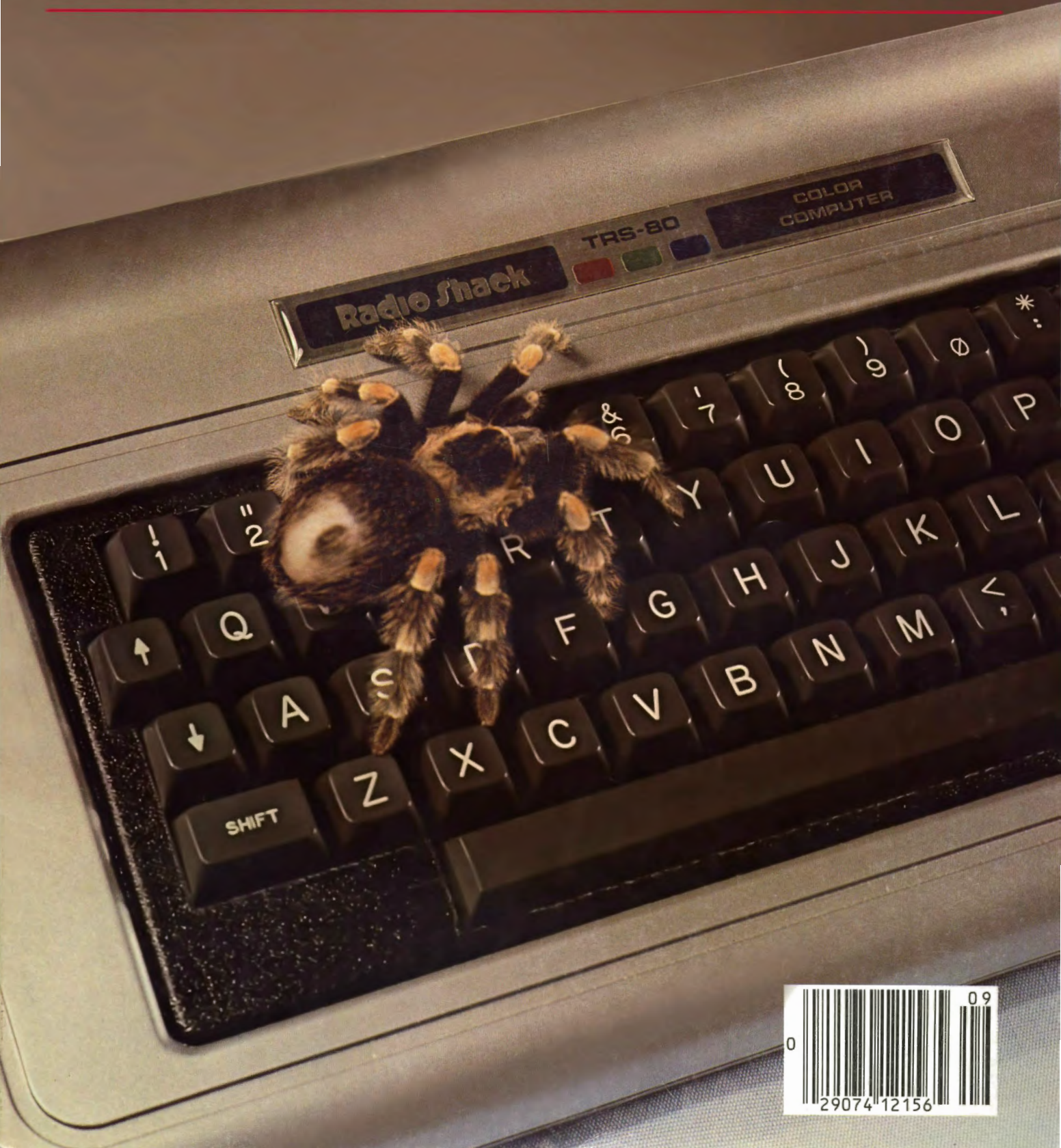


# Color Computer News

\$2.95

The Color Computer Magazine for 6809 Users Iss. 24 Sept. 1983



# TO REALIZE THE FULL POWER & PERFORMANCE OF THE 6809, LOOK TO GIMIX.

## GIMIX OFFERS YOU A VARIETY OF SS50 BUS COMPONENTS AND SYSTEMS.

### OS-9 GMX III

The **GMX 6809 CPU III** and **OS-9 GMX III**. A Multi-user, Multi-tasking package for the ultimate in System Performance plus protection of the system and other users from crashes caused by errors in individual users programs

#01 (CPU & Software) **NEW!** \$1698.01

**INTELLIGENT I/O PROCESSOR BOARDS** increase system throughput by reducing interrupts to the host, buffering data transfers, and data preprocessing. Prices include on board firmware. Requires system drivers.

#11 3 port RS232 Serial (SS30) **NEW!** \$498.11

#12 4 port Parallel (SS50) \$538.12

OS-9 GMXIII drivers. (included when purchased with GMX III package). \$200.00

OS-9 Level 2 users - contact GIMIX for system requirements and availability.

**192K GMX III #79 SYSTEMS:** All include GMX 6809 CPU III and OS-9 GMX III (#01); a #11 3 port intelligent serial I/O & cables; #19 Classy Chassis; 192KB Static RAM; #68 DMA controller, all necessary cables, power regulators, and filler plates. The OS-9 Editor, Assembler, Debugger, BASIC-09, and RUNB are included.

#79 with dual 40 track DSDD drives \$5998.79

#79 with dual 80 track DSDD drives **NEW!** \$6298.79

#79 with #68 8" Dual Drive Disk System \$7598.79

#79 with #90 19MB Winchester subsystem & one 80 track DSDD drive \$8998.79

UnIFLEX for the GMX 6809 CPU III and intelligent I/O boards is in development.

### OS-9 GMX I; OS-9 GMX II; FLEX; and UnIFLEX

The #05 GIMIX 6809 PLUS CPU board \$578.05

Options: GMX DAT \$35.00 SWTPC DAT \$15.00

9511A \$312.00 9512 \$265.00

**#49 64KB GHOST SYSTEM** Includes: #05 CPU; #19 Classy Chassis; 64KB static RAM; a #43 2 port serial card & cables; #68 DMA Controller; all necessary cables, power regulators, and filler plates; GMXBUG monitor; FLEX; and OS-9 GMX I. You can software select either FLEX or OS-9, The OS-9 Editor, Assembler, Debugger, BASIC-09, and RUNB are also included.

