handling on all orders.



FUNDFILE is a portfolio and account management program for securities. Manage single or multiple portfolios of stocks, mutual funds, bonds, money market funds, etc. FUNDFILE allows easy maintenance of all your records for accurate portfolio evaluation. NEW 32 K VERSION of FUNDFILE summarizes all transactions (dividends, interest, purchases and sales) between any two dates of your choice - weekly, yearly, etc. Categorizes interest and dividends paid as to tax liability (tax free, etc.) and capital gains as long or short term. Great for tax reports.

FUNDFILE REQUIRES 16 K ECB min. and 80-COL. PRINTER.
5-in. Diskette only for 16 K ECB \$27.95
5-in. Diskette only for 32 K ECB \$37.95
ADD \$2 handling on all orders.



Write for free brochure for details. Dealer inquiries invited.

PARSONS SOFTWARE, DEPT. G
118 WOODSHIRE DRIVE
PARKERSBURG, WV 26101

essentially complete. Unfortunately, as it stands there is a flaw in the program. Using the data given in the manual, namely four records containing age, sex and income, and repeatedly running the multiple regression of age on sex and income, I obtained a different equation on each occasion! The problem is that one accumulating variable, X2(6), is not cleared to zero before use. Change J=1 TO 5 to J=1 TO 6 in Line 8500 to remove the difficulty.

The final selection enables the user to obtain a one-way analysis of variance together with the means and standard deviations of the separate treatment groups. Here the omission of the separate sample sizes is more of a difficulty, and in Line 6820 the denominator of the expression for the standard deviation appears incomplete, 'N' being written for (NI(J)-1). The result is that the standard deviations given by the program are (very often) incorrect.

Minor errors I have found in the manual are stating the filename to have a maximum of eight characters whereas the program, Line 265, allows 10; the DF BETWEEN in the table on Page 39 should have value one, not zero; the suggestion that data values may be up to 15 characters in length on Page 11 (Color BASIC stores about nine significant digits). The main drawback to the manual is the lack of a small appendix giving precise definitions to each term used in the various outputs. For example, the descriptions on the descriptive statistics section are not consistent with those used later. I had to work through the program in order to be clear about the definition of each term.

Considerable care has been taken to make the screen appearance attractive and the creation of data files straightforward. Less care has been taken with the selection of presented statistics and the programming details.

Statistics is now being taught in high schools, and with these two small programming errors corrected, this would be a useful accompanying program. It does not quite cover the curriculum of the usual college introductory statistics semester.

Standard error of the mean, single sample t-tests, the binomial distribution and chi-square analysis of contingency tables are not contained in *ColorStat*. If the formulas for the output results had been given, then this would have been a very useful program for people attempting to learn statistics by themselves, as it would have removed the drudgery and allowed them to concentrate on the new ideas.

(Radio Shack stores nationwide, cassette \$34.95)

One-Liner Contest Winner . . .

Design draws a box that shrinks and changes shape.

The listing:

```
10 PMODE3,1:SCREEN1,1:PCLS:FOR Q
=1TO5:X1=0:Y=191:X3=255:FOR Z=1T
O 190:COLOR RND(8):LINE(X1,X1)-(
X3,Y),PSET,B:X1=X1+1:X3=X3-1:Y=Y
-1:NEXT Z,Q
```

Dan Wittig
Warren, PA

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

CoCo Professional Tax Preparer Is An Excellent Tax Aid

Are you tired of seeing your computer sit around doing nothing? Would you like to make some extra dollars by using your CoCo? Would you like to do your own taxes just like the professionals without paying the professionals?

If you answered yes to any or all of the above questions, then you owe it to yourself to read on.

Micro Data Systems has made available a program that can do all of the above. The program is called *The CoCo Professional Tax Preparer* and was designed by a tax consultant with 15 years experience. The program runs in 32K memory and requires one or two disk drives. The package consists of a professionally prepared one-inch notebook binder compiled of approximately 350 pages packed full of perfectly written documentation along with step-by-step examples.

The manual is broken down into eight color-coded sections consisting of: General, Income, Adjustments, Itemized deductions, Tax computation, Credits, Other taxes, and Appendix. Whatever section you are in need of, it is just a matter of flipping straight to the section for a detailed description of that particular category.

Also included in the package is a file containing all of the government income tax forms. An added extra is a book called *Miller's Personal Income Tax Guide* (a \$7.95 value). This book offers detailed step-by-step worksheets that take you line by line through complex tax calculations, which is ideal for the beginner who has never completed a tax form before. Together with the program and the tax preparation book, it makes income tax calculating a breeze.

The program consists of four diskettes, three program disks and one data disk. All disks are not copy-protected, which allows the user to make backup copies. After initiating the system, the program will prompt you with entering one or two drives. If two drives are entered, you can then place program disk #1 in Drive 1 and the data disk in Drive 2. If only one drive is selected, you must switch the program disk and the data disk as the program requests.

After you have completed the above section you will be asked to input one of the following: review of a tax return, new tax return or print return. If you select "review return," you will be presented with the main menu. You

→ CANADIAN PAYROLL ← OPTION 4 1-9-84
1-7-83 BY VGS

RAINBOW
OPTION 4

C.C.M.S.

EXCEPTIONAL... EXCELLENT... SOFTWARE... BEST
TO USE EVEN FOR NEWCOMERS TO COMPUTERS...
..... A DEFINITE ASSET TO ANY COMPANY!

IS FOR YOU..... NO CHANCE OF UNHEAVILY
LOADING DATA..... IS A SPECIALIZED PRODUCT...
..... BANGS, WELL ORGANIZED EASY TO FOLLOW!

FEATURES
*ALL PROVINCES & TERRITORIES/AUTO. S.I.N. VALIDATION
*FORMATTED SCREENS/FULL FORMAT TRAPPING/ANY PRINTER
*ANY PAY PERIOD/SATCHED CHECKS/NO TALKED PAY STUBS
*TOTAL COST/DUTY ALLOCATIONS/YEARLY USER UP-DATABLE
*ALL MEDIA TRANSFER/BACK-UP/PABLE/PASSWORD PROTECTED

REQUIRES: 32K KBM COLOUR COMPUTER/TOP 100/SINGLE DISK
CONDENSED PRINTER MODE..... ONLY \$149.95 (CASH)
NEW! NUMBER 99 (P.47)

CALCULATES
*12 OR MULTIPLE PAY RATES/C.P./PHEALTH/ILL. I. CERT/LEAVE
*SCHEDULED PAY ANY PERIOD/CALCULATED HOURS *MEMBERS

YGS IN ALL BUSINESS PO BOX 308
VISA 1-705-484-5491 BRIDGEMAN, ONTARIO
APP-7PM EST ONLY PLEASE L6H 1B0

will be asked to place an 'X' beside all of the categories you wish to review. The program will then review any of the categories that you have selected.

If you chose "new return," you will again be presented with the main menu and be asked to place an 'X' beside all categories which pertain to your return. After you have selected the categories that best suit your return, the program will interview you in an organized fashion, beginning with the heading information and proceeding step by step through all income, adjustments and deductions, then proceed to compute your taxes. Based on these inputs, the balance due or refund will be computed, very much the way a professional tax preparer or CPA would do.

After all of the information is completed, you will have the option to print your return. The printer function will print all data on government-approved forms. Included in the package are some carrier strips which will enable you to attach non-tractor feed forms so they may be printed.

The program has a unique diagnostic mode built into it. In other words, before the computer writes any information to the disk, it will go into the diagnostic mode to be sure all of the data that was input is correct. If it comes across a piece of information that is not correct, it will give an error code and the user must then go to the appendix of the manual where there is a listing of 94 error codes. The error code will tell you exactly what the problem is and how to correct it. The error must be corrected in order for the program to continue. This measure guards against bad data being input which would produce a bad tax return.

As a reviewer, I make it a habit to call the company offering the software to make sure everything I see is what the customer will receive when purchasing the software. My conversation with Micro Data Systems was not only a pleasure but most enjoyable. Micro Data's main concern is offering fine quality software and excellent product support, meaning that if you have any problems with your software, you can write or call for help and be assured of complete satisfaction. They also assured me that the new package now available has been improved, offering a much better tax preparation program.

In the back of the manual, you will find an order form to order extra forms; also included is a registration form to be filled out and returned so the user will be informed on updates and enhancements. Yearly updates are available for \$59.95.

For those of you who have experience with doing tax forms, I think you will find this a masterpiece and a valuable part of your software library. For those of you who do not have any experience in income tax calculating, I feel you owe it to yourself to learn how the right way.

I would like to thank Micro Data Systems for making such a fine and high quality piece of software available for our good old Color Computer. I found it a pleasure to review.

(Micro Data Systems, 6 Edward Drive, Ashland, MA 01721, \$149.95)

— Bob Brown

PERRY COMPUTERS

COLOR COMPUTERS

CALL TOLL FREE 1-800-248-3823

COLOR COMPUTER, DISK DRIVE AND PRINTERS

	LIST PRICE	OUR PRICE
26-3136 16K Extended Color Computer 2	\$ 159.95	\$ 130.00
26-3127 64K Extended Color Computer 2	219.95	185.00
26-3129 Disk Drive 0 for Color Computer	349.95	290.00
26-1161 Disk Drive 1, 2, 3 for Color Computer	279.95	230.00
26-1276 DMP-105 80 cps Dot Matrix	199.95	189.00
26-1271 DMP-110 90/25 cps Triple Mode Printer	399.95	299.00
26-1255 DMP-120 120 cps Dual Mode Matrix	499.95	385.00
26-1208 Computer Cassette Recorder	59.95	50.00

COLOR COMPUTER SOFTWARE

	LIST PRICE	OUR PRICE
Teletwriter 64 Tape	\$ 49.95	\$ 42.00
Teletwriter 64 Disk	59.95	49.00
VIP Writer	69.95	59.00
VIP Database	59.95	49.00
VIP Terminal Disk	49.95	45.00
VIP Integrated Software	149.95	139.00
RADIO SHACK Software		15% Off
TOM MIX Software		CALL

OTHER PRINTERS AND ACCESSORIES

	LIST PRICE	OUR PRICE
EPSON LX-80 Printer	\$ 389.95	\$ 275.00
OKIDATA 82 Printer	349.00	295.00
STAR SG-10 Printer	399.00	265.00
COMREX CR-II Daisy Wheel Printer	499.00	400.00
C. ITOH 7500 Prowriter Printer	289.00	225.00
BOTEK Serial to Parallel Interface	59.00	49.00

MONITORS

	LIST PRICE	OUR PRICE
COMREX 12" Green Monitor	\$ 119.00	\$ 95.00
COMREX 12" Amber Monitor	129.95	110.00
COMREX 13" Color Monitor	329.95	285.00
ANDEK 300A Monitor	199.95	155.00
VIDEO PLUS Monitor Adaptor		CALL
Teknika RGB/Composite Color Monitor	399.00	299.00

COLOR ACCESSORIES

	LIST PRICE	OUR PRICE		LIST PRICE	OUR PRICE
26-2226 RS-232 Program Pak	\$ 79.95	\$ 68.00	26-3018 Extended Basic Kit	\$ 39.95	\$ 34.00
26-3012 Deluxe Joystick (EACH)	39.00	34.00	26-1175 Direct-Connect Modem I	99.95	85.00
26-3017 64K RAM Kit	69.95	59.00	26-1173 Direct-Connect Modem II	199.95	169.00
26-3008 Joysticks	24.95	21.00	Signalman Modem 300/1200 Baud	399.00	275.00
26-3016 Keyboard Kit	39.95	34.00	Hayes Modems		185.00

All prices and offers may be changed or withdrawn without notice. Advertised prices are net prices. For shipping, add 2% (minimum shipping charge \$3.95). C.O.D. accepted. \$1.00 charge per section on C.O.D. Call for further C.O.D. information. M.C., Visa, A.K. add 3%.

PERRY COMPUTERS • 124 SOUTH MAIN STREET • PERRY, MI 48872

Sam Sleuth P.I. Is An Extraordinary Case

When I opened the package and saw the game I had received for review, I said, "Golly gee, another Adventure program." But, when I proceeded to read the instructions and load the game, I found out that *Sam Sleuth P.I.* is anything but your usual Adventure game.

Sam Sleuth P.I. is a 32K graphics Adventure program available on disk or cassette tape. One joystick is required.

The scenario is as follows: You are Sam Sleuth, Private Investigator. Your job is to investigate one of three different cases. The case levels and descriptions are described as Novice, Experienced and Expert.

Level 1) Novice — The Case of the Missing Cat: You have been out of work for quite some time. As you sit passing the time away, Shirley Voff, the local school teacher, comes into your office. She wants you to locate a cat she had been asked to watch that is now missing.

Level 2) Experienced — The Mystery at the Museum: The day after you find the cat, you get a call from Rick Anthers, the museum owner. Rick tells you that a valuable statue has been stolen from the museum. He says he had borrowed the statue from another museum and it wasn't insured, which means if Rick doesn't get the statue back, he will have to pay for it. Your job is to find the thief, and the statue.

Level 3) Expert — Baffling Bank Robbery: Rip Voff, the owner of the bank, has heard about the good job you did for his wife, Shirley. He hires you to find the thief who robbed the bank.

One unique feature of this game is that the commands can be entered through a joystick. Commands are entered by positioning a cursor over an icon describing one of the several alternatives at your disposal.

Other features include graphics showing your walk to a telephone booth. You can flip through the pages of the phone book using the joystick. When you get to the number you want, you press the firebutton and it will dial that number. There is even a ring or a busy tone.

Another feature is that you can walk to your car, drive it all over town while you see the car moving through the streets on your screen, and even have a wreck if you're not careful.

I thought the documentation of this game was excellent. The manual tells you everything you need to know about the game, and it even shows you a street map of the whole town with all of the businesses and houses.

I liked this game thoroughly and give it a five out of five stars. It has all the features of a good Adventure, with the bonus of excellent graphics, sound and game-like response while driving your car.

(Computerware, P.O. Box 668, Encinitas, CA 92024, tape \$24.95, disk \$27.95)

— Pat Downard

COCO DOS FLEX OS-9 DEVELOPMENT TOOLS

C COMPILER

- generate fast efficient code
- longs, FLOATS, most operators

FLEX \$59.95 OS-9 \$59.95 COCO DOS \$49.95

RASMB (relocatable macro assembler)

- assembler, LINKER, library builder

FLEX \$59.95 OS-9 \$59.95 COCO DOS \$49.95

GTRM HI RES OS-9 WINDOWS

- 52X24 hi-res display
- multi-window displaying and running

OS-9 only \$29.95

SOLVE (SYMBOLIC DEBUGGER)

- debug using symbols, assembler, disassembler
- single stepping, multi-breakpoints, etc.
- easy to use/understand

OS-9 only \$75.00

MATH PACK

- complete math package (sine, cosine, square root, etc.)

requires RASMB or INTROL C

RASMB version \$49.95 INTROL version \$75.00

PC09-F (read/write IBM PC diskette)

- directory command
- copy command to/from IBM diskette

FLEX OS-9 COCO DOS \$34.95

PC09 P,F,X (bridges the gap between 6809 systems and IBM PCs)

- connects the two systems together using many different options
- write for further details, pricing, availability

DUgger's GROWING SYSTEMS

Add \$3 for shipping, foreign add 15%. Post Office Box 305, Solana Beach, CA 92075 (619) 755-4575
VISA and MC welcomed. Sorry NO C.O.D. California orders add 6%. Technical information 8AM-5PM PST only
For more information write or call. Business hours 8AM-5PM PST

TRADEMARKS—FLEX (TSC) OS-9 (MICROWARE) IBM PC (IBM) INTROL C (INTROL)

NEW

Full Character Set FOR CoCo or CoCo2

NEW

Easy to install board adds:

- All 96 Standard ASCII Characters
- Upper & Lower Case Displayed Simultaneously with NO Inverse Video
- True Lower Case Descenders
- Braces & Vertical Bar Characters
- Slashed Zero
- Other Features

Board is hardware driven and requires NO software drivers. NO effect on any memory.

Enhances CoCo screen for:

- OS-9 Operating System Programming
- "C" Language Programming
- Word Processing
- Communications Terminal Modes



PRICE.....\$38.00

(+\$2.00 shipping/handling if charge)

CoCo Devices
Box 677, Seabrook, TX 77586
713-474-3232

Visa

(Specify CoCo or CoCo2) Mastercard

Create Your Own Fashions With DESIGNER

DESIGNER is a recent release from the Cognitive Development Company. It is developed for the 32K Color Computer with Extended Color BASIC. With this type of software, it is apparent the Cognitive Development Company is in the business of providing software for young people that will aid in the growth of certain skills and visual perceptions.

DESIGNER is for girls of all ages and teaches not only fashion design, but also teaches computer skills in a non-threatening way. This is of particular value in that concern has been expressed in the educational community regarding the lack of computer use by the female population.

Very simply put, DESIGNER is a computer "paper doll." Once the program disk is inserted and run, a color test is given. The program is extremely friendly and can be used without any fear of messing up anything. The main menu gives you four choices: Design Fashions, Design Fabrics, Check Closet and Finished. You select the choice using the arrow keys and pressing ENTER.

"Design Fashions" is done very simply. You select what style of neckline, sleeve, skirt or pants you desire. You can select one at a time with nine choices given in each category. If you do not like a particular choice, then change it. All selections are shown on the model immediately. When you are finished, you can select fabrics.

There are 26 fabric pages and each page contains eight different fabrics. If you do not like what you see, you can design your own from the main menu. You select fabrics for the top, belt and bottom. Fabric selections include solids, horizontal stripes, vertical stripes, checks, houndstooth, plaids, dots, white patterns and black/white combinations.

After finishing your design, you can store your creation in the "closet." In the "memory closet" there are 12 racks and each rack can hold three fashions. The racks are labeled A-L. As each rack is shown on the screen, you can replace a design, go to the next rack or go back to the main menu. If you do not save your design, it will be lost!

"Designing Fabrics" is the most complicated task in the program. However, the instruction manual is sufficient to lead you through the process. You have 26 design pages with eight patterns on each page for a total of 208 patterns. Any of these patterns can be changed. You do not have to design any fabrics to use the program, but this is a nice option.

The instruction manual suggests various projects: Design fashions for various activities such as swimming, prom date, golfing, day at the office, gardening and school event. Design a wardrobe for a particular person for an entire week, including pajamas and dates. Discover the role and use of fabrics on certain designs by putting the same designs in the same closet with different colors and types of fabrics.

Cognitive Development Company should be congratulated for developing such fine educational software. The graphics are exceptional and the ease of operation is masterful. DESIGNER would fit in the library of any home and in the classroom as well. Their motto is very appropriate: "Fun Things for the Mind!"

(Cognitive Development Company, Suite 141, 12345 Lake City Way, NE, Seattle, WA 98125, disk only, \$24.95)

— J.D. Ray

Nexus presents New Keys to Creativity!

CHROMA-SKETCH The Picture Program Writer

CHROMA-SKETCH has an option that writes a BASIC program as you draw each and every dot on the screen in 88 colors and shades (32 in each of 2 color sets). Save programs to disk or tape to recreate your picture from BASIC at any time, or save the screen as a binary image.

Your drawings simplify arcs, circles, lines and boxes. Drawing with multiple options for full-screen on-screen cursor and "graph-paper" grid. Automatic erasing and undo commands available in BASIC. Help key gives command and usage details. If the program writer is enabled, you can return to any previous stage of your picture!

Draw complex shapes and CHROMA-SKETCH will redraw, rotate, reflect or average them at any position in any color or colors. Save the shape definitions to disk or tape for use in BASIC programs. Paint in any dot pattern including checks, stripes (horizontal or vertical) or others you define yourself. Draw dashed or dotted lines. Overlay color patterns for translucent effects.

CHROMA-SKETCH can be used with any combination of graphics adapters including Touch-Pad or Color Mouse. If you prefer, you may use the fast auto-repeat cursor keys to move diagonally, horizontally or vertically. The fast, compact graphics programs you can write using CHROMA-SKETCH are yours to alter or use in any way you wish. These BASIC programs may be used for games, graphics adventures, educational software or on-screen slide shows.

Requires 32K (Extended BASIC). Supports disk or cassette systems, all ROM versions, all graphics modes.

CHROMA-SKETCH
\$29.95
\$34.95
disk

The WIZARD^{Foot} For Telewriter-64*

* Unannounced Wizard for Telewriter-64 users who want to do something new for their hard-working word processor!

Scott Newman
1983 Coda, Feb. 83

1. A last chance to see what this unique software offers. The next time you purchase a Telewriting WIZARD for another CodaC computer. (CodaC, Inc., 3300 N. 10th St., Phoenix, AZ 85018)

The pleasantly proportional characters of the WIZARD font have true ascenders and optional end-of-line markers. If you do not prefer the clean attractive font, take advantage of our money back guarantee.

The simple modifications of Telewriter-64 save to disk (saving no change in the operation of the word processor) or the amount of buffer space. You may choose to permanently install the font in a backup copy of Telewriter-64 or to quickly recall the font each time you load an unmodified copy of Telewriter-64.

The end-of-line markers are useful for leaving out an option at the end of lines and between lines, and for counting lines between paragraphs. They are essential for the complex on-screen formatting that tables or forms often require, as well as for keeping track of carriage returns in program code.

WIZARD will run in any CodaC 16-BASE disk or cassette. The WIZARD font does not alter the characters produced by your printer.

Details of how the new font is added to Telewriter-64 may be requested when you order WIZARD. Please purchase may request the information if they include the WIZARD font and a SASZ.

WIZARD
\$19.95
\$21.95
disk

MONEY BACK GUARANTEE: If not completely satisfied, you may return the material within 30 days for a prompt refund. Specify the program and make desired Programs installed on disk and cassette are identical in all respects. Send check or money order. Personal checks — no delay. Next day shipping in most areas.

NEXUS
P.O. Box 6303
Midland, TX 79706

For additional information: Call 715-76-1799
Write for a catalog. Dealer inquiries are welcome.

CCD add \$5.00

One-Liner Contest Winner . . .

This one-liner plays "Luke Skywalker's Theme" from the *Star Wars* films.

The listing:

```
Ø SOUND 89,1Ø:SOUND 147,7:CLS(4)
:FORX=1TO1ØØ:NEXT:RESTORE:FORT=1
TO2:FORL=1TO5:READA,B:SOUNDA,B:N
EXT:RESTORE:FORX=1TO1ØØ:NEXT:NEX
T:FORL=1TO4:READA,B:SOUNDA,B:NEX
T:RUN:DATA133,4,125,4,1Ø8,4,174,
8,147,9,133,4,125,4,133,4,1Ø8,8
```

Richard Davis Jr.
Williston, FL

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

CoCo Tuner — Fine Tuning With The CoCo

It never ceases to amaze me how the Color Computer takes on more and more tasks. A unique new product came on the market this past December that permits one to use the Color Computer to assist in the tuning of pianos and other stringed instruments. I am not a piano tuner and really not terribly aware of what tuning aids are on the market, but I can assure you that this product is quite simple to use, and it seems to be a very viable way to do the job.

The manual which comes with *CoCo Tuner* is more than adequate, and really quite unnecessary for getting your first taste of what the *CoCo Tuner* can do. Slip in the ROM pack and you have a menu on the screen that lays out all the features. Within a couple of minutes, you can try them and either be bored with the simplicity or pleased with your brilliance in figuring it out all by yourself. At any rate, if you now go beyond the the first two introductory paragraphs in the manual (probably trying to find out what that dancing black line is in the center of the screen) you will find the *CoCo Tuner* is not as simple as it first appears.

The manual is a real gem; it's actually a physics lesson, piano tuning course and program manual all wrapped up in one. Before we get further into its contents, let me quickly review the *CoCo Tuner's* features. The program causes the computer to sound the notes of the scale at their precise pitch. By pushing the letters 'A' 'B' 'C' 'D' 'E' 'F' 'G,' you can sound the equivalent scale note (beginning with note 'A' which is at the frequency of 220 hertz, for those of you who are technically minded).

When the program starts, you are in octave four (fourth from the bottom of the piano keyboard) and you can change octaves by pushing the zero key. By pushing the up-arrow key or down-arrow key, you can get the sharp and flat notes, or you can continuously push the up-arrow key and proceed through the entire group of octaves. If you sound the 'A' pitch and find it matches none of your black keys or white keys but seems to be somewhere in one of the cracks, there are solutions for that, also.

You can push the 'P' key and adjust the pitch by any given percentage you put in, or you can push the 'H' key and enter the exact number of cycles you want the pitch to have, which would not be any help for piano tuning, but rather is a feature put in for the sound laboratory engineers who have need for a precise frequency of their own choosing.

From a program-function point of view, that's about it, except for that curious dancing black line, which leads us back to the manual and the practical use of the *CoCo Tuner* in the piano-tuning trade. The *CoCo Tuner* ROM pack has a place to insert a high-impedance microphone. By permitting the TV sound being produced by the program to enter the microphone, the black bar in the center of the display should form a stationary pattern. If you turn off the TV sound and try humming the same note into the microphone, you should also be able to cause the black bar to form the same stable pattern.

It is here that the fun begins. If you are flat, the bar slips to the left; it moves to the right if you are sharp. But that is only the beginning; if you sound a note exactly

an octave away or harmonically related, the overtones can greatly confuse you in trying to judge if you have the correct stable pattern. This is a case of practice in interpreting the moving bar pattern. Even with my great lack of musical skill, I began to get the hang of it.

Now perhaps you can see the whole picture. By setting the *CoCo Tuner* to a specific note and sounding that note on the piano, you can judge if the piano note has the right pitch by observing the black bar on the screen. The sensitivity and accuracy of the *CoCo Tuner* is really beyond what the human vocal chords can perform and beyond what one would need for any piano-tuning environment.

The limiting factor in sensitivity, for example, is going to be the ambient interference noise rather than a failure to pick up the sound. As the manual says, the pitch accuracy may actually be too great for you when tuning some instruments, such as a guitar, where the bar may move to the right when the string is first plucked and then move to the flat side as the note dies out. This is normal for a guitar sound, but might drive you nuts if you insist on trying to match the *CoCo Tuner* pitch exactly.

What do you want to know about sound or piano tuning? Be it diatonic scales, physics of pianos, theory of tuning, beat frequencies, use of rubber mutes, the art of handling a tuning lever, it is all there in the manual. You are definitely buying a lot more than a computer device when you purchase this product. I found the writing and topics in the manual interesting (even though I probably would never use the information on a practical level).

The *CoCo Tuner* is produced by someone who cares and who knows the field of its intended use quite well.

I tried to get some reaction from professionals in the field. I was concerned professionals might feel that the gimmickry of the *CoCo Tuner* would impinge upon what they thought of as the heart of their professional skills, but this is not the case according to those with whom I spoke. The fairly wide use of strobe-type tuning assistance has already put the profession at ease with sophisticated aids. It would appear there really is a market for a product like the *CoCo Tuner*.

(Real-Time Specialties, Inc., 6384 Crane Road, Ypsilanti, MI 48197, \$89)

— Tom Carl

One-Liner Contest Winner . . .

Color BASIC Organ is a musical organ that runs on any version of the CoCo. Just type in a number from '1' to '3,' and when the screen goes blank, bang away at the keyboard. To start over, press SHIFT and CLEAR.

The listing:

```
Ø INPUTM:CLSØ:FORX=ØTO1STEPØ:N$=
INKEY$:IFN$="\"THENØELSEIFN$="\"T
HENNEXTELSEN=INT(ASC(N$)*M):IFN>
255ORN<ØTHENNEXTELSESDNDN,1:NEX
T
```

Marc Andreessen
New Lisbon, WI

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

Zookey Is A Fun And Helpful Typing Tutor

Whether one is an experienced typist or pecks across the keyboard with two fingers, *Zookey*, from Mark Data Products, is an interesting, fun, innovative way to practice typing.

In *Zookey*, Mark Data demonstrates how learning can be fun by teaching typing in the format of a game. Rather than typing about nine million "fff-gggs" to practice, *Zookey* shows you a high resolution screen of animals, cages, keepers and keyboard symbols.

The object of *Zookey* is to type the letter, number or symbol shown at the bottom of the screen in eight columns before the escaping animal gets to the trap door on the screen. If the typist is successful, the keeper scoots up the screen and closes the trap door and the typing score increases. If you are too late, the animal escapes and you lose a key. When all the keys are gone, the game ends.

Zookey provides up to eight skill levels and up to eight speed levels, with your choice of letters, numbers, symbols (punctuation) or a mixture of all characters. The lowest speed and skill levels would be suitable for a beginner and, as an experienced typist, I had a tough time keeping up with the fastest levels.

The high resolution graphics in *Zookey* are colorful, interesting and entertaining. The characters displayed for

typing are large and clearly formed, with the exception of some punctuation such as the semi-colon and arrow keys, which can be slightly difficult to decipher immediately. Once you are used to their appearance, however, you can zip right along. One disappointment is that the animals which escape are the same in every instance, rather than being varied. They have the appearance of plump little rabbits with pink cheeks, and as they try to escape, a marching sound is heard over the monitor speaker.

Zookey is much better suited as a tutor than as a teacher for the typist just starting out. If you have some touch-typing experience, the instructions will be very clear and the keyboard finger chart will serve as a helpful reminder. If you are just starting out, there are many bad habits and details of touch-typing that are not listed in the documentation, and I would recommend consulting a touch-typing manual.

Because *Zookey* is in a game format, it is important to limit playing/practice time; the documentation recommends 15 minutes a day, a figure which can help alleviate frustration and boredom. Also, the user should remember that he is competing with himself; "cheating" with finger positions in an effort to achieve a higher score is something to watch out for!

Zookey is enjoyable, easy and fun to use, and most importantly, a very helpful typing tutor. I found that my own typing began to improve very quickly with it. I recommend this program to anyone wishing to improve his or her typing skills.

(Mark Data Products, 24001 Alicia Parkway, #207, Mission Viejo, CA 92691, requires 32K, tape \$24.95, disk \$27.95)

— Jeffrey S. Parker

Dyson Software presents **PROPERTY MANAGEMENT & REPORT SYSTEM**

A new, easy-to-use system for
property owners and managers.

FEATURES:

- ★ Completely menu-driven
- ★ Comprehensive reports, include:
 - Income and Expenses:
 - All properties
 - By Tenant
 - By Property
 - Mortgage Schedule
 - Mailing Labels
 - Property Profile
 - Rent Schedule
- ★ Handles single or multiple units

**IDEAL FOR LANDLORDS AND REAL
ESTATE PROFESSIONALS.**

Min. Req. 32K Ext. Basic w/1 Drive
Special Introductory Price \$99.50 post paid

Distributed by



POLYGON COMPUTERS

1316 Wilshire Blvd., Suite 206

Los Angeles, CA 90017

(213) 483-8388



Ca. Res. 6 1/2% tax
Visit our Retail Store

Shipping: \$2 Software
Charges: \$5 Hardware

Submitting Material To Rainbow

Contributions to THE RAINBOW are welcome from everyone. We like to run a variety of programs which will be useful/helpful/fun for other CoCo owners.

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. All programs should be supported by some editorial commentary explaining how the program works. Generally, we're much more interested in how your submission works and runs than how you developed it. Programs should be learning experiences.

We do pay for submissions, based on a number of criteria. Those wishing remuneration should *so state* when making submissions.

For the benefit of those who wish more detailed information on making submissions, please send a SASE to: Submissions Editor, THE RAINBOW, P.O. Box 385, Prospect, KY 40059. We will send you some more comprehensive guidelines.

Please do not submit programs or articles currently submitted to another publication.

Centipede ABC's and 123's Provide Unpressured Learning For Children

At what age can a child be introduced to a computer? When is a good time for a child to start on the road to computer literacy? Triad Pictures Corp. feels that a 2-year-old is capable of using a computer and they have produced two programs for very young children. *Centipede ABC's* is a program for children aged 2 to 10 which deals with the alphabet, and *Centipede 123's* is written for children aged 2 to 6 and uses the numbers one through 20. Both programs require 16K Extended BASIC.

These programs work primarily in the same way except for their main focus. After **LOADING** either program, you will be asked to type in the child's name. After this, a skill level will have to be chosen. Each program has three skill levels. Level 1 is a letter or number match; it is really the only level that is appropriate for very young children. Level 2 is for children who are somewhat familiar with letters and letter sequences or number and number sequences. To use Level 3, the child should be very familiar with the alphabet and alphabetizing and counting.

If Level 1 is chosen, the child will see a large letter 'A' (or number 1) displayed in the middle of the screen. The child has to match the large letter to the corresponding key on the computer keyboard. A correct answer will be rewarded with an animated piece of a centipede being added to a smiling centipede face. The object is to build a long, cute bug. An incorrect answer will cause the correct answer to be displayed and the child will be given another chance to answer.

This type of matching exercise is very commonly used as a learning tool for young children. The main flaw here is that the shape of the Hi-Res letters or numbers on the screen is different from those on the keyboard. For children who may not yet recognize their letters and numbers, there is no exact match. My early childhood education experience indicates that for young children doing these matching drills, shapes have to be the same; close doesn't count.

During Level 2 play, the child has to enter the alphabet or numbers in sequence beginning with 'A' or '1'. No hints are given. Level 3 asks the child to insert the missing letter or number between two others. For example, the computer will display 'A' and 'C' with a box between them. The child should type 'B' as the correct answer. In both of these games, a correct answer is rewarded as in Level 1. However, after an incorrect response, the computer will advance to a new question.

Both *Centipede ABC's* and *Centipede 123's* are very low-key kinds of games. They provide an unpressured learning experience for some children and useful review for others, depending on each child's individual level. There is no time limit in the games, so each child can work at his/her own pace.

The routines for correct and incorrect responses are quiet and unobtrusive, but the child can easily distinguish

between the two. In no way is he/she ever made to feel badly about an incorrect response. Once the child becomes familiar with using a computer, the programs are easy to use and require little adult supervision.

I became fascinated with the claim that both programs could be used by a 2-year-old, so I invited Heather, a neighbor, to my house. She liked the pictures and pressing the computer keys. However, she had a five minute attention span. Even if she had the knowledge necessary for Level 1 games, they were both much too long. It is too bad, especially in *Centipede 123's*, that the user is not given a choice of parameters. There are more young children who can count to five than can count to 20. The length of the game could be better controlled and the child could get the feeling of finishing something and reaping the rewards.

Along with Heather came Sean, aged 4. The programs were ideal for him and he really enjoyed using them. I went on to observe other children and found these programs are ideal for preschoolers through second graders.

There are, of course, children at both ends of the spectrum that will benefit and enjoy both *Centipede* programs. Individual differences and your child's own ability should always be taken into consideration. Like the centipede in these programs, a child's knowledge will keep on growing.

(Triad Pictures Corp., P.O. Box 1299, 134 Simders Rd., Sequim, WA 98382, both tapes for \$25)

— Stephanie Snyder

ADOS ENHANCED, EPROM-ABLE DISK BASIC

Now, you can supercharge Basic with an impressive array of extra features. WITHOUT sacrificing compatibility! ADOS is compatible with virtually 100% of commercial software. Customizing utilities are provided to allow user-defined command abbreviations, baud rate, step rate, tracks per disk (25 or 40), support of double-sided drives, and more. After customizing ADOS, you can have it burned into an EPROM that plugs into the Disk Basic ROM socket, or just use it in RAM as a 64K disk utility. (EPROM - burning will cost about \$20 - we provide information concerning how you can have this done.) Features include: • repeat and edit of the last direct-mode command • 26 definable control key abbreviations • automatic line-number prompts • DOS command • lowercase command entry is fine complement to a Lowlevel or PBJ WordPak • COPY (internal to drive number) • AE entry override option • RAM command (54K) • RDHM command • fast action to printer • ML monitor • fast file scan • enhanced directory • error trapping • fixes text utility included (42, 51, or 64 characters per line)

"I COULD NOT FIND ANY SOFTWARE THAT WOULD NOT RUN UNDER ADOS."
THE RAINBOW, December 1984

"I LOVE ADOS! ... A GENUINELY FIRST RATE PRODUCT."
Color Micro Journal, February 1985

"I WON'T PART WITH MY ADOS EPROM FOR ANYTHING ... NO COMPATIBILITY PROBLEMS."
Hot CoCo, May 1985

Disk \$27.95

THE PEEPER ML PROGRAM TRACER


Monitor machine-language programs AS THEY ARE RUNNING! Peeper actually timeshares with the target program, giving FULL CONTROL as ML programs run. Switch instantly between watching regular program output and Peeper's trace of registers and stack on screen or printer. Inspect memory in any of 26 display modes. Execution speed can be varied from full speed to the barest crawl, or halted entirely as programs run. Single-stepping, breakpoints, memory or register examine/change. Retraceable, supports BAK use. (16K required). See February '85 review.

Disk \$23.95 Tape \$21.95 Assembler/source listing...Add \$3.00

FASTAPE THE NEXT BEST THING TO A DISK DRIVE

Fastape allows cassette I/O at 3000 baud—TWICE NORMAL SPEED. It uses the high-speed (POKE \$5495.0) mode, and makes it convenient to stay in this mode throughout. Features automatic adjustment of cassette and printer parameters when speed mode is changed. Control key functions for many Basic commands and for changing speed modes. Compatible with all file types, and can be used with Teletext-84 and many other tape utilities.

Tape \$21.95 (16K required). See July '83 review.

SPECTROSYSTEMS 

No delay on personal checks

Please add \$2.00 shipping. Sorry, no credit cards or COD's

11111 N. Kendall Drive,
Suite A108
Miami, Florida 33176
(305) 274-3699 Day or
Even

Dan Tucker's Mine Is A Gold Mine Of An Adventure

This text Adventure from Pal Creations is billed as an expert level encounter, and it is! *Dan Tucker's Mine* offers a challenge to anyone who considers himself to be a master at this kind of challenge. There are cabins with locked doors, old sheds, bridges, rivers and more in this program — enough to test the wits of any Adventure buff.

The program is supplied on a high quality cassette and a short, but adequate, instruction sheet is included. The Adventure begins when Dan Tucker's will is read and you find that he has left you his property. Unfortunately, he has left no information on how to find the fortune in gold rumored to be hidden there, so begins a great Adventure.

The program begins with a colorful title screen followed by instructions and a list of available verbs. You have the option of playing with the objects in the same location for every game or you may select randomized placement of the objects for a different challenge. As with most of the more complex Adventures, you must have the right equipment at the right time. This can lead to some retracing of steps to achieve the right combination, but it's all part of the game.

The game is written in Extended Color BASIC for 32K machines and, as supplied, it will not run with the disk controller installed. Listing the first 30 lines revealed the reason for this. The Pal Creations logo on the title page takes enough memory to prevent the use of the disk controller. I was able to delete the logo, save the remaining program to disk and run from disk with no problems. (The logo is a neat piece of work and produces a different color pattern each time, but I don't like to remove my disk controller and can't yet afford a multi-pack interface.)

My only other complaint with this Adventure is not being able to save a game in progress. As difficult as this one is, I really would appreciate the ability to save my progress. I suppose for the price this fault can be excused, as the Adventure itself is what it's all about and this one is cleverly done and runs quickly and smoothly on the screen.

There is a lot of entertainment value packed into *Dan Tucker's Mine*. My 15-year-old son said: "If I was sentenced to life imprisonment and could take only one game, this would be it!"

(Pal Creations, 10456 Amantha Ave., San Diego, CA 92126, 32K ECB, cassette \$14.95)

— Charles Bream

See You At
RAINBOWfest New Brunswick
October 18-20



SUPERB GRAPHICS UTILITIES FOR YOUR COCO III

GRAFP

NO Y-CABLES or MULTIPACKS NEEDED EVER!!

VIZIDRAW...

SIMILAR TO OTHER COMPUTER'S PRINT SHOP AND MACPAINT! YOU CAN DESIGN PRACTICALLY A WHOLE SHEET OF PAPER IN THE COLOR COMPUTER'S MEMORY (7'X7'). MAKE PRESENTATION QUALITY GRAPHICS, SPECIAL NEWSLETTERS WITH OVER 30 DIFFERENT FONT SETS!! REQUIRES 64K JOYSTICKS OR MOUSE. RUNS ON DISK OR TAPE SYSTEMS. PRINTER OPTIONS FOR VIZIDRAW ARE RS LP 8 FORMAT, EPSON, C-ITON, GENIUS 10-10X.

SPECIAL...ORDER NOW AND GET OPTIONAL FONTS SETS FREE!!

PLEASE SPECIFY DISK or TAPE...only \$49.95 +\$2 postage

VIDX...VIDE9 D35T3333

DIGITIZE ANY VIDEO SOURCE VIA THE RS-232 PORT. SYSTEM REQUIREMENTS 16K TAPE, 32K TAPE OR DISK. SAVE HOURS DRAWING...DIGITIZE IT! EASY ONE STEP MENU! READS/WITES TO GRAPHICON.

VIDX-1 only \$99.95 + \$3 postage

VIDX-2 only \$124.95 + \$3 postage (VIDX-2 has 2 port RS-232 switcher)

GRAFPAX.....joystick/mouse interface
Access all pixels (256x192) via the RS-232 port. Draw those circles and arcs free-hand, even sign your name! Digitize a picture (VIDX digitizer is optional) and touch it up without going into any other graphics utility! GRAFPAX is easily modifiable to any program with joystick/mouse readouts...such as those that use A-D converters. Comes with its own great graphics program.
REQUIRES 64K DISK.....only \$59.95 + \$2 postage

NEW!

64K RAM CHIPS.....set of 8 w instructions only \$19.95 +\$2 postage
We are now carrying most parts for the RS Disk CONTROLLERS
Drop us a card for details and prices!!!!

DSS PERIPHERALS DISK CONTROLLER
Gold contacts and write/data L.E.D.
With RS disk ROM 1.1.....reg. \$139....special \$110
without disk rom.....only \$100 +\$2 postage

CERTRON DISKETTES
With plastic disk case and jackets, protect labels
SS/DD....\$12.50 DS/DD.....\$20.00
plus \$2 postage

TO PLACE YOUR ORDER SEND CHECK OR MONEY ORDER TO:



P.O. BOX 254
WEST MIFFLIN, PA 15122
(412) 466-6974 (6-9 pm)
COCONET 24 HR: BBS 300/1200
BAUD MODEM ONLINE
(412) 744-2335
DOWNLOAD FREE DIGITIZED PIX

Destroy The Enemy And Don't Get Caught in *Metabot*

Metabot, written by Jay R. Hoggins, is a new strategy game from HARMONYCS Software. The object of the game is to destroy the enemy Metabots by luring them into the electric fences or acid pots randomly placed on the screen by the computer. If you are able to accomplish this, a new screen is drawn and two more Metabots are added to the number needed to advance to the next screen.

