A CWC/I PUBLICATION
JANUARY 1985
USA $2.95 CAN $3.50

NEW COLUMN
Make Money with Your CoCo

HOT CoCo®

THE MAGAZINE FOR TRS-80 COLOR COMPUTER® AND MC-10® USERS.

Winning On Wall Street

Try Our Free Stock-Charting Program

Inside

Homespread—A Spreadsheet Anyone Can Use

Reviewed

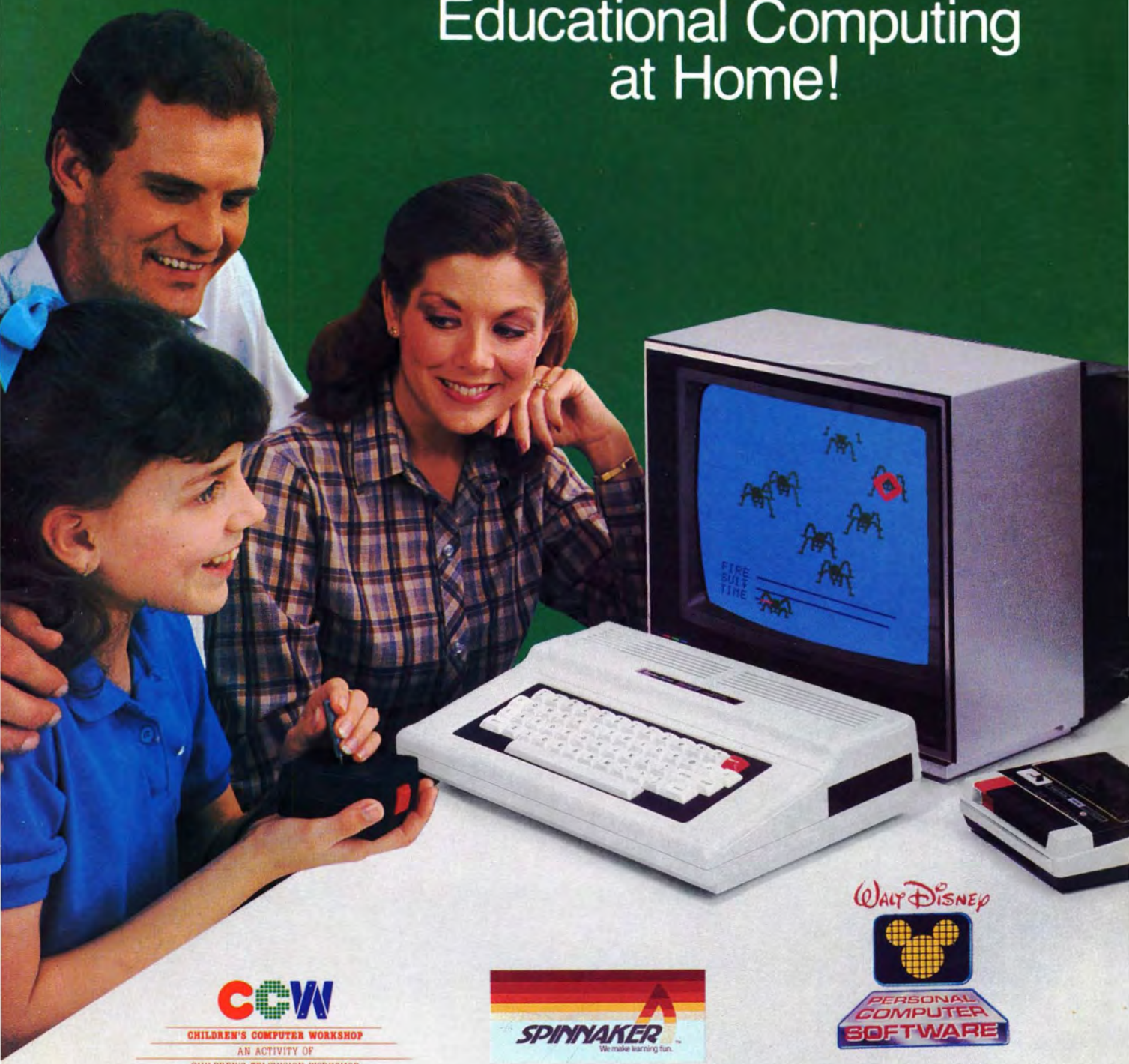
Dennis Kitsz's
Learning the 6809

Plus: Advice, Utilities, And Tips for Every Color Computer Owner

0 74470 12067 01

Enjoy Holiday Savings on All of Our Popular Color Computers

And Start Educational Computing at Home!



CHILDREN'S COMPUTER WORKSHOP
AN ACTIVITY OF
CHILDREN'S TELEVISION WORKSHOP

SPINNAKER
We make learning fun.

WALT DISNEY
PERSONAL COMPUTER SOFTWARE

Put Radio Shack's exciting Color Computer 2 and the best in children's software under your tree this Christmas. You'll save money now and delight your family throughout the year!

The Perfect Gift at the Perfect Price

Now you can save up to $60 on the remarkable Color Computer 2 and enjoy home computing with your children anytime. Just attach the Color Computer 2 to your television set and Radio Shack's easy-to-understand instructions will have you and your children programming right away—even if you've never used a computer before. Or select from dozens of useful programs and colorful game packs to make the Color Computer 2 the perfect computer for everyone at home!

Choose the Model Right for Your Family

Radio Shack offers three affordable models of the Color Computer 2. The 16K Standard BASIC Color Computer 2 includes a typewriter-quality keyboard, compact styling and built-in BASIC language capability. BASIC is a versatile computer language your children may already have used in school. Now they can write their own programs and create spectacular eight-color graphics at home. And the 16K Standard Color Computer 2 is supported by a full line of quality Radio Shack accessories, so you can expand as your children's interest and skills grow.

The 16K Extended BASIC Color Computer 2 includes the features of the Standard Color Computer 2, plus advanced programming capabilities made possible by the Extended BASIC language. You'll be able to write more sophisticated programs and create high-resolution color graphics using simple one-line commands.

Color Computing for Advanced Programmers

The 64K Extended BASIC Color Computer 2 has the power and performance for advanced home and small-business use. The 64K Extended Color Computer 2 can easily see your children through high school, college and beyond, or stay at home with you to help out with investment analysis, home budgeting, business records and more. With the built-in Extended BASIC, your family can take advantage of 32K memory, enough for many advanced programs and computer games. Add an optional disk drive and operating system and your family can access 64K.

A Terrific Gift to Give or Get!

Take advantage of Radio Shack's special holiday savings on the Color Computer 2. It's a gift your children will use and enjoy, and a handy tool you can use at home or work.

Bring Home the Best in Educational Software

Your children will enjoy Radio Shack's selection of educational software as much as the Color Computer 2. You'll enjoy knowing they're using carefully prepared educational software from the names you can trust: Children's Computer Workshop (a division of CTW—the creators of Sesame Street™), Walt Disney and Spinnaker. Choose from programs to help improve reading, writing, math and science skills for children age 3 and older.

Start Home Computing This Christmas

Radio Shack makes it easy to start computing with your family. Just visit your nearest Radio Shack Computer Center, participating store or dealer for a demonstration of the exciting Color Computer 2 and accessories like printers, cassette recorders, joysticks—even disk drives. And don't forget the software!

16K Standard
99.95
26-3134
Reg. 119.95

16K Extended
139.95
26-3136
Reg. 159.95

64K Extended
199.95
26-3127
Reg. 259.95

Radio Shack CITILINE

USE YOUR CITILINE

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

Prices apply at Radio Shack Computer Centers and at participating Radio Shack stores and dealers. Sale ends 12/31/84. TV, cassette recorder and joysticks sold separately. Walt Disney is a trademark of Walt Disney Productions. Spinnaker is a trademark of Spinnaker, Inc. Sesame Street is a trademark of Children's Television Workshop. All rights reserved.

Send me a 1985 Computer Catalog.
Mail To: Radio Shack, Dept. 85-A-353
300 One Tandy Center, Fort Worth, Texas 76102

NAME _____
ADDRESS _____
CITY _____
STATE _____ ZIP _____
PHONE _____

HOT CoCo

Vol. 2 No. 8 January 1985

DEPARTMENTS

Digressions ____ 4
Michael E. Nadeau

Instant CoCo Directory ____ 6

Tips on Entering Our Programs ____ 6

Feedback ____ 8

The Basic Beat ____ 12
James W. Wood

NEW

CoCo for Hire ____ 70
So you want to go into business for yourself?
Terry Kepner and Linda Tiernan

6809 On Line ____ 72
Happy Anniversary, AT&T.
Bobby Ballard

The Educated Guest ____ 74
Education and the Information Age.
Charles H. Santee

The DOSsier ____ 82
What's up at Computerware?
Scott L. Norman

Doctor ASCII ____ 78
Richard E. Esposito, Jesse W. Jackson, and Ralph E. Ramhoff

Reader's Forum ____ 80

Coming Next Month ____ 81

Product News ____ 85
edited by J. Scot Finnie

Reviews ____ 88
Color Compac, Pre-Algebra Integers, ETT, Smith-Corona D-200 printer, and more.
edited by J. Scot Finnie

Gameware ____ 95
Three from Tom Mix.
Peter Paplaskas

ARTICLES

Cover concept and graphics by Donna Wohlfarth

There's No Royal Road to Assembly Language ____ 20
Will Dennis Kitsz's Learning the 6809 really teach you Assembly?
Richard Ramella

Relate Better to Your Data ____ 24
Elite-File is a true relational database manager.
Scott L. Norman

A Productivity Tool for Everyone ____ 30
Use Homespread for household number crunching or bookkeeping at the office.
Adrian Rose

Take Stock in CoCo ____ 38
If you want to win on Wall St., these two programs will give you a leg up.
Carl Christensen

A Shaper of Screens to Come ____ 46
Having trouble designing your textual video screens? Try this helpful utility.
Glen Tapanila and Dick Court

ROM Hacker Part IV ____ 50
Begin construction of your computer-controlled robot arm.
James J. Barbarello

Print It Pretty ____ 56
Use your dot-matrix printer to create fancy letterhead or pleasing graphics.
Robert Smith

Adding Advantage ____ 60
Give your CoCo a calculator mode for statistical analysis.
Bruce Ellis

Computer Dating: A Calendar Generator ____ 65
Never find yourself without a calendar again.
Brian E. Hawkins

CoCoHex ____ 68
Play this classic strategy game with a friend.
Wally Adams

This symbol indicates the program's placement on the Instant CoCo loader, available on cassette. See our Instant CoCo ad for details.

TRS-80 is a trademark of Radio Shack, a division of Tandy Corp.

MPA

HOT CoCo (ISSN 0740-3186) is published monthly by CW Communications, 80 Pine St., Peterborough, NH, and additional mailing offices. Subscription rates in U.S. are $24.97 for one year, $38 for two years, and $53 for three years. In Canada and Mexico, $27.97—one year only, U.S. funds. Application to mail at second class postage rates is pending at Peterborough, NH and additional mailing offices. Nationally distributed by International Circulation Distributors. Foreign subscriptions (surface mail), $44.97—one year only, U.S. funds drawn on a U.S. bank. Foreign subscriptions (air mail), please inquire. In South Africa contact *HOT CoCo*, P.O. Box 782815, Sandton, South Africa 2146. **All subscription correspondence should be addressed to *HOT CoCo*, Subscription Department, P.O. Box 975, Farmingdale, NY 11737. Please include your address label with any correspondence.** Postmaster: Send address changes to *HOT CoCo*, Subscription Services, P.O. Box 975, Farmingdale, NY 11737.
Entire contents copyright 1984 by CW Communications/Peterborough, Inc.

Graduate With DEFT Pascal

As a result of the programming language requirement of the Advanced Placement (AP) Tests, Pascal has become the standard language used in High Schools and Colleges today. On the Color Computer, DEFT Pascal is the standard.

DEFT Bench $49.95

DEFT Edit
Full screen editor

DEFT Linker
(see **DEFT Pascal**)

DEFT Lib
create and maintain program object libraries

DEFT Debugger
debug Pascal machine programs **symbolically**

DEFT Macro/6809
supports entire 6809 instruction set, lets you define your own instructions

R.S. Cat. #90-5001

DEFT Pascal $79.95

DEFT Pascal *Compiler*
complete **Pascal** language, generates machine language object

DEFT Linker
combines multiple program objects into one binary program

R.S. Cat. #90-5000

DEFT Pascal Workbench $119.95

(DEFT Pascal And DEFT Bench Together)

R.S. Cat. #90-5002

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 TRS-80 Color Computer with Extended Disk BASIC, at least 32K of RAM and One Disk Drive. With **DEFT Pascal** ($79.95) you will also need a text editor to write your programs. Software licensing arrangements are available for schools. Dealer inquiries welcome.

DEFT™ SYSTEMS, INC.

#243

Now Available By Express Order At Your Local Radio Shack Store!

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

Quantity of Each: _ DEFT Pascal _ DEFT Bench _ DEFT Pascal Workbench

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 3% for shipping and handling; Maryland residents add 5% for State Sales Tax; add $2.00 for COD.

DEFT Systems, Inc.
Suite 4, Damascus Centre
Damascus, MD 20872

DEFT is a Trademark of DEFT Systems, Inc. **TRS-80** is a Trademark of TANDY Corporation

HOT CoCo

Publisher
JEFF DETRAY

Editor-in-Chief
MICHAEL E. NADEAU

Managing Editor
MARK E. REYNOLDS

Review/New Products Editor
J. SCOT FINNIE

Education Editor
NANCY KIPPERMAN

Technical Editors
PETER PAPLASKAS,
GUIER WRIGHT,
KEITH JOHNSON (INSTANT COCO)

Art Director
DONNA WOHLFARTH

Production Supervisor
SUSAN HAYS

Advertising: 1-800-441-4403
BEVERLY POIRER

West Coast Office: 1-415-328-3470 or 3471
160 Marsh Rd.
Menlo Park, CA 94025

Sales Manager:
GIORGIO SALUTI

Sales Representative:
ALLISON WALSH,
KAREN LETENDRE

Production Manager:
JOYCE PILLARELLA

Manufacturing Consultant:
SUSAN GROSS

Typesetting Manager:
DENNIS CHRISTENSEN

Film Production Manager:
ROBERT M. VILLENEUVE

Darkroom Manager:
NATHANIEL HAYNES

Vice President/General Manager
DEBRA WETHERBEE

Vice President/Finance
ROGER MURPHY

Assistant to Vice President/GM
MATT SMITH

Assistant to Vice President/Finance
DOMINIQUE SMITH

Marketing Manager
PAM ESTY

Director of Circulation
WILLIAM P. HOWARD

Assistant Circulation Manager
FRANK S. SMITH

Direct & Newsstand Sales Manager
RAINO WIREIN: 1-800-343-0728

Director of Credit, Sales, and Collection
WILLIAM M. BOYER

Executive Creative Director
CHRISTINE DESTREMPES

Founder
WAYNE GREEN

DIGRESSIONS

OUR MEAT AND POTATOES

Personal-productivity software has received a lot of press lately, and for good reason. The best of it truly justifies owning a microcomputer, and the worst of it gives ammunition to those who consider owning a micro frivolous.

Word processors, database managers, calendar organizers, and even typing tutors fall into the personal-productivity category. The programs let the individual do more work in less time, whether it's at home or in the office.

But many programs sold under this label are of dubious value. A prime example is the checkbook balancer. Ads will tell you that these programs will straighten out your bank book and help you manage your money better. Human nature dictates, however, that if a person cannot keep a written record of check transactions, it is unlikely that this person will do so on a microcomputer. On the other hand, the meticulous record keeper will find little use for such a program, already having an accurate written account.

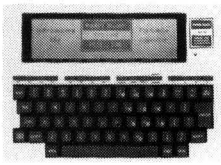
Personal-productivity software is what makes the microcomputer world go 'round. Games provide entertainment, and programming provides intellectual stimulation. But no one can argue that spreadsheets, word processors, financial-planning programs, and the like haven't made life easier for those owning microcomputers.

One of *HOT CoCo*'s main goals is to bring you programs that help you work better at home or in the office. After all, you buy this magazine to make your Color Computer more useful, don't you? Programming techniques are the appetizer, and games are dessert, and we'll give the best of both. But personal-productivity software is our meat and potatoes. *—Michael E. Nadeau*

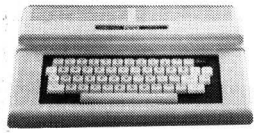
HOT CoCo is a member of the CW Communications/Inc. group, the world's largest publisher of computer-related information. The group publishes 52 computer publications in 19 major countries. Members of the group include: Argentina's *Computerworld/Argentina*; Australia's *Australia Computerworld, Australian Micro Computer Magazine, Australian PC World and Directories*; Brazil's *DataNews* and *MicroMundo*; China's *China Computerworld*; Denmark's *Computerworld/Danmark* and *MicroVerden*; Finland's *Mikro*; France's *Le Monde Informatique, Golden* (Apple) and *OPC* (IBM); Germany's *Computerwoche, Microcomputerwelt, PC Welt, Software Markt, CW Edition/Seminar, Computer Business* and *Commodore Magazine*; Italy's *Computerworld Italia*; Japan's *Computerworld Japan* and *Perso ComWorld*; Mexico's *Computerworld/Mexico* and *CompuMundo*; Netherland's *CW Benelux* and *Micro/Info*; Norway's *Computerworld Norge* and *MikroData*; Saudi Arabia's *Saudi Computerworld*; Singapore's *The Asian Computerworld*; Spain's *Computerworld/Espana* and *MicroSistemas*; Sweden's *ComputerSweden, MikroDatorn* and *Min Hemdator*; the UK's *Computer Management* and *Computer Business Europe*; United States: *Computerworld, HOT CoCo, inCider, InfoWorld, jr, MacWorld, Micro MarketWorld, Microcomputing, PC World, PC Jr. World, RUN, 73 Magazine* and *80 Micro*.

From Computer Plus to YOU . . .

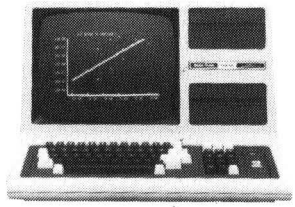
PLUS *after* PLUS *after* PLUS



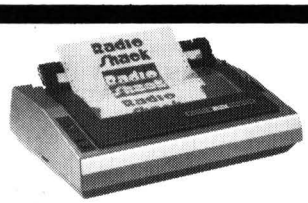
Model 100 8K $495
Model 100 24K $625



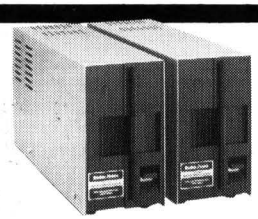
Color Computer II
w/16K Ext. Basic $135
w/64K Ext. Basic $195



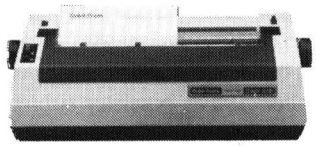
Model 4 16K $629
Model 4 64K
2 Disk & RS232 $1020



DMP120 $385



Color Computer Disk Drive
Drive 0 $289 Drive 1 $220



DWP210 $489
DWP510 $1295

BIG SAVINGS ON A FULL COMPLEMENT OF RADIO SHACK COMPUTER PRODUCTS

COMPUTERS	
Model 4 Portable 64K w/2 Drives	1020
Model 2000 2Dr	2299
Model 12 1 Drive	2360
Model 16B 1Dr 256K	3965
MODEMS	
Hayes Smartmodem II	215
AC-3	125
DC Modem I	89
DC Modem II	160
DC Modem 2212	315
PRINTERS	
Silver Reed EXP500 D.W. Par.	365
Silver Reed EXP550 D.W. Ser.	430
CGP115	159
CGP220 Ink Jet	545
DMP110	299
Gemini 10X	$265
Gemini Powertype	345
Panasonic P1091	315
Smith Corona Fastext	190
Prowriter 8510	345
Okidata and Epson	CALL

ETC.	
Disk Drive Controller	139
Extended Basic Kit	39.95
PBH Ser/Par Conv.	69
64K Ram Chips	62.95
Deluxe Keyboard	35.95
HJL Keyboard	79.95
CCR-81 Recorder	52
Deluxe Joystick (each)	35.95
Joysticks (pair)	22
Video Plus (monitor adapter)	24.95
Video Plus IIC	39.95
Amdek Color 1+ Monitor	299
Amdek Video 300 Green	145
Amdek Video 300 Amber	159
Taxan Color 210 Monitor	235
Taxan Green	125
Taxan Amber	129
SOFTWARE (Tape Version)	
The King	26.95
Screen Print (specify printer)	19.95
Buzzard Bait	27.95
World of Flight	29.95
Colorpede	29.95

Juniors Revenge	28.95
Pac Attack	24.95
Block Head	26.95
Lunar Rover Patrol	24.95
Lancer	24.95
Typing Tutor	23.95
Galagon	24.95
Scott Adams Adventures	19.95
Sea Dragon	34.95
Colorcome	49.95
Telewriter 64	49.95
O-Pak (disk)	34.95
Key-264K	39.95
Deft Pascal	79.95
Elite-Calc	59.95
VIP Writer	69.95
VIP Calc	69.95
VIP Terminal	49.95
VIP Database (disk)	59.95
Graphicom	29.95

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*

VISA AMERICAN EXPRESS MasterCard

computer plus

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

SINCE 1973

IN MASSACHUSETTS CALL (617) 486-3193

18

TRS-80 is a registered trademark of Tandy Corp.

Back Issues

Yes, back issues of *HOT CoCo* are available for all months. Here's a short list of some of the best of what we've published in the past:

June 1983—The CoCo Word Processor, a serial-to-parallel interface project, and a tutorial on tape reliability
July 1983—How to upgrade your CoCo to 64K
August 1983—Speech synthesis without hardware
September 1983—Disk utilities, character generator
October 1983—Animation techniques, build a biofeedback device
November 1983—Nuclear submarine simulation
December 1983—Education issue
January 1984—Programs for the investor and businessman
February 1984—Simulate Extended Color Basic on Color Basic CoCos
March 1984—How a disk stores information, create your own word-search puzzles
April 1984—Peripherals Buyer's Guide, how to shop for a disk drive
May 1984—OS-9 review, Financial Transactions Tracker program
June 1984—Simulations issue, how to build an Atari joystick interface
July 1984—Build your own lowercase modification
August 1984—Your disk drive as a graphics tool
September 1984—Buyer's Guide to Educational Software

In each back issue, you'll also find our regular features, reviews of popular software and hardware, and dozens of useful programs that are yours for the typing in.

Each back issue costs $3.50 plus $1 shipping and handling. On orders of 10 or more back issues, there is a flat $7.50 shipping and handling fee. Send your orders to *HOT CoCo*, Attn.: Back-Issue Orders, 80 Pine St., Peterborough, NH 03458.

Instant CoCo

This directory lists all programs available on HOT CoCo*'s Instant CoCo cassette. See our ad on page 64 for more details.*

Side A

ARTICLE NAME/AUTHOR	PAGE#	FILE	SYSTEM
Copyright Statement	---	TITLE	All
A Productivity Tool for Everyone/Rose Use this spreadsheet program at home or in the office.	30	HOMESPRD	32K ECB
Take Stock in CoCo/Christensen Track and graph your stocks quickly and easily.	38	STKGRAPH QUTENTRY MAKELGON	32K ECB
A Shaper of Screens to Come/Tapanila and Court Use your CoCo to design textual displays.	46	SCRNFORM	16K CB
Print It Pretty/Smith Create attractive letterheads and graphics with a dot-matrix printer.	56	LISTING1 LISTING2 LISTING3 LISTING4	16K CB
Adding Advantage/Ellis Use your CoCo for statistical analysis.	60	ADDING	16K ECB
Side B			
Computer Dating: A Calendar Generator/Hawkins Make calendars for years to come.	65	CALENDAR	16K ECB
Machine-Language Disk I/O/Goodwin (See December 1984 HOT CoCo, p. 70.) CSAVEM"TAPEDISK",4096,4675,4096 Save your machine-language programs to disk.	---	TAPEDISK (m)	16K DECB (1.0 ROM only)
****BONUS PROGRAM****			
Search for Almazar/Williamson Adventure fans will not be disappointed with this complex game.	---	ALMAZAR SFAMAIN ORGSMOVE ORGSLDES ORGSSDES ORGSVOC ORGOBDES ORGSRESP	32K DECB

CB = Color Basic, DECB = Disk Extended Color Basic, ECB = Extended Color Basic, (m) = machine-language program (use CLOADM).

Tips on Entering Our Programs

Having trouble entering our listings from the magazine? Here are a few tips that might help.

First, we print all our Basic listings in the CoCo's 32-column format. This means that each line should appear the same on the screen as it does in the magazine. If a line on your screen does not match the same line in the magazine, reread what you have typed; you might have made an error.

Second, make sure the program is for your computer. Read the System Requirements box. The information in this box represents the minimum system configuration needed to run that particular program. Also, read the article thoroughly before typing in the program. Sometimes the article contains instructions vital to making the typed-in listing work. For instance, some CoCos will not accept the high-speed POKE (POKE 65495,0). The article for a program using this POKE will tell you to change those POKEs to 65494,0 if your computer will not work at the faster speed.

Anyone who owns the new CoCos with the 1.2 ROMs, have noticed poor keyboard response in some published programs. To solve this, you can insert this line: FOR Z = 1TO4:POKE340 + Z,255:NEXT after any line that makes reference to PEEK 338 345. This loop will slow down a Basic program. Another way is to directly insert a POKE xxx,255, where xxx is any keyboard location between 338 and 345. Example: IF PEEK(341) = 251 THEN POKE341,255:Y = Y – 1.

Assembly listings usually require an editor/assembler to enter them into your CoCo. The two most common editor/assemblers are Radio Shack's EDTASM + and The Micro Works' SDS80C. An Assembly listing assembled using the SDS80C will probably not run under EDTASM + .

If all the above fails, send us a printout or a detailed description of the problem you experience along with any error messages. We'll try to work it out for you. We cannot help you if you have modified the original program.

The up-arrow indicates exponentiation on your Color Computer. However, our printer does not have an up-arrow and prints a caret instead. When entering programs from *HOT CoCo*, please change all carets to up-arrows.

Article submissions from our readers are welcomed and encouraged. Inquiries should be addressed to: *HOT CoCo* Submissions Editor, 80 Pine Street, Peterborough, NH 03458. Include an SASE for a copy of our writer's guidelines. Payment for accepted articles is made at a rate of approximately $50 per printed page; all rights are purchased. Authors of reviews should contact the *HOT CoCo* Review Editor, 80 Pine Street, Peterborough, NH 03458.

Problems with Subscriptions: Send a description of the problem and your current and/or most recent address to: *HOT CoCo*, Subscription Department, P.O. Box 975, Farmingdale, NY 11737.

Change of Address: Send old label or copy of old address and new address to: *HOT CoCo*, P.O. Box 975, Farmingdale, NY 11737. Please give eight weeks advance notice.

Dealers: Contact Ginnie Boudrieau, Bulk Sales Manager, *HOT CoCo*, Pine St., Peterborough, NH 03458. (800) 343-0728.

Problems with Advertisers: Send a description of the problem and your current address to: Magazine, Rt. 101 & Elm Street, Peterborough, NH 03458. ATTN.: Rita B. Rivard, Customer Service Manager. If urgent, call 1-800-441-4403.

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, Terminet, 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 N. Nob St.
Del Mar, CA 92014 ↙ 121

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. Allow 2 weeks for personal checks. Send self-addressed stamped envelope for Telewriter reviews from CCN, RAINBOW, 80-Micro, 80-U.S. Telewriter owners: send SASE or call for information on upgrading to Telewriter-64. Telewriter-compatible spelling checker (Spell 'n Fix) and Smart Terminal program (Colorcom/E) also available. Call or write for more information.)

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.

Feedback

Send your letters to Feedback, HOT CoCo, 80 Pine St., Peterborough, NH 03458.

Important Spaces

I've received several letters from readers who are having problems with my program, Hurricane Tracker (*HOT CoCo*, August 1984, p.80). All were getting an FC error in line 6020.

The listing is correct as printed. The error occurs in line 6020 when the space before ELSE in line 6000 is omitted. The Color Computer's Basic sees SSELSES1 as one variable name (equivalent to SS) when the space is left out. This causes S1 to receive a value of zero (if SS≠SB) or −1 (if SS=SB). Either value will cause a function-call error in 6020 when the computer tries to set the draw scale to S1.

Other lines that include significant spaces are 110, 11050, 11060, 12030, 12050, 13100, 13110, 14010, 14030, and 14050.

The moral of this story is that any time you have a variable name followed by a keyword (such as TO, ELSE, and THEN), be sure to separate them with a space.

Roger Smith
Crestview, FL

Future Remedy

Thank you for reviewing CoCoPort in your October issue (*HOT CoCo*, p.94) and for your helpful comments regarding the documentation. We're happy you think "the quality of the kit is outstanding," and we hope to remedy the discrepancies in future instructions.

Richard B. Fredette
Vice President
Green Mountain Micro

"Night Racer" POKE Correction

*The double-speed POKE was printed incorrectly in the text for the article "Night Racer" (*HOT CoCo, *November 1984, p.52). It should read POKE 65495,0 instead of POKE 65494,0. The problem is listed correctly.*

—eds.

The Rest of K-Lock

We inadvertently left out part of the Assembly version of K-Lock, November, p.42. The missing portion appears on this page.

Also, do not lock the disk that contains your only working copy of K-Lock. If you do so and then turn off your CoCo, you will have no way to unlock that disk until you get another copy of K-Lock.

—eds.

Newer Paintpot

The version of Paintpot reviewed in the October issue (*HOT CoCo*, p.104) was an early version of the program used by mistake instead of the current one. The newer Paintpot has been considerably enhanced and virtually all the weak points mentioned by the reviewer corrected.

The current version can draw or erase lines, boxes, and circles with one keystroke, and the palette can be switched on and off. It expands the paint feature, allowing shapes to be filled with any color. The text capability is also a major addition to the program. One of the printed sample graphics (p.106) shows several of these features, although they weren't in the version used by the reviewer.

Paintpot is the result of an effort to create a graphics program that is easy for young CoCo users, yet fun and useful for older artists. A free game is now included with all orders. I hope this gives a better idea of what buyers can expect for their money.

Tim Skene
6073 Durocher Ave.
Montreal, Quebec H2V 3Y7

Clubhouse

Have a Color Computer Club? Let prospective members know about it through a letter to Feedback.

San Luis Obispo, CA

We're organizing a user's group for owners of TRS-80 computers, including the CoCo, in San Luis Obispo. We meet on the third Tuesday of each month in the Radio Shack store at 209 Madonna Road.

Wes Porter
2840 Halycon Road
Arroyo Grande, CA 93420
805-481-2387

```
02400           FDB     $6042
02410           FCB     $D9
02420           FCC     'KENNETH'
02430           FDB     $604C
02440           FCB     $60
02450           FCC     'WUELZE'
02460           FCB     $D2
02470 DISK      FCC     'DISK'  . DISK IS LOCKED
02480           FDB     $6049
02490           FDB     $5360
02500           FCC     'LOCKE'
02510           FCB     $C4
02520 DISKU     FCC     'DISK'  . DISK IS UNLOCKED
02530           FDB     $6049
02540           FDB     $5360
02550           FCC     'UNLOCKE'
02560           FCB     $C4
02570 SORRY     FCC     'SORRY' . SORRY, INVALID PASSWORD
02580           FDB     $6C60
02590           FCB     $60
02600           FCC     'INVALID'
02610           FCB     $60
02620           FCC     'PASSWOR'
02630           FCB     $C4
02640 ERROR     FCC     'DISK'  . DISK ERROR
02650           FCB     $60
02660           FCC     'ERRO'
02670           FCB     $D2
```

```
02680 PASS      FCC     'ENTER' . ENTER PASSWORD
02690           FCB     $60
02700           FCC     'PASSWOR'
02710           FCB     $C4
02720 LMSG      FCC     'LOCKED'
02730           FDB     $2020   . LOCKED
02740           FDB     $2020
02750           FDB     $1000
02760           FDB     $0020
02770           FDB     $0001
02780 MASK      FCB     $80     . MASK BIT FOR PRNT
02790 SECCTR    FCB     0       . SECTOR COUNTER
02800 COUNT     FCB     0       . PASSWORD ATTEMPTS
02810 COMP      FCB     0       . COMPARE SAVE CHAR
02820 SAVE      FDB     0       . RETURN TO BASIC
02830 IN        FDB     0       . PASSWORD BUFFER
02840           FDB     0
02850           FDB     0
02860           FDB     0
02870           FDB     0
02880           FDB     0
02890           FDB     0
02900 ECHO      FCB     0       . ECHO FLAG
02910 BUFF1     RMB     256     . GRAN TABLE BUFFER
02920 BUFF2     RMB     16      . DIR BUFFER
02930 B16       RMB     16      . DEAD SPACE
02940 B32       RMB     16      . SECOND DIR ENTRY
```

Missing Portion of K-Lock

Frogmore, LA

I would like to know if other people in the Ferriday/Jonesville area are interested in starting a Color Computer Club.

George Tanner
Frogmore Pltn.
Frogmore, LA 71335

West Knoxville, TN

I'm trying to form a CoCo User's Group in the West Knoxville and Lenoir City area. Anyone interested can contact me after 3 p.m. by phone or write to me. I'd also like to exchange programming tips and and original software with interested people anywhere.

Kenneth Duckworth
Rt. 8, Box 223
Lenoir City, TN 37771
615-986-8994

CoCo Nuts In Portland, OR

We invite anyone in the Portland Metropolitan area to attend meetings of the CoCo Nuts computer club. Meetings are on the first Saturday of every month at the Far West Federal building on 45th and Woodstock. A large program library on tape and disk is available to all members.

CoCo Nuts would like to exchange newsletters with other CoCo clubs.

Rick Roth
Club President
PO Box 6507
Portland, OR 97228
503-252-5681

Beckley, WV

I'm forming a computer club for TRS-80s in the Beckley area.

Greg Reed
Route 2, Box 76-C
Beckley, WV 25801

Simcoe, Ontario

All CoCo owners or potential owners in the Barrie, Angus-Borden, and surrounding areas are welcome at our club meetings. The new Essa Color Computer Club (ECCC) meets at 7:30 p.m. every other Monday night at the Simcoe St. Public School in Angus. The club's activities include instruction in Basic and Assembly languages, preparation of a newsletter, and discussions on all CoCo-related subjects.

Eldon Doucet
PO Box 1001
Angus, Ontario
LOM 1BO

Framingham, MA

The Framingham Computer Club meets at the Nat Walsh Music Studio on the second and the fourth Thursday of every month. The club also runs a BBS on a CoCo that anyone can access at 617-872-5170.

Mitch Cohen
43 Fox Hill Road
Framingham, MA 01701

New England

The New England Color Computer User's Group has a new address. We meet every three to four weeks and produce a newsletter every month.

Chris Sweet
President
N.E.C.C.U.G.
RD 2, Box 261
Harvard, MA 01451

Northglenn, CO

The Colorado Computer Club meets at 7 p.m. on the first Wednesday of each month at the Westminster Public Library, 3031 W. 76th Ave.

Lee R. Castens
Colorado Computer Club
PO Box 33492
Northglenn, CO 80233
303-427-1925

MC-10 Newsletter

Share ideas, tips, and programs for the MC-10 through a newsletter sponsored by the MC-10 Newsletter Club. The newsletter contains articles, BBS listings, and a feedback section for pooled information. The club's annual dues, which include subscription, are $4.

Jose J. Bray
4730 Cass St.
San Diego, CA 92109

Couleur du Quebec

We'd like to tell readers in Montreal that there's a club strictly for the CoCo in their area, Le Club d'Ordinateur Couleur du Quebec Inc. Members meet in Pointe-Aux-Trembles every Wednesday night at 7:30 p.m.

Nous voudrions informer les lecteurs de Montreal que 'Le Club d'Ordinateur Couleur du Quebec Inc.' (TRS-80 couleur seulement) existe. Les membres se reunissent tous les mercredis soir a 19.30 a Pointe-Aux-Trembles.

Jean-Marie Beaujean
PO Box 452
Succursale P.A.T.
Montreal, Quebec
H1B 5P3
514-270-7507

Saskatoon, SK

The Saskatoon Color Computer Club (SCCC) is a group of CoCo and CoCo-compatible users that meets biweekly to exchange ideas, programs, and programming tips. We have lessons in Color Basic, Extended Color Basic, and machine language. SCCC has a large club library and produces a monthly newsletter. The many software and hardware hackers in our club are happy to help other members with questions.

R. Allen Smith
Vice President
S.C.C.C.
One Madison Crescent
Saskatoon, Saskatchewan
S7L 3V7

On Line

Are you operating a BBS? Drop a note to Feedback and let our readers know about it.

Yonkers, NY

Colorama of Yonkers is now on line. The BBS is in operation 24 hours a day, seven days a week. Colorama has download, boutique, want ads, magazine, graphics, email, and other special features.

Fred Siudym, Sysop
PO Box 253
Yonkers, NY 10704
914-965-7600 (BBS)

North West New Jersey

Colorama of North West Jersey is up and running 24 hours a day, seven days a week. The BBS features news, upload and download, want ads, a shop-at-home service, email, and much more.

Robert Johnson, Sysop
Colorama of North West Jersey
252 RT 46, PO Box 337
Vienna, NJ 07880
201-637-6286 (BBS)

Hubbards, Nova Scotia

All callers are welcome, 24 hours a day and seven days a week, to link up with the new BBS in Nova Scotia. The system has upload, download, email, a magazine section, an online game with scoreboard, and many more sections.

Bruce A.V. Hall, Sysop
PO Box 49, CFS Mill Cove
Hubbards, Nova Scotia
B0J 1T0
902-857-9843 (BBS)

Williamsburg, VA

The Great Gamma Color 80 BBS of the Colonial Capitol of Virginia is a new BBS that operates 24 hours. It features down- and uploading, data files, sysop chat, user log, a public message base, and an email order system for information on hardware, software, and service.

George A. Marsh III
16 Embers Lane
Williamsburg, VA 23185
804-887-5302 (BBS)

Tallahassee, FL

Four BBSs now operate on a 24-hour basis in the Tallahassee area. A large number of CoCo users access these bulletin board systems, though any computer is suitable. The four boards are: The New Tallahassee Board 904-681-6250, Niteowl 904-386-2618, SBBS 904-893-4839, and Time Lord Research RCPM 904-878-1399.

John Guy
1679 Kilkenny Drive
Tallahassee, FL 32308

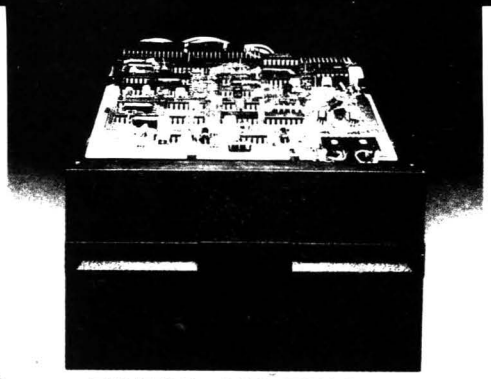
NEW DISK DRIVES

STARTING AT

$159.00

WITH CASE & POWER SUPPLY

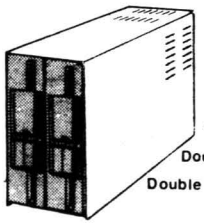
$189.95



TANDON MPI TEAC

Speed 6 ms tk to tk and up
Capacity 250k unformatted
Tracks 40
Warranty **now 1 YEAR**

New Low Price!



40 Tks 6Ms
Double Sided
Double Density

1/2 Hght. Teac/Panasonic

CALL FOR SALE PRICES

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 $189.95

Two Drives in Dual Case & Power Supply ..... ~~$359.00~~ Call

1/2 ht double sided double density Disk Drives (Panasonic/Teac) ~~$219.95~~ Sale

1/2 ht double sided double density Disk Drive with ps & case ..... ~~$249.95~~ Sale

free How to use your new drive system on audio cassette

Single ps & case ...$44.95 ..... Dual ps & case $79.95

Color Computer Controller (J&M) $129.95

DRIVE Ø 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 Ø 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!! (617)234-7047
ORDER TOLL FREE **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

Columbia, SC

The Midlands 80 Computer Club, which has special sections for the CoCo, has a new number for its TBBS. The new number is 803-776-8261. The BBS operates at 300 or 1,200 baud, 24 hours a day, seven days a week. Your sysop is Ed Sehlhorst.

Tommy R. Sanders
Midlands 80 Computer Club
PO Box 7594
Columbia, SC 29202

Tracy, CA

For uploading, downloading, and data files, there's a new Color Computer BBS in the Tracy area that runs on a Silicon Rainbow Products board. The new BBS operates 24 hours a day, seven days a week, and it also supports TRS-80 models III and 4.

Dennis Neatherland
403 W. 11th St.
Tracy, CA 95376
209-835-6496

Cleburne, TX

The Dragonfire BBS has just come on line for the Color Computer. The new BBS operates at 300 baud, no parity, seven data bits, and full duplex. Dragonfire communicates with an air of Dungeon-and-Dragons mystery. A section called The Scroll is devoted to fantasy games. The new BBS has all the features of other BBSes as well. Dragonfire operates from 10 a.m. to 10 p.m. on weekdays, and 24 hours a day on weekends and holidays.

James Redmon, Sysop
1004 Berkley Drive
Cleburne, TX 76031
817-641-0133 (BBS)

Carlisle, Ontario

Dave's CoCo Datacomm is on line 24 hours a day, seven days a week. The BBS features uploading, downloading, message board, and a large on-line shopping section. Sysop David Pearce is glad to chat when he's available.

David O. Pearce
PO Box #3
Carlisle, Ontario
L0R 1H0
416-689-7950 (BBS)

Queens, NY

DSS Peripherals has opened a new BBS for the CoCo. The board supports download, upload, and several other interesting features. It replaces The CoCo's Nest BBS, which is no longer operational. The number of the new CoCo's Nest of Bellerose is 718-DIR-0 BBS. The board has a validation process that eliminates some of the problems common to electronic bulletin-board systems.

Arnie Schiffman, Sysop
Queens, NY

Kabalarian Philosophy

The Philosophy Bulletin Board has been started by Kabalarian Philosophy, an international organization. It introduces the principles of Kabalarian Philosophy and provides a forum for philosophical dialogue. We are also developing course software to introduce Kabalarian concepts. The organization intends to begin several regional BBSes shortly.

Dhorea Delain, Editor
Kabalarian Philosophy
908 W. 7th Ave.
Vancouver, BC
V5Z 1C3
733-1000 (BBS)

OS-9 SIG on CompuServe

The CompuServe OS-9 Forum is a new special-interest group that provides OS-9 users with a message section, real-time conversation, formal instruction, and access to a large section of useful programs for downloading. To access a more extensive library, you can also join the OS-9 User's Group. The fees for the user's group are $25 annually. Call 800-848-8199 for more information about hooking up to CompuServe.

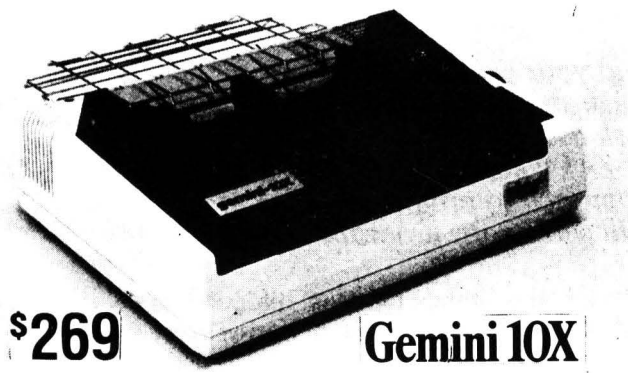
Wm. A. Van Nest, Sysop
18 Brook Village Court
Reisertown, MD 21136
301-526-7211

PRINTER CABLES AND INTERFACES AVAILABLE
Call for current pricing

star 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 .....$CALL
GEMINI 15 (15 Inch Carriage, 100cps) Friction and Tractor .....$CALL
GEMINI 15X (15 Inch Carriage, 120cps) Friction and Tractor ....$CALL
DELTA 10 (10 Inch Carriage, 160cps) Friction and Tractor .....$CALL



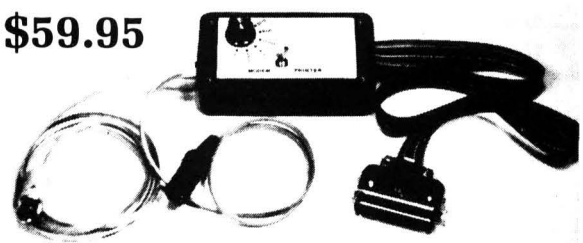
$269 **Gemini 10X**

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 319.95

Nothing more to buy!

Dealer inquiries invited

TDP *TRUE DATA PRODUCTS*
195 Linwood Street, P.O. Box 546
Linwood, Massachusetts 01525
97

CALL US TODAY!! (617)234-7047
ORDER TOLL FREE 1-800-635-0300

See List of Advertisers on page 81

The Basic Beat

HIGH-SPEED CHR$ GRAPHICS AND THE PRINT COMMAND

by James W. Wood

Have you come up with any uses for arrays that I didn't mention last month? There are always new ways to use your computer. The gamblers out there might like a program that picks lottery numbers. In Illinois, you pick six numbers from 1 to 44 and you win various amounts of money if four, five, or six of your numbers match those the state has chosen.

Program Listing 1 generates six numbers from 1 to 44, but you can easily adapt it for any state's system. Line 20 set the FOR loop for the six numbers. Line 40 makes it so the program won't pick the same number twice, and line 50 prints out the winning number. (Do you really think so?) I'll take 10 percent of your winnings.

PRINT@

In order to use high-speed CHR$ graphics, you must know how to use the PRINT@ command, which will let you print a string or numeric value anywhere on the screen. Program Listings 2 and 3 show some of the advantages of PRINT@. Listing 2 covers the screen with numbers from 1 to 100, and Listing 3 displays these numbers at the same screen position. Each new number erases the previous one.

The Color Computer's video screen has 32 columns and 16 rows, giving a total of 512 PRINT@ positions, numbered from 0 to 511. The command, PRINT@ 100, "COMPUTER" prints the C in position 100, the O in 101, the M in 102, and so on. To find position 100, add 96 from the left side of the chart to the 4 from the top row. The row and column meet at position 100.

When you run Program Listing 4, the "HI" erases the "THERE." It is usually best to end PRINT@ statements with a semicolon; retype line 30, but add a semicolon after the second quote.

Does Program Listing 5 print on the bottom line? Yes, but not because you ended line 20 with a semicolon. The PRINT command extended to the end of the bottom row. Whenever anything is printed at position 511, the screen scrolls upward, a feature that goes into many scrolling arcade-type games. Program Listing 6 demonstrates a possible game background. Call it "Number Run."

Now that you can print letters or numbers at any position, I'll show you how to print graphics using something called ASCII (American Standard Codes for Information Interchange) codes, the standard numeric codes that computers change into electric signals to send messages to printers or to each other. Program Listing 7 uses ASCII codes to create the alphabet.

The ASCII codes up to number 128 include such characters as upper- and lowercase letters and numbers and are pretty much the same for all brands of computer. The codes from 128–255 let you create graphics.

The characters that these codes generate on the Color Computer screen are unique. For example, the character the PRINT CHR$(187) creates on the CoCo are different than those for the same command on the Model III or the Apple.

Program Listing 8 shows you all the graphics available. Each PRINT@ position contains four SET positions in a two-by-two pat-

Continues on p. 17

```
10 DIMA(44)
20 FOR B=1 TO 6
30 R=RND(44)
40 IF A(R)=1 THEN30 ELSE A(R)=1
50 PRINTR;
60 NEXT B
```

Program Listing 1

```
10 CLS
20 FOR A=1 TO 100
30 PRINTA
40 NEXT A
```

Program Listing 2

```
10 CLS
20 FOR A=1 TO 100
30 PRINT@80,A
40 NEXT A
```

Program Listing 3

```
10 CLS
20 PRINT@115,"THERE"
30 PRINT@110,"HI"
```

Program Listing 4

System Requirements
4K RAM
Color Basic

```
10 CLS
20 PRINT@480,"BOTTOM LINE"
30 GOTO30
```

Program Listing 5

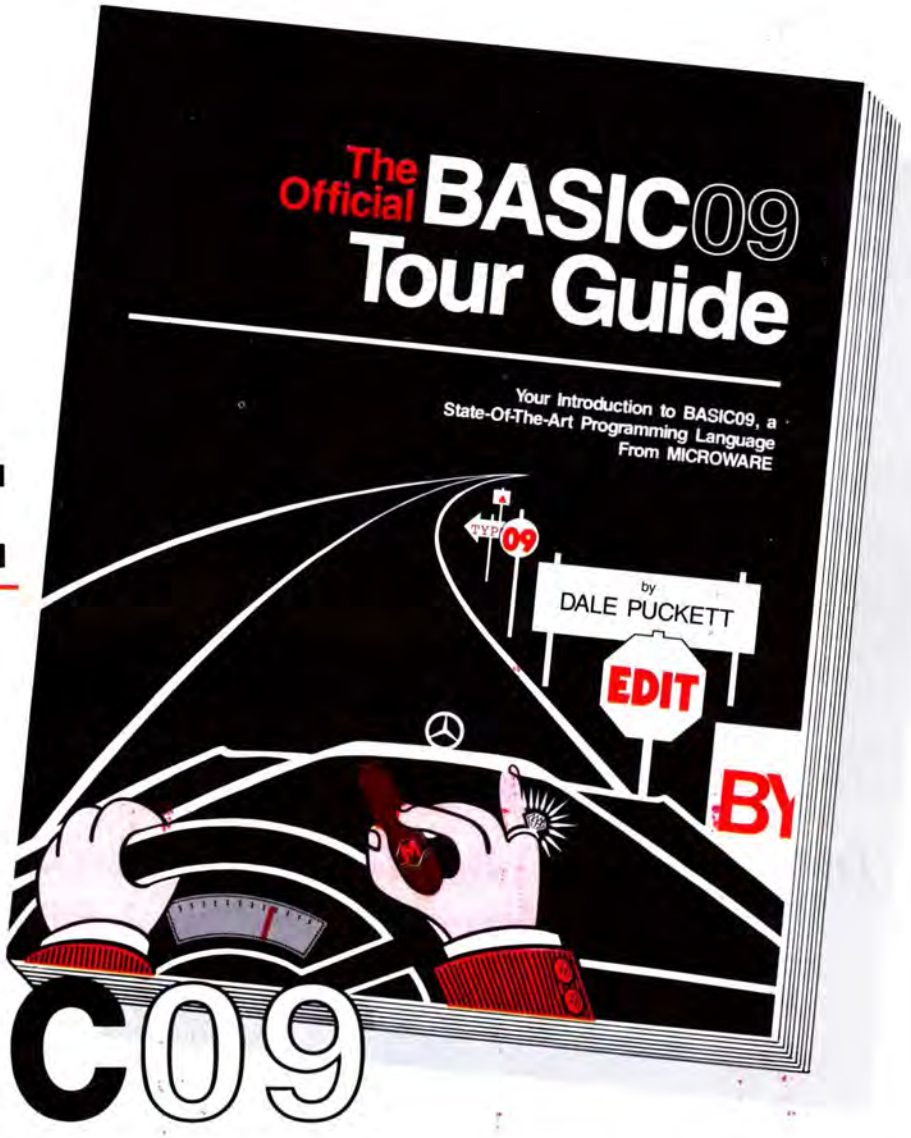
```
10 CLS
20 PRINT@480+RND(30),RND(9)
30 GOTO20
```

Program Listing 6

```
10 CLS
20 FOR A=65 TO 90
30 PRINTCHR$(A);
40 NEXT A
```

Program Listing 7

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 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 $5.00 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 _____

microware®

Specialists in system software for 68-family microprocessors since 1977.

OS-9 and BASIC09 are trademarks of Microware and Motorola.

137

DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES

PRICE BREAKTHROUGH

Super Sale on New Hard Drives

Warranty - One Full Year

Introducing

MEGADISK™

Winchester Hard Drive ready to run on the TRS 80 Model I/III/IV/4P, Color Computer, I.B.M.-PC, Apple, Franklin, Max/80.
Software Drivers: LDOS, NewDos/80, Dosplus, TRSDOS 6.0, CP/M

CALL FOR NEW LOW PRICE

DRIVE A HARD BARGAIN™ **Complete Systems Starting at ~~$999.95~~**

Call Toll Free Ordering 1-800-343-8841

High Quality Lowest Price
Drive 0, 1, 2, 3
for the
Color Computer
Starting at ~~$199.95~~ CALL FOR NEW LOW PRICE

Disk Drive Upgrade
for Model III/IV easy to install system
Starting at ~~$309.95~~ CALL FOR NEW LOW PRICE

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. 10:00 am to 3:30 pm

DEALER INQUIRIES INVITED.

TERMS:
M.C., Visa/Amex and personal checks accepted at no extra charge.
C.O.D., please add $3.00.
Shipping: Please call for amount.
Not responsible for typographical errors.
Prices subject to change.

CANADA
MICRO R.G.S. INC.
751, CARRE VICTORIA, SUITE 403
MONTREAL, QUEBEC, CANADA, H2Y 2J3
Regular **Tel. (514) 287-1563**
Canadian Toll Free 800-361-5155

Service! Service!

All in stock products are shipped within 24 hours of order. Repair/Warranty service is performed within 24 hours of receipt unless otherwise noted. We accept C.O.D., foreign and APO orders. School and D&B corporate P.O.s accepted.

TRS/80 Registered Trademark Tandy Corp. Apple Registered Trademark Apple Computer Corp
IBM-PC Registered IBM Corp. Franklin Registered Trademark Franklin Corp. Max/80 Registered Trademark Lobo Int.
LDOS Reg. Logical System Inc. Dosplus - Micro Systems Software Newdos/80 - Apparat Inc.

DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES

DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES

PRICE BREAKTHROUGH

Super Sale on New Disk Drives

Starting at **$~~169.00~~!** CALL FOR NEW NEW LOW PRICE

Tandon — Siemens — Remex — MPI — Teac — Shugart

40 or 80 Tracks — Single or Dual Head

IBM/PC — TRS/80 — Sanyo Computers -----$Call

Drive a Hard Bargain™!! For your TRS/80, Color Computer, IBM, Apple, Franklin, Max/80, Complete Systems.....from ~~$999.95~~ CALL FOR NEW LOW PRICE

PLEASE CALL FOR OUR MOST CURRENT PRICE REDUCTIONS.

TOLL FREE ORDERING
1-800-343-8841

GENERAL AND TECHNICAL
1-617-872-9090

Disk Drives (0123) TRS/80-IBM-Apple-TI-Franklin-Max/80-LNW ◄ CALL
Model I/III/IV Upgrade (Disk Drives - Memory) ◄
Printers—Daisywheel/Dot Matrix ◄ TOLL
Double Density Controller (Model I) ◄
Color Computer Printer Interfaces ◄ FREE
Disk Drive Operating Systems ◄
Repair Services Now Offered—FAST Turn-a-Round ◄ FOR
Apple/Franklin Compatible Add-On Drives with Case & Cable ◄
Diskettes — Lifetime Guarantee — **Low-Low Prices** ◄ NEW
DISK DRIVE CASES AND POWER SUPPLIES (5 year warranty) ◄ PRICES
Printer **Buffers 8K to 512K** ..... **starting at $143.95**
Model I/III/IV Speed-up Mod ..... **starting at $75.00**
Cables—Printer/Disk Drive ..... **starting at $16.00**

Warranty on Disk Drives — 1 Full Year Parts and Labor

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

DEALER INQUIRIES INVITED.

TERMS:
M.C./Visa/Amex and personal checks accepted at no extra charge.
C.O.D., please add $3.00.
Shipping: Please call for amount.
Not responsible for typographical errors.
Prices subject to change.

CANADA
MICRO R.G.S. INC.
751, CARRE VICTORIA, SUITE 403
MONTREAL, QUEBEC, CANADA, H2Y 2J3
Regular **Tel. (514) 287-1563**
Canadian Toll Free 800-361-5155

Service! Service!

All in stock products are shipped within 24 hours of order. Repair/Warranty service is performed within 24 hours of receipt unless otherwise noted. We accept C.O.D., foreign and APO orders. School and D&B corporate P.O.s accepted.

TRS/80 Registered Trademark Tandy Corp. Apple Registered Trademark Apple Computer Corp
IBM-PC Registered IBM Corp. Franklin Registered Trademark Franklin Corp. Max/80 Registered Trademark Lobo Int.
LDOS Reg. Logical System Inc. Dosplus - Micro Systems Software Newdos/80 - Apparat Inc.

DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES

Now you can learn how to use your color computer for more than just games . . . with HOT CoCo magazine.

With the right information on programming utilities, debugging, and graphics there's no limit to what you can do with your color computer. **HOT CoCo** gives you that information. It can make your computer a versatile tool that you'll find indispensible. **HOT CoCo** is packed with:

- **Business application instructions** to help you understand what the color computer can do at the office. You can use these applications immediately because they're written in plain english.
- **Home management help**—let **HOT CoCo** show you how everyday chores can be done on your machine. You'll be surprised at just what you can do and just how much time can be saved with your color computer.
- **Programming tips & tutorials**—**HOT CoCo** will show you how to program. It's loaded with programming techniques and hints to help the novice and expert programmer write and improve their programs.
- **New product reviews & announcements**—if you're looking for equipment to expand the use of your computer, **HOT CoCo** reviews numerous hardware and software products each month. Plus, **HOT CoCo**'s new product announcements let you comparison shop at home—spend more time at your computer and less time in computer stores.

And **HOT CoCo** is loaded with challenging games to provide hours of fun and excitement for your whole family.

Let **HOT CoCo** show you how much time you can save with your color computer. Order **HOT CoCo** today! Take advantage of this money-saving offer. Get 12 issues of **HOT CoCo** for only $24.97. Use the attached order card, the coupon, or call

TOLL FREE 1-800-258-5473.
IN NH CALL 1-924-9471.

☐ ***YES! I want more use from my CoCo!***

Send me 12 issues of **HOT CoCo** for the low subscription price of $24.97. I'll save 30% off the newsstand price!

☐ *Check Enclosed* ☐ *Bill Me*

Name _____

Address _____

City _____ *State* _____

Zip _____

Canada & Mexico $27.97, 1 year only, US funds drawn on US bank.
Foreign Surface $44.97, 1 year only, US funds drawn on US bank.
Foreign airmail please inquire. Please allow 6–8 weeks for delivery.

HOT CoCo • PO Box 975 • Farmingdale, NY 11737

351F 4

Continued from p. 12

tern. Therefore, you have 16 ways of turning four colors off or on, so each color has 16 graphics patterns, but you'll have a hard time seeing the individual patterns in Listing 8.

Program Listing 9 displays the graphics characters one at a time in a PRINT@ position surrounded by a border. Notice how the pattern flashes through a definite sequence in each color. Did you catch anything when you ran Listings 8 and 9? The same pattern repeats in each color.

To create a graphic picture, you must determine which CHR$ codes you need to print. Use Fig. 1 to create a program that draws the spaceship in Fig. 2. If you need help, take a look at Program Listing 10. T$ is a string that represents the top row. The CHR$(128) represents a blank or blank space. CHR$(177) represents red (177 plus the 1 from the lower left corner of Fig. 1). The 191 is a solid red (all four corners).

If you remember your SET graphics lessons, you'll know that the CoCo can combine black and another color in one PRINT@ position, but that's all—you can't combine any other two colors in the same position.

Notice how much faster CHR$ graphics are than SET graphics. Try creating your own design.