#49 with dual 40 track DSDD drives \$4398.49

#49 with dual 80 track DSDD drives \$4698.49

#49 with #68 8" Dual Drive Disk System \$5998.49

#49 with #90 19MB Winchester subsystems & one 80 track DSDD drive \$7398.49

**#39 128KB SYSTEM** Includes: #05 CPUwDAT; #19 Classy Chassis; 128KB of static RAM; a #43 2 port serial card & cables; #68 DMA Controller; all necessary cables, power regulators, and filler plates; GMXBUG monitor; FLEX; and OS-9 GMX II. You can software select either FLEX or OS-9. The OS-9 Editor, Assembler, Debugger, BASIC-09, and RUNB, and GMX-VDISK for FLEX are included.

#39 with dual 40 track DSDD drives \$4998.39

#39 with dual 80 track DSDD drives \$5298.39

#39 with #68 8" Dual Drive Disk System \$6598.39

#39 with #90 19MB Winchester subsystem & one 80 track DSDD drive \$7998.39

UnIFLEX, available at extra cost, requires 8" or Winchester drives. A signed license agreement with TSC is required before shipment.

You can add to any GIMIX system RAM, I/Os and other options, or substitute non-volatile RAM. GIMIX will customize to your needs.

**COMING SOON:** Contact GIMIX for price and availability on 40MB and 72MB Winchester (5 1/4") drives, removeable pack Winchesters, 256KB static RAM boards.

All GIMIX systems are guaranteed for 2MHz operation. GIMIX systems include documentation for all boards and software in a GIMIX binder. **ALL DRIVES ARE 100% TESTED AND ALIGNED BY GIMIX.**

**ALL BOARDS AND SYSTEMS ARE ASSEMBLED, BURNED-IN, AND TESTED. GOLD-PLATED BUS CONNECTORS ARE USED.**

**TO ORDER BY MAIL:** SEND CHECK OR MONEY ORDER OR USE YOUR VISA OR MASTER CHARGE. Please allow 3 weeks for personal checks to clear. U.S. orders add \$5 handling if order is under \$200.00. Foreign orders add \$10 handling if order is under \$200.00. Foreign orders over \$200.00 will be shipped via Emery Air Freight COLLECT, and we will charge no handling. All orders must be prepaid in U.S. funds. Please note that foreign checks have been taking about 8 weeks for collection so we would advise wiring money, or checks drawn on a bank account in the U.S. Our bank is the Continental Illinois National Bank of Chicago, 231 S. LaSalle Street, Chicago, IL 60693, account #73-32033. Visa or Master Charge also accepted.

**EXPORT MODELS: ADD \$30 FOR 50Hz. POWER SUPPLIES.**

GIMIX Inc. reserves the right to change pricing, terms, and product specifications at any time without further notice.

ALL PRICES ARE F.O.B. CHICAGO

### Choose from GIMIX' wide variety of system components.

The **GIMIX CLASSY CHASSIS #19** consists of a heavyweight aluminum cabinet, constant voltage ferro-resonant power supply, and SS50 Mother board with baud rate generator board

Triple Disk regulator card and cables	\$88.22	Baud rate generator card	\$1398.19
Missing cycle detector	\$38.23	Filler plates	\$88.93
Back panel connector plates (specify)	\$8.60	50 Hz. option	\$14.92
			\$30.00

### MEMORIES (GIMIX uses only Static RAM)

#67 64KB NMOS STATIC RAM board	\$478.67
#64 64KB CMOS STATIC RAM board w/battery back-up	\$568.64
#34 8K PROM board	\$98.34
#32 16 socket PROM/ROM/RAM board	\$238.32

### I/O Boards (see above for Intelligent I/Os)

#41 Single port serial, RS232/20ma. current loop	\$88.41
#43 2 port serial, RS232	\$128.43
#46 8 port serial, RS232	\$318.46
#42 2 port parallel	\$88.42
#45 8 port parallel	\$198.45
#50 serial, RS232, RS422, RS423	\$244.50
#52 SSDA serial, RS232, RS422, RS423	\$254.52
#54 ADLC serial, RS232, RS422, RS423	\$268.54
Each cable with connectors for back panel mounting (specify board)	\$24.95

### DISK CONTROLLERS

#68 DMA (featured in all systems above)	\$588.68
#28 dbl. dens. programmed I/O (5" drives only)	\$298.28
#58 single dens. programmed I/O (5" and/or 8" drives)	\$226.58
#48 same as #58 but for 5" drives only	\$198.48
Cable sets: 8" with Back Panel connector	\$29.25
for two 8" external drives	\$44.26
for two 5" drives	\$34.96

**SOFTWARE:** GIMIX exclusive versions of OS-9/GMX I, II, III & FLEX are for GIMIX hardware only. All versions of OS-9 require the #68 controller. When ordered with any controller, FLEX is \$30.00

GMXBUG PROMs and manual	\$98.65
Boot or Video boot PROM	\$30.00
OS-9 GMX I	\$200.00
Editor	\$125.00
BASIC-09	\$200.00
UNIFLEX boot PROM	\$50.00
OS-9 GMX II	\$500.00
Assembler	\$125.00
RUNB	\$100.00

### DISK DRIVES FOR GIMIX SYSTEMS -- complete with cables and power regulators.

5" DSDD 40 track	2 for \$900.00
5" DSDD 80 track	2 for \$1300.00
#68" Dual 8" DSDD drives, cabinet, power supply, & cables	\$2698.88
Cabinet only	\$848.18
Filler plate	\$14.83
Cable for 2 drives	\$44.82
Cable for 4 drives	\$67.84
Cable for cabinet to mainframe	\$45.81

### WINCHESTER SUBSYSTEMS: for use only in GIMIX systems with #68

DMA controller.	
#90: includes one 19MB drive, interface, and Software	\$3588.90
#91: includes two 19MB drives, interface and Software	\$5288.91

Contact GIMIX for price and availability of other forthcoming subsystems.