Upon CLORding and EXECuting the program, the player is greeted with a title page and a four-part harmony rendition of "Darth Vader's Theme" from *Star Wars*. The computer then asks if you need instructions; if you reply "yes," the title screen disappears and a new screen is drawn with a little poem which gives the general object of the game. Pressing any key will cause the program to ask the player to type in his name of up to nine letters. The program next asks the player which of the three levels he wishes to attempt. Once all this preliminary information is entered, the game begins.

The computer draws the game board, printing your name in the lower left corner, and a diagram of the keyboard layout you are to use to move your player around the grid is displayed in the lower right corner. Your player can move in eight directions, controlled by pressing the 'U,' 'I,' 'O,' 'J,' 'M,' comma and period keys. The game board consists of the electric fences, the acid pots, your player and the Metabots.

To destroy the Metabots, the player must move around the board trying to make the enemies run into the fences or pots without the player running into the obstacles.

If you move your player within three seconds of the start of the game, you will receive the optimum amount of points for each robot destroyed for that level. Otherwise, the value for the destroyed robots is decreased 10 points for moves taking between three and 10 seconds, and then 20 points for moves taking beyond 10 seconds. Every time your player moves one space, all the enemy robots move one space, continually stalking your player.

Destroying all the Metabots takes you to the next screen, but if one should touch your player or should you run into a pot or fence, the game is over and your position on the high score list is displayed.

There is an old proverb that states, "You can't judge a book by its cover." If I had just read the instructions to this game and had not seen the program itself, I would have envisioned the game to have a little man running around the screen, dodging these big robots and watching out for the electric fences. But, what you get is a flashing dot, similar in shape to a cursor, representing your player. The deadly Metabots are multicolored blocks the same size as your player. The pots and fences are solid blocks, again the same size as your player.

On Page 153 of the December 1984 issue of THE RAINBOW, one can get a fairly accurate picture of the program in the advertisement for the game. One might argue that a strategy game (what this program claims to be) does not require great graphics, just something to aid the player in determining his next moves. I don't agree with this because if I'm to pay up to \$21 for a game, I

expect graphics the CoCo is capable of, not something that looks like it came off the TRS-80 Model 4. To say the least, I was disappointed with the graphics in *Metabot*.

Even with sub-par graphics, a game can be good if it is fun to play. Again, I believe *Metabot* falls short in this area. The basic problem with this game is that it is too easy. The Metabots have virtually no intelligence; they just move until they are lined up with your player and then just follow your every move no matter where it takes them.

The three levels of play don't significantly alter the difficulty of the game. When you do clear the screen of all the Metabots, your reward is nothing but a little message written on the top of the screen.

The sound effects aren't as exciting as the documentation claims, just "beeps," although the music at the start of the game sounds pretty good. The documentation supplied with the program is very comprehensive for a game, but I did find some typos within its six small pages, maybe signifying that the program was rushed out on the market too quickly.

If you don't mind paying up to \$21 for an easy strategy game, then this game is for you, but frankly, I don't think the program is worth the price. *Metabot* may have a problem finding a specific age audience because the younger set will become uninterested with the lack of good graphics, sound and incentive to continue on destroying *Metabots*, while older players, who might be able to forgive the game for these points, will find the game too simple.

(HARMONYCS, 1747 Patricia Lane, Salt Lake City, Utah 84116, cassette \$18.95, disk \$20.95)

— Ken Coleman

About Your Subscription

Your copy of THE RAINBOW is sent second class mail. If you do not receive your copy by the 5th* of the month of the publication date, send us a card and we will mail another. *Canadian subscribers and foreign air mail allow two additional weeks.

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 P.O. Box 385, Prospect, KY 40059. This applies to everyone except those whose subscriptions are through our distributor in Australia.

Recess Games Encourages Logical Thought Processes

Recess, in my day, meant running out to the schoolyard and playing with the equipment there. When it rained, we usually went to the school gym. Times have changed, if B-5 Software's title, *Recess Games*, is taken literally. What we have here is a group of four computerized games which provide a break from more formal learning, but all of which improve a child's use of logic, not a group of games for outdoor use.

The disk version loads a title screen and a menu from which the individual games are selected, while in the tape version each game is loaded individually. From the instructions, I infer that is the only difference between the two.

In *Treasure Hunt*, the object is to find a treasure chest concealed beneath one of the squares on a 10 by 10 grid. Horizontally the grid is labeled with red letters, vertically with green letters. Squares are chosen by specifying the coordinate letters. To the right of the grid is a thermometer which indicates how close your selection is to the goal; the higher the temperature, the closer you are.

As squares are selected they become chess pawns, until the square with the chest is found. Then a small chest is seen in that square; the screen clears and a large treasure chest fills the screen.

This game provides an excellent introduction to the use of coordinates, but has one puzzling peculiarity. When the game initializes, most of the squares are blue, but some, apparently at random, have pictures on them. Everyone (child and adult) who tried this game immediately wanted to know what the pictures were for, but no one could think of a reason for their presence.

Master Brain is a computerized version of "Mastermind," in which numbers are to be guessed. The player selects the size of the number to be guessed, from two to four digits, and the range of digits to be used, with a maximum of 10, using zero through nine. The number chosen as the guess is on the left, and on the right are two columns, labeled right and wrong. If a zero is placed in the right column, one number guessed is in the puzzle and in the right place. If an 'X' is in the wrong column, one number is in the puzzle but in the wrong place. If nothing appears in either column, all numbers used in the guess are incorrect.

The screen display is good and clear. However, it allows for the display of only 12 guesses and no provision is made for scrolling earlier choices off the screen, so the player has only 12 chances for each puzzle. The instructions advise beginners to start with a few digits and then go to the more advanced levels. Although this is good advice, a very common comment heard during testing was "I almost had it figured out." For children learning to play such logic games, it is better to allow them as many chances as they need for success rather than to establish arbitrary limits which lead to frustration.

Number Guess is a good version of the old favorite, which allows the player to select the range of numbers in which the number is found, and the screen shows if the guess is too high or too low. Unlike *Master Brain*, there is scrolling so the child can see the last eight guesses made and continue until successful.

The fourth game is a nice version of *Tic-Tac-Toe* for one or two players, which uses the arrow keys to move the X's and O's.

On the whole, these are colorful, well-presented games that are fun to play and at the same time encourage logical thought processes. The accompanying booklet gives clear instructions for game play and includes some suggested learning activities.

(B-5 Software Co., 1024 Bainbridge Place, Columbus, OH 43228, tape requires 16K ECB, \$19.95; disk requires 32K ECB, \$21.95.)

— Carol Kueppers

Co Co - Cooler

- Brings operating temperature to ambient, regardless of accessory load

- Reduces temperature of ENTIRE computer... not just the SAM chip

- Easy 1-minute installation

- \$39.95

Companion Keyboard Cover \$7.95

Co Co Software

NOW SHIPPING

Co Co - Cooler Too

(Same Price, Same Fit, For Color Computer II)

- For Fastest Service Send Money Order Or Certified Check
- Add \$2.00 Shipping For Continental U.S.
- Add \$4.00 Shipping For Alaska, Hawaii, Canada, & APO's
- Add \$15.00 Shipping For Overseas
- Add \$3.00 For 220-250 Volt Model
- Calif. Residents Add 6 1/2% Sales Tax
- Will Ship C.O.D. On U.S.A. Shipments Only
- All Merchandise Shipped From Stock

REM Industries, Inc.

9420 "B" Lurline Ave., Chatsworth, CA 91311

(818) 341-3719



 **COSMIC PAINT**

THIS PROGRAM HAS IT ALL!!
WHY PAY MORE? THIS IS THE
BEST PAINT PROGRAM FOR
THE COCO AT ANY PRICE!

REQ. 32K DISK EXT. BASIC
SEND CHECK OR M.O. FOR \$20
C.O.D. ORDERS (501) 758-5569

 COSMIC SOFTWARE
515 BEVERLY WEST
SHERWOOD, AR 72116 

Test Your Command Strategies With *Debacle*

Debacle is a historical Simulation of the 1755 battle involving a French garrison and their Indian allies at Fort Duquesne against a vastly superior British force. The Simulation's name is derived from the overwhelming defeat the British suffered even though they outnumbered their adversaries nearly four to one.

The game requires 32K of Extended Color BASIC and has two copies on tape but can easily be transferred to disk. The eight-page instruction manual is very attractive and professionally printed on heavy parchment-type paper analogous with the game's time frame. Furthermore, the first two pages of the manual are a detailed reflection on the historical nature of the battle. These two factors effectively establish the game's mood once the Simulation is CLOADED (which takes a little over two minutes) and run.

Upon running, there are various user responses required. These include whether the high-speed POKE is usable on your particular computer, whether it is a new or continued game (the program reads and saves the game to disk if a disk drive is attached; otherwise, it is saved to tape) and what skill level is desired (level 1 is a practice session for game familiarization, up to level 5, which is an accurate representation of the actual battle).

The title page graphics are relatively simple and it plays several short classical tunes which are apropos to *Debacle's* setting. This musical interlude is rather lengthy, but apparently permits CoCo to draw the playing field map. However, do not let this simplistic graphics title page deceive you; this is a very sophisticated Simulation which belies its introductory sequence.

The playing field map consists of forest areas, mountains and streams which you, as commander, must navigate from the lower right of the monitor screen to the upper left where Fort Duquesne is located. Other factors hampering your march are a time factor, Indian attacks, and supplying your combat units.

You commence your march on May 29 with four combat units and one supply unit under the command of Dunbar. Their initial task is to clear the forested areas so when the major force of Halket, Ranger, Artillery and Supply arrive on June 9, they will have an easier time of marching to the main destination of Fort Duquesne. Since there are numerous Indian attacks enroute, it behooves you to lessen their numbers by searching and capturing their camps in the woods. The more Indian camps captured, the fewer Indians there are to assist the French in defending the fort. Capturing the Indians is best accomplished by the Rangers since they have the best maneuverability.

A recurring situation you must cope with is keeping the

combat units adequately supplied because they become immobile once their supplies are exhausted. However, the supply units are the least maneuverable of all the units; therefore, a carefully orchestrated method of supply is necessitated, especially since your battle plan must be completed no later than July 17.

Selecting which unit to move is performed by a polling cursor routine which shows the unit's identity, their current strength, the number of days of supplies on hand, and the number of moves available. It is essential that you know which unit you wish to move because once you key in the movement code, it is too late to change your mind; that unit must be moved.

Even though this war Simulation is relatively short in its playing time (two to three hours), it requires intense concentration and an effective method of attack to succeed at winning. Part of the enjoyment in a game like this is discovering the various scenarios that may be utilized to ascertain the most effective strategy, so I will avoid giving any specific tips, however, a few general words of advice are to make sure all combat units are well supplied before reaching the fort, try to capture as many Indian camps as possible and determine an efficient means of crossing the mountains.

Once *Debacle* is completed, the computer critiques your battle plan and lists statistics concerning the battle. After you have digested this data and are ready to play again, you must press Reset to exit the statistic screen.

A few problems I incurred primarily concerned trying to save or load games in progress. Upon loading a saved game from tape, I received an I/O Error in Line 363. On another occasion, I received an FD Error (bad file data) in Line 364. According to the author, there are three saves made on tape but I could not get any of them to load.

When trying to save a game on disk, I received an SN Error in Line 508. According to the author, this was a common problem when he and associates play-tested the game. This problem varies from computer to computer and is caused by either having or not having a space between the WRITE and # codes in lines 508, 510, 512, 514, 516 and 518. After careful consideration, the author decided to omit the spaces in these lines. Once I made these changes, I was pleased to find that disk saves/loads were easily accomplished.

A final problem I encountered concerned the polling cursor routine. On two separate occasions, once at level 1 and once at level 5, the routine unexpectedly hung up, preventing any input whatsoever. This was particularly frustrating after playing a game for nearly two hours. Numerous conversations between the author and me failed to resolve the problem and it finally appeared to be a genuine bug in the program. The author is currently attempting to resolve the bug and may have it done by the time this review is published. I was genuinely impressed with the author's concern in attempting to make the game 100 percent operational and his historical knowledge.

If you enjoy war Simulations, you will find *Debacle* testing your best command strategies.

(Picosoft Games, P.O. Box 35, Eighty Four, PA 15330,
tape \$24.95, Pennsylvania residents add 6% tax)

— Dan Smith

Clip Surge Spikes With Electra-Guard

Several weeks ago I received Electra-Guard, the SS-1 Surge Suppressor, for review. My first reaction was panic. How was I going to check out the surge suppressor? There was no way I was going to induce voltage or current surges into my equipment. I decided on an alternative to actual surge testing, running Electra-Guard under various loads.

Electra-Guard was tested on a large variety of equipment, everything from video recorders to complete computer setups. Normally, I had a six-outlet power strip plugged into the surge suppressor. All the equipment operated properly.

The specification data included with Electra-Guard was a little skimpy for a review. I called Howard Medical, the manufacturer, for more information. I placed the call at 8 p.m. (Chicago time), and there was someone on duty to answer my questions. I talked to Ross Litton, and he gave me the information I needed. Electra-Guard can handle 15 amps of current and works on 115 VAC house power. The response time of the surge suppressor is five billionths of a second. Surge spikes of 6000 volts will be clipped to 240 volts.

There is a red window on Electra-Guard. If the window turns black, return Electra-Guard to Howard Medical. The black color indicates the surge suppressor has been hit by a very large surge. I was told that Electra-Guard has a five year warranty.

From my research, I discovered that you can put a six-outlet power strip, with power indicator, on/off switch and circuit breaker together with Electra-Guard for about \$35. I found one thing missing that I like to see on electrical devices: a UL number. According to the package I received, Electra-Guard was not tested by Underwriters Laboratory. I think products of this type should be tested by an independent laboratory.

(Howard Medical, P.O. Box 2, Chicago, IL 60690, all CoCo equipment, \$16.25 plus \$2.00 S/H)

— Gabe Weaver

YACHTSEE Can Make Dice-Rolling Addictive

In our rush to find uses for our computer, we sometimes overdo it. If I write only five checks a month, a check balancing program is probably unnecessary. If my taxes only require the short form, I'm probably wasting money and time if I purchase income tax software. Twenty phonograph records or 10 recipes do not usually justify a database program.

The same goes for games. A game that is simple, fast and enjoyable is not necessarily improved by playing it on the computer. Such is the case with *YACHTSEE* by Beargrip Software.

The original non-computer game which this game is based on is played with five dice and a scoresheet. Players take turns rolling and rerolling the dice trying to make certain combinations. Points are scored and the game ends when the various categories are filled. Despite the randomness of the dice roll, there is some skill involved in winning. The game is fast and fun, and sometimes even addictive.

YACHTSEE uses the Color Computer to roll the dice and keep score for up to six players. The game's graphics are good and the scorekeeping is correct and helpful, but the game simply moves too slowly. The slowdown occurs while waiting for the game to ask if you wish to roll again and then which dice you will reroll. The program is written in BASIC and the slowness clearly affects the game's playability.

THE RAINBOW's guidelines for reviewers asks us to let the product stand on its own. Even if you have never played the original dice game, I think you will find the game's pace is just not fast enough. If you have played the original, you'll probably want to stick with it — some things are just not improved by putting them on a computer.

(Beargrip Software, distributed by Softmart, P.O. Box 61095, Raleigh, NC 27661, 32K ECB, tape \$16.95, disk \$17.95)

— John Matviko

CCAD-B SYSTEM

The CCAD-B system is:

- * 13 Bit Analog/Digital Converter *
- * 16 Input Channels for Analog Sensor signals *
- * 3 TTL Compatible Latched Outputs for OUT of RANGE Indicators *
- * Operates with CoCo 1 or 2, Disk or Tape *
- * On-Board User Amplifiers for Scaling of Sensor Inputs *
- * Operating Addresses Switch Selectable for Multiple Units *
- * On-Board HIGH PRECISION Reference for Stability and Accuracy *
- * Optional MENU DRIVEN BASIC/MACHINE CODE Operating System for CCAD-B

ORDER: CCAD-BH \$169.00
CCSOFT-DISK \$29.50
CCSOFT-TAPE \$27.50

TEACH YOUR COCO 1 or 2 COMPUTER 'ANALOG'

Allow your Computer to understand the World of Analog signals. The integration of your computer and a Technical Hardware Analog to Digital Converter creates a Sophisticated Data Acquisition System whose Performance is Equal to systems costing Thousands more.

- * Easily Installed, Simply Plug In to Cartridge Port *
- * Use of Optional Operating System (CCSOFT) requires no Software Knowledge *
- * General Applications Include: * Energy Management * Temperature * Pressure * Light * Current * Colorimetry * Process Control

TECHNICAL HARDWARE INC., PO BOX 3609
FULLERTON, CALIF. 92634

AD-B SYSTEM

- * 8 Bit Analog/Digital Converter *
- * 8 Input Channels for Analog Sensor signals *
- * Operates with CoCo 1 or 2, Disk or Tape *
- * Interface contained in Plastic Case for Convenience *
- * Sensor Interface via PC Mount Terminal Strip *
- * Operating Addresses Switch Selectable for Multiple Units *
- * Optional MENU DRIVEN BASIC/MACHINE CODE Operating System for AD-B

ORDER: AD-BH \$69.95
ADSOFT-DISK (AD-BD) \$ 9.95
ADSOFT-TAPE (AD-BT) \$ 7.95

THinc — W —

ME-128-64 128K Upgrade Expands CoCo's Memory

Many of us old timers can remember when we only had 4K. Then came 16, 32 and now 64K. I used to think this was the limit to my CoCo's memory. Recently, my ideas of the CoCo's ability have been expanded by the introduction of the ME-128-64 128K Upgrade from Dynamic Electronics.

This upgrade comes with all the parts needed. The only tools needed are a screwdriver to open up your CoCo's case. I also used an IC extractor/insertor to help me, but a small flat blade screwdriver should also work. The upgrade consists of 10 ICs, installation instructions, a small user's guide and a copy of Dynamic's catalog.

The installation was fairly simple because all the soldering has already been done for you by Dynamic. To do the upgrade, you first open the cover of your CoCo. A word of advice at this point: as you loosen each screw, place a piece of tape over the screw hole. This way, when you turn the CoCo right side up, you don't have to worry about where the little parts have gone in your shag rug.

After the cover is off, you must remove your RF shield. Then, you remove your eight 4164 memory chips from their sockets and put them aside. The same is done with the 6883 SAM chip and the 6822 or 6823 PIA chip #U18, for 'F' boards, or U8 for 'D' or 'E' boards. (My documentation did not say what chip it was in the CoCo 2. I also suspect those of you who have the new CoCo 2 with the new SAM chip and only two memory chips will not be able to use this upgrade.)

After the old chips are out, put the new chip/socket combos back in their place. At this time, you can check to see if these new chips are working. After this, put your original chips back in the sockets on top of the new chips. It will remind you of the old "piggyback" upgrades as each memory socket, the SAM chip and one of your PIAs now has two chips plugged with one on top of the other.

A small hole should be drilled in your CoCo's case to hold the small toggle switch that switches between your two banks of memory. Replace the cover on the CoCo, tighten the cover screws (wasn't the tape a great idea?) and you are done.

Use of your two banks of 64K can be controlled by hardware or by software. Two simple pokes switch you between banks or you can use the switch to do it manually. In effect, you now have two 64K computers in one.

You can use either bank you wish but there is a catch. Because you have only one CPU and VDG, you must be doing similar things in both banks or these chips will get confused. You can run two BASIC programs if, when you switch banks, you are in the text mode.

You can also run any two copies of a heavy graphics program. For example, I edited two documents with my word processor at the same time. I switched the switch and the document on the screen changed. I also was able to run two copies of an arcade game. By doing this, two sets of high scores can be kept going at the same time.

One fault I found was the claim that you could pass variables between banks. The instructions contained no indication of how this could be done. A call to Dynamic (they were open on a Saturday!) cleared it up. You can

pass a zero through 128 integer value between banks from BASIC. To do this, you take the value you want to pass, multiply it by two and POKE it in memory address 65321. The receiving bank PEEKs that address and divides it by two. The multiplying and dividing is needed because you are actually storing a value in a PIA register which masks out bit zero when it does the switch. I was told this information would be included in future editions of their instructions.

One other problem I had was with overheating the SAM chip. With two SAMs stacked on top of each other, heat can build up after three or four hours. The overheating of the SAM chip will make your computer lose track of where memory is and what's in it. I found pieces of my text wandering around my review as I typed it in. One of the small fans you can buy should cure this. Possibly a heat sink could be built into the kit by Dynamic, also.

Overall, I found this to be an easy-to-install upgrade that performed exactly as is advertised. What I would like to see now is more software that could take advantage of the extra 64K. How about a 64K RAM disk? Dynamic has shown us what could be the next step in the continuing evolution of the CoCo.

Dr. Megabyte salutes the pioneers who blaze a new trail of CoCo power for the rest of us. For those of you who want to follow right behind these pioneers, I recommend the ME-128-64 128K Upgrade from Dynamic Electronics.

(Dynamic Electronics Inc., P.O. Box 896, Hartselle, AL 35640, \$129.)

— Mark E. Sunderlin

PICOSOFT STRATEGY GAMES



THE SPANISH ARMADA

Simulates the problems faced by the English Commanders in 1588 as they struggled to defeat the ARMADA. Cope with fickle winds. A relentless current. Difficulty of supply. \$24.95

DEBACLE

Command an 18th century army in the opening campaign of the French and Indian War. Build a road through the wilderness. Establish supply lines. Cope with Indian attacks. Capture a frontier fort. \$24.95



FEUER AND GASSE



Lead the American 2nd Division in a counter offensive against von Ludendorff's final drive on Paris in 1918. Recreates the battles of Belleau Wood and Chateau Thierry. Plays in real time. \$24.95

All games require a 32K computer and are graphically portrayed using the semi-graphics 4 mode to depict the battle maps. Tape and disk compatible. Games are shipped on tape.

Send check or money order to PICOSOFT GAMES, P.O. BOX 35, EIGHTY FOUR, PA 15330. (412) 267-3721. Games are shipped postage paid. PA residents add 6% Tax. No delays for personal checks.

Distributed in Canada by Kelly Software Distributors Ltd. P.O. Box 11932, Edmonton, Alberta T5J 3L1; (403) 421-8003.

The Shadow Lurks In Action-Packed *Shamus*

He's here all right. You could tell from the moment you entered. This is just the type of place the "Shadow" loves — dark, dreary, dangerous and deadly. Deadly, at least, for you. The Shadow's Lair has the most modern intruder-exterminating system in the known galaxy. Robo-Droids patrol the corridors, programmed to destroy you at any cost. Whirling Drones home in on your every move and Snap-Jumpers snap in and out of your time-space continuum appearing first in front, then in back of you, or worse, *on* you.

And, as if his creatures were not enough to dispose of you, the Shadow has electrified the walls. Of course, your every move is monitored by the big man himself, who at any moment might appear on the scene, covered in his impregnable Tri-Gamma armor.

But you are the "Shamus," and the word "quit" is most decidedly absent from your vocabulary. Armed with your Ion-Shivs, which you can fire in any one of eight directions, you have vowed to kill this shady Shadow character if it's the last thing you do! But it won't be easy . . . you knew that from the start.

The Shadow has built a four-level, 148-room complex. You must traverse the treacherous maze-like passageways in search of the keys which will allow you to advance to the deeper levels of this dungeon, for it is only in the deepest

recesses of Level 3 that you have a chance to annihilate your nemesis.

Thus begins the game of *Shamus*, one of Radio Shack's latest disk-based game programs. *Shamus* itself is not a new game. It was released about a year ago by Synapse Software, which has since ceased marketing CoCo software. The game is fun, action-packed and is well thought out, but the real question in any game review is not "Is the game good?", rather, "With all the other games available for the CoCo, is this game worth spending money on?" Read on for the answer.

To load *Shamus*, insert one of the two copy-protected disks which Tandy supplies into the drive and type RUN "SHAMUS". After a few seconds, a title screen will appear, accompanied by some very good music. The game will then give you the option of changing the skill level from Novice to either Advanced or Expert. One of the novel features here is that changing the skill level affects only one thing in the game — the speed. In fact, at the Expert level, I'd say it is one of the fastest CoCo games you could buy.

Shamus is a "shoot-'em-up" game. It doesn't pretend to be much else. Rather, it makes the most of what it is. The graphics are good, animation smooth and sound effects adequate. Joystick response is good, even from the old Radio Shack ones.

And addicting it is. One of the elements which makes the game even more addictive is that unlike many shoot-'em-ups, *Shamus* never really ends until you defeat the Shadow, a task which is not easily accomplished (I have yet to reach Level 3!). The game doesn't just end; instead, your quest continues and your desire to crush the Shadow intensifies.

All of which brings us to the real point in this review — is *Shamus* worth \$30? If you abhor shoot-'em-ups, or would prefer strategy games, perhaps not. But if a fun-filled game which is 98 percent pure action is what you yearn for, I'd be hard pressed to recommend a better game.

(Radio Shack Stores nationwide, 16K, disk \$29.95, Catalog No. 26-3289)

— Eric Tilenius

Canadians
Can you imagine it?
It's free



84

Kelly Software
Distributors Ltd.
11932 P.O. Box
Edmonton, Alberta
T5J-3L1

Send for your free copy of our catalog/newsletter. It will contain articles, rumors and letters of interest to all Canadians. We stock all of the latest products available for the color computer, and the best news is that it will usually cost you less than importing from the United States. Kelly Software is Canada's largest distributor of CoCo Software.

Dealer inquiries invited.

Kelly Software Distributors Ltd.

P.O. Box 11932
Edmonton, Alberta
T5J-3L1

Telephone (403) 421-8003.

One-Liner Contest Winner . . .

Barry Becker says, "My entry is called *Blobs*. Big deal." Try it and see what he means.

The listing:

```

Ø PMODE4: SCREEN1, 1: PCLS5: X=RND(-
TIMER): FORK=1 TO 1E9: X=4Ø+RND(175)
: Y=4Ø+RND(111): N=RND(4Ø): C=RND(2
)-1: FORJ=1 TO N: CIRCLE(X, Y), J, C: NE
XTJ: C=C+1: CIRCLE(X, Y), J, C: NEXTK'
***** BLOBS *****
***** BY BARRY E. BECKER *****
    
```

*Barry Becker
Smithtown, NY*

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

PANZERS EAST! Gives Many Hours Of War Game Competition

The date: June 22, 1942. The time: 3 a.m. You have been given sole responsibility for Operation Barbarossa, the Nazi plan for the invasion and destruction of the Soviet empire. At your disposal are over 400 divisions as well as the might of the Luftwaffe. Your opponents are a defending army about 25 percent larger than your own, the vast distances of the Soviet steppes, and time — time for the Soviets to dig in, time for their rearmament and recovery from your surprise attack, and time that will bring the bitter Russian winter; the same winter that crushed Napoleon and would force a halt of your offensive for months, depriving you of the momentum of the attack and allowing the Soviets to rebuild for a counterattack. It's time now to order *PANZERS EAST!*

Game components are limited to the cassette (which has a Commodore 64 version on side one and Radio Shack versions I/III/4 followed by the CoCo version on side two), a clearly written 12-page instruction booklet and a small, attractive map of the Western Soviet Union. The map is necessary as (unfortunately) no graphics are used in the program.

As with another Avalon Hill game for the CoCo (*MIDWAY*) the CoCo version of *PANZERS EAST!* has

extra options not included in the versions for the other systems. These allow the player to check the geographic regions of greatest importance to final victory, or order up a standard Combat Air Patrol for selected areas. Both make for easier and faster play.

My trusty 'E' board is willing to ignore cassette programs for the models I/III/4, so it was possible to avoid fiddling with earphone and microphone jacks when loading by 1) going fast forward to the end of side one, 2) flipping the tape, 3) typing POKE25,6, and 4) CLOAD. Now go and prepare a hearty snack: two sandwiches and a glass of milk should do. Don't rush. When all is "OK" type RUN.

The playing time is given as one to three hours. Except for my first two games (in which the CoCo beat me solidly in under 90 minutes each time), I found playing times to run from five to seven hours. Be sure you have a comfortable location as you are likely to be pinned down for some time. This may be a personal problem, though, as I find playing times longer than listed with most strategy games I've played.

After typing RUN and the Avalon Hill logo leaves the screen, you are asked if this is a new game or one in progress. If a continuing game, you now place the cassette with the previously saved data file in the cassette player, press Play and continue. A new game requires further decisions of playing a historical game or a very slightly shortened version which gives one week of better weather and a few more ready units at the start.

Next, you set the importance of general campaign objectives — capture of population centers, industry, agricultural areas, isolating the Soviet Union and maintenance of Allied good will. These are key decisions

TRS-80 COMPUTER DISCOUNTS



COLOR COMPUTERS

26-3134 16k color II	110.00
26-3136 16k ext color II	130.00
26-3127 64k color comp	179.00
26-3029 1st disk drive	289.95
26-3130 2nd disk drive	169.95

PRINTERS

26-1276 DMP-105	169.95
26-1271 DMP-110	299.95
26-1255 DMP-120	395.00
26-1278 DWP-220	500.00

MODEL 4 and 1000's

25-1000 mod 1000	999.95
26-3211 Monochrome monitor	125.00
26-1069 mod 4 64k 2dr.	999.00
26-1080 mod 4 p	CALL
25-1005 2nd drive mod 1000	215.00
25-1004 128K memory board	250.00

**We Carry the Complete Line of TRS-80
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

as this information is used to generate a list of areas with moderate to high victory point values, so you must set your military objectives for the game. Avoiding the main objectives can lead to being relieved of command or more often the firing squad (a bit drastic I thought).

The last choice to make (we are still in pre-game set up) is what percentage of the Luftwaffe to throw against the Soviet air force. (I suggest a full 100 percent as anything less risks the survival of a significant portion of Russian air power and to provide effective support requires at least one-third of the available aircraft.) A strong first strike leaves the Soviets with about 10 percent of German air strength; unless checked, this will build as the game progresses.

At the start of each turn, except the first, you must decide which single area will receive supply priority. It is critical that attacking units be kept in supply, as poor supply can reduce effective strength by 75 percent! Many times this will call for a difficult choice as several areas may be in combat or open to counterattack, and each may be in need of resupply. The greater the number of areas you occupy, the greater the difficulty in supply and danger of counterattack.

The key to playing *PANZERS EAST!* is keeping track of both Soviet and German troop strengths and locations. This data can be taken from the "review troops" command and the "intelligence" command. To provide an easily readable record of the situation, I found it helpful to use self-made counters representing either 20 or 50 units to be placed on the map provided with the game. These are updated each turn, allowing a close watch to be kept on a gradual Soviet buildup and also ensure you know your

own strong and weak points.

The Luftwaffe is available for Combat Air Patrol (CAP), Bomber Escort, Ground Attack (straffing) and Bombing Missions. From about turn three on, be sure to assign CAP to all areas in which you have troops. Also, some long range CAP to go with bombers and escorting fighters often brings in a bonus of extra downed Soviet aircraft. A CAP of three or four over rear areas is generally enough, while four to seven over your main troop concentrations might be called for late in the game (when they are most difficult to spare).

Use the Luftwaffe as a disrupting force against Soviet troop buildups and in support of attacking troops. It appears that straffing does little damage while incurring relatively heavy losses. Don't be concerned about transferring air assets from one operational zone to another. Air power should largely follow the troops.

PANZERS EAST! touches many problems from air power to partisans (they attack weakly-held areas) to weather, even Allied troops who refuse to move beyond their limited zones of responsibility. A game save feature even allows the saving of a game at a given point, so it may be played again from that point to fine tune strategies — an interesting technique to apply if you want to win a particular game at all costs!

For those of you with an interest in the eastern front war, or any wide scale conflict involving the military aspects of expansion and occupation, *PANZERS EAST!* will give many evenings of competition. Avalon Hill has provided another welcome addition for your war game collection.

(The Avalon Hill Game Company, 4517 Harford Road, Baltimore, MD 21214, 32K ECB, tape \$25)

— Nevin J. Templin

NEW SOFTWARE SPECIALS!

EZDISK - THE EASY TO USE DISK UTILITY IS HERE NOW. NO MORE "RUN" OR "LOADM". JUST TYPE THE FILE NAME AND IT LOADS & RUNS. INCLUDES FULL SCREEN EDIT! EVERY PROGRAM BECOMES A COMMAND! INCLUDES HELP UTILITY, DIRECTORY PRINT, COLD START, A QUICK DISK FORMATTER, AND OTHER UTILITIES. USER MODIFIABLE COMMANDS!

SPECIAL INTRODUCTORY PRICE.....\$15.00

FSE - THE FULL SCREEN EDITOR FOR TAPE OR DISK! EASY TO USE UTILITY FOR 32/64K AND ALL ROMS. INCLUDES AUTO KEY REPEAT. INTEGRATES WITH BASIC SO IT IS AS IF YOUR COMPUTER WAS BORN WITH FSE. REPEAT KEYBOARD COMMANDS, EASILY MOVE AND RENUMBER LINES, EDIT LINES BY LIST IN ADDITION TO EDIT.

SPECIAL INTRODUCTORY PRICE.....\$11.95

F-16 INSTRUMENT FLIGHT SIMULATOR FLYS MACH 2.6, IS FULLY AEROBATIC, SPECIFY 16/32K.....\$21.95

DESCENDERS - FIX RADIO SHACK® LPVII, DMP100, TDP-1, AND GORILLA BANANA® CHARACTERS. SPECIFY PRINTER.....\$17.95

TSPPOOL - SOFTWARE SPOOLER FOR TELEWRITER-64® ONLY. INCLUDES DESCENDERS.....\$24.95

U.S. FUNDS ONLY - ADD \$2.00 S & H TO ALL ORDERS

NEW: CoCo WORLD Catalog

ISSUE #2 NOW AVAILABLE! TIRED OF SEEING FABULOUS AD PICTURES THAT DON'T RESEMBLE THE PROGRAM AT ALL? WONDER WHAT THE PROGRAMS REALLY DO? OUR CATALOG IS ON TAPE OR DISK AND CONTAINS DETAILED EXPLANATIONS OF PROGRAMS, DEMO PROGRAMS & GRAPHICS, ALONG WITH REVIEWS & ARTICLES FOR YOU. SEND \$3.00 & WE WILL RUSH YOU OUR LATEST INFORMATION. PLEASE SPECIFY TAPE OR DISK. NOTE: ANY SOFTWARE AUTHOR MAY ADVERTISE IN OUR CATALOG AT NOMINAL COST. BACK ISSUES AVAILABLE. ISSUE #1 OWNERS CALL FOR SPECIAL OFFER. CALL OUR ORDER LINE (813) 321-2840 9-5 PM EST

KRT Software Inc.

P. O. Box 41395

St. Petersburg, Florida 33743

One-Liner Contest Winner. . .

This one-liner is a "micro" tutorial in using variables in DRAW and PLAY.

The listing:

```
1 PMODE4, 1: PCLS: SCREEN1, 1: PMODE3
: X=RND(200): Z=RND(200): Y=RND(100)
: S=RND(100): X1=RND(15): X2=RND(25)
: DRAW"BM=X; ,=Y; R=X2; D=X1; L=X2;
U=X1; ": PAINT(X+1, Y+1), 2, 4: CIRCLE
(Z, S), X2: PAINT(Z, S), 2, 4: LINE(X, Y)
)-(Z, S), PSET: PLAY"L=X1; A; L=X2; B"
: GOT01
```

*Jo Ann Karaffa
Wilmerding, PA*

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

Youngsters Can Enjoy Tic-Tac-Toe With CoCo

The classic game of "Tic-Tac-Toe" is certainly one of the earliest board games a young child learns to play. This cassette-based version, for the 16K Extended BASIC Color Computer, is definitely more enjoyable than the version typically played on paper.

Loading instructions are on the cassette label and the program loads in approximately 60 seconds with no problem at all. Upon running, there is a title page and a high speed 'X' and 'O' traveling across the screen. These two alpha characters generate tones that with a little imagination sound like their pronunciation.

The operating instructions are complete and easy to understand. Game options include: A) If there are two players or if you are playing against the computer; B) If you want to be 'X' or 'O'; C) If you would rather use joysticks or the arrow keys; D) The number of games per match (one to five); and E) The level of play (this is for playing against the computer only and includes beginner, average, or impossible-to-beat levels).

Since this game appears to be for a child who is a novice to *Tic-Tac-Toe*, I am surprised there are no instructions whatsoever on how to play the game itself.

The graphics are very colorful and easily legible for young eyes while most of the sound effects are pleasurable enough. Even though my 16-month-old son is much too young to comprehend the game's concept, he enjoyed viewing the screen and listening to the audio.

Playing against the computer, I found it pleasing to discover that it did not make moves that were obviously

incorrect. Even though most of the games were draws, the computer can be beaten in the first two levels of play by using the classic "Two-Ways-To-Win" scenario.

By using this strategy, the computer gives a surprising message (I won't tell you what it is); a nice touch. On the impossible-to-beat level, it lives up to its name; after playing at least a half hour, every game resulted in a draw.

However, this version of the game is not a total bed of roses; there are some thorns. The problem areas are threefold; one major, one minor, and one irritating.

The major problem is that in playing against the computer, while using the arrow keys, the computer quite often (approximately 75 percent of the time) automatically gave me the key center block without having me supply any input. This occurred regardless of whether or not I had the first move. The minor problem is that in games where seven or eight blocks are filled and there is no possible way for either opponent to win, the game must be finished with all blocks filled to its inevitable conclusion of a draw. The irritating problem again concerns playing against the computer. After winning a match, I was given a "razzing" tone; certainly poor sportsmanship by my electronic adversary.

Nevertheless, the youngster who is having his first exposure to *Tic-Tac-Toe* should find the game enjoyable and at only \$4.95, well worth the expenditure.

(Draco Software, 22 Lassell St., Portland, ME 04102, \$4.95)

— Dan Smith

One-Liner Contest Winner . . .

This program will turn your CoCo into an alarm system to guard against any little "door-slammer" who may want to bang on those keys if you have to leave the room. Just turn up the TV volume and wait.

The listing:

```
10 A$=INKEY$:IFA$=""THEN10ELSEFO
RX=1TO5:Y=RND(8):CLSY:SOUND150,8
:PRINT@224,"DO NOT TOUCH THOSE K
EYS AGAIN !!":FORT=1TO100:NEXT:S
OUND180,8:FORT=1TO100:NEXTT,X:CL
S:GOTO10
```

Tom McCarthy
Sterling, VA

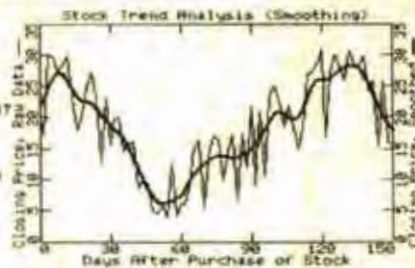
(For this winning one-liner contest entry, the author has been sent copies of both *The Rainbow Book Of Simulations* and its companion *Rainbow Simulations Tape*.)

GRAF PLOT

TRY IT BEFORE YOU BUY IT!!

FREE!!
DEMO!!

TEST DRIVE GRAF PLOT
IN YOUR OWN HOME,
ABSOLUTELY FREE!!
YOU'LL WONDER HOW
YOU EVER GOT ALONG
WITHOUT IT!!



- * YOU CAN BE A GRAPHIC ARTIST!
- * PUNCH UP YOUR PRESENTATIONS!
- * PROFESSIONAL GRAPHS WITH EASE!
- * BUSINESS-FINANCE-SCIENCE-ENGRS
- * IRONCLAD MONEY-BACK GUARANTEE!

~~~~~  
CALL NOW FOR YOUR FREE DEMO!  
~~~~~

24 HOUR HOTLINE (415) 547-7557

HERE'S WHAT THE EXPERTS SAY ABOUT GRAF PLOT:

A great package gets even better ... totally impressed ...
equally useful in the home and office ... meticulous, hand-
holding documentation ... very easy to use! RAINBOW, 6/84 & 7/83
"A high quality product ... slick presentations" Hot CoCo, 8/84

- * Easy to Use, Menu-Driven Operation with 37 Page Manual.
- * Nine Graphing Symbols and Unlimited Overlay of Data Sets.
- * Automatically Scales and Labels All Three of the Axes.
- * Calculates Math Functions, Integrals and Moving Averages.
- * Works with all CoCo models - requires Extended BASIC.

16K TAPE - \$35.00, 32K TAPE - \$40.00, 32K DISK - \$45.00 (US)

ASK YOUR DEALER FOR GRAF PLOT OR ORDER DIRECT FROM:
HAWKES RESEARCH SERVICES, 859 STANFORD AVE, OAKLAND, CA 94608
YOUR PERSONAL CHECK IS WELCOME! SHIPMENT WITHIN 48 HOURS!
\$3.00 SHIPPING ON ALL ORDERS. CA. RESIDENTS ADD SALES TAX.

Go On An 'Eeblewalker' Hunt With *LINER*

Software documentation can be misleading. A perfect example is the documentation/directions I received with a program called *LINER*, by Michael Stuller. *LINER* needs at least a 16K ECB CoCo and comes on cassette. The documentation is quite adequate, but misleading.

The background tells of a strange, rectangular planet called Oktry, which is inhabited by Eeblewalkers. You, being an Oktrite, make your living by hunting Eeblewalkers. It goes on to say that as you move about the planet, you dig a trench, which if fallen into, will cause you to tumble to your death.

After reading the background, I had visions of neat little graphics creatures running around on Oktry with me chasing them as I was digging trenches. *LINER* is simply a green screen with a rectangular border which has about 15 randomly placed blue squares (what you get if you PSET in PMODE 1,1). A yellow line from the left side of the screen starts to move to the right. Using the arrow keys, you guide the line across the blue squares, "killing" the Eeblewalkers.

If your path crosses the "trench," you die and lose one of your three lives. If you successfully "kill" all the blue squares, another screen full of squares will appear. Five points are scored for each square you destroy, plus a bonus for each screen you complete.

I found *LINER* to be boring, but decided that it deserved a second opinion. I sat my 8- and 12-year-olds down and had them play. Both lost interest in about five minutes.

To sum up this review, my conscience won't allow me to say anything other than don't waste your money on this one.

(Michael Stuller, 2 Audubon Place, Rolla, MO 65401, 16K ECB, cassette \$7.95 plus \$1.50 S/H)

— Paul Austin

Triple Joyport Switcher Saves Wear and Tear On Your CoCo

The Triple Joyport Switcher from Spectrum Projects is a nice accessory for those of us who use more than one product that plugs into the joystick ports. Imagine the wasted time, worn out plugs and worn out fingers used to switch between one type of joystick to another.