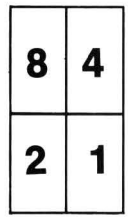
Add Program Listing 10A to Listing 10 to move the spaceship across the screen from left to right. The FOR A loop prints the ship at a different location each time. The FOR T loop in line 55 smooths the animation somewhat, but a better way is to shift the object half a PRINT@ position each time it moves. I'll show you how to do that in a future column, since it involves two different sets of CHR$ codes. Notice that PRINT@ A+32 and A+64 place the middle and bottom of the spaceship directly below the top. Adding 32 moves an item down one column.

Using the keyboard to move objects on the screen can be a little complicated. Program Listing 11 performs this task about as simply as possible to let you press the arrow keys to move a square of light on the screen. It is only possible to use the arrow keys with INKEY if you define their CHR$ codes as in lines 20–30 (U for up, D for down, R for right, and L for left).

The values of the four sections of each PRINT@ position.

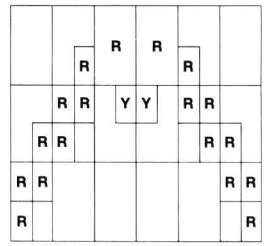
Starting numbers:

128	green
144	yellow
160	blue
176	red
192	buff
208	cyan
224	magenta
240	orange



Add the starting number of the desired color to the values of the sections you want to be that color. For example, to make the upper left and lower right red, use 176 + 8 + 1 = 185. Therefore, PRINT CHR$(185);

Fig. 1. SET Positions and the ASCII Codes for Color



R = red
Y = yellow

Fig. 2. A Spaceship Design

Line 60 prevents the square from moving beyond the screen's upper border. If the PRINT@ position (A) is less than zero, add 32 to bring it back down below the border. In the same way, line 70 keeps the square from moving below the bottom border.

Line 80 is somewhat more complicated, and prevents the spaceship from passing too far to the left. If A is reduced from 32 to 31, then (31 + 1)/32 equals 1 and so does INT(31 + 1)/32. INT chops off the decimal part of a number. Not stopping at 31 and adding 1 back to A would result in the square

```
10 CLS0
20 FOR A=128 TO 255
30 PRINTCHR$(A)+CHR$(128);
40 NEXT A
```

Program Listing 8

```
10 CLS0
20 GR$=CHR$(143):G$=GR$+GR$+GR$
30 FOR W=139 TO 203 STEP 32
40 PRINT@W,G$;:NEXT W
50 FOR A=128 TO 255
60 PRINT@172,CHR$(A);
70 PRINT@180,A;
80 FOR B=1 TO 200:NEXT B
90 NEXT A
```

Program Listing 9

```
10 T$=CHR$(128)+CHR$(177)+CHR$(1
91)+CHR$(191)+CHR$(178)+CHR$(128
)
20 M$=CHR$(177)+CHR$(190)+CHR$(1
48)+CHR$(152)+CHR$(189)+CHR$(178
)
30 B$=CHR$(190)+CHR$(128)+CHR$(1
28)+CHR$(128)+CHR$(128)+CHR$(189
)
40 CLS0:A=40
50 PRINT@A,T$;:PRINT@A+32,M$;:PR
INT@A+64,B$;
60 GOTO60
```

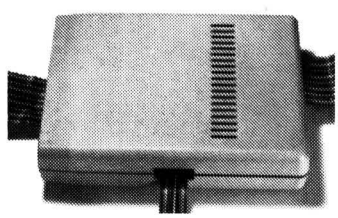
Program Listing 10

```
40 FORA=32TO57:CLS0
50 PRINT@A,T$;:PRINT@A+32,M$;:PR
INT@A+64,B$;
55 FORT=1TO2:NEXTT
60 NEXTA:GOTO40
```

Program Listing 10a

ATM-80

DATA ACQUISITION & CONTROL SYSTEM
FOR THE COLOR COMPUTER



APPLICATIONS:
• ENERGY MANAGEMENT • PROCESS CONTROL • SCIENTIFIC EXPERIMENTS • ROBOTICS • TECHNICAL EDUCATION • SECURITY SYSTEMS

FEATURES:
• 20us 8-BIT A-TO-D CONVERTER • 32-CHANNEL ANALOG MULTIPLEXER • PROGRAMMABLE GAIN AMPLIFIER • PEAK DETECTOR AMPLIFIER • 8-BIT D-TO-A CONVERTER • 4-BIT I/O PORT (PROGRAMMABLE) • 2K RAM • CONTROL SOFTWARE IN ROM • USER'S MANUAL

ASSEMBLED & TESTED $184.95
MANUAL ..... $ 15.00

CLOCK/CAL/MEM CARTRIDGE

FEATURES:
• COUNTS HOURS, MIN., SEC., MONTH, DATE, DAY OF WEEK, YEAR, LEAP YEAR • PROGRAMMABLE INTERRUPT TIMER (.5, 5.0 AND 60 SECOND INTERVALS) • ROM BASED CONTROL SOFTWARE • 8K RAM SPACE • CLOCK BACKUP BATTERY

ASSEMBLED & TESTED ..... $ 89.95
W/8K RAM $119.95

For more information, call or write to:

CYBERTRON TECHNOLOGY
3131 TIMMONS #723
HOUSTON, TEXAS 77027
(713) 840-1272

536

See List of Advertisers on page 81

jumping instantly from the left to the right edge of the screen. You can delete line 190, but you'll have to release the arrow keys and press them again each time you want to move the square one position.

Next month I'll show you how to use DATA lines to store information. They're a great way to store CHR$ code values, and you can use them for other things, too.

Oh yes, remember the CHR$ codes for the alphabet? Figure 3 lists them. You could use them to put secret messages into a program—take a look at Program Listing 12, for example. An incorrect password erases the program, but unless you executed a POKE to keep someone from displaying the listing, you don't have much protection from someone easily finding the secret. Once protected, though, you could use this method to hide clues in an adventure game, or answers to a quiz.■

```
PRINT    CHR$(71) + CHR$(79) +
CHR$(79) +  CHR$(68) + CHR$(66)
CHR$(89) + CHR$(69)
```

```
10 CLS0:A=272:C$=CHR$(128)
20 U$=CHR$(94):D$=CHR$(10)
30 L$=CHR$(8):R$=CHR$(9)
40 PRINT@A,CHR$(255);
50 A$=INKEY$
60 IFA$=U$ THEN PRINT@A,C$;: A=A
-32:IFA<0THEN A=A+32
70 IFA$=D$ THEN PRINT@A,C$;: A=A
+32:IFA>510THENA=A-32
80 IF A$=L$ THEN PRINT@A,C$;:A=A
-1:IF INT((A+1)/32)=(A+1)/32 THE
N A=A+1
90 IF A$=R$ THENPRINT@A,C$;:A=A+
1:IF INT((A+1)/32)=(A+1)/32 THEN
 A=A-1
190 FORW=341TO344:POKEW,255:NEXT
W
200 GOTO40
```

Program Listing 11

```
10 CLS
20 A$ = CHR$(82)+CHR$(85)+CHR$(7
1)
30 INPUT"WHAT IS THE PASSWORD";B
$
40 IF B$<>A$ THEN NEW
50 REM ---PROGRAM STARTS HERE
```

Program Listing 12

Address correspondence to James W. Wood, 424 N. Missouri, Box 507, Atwood, IL 61913.

Letter	ASCII
A	65
B	66
C	67
D	68
E	69
F	70
G	71
H	72
I	73
J	74
K	75
L	76
M	77
N	78
O	79
P	80
Q	81
R	82
S	83
T	84
U	85
V	86
W	87
X	88
Y	89
Z	90

Fig. 3. CHR$ Codes for the Alphabet

New From Saguaro Software! ⌐70

History From 1863 To 1976
On two 16K non-extended tapes. For 1-4 people, informative & fun way to learn important dates in world history. Written for students by a teacher. Tape - $19.95, Disk or Amdek - $24.95.

Raid On Boordanovka
Your mission, should you decide to accept it, is to steal Russia's newest weapon and save the world. Text adventure with 50 rooms. Tape - $24.95. Disk or Amdek - $29.95.

Search For The Llangth
After years of study & searching, you have at last traced the alien race of Llangth to this valley. Now your quest for the power of Llangth begins! Tape - $24.95. Disk or Amdek - $29.95.

We Are Discount Distributors For:
- Prickly Pear
- Petrocci Freelance
- Tom Mix
- Computer House
- Sugar Software

Call For Our Catalog!

Saguaro Software
Toll-Free Order Line
1-800-223-5369, Ext. 260
Monday - Friday, 9 AM - 5 PM MST

Co-Co Receivables
Keep track of all those accounts with current list of accounts, statement printing, last activity date, and current month's transactions, debits & credits. Disk storage of data. 32K disk, $29.95.

OTHXO
Othello® machine language game for the 16K Co-Co. 2 modes of play - you against a friend or you against the computer. When playing the computer, it will play hard or easy. In either, you had better think hard! Object of the game is to change the opponent's spots to yours by placing your marker at the end of a row started by your marker. Not as easy as it sounds! Tape or disk, $24.95. Amdek, $29.95.

Treasure Hunt
A graphics text adventure. You walk with our graphics character through desert, mountains and city to seek the illusive treasure of gold. Super graphics with a person who walks with you at each turn.
Disk - $29.95.

Do Or Die!
The year is 4001 A.D. You are a cargo trucker delivering a load in the Dorfian star system. Your mission is to get back to your home planet of Irat, alive. Can you survive the journey? Tape or disk - $24.95. Amdek - $29.95.

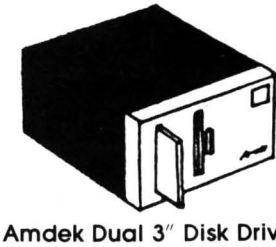
Loveless Manor
Trapped in a bedroom by your evil aunt, you've admired Queen Cinderella's castle in the distance... and you've just discovered she's a distant cousin. Can you escape to her protection? 32K Great word adventure. Tape - $19.95. Disk - $24.95. Amdek - $29.95.

Stars Of America
Education should be fun - this program is just that! This tutorial uses 25 of the superstars of American history, from George Washington to Ronald Reagan.

The Civil War
A challenging two - person game. Questions cover Carpet baggers to the Battle of Vicksburg. Points are assigned according to the difficulty of the question, scores are displayed throughout the game.

Both Only: Tape 19.95. Disk 24.95

Move-It	Co-Co 1	15.95
Kidstuf		19.95
CONFUSION	Tape	19.95
Ultimate Bingo And Jackpot	Tape	19.95
Co-Co Keno	Tape	24.95



Amdek Dual 3" Disk Drive
Call For Absolute Lowest Price!
We'll Beat Any Advertised Price!

New!
Amdek Color Monitors
Color 300 • Color 400
Color 500
Call For Absolute Lowest Price!

Gift Certificates Available!
In Any Amount

VISA

7331 E. Beverly Drive • Tucson, AZ 85710
Arizona Residents Add 7% Tax • Add $1.50 Shipping Per Program ($5 Max)
Dealer Inquiries Welcome • Ask About Royalties • Some Quantities Limited

MasterCard

HARD DISK *for the CO CO*

5 meg $1295 *10 meg $1595*

---------- COMPLETE SYSTEM ---------- JUST PLUG IN ----------

HARD DISK - OPERATING SYSTEM features

- FULLY INTEGRATED INTO COLOR DISK BASIC
- TAPE TO HARD DISK
- DISK TO HARD DISK
- HARD DISK TO TAPE
- HARD DISK TO DISK
- D U P L I C A T E
- COLD START
- M-RUN
- ALL EXTENDED DISK BASIC COMMANDS

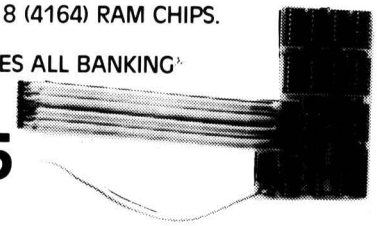
without hard drive ... operating system only
INTERFACE CARD & H-DOS $425.00

PERIPHERAL *H-DOS UTILITY PACK* $129.00
BOOT STRAPS OS-9 OR FLEX, MDIR (master directory)

128 K - RAM CARD

INCREASE YOUR 64 K Co-Co OR Co-Co II TO 128 K RAM

- ☐ FITS COMPLETELY INSIDE YOUR COMPUTER.
- ☐ SWITCHES TWO NEW 32 K BANKS OF RAM IN AND OUT OF MEMORY.
- ☐ BANKS CAN BE MAPPED IN THE UPPER HALF OR LOWER HALF, OR CAN ALSO BE A SECOND COMPLETE 64 K BANK.
- ☐ SWITCH TABLES INCLUDED.
- ☐ SIMPLE INSTALLATION AND DOCUMENTATION.
- ☐ A MUST FOR OS-9 USERS.
- ☐ COMPLETE WITH 8 (4164) RAM CHIPS.
- ☐ PAL CHIP HANDLES ALL BANKING COMMANDS.



$149.95

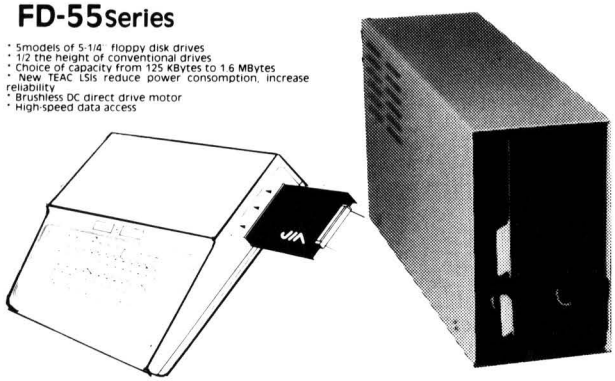
DISK DRIVES for the CoCo

TANDON DISK DRIVES
40 track - 6 ms trk-trk
FULLY COMPATIBLE

TEAC *DISK DRIVES*

FD-55Series

* 5models of 5-1/4" floppy disk drives
* 1/2 the height of conventional drives
* Choice of capacity from 125 KBytes to 1.6 MBytes
* New TEAC LSIs reduce power consomption, increase reliability
* Brushless DC direct drive motor
* High-speed data access

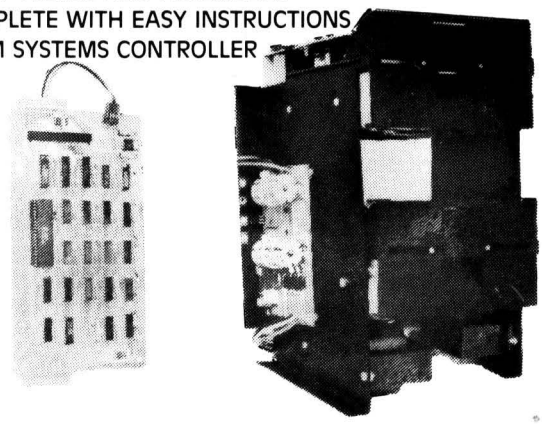


Super Sale on New Disk Drives

Distributor for - SOFTWARE SUPPORT, INC. Framingham, MA.

MODEL III & 4 DISK CONTROLLER KIT

- ☐ AVAILABLE FOR FULL HIGHT OR SLIM LINE DRIVES
- ☐ EASY INSTALLATION
- ☐ FULLY TESTED AND ASSEMBLED
- ☐ COMPLETE WITH EASY INSTRUCTIONS
- ☐ J & M SYSTEMS CONTROLLER



USA
RGS MICRO INC.
MAIN STREET
DERBY LINE, VERMONT
ZIP 05830
TEL: 802-873-3386
ORDER LINE 800-361-4970

RGS MICRO INC.

185

CANADA
RGS MICRO INC.
759, VICTORIA SQUARE 405
MONTRÉAL H2Y 2J3
TEL.:(514) 287-1563
ORDER LINE ONLY ★★★
QUÉBEC - ONTARIO - MARITIMES
800-361-5338
WESTERN CANADA 800-361-5155

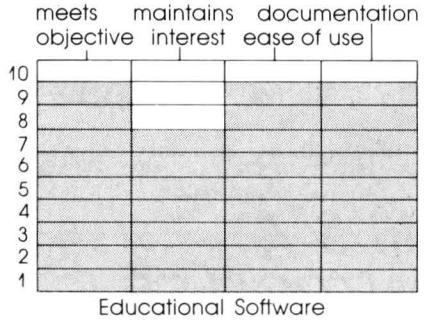
TERMS: VISA - MASTER CARD - AMERICAN EXPRESS ——— **HOURS:** MONDAY - SATURDAY 10:00 AM - 6:00 PM

See List of Advertisers on page 81

BY RICHARD RAMELLA

THERE'S NO ROYAL ROAD TO ASSEMBLY LANGUAGE

All you need to learn Assembly language is *Learning the 6809*—and a lot of sweat and determination.



***Learning the 6809*—**
Micro Language Lab
Green Mountain Micro
Bathory Road, Box H
Roxbury, VT 05669
802-485-6112
$99 ($3 postage)

by Richard Ramella

When Euclid was teaching geometry to King Ptolemy of Egypt in about 300 B.C., His Highness is said to have asked for an easier way of learning. Euclid allegedly told him, "There is no royal road to geometry."

The same goes for Assembly-language programming, except double. Maybe quadruple.

However, Dennis Kitsz and his elves at Green Mountain Micro have fielded an Assembly-language course that could be the turning point in your programming life. *Learning the 6809* is no royal road, but it is a fairly comfortable way to ride along the arduous highway en route to proficiency in Assembly-language programming.

Can you do it? Yes, if you're strongly motivated. No, if you're impatient or lack concentration. Yes, if you know a little bit or a lot about Basic. No, if you dislike mental travail. It is not easy, and Kitsz honestly says so up front.

If you opt for the course, be prepared to spend 200–300 hours on it. You will not zip through these lessons, for they include new concepts. Your knowledge of Basic is only a departure point for clues to the mysteries of Assembly-language programming. You will be traveling across alien landscapes. (That reads like something Kitsz said on the tape. If so, I stole it and he's right!)

The course costs $99. You also need Radio Shack's EDTASM (ROM pack or disk), which costs a bit more than $50.

Learning the 6809 includes 24 half-hour lessons on 12 cassettes. The tapes contain Kitsz's enthusiastic and nearly verbatim recitation of the lessons in the text, which has 222 loose-leaf pages, plus technical appendices on the Motorola processor.

The tapes also contain 35 Basic and Assembly programs printed in the text, so there is no need to type in any program. These include an Assembly listing for the Game of Life, which is very interesting to see run. Questions and answers in a style worthy of the *Baltimore Catechism* (e.g., *What does bit mean? Bit means binary digit*) grace the margins around each lesson.

You get two different teaching techniques. Reading a lesson while listening to Kitsz go through it is an excellent method of pacing and reinforcing new information. When Kitsz's enthusiasm exceeds your ability to understand, you can rewind the tape a few paragraphs and try, try again (and again. . .).

The margin, catechism style, ties together concepts from different approaches by posing and answering questions in a simple way.

Now, let me tell you what happened to me: I agreed to go through this course for the same reasons any Basic programmer might. Assembly-language programs are lightning-fast in execution, they surpass unwieldy Basic's abilities, and Assembly is what the big boys use to write arcane programs envied by us plebians who live in a Basic world.

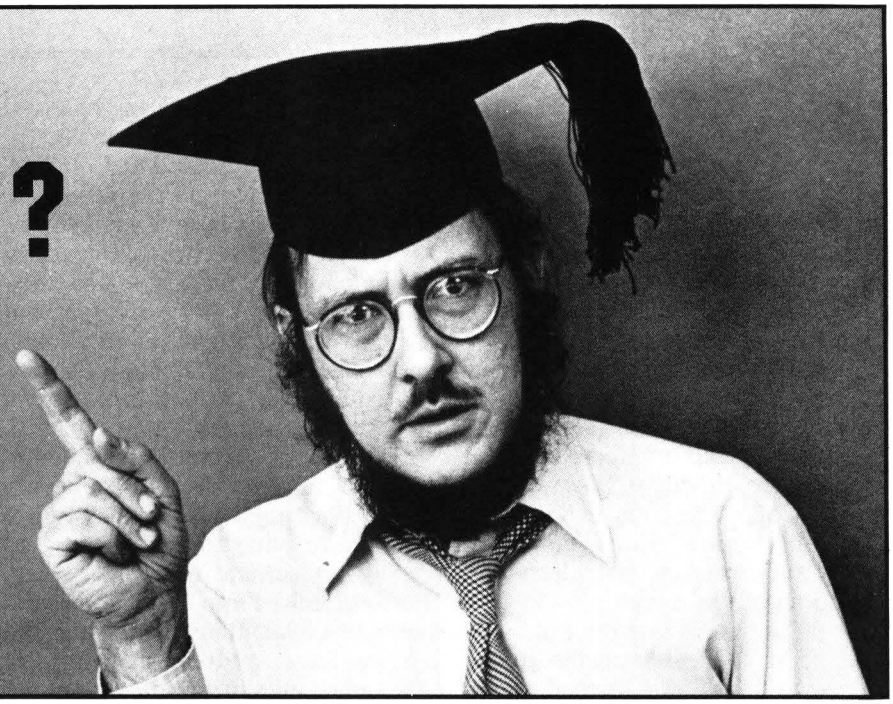
When the course arrived, I noted its 24 lessons and multiplied each by two hours. I would spend two hours per lesson each evening and know Assembly language in only 24 days.

I was an optimistic fool, as became clear by the second lesson, when Kitsz teaches how to count in hexadecimal numbers. It's rather like being told you must memorize the multiplication table from 24 times 24 to 50 times 50, for reasons which would become clearer later. It was the first of many occasions in which there is no other way than stopping the lesson and learning the concept.

So I stopped and learned it.

I got a bit lost in Lesson 3. By Lesson 4 I was hopelessly confused, though I had been studying for more than a week of evenings. At that point I resolved to listen to the lesson tapes and read the text straight through, for two reasons. One, I had a vague hope I

FEELING HELPLESS? YOU NEED TO LEARN A LESSON!



MICRO LANGUAGE LAB: LEARNING THE 6809

Feeling at the mercy of a programmer somewhere? Mystified by a machine? My **Micro Language Lab** will give you the power to end those helpless feelings.

Here's why. The heart of *any* computer program *anywhere* is machine language. Every piece of software uses it — your favorite game, spreadsheet, word processor, data base manager, or recipe file. Every time you hit "Enter", it's working. All the languages and operating systems are created from it. Basic, Fortran, Pascal, Flex, OS-9, TRSDOS... they're 6809 machine language, the whole lot!

And you can learn the language of the 6809, the programming heart of your Color Computer, with my **Micro Language Lab.**

Not everyone can program. Writing a few lines in Basic now and then doesn't make you a programmer. But if you *can* program, then my **Micro Language Lab** will teach you — the right stuff, the right way.

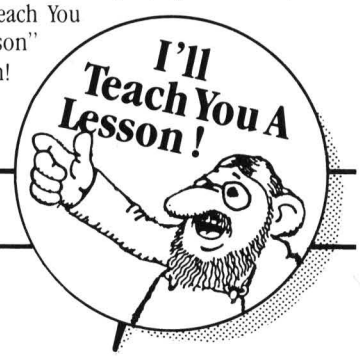
I'll teach you in 24 half-hour lessons on 12 audio cassettes, with a 220-page textbook, with data booklets, with 35 sample programs, and with a programming reference card. You'll spend 50 hours or more with my course, listening, watching, and working. And when you're done, you'll be programming your Color Computer in the 6809's language.

Stop ignoring those gnawing feelings of helplessness. The 6809 is where the power lies in your computer. Turn on that power with the **Micro Language Lab.**

- **Micro Language Lab,** $99.00 (plus $3.50 shipping and handling)

  Requires 16K Extended Basic EDTASM +

Not sure? Write or call for a Table of Contents and sample pages — and your "I'll Teach You A Lesson" button!



ALSO AVAILABLE FROM GREEN MOUNTAIN MICRO

(Add $2.50 shipping and handling to your order)

Lowerkit III

- Full-time upper and lowercase installs in 15 minutes.
- Normal and reverse video standard
- Fully compatible with all Alpha and Graphic modes

$79.95 assembled and tested
$49.95 complete kit of parts
Important! Specify Color Computer or Color Computer II

TV Buff II, clear image for video monitors, $19.95 (specify CoCo or CoCo2)

CoCoPort parallel interface (now includes plastic case), $54.95 / $44.95 kit

ColorPack ROM/RAM pack, $29.95 (specify configuration) / $19.95 kit / case $3.00 extra

64K memory upgrade kit with full instructions, $49.95 / with memory test on tape, $54.95

Color Quaver Software Music Synthesizer on tape (requires 32/64K), $19.95

Color Burner EPROM Programmer (2716/32/32A/64/64A/128, 68764/66) with software, $69.95 / $56.95 kit

User Group, Educational, Club and Dealer Discounts are available.

TRS-80 and TRSDOS are trademarks of Tandy Corporation. Flex is a trademark of TSC, Inc. OS-9 is a trademark of Microware Corporation.

Green Mountain Micro
Bathory Road, Box H
Roxbury, Vermont 05669
802 485-6112 ✓98

Hours: 9am - 5pm EST, Monday - Friday
COD/VISA/MASTERCARD

✓ See List of Advertisers on page 81

would begin to learn through some mysterious osmotic process—more foolishness on my part. Two, I wanted an overall flavor of the material so I could decide whether to return the course to *HOT CoCo* in shameful failure or convince myself to go through the lessons in the depth required.

An unexpected third thing happened, despite the fact I got rather groggy in the process. Without understanding Assembly language, I began to absorb the harmony and connectedness of what Kitsz was driving at. I began to regard the Color Computer as a kind of warehouse maze whose contents opened and closed to my understanding as I traveled through.

In time I dimly saw the links between these suddenly tangible guideposts within. And as I listened to the final lesson, in which Kitsz bestowed the title of Assembly programmer on me without knowing I'd shamelessly cheated, I was resolved with a definite sense of excitement and discovery to go back and do the course the right way.

This, then, is a progress report. I have now spent about 50 hours on the course and have arrived at Lesson 8. I can put together very simple Assembly listings, but I'm far from creating even intermediate efforts. I'm learning some hybridizations—calling machine code from a Basic program, but I'm far from my goal of translating my own Basic programs into Assembly and, better, writing in Assembly as a starting point.

There is an overwhelming number of new concepts. The introductory lesson filled me with hope. Lesson 2 was simple but grinding with its necessity of learning to count in hex. Lesson 3 delved into the microprocessor with explanations of registers, the accumulator, addresses and more. The mnemonics of Lesson 4 threw me completely.

Then followed lessons on the editor/assembler, addressing modes, instructions, and . . . well, I'm not qualified to say what comes next even though I've read it. But bit by bit (and byte by byte) I began to learn about hand assembly, timing, sound, and different ways of making things happen.

When I become enmired in some confusing concept, often an idea from a previous lesson will intercede and help me understand the new material. At other times, I find myself repeating entire chapters, slowly and painfully.

When I am depressed, I recall my early days of learning Basic. There was a time when I knew, for example, exactly what Basic's string statements did, but I was unable to use them well because I hadn't run up against programming puzzles for which a string trick would be the solution. It's somehow the same at this point in Assembly.

The finding? If you want to learn Assembly and are determined, get this course. The price can't be beat, all the answers are here, and Kitsz has put out a first-rate, honest product.

Despite the occasional fear that my IQ has dropped to equal by belt size, I give this product a 9.8 out of a possible 10. Green Mountain Micro, you're my kind of people.■

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
64k (DEI) Memory Upg	$ 59.95
Amdek Disk Drives	$499.95
26-3029 CoCo Drive 0	$309.95
26-3023 CoCo Drive 1	$239.95
HJL Keyboard (D,E,F,2)	$ 79.95
Super Pro Keybd. (D,E)	$ 64.95
26-3127 64K Extended CoCo2	**$179.95**
26-3134 16K Standard CoCo2	$ 89.95
26-3136 16K Extended CoCo2	$129.95
26-3801 Model 100 8K	**$349.95**
26-3816P 8K Upgrade Model 100	$ 69.95
26-1192 CGP-115 Printer/Plotter	$119.95
26-1276 DMP-105 Printer 80 cps	$179.95
C. Itoh 8510 AP Printer 120 cps	$399.95
Gorilla/NAP Video Monitor (Grn)	$109.95
Video Monitor Adapters	$ 29.95
26-3024 RS Multi-Pac Interface	$ 89.95
Botek Ser/Par Interface	$ 69.95

ACCESSORIES

RS D.C. Modem IB	$ 89.95
Novation J-Cat Modem	$129.95
RS D.C. Modem II	$179.95
USR Password 300	$179.95
Hayes SM 300 Modem	$239.95
USR Password 1200	$429.00
CoCo Switcher	$ 39.95
Elephant Disks ssdd	$ 22.95
26-3030 OS-9 (64k)	$ 64.95 (disk)
Basic-09 (req. OS-9)	$ 87.95 (disk)
"C" Compiler (OS-9)	$ 87.95 (disk)
FHL O-Pak (req. OS-9)	$ 34.95 (disk)
Elite Word	$ 59.95 (d&c)
Elite Calc	$ 59.95 (d&c)
Color Term Plus	$ 29.95 (cass)
Deft Pascal	$ 79.95
26-3012 Deluxe Joystick	$ 34.95

NEW! Dual Double Sided Drives including case, power supply & cable $475.00

NEW! 26-3128 64K Direct Video CoCo2 $219.95

MSI SOFTWARE

MSI DISKUTIL	NEW	$19.95
COLOR FINANCE 1	RAINBOW CERTIFICATION SEAL	$49.95
COLOR FINANCE II	NEW	$69.95
MSI NAMEFILE	RAINBOW CERTIFICATION SEAL	$24.95
MSI CALENDAR	NEW	$19.95

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.

TOLL FREE TENNESSEE 1-800-545-2502 TOLL FREE 1-800-251-5008

DELKER ELECTRONICS

DELKER ELECTRONICS, INC. ↙397
P.O. Box 897
Dept. R
408C Nissan Blvd.
Smyrna, TN 37167

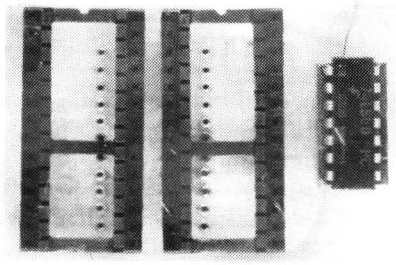
VISA MasterCard AMERICAN EXPRESS

800-251-5008
800-251-2502 (TENNESSEE)
615-459-2636 (TENNESSEE)
615-254-0088 (NASHVILLE)

Write for our FREE Newsletter!

16 K DOS CARD

- ☐ PLUGS INTO YOUR J-M DISK CONTROLLER AND ALLOWS YOU TO MAP ON AN EXTRA 8 K E-PROM ABOVE DOS.
- ☐ USE YOUR OWN 24 PIN, 8 K DOS AND ONE 2764 E-PROM OR TWO 2764 E-PROMS.
- ☐ GREAT FOR UTILITIES OR A MACHINE LANGUAGE MONITOR.
- ☐ ON BOARD DE-CODING, ONLY ONE WIRE TO SOLDER. COMPLETE WITH INSTRUCTIONS.



$19.95

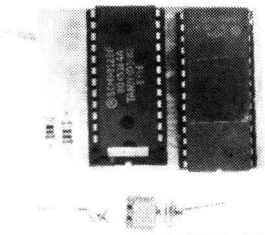
RGS DUAL DOS CARD

WITH SWITCH SELECTOR

DESIGNED TO ACCOMODATE TWO DIFFERENT DOS CHIPS INSIDE YOUR J-M DISK CONTROLLER.

- ☐ PIN TO PIN COMPATIBLE WITH RS-DOS AND J-DOS CHIPS.
- ☐ THE SWITCH ALLOWS YOU TO HARD SELECT ANY ONE OF THE TWO DOS SYSTEMS OF YOUR CHOICE.
- ☐ IN CENTER POSITION, THE SWITCH DISCONNECTS FROM THE DOS AND BRINGS YOU BACK TO BASIC.
- ☐ DESIGNED FOR ONE 24 PIN ROM AND A 28 PIN E-PROM OR TWO 28 PIN E-PROM CONFIGURATION.
- ☐ EASILY MODIFIED BY CUTTING TWO TRACES ON THE BACK OF THE BOARD.

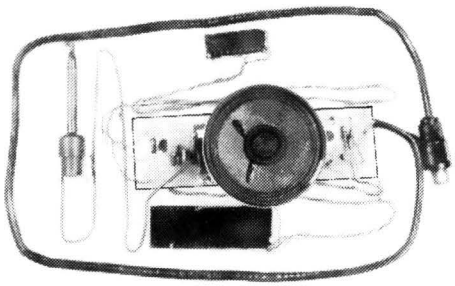
$19.95
(Board with switch only)



VIDEO PAL

- ☐ AUDIO-VIDEO INTERFACE
- ☐ MONOCHROME COMPOSITE OUTPUT
- ☐ EASY TO INSTALL, FITS UNDER YOUR KEYBOARD
- ☐ NO SOLDERING!
- ☐ BUILT-IN SPEAKER
- ☐ DOES NOT DISABLE YOUR REGULAR T.V. OUTPUT
- ☐ FULLY TESTED AND ASSEMBLED
- ☐ COMPLETE WITH INSTRUCTIONS.

ALSO AVAILABLE FOR COLOR MONITORS



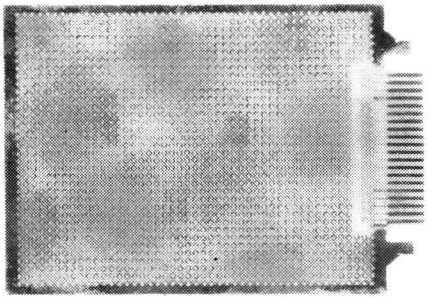
$29.95

PROJECT BOARD

A MUST FOR EXPERIMENTS

- ☐ UNLIMITED CHIP POSITIONS
- ☐ GOLD PLATED EDGE-CARD CONNECTOR
- ☐ FITS INTO ANY RS DISK PACK
- ☐ HOLES PLATED THROUGH BOTH SIDES
- ☐ EASY TO WIRE - WRAP

GREAT TO BUILD YOUR "TURN OF THE SCREW" PROJECTS.



$19.95
(TWO FOR $34.95)

USA
RGS MICRO INC.
MAIN STREET
DERBY LINE, VERMONT
ZIP 05830
TEL: 802-873-3386
ORDER LINE 800-361-4970

RGS MICRO INC.
185

CANADA
RGS MICRO INC.
759, VICTORIA SQUARE 405
MONTRÉAL H2Y 2J3
TEL.:(514) 287-1563
ORDER LINE ONLY ★★★
QUÉBEC - ONTARIO - MARITIMES
800-361-5338
WESTERN CANADA 800-361-5155

TERMS: VISA - MASTER CARD - AMERICAN EXPRESS

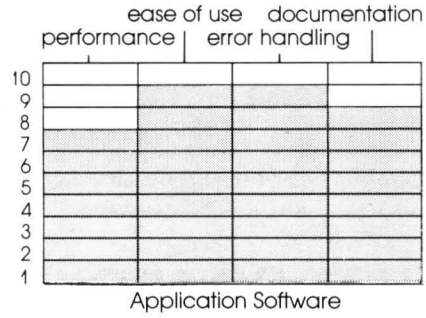
HOURS: MONDAY - SATURDAY 10:00 AM - 6:00 PM

See List of Advertisers on page 81

BY SCOTT L. NORMAN

RELATE BETTER TO YOUR DATA

A true relational DBM, Elite-File offers ease of use and good data manipulation.



Elite-File
Elite Software
P.O. Box 11224
Pittsburgh, PA 15238
412-795-8492
$74.50 32K disk

by Scott L. Norman

Here is another worthy entry in the CoCo applications sweepstakes: an easy-to-use relational database manager with a good capacity for data storage. It's not perfect—its mathematical abilities are limited, and you'll need another program to set up complex reports—but Elite-File can still do a whale of a job for many purposes.

A Little Background

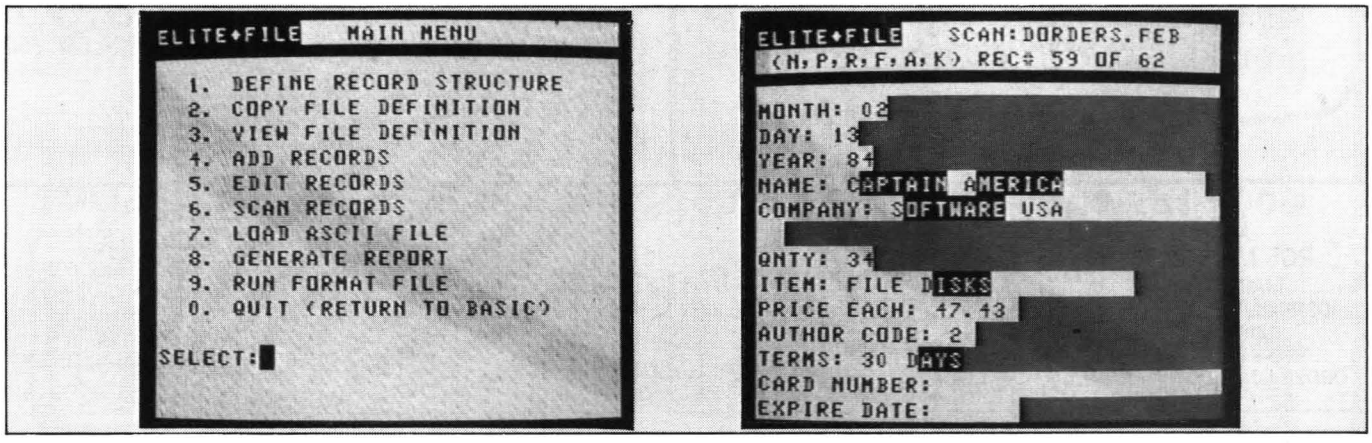
A few definitions might be helpful before I dive into the details of the program. At the highest level, a computer stores a mass of data in a *file*. The data consists of a number of independent entries called *records*, each of which in turn is composed of a certain number of *fields*. The most overworked example in the business is an address-book file, in which each record consists of all the information about a given person and the fields are last name, first name, street address, and so on.

Every record in a file has the same structure: the same fields, in the same order. Many so-called database managers for personal computers are actually data*file* managers, capable of working with only one file at a time. Elite-File and few other high-end CoCo information-management programs satisfy the definition of a true data*base* manager in that they can manipulate several files at once, whether searching for a piece of data or storing new information.

Taking this one step further, a *relational* database manager can work with files that have different overall structures. For instance, a small business might keep a customer mailing list, along with a whole set of files concerning credit rating, date of last purchase, special needs, and so forth.

As long as there is some way to establish a correspondence between the records in different files (by using the customer name as a field in each, for example), a relational database manager can use information from many sources to construct a special report or to provide new insights into the information.

Elite-File has this sort of capability,



Elite-File's Main Menu *A Sample Record*

within certain limits. This, along with the program's general simplicity, are perhaps its most attractive features.

The Big Picture

Elite-File is one component of Elite Software's family of applications programs; the others are the Elite-Calc spreadsheet (*HOT CoCo*, December 1983, p. 19), and Elite-Word, a word processor (June 1984, p. 22). The three are well integrated: Elite-File will read ASCII data prepared by Elite-Calc or -Word, and can be used to supply data for the latter's "variable text" feature. This lets you perform mail-merge operations such as inserting names, addresses, and so on into a form letter.

There is a negative side to all this compatibility: Elite-File depends on Elite-Word to prepare and store report formats—the lists of commands that will produce complex reports from a data file. While there is a report-generation facility within the database manager itself, you can only use it during a single working session; there is no way to save the design of any report, except by using the word processor. This, in my opinion, is one of the few drawbacks to the package.

But let's not belabor the point; there is a lot to like about Elite-File. It can handle a respectable amount of data, stored in fairly elaborate files. As is typical of such programs, there are overlapping limits on the size of data structures; e.g., a record can contain up to 255 fields or 2,000 characters, but no single field can be longer than 255 characters: Any one file can contain a maximum of 4,000 records.

Elementary Operations

The program will run on a 32K, single-drive system. A 64K machine offers no advantage, but you can use as many as four drives for data files. Elite-File itself is entirely memory-resident, so once you've loaded it, you can remove the program disk and replace it with a data disk to maximize storage space.

The master disk is not copy-protected, and you are encouraged to make duplicates for your working sessions. This also means you can customize the system to your printer. You can edit a POKE command in the loader program to set up the baud rate you prefer, according to the usual scheme. Then you can save the modified routine and use it in subsequent operations.

The 70-page manual is divided into sections for general, advanced, and expert users, plus a comprehensive command summary. The general and advanced sections, which you should read thoroughly, will get you through most of your work.

The expert portion is just a little over three pages long and is devoted principally to using Elite-File in variable-text applications and accessing its data files from Basic programs. It is quite possible to construct simple databases using only the information in the general section, but you will need the advanced material if you plan to do calculations.

Setting up a data file with Elite-File is much like operating with other programs of the breed. Selections from a main menu let you define record structure, add records to a file and edit them, scan through the stored information, generate reports (within limits), and so on. Editing and report generation call up their own menus; the report menu includes the commands for sorting the file and selecting records that meet certain criteria.

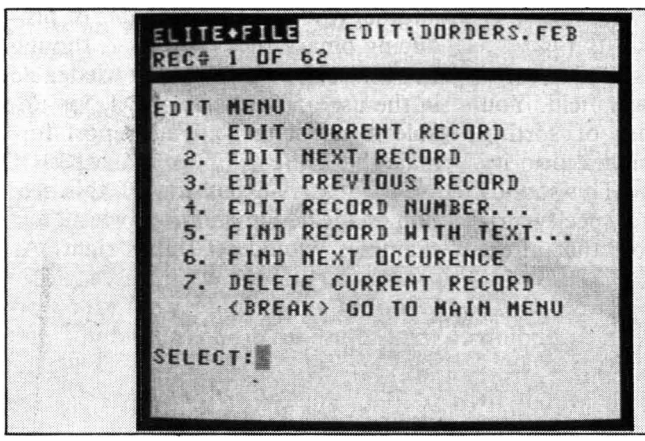
Field definition is somewhat simpler than it is with some other data managers. Elite-File recognizes only two types of data—plain text and numerical values—and you only need the latter if you intend to do calculations with stored values. The program stores zip codes, telephone numbers, dates, and so forth as text. Thus, you can set up a file by entering the field names you wish to use, each followed by a colon and the number of bytes you want to reserve.

It is possible to change the structure of a record after you've entered data into a file, but it's not advisable. It pays to think about your data-management needs beforehand, and not count on doing any brilliant improvisation at the keyboard.

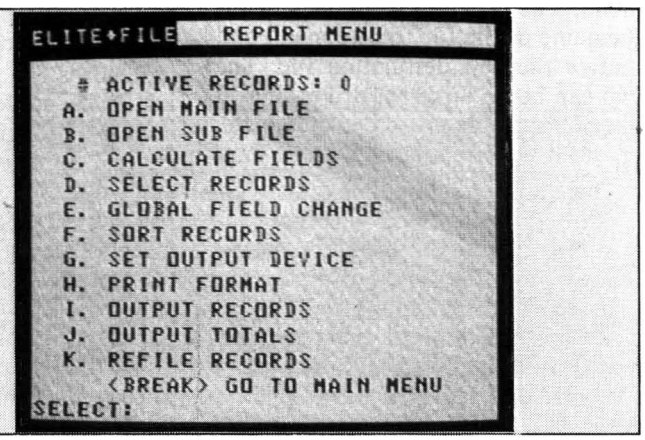
Once you've defined the structure, Elite-File prompts you for the "primary keys". These are as many as eight fields that determine the order in which the program stores records on disk; no separate index file is generated. You can always rearrange the records for any given report, of course.

If you enter your records randomly, without a bit of prearranging first, you'll find that Elite-File takes several seconds of reading and rewriting to disk as the program puts new entries in proper order. The process becomes longer the more records you enter.

Once you've defined the fields, you can start loading a file with informa-



The Edit Menu



The Report Menu

tion. Elite-File generates a simple form on the display, with highlighting used to indicate the space allotted for the various fields; it uses the conventional 32-by-16 text format.

You can edit data during the entry process, of course, and Elite File also features a convenient editing menu for working on an existing file. You can locate records in a file by their sequential storage number or (more conveniently) by any text string they contain.

You must properly distinguish between upper- and lowercase letters to obtain a successful match with the test-search command, but it will examine all data fields and will work on substrings.

It is not necessary to destroy the old version of an edited record in order to save the new one. You can keep both in the file, which leads to a convenient method for entering a whole series of records that are similar but differ in one or two fields. Pressing the clear key after editing saves the latest version to disk; using a shifted clear instead leaves the original version alone and also stores the new one in the proper place.

This is just one way in which Elite-File reduces the amount of retyping you have to do when duplicating information. There is also an easy way to copy the structure of an entire file, shorn of the information it contains. This can come in handy if you have to keep separate sets of data for each month or other fiscal period, to mention just one example. You don't have to spend time specifying the same set of fields for each file.

The deed is done through the Copy File Definition option of the main menu. The program prompts you for the name of the file to be copied, and that of the new destination file. The two can be on different drives, if you like. This simple process is one of the program's more appealing features.

There are several options for browsing through a file. Specifying the Scan Records feature of the main menu, followed by a file name, brings up the first record in that file. A subsidiary menu lets you look at the very next record or locate one by number or by contents. The latter option is a little more elaborate than the text-search command of the editing menu, however.

"Elite-File is a very decent program and you can learn to do a lot with it in a hurry."

To begin with, there are now two text-search commands: Find and Key. Find works like the corresponding command on the Edit menu and locates any specified substring in any field. Key, on the other hand, only searches the first field that was specified as a primary key. In many cases, this is enough to locate a unique record.

The advantage is that a Key search is fast. This makes sense when you realize that Find has to examine every field of every record before moving on. I should mention one drawback of the Key search technique: To be successful, the substring you specify must include the beginning of the key field. If you're looking for fields in which "elephant" appears and want to save typing, you would still have to specify "elep," or at least "el." Something like "hant" or "ant" wouldn't work.

Calling for report generation brings up another menu that includes a good set of record-selection options. All the usual logical equality and inequality relationships are available, and you can AND or OR them together at will. You can also compare field names with constants or with other field names. Only the records meeting a selection criterion remain active through subsequent operations. A select-@ command restores the entire file.

Records can also be sorted according to the contents of any field. You can specify any number of sorting keys, starting with the highest priority and working downward. (This sounds like the method used to specify primary keys, but remember that after-the-fact sorts do not change the order in which things are stored on disk.) Sorts are normally done in ascending order, but you can specify the converse.

Reports—A Bugaboo?

Elite-File is a very decent program, and you can learn to do a lot with it in a hurry. However, the matter of report generation might be troublesome.

Logically enough, the preparation of a report begins with any record selecting or sorting operations you might desire. Next comes the designation of an output device—screen, printer, or disk file. Then you can design the report format and produce the document or video display.

And that's where the trouble lies. A particular type of text string specifies the format of an Elite-File report. The text string isn't difficult to set up, but it's something that the program cannot store on disk. In fact, the format is retained in RAM only until you use some other report-menu command; then it's gone, and you must reenter it to produce another report. It can be inconvenient to retype simple report specifications, and outrageous to have to do so for complex reports. Elite-File offers several formatting options, so those format strings can get lengthy. Elite-Word provides a way out. You can use it to prepare and store command files, which Elite-File can then read from disk at report time. Unfortunately, this amounts to buying a $60 accessory to do the job.

Elite-Word is a competent program, but people who are satisfied with their word processors might not want to buy another one just to set up database documents. I wouldn't blame them, although to be fair, I'll say again that you can use Elite-File with Elite-Word's "variable text" feature.

The expert-user section of the manual does briefly discuss the makeup of a format file, and mentions that it should be possible to compose one by other means—presumably by using another text processor capable of producing binary files. However, though I consider myself fairly knowledgable in the use of Telewriter-64, I was unable to use it to generate report formats that Elite-File would accept.

Perhaps an expansion of this section of the documentation, with a few examples, would set things right. As matters stand, the reliance on Elite-Word is unfortunate for those who want to use Elite-File as a stand-alone package.

Some Other Features

Although Elite-File is not particularly strong on calculational ability, it

★ COLOR COMPUTER DATA BASE MANAGER ★

Elite•File™

Available with Calc-List

★ COLOR COMPUTER WORKSHEET ★

Elite•Calc™

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.

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 16 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 • Locate any record by field contents • Select specific groups of records by field content with full logic combination capabilities • Sort records in ascending or descending order by any field, or group of fields • Calculate values from combinations of field contents • Output any subset of fields in any order for printed reports • User setable print formats; Page Title, Top and Bottom Margin, Line Spacing, Page Length, Page Pause, Form Feeds and more • Output format also supports TAB, VTAB, CR, PAGE, text, HEX printer controls, and more • Join up to four sub-files to extend data record for printing • Produce detailed repetitive reports, for output on preprinted forms, using output formats written on Elite•Word • Variable Text Insert feature of Elite•Word is fully supported • Refile old record data into NEW record structures • Data, Field Definitions, Indices all stored on a single file • Memory resident, no program overlays from disk • Single program performs all features • List disk Directories and "Kill" files without leaving the program • Data files also accessible from BASIC programs.

Radio Shack® catalog # 90-0189

COMPARE features and performance speed ... you'll agree that Elite•File is the one to buy.

THE BEST FOR ONLY **$74.50** Disk Only

✓392

ELITE•CALC was the first Color Computer spreadsheet program offering "major league" features. All the magazine reviewers loved it! Today, when you consider program performance speed, ease of use, price, and total features ... ELITE•CALC is still your best choice.

MAJOR features include:
Very EASY to use • FAST Sorting • Printed Output, Screen Re-write, and Calculations all done FAST • Full cell-edit capability • Powerful cell-format options • Individual cell formulas • FREE sample worksheets • CALC-LIST availability.

Single character commands • Help displays • 255 maximum rows • 255 maximum columns • Available memory always displayed • Rapid Entry modes for text and data • Selectable, automatic, cursor movement • Insert, Delete, Move entire rows or columns • Replicate one cell to fill a row or column with selectable formula adjustment • All machine language for speed • Extended BASIC required for ROM routine calls • Automatic memory size detection for 16K, 32K, or 64K • >20K bytes storage available in 32K systems • Math operators: +, −, x, /, ↑, (,) • Relation operators: =, >, <, <=, >=, <> • Logic Operations: AND, OR, NOT • Conditional Formula: IF, THEN, ELSE • Trig Functions: SIN, COS, TAN, ATN • Log Functions: LOG, EXP, SQR • Misc. Functions: INT, FX, ABS, SGN, RND • Range Functions: SUM, AVERAGE, COUNT, MIN, MAX, LOOKUP • Definable constant table • User definable printer set-up commands • Individual column width settings • Adjustable row height to insert blank lines without wasting memory • Hide columns or rows • Alternate print font selectable on a cell by cell basis • Display/Print formats set by cell, row, or column • Dollar format, comma grouping, prefix or postfix sign • Scientific notation, fixed point and interger formats • Left and Right cell contents justification • Full page formatting • All formats stored with worksheet on disk (tape) • Save/Load Disk (tape) files in compact memory form • Scan disk directories • Output ASCII file for word processor input capability • Memory resident code ... no repeated disk calls.

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. You get all the valuable worksheet format data including assigned Column Widths, all cell Format specifications ($, C, I, F#, G, etc.), Constant table assignments, and Printer Format information (Set-up, Page Length, Line Width, etc.). Use your CALC-LIST printout as a hardcopy backup of your worksheet for review or archival purposes. You can even let your friends use the listing so they can type your worksheets.

Elite•Calc TAPE
RS catalog #90-0187

Elite•Calc DISK
RS catalog #90-0188

Specify Tape or Disk

Elite•Calc	$69.95
Calc-List	$24.95
Elite•Calc and Calc-List	$79.95

"Elite•Calc is a great spreadsheet program! This professional quality program has the performance required for serious home applications as well as small businesses."
—Stuart Hawkinson, RAINBOW

"Truly one of the best programs I have seen."
—John Steiner, MICRO

"Elite•Calc is an extremely powerful worksheet..."
—Jack Lane, COLOR MICRO JOURNAL

"Bruce Cook's Elite•Calc is a very fine program indeed; potentially one of the great Color Computer Programs." "... a very impressive product."
—Scott L. Norman, HOT COCO

Elite Software

Productive Programs for Serious Users

• Box 11224 • Pittsburgh, PA 15238 • (412) 795-8492 •
VISA and MASTERCARD Accepted-Add $3.00 Shipping/Handling

✓ See List of Advertisers on page 81

can carry out elementary mathematical operations on data fields. The results are stored in so-called calculated fields, which are not actually part of the permanent data file. Instead, they are defined and evaluated at run time. You can use a calculated field in a report, and print out the total of any numerical field.

A useful option known as Refile Records lets you merge a collection of records from one file into another. You can also use Refile to add more fields to an existing set of records, since the original and final files need not necessarily have the same structure.

Again, Elite-File is a true relational database manager. This capability hinges on the concepts of main files and subfiles. There is nothing in their definition or structure that sets the two apart, and in fact a main file in one application can serve as a subfile in another.

The distinction is in the way in which you link together separate files when you use them. Then you must inform Elite-File as to which main files and which subfiles you want to open. Here is the rule:

> A subfile contains, as one of its primary keys, a field that appears (but not necessarily as a key) in a main file. It is the subfile key that determines which records are to be linked.

With multiple-file management, you can have up to 16 main files open at once, provided that all have the same structure. This is a convenient way to combine monthly financial records into quarterly or yearly summaries, for instance. Elite-File will treat all the files as one big database for sorting, selection, and reporting purposes.

Wrap-Up

Elite-File is exceptional in the areas of ease of startup and use, and in file manipulation (sorting, selection, merging, and so on).

Again, the lack of a built-in facility for saving report formats is one of the two major obstacles to Elite-File as a data-management system for a small business. The other is the lack of password protection for sensitive material. The first problem disappears if you use Elite-Word for reporting chores, but the second is simply a fact of life.

Things are somewhat brighter for the casual user, however. Because the program is so straightforward, I find myself firing it up for applications like the management of my classical-record collection. Here, my reporting requirements are quite simple—occasional "Have" or "Don't have" lists containing a few fields each—and it's not too difficult to set up the formats whenever needed.

I have also begun to use the program professionally in a solid-state physics laboratory. Here, I am more concerned with keeping track of the processing steps that various samples have gone through than I am with printing comprehensive reports about a whole file. If you have similar needs, or if you are in the market for a companion word processor as well, Elite-File deserves your attention. ■

124

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	$ 139.95	$ 120.00
26-3127 64K Extended Color Computer 2	$ 199.95	$ 169.00
26-3029 Disk Drive 0 for Color Computer	$ 349.95	$ 295.00
26-1161 Disk Drive 1, 2, 3 for Color Computer	$ 279.95	$ 230.00
26-1276 DMP-105 80 cps Dot Matrix	$ 199.95	$ 169.00
26-1271 DMP-110 50/25 cps Triple Mode Printer	$ 399.95	$ 299.00
26-1255 DMP-120 120 cps Dual Mode Matrix	$ 499.95	$ 385.00
26-1257 DWP-210 14 cps Daisy Wheel Printer	$ 459.00	$ 485.00

COLOR COMPUTER SOFTWARE

	OUR PRICE
Telewriter 64 Tape	$ 49.95
Telewriter 64 Disk	$ 59.95
VIP Writer	$ 59.95
VIP Speller	$ 49.95
VIP Database	$ 59.95
VIP Terminal Disk	$ 49.95
TOM MIX Software	$ CALL
RADIO SHACK Software	15% Off

OTHER PRINTERS AND ACCESSORIES

	OUR PRICE
EPSON Printer	$ CALL
OKIDATA Printer	$ CALL
STAR GEMINI 10X Printer	$ 275.00
COMREX CR-II Daisy Wheel Printer	$ 415.00
C.ITOH 8510 Prowriter Printer	$ 335.00
BOTEK Serial to Parallel Interface	$ 59.00

MONITORS

	OUR PRICE
COMREX 12" Green Monitor	$ 95.00
COMREX 12" Amber Monitor	$ 110.00
COMREX 13" Color Monitor	$ 285.00
AMDEK 300A Monitor	$ 155.00
VIDEO PLUS Monitor Adaptor	$ CALL
GORILLA Monitor	$ 85.00

COLOR ACCESSORIES

	LIST PRICE	OUR PRICE
26-2226 RS-232 Program Pak	$ 79.95	$ 68.00
26-3012 Deluxe Joystick (EACH)	$ 39.00	$ 34.00
26-3017 64K RAM Kit	$ 69.95	$ 59.00
26-3008 Joysticks	$ 24.95	$ 21.00
26-3016 Keyboard Kit	$ 39.95	$ 34.00
26-3018 Extended Basic Kit	$ 39.95	$ 34.00
26-1175 Direct-Connect Modem I	$ 99.95	$ 85.00
26-1173 Direct-Connect Modem II	$ 199.95	$ 169.00
Signalman Modem 300/1200 Baud	$ 399.00	$ 275.00
Hayes Modems		$ 215.00

All prices and offers may be changed or withdrawn without notice. Advertised prices are cash prices. For shipping, add 2% (minimum shipping charge $3.00). C.O.D. accepted. ($4.00 charge per carton on C.O.D. Call for further COD information.) M.C., Visa, AX, add 3%.

PERRY COMPUTERS • 137 NORTH MAIN STREET • PERRY, MI 48872

DATAMAT INTERNATIONAL

VISA 1-416-529-1319 MC

GRAPHIC MASTER

is a program in a class by itself. This extremely powerful, compact program adds 30 NEW COMMANDS to any version of RS COCO BASIC. The commands are more versatile and operate up to 60 TIMES FASTER than Extended Basic. 32 software sprights, dual page flipping, vert. scroll, polygon and dye are just a few of the features you can use in your own programs.

$42.95 (T)US
$46.95 (D)US
$49.95 (T)CN
$53.95 (D)CN

Includes 60 page manual.

TEXT MASTER

is the most comprehensive and powerful text utility available for the COCO. 24 printing sizes, printer echo, key click & repeat, underlining, full English error messages, even proportional and mirror printing. If you wish you may design your own character set and keyboard layout. TEXTMASTER includes an extensive manual in a 3 ring binder.

$25.95 (T)US
$29.95 (D)US
$29.95 (T)CN
$33.95 (D)CN

REQUIRES 64K

LIMITED TIME SPECIAL

SPECIAL

Buy the DISK versions of TEXT MASTER and GRAPHIC MASTER together at a special price and get a FREE 30 MINUTE DEMO.