### OTHER BOARDS

#76 GHOST 80X24 VIDEO BOARD	\$398.76
#66 50 pin Protoboards	\$56.66
#33 30 pin Protoboards	\$38.33
#03 6800 CPU	\$224.03
#06 6800 CPU with timers	\$288.06
Baud rate option, add	\$30.00
#08 RELAY DRIVER (board, bracket, transformer, and 31 relays)	\$1128.08
#66 - #08 (board, bracket, transformer, without relays)	\$538.66
#85 OPTO board	\$348.85
<b>WINDRUSH EPROM PROGRAMMER</b>	\$375.00
3" Binder	12.00
2" Binder	\$9.00

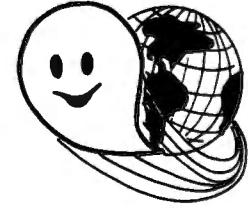
**GIMIX DOES NOT GUARANTEE PERFORMANCE OF ANY GIMIX SYSTEMS, BOARDS OR SOFTWARE WHEN USED WITH OTHER MANUFACTURERS PRODUCT.**

**DON'T SEE IT??? ASK! OUR BROCHURE HAS MORE COMPLETE DESCRIPTIONS AND SPECS. PHONE OR WRITE TODAY FOR YOUR COPY.**

BASIC-09 and OS-9 are trademarks of Microware Systems Corp. and MOTOROLA, Inc. FLEX and UnIFLEX are trademarks of Technical Systems Consultants, Inc. GIMIX, GHOST, GMX, CLASSY CHASSIS, are trademarks of GIMIX, Inc.



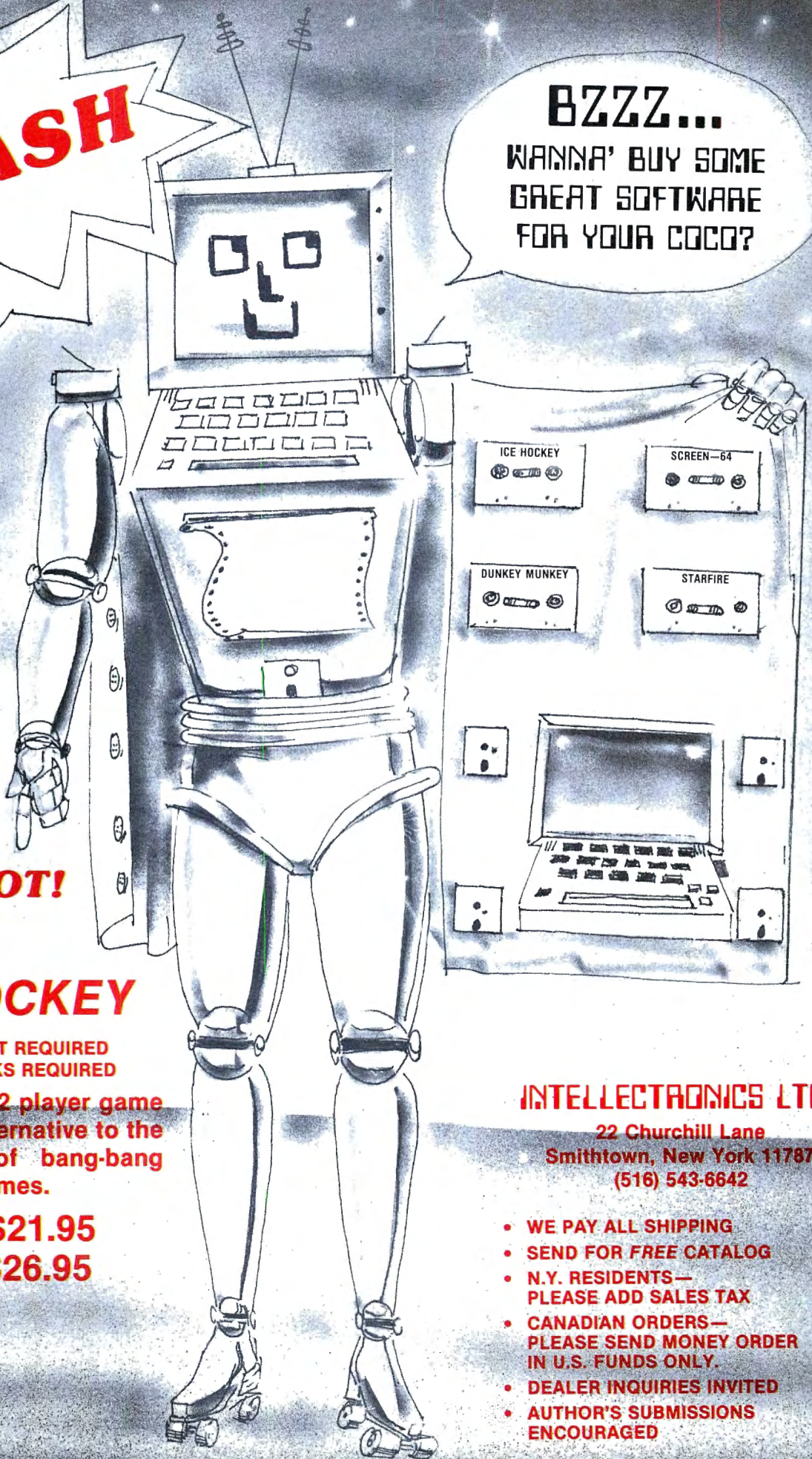
1337 WEST 37th PLACE • CHICAGO, ILLINOIS 60609  
(312) 927-5510 • TWX 910-221-4055



**FLASH**

**BZZZ...**

**WANNA' BUY SOME  
GREAT SOFTWARE  
FOR YOUR COCO?**



**NEW & HOT!**

## **ICE HOCKEY**

**EXT. BASIC NOT REQUIRED  
16K, 2 JOYSTICKS REQUIRED**

**This fast paced 2 player game  
is a fantastic alternative to the  
extended list of bang-bang  
shoot 'em up games.**

**Tape...\$21.95  
Disk...\$26.95**

## **INTELLECTRONICS LTD.**

**22 Churchill Lane  
Smithtown, New York 11787  
(516) 543-6642**

- **WE PAY ALL SHIPPING**
- **SEND FOR FREE CATALOG**
- **N.Y. RESIDENTS—  
PLEASE ADD SALES TAX**
- **CANADIAN ORDERS—  
PLEASE SEND MONEY ORDER  
IN U.S. FUNDS ONLY.**
- **DEALER INQUIRIES INVITED**
- **AUTHOR'S SUBMISSIONS  
ENCOURAGED**

---

COLOR COMPUTER NEWS STAFF

Publisher/Editor in Chief  
Bill Sias

Editor  
Barbara Bectel

Circulation Manager  
Amanda Morris

Graphic Arts Manager  
George Sias

Advertising Manager  
Arvid "Arv" Sias

Publisher's Assistant  
Diane Wright

West Coast Advertising Representative  
Jay Eisenberg  
6855 Santa Monica Boulevard  
Suite 200  
Los Angeles, CA 90038  
(213) 467-2266

San Francisco  
(415) 864-3252

Denver  
(303) 595-4331

Dallas  
(214) 660-2253

---

Application to mail at Second Class  
Postage Rates is pending at Muskegon,  
Michigan and at additional mailing  
offices. POSTMASTER: Send address  
changes to Color Computer News, 1853  
Ruddiman Drive, North Muskegon, MI  
49445.