For instance, suppose a person is an artist, game player and aviation expert. There is a specially built joystick assembly for the popular graphics program, another contraption for some of the flight simulators and the run of the mill joystick for "normal" games. Just having to switch plugs every time he/she changes programs is anything but pleasant. Spectrum Projects also knows that; that's why they have come up with the Joyport Switcher.

First, a description of the switcher. It comes in a generic experimenter's box slightly larger than a deluxe joystick. Running from the back are four cables: three for the different joysticks and one to be plugged into the computer. All you have to do is plug the three cables (or less if you don't wish to use all of them) into the accessories, and the fourth one into the joystick port in back of the computer. After that, all you have to do is turn a knob to select which one you wish to use.

Although the box is not very decorative, it is very well-constructed and looks "distinguished." The purpose of the switcher is not to be attractive, but to save wear and tear on the user and the computer, of which it does an excellent job. If you ever find yourself unplugging one joystick to use another one, you probably will be grateful for this product.

(Spectrum Projects, Inc., P.O. Box 21272, 93-15 86th Drive, Woodhaven, NY 11421, \$39.95 plus \$3 S/H)

— Jim Sewell

* *
* fss *

FOUR STAR SOFTWARE

GALACTIC FIGHTER

A fast-paced arcade game with great graphics and sound. CoCo at its best!

Save earth by fighting your way to Dracoz, the home world of the invaders. Fly earth's secret weapon, "The Galactic Fighter". Overcome alien ships, missiles and meteor showers. Try and survive the deadly laser trench.

32K, one joystick required.

CASS. \$19.95 (U.S.)
DISK \$24.95 (U.S.)

\$24.95 (CDN.)
\$29.95 (CDN.)

Write for free catalogue
Dealer enquiries welcome
Overseas orders add 10%

COCO PAINT

A very advanced, easy-to-use graphics development system for a 64K, single-drive CoCo!

- Supports: keyboard, single joystick, mouse or X-pad
- Mix graphics and text, using built-in or user-definable characters and textures
- Create stamps: rotate, mirror, shrink, expand or invert
- Screen dump to most common printers
- 300 - 1200 baud modem communications capabilities
- Plus many more excellent features

DISK \$39.95 (U.S.)

\$49.95 (CDN.)

P.O. BOX 730
STREETSVILLE, ONTARIO
CANADA
L5M 2C2

BUGS II

An adventure game with all the excitement of arcade action.

Earth is infested with intelligent killer bugs. Find your way through the maze and destroy their reactor. However, you must fight the bugs all the way!

New and improved version of the game that won the Color Computer Magazine® programming contest. 64K required.

CASS. \$19.95 (U.S.)
DISK \$26.95 (U.S.)

\$24.95 (CDN.)
\$32.95 (CDN.)

Cheque or Money Order

Add \$2.50 shipping
Ont. Residents add 7% tax

CoCo Max Delivers An Outstanding Performance

By Jesse W. Jackson and David L. Tate

CoCo Max is a sophisticated graphics system that can be used to generate, process and edit graphics pictures with a single joystick, mouse or touch pad. The program is a nearly perfect clone of the Macintosh's *MacPaint* program. In fact, we put Mac and CoCo side by side to compare the two, but we'll get to that later in this review.

The disk version comes with a non-copy-protected diskette, a program-pak and a 39-page user's manual. The diskette contains the *CoCo Max* system, several pictures, and a BASIC program to configure the system for various printer models and Baud rates. The program-pak contains a high resolution A/D (analog-to-digital) converter with a DIN connector for plugging in any device, such as a joystick, mouse or touch pad, that can be used on CoCo's joystick inputs.

My diskette contained machine language drivers for Gemini-10X/15X, Epson MX and RX, DMP-100, DMP-200, DMP-400 and C. Itoh printers. I had to modify the Gemini driver for my Gemini 10 because of differences between the 10X/15X and 10/15 in graphics mode. The Epson MX driver worked well on an EPSON FX-100 the first time.

The program-pak is well-constructed and has the same size and appearance of a Radio Shack cartridge. The DIN connector for the joystick input is flush, mounted at the end of the cartridge for a firm fit. This cartridge contains no program ROM, but an eight channel, eight-bit A/D for accessing any of the 256 possible horizontal pixels and the 192 vertical pixels in the work area.

This program-pak is needed to optimize *CoCo Max*'s performance because CoCo's six-bit A/D limits access to 64 pixels in each direction at any one time. CoCo's A/D could be scaled by software but at a loss of resolution (the cursor steps would be every fourth pixel). A sliding window could be used at the expense of the response time (the joystick could access every pixel in a 64 by 64 movable area and this would require extra processing time).

The user's manual is comprehensive, complete with illustrations and well-organized. You will want to read it carefully to discover the full capabilities of *CoCo Max*, such as menu shortcuts and using the SHIFT for special effects.

Description

First of all, you should look at Colorware's advertisement in this issue to visualize how the program presents the menu and graphics pictures. Secondly, let's define some terms. "Icons" are pictures symbolic of the function to be performed. "Pointing" will be defined as positioning the

program's cursor or arrow pointer with the input device (joystick, mouse or touch pad). "Clicking" means pressing that device's firebutton. "Dragging" is holding the firebutton down while moving the joystick.

CoCo Max is operated by POINTing and CLICKing. The only typing you must do is to enter the filename you wish to LOAD or SAVE. You can insert text into the picture from the keyboard in several fonts and styles. The SHIFT key can be used for special effects, and supplements the firebutton.

You create a picture by selecting tools from the icons in the tool kit and using them within the work area.

When you have selected a tool, the cursor becomes the icon of the tool while in the picture area and is an arrow pointer in the menu, tool or pattern area. The tool kit contains a lasso, editing box, hand, alphanumeric set, paint can, spray can, paint brush, pencil, rubber band line, eraser, rectangle, rectangle with fill, rounded rectangle, rounded rectangle with fill, circle ellipse, circle/ellipse with fill, free-hand shape, free-hand shape with fill, polygon and polygon with fill.

The brush, paint can, spray can, rubber band line and fill tools paint in one of 60 selectable patterns at the bottom of the page. CLICKing causes the brush to paint its shape, the spray can to apply a shot of its pattern, or the paint can to fill in an enclosed area where it's poured. The pencil draws and the eraser erases while CLICKed. The rubber band line and shapes are drawn by DRAGging between two points. The shape icons can paint using one of five selectable line widths from the line width menu in the lower left-hand corner of the page.

The lasso defines an irregular shape to be captured for

FREE 10 DISKETTES OR 20 C-20 CASSETTES

A subscription to the 'Coco-Cassette' gets you a tape or disk full of 10 quality programs delivered to you by first class mail every month. The documentation included will help you run great utilities like 'Word Processor,' and 'Budget Analyzer,' or enjoy great games like 'Frogjump' and 'Caterpillar Cave' FOR AS LITTLE AS 46 CENTS EACH!

★ Limited offer ★ Subscribe for a year on cassette and receive 20 Free C-20 cassettes or subscribe for a year on disk and receive 10 Free 5 1/4 single sided double density diskettes!

Now available on disk!

PRICES

	TAPE	DISK
1 YR (12 ISSUES)	55 ⁰⁰	70 ⁰⁰
6 MO (6 ISSUES)	30 ⁰⁰	40 ⁰⁰
Single Copies	6 ⁰⁰	8 ⁰⁰



- ★ 16K extended required
- ★ Some programs require 32K, and/or disk
- ★ Over 3000 satisfied customers
- ★ Back issues available from July '82 PERSONAL CHECKS WELCOME! (over 280 programs to choose from!)
- ★ Also available for Commodore 64.

Mch. Res. add 4%
Overseas ADD \$10 to subscription
and \$1.00 to single issues.

T & D Subscription Software
P.O. BOX 256-C
HOLLAND, MI 49423
(616) 396-7577



See You At

RAINBOWfest CHICAGO

May 17-19

editing, while the edit box defines a rectangular box for editing. This allows rubber stamping of parts of the picture, and some other capabilities, too.

The alphanumeric set allows insertion of text into the picture from the keyboard using the selected font and style options. Fonts available are Woodhaven, Topeka, MonaCoCo, Fort Worth and Paris. Styles are plain, bold, italic, outline and shadow. Left, middle and right options in the style menu define the alignment of the entered text.

Display

A *CoCo Max* picture consists of two PMODE 4 screens, one atop the other, to give a 512 pixel wide and 384 pixel high picture. This is the equivalent of having the top half in PMODE 4,1 and the bottom half in PMODE 4,5 in Extended BASIC. *CoCo Max* will only LOAD files with an extension of "/MAX," so you must rename a non-*CoCo Max* picture before you can LOAD it into *CoCo Max*. I was successful in using *Graphicom's* "GC>BIN/BAS" program to convert a *Graphicom* picture to LOAD into *CoCo Max*.

CoCo Max always presents a graphics screen to the user. The upper border contains several menu selections that can be pulled down to give menu options. You pull the menu down by pointing to it and clicking.

The menu options are graphically displayed under the menu selected. You pick the menu option by pointing and clicking, too. The menu option pointed to is highlighted in reverse video to let you know you've pointed accurately, and a checkmark to the left indicates that the option is on, absence of a checkmark indicates the option is off.

The actual work area is about 208 pixels wide by 128 pixels high. You slide the work area around the picture by using the hand in the tool kit. A scroll page option in the goodies menu lets you move the entire picture in detail. The show page option in the files menu lets you visualize the entire picture in reduced detail.

Features

The files menu allows you to LOAD, SAVE, do a directory of *CoCo Max* pictures and PRINT pictures in double-size, double strike and single-size modes. You may also CLEAR the page (erase the picture), undo your last step (re-do it, too) or quit to BASIC. My disk version has no provision for cassette SAVE or LOAD.

The edit menu lets you copy, cut, and paste portions of a picture to/from the clipboard on the disk. You may also invert, clear, fill, trace edges or flip horizontal and vertical the pasted portion.

The goodies menu lets you select an invisible grid of 8 by 8 pixels that, when turned on, forces the end points of lines, boxes and circles to snap and lock on to the grid. "Fat bits" is a fixed zoom-in magnification of eight times normal size. "Show page" gives you an overall view of your picture in reduced detail. "Edit pattern" lets you change any of the 60 selectable patterns to a custom one, designed by you. "Brush shape" lets you select one of 32 different shapes for painting. "Brush mirror horizontal" and "vertical" lets you create symmetrical pictures by mirroring your brush strokes about the horizontal and/or vertical center of the page. "Inertia" is a special function to smooth out the jerky signal from the touch pad (it's not included in the version I have, but the manual discusses it).

Deficiencies

The major deficiency of *CoCo Max* is error reporting:

it doesn't. I couldn't get *CoCo Max* to crash, but it doesn't report errors such as "disk full," either. I intentionally filled a diskette so only five granules remained free. The picture I wanted to save needed six granules.

CoCo Max SAVED the picture, but *only* five granules of it, and didn't bother to report this to me. The next SAVE (the disk is full, now) turned the drive on briefly and returned to *CoCo Max*. The diskette structure was not destroyed, but a directory showed that the picture didn't get SAVED.

Also, I succeeded in saving a file called "1:JUNK" on Drive 0; the "1:" was part of the name. Try to KILL that from Disk BASIC. *CoCo Max* has no provision for KILLING files. My disk version of *CoCo Max* is a one-drive system. *CoCo Max* doesn't normally need the system diskette, except for certain EDITING functions and to SAVE or LOAD pictures.

Though not deficiencies, here are a few things I'd like to see added to *CoCo Max*: multiple drive support; a programmable zoom magnification; the ability to stretch areas horizontally and/or vertically; the ability to SAVE and LOAD edited patterns.

CoCo's CoCo Max vs. Macintosh's Macpaint

Having seen *Macpaint* first, I was skeptical when I saw Colorware's advertisement for *CoCo Max*, but the resemblance hooked me. Putting the two side by side, we began to look for Mac's 16-bit powerhouse 68000 to outpace its smaller eight-bit brother 6809 in CoCo. We were surprised at how CoCo stood up to the task!

Macpaint's picture is black and white, 512 pixels wide by 768 pixels high; four times the area of *CoCo Max*. *CoCo Max* presents an artifacted (more than two colors from a two-color mode) color display of a picture, even though it's a PMODE 4 picture. Although *CoCo Max* can paint colored patterns in this mode, the colors change with detail and position on the screen.

Macpaint has a function that allows portions of a picture to be stretched horizontally or vertically. *Macpaint* has a file menu that includes new, open, close, revert and print catalog. *CoCo Max* has more patterns to choose from: 60 versus *Macpaint's* 38. *Macpaint* has an additional option, "rotate" in the edit menu. *Macpaint's* goodies menu has "introduction" (a help file), while *CoCo Max* has a "scroll page" option. *Macpaint* has more fonts and styles than *CoCo Max*.

I was certain Mac would be faster, and it is, but that's not to imply CoCo is slow. I did not find myself waiting for *CoCo Max* except a few seconds to fill large areas, about half a page, or to capture a detailed area with the box edit function. A fill that took CoCo 2.4 seconds took Mac 1.3 seconds (remember Mac is filling four times the area of CoCo).

Conclusions

This software/hardware graphics system is an outstanding buy for the performance achieved. I am pleased that Colorware's advertisement accurately described the product and that their delivery was timely, as promised.

(Colorware, Inc., 78-03F Jamaica Ave., Woodhaven, NY 11421, 64K, joystick, mouse or touch pad required, disk \$69.95 plus \$3 S/H)

Double CoCo's Serial Port With Data Line Switch Box

All of us have known the pain of wanting to use two RS-232 devices on our CoCo's one serial port. Many switch devices are already on the market to let you hook up two, or even three peripherals to your one port. A new entry is Phelan Enterprises' Data Line RS-232 Switch Box.

The Data Line Switch Box is a device to hook any two peripherals to the CoCo's single serial port. It consists of a 4" x 2" x 1" plastic box with one cable to hook to the CoCo port, and another two cables for peripherals to plug into. On the top are two switches to change which peripheral the computer is responding to.

Data Line does exactly what it is advertised to do, but I feel it has several shortcomings. The first is the use of two toggle switches, both of which must be flipped to switch peripherals. Also, the switches have a mysterious center position which is not documented. In my testing, I found it was very easy to think you've switched both switches, but actually leave one in the center position.

My second objection is with the price. Data Line is advertised at \$39.95. Other advertisers in RAINBOW are offering similar products at \$19.95 and I know of superior products of this type at \$29.95. These other products offer metal casing and one switch to do the job of the two used in Data Line. Rather than a professional product, Data Line looks like a very well-done project from "Turn Of The Screw."

The only documentation with the product is one page of computer print (dot matrix at that) with very skimpy instructions. The documentation also gives information on your warranty, which is 90 days.

Dr. Megabyte cannot prescribe this product because the bill is too high for the performance delivered. If Phelan can lower its price to the point where it matches the performance, it would get a much better recommendation. As it is, I would have to advise you to carefully look at very similar products' prices before buying this one.

(Phelan Enterprises, 4704 Bluejay Court, Fayetteville, NC 28304, \$39.95)

— Mark E. Sunderlin

ADVENTURUS SUPREMUS 4.6B

Are You tired of the standard medieval or science fiction type adventure game? If so, then Adventurus Supremus is for you. Funny, and farcical, it offers a change for the experienced adventurer. If You have some adventuring experience, this is the game for You.

Send \$9.95 (Check or MO) to:
Bacchus Computer Software
P.O. Box 265
Paw Paw, MI 49079
WE PAY THE SHIPPING!



FOR THE COLOR COMPUTER FROM

triad pictures corp.

p.o. box 1299 sequim, wa 98382

WAR of the WORLDS

A 100% JOYSTICK-DRIVEN ILLUSTRATED ADVENTURE!
NO MORE "HUNT-AND-GUESS" ON THE KEYBOARD!
HUNDREDS OF CHALLENGING SITUATIONS!



The highly detailed black & white illustrations put even the best color adventure graphics to shame... the first of a whole new kind of 'point-and-click' adventure... the wave of the future!

WAR of the WORLDS Chapter One - The Landing
SPECIAL INTRODUCTORY OFFER - \$16.95

SOLD SEPARATELY for \$18.95 each:
WAR of the WORLDS Chapter Two - The Quest
WAR of the WORLDS Chapter Three - The Last Hope
SPECIAL PACKAGE PRICE - All 3 Chapters for \$39.95

SUPPLIED ON CASSETTE
REQUIRES 64K AND ONE RADIO SHACK-TYPE JOYSTICK

Please send me: order form

_____ \$
_____ \$

Bill me Add \$3 shipping and handling... \$3
 Payment enclosed TOTAL \$ _____

name _____ **TRIAD PICTURES**
address _____ **P.O. Box 1299**
city _____ state _____ zip _____ **Sequim, WA 98382**
(206) 683-6459

CALL OR WRITE FOR CATALOG

IN AUSTRALIA

ORDER TRIAD PICTURES SOFTWARE FROM
SOFTWARE SPECTRUM, P.O. BOX 2101
ADELAIDE, SOUTH AUSTRALIA, 5001
(08) 211 8763 OR 51 4866

Aut-O-Start Is Your Cassette Program's Best Friend

If anyone has ever, or ever will have, written a program for a tape system to be marketed, your best friend could be *Aut-O-Start* by Spectrum Projects. This amazing program will do several things: it will allow you to make impressive title screens, auto-load BASIC or machine language programs (from cassette), load BASIC programs anywhere above PCLEAR 0, and protect your program from pirates.

When you have your program ready to be marketed, the first thing you must do is save it to cassette. After doing this, you can then put the *Aut-O-Start* tape in your recorder. All that is needed to load and start the program is CLOADM, then hitting ENTER. After awhile, the program will display a colorful title screen and continue to load the program.

When the program is totally loaded, you will see the main menu. This has three options: Create Title Screen, Produce Program Tape or End Program. The first choice will allow you to create a screen to go with your program. Within this option, you are allowed to choose background and boundary colors using the up- and down-arrow keys, edit the title screen with certain key sequences, save and load title screens, and go back to the main menu. While editing the title screen, you may change cursor color, reset

border color, set text mode to allow for text in your title screen, move the cursor with or without leaving a trail of the selected color or switch between graphics only and graphics and text modes.

The next option is Produce Program Tape. This will lead you to another menu which allows you to define parameters, save *Aut-O-Start* to tape or return to the main menu. The parameters to be defined are as follows: "Do you wish to have a title screen?" "Is the program in BASIC or Machine Language?" "Where does your BASIC program start (PCLEAR Values)?" and "Do you wish to protect your program?" The first two are self-explanatory. The next (start address) is, simply put, a PCLEAR value to use before loading the program.

The final one is the most interesting. The "protection" is to protect against most tape-to-disk copy programs and against the user breaking the protection by "skipping past" the loader section. That is to say, with some protections, all you have to do is skip the loader, then load the program as you normally would. *Aut-O-Start*, however, will not allow that. After doing all of this, you simply CSAVE or CSAVEM your program and *Aut-O-Start* will do the rest.

I think *Aut-O-Start* is an excellent program for those who need it to protect a product they are marketing. It would be extremely hard for someone to break the protection and look at your source code for devious purposes. If you need a safeguard, this product is definitely for you.

(Spectrum Projects, Inc., P.O. Box 21272, 93-15 86th Drive, Woodhaven, NY 11421, \$19.95 plus \$3 S/H)

— Jim Sewell

YORK 10[®] CASSETTES



**COMPUTER GRADE
• DATA TRAC •
BLANK CASSETTES**

C-05, C-06, C-10, C-12, C-20, C-24, C-32

From the leading supplier of Computer Cassettes, now, longer length C-12's (8 minutes per side) provide the extra few feet needed for some 16K programs.

- BASF-LHD (DPS) world standard tape
- Premium 3 screw shell with leader
- Internationally acclaimed. Thousands of repeat users.
- Error Free • Money back guarantee

Call: 818/700-0330
FOR IMMEDIATE DELIVERY
on Credit Card Orders.

BUY THE BEST, AT FACTORY-DIRECT PRICES

• 500 C-12's or C-10's — 36¢ each
includes: 500 #2 • Shipping \$17.00
500 Boxes 1.6¢ ea. • Shipping \$10.00
(Free Cards after order not apply)

CASSETTE STORAGE CADDY
holds 17 cassettes \$2.95
also holds
includes egg slicer
and more cards

FRAC-TION FREE • 26 CUT
BLANK CASSETTE LABELS
WHITE \$2.50/box \$25.00/box
COLORED LABELS • 7/box
Red, Blue, Green, Yellow, Lavender
\$4.50/box \$22.00/box

FREE
1 CADDY WITH EVERY
4 BOX CASSETTES PURCHASED
(does not apply to 500 quantity order)

ORDER NOW . . . MAIL TO —
YORK 10 8525 Vassar Ave. #R1
Chatsworth, CA 91311

NEW	1 BOXEN	1 BOXEN	TOTAL	#R1
C-05	1.50	13.50	15.00	
C-06	1.75	15.75	17.50	
C-10	1.75	15.75	17.50	
C-12	1.75	15.75	17.50	
C-20	8.75	78.25	87.00	
C-24	9.50	85.50	95.00	
C-32	11.25	98.25	109.50	
Head Set	3.50	—	4.00	
Qty Labels	3.00/box	25.00/box	28.00/box	
Color Labels	4.50/box	35.00/box	39.50/box	
Caddy	—	—	2.95	
Shipping/Handling	—	—	3.50	
Supplies 48 Continental States — additional \$1 per order, per box cassettes or tapes	—	—	—	
TOTAL				

Each cassette includes 2 labels only. Boxes sold separately. In Continental U.S. shipment by U.P.S. if Parcel Post preferred, check here.

Check or M.O. enclosed Send Quantity Discounts
Charge to credit card: VISA MASTERCARD

Card No. _____ Exp. _____
Name _____
Address _____
City _____ State/Zip _____
Signature _____ Phone _____

Ask about our DUPLICATING SERVICE

One-Liner Contest Winner . . .

A tribute to Roy G. Biv, whom the author first met in high school. (Who is he, anyway?)

The listing:

```
Ø PCLS:R$="U6R3FDGL3RF3BR4":O$="
BRHU4ER2FD4GL2BR7":Y$="BR2U3E2UB
L4DF2D3":PMODE3:SCREEN1,Ø:COLOR4
,2:FORS=4TO16STEP4:FORA=ØTO3:S$=
"S"+STR$(S):A$="A"+STR$(A):R=6*S
:CIRCLE(128,96),R:DRAW"BM128,96"
+S$+A$+R$+O$+Y$:FORB=ØTO3ØØ:NEXT
B:PCLS:NEXTA:NEXTS:GOTO
```

E.L. Higdon
Grain Valley, MO

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

Adventurus Supremus 4.6B: A Departure From The Usual

I found myself standing at the front door of a house. Looking around, I saw a doormat under me, a door to the north and a road to the south. Hesitantly, I walked through the doorway, and that's when the fun began.

This is how I started Bacchus Computer Software's Adventure, *Adventurus Supremus 4.6B*. *Supremus* is a 16K BASIC, text-only Adventure game set in a pseudo-modern setting. The object of the game is to figure out a special verb and to apply it in a specific setting.

The documentation accompanying *Supremus* is quite thorough. It covers loading the game, running it, how to win, how to play an Adventure, how to contact Mr. Marcelletti for advice, and a verb list as well as a couple of other things!

The Adventure itself is not of the standard genre. Most of the locations are within a house, but there is also a gazebo and a desert with sand stretching for miles and miles. I encountered a big, mean ogre, as well as a calm looking man. The room descriptions were colorful and gave a sense of actually being there. A couple of situations (which I shall not name for fear of giving away anything) I've seen in other Adventures. These do not really detract from the Adventure, though.

There are, however, some bad points about *Supremus* that I must bring up in order to be fair to the readers of this review. First of all, I found it slightly annoying that the Adventure did nothing to tell you if it didn't understand what you just typed in. Also, the use of "OK" as a prompt is almost maddening. I get enough of that smug little word in BASIC, I don't need it in an Adventure, also!

To continue, I found a couple of things offensive, these being "R-rated" actions. One of these is pointless, getting you killed; the other action you must perform in order to progress further in the Adventure. Lastly, in order to run this Adventure on a 16K ECB computer, you must perform the infamous PCLEAR 0 with a PDK 25,6, etc. I have no objection to this if the program truly will not fit into less space, but *Supremus* is written in a very inefficient way and could be written so the PCLEAR 0 wouldn't be needed.

All in all, *Supremus* is not a bad Adventure when one considers the price. It could be more efficient, and the R-rated actions really aren't necessary in this Adventure. I'm probably being picky, but I would not suggest this Adventure be purchased for young children. Also, *Supremus* is not the easiest Adventure I've ever played, so novices beware!

This is one of the lowest priced Adventures I've ever seen. If you really want to play something "different," buy *Adventurus Supremus 4.6B*; for \$9.95, it's a good deal.

(Bacchus Computer Software, P.O. Box 265, Paw Paw, MI 49079, cassette \$9.95 includes S/H)

— Lewis R. Jansen



The Handicapper

Improve your performance at the track! These 16K programs for Thoroughbred, Harness and Greyhound racing let you rank the horses or dogs in each race quickly and easily, even if you've never handicapped before! All the information you need is readily available from the Racing form, thoroughbred or dog track program. We even provide a diagram showing you where to find it!

Thoroughbred factors include speed, distance, past performance, weight, class, jockey's record, beaten favorite and post position. Harness factors include speed, post position, driver's record, breaking tendencies, class, parked-out signs and beaten favorite. Greyhound factors include speed, past performance, maneuvering ability, favorite box, class, kennel record, beaten favorite and breaking ability.

Data entry is quick and easy. Handicap a race in minutes! Complete instructions and wagering guide tell you which races to bet and which to avoid. Thoroughbred, Harness and Greyhound Handicappers sold separately at \$34.95 each on tape or disk.



Baseball Statpak!

Your Little Leaguer, manager or coach will love these Big-League stats! This package of 16K Ext. Basic programs will track your hitters, pitchers and teams, with beautiful screen displays and printouts. Batter's Scorecard keeps records of 180 hitters, including AB, hits, batting average, RBI's, home runs, walks, strikeouts and On Base Percentage. Pitcher's scorecard includes games and innings pitched, earned runs, ERA, hits, walks, strikeouts and won-lost record. Team Scorecard keeps team standings for an entire league. Lightning fast sort by any statistic for incredible reports! Whether you're involved in Little League, high school, college or company softball, Baseball Statpak will make you an instant winner! \$28.95 on tape, \$31.95 on disk.



Federal Hill Software
825 William Street
Baltimore, Md. 21230



Toll Free (Orders Only) 800-245-6228
For Information Call 301-547-1447

P51 Mustang Attack Flight Simulator Takes You On A WW II Aerial Battle

Imagine sitting in the cockpit of a WW II P51 Mustang fighter. While getting a full load of fuel and ammo, you review your mission: "Take off, find and destroy enemy fighters, and capture enemy fields if possible." This is the object of the *P51 Mustang Attack Flight Simulator* produced by Tom Mix.

P51 is an excellent Simulation. Unlike other Simulations, you can play by yourself, or with two computers hooked together either directly or through a modem.

The one-player version is usually used to get acquainted with the Simulation. The "enemy" in this mode is a drone that keeps on the same course and doesn't fight back. Although you don't do much fighting in this version, you can shoot down the drone for practice. I like using this version just as a regular flight simulator since it has the same basic elements as other flight simulators.

With two CoCos hooked together or through modems (the modem is a little slower), it is especially fun because the two computers are independent of each other. During this time, you can use any of the modes. It is not like other two-player games/Simulations where you both attack the same thing for points, but you attack each other, trying to shoot down your opponent's plane.

It takes at least 15 hits to shoot the other person down, so it's not one of those one-hit-and-it's-all-over type Simulations. Each hit before destruction of the craft causes some sort of damage which I'll talk more about later.

There are four modes in which you can play. Peace is self-explanatory as is the war mode. In the "talk" mode, if you're playing through the modem or directly connected, the program will cause a distinct beeping sound on both computers. This will alert the other person that you want to talk. If he/she switches to this mode, the game will freeze and you can pick up the phone and talk to each other without messing up the game presently going on.

The last mode, turkey, is the equivalent of challenging the other player to a fight and if he answers it, the Simulation automatically switches to the war mode.

P51 offers four quadrants. In each quadrant, there is a north-south runway. When playing by yourself, you can land safely at any field, but during dogfight mode, you can only land on your own fields. You start out with two fields and can gain more by shooting out the beacons next to your opponent's field five times. When you land on your own field, you get a full load of bullets and fuel.

Unlike other flight Simulations, you have a radar you can access while flying to find your enemy's position. Also, there are three skill levels which determine how many bullet holes are inflicted by each hit. Some of the damages I mentioned before include: reduction of your engine power, guns jamming, can't reduce/increase power, landing gear breaking or some of your instruments malfunctioning.

There are two negative points I feel are worth talking about. The first thing is that the graphics are limited. About the only things shown are your instruments, cross hairs (target finders), airfield markers and the enemy plane. The horizon is shown by the line where the ground and sky meet. The documentation explains that the programmer lives in Kansas and has never seen a hill.

The other problem will be evident to the people who buy flight Simulations just for the real life experience; they will notice there is no rudder control. This is for ease in the Simulation. The documentation explains that a rudder is not needed and why.

All in all, *P51 Mustang Attack Flight Simulator* is a very good and realistic Simulation. I think it's worth the money and recommend it.

(Tom Mix Software, 4285 Bradford N.E., Grand Rapids MI, 49506, tape \$29.95, disk \$34.95)

— Donald A. White

IMAGINE!

- * A language that, inherently with logical line instructions, lets YOU accomplish, in 32 or 64K:
 - * Up to 40 ML programs RUNNING at the same time, with program and/or data overlays.
 - Demonstration program runs 10 programs -
 - * Programs interchange between CC and CC II.
 - * Treating disk files as virtual memory.
 - * Inserting machine code directly into memory.
 - * Creating source programs with line numbers as CC BASIC -or- in your ASCII output Editor.
 - * Creating ML overlay segments as elements and linking them under a master control program -an overlay library-
 - * Linking ML programs from your assembler into overlays or in your master control program.
 - * Using the almost 88 K available in 64K machines
 - * Running all this with Disk Extended Color Basic (1.0 or 1.1).*** All in ML.***
- *** BACKUP AND COPIES OF PROGRAM DISK ALLOWED **
NO SPECIAL OPERATING SYSTEM REQUIRED.

LFAST -BEYOND ASSEMBLY-
IF YOU HAVE THE DESIRE TO DO SOMETHING REALLY SPECTACULAR IN ML-THEN-LFAST IS FOR YOU.

Program disk with demo programs and Owners Manual \$68.50. Manual separate \$8.50
FLORIDA residents add 5% State sales tax.
TO ORDER OR FOR MORE INFORMATION
CALL 305-783-2713 OR WRITE D. J. LEFFLER
955 TRINIDAD ROAD ,COCOA BEACH, FL. 32931
(please send check or money order. NO C.O.D.'S)

NEW PRODUCT
24 PIN MOTOROLA

PROM
\$10⁰⁰
EACH

PROGRAMABLE REPLACEMENT FOR THE
COCO ROMS. 350 NS

ADD \$2.00 SHIPPING FOR ANY QUANTITY

HARD DRIVE SPECIALIST
1-713-480-6000
16208 Hickory Knoll
Houston, TX 77059



SBASIC — BASIC With A Foreign Accent

After spending a few hours reading and pondering over the user's manual for this program, I was reminded of my efforts to learn pidgin English during my wanderings among the South Pacific Islands. In those days, I began to wonder why the natives could not just learn the English word "piano," instead of saying "big box beatem teeth noise come out." Some of *SBASIC*'s user's manual language is equally as frustrating.

The user's manual describes *SBASIC* as a machine language utility to convert structured BASIC commands into Color BASIC.

After spending many hours trying to understand and operate this program, following the manual and trying all the samples in the manual with confusing results, I invested a few dollars in a telephone call to the author in Canada. I told him I thought most of his prospective purchasers of *SBASIC* would be nonexpert programmers who would like to have clearer and more detailed instructions. I asked that he send me step-by-step instructions on how to use at least two of his examples. I received a sheet to be inserted into the user's manual, but it adds little to clarity.

My next step was to prepare several short programs which I thought would demonstrate the use of *SBASIC*, and ask *SBASIC* to work its magic on them. I found that the Compile portion of the program would change some pidgin into English, and make certain translations from *SBASIC* to Color BASIC.

The Pack portion of the program eliminated leading blanks and unnecessary colons which were placed in the test programs to make them easier to read when printed. Pack, however, did not take out other unnecessary spaces nor combine lines to reduce the number of bytes unnecessarily consumed by the program.

I could see no great improvement over CoCo's Extended BASIC. The first three examples given in the user's manual are examples of *SBASIC*'s substitute for BASIC's FOR/NEXT statement:

Example

```
10 I=1:Total=0
20 LOOP
30 : TOTAL=TOTAL+PART(I)
40 : I=I+1
50 UNTIL(TOTAL>1000)
60 END
```

When the first example was put through the Compiler, the only change was that Line 20 was changed to 20 REM, but indicated an SN Error in Line 10. When put through the Pack portion of the program, the result was to eliminate the colon and leading spaces in lines 30 and 40. The second example resulted in an SN Error in Line 20. The third example had similar results.

Two examples were given of *SBASIC*'s substitute for BASIC's IF/THEN/ELSE.

Example

```
10 SIF(A>12?)THEN
20 : A=A-12B
```

```
30 : PRINT "NUMBER WAS TOO LARGE"
40 ELSE
50 : PRINT "NUMBER OK"
60 ENDIF
70 END
```

Are these really improvements over BASIC?


It could be likely I was doing something wrong, but I followed the user's manual to the letter, time after time. I believe that this is the proper way to review a program: The reviewer should follow the instructions exactly. The program and the manual must be taken as a package and if the package, taken as a whole, does not work, it is in need of revision.

If one has written a long program in easy-to-read form, and wishes to eliminate the colons and blanks which have been inserted just to make it easy to read, the Pack portion of *SBASIC* would be useful in "tightening up" the program. To me, this would be the most valuable part of *SBASIC*. However, similar "Pack" programs are in the public domain. I do not believe I would use the other parts of the program, as I do not see any great advantage of the *SBASIC* language over Extended BASIC language.

The least that Tandar Software should do is rewrite the user's manual so an average, novice programmer could easily understand it and operate the program from the information in that manual.

(Tandar Software, 12 Araman Drive, Agincourt, Ontario, Canada M1T 2P6; \$19.95 U.S., \$24.95 Canadian)

— Charles L. Redman, Jr.

TRS-80+ MOD I, III, COCO, T199/4a 
TIMEX 1000, OSBORNE, others

GOLD PLUG - 80

Eliminate disk reboots and data loss due to oxidized contacts at the card edge connectors. **GOLD PLUG 80** solders to the board edge connector. Use your existing cables. (if gold plated)



COCO Disk Module (2)	\$16.95
Ground tab extensions	INCL
Disk Drives (all R.S.)	\$7.95
Gold Disk Cable 2 Drive	29.95
Four Drive Cable	39.95

USA shipping \$1.45 Can/Mex \$4.
Foreign \$7 Don't wait any longer TEXAS 5% TAX

Available at your favorite dealer or order direct from



E.A.P. CO.

P.O. BOX 14

KELLER, TEXAS 76248

(817) 498-4242

+ trademark Tandy Corp



MC/VISA

Computer Island Educational Software

PROGRAM TITLE	GRADES	MEMORY	PRICE	PROGRAM TITLE	GRADES	MEMORY	PRICE
PRESCHOOL				MATH			
Preschool I - counting	Pre-K	16K-Ext.	11.95	Dollars & Sense	2-4	16K-Ext.	14.95
Preschool II - adding	Pre-K	16K-Ext.	11.95	McCoco's Menu	3-5	16K-Ext.	14.95
Preschool III - alphabet	Pre-K	16K-Ext.	11.95	Moneypak	2-5	32K-Ext.	24.95
Music Marvel-play songs	Pre-K,1	16K-Ext.	11.95	Graph Tutor	3-7	32K-Ext.	19.95
Arrow Games - 6 games	Pre-K,1	32K-Ext.	21.95	Graph-It	7-up	16K-Ext.	14.95
First Games - 6 games	Pre-K,1	32K-Ext.	24.95	Math Invaders	1-8	16K-Ext.	17.95
Mr. Coccohead-facemaker	K-3	16K-Ext.	16.95	Mathquiz - 4 operations	2-5	32K-Ext.	19.95
Bentley Bear	Pre-K	32K-Disk	29.95	Addition & Subtraction	2-3	16K	11.95
LANGUAGE ARTS				Skill Tutor Series			
Beyond Words 1-3 parts	3-5	32K-Ext.	19.95	Division Tutor	3-7	16K-Ext.	14.95
Beyond Words 2-3 parts	6-8	32K-Ext.	19.95	Multiplication Tutor	3-7	16K-Ext.	14.95
Beyond Words 3-3 parts	9-12	32K-Ext.	19.95	Factors Tutor	5-8	16K-Ext.	19.95
Vocabulary 1-1000 words	3-5	32K-Ext.	19.95	Fractions Tutors <i>(3 programs)</i>			
Vocabulary 2-1000 words	6-8	32K-Ext.	19.95	addition subtraction & multiplication	4-8	16K-Ext.	19.95
Vocabulary 3-1000 words	9-12	32K-Ext.	19.95	Trigonometry	8-10	32K-Ext.	24.95
Context Clues	4,5,6,or 7	16K-Ext.	17.95	Equations Linear	7-9	32K-Ext.	19.95
Cocojot - jotto game	3-up	16K	11.95	Equations Quadratic	8-11	32K-Ext.	19.95
Reading Aids - 4 parts	2-4	16K-Ext.	19.95	Arith. Diagnostic Disk	3-8	32K-disk	49.95
King Author - writing tool	2-6	16/32 Ext.	29.95	Fraction Diagnostic Disk	4-9	32K-disk	49.95
Cocowheel of Fortune	4-up	32K-tape*	19.95	Verbal Problems Series			
FOREIGN LANGUAGES				Distance Problems	5-8	32K-Ext.	19.95
French Baseball-200wds.	4-up	16K-Ext.	11.95	Area & Perimeter	5-8	32K-Ext.	19.95
French Baseball-500wds.	4-up	32K-Ext.	19.95	Pizza Game	3-5	32K-Ext.	19.95
Spanish Baseball-200wds.	4-up	16K-Ext.	11.95	Sales & Bargains	6-8	32K-Ext.	19.95
Spanish Baseball-500wds.	4-up	32K-Ext.	19.95	SOCIAL STUDIES			
Italian Baseball-200wds.	4-up	16K-Ext.	11.95	Know Your States	5-up	32K-Ext.	19.95
Hebrew Alphabet	beginners	16K-Ext.	11.95	History Game	5-up	32K-Ext.	14.95
Hebrew Utility	drawing utility	16K-Ext.	15.95	States & Capitals	5-up	32K-Ext.	19.95
CRITICAL THINKING PROBLEMS				Explorers & Settlers	4-up	32K-Ext.	19.95
Factory by Sunburst	4-up	32K-disk	39.95	Famous American Women	6-up	32K-Ext.	19.95
Pond by Sunburst	2-up	32K-disk	39.95	Street Map Game	3-5	32K-Ext.	19.95
Teasers by Tobbs-Sunb.	4-up	32K-disk	39.95	MISCELLANEOUS			
Inner City - simulation	7-up	32K-disk	49.95	Name That Song 1,2,or 3	2-up	16K-Ext.	11.95
Find The Math Sequence	4-up	32K-Ext.	19.95	Circus Adventure	1-3	16K	11.95
Stranded-graphic advert.	4-up	32K-disk	24.95	Schoolmaze Adventure	1-4	16K	11.95
TEACHER/STUDENT AIDS				Treasure Hunt - joystick	1-5	16K-tape*	19.95
Colorgrade - gradebook	Adult	32K-disk	29.95	Picnic - 2 arcade games	3-up	16K-Ext.	11.95
Quizmaker - write quizzes	5-up	32K-Ext.	24.95	Music Drill	3-up	16K-Ext.	19.95
ETT typing tutor <i>(CocoKeyboards)</i>	4-up	16K-Ext.	21.95	Science Game	8-up	32K-disk	29.95
The Puzzler <i>(ColorConnections)</i>	4-up	32K-disk	23.95	Computer Literacy	6-up	32K-Ext.	19.95
				5 Educational Programs with Lightpen	1-2	32K-disk	44.95



tape* - indicates available on tape only
add \$5.00 for any program on disk.

The Educational Answers

LIGHTPEN PROGRAMS

Grades 1-2, SPECIAL EDUCATION
LIGHTPEN PROGRAMS

Grades 3-6, SPECIAL EDUCATION
32K E.B. \$44.95 Each,
INCLUDING LIGHTPEN

Five menu driven educational programs on each disk designed for early elementary or upper elementary students, or as an alternative for those children who have difficulty using the keyboard. Grade appropriate material on each disk covering reading readiness and math for early grades, and math, social studies and sciences for the upper grades. Hi-res graphics and text combined on the screen. Light pen included.

COCO WHEEL OF FORTUNE

32K EB \$19.95 TAPE ONLY

Hi-res graphics and screen in this version of the popular TV show. One or two players. Spin the wheel for points and guess a letter to solve the puzzle. Over 225 puzzles. Have fun while strengthening language arts skills.



I LOVE MY COCO
TEE SHIRT

\$6.95 each + \$1.00 S/H per shirt

Available in Adult Sizes

S, M, L, XL, and Youth L (14-16)

White with Red Trim

and Blue Logo

TREAT YOURSELF OR A FRIEND

TO A GREAT GIFT.

CALL US FOR DETAILS

ON SCHOOL/CLUB ORDERS.



The Factory: FROM SUMMIST Strategies in Problem Solving

Grades 4-adult. Winner 1983 Learning Software Award. Recommended in Classroom Computer Learning. Courseware Report Card and Electronic Learning Unique three-level program challenges students to create geometric "products" on a simulated machine assembly line which the student designs.

Diskette for 32K TRS-80 Color Computer with Extended Color BASIC. \$39.95

The Pond: FROM SUMMIST Strategies in Problem Solving

Grades 2-adult. Winner 1983 Learning Software Award. Recommended in Classroom Computer Learning. A small green frog lost in a pond of lily pads, helps students recognize and articulate patterns, generalize from raw data and think logically.

Diskette for 32K TRS-80 Color Computer with Extended Color BASIC. \$39.95

STRANDED 32K EB \$24.95 DISK ONLY

A fully graphic adventure in which you are an astronaut stranded on the moon. Your space ship cannot be repaired and you must get back to earth. Inventory displayed on screen at all times. Save and reload at any time. Map included, if you wish to use it. An entertaining way to improve critical thinking.