$69.95 US
$79.95 CN

INCLUDE $2.50 SHIPPING

DATAMAT INTERNATIONAL
125 SOUTH FIFTH STREET
LEWISTON, N.Y. 14092

DATAMAT INTERNATIONAL
420 FERGUSON AVE. N.
HAMILTON,ONT.,L8L 4Y9

See List of Advertisers on page 81

BY ADRIAN ROSE

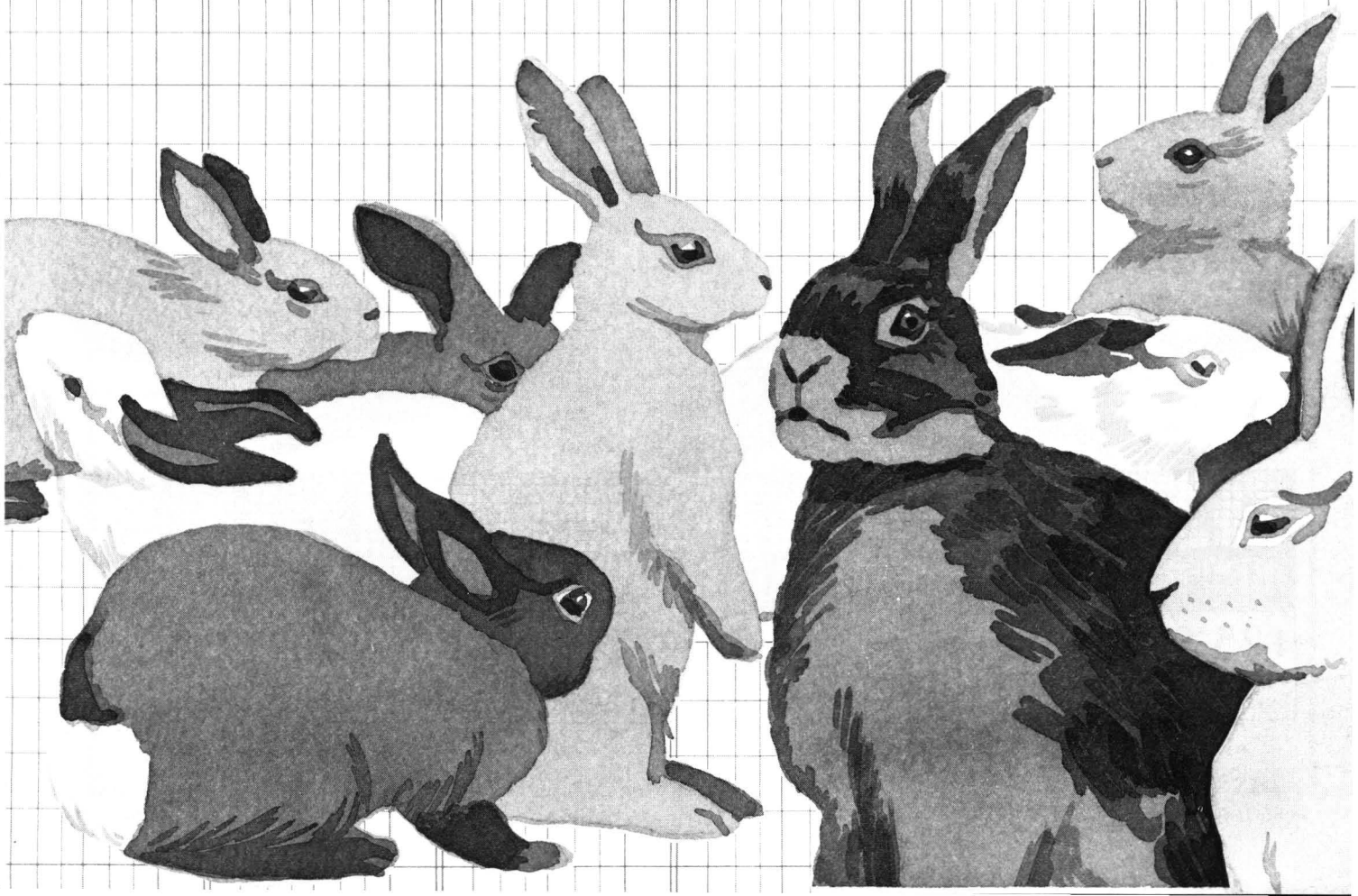
A PRODUCTIVITY TOOL FOR EVERYONE

Homespread is no rabbit when it comes to speed, but it's one hare of a spreadsheet.

Unless you got your CoCo yesterday, you've probably played at least several games, put your home inventory on tape or disk, and tried your hand at programming in Basic. But have you ever tried really putting your CoCo to work? Homespread is a spreadsheet program designed to use commands that are the same or similar to the popular VisiCalc spreadsheet program. It can do almost anything the high-priced business spreadsheets do. Suddenly, taking work home to your CoCo from the office is a much better proposition.

Homespread can help you juggle expense accounts and prepare business forecasts, cost analyses, and reports for the office. And it can be very useful around your home. It will help you plan budgets, organize files, and prepare purchase analyses. Use it to record expenses and balance your budget.

Figure 1 is an example of how you could keep track of your monthly checks, charges, and uncommitted



balances. Or set Homespread to work organizing your recipe files. Figure 2 shows a recipe printout. Enter your recipes with the number of people they serve. If five people show up instead of four, type 5 under WANT and Homespread will recalculate the quantities and place them under TQUANT.

You might design a format for listing and calculating quantities and costs for home construction projects, such as in Fig. 3. The advantage of organizing a project with a spreadsheet is that you can insert amounts or items and instantly know the total price. This lets you brainstorm about materials without losing touch with the reality of cost. After you use Homespread to organize the refinishing of your attic, you can erase the specifics and save the format for building a tool shed or other project.

How It Works

Homespread is written in Basic, which makes it slower than programs written in machine language, and it displays a smaller area than that of the high-cost office spreadsheets. But it doesn't skimp on the functions. Homespread has an eight-column by 99-row capacity and a four-column by 12-row display that scrolls in four directions with the movement of the cursor. Its label fields hold five characters. It displays column headers from anywhere on the spreadsheet, or holds them offscreen to increase the display area. Homespread easily handles formulas and automatically updates column summations when you enter new data.

When you run this program, its screen displays a matrix with headings for the first 12 rows and the first four columns. It numbers the rows and assigns letters to the columns. In addition to these letter or number labels, Homespread allows you to enter up to five alphanumeric characters as a header or title for each column and row. The program automatically enters what you have typed if you try to type more than five characters. To head a column, for example, move the cursor to the first row under the column you want, and position it a little to the left of the column heading before typing your title.

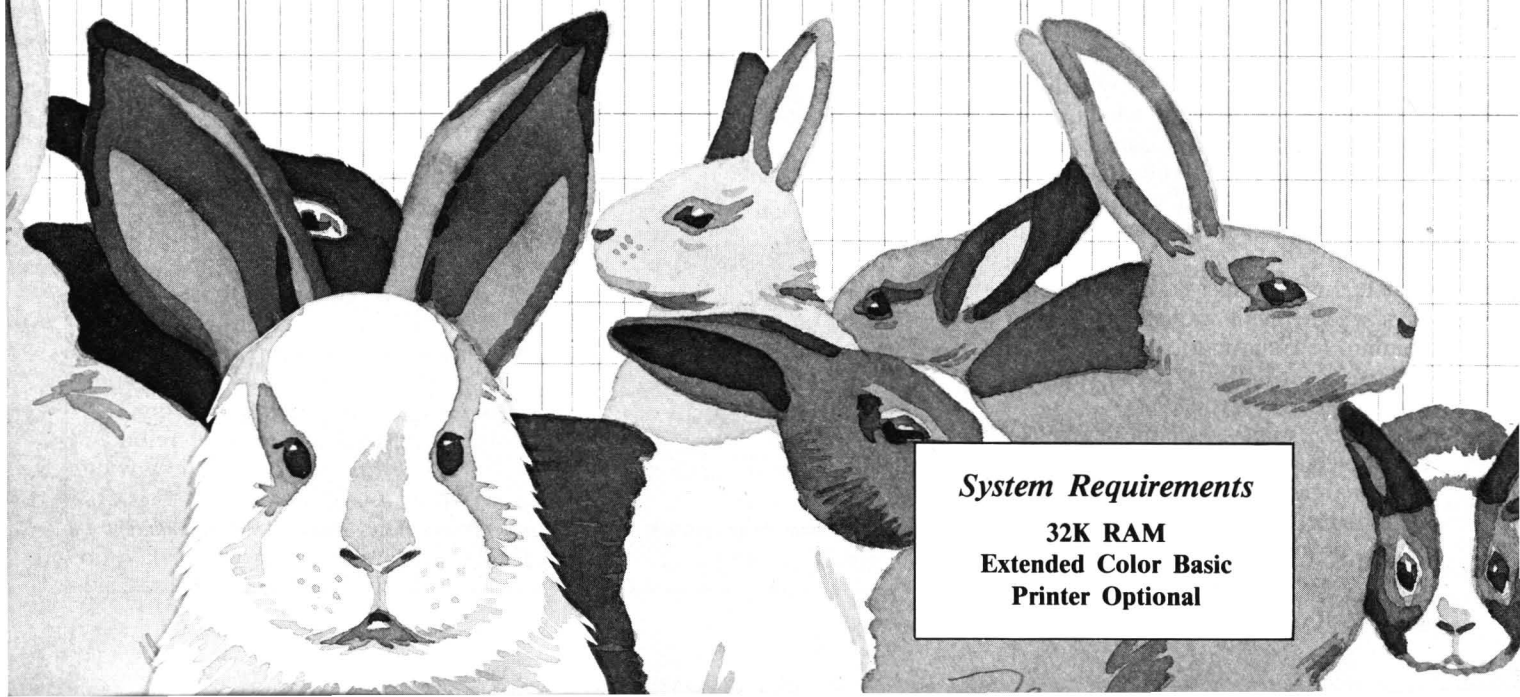
Homespread can take numbers from designated positions and place the calculated results in any position you choose. Position the cursor where you want the results of the calculation to appear and enter a plus sign, the symbol that prepares the computer to accept the formula to follow. Then, type in the formula. Suppose you want the number in A1 to be added to the number in B1, and the sum to reside in C3. Position the cursor at C3. Then, type A01 + B01. (Row numbers below 10 must be typed as two-digit numbers beginning with zero.)

Homespread lets you combine two operations in a single formula, and enter several formulas at the same location. The program executes entries in the order you enter them. It checks all the formulas you enter after each number entry in order to calculate immediate updates; as a result, if there are many formulas, the computer slows down number entry. Entering the formulas last will speed up execution. In addition, typing and execution go more quickly if you use the summation command described below because summation formulas are the most commonly used.

Commands

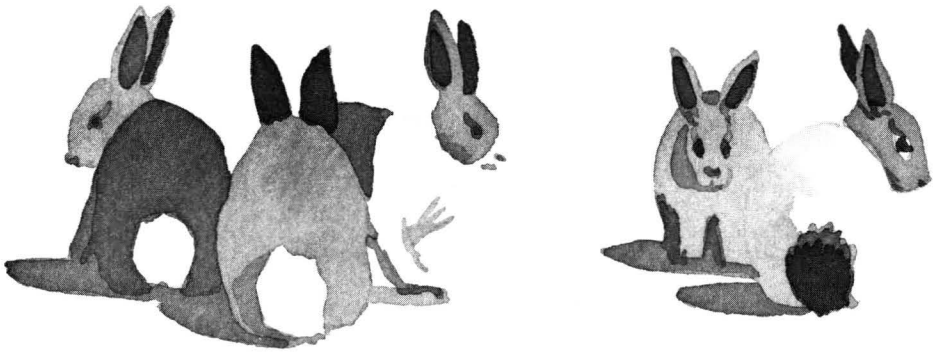
Homespread's command letters are B, C, I, P, S, and T. To execute these commands, type a slash followed by the command letter. B is for blank; it erases all letters, numbers, and formulas in the square in which the cursor is located. C clears all data from the computer's memory, enabling you to start another set of data. I inserts a new row, but it does not erase for-

illustration by Katherine Mahoney



System Requirements

32K RAM
Extended Color Basic
Printer Optional



mulas. Run the cursor along the row into which you've inserted while you watch the "information" row at the bottom of the screen—it will show if the row contains formulas. Use the B command to eliminate unwanted formulas.

The P command directs the program to print selected rows. The computer prompts you to enter the column-letter/row-number combinations that begin and end the row you want to print. The S command allows you to save, verify a save, or load a file. Because an input/output error in verification causes loss of all data, it's a good idea to make a backup copy before using the verify command.

Spreadsheet programs commonly locate column headers or titles in row 1. But when you are working in row 55, it's frustrating to have to scroll all the way back to row 1 to find out what column you're in. To put the titles contained in row 1 at the top of your columns, no matter where you are in Homespread, enter /T. This is somewhat different from VisiCalc, which constantly displays its titles. Homespread displays only column titles, not row titles. The ability to display row titles from anywhere on the spreadsheet would have considerably limited the display area. And because Homespread has only eight columns, accessing row headers never takes very long.

VisiCalc users are probably familiar with its sum command, which is activated by the @-S key combination, followed by row or column ranges. Homespread's sum command is somewhat less sophisticated, but no less useful. To sum, simply position the cursor and type @. The program asks whether you want a row (R) or column (C) summation. When you have selected either R or C, the program gives you a total.

You can sum rows either singly or collectively. Position the cursor on the column in which you wish the sums to appear, in the row just below the last row to be summed. The row summation command totals rows to the column before the one containing the cursor. It sums all the rows above the row containing the cursor. For example, if you place your cursor at F4, type @, and then type R after the prompt, Homespread will give you the totals of A1 to E1 in F1, A2 to E2 in F2, and A3 to E3 in F3.

Homespread sums columns individually. Position the cursor one row below the last in the column you want summed. The program displays the sum in the square containing the cursor. If an entry in a previously summed column changes, Homespread automatically updates the sum. Row sums do not update in this manner because it is easy enough to total all rows in one operation. Homespread does not save row-sum commands onto tape or disk, but it does save column-sum commands.

A Tutorial

Once you have an idea how the program works and have typed it into your CoCo (don't forget to save it), you'll want to put Homespread through its paces. Homespread is an excellent aid to decision making about purchases for your home. Suppose you are buying a new home computer system. Naturally, you've got a 64K CoCo 2 in mind, and you've decided you want to add two disk drives, a printer, and two programs. You would prefer to go to the local Radio Shack store, pick out what you want, and take it home. But would you be better off ordering by mail? Will avoiding your state sales tax help?

Load and run Homespread. Press the enter key after the prompt. The cursor should be on row 1 just to the left of the A label in column A (the A1 position). Type ITEM, and press the enter key. Move the cursor to the B1 position with the arrow key. Type NO, for number, and press the enter key. Type U/PR, for unit price, in the C1 position, and in the D1 position enter PRICE, which functions as a subtotal. The computer enters PRICE automatically because it is an entry with five characters. Move to E1. Don't worry if you can't see the column label for E. The program doesn't display more than four column headings at a time, but it does let you type into a fifth column to the right. Moving the cursor two blocks to the right of the D1 position reveals the E1 heading, which is now one block to the left of the cursor's position. Enter TAX in the E1 block and TOTAL at the F1 position.

You'll notice that from time to time the cursor may go off the screen or past a marked column. Use the arrow keys to retrieve it: The left arrow key is probably universally useful in this situation. In any case, it is impossible to crash the program by going off the screen with the cursor keys.

Now that you have entered the column headings, move the cursor back to A1 to begin labeling row headings. Use the down arrow to move to A2, and type COCO. At A3 type DRIVE, at A4 type PRNTR, and at A5 type PROGR. Under the B column enter the number of pieces of each kind of component you are considering: one

DESCR	CHECK	VISA	AM EX	FIXED MONTH EXP.		TOTAL 3395	BANK
GAS	27						
DINE 2/7		29.50		MORT	550	1212	CHGS
WATER	14.95			PAYTV	25	1373	UNCOM FUNDS
AIR TCKT			590	CAR L	75		
MD	25			OIL	160		
ACME	66.95				810		
STOVE REPR.	45						
NEWTV		495.5					
PLNTS		37.50					
ACME	89.77						
DINE 2/14			59.50				
TOTAL	268.67	562.5	649.5				

Fig. 1. An example of a format that keeps track of your checks, charges, and uncommitted bank balance.

CoCo 2, two disk drives, one printer, and two programs. In the C column under U/PR, enter the price for each piece of equipment. In Fig. 4 these prices appear in blocks C2–C5 as 250, 300, 250, and 40. Use these numbers for now. Under TAX in the E column, from E2–E5 enter 1.08 (the figure to use for 8 percent sales tax).

ITEM	QUANT	TQUAN	UNITS	SERV
SUGAR	3	6	TBLSP	3
FLOUR	1.5	3	CUPS	WANT
SHORT	5	10	TBLSP	6
V.EXT	.25	.5	TSPN	MULT
CINN.	2	4	TSPN	2
EGGS	2	4		

Fig. 2. Homespread can create a recipe file that figures ingredient quantities based on any number of servings.

After you have entered all the figures above, Homespread is ready for formulas. Move the cursor to the D2 square. Type a plus sign to prepare the computer to accept the formula to follow. Then, type B02*C02 and press the enter key. The product of B2 multiplied by C2, 250, automatically appears in the D2 square. Move the cursor to the F2 block. Following the same procedure, type D02*E02. The

ITEM	QUANT	UNIT	U/C	TOTAL
2X4	50	LFEET	.55	27.5
PLYWD	455	SQ FT	.49	222.95
2X3				
WNDOW	5	EA	4.50	22.5
PUTTY	1	CAN	1.95	1.95
PAINT	5	GAL	15	75
SHING	500	EA	.10	50
FLOOR	100	SQ FT	.59	59
1X2	75	LFOOT	.34	25.5
			TOTAL	484.4

Fig. 3. A materials cost list for a home construction project.

program displays the number 270, representing price plus tax, in F2. Repeat this procedure for rows 3, 4, and 5, changing the numbers to accommodate each row. If you make a mistake, just type /B to erase all entries in that position.

When you have entered all the formulas correctly, move to F6 and type -----. Then, type @ in F7. The computer calculates your total cost, which should be $1,274.40, and displays it in F7. Figure 4 represents your screen at this point, without the column letters and row numbers.

Is this more than you want to spend? What if you buy some of these components by mail order? That will save you the sales tax. Type 1 at E2

ITEM	NO	U/PR	PRICE	TAX	TOTAL
COCO	1	250	250	1.08	270
DRIVE	2	300	600	1.08	648
PRNTR	1	250	250	1.08	270
PROGR	2	40	80	1.08	86.4

					1274.4

Fig. 4. Follow instructions to construct this format for purchasing the CoCo.

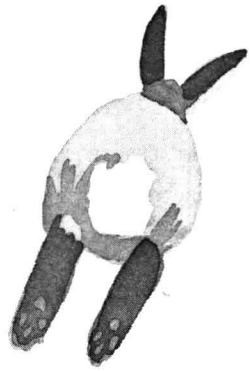
and @ at F7. Now the total is $1,254.40. What if you buy mail-order disk drives at $240 each from one of the well-known firms advertising in *HOT CoCo*? Change C3 to 240 and E3 to 1. Then, type @ at F7. Now the total is $1,086.40. What if you decide to live with one disk drive for the time being? Insert 1 in B3 and type @ at F7. Now the total is $846.40. A print-

ITEM	NO	U/PR	PRICE	TAX	TOTAL
COCO	1	250	250	1	250
DRIVE	1	240	240	1	240
PRNTR	1	250	250	1.08	270
PROGR	2	40	80	1.08	86.4

					846.4

Fig. 5. By posing "what if" questions, the price of a large, multicomponent purchase can be reduced.

out at this point would look like Fig. 5. If a final total of $846.40 is what you had in mind, you can save this information. But if you are not satisfied, use Homespread to continue calculating "what ifs" for as long as you wish.■



Address correspondence to Adrian Rose, 81 Springbrook Trail, Sparta, NJ 07871.

Program Listing. Homespread.

```
1 CLEAR5000:GOTO12000
10 DIMA$(100),B$(100),C$(100),D$
(100),E$(100),F$(100),G$(100),H$
(100):'STRINGS WILL BE CONVERTED
 TO NUMBERS AS REQ
12 DIMCT(8),CE(8)
20 DIMR(100):DIMFT$(100):DIMFI$(
17):F=0
25 Y=1:CLS:GOTO80
30 FOR X=31 TO 383 STEP 32
40 R(Y)=Y
50 PRINT@X,R(Y)
60 Y=Y+1
70 NEXT:Y=Y-12
71 PRINT@448,"HOME SPREAD-BY ADR
IAN ROSE":PRINT@480,"A SPREAD SH
EET PROGRAM-HIT<ENTER>TO CONTINU
E"
72 X$=INKEY$:IFX$="" THEN72
73 RETURN
80 'SETS UP ROWS
81 GOSUB30
90 A$(0)="A":B$(0)="B":C$(0)="C"
:D$(0)="D":E$(0)="E":F$(0)="F":G
$(0)="G":H$(0)="H"
110 L=34'L=LOCATION.34 IS START
LOCATION
111 HP=1'LEFT ARROW SUBTRACTS-RI
GHT ARROW ADDS
112 VP=1'UP ARROW SUBTRACTS-DOWN
 ARROW ADDS
115 RL=1
120 GOSUB500:POKE1023+L,128:GOSU
B18000
130 O1$=INKEY$:IF O1$="" THEN 13
0
135 PRINT@448,O1$
140 IF O1$="/"THEN GOTO 600'COMM
AND
150 IFO1$="+"THEN GOTO2400'CALCU
LATION
160 IF ASC(O1$)>47AND ASC(O1$)<5
8OR ASC(O1$)=45 OR ASC(O1$) =46T
HEN GOTO800
170 IF ASC(O1$)=9 THEN GOTO 900'
MOVE RIGHT
180 IF ASC(O1$)=8 THEN GOTO 1100
'MOVE LEFT
190 IF ASC(O1$)=94 THEN GOTO1300
'MOVE UP
200 IF ASC(O1$)=10 THEN GOTO1500
'MOVE DOWN
210 IF ASC(O1$)>64 AND ASC(O1$)<
94 OR ASC(O1$)=34 THEN GOTO 800
220 IF O1$="@" THEN GOSUB7000'SU
M COLUMS
499 GOTO130
500 'PRINT ALL VALUES
505 IF T$="" OR T$="N" THEN H$(0
)="H"
510 ON HP GOTO 520,530,540,550,5
55
520 CLS:FOR X=Y-1 TO Y+11:R(X)=X
:PRINTTAB(0)R(X);TAB(2)A$(X);TAB
(9)B$(X);TAB(16)C$(X);TAB(23)D$(
X):NEXT X
522 GOTO 560
530 CLS:FOR X=Y-1 TO Y+11:R(X)=X
:PRINTTAB(0)R(X);TAB(2)B$(X);TAB
(9)C$(X);TAB(16)D$(X);TAB(23)E$(
X):NEXT X:GOTO560
540 CLS:FOR X=Y-1 TO Y+11:R(X)=X
:PRINTTAB(0)R(X);TAB(2)C$(X);TAB
(9)D$(X);TAB(16)E$(X);TAB(23)F$(
X):NEXT X:GOTO560
550 CLS:FOR X=Y-1 TO Y+11:R(X)=X
:PRINTTAB(0)R(X);TAB(2)D$(X);TAB
(9)E$(X);TAB(16)F$(X);TAB(23)G$(
X):NEXT X:GOTO 560
555 CLS:FORX=Y-1TOY+11:R(X)=X:PR
INTTAB(0)R(X);TAB(2)E$(X);TAB(9)
F$(X);TAB(16);G$(X);TAB(23)H$(X)
:NEXT X
560 RETURN
600 PRINT@448,"COMMAND:B,C,I,P,S
,T?"
610 SC$=INKEY$:IF SC$="" THEN 61
0
```

Listing continued

```
62Ø IF SC$="B" THEN 66Ø
625 IF SC$="C"THEN 67Ø
63Ø IF SC$="I" THEN 3ØØØ
635 IF SC$="P" THEN 32ØØ
645 IF SC$="S" THEN 38ØØ
65Ø IF SC$="T" THEN 4ØØØ
655 GOTO 13Ø
66Ø PRINT@448,"BLANK":FOR X=1 TO
 5ØØ:NEXTX
661 OT$=""
662 FOR X=1 TO F
663 IF VAL(RIGHT$(FT$(X),2))=RL
THEN FT$(X)=""
664 NEXTX
665 FOR X=1 TO 8:IF X=CN THEN CE
(X)=1ØØ:NEXTX
666 GOSUB 2ØØØ:GOSUB5ØØ:GOTO13Ø
67Ø PRINT@448,"CLEAR-ARE YOU SUR
E(Y/N)?":X$=""
671 X$=INKEY$:IF X$="" THEN 671
672 IF X$="Y" THEN 675 ELSE 13Ø
675 FOR X= 1TO99:A$(X)="":B$(X)=
"":C$(X)="":D$(X)="":E$(X)="":F$
(X)="":G$(X)="":H$(X)="":FT$(X)=
"":NEXTX
676 FOR X=1 TO 8:CT(X)=2:NEXTX
677 F=Ø
68Ø GOTO12Ø
8ØØ 'NUMBER OR LABEL
8Ø1 FOR X=1 TO F+1
8Ø2 TA=VAL(RIGHT$(FT$(X),2))
8Ø3 IF TA=RL THEN FT$(X)=""
8Ø4 NEXT X
81Ø GOSUB22ØØ'ENTRY
83Ø OT$=O1$+O2$+O3$+O4$+O5$+O6$
835 IF ASC(O2$)=13 THEN OT$=LEFT
$(OT$,1):IF ASC(O2$)=13 THEN84Ø
836 IF ASC(O3$)=13 THEN OT$=LEFT
$(OT$,2):IF ASC(O3$)=13 THEN84Ø
837 IF ASC(O4$)=13 THEN OT$=LEFT
$(OT$,3):IF ASC(O4$)=13 THEN84Ø
838 IF ASC(O5$)=13 THEN OT$=LEFT
$(OT$,4)
84Ø GOSUB 2ØØØ
841 IF F<>Ø THEN GOTO 24ØØ
842 GOTO7Ø4Ø
85Ø GOTO12Ø
9ØØ 'RIGHT ARROW MOVE
9Ø5 IF CN>4 AND HP<>5 OR CN=8THE
N GOTO9Ø7'RIGHT SCREEN LIMIT
9Ø6 POKE1Ø23+L,143:L=L+7:POKE1Ø2
3+L,128:GOTO91Ø
9Ø7 HP=HP+1:IF HP=6 THEN RL=RL-1
:IF HP=6 THEN HP=5
9Ø8 GOSUB5ØØ:POKE1Ø23+L,128:GOTO
91Ø
91Ø RL=RL+1
92Ø GOSUB 18ØØ'LOCATE POSITION
925 GOSUB 955
93Ø GOTO 13Ø
955 PRINT@448," ":FOR X=1TO F: I
F VAL(RIGHT$(FT$(X),2))=RL THEN9
56 ELSE 957
956 PRINT@448,FT$(X);" ";X
957 NEXT X
958 RETURN
11ØØ 'MOVE WINDOW LEFT
11Ø5 IF CN=HP THEN GOTO11Ø7
11Ø6 POKE1Ø23+L,143:L=L-7:POKE1Ø
23+L,128:GOTO111Ø
11Ø7 HP=HP-1:IF HP=Ø THEN RL=RL+
1:IF HP=Ø THEN HP=1
11Ø8 GOSUB 5ØØ:POKE1Ø23+L,128:GO
TO111Ø
111Ø RL=RL-1
112Ø GOSUB 18ØØ'LOCATE POSITION
1125 GOSUB955
113Ø GOTO 13Ø
13ØØ 'MOVE WINDOW UP
13Ø5 IF L<34 THEN 13Ø7
13Ø6 POKE 1Ø23+L,143:L=L-32:POKE
1Ø23+L,128:GOTO131Ø
13Ø7 Y=Y-1:VP=VP-1:IF VP=Ø THEN
RL=RL+8:IF VP=Ø THEN Y=Y+1:IF VP
=Ø THENVP=1
13Ø8 GOSUB5ØØ
131Ø RL=RL-8
132Ø GOSUB18ØØ
1325 GOSUB 955
133Ø GOTO13Ø
15ØØ 'MOVE WINDOW DOWN
15Ø5 IF L>383 THEN GOTO 15Ø7
15Ø6 POKE1Ø23+L,143:L=L+32:POKE1
Ø23+L,128:GOTO151Ø
15Ø7 Y=Y+1:VP=VP+1:IF VP=89 THEN
 RL=RL-8:IFVP=89 THENY=Y-1:IFVP=
89 THEN VP=88
15Ø8 GOSUB 5ØØ:POKE1Ø23+L,128:GO
TO 151Ø
151Ø RL=RL+8
152Ø GOSUB 18ØØ
1525 GOSUB955
153Ø GOTO13Ø
18ØØ 'LOCATE REAL POSITION
181Ø X=1
182Ø T1=RL-X
183Ø T1=T1/8
184Ø T2=INT(T1)
185Ø IFT2=T1 THEN187Ø
186Ø X=X+1:GOTO182Ø
187Ø CN=X'CN IS COLUMN NUMBER-1-
8
188Ø RN=1:UL=8
1885 IF RL<=8 THEN RN=1:IF RL<=8
 THEN 192Ø
19ØØ UL=UL+8
19Ø5 IF RL<=UL THEN 1915 ELSE191
Ø
191Ø RN=RN+1
1911 IF RN=1ØØ THEN192Ø
1912 GOTO 19ØØ
1915 RN=RN+1
192Ø RETURN
2ØØØ 'FILL STRING LOCATION
2Ø1Ø IF CN=1 THEN A$(RN)=OT$
2Ø2Ø IF CN=2 THENB$(RN)=OT$
2Ø3Ø IF CN=3 THEN C$(RN)=OT$
2Ø4Ø IF CN=4 THEND$(RN)=OT$
2Ø5Ø IF CN=5 THENE$(RN)=OT$
2Ø6Ø IF CN=6 THENF$(RN)=OT$
2Ø7Ø IF CN=7 THEN G$(RN)=OT$
2Ø8Ø IF CN=8 THEN H$(RN)=OT$
2Ø9Ø RETURN
22ØØ GOTO22Ø9'ENTRY
22Ø5 O1$=INKEY$:IF O1$="" THEN22
Ø5
22Ø6 PRINT@448,O1$
22Ø9 O2$= INKEY$:IF O2$="" THEN
22Ø9
221Ø IF ASC(O2$)=34THEN 22Ø5
2215 IF ASC(O2$)=13 THEN 23ØØ
222Ø PRINT@449,O2$
2225 O3$=INKEY$:IFO3$="" THEN 22
25
223Ø IF ASC(O3$)=34 THEN 22Ø9
2235 IF ASC(O3$)=13 THEN23ØØ
224Ø PRINT@45Ø,O3$
2245 O4$=INKEY$:IFO4$="" THEN224
5
225Ø IFASC(O4$)=13 THEN 23ØØ
2255 PRINT@451,O4$
226Ø O5$=INKEY$:IF O5$="" THEN 2
26Ø
2265 PRINT@452,O5$
23ØØ RETURN
232Ø RETURN
24ØØ IF O1$="+" THEN 24Ø5 ELSE 2
6ØØ'241Ø IS SET UP FORMULA
24Ø5 FOR X=1 TO 15:FI$(X)="":NEX
TX:F=F+1
241Ø Z=1:PL=448
242Ø FI$(Z)=INKEY$:IF FI$(Z)=""
THEN 242Ø
243Ø IF ASC(FI$(Z))=13 THEN254Ø
2431 PRINT@PL,FI$(Z)
244Ø PL=PL+1
245Ø Z=Z+1:IF Z=13 THEN 254Ø ELS
E242Ø
254Ø FOR X=1 TO Z-1:FT$(F)=FT$(F
)+FI$(X):NEXT X:FT$(F)=FT$(F)+ST
R$(RL):GOTO 26ØØ
26ØØ 'CALCULATION
26Ø5 POKE65495,Ø
261Ø FOR W=1 TO F
2615 IF FT$(W)="X" THEN 294Ø
262Ø 'SUBSCR MUST BE 2 DIGITS
263Ø N=1:PO=1
264Ø GOSUB265Ø:OP$(1)=P$:GOTO278
Ø
265Ø SU(N)=VAL(MID$(FT$(W),PO+1,
2))
2655 IF MID$(FT$(W),PO,1)="A" TH
EN P$=A$(SU(N))
266Ø IF MID$(FT$(W),PO,1)="B" TH
EN P$=B$(SU(N))
267Ø IF MID$(FT$(W),PO,1)="C" TH
EN P$=C$(SU(N))
268Ø IF MID$(FT$(W),PO,1)="D" TH
EN P$=D$(SU(N))
269Ø IF MID$(FT$(W),PO,1)="E" TH
EN P$=E$(SU(N))
27ØØ IF MID$(FT$(W),PO,1)="F" TH
EN P$=F$(SU(N))
271Ø IF MID$(FT$(W),PO,1)="G" TH
EN P$=G$(SU(N))
272Ø IF MID$(FT$(W),PO,1)="H" TH
EN P$=G$(SU(N))
273Ø RETURN
278Ø PO=5:N=2:GOSUB 265Ø:OP$(2)=
P$
279Ø IF LEN(FT$(W))>1Ø THEN28ØØ
ELSE 281Ø
28ØØ PO=9:N=3:GOSUB 265Ø:OP$(3)=
P$
281Ø IF MID$(FT$(W),4,1)="+" THE
N RE=VAL(OP$(1))+VAL(OP$(2))
282Ø IF MID$(FT$(W),4,1)="-" THE
N RE=VAL(OP$(1))-VAL(OP$(2))
283Ø IF MID$(FT$(W),4,1)="*" THE
N RE=VAL(OP$(1))*VAL(OP$(2))
284Ø IF MID$(FT$(W),4,1)="/" THE
N RE=VAL(OP$(1))/VAL(OP$(2))
285Ø IF LEN(FT$(W))>1Ø THEN286Ø
ELSE 29ØØ
286Ø IF MID$(FT$(W),8,1)="+" THE
N RE=RE+VAL(OP$(3))
287Ø IF MID$(FT$(W),8,1)="-" THE
N RE=RE-VAL(OP$(3))
288Ø IF MID$(FT$(W),8,1)="*" THE
N RE=RE*VAL(OP$(3))
289Ø IF MID$(FT$(W),8,1)="/" THE
N RE=RE/VAL(OP$(3))
29ØØ RE$=STR$(RE)
292Ø RS=VAL(RIGHT$(FT$(W),2))
293Ø GOSUB 5ØØØ
294Ø NEXT W
2945 POKE65494,Ø
295Ø GOTO 12Ø
3ØØØ PRINT@448,"INSERT ROW"
3Ø15 X=1
3Ø2Ø IF A$(X)="" AND B$(X)="" AN
D C$(X)="" AND D$(X)="" AND E$(X
)="" AND F$(X)="" AND G$(X)="" A
ND H$(X)="" THEN 3Ø3Ø ELSE 3Ø25'
ROW INSERT
3Ø25 X=X+1:GOTO3Ø2Ø
3Ø3Ø MR=X:GOSUB 18ØØ
3Ø35 FOR X=MR TO RN STEP-1
3Ø4Ø A$(X+1)=A$(X):B$(X+1)=B$(X)
:C$(X+1)=C$(X):D$(X+1)=D$(X):E$(
X+1)=E$(X):F$(X+1)=F$(X):G$(X+1)
=G$(X):H$(X+1)=H$(X)
```

Listing continued

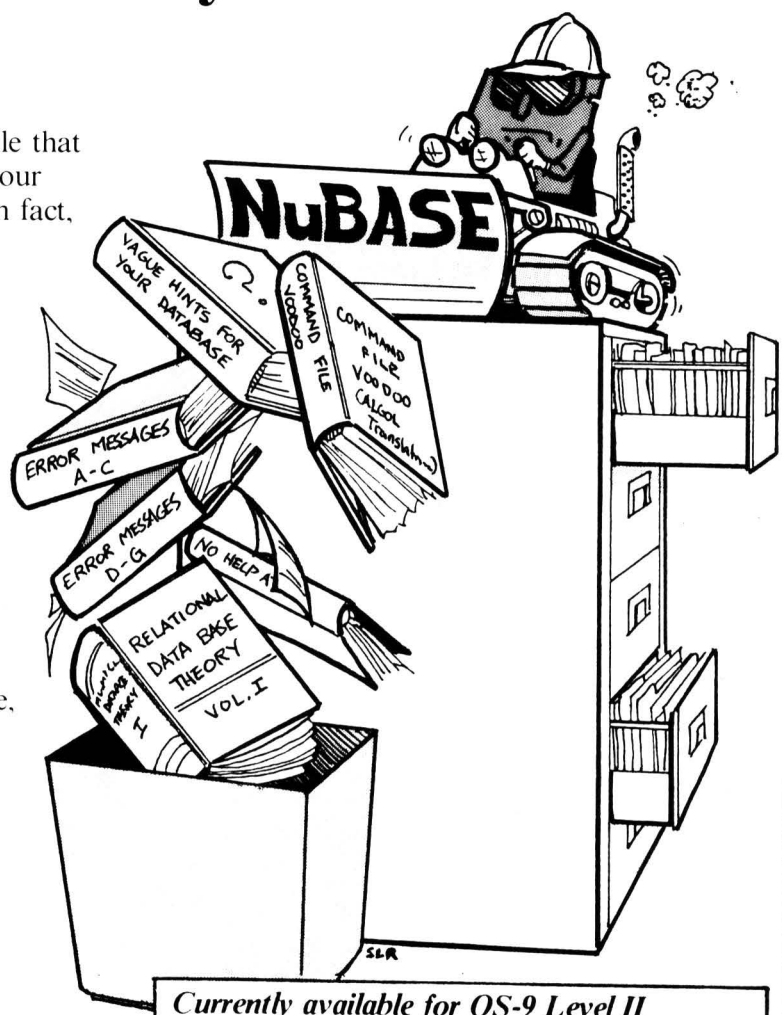
Introducing NuBASE: the *uncomplicated* data base

It lets you throw away all the books!

NuBASE is a data base manager so versatile that you can use it to do what you want with your data. It's not complicated or overbearing; in fact, it's so easy to use that you'll be up and running in minutes.

Simple user-specified masks insure data accuracy. Data integrity is assured through the use of highly crash-resistant software. *See what you're doing* through the interactive generation of files, screens and reports.

NuBASE is as affordable as it is complete. There's nothing else to buy... $150 brings you the comprehensive package, including a ready-to-use mailing list application to get your **NuBASE** working for you on day one.



The computing power of NuBASE is limited only by the capacity of your hardware.

DO WE HAVE YOUR NAME & ADDRESS
For new products news & announcements?

VISA MasterCard

Currently available for OS-9 Level II
For more information or to place an order, contact:

Dept. HC 16

The JBM Group, Inc.
Continental Business Center
Front & Ford Streets
Bridgeport, PA USA 19405
TWX: 510-660-3999

the JBM group

190

215-275-1777

PA res. add 6% sales tax.
US orders, add $5.00 postage and handling.

* OS9 is a registered trademark of Microware Corp.

See List of Advertisers on page 81

```
3045 NEXT X
3046 A$(RN)="":B$(RN)="":C$(RN)=
"":D$(RN)="":E$(RN)="":F$(RN)=""
:G$(RN)="":H$(RN)=""
3047 GOSUB 5000:GOTO1300
3200 'PRINT OPTION
3205 PRINT@448,"START ROW"
3210 GOSUB 6000
3215 SR=RI
3220 PRINT@448,"END ROW"
3225 GOSUB6000
3230 ER=RI
3231 PRINT@448,"PRINTING"
3235 FOR X=SR TO ER
3236 PRINT#-2,TAB(5)A$(X);TAB(14
)B$(X);TAB(23)C$(X);TAB(32)D$(X)
;TAB(41)E$(X);TAB(50)F$(X);TAB(5
9)G$(X);TAB(68)H$(X)
3240 NEXT X
3241 PRINT@448,""
3245 GOTO 1300
3800 PRINT@448,"SAVE(S),LOAD(L)
OR VERIFY(V)?"
3805 SA$=INKEY$: IF SA$="" THEN
3805
3810 IF SA$="S" THEN 3815
3811 IF SA$="V" THEN 3860 ELSE 3
875
3815 CLS:INPUT"FILE NAME TO SAVE
";NF$
3820 OPEN"O",#-1,NF$
3825 PRINT#-1,L,RN,CN,RL,Y,F,HP,
VP
3830 A$(100)=".":B$(100)=".":C$(
100)=".":D$(100)=".":E$(100)="."
:F$(100)=".":G$(100)=".":H$(100)
="."
3831 FORX=1 TO F:PRINT#-1,FT$(X)
:NEXTX
3832 FOR X=1 TO 8:PRINT#-1,CT(X)
,CE(X):NEXT X
3835 FORX=1 TO 100:PRINT#-1,A$(X
):NEXTX
3836 FORX=1TO100:PRINT#-1,B$(X):
NEXTX
3837 FORX=1 TO100:PRINT#-1,C$(X)
:NEXTX
3838 FOR X=1 TO100:PRINT#-1,D$(X
):NEXTX
3839 FOR X=1 TO100:PRINT#-1,E$(X
):NEXTX
3840 FOR X=1TO100:PRINT#-1,F$(X)
:NEXTX
3841 FORX=1TO100:PRINT#-1,G$(X):
NEXTX
3842 FORX=1TO100:PRINT#-1,H$(X):
NEXTX
3855 CLOSE #-1:GOTO1200
3860 CLS:INPUT"FILE TO VERIFY";N
F$
3865 SKIPF NF$
3867 PRINT"FILE VERIFIED"
3868 FOR X=1 TO500:NEXTX
3870 GOTO 1200
3875 CLS:INPUT "FILE TO LOAD";NF
$
3880 OPEN"I",#-1,NF$
3885 INPUT#-1,L,RN,CN,RL,Y,F,HP,
VP
3900 A$(100)="":B$(100)="":C$(10
0)="":D$(100)="":E$(100)="":F$(1
00)="":G$(100)="":H$(100)=""
3910 FOR X=1 TO F:INPUT #-1,FT$(
X):NEXT X
3915 FOR X=1 TO8:INPUT#-1,CT(X),
CE(X):NEXT X
3920 FORX=1TO100:INPUT#-1,A$(X):
NEXTX
3922 FOR X=1TO100:INPUT#-1,B$(X)
:NEXT X
3924 FOR X=1TO100:INPUT#-1,C$(X)
:NEXTX
3926 FORX=1TO100:INPUT#-1,D$(X):
NEXTX
3928 FORX=1TO100:INPUT#-1,E$(X):
NEXTX
3930 FOR X=1TO100:INPUT#-1,F$(X)
:NEXTX
3932 FORX=1TO100:INPUT#-1,G$(X):
NEXTX
3934 FORX=1TO100:INPUT#-1,H$(X):
NEXTX
3970 CLOSE#-1
3975 GOTO1200
4000 'TITLE
4005 ON HP GOTO4010,4020,4030,40
40,4050
4010 PRINT@3,A$(1):PRINT@10,B$(1
):PRINT@17,C$(1):PRINT@24,D$(1):
GOTO4060
4020 PRINT@3,B$(1):PRINT@10,C$(1
):PRINT@17,D$(1):PRINT@24,E$(1):
GOTO4060
4030 PRINT@3,C$(1):PRINT@10,D$(1
):PRINT@17,E$(1):PRINT@24,F$(1):
GOTO4060
4040 PRINT@3,D$(1):PRINT@10,E$(1
):PRINT@17,(F$(1):PRINT@24,G$(1)
:GOTO4060
4050 PRINT@3,E$(1):PRINT@10,F$(1
):PRINT@17,G$(1):PRINT@24,H$(1)
4060 PRINT@448,"PRESS<ENTER>TO C
ONTINUE"
4065 X$=INKEY$:IF X$="" THEN 4065
4070 GOTO1200
5000 'LOCATE RESULTS OF FORMULA
CALC
5010 U=1
5020 T1=RS-U
5030 T1=T1/8
5040 T2=INT(T1)
5050 IF T2=T1 THEN 5070
5060 U=U+1:GOTO 5020
5070 FC=U
5080 FR=1:UL=8
5085 IF RS<=8 THEN FR=1:IF RS<=8
 THEN 5200
5100 UL=UL+8
5105 IF RS<=UL THEN 5115 ELSE 51
10
5110 FR=FR+1
5111 IF FR=100 THEN 5120
5112 GOTO 5100
5115 FR=FR+1
5200 IF FC=1 THEN A$(FR)=RE$
5210 IF FC=2 THEN B$(FR)=RE$
5220 IF FC=3 THEN C$(FR)=RE$
5230 IF FC=4 THEN D$(FR)=RE$
5240 IF FC=5 THEN E$(FR)=RE$
5250 IF FC=6 THEN F$(FR)=RE$
5260 IF FC=7 THEN G$(FR)=RE$
5270 IF FC=8 THEN H$(FR)=RE$
5280 RETURN
6000 'ROW IMPUT
6010 R1$=INKEY$:IF R1$="" THEN 6
010
6020 PRINT@448,R1$
6030 R2$=INKEY$:IF R2$="" THEN 6
030
6040 PRINT@449,R2$
6049 RI$=R1$+R2$:RI=VAL(RI$):GOT
O6060
6050 RI=VAL(R1$)+VAL(R2$)
6060 RETURN
7000 'SUM COLUMNS
7010 PRINT@448,"ROW(R) OR COL(C)
"
7011 X$=INKEY$:IFX$="" THEN7011
7012 IFX$="C" THEN 7020 ELSE 730
0
7020 FOR X=1 TO 8:IF X=CN THEN C
T(X)=1
7030 IF CT(X)=1 THEN CE(X)=RN
7035 NEXT X
7040 IF CT(1)=1 THEN 7045 ELSE 7
065
7045 CS=0:FOR X=1 TO (CE(1))-1
7050 CS=VAL(A$(X))+CS
7055 NEXT X
7060 A$(CE(1))=STR$(CS)
7065 IF CT(2)=1 THEN 7070 ELSE 7
090
7070 CS=0:FOR X=1 TO (CE(2))-1
7075 CS=VAL(B$(X))+CS
7080 NEXT X
7085 B$(CE(2))=STR$(CS)
7090 IF CT(3)=1 THEN 7095 ELSE 7
115
7095 CS=0:FOR X=1 TO (CE(3))-1
7100 CS=VAL(C$(X))+CS
7105 NEXTX
7107 C$(CE(3))=STR$(CS)
7110 CS=0:FOR X=1 TO (CE(6))-1
7115 IF CT(4)=1 THEN 7120 ELSE 7
140
7120 CS=0:FOR X=1 TO (CE(4))-1
7125 CS=VAL(D$(X))+CS
7130 NEXTX
7135 D$(CE(4))=STR$(CS)
7140 IF CT(5)=1 THEN 7145 ELSE 7
165
7145 CS=0:FORX=1 TO (CE(5))-1
7150 CS=VAL(E$(X))+CS
7155 NEXTX
7160 E$(CE(5))=STR$(CS)
7165 IF CT(6)=1THEN 7170 ELSE 71
90
7170 CS=0:FOR X=1 TO (CE(6))-1
7175 CS=VAL(F$(X))+CS
7180 NEXT X
7185 F$(CE(6))=STR$(CS)
7190 IF CT(7)=1 THEN 7195 ELSE 7
215
7195 CS=0:FOR X=1 TO (CE(7))-1
7200 CS=VAL(G$(X))+CS
7205 NEXT X
7210 G$(CE(7))=STR$(CS)
7211 IF CT(8)=1 THEN 7215 ELSE 7
235
7215 CS=0:FOR X=1 TO (CE(8))-1
7220 CS=VAL(H$(X))+CS
7225 NEXT X
7230 H$(CE(8))=STR$(CS)
7235 GOTO1200
7300 'ROW SUM
7310 GOSUB1800
7320 SA=RN:SD=CN
7330 ON SD GOTO 7331,7332,7340,7
350,7360,7370,7380,7390
7331 GOTO1200
7332 GOTO1200
7340 FOR X=1TO SA-1:Z=VAL(A$(X))
+VAL(B$(X)):C$(X)=STR$(Z):NEXTX:
GOTO1200
7350 FORX=1TO SA-1:Z=VAL(A$(X))+
VAL(B$(X))+VAL(C$(X)):D$(X)=STR$
(Z):NEXTX:GOTO1200
7360 FORX=1TO SA-1:Z=VAL(A$(X))+
VAL(B$(X))+VAL(C$(X))+VAL(D$(X))
:E$(X)=STR$(Z):NEXTX:GOTO1200
7370 FORX=1TOSA-1:Z=VAL(A$(X))+V
AL(B$(X))+VAL(C$(X))+VAL(E$(X)):
F$(X)=STR$(Z):NEXTX:GOTO1200
7380 FORX=1TOSA-1:Z=VAL(A$(X))+V
AL(B$(X))+VAL(C$(X))+VAL(D$(X))+
VAL(E$(X))+VAL(F$(X)):G$(X)=STR$
(Z):NEXTX:GOTO1200
7390 FOR X=1 TO SA-1:Z=VAL(A$(X)
)+VAL(B$(X))+VAL(C$(X))+VAL(D$(X
))+VAL(E$(X))+VAL(F$(X))+VAL(G$(
X)):H$(X)=STR$(Z):NEXTX:GOTO1200
12000 PCLEAR1:GOTO 10
```

END

SUPPORT

(sə·pôrt) v.t. **1**. To bear the weight of, especially from underneath; uphold in position; keep from failing, etc. **2**. To bear or sustain (weight; etc.) **3**. To keep from failing; strengthen: *PBJ, Inc. supports their product line with technical personnel that are always there to help you.* **4**. To serve, to uphold or corroborate (a statement, theory, etc.) substantiate; verify: *PBJ, Inc. receives testimonials on a daily basis that support their product line.* **5.** To provide (a person, institution) with maintenance; provide for: *PBJ, Inc. supports the CoCo user by consistently creating new advancements in their field.*

Synonym: **PBJ, Inc.**

A long description indeed, yet very applicable to the kind of service delivered by PBJ, Inc. When the serious CoCo user needs back-up support, technical information or assistance, PBJ, Inc. is there! From the products they manufacture through to the strategic solutions they offer, PBJ, Inc. has rightfully gained the reputation of "the company with *the most support* for the Color Computer."

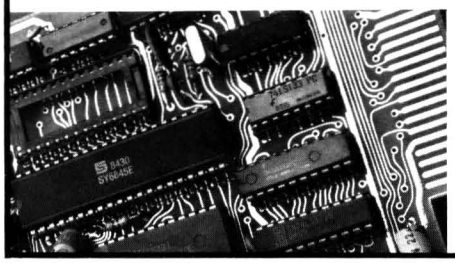
↙214

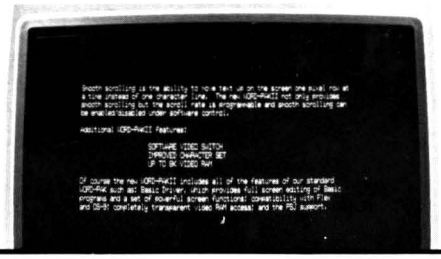
pbj inc.

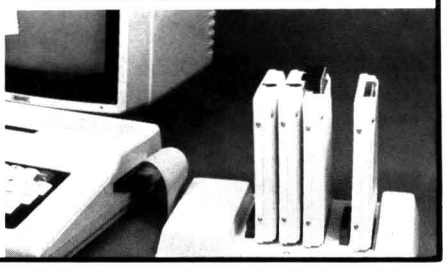
"Innovative Products for the CoCo User"

Call or write today for our **FREE** Catalog ...
P.O. Box 813 • North Bergen, N.J. 07047 • **201-330-1898**

*Derived from *Funk & Wagnall's International Dictionary*







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!

TCE™

Send for FREE Catalog

TCE EDUCATION DIVISION
P.O. BOX 2477
↙387 GAITHERSBURG, MD 20879
(301) 963-3848

MasterCard VISA

↙ See List of Advertisers on page 81

BY CARL J. CHRISTENSEN

TAKE STOCK IN COCO

Keep on top of Wall Street with this pair of stock tracking and graphing programs.

If you follow the stock market, you have probably wished that the Dow Jones market-tracking programs were available for your Color Computer. Dow Jones has made them available for IBM and Apple and appears to be in no hurry to adapt the programs for other machines. However, while you are waiting, you can use these programs to store and chart stock market quotes.

Program Listing 1, Stock Grapher, allows you to enter the date, high, low, close and volume for a stock and then store this information on tape or disk. The program handles one year of daily quotes. It graphs daily quotes for any three-month period or the weekly trading range and Friday close for an entire year.

The quotes for each stock are saved in separate files and are loaded into the program one at a time for updating or graphing.

The program graphs the trading range as a vertical bar with a tick mark indicating the close. Volume is shown by a vertical bar on the lower half of the graph. The program picks an appropriate scale so your stock never goes off the chart.

Any screen-print program can provide a hard copy of a stock chart. If possible, load the screen-print program at hex 7C00.

Program Listing 2, Quote Entry, provides disk owners with a method for easily updating their quote files either manually or automatically, using Dow Jones News/Retrieval and a terminal program. One disk holds a year's worth of daily quotes for 10 stocks.

Delete the high-speed POKEs in lines 120, 5080, and 5110 in Listing 1 if your computer (especially D and ET board versions) cannot handle it.

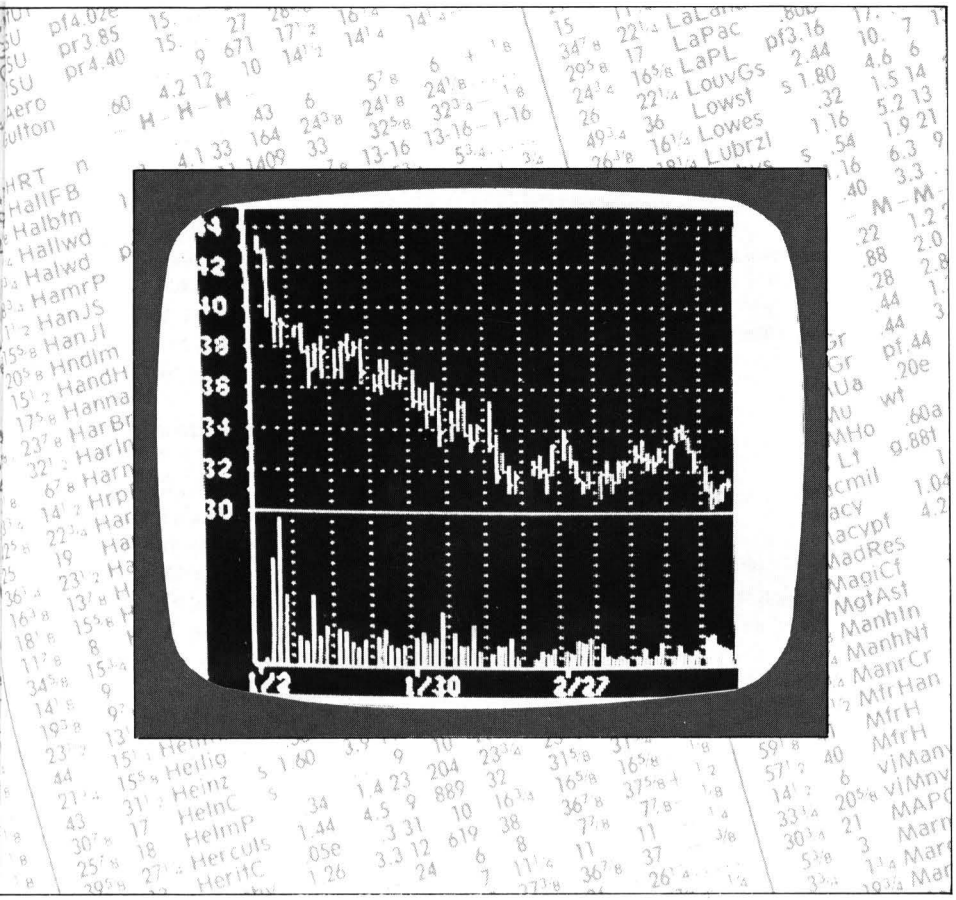
- Use the Create a New File option.
- Find the number of the week in the current year and enter it at the appropriate time.
- Use the standard stock symbol for the file name.
- Use selection 1 to enter Monday's data for this stock.
- Use selection 5 to save the information on disk or tape. If you are using tape, I suggest using a separate tape for each stock. By the end of the year it will only take about two minutes to load or save a file.
- If you wish to enter data for another stock, use selection 6 and repeat the whole process.

To view or update a file, follow these steps:

- Use the Load an Old File option.
- Always use the standard ticker-tape symbol for the file name.
- Use selection 1 to enter a new quote. Make an entry for every weekday, even holidays and days that you miss. This way the graph will clearly show each week separately. The program does not contain a calender routine. Keep your dates straight! Using selection 3, you can enter quotes for as many days as you wish. For example, you could wait for the weekend to enter the quotes for the previous week.
- Use selection 2 to view the quotes.
- Use selection 3 to graph the information. When viewing the graph, push any key to return to the menu. You will be able to view it again without having to redraw it.
- If you add new information, use selection 5 to save it.

More on the Graphs

There are two options for graphing



the stock quotes. The first shows daily quotes for any three-month period and the second shows weekly trading range for the whole year. The scale of the graph automatically adjusts for the range of prices being graphed.

Figure 1 shows the daily price movements for the stock of Tandy Corp. for the first three months of 1984. Vertical lines indicate the beginning of each week. Figure 2 begins with the second month and Fig. 3 with the third month. Notice that the vertical scale is changed for each.

Figure 4 shows the same information, but uses the whole-year option. Now the vertical lines mark the end of each 13-week quarter. The trading range is weekly and the tick mark is the Friday close.

Program Notes

Since the program creates and maintains a database, it contains such standard database functions as load, update, view, modify, and save. In addition to these functions, the program also graphs the data in several formats. Refer to Listing 1. Notice that each function is carried out in modules that begin at line numbers that are multiples of 1000. Table 1 lists variables used in Stock Grapher.

Line 120 uses the high-speed POKE. If your machine can't use it, eliminate it here and also in lines 5110 and 6150. The menu's quit option returns the computer to normal speed.

If a new file is to be created using the New/Old? option, the program asks for the number of the week in the current year so that it can fill in previous dates with a one. This is because the graphing module will stop graphing when it finds a blank date. This way your charts will all be positioned correctly on the yearly graph if you start following some stocks at a different date. Also the earlier dates can be filled in at a later date using the Modify selection. Remember, always start on a Monday because the graph of daily quotes is divided into five-day segments.

Table 1. Stock Grapher Variable List

String Variables			
MM$	month	N$(0-9)	Numerals for drawing
DD$	day	SL$	slash
HI$	high	CW$	current week
LO$	low	FL$	file name
CL$	close	LC$	screen location
V$	volume	I$	input
N$	price for labeling graph	AA$	input
C$	each charter for graph labels		
Numeric Variables			
HI	high	WHI	weekly high
LO	low	WLO	weekly low
CL	close	WCL	weekly close
V	volume	WV	weekly volume
MAX	maximum price during the period		
MIN	minimum price during the period		
HV	highest volume		
RANGE	maximum less minimum		
MM	month	DD	day
CW	current week	TQ	total quotes
N	counters	BM	beginning month
SH	search target	BQ	beginning quote
I	input	AA	input
Used in the graphing routines			
CH	value of a character	P	point
PR	price	VS	volume scale
V1-V8	points for drawing blank graph	X and Y	coordinates in graph
DAY	day	WEEK	week
		SL	screen location

System Requirements

32K RAM
Extended Color Basic
Disk Drive Optional
Printer Optional

Table 2. Sample Sessions

Session 1. No new stocks added

If you are retrieving quotes from Dow Jones:
- Insert Colorcom/E. RUN "GO". Press ENTER. Press down arrow plus 5.
- Insert your disk. Touch R. Touch 1. File name: "LOGON".
- Press spacebar. Dial Dow Jones. Switch on modem. Press BREAK repeatedly. When PLEASE LOG IN: appears, press down arrow plus 1.
- Press down arrow plus 1 each time printing stops.
- Turn modem off. If Colorcom/E menu doesn't appear, press down arrow key plus 5.
- Touch W. Touch 2. File name: QUOTES.
- Remove disk and turn computer off.

Insert disk and RUN "ENTRY". No, you are not a new user. Choose manual or automatic entry. Choose 7 to finish.
WAIT! RUN "STOCKS" to inspect and graph quotes.

Session 2. New stocks added

Start on Monday. Use STOCK GRAPHER to enter first quote. Enter other quotes normally. Don't add new stock to QUOTE ENTRY yet. RUN "STOCKS" to inspect and graph quotes.

Tuesday:
- If using automatic entry, RUN "MAKELGON". Enter all symbols. Use Colorcom/E to retrieve quotes.
- RUN "ENTRY".
- No, you are not a new user.
- Use selection 4 to add the new symbols.
- Enter quotes in normal manner.
- Update. Wait.
- RUN "STOCKS" to inspect and graph information.