\*\*\*\*\* Contributing Editors \*\*\*\*\*

FLEX CORNER  
Roger Degler

DISK DIGEST  
Dennis Derringer

COMMENT CORNER  
Andrew Hubbell

QUICKIE REVIEWS  
Old Father William +  
Jeffrey Stipes

COVER PHOTO BY  
Philip C. Brautigam

---

Flex is a trademark of Technical  
Systems Consultants.

OS-9 and BASIC09 are trademarks of  
Microware Systems Corporation.

TRS-80 is a trademark of the Tandy  
Corporation.

Color Computer is a trademark of the  
Tandy Corporation.

The entire contents of this publication  
is copyright 1983 by REMarkable  
Software, Inc., unless specific copy-  
right is held by an individual author.

Color Computer News is published  
monthly by:

REMarkable Software, Inc.  
1853 Ruddiman Drive  
North Muskegon, MI 49445  
(616) 744-4796

For subscription problems or informa-  
tion write to the above address.

---

---

## INDEX

REMARKS	7	COMMENT CORNER	69
MAIL CALL	13	This month: Examine your computers digital to analog converter (DAC) and use some commands which use it.	
Letters To The Editor			
HOW TO PAGINATE YOUR LLISTINGS	19	THE ORACLE	78
Do you like a margin at the bottom of a page, no printing across perforations, etc... then this program is for you!		A review of an assembly language debug monitor from Spectral Associates.	
ZAXXON	38	PRINTER LINE WIDTH CONTROL FOR THE COLOR COMPUTER	81
A review of the game from Datasoft		Have you tried changing printer output width to 60 characters to a non-default value without noticeable improvement? Then this is what you're looking for.	
FINGERKEY	40	SUPER CHARGER	90
This program was written to help students learn the home keys.		A review of Spectral Associates "Super Charger" Board.	
FLEX CORNER	52	LATEST SCORE:	96
This month: Comparing graphics, avoid, input/output & control transfer statements.		PROGRAMMER 1 - PIRATES 0	
CRYSTAL REVENGE	66	A software review by Old Father William+	
A review of the game from Owl-Ware		AN INTERVIEW WITH LANCE LEVENTHAL	98
TAPEUTIL HAS USEFUL COMMANDS	68	NEW PRODUCTS	125
A quickie review by Old Father William+			



# of the hill!

It's a jungle out there, but the latest news on the Color Computer grapevine is that, above the swirling mists of confusion, more and more people are discovering **the Rainbow**.®

Now in its third year, **the Rainbow** has become the standard by which all other Color Computer magazines are compared. And no wonder! **The Rainbow** towers above the crowd, now offering more than 300 pages each month, including more than two dozen type-in-and-run program listings, a host of articles and in excess of 30 hardware and software product reviews.

We lead the pack in Color Computer publications and are devoted *exclusively* to the TRS-80® Color, TDP-100 and Dragon-32. We made our climb to the top by continually offering the best and the most by such well-known authors and



innovators as Bob Albrecht and Don Inman, and games from top programmers like Chris Latham, Fred Scerbo and John Fraysse. **The Rainbow** offers the most in entertainment and education, home uses, technical details and hardware projects, tutorials, utilities,

graphics and special features like Rainbow Scoreboard and our new CoCo Clubs section.

For only \$22 a year, you get the keys to all the secrets locked in your CoCo!

Are you searching through the jungle of claims and clamor? Climb above it all. Look up. Find **the Rainbow**.

® Registered trademark of Falsoft Inc.  
 ® Registered trademark the Tandy Corp.  
 © 1983 the Rainbow

**the Rainbow** 9529 U.S. Highway 42  
 502/228-4492 P.O. Box 209  
 Prospect, Ky. 40059

YES! Sign me up for a year (12 issues) of **the RAINBOW**.

Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Payment Enclosed

Charge  VISA  MasterCard  American Express

My Account# \_\_\_\_\_ Interbank# (MC only) \_\_\_\_\_

Signature \_\_\_\_\_ Card Expiration Date \_\_\_\_\_



Subscriptions to **the RAINBOW** are \$22 a year in the United States. Canadian and Mexican rate U.S. \$29, surface rate to other countries U.S. \$57; air rate U.S. \$85. All subscriptions begin with the current issue. Please allow up to 5-6 weeks for first copy.

Just for your  
 TRS-80® COLOR  
 TDP System 100  
 Dragon-32  
 MC-10

---

---

**REMARKS**  
**By Bill Sias**

We've been using the same computer for over a year and a half for everything from subscriber files to typesetting. To give you a feel for the power of our operating system, I have just walked through the other offices to see what everyone was doing. I found one person typing in an article, another proof-reading, two doing various things with the subscriber list, a printer is printing labels for last issue, and a color computer is transferring an article to the computer. As I look at the "procs" (current procedures) the computer is also sorting the Forum Sixty-Eight subscribers in preparation for printing those labels. All this, while I type this editorial. Better yet, no one here is aware of any slowdown from the multi-processing. If that doesn't impress you sufficiently let me add that our computer uses a 6809.

The operating system I am using is OS-9 and the computer is a GIMIX. I brought this up because Radio Shack has finally announced OS-9 for the Color Computer. Just a little over a year ago, in this column, I first mentioned that OS-9 would be available soon from Radio Shack and at long last it has appeared.

The part numbers and prices are:

26-3030	\$69.95	OS9,Edit,Asm,Debug
26-3036	\$99.95	BASIC09

Why buy OS9? If you are a "Hacker" then the advantage for you is huge. The

languages available include C, Cobol, Pascal, a couple of versions of BASIC, to name just some. All of these languages are compilers so they run FAST. The C compiler is the most exciting to me. C is an unusual language in that it produces Assembler source code that, when assembled, runs so close to the speed of hand written assembly language that many operating systems and languages are written in C. I just recently learned that a version of CPM was rewritten in C. The other thing that makes C exciting is the fact that the programs are portable. By that I mean that a C program written on most any computer can be recompiled and run on most any other. A Forum Sixty-Eight advertiser recently informed me that he had downloaded some C source code from a VAX 11/780 running UNIX as its operating system and all of the programs ran without modification on their OS-9 based GIMIX. Since OS-9 Level 1 for larger systems is the same as OS-9 for the Color Computer (and Dragon 64) the same will be true.