BENTLY BEAR'S LETTERS, NUMBERS AND SHAPES

32K E.B. \$29.95 Disk

An excellent preschool program on disk that reinforces the learning of letters, numbers, and shapes. Correct responses are rewarded by a hi-res Bently Bear. Musical accompaniment in 4 part harmony. Delightful learning for the young child. Beautiful graphics and sound.



STREET MAP GAME 32K E.B. \$19.95 Tape \$24.95 Disk

Hi-res screen and graphics portray a typical section of a street map. This one shows people's homes, the school, the park, the post office, etc. Questions are asked on how to get from one place to another and the footsteps are shown after response. A fun way to improve map skills.

BINARY DICE GAME 32K E.B. \$19.95 Cassette \$24.95 Disk

Learn to work with binary numbers. Makes the binary system clear and understandable. Two levels. Learn to convert from binary to regular numbers. A great enhancement to any computer literacy program for groups or individuals. Set of binary dice included.

SCIENCE GAME \$29.95

by J. Keeling 32K EB, Disk Only

Over 600 questions in 9 categories. Makes learning science facts fun. Game format. 1 or 2 players, teams. Grade 8 and up.



Dealers inquiries invited.



(718) 948-2748

Dept. R 227 Hampton Green, Staten Island, N.Y. 10312

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.

Authors: We are seeking quality children's software for leisure or learning. Write for details. Top Royalties.

TRS-80 Color Computer. TOPSystem 100.



CORRECTIONS

"PERT" (March 1985, Page 140): Jorge Mir tells us he's had some reports of problems having to do with various printers. PERT was written for the Okidata Microline 92 printer, and these special effects codes are used:

CHR\$(12) Feed paper to beginning of next page
 (most printers have this)
 CHR\$(28) Select elite font (96 chars/line)
 CHR\$(29) Select compressed font (132 chars/line)
 CHR\$(30) Select normal font (80 chars/line)
 CHR\$(31) Switches on double-emphasized mode

If you have some other printer, you will need to change the printer codes contained in lines 1740, 1800, 1810, 2320, 2330, 2470, 2480 and 2500 to make the special modes work with your printer. If your printer does not have the elite (96 characters per line) font, the compressed font will work. Also, on most other printers you will need to use two modes (emphasized and double-strike) in combination to create the double-emphasized mode.

The Okidata printers automatically clear the double-emphasized mode when changing fonts; if your printer doesn't, you will need to insert the necessary codes as well.

If your printer doesn't have the form feed function, change the following two lines to read as follows:

```
1800 IF INT(I/58) = I/58 THEN FO
R XX=1TO6:PRINT#-2,"":NEXTX
1810 NEXT I
```

Finally, all users should change the word PAINTRICAL in Line 2400 to read CRITICAL.

"Restoring BASIC Programs" (April 1985, Page 14): Richard Benton advises us that our description of his program was incorrect. First, he says the version given will only work on disk systems because the machine language code falls in the cassette I/O buffer area. To create a cassette version, change lines 10 and 40 to read as follows:

```
10 CLS:FOR I=600TO630:READA$:POKE
I,VAL("&H"+A$):NEXT
40 CSAVEM"RESTORE",600,630,600
```

It should be emphasized that the BASIC program creates disk or cassette copies of the ML code, and the resulting saves are the program that actually does the work. If you were to load the BASIC program after the system crashes, it would replace the program you are trying to recover. (If you have a cassette system, you may want to keep the ML program on a separate tape.)

"CoCo Becomes The Paymaster" (March 1985, Page 58 and April 1985, Page 82): Dennis Weide informs us that a few changes need to be made in the EMPLOYER and CKWRITER programs. Add the following lines to

EMPLOYER to allow editing of state taxes:

```
14650 PRINT"STATE TAX TOTAL":INP
UT B1$:IF B1$="" THEN 14700 ELSE
TL=VAL(B1$)
15550 PRINT"STATE TAX TOTAL":INP
UT B1$:IF B1$="" THEN 15600 ELSE
YL=VAL(B1$)
```

Edit the following lines in EMPLOYER to read as follows:

```
14600 PRINT"FED. INC. TOTAL":INP
UT B1$:IF B1$="" THEN 14650 ELSE
TF=VAL(B1$)
15500 PRINT"CONTRIBUTIONS":INPUT
B1$:IF B1$="" THEN 15550 ELSE Y
C=VAL(B1$)
```

Edit the following lines in CKWRITER to read as follows (to allow printing of first names with over six characters):

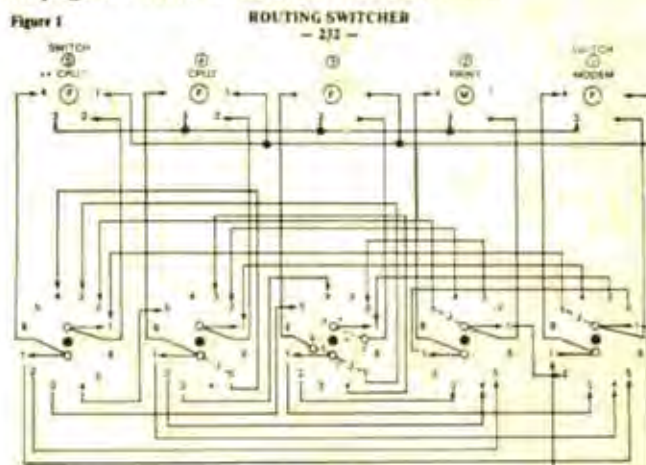
```
17300 FOR Q=1 TO LEN(A$):IF MID$(
A$,Q,2)="" THEN NA$=LEFT$(A$,
Q):GOTO17500:ELSE NA$=A$
17500 FOR Q=1 TO LEN(B$):IF MID$(
B$,Q,2)="" THEN NB$=LEFT$(B$,
Q):GOTO17700:ELSE NB$=B$
```

"We Want Our Q-NERD!" (May 1984, Page 175): Jerry Forsha tells us that two lines have to be modified for use on the Color Computer 2 or any other CoCo that has the Color BASIC 1.2 ROM:

Delete Line 1, then edit Line 55 to read as follows:

```
55 SCREEN1,0:SC=0:Y2=56:M=3:YP=1
70:C=3:CS=1:SS=4000:INKEY$="" :GO
TO10
```

Routing Switcher (April 1985, Page 32): Michael Lill tells us that there are some errors in the schematic diagram on page 33. Here is the corrected schematic:



*See article for proper connections

**CPU1 can duplicate other outputs with "J" jumpers at output

Drawing is from connection add

A steal at any price. Darn near a felony at these prices.

SDOS®

Real Disk Operating System
and Professional Software Tools

Full 2-Pass Assembler
Text Editor
6809 Debugger

Fully interrupt driven
Disk buffer pool/LRU cache
Supports up to 4 drives
Date-stamped file backup utility
Disk disaster recovery utility
RSDOS data file transfer utility

Friendly command interpreter
User-definable error messages
Keyboard typeahead at all times
(not just when disks are idle)
Screen-edit style input editing

Full ASCII keyboard (inc. CTRL)
Software selectable baud rates
Full serial I/O to 19.2Kb
thru RS Modem cartridge

400+ pages documentation
only \$49.95!

SD BASIC Compiler

Full-featured language
Tight code, fast execution
(3X times faster than RSBASIC
doing Prime Number search)
FOR I=1 to 10000/NEXT I
takes 1.8 second (12X faster)
A=1 takes 2 bytes of memory
(not counting Runtime Package)
Automatic runtime integer/
floating point optimization

32 letter variable/label names
True Subroutine/Functions with
named, multiple arguments
WHILE-DO and IF-THEN-ELSE
All execution errors trappable
Fast, 65K char string facilities
Assembly language interface
Fast Decimal f.p. arithmetic
(no money conversion errors!)

Cursor positioning
Print USING

Device-independent ASCII and
binary file I/O to the byte
Indexed file option available

\$49.95 (requires SDOS)
Not RSBASIC compatible

All products require Color Computer with 64K and at least one disk drive.



COMPUTER SYSTEMS DISTRIBUTORS
P.O. Box 9769
Anaheim, California 92802
(714) 772-1390

SEEDIT/TYPE: Word Processing

SEEDIT: full screen text editor
Place cursor and start typing!
What-you-see-is-what-you-get
Typeahead and autowrap on margin
"No wrap" mode for programs
Edits files up to 80Kb
Global Search/Change
SEEDIT or SDOS can use 24 by 80
CRT via modem card with multipak

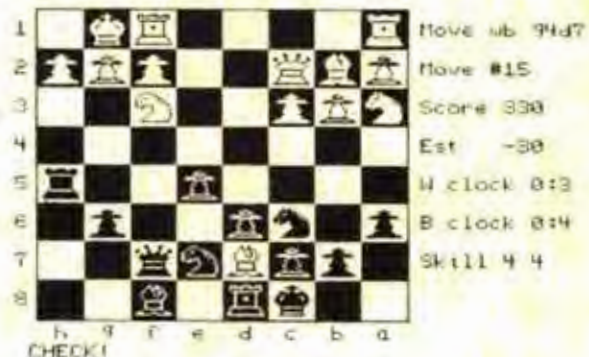
TYPE: Document Processor

Formats raw text mode with SEEDIT
according to embedded commands
Automatic justification
Automatic pagination
Definable page titles/footings
Automatic page numbering
Centering
Foreign language accents
Multiple file merge
(for big documents or mailings)
Table of Contents generation
Semi-automatic index generation

150+ pages documentation

\$49.95 (requires SDOS)

CHESSD™: A REAL CoCo Chess Program



High resolution display
High quality play
Variable skills levels
Plays Black or White
Can act as referee

Accepts Algebraic-like notation
Handles and plays special moves
Castle, En Passant, Pawn Promote
Tournament/Rapid Transit Modes
Tournament timer logic built-in
32,000 move disk opening book
\$49.95 (does NOT require SDOS)

*SDOS is a registered trademark of Software Dynamics.
**CHESSD is a trademark of Software Dynamics.

Derringer Software Announces That Derby City Now Carries The Complete Pro-Color-Series

COMMUNICATIONS

COLORCOME (Spectrum) (ROMPAK Disk) \$47.95
Complete smart terminal package! Updated, download Hi-Res screen - 300/1200 BAUD - Off line printing "Disk version with CoCo Sq & TBSB" Download ML" Supports: XMODEM & Auto-dial modems.

COLORAMA BBS (Spectrum) (64K Disk) \$87.95
The best - Full featured BBS package for the CoCo. Especially geared for the CoCo users - Includes an on-line lesson for running a mail-order business. Supports color graphics - Rainbow review July 84

COLORAMA BBS TIME MODULE \$39.95

DATABASE MANAGEMENT

PRO-COLOR-FILE Enhanced 2.0 (Derringer) \$57.95

The premier database program for your CoCo "Compatible for DYNACALC and TELEWRITER files " 4000+ record capacity - 60 data fields each record 1020 byte records and true multiple drive support! "Formats 8 reports - 4 screens - 6 labels Formats" Fast ML sort, 1750 reports in 5 minutes; sort by three fields; re-sort file on any field; Key click auto key repeat; Global search - indexed records!"

PRO-COLOR-FORMS 2.0 (Derringer) \$37.95

Access data files created from PRO-COLOR-FILE then merge them with a letter or print on a pre-printed form or print on tractor fed index cards or etc. Menu driven 6 formats - Place fields anywhere in text - Merge graphics from MASTER DESIGN. Includes all the user friendly features in PRO-COLOR-FILE.

EZBASE (Spectrum) (Disk) \$21.95

A truly user friendly - Lists complicated data base program at an affordable price; maintain 15 fields in 500 records; Hi-res screen - Search by records or by fields - Mailing labels - Reviewed July 84

SPREADSHEET

DYNACALC (Derringer) (64K Disk) \$79.95

ACCLAIMED BY ALL THE EXPERTS AS THE BEST & FASTEST - Reviewed by Dan Downing, Rainbow, September 1984 - Reviewed by Scott Norman, HOT CoCo; October 1984 - Two-way communication with PRO-COLOR-FILE Enhanced! More features than in VisiCalc, but can use VisiCalc worksheets & training materials - Auto-repeat keys 256 Columns or 256 Rows - 51x24 screen display and lower case - Easy communication with Basic-Dos and TELEWRITER 64 programs - Fast 16 Digit math - Full Graphics captioning and overlays - Use DYNAGRAPH & MASTER DESIGN to create professional graphs/charts

DYNAGRAPH (Derringer) (Disk) \$18.95

Transfer DYNACALC graphic file to standard graphic file for further enhancing and labeling by graphic editing programs such as MASTER DESIGN

WORD PROCESSING

TELEWRITER 64 (Derringer) (T D) \$45.95-\$57.95

"Three Hi-Res screens - Two character sets screen " True lower case - Right justification - Full screen editor. Easily embedded printer commands, logical and easy, but powerful commands make this the best word processor for your CoCo. Reviewed June 83.

THE WIZ (Spectrum) \$14.95

Adds new character set, with true descenders - Also adds visible end of line markers to TELEWRITER 64. THE WIZ - TELEWRITER 64 together (T D) \$82.90-\$72.90

OPERATING SYSTEM

KEX (The New FLEX) (Spectrum) (Disk) \$99.95

Includes: 128k support, Disk Drives 35, 40 or 60 track, 1X or 2X speed, density and stepping for 40 track drives to be used with 80 track drives. Also define stepping rates. Modular Construction - User definable keyboard, Hi-Res Screens - Supports 3rd party hardware - User friendly - Easy to use - One Disk boot - Some system source code included - RS BASIC compatible with DBASIC. Telephone support - ETC With FHL-O-PAK \$132.90

SPECTRUM DOS (Spectrum) (Disk) \$25.00

Adds 24 NEW COMMANDS! Use it straight or burn it into an EPROM for faster processing. Hi-Res screen True upper and lower case - Print works in any of the character densities. The clear key and the CLS work normally without corner codes - Add any type of drive, change the disk seek rates on any of all drives - Auto-key repeat. Retail collected - Etc

MAJOR UTILITIES

MLBASIC COMPILER (Spectrum) (Disk) \$67.95

The most comprehensive BASIC Compiler available to the CoCo " Create machine language from BASIC " Compactly supports ALL of EXTENDED BASIC commands plus MLBASIC is all machine language Mas!! Full

FLOATING POINT ARITHMETIC plus other features that are not available with Interprete Basic programs

DISK SORT & ORDER (Derby City) (Disk) \$16.95

Eliminate ALL disk sort data on diskettes plus save 20 to 35 percent of the physical file of your disk driver! Convert 35 track RS diskettes to JDOS 35 or 40 track 80KBites & vice versa - Double and single sided drives - Alphabetic directory - With " 7 combinations of from - to diskette formats "

PRO-COLOR-DIR (Derringer) (Disk) \$21.95

Creates a Master Data file of diskette directories so that PRO-COLOR-FILE can sort them out and print you one nice master listing. Which includes - Date diskette created - Last date diskette was updated! Diskette ID name - Filename-EXT - File type - Load Exit-entry points and Length - Number of grams used and the number of sectors allocated used. Also can print out labels you can stick to the diskettes!

64K DISK UTILITY PACKAGE (Spectrum) \$20.00

Takes advantage of an expanded 64K computer. Makes an additional 8K or RAM available. Create a buffer for a printer spooler that is as big as 32K - Copy ROM cartridges to disk - Rainbow review July 83

DISK UTILITY 2.1 (Spectrum) (Disk) \$24.95

Multiple-featured tool - User friendly - Fast disk I/O for format, copy & backup. Utilize a directory window to selectively sort, move, rename and kill files. Examine a files contents, the Granule table, also finds the size, load & entry addresses of all programs. Single command execution of both Basic & ML programs. Reviewed Oct. 84.

COCO CHECKER (Spectrum) (T D) \$19.95

Something's wrong with your CoCo and you just don't know where the problem is? Or even how to run test to find the problem?? CoCo CHECKER is your answer! Will test: ROMs, RAMs, PIAs, VOG, Joysticks, Clock speeds, Printer, Disk Drives and Controller - Also test the keyboard and cassette. Reviewed Jan. 84

SPIT-NIMAGE (Spectrum) (Disk) \$29.95

Super upgrade from Disk Dross-Clone! Backup any non-standard Disk with ease. We haven't found any disk yet, that it can't handle! Don't be caught without a backup ever again! Beats most copy protection!

SCHEMATIC DRAFTING PROCESSOR (Disk) \$29.95

Save time and design professional looking diagrams using a 480x420 worksheet, w/5 viewing windows and over 30 electronic symbols w/ 10 definable symbols! Print hard copy & save to disk. Reviewed Jan. 84.

HARDWARE

CoCo II 64K Computer (limited quantity) \$169.95
DOS Switch - For IBM and RS controllers - No Soldering or trace cutting necessary! - 48 Gold Contacts - Allows switching of any combination of 34 pin into 28 pin ports by moving one pinwire

For IBM Controller \$21.95
For RS Controller \$31.95
JDOS Rom 1 1 \$39.95
with RS DOS 1 1 \$49.95
with JDOS 1 1 \$62.95
RS DOS Rom 1 1 \$37.95

JDOS ROM comes with manual
Prom Switches All gold contacts, no soldering. Fits ALL CoCo 1's and CoCo 2's. Switch any combination of 24 or 28 pin PROMs \$21.95

RS 222-C Serial Port Switches

Two position \$24.95
Three position \$29.95
Four position \$34.95
Five position \$39.95

GRAPHIC UTILITIES

MASTER DESIGN (Derringer) (Disk) \$28.95

TEXT designer editor - Generate graphic lettering. Multiple font sizes, letters, shadows, thickness and special patterns for creative backgrounds also includes LETTER HEAD UTILITY that interfaces with TELEWRITER 64. Screen Dump for all dot matrix type printers (7 & 8 bit) and more! Reviewed July 84

COCO MAX (Spectrum) (ROMPAK) \$69.95

Includes icons - Full down menus - Graphic editing Font styles - Point & Click method! You can Spray, Brush or Fill with any Color, Shading or Pattern! Use Rubber Band Lines & Shapes (square, rectangle, Circle ellipse, etc.) or even Calligraphy Brushes!! Trace Edge, Invert, Brush Mirrors, UNDO & FAT BITS joystick input - 256/182 resolution! Needs the Multi Pak or 40 Pin "Y" cable. Get to see to believe!

GRAPHICOM (Spectrum) (Disk) \$23.95

The original - Advanced - CoCo graphic development tool with sophisticated editing, preview animation tele-communication and printer support. Hi-Res and multi-wrap! With GRAPHICOM JOYSTICK \$48.95

BJORK BLOCKS (SPECTRUM) (T D) \$33.95

Powerful graphic unity developed by Steve Bjork. Use for designing screens in your on games or just for your own pleasure. Has a very efficient storage routine for graphics information (64K animation)!

SCREEN DUMP - UTILITIES

GEMINI EPSON (Derby City) (T D) \$13.95

The LOWEST priced GEMINI EPSON screen dump for the CoCo ANYWHERE! But has all the advanced options of the higher priced programs! Super fast ML compiled from Basic. Very user friendly - Menu driven. Also compatible with GRAPHICOM & BJORK BLOCKS. Any baud rate - Standard & Reverse Images - Full or Quarter page pictures - High Speed Pave option - Nice Buy!

PP-115 COLOR DUMP (Derby City) (T D) \$21.95

The FASTEST and HIGHEST QUALITY CGP 115 P P screen dump. Completely menu driven - Works in ALL PMODES and compatible with GRAPHICOM. Will dump any image on any one of the graphics pages! Reverse PMODES 4 and 2 and 0 images. Exchange any color for another color in PMODES 1 or 3! Print out largest possible picture - Delete background option. Review Feb. 84

SPEECH - MUSIC - GAMES

SPECTRUM VOICE PAK (CoCo II II) \$67.95-\$77.95

The VOICE PAK is a simple to use, complete phoneme based voice system, that employs the VOTRAX SC01 speech synthesizer chip. It provides for unlimited vocabulary! Automatic or user supplied inflection! Plus four programmable levels of pitch! Comes with Word Manager that constructs and edits custom user dictionaries & a text to screen scanner translator that can be used either interactively or under the users program control! With a single line of Basic code, the VOICE PAK will add speech to any of your Basic programs! RAINBOW review Nov 84.

TERM TALK (Spectrum) (T D) \$37.95-\$47.95

The COMPLETE talking terminal program. In addition to printing incoming & outgoing text on the screen it is capable of speaking the text! An ASCII based communication program that features: Download programs & text files. Save & load buffers to tape or disk, split or fill screen, normal or reverse display. Fill buffer before logging on, re-define any communication protocols. Reviewed in March, 1984

COCO BINGO (Spectrum) (Tape) \$24.95

The same as the popular game of BINGO but this one will talk! Comes with 20 Bingo player cards & 250 markers plus complete documentation on rules. Also includes 3 timing levels of play, ball count and a pause control. Compatible with disk. N 32 B 2

FINAL COUNTDOWN (Spectrum) \$24.95

A Desert General has started the FINAL COUNTDOWN! He has aimed the missile at MOSCOW! Your mission is to stop the launch and prevent the impending World War III. Has multiple voices for added realism!

MUSICA (2 Spectrum) \$39.95

4 voices simultaneously - Play music easily from a Basic program - Book copy music - No hardware and 100% machine language - Easy vibrato effect - High resolution display - Output sheet music to printer and input from keyboard or joystick - 30 page book describing how to Exchange a waveform between any voice, at any point - Control the loudness of each voice individually - and much - much more! Try it!

COLOR BIORHYTHM (Derby City) (T D) \$12.95

For the CGP-115 Printer/Plotter. Find your Highs & Lows! Full 4 color printout that lasts! A years complete analysis printout & one month page. Fully color coded for easy understanding - Every months analysis contains a complete sine wave chart and a full color coded breakdown of the daily codes

PENTAY (Derby City) (T D) \$19.95

The same classic game of skill, published by PENTE, GAMES, INC. and Co-Author'd by Gary Gabriel and Tom Braunich. Play a basic two player game or try the more advanced tournament rules. The program is not protected in any way and is in straight EXT BASIC code. The reason for this is because you may want to modify the code to add features or enhancements like many of the users, that I have heard from in the past few months, like ones that want to find out how it is done. Don't be fooled though! PENTAY is a game that is a Hi-Res, 4 color, graphics program - with graphics, text and speed that call & will more than surprise you! (Let me know if it helps.)

BLACKJACK ROYAL (Spectrum) (T D) \$24.95

A Hi-Res graphics, casino blackjack simulation and card counting tutor. Includes Double down skills, surrender insurance bets, 1-B decks, burnt cards, shuffle frequency and more! Reviewed August 1983

DERBY CITY SOFTWARE - SPECTRUM PROJECTS SOUTH
3825 Bardstown Road, Suite 232, Louisville, KY 40218
(502) 454-6809

All orders add \$3.00 shipping and handling. KY residents add 3% sales tax.
© C.D. WSA MasterCard or Cash

Wandering Star Learns To PEEK

I know it is in my heart. It reaches out to my mind. It speaks to my soul. Yet, I see it only dimly — a key to the future. A child approaches and touches it. She laughs and claps her hands. I see, because she has made it clear.

— Laran Stardrake

By Bob Albrecht and Ramon Zamora
Rainbow Contributing Editors

"School Is In The Heart Of A Child" is for parents of quite young children. We want to help you work and play with your 3- to 8-year-old child and learn to use computers as a joyful family experience. We suggest ways to use the home computer as another means to encourage your child's independence, growth and control over his own life. See the pride on her face as she directs the computer to do what she selects with deliberation. See her head gears switch to "on" as she progresses step by step with your presence and caring guidance. We will explore (we hope, with your help) the following:

- Specific "teaching" techniques so the discovery can be the child's own.
- Critical evaluation of software based on extensive playtesting in family and related environments.
- Additional resources to consult: books, magazines, software publishers, networks, etc.
- Suggestions for interludes and fun times away from the computer (a must!): call the librarian for information; watch TV together and discuss it; work together as volunteers in a community project; take an "awareness" walk
- Whatever we learn from families we work with in Menlo Park or from you, our readers. Let's pool our knowledge and share our experiences as we learn from our children.

Copyright © 1985 by DragonQuest, P.O. Box 7627, Menlo Park, CA 94026.

(Well-known author Bob Albrecht co-authors the "GameMaster's Apprentice" feature for THE RAINBOW each month. Ramon Zamora is author and co-author of several books, co-founder of Computer Town USA!, and currently designing computer games for kids at Child Ware Corp. in Menlo Park, Calif.)

Wandering Star, as regular readers know, is a hungry creature who subsists on cosmic dust motes. Your CoCo's TV screen is her universe.

Wandering Star sometimes moves next to a cosmic dust mote, then moves away. Let's teach her how to "peek" at nearby places to see if any cosmic dust is there. If there is, she will move directly to it instead of wandering randomly — a much more efficient way to gather food.

Remember, print positions on the screen are numbered from zero (upper left corner) to 511 (lower right corner). For each screen position, there is a corresponding location in the CoCo's memory. These memory locations are numbered from 1024 to 1535.

- Memory location 1024 corresponds to screen position zero
- Memory location 1025 corresponds to screen position one
- And so on. Memory location 1535 corresponds to screen position 511

You can easily compute the memory location that corresponds to a given screen position.

$$\text{memory location} = \text{screen position} + 1024$$

You can also easily compute the screen position that corresponds to a given memory location, provided the memory location is in the range 1024 to 1535.

$$\text{screen position} = \text{memory location} - 1024$$

For each character on the screen, the CoCo keeps the character's ASCII code in the memory location that corresponds to the screen position of the character.

- The code for short-tailed cosmic dust (.) is 46
- The code for long-tailed cosmic dust (,) is 39
- The code for cosmic escargot (@) is 64

If screen position 235 contains a short-tailed dust mote (.), then memory location 1259 contains the number 46. If screen position 400 contains a long-tailed dust mote (,), then memory location 1424 contains the number 39. Suppose screen position 510 contains one cosmic escargot (@). The corresponding memory location is $510 + 1024 = 1534$. Location 1534 contains the number 64, which is the ASCII code for '@'.

Now learn how to PEEK into a memory location and find out what number is there.

- Press the CLEAR key
- Type PRINT PEEK(1024) and press ENTER

Don't abbreviate PRINT with a question mark — type the word PRINT. The screen should look like this.

```
PRINT PEEK(1024)
  80
DK
█ PEEK into memory location 1024
```

You told the CoCo to PEEK into memory location 1024 and PRINT the number stored there. Remember, memory location 1024 corresponds to screen position zero. The letter 'P' is in screen position zero. The ASCII code for 'P' is 80, so the CoCo printed 80. Try another.

- Press the CLEAR key
- Type PRINT PEEK(1535) and press ENTER

The screen looks like this.

```
PRINT PEEK(1535)
  96
DK
█ PEEK into memory location 1535
```

This time you PEEKed into memory location 1535 which corresponds to screen position 511. That screen location is solid green, so we thought the CoCo would print 143, the ASCII code for the solid green graphics character. Not so! If you clear the screen by pressing the CLEAR key (or by typing CL5), the CoCo puts the code 96 in every memory location that corresponds to a screen position. Try this.

- Type CLS 1 and press ENTER
 - Type PRINT PEEK(1535) and press ENTER
- The screen looks like this.

```
DK
PRINT PEEK(1535)
 143
DK
█
```

When you use CLS 1 to clear the screen, the computer puts 143 into memory locations 1024 to 1535. Hmm . . . what if you use CLS 0, CLS 2, CLS 3, CLS 4, CLS 5, CLS 6, CLS 7 or CLS 8? Try it and find out. Then try one more example.

- Press the CLEAR key
- Type PRINT @80, "@" and press ENTER
- Type PRINT PEEK(1104) and press ENTER

The screen looks like this.

```
PRINT @80, "@"
                                     @
DK
PRINT PEEK(1104)
  64
DK
█ Cosmic escargot at screen position 80
```

You cleared the screen, put a byte of cosmic escargot at screen position 80, then PEEKed into the memory location corresponding to screen position 80: memory location = $80 + 1024 + 1104$. Just what you expected — 1104 contains the ASCII code (46) for a byte of cosmic escargot (@). Go gobble it up, Wandering Star!

Now we will give Wandering Star a program that lets her peek one place right, left, down or up to see if there is anything to eat nearby.

Nothing to the right.
Nothing to the left.
Aha! Cosmic escargot one place down.



470247
 END147

Listing 1: OASIS

```
100 REM**WANDERING STAR SCH 14-1
110 CLS
199 '
200 REM**GOURMET OASIS
210 MENU$ = ".....@"
220 FOR K=1 TO 100
230 : GD = RND(10)
240 : GD$ = MID$(MENU$,GD,1)
```




OWLS NEST SOFTWARE

' WE GIVE A HOOT '

TWO NEW PROGRAMS DESIGNED FOR THE 64K COLOR COMPUTER !

LABEL64 - LABEL64 is a name and address file/print system that takes advantage of your 64K. You can develop and maintain a mailing list. Print lists or mailing labels in your choice of 1, 2, or 3 wide. Supports 3 or 4 line addresses with phone optional. You can sort by last name, first name, and/or zip code. You can work with up to 300 records in memory at a time. We include a second copy for back up at no additional charge. Take advantage of your 64K with LABEL64.
Cassette - 64K EXT Postpaid \$24.95

FILE64 - FILE64 is a data management system designed to take advantage of a 64K machine. You can create and maintain records on anything you choose. Recipes, coupons, household records, financial records - you name it. You create records containing up to five fields you define. You can search, sort, modify, add, delete, save on tape, display on the screen and print on a printer. The program could cost you much more and we include a back up copy at no additional charge.
Cassette - 64K EXT Postpaid \$24.95

SAVE \$\$ Take both our LABEL64 and FILE64 for only \$40.00 Postpaid. Don't miss this special offer!

NOTE: If you already have our LABELIII or FILEIII program we will upgrade you to the 64K version for only \$10.00. Upgrade both for only \$15.00. It is not necessary to return your old programs. Simply send your invoice number with your request.

ALCATRAZ ADVENTURE Our newest and we think most involved adventure. You have been unjustly imprisoned and sentenced to death. You must escape to prove your innocence. You will face many unique problems as you work on your goal. If you liked our BASHAN adventure you will love ALCATRAZ. Your adventure contains a large vocabulary and some unique features. This is a tough one recommended for advanced players.
32K EXT Postpaid Disk \$20.95 Cassette \$17.95

CUBE ADVENTURE - Cube is a non violent adventure for a minimum 16K EXT system. You must locate and enter the "CUBE" gathering treasures along the way. You will encounter some unique problems as you work on your goal. CUBE is an intermediate to hard adventure suitable for everyone.
16K EXT postpaid Disk \$20.95 Cassette \$17.95

GOOD NEWS FOR OUR FRIENDS FROM DOWN UNDER!

We are pleased to announce that our customers in Australia can now purchase our programs from our Australian distributor. This will avoid long shipping delays. Remit in Australian Dollars to COMPUTER HUT SOFTWARE 21 WILLIAMS St. BOWEN QLD. 4805 Phone (077) 862220

GOOD NEWS FOR OUR FRIENDS FROM UP NORTH!

Now our friends from Canada can purchase our programs direct from our Canadian distributor. Remit in Canadian dollars to KELLY SOFTWARE DIST. LTD. P.O. Box 11932 EDMONTON, ALBERTA T5J 3L1 (403) 421-8003

NOW LABELIII IS AVAILABLE ON DISK!

LABELIII - (Reviewed in Nov 83 Rainbow) With LABELIII you can develop and maintain a mailing list. Print lists or mailing labels in your choice of 1, 2, or 3 wide. Supports 3 or 4 line addresses with phone optional. Sort by last name, first name or zip code.
16K EXT Postpaid Disk \$21.95 Cassette \$19.95

FILEIII - Data management system. With FILEIII you can create and maintain records on anything you choose. Recipes, coupons, household records, financial records - you name it. You create records containing up to five fields that you define. You can search, sort, add, delete, modify, display on the screen or send to a printer. The program is user friendly and user proof. Prompting is extensive. A comparable program could cost you much more. This one is a bargain!
Cassette - 16K EXT Postpaid \$19.95

PROGRAM FILE - (rev Oct 83 Rainbow) Organize your programs. With PROGRAM FILE you create a file of your computer programs. You can search, sort, add, modify, delete, save to tape and display on the screen or send to a printer.
Cassette 16K EXT Postpaid \$14.95

DATA MANAGEMENT PACKAGE - Save \$\$ Take the three above programs on three cassettes for only \$40.00 Postpaid

ESPIONAGE ISLAND ADVENTURE - (reviewed in June 84 Rainbow) You have been dropped off on an island by submarine. You must recover a top secret microfilm and signal the sub to pick you up. Problems abound in this 32K EXT adventure.
32K EXT Postpaid Disk \$20.95 Cassette \$17.95

FOUR MILE ISLAND - You are trapped in a disabled nuclear power plant. The reactor is running away. You must bring the reactor to a cold shutdown and prevent the "China Syndrome". Can you save the plant (and yourself)? It's not easy!
16K EXT Postpaid Disk \$20.95 Cassette \$17.95

KINGDOM OF BASHAN - Our flagship adventure. Bashan has a very large vocabulary and some unique features. You must enter BASHAN (not easy), gather the ten treasures of the ancient kingdom (even harder) and return to the starting point (harder yet). If you can score the maximum 200 points in BASHAN you are an expert!
32K EXT Postpaid Disk \$20.95 Cassette \$17.95

ADVENTURE COMBO Save \$\$ The three above adventures on three cassettes or one disk (specify) postpaid for only \$40.00

ATLANTIS ADVENTURE - This one is not easy - in fact we challenge you to complete it in 30 days. If you do we will send you any program we sell - postpaid - at absolutely no charge. You start on a disabled sub near the lost city of Atlantis. You must get the sub (and yourself) safely to the surface. Do you think Atlantians are friendly?
Postpaid 32K EXT Disk \$24.95 16K EXT Cassette \$21.95

ADVENTURE STARTER - Learn to play those adventures the painless way. You start with an easy adventure and move to an intermediate. Two complete separate non violent adventures plus hints and tips on adventuring in general. Finish this and you will be ready for ATLANTIS!
Cassette - 16K EXT Postpaid \$17.95

C.O.D. orders please add 1.50
No Delay For Personal Checks
In a Hurry? Call (615) 238-9458

OWLS NEST SOFTWARE
P. O. BOX 579
OOLTEWAH, TN 37363



MORETON BAY

MORE KEYS

At last a quality numeric keypad for your Color Computer. This 15 key numeric pad plugs inside your computer and gives you the convenience of rapid numeric data entry. Dimensions: length 6½" (165mm), width 4" (101 mm), height 3" (76 mm). Baked black enamel finish. Specify computer model. MORE KEYS complete with cable and connector. \$69.95



RESET-POWER-SWITCHES A REAL IMPROVEMENT

Move the power switch and reset switch where they belong. An LED power on light too! High quality parts. D, E boards and CoCo 2 totally solderless kit. F board requires soldering.

Reset 1 CoCo 1 \$24.95
Reset 2 CoCo 2 \$27.95



Either kit add \$2.00 shipping and handling

DOUBLE DRIVER

The BEST monitor driver available. Color composite, monochrome and audio output. For original CoCo D, E and F boards. \$24.95.

Mono II for Color Computer 2. An excellent monochrome monitor driver that has audio output also. \$24.95. Specify model needed.



MINI MOUTH

Add sound to your mute monitor. Hear the bells and whistles of your software again. No batteries. Solderless installation.

All Color Computer Models
\$24.95



THE COCO-SWITCHER

A QUALITY PIECE OF HARDWARE

The CoCo Switcher allows you to hook up three peripherals to your RS-232 jack. Connect your modem, printer and any other RS-232 compatible peripheral to the CoCo Switcher. An LED on the CoCo Switcher shows if your computer is on or off at a glance. The LED flickers when transmitting or receiving data.

Dimensions: 2½" (64 mm) x 4" (102 mm)
x 5 7/8" (150 mm)

\$39.95 plus \$2.00 shipping and handling



64K UPGRADES



Instantly access 64K via M/L totally solderless kit to upgrade E Boards. Kit includes eight 4164 prime chips and chips U29 and U11 already soldered.

SPECIAL: E Board Kit \$39.95, F Board and Color Computer 2 \$26.95.

Guaranteed Pretested

TRIVIA AND SOME SIGNIFICA NOW MORE THAN 2000 QUESTIONS!

Humorous, educational, nostalgic and tricky. The game even has a mathematics and computers category. Good family and party entertainment. Included is a utility so you can create your own trivia questions.

16K EXB Cassettes \$21.95
32K Disk \$24.95

CLOSE OUT SPECIAL

Get 4 educational math programs for grades K-6.

16K EXB Cassette \$15.95

Get 2 game cassettes

32 K EXB Cassette \$12.95

Having trouble with your CoCo? We have the chips you need. Call us. (805) 962-3127



SOFTWARE

SAM DIAMOND, P.I.

The first of our new Sam Diamond graphic adventures. More than 40 detailed high resolution graphic scenes. A killer is loose in the city. Can you bring him to justice before he gets you? Excellent graphics and a tough mystery to solve.

32K Disk Only \$29.95
plus \$2.00 shipping and handling.



WHEELS

GET THE MOST FROM YOUR GRAPHIC PROGRAMS

How to integrate Graphicom and CoCoMax. Two tutorial disks full of examples and suggestions. See how to create graphics step by step. Learn how to display and even animate your graphics from Basic.

1 Disk \$14.95
2 Disks \$24.95



This is the final result after using the Plot using Graphicom.

THE VERY BEST IN GRAPHICS

PLACES AND FACES

BJORK BLOCKS

An incredible graphic utility. Fun. Easy. Create graphic screens as good as any you have seen. All you need is a joystick or mouse. "The most user friendly program I have ever seen for the CoCo. For those of you with graphic interests, I guarantee that you will not be disappointed." Review in *Rainbow*, Oct. 1984.

Requires 32K EXB
(64K for animation)
Tape or Disk \$34.95
BUILDING BLOCKS I
(Picture Disk) \$15.95



Created with Bjork Blocks

SPECIAL: BJORK BLOCKS and GRAPHICOM \$55.00

MORETON BAY SOFTWARE

A Division of Moreton Bay Laboratory



316 CASTILLO STREET
SANTA BARBARA,
CALIFORNIA 93101
(805) 962-3127

GRAPHICOM

Buy Graphicom from us and get one of our unique picture disks free! Get our improved Picture Disk One also. The first in the new generation of graphic utilities. An excellent utility. Requires: 64K EXB, Disk Drive and Joy Sticks. Three disks and the best bound documentation for only \$29.95.

Calligraphy STAMP DISK: Useful letters and designs for making your own signs and menu screens.

Adventure Disk I: Indoor scenes and objects. Helps you draw pictures and learn more about Graphicom.

Adventure Disk II: Outdoor scenes and objects. A Graphicom tutorial as well as a useful library of images you can use.

Calligraphy II
Calligraphy II
Calligraphy I
Calligraphy II
Calligraphy III
CALLIGRAPHY II

Calligraphy Disk II: 23
New letter stamp sets



The three disks in this set are designed for sharing. Each one will have the appropriate disk depending on the content of your system. Check the box on the cover of the disk you want.

Adventure Disk II

Adventure Disk I



1 Picture Disk \$15.95
2 Picture Disks \$24.95
3 Picture Disks \$29.95
4 Picture Disks \$34.95



Ordering information



Add \$2.00 shipping and handling per order. We ship within 24 hours on receipt of order. Blue Label Service available. California residents add 6% sales tax.

```

250 : PRINT @RND(510), GD$;
260 NEXT K
299 '
300 REM**WANDERING STAR APPEARS
310 WS$ = "*"
320 R = 7: RN = R
330 C = 16: CN = C
340 SP = 32*RN + CN
350 PRINT @SP, WS$;
360 FOR ZZ=1 TO 1000: NEXT ZZ
399 '
400 REM**WS PEEKS R, L, D, U
410 ML = SP + 1024
420 IF C<31 THEN PR=PEEK(ML+1)
430 IF C>0 THEN PL=PEEK(ML-1)
440 IF R<15 THEN PD=PEEK(ML+32)
450 IF R>0 THEN PU=PEEK(ML-32)
460 IF PR<>96 THEN CN=C+1: GOTO
710
470 IF PL<>96 THEN CN=C-1: GOTO
710
480 IF PD<>96 THEN RN=R+1: GOTO
710
490 IF PU<>96 THEN RN=R-1: GOTO
710
499 '

```

```

500 REM**NO FOOD-MOVE RANDOMLY
510 W = RND(4)
520 IF W=1 THEN CN = C + 1
530 IF W=2 THEN CN = C - 1
540 IF W=3 THEN RN = R + 1
550 IF W=4 THEN RN = R - 1
599 '
600 REM**KEEP HER IN THE OASIS
610 IF CN<0 THEN CN = 0
620 IF CN>31 THEN CN = 31
630 IF RN<0 THEN RN = 0
640 IF RN>15 THEN RN = 15
650 IF 32*RN+CN=511 THEN 510
699 '
700 REM**WANDERING STAR WANDERS
710 PRINT @SP, " ";
720 R=RN: C=CN: SP=32*R+C
730 PRINT @SP, WS$;
740 SOUND RND(255), 1
750 FOR ZZ=1 TO 20: NEXT ZZ
799 '
800 REM**GOTO DIRECTION SELECTOR
810 GOTO 410

```

Perhaps You Have Some Patterns in Mind

Perhaps you have a plan in mind — a pattern of patterns or a sequence of sequences. You would like your student, child or friend to experience first this pattern, then another and another. You have a plan which begins with easy patterns, then slightly more difficult, then more difficult, etc. It is your plan, do it your way.

Instead of letting the CoCo select random number patterns, you can prescribe a sequence of patterns. The following program allows you to do this. All *you* have to do is rewrite the DATA statements, so your plan replaces ours.

Listing 2: PATTERNS

```

100 REM**NMBR PATTERNS SCH 14-2
110 CLS
120 PRINT "TRY SOME NUMBER PATTE
RNS.": PRINT
130 PRINT "PRESS THE spacebar TO
BEGIN."
140 IF INKEY$="" THEN 140
199 '
200 REM**READ STARTING NUMBERS
210 CLS
220 READ S, A
230 IF S = 1E37 THEN PRINT "I'M
OUT OF PATTERNS": END
299 '
300 REM**SHOW 'LATEST' NUMBER
310 PRINT @448, S
320 PRINT
399 '
400 REM**COMPUTE NEXT NUMBER
410 S = S + A

```

TELE-FORM

THE SMART TEXT FORMATTER
FOR TELEWRITER-64®



- Tele-form turns Telewriter into a powerful mail-merge with simple embedded codes. Simply type in a letter, then follow it with your list of names. A 64K machine holds one page of text with a 500 name list.
- Tele-form includes an embedded code that stops printer output, then waits for you to type information into that location in the text; a form letter code.
- Loads into Telewriter's BASIC buffer without touching any Telewriter code. Works interactively to pass parameters back and forth between Telewriter, and easily returns to Telewriter.
- Tele-form can do all formatting, even mail-merge and form letters, in memory. You can immediately see all margins, headers, page numbers, etc., on Telewriter's screen.