The Generate Random File module generates a year's worth of random quotes. To use it, temporarily delete line 305. Use it to see what a full year of data looks like on the graph. Modify one quote out of the range of the others to see the scale change. Be sure to insert line 305 (GOTO 500) before using the program.

In addition to showing the list of selections, the menus show the stock symbol and date of last entered quote. When finished, be sure to use the Quit option to return the computer to normal speed.

If you enter the Enter New Quotes module by mistake, you can return to the menu by entering M instead of a month number. In this mode, the program will not accept a low if it is greater than the high. Also, the close has to fall between the high and low.

The first option of the Graph Quotes is to view an old graph or draw a new one. This lets you return to a graph without waiting for it to be redrawn. Notice that once a graph is drawn, it stays there in memory and can be viewed with a simple SCREEN1,1. Also, if your screen-print routine cannot be relocated above this program at hex 7C00, just quit this program and load and execute your screen-print routine. The graph is still there for the routine to read.

The Modify Previous Entries module lets you correct previous entries. Recall the quote by its number. Pressing enter when the cursor is next to a value leaves it unchanged. You can save or load files using either tape or disk. Be sure to use the stock symbol as the file name. Disk users should make a daily disk backup and weekly tape backup.

Quote Entry

Quote Entry (Listing 2) updates files that you create using Stock Grapher. You first enter the symbols for the stocks you are following. Then enter today's quote either manually or automatically for each stock. You can later modify this information and add new stocks to the list. Finally, the program adds these most recent quotes to the data file for each stock.

Before reading a file, the program checks the directory to see if the disk contains that file. If the file is not on the disk, the program tells you so you can insert another disk when the program is finished updating the first disk. Although each disk will hold only 10 stocks, a portfolio of up to 40 stocks could be maintained by using four different disks on a single-drive system. This number could be increased by changing the DIMs in line 10.

Using Quote Entry

Here's how to start up Quote Entry:

- Make a backup of the disk that contains Stock Grapher and the data-files of the stocks you are tracking. Remember, if a new issue is to be followed, the file of quotes must be started on a Monday using Stock Grapher.
- Type in Quote Entry, proofread it, and save it as "ENTRY".

For first-time use via Colorcom/E and Dow Jones News/Retrieval, follow these steps (if you do not own a Colorcom/E or are not a Dow Jones subscriber, skip this section):
- Key in Program Listing 3 and save it on the disk as "MAKELGON".
- Run "MAKELGON".
- Enter the symbols for the stocks that you are following.
- Enter XX when you are finished.
- Remove your disk. Insert the Colorcom/E and type RUN "GO".
- Remove the Colorcom/E disk. Press enter. Press the down-arrow and five keys.
- Insert your disk. Touch R.
- Press the one key (Xmit Options = 1. None.)
- Enter as file name "LOGON". Press spacebar.
- Dial your Dow Jones access number. Switch on the modem. Press break repeatedly until "Please log on:" appears.
- Press the down-arrow and one keys each time the printing stops.
- When "Please log on:" appears again, turn the modem off.
- If Colorcom/E menu does not return, press the down-arrow and five keys.

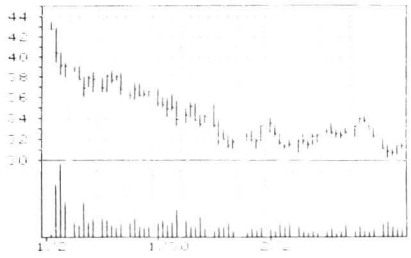


Fig.1. Daily Price Movements for Tandy Stock for First Three Months

Fig.2. Price Movements for Tandy Stock Beginning with the Second Month

- Press the W, then the two key (no capture characters). Enter as the file name "QUOTES".
- Remove your disk and turn the computer off.

If you do not use the Colorcom/E or Dow Jones News/Retrieval, follow these first-use steps:

- Run "ENTRY".
- Press Y in response to "Are you a new user?"
- Enter the stock symbols for the issues that have begun to follow using Stock Grapher.
- When you are finished, enter XX.
- Enter the date.
- Use menu selections 4, 5, and 6 to inspect, correct, or add more stock symbols.

Here are the steps for automatic quote entry:

- Choose the Enter New Quotes, Automatic Entry, and Wait! menu options.

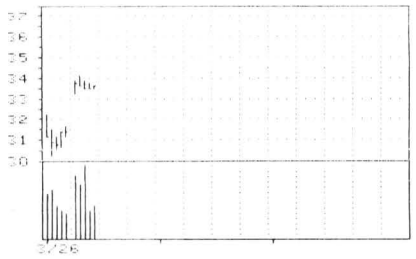


Fig.3. Price Movements for Tandy Stock Beginning with the Third Month

Use these steps for manual quote entry:

- Choose the Enter New Quotes and Manual Entry options.
- You will be prompted to enter the new quotes for each stock.

To scan and modify quotes, use menu selections 2 and 3 to view and, if necessary, modify the information entered.

To update files:

- Use selection 7 when you are satisfied that the quotes are accurate.
- Wait until the prompt "Press any key to continue" eventually returns.
- If any files were not found, press any key, insert the data disk containing those files, and use selection 7 again. The files on the first disk will be "not found" this time.

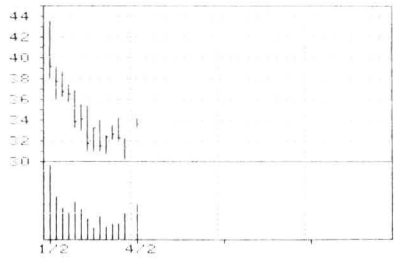


Fig.4. Price Movements for Tandy Stock Using the Whole-Year Option

Your master disk should now contain:

STOCKS (Stock Grapher)
ENTRY (Quote Entry)
STKSYM (list of symbols in portfolio)
XYZ
ABC etc. up to 10 data files
If you are using automatic entry,
MAKELGON (to create automatic file for Colorcom/E)
LOGON (automatic file for Colorcom/E)
QUOTES (most recent data from Dow Jones)

Other disks should have:

STOCKS
STKSYM (will be written by QUOTE ENTRY)
XYZ
ABC
etc. data files

See Table 2 for sample sessions.

If this seems a bit complicated, it is because this system is designed to accommodate three types of user: the tape-system user, the disk-system user who does not use the Dow Jones News/Retrieval system, and the disk-system user who has Colorcom/E or some other terminal program and who uses the Dow Jones system. For example, the routine could be simplified for the latter user by modifying Quote Entry so that it would create Logon as well as STKSYM.

Program Notes

Table 3 contains a list of variables.

The list of stocks to be followed is put in alphabetical order. This is accomplished by a standard bubble sort where each item in the list is compared to the next one. If they are not in alphabetical order, they switch places, and the switch is recorded (SW = 1). ■

Address correspondence to Carl J. Christensen, 523 Inca Way, Salinas, CA 93906.

Table 3. Quote Entry Variable List

String Variables			
SYM$(x)	stock symbol	AA$ and I$	inputs
A$(x)	month from tape	B$(x)	day from tape
PM$	previous month	PD$	previous day
MM$	today's month	DD$	today's day
HI$	today's high	LO$	today's low
CL$	today's close	V$	today's volume
A$(x)	lines read from Dow Jones Data file		
IT$	integer	DE$	denominator
SH$	search target	NU$	numerator
S$	temporary storage in alphabetizer sort		
J$ and K$	strings read by DSKI		
Numeric Variables			
BD(x)	today's bid	AK(x)	today's ask
HI(x)	today's high	LO(x)	today's low
CL(x)	today's close	V(x)	today's volume
A(x)	tape high	B(x)	tape lose
C(x)	tape close	D(x)	tape volume
I & AA	inputs	X and N	counters
TI	total issues	SL	screen location
MM	month	DD	day
SW	switch	A	value of A$
IT	integer	DE	denominator
S1, S2, S3 and S4	temporary storage in ABC sort		
J and K	value of J$ & K$ from DSKI		

Program Listing 1. Stock Grapher

```
10 GOTO 105
15 ' subroutine used in graph
20 MAX=0:MIN=10000:HV=0:WV=0
25 FORN=1TO26:PRINT@0,N
30 IF MM$(1)="" THEN500
35 IF HI(N)=0 THEN50
40 IF HI(N)>MAX THEN MAX=HI(N)
45 IF LO(N)>0 AND LO(N)<MIN THEN
 MIN=LO(N)
50 WV=WV+V(N):IF N/5=INT(N/5) TH
ENX=X:IF WV>HV THEN HV=WV
55 IF N/5=INT(N/5) THENWV=0
60 IF MM$(N)="" THEN70
65 NEXT:RETURN
70 IF WV>HV THEN HV=WV:RETURN
75 RETURN
100 ' title
105 CLS:PRINT@65,"* S T O C K
 G R A P H E R *"
110 PRINT@260,"EXTENDED COLOR BA
SIC 32K":PRINT@297,"(TAPE OR DIS
K)"
115 PRINT@396,"(C) 1984":PRINT@4
22,"CARL J. CHRISTENSEN":GOSUB70
00:CLS
120 POKE65495,0:CLEAR4000,&H7BFF
:DIMMM$(260),DD$(260),HI(260),LO
(260),CL(260),V(260)
125 N$(0)="BM+1,0H1U4E1R2F1D4G1L
2BM+6,0"
130 N$(1)="BM+1,0R1NR1U6G1BM+6,+
5"
135 N$(2)="NR4U1E1R1E2U1H1L2G1BM
+7,+5"
140 N$(3)="BM+0,-1F1R2E1H2E2H1L3
BM+7,6"
145 N$(4)="BM+3,0U2NR1L3U1E3D3BM
+4,3"
150 N$(5)="BM+0,-1F1R2E1U2H1L3U2
R4BM+3,+6"
155 N$(6)="BM+4,-5H1L2G1D4F1R2E1
U1H1L3BM+7,+3"
160 N$(7)="U1E4U1L4BM+7,+6"
165 N$(8)="BM+1,-0H1U1E1H1U1E1R2
F1D1G1NL2F1D1G1L2BM+6,0"
170 N$(9)="BM+0,-1F1R2E1U4H1L2G1
D1F1R2BM+4,+3"
175 SL$="U1E4U1BM+3,+6"
200 ' new/old file??
210 CLS:PRINT"1. CREATE A NEW FI
LE":PRINT"2. LOAD AN OLD FILE":P
RINT@480,"TYPE 1 OR 2.";
220 GOSUB7020:IF AA<1 OR AA>2 TH
EN 220
230 IF AA=2 THEN 6000
240 CLS:PRINT"START THE NEW FILE
 ON A MONDAY."
250 PRINT@64,"ENTER THE NUMBER O
F THIS WEEK INTHE CURRENT YEAR (
1-52). ";:LINEINPUTCW$:CW=VAL(CW
$):IFCW<1 OR CW>52 THEN250
260 TQ=(CW-1)*5:FORN=1TO TQ:MM$(
N)="1":NEXT
270 PRINT@160,"NAME THE FILE USI
NG THE STOCK   SYMBOL (TAN).":LI
NEINPUT"FILENAME ";FL$:IF FL$=""
THEN270
300 ' generate random file
305 GOTO500
310 MM=1:DD=1:FORN=1 TO 260
315 MM$=STR$(MM):MM$(N)=RIGHT$(M
M$,LEN(MM$)-1)
320 DD$=STR$(DD):DD$(N)=RIGHT$(D
D$,LEN(DD$)-1)
325 HI(N)=RND(5)+30+.125
330 LO(N)=HI(N)-RND(5)
335 CL(N)=LO(N)+(HI(N)-LO(N))/2
340 V(N)=RND(100)*100
345 IF DD=21 THEN DD=0:MM=MM+1
350 DD=DD+1
355 NEXT:TQ=N-1
500 ' menu
510 CLS:PRINT"********** SELECTI
ONS **********";
520 PRINT"FILE: ";FL$;:PRINT@46,
"LAST QUOTE: ";MM$(TQ);"/";DD$(T
Q)
530 PRINT:PRINT"1. ENTER NEW QUO
TES"
540 PRINT:PRINT"2. SCAN QUOTES"
550 PRINT: PRINT"3. GRAPH QUOTES
"
560 PRINT:PRINT"4. MODIFY PREVIO
US ENTRIES"
570 PRINT:PRINT"5. SAVE QUOTES"
580 PRINT:PRINT"6. LOAD ANOTHER
FILE"
590 PRINT:PRINT"7. QUIT";
600 PRINT@499,"type 1 - 7";:GOSU
B7020
610 IF AA<1 OR AA>7 THEN 600
620 CLS:ON AA GOTO 1000,2000,300
0,4000,5000,700,800
700 CLS:PRINT"<L>OAD A NEW FILE
   <M>ENU":GOSUB7020:IF AA$="L"T
HEN120 ELSE500
800 CLS:POKE65494,0:CLEAR 200:EN
D
1000 ' enter new quotes
1010 IF TQ<0 THEN TQ=0
1020 IF TQ=260 THEN PRINT"THIS F
ILE (";FL$;") IS":PRINT"FULL. ST
ART A NEW FILE.":GOSUB7000:GOTO5
00
1030 PRINT"ENTER NEW QUOTES FOR
";FL$;"."
1040 PRINT"MOST RECENT QUOTE IS:
":PRINT"#";TQ;"- ";MM$(TQ);"/";D
D$(TQ);"  ";V(TQ)
1050 PRINTHI(TQ);LO(TQ);CL(TQ):P
RINT
1060 PRINT"MONTH (1-12)":PRINT@1
80,"M=MENU":PRINT"DAY (1-31)":PR
INT"HIGH":PRINT"LOW":PRINT"CLOSE
":PRINT"VOLUME":PRINT@416,"MAKE
AN ENTRY FOR EVERY WEEKDAY.FOR H
OLIDAYS ENTER THE DATE AND ZEROS
 FOR THE QUOTE.";:SL=173
1070 TQ=TQ+1
1080 PRINT@SL,;:LINEINPUTMM$(TQ)
:MM=VAL(MM$(TQ)):IF MM$(TQ)="M"T
HENTQ=TQ-1:GOTO500
1090 IF MM<1 OR MM>12 THEN1080 E
LSE SL=SL+32
1100 PRINT@SL,;:LINEINPUTDD$(TQ)
:DD=VAL(DD$(TQ)):IF DD<1 OR DD>3
1 THEN 1100 ELSE SL=SL+32
1110 PRINT@SL,;:LINEINPUTHI$:HI(
TQ)=VAL(HI$):SL=SL+32
1120 PRINT@SL,;:LINEINPUTLO$:LO(
TQ)=VAL(LO$):IF LO(TQ)>HI(TQ) TH
EN1120 ELSE SL=SL+32
1130 PRINT@SL,;:LINEINPUTCL$:CL(
TQ)=VAL(CL$):IF CL(TQ)>HI(TQ) OR
 CL(TQ)<LO(TQ) THEN 1130 ELSE SL
=SL+32
1140 PRINT@SL,;:LINEINPUTV$:V(TQ
)=VAL(V$)
1150 PRINT@360,"CORRECT?  (Y/N)"
;
1160 GOSUB7020:IF AA$="Y" THEN 5
00
1170 IF AA$="N"THEN TQ=TQ-1:CLS:
GOTO1000
1180 GOTO1160
2000 ' scan quotes
2010 CLS:INPUT"BEGIN WITH MONTH"
;BM:IF BM<1 OR BM>12 THEN2010
2020 N=(BM-1)*21
2030 N=N+1
2040 IF N<1 THEN N=1
2050 IF N>TQ THEN N=TQ
2060 PRINTN;FL$;" * ";MM$(N);"/"
;DD$(N);"  ";V(N)
2070 PRINTHI(N);LO(N);CL(N):PRIN
T
2080 IF N=TQ OR N/5=INT(N/5)THEN
PRINT@480,"<F>ORWARD    <B>ACK
   <M>ENU";:GOSUB2100
2090 GOTO2030
2100 GOSUB7020:IFAA$="F"THENCLS:
RETURN
2110 IFAA$="B" THEN N=N-9:CLS:GO
TO2040
2120 IFAA$="M"THEN N=0:GOTO500
2130 GOTO2100
3000 ' graph quotes
3010 CLS:PRINT"1. VIEW PREVIOUS
GRAPH":PRINT"2. DRAW A NEW GRAPH
":GOSUB7020:IF AA<1 OR AA>2 THEN
3010
3020 IF AA=1 THEN SCREEN1,1:GOSU
B7020:GOTO500
3030 CLS:PRINT"1. GRAPH THREE MO
NTHS":PRINTTAB(5)"(DAILY QUOTES)
":PRINT:PRINT"2. GRAPH ENTIRE YE
AR":PRINTTAB(5)"(WEEKLY TRADING
RANGE)":GOSUB7020:IF AA<1 OR AA>
2 THEN3030ELSECLS
3040 IF AA=2 THEN3300
3050 CLS:INPUT"ENTER FIRST MONTH
";FM:IF FM<1 OR FM>12 THEN3050
3060 IF FM>11 THEN FM=11
3070 FM=FM-1:BQ=INT(FM*20)+1
3100 ' one quarter
3105 MAX=0:MIN=10000:HV=0
3110 FORN= BQ TO BQ+64
3115 IF N=261 THEN3145
3120 IF MM$(BQ)="" THEN500
3125 IF HI(N)>MAX THEN MAX = HI(
N)
3130 IF LO(N)>0 AND LO(N)<MIN TH
EN MIN=LO(N)
3135 IF V(N)>HV THEN HV=V(N)
3140 NEXT
3145 GOSUB7100:V1=255:V2=18:V3=2
4:V4=168:V5=72:V6=BQ:V7=3:V8=20:
GOSUB3500
3150 X=24:DAY=0
3155 FORN= BQ TO BQ+64
3160 IF N=261 THEN3205
3165 DAY=DAY+1
3170 IF HI(N)=0 THEN3190
3175 LINE(X,120-(HI(N)-MIN)*S)-(
X,120-(LO(N)-MIN)*S),PSET
3180 LINE(X,120-(CL(N)-MIN)*S)-(
X+1,120-(CL(N)-MIN)*S),PSET
3185 LINE(X,180)-(X,(180-(V(N)/V
S))),PSET
3190 IF DAY/5=INT(DAY/5) THEN X=
X+6:GOTO3200
3195 X=X+3
3200 NEXT
3205 GOSUB7030:GOTO500
3300 ' whole year
3305 GOSUB2000:GOSUB7100:V1=245:V2
=56:V3=25:V4=225:V5=56:V6=1:V7=4
:V8=65:GOSUB3500
3310 X=25:WEEK=0:N=-4
3315 N=N+5
3320 WEEK=WEEK+1
3325 WHI=0:WLO=10000:WV=0
3330 FORD=0TO4
3335 IF HI(D+N)=0 THEN3355
3340 IF HI(D+N)>WHI THEN WHI=HI(
D+N)
3345 IF LO(D+N)>0 AND LO(D+N)<WL
O THEN WLO=LO(D+N)
3350 WV=WV+V(D+N):WCL=CL(D+N)
3355 NEXT
3360 IF WHI=0 THEN3380
3365 LINE(X,120-(WHI-MIN)*S)-(X,
120-(WLO-MIN)*S),PSET
3370 LINE(X,120-(WCL-MIN)*S)-(X+
1,120-(WCL-MIN)*S),PSET
3375 LINE(X,180)-(X,(180-(WV/VS)
)),PSET
3380 IF WEEK/13=INT(WEEK/13) THE
N X=X+8:GOTO3390
3385 X=X+4
3390 IF N>251 THEN3400
3395 GOTO3315
3400 GOSUB7030:GOTO500
3500 ' draw blank graph
3505 PMODE4,1:PCLS:SCREEN1,1
3510 LINE(21,0)-(V1,0),PSET
3515 LINE(21,180)-(V1,180),PSET
3520 LINE(21,120)-(V1,120),PSET
3525 LINE(21,0)-(21,180),PSET
3530 LINE(V1,0)-(V1,180),PSET
3535 FORX=21TO V1 STEP V2:FORP=0
TO180STEP4:PSET(X,P):NEXT:NEXT
3540 FORY=8TO120STEP16:FORP=21TO
 V1 STEP6:PSET(P,Y):NEXT:NEXT
3545 FORY=0TO120STEP8:LINE(19,Y)
-(20,Y),PSET:NEXT
3550 DRAW"BM0,123"
3555 PR=INT(MIN):FR=MIN-INT(MIN)
:MIN=MIN-FR
```

Listing continued

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 196

P.O. Box 1110 Del Mar, CA 92014 (619) 942-2400

```
356Ø FORN=1TO8
3565 N$=STR$(PR):N$=RIGHT$(N$,LE
N(N$)-1):N$=RIGHT$(N$,3)
357Ø IF INT(PR)<>PR THEN358Ø
3575 FORC=1 TO LEN(N$):C$=MID$(N
$,C,1):CH=VAL(C$):DRAWN$(CH):NEX
TC
358Ø PR=PR+(1*(16/S))
3585 LC$="BM"+STR$(Ø)+","+STR$(1
23-(N*16))
359Ø DRAWLC$:NEXTN
3595 FORX= V3 TO V4 STEP V5:LINE
(X,18Ø)-(X,183),PSET:NEXT
36ØØ DRAW"BM18,19Ø":DT=V6
36Ø5 FORN=1TO V7
361Ø IF VAL(DD$(DT))=Ø THEN363Ø
3615 FORC=1 TO LEN(MM$(DT)):C$=M
ID$(MM$(DT),C,1):CH=VAL(C$):DRAW
N$(CH):NEXT
362Ø DRAWSL$
3625 FORC=1 TO LEN(DD$(DT)):C$=M
ID$(DD$(DT),C,1):CH=VAL(C$):DRAW
N$(CH):NEXT
363Ø DT=DT+V8:LC$="BM"+STR$(18+(
N*V5))+","+STR$(19Ø)
3635 DRAWLC$:NEXTN:RETURN
4ØØØ ' modify previous entries
4Ø1Ø CLS:PRINT"YOU NEED TO KNOW
THE NUMBER OF  THE QUOTE THAT YO
U WISH TO MOD- IFY":PRINT
4Ø2Ø PRINT"SCAN THE OLD QUOTES T
O FIND THE NUMBER."
4Ø3Ø PRINT@448,"<S>CAN   <M>ODIF
Y":GOSUB7Ø2Ø
4Ø4Ø IF AA$="S"THEN2ØØØ
4Ø5Ø IF AA$<>"M"THEN4Ø3Ø
4Ø6Ø CLS:INPUT"NUMBER OF QUOTE";
SH:IF SH>TQ THEN4Ø6Ø
4Ø7Ø IFSH=ØTHEN5ØØ
4Ø8Ø CLS:PRINT"MONTH "MM$(SH):PR
INT"DAY "DD$(SH):PRINT"HIGH"HI(S
H):PRINT"LOW"LO(SH):PRINT"CLOSE"
CL(SH):PRINT"VOLUME"V(SH)
4Ø9Ø PRINT@448,"PRESS <ENTER> IF
 CORRECT.";
41ØØ SL=15:PRINT@SL,;:LINEINPUTI
$:I=VAL(I$):IF I>12 THEN41ØØ ELS
E X=X:IF I$="" THEN411Ø ELSE MM$
(SH)=I$
411Ø SL=SL+32
412Ø PRINT@SL,;:LINEINPUTI$:I=VA
L(I$):IF I>31 THEN412Ø ELSE X=X:
IF I$="" THEN413Ø ELSE DD$(SH)=I
$
413Ø SL=SL+32
414Ø PRINT@SL,;:LINEINPUTI$:I=VA
L(I$):IF I$="" THEN415Ø ELSE HI(
SH)=I
415Ø SL=SL+32
416Ø PRINT@SL,;:LINEINPUTI$:I=VA
L(I$):IF I$="" THEN417Ø ELSE X=X
:IF I>HI(SH) THEN 416Ø ELSE LO(S
H)=I
417Ø SL=SL+32
418Ø PRINT@SL,;:LINEINPUTI$:I=VA
L(I$):IF I$="" THEN419Ø ELSEX=X:
IF I<LO(SH) OR I>HI(SH) THEN418Ø
 ELSE CL(SH)=I
419Ø SL=SL+32:PRINT@SL,;:LINEINP
UTI$:I=VAL(I$):IF I$="" THEN 42Ø
Ø ELSE V(SH)=I
42ØØ GOTO5ØØ
5ØØØ ' save quotes
5Ø1Ø CLS:PRINT"<T>APE   <D>ISK
 <M>ENU ?":GOSUB7Ø2Ø:IFAA$="M" O
R AA$="T" OR AA$="D" THEN5Ø2Ø EL
SE5Ø1Ø
5Ø2Ø IF AA$="M"THEN5ØØ
5Ø3Ø POKE65494,Ø:CLS:LINEINPUT"F
ILENAME ";FL$
5Ø4Ø IF AA$="D" THEN CLS:PRINT"*
* INSERT DATA DISK":PRINT"** PRE
SS <ENTER>":GOTO5Ø9Ø
5Ø5Ø CLS:PRINT"** POSITION TAPE"
:PRINT"** PRESS PLAY AND RECORD"
:PRINT"** PRESS <ENTER>"
5Ø6Ø INPUTX:OPEN"O",#-1,FL$
5Ø7Ø FORN=1TOTQ:PRINT#-1,MM$(N),
DD$(N),HI(N),LO(N),CL(N),V(N):NE
XT
5Ø8Ø CLOSE#-1:POKE65495,Ø:GOTO5Ø
Ø
5Ø9Ø INPUTX:OPEN"O",#1,FL$
51ØØ FORN=1TOTQ:WRITE#1,MM$(N),D
D$(N),HI(N),LO(N),CL(N),V(N):NEX
T
511Ø CLOSE#1:POKE65495,Ø:GOTO 5Ø
Ø
6ØØØ ' load quotes
6Ø1Ø CLS:PRINT"<T>APE  OR  <D>IS
K ?":GOSUB7Ø2Ø:IFAA$="T" OR AA$=
"D" THEN 6Ø2Ø ELSE6Ø1Ø
6Ø2Ø IF AA$="M"THEN5ØØ
6Ø3Ø POKE65494,Ø:CLS:LINEINPUT"F
ILENAME ";FL$
6Ø4Ø IF AA$="D" THEN CLS:PRINT"*
* INSERT DATA DISK":PRINT"** PRE
SS <ENTER>":GOTO611Ø
6Ø5Ø CLS:PRINT"** POSITION TAPE"
:PRINT"** PRESS PLAY":PRINT"** P
RESS <ENTER>"
6Ø6Ø INPUTX:TQ = Ø:OPEN"I",#-1,F
L$
6Ø7Ø IF EOF(-1)=-1 THEN61ØØ
6Ø8Ø TQ=TQ+1
6Ø9Ø INPUT#-1,MM$(TQ),DD$(TQ),HI
(TQ),LO(TQ),CL(TQ),V(TQ):GOTO6Ø7
Ø
61ØØ CLOSE#-1:POKE65495,Ø:GOTO5Ø
Ø
611Ø INPUTX:CLS:TQ=Ø:OPEN"I",#1,
FL$
612Ø IF EOF(1)=-1 THEN615Ø
613Ø TQ=TQ+1:PRINT@Ø,TQ
614Ø INPUT#1,MM$(TQ),DD$(TQ),HI(
TQ),LO(TQ),CL(TQ),V(TQ):GOTO 612
Ø
615Ø CLOSE#1:POKE65495,Ø:GOTO 5Ø
Ø
7ØØØ ' inkey$ sub
7Ø1Ø PRINT@48Ø,"PRESS ANY KEY TO
 CONTINUE.";
7Ø2Ø FORAA=1TO1Ø:A$=INKEY$:NEXT
7Ø3Ø AA$=INKEY$:IFAA$=""THEN 7Ø3
Ø
7Ø4Ø AA=VAL(AA$):RETURN
71ØØ ' graphing scale sub
711Ø RANGE=MAX-MIN:IF RANGE>48Ø
THENPRINT"RANGE TOO GREAT":GOSUB
7ØØØ:GOTO5ØØ
712Ø S=.25
713Ø IF RANGE<24Ø THEN S=.5
714Ø IF RANGE<12Ø THEN S=1
715Ø IF RANGE<6Ø THEN S=2
716Ø IF RANGE<3Ø THEN S=4
717Ø IF RANGE<15 THEN S=8
718Ø IF RANGE<7 THEN S=16
719Ø IF RANGE<3 THEN S=32
72ØØ VS=HV/57:RETURN
```

Program Listing 2. Quote Entry

```
5Ø ' clears & dims
6Ø CLEAR3ØØØ:DIMSYM$(4Ø),BD(4Ø),
AK(4Ø),HI(4Ø),LO(4Ø),CL(4Ø),V(4Ø
),A$(26Ø),B$(26Ø),A(26Ø),B(26Ø),
C(26Ø),D(26Ø)
1ØØ ' title
11Ø CLS:PRINT@64,"**   Q U O T E
     E N T R Y  **"
12Ø PRINT@13Ø,"(FOR STOCK GRAPHE
R PROGRAM)"
13Ø PRINT@257,"DISK EXTENDED COL
OR BASIC 32K"
14Ø PRINT@396,"(C) 1984":PRINT@4
22,"CARL J. CHRISTENSEN"
15Ø GOSUB1ØØØØ
2ØØ ' new user?
21Ø CLS:PRINT"ARE YOU A NEW USER
? (Y/N)":GOSUB1ØØ2Ø:IFAA$="N"THE
N3ØØ
22Ø IFAA$<>"Y"THEN21Ø
23Ø GOSUB4ØØØ:GOTO4ØØ
3ØØ ' read STKSYM file
31Ø OPEN"I",#1,"STKSYM"
32Ø INPUT#1,PM$,PD$
33Ø IF EOF(1)=-1 THEN36Ø
34Ø TI=TI+1
35Ø INPUT#1, SYM$(TI):GOTO33Ø
36Ø CLOSE#1
4ØØ ' enter date
41Ø CLS:PRINT"MOST RECENT QUOTES
 ON FILE WERE ENTERED ON: ";PM$;
"/";PD$
42Ø PRINT@96,"ENTER TODAY'S DATE
.":PRINT@16Ø,"MONTH (1-12)":PRIN
T"DAY (1-31)":SL=174
43Ø PRINT@SL,;:LINEINPUTMM$:MM=V
AL(MM$):IF MM<1 OR MM>12 THEN43Ø
 ELSE SL=SL+32
44Ø PRINT@SL,;:LINEINPUTDD$:DD=V
AL(DD$):IF DD<1 OR DD>31 THEN 44
Ø
5ØØ ' menu
5Ø5 CLS:PRINT"MENU"
51Ø PRINT:PRINT"1. ENTER NEW QUO
TES"
515 PRINT:PRINT"2. SCAN QUOTES"
52Ø PRINT:PRINT"3. MODIFY QUOTES
"
525 PRINT:PRINT"4. ENTER NEW ISS
UES TO FOLLOW"
53Ø PRINT:PRINT"5. SCAN ISSUES L
IST"
535 PRINT:PRINT"6. MODIFY ISSUES
 LIST"
54Ø PRINT:PRINT"7. FINISHED - UP
DATE FILES"
545 GOSUB1ØØ2Ø:IFAA<1 OR AA>7 TH
EN545
55Ø ON AA GOSUB 1ØØØ,2ØØØ,3ØØØ,4
ØØØ,5ØØØ,6ØØØ 7ØØØ
555 GOTO5ØØ
1ØØØ ' new quotes
1Ø1Ø CLS:PRINT"1. MANUAL ENTRY."
:PRINT:PRINT"2. AUTOMATIC ENTRY
FROM DISK       FILE.":PRINT:PRI
NT"3. MENU.":GOSUB1ØØ2Ø
1Ø2Ø ON AA GOTO11ØØ,12ØØ,5ØØ
1Ø3Ø GOTO1Ø1Ø
11ØØ ' manual data entry
11Ø5 FORN=1TOTI
111Ø CLS:PRINT"DATE: ";MM$;"/";D
D$:PRINT@64,"QUOTE FOR: "SYM$(N)
;"."
1115 PRINT@128,"HIGH":PRINT"LOW"
:PRINT"CLOSE":PRINT"VOLUME":SL=1
35
112Ø PRINT@SL,;:LINEINPUTHI$:HI(
N)=VAL(HI$):SL=SL+32
1125 PRINT@SL,;:LINEINPUTLO$:LO(
N)=VAL(LO$):IF LO(N)>HI(N) THEN1
125 ELSE SL=SL+32
113Ø PRINT@SL,;:LINEINPUT CL$:CL
(N)=VAL(CL$):IF CL(N)>HI(N) OR C
L(N)<LO(N) THEN113Ø ELSE SL=SL+3
2
1135 PRINT@SL,;:LINEINPUTV$:V(N)
=VAL(V$)
114Ø PRINT@448,"CORRECT? (Y/N)";
:GOSUB1ØØ2Ø
1145 IF AA$="N" THEN111Ø
115Ø IF AA$<>"Y"THEN114Ø
1155 NEXT:RETURN
12ØØ ' auto data entry
121Ø OPEN"I",#1,"QUOTES/    "
122Ø IF EOF(1)=-1 THEN19ØØ
123Ø INPUT#1,A$
13ØØ ' find "stock   xyz" line
131Ø T=INSTR(A$,"STOCK")
132Ø IF T=Ø THEN122Ø
133Ø T=INSTR(A$," ")
134Ø IF MID$(A$,T,3)<>"   "THEN1
22Ø
14ØØ ' strip spaces in front of
symbol
141Ø T=INSTR(A$," "):A$=RIGHT$(A
$,LEN(A$)-T)
142Ø IF LEFT$(A$,1)=" "THENA$=RI
GHT$(A$,LEN(A$)-1):GOTO142Ø
15ØØ ' find # of stock in list
151Ø FORN=1TOTI
152Ø IF A$=SYM$(N)THEN16Ø5
153Ø NEXT
```

Listing continued

Listing continued

```
16ØØ ' read quote lines
16Ø5 INPUT#1,A$:GOSUB17Ø5:BD(N)=
A
161Ø INPUT#1,A$:GOSUB17Ø5:AK(N)=
A
1615 INPUT#1,A$:GOSUB17Ø5:HI(N)=
A
162Ø INPUT#1,A$:GOSUB17Ø5:LO(N)=
A
1625 INPUT#1,A$:GOSUB17Ø5:CL(N)=
A
163Ø INPUT#1,A$:GOSUB 17Ø5:V(N)=
A
1635 IF HI(N)= Ø THEN HI(N)=AK(N
)
164Ø IF LO(N)= Ø THEN LO(N)=BD(N
)
1645 IF CL(N)= Ø THEN CL(N)=AK(N
)

165Ø GOTO122Ø
17ØØ 'sub-convert str's  to #'s
17Ø5 T=INSTR(A$," "):A$=RIGHT$(A
$,LEN(A$)-T)
171Ø IF LEFT$(A$,1)=" "THENA$=RI
GHT$(A$,LEN(A$)-1):GOTO171Ø
1715 ' is it volume?
172Ø T=INSTR(A$,")"):IF T<>Ø THE
N A$=RIGHT$(A$,LEN(A$)-T):A=VAL(
A$):RETURN
1725 ' no fraction?
173Ø T=INSTR(A$,"/"):IF T=Ø THEN
A=VAL(A$):RETURN
1735 'convert frac. to decimals
174Ø T1=INSTR(A$," "):IT$=LEFT$(
A$,T1-1)
1745 DE$=RIGHT$(A$,LEN(A$)-T)
175Ø NU$=MID$(A$,T1+1,T-T1+1)
1755 IT=VAL(IT$):DE=VAL(DE$):NU=
VAL(NU$)
176Ø A=IT+(NU/DE):RETURN
19ØØ CLOSE#1:CLS:PRINT"FINISHED.
":GOSUB1ØØØØ:RETURN
2ØØØ ' scan quotes
2Ø1Ø CLS:FORN=1TOTI
2Ø2Ø PRINT SYM$(N);HI(N);LO(N);C
L(N):PRINTV(N):PRINT
2Ø3Ø IF N/5=INT(N/5)THENGOSUB1ØØ
ØØ:CLS
2Ø4Ø NEXT:GOSUB1ØØØØ:RETURN
3ØØØ ' modify quotes
3Ø1Ø CLS:PRINT"TYPE SYMBOL OF IS
SUE TO BE       CHANGED AND PRESS
 <ENTER>: ";:LINEINPUTSH$
3Ø2Ø FORN=1TOTI:IF SH$=SYM$(N)TH
EN3Ø4Ø
3Ø3Ø NEXT:RETURN
3Ø4Ø CLS:PRINTSYM$(N):PRINTMM$;"
/"DD$
3Ø5Ø PRINT@96,"HIGH";HI(N):PRINT
"LOW";LO(N):PRINT"CLOSE";CL(N):P
RINT"VOLUME";V(N):SL=114
3Ø6Ø PRINT@SL,;:LINEINPUTI$:I=VA
L(I$):IF I$="" THEN3Ø7Ø ELSE HI(
N)=I
3Ø7Ø SL=SL+32
3Ø8Ø PRINT@SL,;:LINEINPUTI$:I=VA
L(I$):IF I$="" THEN3Ø9Ø ELSE X=X
:IF I>HI(N) THEN 3Ø8Ø ELSE LO(N)
=I
3Ø9Ø SL=SL+32
31ØØ PRINT@SL,;:LINEINPUTI$:I=VA
L(I$):IF I$="" THEN311Ø ELSE X=X
:IF I<LO(N) OR I>HI(N) THEN31ØØ
ELSE CL(N)=I
311Ø SL=SL+32:PRINT@SL,;:LINEINP
UTI$:I=VAL(I$):IF I$="" THEN 312
Ø ELSE V(N)=I
312Ø RETURN
4ØØØ ' new issues
4Ø1Ø CLS: PRINT"TYPE THE SYMBOLS
 OF THE ISSUES  TO BE FOLLOWED."
:PRINT"PRESS <ENTER> AFTER EACH
ONE.":PRINT@448,"WHEN FINISHED,
TYPE 'XX' AND    PRESS <ENTER>."
;
4Ø2Ø TI=TI+1
4Ø3Ø PRINT@26Ø,;:LINEINPUT SYM$(
TI):IF SYM$(TI)=""THEN4Ø3Ø
4Ø4Ø IF SYM$(TI)="XX"THEN SYM$(T
I)="":TI=TI-1:GOTO41ØØ
4Ø5Ø PRINT@26Ø,STRING$(1Ø,32):GO
TO4Ø2Ø
41ØØ ' abc sort
411Ø SW=Ø
412Ø FORN=1TO TI-1
413Ø IF SYM$(N)<=SYM$(N+1)THEN41
8Ø
414Ø S$=SYM$(N):S1=HI(N):S2=LO(N
):S3=CL(N):S4=V(N)
415Ø SYM$(N)=SYM$(N+1):HI(N)=HI(
N+1):LO(N)=LO(N+1):CL(N)=CL(N+1)
:V(N)=V(N+1)
416Ø SYM$(N+1)=S$:HI(N+1)=S1:LO(
N+1)=S2:CL(N+1)=S3:V(N+1)=S4
417Ø SW=1
418Ø NEXTN
419Ø IFSW=1THEN411ØELSE RETURN
5ØØØ ' scan issues
5Ø1Ø CLS:FORN=1TOTI
5Ø2Ø PRINTN;SYM$(N)
5Ø3Ø IF N/1Ø=INT(N/1Ø)THENGOSUB1
ØØØØ:CLS
5Ø4Ø NEXT:GOSUB1ØØØØ:RETURN
6ØØØ ' modify issues list
6Ø1Ø CLS:PRINT"TYPE SYMBOL OF IS
SUE TO BE       CHANGED AND PRESS
 <ENTER>: ";:LINEINPUTSH$
6Ø2Ø FORN=1TOTI:IF SH$=SYM$(N)TH
EN6Ø4Ø
6Ø3Ø NEXT:RETURN
6Ø4Ø CLS:PRINT"STOCK";N;"IS ";SY
M$(N);"."
6Ø5Ø PRINT@96,"CORRECT? (Y/N)":G
OSUB1ØØ2Ø:IFAA$="Y"THENRETURN
6Ø6Ø IFAA$<>"N"THEN6Ø5Ø
6Ø7Ø PRINT@96,"DELETE FROM LIST?
 (Y/N)":GOSUB1ØØ2Ø
6Ø8Ø IFAA$="N"THEN617Ø
6Ø9Ø IFAA$<>"Y"THEN6Ø7Ø
61ØØ SYM$(N)=""
611Ø FORN=1TOTI
612Ø IF SYM$(N)=""THEN T=N
613Ø NEXT
614Ø FORN=T TO TI
615Ø SYM$(N)=SYM$(N+1):HI(N)=HI(
N+1):LO(N)=LO(N+1):CL(N)=CL(N+1)
:V(N)=V(N+1)
616Ø NEXT:TI=TI-1:RETURN
617Ø PRINT@96,"TYPE NEW SYMBOL A
ND PRESS":PRINT"<ENTER>: ";:LINE
INPUTSYM$(N)
618Ø IFSYM$(N)=""THEN617ØELSE RE
TURN
7ØØØ ' finished - update files
71ØØ ' save STKSYM
711Ø CLS:OPEN"O",#1,"STKSYM"
712Ø WRITE#1,MM$,DD$
713Ø FORN=1TOTI:WRITE#1,SYM$(N):
NEXT
714Ø CLOSE#1
72ØØ 'read,update&save files
73ØØ ' file on disk?
731Ø FORN=1TOTI
732Ø SH$=SYM$(N)
733Ø IF LEN(SH$)<8 THEN SH$=SH$+
" ":GOTO733Ø
734Ø SH$=SH$+"DAT"
735Ø FORX=3TO11:DSKI$Ø,17,X,J$,K
$
736Ø J=INSTR(J$,SH$):K=INSTR(K$,
SH$)
737Ø IF J<>Ø OR K<>Ø THEN GOSUB7
4ØØ:GOTO79ØØ
738Ø NEXTX
739Ø PRINT SYM$(N);" NOT FOUND."
:GOTO79ØØ
74ØØ ' read in old file
741Ø TQ=Ø:OPEN"I",#1,SYM$(N)
742Ø IF EOF(1)=-1THEN744Ø
743Ø TQ=TQ+1:INPUT#1,A$(TQ),B$(T
Q),A(TQ),B(TQ),C(TQ),D(TQ):GOTO7
42Ø
744Ø CLOSE#1:TQ=TQ+1
745Ø IF TQ=261 THEN PRINT SYM$(N
);" FILE IS FULL.":GOTO79ØØ
75ØØ ' update
751Ø A$(TQ)=MM$:B$(TQ)=DD$:A(TQ)
=HI(N):B(TQ)=LO(N):C(TQ)=CL(N):D
(TQ)=V(N)
76ØØ ' save
761Ø OPEN"O",#1,SYM$(N)
762Ø FORX=1TOTQ:WRITE#1,A$(X),B$
(X),A(X),B(X),C(X),D(X):NEXT:CLO
SE#1:RETURN
79ØØ NEXTN:GOSUB1ØØØØ:RETURN
1ØØØØ ' inkey$
1ØØ1Ø PRINT@48Ø,"PRESS ANY KEY T
O CONTINUE.";
1ØØ2Ø FOR AA=1TO1Ø:AA$=INKEY$:NE
XT
1ØØ3Ø AA$=INKEY$:AA=VAL(AA$):IFA
A$=""THEN1ØØ3ØELSE RETURN
```

Program Listing 3. MAKELGON

```
1Ø ' CREATE AN QUOTE RETRIEVAL F
ILE
2Ø CLEAR3ØØØ:DIMA$(1ØØ)
3Ø A$(1)="DOW2;;    DJNS"
1ØØ CLS:LINEINPUT"ENTER YOUR PAS
SWORD ";A$(2)
11Ø A$(3)="//CQ"
12Ø X=3
13Ø X=X+1:CLS:PRINT@448,"ENTER '
XX' WHEN FINISHED.";
14Ø PRINT@64,;:LINEINPUT"ENTER S
TOCK SYMBOL ";A$(X)
15Ø IF A$(X)="XX"THENA$(X)="DISC
":GOTO2ØØ
16Ø GOTO13Ø
2ØØ CLS:OPEN"O",#1,"LOGON/    "
21Ø FORN=1TOX
22Ø PRINT#1,A$(N):PRINTA$(N)
23Ø NEXTN
24Ø CLOSE#1:END
```

END

ADVENTURUS SUPREMUS 4.6B

Are you an adventurer with at least some experience? Are you just a little tired of games set in some repetitive science fiction or medieval type setting? Adventurus Supremus 4.6B offers a different type of adventure, realistic yet humorous. Challenging, comical, and farcical, it offers an out of the ordinary adventure experience, that's just the change that you need. Only those with at least some adventuring experience need apply.

16k Color Basic Minimum Required (On Tape)

Send 9.95 (check or M.O.) to:

Bacchus Computer Software
143 East Michigan Avenue
Paw Paw, MI 49079

We Pay the Shipping!

RAINBOW CERTIFICATION SEAL

✓325

✓ See List of Advertisers on page 81

BY GLEN R. TAPANILA AND DICK COURT

A SHAPER OF SCREENS TO COME

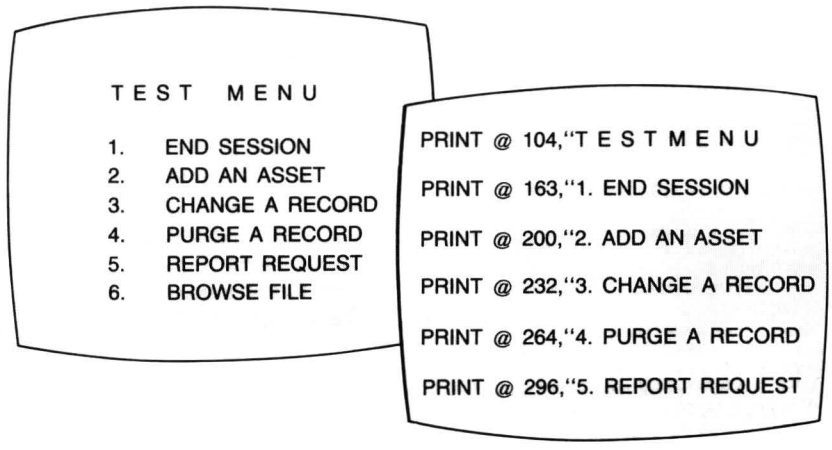
Spruce up the text format of your programs with this screen formatter and menu designer.

Screen Formatter lets you create formatted screens and menus at your keyboard. It can document the PRINT@ locations for any text you've entered on screen, or screen display them if you don't have a printer.

When you start up Screen Formatter, a flashing cursor appears in the left corner of the screen. Most typists are able to type at their usual high speed because the program responds quickly to keystrokes. Lowercase characters are displayed on screen as uppercase green letters in a black box, but they are printed out as true lowercase letters. The program features a nondestructive cursor, which allows you to move around the screen without erasing previously entered text. Use the space bar for erasing. You can enter text anywhere on the screen except the lower right corner.

Once you have created a screen that you like, press the enter key to print it out along with the PRINT@ locations of each typed line. For a screen display of the PRINT@ locations, press the @ key. The program displays six lines at a time; pressing the enter key advances the screen to the next six lines. When you have viewed all the PRINT@ locations, the program prompts you to press either the @ key to clear the screen and start a new format, or the ! key to bring back the original screen. Pressing either the break or reset key stops the program. ■

Address correspondence to Glen R. Tapanila and Dick Court, 316 Laurelhurst Drive, Tumwater, WA 98501.



A sample menu you might create with Screen Formatter. The program lets you print out or display PRINT@ statements, such as those on the right, for easy reference to text location on the screen.

```
170 A = 16384 + L*32 + CP - 1
1100 POKE(16384 + X* 32 + Y - 1)
,BB
1130 POKE (16384 + X* 32 + Y - 1)
,BB
1150 POKE(16384 + X* 32 + Y - 1)
,ASC (B$(X,Y))
1170 A = 16384:L = 0:CP = 1
```

Table 1. Line Listing Changes for MC-10.

System Requirements

Color Computer or MC-10
16K RAM
Color Basic or Micro Color Basic
Printer Optional

DYNACALC®

CoCo's Best & Fastest Spreadsheet System

ACCLAIMED BY THE EXPERTS

"DYNACALC is my choice for a CoCo spreadsheet."
Dan Downard, RAINBOW, September, 1984.

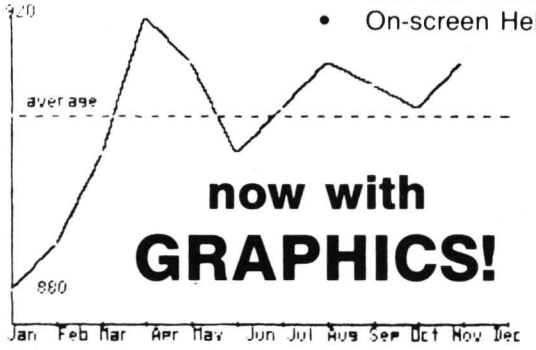
"Eat your heart out, Lotus 1-2-3!"
Scott Norman, HOT CoCo, October, 1984.

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
- 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/Lo/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 $99.95

RAINBOW CERTIFICATION SEAL



now with GRAPHICS!

FOR 64K DISK SYSTEMS
available from

COMPUTER SYSTEMS CENTER ✓506
13461 Olive Blvd.
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

CANADA- CDN$129.95
RGS MICRO INC.
759, VICTORIA SQUARE 405
MONTREAL H2Y 2J3
TEL.: (514) 287-1563
ORDER LINE ONLY ★ ★ ★
QUEBEC-ONTARIO-MARITIMES
800-361-5338
WESTERN CANADA 800-361-5155

MasterCard
VISA

DYNACALC Reg. U. S. Pat. Off.
Lotus and 1-2-3 are trademarks of Lotus Development Corp.
VisiCalc is a trademark of VisiCorp

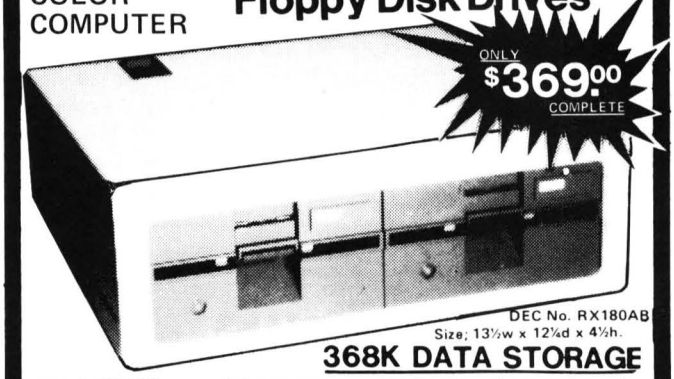
✓ See List of Advertisers on page 81

Program Listing. Screen Formatter.

```
100 CLEAR2000
110 Q$=CHR$(34)
120 DIMB$(16,32):CLS5
130 FORX=0TO16:FORY=1TO32:B$(X,Y
)=CHR$(32):NEXTY:NEXTX
140 CLS
150 L=0:CP=1
160 IF L=15 AND CP=32 THEN CP =
31
170 A=1024+L*32+CP-1
180 A$=INKEY$:POKEA,206:POKEA,20
7
190 IFA$="" THEN 180
200 IFASC(A$)=8 OR ASC(A$)=9 OR
ASC(A$)=10 OR ASC(A$)=94 THEN 24
0
210 IFASC(A$)=12 OR ASC(A$)=13 O
R ASC(A$)=64 THEN 350
220 B$(L,CP)=A$:PRINT@32*L+CP-1,
B$(L,CP);:CP=CP+1:IFCP>32 THEN C
P=1:L=L+1:IFL>15 THEN L=15
230 GOTO160
240 PRINT@32*L+CP-1,B$(L,CP);
250 IF ASC(A$)=8 THEN 260
252 IF ASC(A$)=9 THEN 280
254 IF ASC(A$)=10 THEN 300
256 IF ASC(A$)=94 THEN 320
260 CP=CP-1:IF CP<1 THEN CP=32:L
=L-1:IF L<0 THEN L=15
270 GOTO160
280 CP=CP+1:IF CP>32 THEN CP=1:L
=L+1:IF L>15 THEN L=15
290 GOTO 160
300 L=L+1:IFL>15 THEN L=0
310 GOTO 160
320 L=L-1:IFL<0 THEN L=15
330 GOTO 160
340 REM * OUTPUT
350 IFASC(A$)=12 THEN 180
360 IFASC(A$)=64 THEN 760
370 REM ********************
380 REM *  OUTPUT TO PRINTER
390 REM ********************
400 FORX=1TO2:PRINT#-2,"":NEXTX
410 X$="                    "
420 PRINT#-2,X$"----------------
------------------"
430 FORX=0TO15
440 PRINT#-2,X$"!";
450 FORY=1TO32
460 PRINT#-2,B$(X,Y);
470 NEXTY
480 PRINT#-2,"!"
490 NEXTX
500 PRINT#-2,X$"----------------
------------------"
510 FORX=1TO2:PRINT#-2,"":NEXTX
520 LC=22
530 FORX=0TO15
540 XX=0
550 FORY=1TO32
560 IFB$(X,Y)=" " THEN GOTO 610
570 XX=1
580 PA=X*32+Y-1
590 Y1=Y
600 Y=32
610 NEXTY
620 IF XX=0 THEN 680
630 PRINT#-2,"PRINT @"PA","Q$;
640 FOR Z=Y1 TO 32
650 PRINT#-2,B$(X,Z);
660 NEXT Z:PRINT#-2,""
670 LC=LC+1
680 NEXT X
690 FORX= LC+1 TO 66
700 PRINT#-2,""
710 NEXTX
720 GOTO170
730 REM **********************
740 REM *  OUTPUT TO SCREEN
750 REM **********************
760 CLS
770 LC=0
780 FOR X=0 TO 15
790 XX=0
800 IF LC>10 THEN 810
805 GOTO 840
810 INPUT "PRESS <ENTER> TO CONT
INUE";AA$
820 CLS
830 LC=0
840 FOR Y=1 TO 32
850 IFB$(X,Y)=" " THEN GOTO 890
860 XX=1
870 PA=X*32+Y-1
880 Y1=Y:Y=32
890 NEXTY
900 IF XX=0 THEN 970
910 PRINT"PRINT @"PA","Q$;
920 LC=LC+2
930 FOR Z=Y1 TO 32
940 PRINTB$(X,Z);
950 NEXTZ
960 PRINT""
970 NEXTX
980 PRINT "----------------------
-----------"
990 PRINT "PRESS <!> TO RETURN T
O SCREEN"
1000 PRINT"     OR
1010 PRINT "PRESS <@> FOR NEW SC
REEN"
1020 I$=INKEY$:IF I$="@" THEN GO
TO 1040
1025 IF I$="!" THEN GOTO 1050
1030 GOTO 1020
1040 CLS:GOTO 130
1050 CLS
1060 FORX=0TO15:FORY=1TO32
1070 IF ASC(B$(X,Y))=32 THEN GOT
O 1160
1080 IF ASC(B$(X,Y))>32 AND ASC(
B$(X,Y))<65  THEN GOTO 1090
1084 GOTO 1120
1090 BB=ASC(B$(X,Y))+64
1100 POKE (1024+X*32+Y-1),BB
1110 GOTO 1160
1115 GOTO 1150
1120 IF ASC(B$(X,Y))>96 THEN BB
= ASC(B$(X,Y))-96
1125 GOTO 1150
1130 POKE (1024+X*32+Y-1),BB
1140 GOTO 1160
1150 POKE(1024+X*32+Y-1),ASC(B$(
X,Y))
1160 NEXTY:NEXTX
1170 A=1024:L=0:CP=1
1180 GOTO180
```


COLOR COMPUTER

Floppy Disk Drives



DEC No. RX180AB
Size: 13⅛w x 12¼d x 4½h.

368K DATA STORAGE

WE SUPPLY: Dual (2) 5¼" Floppy Disk Drives (all mounted in a case, with fan & power supply) as shown in photo, A Disk Controller Module, and Interface Cables.
The Drives are 40 track, single sided, double density.
The Disk Controller will handle up to 3 drives so you still have room for more drives. Runs on 115/220 VAC, 50/60 Hz.
Use Order No. **430599** . . . . . **$369.00 each.**
PLUS $8.00 shipping and handling.

DISK CONTROLLER
We also sell the disk controller seperately. Supplied with data and mating cables.
Use Order No. **430600** . . . **$144.00 each.**
Plus $5.00 shipping and handling.

PHONE ORDERS
(617) 532-2323

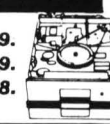
363

SHOP WITH OUR FREE 40 PAGE MAILORDER CATALOG PACKED WITH COMPUTER EQUIPMENT.

ELECTRONIC SUPERMARKET
P.O. Box 988 Lynnfield, MA. 01940
(617)532-2323
TELEX 88268?
Charge Card Customers Phone Orders Welcome when you Charge It

your best buys!
are with SWD SOUTH WESTERN DIGITAL

DISK DRIVES



DRIVE 0 40 track single sided	$279.
DRIVE 1 40 track single sided	$169.
DRIVE 0 and 1 SS/DD	$428.
(add $70. for double sided drives)	

MEMORY

64K KIT (8 chips)	$45.

PRINTER ADAPTERS

PBH SERIAL TO PARALLEL ADAPTER	$50.

KEYBOARDS

HJL Keyboard	$69.
Micronix Keyboard	$69.
Keytronic Keyboard	$79.

DISKETTES

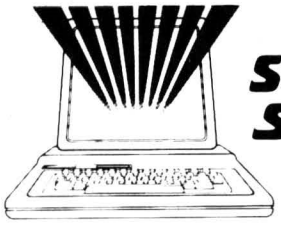
VERBATIM	box of 10	$20.

Southwestern Digital
1-713-480-3296
2515 W. Main #337, Houston, Texas 77098

454

Ordering Information
All prices reflect a pre-made discount for cash. Visa, MasterCard orders are at regular price (add 5%).
Mail your payment directly to us, or call your order in today. All non-certified funds are held for proper clearance

GREAT COCO PRODUCTS



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

Super Screen comes with complete, well detailed instructions and is available on cassette or disc. It adjusts automatically to any 16K or greater, Extended or Disc basic Color Computer or TDP-100 and uses only 2K of memory in addition to the screen memory reserved during power up. Guaranteed to be the most frequently used program in your software library...once you use it, you won't be without it!

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 utility 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..."*

Cassette $29.95 **Disc $32.95**

NEW! EASY-FILE

Data Management System

- 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.
- **EASY-FILE** makes data managing a breeze with single key menu selections, extensive error handling procedures, a demonstration data file and a detailed, easy to understand instruction manual.
- **EASY-FILE** is powerful too. It automatically enhances your monitor screen to a full upper and lower case 51 character by 24 line display. **EASY-FILE** allows up to 30 data fields and provides password file protection, selectable numeric totalling, and complete data searching and editing capabilities. You can quickly enter, locate, review and modify data records, and even transfer records from one file to another.
- Sorting? You bet! **EASY-FILE** allows you to sort up to 5 levels of data and allows you to define upper and lower limits as well. You can sort in many different ways and save the results in individual index files. These index files may be used later to determine what will appear on your printed reports.
- Reports are easily prepared with **EASY-FILE** because it offers so many automatic features. There is no need to generate complex report forms. With **EASY-FILE** you simply select from a list of options to determine what your report and header will look like. There are countless variations. **EASY-FILE** takes care of tab stops and field spacing automatically. Prepare horizontal reports (80 or 132 columns), vertical reports or labels! Save your favorite report formats right in a data file so they may be used whenever you need them.
- 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 $59.95!