BASIC09 is an extremely "slick" language in that it is a structured language that, in my opinion, is more of a cross between Pascal and C. It compiles to I-code (Intermediate code) which is quite low level code but not machine code. Also available is RUNB which is the run-time interpreter. RUNB allows you to run your BASIC09 programs without the

memory overhead of BASIC09.

An example of a BASIC09 procedure follows this article. This example is the search function for the subscriber list program I wrote.

If it sounds like I am excited about OS-9 being available for the Color Computer it's because I am. I've read a few things lately about how excited other people are about this "new" operating system, my reasons are quite different. I'm excited about this inovative, familiar operating system being available

for another of my favorite computers.

As you can see, the print quality stinks on some of the articles this month. Our old Compugraphic typesetter "gave up the ghost" in the process of putting this issue together. You'll also notice that the paper is of much higher quality. It's truely disappointing to me that when we finally locate a printer that can do the quality of work we need our equipment dies for the same issue. I'm exploring replacing it and should be back to typesetting by the next issue.

---

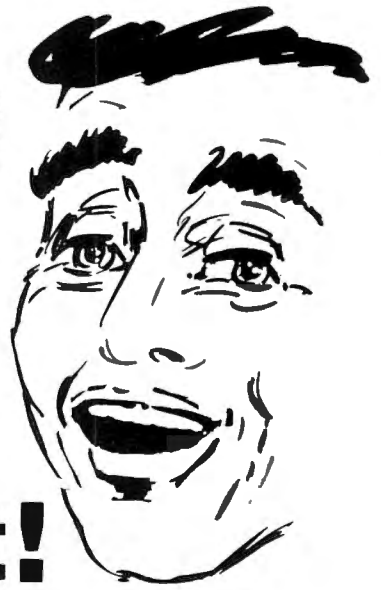
```
PROCEDURE Find
0000      (* Given a zipcode this will do a binary search of the
          Index file. *)
0045
0046      PARAM Search_Key:REAL
004D      TYPE Key=Zip:REAL; Location:INTEGER
005E      PARAM Index:Key
0067      PARAM idx_pointer:INTEGER
006E      PARAM idx_path:BYTE
0075      PARAM max_subs:INTEGER
007C      DIM top,bot,num:INTEGER
008B      top=max_subs \bot=0 \idx_pointer=top/2
00A5      SEEK #idx_path,0
00AE
00AF      REPEAT
00B1          SEEK #idx_path,idx_pointer*SIZE(Index)
00C1          GET #idx_path,Index
00CB
00CC          IF Search_Key<Index.Zip THEN
00DC              top=idx_pointer \idx_pointer= top-(top-bot)/2
00F7          ENDIF
00F9
00FA          IF Search_Key>Index.Zip THEN
010A              bot=idx_pointer \idx_pointer= bot+(top-bot)/2
0125          ENDIF
0127
0128          UNTIL Search_Key=Index.Zip OR top=bot OR top-1=bot
014A          END
```

---



**TURN  
THIS PAGE  
FOR A  
SUPER  
SUMMER  
SPECIAL**

# Hey OS-9 USERS



## Look what we've got!

### O-Pak

#### CoCo OS-9 Utilities and Hi-Res Screen Package

This is the same Hi-res screen that is used on FHL FLEX. Using the same control codes and the same features. The utilities include a three way copy utility that allows copying files between FLEX, OS-9 and Radio Shack DOS. For CoCo OS-9 - **\$34.95** - Available by the end of September.

**DYNASTAR** - Screen Editor - A powerful menu-driven screen editor equally suited to the tasks of program preparation and document processing. For OS-9 or FLEX - **\$149.95** CoCo FLEX or OS-9\* - **\$90.00** (\*Requires FHL O-Pak)

**DYNAFORM** - Text Formatter - Provides all the standard features such as pagination, headers and footers with page numbers, single space, double space, bold face, double strike and more. Purchase with DYNASTAR for complete word processing system. For OS-9 or FLEX - **\$149.95** CoCo FLEX or OS-9 - **\$90.00**  
Buy both together - \$275 for the standard versions or \$175 for CC versions.

**DYNASPELL** - The most versatile 6800 spelling checker available. Fast and easy to use. In assembler for OS-9 or FLEX - **\$199.00** (Requires FHL O-Pak)

**DYNASOFT PASCAL** - A fast, integer only, P-Code compiler ideal for ROMmable applications. Powerful enough for the DYNASTAR word processor. Written for OS-9 - **\$69.95** or FLEX - **\$59.95**  
(Run-time source is an additional \$30.00)

**DYNA 'C'** - The best small 'C' available. A very fast middle 'C' from the people who brought you Dynasoft Pascal. OS-9 - **\$124.95** FLEX - **\$99.95**

**A/BASIC COMPILER** - generates pure, fast efficient 6809 machine code from easy to write BASIC source programs. For OS-9 or FLEX - **\$150.00**

**CRASMB** - Will cross assemble source code into object code. The source or binary available for the following: 6800, 6801, 6809, 6502, 1802, Z80, Z8, and 8048. OS-9 version includes binary. ( Use system to develop software for the MC-10 6803 based Micro Color Computer). OS-9 and FLEX - **\$200.00** (CPM's **\$35.00** ea. additional)

**OSM** - A fast and versatile macro assembler with ability to define macros with substantial parameters, conditional assembly directives and ability to change value of a label or symbol. Create OS-9 binary files in FLEX and vice versa! For OS-9 or FLEX - **\$125.00**

**SUPER SLEUTH** - A set of programs which will enable the user to examine and/or modify binary program files on disk or in memory. For OS-9 or FLEX - **\$99.00**

**6502-6809 TRANSLATOR** - Enables the user to translate 6502 assembler code into 6809 assembler code. OS-9 - **\$85.00** FLEX - **\$75.00**

**FHL IS  
THE  
WORLD'S LARGEST  
SUPPLIER  
OF SOFTWARE  
FOR  
OS-9 OR FLEX**

Send for info on more OS-9 and FLEX programs!

We have been using OS-9 for over 2 years and we are experts on the use and type of software for OS-9. We are working on converting (where needed) all of our OS-9 software to the Radio Shack OS-9. The main difference is Radio Shacks 16X32 screen size. Some of our programs require the 51X24 screen that FHL's O-Pak Hi-Res Screen and Utility package provides.

#### WE ACCEPT

**Visa, M/C, Diners, and American Express or COD.**  
For more detailed information on these programs and others, please call or write for our FREE 32 page catalog. See what we can do for your OS-9 or FLEX systems!!