TAPE \$24.95 DISK \$29.95

Send Check or Money Order Today To:
CIGNA CO. 115 BELMONT ST. ROCHESTER, NY 14620
716-442-3705

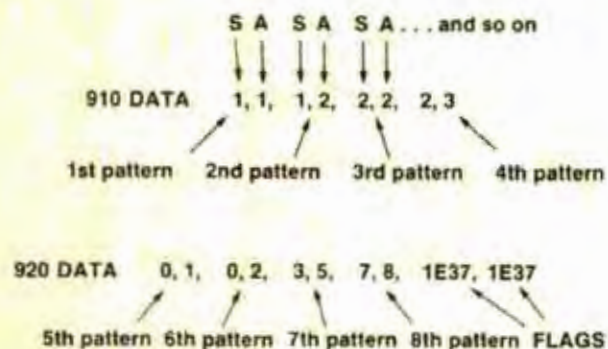
Telewriter is a trademark of Cognitac.

```

499 .
500 REM**WHAT TO DO NEXT
510 PRINT @480, "FOR NEXT NUMBER
, PRESS spacebar"
520 PRINT "FOR NEW PATTERN, PRES
S clear";
530 K$=INKEY$:IF K$="" THEN 530
540 IF K$=" " THEN 310
550 IF K$=CHR$(12) THEN 110
ELSE 530
599 .
900 REM**VALUES OF S AND A
910 DATA 1,1, 1,2, 2,2, 2,3
920 DATA 0,1, 0,2, 3,5, 7,8, 1E3
7, 1E37

```

For each pattern, the two starting numbers, 'S' and 'A,' are stored in a DATA statement. These numbers are read by Line 220. The DATA statements are in lines 910 and 920.



The DATA statements have values of 'S' and 'A' for eight patterns, followed by two outrageous numbers, 1E37 and 1E37. These numbers are the flags which say: "There are no more numbers. We are not pattern numbers. We are here only to tell the computer there are no more numbers."

Why two flags? Because the READ statement (Line 220) reads two values. There must be two values, or an OD (Out of Data) Error message will occur when the CoCo tries to read two numbers in Line 220. The second flag is not used, but must be there.

With the above program, you can plan your sequence of sequences, or pattern of patterns. You pick each FIRST NUMBER and you pick each ADD-ON number. You pick each pair of numbers in the DATA statements. Use as many pairs as you want, then finish with two flags, 1E37 and 1E37. If you don't like our flags, use your own. But, if you change the flags, also change Line 230 in the program. Please don't confuse the computer.

If you want geometric sequences instead of arithmetic, change Line 410 as follows:

```
410 S = S*A
```

Try the program, using our DATA statements. It begins like this.

```

TRY SOME NUMBER PATTERNS.
PRESS THE SPACE BAR TO BEGIN

```

This is in reverse color

Press the space bar and the first pattern begins.

```

1
FOR NEXT NUMBER, PRESS SPACE BAR
FOR NEW PATTERN, PRESS CLEAR KEY

```

Reverse color

Reverse color

To continue with this pattern, keep pressing the space bar. To get the next pattern, press the CLEAR key. If all the starting numbers have been used, you will see the following message.

```

I'M OUT OF PATTERNS
OK
■

```

Do you want geometric sequences instead of arithmetic sequences? If yes, change Line 410 as follows:

```
410 S = S*A
```

DragonSmoke

DragonSmoke is our monthly newsletter about new ways to learn, including computers, role playing games, play-by-mail games, COPY ME stuff, public domain instructional materials, software for beginners, and our own play-by-mail game, *DragonFun*.

DragonFun is a play-by-mail role playing game for beginners. It is nonviolent and features cooperation, exploration, problem-solving and story-telling. How to play is described in the February 1985 issue of *DragonSmoke*. For a free copy, send a self-addressed, stamped envelope to *DragonSmoke*, P.O. Box 7627, Menlo Park, CA 94026.

See You At
RAINBOWfest
New Brunswick
 October 18-20

GREAT COCO PRODUCTS

ORDER ENTRY SYSTEM

Rainbow, Feb. '84 "If you are looking for a program to keep track of your sales and print invoices, then this one will take care of those needs quite well. A good program that would serve the invoicing needs of a small company quite nicely."

Hot CoCo, July '84 "Instructions for using the system are excellent. The Order Entry System is an easy way to generate invoices and track sales. The Mark Data Products system is well worth its nominal price."

The Mark Data Product sales order processing system provides a fast, efficient means to enter orders, print shipping papers and invoices, prepare sales reports, and monitor receivables. The system automatically enhances the monitor screen to a 51 character by 24 line display. 32K of memory is required along with an 80-column printer and one or more disc drives.

This order entry software equals or exceeds higher priced packages for other computers and includes a detailed operating manual. **ONLY \$95.95**

NEW! EASY EDIT

Easy-Edit is a versatile, easy to use text editor which is particularly convenient for assembly language and BASIC programming. This editor offers powerful text handling capabilities along with many special features including a built-in disc operating system, 32/64K memory sense, a 51 character by 24 line screen, auto key repeat, extensive error reporting, and complete compatibility with popular assemblers. Requires 32K and at least one disc drive. Master disc and instructions are packaged in an attractive 3-ring binder. **\$34.95**

SUPER PRO KEYBOARD



GREAT NEW PRICE \$59.95*

- Original key layout
- Fast, easy installation—no soldering
- Individually boxed with full instructions
- Smooth "Touch Typist" feel—no sagging
- U.S. made—high quality, quad gold contacts
- Professional, low profile, finished appearance

* Computers produced after approximately October 1982 require an additional keyboard plug adapter. Please add \$3.95.

SUPER BUG



Mark Data Products' **SUPER BUG** is a powerful, relocatable machine code monitor program for your CoCo. If you are a beginner, the program and documentation are an indispensable training aid. If you are an accomplished computerist, **SUPER BUG's** capabilities, versatility and convenience will prove invaluable during programming and debugging. Many outstanding features, including hex and alpha numeric memory display, modify, search and test; full printer support with baud rate and line feed select; up to 220 breakpoints; mini object code disassembler; 64K mode setup; decimal, hex and ascii code conversion routines and extensive documentation. **Cassette \$29.95 Disc \$32.95**

NEW! EASY-FILE Data Management System

Rainbow, Nov. '84 "Easy File is one program that lives up to its name... Easy File is so easy it speaks for itself."

Hot CoCo, Feb. '85 "I've examined four database programs for the CoCo in the last few months. Easy File is the easiest to master and the one that best addresses my needs. If you need to organize the information in your life, Easy File might just be the best method."

(need a good mailing list or customer list program) How about a program to keep track of your investments, your computer magazines, or record collection? Do you have an inventory of all household items for insurance purposes? **EASY-FILE** will do all of these things and many more. The **EASY-FILE** master disc and instructions are packaged in an attractive 3-ring binder. Requires 32K and at least one disc drive.

Order Yours Now! Get Organized for Only \$39.95!

COCO DISC DRIVES

COMPLETE SYSTEMS INCLUDE:

- Hi-Quality Teac Thin Line Drives
- Attractive, Beige Dual Drive Cabinet/Power Supply
- I/O Panel for Single Drive Disc System
- Radio Shack or J & M Controller
- Cable and Operating Manual
- Full 90 Day Warranty



Single Drive (SSDD) in Dual Cabinet w/Controller	\$299.95
Additional Drive	99.95
Two Drives (SSDD) in Dual Cabinet w/Controller	399.95
Single Drive (DSDD) in Dual Cabinet w/Controller	359.95
Additional Drive	149.95
Two Drives (DSDD) in Dual Cabinet w/Controller	509.95
Dual Cabinet/Power Supply	79.95
Disc Controller (Radio Shack or J & M)	139.95
Connecting Cable	24.95
Radio Shack DOS ROM 1.1	39.95

UNIVERSAL VIDEO DRIVER

Carefully engineered to work with ALL Color Computer models, including the new COCOII.

ENABLES YOUR COCO TO OPERATE WITH A VIDEO MONITOR INSTEAD OF A TELEVISION.

- Works with Monochrome Monitors
- Works with Color Monitors
- Easy Installation—No Soldering
- Great Price! **ONLY \$29.95**



\$\$ SAVE MONEY ON YOUR \$\$ CASSETTE & DISC SUPPLIES

CASSETTES

We buy cassettes and discs in large quantities for our own use and can pass the savings on to you.

C-70 Cassettes w/labels	59 ea	10 for \$5.50
Cassette storage box	25 ea	10 for 2.00

5 1/4 DISCS

High quality, nationally advertised brand. **Guaranteed Performance.** We will replace any disc that fails during normal use. Discs are double density, reinforced hub with Tyvek sleeve. \$15.95 for 10 discs in an attractive storage box.

ROMS

Basic 1.2	\$39.95
Extended 1.1 w/manual	\$49.95
Disc 1.1	39.95

NEED MORE MEMORY?

64K Memory Expansion Kit

All parts and complete instructions (for 'E' and 'F' boards and CoCo II)
\$39.95

QUALITY VIDEO MONITORS



SAKATA COLOR SC-100 — \$259.95

The SC-100 is a streamlined 13" composite monitor which produces sharp, brilliant colors. The cabinet is made of durable styrene and is available in an attractive off-white color. Includes audio with speaker and earphone jack. We highly recommend this color monitor because of its excellent performance and beautiful styling.



TAXAN AMBER SCREEN — \$125.95

A 12" amber screen composite monitor of the highest quality with exceptional reliability and performance. 18 MHz bandwidth. Attractive off-white cabinet. We use this monitor in our offices.

Call for additional monitor information.

ACCOUNTING SYSTEM

Rainbow, May '84 "Considering what it can do to organize a small business, it is quite a value."

Hot CoCo, Jan '84 "...a serious, professional accounting program and well worth its price. The program is complete and simple to use."

The Mark Data Products Accounting System is ideal for the small businessman needing a fast, efficient means to process income and expenses, prepare detailed reports and maintain most of the information required at tax time. The system is a family of programs which operate by means of a "menu" selection scheme. When the operator selects a task to perform, the computer loads a program designed to handle that task from the system disc. The system disc contains all of the programs required to create, update and maintain data files and prepare the necessary accounting reports including a transaction journal, 4P & L or income report, an interim or trial balance and a balance sheet.

This accounting software equals or exceeds higher priced packages for other computers and includes a detailed operating manual. **ONLY \$99.95**

NEW! ZOOKEY

It's Fun!

It's Educational!

It's a great new way to learn typing skills!

Cassette \$24.95 Disc \$27.95

The combination of exciting game-play action and colorful, hi-res graphics in Zookey make it an outstanding typing tutor. Speed and skill levels are fully adjustable to train the beginner or challenge the most experienced typist.

Stimulating for both youngsters and adults...Ideal for classroom or individual instruction.

NEW! DISC STORAGE

Attractive, heavy duty, smoked acrylic case. Holds and protects up to 75 5 1/4" discs with six moveable, indexed dividers.

SUPER BARGAIN — ONLY \$10.95



SUPER SCREEN

The Color Computer Supercharger

- A big 52 character by 24 line screen
- PRINT ® is fully implemented on the big screen
- Easily combine text with hi-res graphics
- Auto-key repeat for greater keyboard convenience
- The "ON ERROR GOTO" statement is fully implemented
- Control codes for additional function



Guaranteed to be the most frequently used program in your software library... once you use it you won't be without it! **Cassette \$29.95 Disc \$32.95**

Hot CoCo, Jan '84 "Super Screen represents a quality utility program that fills a definite need for the serious CoCo user. No other programs on the market so far have offered the error-trapping ability of Super Screen."

Color Computer Magazine, May '84 "Super Screen is a worthy addition to anyone's software library. It has become my most used utility and has made programming in BASIC on the Color Computer a joy."

JUST FOR FUN

Adventures
Now Available
for IBM &
Tandy 1000/1200

Adventure and Arcade Games • Cassette \$24.95 Disc \$27.95 • All require 32K



TREKBOER

This exciting hi-res **adventure** begins aboard the starship *Trekboer* in the 21st century. Life on Earth is threatened by a deadly virus and your mission is to search the frontiers of space and return with a cure to save mankind from disaster.



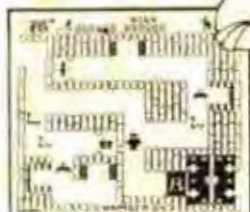
CALIXTO ISLAND

A valuable museum treasure has been stolen; can you recover it?? This is a challenging **adventure** with an occasional twist of humor. You'll visit a secret laboratory, a Mayan pyramid, and you'll meet crazy Trader Jack—all in living color and exciting detail.



SHENANIGANS

Countless legends tell of a magnificent pot of gold hidden at the end of the rainbow. Many have attempted to find the marvelous treasure but success has eluded them and it remains hidden to this day. You, as a dedicated **adventurer**, have determined to search for the fabled riches.



TUT'S TOMB

Explore the ancient, mystical tomb of the great Pharaoh. Find the magical keys which lead you to unbelievable treasures as you outmaneuver the creatures that slither and swarm about you. Super fast **arcade** action—this one will knock your socks off.



SEA SEARCH

Get your shark repellent and scuba tanks ready! The graphics in this **adventure** are truly outstanding and the underwater scenes are unforgettable. You'll run into a pirate, a mermaid and some hungry sharks in this colorful and unique treasure hunt.



BLACK SANCTUM

Encounter the forces of black magic as you roam around an 18th century manastery. You'll see all the evil locations in this spooky **adventure**; you'll love searching for and destroying evil in this classic tale. A MUST for every adventure game fan!

SHIPPING: All orders under \$100 please add \$2 regular, \$5 air. All orders over \$100 please add 2% regular, 5% air. California residents please add 6% sales tax. Orders outside the continental U.S., check with us for shipping amount, please remit U.S. funds. Software authors—contact us for exciting program marketing details. We accept MasterCard and VISA. Distributed in Canada by Kelly Software

FREE - Send for our NEW 24 page catalog!

MD

Mark Data Products

24001 ALICIA PKWY., NO. 207 • MISSION VIEJO, CA 92691 • (714) 768-1551

Spreadsheet Application For Home Economics: Buying A Car

By Richard A. White
Rainbow Contributing Editor

What's buying a car got to do with spreadsheets or other computer programming? A lot if you use the spreadsheet in the process. I just went through that process. I knew pretty much what I wanted, so I didn't do many "what if" projections. If you feel like looking at a variety of makes and models, more spreadsheet use could be involved.

You can really get organized easily using a spreadsheet. And when you are organized, you can be on the offense with the dealer who is on the defense. Let's start the story.

First, I got \$500 "free money" toward a new car. Some may remember when Chrysler announced record earnings in January, they also announced that all employees and all customers who had purchased a new Chrysler product between 1979 and 1984 would get a certificate worth \$500 on a new 1985 car.

One must address these situations with great care. After all, my '72 station

(Richard White has a long background with microcomputers and specializes in BASIC programming. With Don Dollberg, he is the author of the TIMS database management program.)

Example 1

[	A	]	B	]	C]
1-	ITEM		LIST		COST	
2-						
3-	RELIANT SE KPH45 WAGON		7939		7063	
4-						
5-	FREIGHT AND DEALER CHARGE		536		536	
6-						
7-	H4 BENCH SEAT VINYL		31		26	
8-	AAB POPULAR EQUIPMENT PKG		516		439	
9-	WSW TIRES					
10-	LIGHT PKG					
11-	AM/FM STEREO					
12-	PWR STEERING					
13-	LEFT REMOTE MIRROR					
14-	TINTED GLASS					
15-	SDB HVY DTY SUSPENSION		58		43	
16-	MCC BUMPER GUARDS		56		48	
17-	GFA REAR WINDOW DEFROST		143		122	
18-	MWA LUGGAGE RACK		116		99	
19-	HAA AIR CONDITIONER		737		626	
20-	TJA TIRE UPGRADE TO P185		36		31	
21-	XPB UNDERCOATING		43		37	
22-	NHM AUTO SPEED CONTROL		179		152	
23-						
24-	TOTAL		10390		9222	



BUT...CHECKERBOARDS ARE FOR TABLECLOTHS!

THE LOWERKIT III FROM GREEN MOUNTAIN MICRO

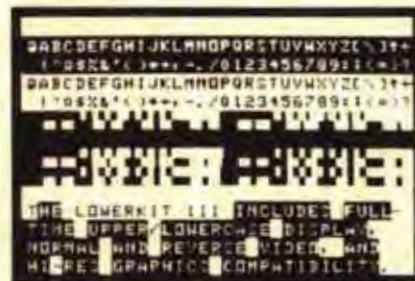
Still cloaking your Color Computer in a checkerboard tablecloth? Since 1981, thousands of Color Computer users have uncovered their computer by discovering the Lowerkit — the first and best full-time lowercase and special symbols generation system for your Color Computer.

Why a Lowerkit? Because uppercase-only display is a relic of the user-unfriendly past. And because you can't really read a checkerboard excuse for lowercase display. Sure, software lowercase comes with a handful of commercial programs. But software lowercase gobbles up over 6,000 bytes of your precious memory. Even if you have 64K, you'll give up 10% of it for a simple lowercase display. And software lowercase vanishes when you change programs or turn off your computer.

Take 15 minutes. Put the lowerkit in. A Lowerkit is simple, reliable — and it's always there. You flip on your machine, and Lowerkit's bold lettering greets you.

No tapes, disks or cartridges to load first. No compatibility problems; when you don't want it, you switch it off.

And now, the new Lowerkit III includes a reverse screen switch as well. Big, bright green letters on a black background.



Original Color Computer Display



LOWERKIT III Display (reverse video, too)

Four years ago, the Lowerkit made history and set the standard in Color Computer lowercase. For example, game and education programs from Sugar Software have Lowerkit display options. Spectrosystems' ADOS supports the Lowerkit; so does Cer-Comp's TextPro. Cartridge Scripsit looks beautiful with a Lowerkit. Spectrum Projects, Cheshire Cat and many others have developed beautiful alternate character sets which you can download from Micronet, burn into an EPROM, and snap into your Lowerkit.

Pull the checkerboard tablecloth off your Color Computer with a **Lowerkit**. The original. The standard.

New Low Price on the Assembled Lowerkit III!

- Lowerkit III, assembled and tested, \$67.50
 - Lowerkit III, complete kit of parts, \$49.95
 - Lowerkit III, printed circuit board, \$20.00
- Be sure to specify Color Computer or Color Computer 2.*

ALSO AVAILABLE FROM GREEN MOUNTAIN MICRO

Color Burner with/software, \$69.95 / \$56.95 kit

Micro Language Lab "Learning the 6809", \$99 (plus \$3.50 shipping and handling)

CoCoPort interface, \$54.95 / \$44.95 kit

RAM/ROM pack, \$29.95 / \$19.95 kit

64K Color memory upgrade kit, \$49.95 with *NEW* Memory Tester, \$54.95

Color Quaver, Software Music Synthesizer, \$14.95

Multipak Extender Cable 24". It works! \$35.00

TV Buff II*, improved to handle virtually all monitors, \$19.95

*(Add \$2.50 shipping and handling)
Specify Color Computer or CoCo II

Green Mountain Micro

Bathory Road, Box R
Roxbury, Vermont 05669
802 485-6112

Hours: 9am-5pm, Monday-Friday
COD/VISA/MASTERCARD

TRS-80 is a trademark of Tandy Corporation



wagon was still getting from gas station to gas station and my '80 Horizon is still new by comparison.

I reflected for a couple of weeks. The station wagon was aging, rusting and pieces were falling off. Signals of middle age perhaps. But, a Tandy 1000 seemed a bit neater than a new car and is unlikely to rust. On the other hand, computers aren't mobile. It seemed a brief fact-finding trip to the local Dodge dealer would be in order for a new car consideration.

The dealer was out of station wagons and had only one car that cost more than four IBM PCs with a printer thrown in. I did get literature and stopped at a newsstand on the way home to buy a book containing both suggested retail and dealer costs for new cars and their options. Now I could rationally evaluate the situation from the safety of my easy chair with my wallet secured between me and the upholstery.

On the way home the next evening, I stopped at a Plymouth dealer who had no new wagons, either. He could sell me an '84 demonstrator where my Iacocca Certificate did not apply, and which did not benefit from the free automatic transmission promotion. I had the feeling I would pay more for that car than a new one ordered to my specifications. Time to do a spreadsheet.

Example 1 is the final spreadsheet for the car I ordered and is typical of what you might do a number of times as you

narrow down your choices. All the data comes right out of the manufacturer's literature and the price book. The only formulae, @SUM(B1...B23) and @SUM(C1...C23), are in cells B24 and C24 which sum the entries in the columns of Example 1.

The formulae cover the entire column above the total row including the heading and the blank row above the

"The one number you won't be able to exactly define without visiting the dealer is the freight and dealer charge. If you do a lot of looking and asking, you will pick up some examples of this and have a 'ball park' figure to apply to various cars."

totals. You can insert and delete any row within this range and the formulae will adjust themselves. This makes "what if" testing easy.

For example, you may have chosen three options that are also included in the discounted "popular options package." Save your current spreadsheet, then delete those options and add the popular options package. A recalcula-

tion shows the new totals which you can compare with those in the unmodified spreadsheet. Since the popular options package is discounted, you might find that \$50 more buys \$150 worth of options.

The one number you won't be able to exactly define without visiting the dealer is the freight and dealer charge. If you do a lot of looking and asking, you will pick up some examples of this and have a "ball park" figure to apply to various cars.

Those with printers will do well to print each sheet they make and take these along when they visit the dealers. On my next dealer visits, I had done some spreadsheets, but did not have them along. Having done the spreadsheets only the night before, I knew from memory what I wanted and the costs to the dealer for these.

Sensing I knew what I wanted, the salesperson got a scrap of paper, pencil and her price book and set about recreating my spreadsheet by hand. After minutes of writing, erasing, adding and subtracting, we had a list number to work from. I was thinking about how much easier the same thing had gone with *DynaCalc*.

The next day, we arrived with the Example 1 spreadsheet to finalize the order. Again pencils, papers and calculators came out as they strived to determine the price. The first cut price was wrong. They left out the vinyl seats. Finally they got it right. I should have

Example 2

[A]	B	[C]	[D]
1-MONTHS	36	0-B1	
2-PRINCIPAL	8500	(1+(B3/12))c1	
3-INTEREST RATE	.125	(1-C2)/(B3/12)	
4-	-----		
5-PAYMENT/MO.	B2/(1-((1+(B3/12))H0-B1))/(B3/12))	B2/C3	
6-			
7-TOTAL PAYMENTS	B5*36		
8-			
9-INTEREST PAID	B7-B2		
10-			
11-MONTH	1		
12-START PRINCIPAL	B2	INTEREST	B12*(B3/12)
13-PRINCIPAL PYMT	B5-D12	PRINCIPAL	B12-B13
14-MONTH	B11+1		
15-START PRINCIPAL	D13	INTEREST	B15*(B3/12)
16-PRINCIPAL PYMT	B5-D15	PRINCIPAL	B15-B16
17-MONTH	B14+1		
18-START PRINCIPAL	D16	INTEREST	B18*(B3/12)
19-PRINCIPAL PYMT	B5-D18	PRINCIPAL	B18-B19

made two printouts and given them one to check. It would have saved some hassle and mistakes.

Next came the financing. I had looked in a few references for the formula for calculating monthly payments and came up dry when Herb Slodounik of Decatur, Ill., sent me a letter with the formula saying it works in *EliteCalc*, but not in *DynaCalc*.

The book formula is $P=B((1-(1+(1/12))^N)/(1/12))$. BASIC, *EliteCalc* and *Multiplan* for other computers have a hierarchy of operators. In our equation, these "languages" would raise $(1+(1/12))$ to the power $-N$ and then subtract that value from one. That is because raising to a power is above subtraction in the hierarchy. *VisiCalc*-type spreadsheets do not have such a hierarchy. Therefore, *DynaCalc* and *VIP Calc* evaluate all math expressions on a strictly left to right basis, except as modified by parentheses. This is extremely important since it is contrary to how you would solve equations using pencil and paper or how you would program the equation in BASIC.

Example 2 is a formula dump of a *DynaCalc* spreadsheet to calculate monthly payments given number of payments, amount financed (principal) and the interest rate given as a decimal number. An interest rate of 12.5 percent is entered as .125. These variables are entered in cells B1 . . . B3. The formula to calculate payments is in B5 and looks like this:

$$B2 / (1 - ((1 + (B3 / 12))^{B1} - B1)) / (B3 / 12)$$

(---1---) (---3---) (---5---)
 (-----2-----)
 (-----4-----)
 (-----6-----)
 (-----7-----)

The diagram below the equation shows the order of calculation and how the parentheses group. The innermost expression $(B3/12)$ is calculated first. $(1+Value1)$ and $(0-B1)$ are at the same level so the left one is calculated first.

Note that *DynaCalc* will not accept $(-B1)$, but $(0-B1)$ works. The same cell construction is used in C1. Other spreadsheets are not so fussy. In Step 4 the raise-to-power operation occurs. At this point you should be able to reason out steps 5 through 7 for yourself.

To get to the equation in B5, I broke the book formula into pieces and put these into cells C1 . . . C5. These produce the same answer in C5 as the full

equation produces in B5. Many times it is easier to put work areas like C1 . . . C5 outside the formal area of the spreadsheet and move their results back to where that value is to appear in a printout. Now the consideration is the order of calculation for the whole spreadsheet, rather than order of calculation for a specific formula.

A forward reference is where a formula in a cell uses a value from another cell that has not been calculated yet. A typical order is to calculate the values in Column A starting at Row 1, then the spreadsheet moves to Column B and does the same thing. This would work fine for the top part of our spreadsheet.

The last nine lines of the spreadsheet start a series of calculations that calculate how much of each payment goes to interest and to principal, then calculates the outstanding principal after each monthly payment.

In cell B12, the starting principal is brought down from cell B2. This value is used in cell D12 along with the interest rate from B5. The interest charged in D12 is subtracted from the monthly payment in cell B5 to get the amount available to reduce the principal. In cell D13, the starting principal for the month is reduced by the value from B13.

This spreadsheet arrangement becomes a disaster when columns are calculated from left to right. The calculation of the principal payment in B13 needs the interest payment from D12 which has not been calculated yet. The effect snowballs since the start principal in B15 needs the value from D13 which is not right because B13 is not yet right, etc.

You can manually cause a recalculation which will fix B13 and D13, but D13 is calculated too late for B15 to be right. In fact, two recalculations for each month in the spreadsheet would be necessary. With *DynaCalc*, you can change the order of calculation so rows are done in order down the spreadsheet and all our troubles go away.

EliteCalc calculates rows down the spreadsheet in order from left to right. Example 2 is a very worst case situation that was not purposely designed to exemplify the problem, but which does so in spades.

VIP Calc also permits changing a default column-by-column calculation order to a row-by-row sequence using the Global command. The *VIP Calc* manual also warns against circular



- *232 RemotePlus* by David Olsen
- Requires RS232 Pak or PRJ 2SP
- Remote Terminal Program
- Parallel to Keyboard
- No Lost or Garbled Data
- Error Trapping - Software Clock
- Disable Break Key - Inkey\$ Support
- New Terminal Program
- Conversation Mode
- All Ext. & Disk Commands
- 20 Commands Added
- Perfect for BBS
- 4 Versions Incl: Ext., 1.0, 1.1 & JDOS
- Much More - Uses 4K



\$24.95 + 2.50 S & H (S.A. inc. + tax)

SEE OUR PREVIOUS ADS
A.E. COCO I CONSOLE

Monitor Stand + Much More
 Lrg. w/storage \$119.95
 Small COCO only \$109.95

E.D.C. carries the most complete line of software and hardware in the market.

- Green Mountain Micro!
 - Computerware (All)
 - Custom Software (No Disc.)
 - Key Color Software (Key 264K)
 - Michtrom
 - Tom Mix (All)
 - Moreton Bay (More)
 - Prickly Pear (Colorkit!)
 - Platinum Software (!)
 - Softlaw (VIP)
 - Spectral Associates
 - Speech Systems (All)
 - Sugar Software & (Super)
 - CoCoPro (V2)
 - Computer Systems Center
 - Valley Micro Systems (BBS)
 - PBH HJL Elephant
 - Hayes Teac Gemini
 - Interfaces Monitors Controllers
 - Speech Music
- ALWAYS MORE AND BETTER

JUNE SPECIAL
Amdek Amdisk III B. \$249.95



COLOR & MICRO COMPUTERS

Software • Hardware • Support
 Educational • Small Business • Games
 VOICE (213) 254-6809 10 A.M.-10 P.M.
 BBS (213) 258-0640 24 HRS.
 309 and 1200 Band
 Extended Hours + Call before coming.

6130 YORK BOULEVARD
 POST OFFICE BOX 42718
 LOS ANGELES, CA. 90042

references that cannot be resolved. A trivial example follows:

[	A	]	[	B]
1B1		A1			

Cell B1 contains nothing but the formula A1. Cell A1 evaluates to zero since there is nothing in B1. Likewise B1 equals zero since A1 equals zero. Here no harm is done or anything useful done, but in more complex expressions, there is no telling what may happen.

For those who have hung in there up to now, Example 3 is the interest payment spreadsheet as you would see it without the formula dump.

I have shown only three months of the calculations of monthly principal and interest. The formulae for Month 1 are a bit different than for succeeding months. The month number in B11 is entered as '1.' The principal in B12 is obtained from B2. The month number for Month 2, B14, is calculated by adding one to the value in B11. The principal in B15 is the amount calculated in D13. The same pattern occurs for Month 3, B17 adds one to the value three cells above.

The value in B18 is from the cell two up and two right. This is describing relative cell addresses. How many cells away in each direction is the cell from which to get a value?

Another type of cell addressing is fixed addressing. The interest rate is in B3. Whenever we need the interest rate, we always go to that cell. Likewise, the monthly payment is in B5; we always go to that cell for it.

If we replicate cells with formulae to enlarge our spreadsheet so it will produce interest and principal for the full term of the loan, *DynaCalc* will display the formula in each cell and move the cursor to the first cell reference and ask (S)ame or (R)elative. If we want fixed addressing, we press the 'S' for same cell displayed. More likely than not we will be dealing with relative addressing and strike the 'R.'

In Example 3, the payment amount and interest come from fixed address cells and we enter 'S' for them when asked. Two data pieces, the last month number and the outstanding principal, come from the previous month and relative addressing is required to get them. Finally, the amount of interest and the principal payment for the particular month are relatively addressed within the lines for that month.

When the replicate is complete, the actual cell numbers are shown in the equations. *DynaCalc* used the (S)ame or (R)elative information you entered to calculate the right cell address to use.

The *Elite*Calc* Copy command works in a similar manner. I really like the way *Elite*Calc's* copy works; it can deal with blocks rather than only

columns or cells. You need to tell *Elite*Calc* if you want to adjust some of the formulae for relative addressing by choosing the Q=QUERY option. It then stops at each cell reference to ask if you want that cell reference adjusted for relative addressing. If you press ENTER at the system prompt, OPTIONS (V,N,Q), all references are adjusted for relative addressing. Press 'N' and none are. 'V' copies only the values in the cells, but not the formulae that created those values.

When using the *Elite*Calc* Copy command, you may specify a single cell or a range of cells to copy. For example, you could copy A14:D19 to A20 to get calculations for months 4 and 5. When *Elite*Calc* asks OPTIONS (V,N,Q), press 'Q,' then answer 'N' to adjust cell references B3 and B5, and 'Y' to all others. Next, copy A14:D25 to A26 to calculate months 6 through 9, and so on.

DynaCalc's replicate is similar except you cannot replicate a block. To accomplish the block move we just discussed, you need to replicate columns A, B, C and D separately. That's more work in this case, but in other cases, *DynaCalc* lets you replicate a single cell to a range of cells, all in a row or a column. Further, you can replicate a column or row of cells to multiple columns or rows.

Now, if we had the features of *Elite*Calc's* Copy and *DynaCalc's* Replicate combined into one command, wow! *VIP Calc's* Replicate is just like *DynaCalc's*, except the program asks "Relative Y/N" for each cell reference.

To wrap up this month, I want to point out a new version of *Elite*Calc* has come out to run with PBJ's *Word-Pak* with an 80-character screen. One owner I spoke with is very pleased with the program; it offers a number of upgrades and changes, most important of which is the inclusion of vertical and horizontal windowing. A borders option to provide column and row identification on printed spreadsheets is also available. The new Zap command will blank all cells containing numbers while preserving formulae and text. This may be neat for blanking out all values from a shell you are developing. But, be careful, this will wipe out constants, LOOKUP tables and the like. The disk is copy protected with a backup copy provided in the package. Check out the ads in this RAINBOW for price and availability.

Example 3

[	A	]	[	B	]	[	C	]	[	D]
1-MONTHS			36			-36					
2-PRINCIPAL			8500			.6886237					
3-INTEREST RATE			.125			29.89213					
4-											
5-PAYMENT/MO.			284.3558			284.3558					
6-											
7-TOTAL PAYMENTS			10236.81								
8-											
9-INTEREST PAID			1736.809								
10-											
11-MONTH			1								
12-START PRINCIPAL			8500.00			INTEREST			88.54		
13-PRINCIPAL PYMT			195.81			PRINCIPAL			8304.19		
14-MONTH			2								
15-START PRINCIPAL			8304.19			INTEREST			86.50		
16-PRINCIPAL PYMT			197.85			PRINCIPAL			8106.33		
17-MONTH			3								
18-START PRINCIPAL			8106.33			INTEREST			84.44		
19-PRINCIPAL PYMT			199.91			PRINCIPAL			7906.42		

NOVASOFT™

★ A TOM MIX COMPANY ★

AT LAST!

TOP QUALITY SOFTWARE AT AFFORDABLE PRICES! WRITTEN BY WELL-KNOWN AUTHORS IN 6809 MACHINE LANGUAGE ESPECIALLY FOR NOVASOFT™



BUZZWORM

This one will drive you nuts. Guide the snake around the screen, eating the snakebait for points, but don't bite yourself! Lots of fun awaits you with this one.

REQUIRES 32K & JOYSTICK
TAPE \$15.95
DISK \$18.95



BREWMASTER

Move along the end of the bars serving beer to your thirsty customers. Watch for falling glasses and rowdy customers. Loads of fun.

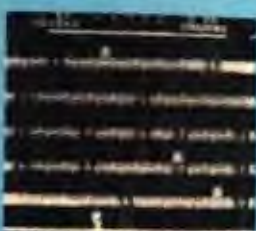
REQUIRES 32K & JOYSTICK
TAPE \$14.95
DISK \$17.95



BLACKBEARD'S ISLAND

A brand new high res graphic adventure. This one will blow your socks off! Wander around Blackbeard's island being ever mindful of the hazards while your lust builds for Blackbeard's buried treasure. Taint easy, malky!

REQUIRES 32K DISK ONLY
DISK \$19.95



PANIC

Climb the ladders and fight the "meanies". Dig holes and bury them. Hours of fun await you in this outstanding graphic arcade game. Enjoyment for all ages.

REQUIRES 32K & JOYSTICK
TAPE \$14.95
DISK \$17.95



MONEYOPOLY

Now! Play this popular board game on your computer. Probably the most realistic computer board game simulation ever. Contains all the features of the original. Buy, rent or sell properties and become a wealthy land baron with this program.

REQUIRES 32K & JOYSTICK
TAPE \$19.95
DISK \$22.95



GOLD RUNNER

Travel the maze, in your never ending search for GOLD. But be careful! There are hidden trap doors, burly guards, tricky ladders & slippery ropes. Sounds easy, you say? Clear the 1st screen and 24 more await you!

REQUIRES 64K MACHINE
JOYSTICK OR KEYBOARD
TAPE \$14.95
DISK \$17.95



BATTLE STATIONS

BATTLE STATIONS is a remake of a popular board game. Without a doubt the most outstanding sound and graphics you have ever heard of seen. BATTLE STATIONS is a one player interactive simulation of skill, strategy and luck. The player pits his tactical skills against the cold, cunning logic of the computer.

REQUIRES 32K DISK
TAPE \$21.95
DISK \$24.95



VEGAS GAME PAK

Have you ever wanted to bring Las Vegas home with you? Now you can! Six different games in this package: Blackjack, Keno, Poker, plus three other slot machine lookalikes. The only thing missing is the voice of Wayne Newton!

REQUIRES 16K EXT. BASIC & Games
TAPE \$24.95
DISK \$27.95



COLOR CAR

You asked for it and now here it is! Fast moving Grand Prix style racing. With your computer sit at the wheel of your racer through the difficult racecourse. "Bump & Jump" other cars, but be careful because they'll return the favor!

REQUIRES 64K & JOYSTICK
TAPE \$19.95
DISK \$22.95

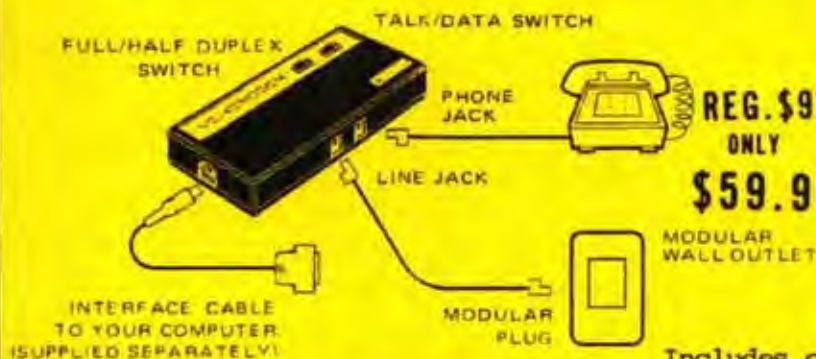
NO DEALERS PLEASE



Phone Orders (616) 957-0444
4285 Bradford N.E.
Grand Rapids, MI 49506

*Add \$2.00 shipping & handling.

Introducing Volksmodem



SPECIFICATIONS

Data Interface	RS-232C compatible
Output	MARK (OFF) -4.0V min (typical) SPACE (ON) +4.0V min (typical)
Input	MARK (OFF) 0 to -25V SPACE (ON) +2.5 to +25V
Data Format	Serial, binary, asynchronous
Operate Mode	Manual dial, manual answer, automatic answer/originate mode select
Data Rate	0 to 300 bps, full duplex or half duplex
Modulation	Phase coherent, frequency shift-keyed (FSK)

REG. \$99
ONLY
\$59.95

MODULAR WALL OUTLET

Includes cable for color computer

GET ON LINE FOR \$85



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

Cassette \$39.95

Diskette \$49.95

- Total Communications Capability
- Send/Receive Text, Graphics, & ML Programs
- Scroll, Search, Edit, Load, Save while On Line
- Built-in Word Processor
- HI-RES Lower Case is Optional & Fast
- Screen Widths of 32, 40, 42, 51, & 64
- Many Printer Options
- Optional Key-Beep & Error Beebop
- Automatic Block Graphics
- Unbelievable Keystroke Multiplier Abilities

SPECIAL PACKAGE PRICE

Volksmodem™ & AUTOTERM



NEW



ONLY
21.95

COPY HOLDER

For all typing and reading matter
... Hold copy at your eye level ...

Copy Holder accommodates letter or legal size paper. Features a non-glare reflective surface and a stable (movable) line finder. Mount easily on horizontal surface and offers a spring balanced flexible arm which adjusts copy holder for your needs. Shipping Weight, 4 lbs.

SALE

ORDERING INFORMATION

ADD \$2.00 PER ORDER FOR SHIPPING.
WE ACCEPT VISA, MASTERCARD, CHECKS, M.O.
C.O.D. ADD \$3.00 EXTRA.
California Residents, Add 6%

Sales Tax to Orders



SOFTWARE PLUS



6201 C Greenback Lane

(916) 726-8793

Citrus Heights, CA 95610

RAINBOWTECH



Downloads/Dan Downard _____	246
<i>Answers to your technical questions</i>	
KISSable OS-9/Dale L. Puckett _____	252
<i>News, hints and answers</i>	
MAIL09/Timothy A. Harris _____	249
<i>A database for keeping track of personal and business mailing lists</i>	

Securing A Graphics Cache

By Dan Downard
Rainbow Technical Editor

• I am working on a program to draw pictures on my computer that I can recall on my cassette for later use with other programs. My problem is within the realm of getting the same picture after I have stored and recalled graphics pages one to four and the PMODE, SCREEN, foreground color and background color. I own a 64K Color Computer.

Greg Arnold
Xenia, OH

Greg, your question is a very hot topic due to the popularity of several new graphics programs on the market. The immediate answer to your problem is quite simple. Assuming your graphics screen has been saved as a binary file starting at SE00, the default address for Extended BASIC graphics memory, just run the following BASIC program.

```
10 PMODE X,X:SCREEN X,X
20 (C)LOADM"FILENAME"
30 GOTO 30
```

The variables of 'X' describe the graphics mode from which the picture was saved. This program appears in the *CoCo Max* manual as an example of displaying the PMODE4,1:SCREEN1,1 screen necessary for artifacted colors.

Let's go a little further, though, Greg. If you are interested in accessing graphics screens from machine language, how do you duplicate the PMODE and SCREEN commands? The inputs for the VDG are bits three through seven of U4, a 6821 PIA at address \$FF22.

To experiment with the different graphics modes not available with the PMODE command, you need some information on the VDG. This information is in the *TRS-80 Color Computer Technical Reference Manual* and also in Section IV of the older

(Dan Downard is an electrical engineer and has been involved in electronics for 25 years through ham radio [K4KWT]. His interest in computers began about six years ago and he has built several 68 XX systems.)

Getting Started With Color BASIC manuals. This information can be summarized as follows:

\$FF22-Bit 3	CSS
\$FF22-Bit 4	GM0 & INT/EXT
\$FF22-Bit 5	GM1
\$FF22-Bit 6	GM2
\$FF22-Bit 7	A/G

All of the new graphics programs are really fun to play with, but compatibility of the information is a real problem. The above information is the basis of converting files from one system to another. Of course, the address of the graphics screen is different for all of the programs also, and has to be converted from one program to another.

Good luck, and if you come up with any good screens, send them to us and we'll publish them in the "CoCo Gallery."

CHIP CHANGE

• I have a 64K 'E' Board CoCo 1. About three weeks after installing 64K, my computer locked up. Pressing Reset or on/off results in columns of inversed @'s and spaces, and I cannot control the computer. Occasionally, turning the computer off for a long period of time then turning it on and hitting Reset a few times will clear the screen and return everything to normal. But, after two minutes, the computer locks up and the whole thing starts over.