NEW! UNIVERSAL VIDEO DRIVER

Carefully engineered to work with **ALL** Color Computer models, including the new **COCO II**

ENABLES YOUR COCO TO OPERATE WITH A VIDEO MONITOR INSTEAD OF A TELEVISION

- Works with Monochrome Monitors!
- Works with Color Monitors!
- Audio Connection Included!
- Easy Installation—No Soldering!
- Great Price! **ONLY $29.95**

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."*

The Mark Data Products 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.

The MDP Order Entry System is a family of programs which operate interactively by means of a "menu" selection scheme. Up to 900 products may be defined and a single disc system can hold over 600 transactions. When the operator selects a task to be performed, 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 paperwork including shipping and invoice forms, daily sales reports, a monthly (or other period) sales report and a receivables report.

This order entry software equals or exceeds higher priced packages for other computers and includes a detailed operating manual. **ONLY $99.95**

SUPER PRO KEYBOARD

ONLY $64.95*

- 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 $4.95.

ACCOUNTING SYSTEM

Rainbow, May '84 *"Considering what it can do to organize a small business, it is quite a value."*

Hot CoCo, June '84 *"...a serious, professional accounting program and well worth its price. The programs are 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, a P & L or income report, an interim or trial balance and a balance sheet.

Up to 255 separate accounts may be defined and a single disc system can hold over 1,400 transactions. This 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 accounting software equals or exceeds higher priced packages for other computers and includes a detailed operating manual. **ONLY $99.95**

FREE - Send for our NEW 24 page catalog!

MD

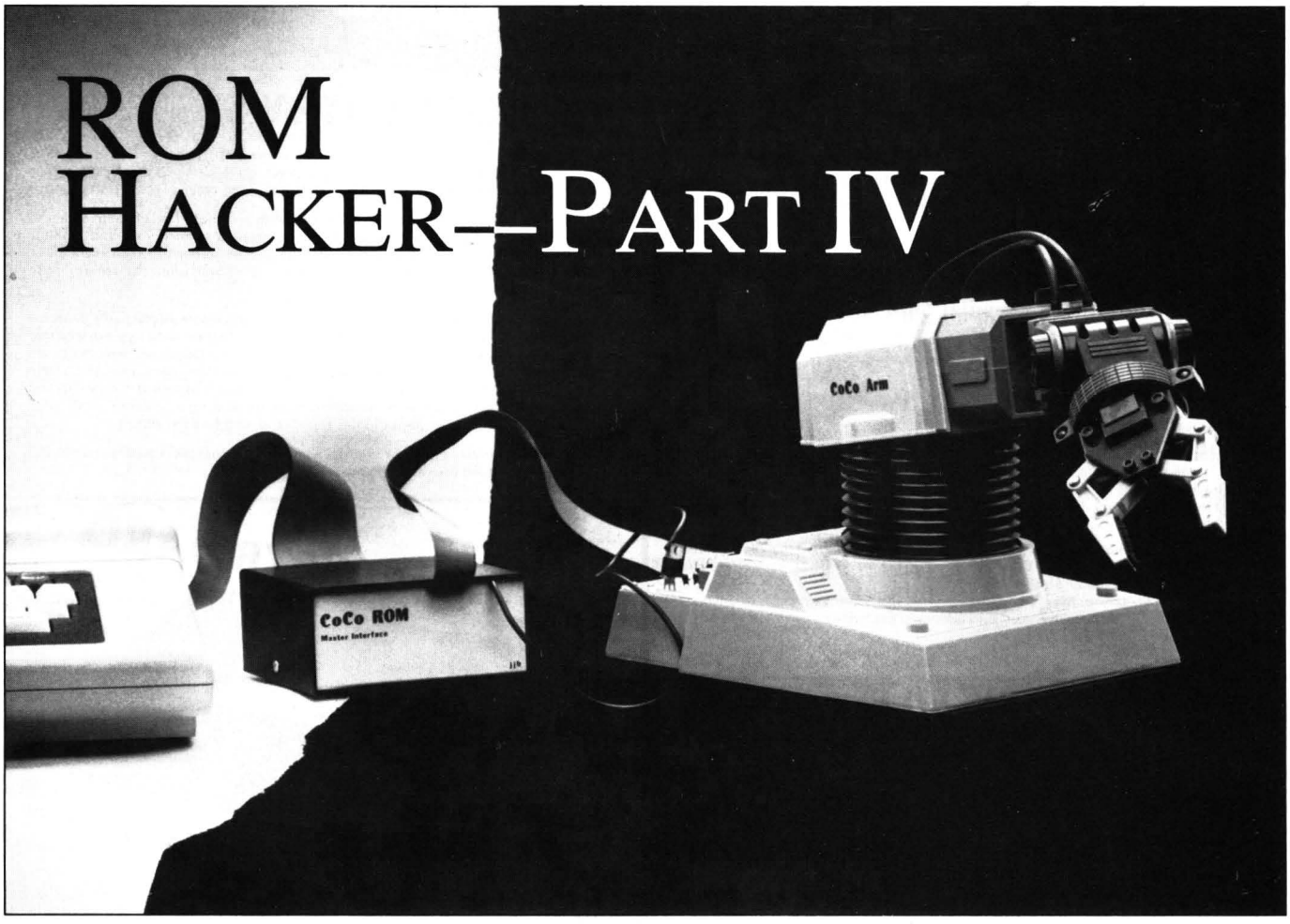
Mark Data Products

24001 ALICIA PKWY., NO. 207 • MISSION VIEJO, CA 92691 • (714) 768-1551

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.

BY JAMES J. BARBARELLO

ROM HACKER—PART IV



Construct your own computer-controlled robot arm and program it to perform complicated procedures

We've come to the last project in the ROM Hacker series, the one many of you have been waiting for—the robot arm. The prospect of building a robot arm has always fascinated me, and long ago I decided I wanted one for my CoCo. An ideal robot arm would have a reach of two feet and be able to pick up 10 to 20 pounds. It would be a closed-loop system, for greater accuracy, that fed data back to the computer describing exactly where each segment of the arm was at any given moment. It would also have a teaching mode that allowed it to remember a series of subtle movements that you initiated manually.

Unfortunately, the cost of a robot arm such as the one above would be about the same as a new car. A more economical system might not have a teaching mode or feedback, and would be limited to lifting one pound. But a robot arm of these specifications would cost $400, and that's assuming you build everything from scratch (not a simple task). When you consider that you could buy two 64K Extended Color Basic CoCos, a good printer, or drive 0 for about the same price, it is evident that not many of us want to spend that much on a hobby project.

After careful consideration, I decided that modifying an existing robot arm would be the best approach. Armatron, Radio Shack's robot arm, is ideal for this application. Using it as a basis for our CoCo-controlled project eliminates the considerable complexity of building the mechanical structure of a robot arm. You can modify its drive mechanism to use six inexpensive dc motors and control it with an uncomplicated interface circuit using parts that are readily available from Radio Shack. Best of all, the total cost for the project is about $80, including the cost of the Armatron.

Ed. note: Due to the length of this project, we must give it to you in two parts. This month you will make the modifications to Armatron itself; next month you will build the additional electronics needed.

Armatron is a fairly complex piece of equipment. It uses one motor that employs a large set of gears, rotating cams, connecting rods, and mechanical linkages to allow six axes of movement

System Requirements

16K RAM
Extended Color Basic

(in two directions). Radio Shack's robot arm is a marvel of mechanical engineering and a bargain at around $32. Its controlling mechanisms, however, are also mechanical. By moving the joystick (a mechanical linkage), you select one of a series of rotating cams that connect a gear to the power shaft. This is probably the worst design possible for modification to electronic control. But all is not bleak.

Disarmatron

If you open Armatron and strip away the mechanical linkages, cams, and drive motor, you'll see that you can drive each of the six remaining movement gears with small, individual replacement dc motors. For our last project, the CoCo Mouse (see "ROM Hacker—Part III" in the October 1984 issue of *HOT CoCo*, p. 50), I explained how to control a dc motor. All you have to do is modify Armatron by removing a major portion of the mechanical drive assembly, custom fit the housing to accept six dc motors and the control circuitry outlined here, install and position the motors, build and connect the control circuitry, and put everything back together again. Did I say *all*? Don't despair. If you have a little skill with hand tools and an adventurous spirit, you should have no problem with this project.

Figure 1 shows the complete schematic of the CoCo Arm. There are six identical circuits, the first of which contains R1, R2, Q1, Q2, K1, K2, and M1. Say you provide a high signal to pin 1 of S01. This energizes K1 via R1 and Q1, and connects the positive 5-volt line to the upper side of M1. If you provide a low signal to pin 2 of SO2, K2 is de-energized, and the other side of M1 connects to the ground line. Because of the 5-volt differential running across it, M1 begins to operate. If you reverse the voltage levels on pins 1 and 2 of SO1, the voltage potential to the motor reverses, causing a change in its direction of rotation. Finally, if you bring pin 1 to ground (or make pin 2 high), you'll have an identical voltage potential on both sides of the motor, causing it to stop rotating. This same reasoning applies to the remaining motors M2 to M6.

A 9-volt cube or plug-in power supply provides the power for the circuit. The 9 volts dc are regulated in IC1 to positive 5 volts dc, a level that is compatible with the motors for which this project calls.

Reference	Description	RS Part #
Armatron	Robot arm	60-2364
C1,C2	1.0 uF, 16WVDC tantalum capacitor	272-1434
IC1	7805 5-volt regulator	276-1770
J1	Coax dc pow. jack (2.1 mm insd. dia.)	274-1549
K1-K12	Micro-mini SPDT relay, 5 VDC coil	275-240
M1-M6	1.5–6VDC hobby motor	273-222
PP1	9 VDC "cube" power supply	273-1651
Q1-Q12	Power MOSFET (IRFD-1Z3)	276-2073
R1-R12	2.2k-ohm, ¼ w fixed resistor	271-1325
R.Phantom	4.7k-ohm, ¼ w fixed resistor	271-1330
S01-S04	16-pin DIP socket	276-1998

Misc: 2-½ feet #22 black-stranded wire; 2-½ feet #22 red-stranded wire; PC board; white glue; Duco cement; 4-½ inch length of felt weatherstripping; solder.

Table 1. CoCo Arm Project List of Materials

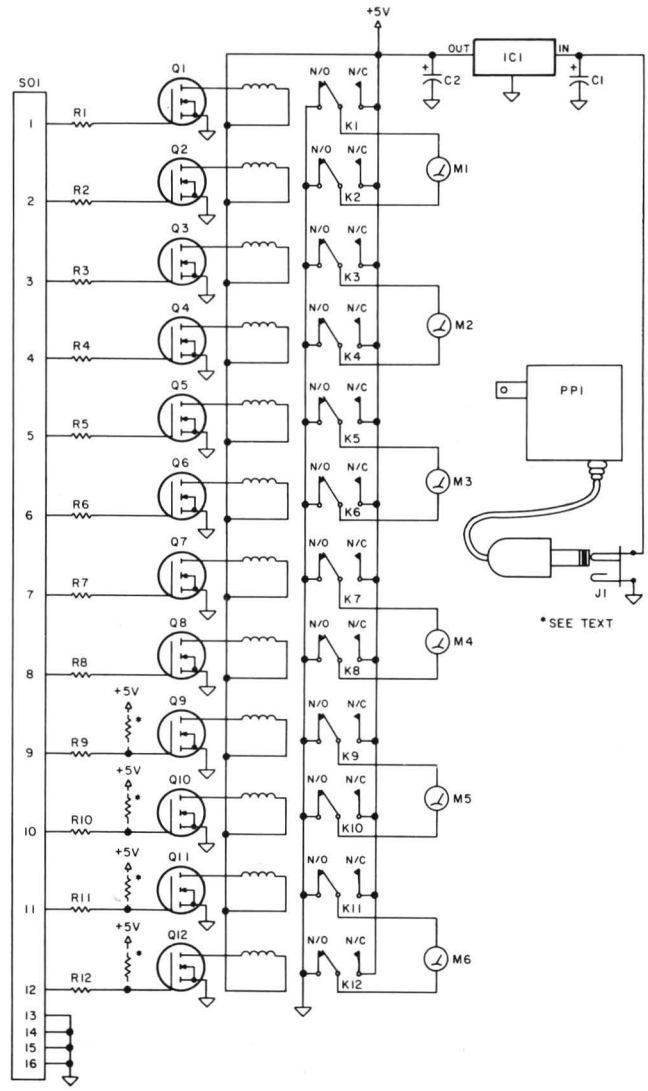


Fig. 1. Schematic Diagram for CoCo Arm Control Board

The schematic shows "phantom" resistors on the inputs of Q9 to Q12. The PIA high level can be anywhere between 3.5 and 4.8 volts. If the MOSFETs are not particularly sensitive, 3.5 volts might be insufficient power to trigger the circuit. In this instance, adding a "pull up" resistor of 4.7k ohms boosts the power level at the gate of a power MOSFET enough to ensure proper triggering, but allows the device to remain off when the output from the PIA is low. Though these resistors should be necessary only on SO1 lines 9 to 12 of the PIA (side B), they can be used on any of the lines if you experience a problem with triggering.

Making the Mod

Before you begin, you'll need to gather the following tools: a Phillips-head screwdriver, a Mototool (or mini drill) with a small grinding wheel, diagonal cutters, a bit of fine sandpaper, and a fine-toothed hacksaw blade or coping saw.

Remove the Armatron from its box. It has a base that contains the joystick controls. A vertical shaft extends from the base into the arm. The arm segments consist of an upper arm section, a joint, a forearm portion, a wrist, and a hand. On the upper arm section there is a cowling with a decal that reads "Radio Shack Armatron." You'll find two screws on the top of the cowling. Loosen them and remove the cowling, disconnecting the two cosmetic rubber tubes from the forearm segment. Store

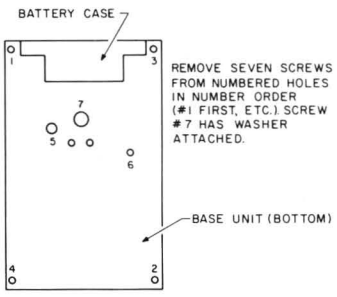


Fig. 2. Armatron Bottom and Location of Screws

the cowling in a safe place until later.

When you move Armatron, always support its arm—don't let it fall or move on its own. Turn Armatron over to look at its base. Loosen the seven screws shown in Fig. 2 while holding the unit together. They are loose when they

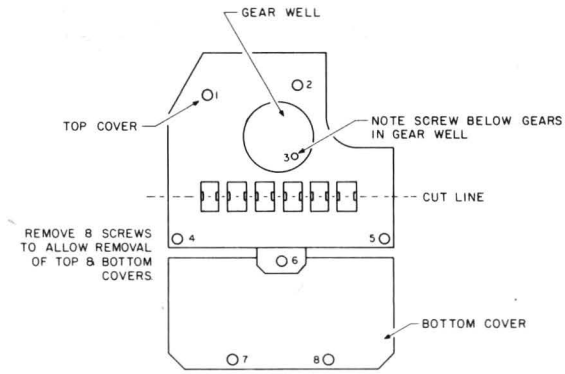


Fig. 3. Top and Bottom Cover Locations

begin to click as you rotate them. When all screws are loose, place Armatron upright. Carefully lift away the arm and light blue portion of the base from the dark blue bottom. Below the vertical shaft is a gear assembly. One large, removable gear is probably still on the assembly. Remove it and label it gear 5. Place the arm section in a safe place for later.

The base contains two white covers (see Fig. 3). The top cover has a depression with gears in it. The bottom cover is smaller. Take out the uppermost gear and label it gear 4. Then, remove the remaining three gears and label them 3, 2, and 1, respectively. Store them in a safe place.

Loosen the eight screws in the top and bottom covers. Discard the bottom cover, but save the top one. Place it in a safe location for later. You will not need several parts that come with the Armatron. The base contains 10 bright orange linkages that were under the bottom cover. Take out these linkages. Above where the linkages were you'll find a brass shaft with six black gears that you should remove. You'll see a short brass shaft with a white and pink gear to the right of a green cylinder. Remove it along with the white gear beneath it. Then, take out the green cylinder and the nearby dc motor. (Clip the motor wires at the battery compartment.)

The base still contains one brass shaft with six black gears below several green, white, pink, and black gears. The brass shaft is the drive mechanism for the remaining gears that move the arm. The drive shaft hangs into two rectangular cavities (see Fig. 4). Note the protrusion inside the left wall labeled A in Fig. 4 and the wall separating the two cavities labeled B. The six motors must fit into the cavities, but the left wall protrusion and the middle wall block their installation.

Using a small grinding wheel, grind away the protrusion on the left wall. Then, use diagonal clippers to cut most of the middle wall away. Grind the remaining portion down so that it is flush with the back and bottom of the cavity. You should now have a single cavity into which the six gears can protrude.

The plan calls for the motors to rest on a wooden ledge that is affixed to the bottom of the cavity. Cut a piece of

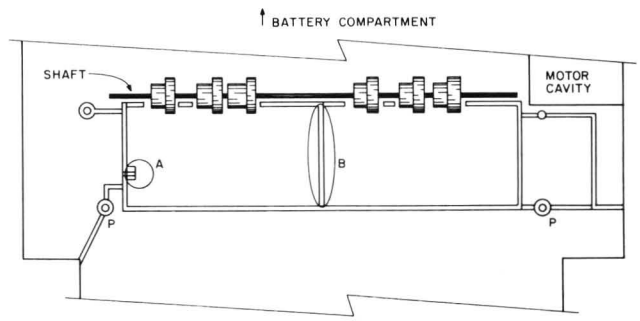
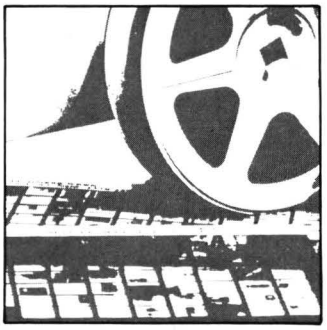


Fig. 4. Rectangular Cavities in Base Unit

This Publication is available in Microform.



University Microfilms International

Please send additional information
for _____
Name _____
Institution _____
Street _____
City _____
State _____ Zip _____

300 North Zeeb Road
Dept. P.R.
Ann Arbor, Mi. 48106

OS-9* SOFTWARE

SDISK—Standard disk driver module. Allows the use of 40 or 80 trk single/double-sided drives with coco OS-9, plus you gain the ability to read/write/format the standard OS-9 disk formats used on other OS-9 systems.—**$29.95**

SDISK + BOOTFIX — To create BOOTABLE double sided disks.—**$35.95**

Filter Kit #1—Perform "wild card" directory lists, copies, etc.—**$29.95**

Filter Kit #2—Macgen and 9 other programs—**$29.95**

Hacker's Kit #1—Disassembler and memory dump/load utilities—**$24.95**

Terms: Prepaid by check, MO, VISA, Mastercard, or COD. Add $1 S&H, COD add $3. Send SASE for current catalog.

D.P. Johnson 7655 SW Cedarcrest St., Portland, OR 97223
(503) 244-8152 (we appreciate your calling only 9-11 am PST)

*OS-9 is a trademark of MICROWARE and MOTOROLA, INC.

Cynwyn

4791 Broadway, Suite 2F Dept. CM
New York, New York 10034

MORSE CODE TEACHER — Teaches the letters and numbers and gives practice to up to 5 wpm. Req. 16K ECB **$15/Cass**

MORSE CODE TUTOR — Gives code practice up to 27 wpm. A must for upgrades **$15/Cass**

HF ANTENNA DESIGN — Calculates dimensions of quads, dipoles, and Yagis, optimized for maximum gain. Req. 4K RAM **$10/Cass**

GORILLA HI-RES MONITORS ~~
Green Screen $99
Amber Screen $109
BMC COLOR MONITOR w/ SOUND . . $299
COMPOSITE VIDEO ADAPTER $15
With purchase of monitor. $5

Check or MO to CYNWYN. NY residents add sales tax. 3% shipping, $2 minimum. SASE for catalog or call (212)567-8493 ✓352

MUL-T-SCREEN

RAINBOW CERTIFICATION SEAL

COLOR CHARACTER GENERATOR

A NEW DIMENSION IN COLOR COMPUTING

RAINBOW CERTIFICATION SEAL

- Now includes a character generator and sample graphic space game at no extra cost.
- Full 224 text and graphic characters. Underline in all PMODES. 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 defineable 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 ✓91

(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

VISA MasterCard

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.

✓ See List of Advertisers on page 81

wood 1 inch wide by 4 3/16 inches long by ¼ inch thick (be precise). Place this piece of wood into the cavity to check its fit. Does it teeter or rock? You might have to file a groove in the wood where it meets the vestige of the middle wall. It is important to make this piece of wood fit snugly. Once the ledge fits well, use a bit of sandpaper to clean and scuff up the bottom of the cavity. Then, glue the wood in place with white glue or Duco cement.

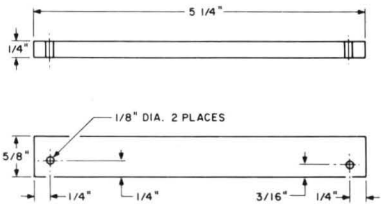


Fig. 5. Motor Construction Details

While the glue is drying, cut another piece of wood to ⅜ inch wide by 5¼ inches long by ¼ inch thick. This piece serves as the motor brace. Drill a ⅛-inch diameter hole on each end, using Fig. 5 as a reference. Glue a 4½-inch length of felt weatherstripping (maximum ⅛-inch thick) to the underside of the brace, centering it between the holes. Then, pass two 4-40 by 1-inch machine screws through the holes from the top of the motor brace. Carefully turn the machine screws into the holes in the posts that are labeled P in Fig. 5.

Meshing and Testing

Take the six motors listed in Table 1 and place them under the brace, making

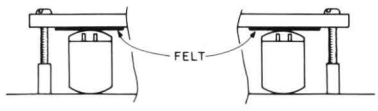


Fig. 6. Motor Mounting (Side View)

sure that the motor terminals are outside the cavity (see Fig. 6) and the motor gear can mesh with the drive gear. Think of the motors as having numbers from 6 to 1 running from left to right. The first and fourth motors must mesh to the right of the first and fourth drive gears. The other motors mesh to the left

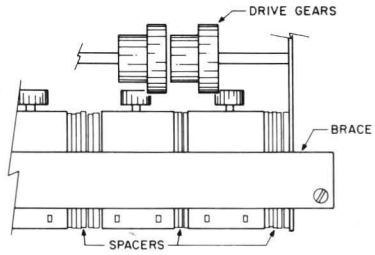


Fig. 7. Motor Mount Spacers and Meshing

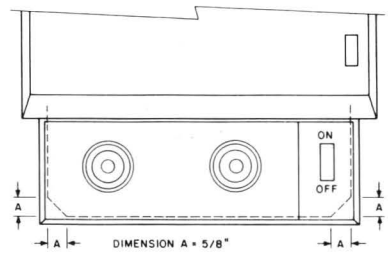


Fig. 8. Top Base Machining Details

of their appropriate drive gears. See Fig. 7 for an idea of how the gears should mesh. When you have correctly positioned the motors, tighten the screws on the brace until it holds the motors lightly in place.

For the next step, find a large piece of stiff cardboard. The back of an 8½-by 11-inch pad will do nicely. Cut the sheet into ¾- by 1-inch pieces. Use these as spacers for holding the alignment of the motors with their gears (see Fig. 7). When you have inserted all the spacers that you think are necessary, test the meshing of the gears by manually rotating the drive gear. Make adjustments by adding or taking away cardboard spacers. When you are satisfied that you have properly aligned the motors and gears, tighten the two brace screws until the motors are snug in their positions.

Before you test the motors, you should modify the top cover and replace it to keep the other gears from flying all over the place. Refer back to Fig. 3. The top cover contains six rectangular cutouts below the circular gear well. There are 12 protrusions, one on each of the long walls of the cutouts. Draw a line through these protrusions, and cut along this line with a hacksaw blade. Discard the bottom portion of the cover and reinstall the top portion, which contains the gear well. You need only three screws for this now because the bottom portion contained the other two screw holes.

Retrieve the five gears you labeled and set aside earlier. Install them, 1 to 5, back into the gear cavity. The bottom of gear 1 has a small hole. The gears fit into the cavity bottom end first. When reinstalling gear 5, you might have to jockey it past the small pink gear to the right of the cavity.

To test the proper operation and positioning of the motors, you need a 1½-volt battery and two jumper wires. Attach the jumper wires to the battery. Then touch the other ends of the jumper wires to the terminals of each of the motors in turn. The motor you are testing, its associated drive gear, and one of the gears in the gear well should all spin. If they do not, reposition the motor until its gear and the associated Armatron gears spin when you apply voltage to the motor. Repeat this for all motors.

Pull the joysticks and face plate out of the base of the arm section of Armatron and discard them. Follow Fig. 8 to cut out the surface beneath the face plate. Use a hacksaw blade to cut along the dotted lines. The plan calls for leaving a triangular piece of plastic in each outer corner that covers the posts to which you'll screw the PC board later. These corner wedges help support the PC board. You drill holes through them so that screws can reach from the PC board above down to the anchoring posts below.

When you have cut out the face plate area, use sandpaper to smooth the edges. Then place the base on a table. Grasp the vertical shaft of the robot arm with your left hand and hold the arm section with your right hand. Slowly lower the arm section onto the base, rotating it as necessary to allow the gears to mesh. When they mesh, the assembly can come down onto the base. Hold the arm section together while you turn the unit over. Reattach the two pieces with the seven screws you removed earlier. (The screw with the attached washer goes into the center hole.) You've now completed the modification. Next month you'll begin constructing the parts that will control your CoCo Arm. ■

Address correspondence to James J. Barbarello, RD 1, Box 241H, Tennent Road, Englishtown, NJ 07726.

*** 96KX-M EXPANDER ***

You have a 64K computer but can only use 32K. Our 96KX-M module allows full use of both 32K memory banks. Run BASIC in both, transfer data from one bank to the other, or continue a BASIC program into the other bank. Nothing to load just EXEC 57701 when you need the software. Does not use any of your computer's RAM. 1 yr warrranty $59.95

*** VIDEO REVERSER ***

Provides (1) Reversed, (2) Reversed all capitals, & (3) Normal. Solderless installation. $19.95

*** DYNAMIC COLOR NEWS ***

A monthly engineering newsletter that explains how the Color Computers work in nontechnical terms. Includes Basic & Machine Language Programming, expansion techniques, questions & answers, etc. Receive discounts on our products. $15/yr, Sample $1

*** MEMORY EXPANDERS ***

No trace cutting, solderless, & reversible.

ME-4 . . . D & E computers to 64K $89.95
ME-4F . . F or 285 computers to 64K $79.95

*** 128K EXPANDERS ***

Plug-in modules mount inside your computer. Compatible with all software. Transfer variables & program control from one 64K bank to the other.
ME-128-64 upgrades 64K computers to 128K now $169

DYTERM - 300 to 2400 baud Terminal Program $14.95
MPM - Stack 5 programs in your Computer $14.95

*** SECOND EXPANSION PORT ***

Plug in installation allows you to add a second port. Switch is included to select ports. $44.95

* DEALER & CLUB INQUIRIES * * FREE CATALOG *

24 hr. phone. Checks, VISA & MC cards. Add $2 ship.

DYNAMIC ELECTRONICS INC.
Box 896 (205) 773-2758
HARTSELLE, AL 35640 ✓72

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 5¼ 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 (over 280 programs to choose from!)
★ Also available for Commodore 64.

Mich. Res. add 4%
Overseas ADD $10 to subscription and $1.00 to single issues.

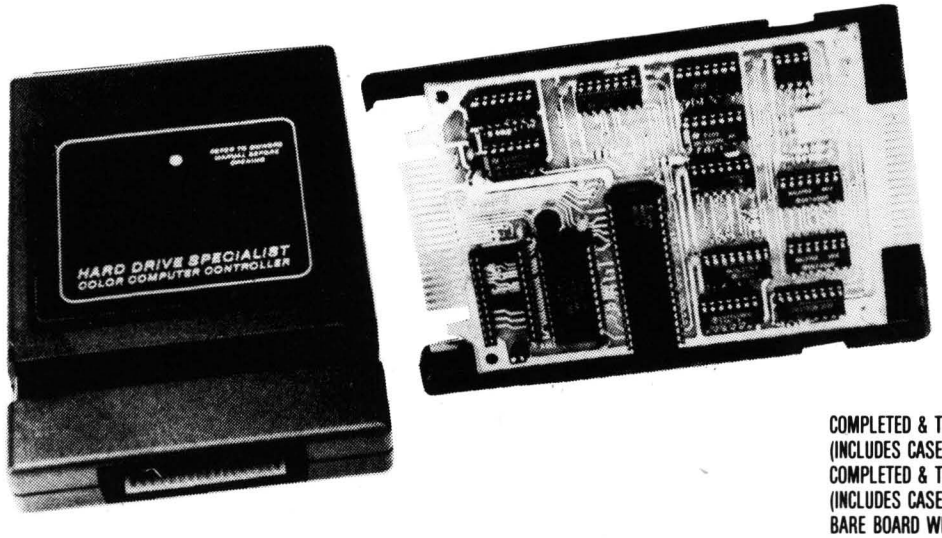
PERSONAL CHECKS WELCOME!

✓236

T & D Subscription Software
P.O. BOX 256-C
HOLLAND, MI 49423
(616) 396-7577

✓455

NEW! HDS FLOPPY DRIVE CONTROLLER



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
- FULLY SOCKETED BOARD

REDUCE YOUR I/O ERRORS WITH THE NEW HARD DRIVE SPECIALIST FLOPPY DRIVE CONTROLLER FOR THE COLOR COMPUTER. GOLD EDGE CARD CONNECTORS AND THE ABSENCE OF POTENTIOMETERS MAKE THIS THE BEST BOARD AVAILABLE TO DATE. SOLD WITH AND WITHOUT ROM (Read Only Memory)

COMPLETED & TESTED BOARD WITH ROM $139.00
(INCLUDES CASE, AND DOS INSTRUCTIONS)
COMPLETED & TESTED BOARD WITHOUT ROM $119.00
(INCLUDES CASE)
BARE BOARD WITH INSTRUCTION MANUAL $39.95
(ADD $40. FOR COMPLETE PARTS KIT, ADD $20. FOR ROM)

HARD DRIVE SPECIALIST

Ordering Information
We accept Visa, Mastercard, Wire Transfers, and Certified checks for quickest shipping. Orders received on personal checks are held.

Dealer inquiries invited
16206D Hickory Knoll, Houston, Texas 77059

Order Line
1-800-231-6671
Local Sales and Service Line
1-713-480-6000

✓ See List of Advertisers on page 81

BY R.W. SMITH

PRINT IT PRETTY

Liven up your letterheads with fancy dot-matrix designs.

Tired of hum-drum letters and forms? With a little ingenuity and a dot-matrix printer, your CoCo can create just about any letters and designs that you can imagine.

Start with some understanding of how the graphics mode works and graph paper to work out the details. You don't need an expensive printer. This article was written for Radio Shack's DMP-120. Even though some of the CHR$ codes may be different, the methods outlined here should apply to all dot-matrix printers.

If you want a dividing line across the paper, you don't have to settle for ********, $$$$$$$$, or --------. Look up the graphics characters that are built in. For instance, try this:

```
10 FOR Z = 1 TO 40
20 PRINT# - 2,CHR$(62);CHR$(60);
'DON'T FORGET THE SEMICOLON
30 NEXT Z
```

When you run these lines your printer prints this design:

><><><><><><><><><><><><

By changing the CHR$ numbers in line 20 you will find several attractive combinations. If you insert 253 and 254 into the parentheses you'll get:

Typing 253 and 251 into the parentheses renders this line divider:

But this is just the tip of the iceberg. If you experiment, you can find other designs in the text mode. But don't forget about the graphics mode. With a little planning, the graphics mode can help you create distinctive forms and letters. The following routine can form the basis for several variations of the straight line or rule. Note that use of the graphics mode in this manner often causes a long pause after a PRINT statement before your printer begins printing.

```
10 PRINT# - 2,CHR$(18) 'SWITCH TO
GRAPHICS MODE
20 FOR Z = 1 TO 480
30 PRINT# - 2,CHR$(192); 'DON'T FOR-
GET SEMICOLON
40 NEXT Z
```

For variations on this dividing line, replace the CHR$ number in line 30 with each of the following numbers: 214, 170, 197, and 214.

Perhaps borders are what you really want to try. Enter this routine for a diamond design with center dots:

```
10 PRINT# - 2, CHR$(18) 'SWITCH TO
GRAPHICS MODE
20 FOR Z = 1 TO 68
30 PRINT# - 2,CHR$(136)CHR$(148)
CHR$(162)CHR$(201)CHR$(162)CHR$(148)
CHR$(136);
```

System Requirements

16K RAM
DMP-120 Printer

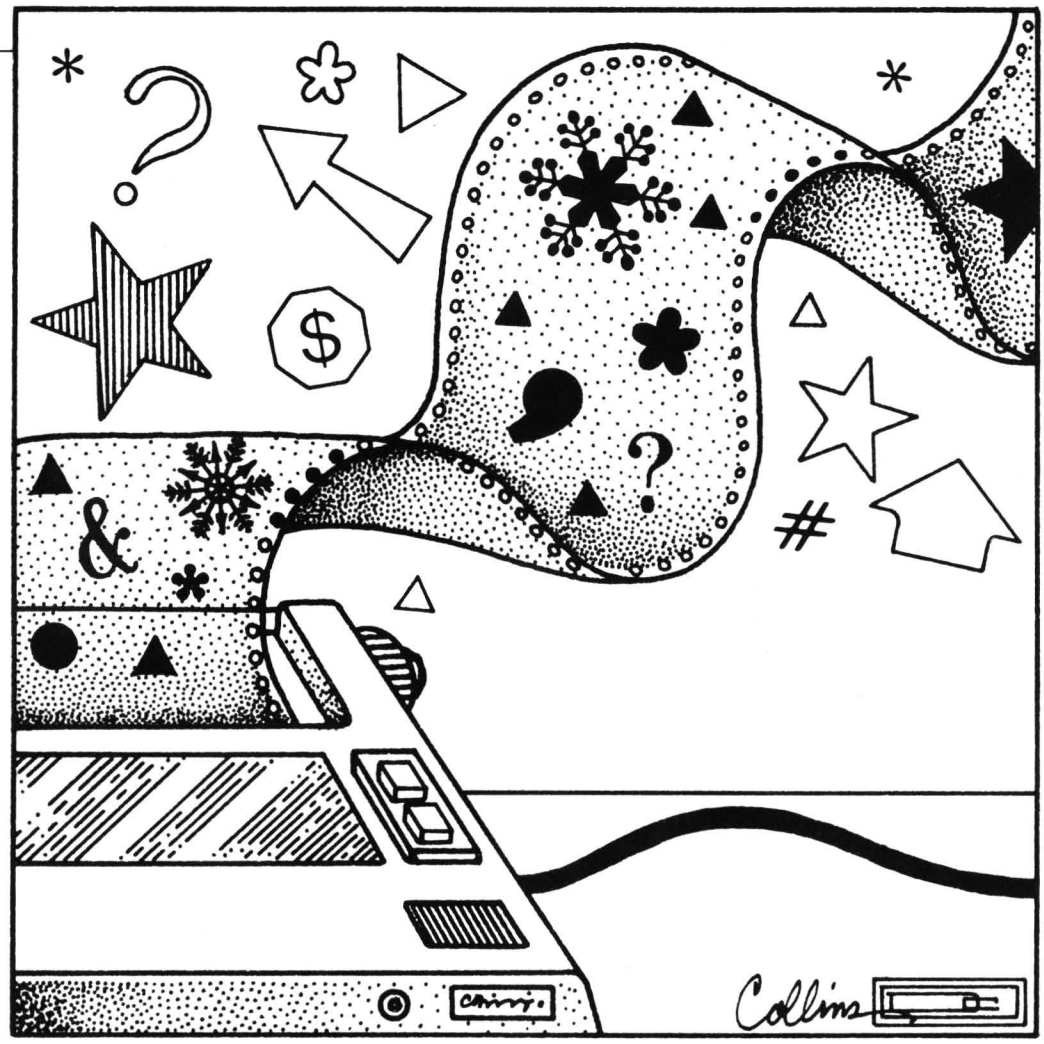


illustration by Dan Collins

```
40 NEXT Z
```

Replacing lines 20 and 30 with the following lines produces a rope-like design:

```
20 FOR Z = 1 TO 80
30 PRINT# - 2,CHR$(194)CHR$(197)CHR$
(201)CHR$(209)CHR$(161)CHR$(193);
```

For a Roman motif enter these lines in place of lines 20 and 30:

```
20 FOR Z = 1 TO 60
30 PRINT# - 2,CHR$(255)CHR$(129)CHR$
(253)CHR$(197)CHR$(221)CHR$(209)
CHR$(223)CHR$(192);
```

With the graphics mode you can create logos and complex designs. How does it work? Radio Shack's DMP-120 has seven print pins. They are aligned vertically and numbered 1, 2, 4, 8, 16, 32, and 64 from top to bottom. Other dot-matrix printers may have more pins, but the principle is the same. Set down your designs on graph paper in the form of dots (see Fig. 1). On the left side print the numbers of the pins. If your design requires more than seven pins (up and down), the print head will have to make more than one pass. It is helpful to draw horizontal lines to separate the seven-pin passes the print head will make.

The design in Fig. 1 is of a rope-like border that repeats after six horizontal spaces. To get the CHR$ numbers you need to program the graphics mode, you follow a formula. Add the numbers of the pins in each column. In the first column of the rope design there are dots in the second pin position (2) and the seventh pin position (64). The sum of these two pins is 66. Write the sums of each column under the sketch. Add 128 to each of these sums to arrive at the required CHR$ number. In the second column the 1, 4, and 64 pin positions contain dots. They add up to 69. Add 69 to 128 and you get 197. This is the CHR$ number for the second column.

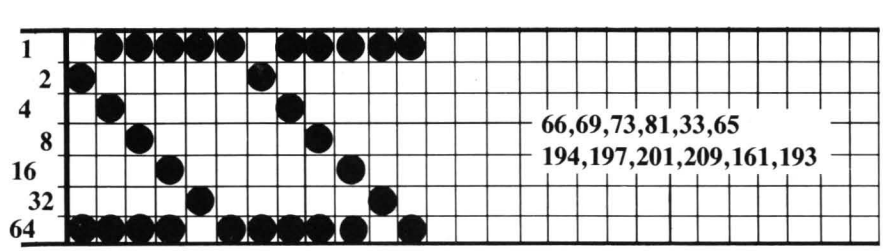


Fig. 1. A rope-design unit consists of six print-head positions of seven possible pins each.

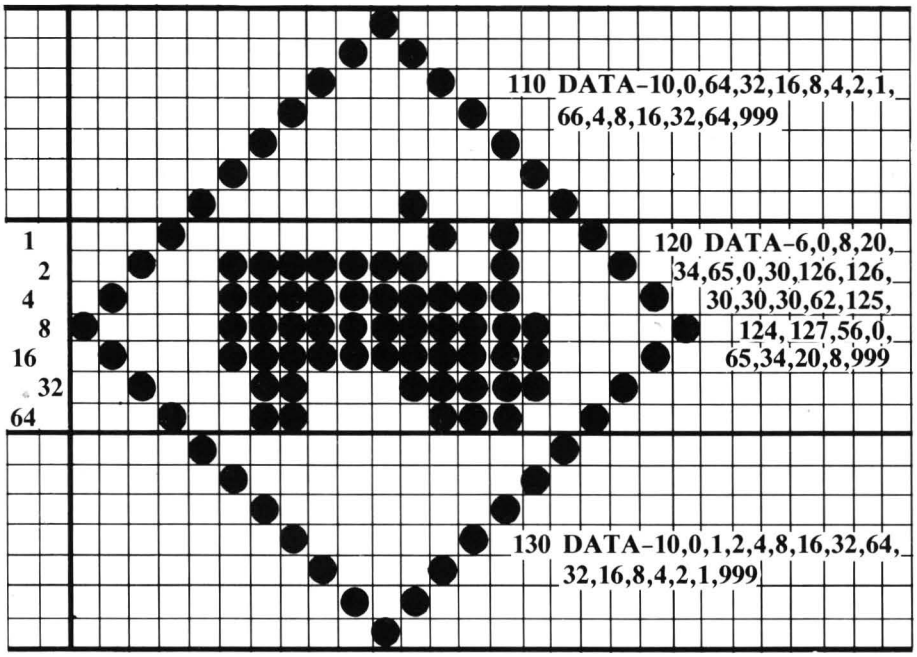


Fig. 2. This farm-equipment-crossing design requires the DMP-120's print head to make three passes.

The rope design is a continuing pattern, each unit of which uses six print positions. There are 480 horizontal pin positions on each page. By dividing 6 into 480 you get 80—the number of rope design units that will fit on one line. In the rope design routine above, line 20 reads Z = 1 TO 80. If a design requires seven pin positions, such as the diamond border routine above, line 20 should be Z = 1 TO 68. If you divide 480 by 7 you get several numbers to the right of the decimal point. Those numbers represent the fraction of the unit size of your design that remains. Round down to the nearest whole number.

For large designs and drawings you are better off simplifying wherever possible. Circles and curves are not as easy to recreate as straight lines. Figure 2 is the highway symbol for farm equipment crossing. This design requires three passes of the print head at this size. Drawings that require more than one line are easier to program with Data statements.

After you draw a sketch, list the CHR$ numbers into DATA lines (see lines 110–130 in Program Listing 1). You won't have to add 128 to each column sum this time; the computer can do it for you. When you have a dot or blank space that repeats three or more times, there is a shorthand you can use. I have started all lines in the program listings with several spaces to leave a margin between the design and the edge of the page. If you want five blank spaces, write –5,0. If you want seven dots in a row at the 64 pin positon, write –7, 64.

In Program Listing 1, line 10 switches the printer into the graphics mode. Line 20 sets the amount of passes the printer makes for the design. Line 30 reads the data and looks for the number 999, which is the flag or signal to advance to the next row. Line 40 screens for a positive number that it adds to 128 and sends to the printer before looping back for another number. If a number is negative, it reads the next DATA statement number in line 50. Line 60 converts the negative number to a positive multiplier. Line 70 loops back to line 30 to continue the process.

Program Listing 2 doubles the size of the farm-equipment-crossing figure. In line 20 the number of passes has been increased from three to six. The DATA statements have been augmented and ammended to account for the increase in lines and resolution.

What about mixing text and graphics? Heed a few precautions and you will have no trouble. The line feeds for the two modes are slightly different so it takes a little planning. Program Listing 3 creates a giant T with which you might begin a story. Because the graphics blocks are only six pins high, you must use a different line feed. In line 100, the 27 and 28 change the line

```
Ø ' PROGRAM LISTING 1
1 ' *FARM EQUIP X-ING SYMBOL*
1Ø PRINT#-2,CHR$(18)
2Ø FOR R=1TO3
3Ø READ N:IF N=999THEN8Ø ELSE IF
 N=888 THEN 2ØØ
4Ø IF N>=ØTHEN PRINT#-2,CHR$(128
+N);:GOTO3Ø
5Ø READ M
6Ø FOR L=1TO-N:PRINT#-2,CHR$(128
+M);:NEXTL
7Ø GOTO3Ø
8Ø PRINT#-2:NEXT R
11Ø DATA -1Ø,Ø,64,32,16,8,4,2,1,
66,4,8,16,32,64,999
12Ø DATA -6,Ø,8,2Ø,34,65,Ø,3Ø,12
6,126,3Ø,3Ø,3Ø,62,125,124,127,56
,Ø,65,34,2Ø,8,999
13Ø DATA -1Ø,Ø,1,2,4,8,16,32,64,
32,16,8,4,2,1,999
```

Program Listing 1. Routine to Print Farm-Equipment Figure

```
Ø ' PROGRAM LISTING 2
1 ' *FARM EQUIP X-ING SYMBOL*
1Ø PRINT#-2,CHR$(18)
2Ø FOR R=1TO6
3Ø READ N:IF N=999THEN8Ø ELSE IF
 N=888 THEN 2ØØ
4Ø IF N>=ØTHEN PRINT#-2,CHR$(128
+N);:GOTO3Ø
5Ø READ M
6Ø FOR L=1TO-N:PRINT#-2,CHR$(128
+M);:NEXTL
7Ø GOTO3Ø
8Ø PRINT#-2:NEXT R
11Ø DATA -25,Ø,64,32,16,8,4,2,4,
8,16,32,64,999
115 DATA -18,Ø,64,32,16,8,4,2,1,
-11,Ø,1,2,4,8,16,32,64,999
117 DATA -11,Ø,64,32,16,8,4,2,1,
-3,Ø,-13,12Ø,1Ø6,1ØØ,1Ø4,112,12Ø
,12,4,-2,Ø,1,2,4,8,16,32,64,999
12Ø DATA -1Ø,Ø,1,2,4,8,16,32,64,
-4,Ø,15,47,127,127,47,-8,15,31,6
3,-3,127,62,28,-3,Ø,64,32,16,8,4
,2,1,999
125 DATA -17,Ø,1,2,4,8,16,32,64,
-13,Ø,64,32,16,8,4,2,1,999
13Ø DATA -24,Ø,1,2,4,8,16,32,64,
32,16,8,4,2,1,999
```

Program Listing 2. Routine to Print Double-Sized Farm-Equipment Figure

```
Ø 'PROGRAM LISTING 3  BIG T
1ØØ PRINT#-2,CHR$(27)CHR$(28)CHR
$(235)CHR$(239)CHR$(236)
11Ø PRINT#-2," ";CHR$(239)
12Ø PRINT#-2," ";CHR$(239);" was
 the night before Christmas,"
13Ø PRINT#-2,CHR$(27)CHR$(54)
14Ø FOR S=1TO7:PRINT#-2:NEXT S
```

Program Listing 3. Routine to Create Giant T

feed so that the graphics blocks can be stacked without a bare space. Lines 110 and 120 start with a space to make the two CHR$(239) statements in lines 110 and 120 stack into a giant T.

Once you understand how to make a drop capital, you can incorporate several stylistic changes to suit your needs. Make the following change to create condensed print:

```
100 PRINT# - 2,CHR$(27)CHR$(28)CHR$
(27)CHR$(20)CHR$(235)CHR$(239)
CHR$(236)
```

For a condensed giant T and standard print enter this:

```
120 PRINT# - 2," ";CHR$(239)CHR$(27)
CHR$(19);" was the night before Christmas,"
```

Try other variations. For example, change the 20 in line 100 to 14 and the 19 in line 120 to 15. This provides an elogated giant T and standard print. After the CHR$(14) you entered above in line 100, add CHR$(27)CHR$(20) for a condensed-elongated giant T with elongated print. To alter the last style to effect standard print insert CHR$(27) CHR$(19) in line 120 after CHR$(15).

Program Listing 4 thoroughly mixes the graphics and text modes. This listing creates a giant, Victorian-style T. The program is similar to listings 2 and 3. Line 30, however, has an additional flag (888) to jump to line 200, which ends the graphics mode and joins the text mode. You can switch from text to graphics mode and back at any time, but keep in mind that you may need to coordinate the line-feed specifications.

```
1 ' *VICTORIAN "T"
1Ø PRINT#-2,CHR$(18)
2Ø FOR R=1TO3
3Ø READ N:IF N=999THEN8Ø ELSE IF
 N=888 THEN 2ØØ
4Ø IF N>=ØTHEN PRINT#-2,CHR$(128
+N);:GOTO3Ø
5Ø READ M
6Ø FOR L=1TO-N:PRINT#-2,CHR$(128
+M);:NEXTL
7Ø GOTO3Ø
8Ø PRINT#-2:NEXT R
11Ø DATA -5,Ø,2,69,4,114,9,5,66,
68,1Ø6,49,33,34,36,4Ø,5Ø,53,49,4
2,36,34,33,33,33,34,38,1Ø5,17,38
,64,7Ø,41,33,18,12,2,5,9,6,999
12Ø DATA -5,Ø,1,2,2,49,74,4,5,4,
95,48,23,19,9,69,61,1,127,127,1,
61,69,9,19,23,16,127,16,8,1Ø4,7,
999
13Ø DATA -7,Ø,48,72,7Ø,49,1,1,24
,36,5Ø,98,81,74,68,81,95,95,81,6
8,74,81,96,-3,Ø,1,1,888
2ØØ PRINT#-2,CHR$(3Ø);"was the n
ight before Christmas,
```

Program Listing 4. Routine to Create Giant Victorian T

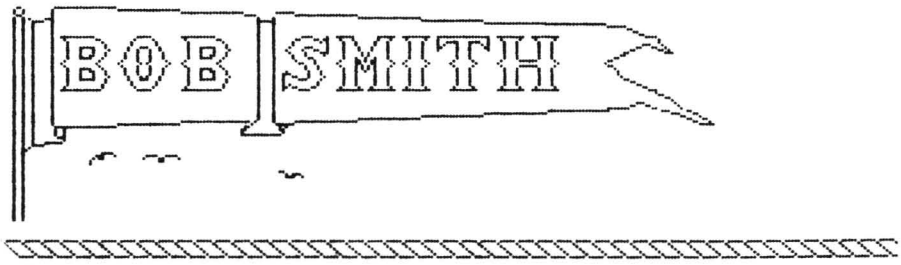


Fig. 3. One example of how you can use the CoCo to design your letterhead.

These programs are not practical for all applications, but they can add pizazz to your documents, making them stand out in a crowd.■

Address correspondence to R.W. Smith, 920 Central Ave., Ocean City, NJ 08266.

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

NEW **TAPE $34.95**

"FEATURES"

28-64x24 Hi-Resolution Display

64K Support Up To 55K Text Buffer

9 Unlimited Variable Length Macro Key Buffers

BUFFER EDITOR Insert, Delete, Change or Add To Buffer

- No Lost Information When Using Hi Resolution Display On Line
- ASCII Compatible File Format
- Full Text Buffering
- Terminal Baud Rates 300 to 9600
- Automatic Word Wrap Eliminates Split Words
- Full/Half Duplex
- 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
- Kill Graphics Option for an Extra 6K
- Supports Line Break
- Freeze 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 Baud 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

"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!!! NEW!!!

CBASIC is a fast Machine Language integer Basic Complier 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, PCLS, PCOPY, PMODE, PRESET, PSET, PUT, RESET, SCREEN, SET, POINT, PPOINT
Sound Commands:	PLAY, SOUND
String Functions:	CHR$, LEFT$, MID$, RIGHT$, LEN, INSTR, LSET, RSET, TRM$, STR$, STRING$, INKEY$, MKN$
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, PUT, KILL, CHAINM, FIELD, DATA, READ, RESTORE
Program Control:	FOR/NEXT/STEP, GOTO/GOSUB, IF/THEN/ELSE, RETURN, STOP, RETI, ON n GOTO/GOSUB, ON ERROR, ON RESET, ON IRQ/FIRQ/NMI, ON OVR/NOVR, EXEC, LET
Directives:	ORG, REM OR ', END, DIM, END, BASE, RAM, ON/OFF, RAM64K, HIRES, 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*
- *PROPTECT 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 64K 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 ✓335

5566 Ricochet Avenue Las Vegas, Nevada 89110

(702) 452-0632

Screen Enhancement Program Comparison Chart

PROGRAM FEATURES	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	51 only
Different line lengths	28 to 255 (9)	28 to 255 (9)	51 only (1)
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
Solid or Blinking Cursor	Yes	No	Yes
CLS command supported	Buff/Black	Buff/Black	Buff/Black
X,Y Coordinate Cursor Positioning	Yes	Yes	No
Double Size Characters	Yes	Yes	No
Individual/Continuous Highlighting	Yes	Yes	No
On Screen Underlining	Yes	Yes	No
Clear Key functional	Clear/L key	Clear key	No
16/32 & 64K Supported	Yes	Yes	Yes
Green or Black Background Color	Yes	No	No
Dual Character sets for Enhanced 64 and 85 Characters per line display	Yes	No	No
Protected Screen Lines (programmable)	1 to 23	No	No
Full Control Code Keyboard for Screen control directly from the keyboard	Yes	No	No
Programmable Tab Character Spacing	Yes	No	No
Full Screen Reverse Function	Yes	Yes	No
Switch to & from the Standard 16 by 32 Screen for full compatability	Yes	No	No
On Error Goto Function	No	No	Yes
Extended Basic Required	No	Yes	Yes
All Machine Language Programs	Yes	Yes	Yes
RAM Required in addition to Screen RAM	2K	2K	2K
Program Price (Tape)	$24.95	$19.95	$29.95

VISA MasterCharge

VISA, MASTERCARD AND C.O.D. ACCEPTED

✓ See List of Advertisers on page 81

BY BRUCE ELLIS

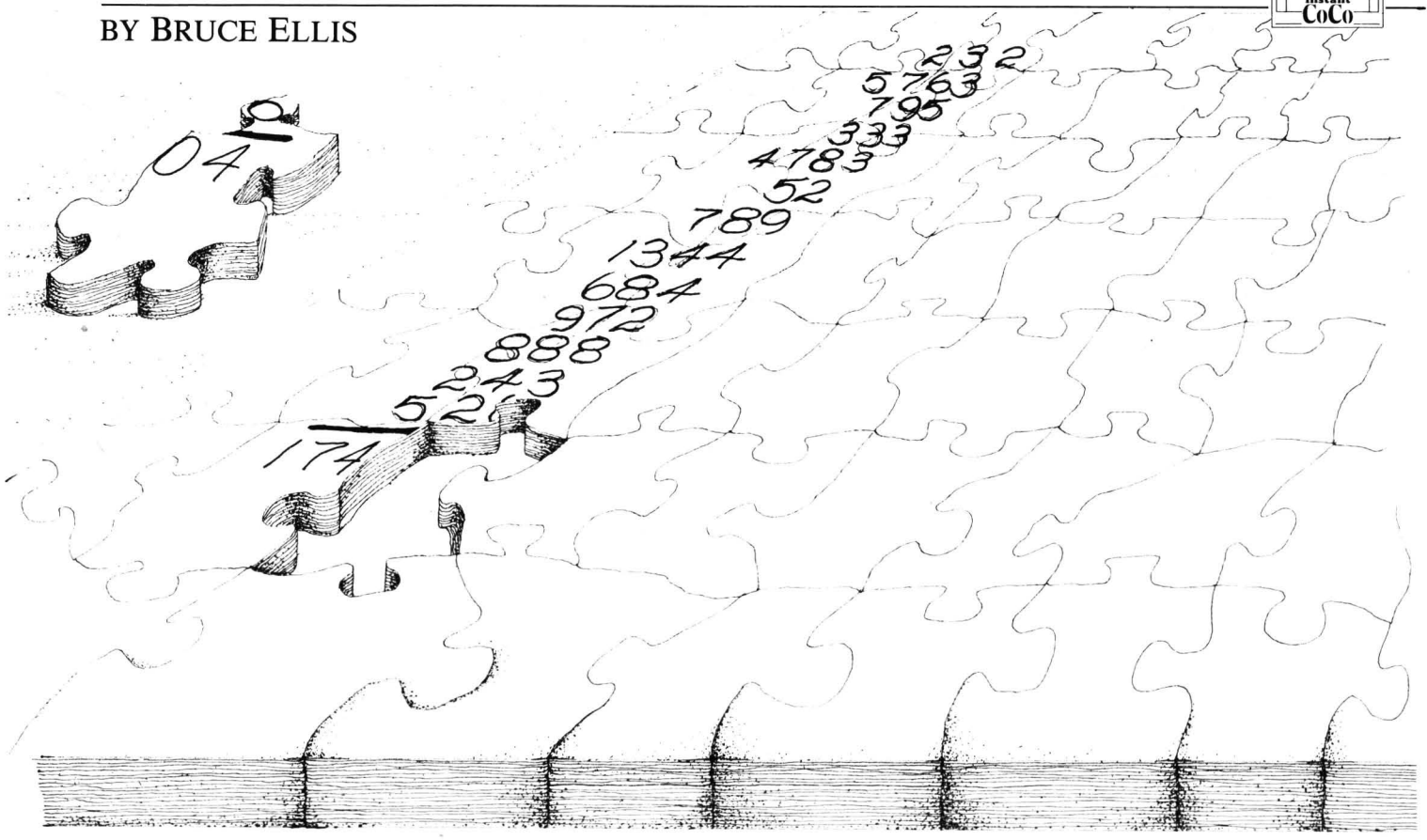


illustration by Dion Owens

ADDING ADVANTAGE

You can add many programs to your library, but how many adding programs add these features.

Adding is a program that turns the CoCo into a four-function adding machine. At first glance that may seem to be a limited application for the CoCo, but it's actually very flexible and useful. Adding can be modified easily to include a wide range of specialized functions, and you can use it in conjuction with similar programs.

The essence of Adding is a routine that allows your CoCo to treat a matrix of letters on the right side of its keyboard as a numeric keypad. (See Fig. 1 for a look at how Adding redefines the CoCo's keyboard.) As you enter numbers into this keypad, the program builds a string variable, which is added to a running total when you press one of the keys designated as operators. In addition to a running total, Adding features a subtotal, two constant keys, a composite function, and a moving average. Other features of the program are an edit routine, which permits the selective review of entries by several criteria as well as correction, deletion and insertion, and an evaluation routine, which computes summary statistics for the entries and presents a frequency distribution.

Adding can handle 150 entries on a 16K system following a PCLEAR 1 statement. After you have entered 150 items, Adding clears its registers, but retains a running total so that work can continue. Items that you have entered before are no longer available for review or evaluation.

Program Operation

After an initial instruction page and a query about whether or not you want to read a file, the program maintains a single display that is updated using PRINT@ statements, rather than clearing the screen. That allows a set of very brief instructions to remain at the bottom of the screen.

System Requirements

16K RAM
Extended Color Basic

Adding asks several questions when you start it up that you answer with the standard keyboard. How many digits do you want displayed? The program displays and evaluates entries as you type them, but total and subtotal displays are rounded according to your instruction here. Would you like a moving average? If so, how many items do you want averaged? Selecting this option disables the composite function to avoid confusion. What two constants would you like to set? The program reverts to its default parameters (no decimal point, no moving average, no constants) if you do not select values for its questions.

Adding displays your entries in the upper left corner as you type them in. You can correct errors with the left arrow. To add or subtract your entries from the accumulating total and subtotal, press the enter and @ keys, respectively. Negative numbers cannot be entered; type them as positive numbers and subtract them. The subtotal is reset to zero every time an entry is begun with a blank space.

Constants can be called by following an entry with one of the following letters: A, S, X, or Z, which denote addition, subraction, multiplication, and division, respectively. Then press one of the two constant keys. When constants are called in this manner, the program cannot look for a response to the enter or @ key. Use of the constant keys disables the composite function.

The up arrow is also used throughout the program to access the main menu, which allows you to select data entry, clearing the registers, data review, evaluation, or creation of a new or updated file. In addition, the up arrow terminates the data review and evaluation functions, sending you back to their menus.

To use the review and edit function for selectively reviewing data that you have already input, enter specific values or the entry sequence number in response to the appropriate prompts. The entry sequence number, value, and the value of the previous entry are displayed along with the running total as it was calculated when the item was entered. Because entries are stored, they are identified by initial calculations using the constants or the composite function. For example, an item entered as 35*2 must be located using 70 as a selection criterion.

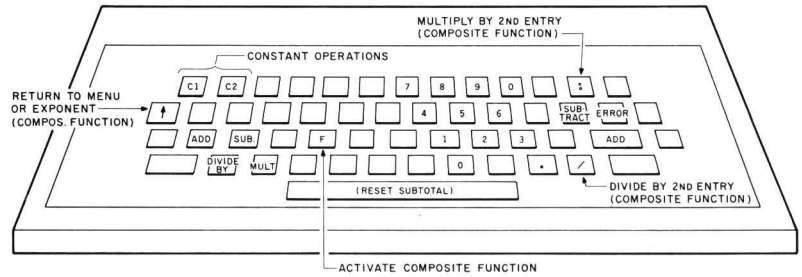


Fig. 1. Adding converts much of the CoCo's keyboard to practical function keys that allow you to perform complex tasks.