**FHL FRANK HOGG LABORATORY**  
THE REGENCY TOWER • SUITE 215 • 770 JAMES ST. • SYRACUSE, NY 13203  
PHONE (315) 474-7858 • TELEX 646740

# THE BEST JUST GOT BETTER

## ED/ASM . \$69<sup>95</sup>

### LOOK AT THESE FEATURES ED

ED is both line and screen oriented. This means that you can edit by line number or by using screen type editing where you move the cursor to where you wish to edit and then make your changes. The line editing mode is very handy for programming as most assemblers and compilers refer to line numbers when an error occurs, thus making it easy to correct if the editor like ED can go to a line number to edit. Once there, ED can switch to screen editing to make the corrections.

ED also has cut and paste type of editing, where you can split a line and move the other half. You can also delete and rename files on disk from ED, edit more than one file without leaving ED, and many more. Here is a list of features:

- Menu** will list the command set for ED
- Set** allows changing editor characters
- Cursor** allows changing cursor control strings
- X** sends out a user defined string
- Status** list flags and other internal editor settings
- Head** allows setting and listing of headers and tabs
- Tab** allows setting tab stops
- Width** set screen width
- Number** toggle number flag
- Renumber** rennumbers the lines
- Verify** toggle the verify flag
- Zone** set or reset the zone flag for string searches
- Top** go to the top of the text (also works)
- Bottom** go to the bottom of the text (! also works)
- Next** target line becomes the current line
- Find** finds target string
- Append** appends a string to the current line
- Change** changes this to that in the text
- CChange** like above but asks you first
- Copy** copy a block a text
- Cut** cut the current line at a specified column
- Delete** a line or block of lines
- Expand** tabs in the text
- Insert** insert after the current line
- Move** move a block of text
- Overlay** the line
- Print** a line or block of lines
- Replace** a line or lines
- Splice** a line to the current line
- Stop** save the text to disk and edit
- Abort** exit the editor without changing anything
- New** allows working with files larger than available memory
- Edit** restart the editor with a new file
- Dir** list the directory of the disk
- Read** insert a file from disk into the file in memory
- Write** write a block of lines to a file on disk
- Save** save the file to disk
- List** list a line or group of lines
- FEDL** deletes a file on disk
- FREN** renames a file on disk
- CMACRO** create a macro
- LMACRO** list one or all macros
- DMACRO** delete a macro
- MACRO** execute a macro
- CALCULATE** performs math functions with results in binary, decimal, and hex
- EXEC** exec a text file as a set of commands for the editor
- Bell** rings the terminal bell (useful in macros)
- REM** used to document macros.

As you can see, ED is a very versatile and powerful editor for all your editing needs. It is particularly useful for the programmer that needs a flexible editor!!

**THE BEST JUST GOT BETTER  
\*\* SUMMER SPECIAL\*\*  
ED/ASM ONLY \$69.95**

FHL ED/ASM has been recognized as the most versatile package in its price range for FLEX. Now the best is less. Save \$30 by buying ED/ASM during our summer special!!

### LOOK AT THESE FEATURES ASM

ASM is a fast and versatile (8 bit) macro assembler. It has the necessary elements to support structured constructs like WHILE and FOR etc. These are the ability to define macros with substitutable parameters, conditional assembly directives, and the ability to change the value of a label or symbol. In addition, source code may be assembled in modular form. That is as a series of LIBRARY files. A short file containing a list of file specifications in standard assembler source format may call as many library files as desired. Symbols default to a maximum length of 6, but may be redefined to a maximum length of 3 to 30 characters.

ASM supports auto fielding and automatic label generation. Labels may be automatically generated and accessed within expressions.

This function has great power when used within macros. An example is the BASIC statement PRINT "HI". A macro would be created as:

An example would be:	PRINT MACRO	would expand into:
BRA :1	LDX #:1	PRINT "HI"
FCC "HI",4	JSR PSTRNG	LDX L0001
: EQU *	BRA :2	JSR PSTRNG
becomes:	: FCC "&1",4	BRA L0002
L0001	: EQU *	L0001 FCC "HI",4
FCC "HI",4	ENDM	L0002 EQU *
L0001 EQU *		

### ASM supports the following directives or pseudo operators.

<b>FCC</b>	form constant character(s)	<b>MACRO</b>	define a macro
<b>FCS</b>	form constant string	<b>ENDM</b>	end a macro definition
<b>FCB</b>	form constant byte	<b>EXITM</b>	exit macro being called
<b>FDB</b>	form double byte	<b>DUP</b>	duplicate lines n times up to 'ENDD'
<b>SPC</b>	insert spaces in the output listing	<b>ENDD</b>	end duplication bracket
<b>LEN</b>	set up length of output line for printing	<b>IF</b>	conditional assembly control
<b>OPT</b>	switch assembler options	<b>ELSE</b>	complement true/false flag
<b>PAG</b>	skip to next page	<b>ENDIF</b>	end conditional assembly clause
<b>ORG</b>	define a new origin (*)	<b>ENDC</b>	end conditional assembly clause
<b>RAM</b>	define a new storage counter origin (.)	<b>WHILE</b>	incremental conditional assembly control
<b>EQU, SET</b>	(re-) assign a value to a symbol	<b>WELSE</b>	complement sense of WHILE test
<b>END, MON</b>	signal end of source code	<b>ENDW</b>	end WHILE clauses
<b>NAM, TTL</b>	specify a name or title	<b>LIB</b>	open a library source code file
<b>\$TTL</b>	specify a subtitle	<b>SYM</b>	define length of significant characters for symbols
<b>RMB</b>	reserve memory bytes		
<b>ERR</b>	print error message		
<b>RPT</b>	repeat following line n times		

So, order FHL ED/ASM today and take advantage of our SUMMER SPECIAL to bring out the true power of your CoCo.

We will accept Prepaid, COD, VISA, M/C and Diners. Please include \$3.50 for shipping and handling.

# FHL FRANK HOGG LABORATORY

THE REGENCY TOWER • 770 JAMES ST. • SYRACUSE, NY 13203 • TELEX 646740 • (315) 474-7856

# THE BEST JUST GOT BETTER SUMMER SPECIAL FHL FLEX ONLY \$69<sup>95</sup>

FHL CC-FLEX has become the standard FLEX for the CoCo. Now you can buy CC-FLEX for only \$69.95 for a savings of \$30. CC-FLEX includes more extras, more utilities, and more functions than any other.