I noted that removing the 6809 chip and turning on the computer results in the same screen pattern. Is my 6809 overheating and going bad?

Steve Powell
Cochrane, Ontario

Normally, garbage on the screen tells me that you have a bad memory chip, Steve. Get one spare chip and start swapping out the chips on a one-by-one basis. If this doesn't work, try the SAM and 6809 chips.

WRITE-PROTECT PROTECTION

• For floppy disks in general, and for Radio Shack drives specifically, I'd like to know if there is a possible failure mode that could ruin a disk that has a write-protect sticker installed. I use library disks to consolidate utility software for transfer to other disks and because copies of these programs exist on a variety of other disks, I do not want to back up these library disks. But, I do not want to lose these convenient sources of utilities, either.

Also, I have some purchased software, such as DynaCalc, that comes on a master disk that cannot be duplicated from which runnable copies are created. I'd like to know what dangers exist — other than handling and dirty heads — that could ruin a write-protected disk.

Dennis Page
Hawthorne, CA

According to schematics of the CoCo disk system, the write-protect switch in your drive is connected to an input on the WD1793 inside the disk controller interface. According to Western Digital, the manufacturer of the WD1793, "a logic low terminates the command and sets the Write-Protect Status bit."

This sounds pretty safe, doesn't it? There are other problems associated with lost data on disks, Dennis. If you maintain these disks for archival purposes, I don't think you will have anything to worry about. But if you use them everyday, just as you mention, head wear and handling in general could cause problems.

For programs you use a lot, it pays to have a backup.

WANTS DISK AND UPPER RAM, TOO

• I have an 'E' Board CoCo with Extended BASIC 1.1 and Disk BASIC 1.0. It was upgraded by Radio Shack to 32K and by me to 64K. I have a 64K Boot provided by Skyline Marketing with the 64K upgrade as well as one from THE RAINBOW. I can

open the upper RAM when the disk controller is not installed and access it. But with the controller in my place, it will not access normally. If I run a program to poke consecutive numbers into a byte of upper RAM, I get the following result:

Before Poke	# Poked	After Poke
2	0	0
0	1	0
0	2	2
2	3	2
2	4	0
0	5	2
2	6	2
2	7	2
2	8	0
0	9	2

I would like to be able to use upper RAM with the disk. Can you help?

Richard E. Hawley
San Francisco, CA

Richard, you didn't mention what addresses you were poking. If they are above \$FF00, you will not be able to read what you wrote, or PEEK what you POKEd, as this is the area of memory reserved for SAM registers. Try some addresses between \$E000 and \$FF00.

THE ENVELOPE, PLEASE

Can you tell me where I can get a schematic diagram and maybe a service manual for the Disk Controller 1 Card? Do you know where I can get a disassembled listing of the Disk 1.0 ROM and a good disassembler? And also, how does the 6809 CPU know that the Disk Controller Card is connected on power up when the cartridge select pin on the card is not used?

Rick Thorne
East Keansburg, NJ

Rick, I am going to nominate you for an award for the most questions in the shortest letter! Unfortunately, the answers are not going to be that short.

Radio Shack publishes a service manual for the Color Computer Disk Interface. Ask your dealer for a service manual, Catalog No. 26-3022.

Spectral Associates published a ROM disassembly entitled *Disk BASIC Unravelled*. The set consists of three books, one each for Color BASIC, Extended BASIC and Disk BASIC. If you care to try yourself, there are several disassemblers on the market. Two I am familiar with are the Micro Works' 80C and Computerware's *Super Sleuth*. Of course, *EDTASM+*, from Radio Shack, has a disassembler as part of ZBUG.

Address \$80A6 of the Extended BASIC ROM checks the first two memory bytes at address \$C000, the beginning of the Disk BASIC ROM. If they are correct, Extended BASIC assumes a disk ROM is installed and jumps to the disk ROM for initialization.

RPM OVERLOAD

On Page 238 of the September 1983 *RAINBOW*, Dan Downard states he will address the subject of adjusting the CoCo disk drive RPM in the October issue. I've looked in every issue since September 1983 and cannot find it.

I've been using OS-9 for three months with no problems until now. All of a sudden my disks spin at 307.8 RPM which is beyond OS-9's specifications. Is this speed something I can adjust myself and how, or do I have to support Radio Shack again? I await with baited chips.

Rick L. Earsley
Elgin, IL

Rick, I had a problem finding it myself. On Page 294 of the November 1983 issue you will find a picture explaining the calibration procedure.

For those of you who don't have this issue we will try to explain the procedure. On the older TEAC drives, there is a yellow potentiometer on a circuit board at the front left of the disk drive. This pot controls the speed of the drive. While under a fluorescent light, or using a speed checking program, adjust this pot for 300 RPM.

The following diagram shows how to install a 27128 EPROM on the latest CoCo 2 single ROM, two-RAM Board.

Jump across J1 (an address line), then follow this diagram for jumpers J2, J3, J4 and J5:



Jump Pin #1 to Pin #27 on EPROM

Douglas Cook
W. Jordan, UT

Thanks, Doug. I'm sure there are quite a few people who will benefit from your hint.

SWITCH HITTER

I am the owner of a 64K Color Computer ('D' Board). I have installed my disk controller inside my computer and wired it all into the circuit board (works just super, cleared up a lot of problems), but this created a problem I can't figure out. I'd like to know if it is possible to put a switch somewhere to detach the Disk BASIC and if it is, where would I put it? I would like to be able to just flip a switch to disable

it, as I would like to use ROM packs at the odd time.

Ralph Hansen
Nelson, British Columbia

I would suggest installing a switch in the CE line of the ROM. This would disable any addressing of the ROM and make your system think you are using Extended BASIC.

KEYBOARD CONNECTION

I would like to hook up a typewriter-style keyboard, but they are quite expensive. Could I hook up a cheaper keyboard from a CoCo 2 to my 'E' Board CoCo?

Mary Darr
Grand Ledge, MI

Mary, the only problem with using a CoCo 2 keyboard is the connector is different. There are adapters made for this purpose. Radio Shack supplied these adapters with their keyboard upgrade kits, so ask your local service rep where you can order one.

BASIC BOOBY-TRAP

I am a SYSOP of a BBS and my problem is that when the computer finds an error, it throws the caller into BASIC. Do you happen to know of a way to achieve an EN ERROR GOTO statement?

Gary Wright Jr.
Huntsville, AL

One solution that comes to mind, Gary, is to use a program called *Superscreen* by Mark Data Products. It supports full error trapping in Disk BASIC. There are several other ads for programs that add error trapping to BASIC, along with a few suggestions in recent *RAINBOW* articles.

CURSOR CURSES

Is it possible to reduce the size of the blinking cursor on the CoCo? There are times when it becomes distracting.

Norman L. Garton
Joliet, IL

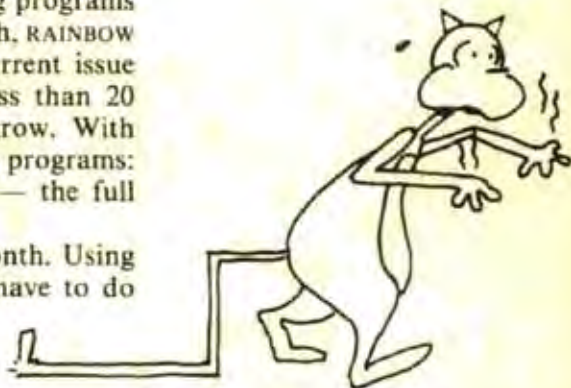
Norman, try the following: POKE &H1A6,0 — my cursor disappears. The routine for blinking the cursor is located at SA199 in your Color BASIC ROM.

Your technical questions are welcomed. Please address them to: Downloads, THE *RAINBOW*, P.O. Box 385, Prospect, KY 40059. We reserve the right to publish only questions of general interest and to edit for space and clarity. Due to the large volume of mail we receive, we are unable to answer letters individually.

Give Your Eyes And Fingers A Break!

With RAINBOW ON TAPE, you'll spend your time enjoying programs instead of typing . . . typing . . . typing them. Each month, RAINBOW ON TAPE brings you ready-to-run programs from the current issue of THE RAINBOW (excluding OS-9 programs and any less than 20 lines long). Think of how your software library will grow. With your first year's subscription, you'll get more than 230 new programs: games, utilities, business programs, home applications — the full spectrum of THE RAINBOW's offerings.

You will receive as many as two dozen programs a month. Using the documentation provided by the magazine, all you have to do is load and run them!



A luxury service at a bargain-basement price:

RAINBOW ON TAPE single-copy rate is \$10 within the U.S.; \$12 for all other countries. RAINBOW ON TAPE annual subscription rate is \$80 within the U.S.; \$90 in Canada; and \$105 for all other countries.

Past Releases of RAINBOW ON TAPE Available, Too!

If you're among many readers of THE RAINBOW who file every issue of the magazine, expecting someday to need a program or article contained within the magazine, past releases of RAINBOW ON TAPE are available — beginning with the April 1982 edition (Please check this issue's Table of Contents for "Back Issue Information" to review previous magazine themes).

Music From Past Printer Issues:

June 1984 — Our first Music Issue featured such classics as Tchaikovsky's "1812 Overture," Bach's "Tocatta in D Minor," Handel's "Hornpipe," and Kuhlau's "Sonatina," as well as such sentimental favorites as "I'm Looking Over a Four-Leaf Clover" and "The Entertainer." Also: Larry Konecky's innovative 12-tone composition program which is an alternative to traditional methods of creating music pieces, a BASIC program which loads a machine language music synthesis program for entry, editing and playing of music, and tutorials to help you become familiar with the location and functions of piano keys and guitar strings. Plus, a variety of games and graphics programs.

Other Issues — Our **December 1983** issue contained Larry Konecky's "CoCo Composer," a program that makes it possible for you to compose in four-part harmony. It also included eight of the most popular Christmas carols of all time. Our **December 1984** issue included seven more holiday favorites (plus the winning entries in last year's Adventure Contest). Our **November 1983** issue featured Bach's "Sinfonia."

The Perfect Companion To Your RAINBOW

Each edition of RAINBOW ON TAPE is a collection of ready-to-load-and-run programs from the corresponding month's issue of RAINBOW magazine. RAINBOW ON TAPE is not a "stand-alone" product, but is intended to be an adjunct and complement to the magazine. That is, even if you purchase RAINBOW ON TAPE, you will still need the magazine for loading and operating instructions. RAINBOW ON TAPE will not run on Dragon or MC-10 computers.

Look for the order card between pages 34 and 35 in this issue.

To order by phone, call: (502) 228-4492

OS-9 UTILITY

This database program keeps track of two separate mailing lists — a personal list and a business list

MAIL09

Many persons who have purchased the OS-9 operating system and the BASIC09 language from their Radio Shack dealers have found themselves with a very powerful system and not a lot of software to run on it. *MAIL09* is a piece of software to help fill part of the need.

MAIL09 is a database program which keeps track of two separate mailing lists — one a personal list and a business list. It is menu and prompt driven, and thus is very easy to use. It also contains operations not found in many similar programs such as the ability to not only make labels of all the addresses you have, but also to make multiple mailing labels of a single

(Tim Harris has a bachelor's degree in computer science and is employed as a software engineer. Several of his programs have also been featured in the "KISSable OS-9" column of THE RAINBOW.)

By Timothy A. Harris

entry. This is nice if you don't like to write return addresses all the time — just run off a few hundred labels and you're set.

MAIL09 also uses an indexed file structure so you can locate an item quickly and the mailing list is always sorted alphabetically for you via a bubblesort routine run on the index.

The two mailing lists can each be up to 100 entries long as currently implemented and each entry contains up to 10 fields. These fields are a company name for the business list, a last name, first name, title, two address fields, city, state, ZIP and phone. The last name is used to index the personal list and the company name is the index key for the business list. These two fields can contain up to 25 characters; the first name up to 10, the title up to four and

the address fields up to 32. The city can have up to 15 characters, the state up to 10 if you don't like to abbreviate, the ZIP code can be up to 10 characters long for the new nine-digit ZIPs, and the phone can handle 14 characters for area code and number in a format of (XXX) XXX-XXXX.

MAIL09 is written in BASIC09 which is an ideal language for implementation of application programs in the OS-9 environment. One major advantage of BASIC09 is the use of user-defined TYPE declarations like PASCAL which allow the label (that includes the above fields) to be a single data item.

Another advantage of BASIC09 is its modularity; the total code for *MAIL09* is very large, too large, in fact, to run on the CoCo with OS-9 if it is all in one big chunk of code as regular Microsoft BASIC programs are, but BASIC09 allows one to make programs in separate modules and have these modules loaded as needed from disk when they are called from another module. The modules communicate with each other via the parameters they pass.

If you look at the code, you will notice there are four main parameters used: label, index, listfile and indexfile. Since the label is only used within a given procedure, it need not be passed as a parameter and could be declared by a DIM statement in each procedure that needs to read or write an entire label. This approach, however, takes up a lot of space since the label uses up quite a chunk of memory.

I chose to save on this memory use by declaring the label only in the first procedure and then passing it to all others as a parameter, making only the main procedure save the memory for the label and then all the others need only save the address of the label to access it.

The index array is also passed around for similar reasons. The listfile and indexfile are the actual names of the data file you will be using, and let you

work with two separate lists and still have only one index file in memory at any given time.

I would like to make a few technical notes first before I actually get into the operation of the *MAIL09*. First of all, the program requires a Hi-Res screen to run, such as those found in *O-Pak* or that obtained by the *PBJ Word-Pak*. The standard display of the Color Computer will just not work; the menus would be too large to fit on a single screen.

I used the 64 by 19 display of *O-Pak* to write the program, but the 51 by 24 would work just as well, and an 80 by 24 would be great. The use of *O-Pak* gives a nice display at the cost of memory — lots of it — which further limits the memory available with BASIC09. BASIC09 needs about 22K to load and *O-Pak* takes up another 6K or so, leaving about 7-8K of workspace in BASIC09. I can get a workspace of 9983 with BASIC09 and *O-Pak* installed, but only after eliminating several device descriptors and drivers from my boot file.

Due to these constraints, the program will not run within BASIC09 itself, but needs to run PACKed with the *RUNB* package in memory. The use of the KILL statement after RUNNING a procedure helps conserve memory space also, by unlinking the data space used by that procedure. The program modularity also has its drawbacks, although it allows a large program to run in limited memory, it does this by leaving things on the disk until they are actually needed, making a program access the disk drive a lot during execution.

If you have standard Radio Shack drives tracking at 30 ms, this can cause delays, so it is best to have your drives tracking as fast as they can (mine go at six ms and there is not much delay in the program execution). For hints on how to make your drives work faster or how to get rid of unwanted device descriptors and drivers, look into some of the past issues of *RAINBOW* at the "KISSable OS-9" column.

MAIL09 consists of 21 separate procedures which are PACKed into 15 modules; to get it up and running on your system, it's best to have a disk set up with a CMDS (Commands) directory for *RUNB*, the program modules and any system utility you might want, mainly *dir* and *del*.

If you have a single disk system, you would also want to put BASIC09 in the CMDS directory so you could edit the

programs and put the sources in a separate SOURCE directory before PACKing them to the CMDS directory. Remember, you cannot turn PACKed I-Code back to BASIC09 source code if you have to edit it, so always SAVE the source code first.

I also set up a separate DATA directory to hold the files generated by the program and use it as the data

directory while running the program.

When entering the code, I chose to PACK those procedures common to all of the program into the main module. Thus, enter the code for the modules *mail09*, *clearscreen*, *entryerror*, *getindex*, *printlabel* and *inputdata* all into the workspace at one time, then use "run *mail09*" or "list *mail09*" to get that to be the current module, and SAVE*

The listing:

```

PROCEDURE mail09
TYPE labeltype=companyname:STRING[25]; title:STRING[4]; lname:STRING
[25]; fname:STRING[10]; address1:STRING; address2:STRING; city:STRING
[15]; state:STRING[10]; zip:STRING[10]; phone:STRING[14]
TYPE indextype=name:STRING[25]; number:BYTE
DIM label:labeltype
DIM index(100):indextype
DIM ciname,piname:STRING[6]
DIM ciname,piname:STRING[5]
DIM resp:BYTE
ciname="cindex"
ciname="clist"
piname="pindex"
piname="plist"
LOOP
RUN clearscreen
PRINT "
                                MAIL09"
PRINT "
                                List Selection Menu"
PRINT "
                                ====="
PRINT
PRINT "
                                1 -- Work on Personal List"
PRINT "
                                2 -- Work on Buisness List"
PRINT "
                                0 -- Exit to OS-9"
PRINT
INPUT "
                                Selection : ",resp
EXITIF resp=0 THEN
RUN clearscreen
ENEXIT
IF resp=1 THEN RUN mainmenu(label,index,piname,piname)
ELSE IF resp=2 THEN RUN mainmenu(label,index,ciname,ciname)
ELSE RUN entryerror
ENDIF
ENDIF
ENDLOOP
END
PROCEDURE clearscreen
DIM clearcode:STRING[1]
clearcode="CHR$(50C)
PRINT clearcode
END
PROCEDURE entryerror
DIM resp:BYTE
PRINT
PRINT "
                                Illegal Selection"
PRINT "
                                Hit any key to Continue"
GET #0,resp
END
PROCEDURE getindex
TYPE indextype=name:STRING[25]; number:BYTE
PARAM id:INTEGER
PARAM index(100):indextype
PARAM numentries:INTEGER
numentries:=0
WHILE NOT(EOF(#id)) DO
numentries:=numentries+1
GET #id,index(numentries)
ENDWHILE

```

them and PACK* them into the SOURCE and CMDS directory. The ** will make all the procedures go into a single module called mail09. The mailsort and xchange procedures should be similarly SAVE*ed and PACK*ed into a module named mailsort.

All the remaining procedures should be PACKed individually into separate modules making for 15 modules and 21 procedures. If you follow this procedure, you should be able to run the program by getting out of BASIC09, making sure your execution directory is CMDS and the data directory is DATA, then typing "mail09" which will bring up RUNB and the main module of the program.

Once you get the program up and running, the actual use of it is simple. The entire program is menu and prompt driven, so it tells you or asks you what to do at every step of the way. You are first asked if you want to work on your personal or business list, both of which can contain up to 100 entries. Also on the selection menu is the option of zero (to return to OS-9); throughout the program the option of zero will return you to the previous level of the program.

After selecting a list to work on, you will go to the main menu where you can 1) create the list; 2) update the list; 3) display the list to the screen; 4) print the list to the printer; 5) print mailing labels (the program is set up to use one wide fanfold labels that are 3½ inches wide and 1½/16 inches high; 6) print individual labels and make multiple copies of a single label; 7) execute a Shell command; and 0) return to the selection menu. If you choose to update the list, you will see the update menu which allows addition of entries, alteration of an entry and deletion of an entry. At all times you will be told what exactly to do or given a menu to decide from, so the program is very user friendly.

I hope MAIL09 helps to bridge the gap of availability between having a powerful operating system and having some powerful software to run on it. The source code is rather long and does take some time to type it all in, but the BASIC09 editor makes it an easier and faster job by automatically capitalizing for you and doing a lot of error checking as you type.

(You may contact Mr. Harris with any questions about this program at 6620 Forest Court, Des Moines, IA 50311, phone (515) 274-2393.)

```

END
PROCEDURE printlabel
TYPE labeltype=companyname:STRING[25]; title:STRING[4]; lname:STRING
[25]; fname:STRING[10]; address1:STRING; address2:STRING; city:STRING
[15]; state:STRING[10]; zip:STRING[10]; phone:STRING[14]
PARAM path:INTEGER
PARAM label:labeltype
PARAM dophone:BOOLEAN
DIM numlines,i:INTEGER
numlines:=0
IF label.companyname<>"" THEN PRINT #path,label.companyname
numlines:=numlines+1
ENDIF
IF label.title<>"" THEN PRINT #path,label.title; " ";
ENDIF
IF label.fname<>"" THEN PRINT #path,label.fname; " ";
ENDIF
IF label.lname<>"" THEN PRINT #path,label.lname
numlines:=numlines+1
ENDIF
IF label.address1<>"" THEN PRINT #path,label.address1
numlines:=numlines+1
ENDIF
IF label.address2<>"" THEN PRINT #path,label.address2
numlines:=numlines+1
ENDIF
PRINT #path,label.city; ", "; label.state; " "; label.zip
numlines:=numlines+1
IF dophone THEN
PRINT #path,label.phone
numlines:=numlines+1
ENDIF
FOR i:=numlines TO 5
PRINT #path
NEXT i
END
PROCEDURE inputdata
TYPE labeltype=companyname:STRING[25]; title:STRING[4]; lname:STRING
[25]; fname:STRING[10]; address1:STRING; address2:STRING; city:STRING
[15]; state:STRING[10]; zip:STRING[10]; phone:STRING[14]
PARAM label:labeltype
PARAM listfile:STRING[5]
PARAM alldone:BOOLEAN
alldone:=FALSE
IF listfile="plist" THEN
label.companyname=""
INPUT "Last Name" : ",label.lname
IF label.lname="" THEN
alldone:=TRUE
ENDIF
ELSE
INPUT "Company Name" : ",label.companyname
IF label.companyname="" THEN
alldone:=TRUE
ELSE
INPUT "Last Name" : ",label.lname
ENDIF
ENDIF
IF NOT(alldone) THEN
INPUT "First Name" : ",label.fname
INPUT "Title" : ",label.title
INPUT "Address 1" : ",label.address1
INPUT "Address 2" : ",label.address2
INPUT "City" : ",label.city
INPUT "State" : ",label.state
INPUT "Zip Code" : ",label.zip
INPUT "Phone Number" : ",label.phone
ENDIF
END

```

KISSable OS-9

News, Hints And Answers

By Dale L. Puckett
Rainbow Contributing Editor

We don't have a lot of news this month, but we have more questions to answer. We'll start with a load of hints and we'll wrap up the column with a number of interesting BASIC09 procedures from several readers.

First, I stumbled upon a long thread where members were discussing the merits of several alternatives to Tandy's CCDISK module and learned about a new driver we haven't mentioned before. MJS Software (3121 Sea Lane, Bremen, IN 46506, (219) 546-4009) offers a CCDISK that reportedly does an excellent job handling 80-track, double-sided drives.

A lot of the coding was done by an OS-9 pioneer, Carl Kreider. Carl is one of the leading contributors to the OS-

9 Users Group's software library and is very knowledgeable. If you call MJS, tell them they should have let us know about it sooner! That goes for anyone producing OS-9 software... tell us and we'll tell the world in "KISSable OS-9."

We mentioned recently that several readers were interested in running OS-9 on the Dragon computer; while reading the SIG, we noticed that Jim Omura had left the company's address: Dragon Data Ltd., Kenfig Industrial Estate, Margam, Port Talbot, West Glamorgan, SA13 2PE. Should be a good place to write for Dragon information.

Speaking of addresses, Jonathan C. Keatley left the following for the Dragon's 6551 ACIA:

```
Sff04 — Receive/Transmit Data
Sff05 — Status Register
Sff06 — Command Register
Sff07 — Control Register
```

Jonathan also left a four-line BASIC program that emulates a dumb terminal. If you have one of the new RS-232 Paks and the new version of OS-9 with the ACIAPAK drivers, you should be able to emulate it nicely in BASIC09. When

you do, you'll need to use the corresponding addresses for the RS-232 Pak's registers. See the *SysType* listing later in this column or look in the device descriptor for /T2 to find the base address of the RS-232 Pak's ACIA. Here goes!

```
10 POKE &HFF06, &H6B : POKE
   &HFF07, &H36
20 Y$=INKEY$: IF Y$ < > "" THEN
   POKE &HFF04, ASC(Y$)
30 IF PEEK (&HFF05) AND B THEN
   PRINT CHR$(PEEK(&HFF04));
40 GOTO 20
```

Software Library News

You've probably had a chance to peruse the complete listing of the OS-9 Users Group's Software Exchange Library in the May RAINBOW. Here's some more good news. The list you read was complete as of February 1, 1985. I've learned that 10 more disks have already been added to the list. We'll try to get it compiled for you in a future RAINBOW. Dave Kaleita, the group's software librarian, has sure been busy.

MOTD, the group's newsletter, has picked up a new contributing editor. Hubert "Bert" Schneider in Omaha, Neb., has signed on to write a regular

(Dale L. Puckett is a free-lance writer and programmer who has worked with the Motorola family of microprocessors since 1976. He is the author of The Official BASIC09 Tour Guide, published by Microware and The Official Rainbow Guide to OS-9, published through the Rainbow Bookshelf. He serves on the InfoWorld Software Review Board and is a chief warrant officer in the U.S. Coast Guard.)

Incredible!



Terminal not included

4 User **68000**

* **Special!**
512K
FREE!



Multi-User!

Frank Hogg Laboratory announces their Quad Terminal (QT) series of multi-user computer systems, designed to run Microwares new OS-9/68000 operating system. The QT offers 32 bit processor power in a compact integrated package that requires only a terminal to operate.

The QT hardware features: 68008 processor running at 8 Mhz, 128K bytes expandable to 512K bytes, an interval timer for time sharing, 4 serial ports with selectable baud rates from 300 to 19,200, 2 centronics compatible parallel printer ports. Supports 2 double sided double density 96 tpi floppy disk drives and a SCSI (SASI) bus interface for Winchester disk drives. The QT is available as a single floppy (1), a dual floppy (2) or as a single floppy and a 10 or 20 megabyte hard disk (HD). Size 5 1/2 high, 11 1/2 deep, 9 1/2 wide. Can be mounted vertically or horizontally.

Software Included!

SOFTWARE included is OS-9/68000, the 68000 version of the proven OS-9 operating System that is both disk and file compatible with standard and Color computer versions of OS-9. Basic09 is the 68000 version and is source compatible with the 6809 version. DynaCalc is the 68000 version of the proven 6809 spreadsheet. Stylograph is the 68000 version of the popular 6809 word processor. Mail merge and speller are the 68000 versions of those programs. Programming tools included are a relocating macro assembler with linkage editor, screen and line editors, and an interactive debugger. The software has a retail value in excess of \$2000 and is INCLUDED free! Programming languages available and under development include C, Pascal, Fortran and Sculptor.

A Hellava Deal!

The QT is available in four basic configurations. Other configurations are possible and are available. Call for price.

QT 1

128K, single 96tpi double sided floppy and all software **\$1595.00**

QT 2

same as 1 but with 2 floppys **\$1750.00**

QT HD

same as 1 but add a 10 meg hard disk **\$2695.00**

QT HDXL

same as HD but with 512K **\$2695.00** **Special Offer ***
Reg. \$2995.00

512K expansion kit (16 256K DRAMS) **\$350**
Replace the 10 meg with a 20 meg **Add \$300**

Note: The QT can hold 2 half height drives internally (floppy or hard). Provision has been made for hooking up external floppy drives. This allows using large capacity full height hard disk drives in the QT case with floppy drives in another case. You can boot from the hard disk so floppys would only be necessary for program transfers and backup. Removable hard drives are also available. Call or write for complete specifications and prices.

FHL **FRANK HOGG LABORATORY**

770 James St., Syracuse, New York 13203

315/474-7856

column about the OS-9 Users Group's Software Exchange Library. He'll be highlighting software in the library and reviewing it for you. I received *MOTD* number five recently. It looked great and featured an excellent overview of OS-9 from Greg Morse, plus at least a dozen other good articles.

But, the group's new editor, Tim Grovac, is already preparing another issue. We quote: "I need some more articles for *MOTD*. Become famous instantly! Help support your Users Group! Certainly there must be something you all are doing with your computers that others would like to hear about." Send disk or printed copy to:

MOTD Publishing
25825 104th Ave. SE
Suite 344
Kent, WA 98042

We still keep getting letters here at THE RAINBOW asking how to join the OS-9 Users Group. Once again, here's the address.

OS-9 Users Group
P. O. Box 7586
Des Moines, IA 50322

You may use this address either for information or to join. To join, simply enclose a check for \$25 — one year's dues — and state the name of the computer you own and the type of disk drives you use so you will receive your copy of Users Group Disk #0 on a disk of the right format. Make sure you include your correct address and include your CompuServe number if you have one.

Joe Dubuc, chairman of the Membership Committee, has received many requests for information about local users groups. People want to know where they meet and how to form one. Please send Joe information about any groups you know about. Give him the group's name, its main interest, the name of a contact person, the group's BBS number, its meeting place and the date and time of its monthly meetings. Here's the address.

OS-9 Users Group Membership
Committee
13229 Blue Quail Rd.
Yukon, OK 73099

New OS-9 Machines

Since the rumor mill has decided that

Tandy won't release a new Color Computer until 1986, I found this note from Steve Sampson interesting.

If you are interested in a high performance OS-9 machine, please contact Jack Gerblich, 1945 Gallows Road, Suite 305, Vienna, VA 22180. It seems Fujitsu is thinking about selling its 68XX(X)-based machines here in the states.

In Steve's words, "The FM-11 is a simply astonishing dual 6809-based machine with very good color graphics and OS-9/6809 Level Two. In my opinion, it blows away a Macintosh, even without the 68000 board that can be installed in it. The FM-77 is another dual 6809 machine that starts smaller than the FM-11 but is expandable. The FM-16, in its Japanese incarnation at least, is a 68000-based computer."

Anyone who attended either of the last two Microware Seminars in Des Moines can vouch for Steve's description. They were pretty slick. The bottom line? I guess it's up to us — today's OS-9 pioneers — to convince Fujitsu they need to invest in the U.S. market. You've got the address; go to it.

Here's a tip from John Schira that may help solve your problems with *ACIAPAK* and /T2 in OS-9 Version 1.01. John believes the people who aren't having any trouble are using smart modems. Conversely, he feels if you are using a dumb modem — a Radio Shack Modem I, for example — you're probably having trouble making this combination work right. The reason?

"Smart modems leave the carrier detect signal between the computer and the modem high — or on — so the computer can send commands to the modem while it is offline. I've found that /T2 and *ACIAPAK* work consistently well as long as this signal is present," he said. "Without this signal, they won't work. The solution is to try jumpering pin 8. If this doesn't work, try pin 6."

Invasion of the Hard Drives? Maybe!

I've received about a half-dozen calls about hard disk drives during the past month. It seems like everyone has noticed the price dive the bare drives are taking and are hoping some enterprising entrepreneur will come out with a system for their CoCo. I saw one working at Irvine, but the company hadn't announced it yet — they believe in announcing a product when it is

ready, not before. When they tell us it's ready, we'll let you know.

The real problem here is the cost of the cables, controller, power supply and everything else it takes to build a complete hard drive system. Another firm designed a system for the Color Computer recently, but will it ever go into production? I doubt it. Why? Even though a manufacturer can buy a five megabyte hard drive for around \$100 now, it is still going to cost them around \$600 (final selling price) to build a tacky system . . . or \$1400 to build one that discriminating computer owners would be proud to own. The question then remains: Is a person who paid \$200 for his computer going to spend \$600 — or \$1400 — for a hard disk system? Probably not!

For the same reason you aren't seeing software houses rush to invest the talent and time necessary to develop new applications software, you probably won't see much new hardware either. Because of the unique marketing strategy used by Tandy (i.e., they only sell their computers in their own stores), a manufacturer can only sell peripheral equipment by mail order. When he does, he may reach 10 percent of the market. To succeed he needs a higher percentage. The software houses are in the same boat, so we all lose. That's life!

This scenario was played out again in a letter I received from Cliff Davis (12714 Burson Drive, Manchaca, TX 78652). It seems that he and Jim Smith have designed a CoCo RAM Disk. The ttl prototype uses 55 chips in addition to four banks of dynamic memory chips and bank select logic to support four additional banks — a total of 512K. It plugs into the bus expander and uses the Color Computer's 'E' and 'Q' clocks for timing. To transfer data, you send a two-byte logical sector address and a function code to the controller. The software includes an OS-9 device driver, device descriptor and a "prep" utility.

So what's the problem? Well, Cliff and Jim have gone to three companies so far. All have said that it looked like a great enhancement for the CoCo, but, they don't believe the market will bear the cost of the finished product. Cliff's alternative is to offer the board as a construction project in RAINBOW. He would like to create enough interest in the design to justify making a PC board. Let him know what you think.

FHL

Hardware Library

I can see clearly now. Can you?

From GE by special purchase we offer the best buy in the Gold Star Super AMBER monitor. Now you can see clearly too. Match up with the Universal Video Driver and/or WordPak II and you can't beat it!

This is a 12 inch composite monitor with 19mhz bandwidth! Very attractive off white cabinet that matches the CoCo well. Compare this to other AMBER monitors that cost \$20-\$30 more! This is a SUPER buy!

SPECIAL ONLY \$99.95



We looked at all the Video adaptors available and the UVD is by far the best buy. Works with B&W and Color monitors and with all CoCos, even the new CoCo II. No soldering or chip removal, easy installation. Perfect with our AMBER monitor and WordPak II.

Only **\$29.95**

Word-Pak II The New Standard Video Board

Get an 80 column display with your CoCo. Makes the CoCo easy to use with word processors like DynaStar and Stylo. Works with many RS DOS programs too. Acclaimed by all as the best for the CoCo. Works GREAT with our AMBER monitor from GE. Smooth scrolling and an improved character set, the WP II works with FLEX, XEX, and RS OS9 and RS Basic.

ONLY \$149.95
Original Word-Pak now **\$119.95**
OS-9 or FLEX drivers **\$19.95**
RS Basic drivers included free.
P-C Pak w/printer port and clock **\$132.70**
OS-9 driver for P-C Pak **\$19.95**

NOMAD

The Color Computer Robot

NOMAD is controlled by your Basic programs running on your CoCo. Requires 16K Basic. NOMAD can be told to move forward, backward, turn left or right. NOMAD can see with an ultrasonic sensor and report distances accurate to 2 tenths of an inch. Program NOMAD for collision avoidance or to protect your house from intruders. Includes everything, power supply, software on tape and NOMAD with 25' cord.

Move into the future today with your own Robot.

ONLY \$250

DISK DRIVES AND SYSTEMS FREE FLEX WITH SYSTEMS

Includes drive(s), dual case with power supply cables and disk controller. Drives are 1/2 height double sided Teac with a 1 year guarantee. Case will hold two drives. CC FLEX, a \$49.95 value is FREE with all systems!!! Best price anywhere!!!

Drive 0 double sided 40 **\$374.00** 0 and 1 double sided 40 **\$536.00**
Drive 0 double sided 80 **\$391.00** 0 and 1 double sided 80 **\$570.00**

BARE DRIVES

Double sided 40 track **\$168** Double sided 80 track **\$185**
Dual case w/power supply **\$79.95** J&M controller with JDOS **\$139.95**
RS DISK BASIC 1.1 **\$15.00** J&M controller with RS DOS **\$129.95**
Two drive cable **\$25.00** Call for custom cables
Filler plate **\$6.00** J&M controller with JDOS **\$139.95**



BOOKS

NEW Complete Rainbow Guide to OS-9 **\$18.95**

Basic09 Tour Guide **\$18.95**

Starting FORTH **\$18.95**

Official OS9 Manual set **\$40.00**

RMA Manual **\$25** (Use the relocating assembler that you get with Tandy's 'C')

BULK DISKS as low as \$1.29

10 for \$1.50 each

50 for \$1.40 each

100 for \$1.29 each

We use these for in-house and software distribution. Guaranteed for life.

GOOD STUFF

Volksmodem 300 baud **\$79.95**

Mark XII 300/1200 **\$335.00**

Starter Kit for Compuserve **\$39.95**

HJL Keyboard **\$79.95**

8 64K RAMS **\$45**

FHL FRANK HOGG LABORATORY

770 James St., Syracuse, New York 13203

ORDERING INFORMATION:

In USA Add \$3.50 (small items) \$10.00 (large items) excess refunded.

All Others Add 10% Excess Refunded.

Visa, MasterCard Accepted

315/474-7856

New Software Newsletter

I talked with Frank Hogg at FHL and learned that his company plans to publish a newsletter for software developers. It's for you if you are developing software for any computer. Regular columns will feature columns for programmers, engineers and yes, even the marketing types. The new publication will be named *SoftNews*.

Frank has been in the software business for several years so he has plenty of experience to share. The price: \$24 for 12 issues. The first issue was scheduled to hit the stands in May. After that, it will be published every other month until August when it goes monthly. If you are developing software for any computer or are interested in the software development business, call FHL. By the way, if you are in the business and have a few tips to share, Frank is also looking for writers.

Everyone's Talking about OS-9 68K

Frank couldn't contain his enthusiasm for OS-9 — 68K that is. He had been working with Microware's C compiler on his K System, "QT," and successfully ported many C programs from the OS-9 Users Group Library to the QT.

"All of the C programs that were written in 6809 Microware C compiled the first time in 68000 C and most ran immediately," Frank said. "The only ones that wouldn't run were the ones that were written specifically for the 6809 microprocessor using in-line assembly language code. Some of the C programs written in Intral C would not compile, but this is true for the 6809 C compiler, also."

Frank reported that most of the BASIC09 programs loaded and ran

immediately. The only one that wouldn't run was a modem program that used a lot of direct pokes to memory. "It is quite a kick to type 'BASIC09 #375375k and receive a report that you have 388,106 bytes free for programs (in a 512K QT)."

And Frank wasn't the only one excited about OS-9 68K. Rodger Snyder at Great Plains Computing — now named Stylo Software, Inc. — reports that you can edit a file 150 pages long and have it all in memory at one time. Wow! Also, Brian Lantz, author of Computerware's *Databank Manager*, reported that BASIC09 appeared to be almost 100 percent compatible — at the source level — with BASIC09 on the Color Computer. He noticed that a new function, "INKEY #filename" has been added along with a "DIGITS" statement that lets you control the number of digits printed from a real number.

More Version 1.01 Notes

John Carter of Smyrna, Ga., who showed you how to personalize your OS-9 prompt several months ago, has been studying the differences between OS-9 Version 1.0 and Version 1.01, and he was good enough to share them with us.

His first tip is that the *OS9Boot* file that comes with the new version is 53607 bytes long compared with 53032 bytes in the original. This means if you use the trick we passed along in the February column to place the CMDS directory at the same location on each disk, you must make sure all of those disks are using the same version of OS-9. If you have different versions the trick will not work, so beware.

Here is a table that shows you a few more of the size differences.

In the CMDS directory:

File	Original Size	New Size
dcheck	\$28A0	\$27C6
free	\$2C1	\$2D1
ident	\$6CE	\$6E7
tmode	\$2CF	\$2DE
xmode	\$380	\$38F

In the DEFS directory:

OS9Defs	\$4A7A	\$54B4
RBFDefs	\$11FF	\$154E
SCFDefs	\$A0F	\$E94
SysType	\$42	\$81

The DEFS directory in the new version has a new file named *defsf*. This file has been in non-Color Computer versions of OS-9 for several years and simply tells the assembler to use all of the other "defs" files.

If you are a person who delights in trying to stay on top of what Tandy is up to with the Color Computer, Carter suggests you browse through the files in the new DEFS directory. You'll learn that plans really did exist for a "Deluxe CoCo" at one time — study these lines from the new *SysType* file.

```
ifeq COCOType-Delux
ACIAType set ACIAG551
A.T2 set $FF3C 6551 Acia
Internal
A.T3 set $FF68 6551 AciaPak
else
A.T2 set $FF68 6551 ACIA
external
endc
```

OS-9™ SOFTWARE

SDISK—Standard disk driver module allows the use of 35, 40, or 80 track double sided drives with COCO OS-9 plus you can read/write/format the OS-9 formats used by other OS-9 systems. **\$29.95**

SDISK + BOOTFIX—As above plus boot directly from a double sided diskette **\$35.95**

FILTER KIT #1—Eleven OS-9 utilities for "wild card" directory lists, copies, moves, deletes, sorts, etc. Now includes disk sector edit utility also. **\$29.95**

FILTER KIT #2—Macgen command macro generator builds new commands by combining old ones with parameter substitution, 10 other utilities. **\$29.95**

HACKER'S KIT #1—Disassembler and related utilities allow disassembly from memory, file. **\$24.95**

PC-XFER UTILITIES—Utilities to read/write and format MS-DOS™ diskettes on CoCo under OS-9. Also transfer files between RS disk basic and OS-9 (requires SDISK). **\$45.00**

Prices are CoCo OS-9 format disk, other formats, add \$2.00 per disk and specify format and OS-9 level. All orders prepaid or COD, VISA and MasterCard accepted. Add \$1.50 S&H on prepaid, COD actual charges added.

**D.P. Johnson, 7655 S.W. Cedarcrest St.
Portland, OR 97223 (503) 244-8152**

(For best service call between 9-11 AM Pacific Time.)

OS-9 is a trademark of Microware and Motorola Inc.
MS-DOS is a trademark of Microsoft, Inc.

FHL Software Library

DynaStar Screen editor/ word processor

Acclaimed by professionals as their favorite editor/word processor. Simple and easy to use but powerful. Patterned after Word Star™ I use it ALL the time!

RS OS9 or Flex **\$49.95**

DynaForm (NEW OS9 VERSION) Formatter for DynaStar

This new version has features galore. Everything you asked for in the past. Format output from DynaStar for manuals, letters, anything!

RS OS9 or Flex **\$49.95**

DynaSpell On the BEST SELLER list!!!

The Mac version of DynaSpell (Hayden Speller) is on the best seller list for good reasons. DynaSpell is the BEST!!

CoCo OS9 or Flex **\$59.95**

Lookup for CoCo OS9 **\$34.95**

O-Pak #1 OS9 Utility!

If you have OS9 then you need O-Pak. The first and best Hi Res screen display for OS9. You select the type of screen and font you want to display. Includes a Character set editor and copy utilities for Flex/OS9/RS DOS file transfers.

Best Buy! only **\$34.95**

XEX NEW version of Flex for CoCo

If you want the best operating system for your 64K CoCo then XEX is it! Easy to use and understand. XEX includes most of the source. Includes Ed/Asm and DBasic. Order TODAY!

\$99.95 for everything.

DynaCalc

All we can say is that this IS THE BEST spreadsheet! Available for RS DOS, RS OS9(soon) and FLEX

RS DOS & RS OS9 **\$99.95**

Flex **\$200.00**

CModem Telecommunications

Menu driven terminal program that supports dumb terminal mode to 2400 baud. Upload and download in non-protected mode, and Christensen (CP/M Modem7) mode. All disks have both CoCo and standard versions. OS9 or FLEX. **\$50** binary

\$100 with source.