You can also review data sequentially, beginning with either a specified number or with a total. Using a total as a selection criterion displays all entries for which the running total as calculated to be greater than or equal to the specified total. After the program diplays an item, tapping any key displays the next record for review. When you are reviewing selectively, pressing any key accesses a menu. Tapping the D key deletes an item, and tapping the R key activates the keypad for reentering an item. Pressing the I key activates the keypad as well, and allows a new item to be inserted immediately before the item under review. After deletion, insertion, or reentry, Adding recalculates running totals for all items.

When you request the evaluation routine, the program calculates several statistical measures and sorts the entries by copying them in ascending order into the array previously used for subtotals. Option 1 displays range, minimum and maximum values, mean (arithmetic average), standard deviation, variance, and standard error.

Type in the letter F after an entry to use the composite function. The program waits for a second number to be entered and operated on the first entry before their outcome is added to the running total. You type a colon after the second number to multiply it by the first, and enter a slash to divide the first number by the second. An up arrow identifies the second entry as an exponent that causes the first entry to be carried to that power. Be careful using exponents because it is possible to generate a number large enough to overload the program.

The frequencies routine sorts, counts, and presents all entered items as a tabulation in ascending order. The program displays five values at a time. It measures their frequencies as percentages derived from the total number of times they occur.Pressing any key continues the display.

Adding's routines for reading or creating files provide manual control of the recorder for inserting and positioning tapes. The program then turns the motor off and asks for the name of the file to be saved or read.

A few words of caution: Don't run the program to identify typos without saving it first. Otherwise, you'll find that all your work is on a tape the computer steadfastly refuses to acknowledge. Some CoCos are sensitive to spacing in program lines. If you encounter a syntax error, make sure there are spaces before and after all Basic commands in the line with the error. Also, Adding contains a POKE statement that speeds up execution on some models of the CoCo. But it might not work on your model. Delete POKE65495,0 in line 15 and POKE65494,0 in line 107 to disable this function if it does not work on your CoCo.■

Address correspondence to Bruce Ellis, Star Route 1, Box 245, Prince Frederick, MD 20678. Mr. Ellis holds a Master's Degree in Research and Statistical Methodology and is a government statistician.

Program Listing on the following pages.

Program Listing. Adding.

```
1 PCLEAR1:POKE65494,Ø:CLEAR17ØØ:
BL$=STRING$(192,143):H$=STRING$(
17,128)+"adding"+CHR$(128)+"mach
ine"+CHR$(128):DIMC(15Ø),T(15Ø),
ST(15Ø),D$(15Ø):'     ADDING
B.ELLIS 2/84
2 CLS:PRINT@32,H$:PRINT" THIS PR
OGRAM CREATES A NUMBER   PAD USI
NG A MATRIX OF LETTERS   ON THE
KEYBOARD.  DURING DATA   ENTRY,
TWO CONSTANTS ARE AVAIL  -ABLE,
ALONG WITH A 'FUNCTION'  KEY.  S
UBTOTALS ARE DISPLAYED   STARTIN
G WITH ITEMS BEGUN WITH"
3 PRINT" A SPACE. MOVING AVERAGE
S ALSO   AVAILABLE.  EDIT & REVI
EW DATA  FROM THE MAIN MENU.  RE
TURN TO  MAIN OR OTHER MENUES WI
TH '^'.     PRESS ANY KEY TO STA
RT."
4 Z$=INKEY$:IFZ$=""THEN4 ELSECLS
:PRINT@32,H$:INPUT" PREVIOUS fIL
E ('Y'IF YES)";Z$:IFZ$<>"Y"THEN1
5 ELSELINE INPUT" [eNTER] FOR RE
CORDER CONTROL ";Z$:MOTORON:AUDI
OON:LINE INPUT" [eNTER] WHEN TAP
E POSITIONED ";Z$:MOTOROFF:AUDIO
OFF
5 LINE INPUT" [eNTER] fILE nAME
--";N$:LINE INPUT" PRESS pLAY, T
HEN [eNTER] ";Z$:OPEN "I",#-1,N$

6 IFEOF(-1)THEN8
7 X=X+1:INPUT#-1,C(X),D$(X),T(X)
,ST(X):GOTO6
8 CLOSE#-1:CF=1:PRINT" fINISHED.
 "X"ITEMS READ":FORI=1TO9ØØ:NEXT
:GOTO15
9 IFC$=""ANDA$=" "THENST(X-1)=Ø:
SOUND4Ø,1:RETURN
1Ø IFA$="J"THENB$="1":GOTO14:ELS
EIFA$="K"THENB$="2":GOTO14:ELSEI
FA$="L"THENB$="3":GOTO14:ELSEIFA
$="U"THENB$="4":GOTO14:ELSEIFA$=
"I"THENB$="5":GOTO14:ELSEIFA$="O
"THENB$="6":GOTO14
11 IFA$="7"THENB$="7":GOTO14:ELS
EIFA$="8"THENB$="8":GOTO14:ELSEI
FA$="9"THENB$="9":GOTO14:ELSEIFA
$="Ø"THENB$="Ø":GOTO14:ELSEIFA$=
"M"THENB$="Ø":GOTO14:ELSEIFA$=".
"THENB$=".":GOTO14
12 IFA$=CHR$(8)ANDDS>1THENC$=LEF
T$(C$,DS-2):PRINT@DS-1," ":DS=DS
-1:SOUND1Ø,1
13 DS=DS-1:RETURN
14 PLAY"T255L2550O4C":C$=C$+B$:PR
INT@DS,B$:PRINT@28,USING"###";X:
D$(X)=C$:RETURN
15 POKE65495,Ø:PLAY"T8L8O3AD":CL
S:PRINT@32,H$
16 PRINT" USE 'NUMBER PAD' FOR D
ATA...     KEYBOARD NBRS FOR OTHE
R INPUT"
17 INPUT" dIGITS RIGHT OF DECIMA
L POINT    FOR TOTALS DISPLAY (Ø-
7)";D$:D=VAL(D$)+1:PLAY"CF":IFD>
8THEND=8
18 INPUT" cONSTANT #1";Z$:PLAY"C
G":C1=VAL(Z$):INPUT" cONSTANT #2
";Z$:PLAY"GC":C2=VAL(Z$)
19 INPUT" mOVING aVERAGE ('Y'IF
YES)";M$:PLAY"AF"
2Ø IFM$="Y"THENPRINT@321,"note-M
ULT ENTRY ('X') CAN'T BE  USED W
HEN MOVING AVG CHOSEN":INPUT" nB
R ITEMS TO BE AVERAGED";Z$:MA=VA
L(Z$):IFMA=ØTHEN MA=5
21 PRINT@289,"key <ENTER> TO ADD
 <@>SUBTRACT  'F' FACTORS(*/^) B
Y A 2D ENTRY  cONSTANTS- (A)ADD,
 (S)SUBTRACT  (X)MULTIPLY BY OR
(Z)DIVIDE BY  CONSTANT #1 OR #2
-ENTER DATA,  THEN A-S-X-Z, THEN
 '1' OR '2'."
22 IFCF<>1 THENX=1:T(Ø)=Ø+TF:ST(
Ø)=Ø:ELSEX=X+1
23 GOSUB27:GOTO51
24 ZZ=VAL(C$):C$="":PRINT@DS+2,"
f":PLAY"D":FORDS=12TO22
25 A$=INKEY$:IFA$=""THEN25ELSEGO
SUB9:IFA$=":"ANDC$<>""THENC(X)=V
AL(C$)*ZZ:D$(X)=STR$(ZZ)+"X"+D$(
X):RETURNELSEIFA$="/"ANDC$<>""TH
ENC(X)=ZZ/VAL(C$):D$(X)=STR$(ZZ)
+"/"+D$(X):RETURNELSEIFA$="^"AND
C$<>""THENC(X)=ZZ^(VAL(C$)):D$(X
)=STR$(ZZ)+"^"+D$(X):RETURN
26 NEXT:RETURN
27 FORDS=1TO31
28 A$=INKEY$:IFA$=""THEN28
29 GOSUB9
3Ø IFC$=""THEN39:ELSEIFA$=CHR$(1
3)THENC(X)=VAL(C$):C$="":PLAY"FG
":GOTO41:ELSEIFA$=CHR$(64)THENC(
X)=Ø-VAL(C$):C$="":PLAY"DE":GOTO
41:ELSEIFA$="F"ANDM$<>"Y"THENGOS
UB24:C$="":PLAY"CC":GOTO41
31 IFA$<>"A"THEN33ELSEPLAY"T8L8D
":D$(X)=D$(X)+"+C"
32 A$=INKEY$:IFA$="1"THENC(X)=VA
L(C$)+C1:C$="":PLAY"CG":GOTO41:E
LSEIFA$="2"THENC(X)=VAL(C$)+C2:C
$="":PLAY"GC":GOTO41:ELSE32
33 IFA$<>"S"THEN35ELSEPLAY"T8L8E
":D$(X)=D$(X)+"-C"
34 A$=INKEY$:IFA$="1"THENC(X)=VA
L(C$)-C1:C$="":PLAY"CG":GOTO41:E
LSEIFA$="2"THENC(X)=VAL(C$)-C2:C
$="":PLAY"GC":GOTO41:ELSE34
35 IFA$<>"X"THEN37ELSEPLAY"T8L8F
":D$(X)=D$(X)+"XC"
36 A$=INKEY$:IFA$="1"THENC(X)=VA
L(C$)*C1:C$="":PLAY"CG":GOTO41:E
LSEIFA$="2"THENC(X)=VAL(C$)*C2:C
$="":PLAY"CG":GOTO41:ELSE36
37 IFA$<>"Z"THEN39ELSEPLAY"T8L8G
":D$(X)=D$(X)+"/C"
38 A$=INKEY$:IFA$="1"ANDC1<>Ø TH
ENC(X)=VAL(C$)/C1:C$="":PLAY"CG"
:GOTO41:ELSEIFA$="2"ANDC2<>Ø THE
NC(X)=VAL(C$)/C2:C$="":PLAY"GC":
GOTO41:ELSEIFA$<>""THEN28 ELSE 3
8
39 IFA$="^"THENC$="":X=X-1:RETUR
N
4Ø NEXTDS
41 T(X)=T(X-1)+C(X):ST(X)=ST(X-1
)+C(X):IFA$="1" ORA$="2" THEND$(
X)=D$(X)+A$:ELSEIFA$="@" THEND$(
X)=D$(X)+"-"
42 PRINT@Ø,STRING$(27," ")+"#"
43 PRINT@28,USING"###";X:PRINT@9
7,"total=
   sUBTL (#";ST;"=                "
:PRINT@161,"eNTRY:";D$(X);" VAL=
";C(X):PRINT@192," lAST VALUE:";
C(X-1):PRINT@225,"mVG AVG="
44 PRINT@256," constants#1:";C1;
"#2:";C2
45 IFX=>MA ANDM$="Y"THENGOSUB63
46 J$=STR$(INT(T(X))):LJ=LEN(J$)
:E=D
47 IFLJ>(1Ø-D)THENE=(1Ø-LJ):IFE<
1THENE=1
48 ONE GOSUB55,56,57,58,59,6Ø,61
,62
49 IFCG<>1 ANDX<15Ø THENX=X+1:GO
TO27:ELSEIFCG=1THENRETURN
5Ø PRINT@96,BL$:SOUND1Ø,5:PRINT@
128," full-- 15Ø VALUES ENTERED
...    YOU CAN REVIEW, EVALUATE O
R     SAVE, BUT REGISTERS MUST B
E     CLEARED TO CONTINUE ENTRY
--    cURRENT tOTAL WILL BE SAVE
D.":X=15Ø:TF=T(15Ø):FORI=1TO25ØØ
:NEXT
51 PRINT@96,BL$:PLAY"T8L16AFAF":
PRINT@129,"choose (1) CONTINUE K
EY-ENTRY          (2) CLEAR REGI
STERS             (3) REVIEW
                  (4) EVALUATE
                  (5) SAVE"
52 Z$=INKEY$:IFZ$=""THEN52 ELSEZ
=VAL(Z$):IFZ=ØORZ>5THEN51
53 ONZ GOTO54,65,68,84,1Ø6
54 IFX<15Ø THENST(X)=Ø:X=X+1:PLA
Y"CG":GOTO23:ELSE51
55 PRINT@111,USING"#,###,###,###
";T(X):PRINT@143,USING"#,###,###
,###";ST(X):PRINT@234,USING"##,#
##,###.#";MV;:PRINT" (";MA;")":R
ETURN
56 PRINT@111,USING"##,###,###.#"
;T(X):PRINT@143,USING"##,###,###
.#";ST(X):PRINT@234,USING"#,###,
###.##";MV;:PRINT" (";MA;")":RET
URN
57 PRINT@111,USING"#,###,###.##"
;T(X):PRINT@143,USING"#,###,###.
##";ST(X):PRINT@234,USING"###,##
#.###";MV;:PRINT" (";MA;")":RETU
RN
58 PRINT@111,USING"###,###.###";
T(X):PRINT@143,USING"###,###.###
";ST(X):PRINT@234,USING"##,###.#
###";MV;:PRINT" (";MA;")": RETUR
N
59 PRINT@111,USING"##,###.####";
T(X):PRINT@143,USING"##,###.####
";ST(X):PRINT@234,USING"#,###.##
###";MV;:PRINT" (";MA;")": RETUR
N
6Ø PRINT@111,USING"#,###.#####";
T(X):PRINT@143,USING"#,###.#####
";ST(X):PRINT@234,USING"###.####
##";MV;:PRINT" (";MA;")":RETURN
61 PRINT@111,USING"###.######";T
(X):PRINT@143,USING"###.######";
ST(X):PRINT@234,USING"##.#######
";MV;:PRINT" (";MA;")":RETURN
62 PRINT@111,USING"##.#######";T
(X):PRINT@143,USING"##.#######";
ST(X):PRINT@234,USING"#.########
";MV;:PRINT" (";MA;")":RETURN
63 V=Ø:FORQ=1TOMA:V=V+C(X+1-Q):N
EXT
64 MV=V/MA:RETURN
65 PRINT@96,BL$:PLAY"BGBG":PRINT
@129,"key 'Y' [eNTER] to";CHR$(1
28);"clear";CHR$(128);"all":LINE
 INPUT" IF YOU'VE CHANGED YOUR M
IND,    JUST PRESS [eNTER] ";Z$
66 IFZ$="Y"THENFORQ=1TOX:C(Q)=Ø:
T(Q)=Ø:ST(Q)=Ø:NEXT:GOTO15
67 X=X+1:PLAY"CG":GOTO23
68 PRINT@96,BL$:PLAY"BGBG":PRINT
@129,"rEVIEW- (1) ITEM BY ITEM,
              (2) BY ITEM NUMBER
,             (3) BY ITEM VALUE,
              (4) BY TOTAL"
69 Z$=INKEY$:IFZ$=""THEN69 ELSEI
FZ$="^"THEN51ELSEPLAY"F":Z=VAL(Z
$):IFZ=ØORZ>4THENZ=1
7Ø R$(1)=" BEGINNING WITH iTEM #
 ": R$(2)=" iTEM # ":R$(3)=" iTE
M VALUE ":R$(4)=" iTEM TOTAL =>
"
71 PRINT@96,BL$:PRINT@96,R$(Z);:
LINE INPUTS$:IFS$="^"THEN68 ELSE
S=VAL(S$):ONZ GOSUB73,75,76,78
72 PRINT@256,STRING$(22," ");Z$=
INKEY$:IFZ$=""THEN72 ELSEIFZ$="^
"THEN68 ELSE71
73 IFS=ØTHENS=1ELSEIFS>XTHENS=X
74 FORN=S TOX:GOSUB8Ø:GOSUB81:IF
Z$="^"THENRETURNELSENEXT:RETURN
75 N=S:GOSUB8Ø:GOSUB81:RETURN
76 FORN=1TOX:IFC(N)=S THENGOSUB8
Ø:GOSUB81:IFZ$="^"THENRETURN
77 NEXT:RETURN
78 FORN=1TOX:IFT(N)=>S THENGOSUB
8Ø:GOSUB81:IFZ$="^"THENRETURN
79 NEXT:RETURN
8Ø PRINT@128," iTEM NBR ";N;" vA
L=";C(N):PRINT@16Ø," iTEM TOTAL=
";T(N);"       ":PRINT@192," kEYE
D:";D$(N);"       ":PRINT@224," P
REV vAL=";C(N-1):RETURN
81 PRINT@256," -hIT R-REKEY D-DE
LETE I-INSERT":Z$=INKEY$:IFZ$=""
 THEN81 ELSEIFZ$="D" THENPLAY"DA
":FORQ=N TOX:C(Q)=C(Q+1):D$(Q)=D
$(Q+1):NEXT:X=X-1:GOSUB1Ø5:RETUR
N
82 IFZ$="R" THENPLAY"AA":XS=X:X=
N:CG=1:GOSUB27:X=XS:GOSUB1Ø5:CG=
Ø:FORI=1TO1ØØØ:NEXT:LINE INPUT"
```

Listing continued

Listing continued

```
  <eNTER> TO CONT. REVIEW ";Z2$:
SOUND4Ø,1:PRINT@96,BL$:PRINT@96,
R$(V);S:N=N-1:RETURN
83 IFZ$="I" THENPLAY"AD":FORQ=X
TON STEP-1:C(Q+1)=C(Q):D$(Q+1)=D
$(Q):NEXT:XS=X:X=N:CG=1:GOSUB27:
X=XS+1:GOSUB1Ø5:CG=Ø:FORI=1TO1ØØ
Ø:NEXT:LINE INPUT"   <eNTER> TO
CONT. REVIEW ";Z2$:SOUND4Ø,1:PRI
NT@96,BL$:PRINT@96,R$(V);S:RETUR
N:ELSERETURN
84 PLAY"BG":PRINT"        ONE MO
MENT ...":FORS=1TOX:ST(S)=-9E+37
:NEXT
85 FORS=1TOX:P=Ø
86 FORS1=1 TOX:IFC(S1)<=C(S) THE
NP=P+1
87 IFST(P)=C(S) ANDP<>1 THENP=P-
1:GOTO87
88 NEXT:ST(P)=C(S):NEXT
89 SUM=Ø:SSQ=Ø:FORS=1TOX:SUM=SUM
+ST(S):SSQ=SSQ+(ST(S)^2):NEXT:M=
SUM/X:VR=(SSQ-(X*(M^2)))/X:SD=VR
^.5:CV=(SSQ-(X*(M^2)))/(X-1):CD=
CV^.5:SE=CD/(X^.5):RG=ST(X)-ST(1
)
9Ø PRINT@96,BL$:PLAY"BGBG":PRINT
@129,"tASK    1) SUMMARY STATS
              2) STANDARD SCORES
              3) FREQUENCIES"
91 Z$=INKEY$:IFZ$=""THEN91 ELSEI
FZ$="^"THEN51ELSEPLAY"F":Z=VAL(Z
$):IFZ=ØORZ>3THENZ=1
92 ONZ GOSUB93,95,98:GOTO9Ø
93 PRINT@96,BL$:PRINT@97,"n=";X:
PRINT@1Ø5,"rANGE=";RG:PRINT" mIN
";ST(1),"mAX";ST(X):PRINT" mEAN=
";M:PRINT" sD=";SD:PRINT" vR=";C
V:PRINT" sE=";SE,"s=";CD
94 Z$=INKEY$:IFZ$=""THEN94ELSERE
TURN
95 PRINT@96,BL$:PRINT@97,"VALUES
 NEED NOT HAVE OCCURRED   TO COM
PUTE STANDARD SCORES.":INPUT" VA
LUE";Z$:IFZ$="^"THEN9Ø
96 DZ=VAL(Z$)-M:Z=DZ/CD:ZD=VAL(Z
$)*CD+M:PRINT" mN";M,"s=";CD:PRI
NT" Z=";Z:PRINT" V=";ZD
97 Z$=INKEY$:IFZ$=""THEN97 ELSEI
FZ$="^"THENRETURNELSE95
98 GOSUB1Ø4:F=1
99 FORF2=F TOX:IFST(F2)=ST(F) TH
ENFR=FR+1:NEXT
1ØØ PRINTST(F);TAB(16);FR;TAB(21
);:PRINT USING"##.#";FR/X*1ØØ;:P
RINT USING"####.#";(F2-1)/X*1ØØ
1Ø1 G=G+1:F=F+FR:FR=Ø:IFF>X THEN
GOSUB1Ø3:RETURN
1Ø2 IFG/6=INT(G/6) THENGOSUB1Ø3:
GOSUB1Ø4:GOTO99:ELSEGOTO99
1Ø3 Z$=INKEY$:IFZ$=""THEN1Ø3 ELS
E RETURN
1Ø4 G=1:PRINT@64,BL$:PRINT@96,BL
$:PRINT@96," iTEM ---------- fRQ
 %tTL  %cUM":RETURN
1Ø5 FORL=N TOX:T(L)=T(L-1)+C(L):
ST(L)=ST(L-1)+C(L):NEXT:RETURN
1Ø6 PRINT@96,BL$:PLAY"BGBG":PRIN
T@64," ":LINE INPUT" [eNTER] FOR
 RECORDER CONTROL ";Z$:MOTORON:A
UDIOON:LINE INPUT" [eNTER] fILE
nAME --";N$:N$=LEFT$(N$,8):MOTOR
OFF:AUDIOOFF:LINE INPUT" PRESS p
&r, THEN [eNTER] ";Z$
1Ø7 POKE65494,Ø:OPEN"O",#-1,N$:F
ORZ=1TOX:PRINT#-1,C(Z),D$(Z),T(Z
),ST(Z):NEXT:CLOSE#-1:GOTO51
```

END

ATTENTION

Foreign Computer Stores/ Magazine Dealers

You have a large technical audience that speaks English and is in need of the kind of microcomputer information that CW/ Peterborough provides.

Provide your audience with the magazine they need and make money at the same time. For details on selling **80 MICRO, inCider, HOT CoCo,** and **RUN** contact:

SANDRA JOSEPH
WORLD WIDE MEDIA
386 PARK AVE., SOUTH
NEW YORK, NY 10016
PHONE (212) 686-1520
TELEX—620430

WORKBASE

BUSINESS SOFTWARE

$ PORTFOLIO $

BUSINESS DATABASE SYSTEMS

An economical and powerful business management database system. A few of the many features of WORKBASE I & II are: • a spread sheet module to define and store calculations for updating your database • a report module to define and store unlimited report formats with totals and headings • a word processor to merge a database with custom letters, reports, and mailing labels • utilities for generating, merging, summarizing, and updating • only 1 disk drive and a 32K Color Computer are required • 216 page step-by-step user's manual with tutorial and separate demonstration disk.

WORKBASE DATABASE I—600 Records $64.95
WORKBASE DATABASE II—1200 Records $79.95

BUSINESS APPLICATION PACKAGES

Self-contained application programs which can be used independently, in combinations or with WORKBASE DATABASE I or II for additional updating and reporting. The following apply to each application package: • predefined reports • print or display selected records • simultaneous updating of related database files • 600 records per predefined database • built-in calculations • menu driven • complete audit trails • 40 to 50 page step-by-step user's manual.

Packages currently available: • INVENTORY CONTROL • ACCOUNTS RECEIVABLE • SALES ORDER ENTRY • CHURCH MEMBERSHIP • ACCOUNTS PAYABLE • PURCHASE ORDERS • RENTAL PROPERTY MANAGEMENT • GENERAL LEDGER • PAYROLL
COST PER PACKAGE $24.95 ($19.95 when purchasing 2 or more)

BUY WORKBASE DATABASE I or II AND GET ONE APPLICATION PACKAGE FOR $19.95

• SEND CHECK OR MONEY ORDER OR USE OUR TOLL FREE NUMBER FOR PLACING CREDIT CARD ORDERS: 1-800-334-0854 (Ext. 887)

• PRICE INCLUDES SHIPPING & HANDLING WITHIN USA • ADD $5 FOR ALL FOREIGN ORDERS • CASH ONLY COD ORDERS ADD $2 • NC RESIDENTS ADD 4.5% SALES TAX

WORKBASE DATA SYSTEMS ↙359

P.O. Box 3448. Durham, N.C. 27702•(919)286-3445

↙ See List of Advertisers on page 81

OUR HOTTEST IDEA YET

A FREE PROGRAM WITH EVERY CASSETTE

We want to give you something that *HOT CoCo* can't. That's right! **instant CoCo** will now include a previously unpublished BONUS PROGRAM on each monthly cassette . . **FREE**.

The NEW AND IMPROVED **instant CoCo.** More than just another magazine loader. Each free program is our way of making sure you get state-of-the-art software.

You'll find variety and excitement every month. Everything from great games to helpful utilities. Commercial quality programs that would cost up to $50 if purchased separately in any leading software store.

Since the bonus programs have never appeared in **HOT CoCo** due to their length, all necessary documentation will be specially provided with each cassette.

Save yourself some money. Subscribe to **instant CoCo.** Each month you'll get 10–15 of the best ready-to-run programs from the pages of **HOT CoCo:**

- **The best** action-packed games . . . hours of challenge and entertainment.
- **The best** business, school, home, and hobby programs.
- **The best** utilities . . . ease routine tasks . . . increase your computer's capabilities.

Increase your software library. Order a full 12 month subscription and we'll give you one FREE program on each monthly cassette.

Simply mail in the coupon below, or call TOLL FREE 1-800-258-5473. In New Hampshire, call 1-924-9471. VISA, MASTERCARD, and AMERICAN EXPRESS welcome.

With the new **instant CoCo**, we'll deal you the **BEST** programs—plus a great deal more!

YES! I want a FREE program with every cassette.

- ☐ Please send me _____ copies of the "Best of 83" at $16.47 each.
- ☐ Please send me _____ copies of this month's issue at $11.47 each.
- ☐ Please sign me up for a one year subscription beginning with this month's issue at $99.97.

* Price includes postage and handling. Foreign Air Mail please add an additional 45¢ per cassette or $25 per subscription. US funds drawn on US banks ONLY.

☐ Check Enclosed ☐ MC
☐ VISA ☐ AE

Card #_____ Exp. Date_____

Signature_____

Name_____

Address_____

City_____ State_____ Zip_____

Please allow 4–6 weeks for delivery.

instant CoCo • 80 Pine Street • Peterborough, NH 03458

IC8501

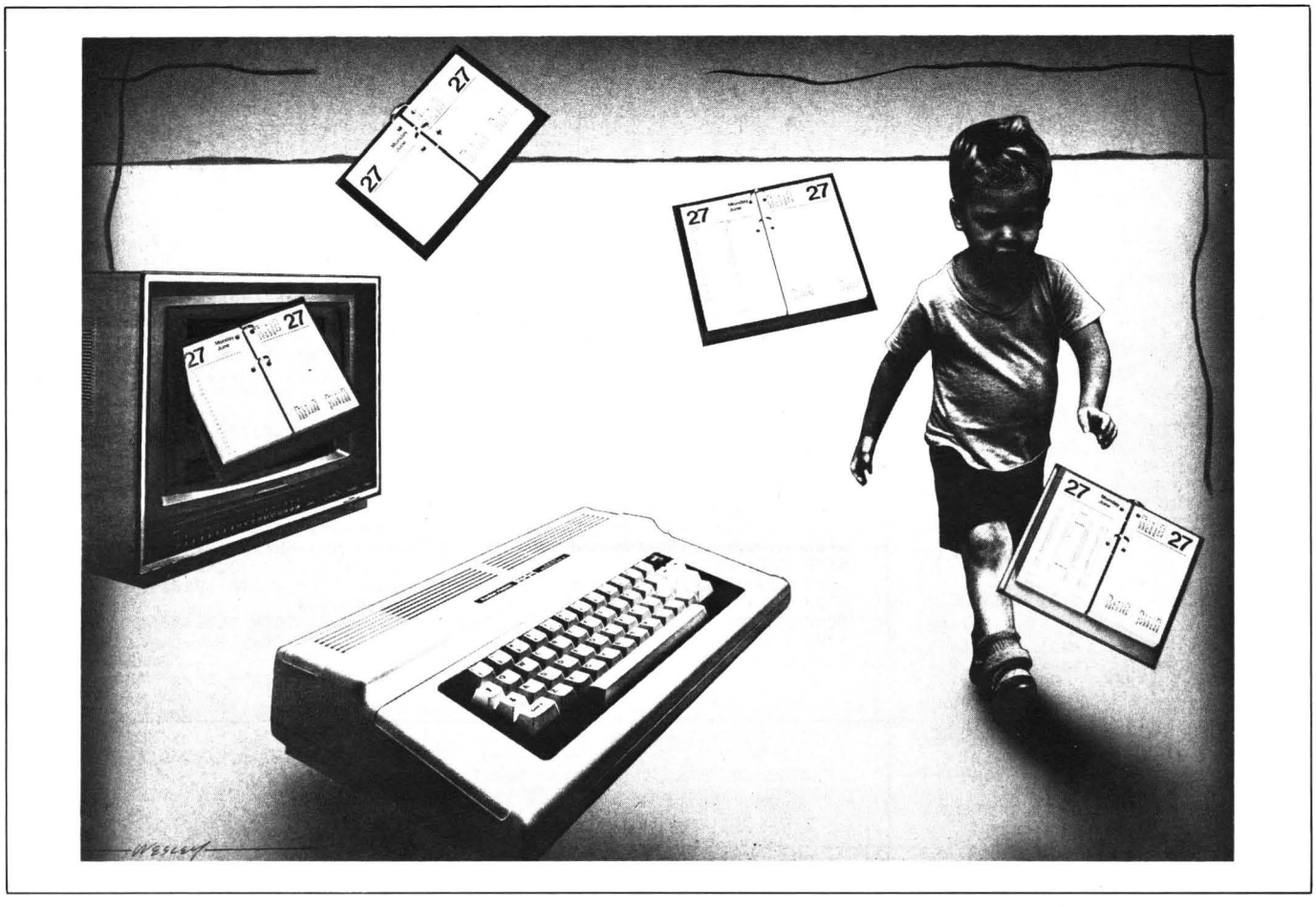


illustration by Carl Wesley

COMPUTER DATING: A CALENDAR GENERATOR

Now your CoCo can show you the future with calendars for every day of the week.

BY BRIAN E. HAWKINS

Have you ever noticed that there are items around the house that become scarce just when you need them most? Take calendars, for instance. While making long-distance arrangements for your favorite vacation spot, you realize that you can't find a calendar. Searching for one could take several frustrating minutes—and Club Med is holding the phone.

The following program gives you access to 26 years of calendars, from January 1984 to December 2009. It displays months on the PMODE 4 graphics screen and allows you to print a 12-month calendar in 40-, 80-, or 132-column format. Fig. 1 is an example of the 80-column format. To make screen-generated calendars easier to read, the normal PMODE 4 graphics colors have been reversed to black on white. The CoCo Calendar Generator is completely menu driven, and it error checks all user input. Holidays aren't included—but then most of us can remember the Fourth of July anyway. ■

Address correspondence to Brian E. Hawkins, 1301 Wembley Drive, Charlotte, NC 28205.

System Requirements

16K RAM
Extended Color Basic
Printer Optional

Program Listing. CoCo Calendar Generator

```
5 CLEAR 1000
10 DIM YB(25),DM(12),NS$(9),SS$(
12),MT$(12)
20 FOR I = 0 TO 25:READ YB(I):NE
XT
30 FOR I = 1 TO 12:READ DM(I):NE
XT
40 FOR I = 0 TO 9:READ NS$(I):NE
XT
50 FOR I = 1 TO 12:READ SS$(I):N
EXT
60 FOR I = 1 TO 12:READ MT$(I):N
EXT
100 PMODE 4,1
200 COLOR 0,5
400 CLS:PRINT"    COCO CALENDAR
GENERATOR.":PRINT:PRINT"
 1984 TO 2009."
450 FOR I = 1 TO 2000:NEXT
500 CLS:PRINT"CHOOSE ONE OF THE
FOLLOWING:":PRINT:PRINT"(1).....
SCREEN GENERATION":PRINT"(2)....
.PRINTER GENERATION":PRINT"(3)..
...EXIT THE PROGRAM"
600 PRINT@153,"     ";:PRINT@153,
"";:LINEINPUT AN$
700 AN=VAL(AN$):IF AN<1 OR AN>3
THEN SOUND 100,2:GOTO600
800 CLS:ON AN GOSUB 1000,5000,95
0
900 GOTO 500
950 END
1000 GOSUB 10000
1050 PCLS
1100 SCREEN 1,1
1200 LINE (0,30)-(252,191),PSET,
B
1300 FOR I = 0 TO 255 STEP 36:LI
NE(I,30)-(I,191),PSET:NEXT
1500 FOR I = 30 TO 160 STEP 32:L
INE(0,I)-(252,I),PSET:NEXT
1600 LINE(0,0)-(252,30),PSET,BF
1700 GOSUB 15000
1800 D=DD:L=1:DH=DM(MH):IF (YR/4
=INT(YR/4)) AND MH=2 THEN DH=DH+
1
1900 FOR J = 1 TO DH
1950 IF L=6 THEN VL=189:DRAW"BM"
+STR$((DD-1)*36)+",174R35" ELSE
VL=(L*32)+6
2000 XL=(DD-1)*36:DS$=RIGHT$(STR
$(J),LEN(STR$(J))-1)
2100 DRAW"BM"+STR$(XL)+","+STR$(
VL)+NS$(VAL(LEFT$(DS$,1)))
2200 IF LEN(DS$)=2 THEN DRAW NS$
(VAL(RIGHT$(DS$,1)))
2300 DD=DD+1
2400 IF DD=8 THEN DD=1:L=L+1
2500 NEXT J
2600 IF INKEY$="" GOTO 2600
2700 RETURN
5000 CLS:PRINT"(1).....40 COL. P
RINTER":PRINT"(2).....80 COL. PR
INTER":PRINT"(3).....132 COL. PR
INTER"
5050 DL$="":DD$="":LD$=""
5100 PRINT@128,"CHOOSE ONE OF TH
E ABOVE  ";:LINEINPUT CH$:CH=VAL
(CH$):IF CH<1 OR CH>3 THEN SOUND
 100,2:GOTO 5100
5150 IF CH=1 THEN L=5:LT=4:TB=10
:QT=5 ELSE L=10:LT=L:TB=30: QT=1
1
5160 IF CH=3 THEN PT=26 ELSE PT=
0
5170 TB=TB+PT
5200 GOSUB 10000
5202 DH=YB(YS):H2=DH
5205 YR$=RIGHT$(STR$(YR),LEN(STR
$(YR))-1)
5210 FOR I = 1 TO L:DL$=DL$+YR$+
"....":NEXT
5215 FOR I = 1 TO 7:LD$=LD$+"+"+
STRING$(LT,"-"):NEXT
5220 LD$=LD$+"+"
5225 FOR I = 1 TO 7:DD$=DD$+"!"+
STRING$(LT," "):NEXT
5230 DD$=DD$+"!"
5240 IF CH=1 THEN QD$="!SUN !MON
 !TUE !WED !THU !FRI !SAT !" ELS
E QD$="!    SUN    !    MON    !
  TUE    !    WED    !    THU    !
   FRI    !    SAT    !"
5250 IF CH=1 THEN DL$=LEFT$(DL$,
36) ELSE DL$=LEFT$(DL$,78)
5300 PRINT"PREPARE PRINTER AND H
IT ENTER."
5400 IF INKEY$="" GOTO5400
5450 FOR MH = 1 TO 12
5500 PRINT#-2,CHR$(13),CHR$(13)
5600 PRINT#-2,TAB(PT);DL$
5650 PRINT#-2,CHR$(13)
5800 PRINT #-2,TAB(((L*8)-LEN(MT
$(MH)))/2);MT$(MH)
5900 PRINT#-2,CHR$(13):PRINT#-2,
TAB(PT);DL$
5910 PRINT#-2,TAB(PT);LD$
5920 PRINT#-2,TAB(PT);QD$
6000 MD=DM(MH)
6050 IF(YR/4=INT(YR/4)) AND MH=2
 THEN MD=MD+1
6100 J=1
6200 FOR L1 = 1 TO 6
6300 PRINT#-2,TAB(PT);LD$
6400 PRINT#-2,TAB(PT);DD$
6500 D2$=DD$
6600 GOSUB 20000
6700 PRINT#-2,TAB(PT);D2$
6800 L2=INT(L/2)
6900 FOR I = 1 TO L2:PRINT#-2,TA
B(PT);DD$:NEXT
7000 NEXT
7100 PRINT#-2,TAB(PT);LD$
7200 PRINT#-2,CHR$(13),CHR$(13)
7210 H2=H2+MD
7220 DH=H2-(INT(H2/7)*7):IF DH=0
 THEN DH=7
7300 NEXT MH
7400 RETURN
7500 END
10000 CLS:INPUT"WHICH YEAR WOULD
 YOU LIKE";YR
10100 YS=YR-1984:IF YS<0 OR YS>2
5 THEN SOUND 100,2:GOTO 10000
10200 CLS:PRINT"YEAR IS:  ";YR
10250 IF AN=2 THEN RETURN
10300 PRINT:PRINT"(1)...JANUARY
  (7)...JULY":PRINT"(2)...FEBRUA
RY  (8)...AUGUST":PRINT"(3)...MA
RCH     (9)...SEPTEMBER"
10400 PRINT"(4)...APRIL     (10)
...OCTOBER":PRINT"(5)...MAY
  (11)...NOVEMBER":PRINT"(6)...J
UNE      (12)...DECEMBER"
10500 PRINT@288,"WHICH MONTH? (B
Y NUMBER)  ";:LINEINPUT AN$
10600 MO=VAL(AN$):MH=MO:IF MO<1
OR MO>12 THEN SOUND 100,2:PRINT@
313,"    ";:GOTO 10500
10700 DT=0
```

Listing continued

```
                    JANUARY

1985....1985....1985....1985....1985....1985....1985....1985....1985..
+----------+----------+----------+----------+----------+----------+----------+
|   SUN    |   MON    |   TUE    |   WED    |   THU    |   FRI    |   SAT    |
+----------+----------+----------+----------+----------+----------+----------+
|          |          |    1     |    2     |    3     |    4     |    5     |
+----------+----------+----------+----------+----------+----------+----------+
|    6     |    7     |    8     |    9     |   10     |   11     |   12     |
+----------+----------+----------+----------+----------+----------+----------+
|   13     |   14     |   15     |   16     |   17     |   18     |   19     |
+----------+----------+----------+----------+----------+----------+----------+
|   20     |   21     |   22     |   23     |   24     |   25     |   26     |
+----------+----------+----------+----------+----------+----------+----------+
|   27     |   28     |   29     |   30     |   31     |          |          |
+----------+----------+----------+----------+----------+----------+----------+
```

Fig. 1. This is what this month looks like in the 80-column format. The CoCo Calendar Generator can print any of 26 yearly calendars in three formats.

Listing continued

```
1Ø75Ø MO=MO-1:IF MO=Ø GOTO1Ø9ØØ
1Ø8ØØ FOR I = 1 TO MO:DT=DT+DM(I
):NEXT
1Ø85Ø IF (YR/4 = INT(YR/4)) AND
MO>1 THEN DT=DT+1
1Ø9ØØ DD=DT-(INT(DT/7)*7):DD=DD+
YB(YS):IF DD>7 THEN DD=DD-7
11ØØØ RETURN
15ØØØ COLOR 5,Ø
15Ø1Ø LINE(Ø,2Ø)-(252,2Ø),PSET
15Ø2Ø FOR I = 36 TO 22Ø STEP 36:
LINE(I,2Ø)-(I,3Ø),PSET:NEXT
15Ø95 DRAW"BM9,27F1R2E1U1H1L2H1U
1E1R2F1BM+2,-1D5F1R2E1U5BM+2,+6U
6F4D2U6"
151ØØ DRAW"BM45,28U6F2D1U1E2D6BM
+3,+ØR2E1U4H1L2G1D4BM+6,+1U6F4D2
U6"
152ØØ DRAW"BM83,28U6L2R4BM+2,+ØD
5F1R2E1U5BM+6,+ØL4D3R4L4D3R4"
153ØØ DRAW"BM118,22D6E2F2U6BM+6,
+ØL4D3R4L4D3R4BM+2,+ØR2E2U2H2L2D
5"
154ØØ DRAW"BM156,28U6L2R4BM+2,+Ø
D6U3R4U3D6BM+2,-6D5F1R2E1U5"
155ØØ DRAW"BM19Ø,28U3R3L3U3R4BM+
2,+6U6R3F1D1G1L2F3BM+2,+ØR4L2U6L
2R4"
156ØØ DRAW"BM226,27F1R2E1U1H1L2H
1U1E1R2F1BM+2,+5U5E1R2F1D2L3R3D3
BM+4,+ØU6L2R4"
157ØØ DRAW "BM55,15S8"
1575Ø DRAW SS$(MH)
1576Ø DRAW "BM1Ø7,15U1L1D1R1"
1577Ø DRAW "BM122,15"
1578Ø Y$=RIGHT$(STR$(YR),LEN(STR
$(YR))-1)
1579Ø FOR I = 1 TO 4:DRAW NS$(VA
L(MID$(Y$,I,1))):NEXT
1598Ø DRAW "S4"
1599Ø COLOR Ø,5
16ØØØ RETURN
2ØØØØ FOR IJ = DH TO 7
2Ø1ØØ IF J>MD GOTO 2Ø4ØØ
2Ø2ØØ MID$(D2$,((IJ-1)*QT)+3,LEN
(STR$(J)))=STR$(J)
2Ø3ØØ J=J+1
2Ø4ØØ NEXT
2Ø45Ø DH=1
2Ø5ØØ RETURN
211ØØ DATA 1,3,4,5,6,1,2,3,4,6,7
,1,2,4,5,6,7,2,3,4,5,7,1,2,3,5,3
1,28,31,3Ø,31,3Ø,31,31,3Ø,31,3Ø,
31
3Ø15Ø DATA "BM+8,+ØR2E1U4H1L2G1D
4F1BM-1,+Ø"
3Ø2ØØ DATA "BM+7,+ØR4L2U6G2BM+Ø,
+4"
3Ø3ØØ DATA "BM+11,+ØL4U1E4H1L2G1
BM+Ø,+5"
3Ø4ØØ DATA "BM+7,-1F1R2E1U1H1L2R
2E1U1H1L2G1BM+Ø,+5"
3Ø5ØØ DATA "BM+1Ø,+ØU6L1G2D1R4BM
-4,+3"
3Ø6ØØ DATA "BM+7,-1F1R2E1U1H1L3U
3R4BM-4,+6"
3Ø7ØØ DATA "BM+8,-2E1R1F1D1G1L2H
1U4E1R2F1BM-4,+5"
3Ø8ØØ DATA "BM+9,+ØU3E2U1L4D1BM+
Ø,+5"
3Ø9ØØ DATA "BM+8,+ØR2E1U1H1L2H1U
1E1R2F1D1G1L2G1D1F1BM-1,+Ø"
31ØØØ DATA "BM+7,-1F1R2E1U4H1L2G
1D1F1R2BM-3,+3"
311ØØ DATA "BM+7,-2D1F1R2E1U5BM+
2,+6U5E1R2F1D2L4R4D3BM+2,+ØU6F4D
2U6"
312ØØ DATA "BM+7,+ØU3R3L3U3R4BM+
6,+ØL4D3R4L4D3R4BM+2,+ØU6R3F1D1G
1L2R2F1D1G1L3"
313ØØ DATA "BM+7,+ØU6F2D1U1E2D6B
M+2,+ØU5E1R2F1D2L4R4D3BM+2,+ØU6R
3F1D1G1L2F3"
314ØØ DATA "BM+7,+ØU5E1R2F1D2L4R
4D3BM+2,+ØU6R3F1D1G1L3BM+6,+3U6R
3F1D1G1L2F3"
315ØØ DATA "BM+7,+ØU6F2D1U1E2D6B
M+2,+ØU5E1R2F1D2L4R4D3BM+4,+ØU3H
2U1BM+4,+ØD1G2"
316ØØ DATA "BM+7,-2D1F1R2E1U5BM+
2,+ØD5F1R2E1U5BM+2,+6U6F4D2U6"
317ØØ DATA "BM+7,-2D1F1R2E1U5BM+
2,+ØD5F1R2E1U5BM+2,+ØD6R4"
318ØØ DATA "BM+7,+ØU5E1R2F1D2L4R
4D3BM+2,-6D5F1R2E1U5BM+6,+1H1L2G
1D4F1R2E1U2L2"
319ØØ DATA "BM+7,-1F1R2E1U1H1L2H
1U1E1R2F1BM+6,-1L4D3R4L4D3R4BM+2
,+ØU6R3F1D1G1L3"
32ØØØ DATA "BM+7,-1U4E1R2F1D4G1L
2H1BM+11,+ØG1L2H1U4E1R2F1BM+2,-1
R4L2D6"
321ØØ DATA "BM+7,+ØU6F4D2U6BM+3,
+ØR2F1D4G1L2H1U4BM+7,-1D1F1D2F1D
1U1E1U2E1U1"
322ØØ DATA "BM+7,+ØU6R2F2D2G2L2B
M+1Ø,+ØL4U3R4L4U3R4BM+6,+1H1L2G1
D4F1R2E1"
323ØØ DATA JANUARY,FEBRUARY,MARC
H,APRIL,MAY,JUNE,JULY,AUGUST,SEP
TEMBER,OCTOBER,NOVEMBER,DECEMBER
```

END

TCE News Release

MONDAY OCTOBER 1, 1984 — *GAITHERSBURG, MARYLAND*

In 1985 TCE Will Introduce CHILD'S PLAY

Mouse Technological Software For The Color Computer!

Ted Malaska, President & Co-founder of TCE Programs Inc., announced today a new division for the development of business software.

The new division will distribute a series of machine language business programs, under the name *Child's Play* beginning in the first half of 1985. The *Child's Play* series will use mouse technology and what Mr. Malaska termed "*Floating Overlays*", to control the operations within the program.

When asked why the name *Child's Play* was selected for a business series, Mr. Malaska responded: "Floating Overlays will make the program operation seem like *Child's Play* , compared to other business software of today."

TCE™ ✓388

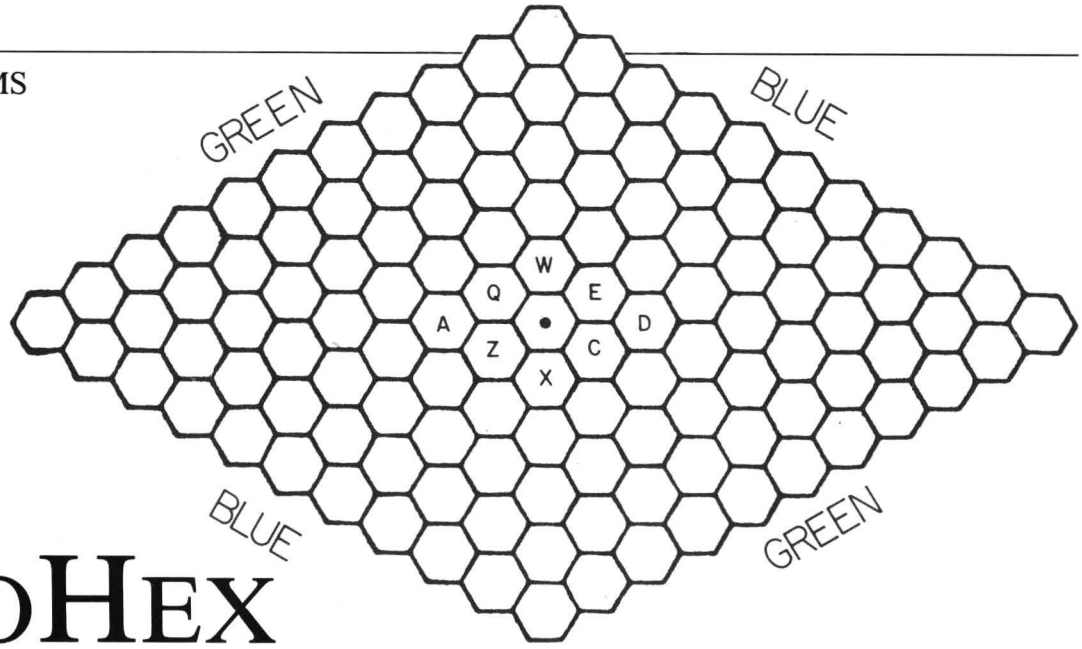
Send for FREE Catalog

TCE BUSINESS DIVISION
P.O. BOX 2477
GAITHERSBURG, MD 20879
1-(301) 963-3848

MasterCard VISA

✓ See List of Advertisers on page 81

BY WALLY ADAMS



CoCoHex

Try this high-tech version of an old-tech game.

CoCoHex is based on the traditional game, Hex. It uses a diamond-shaped game board, and although the size can vary, it usually has 11 hexagons on each side. Opposite sides of the board are designated as green, and the other two sides as blue, with the hexagons at the corners of the diamond belonging to either side. The object of CoCoHex is to complete an unbroken chain between your two sides.

Your chain can twist and turn freely, and all hexagons are legal moves. You cannot play a hexagon that is already occupied, and the game cannot end in a draw since one player can block the other only by completing his own chain.

Enter and run CoCoHex and it draws the board. Green has the first move. Its sides are indicated by green squares drawn on opposite sides. The program draws a flashing cursor board. To move this cursor to a desired position, use the following keys: Q, W, E, A, D, Z, X, C. (As indicated in above illustration.)

When you have reached the desired hexagon, press M to mark the hexagon with your color. When you mark a move, your opponent's sides are indicated, signifying his turn. Press 0 to start a new game. Line 100 is the high-speed POKE. If your computer cannot handle this POKE, delete it.■

Address correspondence to Wally Adams, P.O. Box 871, Winter Garden, FL 32797.

System Requirements
16K RAM
Extended Color Basic

```
100 POKE 65495,1
110 PMODE3,1:COLOR4,2:PCLS:SCREEN1,0
120 LINE(3,88)-(0,96),PSET
130 LINE-(3,104),PSET
140 LINE-(11,104),PSET
150 LINE-(15,96),PSET
160 LINE-(11,88),PSET
170 LINE-(3,88),PSET
180 DIM V(6)
190 GET(0,88)-(15,104),V,G
200 B=88
210 FOR A=0 TO 120 STEP 12
220 B=B-8:Y=B
230 FOR X=A TO A+120 STEP 12
240 Y=Y+8
250 PUT(X,Y)-(X+15,Y+16),V,PSET
260 NEXT X,A
270 PAINT(1,1),0,4
280 PAINT(1,191),0,4
290 COLOR1:LINE(40,24)-(52,36),PSET,BF:LINE(204,167)-(216,178),PSET,BF
300 C=1:X=128:Y=96
310 A$=INKEY$:IF A$="" GOSUB 540:GOSUB 530
320 IF A$="D" GOSUB 540 ELSE340
330 X=X+24:IF X>248 OR PPOINT(X-1,Y)=4 THEN X=X-24:GOTO 310
340 IF A$="A" GOSUB 540 ELSE360
350 X=X-24:IF X<8 THEN X=X+24:GOTO 310 ELSE IF PPOINT(X-1,Y)=4 THEN X=X+24:GOTO 310
360 IF A$="W" GOSUB 540 ELSE380
370 Y=Y-16:IF Y<16 OR PPOINT(X-1,Y)=4 THEN Y=Y+16:GOTO 310
380 IF A$="X" GOSUB 540 ELSE400
390 Y=Y+16:IF Y>176 OR PPOINT(X-1,Y)=4 THEN Y=Y-16:GOTO 310
400 IF A$="Q" GOSUB 540 ELSE420
410 X=X-12:Y=Y-8:IF X<8 OR Y<16 THEN X=X+12:Y=Y+8:GOTO 310 ELSE IF PPOINT(X-1,Y)=4 THEN X=X+12:Y=Y+8:GOTO 310
420 IF A$="E" GOSUB 540 ELSE440
430 X=X+12:Y=Y-8:IF X>248 OR Y<16 OR PPOINT(X-1,Y)=4 THEN X=X-12:Y=Y+8:GOTO 310
440 IF A$="Z" GOSUB 540 ELSE460
450 X=X-12:Y=Y+8:IF X<8 OR Y>176 THEN X=X+12:Y=Y-8:GOTO 310 ELSE IF PPOINT(X-1,Y)=4 THEN X=X+12:Y=Y-8:GOTO 310
460 IF A$="C" GOSUB 540 ELSE480
470 X=X+12:Y=Y+8:IF X>248 OR Y>176 OR PPOINT(X-1,Y)=4 THEN X=X-12:Y=Y-8:GOTO 310
480 IF A$="M" THEN 490 ELSE 520
490 IF PPOINT(X-1,Y)=1 OR PPOINT(X-1,Y)=3 THEN 310 ELSE GOSUB 540:PAINT(X,Y),C,4
500 IF C=1 THEN COLOR4:LINE(40,24)-(52,36),PSET,BF:LINE(204,167)-(216,178),PSET,BF:LINE(40,167)-(52,178),PSET,BF:COLOR3:LINE(204,24)-(216,36),PSET,BF:LINE(40,167)-(52,178),PSET,BF:C=3:GOTO310
510 COLOR4:LINE(204,24)-(216,36),PSET,BF:LINE(40,167)-(52,178),PSET,BF:COLOR1:LINE(40,24)-(52,36),PSET,BF:LINE(204,167)-(216,178),PSET,BF:C=1:GOTO 310
520 IF A$="O" THEN RUN ELSE 310
530 PSET(X,Y,4):PSET(X,Y+1,4):RETURN
540 PRESET(X,Y):PRESET(X,Y+1):PAINT(X,Y),(PPOINT(X-1,Y)),4:RETURN
```

Program Listing. CoCoHex

ATTENTION SUBSCRIBERS

We occasionally make our mailing list available to other companies or organizations with products or services which we feel might be of interest to you. If you prefer that your name be deleted from such a list, please fill out the coupon below or affix a copy of your mailing label and mail it to:

CW Communications/Peterborough
HOT CoCo
P.O. Box 975
Farmingdale, NY 11737

==========

Please delete my name from mailing lists sent to other companies or organizations.

name _____

address _____

city _____ state _____ zip _____

HOT CoCo

Dealers Dealers Dealers SELL!

Selling **HOT CoCo** will make money for you. Consider the facts:
Fact 1: Selling **HOT CoCo** increases store traffic—our dealers tell us that **HOT CoCo** is one of the hottest-selling computer magazines on the newsstands.
Fact 2: There is a direct correlation between store traffic and sales—increase the number of people coming through your door and you'll increase sales.
Fact 3: Fact 1 + Fact 2 = INCREASED SALES, which means more money for you. And that's a fact.

For information on selling **HOT CoCo**, call 800-343-0728 (In N.H. call 924-9471) and speak with our direct sales manager. Or write to **HOT CoCo**, 80 Pine Street, Peterborough, NH 03458.

HOT CoCo
80 Pine Street
Peterborough, NH 03458
800-343-0728

✓ See List of Advertisers on page 81

SELECTED ★★★★SOFTWARE★★★★
FOR THE COLOR COMPUTER

Upgrade Your Color Computer!

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 BOARDS & COCO 2 ..... **$59.95**
If possible, please specify board revision.

NOTE: All ICs used in our kits are first quality 200NS Prime Chips and carry one full year warranty.

EXTENDED BASIC KIT **$59.95**

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)

DISKETTE CAROUSEL
with 72 color-coded envelopes.
REG. $29.95 SALE $24.95

VOLKSMODEM
300 baud, direct connect, orig/answer automatically selected. Comes with all COCO cables and battery.
$74.95
With COLORCOM/E Rompak or Disk **$109.95**

'REAL TALKER'
with enhanced software on tape & user's manual.
Cartridge $59.95

'REAL TALKER II'
Same as above for COCO 2.
$69.95

Y-BRANCHING CABLE for disk systems ... **$29.95**

PRINTER **$279.00**
GEMINI 10X ..... ~~$289.95~~

PBH SERIAL TO PARALLEL SWITCH
Selectable printer and modem interface.
(Reg. 89.95) **SALE $79.95** **$59.95**
PURCHASED WITH PRINTER ..... ~~$84.95~~

TAKE 20% OFF ANY SOFTWARE ORDER!
All programs are in 16K machine language unless noted.

TOM MIX SOFTWARE

	Tape	Disk
* DRACONIAN (32K)	$27.95	$30.95
** SKRAMBLE	$24.95	$27.95
* CRASH (32K)	$24.95	$27.95
* WORLDS OF FLIGHT (32K)	$29.95	$32.95
* SR-71 (32K Ext. Basic)	$28.95	$31.95
* TOUCHSTONE (32K)	$27.95	$30.95
* KINGTUT	$27.95	$30.95
* BUZZARD BAIT (32K)	$27.95	$30.95
* TRAP FALL	$27.95	$30.95
* THE KING (32K)	$26.95	$29.95

SPECTRAL ASSOCIATES

* GALAGON (32K)	$24.95	$28.95
* COLOR PANIC (32K)	$24.95	$28.95
* CUBIX (32K)	$24.95	$28.95
** FROGGIE (32K)	$24.95	$28.95
* LUNAR ROVER PATROL (32K)	$24.95	$28.95
* LANCER (32K)	$24.95	$28.95
* MS. GOBBLER (32K)	$24.95	$28.95
* WHIRLYBIRD RUN	$24.95	$28.95
* GHOST GOBBLER	$21.95	—

INTRACOLOR

** COLORPEDE	$29.95	$34.95
* ROBOTTACK	$24.95	$27.95
** CANDY CO. (32K)	$34.95	$34.95
** WILLY'S WAREHOUSE (32K)	$34.95	$34.95
** INTRACOLOR GRAND PRIX (32K)	$34.95	$34.95

RAINBOW CONNECTION SOFTWARE

RAINBOW SCREEN MACHINE (Ext. Basic Req.)	$29.95	$32.95
SUPER SCREEN MACHINE (Ext. Basic Req.)	$44.95	$47.95

DATA SOFT

* ZAXXON (32K)	$39.95	$39.95
** MOON SHUTTLE (Tape & Disk)	$29.95	$29.95
** POOYAN (32K—Tape & Disk)	$29.95	$29.95

COMPUTERWARE

* JUNIOR'S REVENGE (32K)	$28.95	$31.95
* DOODLE BUG	$24.95	—

***Requires Joystick** ****Joystick Optional**

WE PAY POSTAGE on all orders in the United States & Canada. Overseas please add $3.00. (MN Residents add 6% sales tax.) We accept Visa, Mastercard, check or money order. U.S. funds only for foreign orders. C.O.D. please add $2.00.

24 HOURS ORDER LINE 612-757-2439

SELECTED SOFTWARE
Dept. H, P.O. Box 32228
Fridley, MN 55432
✓205

CoCo for Hire

WORD PROCESSING, PART I

by Terry Kepner and Linda Tiernan

Not long after buying your CoCo, you probably thought about making the machine pay for itself. You might even have bought it with that in mind. But what can you do with your computer to turn a profit? And once you've decided to put your CoCo to work—how do you go about it?

Several books claim to tell you how to make money with your computer. But few delve into the nitty-gritty details about what it takes to run a home-computer business. Many don't even mention the important business considerations: how to get customers, choosing effective advertising, problems that might crop up, how to collect money owed to you, the legalities specific to a business, residential zoning restrictions, and how to stay on good terms with the IRS. And most get-rich-with-your-computer books are vague about the kinds of equipment and materials you need for particular jobs.

A great deal of print in circulation proffers vague ideas without much practical nuts-and-bolts information. This column is designed to fill that information gap, to give you down-to-earth facts about home-computer businesses and how to start one. We'll explore many of the pitfalls and problems you are likely to face along with possible solutions you might adopt.

The column is divided into two parts. This first installment begins with the incidental, but important, facts you need to know before starting any kind of home business. It concludes with an examination of what is probably the most popular of home-computer businesses—word processing.