## INCLUDES:

- \* **BEST PRICE IN THE WORLD!**  
At \$69.95, CC-FLEX, with all these features, is the best price anywhere!
- \* **OFFICIALLY LICENSED TO FHL FROM TSC**  
CC-FLEX is an official licensed FLEX from TSC. Be wary of unlicensed implementations.
- \* **NEW SMOOTH SCROLLING**  
New with version 5.0:4 is SMOOTH scrolling. This is a feature not found on any other FLEX.
- \* **NEW VARIABLE RATE SCROLLING**  
Variable rate scrolling lets you control the speed that the screen scrolls, from smooth to very fast scroll. Also this version of CC-FLEX is 50% faster in scrolling than previous versions.
- \* **NEW 'TED' TINY EDITOR**  
Included with CC-FLEX at \$69.95 is 'TED', which stands for Tiny Editor. TED is fine for small editing jobs and is the easiest editor to use of any available. You can learn how to use it in less than five minutes!
- \* **NEW 'ISM' INTERACTIVE ASSEMBLER**  
ISM is the program for those interested in assembly language but not convinced that they need to buy one. ISM is the perfect teaching tool to use to learn assembly language programming. You will need to use it in conjunction with a book on the subject (not provided). However, ISM includes a complete manual on its operation.
- \* **NEW EXTERNAL TERMINAL PROGRAM**  
If you want to run CC-FLEX connected to a terminal so that you can get the benefit of a real keyboard and full 24 x 80 display, then EXT will do it for you. EXT allows a standard terminal and printer to be connected to the CoCo. 'NEW' EXT now supports real hardware handshaking.
- \* **EASY START UP**  
Just type RUN"FLEX" or DOS if you have 1.1 Disk ROM. Quote from the June 1983 issue Hot CoCo. Re: FLEX by David Wasler, pg. 143, "It is the easiest to use. After you receive it, just put it in your drive and type RUN"FLEX"."
- \* **ONLINE "HELP" CAPABILITY**  
Just like the big mainframes, CC-FLEX has a help function. Just type 'HELP' and CC-FLEX will answer your questions and help you run FLEX without having to keep paging through the manual.
- \* **RECONFIGURABLE TO YOUR NEEDS**  
CC-FLEX'S powerful SETUP facility lets you change CC-FLEX to suit your needs and hardware. CC-FLEX is the only FLEX that gives you such complete control.
- \* **SUPPORTS ALL DRIVE TYPES AND SIZES, EVEN 3"**  
CC-FLEX supports every type of drive currently available for the CoCo. These include 35, 40 and 80 track single and double sided. Even the new 3 inch from AMDEX. We supply support software on the 3 inch drive.
- \* **SIX DIFFERENT HI-RES SCREENS**  
51 x 24 and 16 x 32 with true lower case, 64 x 24 and 64 x 32 all upper case. You can switch between these screens at will. The different scroll types are available for each screen type.
- \* **SUPPORTED BY THE LARGEST 6809 SOFTWARE FIRM IN THE WORLD!**  
FHL is the largest software house in the world for 6809 based computers! We have over 100 software packages for FLEX and OS-9. We support CC-FLEX like no other.

## OPTIONS AVAILABLE AT EXTRA COST:

- \* **DBASIC** - Radio Shack Disk Basic adapted to work with FLEX.  
This is standard RS Disk Basic working with FLEX. This only works with FHL FLEX at this time. DBASIC has everything that RS Disk Basic has except for Direct access files and those functions that go with Direct access files.
- \* **ED/ASM** - Full feature Editor and Assembler  
SPECIAL now only \$69.95! ED/ASM is the best Editor and assembler for the Color Computer. The editor is both screen and line oriented while the assembler is a full conditional macro assembler.

## REVIEWS:

Quote from the June 1983 issue of HOT COCO. Re: FLEX by David Wasler, pg. 143.  
"Frank Hogg Color FLEX has been on the market the longest and has the most software support. It is also the easiest to use. After you receive it, just put it in your drive and type RUN"FLEX"."

Quote from the March 1983 80 MICRO review by Scott Norman, pg. 101.  
"I think CC-FLEX offers the most painless way of trying one's hand at an advanced operating system for the Color Computer. It offers quite a few "big machine" features, and opens the door for a lot of applications software."

Frank Hogg Lab brought FLEX to the CoCo over a year and a half ago. It has gone thru 5 updates since its original release in February 1982! FHL not only has FLEX, we support our FLEX with more software than anyone else in the world! We have over 100 software packages compatible with FHL CC-FLEX to fulfill all your needs. These range from languages, utilities and software development tools to data base management, word processing and business applications. We guarantee these programs will work with our FHL CC-FLEX and probably with any licensed version of FLEX!

And, there is no better way to purchase FLEX for less!!

So, order FHL CC-FLEX today and take advantage of our **SUMMER SPECIAL** of **\$69.95** to bring out the true power of your CoCo!!

We will accept Prepaid, COD, VISA, M/C and Diners. Please include \$3.50 for shipping and handling.

**FHL** FRANK  
HOGG  
LABORATORY

THE REGENCY TOWER • 770 JAMES ST. • SYRACUSE, NY 13203 • TELEX 646740 • (315) 474-7856

---

## MAIL CALL

Dear Color Computer News,

I thought some readers might like to know how I connected a Freedom 50 terminal to the Color Computer for use with FHL's Flex V5.0:4.

First, the hardware connection from the computer to the terminal:

CC's RS232 DIN Terminal's Main Port

pin 1	pin 2
pin 2	pin 20
pin 3	pin 7
pin 4	pin 3

Next, the hardware connection from the terminal to the printer:

Terminal's Aux. Port	Printer
pin 7	ground
pin 3	data
pin 20	status

Set the printer and terminal to 9600 bits per second. Bring up Flex and set it to 9600 bps with

```
+++ SETUP PB9600
```

then turn control over to the terminal with

```
+++ EXT 1,14,4,12,18,3F,18
```

and everything should work fine. note that this is the version of EXT that works with Flex V5.0:4. The older version of Flex and EXT used a different physical connection, as described in the Flex manual.

My printer is a Microline 92 with a serial-to-parallel interface I built myself. The interface transfers everythig it receives directly to the printer. Unfortunately the code (\$14) that causes the terminal to stop

sending to the printer IS sent to the printer. And, more unfortunately, this code tells the printer to expect vertical tab information which will be terminated by a question mark (\$3F). So, the sequence of codes to turn the printer port on must include the \$3F. Otherwise the printer will not print, thinking it is being fed vertical tab information!