OS9 Utilities

Filter #1, 12 utilities for OS9 LS, BUF, CP, DL, FLIST, INFO, MV, PAG, SELL, SETAT, SECAT, and SORT. Filter #2, 10 Utilities, APPEND, CONFIRM, FF, FORCERROR, MACGEN, NULLDEVICE, REP, SIZE, TOUCH and UNLOAD.

\$29.95 each

SDisk & Bootfix

Replace the disk driver module in OS9 with one that works with ALL types of drives. 35, 40 or 80 track SS or DS. Even reads and writes to standard OS9 disks. Individual stepping rates to 8 ms. Bootfix is needed for DS drives.

\$29.95

\$35.95 with Bootfix.

UniCharger for OS9 Make Unix™ out of OS9!

29 additional commands that make OS9 look like its big brother Unix. Have the power and ease of use that is only available on \$10,000 systems. The most powerful package for OS9 yet available! Featured in 'The Rainbow guide to OS9'.

Only **\$150.00**

Utilix Unix like utilities

15 utilities to manipulate text files. A MUST for programmers and general users alike. cat, code, crypt, diff, display, grep, lower, upper, pack, unpack, pr, sort, tail, time and wc. Featured in 'The Rainbow guide to OS9'.

ONLY **\$49.95**

eFORTH Powerful FORTH

Move up to power programming with eFORTH, the best FORTH available. Complete system with easy to understand manual. Available for CC FLEX or RS DOS.

FLEX or RS DOS **\$79.95**

Cross Assemblers

True (not macro) cross-assemblers will let you develop programs on your Flex or OS9 system for the 1802/5, 6800/01/11/03, 6804, 6805, 6809, 6502/3, 8080/5, 8048, 8051, Z-80, and 68000 Source included (in C)

\$200 for everything!

Dyna C Fast small C

Unlike the others, Dyna C produces compact, ROMable, position-independent, re-entrant optimized code that runs circles around anything else in its price class. 'C' for yourself! Run time source is included!

\$59.95 Flex or OS9

DynaSoft Pascal Small p-code Pascal

Learn Pascal with this fast p-code implementation. It produces ROMable p-code that is very compact!

\$59.95

\$89.95 w/run time source.

Sleuth disassembler

Find out what's going on inside your computer with SLEUTH, the best disassembler for the 6809. Converts binary code into source that you can modify or just examine. Learn about programming by studying other code!

RS DOS **\$49**

FLEX or OS9 **\$50**

Source available, OS9 or Flex for **\$50.00** extra.



770 James St., Syracuse, New York 13203

ORDERING INFORMATION: In USA Add \$3.50
All Others Add 10% Excess Refunded.
Visa, MasterCard Accepted

315/474-7856

If you browse deeper into the "defs" files you'll also find a hint of OS-9's popularity in Japan — it's second in popularity there only to UNIX. There are references to "kata" and "kanji" and "Hoshi." Think about it — these Japanese characters can be drawn on a high resolution screen just as easily as English letters. Interesting!

BASIC09 Graphics Programs

Carter donated several BASIC09 listings that should really help you learn some of the language's fundamentals. We've had a lot of requests for information about using graphics under BASIC09. Two of John's procedures will really get you started. I was impressed when I ran them.

Gfxtest is a simple routine that draws a line and a series of concentric circles in several background/foreground combinations using print statements. *Screentest* uses BASIC09's "gfx" module to dazzle you with circles and lines in several colors and prints big letters. It also shows you how you can use several of the cursor positioning commands on an alpha screen from within OS-9. Enjoy!

Carter wrote a BASIC09 procedure that emulates the CP/M and MS-DOS Type command. It simply lets you display the printable characters in any file on the terminal. Itype, on the other hand, displays printable characters but, also displays the other characters in the file as a two-digit hexadecimal number. It works a lot like the standard "dump" utility — it's just in a different format.

And finally, his *CoCoDir* lets you read the directory of a Radio Shack DOS disk from within BASIC09. It shows you how you to use OS-9's '@' operator along with BASIC09's SEEK and GET statements to look at any disk.

We received another BASIC09 procedure — *cursor_position* — that demonstrates yet another function from Mark W. Smith of Latonia, Ky. He uses the MOD function to create a window on PBJ's *Word-Pak II* since it does not recognize cursor positions greater than 512 when using the POS function.

Smith also had a question. He mentioned that he was unable to install the *Word-Pak II* drivers properly with Version 1.01 of OS-9. He mentioned that *ACIAPAK* and a few other modules didn't appear in memory after he created a new boot file.

Here's the answer, Mark. Most likely the "install" procedure and the *bootlist*

The listing:

```

procedure elapsed
  REM by Thomas Alan Ring
  REM 75 Market, Apt. #4
  REM 315-265-2808

  REM To start typing "run elapsed("S",et)
  REM To Finish typing "run elapsed("F",et)

  PARAM sf:STRING[1]; et:INTEGER
  DIM f,s:STRING[17]
  DIM sc,fc,sm,fm:INTEGER
  DIM sh,sh,nd,fd:INTEGER
  DIM es,em,eh,ed:INTEGER

  ON ERROR GOTO 1

  IF sf="S" THEN
    f=DATE$
  END
  ELSE
    PRINT "Wrong Input Parameter: "
    PRINT "Use S(start) or F(inish)"
  END
  ENDIF

  sc=VAL(MID$(s,16,2))
  fc=VAL(MID$(f,16,2))
  sm=VAL(MID$(s,13,2))
  fm=VAL(MID$(f,13,2))
  sh=VAL(MID$(s,10,2))
  fh=VAL(MID$(f,10,2))
  sd=VAL(MID$(s,7,2))
  fd=VAL(MID$(f,7,2))

  IF fm-sc < 0 THEN
    fh=fm-1
    fs=fs+60
  ENDIF

  IF fm-sm < 0 THEN
    fh=fh-1
    fm=fm+60
  ENDIF

  IF fh-sh < 0 THEN
    fd=fd-1
    fh=fh+24
  ENDIF

  es=fs-sc
  em=fm-sm
  eh=fh-sh
  ed=fd-sd
  et=es+60*(em+60*(eh+24*ed))
  ENDIF
  END

1 PRINT "Probable date/time error: "
  PRINT "Elapsed Time will be wrong. "
  PRINT "Check date, t."
  END

PROCEDURE cursor_positioning
0000 DIM test_string:STRING[80]
000C DIM blank:STRING[1]
001B DIM data_inputs,count,data_lines,remainder,xilch:INTEGER
002F blank=" "
0037 data_lines:=14
003E data_inputs:=1
0045 xilch:=0
004C BASE 0
004E PRINT CHR$(50C)
0054 PRINT USING "S80^", "Contributed to RAINBOW by Mark W. Smith"
0087 PRINT USING "S80^", "Routine to show one way the MOD function can be
used in cursor positioning"

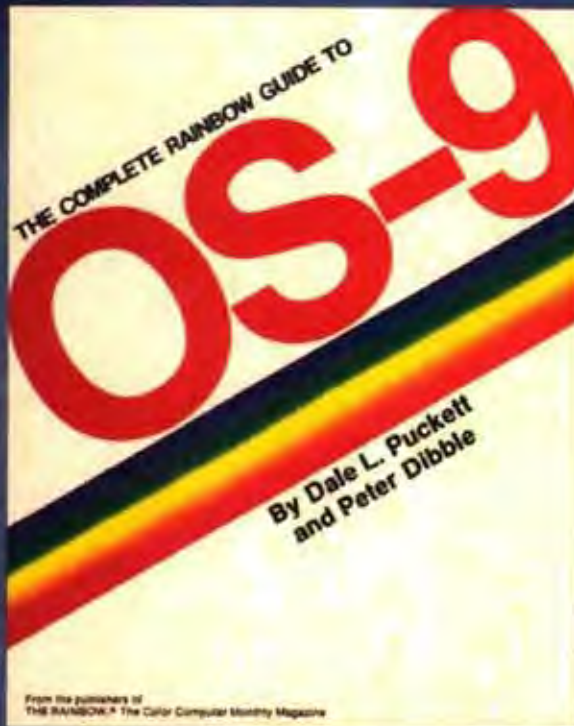
00DE PRINT USING "S79^", "to replace the POS function that WORDPAXII does
not support."
0126 PRINT
0128 PRINT CHR$(502); CHR$(520); CHR$(536);
0139 PRINT USING "S80^", "Hold down the <RETURN> key for demo";
0169 PRINT CHR$(502); CHR$(520); CHR$(526);

```

More than a book . . .

A MILESTONE

THE COMPLETE RAINBOW GUIDE TO OS-9



Today's programmers use short modules of readable code to build complex programs. The OS-9 operating system and the high level languages it brings you make the job easy.

OS-9 has so many things going for it that you need a guide as comprehensive and thorough as *The Complete Rainbow Guide To OS-9* to show you how to talk to OS-9 and realize the potential of this extremely efficient implementation of the UNIX operating philosophy.

Co-authored by Dale L. Puckett and Peter Dibble — two of the foremost authorities on OS-9 — *The Complete Rainbow Guide to*

OS-9 demystifies the dynamic operating system that gives the Color Computer more power and flexibility than many of the high-cost computers on the market . . . and gives you the ability and confidence to reach new programming heights.

With *The Complete Rainbow Guide To OS-9*, you will be prepared to take full advantage of the multitasking system that is setting new standards for Color Computer programming. For only \$19.95!

Also Available!

The Rainbow Guide To OS-9 Disk. An adjunct to and complement to the book. You'll want the book for the tutorials, and the package of two disks to save the many hours of typing in lengthy programs.

Two-Disk Package, \$31

Please send me *The Complete Rainbow Guide To OS-9* for \$19.95.

Please send me *The Rainbow Guide To OS-9 Disk* (a package of two disks) for \$31. *Does not include book.

Name _____ Signature _____

Address _____ City _____ State _____ ZIP _____

My check in the amount of _____ is enclosed.

VISA MasterCard American Express

Account Number _____ Interbank No. (MC Only) _____

Card Expiration Date _____

To order by phone, call: (502) 228-4492

Falsoft, Inc., The Falsoft Building, 9529 U.S. Highway 42, P.O. Box 385, Prospect, KY 40059
*Add \$1 shipping and handling per book. Canada and Mexico add \$2. All other foreign countries add \$4. Allow 4 weeks for delivery.
KY residents add 5% sales tax. In order to hold down costs, we do not bill.
OS-9 is a trademark of Microware Systems Corporation.

file on the *Word-Pak II* disk probably were written for Version 1.0 which didn't contain those modules. Just edit "install" and *bootlist* to include the missing modules and I'm pretty sure they will appear. Good luck!

Another gung-ho BASIC09 programmer in the CoCo crowd is Tom Ring in Potsdam, N.Y. Tom sent two tips and a procedure that will give you accurate execution timings. It's called *elapsed*.

Ring passed along this tip which you may not have tried before. Use the global editing capabilities of BASIC09 to your advantage. It can save a lot of wear and tear on your fingers. Imagine that you want to use a long variable name like *ElapsedSeconds* in a BASIC09 procedure. Why not simply type *ES* and

"When you connect two computers together, you need a null modem cable — a cable that connects the transmit or output line of one to the receive or input line of the other."

then use BASIC09's global change command. Give it a try.

E: c* .ES.ElapsedSeconds. ENTER

Also Ring advised that if you are a little tight on memory, you can save 768 bytes when you run BASIC09 by using OS-9's built-in *ex* command. You'll have to use the *Chd* and *Chx* commands after you return from BASIC09, however, because when you run *ex*, OS-9 throws away the Shell that called it. Here's the command line:

OS-9: *ex basic09*

Don't Forget the Null Cable

If you're looking for a public domain communication protocol that gives you error checking and can be used on your Color Computer, Mark E. Sunderlin, a.k.a. Dr. Megabyte, suggests *Kermit*. It runs on more than 200 different machines ranging from the IBM 370 down to the CoCo and lets any two computers transfer text or binary files. Mark uses it to transfer data between his CoCo and a Zilog Z-8000 UNIX system at work. The CoCo version is written in C. You can get all versions from Columbia University in New York City but Mark didn't give us the

```

017A REPEAT
017C remainder:=MOD(data_input,data_lines)
018B INPUT "PROGRAM DATA MAY BE PLACED IN
THIS AREA!"
01DF PRINT CHR$(508); "I";
01EA IF remainder=0 THEN
01F7 PRINT CHR$(502); CHR$(520); CHR$(526);
0208 PRINT CHR$(518); CHR$(542);
0214 FOR count=1 TO 16
0224 PRINT blank
0229 NEXT count
0234 PRINT USING "S80","Hold down the <RETURN> key for demo"

;
0264 PRINT CHR$(502); CHR$(520); CHR$(526);
0275 ENDIF
0277 data_input:=data_input+1
0282 UNTIL data_input=500
028E END

```

```

PROCEDURE gfxtest
0000 DIM f,g:INTEGER
000B
000C g=0
0013 10 PRINT CHR$(15); CHR$(1); CHR$(g)
0024 PRINT CHR$(20)
0029 PRINT CHR$(21); CHR$(4); CHR$(0)
0036 PRINT CHR$(22); CHR$(4); CHR$(g)
0044 PRINT CHR$(21); CHR$(122); CHR$(95)
0051
0052 FOR f=5 TO 95 STEP 5
0067 PRINT CHR$(26); CHR$(f)
0071 NEXT f
007C
007D g=g+1
0088
0089 IF LAND(g,3)=0 THEN g=g+1
00A2 ENDIF
00A4
00A5 FOR f=1 TO 3000
00B6 NEXT f
00C1
00C2 PRINT CHR$(19)
00C7 GOTO 10
00CB
00CC 100 PRINT CHR$(10)
00D4
00D5 REM chr$(18) clears the graphics memory
00FB REM RUN, BREAK to exit, RUN 100 to clear gfx memory
012D

```

```

PROCEDURE itype
0000 PARAM name:STRING[60]
000C DIM path:INTEGER
0013 DIM f:REAL
001A DIM char:STRING[1]
0026 DIM tst:BOOLEAN
002D
002E ON ERROR GOTO 100
0034 tst=TRUE
003A OPEN #path,name:READ
0046 f=0
004E
004F WHILE tst DO
0058 SEEK #path,f
0062
0063 IF EOF(#path) THEN PRINT
006E CLOSE #path
0074 END
0076 ENDIF
0078
0079 GET #path,char
0083 f=f+1
008F
009D IF char=CHR$(7) OR char=CHR$(10) OR char=CHR$(13) OR char
>=CHR$(31) AND char<=CHR$(127) THEN PRINT char;
00C2 ELSE
00C6 PRINT "\";
00CC PRINT USING "b2",char;
00DB ENDIF
00DA

```

THE X-TEAM FOR OS-9

XTERM

XTERM is a full featured OS-9 communications program that takes full advantage of the power of OS-9. It works with the normal text screen, XSCREEN, or the Wordpak 80 column board.

XTERM is menu oriented for ease of use, it is simple to use even for the novice OS-9 user. And yet, XTERM is powerful enough for the expert OS-9 user.

Some of the features of XTERM include: full upload and download support with remote buffer operation; supports XON/XOFF protocol; 110/300/600/1200 baud, 5/6/7/8 bits, even/odd/no parity, full or half duplex; able to execute an OS-9 shell command from within XTERM.

XTERM works with a Color Computer using the standard serial interface, but also will work with a hardware serial port. Also, if you are using a hardware parallel printer port, you can print data to the printer as it is received.

XTERM \$59.95

XMENU

XMENU is a system that creates a menu-driven environment for the Color Computer using OS-9. OS-9 now becomes easy-to-use with command selections made from menus. Menus are included to access OS-9 commands. An easy-to-use utility is provided that allows for the creation and maintenance of menus.

XMENU works with XSCREEN, the normal text screen, O-PAK, and the WORDPAK 80-column board.

XMENU 29.95

XSCREEN

XSCREEN creates a high resolution screen for the Color Computer using OS-9. This high resolution screen gives you 24 lines of text with 51, 64, or 85 characters per line. Characters can be either white on a black background or vice versa. Easy menu operation.

XSCREEN \$19.95

XWORD

XWORD is a powerful word processing system for the Color Computer using OS-9. XWORD is feature packed with only a few features mentioned here.

Some of the editing features of XWORD include: true character oriented full screen editor; works with the normal text screen, XSCREEN, O-PAK, or WORDPAK 80 column card; full block commands with blocks displayed in inverse characters (except with normal text screen) for easy block manipulation; file size not limited to a buffer size; full find and replace commands with wildcard character; able to execute an OS-9 shell command in the middle of editing. Many, many more features, too many to mention here.

Some of the formatting features of XWORD include: proportional spacing supported; perfectly aligned hanging indents and columns, even when using proportional characters; full printer control with control of character size, emphasized, italics, overstrike, underlining (with or without spaces), super and sub-scripts; up to 10 header/footers; page numbering in decimal or Roman numerals; margins and headers can be set differently for even and odd pages; automatically reads printer initialization file to define XWORD for your printer (many included, and easy to write or modify your own). Many more features.

XWORD \$79.95

XMERGE

XMERGE gives XWORD powerful mail merge capabilities. With it you are able to merge in data from a data file or from the keyboard to get professional looking results.

XMERGE 29.95



XDIR & XCAL

A package of two powerful utilities you won't want to be without. XDIR is an OS-9 directory program that prints full hierarchical directories. The directory does full sorting and has complete pattern matching, including wildcard and character classes.

XCAL is a powerful calculator for OS-9. Ideal for both programmers and for general use. XCAL features include: work in decimal, hexadecimal, binary, previous 25 results are stored, functions include AND, OR, NOT, XOR.

XDIR & XCAL \$24.95



**MICROTECH
CONSULTANTS
INC.** 1906 Jerrold Avenue
St. Paul, MN 55112

Dealer Inquiries Invited
OS-9 is a trademark of Microware

Ordering Information



Add \$2.50 shipping & handling. MN residents add 6% sales tax. Visa, Mastercard, COD (add \$2.50), personal checks: all shipped from stock within 24 hours.

(612) 633-6161



HARDWARE

- DOUBLE SWITCH** — Two LEDs show you which port is being used, 1 or 2. High Quality parts with a great looking face plate! \$29.95
- DOUBLE CABLE** — Hook a MODEM and a PRINTER up at the same time with this Y-connector \$14.95
- EXT-CABLE** — long printer or MODEM cable (15 feet) \$14.95
- Y-CABLE** — You can connect two devices at the same time to your ROM port (80 column card and disk Drive) \$29.95
- DOUBLE DRIVER** — Best video driver available for your CoCo. Made by our friends at Moreton Bay Software. Specify CoCo or CoCo II \$24.95
- MINI MOUTH** — Now get sound from your mute monitor. Plugs right in, nothing to solder \$24.95
- COLOR POWER II** — This plug in CP/M board will allow you to use thousands of CP/M programs \$329.00
- MINI-MODEM** — 300 BAUD, Originate/Answer Full Duplex, Direct Connect \$79.95 (Save \$10.00 when you buy one of our terminal programs and a modem)
- DISKS — DISKS — DISKS — DISKS — DISKS**
Save on blank 5 1/4" diskettes. Buy in bulk and save! No sleeves. (10 minimum in each order) \$16.00

DOUBLE SWITCH



DOUBLE DRIVER



DOUBLE CABLE



MINI-MOUTH



DOUBLE TERM + Plus +

This program is the **ultimate** in CoCo communicating! Double Term+ is used with a plug-in 80 column board. Supports either Double 80 Plus, Color Power II or Word Pak.

Here are just some of the features Double Term + has to offer:

Select:

- Half, Full Duplex or Echo
- Odd, Even, Mark, Space or No Parity
- 7 or 8 Bit Words
- 1 or 2 Stop Bits
- All Caps if needed
- Several Printer Formats
- Trapping of incoming characters

BAUD Rates:

- 110-4800 (communicate)
- 600-9600 (printer)

Screen Format:

- 80 x 24 upper/lowercase
- Send all 128 characters from keyboard

Buffer:

- Merge text or programs
- 49K to 53K memory
- Four Buffer Send Modes
- Display Bytes Used/Remaining
- Editor—Move forward and reverse thru buffer. Insert, type over, delete lines, characters or words. Block delete.

10 Macro keys

- Automatic Capture of incoming files
- X on/X off capabilities
- Send True Line Break
- Transmit/Receive BASIC Programs, Files or Machine Code. No need to translate BASIC programs to ASCII Format.
- Save/Load Macros or Parameters to Disk
- Use 1 to 4 Disk Drives (w/SAVE, LOAD, DIR & Granule Display)
- Print while receiving information*
- Easy to use MENU driven format
- Comprehensive users manual
- Works on All Radio Shack Color Computers, and All Radio Shack Disk systems.

15-day money back guarantee (less a \$10.00 restocking/use charge.)

Only \$5.00 each for all future upgrades when you return your warranty card.

PRICE: Double Term +	\$59.95 (Disk)
Y-Cable	\$29.95
Double 80 Plus	\$99.95
Complete Package	\$189.95 + \$6H

*Requires PC Pak from PBJ, Inc.

DOUBLE 80 PLUS

- TRUE 80 COLUMN OUTPUT
- BUILT IN SWITCH FOR COCO OR DOUBLE 80 PLUS
- ADJUSTABLE VIDEO OUTPUT
- GOLD PLATED EDGE CONNECTOR
- DRIVERS AVAILABLE FOR BASIC, OS9 and FLEX
- DISPLAY ALL ASCII CHARACTERS
- ALTERNATE CHARACTER SETS AVAILABLE
- METAL CASE (not cheap plastic)
- DOUBLE TERM + available for this board
- BACKED BY A 90 DAY PARTS AND LABOR WARRANTY

DOUBLE 80 PLUS (80 column board)	\$99.95
Y-CABLE	29.95
BASIC DRIVER	12.95
OS9 DRIVER	12.95
FLEX DRIVER (available soon)	12.95
DOUBLE TERM + (disk only)	55.95

COLOR TERM + Plus +

Select:

Half, Full Duplex or Echo
 Odd, Even, Mark, Space or No Parity
 7 or 8 Bit Words
 1 or 2 Stop Bits
 All Caps, if needed.
 Several Printer Formats
 Trapping of incoming characters

BAUD Rates:

110-4800 (communicate)
 600-9600 (printer)

Screen Format:

32 x 16, 42, 51, 64 or 85 x 24
 Send all 128 characters from keyboard

Buffer:

Merge text or programs
 49K to 53K memory
 Four Buffer Send Modes
 Display Bytes Used/Remaining
 Editor—Move forward and reverse thru buffer. Insert, type over, delete lines, characters or words. Block delete.

10 Macro keys

Automatic Capture of incoming files
 X on / X off capabilities
 Send True Line Break
 Transmit/Receive BASIC Programs, Files or Machine Code. No need to translate BASIC programs to ASCII Format.
 Save/Load Macros or Parameters to Disk
 Use 1 to 4 Disk Drives (w/SAVE, LOAD, DIR & Granule Display)
 Print while receiving information*
 Easy to use MENU driven format
 Comprehensive users manual
 Works on All Radio Shack Color Computers, and All Radio Shack Disk systems.

PRICE: Color Term +

\$49.95 (Disk/Tape)

VERSION 5.0
 NOW AVAILABLE



SUPER UTILITY SPECIAL!!

Save over \$50⁰⁰!!

Get the following utilities on a single disk for one low price: Double Spooler, ROM Move, Color Disk Saver, Autoload II, Double Mailer, & Color Key Command—

Super Utility Disk \$49⁹⁵

SUPER GAME SPECIAL!!

Save over \$50⁰⁰

Get the following games on a single disk for one low price: Clone Attack, Color Iago, Galactic Math, Color Biorhythm, Modem Chess, & Underground.—

Super Game Disk \$39⁹⁵

DOUBLE DOS II

Double DOS II—Now use 35,40, or 80 track (double or single sided) drives, all on one system, all at the same time. All regular disk commands are supported with Double DOS II and are totally transparent to your BASIC programs! You can get up to 158 granules on a disk using an 80 track drive. These are the added commands:

- BAUD 1-6** . . . change the BAUD rate.
- TRACK 35,36,40,80** . . . change number of tracks.
- DOUBLE** . . . enable the double sided option.
- PDIR** . . . print your directory to printer.
- DUMP ON/OFF** . . . send programs without a terminal program.
- RATE 6,35** . . . change the head stepping rate.
- VIDEO ON/OFF** . . . reverse video without a hardware mod.
- SCROLL 1-255** . . . change your screen scrolling speed.
- COMMAND** . . . will list all new commands.
- DUPE 0,1,2** . . . will allow copy & backup from one side of a drive to another!
- DATE** . . . you can enter the month, day and year as an extension to your programs when they are displayed during a DIR command.

We **guarantee** that this program will work using the above commands, with all types of 35, 40 or 80 track drives!

PRICE: \$29.95 (DISK ONLY) 64K required



Double Density Software™

620 Kings Row • Denton, Texas 76201 • 817-566-2004



\$2.00 shipping and handling on all orders.



address, so here's his: 1430 Greystone Terrace, Winchester, VA 22601.

And speaking of communications, Richard Cambell of Havelock, N.C., wrote to ask why he couldn't get his two Color Computers to communicate with OS-9. He uses OS-9 and an RS-232 Pak on one CoCo and wants to use the other as a terminal via its built-in RS-232 port. He says they both can talk to local bulletin boards, but when he connects one to the other — using the same cables — they just sit there.

Here's the problem: Both computers are talking and both are listening, but they aren't talking to each other. Since you mentioned that both machines can talk to local bulletin boards through your modem, we know that the RS-232 ports on both of the Color Computers are working.

The answer: When you connect two computers together, you need to use a null modem cable — a cable that connects the transmit or output line of one to the receive or input line of the other. You can build one by reversing those two wires on the cable you're using with your modem. Or, if you would rather not attack the cable with

```
000A      ENDWHILE
000F
00E0      CLOSE #path
00E6      PRINT
00E8
00E9      REM If you want a character count, add the next line
011C      PRINT "character count="; f
0134 100  IF ERR=216 THEN PRINT name; " not found"
0152      ENDIF
0154      BYE
0156
```

```
PROCEDURE screentest
0000      (* demonstrates screen controls under coco os9
002E      (* John Carter - WB4HLZ - Feb. 1985
0052      DIM f,g:INTEGER
005D      DIM a,b,c,d:INTEGER
0070      DIM tat:BOOLEAN
0077
007B      tat=TRUE
007E      (* 12 clears screen, 1 homes cursor without clearing screen
0089      PRINT CHR$(12);
008F
00C0      FOR f=1 TO 12
00D0          PRINT "line "; f
00DD      NEXT f
00E8
00E9      FOR f=1 TO 3000
00FA      NEXT f
0105
0106      FOR f=1 TO 4
0116          (* 9 is "up one line"
012B          PRINT CHR$(9);
0131      NEXT f
013C
013D      PRINT "up from 12"
014B
014C      FOR f=1 TO 3000
0150      NEXT f
```

MUL-T-SCREEN



COLOR CHARACTER GENERATOR

A NEW DIMENSION IN COLOR COMPUTING



- Now includes a character generator and sample graphic space game at no extra cost.
- Full 224 text and graphic characters. Underline in all PHOOES. Prints vertically.
- All machine language, user transparent. Supports all BASIC, EXTENDED BASIC and DISK commands.
- Automatic loader recognizes 16K, 32K & 64K computers.
- Mix up to 5 character sizes in 4 colors all on one screen. A total of 10 sizes available from 8*4 to 42*24 or 32*32 in vertical mode.
- Use up to 4 definable window screens of any size. Also includes horizontally scrolling (crawling) one line screens.
- Includes positive & negative screen dumps in 2 sizes for R/S, Epson & Gemini printers. (Please specify)
- Special Trace Delay can be used to debug programs one line at a time (even graphics).
- A special printer control can output characters to the screen & printer simultaneously.
- A must for all color computer owners. Once you try it you won't write another program without it.

INCENTIVE SOFTWARE

(519) 681-0133

P.O. BOX 323
STATION B
LONDON ONTARIO
CANADA N6A 4W1

P.O. BOX 7281
PORT HURON
MICHIGAN 48301
U.S.A.

MINIMUM REQUIREMENT 16K BASIC
TAPE - 24.95 US or 29.95 CDN
DISK - 27.95 US or 32.95 CDN



Tape to Disk upgrade available for \$8US or \$10CDN. We pay postage within US & CANADA on orders over \$20, otherwise please add \$1. Other countries please add \$2. Charge orders please add \$1.

a soldering iron, Bob Rosen at Spectrum Projects will sell you one.

Communications was also the topic of concern for John Kresin of Port Huron, Mich. He's in a local TRS-80 computer club where his Color Computer is outnumbered by Model IIIs and Model 4s. He really wants to find a bulletin board program for his CoCo. John, see if you can reach Saturn Electronics Company, 62 Commerce Drive, Farmingdale, NY 11735, (516) 249-3388. They advertised an "OS-9 BBS" for \$89.95 last summer. If they are out of business, I suggest you put the question on the CompuServe OS-9 SIG as there were several threads discussing bulletin boards for the Color Computer and OS-9 last summer.

Finally, as we wrap up the file named /d/RAINBOW/KISS.June, here's a note about another new product that hit the stands this month. Computerware is now shipping *Look and Listen* for OS-9. Inside, you'll find the high resolution screen that Brian Lantz developed for their stand-alone *Data-bank Manager*, a font editor to create characters for it, several sound commands, as well as a device driver and descriptor that lets you use Tandy's Speech/Sound cartridge.

The Speak command in this package is like the standard OS-9 Echo utility, except it sends its output to the Speech Cartridge, i.e., "Speak Hey turkey, you better not delete that file!" On the other hand "Talk" and "Talker," the device descriptor and driver, act just like any other OS-9 device.

For example, if you want your CoCo to read a listing of the files in your current data directory you need only type this command line:

```
OS-9:dir>/talk ENTER
```

How can the Fourth of July compete? See you then!

```
0168 PRINT CHR$(1); "top line";
0169
017A
017B (* 10 is LF
0186 FOR f=1 TO 12
0196 PRINT CHR$(10);
019C NEXT f
01A7
01A8 PRINT "press enter for graphics"
01C4 INPUT x$
01C9
01CA (* this is the fun part
01E1 (* set 4 color mode [1] - (green background) yellow foreground [1]
0223
0224 RUN gfx("mode",1,1)
0236
0237 (* clear the graphics screen
0253 (* just in case there's something there
027A
027B RUN gfx("clear")
0288 (* wait a bit
0295
0296 FOR f=1 TO 1000
02A7 NEXT f
02B2
02B3 FOR g=5 TO 35 STEP 5
02CB RUN gfx("circle",45,95,g)
02E1 RUN gfx("circle",210,95,g)
02FA NEXT g
0305
0306 (* wait a bit
0313 FOR f=1 TO 4000
0324 NEXT f
032F (* "alpha" takes you back to the alpha screen
035C
035D RUN gfx("alpha")
036A INPUT "press enter to add blue $$$es",x$
038F (* set blue foreground [2]
03A9
03AA RUN gfx("mode",1,2)
03BC RUN gfx("line",0,0,255,191)
03D4 RUN gfx("line",0,191,255,0)
03EC RUN gfx("line",180,12,95,97)
0404 RUN gfx("line",180,181,95,96)
041C RUN gfx("line",76,180,161,95)
0434 RUN gfx("line",76,12,161,97)
044C
044D (* wait
0454 FOR f=1 TO 3000
0465 NEXT f
0470
0471 (* 14 is also back to text
048B PRINT CHR$(14)
0490 PRINT "press enter to add red lines and text"
04B9 PRINT "then press enter again to exit"
04DB INPUT x$
04E0
04E1 (* set red foreground [3]
04FA RUN gfx("mode",1,3)
050C RUN gfx("line",76,181,180,181)
0524 RUN gfx("line",76,12,180,12)
053C RUN gfx("line",95,96,161,96)
0554 RUN gfx("line",0,0,255,0)
056C RUN gfx("line",1,191,255,191)
0584 RUN gfx("line",0,0,0,191)
```

COCO CAT



Get the most out of BASIC09



The **OFFICIAL BASIC09 TOUR GUIDE** is skillfully written in a friendly and easy-to-read style. Just perfect for those new to computers and to BASIC09. It's also a *valuable reference book* for programmers, engineers, students and hobbyists, providing an in-depth look at BASIC09 plus an overview of the OS-9 operating system. Comprehensive reference sections on BASIC09 and OS-9 commands are also included.

The book "maps" out your route through the Mercedes of Basics . . . BASIC09 and puts you in the driver's seat in no time. Fasten your seatbelt, sit back and enjoy the ride to perfecting your programming skills.

MICROWARE . . .

The **OFFICIAL BASIC09 TOUR GUIDE** comes from the people who wrote BASIC09. As the leader in 6809 system software, we at MICROWARE care about our users and want to help you get the most from our products.

It's Easy to Order.

Phone orders are accepted from MasterCard or VISA cardholders or for COD shipment. You can also order by mail using the coupon below. Quantity discounts are available to educational organizations and dealers. For further information contact Microware.

microware[®]

Specialists in system software for 68-family microprocessors since 1977.

OS-9 and BASIC09 are trademarks of Microware and Motorola.

Microware Systems Corporation
1866 N.W. 114th Street
Des Moines, Iowa 50322
Telephone 515/224-1929
Telex 910-520-2535

Please send _____ copies of the **Basic09 Tour Guide** book at \$18.95 each. Add \$2.00 for UPS shipping in the U.S. or \$10.00 for overseas air mail per book. Iowa residents add 4% sales tax.

Name _____

Address _____

City _____

State _____ Zip _____

I have enclosed a check

Charge to my bank card:

MasterCard VISA

Card Number _____

Expiration _____

```

059C   RUN gfx("line",255,0,255,191)
0584
0585   (* set yellow foreground for letters
05D9   (* if mode in '0,1' you get green letters on black background
0616   RUN gfx("mode",1,1)
0628
0629   WHILE tat DO
0632     READ a,b,c,d
0643
0644     IF a=999 THEN GOTO 100
0654     ENDF
0656
0657     RUN gfx("line",a,b,c,d)
0677   ENDWHILE
0678
067C 100 INPUT x$
0684   (* "quit" de-allocates the graphics memory
06AE   RUN gfx("quit")
06DA   END
068C
068D   (* data for the letters
06D4   DATA 4,160,4,188
06E4   DATA 4,160,12,174,12,174,18,160
0700   DATA 20,160,20,188
0710   DATA 24,160,24,188,24,160,36,160
072C   DATA 24,174,30,174,24,188,36,188
0748   DATA 42,160,54,160,42,160,42,188
0764   DATA 60,160,60,188,60,160,72,160
0780   DATA 60,188,72,188
0790   DATA 78,160,78,188,78,160,90,160
07AC   DATA 78,188,90,188,90,160,90,188
07C8   DATA 96,160,96,188,96,188,108,176
07E4   DATA 108,176,120,188,120,160,120,188
0800   DATA 126,160,126,188,126,160,138,160
081C   DATA 126,188,138,188,126,174,132,174
0838   DATA 150,188,162,188,156,160,156,188
0854   DATA 168,160,180,160,168,188,180,188
0870   DATA 168,160,168,188,180,160,180,188

```

```

PROCEDURE type
0000   PARAM name:STRING[60]
000C   DIM path:INTEGER
0013   DIM f:REAL
001A   DIM char:STRING[1]
0026   DIM tst:BOOLEAN
002D
002E   ON ERROR GOTO 100
0034
0035   tst=TRUE
003B
003C   OPEN #path,name:READ
0048   f=0
0050
0051   WHILE tst DO
005A     SEEK #path,f
0064
0065     IF EOF(#path) THEN PRINT
0070     CLOSE #path
0076     END
007B     ENDF
007A
007B     GET #path,char
0085     f=f+1
0091
0092     IF char=CHR$(7) OR char=CHR$(10) OR char=CHR$(13) OR char
>=CHR$(31) AND char<=CHR$(127) THEN PRINT char;
00C4     ENDF
00C6
00C7   ENDWHILE
00C8
00CC   CLOSE #path
00D2   PRINT
00D4
00D5   REM! If you want a character count, add the next line
0108   PRINT "character count="; f
0120 100 IF ERR=216 THEN PRINT name; " not found"
013E   ENDF
0140   BYE
0142

```

PROCEDURE cocodir

The RAINBOW Back Issue Availability



Back copies of many issues of **THE RAINBOW** are still available.

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. A \$5 charge plus \$1 each additional copy for orders sent U.S. Mail. UPS *will not* deliver to a post office box or to another country.

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. We do not bill and no C.O.D. orders accepted.

Due to heavy demand, we suggest you order back issues you want now while supplies last.

To order, just fill out the form on the next page and mail it with your payment to:

THE RAINBOW
9529 U.S. Highway 42
P.O. Box 385
Prospect, KY 40059

BACK ISSUE ORDER FORM

(See overleaf for instructions.)

Please send me the following back issues:
 (Payment must accompany back issue orders. We do not bill.)

MONTH		VOLUME 1	
NO.	YEAR		PRICE
1	JULY '81	PREMIER ISSUE	\$2.00 <input type="checkbox"/>
2	AUG. '81		\$2.00 <input type="checkbox"/>
3	SEPT. '81	EDUCATION	\$2.00 <input type="checkbox"/>
4	OCT. '81	PRINTER	\$2.00 <input type="checkbox"/>
5	NOV. '81		\$2.00 <input type="checkbox"/>
6	DEC. '81	HOLIDAY	\$2.00 <input type="checkbox"/>
7	JAN. '82		\$2.00 <input type="checkbox"/>
8	FEB. '82		\$2.00 <input type="checkbox"/>
9	MAR. '82		\$2.50 <input type="checkbox"/>
10	APR. '82		\$2.50 <input type="checkbox"/>
12	JUNE '82		\$2.50 <input type="checkbox"/>
		VOLUME 2	
9	MAR. '83	NUCLEAR	\$2.95 <input type="checkbox"/>
10	APR. '83	SIMULATIONS	\$2.95 <input type="checkbox"/>
11	JUNE '83	PRINTERS	\$2.95 <input type="checkbox"/>
12	JULY '83	ANNIVERSARY	\$2.95 <input type="checkbox"/>
		VOLUME 3	
1	AUG. '83	GAMES	\$2.95 <input type="checkbox"/>
2	SEPT. '83	EDUCATION	\$2.95 <input type="checkbox"/>
3	OCT. '83	GRAPHICS	\$3.95 <input type="checkbox"/>
4	NOV. '83	DATA COMM.	\$3.95 <input type="checkbox"/>
5	DEC. '83	HOLIDAY	\$3.95 <input type="checkbox"/>
7	FEB. '84	ADVENTURE	\$3.95 <input type="checkbox"/>
8	MAR. '84	BUSINESS	\$3.95 <input type="checkbox"/>
9	APR. '84	GAMING	\$3.95 <input type="checkbox"/>
10	MAY '84	PRINTER	\$3.95 <input type="checkbox"/>
11	JUNE '84	MUSIC	\$3.95 <input type="checkbox"/>
12	JULY '84	ANNIVERSARY	\$3.95 <input type="checkbox"/>
		VOLUME 4	
1	AUG. '84	GAMES	\$3.95 <input type="checkbox"/>
2	SEPT. '84	EDUCATION	\$3.95 <input type="checkbox"/>
3	OCT. '84	GRAPHICS	\$3.95 <input type="checkbox"/>
4	NOV. '84	DATA COMM.	\$3.95 <input type="checkbox"/>
5	DEC. '84	HOLIDAY	\$3.95 <input type="checkbox"/>
6	JAN. '85	BEGINNERS	\$3.95 <input type="checkbox"/>
7	FEB. '85	UTILITIES	\$3.95 <input type="checkbox"/>
8	MAR. '85	BUSINESS	\$3.95 <input type="checkbox"/>
9	APR. '85	SIMULATIONS	\$3.95 <input type="checkbox"/>
10	MAY '85	PRINTER	\$3.95 <input type="checkbox"/>
11	JUNE '85	MUSIC	\$3.95 <input type="checkbox"/>
		RAINBOW INDEX	\$2.50 <input type="checkbox"/>

TOTAL _____
 SHIPPING & HANDLING _____
 U.S. CHARGE _____
 U.S. MAIL CHARGE _____
 KY RESIDENTS ONLY
 ADD 5% _____
TOTAL AMOUNT _____
ENCLOSED _____

Name _____
 Address _____
 City _____ State _____ ZIP _____
 VISA MC AE
 CARD # _____
 EXPIRATION DATE _____ PHONE # _____
 SIGNATURE _____

```

0000 REM
0003 REM program by John E. Carter - W44HLE
0029 REM written as a learning exercise
0048 REM maybe they can be of use to others
0070 REM
0073 REM uses ideas from Mike Dziedzic's "put_dos" program,
00A8 REM which makes an OS9 disk bootable from MS dos under
00D0 REM Disk Basic 1.0 - check the CoCo SIC for the original program
011C REM
011F
0120 BASE 1
0122 ON ERROR GOTO 1
0128
0129 DIM path:INTEGER
0130 DIM i,k:INTEGER
0138 DIM j,firstchar,file_type,ascii_flag,first_gran:BYTE
0152 DIM number_of_bytes:INTEGER
0159 DIM fat(64):BYTE
0165
0166 PRINT
0168 INPUT "drive = /",disk$
0179
017A 1 REM "dir" to put head on track 0
019C SHELL "dir /+disk$"
01AB OPEN #path,"/"+disk$+"@" :UPDATE
01BF REM reading FAT - for future use - to copy rs to os9
01F2
01F3 FOR k=0 TO 63
0203     SEEK #path,307.*256+k
021A     GET #path,fat(k+1)
0228 NEXT k
0236
0237 REM reading directory sectors
0253
0254 FOR k=256 TO 1279 STEP 32
0268     SEEK #path,307.*256+k
0282     GET #path,j
028C     firstchar=j
0294
0295     REM if firstchar=255 we're past the active directory
02C8 EXITIF firstchar=255 THEN
02D4 ENDEXIT
02D8
02D9     REM print the filename.ext
02P2
02P3
0306 IF j>31 AND j<127 THEN
030F     PRINT CHR$(j);
030D
030E FOR i=1 TO 10
031E     SEEK #path,307.*256+k+i
033A     GET #path,j
0344     PRINT CHR$(j);
0348
034C     IF i=7 THEN
0358         PRINT ". ";
035E     ENDIF
0360
0361 NEXT i
036C
036D REM get the file type - 0,1,2,3
0388 SEEK #path,307.*256+k+11
03A6 GET #path,file_type
0380 PRINT " "; CHR$(file_type+48);
038E
038F REM get the ascii flag
03D4 SEEK #path,307.*256+k+12
03E4 GET #path,ascii_flag
03F9
03FA IF ascii_flag=255 THEN
0406     PRINT " A ";
040D ELSE PRINT " B ";
0417 ENDIF
0419
041A IF firstchar>31 AND firstchar<127 THEN
042D     PRINT
042F     ENDF
0431
0432 ENDF
0434
0435 10 REM
0438 NEXT k
0446 CLOSE #path
044C PRINT
044E END
0450
    
```

ENDICOTT

COMPUTER SOFTWARE AND ACCESSORIES

PRINTERS	
* SPIRIT® (80 CPS F/T)	\$214.00
OKIDATA 82 (SER.) W/COCO CABLE	\$329.00
OKIDATA 92 (PAR)	\$394.00
(160 CPS Draft - 40 CPS Correspondance Quality)	
OKIDATA 93 (PAR) 15" CARRIAGE	\$595.00
(160 CPS Draft - 40 CPS Correspondance Quality)	
* CITIZEN MSP-10	\$353.00
(160 CPS Draft - 40 CPS Correspondance Quality)	
* PANASONIC KX 1090 (PAR) (80 CPS F/T)	\$247.00
* PANASONIC KX 1091 (PAR)	\$306.00
(120 CPS Draft & 22 CPS Near Letter Quality)	
* EPSON CODE COMPATIBLE	

PRINTER INTERFACE (Serial to Parallel)	
pbh (PRINTER & MODEM CONNECTIONS)	\$59.95
PURCHASED WITH PRINTER	\$54.95

MODEMS	
VOLKSMODEM WITH ALL CABLES	\$69.95
(300 BAUD - MANUAL ANSWER/DIAL)	
NEW! A GREAT BUY! NEW!	
VOLKSMODEM 1200 WITH ALL CABLES	\$224.95
(300/1200 BAUD - AUTO ANSWER/DIAL)	

CoCo MAX	
COCO MAX	\$66.45
Y BRANCH CABLE	\$25.95

MONITORS	
AMDEK (2 YEAR WARRANTY)	
COLOR 300 (COLOR COMPOSITE AND B&W MODE)	
(REPLACES OLD COLOR I)	\$262.00
VIDEO 300 (GREEN, NO GLARE)	\$149.00
VIDEO 300A (AMBER, NO GLARE)	\$155.00
NAP (AMBER W/AUDIO)	\$109.00

MONITOR INTERFACES	
VIDEO PLUS	\$24.95
(COLOR OR MONOCHROME)	
PURCHASED WITH MONITOR	\$20.95
VIDEO PLUS IIC	\$39.95
(COLOR FOR COLOR II)	
PURCHASED WITH MONITOR	\$31.95
UNIVERSAL VIDEO ADAPTER (By Mark Data)	\$28.95
PURCHASED WITH MONITOR	\$24.95
WORKS WITH ALL COCO'S, BUT A MUST FOR	
NEW COCO II'S WITH SOLDERED IN VIDEO CHIP	

KEYBOARD	
SUPER PRO BY MARK DATA	\$53.95
(NOT FOR COCO II)	
ADAPTER (FOR POST - 10/82 COCO)	\$3.66

AUTOTERM/MODEM SALE!		
AUTOTERM WITH	T	D
VOLKSMODEM (SEE BELOW)	\$95.95	\$99.95
VOLKSMODEM 1200 (See Below)	\$249.95	\$254.95

DISKS		
	1 BX	2 + BX
ELEPHANT SSSD	\$17.50	\$16.50
ELEPHANT SSDD	\$18.50	\$17.50
ELEPHANT DSDD	\$22.00	\$21.00
BASF QUALIMETRIC SSDD	\$19.00	\$18.00
BASF QUALIMETRIC DSDD	\$22.00	\$21.00

TAPES	
C-10 (ONE DOZEN)	\$7.50
TWO OR MORE DOZEN	\$7.00/DOZ.