Setting a Goal

Before embarking on a home-business project, decide what you want to accomplish. Are you just looking for "pin money," or do you want more money to make payments on a car? Perhaps you want to take it a step further and become your own boss. This isn't a decision you should make lightly. Your long-term goal should be a major factor in your selection of a work-at-home computer business. For example, a typing service for college term papers is an excellent business for students, housewives, and others who have unusual schedules because they can do it in their spare time. But it's not a good business for someone contemplating a full-time career change. The opposite is true of a business such as a computer service bureau.

In addition to studying your financial goals, take inventory of your resources. Make sure that you have all the hardware and software you need to start your business. Keep in mind that you'll need a little money for advertising and special supplies to fit the individual needs of your customers. Don't forget the skills you have that can help, such as typing, bookkeeping experience, or an ability to get along with people.

Draw up two lists. Describe all your short and long-term goals in one list. In the other, detail your resources, including time, money, equipment, and skills. Use these lists as guidelines against which you can weigh your home-business choices. When you find one that balances with your needs, examine it carefully to make sure that you really want to do it. Starting a home-computer business takes commitment.

Some people who work at home have another problem. For students and others who work on a part-time basis, it crops up rarely. But it can be a big stumbling block for those who rely on a home business to make a living. When you spend all your time working alone, you become stale and start to feel wistful about the company of others. You can't just take a quick break to talk with a coworker, and no one will drop by your desk to deliver a message or ask a question that breaks up the day. If you are a gregarious person, you might find that a full-time career at home is stifling. People-conscious individuals should limit their home businesses to once-in-a-while projects that supplement their standard incomes.

Word Processing for Hire

In this section of the column, we're focusing on a particular business. You'll find information that is specific to your business on how to approach customers, advertise, target a market, develop rates, collect payments, design a service policy, track income, avoid legal difficulties, and keep on top of the specific hardware and software supplies you'll need. It might take more than one installment to detail each business.

This month we look at word processing, a business that any student, homemaker, or businessman with a computer, word-processing program, and printer can begin with a minor investment.

The Doldrums

Whether you take on a full-time

business or an every-other-weekend project for pocket money, you'll discover two difficulties with working at home: self motivation and keeping up your interest. It takes a special outlook on life to be able to get up in the morning and start working, knowing that no one but yourself is in charge. If you start one hour later than usual, *you* are the only one who'll know. The temptation to put it off until later today or tomorrow can be overpowering. For some, it translates into a get-to-it-later syndrome.

Not everyone works well at home. A friend quit a career as a programmer with a company to become a freelance writer and programmer. In less than four months' time he was out looking for a steady job. His problem was not a lack of work, but that he let days go by without touching his computer. Not having a fixed schedule to follow meant that he sometimes slept until late in the morning. And there was always something else he had to do, such as reading trade journals, going on errands, or doing the laundry. The hardest aspect of working at home might be just getting started. But many people say that once you get started, it's not too much trouble to stick with it.

Tips for Typing

Home-computer typists should follow these suggestions for producing clean copy and maintaining a viable business.

- **Be sure your copy looks good.** Your copy's appearance is of paramount importance. It doesn't matter that your program can make a thousand backups in an instant, or that it is compatible with six other machines. What matters is the typed copy your customer wants to have to impress his client or boss. If the print is not clean and neat, you might hear about it—or you might never hear from that customer again.

The appearance of a completed work must be pleasing to the eye and easy to read. In the days of the typewriting schools that flourished before touch-typing came into vogue, students often learned "type art," a practice that included exercises such as creating a typewritten Mona Lisa. Type art taught students to look for light and dark values in each of the typewriter's keys and to be aware of the appearance of type on the page.

- **Concentrate on your work.** No fancy word-processing program can truly compensate for a typist's poor punctuations, misspellings, and typos.
- **Think ahead.** For instance, most typists begin every page with a clearly discernible heading and page number. Someone could drop the finished manuscript and scramble its page order. If you think about ways to avoid problems before they happen and learn from your mistakes, you will provide the kind of service that customers seek out.
- **Know your equipment.** A thorough knowledge of your equipment gives you confidence about the jobs you can accept and helps you to be realistic about those you should turn down. Know which parts of your equipment you need to monitor. Watch for hardware or software features that can help you to be more efficient. Be aware of mechanical parts that are likely to break or cause trouble and switches or buttons you are apt to forget to turn on or off. A working knowledge of your equipment can save you time and money, and if a problem arises, it will be easier for you to describe it to a technician.
- **Practice general maintenance.** Check your print ribbon and print wheel for wear. Keep your equipment and work area clean. One item frequently overlooked by computerists is the keyboard; it should be vacuumed periodically to prevent dust and debris from shorting out the keys. (Cat hair can be a real problem.) If you own a disk drive or drives, a disk-head cleaning kit is a good investment.
- **Make yourself comfortable.** Earning money by word processing is not comparable to tinkering for a little while with a neat program; it is several hours of grinding out someone else's copy. Clear away the clutter. Organize your work space. Center your body opposite the J key when you sit down to type.

Find a chair that is high enough so that your arms bend at a 90-degree angle when your hands are poised over the keyboard. Make sure it has good back support and a firm seat. Don't allow yourself to maintain a slouching posture.

Get a typing easel, a stand on which you place the copy that you are typing. Because it is adjustable, you can set the easel at a comfortable viewing position. Make sure that the room is well lit and that you angle the copy to eliminate glare. Eye strain is an important consideration. Try not to place your viewing screen so that you have sunlight or a room light directly behind you.

A Word of Warning

When customers hire you to type their copy, they are not giving you *carte blanche* to edit that material as you see fit. Do not edit. It is not your responsibility to correct usage or grammatical errors. Don't make assumptions about what is correct or incorrect. For example, if you are typing a fiction work for a client, don't assume that you are helping out the author by correcting a "misspelled" word. The author might have spelled the word that way purposely; your "correction" could ruin the creative impetus of the entire piece. Similarly, nonfiction works can contain deliberately archaic spellings of familiar words. Change nothing from the original manuscript. If you find what you feel is a glaring error, contact the author before correcting it.

Very often a specific format exists within a client's field or industry to which you must adhere. Scholarly theses, television, radio, film, and advertising scripts, manuscripts for publication, and others have specific and sometimes unusual formats. You cannot change a format to make your work easier or to accommodate the needs of your word-processing program. Ask questions about the format before accepting an assignment. If you can't produce a particular format, don't take the job. Don't leave things to chance because it will cost you money in the long run. A good sales tactic is to develop a file of formats from which your customers can select.

Next month we'll conclude our look into home-computer word processing by exploring pricing, billing, advertising, policy setting, legalities, and the equipment you need to do the job. ■

Address correspondence to Terry Kepner, P.O. Box 481, Peterborough, NH 03458. Terry Kepner is a freelance writer and programmer. He writes monthly columns for 80 Micro *and* Portable 100 *magazines. He's been writing about computers since 1979. Linda Tiernan is a librarian with a master's degree in bio-medical research. She has worked with computers since 1980.*

68Ø9 On Line

AT&T ANNIVERSARY

by Bobby Ballard

I just finished looking over my telephone bills. Yes, plural. A year ago I received only two bills from two companies, and American Telephone and Telegraph was still called "Ma Bell." Now I receive several bills, and it's time to wish AT&T and all the local telephone companies a happy birthday. Along with the birthday greetings, I'll take a look at what one year of divestiture has brought to us, the customers.

On January 1, 1984, Ma Bell became a chorus of little Bells, and AT&T was released from providing local phone service across the nation. Since that time, rapid change has occurred within the telephone industry. Some of the changes can give us clues about the future of AT&T and our long-distance dollars. Also, there are Radio Shack discounts available and good news for late-night modem phreaks.

Before the divestiture, AT&T was one large, regulated corporation restricted to the business it conducted by federal law and the rulings of the Federal Communications Commission (FCC). Two overall divisions of AT&T now dominate the corporate structure. AT&T-C is the communications half of the corporation and is still regulated by the FCC. AT&TIS, the other half, makes up the Information Systems group, which is free to market products such as computers and switchboards.

The most obvious changes are in the rates charged for long-distance and local phone-usage. AT&T lowered their long distance rates by 6.1 percent since divestiture. The competition from other carriers has been a direct influence on prices. Of course, AT&T must make their money somewhere, so other rates have increased.

The news that directly affects all us telecommunicators concerns CompuServe and other utility service increases passed on from AT&T for the use of long-distance network lines. The increase is small, only 25 cents an hour surcharge, but it indicates the direction from which AT&T sees many of its future profits flowing. The increase would have gone into effect sooner had not a large public outcry been registered with the House of Representatives. So, on one side you have some local phone companies considering rate increases and AT&T increasing the cost of long-distance data lines for businesses and corporate customers on the other side. But long-distance voice rates are dropping.

BBS Junkies

Good news for BBS junkies who stay up all night on the modem: AT&T introduced their Reach Out America (ROA) program in April, which allows the customer to sign up for reduced hourly rates on long-distance calls placed after 11 p.m. You pay a $10 monthly fee, which includes an hour of time, to call coast to coast after 11 p.m. weeknights and on weekends at all times except 5-11 p.m. Sunday. Each additional hour costs only $8.75. These rates apply to direct-dialed interstate calls between all points in the continental U.S. including Alaska, Hawaii, Puerto Rico, and the Virgin Islands. Your call must originate or end in the continental United States.

For another $1.50 per month, AT&T will discount your long-distance calls placed between 5 and 11 p.m. an additional 15 percent. If you are interested in finding out more about ROA and when it will be available in your local area, call 1-800-551-3131. There is a $10 sign-up fee, but this fee is waived if you sign up for the service within the first 90 days of availability in your area. By the way, AT&T has filed a petition to the FCC to lower the ROA rates by 6.1 percent. These new rates will probably be in effect by the time you read this.

Radio Shack Discounts

AT&T offers another plan to help you save money. This new plan, available to business and residential customers, is Opportunity Calling. AT&T announced this new service in May and it will eventually be available nationwide as the local companies are able to handle the billing.

Opportunity Calling credits you with $1 in purchasing power for each $1 you spend on long distance with AT&T. You must spend $15 a month to qualify for the credits, but you get $15 worth of credit upon reaching that plateau. The credits are good toward discounts on clothing, travel, film, and Radio Shack computers, including software, peripherals, and accessories. The catalog I saw included a Color Computer.

The program available to businesses, Opportunity Calling for Business, offers discounts on many of the same items for use as employee incentives, but also includes discounts on business-related supplies such as stationery, typewriters, copiers, and small computers. You can also save on overnight couriers, tax services, business publications, car leases, and office help. There are many more details to both Opportunity Calling programs, and you can find out more by calling 1-800-992-0992.

Equal Access Is Coming!

Equal access is also brought to you by the big divestiture. It means that the local Bell Operating Companies (BOC) must offer MCI, Allnet, GTE Sprint, and all long-distance companies the same clear connections as AT&T enjoys. It also means that you can designate one long-distance supplier your primary company and dial "1" for access instead of a local number plus code plus number called.

When equal access comes to your local BOC, you'll know it—just like the folks in Charleston, WV, did. Throughout Charleston, MCI, AT&T and the other companies have been waging a publicity campaign to beat the band. And according to an AT&T spokesman, there are still about 40 percent of the Charlestonians that have yet to decide on their primary long-distance company. By the end of 1986, the entire country should have equal access with good connections for all.

The Trends

BellSouth has plans for a new home-computer network in association with Control Video Corporation of McLean, VA. The plan now is just for test marketing in a few key cities. The test marketing, to begin in the fall, may include an agreement with Commodore International.

Of course, BellSouth will have some opposition from AT&T and other hardballers in the communications industry. Other regional holding companies (RHC) have also requested that they be allowed to sell home computers and other products. I think you'll see more of this trend in the future, especially as AT&T continues to develop its line of hardware to include data, voice, and videotex in the same box, so to speak.

"AT&T apparently sees that networking, equipment, and long-distance lines will be the profit makers of the future."

After looking at the equipment and services AT&T has concentrated on this past year, it's obvious that this corporation sees a future of communications involving more than voice or even data. They apparently see that networking, equipment, and long-distance lines will be the profit makers of the future. Prices for all these services still rest, in part, with the FCC and, in part, with the free marketplace. If the FCC lets the RHCs compete for network and data lines and equipment, then competition will be fierce. If the local companies are excluded, you still have the big boys competing, such as IBM, GTE, and others.

For the past two years AT&T has introduced about three dozen new products a year. This trend will continue, if not increase. In fact, rumor has it that AT&T will soon market a new 32-bit processor. This will just be a small part of AT&T's commitment to new services and new products for the rest of the 1980s.

Finally, the FCC has recently approved the sale of equipment and long distance by the same sales force. I wonder if you'll see an offer like this some day? "Reach out and buy an AT&T PC and get $50 worth of long-distance calls free."

Happy New Year to all and Happy Birthday AT&T!■

Address correspondence to Bobby Ballard, 1207 Eighth Ave. 4R, Brooklyn, NY 11215.

COLOR CHECKBOOK

- RECORD CHECKING AND SAVINGS TRANSACTIONS
- EDIT, DELETE LISTINGS
- SEARCH FILES FOR A LISTING
- ON SCREEN CALCULATOR
- PRINT LISTINGS
- REVERSE VIDEO DISPLAY
- AUTO REPEATING KEYS

.... many more features

PLUS FOR A LIMITED TIME AT NO ADDITIONAL CHARGE

COLOR CHECKWRITER

INPUT DATA, YOUR PRINTER TYPES YOUR CHECK IN SECONDS

64K EXT. TAPE $29.95

ALSO AVAILABLE:

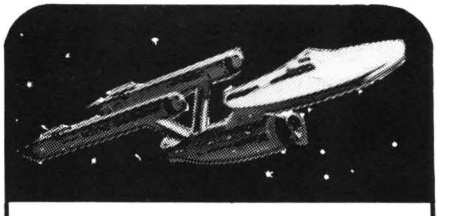
COLOR BUDGET
COLOR ADDRESS BOOK
COLOR VIDEO TAPE LOG
COLOR VIDEO TAPE TITLE SLATE

32K EXT. TAPE.....$19.95 ea.

DETAILED DOCUMENTATION INCLUDED WITH ALL PROGRAMS

WRITE FOR FREE CATALOG!

FOXX SOFTWARE
11684 VENTURA BLVD.
SUITE 388 ⌐164
STUDIO CITY, CA 91604



COLOR TREK — Blast Klingons and save the Federation in this game of both skill and strategy. Includes an instructions program and ten levels of difficulty. Requires 16K of memory.
Cassette $7.95

ADVANCED D&D NON-PLAYER CHARACTER MAKER — Takes into account spells, weapons, hit points, level, class, gender, race, alignment, constitution bonus, racial adjustments, and minimum requirements. Whew! A must for all dice weary DM's. Requires 16K of memory.
Cassette $14.95

ARE YOU BORED WITH YOUR 4K COLOR COMPUTER?

COLOR ALEPH PROGRAM PACKAGE — Includes COLOR CYCLES, COLOR BLACKOUT, and COLOR MAZE. Each is progressively difficult and requires only 4K of memory.
Cassette $11.95

COLOR CYCLES — Play chicken against motorcycles of light with up to seven enemies at one time. Written in machine language.
Cassette $4.95

COLOR BLACKOUT — Armed with only a tennis racquet and five balls, you must knock out the colored bars piece by piece. Joysticks are required.
Cassette $4.95

COLOR MAZE — Run for your life through a twisty maze. All the while, an angry ghost is chasing at your heels throwing paralysis rays. Be wary of the meddlesome programming wizard who rearranges the maze around you. Includes machine language subroutines.
Cassette $4.95

Aleph Unlimited
P. O. Box 8007
Stockton, California 95204 ⌐60

⌐ See List of Advertisers on page 81

The Educated Guest

JOINING THE INFORMATION AGE

by Charles H. Santee

More than 50 percent of today's work force is involved in information-related occupations. This column focuses on what educators will need to prepare students for the information age.

The tools for presenting, analyzing, organizing, or relaying information, i.e., word processors, spreadsheets, database managers, and communication software, consistently lead the microcomputer field in sales. Let's look at the potential uses of this software.

The Word Processor

Word-processing software lets you prepare and edit material on a video screen before sending a copy to the printer. Word processors come in a variety of forms. Most offer insert and delete commands, word-wrapping, exchange or replace options, and the ability to move whole blocks of text.

Some word processors allow several different means for defining the top, bottom, left, or right margins; paragraph and temporary indents; character tabs or decimal indents; and have several options for printing headers and footers.

More advanced features include page numbering, creating libraries of text for inclusion into new text with a keystroke, macro capabilities (the ability to assign a series of commands or written text with a keystroke), mail-merge and form-letter capabilities.

Choosing the Right Word Processor

How do you choose the right word processor? Where do you start? Well, my personal favorite for younger students using a Color Computer is Elite-Word by Elite Software, Box 11224, Pittsburgh, PA 15238. This word processor has relatively short and simple instructions, and yet is powerful enough to challenge the more adventuresome student.

Although I feel that the Color Computer is more than adequate to acquaint younger students to word processing, I realize older students should also be familiar with word-processing software that is not yet available for the CoCo, such as WordStar, Word Perfect, or MultiMate. I recommend that if you are teaching older students, you periodically inventory local businesses to determine which word processors are actually being used.

In my area, WordStar is the most used along with an IBM PC. Although familiarity with these packages would be a plus to students entering the job market, don't despair if your school doesn't have the funds for such software and the systems they run on. Very complex and capable word processors are available for your Color Computer. And I have seen WordStar up and running on a CoCo that was enhanced to run CP/M. *(Ed. note: CP/M upgrades are available for 64K CoCos from Wayne Technology, P.O. Box 5196, Anaheim, CA 92804, and Color Power Unlimited Inc., 1260 Springfield Ave., P.O. Box 606-E, New Providence, NJ 07974.*

Spreadsheets

A spreadsheet is a piece of software that shows an organization of little boxes, or "cells," on the screen that are organized into rows and columns. The organization of rows and columns is called a matrix, a template, or a model. The screen shows only a small portion, or "window," of the matrix, but you can use the arrow keys to reveal the rest of the matrix.

Most often you type in words or numbers at the top of the screen and press the enter key to move them into a cell. A cursor indicates which cell will contain the characters you have entered.

A spreadsheet has three major types of entries. The first is a label that consists of letters. The second consists of numeric values. The final type is formulas.

When a formula is entered, you indicate how numeric values in cells are to be combined. The spreadsheet automatically combines the numbers as directed by the formula and enters the result in the box at the cursor location.

Rows are frequently shown by one or more letter indicators and columns are shown by numeric indicators. The row and column indicator is used in writing the formulas you desire. Spreadsheets have many applications such as accounting, budgeting, computing house payments, and matrix math. One educator used a spreadsheet to generate math problem sheets.

Spreadsheet functions can be very complex, but I have worked with third-grade students who were able to master the elementary concepts.

Spreadsheets include many options for organizing and preparing information on the screen as well as for formatting printed reports. You can introduce any elementary-grade student to spreadsheet functions, but it will be most appropriate in a math class. At a high-school level, you can demonstrate a spreadsheet's varied applications, such as organizing population statistics, doing business inventories or ledgers, illustrating advanced math concepts such as a matrix manipulation, or even computing amounts needed for a recipe.

If you are interested in different applications for the Color Computer, read *Spreadsheeting on the TRS-80 Color Computer* by Harry Anbarlian, McGraw-Hill Book Company, 1981.

Database Managers

A database manager lets you enter and organize large amounts of information. Each piece of information is placed into a unit called a record. Within each record is a smaller unit of information called a field. A database manager's greatest strength is its ability to selectively sort, organize, or call up records or characteristics of any particular field or set of fields. The characteristic used to organize the database is often called a key.

Note that you must specify in advance the length of each record and field. This determines how much information can be stored in any record or field. Thus, you must carefully plan what each record will contain. I suggest you first write out several examples of typical records and at least two records that stretch the record and field lengths to their maximum and minimum.

Databases use vocabulary similar to the commands required to make random or direct-access files in a disk operating system or in Basic. Learning to use a database gave me a better understanding of how to write programs using random-access files.

I also prefer to use specific-purpose databases rather than going through the tedious exercise of setting up my own. For example, there are a number of sophisticated gradebook programs available for the Color Computer that can offer methods of structuring and manipulating a student database.

The most significant advantage to teaching students how to use a database is that they will learn how to access other databases, a crucial skill in college and in many occupations. Students need to learn how to pinpoint information in the haystack of data generated by computers.

Communication Software

A modem is a device that hooks the computer to a phone to access more sources of information than you can possibly imagine. The program that interprets the information is the communication software. This software includes options to match the signals being transmitted with the medium for receiving the transmission and usually to send and retrieve information from or to the disk or to the printer. You must become familiar with terms such as baud, download, stop bit, parity, protocol, and EOF markers to use the software.

Learning how to use a modem and communication software is a most needed skill. In a classroom, I would instruct the students by using a heavy dose of retrieving educationally relevant information from a variety of sources. I also feel that major emphasis should be placed on the ethical use and manipulation of information and security.

There is a real need for software that gives instruction and practice in the use of communication software without going on line or running up a phone bill. I would also like to see a simulation of information retrieval for all the major sources (Dow Jones, CompuServe, etc.).

A Few Tips

You may encounter some minor problems when teaching or learning to use a word processor. For example, the keyboard of a computer is slightly different from that of a typewriter. Those who learn on one invariably have problems with the other, especially when you include the word processor's control keys (e.g., break, clear, control). You won't find them on your typewriter.

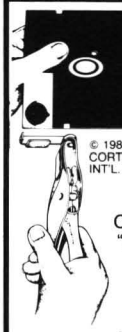
Here are a few of the concepts that you and your students should become familiar with: the various types of printers—dot matrix, daisy wheel, serial, parallel; control codes, DIP switches, internal memory, disk storage, file buffers, keystroke buffers, and printer buffers.

It is also very handy to understand disk and cassette operating commands and to know how to send information from one application package to another by way of ASCII format.

So, you thought using a word processor was easy. Well, eventually it is. Less complex packages require only an hour or two to learn. More complex word processors take about eight hours before you fully understand the process, and many more before you master it.■

Address correspondence to Dr. Charles H. Santee, 8 South 045 Grant St., Westmont, IL 60559.

DOUBLES DISK CAPACITY!



© 1983 CORTRAN INT'L.

Cuts Your Cost 50%!

Now! The back of 5¼" diskettes can be used for data storage even with single head disk drives.

- ***NIBBLE NOTCH*** makes it easy
- Adds the notch needed.
- SATISFACTION OR MONEY BACK.

NIBBLE NOTCH II

Cuts square notch and ¼" inch round "index hole." For use with TRS 80 I & III, Osborne, Kaypro, IBM and others needing an "index hole."

only **$21.90** each*
*add $2.00 each order P&H
($5.00 each foreign P&H)

Florida Residents Add 5% Sales Tax

ORDER TODAY! ↙337

VISA **Toll Free 1-800-642-2536** MasterCard
FLORIDA: 1-305-493-8355
OR SEND CHECK OR MONEY ORDER TO:

NIBBLE NOTCH® COMPUTER PRODUCTS
4211 NW 75th TERRACE, · DEPT. 1 5
LAUDERHILL, FL 33319

PATENTED ALL TRADEMARKS ARE ACKNOWLEDGED

New from

TESSERACT SOFTWARE SYSTEMS

MusiWriter

A "Word Processor for Music

Capture your music on your Color Computer. Then print as many copies as you want on a graphics printer

Supports up to 10 staves per system and a wide range of notes, rests, accidentals and time signatures

Send for sample print out and descriptive literature

Requires: 32k Color Computer with disk and graphics printer (e.g. DMP120/200)

Price: $50.00 US or $60.00 Can plus $5.00 S&H

TESSERACT
SOFTWARE SYSTEMS

5350 MONTCLAIR AVENUE
MONTREAL
Quebec H4V 2L1 ↙342

Subscription Problem?

Hot CoCo does not keep subscription records on the premises, therefore calling us only adds time and doesn't solve the problem.

Please send a description of the problem and your most recent address label to:

HOT CoCo
Subscription Dept.
PO Box 975
Farmingdale, NY 11737

Thank you and enjoy your subscription

↙ See List of Advertisers on page 81

The DOSsier

General Ledger And His Troops

by Scott Norman

I've been working with some of Computerware's business-applications software recently. It hasn't helped me turn a fortune, but it is interesting.

OS-9 at Last!

Paul Searby and his programmers at Computerware have been supporting the 6809 community with utilities and applications material for a number of years. Their initial emphasis, so far as business software was concerned, was on Random DOS—the operating system of Smoke Signal Broadcasting's line of computers. As I understand it, that other portion of the 6809 world continues to receive the lion's share of Computerware's attention.

The company has been an active supplier of CoCo material ever since our machine began to grow up, though, and in recent years this support has grown to include Flex and OS-9. As a result, a set of seven software packages of interest to small-business operators is now available in both of the advanced operating-system formats.

The products are Accounts Receivable, Accounts Payable, Check Ledger, General Ledger, Inventory Control, Payroll, and a Correspondence System: I gained most of my hands-on experience with the OS-9 version of the General Ledger System.

What You Need. . .

The Computerware software performs well and certainly addresses a real need. However, I must point out a few things that don't appear in the catalog. These conern other material that you must have before you can work with the business packages.

To begin with, these programs are written in Computerware's Random Basic, so, naturally, you need that interpreter to run them. In fact, you must transfer the Basic9 version of Random Basic (one of two versions that you get on the master disk) over to the business-software working disk.

All video displays in the applications program are set for the 51-column text format of Hogg Lab's O-Pak. It is possible to ignore this and run with the standard Radio Shack screen, but you get some strange-looking text: menus and messages split in midword—that sort of thing.

Unfortunately, neither Random Basic nor O-Pak is mentioned as a business software prerequisite on the standard Computerware catalog sheets; you have to dig into the installation instructions in an applications-program manual to learn that you need them. If you're not a programmer and use your computer only to keep business records, you might have O-Pak lying around with your OS-9 disks, but Random Basic is another story. Those who only use canned applications software aren't likely to have picked up a second Basic just for the heck of it.

If you're interested in Computerware's OS-9 business series, be prepared to spend up to $110 for the necessary adjuncts. But this can still be a pretty good deal for professional software.

Cobbling Up Your Disks

The slim manuals (General Ledger's runs to only 23 pages, plus sample reports) were originally written with some of those other 6809 systems in mind. The first thing you must do is ignore the "How to Begin" section and go straight to the back of the book, where a plastic pouch holds the real installation instructions.

The distribution disk contains both programs and sample data files. You must distribute them, along with Random Basic and various OS-9 utilitites, among two working disks: "programs" and "data." (Each disk actually has directories for Basic programs and data files: BAS and DTA, respectively.)

This calls for a session at the keyboard, plus a little disk juggling, but it's all worthwhile. You should gain some experience with the sample files—entering transactions, printing reports, and so on—before making up actual production-system disks.

The various program files are dedicated to such tasks as putting up a menu, handling transaction entries, running the Chart of Accounts, and so on. One data file, LEDSYS, is the system control that keeps track of

the location of the General Ledger and Chart of Accounts files, the terminal and printer pathlists, and other details. A utility program lets you change these entries.

The other DTA file, LEDKEY, is the ledger key: a sequentially accessed file, created after you close each month's accounts, that contains a sorted list of all transactions during the month. It plays a vital role in the production of most General Ledger reports. Once the system is up and running, of course, you are never actually aware of which file is doing what.

A final pair of Basic programs go into the data disk's BAS directory, and two data files, LEDACT and LEDMST, go into DTA.

LEDMST is the Chart of Accounts, the master list of names and numbers assigned to the various accounts that categorize your business. It also houses the most recent monthly and year-to-date balances for each account. LEDACT is *the* General Ledger file: the main working file into which you enter transaction numbers and dates, debits and credits, and a description of each transaction. Both are random-access files; I expect them to lead to much faster operation than is possible with sequential-file structures.

How It Works

In two words, pretty well. General Ledger is a comprehensive double-entry package designed for businesses that can get by with 250 or fewer accounts. The sample data files contain 60 accounts and 146 records in the general ledger file—about 35 percent of the allotted capacity. As you might expect, the Color Computer is not the machine you'd use to keep the books for General Motors.

Within its limits, however, General Ledger can provide the manager with a complete set of accounting reports. A transaction register, income statement, general ledger, trial balance, and balance sheet are all available on a monthly basis. A reasonable number of sorting and selection options are available; for example, you can arrange transaction-register reports according to dates, account numbers, or file-record numbers.

Audit trails and monthly closing procedures are provided, as are a certain number of protection features. Information entered from the keyboard must balance before the program will write it to a disk file; once that happens, you can't make changes. This evidently protects past information against accidental damage.

"General Ledger is a comprehensive double-entry package designed for businesses that can get by with 250 or fewer accounts."

The whole thing is menu driven, and if you are familiar with the elements of general-ledger accounting, you shouldn't have any trouble. The documentation is modest, but it does give you a good summary of what to expect from the various menu options.

There are a couple of points that could stand clarification, however. Despite some contrary information in the manual, most of the reporting procedures do *not* give you the option of previewing your information on the video display; you get a printout or nothing. Furthermore, if you mistakenly indicate that the printer is on line when it is not, the program hangs up. Turning the printer on at this point returns you to the OS-9 shell.

Finally, the manual shows signs of its origin as documentation for larger systems, served by 8-inch disks. You can tell by certain references to how the files should be partitioned between drives 0 and 1 (let the CoCo addendum be your guide), and by the description of certain general-management reports on the system menu. Sorry folks, but ratio analyses, cash budgets, yearly comparisons, and a few other things just aren't available to CoCos.

Thoughts on the Side

Making up a set of General Ledger working disks involves a *lot* of copying operations, and it only takes one bout with the standard OS-9 Copy command to make you long for something better. Although I suspect that a number of vendors can come to the rescue, I'm most familiar with another Computerware product for doing this job: the Disk Fix and Other Utilities package (for a review, see *HOT CoCo,* August 1984, p.96). It includes a versatile copying routine, DirCopy, which takes care of everything.

One of DirCopy's options is an interactive mode in which you can specify ahead of time which files are to be copied from one disk to another. You do so by identifying the origin and destination pathlists (only one of each) and then picking the transferees from a list. It beats having to type all the pathlists when you're moving a dozen or more files around.

See there? I've been saying all along that I would get to OS-9 as soon as I found some applications stuff that interested me.■

Products and Vendors mentioned in this month's DOSsier

OS-9 Business Application Software:	
Accounts Receivable	**$95**
Accounts Payable	**$145**
Check Ledger System	**$145**
Correspondence System	**$95**
General Ledger System	**$175**
Inventory Control	**$145**
Payroll System	**$195**
OS-9 Random Basic	**$75**
Hogg Lab's O-Pak	**$34.95**
Disk Fix & Other Utilities	**$29.95**

All available from:
Computerware
P.O. Box 668
Encinitas, CA 92024
619-436-3512

Address correspondence to Scott L. Norman, 8 Doris Road, Framingham, MA 01701.

Doctor ASCII

by Richard E. Esposito, Jesse W. Jackson, and Ralph E. Ramhoff

Got a problem with your Color Computer? Ask the Doctor to solve it. Write to Doctor ASCII, HOT CoCo, *Pine St., Peterborough, NH 03458. Be sure to include a stamped, self-addressed envelope if you want a reply. Due to the volume of mail this column receives, we cannot guarantee that your question will be published.*

Q. I have a TTX-1014 bidirectional, daisywheel printer. It has both serial and parallel interfaces. When I hook it up to my CoCo, I get garbage. I have the DIP switches for 600 baud, 7 bits, no parity, 2 stop bits, auto line feed, and DTR high. My CoCo was a 16K, which I modified for 64K. I put in the 1.1 ROM chip. Would any of this cause my problem?

Steve Gersh
San Luis Obispo, CA

A. By installing the 1.1 ROM for the 64K mod, you got an 8-bit serial driver to replace the Basic 1.0 7-bit driver. Your switches should be set for 600 baud, 8 bits, no parity, 1 stop bit, auto line feed, and DTR high.

Actually, the Color Computer sends 10 bits per character to the printer. The first bit is always a zero—the start bit. It informs the printer that a character is on its way. The next 8 bits are the binary data for the character, least-significant bit first. Last is the stop bit, always a one, which tells the printer it has stopped sending the character. See what having the switch set for 7 bits does? Suppose the computer sends an A; the ASCII value of an A in hexadecimal form is 41, and in binary it's 01000001, where the least-significant bit (bit 1) is the rightmost bit. Look now at the bits as they are sent in serial:

	start	1	2	3	4	5	6	7	8	stop	
7 bit	0	1	0	0	0	0	0	1		0	1
8 bit	0	1	0	0	0	0	0	1	0	1	

See the blank under the 8 for the 7-bit serial? The printer wasn't expecting bit 8. It also wanted bit 8 to be a stop, which is always a one, but it got a zero (and it always is a zero for 8-bit ASCII characters). The printer, when set as you have it, thinks it missed some bits and won't accept the character until it gets 7 bits between a start bit (zero) and 2 stop bits (ones). Inactive serial lines are held in the mark state (one), so if the computer doesn't send another character right away, the printer thinks it is getting the stop bits. It looks like this:

	start	1	2	3	4	5	6	7	stop	stop
7 bit	0	0	0	0	0	1	0	1	1	1

Because the printer passes the bits serially (like a bucket-brigade), until the start and stop bits correctly frame the data bits (after losing the true start bit and bit 1), their bucket was passed to the end of the line before a correct frame was detected. The character received in error is binary 01010000, or hexadecimal 50. That's an ASCII P

Similarly, if the printer is set for the correct number of bits, but 2 stop bits instead of one, you could get garbage if the CoCo sends the next character's start bit with less than a 1-bit time delay after the previous stop bit.

Anything more? Oh yes, Steve. . .that DTR line. Is it connected to pin 2 of the CoCo serial connector? The Color Computer checks that line to determine if the printer is busy. Know what the printer gets if the CoCo starts sending data and the printer is busy for a few bits? Right! Garbage! If you have a one-line or less buffer in your printer and the busy line is not connected, your printer may get most of a good line, but the start of the next line may be missed or the carriage return/line feed may be lost. If you're getting those symptoms, try POKEing 151 and 152 with 255. This sets the line printer delay to 1.15 seconds to allow for a carriage return. If this clears your problem, the DTR line is not connected properly.

Q. I have a CoCo with Extended Basic. Recently, I sent my computer to Peoria to get 64K installed. I have also heard that you can't use the upper 32K without a $400 disk drive and some other equipment. Is this true? If so, what are some prices and places to consider buying from?

Steve Warrick
Peru, IL

A. There are many programs available that use the upper 32K bank of memory. These are some examples, but this list is in no way exhaustive. Telewriter 64, Cognitec, 704 Nob St., DelMar, CA 92014 ($49.95 cassette, $59.95 disk); VIP Library, Softlaw, 9072 Lyndale Ave. S., Minneapolis, MN 55420 ($39.95–$59.95); Disk Data Handler, Custom Software Engineering, 807 Minutemen Causeway, Cocoa Beach, FL 32931 (54.95); DynaCalc (RS DOS version), Computer Systems Center, 13461 Olive Blvd., Chesterfield, MO 63017 ($149.95); Key - 264K, Key Color Software, P.O. Box 360, Harvard, MA 01451 ($39.95 cassette, $49.95 disk); Hi-Resolution Screen Utility and Data Pack II, by CerComp, 5566 Ricochet Ave., Las Vegas, NV 89110 ($19.95–$44.95 cassette and disk); and T-Spool, KRT Software, P.O. Box 41395, St. Petersburg, FL 33743 ($24.95). In addition to these products the Flex and OS-9 operating systems, which require 64K and disk, support vast amounts of varied software packages.

Q. I have just received my second issue of your magazine, which I thoroughly enjoyed. I have read a lot about artifacting colors in Extended Basic in your magazine. The sample I saw of it in Nick Bradbury's "Possum Run," March 1984, p.50, was outstanding. I can't find any information on the technique. Please give me a list of publications explaining this subject.

Mike Davis
Englewood, CO

A. These colors are produced by drawing vertical stripes in alternate columns against a dark background. In the SCREEN 1,0 mode you get medium green and frosted green. In the SCREEN 1,1 mode you get red and blue. A demo program appeared in the October 1983 Doctor ASCII, p.129.

Q. Is there any way to directly type in binary coding from Basic without an editor/assembler?

Robert Fountain
Broadalbin, NY

A. If you are willing to hand assemble the code, you can write a Basic POKE routine to put it in memory. The following program accepts your hexadecimal bytes and POKEs them into memory:

```
10 INPUT "START ADDRESS";A$:A=VA
L("&H"+A$)
20 PRINT "DATA AT ADDRESS ";HEX$
(A);
30 INPUT D$:D=VAL("&H"+D$)
40 POKE A,D
50 A=A+1
60 GOTO 30
```

When your values have been entered, press the break key to exit this program. Be careful where you place your machine-language code, because you can get highly unpredictable results if you POKE Basic's pointers, variables, or the program. A machine-language monitor program appeared in this column in the December 1983 issue of *Hot CoCo,* p.129.

Q. Is there a POKE I can use to make the CoCo generate a buff screen instead of its usual green?

Ronald Berry
Bend, OR

A. Unfortunately, the 6847 video display generator chip does not support text screens with a buff background. You do, however, have an alternative to the green that the CoCo comes up with. This screen has red characters on a yellow background. To get this text screen, you must first stop Basic from resetting the VDG color set with a POKE 359,16, and then select the alternate color set by using a SCREEN 0,1.

Q. I own a factory 64K CoCo. I have searched in vain for a way of getting my errant 32K without OS-9. I paid for the K, and I want it!

Duane T. Doutel
Ogden, UT

A. This program originally appeared in the November 1983 Doctor ASCII, but judging by the mail, it has been overlooked, so I am reprinting it here. It brings the computer up in the 64K mode and copies the Basic ROM into RAM. If you have a nondisk system, you can POKE and PEEK from $C000 to $FEFF to your heart's content after running this program. With disk, $E000 to $FEFF works fine. The code starting with line 110 patches the Basic ROM so you can press the reset button and still keep your machine in 64K RAM mode. If you don't want it or it is incompatible with your ROM or hardware, delete those lines. It works fine with my 1.1 Basic ROM.

```
10 FOR I=32382 TO 32407
20 READ X
30 POKE I,X
40 NEXT I
50 EXEC 32382
60 PRINT "BASIC NOW IN RAM"
70 DATA 26,80,142,128,0,166,132,
183
80 DATA 255,223,167,128,183,255,
222,140
90 DATA 255,0,38,241,183,255,223
,28
100 DATA 175,57
110 REM reset protection
120 POKE &HA055,&H0D
130 FOR I=&HA068 TO &HA071
140 POKE I,&H12: NEXTI
```

Q. I bought a 64K CoCo that was factory upgraded from 16K with the new keyboard, model #28-3003A. Where can I get a technical manual with schematics for this?

What is the best criteria to follow in determining what hardware is most necessary and compatible with my machine? Is my machine compatible with OS-9? I know disk drives are needed.

David L. Thomas
Gillespie, IL

A. Radio Shack markets a *Color Computer Technical Reference Manual,* #26-3193, $14.95. If the one at your local Radio Shack store has the schematic for the wrong version machine, ask them to order the supplemental schematic for your machine to go with the book.

If you are starting out, I recommend acquiring your hardware in this order:

- Upgrade to 64K (I see that you already have).
- Acquire a printer.
- Acquire a disk controller, cable, and drive. I recommend a double-sided one for maximum versatility.
- Acquire a second drive.
- Acquire a monitor, Multi-Pak, and 80-column card.

If you are just starting out, learn to be proficient with the standard DOS before moving on to OS-9. As long as you have good 64K RAMs, properly installed, you should have no hardware problems with OS-9.

Q. As a novice with the CoCo, I entered the following program to play music from a cassette for 60 seconds:

```
10 AUDIO ON
20 MOTOR ON
30 FOR X=0 TO 60
40 FOR Y=1 TO 500
50 NEXT Y
60 NEXT X
70 AUDIO OFF
80 MOTOR OFF
```

Can you explain how the CoCo can pass music from a tape to the television speaker at the same time that it is counting in the above program?

Ben Welijka
Cot St. Luc., Quebec, Canada

A. As far as the audio is concerned, your program instructs the computer to perform four tasks: turn on the audio, turn on the cassette, turn off the audio, and turn off the cassette. Between the first and last two, it performs the calculating. The music itself is not processed by CoCo's 6809 microprocessor. Some of today's computers have more than one CPU and can indeed perform more than one operation at a time. A simple case is when you have a CoCo with PBJ's Word-Pak. The CoCo sends a code to Word-Pak to update the display, and while the display is being updated, the CoCo can be doing something else.

Q. I have a 16K CoCo, which I would like to upgrade to Extended Basic myself. Can I do this?

Bryan Lawrence
French Lick, IN

A. It is a very simple operation. Remove the cover from your CoCo and install the Extended Basic ROM into the empty socket, being careful to line up the notch on the end of the chip with the one in the socket. Make sure all the pins are aligned properly with the holes before exerting pressure. Order part number 26-3018 ($39.95) from your local Radio Shack store or from one of the various advertisers in this magazine. ■

Reader's Forum

OS-9: A 32K Surprise

OS-9 will run on a 32K machine. I had finished running the Telewriter-64 program and, as an experiment, I loaded my OS-9 boot program into my 32K CoCo, pressed B for boot, put in the system disk, and pressed the enter key. Tokenized garbage appeared on the screen and the computer seemed to lock up.

I was about to reset it when the disk started spinning, the screen cleared, and the OS-9 logo appeared. I tried some OS-9 commands, linked in PRINTERR, redirected outputs, ran multiprocessing commands, created and deleted files and directories, changed attributes to lock myself out of my own files, listed all sorts of strange command and system files, and they all worked fine, including the type-ahead feature. The fabled OS-9 was running on a 32K machine with 57 pages of free memory.

I have tried this from Basic with no success. The machine just hangs up when the system disk is loaded. The key seems to be Telewriter, which, I guess, moves memory around and lets the OS-9 system load in and do whatever it has to do.

Here's the sequence to follow: Run Telewriter, get to Disk I/O and press "B" to get into Basic. Now put in the OS-9 boot disk, RUN "*", and answer the prompt with B for boot. Put in the system disk, press enter, and the screen will lock up for a few seconds. Then the disk will spin, the screen clear, the OS-9 logo appear, and you're in business.

Once or twice this routine wouldn't work, so I put something into the editor, aligned and printed it, and then OS-9 booted fine. If you haven't upgraded to 64K yet, you can still run OS-9.

Duff Kennedy
Santa Barbara, CA

Disk Basic 1.1 Entry Addresses

Here is a list of the entry addresses for the Disk Basic ROM version 1.1:

C6EF KILL	D102 LSET
C9E0 SAVE	D15C FILES
CA39 MERGE	D233 UNLOAD
CA48 LOAD	D262 BACKUP
CCA9 DIR	D3B9 COPY
CEC5 DRIVE	D4ED DSKI$
D01B RENAME	D562 DSKO$
D066 WRITE	D599 DSKINI
D0BC FIELD	D6EC DOS
D101 RSET	D74E VERIFY

Note that the DOS command is not documented in the Disk Basic manual.

Jim McDowell
Burlington, VT

Sort by the Date

It takes some planning to sort according to dates. Since our months don't even come in alphabetical order, it always took a lot of subroutines in order to get dates arranged sequentially. I have a simple method for this.

Suppose you want to arrange the following dates:

Jun 18, 1966
Feb 28, 1942
Oct 27, 1983
Jan , 1970 (only the month and year known)
Dec 30, 1920
Mar 2, 1970
Jan 7, 1935

Enter them as follows:

1966.0618
1942.0228
1983.1027
1970.01
1920.1230
1970.0302
1935.0107

Program Listing 1 arranges them and prints:

1920.1230
1935.0107
1942.0228
1966.0618
1970.0100
1970.0302
1983.1027

I have used a bubble sort here. The variable X in lines 90 and 110 keeps you looping through the sort until no more swaps are made and all dates are in order. Line 150 is necessary to make sure that 1920.1230 does not print as 1920.123. If you want descending order, change the less-than sign (<) in line 90 to a greater-than (>) sign.

The PRINT USING statement requires Extended Color Basic. If you don't have Extended Color Basic, you'll have to make do with PRINT in LINE 150.

Anna M. Reeves
Espanola, WA

```
10 '***** INPUT ROUTINE
20 CLS
30 DIM A(7)
40 FOR X=1 TO 7
50 PRINT"ENTER JAN 2,1965 AS 196
5.0102
60 INPUT"DATE"; A(X)
70 NEXT X
80 '***** SORT ROUTINE (BUBBLE)
90 FOR X=1 TO 6
100 IF A(X+1)<A(X) THEN T=A(X):
A(X)=A(X+1):A(X+1)=T:S=1
110 NEXT X
120 IF S=1 THEN S=0:GOTO 90
130 '***** OUTPUT ROUTINE
140 FOR X=1 TO 7
150 PRINT USING "####.####";A(X)
160 NEXT X
170 END
```

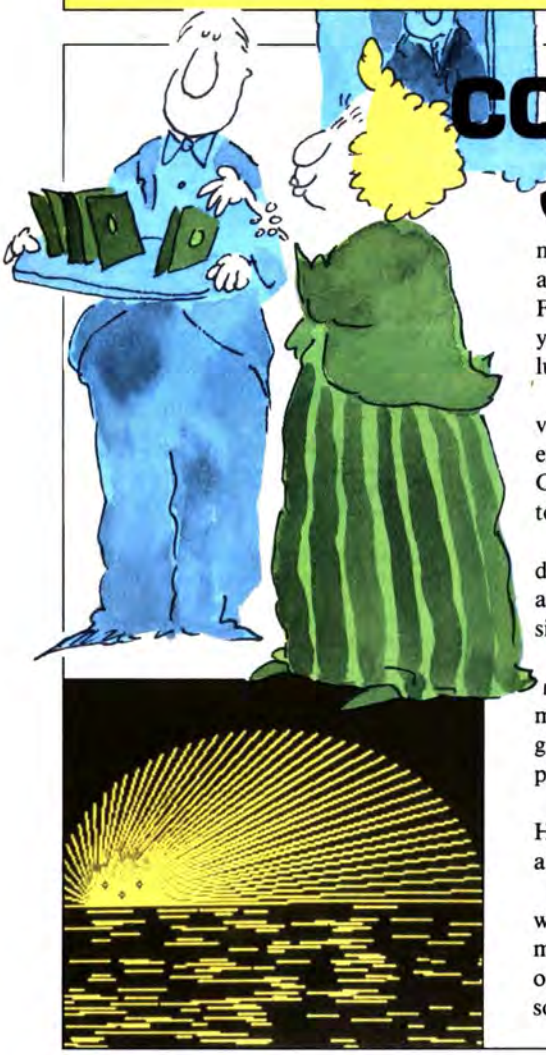
Program Listing 1. Date-Sorting Routine

HOT CoCo INDEX TO ADVERTISERS

Reader Service Number		Page Number
60	Aleph Unlimited	73
325	Bacchus Computer Systems	45
335	Cer-Comp	59
121	Cognitec	7
17	Colorware	82,83
18	Computer Plus	5
506	Computer Systems Center	47
507	Computer Systems Center	87
223	Computer Systems Consultants	91
536	Cybertron	17
352	Cynwyn	53
*	Dataman	29
397	Delker Electronics	22
243	Deft Systems	3
209	Dorsett Educational Systems	96
*	DP Johnson	53
72	Dynamic Electronics	55
216	EAP Company	87
363	Electronic Supermarket	48
392	Elite Software	27
164	Foxx Communications	73
98	Green Mountain Micro	21
440	HJL Products	CIV
455	Hard Drive Specialists	55
359	Homebase Computer Systems	63
*	HOT CoCo	
	Dealer Sell	84
	HOT CoCo Subscription	16
	Instant CoCo	64
	Mailing List	84
	Moving	84
	Subscription Problems	75
	University Micros	53
91	Incentive Software	53
190	JBM Group	35
270	John Wiley & Sons	93
48	Key Color Software	87
*	Mark Data Products	49
185	Micro R.G.S.	19,23
196	Micro Works	43
361	Micron Technology	96
137	Microware Systems Corp.	13
178	Microware	CIII
337	Nibble Notch Computer Products	75
298	Ozone Engineering	84
214	P.B.J., Inc.	37
124	Perry Computers	28
4	Radio Shack	CII,1
37	Robotic Micro Systems	96
70	Saguaro Software	18
205	Selected Software	69
*	Software Support	14,15
454	Southwestern Digital	48
456	Sunlock Corporation	91
236	T & D Software	55
387	TCE Programs	37
388	TCE Programs	67
342	Tesseract Software Systems	75
93	True Data Products	10
97	True Data Products	11

Advertising Offices: (603) 924-7138 or (800) 441-4403

*This advertiser prefers to be contacted directly. For further information from our advertisers, please user the Reader Service card.



COMING NEXT MONTH

Computers are causing a revolution in the art world. They provide a media for the artist's creativity that only a few years ago was unimaginable. In February, we'll show you how you and your CoCo can participate in this revolution.

Free-lance author Paul Statt interviews three individuals who have been experimenting artistically with the Color Computer. Their stories will inspire you to try to match their efforts.

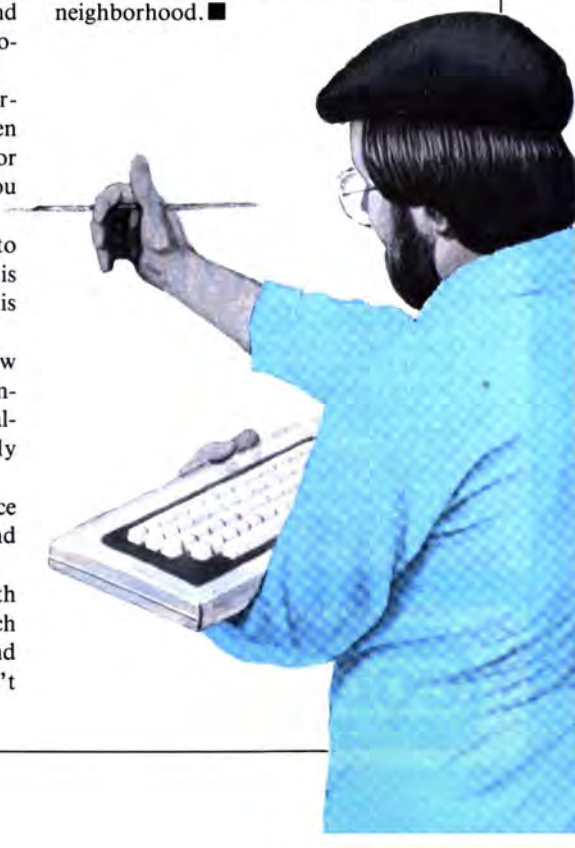
And we'll also provide the means to do just that. Joel Doucet's Paint King is an icon-based drawing program. It is simple to use, yet very flexible.

William Roney will show you how rigonometry and art have much in common. He'll demonstrate how a few algorithms make for an aesthetically pleasing video display.

Other February articles include Space Hawk, a super hi-res arcade game, and a review of Cer-Comp's Textpro III.

Richard Ramella returns next month with a new column, Mindbusters. Each month, Richard will provide puzzles and other thinking games. Bet you can't solve them all.

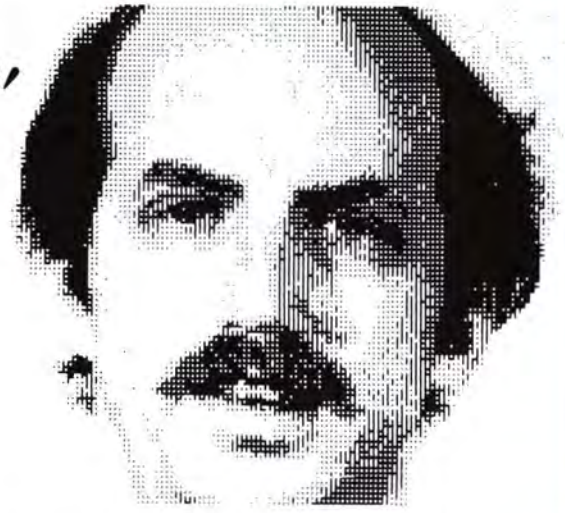
And finally, we'll give you the much awaited Worldwide User's Group List update. There are new groups springing up every day, maybe even one in your neighborhood. ■



TALKHEAD

FOR THE 'REAL TALKER'

"Way beyond anything you have ever seen for the CoCo"



That's a strong statement, we know. But wait until you see 'TALKHEAD'! It's a dazzling creation—easily the most impressive display of CoCo graphics you can buy!

If you have a 'REAL TALKER' voice synthesizer, DO NOT deprive yourself of this absolutely incredible Talking Head simulation program! TALKHEAD uses the 'Real Talker' and extremely high speed/high resolution machine language to create an audio-visual simulation that clearly goes way, way beyond anything that you have ever seen on ANY home computer!

TALKHEAD's fast, smooth-talking animation is so stunningly life-like that it resembles a movie more than a cartoon! This page shows some still shots of the actual moving image as it will appear on your TV screen.

And, TALKHEAD is a real snap to use in Basic, thanks to a new command that we give you: SAY. Type SAY "ANYTHING YOU WANT" and Talkhead instantly appears and speaks ANY text—it has an unlimited vocabulary!

The most impressive CoCo program you can buy . . .

'TALKHEAD' is available on cassette or disk (please specify) for ***only $29.95.*** The cassette version can be transferred to disk in case you ever upgrade. TALKHEAD requires 64K of memory and a Colorware 'REAL TALKER' voice pak.

ONLY $29.95 FROM COLORWARE

PROGRAM BY TIM JENISON SPEECH PROGRAMMING BY H. PUNYON

'TALKHEAD's eyes, mouth and jaw move, realistically animating his speech. The effect is amazing!

MORE SOFTWARE FOR THE 'REAL TALKER' VOICE PAK

STELLAR SEARCH ADVENTURE

If you ever had an urge to command the USS Enterprise, this talking version of 'STELLAR SEARCH' from Owl-Ware is for you! It uniquely combines the best aspects of 'adventure' and graphic 'action' type games and puts the 'Real Talker' voice pak to good use. You'll find graphics galore in this exciting package containing more than 86K of action adventure. Requires 32K and a 'Real Talker' voice pak. ***Cassette....$24.95. Disk....$26.95***

TALKING EDUCATIONAL SOFTWARE

SOFTWARE FOR CHILDREN FROM COMPUTER ISLAND

Math Drill ..... $ 9.95
Foreign Languages..... $ 9.95
Spelling Tester ..... $ 9.95

All 3 for Only $24.95
Requires 16K and a Colorware 'Real Talker' voice pak.

ADVENTURE STARTER

The popular 'ADVENTURE STARTER' from Owl's Nest Software is now available in a speaking version for the 'Real Talker' voice tynthesizer. Adventure Starter is a painless and enjoyable way to learn about computer adventure games. Included are two adventures. The first is "MYHOUSE", an easy game with plenty of help and hints. A second adventure, 'PIRATES', is more challenging. Both are great fun for the adventure minded. This is the only way to get into CoCo adventuring! Requires 16K Extended Basic and a 'REAL TALKER' voice pak. ***Cassette, only $17.95.***

COLORWARE

TOLL FREE 800-221-0916

ORDERS ONLY. N.Y. & INFO CALL (212) 647-2864

★ ORDERING INFORMATION ★ ★ ★

ADD $2.00 PER ORDER FOR SHIPPING & HANDLING.
C.O.D.'S: ADD $3.00 EXTRA.
SHIPPING & HANDLING FOR CANADA IS $4.00
WE ACCEPT VISA, MASTER CARD, M.O.'S, CHECKS.
N.Y. RESIDENTS MUST ADD SALES TAX.
ALL SOFTWARE ON THIS PAGE REQUIRES A COLORWARE 'REAL TALKER' VOICE PAK.

'REAL TALKER'

HARDWARE Voice Synthesizer

NEW from COLORWARE.. only...$59.95

THINKING OF BUYING A COCO VOICE SYNTHESIZER?

READ THIS....

Making your computer talk couldn't be any easier! 'Real Talker' is a full featured, ready to use, HARDWARE voice synthesizer system in a cartridge pak. It uses the Votrax SC-01 phoneme synthesizer chip to produce a clear, crisp voice.

FREE TEXT-TO-SPEECH

Included free with 'Real Talker' is Colorware's remarkable Text-to-Speech program. This is a truly powerful machine language utility. What it does is automatically convert plain English to speech. And it has an unlimited vocabulary! For example, use it in the direct mode: Type in a sentence or a paragraph, even mix in numbers, dollar signs, etc., then press enter. The text is spoken. At the same time a phoneme string is generated which can be saved to cassette or disk, modified or used in a Basic program.

We originally planned to sell this major piece of programming for about $40.00 but decided it was so useful that no 'Real Talker' user should be without it. Besides, it really shows off the capability of 'Real Talker'.

Also included with 'Real Talker' is our unique Phoneme Editor program. It allows you to explore and create artificial speech at the phoneme level. Phenomes are the fundimental sounds or building blocks of word pronunciation. There are 64 different phenomes, as well as 4 inflection levels at your disposal. Creating and modifying speech at the phenome level is both fascinating and educational. The Phenome Editor may also be used to customize the pronunciation of speech produced by the Text-to-Speech program.

You don't have to use any of our utility programs though. If you write your own Basic Programs, you will find the pocket sized Votrax Dictionary (included free) is all you need to make your own Basic programs talk. This dictionary gives you quick access to the phenome sequences used to create approximately 1400 of the most used words in the English language.

How about compatibility? 'Real Talker' is compatible with any 16K, 32K, 64K, Extended or non-extended Color Computer. It works with any cassette or disk based system, with or without the Radio Shack Multi-slot expander. No other synthesizer under $100 can make this claim. Most other CoCo voice synthesizers require an expensive Multi-slot expander in order to work with the disk system. 'Real Talker' requires only an inexpensive Y-adapter. This is an important consideration if you plan on adding a disk or have one already.

'Real Talker' comes completely assembled, tested and ready to use. It is powered by the CoCo and talks through your T.V. speaker so there is nothing else to add. Price includes Text-to-Speech and other programs on cassette (may be transferred to disk), User Manual and Votrax Dictionary. ONLY $59.95

'Y-BRANCHING CABLE' For disk systems. This 40-pin, 3 connector cable allows 'Real Talker' to be used with any disk system $29.95

YOU DECIDE....

Order yours today on our Toll-Free Order Line. If you are not delighted with your 'Real Talker' system, simply return it within 30 days for a prompt, courteous refund.

1-800-524-3131

COLORWARE

COLORWARE INC.
78-03B Jamaica Ave.
Woodhaven, NY 11421
(718)647-2864

VISA MasterCard

★ ★ ★ *ORDERING INFORMATION* ★ ★ ★

ADD $2.00 PER ORDER FOR SHIPPING & HANDLING.
C.O.D.'S: ADD $3.00 EXTRA.
SHIPPING & HANDLING FOR CANADA IS $4.00
WE ACCEPT VISA, MASTER CARD, M.O.'S, CHECKS.
N.Y. RESIDENTS MUST ADD SALES TAX.

TEAC
SANYO
MPI

SLIM LINE DISK DRIVES

DIRECT DRIVE, ½ HT. 40 track, 5ms t/t, DSDD
TEAC Single drive, double sided + case & supply . $259.
TEAC Dual drives, double sided + case & supply . $459.
SANYO Single drive, double sided + case & supply . $249.
SANYO Dual drives, double sided + case & supply . $439.

FULL HEIGHT, 40 track, 5 ms t/t, DSDD.
MPI Single drive, double sided + case & supply .. $199.
MPI Dual drives, double sided + case & supply ... $359.