DISK STORAGE	
FLIPN FILE 10	\$ 5.45
FLIPN FILE 25	\$18.95
FLIPN FILE 50	\$23.95
DISK BANK 5 (HOLDS 50)	\$12.95

JOYSTICKS/ADAPTERS	
WICO JOYSTICK ADAPTER	\$18.95
WICO ANALOG JOYSTICK	\$38.95
(NO ADAPTER REQUIRED - FREE FLOAT OR	
SELF CENTERING BIG BAT HANDLE - RUGGED!)	

Look at These Discounts and Compare...Remember WE PAY SHIPPING!

SOFTWARE PRICES SHOWN ARE **20% OFF** LIST PRICE!

SPECTRAL ASSOCIATES		
	T	D
▶ CRYSTAL CASTLES	\$19.95	\$22.35
▶ GALAGON	\$19.95	\$22.35
▶ PENGON	\$19.95	\$22.35
▶ COLOR PANIC	\$19.95	\$22.35
▶ CUBIX	\$19.95	\$22.35
▶ LANCER	\$19.95	\$22.35
▶ MS GOBBLER	\$19.95	\$22.35
▶ WHIRLYBIRD RUN	\$19.95	\$22.35
▶ LUNAR ROVER PATROL	\$19.95	\$22.35

COMPUTERWARE		
	T	D
▶ STAR TRADER (32K CASS/64K DISK)	\$19.95	\$22.35
▶ MAJOR ISTAR	\$19.95	\$22.35
▶ SAM SLEUTH (64K)	\$19.95	\$22.35
▶ COCO COOKBOOK	\$22.35	\$24.75
▶ MR DIG	\$22.35	\$24.75
▶ JUNIOR'S REVENGE	\$23.15	\$25.55
▶ RANDOM BASIC (OS-9)		\$80.00
▶ COLOR BASIC COMPILER		\$31.95
▶ 64K SCREEN EXPANDER (64K)	\$19.95	\$22.35
▶ THE SOURCERER (R DOS)	\$27.95	\$31.95
▶ THE SOURCERER (OS-9)		\$31.95
▶ MACRO ASSEMBLER & XREF (R DOS)		\$39.95
▶ MACRO ASSEMBLER & XREF (OS-9)		\$39.95
▶ COLOR EDITOR	\$19.95	\$23.95
▶ COLOR MONITOR	\$19.95	\$22.35
▶ MOON HOPPER	\$19.95	\$22.35
▶ BLOC HEAD (O-BERT)	\$21.55	\$23.95
▶ DOODLE BUG (LADY BUG)	\$19.95	\$22.35
▶ GRAN PRIZ	\$17.55	\$21.55

SOFT LAW		
	T & D INCLUDED	
▶ VIP WRITER (INC. SPELLER)	\$55.95	---
▶ VIP SPELLER	\$39.95	(DISK)
▶ VIP CALC	\$55.95	---
▶ VIP TERMINAL	\$39.95	---
▶ VIP DATA BASE	\$47.95	(DISK)
▶ VIP DISK-ZAP	\$39.95	(DISK)
▶ VIP INTEGRATED LIBRARY	\$119.95	(DISK)

COGNITEC		
	T	D
▶ TELEWRITER 64	\$39.95	\$47.95

ELITE SOFTWARE		
	T	D
▶ ELITE-WORD	\$47.95	\$47.95
▶ ELITE-WORD/SPEL		\$59.95
▶ ELITE-SPEL		\$23.95
▶ ELITE-CALC (VER 3.0)	\$55.95	\$55.95
▶ CALC-LIST	\$19.95	\$19.95
▶ ELITE-FILE		\$59.60
▶ ENTIRE LIBRARY (DISK)		\$164.00

DEFT SYSTEMS	
DEFT PASCAL	\$47.95
DEFT BENCH	\$31.95
DEFT PASCAL WORKBENCH (Both Above)	\$71.95
DEFT EXTRA	\$31.95

PXE COMPUTING		
	T	D
▶ AUTOTERM	\$31.95	\$39.95
(SEE PAGE 15 OF RAINBOW)		

SPECIAL SALE!
30% OFF
PRICKLY-PEAR SOFTWARE

PRICKLY-PEAR SOFTWARE		
	T	D
* MODEM MASTER		\$17.45
* SUPER SCROLL (64K)	\$17.45	\$17.45
* COLOR DISK TRIVIA		\$20.95
▶ BIBLE		\$13.95
▶ ENTERTAINMENT		\$13.95
▶ SPORTS		\$13.95
▶ CHILDREN		\$13.95
▶ JUMBO JET	\$17.45	\$20.95
▶ MUSIC READER	\$24.45	\$27.95
* ERLAND	\$17.45	\$20.95
▶ TRAVELIN TOAD	\$17.45	\$20.95
▶ OCKYWOKY	\$17.45	\$20.95
▶ ADVENTURE IN WONDERLAND	\$17.45	\$20.95
▶ THE DISK MANAGER		\$20.95
▶ THE DISK MASTER		\$17.45
▶ COLORKIT (Programming Utility)	\$24.45	\$27.95
▶ FLIGHT	\$13.95	\$17.45

TOM MIX		
	T	D
▶ P51 FLIGHT SIMULATOR	\$23.20	\$27.20
▶ P51 FLIGHT SIMULATOR CABLE		\$9.95
▶ THE SAILORMAN (64K)	\$23.95	\$27.95
▶ PAC PANIC	\$19.95	\$22.35
▶ QUIX	\$19.95	\$22.35
▶ WORLDS OF FLIGHT	\$23.95	\$26.35
▶ SKRAMBLE	\$19.95	\$22.35
▶ SR-71	\$23.15	\$25.55
▶ CUBER	\$22.35	\$24.75
▶ BUZZARD BAIT	\$22.35	\$24.75
▶ AIR TRAFFIC CONTROLLER	\$23.15	\$25.55
▶ SPACE SHUTTLE	\$23.15	\$25.55
▶ THE KING	\$21.55	\$23.95
▶ COLOR GOLF	\$14.35	---
▶ TAPE TO DISK	\$14.35	---
▶ SCREEN PRINT ROUTINE	\$15.95	\$17.55
(Specify Printer DMP - EPSON - OKIDATA)		

ADVENTURE INTERNATIONAL		
	T	D
* FIRE COPTER	\$19.95	---
* SAIGON THE FINAL DAYS	\$19.95	---
* EARTHQUAKE	\$19.95	---
* AIRLINE	\$19.95	---
* SEA DRAGON	\$27.95	---
▶ DISKEY (Utility To Examine And Change Disk Contents Plus Computer Diagnostics)		\$39.95

B5 SOFTWARE		
	T	D
▶ MONEY	\$15.95	---
▶ BORROW	\$15.95	---
▶ CARRY	\$15.95	---
▶ MATH FACT	\$13.55	---
▶ ABC'S	\$ 7.95	---
▶ ALL	\$64.00	---

PROGRAMMERS INSTITUTE		
	T	D
▶ COMPLETE PERSONAL ACCOUNTANT - (1.2 & 3)		\$63.95

NOTE: ALL SALES FINAL. NO RETURNS UNLESS DEFECTIVE. ADDITIONAL LISTINGS IN OUR FREE CATALOG - CALL OR WRITE.

* Requires 16K Ext. Basic Minimum ▶ Requires 32K Ext. Basic Minimum ◻ We Recommend 32K or 64K Others 16K Ext. Std. Basic Minimum

WE PAY SHIPPING TO U.S.A., CANADA, AND MEXICO. C.O.D. ADD \$2.00 (U.S.A. ONLY). ALLOW 2 WEEKS FOR CHECKS TO CLEAR. NO P.O. BOXES! MUST HAVE STREET ADDRESS. SHIPPING - OTHER COUNTRIES: ADD \$2.00 EACH SOFTWARE ITEM AND EACH JOYSTICK - ADD \$5.00 EACH ALL OTHER ITEMS (NO MONITORS OR PRINTERS SHIPPED OUTSIDE U.S.A. - ITEMS ARE SHIPPED AIR MAIL. PRICES SUBJECT TO CHANGE WITHOUT NOTICE.

ENDICOTT
Computer Software And Accessories
2806-A S. MEMORIAL PARKWAY
HUNTSVILLE, ALABAMA 35801
VISIT OUR STORE
PRICES IN AD ARE MAIL ORDER ONLY

PHONE ORDERS
205/536-4400
(PHONE OPEN 7 DAYS A WEEK)
WE PAY SHIPPING!

THESE FINE STORES CARRY THE RAINBOW

The retail stores listed below carry THE RAINBOW on a regular basis and may have other products of interest to Color Computer users. We suggest you patronize those in your area.

ALABAMA

Alberville
Birmingham
Brewton
Florence
Huntsville
Madison
Montgomery

Sewell TV & Radio Shack
Jefferson News Co.
McDowell Electronics
Anderson News Co.
Endicott Software
Madison Books
Trade 'N' Books

ALASKA

Fairbanks Electronic World

ARIZONA

Phoenix
Scottsdale
Tempe
Tucson

The Computer Shop
Home Brew Computers
Tri-Tech Computers
Data Concepts
Softwareland Corp.
All Systems Go
Books Etc.
Computer Library
Anderson News Co.
Mira Electronics

ARKANSAS

Fayetteville
Little Rock

Vaughn Electronics/Radio Shack
Anderson News Co.

CALIFORNIA

Chius Heights
Downey
El Cajon
Eaton
Ft. Bragg
Folsom
Half Moon Bay
Hesperia
Hollywood
Lompoc
Los Angeles
National City
Pacific Beach
Palo Alto
Sacramento
San Diego
Santa Rosa
Southgate
Stockton
Sunnyvale

Software Plus
The Floppy Disk
Radio Shack
Software City
Earthly Delights
B&V Sound
Strawflower Electronics
Desert Sound, Inc.
Lexity Distributors
L&H Electronics Emporium
E.O.C. Industries
Polygon Co.
J&B Software
Willy's Electronics
Pro Am Electronics
Printex, Inc.
Tower Magazine
The Computer Store
Dimensional Software
Disney's Electronics
Radio Shack
Sawyer's News, Inc.
Color Computing
Harding Way News
Computer Literacy

COLORADO

Aurora
Colorado Springs
Westminster

Aurora Newsland
Hathaway's Magazines
Software City

CONNECTICUT

Danbury
Orange

Computer Serv. of Danbury
Software City

DELAWARE

Middletown
Wilmington

Delmar Co.
Milford News Stand
Normat, Inc. - The Smoke Shop

FLORIDA

Boca Raton
Clearwater
Cocoa
Davie
Ft. Lauderdale
Jacksonville
Kissimmee
Madison
Melbourne
Miami
North Miami Beach
Orange Park
Orlando
Panama City

Software, Software, Inc.
The Avid Reader
Scarsen & Winthorpe Books
Software City
Village Book Shop
Software Plus More
Mike's Electronics Distributor
Software Connection
The Book Nook
Book Town
Radio Shack & Elec. Hut
Electronics of Madison
City Newsstand
The Little Store
The News Rack
Newsstand of Cutler Ridge
Amar Bookstore
Software City
The Alamo
Software Unlimited
Boyd-Robert Corp.
Computer Systems Group

Pensacola
Pinellas Park
Sarasota
South
Pasadena
Stuart
Sunrise
Tallahassee
Tampa

FLORIDA

Titusville
Troyville

Georgia
Atlanta
Augusta
Bremen
Columbus
Cumming
Jesup
Marietta
St. Simons
Island
Toccoa

Anderson News Co.
Wolf's Newsstand
Family Computers
Poking Place
Caribbean Engineering Corp.
Sunny's of Sunset, Inc.
Anderson News Co.
Fine Print Bookstore
Software City
Sound Trader & Computer Center
Computroc
Chips, Inc.
Guild News Agency
Software City
Boogie Shoppe
Muscogee News Co.
Karl Radio Shack
Kannon Music
Radio Shack
Act One Video
Radio Shack
Martin Music Radio Shack

IDAHO

Blackfoot
Moscow
Preston River

F/M Systems Electronics
Johnson News Agency
K&W Electronics

ILLINOIS

Aurora
Champaign
Chicago
Chillicothe
Danville
Decatur
Dekalb
East Moline
Evanston
Geneseo
Kewanee
Kewanee
Lisle
Metropolis
Newton
Oak Brook
Oak Park
Paris
Peoria
Schaumburg
Skokie
South Holland
Springfield
Sunrystand
West Frankfort
Wheeling

Koch's & Brentano's
Book Market
B. Dalton Booksellers
N. Walbath St.
West Jackson St.
Bob's in Newtown
Bob's News Emporium
Bob's Rogers Park
Book Market
East Cedar
North Cicero
West Diversely
E.B. Garcia & Associates
Guild Books & Periodicals
Koch's & Brentano's
South Walbath
West Jackson
516 N. Michigan
835 N. Michigan
Parkway Drugs
Parkwest Books
Sandmeyer's Bookstore
Univ. of Chicago Bookstore
Univ. of Illinois Bookstore
Videomat, Inc.
Book Emporium
Book Market
Book Emporium
K-Mart Plaza
Northgate Mall
Applebee's Computers
Book Emporium
Chicago-Main News
B & J Supply
Book Emporium
Book Nook
Jim's Home Center
Bill's TV Radio Shack
Koch's & Brentano's
B.I.E.S. Systems
Koch's & Brentano's
Book Emporium
Book Emporium
Sheridan Village
Westlake Shopping Center
Book Market
Illinois News Service
Koch's & Brentano's
Koch's & Brentano's
Abacus Computer Distributors
Book Emporium
Sangamon Center North
Town & Country Shopping Ctr.
Book Emporium
Paper Place
North Shore Distributors

INDIANA

Berne

White Cottage Electronics

Columbus
Garett
Greenwood
Indianapolis

IOWA

Jasper
Lawrenceburg
Madison
Mason
Mottsville
New Haven
Scottsburg
Walbach

Mico Computer Systems, Inc.
Rin News Agency, Inc.
The Computer Experience
Bookland, Inc.
Indiana News
Computer Store
Elex Mart
Bauer Electronics
Arcs Office Supplies
Computer Corner
Radio Shack
Advanced Color Software
Radio Shack of Scottsburg
Mittling's Electronics

KANSAS

Beltsford
Davenport
Junction City
Topeka
Wichita

Comics Computers
Interstate Book Store
Software City
H's Stereo
Palmer News, Inc.
Town Clerk of Topeka, Inc.
Amateur Radio Equipment Co.
Lloyd's Radio

KENTUCKY

Bardonia
Greenville
Hopkinsville
Louisville
Mayville
Paducah
Parrishville
Riverville
Winchester

Skaggs Electric/Radio Shack
Williams & Wells, Inc.
Hobby Shop
The Computer Store
Radio Shack
Radio Shack
Gus-Stan Enterprises
Gus-Stan Enterprises
Miller Electronics

LOUISIANA

Baton Rouge
Crowley
Gretna

Acme Book Co.
Acadiana Newsstand
Computer Supply Store

MAINE

Bangor
Brockton
South Portland
Waterboro

Magazines, Inc.
Voyager Bookstore
Portland News Co.
Radio Shack

MASSACHUSETTS

Brockton
Cambridge
Danvers
Fitchburg
Ipswich
Littleton
Lyons
Quincy

Voyager Bookstore
Nina Corner, Inc.
Out Of Town News
Microcon Computer & Software Store
Corner Book Shop
Ipswich News
Computer Plus
North Shore News Co.
Soft Ware House

MICHIGAN

Allen Park
Ann Arbor
Brooklyn
Dearborn
Durand
Fenton
Flint
Greenville
Hamson
Kalamazoo
Lapeer
Lowell
Mt. Clemens
Muskegon
Novi
Oakman
Owasso
Pewee
Pontiac
Roseville
Royal Oak
St. John
Southfield
Sterling Heights
Tecomah
Warren

Book Nook, Inc.
Community News Center
Weatherwax Radio Shack
DBL Computer Products
Robbins Electronics
Tri-County Electronics Radio Shack
"O"
Robbins Electronics
Harrison Radio Shack
John Rollins
Computer Corner
User Friendly
Cliff's Sound & Home Arcade Center
Key Book Shop
Michigan Radio
The Eight Bit Corner
MI Software Dist., Inc.
Software City
C/C Computer Systems
Hi-Fi Audio Co.
Perry Computers
Perry Oil & Gas
Computer Shack
New Horizon
Software City
Clinton Electronics
Software City
Sterling Book Center
White Electronics
Gerry's Book Co.

MINNESOTA Minneapolis	Read-More News	Rocky River Toldeo	Programs Unlimited Leo's Book & Wine Shop Reitz Electronics Home Computer Store	CANADA ALBERTA Athabasca Banff Barrow Blainmore Brooks Calgary	McLean's Ltd. Banff Radio Shack Barrow Sound 1982 Ltd. L & K Sports & Music Double "D" A.S.C. Radio Shack Billy's News Imperial Computer Ltd. Rainbow Software Services Radio Shack Associated Stores Radio Shack Associated Stores Coaldale Sight & Sound Langard Electronics DVD Micro Kelly Software Distributor Radio Shack D.N.R. Furniture & TV Fox City Color & Sound Fort Pharmacy Radio Shack
MISSISSIPPI Gretnada Starkville	Stereo State of Gretnada, Inc. Stonehenge Computer Software Center	Westville		Edson Fairview Fox Creek H. Macleod	The Stereo Hut The Book Nook Northern Computer Service Technica TV Ltd. L & S Stereo Tall Pine TV Radio Shack Associated Stores Lloyd Radio Shack H & S Music Centre Radio Shack Associated Stores Thornton & Son's Gale Distributing Computer World Roy's TV Tee-Logic Sunrise Sound Pinewood Sight & Sound Don's Radio Shop Photocraft Vermilion Ltd. Radio Shack
MISSOURI Kansas City Kirkville St. Louis	Midwest CoCo Systems T&R Electronics Book Emporium Computer Exchange Software Centre Final Edition	OKLAHOMA Hobart Oklahoma City	Shortgrass Electronics Mart Micro Software	Grande Cochise Gerald Carrizo Grande Prairie Hanna Innisfail Lacombe Leduc Lloydminster Peace River	
University City		OREGON Alsea Hermiston Portland	B. Color Computer and Software Lee's TV & Radio Clinic 80-Plus		
MONTANA Whitefish	The Computer Coral	PENNSYLVANIA Alison Park Allentown Brookville Coudersport Greensburg Harrisburg Mahan Philadelphia	Software City Newborn Enterprises Larry's Stereo Shop West Computers The Program Store Harrisburg News Co. Personal Software City Software Center Neway Shivers Radio Shack All Pro Souvenirs Pitt Computer & Software Video Programming, Inc. Rainbow Adventure Software Corner The Donna Comm. Co. Shade Tree The Computer Center of York		
NEBRASKA Lincoln Omaha	Hobby Town Computers & Components	Phoenixville Pittsburgh Pleasant Hills Pottstown Shippensburg Temple Tunkhannock Williamsport York			
NEVADA Las Vegas	Hurley Electronics	RHODE ISLAND Warwick	Software Connection		
NEW HAMPSHIRE Peterborough Portsmouth West Lebanon	BBW Electronics/Radio Shack Portsmouth Computers Verham News Corp.	SOUTH CAROLINA Charleston Hts. Greenville Hilton Head Spartanburg Union	Software Haus, Inc. Palmetto News Co. Megatron Corporation Software City Fleming's Electronics		
NEW JERSEY Cedar Knolls Cherry Hill Clinton Lawrenceville Linwood Marmora Monroeville Morristown Pennsville River Edge Rockaway Summit Teaneck Wayne	Village Computer & Software Software City Micro World II Micro Con Software Center Software City Outpost Radio Shack Software City Software City Dawn's Elect. Radio Shack Software City Software Station Software City Software City Wayne Software	TENNESSEE Chattanooga Dickson Knoxville Memphis Nashville Smyrna	Anderson News Co. Highland Electronics Anderson News Co. Fast Byte Computer Co. Computer Center Software, Inc. Campus Computer Corp. Mosko's Book Store Software First Delker Electronics	BRITISH COLUMBIA Burnaby Campbell Over Chilliwack Courtenay H. St. John Ladysmith Merrit N. Vancouver Squamish Sidney Victoria Wilsons Lake	Compu!t TRS Electronics Charles Parker Bell Radio & TV Valley Computers Ken Dawson Ladysmith Sound Center Merrit Radio Shack Microwest Distributors Shuswap Electronics Sidney Electronics Datafact International Software Techworld Narcorn Software
NEW MEXICO Alamogordo Albuquerque	New Horizons Computer Systems Page One Newstand Sat of the Earth	TEXAS Elgin Fl. Worth Houston Orange Pats	The Homing Pigeon RFI Electronics Software Terminal MicroSolutions Northway Books & News Software Solutions		
NEW YORK Brookport Elmira Heights Fairport Hudson Falls Johnson City Mt. Kisco New York	Lift Bridge Book Shop, Inc. Southern Tier News Co., Inc. Software City G.A. West & Co. Unicom Electronics Software City Barnes & Noble—Sales Annex Coliseum Books Eastern Newstand Grand Central Station, Track 37 200 Park Ave., (Pan Am #1) 55 Water Street World Trade Center #2 First Stop News Idle Hour Bookstore International Smoke Shop Jonit Smoke Penn Book State News Usercom Systems, Inc. Walden Books World Wide Media Services Software City Adsonack Computer Supplies Village Green World Wide News M.S. Electronics Spectrum Projects	UTAH Murray Ogden	Deseret Book Computer City		
N. White Plains Pittsburg Rochester		VIRGINIA Gaffon Norfolk Richmond	Electronics Marketing I-O Computers Software City		
Warrensburg Woodhaven		WASHINGTON Bellevue Davenport Mount Lake Terrace Renton Seattle Tacoma	Software City Davenport Electronics Emerald Computer Services Data Base Adams News Co., Inc. Nybbles 'N' Bytes		
NORTH CAROLINA Aberdeen Charlotte Hickory Hickory Laurinburg Marion Newland Raleigh Sylvia	King Electronics Radio Shack Newstand Int'l Papers & Paperback Computer Concerns C? Books & Comics Radio Shack Boomer's Rhythm Center Alpine Electronic Systems D.J.'s Book and News Softmart Total Data Systems	WEST VIRGINIA Huntington Lesage Logan Parkersburg	Nick's News Pioneer Technology Stan's Electronics & Radio Shack Valley News Service		
NORTH DAKOTA Fargo	Computer Associates	WISCONSIN Appleton Cudahy Janesville Ladysmith Milwaukee	Badger Periodicals Cudahy News & Hobby Book World Electronics, Etc. Abacus Micro Book Tree Booked Solid Booked Solid II Harvey Schwartz Bookshop Univ. of Wisconsin Bookshop		
OHIO Canton Cincinnati Coshacton Dayton Fairborn Garion Kent Kenton Lakewood Uma	Little Professor Book Center Cissoft Utopia Software Wike News News-Reader Gal-Tronics The News Shop T.W. Hogan & Associates Lakewood International News Bruner News Agency Edu-Cafeteria	WYOMING Casper	The Computer Store		
Mayfield Heights Mansfield Mount Drab	Software City Wike News Mount Crab Radio Shack	AUSTRALIA SYDNEY Kingsford	Pars Radio Electronics	YUKON Whitehorse	Big Byte Computer Services H & O Holdings
				PUERTO RICO San Juan	Software City

Also available at all Waldenbooks, Coles Bookstores and selected B. Dalton Bookseller stores in the United States and Canada.

ADVERTISER'S INDEX

We encourage you to patronize our advertisers — all of whom support the TRS-80 Color and TDP System-100 computers. We will appreciate your mentioning **THE RAINBOW** when you contact these firms.

Alban Scientific	89	KRT Software	214	Rainbow On Tape	248
Ark Royal Games	175	Landware Co.	70	Rainbow Gift Certificate	135
B & B Software	9	Leffler, D.J.	222	RAINBOWfest	114, 115
Bacchus Computer Software	219	Mark Data Products	236, 237	REM Industries	208
B5 Software	157	Maxsys Electronics & Software	164	Robotic Microsystems	75
Big 3, The	21	Metric Industries	14	Saguaro Software	181
Botek Instruments	56	MichTron	35, 145	Selected Software	85
Cer-Comp	82	Micro Works, The	151	Softmart	54
Challenger	75	Microcom Software	31	Software Connection	98
CIGNA CO.	234	Microtech Consultants Inc.	261	Software House, The	64
Cinsoft	88	Microware Systems Corporation	133, 266	Software Plus	244
CMD	165	Microworld II	96	Software Support, Inc.	10, 11
CNR Engineering	165	Mix, Tom Software	IFC, 118, 119	Spectro Systems	205
CoCo Devices	201	Moore Computer Services	160	Spectrum Projects Inc.	121, 122, 123, 125, 126, 127
Cognitec	13	Moreton Bay	232, 233	Speech Systems	48-53
Color Connection	57	Nexus	202	Sugar Software	29, 76, 77
Color Software Services	137	NOVASOFT	243	Synergetic Solutions	74
Colorware	169, 170, 171	Other Guys Software, The	100	T & D Software	217
Computer Center	101, 186	OS-9 Users Group	89	TCE Programs, Inc.	32, 132
Computer Island	224, 225	Owls Nest Software	231	Tepco	150
Computer Plus	3, 111	Owl-Ware	177	Thinc	210
Computer Systems Distributors	227	Parsons Software	198	Tri-Tech Electronics	139
Computerware	93, 95, 97	PBJ, Inc.	71	Triad Pictures	219
Computize, Inc.	128, 273	PD Software	110	True Data Products	102, 103
Cosmic Software	208	PCM	193	Undercolor	197
Cosmos Computer Services Inc.	167	Perry Computers	200	Vidtron	26
Cranberry Industries	173	Picosoft Games	211	VIP Technologies (Softlaw Corp.)	38, 39
Custom Computer Products	146	Polygon Co.	204	Wasatchware	196
Custom Software Engineering	191	Dr. Preble's Programs	194	White House Computer	16
Dataman International	112	Prickly-Pear Software	131	Woodstown Electronics	213
Dayton Associates of W. R. Hall, Inc.	184	PXE Computing	15	YGS	199
DEFT Systems	17	Radio Shack	186, 187	York 10	220
Deiker Electronics	72	Rainbow Bookshelf	162		
Derby City Software	228	Rainbow OS-9Book	259		
Derringer Software	22, 23, 24	Rainbow Binder	47		
Dorsett Educational Systems	IBC				
Double Density Software	262, 263				
Dragon User	140				
Dragonfly Writing	172				
DSL Computer Products	192				
Duggers Growing Systems	201				
DYNACALC	69				
DYNAMICS	79				
E.D.C. Industries	241				
EAP Co.	223				
Electronics Motion Control	46				
Elite Software	65, 66, 67				
Endicott Software	269				
Everyone's Computer Co.	189				
Federal Hill Software	221				
Four Star Software	216				
GIMIX	274				
GRAFX	206				
Green Mountain Micro	239				
Hard Drive Specialists	143, 222				
Hawkes Research Services	215				
HJL div. of Touchstone Technology, Inc.	27				
Frank Hogg Laboratory	253, 255, 257				
Homesoft	68				
Howard Medical	33, 34				
Incentive Software	264				
J & M Systems	BC				
D.P. Johnson	256				
Kelly Software Distributors	212				
Key Color Software	142				



Call:
Cindy Shackelford
 Director, West Coast Office
 12110 Meridian South — Suite 8
 P.O. Box 73-578
 Puyallup, WA 98373-0578
 (206) 848-7766

Call:
Jack Garland
 Garland Associates, Inc.
 10 Industrial Park Road
 Hingham, MA 02043
 (617) 749-5852

Call:
Kate Tucci
 Advertising Representative
 9529 U.S. Highway 42
 P.O. Box 385
 Prospect, KY 40059
 (502) 228-4492

BUT CAN IT WAX FLOORS?



From the folks that brought you GRAPHICOM PART II, comes **HARDCOPY** - The ultimate printer utility. **Hardcopy** is more than just a screen print utility, compare these features with any other graphic dump program on the market;

- Full GRAPHICOM/GRAPHICOM PART II compatibility! Loads STANDARD 6K images, GRAPHICOM pictures, and COCO MAX pictures too!
- BLACK & WHITE or GREY SCALE printing. In GREY SCALE printing, colors are printed as user definable patterns. Supports hi-res in all 4 GRAPHICOM display modes!

1x, 2x, 3x PRINTOUTS

Three menu options are reserved for the most frequently used printout sizes, 1x (quarter page), 2x (half page), and 3x (full page). The 1x and 2x printouts are right-side-up on the paper, the 3x printout is rotated 90 degrees. The user can select a positive or negative image, hi-res or color interpretation (colors reproduced with user defineable grey scale), and which PMODE the graphic-to-be-printed is usually displayed in.

GREETING CARDS

The greeting card option allows the user to custom design greeting cards using both text and graphics. There are two card styles available, along with a built in "mini-typesetter" (16 different size of text, characters may be rotated, mirrored, inverted, and much more.)

LABELS

The label printing option allows the user to create custom mailing or disk labels with professional looking results. Just load a graphic image from disk, position the proportional label window over the area to be printed. Uses standard $\frac{1}{16}$ " x $3\frac{1}{2}$ " tractor feed adhesive labels. Prints 1-99 labels at a time.

POSTERS

The poster option provides the user with a means of reproducing a hi-res graphic to a multi-sheet poster. Both hi-res and color printing are supported, sizes range from poster-size to mural-size to billboard-size!

HARDCOPY

THE ULTIMATE PRINTER UTILITY



©1984 WHITESMITH V:1.0
ALL RIGHTS RESERVED

SPECIAL EFFECTS

The special effects option allows the user to directly control the printing directives; ROTATION, X&Y SIZE, X/Y FLIP, X/Y GRID, X/Y FILL, TAB, WINDOW, POS/NEG IMAGE, and more! With these, the user can print multi-page banners, change the grey levels used in color printing, rotate printouts 90, 180, or 270 degrees, stretch printouts horizontally or

vertically, zoom in on small areas, superimpose vertical and/or horizontal grid lines with printouts for measurements and graphing, and much much more.

DISK ACCESS

The disk option provides the user with access to standard 6K images, GRAPHICOM and GRAPHICOM PART II files, and COCO MAX files too! "GALLERY" function allows viewing of all pictures on a disk. Supports 1 to 4 disk drive system.

Have an application that **HARDCOPY** doesn't quite match? You can write it easily yourself! The hard work's been done for you, we've FULLY DOCUMENTED the **HARDCOPY** routines and added them to EXTENDED BASIC through the USR command!

(We decided to leave out the Floor-waxing module to keep the price down.)

HARDCOPY* requires a 64K Color Computer or Color Computer II, and at least one disk drive. It supports 1 to 4 disk drives, keyboard or joystick input, COLOR (grey scale) or B/W (hi-res) operation, 4 screen display modes.

Now that you've compared the functions, compare the price \$29.95

Hardcopy will be available for most of the popular printers. Additional printers will be added each month. Please specify printer and cat. number when ordering.

I.D.S. 560-G Cat. No. 170WD
Okidata 92 Cat. No. 171WD

Epson MX-80 Cat. No. 172WD
Epson RX-80 Cat. No. 173WD
Epson FX-80 Cat. No. 173WD

* Due to hardware differences, some features may function differently on certain printers.



CALL OR WRITE
FOR YOUR SAMPLE
DIGITIZED PICTURE
CATALOG TODAY!

Computize

(215) 946-7260 P.O. BOX 207 • LANGHORNE, PA 19047

Circle 1 on M.C. • Bill \$1.00 shipping • PA residents add 6% sales tax

ATTENTION COCO CLUBS
CALL OR WRITE FOR
INFORMATION ABOUT
SOFTWARE DEMOS
FOR CLUBS.

GIMIX STATE OF THE ART 6809 SYSTEMS FOR THE SERIOUS USER.

For the user who appreciates the need for a bus structured system, using **STATIC RAM** and powered by a ferro resonant constant voltage transformer.

GIMIX has single user systems that can run both **FLEX** and **OS-9** or Multi user systems for use with **UniFLEX** or **OS-9**.

GIMIX versions of **OS9** and **UniFLEX** include maintenance and support by **Micro-ware** (90 days) and **TSC** (1 year). Maintenance and support after this period are available at extra cost.

(NOTE: this support and maintenance is only for use with approved GIMIX hardware)

GIMIX has 19MB or high performance 47MB Winchester Drive Systems and/or Floppy Disk Drive Systems.



For the ultimate in performance, the Unique **GMX 6809 CPU III**, using either **OS-9-GMX III** or **UniFLEX GMX III** (available shortly), gives protection to the system and other users from crashes caused by defective user programs, e.g. During program development, a programmer who crashes goes back to the shell or the debugger, while the other users are not even aware anything occurred.

The intelligent serial I/O processor boards significantly reduce system overhead by handling routine I/O functions, therefore, freeing up the host CPU for running user programs. This speeds up system performance and allows multiple terminals to be used at 19.2K baud.



GIMIX 6809 systems support five predominant operating systems:

**OS-9 GMX III,
OS-9 GMX II,
UniFLEX,
OS-9 GMX I,
FLEX**

and a wide variety of languages and development software.

Whatever your application, software development, instrumentation, process control, educational, scientific or business, whether you need single or multi-user capabilities, GIMIX has hardware and the operating systems to get the job done reliably.

Please phone or write if you need further information.



BASIC-99 and OS-9 are trademarks of Microware Systems Corp. and MOTOROLA, Inc. FLEX and UniFLEX are trademarks of Technical Systems Consultants, Inc. GIMIX, GHOST, GMX, GLASSY CHASSIS, are trademarks of GIMIX, Inc.

GIMIX inc.

1337 WEST 37th PLACE • CHICAGO, ILLINOIS 60609 • (312) 927-5510 • TWX 910-221-4055

© 1983 GIMIX Inc.

For Your TRS-80 Color Computer

Apple • Atari • Commodore • TRS 80 I, III, 4 & Color • IBM PC Jr.

DORSETT EDUCATIONAL SOFTWARE PASSES THE COST-EFFICIENCY TEST!

For computer assisted instruction, our software more than passes the test...it EXCELS! With over 1000 educational programs* designed specifically to concentrate learning for all users, from kindergarten level to advanced individual studies, from slow learners to exceptionally bright students, you'll get positive results with our quality, economically-priced courseware.

* 500 Programs available for TRS 80 Color, 400 for IBM PC Jr.

DORSETT Classroom A Room #1

Excellent Work! (A+)

PROGRAMS OFFER	OTHER BRANDS			
	DORSETT	A	B	C D
1. FULL TIME AUDIO NARRATION	Blue			Red
2. SYNTHESIZED, ROBOTIC VOICE		Red		
3. MULTIPLE CHOICE QUESTIONS	Blue		Yellow	
4. CLEAR GRAPHICS				Green
5. NUMBER OF COURSES	Blue		Yellow	
6. VARIETY OF PROGRAMS				Red
7. SELF-PACED PROGRAMS	Blue	Red		
8. PROGRAM LENGTH			Yellow	
9. COMPATIBILITY	Blue			Green
10. YEARS IN EDUCATION	Blue			
11. PRICE PER PROGRAM	\$3.75*	\$14.95*	\$19.95*	\$29.95* \$32.50*

DORSETT COURSEWARE IS COMPATIBLE WITH IBM PC Jr., TRS 80, I, III, 4 & COLOR, APPLE, ATARI & COMMODORE COMPUTERS.
*PRICE PER PROGRAM IN A 16-PROGRAM SERIES



Interactive Tutorial Programs

Over 1000 Programs with Full Time Audio Narration, Pictures & Text!

We're Your Educational Software Source for Grades K-12 and Advanced Studies

Course	No. of Programs
Reading	256
Mathematics	128
Comprehension	48
History	32
Algebra	16
Spelling	16
Government	16

16 Programs in each of the following:

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

Dealer Inquiries Welcome

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 400/500/600/1300 computers require the Atari cassette recorder and the Dorsett 4001 Educational Master Cartridge, \$99.95. For the IBM PC Jr., a cassette adapter cable and a good cassette recorder are required. A Radio Shack OCR-81 or OCR-83 is recommended. \$59.95 for an album containing a 16-program course (5 cassettes with 2 programs, each at \$3.75 per program), \$6.80 for a 2-program cassette.

Send for a catalog of over 1000 programs for Atari, TRS 80, Apple, IBM PC Jr., Commodore, etc.

For more information, or to order call:

TOLL FREE 1-800-654-3871

IN OKLAHOMA CALL (405) 288-2301



DORSETT
Educational Systems, Inc.

Box 1226 Norman, OK. 73070



Rae

J&M's New JFD-CP Disk Controller Speaks for Itself!

My 28-Pin EPROM socket accepts 64K device or *NEW* 128K JDOS 1.2.

RS DOS plugs right into this 24-pin EPROM socket. (RS DOS not included)

This new WD1773 controller chip has built-in data separator & precompensation circuits.

My gold contacts ensure high reliability.

Because they are fully buffered, my I/O lines are more dependable.

You can use this 8-bit parallel port to support a Centronics compatible parallel printer or a Winchester hard drive.

Select ROM A or ROM B with this external switch—no need to unplug controller!

JUMPERS: J1 IN—6ms head step rate; OUT—30 ms head step rate
 J2 IN—serial printer; OUT—parallel printer
 Jumper defaults apply only to JDOS.

NEW JFD-CP DISK CONTROLLER \$149

Our new JFD-CP has redefined the state-of-the-art for Color Computer users. Gold contacts and fully buffered I/O lines ensure maximum reliability, and the JFD-CP is plug compatible with both the original COCO and the COCO-2.

NEW JDOS 1.2

JDOS implements all RS DOS basic commands, plus many more, including:

- auto line numbering
- error trapping
- DOS to boot OS/9**, FLEX***
- hard drive boot for OS/9**
- full parallel printer support for Centronics compatible printers
- Memory Minder†—the most advanced disk drive analysis program on the market*

DRIVE 0 SYSTEM \$289

Upgrade your Color Computer by adding our new JFD-CP disk controller, supercharged JDOS operating system, and a top quality drive with case and power supply: All for only \$289! Comes complete with cable and manual.

- Drive 0 System with one single side drive \$289
- Drive 0 System with one double side drive . . . \$359
- Drive 0,1 System with two single side drives . . \$429
- Drive 0,1 System with two double side drives . . \$499

MEMORY MINDER†

Memory Minder is a disk drive test program that makes the following major checks of your drives without disassembly or special test equipment: head alignment, disk speed, index hole timing, azimuth, hysteresis, read sensitivity, and clamping. Memory Minder can be used to actually align the drives while viewing the graphics on the screen. This program is a must for anyone who values the data that is saved on diskettes.

- 508-200: Tests single side disk drives \$26
- 508-400: Tests double side disk drives \$33

*Diagnostic Diskette not included

**OS/9 is a registered trademark of Microwave, Inc.
***FLEX is a registered trademark of Technical Systems Consultants, Inc.
†Memory Minder is a registered trademark of J&M Systems, Inc.

To order, call (505) 292-4182, or send payment with order to:



J&M SYSTEMS, LTD.
15100-A CENTRAL SE
ALBUQUERQUE, NEW MEXICO 87123
505/292-4182

We accept MasterCard and Visa