All drives include case and power supply in choice of grey or off white. Dual drives come assembled in dual case with dual supply and rear gold plated data connector. To make drives into complete system add J&M disk controller with your choice of DOS plus drive cable.

J&M controller with JDOS and manual ..... $129.
J&M controller with RSDOS subject to avail. ..... $129.
J&M controller without DOS ROM chip ..... $109.
JDOS ROM with manual ..... $ 30.

Single drive cable with gold contacts 3' ..... $ 14.
Dual drive cable with gold contacts 3' ..... $ 19.

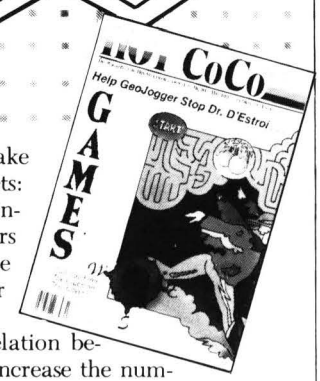
How to order

All items have a 90 day or better replacement policy by us. Include a complete product description of items desired. Add $3. per order for S&H. Add $1.75 for COD. For MasterCard or Visa orders add 3% of total including shipping. Indiana residents add 5% sales tax.

OZONE ENGINEERING
4769 South 200 East
Kokomo, IN 46902
Ph. 317-453-0989
5 - 10 p.m.

298

Dealers Dealers Dealers SELL!



Selling **HOT CoCo** will make money for you. Consider the facts:
Fact 1: Selling **HOT CoCo** increases store traffic—our dealers tell us that **HOT CoCo** is one of the hottest-selling computer magazines on the newsstands.
Fact 2: There is a direct correlation between store traffic and sales—increase the number of people coming through your door and you'll increase sales.
Fact 3: Fact 1 + Fact 2 = INCREASED SALES, which means more money for you. And that's a fact.

For information on selling **HOT CoCo**, call 800-343-0728 (In N.H. call 924-9471) and speak with our direct sales manager. Or write to **HOT CoCo**, 80 Pine Street, Peterborough, NH 03458.

HOT CoCo

80 Pine Street
Peterborough, NH 03458
800-343-0728

ATTENTION SUBSCRIBERS

We occasionally make our mailing list available to other companies or organizations with products or services which we feel might be of interest to you. If you prefer that your name be deleted from such a list, please fill out the coupon below or affix a copy of your mailing label and mail it to:

CW Communications/Peterborough
HOT CoCo
P.O. Box 975
Farmingdale, NY 11737

Please delete my name from mailing lists sent to other companies or organizations.

name _____

address _____

city _____ state _____ zip _____

HOT CoCo

MOVING?

Let us know 8 weeks in advance so that you won't miss a single issue of **HOT CoCo**. *Attach old label where indicated and print new address in space provided. Also include your mailing label whenever you write concerning your subscription. It helps us serve you promptly. Write to: Subscription Department • PO Box 975 • Farmingdale NY 11737.*

☐ *Extend my subscription one additional year for only $24.97.*
☐ *Payment Enclosed* ☐ *Bill Me*

Canada & Mexico $27.97/1 yr. only US funds drawn on US bank. Foreign surface $44.97/1 yr. only US funds drawn on US bank.

affix old label *new address*

name _____ *name* _____
address _____ *address* _____
city _____ *state* _____ *zip* _____ *city* _____ *state* _____ *zip* _____

HOT CoCo • PO Box 975 • Farmingdale NY 11737

PRODUCT NEWS

edited by J. Scot Finnie

Information used in the Product News section is supplied through manufacturers' press releases. *HOT CoCo* has not tested or reviewed these products and cannot guarantee any manufacturers' claim.

Selectable

Hard Drive Specialist has released a new disk-drive controller board that has selectable ROM sockets that let you choose between two different operating system ROMs without having to pull them from the board.

The new disk-controller board features gold-plated card-edge connectors, a fully-socketed board, an advanced circuit design that eliminates the need for periodic adjustments, complete compatibility with all versions of the Color Computer, support of up to four disk drives, and single- and double-density capability.

Hard Drive Specialist offers three versions of the controller. The fully assembled and tested controller sells for $139.95 with the Radio Shack ROM, and for $119.95 without the Radio Shack ROM. HDS also sells parts separately. The bare board with instructions is $39.95. The parts for the board cost $40. The Radio Shack ROM is $20.

For more information, contact Hard Drive Specialist, a division of Compukit, 16208 Hickory Knoll Street, Houston, TX 77059. 800-231-6671.

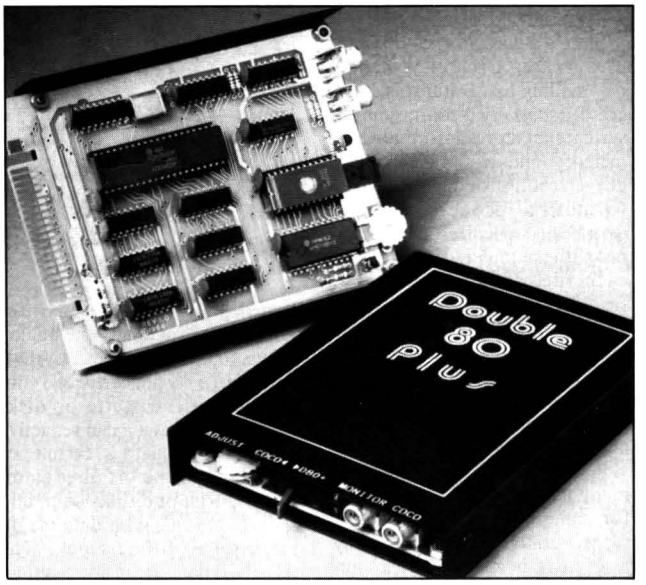
Reader Service 554

The CoCo Elite

Radio Shack is now distributing Elite Software's Elite-Calc, Elite-Word, and Elite-File programs for the CoCo. You can place an order at one of the more than 1,100 participating Radio Shack stores with Radio Shack's new Express Order software system. Radio Shack's stores are connected by a direct computer link with the company's Fort Worth headquarters. Orders can be shipped within 24 hours.

Elite Software has recently added another program to its ranks. Elite-Spel quickly looks up words in one pass through its 24,000-word dictionary. For information about Elite's programs, write to Elite Software, P.O. Box 11224, Pittsburgh, PA 15238. 412-487-2931.

Reader Service 562



An 80-column card with software support.

The Ultra

DSS Peripherals has announced The Ultra Controller, a disk controller that features an LED write indicator, gold-plated contacts, metal enclosure, track-to-track access, multiple sector read/write, single or double-density formats, and soft-sector formatting. The Ultra Controller comes in an off-white finish that matches the CoCo 2. It includes a 5-volt power supply that is compatible with all versions of the Color Computer.

The Ultra Controller handles 8-, 5 1/4-, and 3-inch disk drives and is fully compatible with hard-disk systems. Adding a CP/M board and 8-inch drives to The Ultra turns your CoCo into a respectable CP/M machine. The Ultra is fully compatible with all ROM-Pack interfaces. It is easy on disks because it has selectable motor-off timing. The Ultra Controller comes with an operating system, or you can "burn" your own EPROM operating system. RSDOS and JDOS are available.

The folks at DSS Peripherals offer a one-year warranty on the Ultra. The completely assembled and tested disk controller costs $110. For an additional $5, DSS will install an input buffer that eliminates system hang-ups and glitches. The DSS drive 0 system features The Ultra and sells for $275. For more information, contact DSS Peripherals Corp., 62 Commerce Drive, Farmingdale, NY 11735. 516-249-3388.

Reader Service 550

80-Column Display

Double Density Software has released Double 80 Plus, an 80-column-by-24-line display for the CoCo and CoCo 2 to create a professional size and style display on any monochrome monitor.

Double 80 Plus features 128 different characters, and the full ASCII character set. You can plug it directly into the CoCo, a Y-cable, or a Multi-Pak interface. The Double 80 Plus comes with the 6845-S CRT controller; switchable video output (CoCo or Double 80 Plus); adjustable video (brightness and contrast); a shielded, two-piece metal case; a gold edge connector with ground tabs; a double-sided PC board; and complete documentation.

You can use Double Density's Double DOS Basic, Ultra Term Plus (a communications package), and their new Flex and OS-9 software with the 80-column card.

Double 80 Plus costs $99.95. For more information, contact Double Density Software, 920 Baldwin, Denton, TX 76205. 817-566-2004.

Reader Service 560

Special K

DSL Computer Products has announced a new line of 64K to 128K RAM upgrades for all models of the CoCo. The DSL upgrade mounts inside the computer and is completely compatible with all existing software.

DSL configures the add-on memory in two 64K banks that are divided into 32K pages. One 32K section is common to all banks. You achieve bank switching with POKEs in Basic. When the program selects a memory bank, the other banks switch off while retaining all data, programs, and variables. With this method, you can have as many as three different 32K programs in memory without using any additional software.

The DSL memory upgrade kit comes with 64K of RAM and a logic board that plugs into your SAM Socket. The upgrade requires no soldering, and installation is simple. The complete upgrade costs $99.95, or you can purchase the logic board alone for $34.95 if you want to add your own memory. DSL provides an adapter at $9.95 for CoCos that do not have the F board. The DSL memory upgrade comes with a 90-day warranty. For more information, contact DSL Computer Products, P.O. Box 1176, Dearborn, MI 48121. 313-582-8930.

Reader Service 568

Scourge of The Universe

Mark Data Products has released another in its series of hi-res graphic-adventure games. In Trekboer, life on Earth during the 21st century is threatened by a deadly virus. Your mission is to use the starship Trekboer to search the frontiers of space and return with a cure to save humanity from disaster.The name of your starship provides the first clue.

Trekboer requires 32K and costs $24.95 for cassette and $27.95 for disk from Mark Data Products, 24001 Alicia Parkway, #207, Mission Viejo, CA 92621. 714-768-1551.

Reader Service 551

Aircraft Simulator

The Aircraft Approach Simulator is now available for the 16K CoCo with Extended Color Basic. The program was designed for pilots to practice all kinds of instrument approaches. The new version for the CoCo employs sound, color, and optional joysticks.

Aircraft Approach Simulator is available on cassette for $9.95, on disk for $14.95, and as a source list for $4.95 from Prof. J.C. Sprott, 5002 Sheboygan #207, Madison, WI 53705. 608-273-0627.

Reader Service 553

Calculated Calculus

Calculus Through the Eye of the Color Computer is a series of four math packages totaling 23 programs. MatheGraphics developed the series under a Radio Shack Corp. Educational Software Development grant. Each program in the series provides computer graphics displays, which when combined cover the important calculus concepts and methods.These programs are intended for classroom demonstration and individual exploration.

Algebra is a package of seven drill-and-practice programs that promote student understanding and mastery of the skills needed for elementary and secondary algebra. The programs feature random problem generation and built-in diagnostics, which identify the most common student errors. They also keep track of the time students use on problems and the scores they achieve.

Calculus Through the Eye of the Color Computer and Algebra are available on cassette or disk and run on the 16K Extended Color Basic CoCo. Algebra comes in a Color Basic version as well. For more information, contact MatheGraphics Software, 61 Cedar Road, East Northport, NY 11731. 516-369-3781.

Reader Service 565

Arithmetutor

Third- and fourth-grade children can learn addition, subtraction, multiplication, and division up to the number 12 with Arithmetutor, a new math aid program. Arithmetutor is available on cassette for $9.95 prepaid, from JO, Box 204, Pepperell, MA 01463. 617-433-5784.

Reader Service 564

New Database

Here's what you could have used to keep track of your holiday mailing list. Datalist is a cassette-based file-management system that stores information in memory and uses machine-language sorting for high-speed information processing. You define the structure of the database, the number of records in each file, and the number of fields in each record.

Datalist can sort based on any character or item in each record, and print specialized reports keyed on any character, item, or phrase within each record. It can add, delete, edit, and print individual records. It can print as many as ten items on four lines for mailing labels. And Datalist report formats can select as many as 10 items in any order, with automatic report headings on each page.

Datalist requires 32K and sells for $24.95 on cassette and $32.95 on disk. Contact Computer Associates Inc., West Fargo, ND 58078. 701-281-0549. Their BBS number is 701-281-0233.

Reader Service 559

Junior Typer

Junior Typer uses colorful graphic devices to show the correct keyboard fingering for each letter and teach touch typing to elementary students.

Junior Typer requires 32K and Extended Color Basic. For a free copy of the Aquarius catalog, contact Aquarius People Materials Inc., P.O. Box 128, Indian Rocks Beach, FL 33535. 813-595-7890.

Reader Service 563

Data Acquisition

Technical Hardware has announced two new analog-to-digital converters. The AD-8 is an inexpensive data-acquisition system that you install into the cartridge connector of your CoCo. The AD-8 hardware is available for disk or cassette at $69.95. Disk software for the AD-8 is an aditional $9.95, and cassette software is $7.95.

The CCAD-B is a 16-channel, 12-bit, analog-to-digital converter that lets you digitize 16 bipolar inputs of plus or minus 4.095 volts with plus or minus one millivolt resolution. The board plugs into the cartridge port of the CoCo and the analog input connects to the CCAD-B card with a 44-pin card-edge connector. With cassette or disk-based memory, you can set active channels, save data to cassette or disk, turn on and off three alarm signals, print or display data, and set a time to acquire data via an internal, real-time clock. The CCAD-B data-acquisition system costs $199. The cassette-based system is $190.

The AD-8 and CCAD-B are available from Technical Hardware Inc., PO Box 3609, Fullerton, CA 92634. 305-922-7013.

Reader Service 556

An easy-to-understand CoCo guide.

Low-Cost Spreadsheet

SPR is a sophisticated spreadsheet program available at a low price. It features fully adjustable column widths, commands for configuring the size of the spreadsheet, and all input/output handling routines. Altogether, SPR has 11 functions, including linear regression and approximation. SPR gives you full print-format control of parameters such as printer baud rate, line length, and page length.

SPR comes on 32K cassette with complete documentation for $25 from DSN Computers, 37 Stannard Ave., Branford, CT 06405. 203-481-2653.

Reader Service 552

How to Color Compute

Dilithium Press has released the latest member of its "How to Use" series of books about computers. *How to Use the TRS-80 Color Computer* introduces novices to the use of the CoCo with a simple approach that assumes no previous knowledge of computers. It describes and explains the CoCo's components with step-by-step instructions that help you get started. The book includes chapters that cover peripherals, loading from cassette or disk, programming in Color Basic, graphics, sound, and software. *How to Use the TRS-80 Color Computer* is 128 pages long, has 20 illustrations, and costs $5.95 from Dilithium Press, 8285 SW Nimbus, Suite 151, Beaverton, OR 97005. 800-547-1842.

Reader Service 567

Three from Computerware

Sam Sleuth is another graphics intrigue by Steve Hartford, author of Star Trader. Sam Sleuth changes with every game so you never tire of playing it. Using a joystick or mouse, you search the town of Elmsville in your car, examining grounds and objects, interviewing people, and collecting evidence in real time. Sam Sleuth requires 64K and a joystick or mouse. It costs $24.95 on cassette and $27.95 on disk, plus $2 shipping and handling.

Major Istar combines elements of adventure, simulation, and the arcade. The graphics adventure includes 118 words, 33 objects, and three arcade sequences. The setting is the early 21st century (when undersea cities and interstellar spaceships are realities). Major Istar must travel to Trident Research Dome to answer an urgent call for help from one of the service "droids" stationed there. Your objective is to solve the mystery at Trident in as few moves as possible. Major Istar requires 32K and a joystick. It costs $24.95 on cassette and $27.95 on disk, plus $2 for shipping and handling.

Don't Forget is a personal time-management system and event recorder that uses icons similar to those on the Macintosh. The program can keep track of an entire year of daily memos and appointments. Each day has space for four appointments or occasions, two memos, and hourly notes from 6 a.m. to 9 p.m.

Don't Forget has a 51-column by 24-row upper- and lowercase, hi-res display. You can display or print daily or weekly schedules and print large monthly calenders with room for scribbling notes.

Don't Forget requires 32K and one disk drive and costs $24.95 plus $2 shipping. For more information, contact Computerware, P.O. Box 668, Encinitas, CA 92024. 619-436-3512.

Reader Service 566

TRS-80+ MOD I, III, COCO, TI99/4a
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)	new	$16.95
Ground tab extensions		INCL
Disk Drives (all R.S.)	SPECIAL PRICE	$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 — MC/VISA

+ trademark Tandy Corp

✓216

KEY-264K

- ACCESS YOUR 64K RAM AS TWO 32K BANKS FROM BASIC IT'S LIKE HAVING TWO COMPUTERS IN ONE !!!
- HAVE SEPARATE PROGRAMS IN EACH BANK AND SWITCH INSTANTLY BETWEEN THEM WITH SIMPLE KEYSTROKES
- HAVE ONE LARGE PROGRAM THAT OCCUPIES BOTH BANKS
- RUN TWO PROGRAMS AT THE SAME TIME WITH FOREGROUND/BACKGROUND MULTI-TASKING
- ADDS 16 NEW COMMANDS TO EXTENDED OR DISK BASIC PASS VARIABLES BETWEEN BANKS - CALL SUBROUTINES ACROSS BANKS - VIEW TEXT OR GRAPHICS FROM EITHER BANK - COPY MEMORY ACROSS BANKS, START AND STOP MULTI-TASKING, ALL WITH BASIC COMMANDS
- INCLUDES 8 KEYBOARD COMMANDS TO ALLOW SWITCHING BANKS, MULTI-TASKING, BREAK, RESET, COLD STARTS AND DUPLICATING ONE BANK TO THE OTHER
- WORKS WITH CASSETTE OR DISK BASED SYSTEMS
- WORKS ON ANY 32K OR 64K COCO WITH EXTENDED OR DISK BASIC AND 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. COD (add $2.00), MASTERCARD, or VISA call **** (617) 779-5034 ****

KEY COLOR SOFTWARE
P.O. BOX 360
HARVARD, MA. 01451

✓48

DYNAMITE+™

"THE CODE BUSTER"

disassembles any 6809 or 6800 machine code program into beautiful source

- Learn to program like the experts!
- Adapt existing programs to your needs!
- Convert your 6800 programs to 6809!
- Automatic LABEL generation.
- Allows specifying FCB's, FCC's, FDB's, etc.
- Constants input from DISK or CONSOLE.
- Automatically uses system variable NAMES.
- Output to console, printer, or disk file.
- Available for all popular 6809 operating systems.

FLEX™ $100 per copy; specify 5" or 8" diskette.
OS-9™ $150 per copy; specify 5" or 8" diskette.
UniFLEX™ $300 per copy; 8" diskette only.

For a free sample disassembly that'll convince you DYNAMITE + is the world's best disassembler, send us your name, address, and the name of your operating system.

NEW **CoCo OS-9 VERSION**

$59.95

DISASSEMBLES OS-9, FLEX, DOS FILES

Order your DYNAMITE+ today!

See your local DYNAMITE + dealer, or order directly from CSC at the address below. We accept telephone orders from 10 am to 6 pm, Monday through Friday. Call us at 314-576-5020. Your VISA or MasterCard is welcome. Orders outside North America add $5 per copy. Please specify diskette size for FLEX or OS-9 versions.

Computer Systems Center
13461 Olive Blvd.
Chesterfield, MO 63017
(314) 576-5020

✓507

UniFLEX software prices include maintenance for the first year.

DYNAMITE + is a trademark of Computer Systems Center.

FLEX and UniFLEX are trademarks of TSC.
OS-9 is a trademark of Microware and Motorola.
Dealer inquiries welcome.

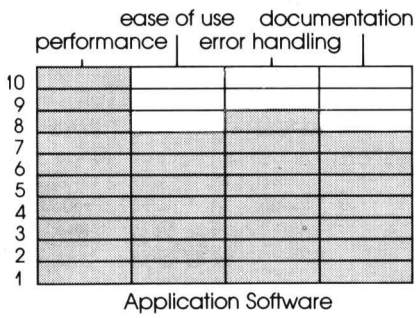
✓ See List of Advertisers on page 81

REVIEWS

CONTENTS

64K Terminal Emulation Package	**88**
E.T.T. (Electronic Typing Teacher)	**89**
D-200 Printer	**89**
Vocabulary Management System	**90**
Color Compac	**92**
Happy Birthday, Mr. Gift	**93**

edited by J. Scot Finnie



64K Terminal Emulation Package
DSS Peripheral Corporation
(Saturn Electronics)
62 Commerce Drive
Farmingdale, NY 11735
516-249-3388
$19.95 64K disk

by Terry Kepner

If you're just getting started in telecommunications and you want a simple and inexpensive terminal program for your 64K Color Computer, then DSS Peripheral's 64K Terminal Package is the one to get. It's not fancy, but it does provide the one thing you'll need most: a massive storage buffer. You can have a buffer anywhere from 24,319–58,367 bytes in length, larger than any other CoCo terminal package I've seen so far.

Before you can use the program you must PCLEAR two or four graphics pages (two for a disk system, four for cassette). Next you decide what size buffer you need. Normally, the program reserves the memory from $A000 to $FEFF for buffer storage (24,319 bytes), but you can use the CLEAR command to drop the lower memory limit and increase the room.

$1B00 (58,365 bytes) is the lowest limit for a disk system, and $1F00 (57,341 bytes) is the limit for cassette. Both are almost right on top of the terminal program itself.

The 64K Terminal Emulator redefines the Color Computer keyboard to generate all the ASCII codes from 0–127, with several left over for the following special functions: report buffer space remaining, get a disk directory, clear the screen, upper-/lowercase toggle, start uploading (from tape or disk), start/stop downloading into buffer, dump buffer to disk (prompts for file name), and exit to Basic.

You have no control over the communications settings (baud rate, stop bits, parity, and so forth). The program is set to 8-bit words, one stop bit, no parity, 300 baud, and full duplex. There aren't even instructions on where to POKE should you wish to change any of these.

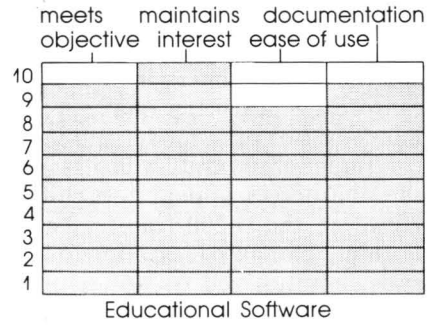
This makes it very difficult to adjust the program to match other systems for data transfer, although in most cases you won't notice the difference. For example, if the system you're communicating with is set to 7-bit words, one stop bit and even parity, the numbers happen to balance out just right.

Every time you toggle the download buffer on, it clears out all previous information. I would rather accumulate the data in memory until I saved it, with a successful save automatically clearing the buffer.

The 64K Terminal Emulator has a unique approach to error handling: It drops you into Basic and prints an error message. This leaves you in a programming environment in which you might fix the problem, while it maintains contact with the host computer so you can EXEC and return to the program and continue working on-line. This has some promising potential for the hacker.

The documentation is just five photocopied pages of instructions. It does present all the necessary information, but requires careful reading before you understand how to use the program.

Certainly there are more powerful programs around, but none as inexpensive as this one. You'll have to read the 64K Terminal Emulator documentation carefully, but after that the program is simple to operate. All you need do is keep the chart of the redefined keyboard in a handy location for quick reference and remember a few simple instructions. ■



E.T.T. (Electronic Typing Teacher)
CoCo Warehouse
500 North Dobson
Westland, MI 48185
313-722-7957
16K, Extended Color Basic
$21.95 cassette

by Beth Norman

E.T.T. (Electronic Typing Teacher) is Cherrysoft's well-designed typing tutor. Although the program is aimed at children, adults can use it to brush up on their skills, too—as long as they don't mind working with E.T., the extraterrestrial. This program pays a lot of attention to the little fellow.

The main menu offers a number of lessons, starting with a keyboard introduction that draws a video picture of the CoCo keyboard (that's what you're supposed to watch during your typing) and explains your options for all the exercises that follow. You can choose to have the TV keys blank, as they are on many classroom machines, or you can ask for labeling of either the home row (A,S,D,F, etc.) or the whole keyboard.

E.T.T. teaches a standard brand of typing. The introduction points out the importance of the home row: "E.T.T. likes home. Always remember to go home!" The documentation also contains practical tips on posture, hand and arm position, and so on.

Finger exercises follow the introduction. These are three-letter groups repeated five times each: AQA AQA AQA. . .. There are 22 of them, designed to exercise each finger and get the student used to the idea of reaching away from the home row to strike a nearby key.

After you have completed these exercises (or any of the units in the program), the computer tells you how you did: the number of perfect responses, your average response time, and an approximate words-per-minute score. Unlike conventional typing courses, E.T.T. doesn't deduct points from your "number correct" score for any incorrect responses.

"E.T.T. was written by an experienced typing teacher and moves along well, taking you from nonsense syllables to complete sentences at just about the right pace."

You can also quit at any point in the middle of an exercise and get this information.

The next portion of the program is E.T.T. Talk. This set of exercises creates 30 sentences from a store of words supposedly containing every letter in the alphabet. There are supposed to be more than 1,000 of these randomly determined sentences, and all are grammatically correct. They also draw heavily upon the adventures of the original E.T. for their material. If you haven't seen the movie, the logic of these sentences might escape you. In order to get a fresh set of sentences for E.T.T. Talk, you have to break the program and run it again.

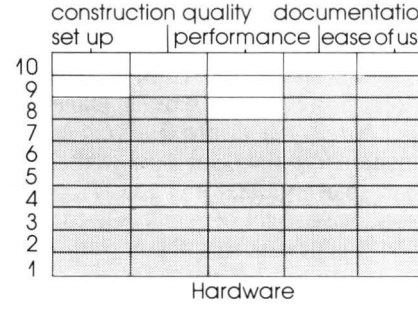
The next feature on the menu lets you create up to 30 sentences of your own, which you then use to test yourself—just as you did with E.T.T. Talk. The computer asks if you want your test sentences given to you in order or randomly, a nice touch. You can also repeat each sentence, and can choose how many times you want to see each one, and save practice sentences on tape.

Nineteen additional sets of exercises are recorded on the second side of the E.T.T. cassette. The first five are words, phrases, and sentences designed for practicing common letter combinations, the sixth is a set of tips for comfortable typing posture, and the seventh through ninth are common words. The documentation claims that you'll find the 50 words in set 7 in over 50 percent of your usual typing.

Sets 10–19 are assorted "story sets," such as "Jack's Journals" (the true story of Jack and the Beanstalk), and "Mark Twain—Wit and (?) Wisdom." These sets are funny, interesting, and challenging.

I haven't found a single bug in E.T.T. It was written by an experienced typing teacher and moves along well, taking you from nonsense syllables to complete sentences at just about the right pace. The only addition I could suggest would be a way to pause in the middle of things to rest your hands without quitting the exercise you are working on.

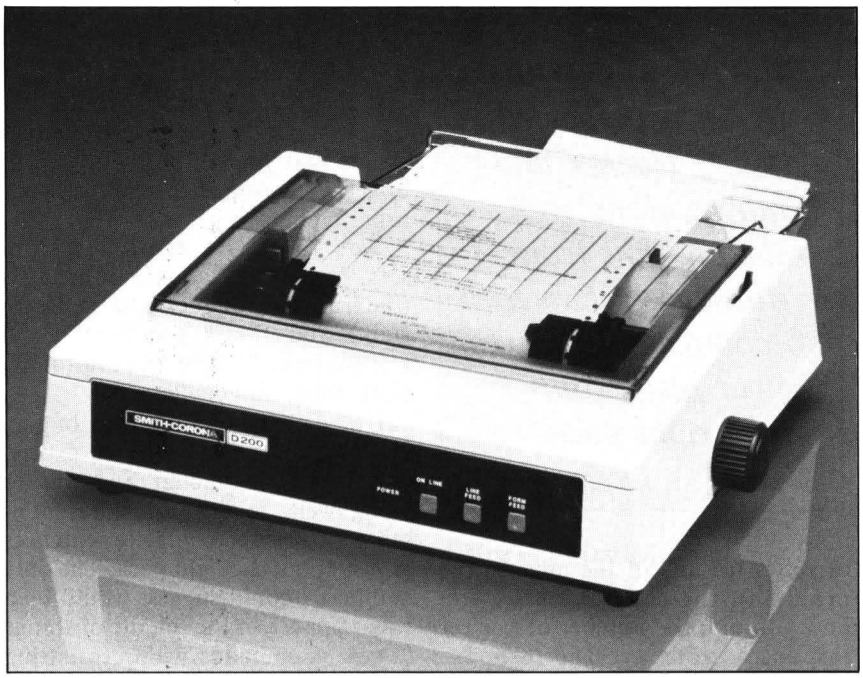
As for results: After using E.T.T. for only two weeks, I improved my typing speed from a lowly 15 words per minute to a more respectable 37. E.T.T. is definitely a program to phone home about.■



D-200 Printer
Smith-Corona
65 Locust Ave.
New Canaan, CT 06840
$400–$600

by Robert W. Eisman

If you're looking for one printer that can handle all your needs (listings, graphics, letter writing and so on), then add the Smith-Corona D-200 to your check list. It's equal in quality and price to its competitors, but the D-200 offers some standard features that usually come as options on other printers. The Smith-Corona machine comes with both a serial



Smith-Corona's D-200 Printer

and parallel interface, a fully adjustable, 11-inch tractor feed, and a 2K data buffer.

The smoked plastic lid is a big plus in reducing the dot-matrix, high-frequency squeal to a rumble. The lid does, however, make the D-200 a paper eater. It's approximately seven inches from the print head to the tear bar, so every time you tear off a page, you lose a sheet of paper. Of course, you'll eliminate this if you print continuously or back the paper up.

The D-200 loads from the rear only, which can be an inconvenience if you prefer bottom loading. And the interface plug is located on the rear panel of the printer, which puts the cable where it can interfere with paper travel.

> *"I find the correspondence print of the D-200 to be the best in its price range."*

The D-200 is a very capable data processor: It prints at 120 characters per second and offers subscripting; superscripting; underlining; proportional spacing; emphasized print modes; and enlarged, condensed, elongated, compressed, or italic characters.

The printer also includes a hex-dump feature. If you press the feed switches when you turn on the unit, it prints all the data in hex code.

The high-resolution graphics give you 120 dots per inch horizontally by 72 vertically. Therefore, a good screen-dump program will let you print out your high-resolution creations.

Normal NLQ CORRESPONDENCE mode

Italic NLQ CORRESPONDENCE mode

NORMAL BOLD MODE

ITALIC BOLD MODE

Emphasized NLQ MODE

Emphasized Italic Mode

Emphasized Bold

EMPHASIZED ITALIC

E L O N G A T E D

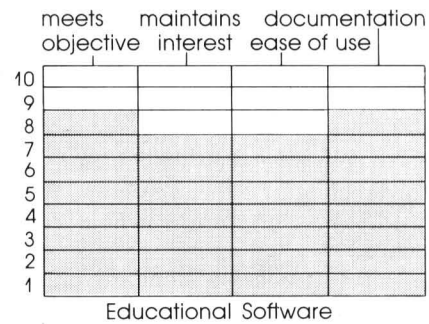
Fig. 1. The D-200's Near-Letter-Quality Print Styles

The D-200 pulls away from its competition as a near-letter-quality printer. Most printers in this price range offer near-letter-quality print in one or two print modes and must use emphasized print, which makes the characters appear too thick. However, the D-200 features italic, normal, elongated, proportional, subs, emphasized or nonemphasized print in the near-letter-quality mode.

The nonemphasized quality is not quite as good as the emphasized, but the clear, sharp characters make this trade off barely noticeable. Note, though, that print speed is cut by more than half in the near-letter-quality mode.

How near is near-letter quality? That's a matter of personal taste, but I find the correspondence print of the D-200 to be the best in its price range (see Fig. 1). Since purchasing the D-200, I only use my daisy-wheel printer for resume-quality printing.

The instruction manual for the D-200 is excellent. You don't have to be a binary giant to set the DIP switches and learn the printer controls. Good diagrams come with the easy-to-follow instructions. Incidentally, you can set the baud rate from 110–9,600 and choose an English or foreign-language character set. ■



Vocabulary Management System
Tom Mix Software
4285 Bradford, NE
Grand Rapids, MI 49506
616-957-0444
16K, Extended Color Basic
$39.95 cassette
$42.95 disk

by James K. Hardy

At one time or another all of us have had to learn new words or terms. As you acquire knowledge in

a new area (e.g., language vocabulary, scientific terms, or Basic programming) you'll have to become familiar with the terms used in the field you are studying. Tom Mix's Vocabulary Management System is designed to help you in your task. The system's 11 Basic programs let a teacher or parent enter words and their definitions and display or print out various tests and games.

Performance

The system comprises three program classes: the data entry/edit program (VMS), four printer-output programs (PTest, PScramble, PCode, and PSearch), and six vocabulary/spelling game programs (Quizzer, Challenge, Code, Scramble, Flash, and Search).

With VMS you can enter and store words of up to 20 characters with definitions of up to three lines. You can use as many as 100 word/definition sets at one time with a 16K system, or 300 for a 32K system, though you can create more than one file. Menu options for VMS include the ability to load and save a data file from tape or disk, enter a new word list, append or edit an existing one, and alphabetize your list.

When you enter data, the program reformats your definitions to prevent word breaks and give you the option of editing each word and definition before you move to the next. Once you've created a data file, you can use the system's remaining programs.

The four printer-output programs let you create vocabulary tests and games. PTest produces either a list of the vocabulary words with their definitions or a matching test in which the words appear at the top of the page and the definitions with spaces for the answer appear below.

PScramble creates the same matching test, but it scrambles the word order in the definitions. It also produces a vocabulary list in which the letters within each word are rearranged.

PCode doesn't scramble the words or definitions but it does encode them with a simple character substitution. Cracking the code for single words can be tough, even for those who are moderately adept at solving cryptograms, and a student must be familiar with the vocabulary words if he is to have a chance at breaking the code.

The final printer program, PSearch, produces a word-search puzzle in which you can select the character width and length for the puzzle. You can also produce an answer key with each of these tests.

Each of the printer-output programs lets you load a data file, list and alphabetize the words in the file, select a random seed, or send the printer output to disk as an ASCII text file for later editing.

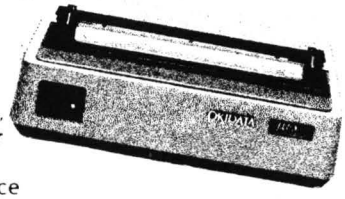
When your data file contains more words than you want to use at one time, you can select individual words for a list or use the random seed feature. Entering a seed lets you produce a random subset within your data file. If you don't change the file, you can run the program later,

PRINTER SALE

$189

ML 80 Features

- 80 cps, unidirectional printing
- 80 columns standard, 132 condensed
- TRS-80 character set
- Graphics 64 block shapes
- Long-life, 7-pin print head, warranted for one full year
- Friction & pin paper feeds
- Parallel Centronics interface



OKIDATA

SUNLOCK SYSTEMS
4217 Carolina Ave.
Richmond, Va. 23222
✓456

ADDITIONAL PRINTER SPECIALS

Epson RX80	$299	Okidata ML82	$349	Brother 15	$479
Epson 80FT	369	Okidata ML83	569	Gemini 10X	279
Epson RX100	529	Okidata ML84	975	Man/Tal 80	319
Epson FX80	479	Okidata ML92	429	Qume 1140	1349
Epson FX100	649	Okidata ML93	699	SCM TP-2+	449

CItoh 8510	$359		
CItoh F10	1099		
Sv.Reed 500	429		
Diablo 620	949		
NEC 2000	849		
NEC 3510	1499		

TO ORDER CALL TOLL FREE 800-368-9191
In Virginia call 804-321-9191
We accept MasterCard, Visa and CODs

DISKETTES AND 680X SOFTWARE

SUPER SLEUTH DISASSEMBLER EACH $99-FLEX, $101-OS-9
interactively generates source on disk with labels, includes xref
specify 6800,1,2,3,5,8,9/6502 version or Z-80/8080/85 version
OS-9 version also processes FLEX object file format
OBJECT-ONLY versions: EACH $50-FLEX & OS-9, $49-COCO DOS
COCO DOS available in 6800,1,2,3,5,8,9/6502 version only

CROSS-ASSEMBLERS EACH $50-FLEX, $55-OS-9, ALL $100
specify for 6800/1, 6502, 6805, Z-80, or 8080/48/85
OS-9 version requires Microware RMA or Lloyd OSM macro assembler
FLEX version requires TSC ASMB or FHL ASM or OSM macro assembler

DEBUGGING SIMULATORS EACH $75-FLEX, $100-OS-9
specify 6800/1, 6805/146805, 6502, or (6809 OS-9 only)
OBJECT-ONLY versions: EACH $50-COCO FLEX & COCO OS-9

6502 TO 6809 ASSEMBLER TRANSLATOR $75-FLEX, $85-OS-9
translates 6502 programs to 6809, noting inexact conversions

6800 TO 6809 & 6809 PIC TRANSLATORS $50-FLEX, $75-OS-9
translates 6800 programs to 6809, 6809 programs to PIC

FULL-SCREEN FLEX TSC XBASIC PROGRAMS
(with complete cursor control)

DISPLAY GENERATOR/DOCUMENTOR	$50 w/source, $25 without
MAILING LIST SYSTEM	$100 w/source, $50 without
INVENTORY WITH MRP	$100 w/source, $50 without
TABULA RASA SPREADSHEET	$100 w/source, $50 without

DISK AND XBASIC UTILITY PROGRAM LIBRARY $50-FLEX
edit sectors, sort directory, maintain master catalog, do disk sorts, ...

CMODEM PROGRAM $100-FLEX & OS-9
menu-driven with terminal mode, file xfer, MODEM7 protocol, etc.
OBJECT-ONLY versions: EACH $50-FLEX & OS-9

5.25" SOFT-SECTORED DISKETTES EACH 10 $14-SSDD, $17-DSDD
with Tyvek jackets, hub rings, labels

Computer Systems Consultants, Inc.
1454 Latta Lane, Conyers, GA 30207
Telephone Number 404-483-1717/4570

Most programs in source on disk: give computer, disk size, OS.
Contact CSC for full catalog and dealer information.
25% off multiple purchases of same program on same order.
VISA and MASTER CARD accepted; US funds only, please.
Add 5% shipping; no shipping charge for disks in lots of 100.

FLEX trademark Technical Systems Consultants. OS-9 trademark Microware. ✓223

✓ See List of Advertisers on page 81

use the same seed, and obtain the same set of words. This also lets you run one of the other printer output programs and use the same set of words.

Once you've selected a set of words, you can enter up to eight lines for a heading. You can then enter printer control-code sequences (decimal) and three sets of control codes, one of which you send before the heading information, the words, and the definitions.

The system offers enough formatting options to let you produce a nice-looking exam, but you're limited in your use of control codes, since the production of special print fonts often requires you to toggle a feature on and off. Once you get a suitable combination of print features, write them down, because the program doesn't let you save and recall them.

The remaining six programs get the student to interact with the computer. Code, Search, and Scramble are almost identical to their printer-output counterparts. The remaining three (Quizzer, Challenge, and Flash) present vocabulary words in a manner not possible with written exams. Flash flashes words on the screen and you retype them. You set the flash rate, and when you make a mistake, the program displays the corrected word with the misspelled part highlighted.

Quizzer presents one definition and up to eight possible answers. You can scramble the word order in the definition to add an extra challenge.

Challenge displays a number of diamonds representing the number of letters in the word. Incorrect guesses (or pressing enter), get you one word from the definition as a clue.

I did find a problem with the keyboard response in these last three programs. The games often dropped characters when I typed quickly to beat a time limit.

Ease of Use

Each program is menu driven, and all are similar in printer output and keyboard relationship, which makes them relatively simple to operate. However, a master-menu program would certainly improve the disk version, and it would be nice if you could press something besides the break key to exit from the VMS or the printer-output programs.

Error Handling

With some of the programs, if you press enter as a file name when you're trying to open a file for ASCII output, you get an error. Other than that, the system caught every attempt to make a mistake, even when I tried to use a disk file without the disk drive attached, tried to edit questions before loading a file, or attempted to print a test with the printer turned off.

Documentation

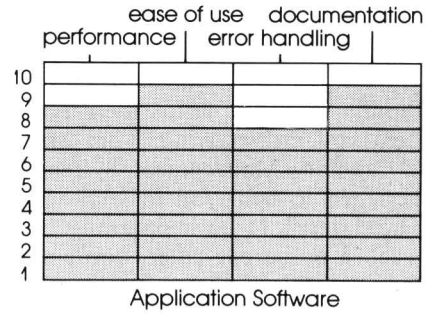
The documentation is massive. Forty-one pages cover each phase of the system's operation, and a 15-page appendix lists typical output for each of the four printer programs. The text does an excellent job of explaining each program and is geared toward the parent or teacher, who in turn must explain the programs to the student who will be using them.

In most cases this amounts to little more than explaining the program objectives, but sometimes the student will need special commands that are not listed in the program (e.g., entering XXX as a letter substitution in the Scramble program results in it displaying the final answer). A one- or two-page instruction set geared towards younger users would be of benefit.

Although the documentation doesn't say so, you could also use the system to learn math formulas or other groups of characters that aren't standard words. For example, as a "word" you could enter "pi x R x R," with "area of a circle" as the definition.

Conclusion

Despite its limitations, the Vocabulary Management System does offer a number of useful features. The ability to produce exams and study sheets as well as scrambled and word-search games should hone vocabulary skills. The games with which you work on screen stress the need to get the right answer rapidly, and they provide immediate positive reinforcement. The programs that encode words and definitions might be beyond younger users, but it could prove useful in challenging more advanced users.■



Color Compac
Radio Shack
1400 One Tandy Center
Fort Worth, TX 76102
Cat. no. 26-3330
$29.95 cassette

by Jeffrey S. Parker

Radio Shack's Color Compac is more than a stand-alone program; actually, it's a terminal kit, because with it you get a subscription to and a free hour on both CompuServe and the Dow Jones Information Service. Therefore, if you have a modem, you're ready to telecommunicate as soon as you get the package home.

The Color Compac has features of both a "dumb" terminal and a "smart" terminal. Whereas dumb terminals only let you receive data on your screen, smart terminals let you manipulate data (save or load data while on line, send data directly to printer, transmit programs directly to another computer, and so on).

The Color Compac won't let information go directly to your printer, even if you have Radio Shack's Deluxe RS-232 Program Pak (cat. no. 26-2226) that lets you connect your modem through the cartridge port, freeing the serial port for a printer.

Other than this limitation, however, this has some nice features. It is very easy to define the settings required for a given host computer, and the manual is very direct in giving detailed instructions. It even includes a sample log-on session. Color Compac is more than a dumb terminal too in that you can save and load information into the computer's memory, and transmit and receive Basic and machine-language programs very easily.

You can load the program into

higher memory addresses to free up more RAM space in the computer. You can also exit to Basic and reenter the program while it is in memory, and change the communications settings while on line.

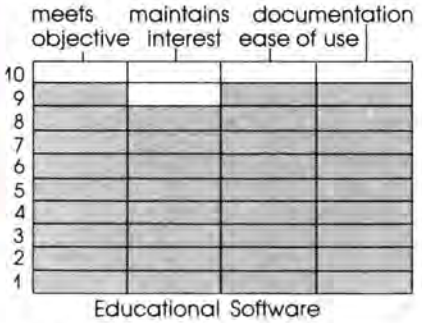
Color Compac should work with any modem.

Your subscription to Compu-Serve connects you to a home-computing-network that includes an electronic mall, an electronic mail service, banking, airline bookings, sports, news, weather, games, and much more. It is ideal for the home enthusiast or, in some cases, the small businessman. A CB simulator lets you talk to people from all over the country via your computer, and you pay only for the connect time, not the long distance service.

Dow Jones is a financial news retrieval network that brings Wall Street right into your own home. Dow Jones is more expensive than CompuServe, but priceless if you're dealing in stocks or need up-to-date information on stock trading. This service can also provide surveys and reports on recent financial histories of stock-exchange companies and their holdings, dealing, earnings, and losses.

Color Compac, even with its limitations, is a simple, straight forward, easy-to-use communications program. It is designed for the home user, and with its included subscriptions to CompuServe and Dow Jones is well worth its price. Its documentation and ease of use make the program especially excellent for first-time users.■

The Color Compac



Happy Birthday, Mr. Gift
Teksym Corp.
14504 County Road 15
Minneapolis, MN 55441
612-471-8320
16K, Extended Color Basic
ages 5–7
$16.95 cassette

by Richard Ramella

A lot of loving computer craft went into this machine-language program, which teaches beginning readers vowel discrimination. It's aimed at kindergartners through second graders.

The other source.

Great ideas you won't find at Radio Shack.
Look for them at your bookstore or wherever
Wiley Press Computer Books are sold.

COCO™ LOGO for the TRS-80® Color Computer
Dale Peterson, Don Inman, and Ramon Zamora
A beginner's guide to using the LOGO language on the TRS-80 Color Computer, *Coco LOGO* is easy enough for youngsters to master, yet challenging enough for the whole family. From startup games, simple learning programs, and some LOGO applications, *Coco LOGO* shows you how to create LOGO's famous turtle graphics and use the LOGO editor. Explanations and screen illustrations are included for every step of the learning process. $12.95

COLOR COMPUTER® APPLICATIONS and MORE COLOR COMPUTER® APPLICATIONS
John P. Grillo and J.D. Robertson
Learn computer graphic techniques while you design brilliant letters, game symbols—even life forms... then explore advanced graphics and sound capabilities with *More Color Computer Applications*. Programs for both are available in the *More Color Computer* book/disk set.
COLOR COMPUTER $10.95
MORE COLOR COMPUTER $14.95
Book/Disk Set $39.90

COCO EXTRAVAGANZA
Roger Valentine
Book/disk set $12.95 $37.90

Wiley Press guides have taught more than three million people to program, use, and enjoy microcomputers. Look for them at your favorite bookshop or computer store! For a complete list of Wiley's Color Computer titles, write to Gwenyth Jones, Dept. 5-1546

WILEY PRESS ↙270
a division of John Wiley & Sons, Inc.
605 Third Avenue, New York, N.Y. 10158
Prices subject to change and higher in Canada.
5-1546

WILEY PRESS COMPUTERBOOKS

The graphics are excellent; a drawing of a vest, for example, looks like a vest. There is a mix of sound: computer-generated music, recorded piano music, and a female narrator's reassuring instructions. The verbal responses vary according to the answer the child gives, and this is a technically interesting capability of the program. The drill is in the form of a game that I think will interest small children, for it combines drawings, a scoreboard, large characters, and a timer made of a round face that smiles at correct answers. The motif is a birthday party.

So much went into the aforementioned good points that there was room left for only 10 questions. They are the same 10 questions each time the program is run—a serious consideration for the potential buyer. This strictly limits the replay value: How much would you pay for a book that taught your child 10 words?

It was difficult to write the previous paragraph, because I like this program very much. However, since I'm 44 years old, what I think is not so important as judging the program as a child might—through eyes of wonder. Therefore, I borrowed a frighteningly precocious four-year-old to test Mr. Gift. She loved it the first time through. On the second play she lost interest at question 5. However, a few days later she asked to play again and went through the game perfectly. She asked me to leave her alone, and I had to spy on her fourth play, in which she disregarded the rules in an effort to create as much color and sound as possible. For this kid, I'd say Mr. Gift was a 9.5 out of 10.

"So much went into the good points that there was room left for only 10 questions."

Now, let's shoo the kid away and look at the program as hard-nosed adults: The documentation is excellent. It's a 10-page booklet that clearly explains the philosophy of what is being taught, the educational objectives, the play and program-loading instructions, and some general material on how to make programs load correctly.

The control program loads in about a minute and a half. You can choose from five play levels that give you from unlimited answer time to five seconds for a response to the question.

I was surprised to hear music emanating from the speaker. It took me a moment to realize I was hearing piano music that the program set into play from the tape. Then came the large words: "Mr. Gift is having a birthday party and you're invited." The narrator slowly reads these words.

To receive an invitation to the party, the child types her or his first name and presses enter. From that point the program displays the child's name in large letters when it asks questions.

As play begins, the program draws a scoreboard at the bottom of the screen. With each question, the screen displays a picture of an object and two choices for the spelling of the object's name. For example, the first question shows a tie in the top right corner of the screen. In the top left corner, two possibilities, "1. tie" and "2. tee," appear.

The narrator gives verbal clues and asks the child to press key 1 or 2, depending on the answer. You don't get credit for a wrong answer, but you do get another try, with more clues. The narrator's responses are always positively phrased.

It takes about 15 minutes to go through the 10 questions. Each right answer draws a brief rendition of the "Happy Birthday" song done via computer sound, and the scoreboard number changes color. If you answer all questions correctly, you'll see a picture of a birthday cake.

The instructions suggest replay value in mastering the game at different time levels, though questions and answers are always the same.

This program is a companion piece to Old McDonald's Farm, and Teksym promises new programs. ■

Two Screens from Happy Birthday, Mr. Gift

Gameware

Touchstone

We've got three of Tom Mix's new arcade-style games this month and they're a real treat. If you have a taste for action, one of these should hit the spot.

The Touchstone (Tom Mix Software, 4285 Bradford N.E., Grand Rapids, MI 49506, 32K, joystick, $27.95 cassette, $30.95 disk) is a one- or two-player game in which you, as a priest of Ra, must search the maze-like passages of the temple to find the Touchstone and become high priest.

You enter the temple alone, but of course you don't stay that way for long. Monsters by the handful start popping out of the poof chambers (there's at least two per screen) and zeroing in on you, wherever you may be. You do have a couple of things on your side, though. For one, the joystick control in this game is very good, allowing you to make quick turns and get through tight spots when you must. You also have the power to shoot death rays from your eyes—right and left simultaneously—a big help in warding off those swarming monsters.

You begin each screen with a time allotment. If your time should run out, you'll suddenly find that your magic eyes don't work anymore (ain't it the truth?) and you have little defense against those priest-seeking monsters.

When the menacing hordes just get to be too much to handle, you can press the spacebar to break a flask of paralyzing gas that will render them immobile for a few seconds. But those flasks are hard to come by, so use them sparingly.

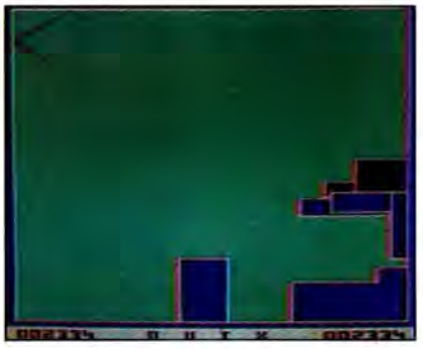
The Touchstone requires quick reflexes, strategic planning and lots of derring-do. Things get especially hectic the farther you go. You can only carry one key at a time, and sometimes there will be two keys hidden on a screen, or a set of double locks that you'll need to open. Therefore, you must grab one key, run to the locked door and open it, and then head back for the second key. Can you zip through that swarm of monsters, grab the second key, and make it back to the door before your time runs out? And there's a treasure down that hallway that you missed the first time through.

The Touchstone is a lot of fun, and a real challenge.

Quix (32K, joystick, $24.95 cassette, $27.95 disk) is kind of a moving-puzzle strategy game in which you try to draw lines to box in the bouncing Quix (a red line) and gain control of at least 75 percent of the screen.

If you have careful planning and judgement, tempered by a good amount of patience, you'll love this game. You begin at the midpoint of the bottom screen border and try to stake your claim on portions of the screen by drawing lines and enclosing areas. Well, that sounds easy enough, but if the bouncing Quix hits your line before you've completed a box, you lose a life.

Therefore, you've got to box in territory in small pieces, venturing out and back before Quix touches your line. The best strategy seems to be to create a small area into which Quix will bounce while you quickly close off the entrance, trapping him. To do that requires careful planning at even the easiest levels, but wait until you have to contend with the two Quixes and the sparklers that follow you. Their touch, as you might guess, also brings your demise.



Quix

Quix is a program for the thinking arcade gamer.

Elec*TRON (32K, joystick, $24.95 cassette, $27.95 disk) is Tom Mix's version of Tron, the popular arcade game consisting of four subgames.

You begin by moving the joystick up, down, right or left to select one of the subgames. In Beam Buggy, you start in the lower center of the screen and begin moving, leaving a light trail as you go. Pressing the fire button makes you go faster and releasing it slows you down. The computer controls a second beam buggy, and your object is to trick it into crashing into the screen borders or into one of the light trails that either of you have created. Of course, the computer is trying to pull the same trick on you. At higher levels, you'll have to deal with more than one computer-controlled buggy at a time. You'll need high-speed reflexes and thinking for this one.

Prachnids begins with you as a small human at the bottom of the screen. Your task is to run up to and enter the transporter at center screen. However, the menacing prachnids come moving downward, blocking the entrance to the transporter and encroaching towards wherever you happen to be standing. And every once in a while they split in two, just to make things interesting.

Oh yes, there's a timer on this task, too. You can pick up a few extra points by blasting an extra prachnid or two, but make sure you're in that transporter come blast-off time.

Force Field finds you at the bottom of a chamber, with a colorful force field descending on you. You can blast away at the field a block at a time with your trusty ray gun, but the blocks keep moving, and new ones will fill in what was once empty space. If you're fast enough, and cunning enough, though, you just might be able to dart through the hole you blast in the field.

Maze puts you in a tank, traveling the corridors of a maze while you search for enemy tanks. You have to hit the enemies three times before you destroy them (although they only have to hit you once), and your bullets don't go in a straight line, which means you can do unusual things like shoot around corners—good, if the enemy happens to be around that corner; bad, if he doesn't.

If you've played Tron in the arcade and liked it, you'll be pleased with this version from Tom Mix—*P.P.*

*Elec*TRON*

6809 SYSTEM DEVELOPMENT

EXPANSION HARDWARE FOR THE TRS-80 COLOR COMPUTER

XPNDR1™

CoCo Expander Card

Gold edge connector plugs into the CoCo cartridge connector. Signals are labeled on the bottom (wire side) with ground and power buses; plated through holes. The 4.3 × 6.2 inch glass/epoxy card is drilled for ICs and components. The finest bare breadboard for your CoCo. Includes 8 page ***Application Notes*** to help you get started.

$19.95 each or **2** for **$36**

SuperGuide™

Precision molded plastic insert designed specifically to align and support printed circuit cards in the CoCo cartridge slot; an unbreakable removable card guide. Patent Pending.

$3.95 each

Available now from:

ROBOTIC MICROSYSTEMS ↙37

BOX 30807 SEATTLE, WA 98103

Now Your Computer Can See!

$295.00*

A total imaging system complete and ready for plug-and-go operation with your personal computer.

MicronEye™ "Bullet"

The MicronEye™ offers selectable resolution modes of 256 x 128 and 128 x 64 with operating speeds up to 15 FPS. An electronic shutter is easily controlled by software or manual functions, and the included sample programs allow you to continuously scan, freeze frame, frame store, frame compare, print and produce pictures in shades of grey from the moment you begin operation.

Only the MicronEye™ uses the revolutionary IS32 OpticRAM™ image sensor for automatic solid state image digitizing, with capability for grey-tone imaging through multiple scans. And with these features, the MicronEye™ is perfectly suited for graphics input, robotics, text and pattern recognition, security, digitizing, automated process control and many other applications.

The MicronEye™ is available with immediate delivery for these computers: Apple II, IBM PC, Commodore 64 and the TRS-80CC (trademarks of Apple Computer Inc., International Business Machines, Commodore Corp., and Tandy Corp. respectively).

Phone for MicronEye™ information on the Macintosh, TI PC and RS232 (trademarks of Apple Computer Inc. and Texas Instruments respectively.)

*(Add $10.00 for shipping and handling [Federal Express Standard Air]; residents of the following states *must add sales tax:* AK, AZ, CA, CO, CT, FL, GA, IA, ID, IL, IN, LA, MA, MD, ME, MI, MN, NC, NE, NJ, NY, OH, PA, SC, TN, TX, UT, VA, VT, WA, WI.)

MICRON TECHNOLOGY, INC.

VISION SYSTEMS
2805 East Columbia Road
Boise, Idaho 83706
(208) 383-4106
TWX 910-970-5973 ↙361

NEW! For Your TRS-80 Color Computer

320 Full-time Audio Talk/Tutor Programs!

We're Your Educational Software Source

Course	No. of Programs
Language Arts (Spelling)	16 Programs
Reading	64 Programs
Comprehension	32 Programs
Phonics	32 Programs
English as a Second Language	32 Programs
Mathematics	64 Programs
Basic Algebra	16 Programs
Physics	16 Programs
Effective Writing	16 Programs
History	32 Programs

In Color, with Pictures and Text!

All of our TRS-80 Color programs have easy to understand professional announcer narration, not synthesized, robotic voices. All text is displayed in easy to read upper- and lower-case characters. Video clearly illustrates key concepts in each frame of the program.

Only **$4.40** per program (**$8.80** for 2, one on each side of a half-hour cassette). **$59.90** for 16 programs (8 cassettes) in an album. Send for catalog of over 1000 programs for Atari, TRS-80, Apple, etc.

Dealer inquiries welcome
For more information, or to order call:

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

DORSETT ↙209
Educational Systems, Inc.
Box 1226, Norman, OK 73070

MasterCard VISA

There's more to OS-9 than meets the eye.

File Handlers Toolbox **$85.00**

The File Handlers Toolbox: a new utility command toolbox specially designed for OS-9 users who do a lot of file manipulation. The package is a collection of twelve OS-9 command programs, including equivalents of some of the most popular UNIX* utilities that are not included in the basic OS-9 command set. Most of the programs are useful as "filters" using the OS-9 pipeline facilities.

Entertainment Pack **$85.00**

Entertainment Pack I is a collection of programs written in Basic09 for the OS-9 Operating System. The package consists of games and other interesting programs that are not only entertaining but serve as excellent instructional examples of Basic09 programming techniques. All programs include complete source files and can be easily edited to run on standard alphanumeric or graphics terminals.

CIS Cobol **$400.00**

CIS COBOL, which meets the ANSI standard for Level One Cobol plus selected features from Level Two, is ideal for microcomputers. This system lets you run COBOL on your small computer and is a great way to learn Cobol.

Relocatable Macro Assembler **$125.00**

At last — a full feature relocatable macro assembler and linkage editor for OS-9. RMA permits sections of assembly language programs to be independently assembled to "relocatable object files". The linkage editor takes any number of program sections and/or library sections and combines them into a single executable OS-9 memory module. Global data and program references are automatically resolved in the process. RMA also supports conditional assembly and library source files.

The Official OS-9 Manual Set **$40.00**

The complete, unabridged OS-9 manual set direct from Microware. This three manual set contains complete information on writing device discriptors, disk drivers and full explanations of how OS-9 works. A great addition to the serious OS-9 programmers library.

The BASIC09 Tour Guide **$18.95**

Map out your route through the Mercedes of Basics . . . Basic09 with **the official Basic09 Tour Guide.** Skillfully written in a friendly and easy to read style this book will put you in the drivers seat in no time. Fasten your seatbelt, sit back and enjoy the ride to perfecting your programming skills.

That's just the beginning . . .

GET EYE TO EYE WITH MICROWARE AND OS-9

microware®

OS-9™

178

MICROWARE SYSTEMS CORPORATION • 1866 N.W. 114th STREET • DES MOINES, IA 50322
TELEPHONE 515/224-1929 • TELEX 910-520-2535

OS-9 and BASIC09 are trademarks of Microware and Motorola. UNIX is a trademark of Bell Laboratories, Inc.

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 latchable), 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 64K CoCo. **Now also available for CoCo 2.**

Call Toll Free

1-800-828-6968

In New York 1-800-462-4891

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.

HJL PRODUCTS

Div. of Touchstone Technology Inc.
955 Buffalo Road • P.O. Box 24954
Rochester, New York 14624
Telephone: (716) 235-8358

440