Frank C. Sergeant  
Austin, TX

Editor:

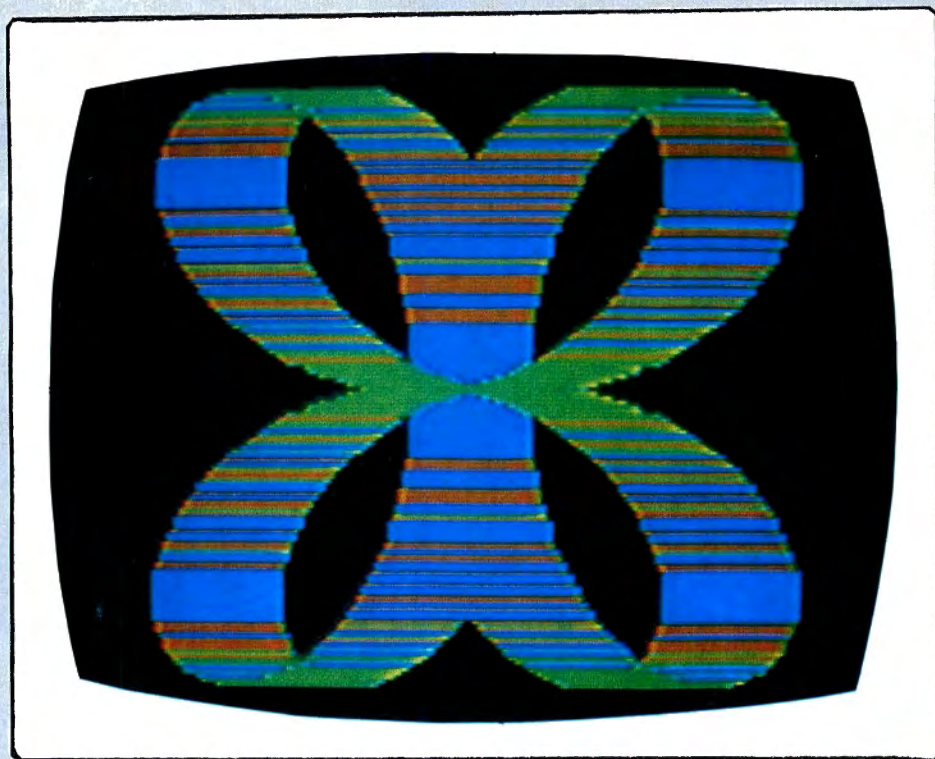
I would like to announce the formation of the COCOMUG of Marion Ind. We are meeting on the second Monday of each month at 7:00 pm at the Marion Public Library. The COCOMUG of Marion Ind. will serve the interests of all present and prospective COCO owners in Marion and Grant County.

Anyone wanting more information about this growing users group may contact me at 3635 N 300 East, Marion, IN. 46952 or just show up at the meeting. I would also be interested in hearing from other clubs in Indiana.  
Yours Truly,  
John A. Helwig  
Marion, IN

Dear Bill,

Please pass on to your readers a couple of corrections and/or updates of my review of PRO-COLOR-FILE from Derringer Software.

# ColorExpo'83



Peripherals Games Education Powers  
Software Bjork Seminars Kitsz Graphics  
Users groups Hardware Exhibits Commander Barden

**Pasadena, California**

**Nov. 4-6, 1983**

**Pasadena Center Conference Building**

Friday Nov. 4 4-10 PM  
Saturday Nov. 5 10 AM-6 PM  
Sunday Nov. 6 10 AM-4 PM

For further information call Mike Federle  
207-236-9621 Highland Mill  
Camden, ME 04843

Dennis Derringer has re-written several portions of P-C-F, and it now seems to be compatible with a wide variety of printers. (I am delighted with his actions, because I failed miserably in my attempts to write changes!) My problem with remembering to get out of lower case to give commands in some routines is no longer a problem, since the programs now accept either upper or lower case commands.

I got too nosy about the contents of the review disk Dennis sent me, and found a routine that was not supposed to be on the disk. Other purchasers should not expect to find on their disks the routine for storing a copy of the disk directory on track one.

Dennis has polished the manual considerably, and has added a few enhancements of some routines. He is still updating Version 1.0 to 2.0 for \$20.00 plus \$2.00 shipping and handling, as advertised. He will soon be advertising an Enhanced Version with more report formats, more equations, simpler additions of fields, etc. When advertised, the Enhanced Version will be available to owners of Version 2.0 for \$5.00 plus \$2.00 shipping and handling.

The more I use P-C-F the easier it is to use and enjoy, so I've revised my subtitle, "Difficult, but Worth It" to "Difficult (at First), but WORTH IT!"  
Old Father William†

Dear Sir;

While working with my new Gemini printer and attempting to become familiar with it, I hit upon an idea which seems to come in handy for me and I hope will prove useful to others. The general idea is to have "Pre-formatted" print codes for your printer and word processor.

I am using the "Telewriter-64" W/P, disk version, and love it, however I had problems putting the formatting codes into the text without going

through and re-defining them each time I wrote something. This proved to be confusing and time consuming.

The T/W 64 program allows you to define nine embedded format codes in the text, which can be used to send print control info to the printer. (e.g. Emphasized Print, Double Wide, Italics).

I have written a short format text and saved it to disk. In it, I pre-define eight format codes which I use regularly and can remember easily. In my situation I predefined as follows:

D1.....Double Width  
D2.....Italics On  
D3.....Italics Off  
D4.....Underline On  
D5.....Underline Off  
D6.....Superscript On  
D7.....Subscript On  
D8.....Super/Sub Off  
D9.....Spare

Now when I write something, I call up this program (text) and therefore have the codes already to use in the main text. I also put in comment lines after each code to help jog my memory in case I forget. In T/W-64 these comment lines are not printed and therefore need not be considered when in use.

Here's to you all, and I hope this little trick is helpful to others.

Yours Truly:  
Dean Norris  
Tempe, AZ

Dear Bill:

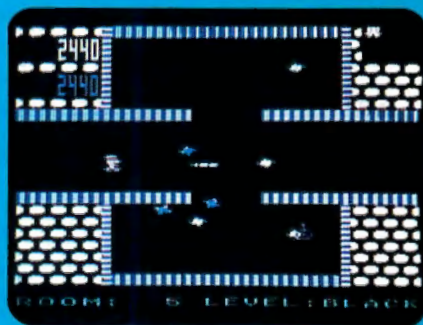
I enjoy the Color Computer News and look forward to its arrival each and every month. Kudos to Kelly Software the Canadian Distributors of Color Computer News; for keeping me up to date with my change of address two months in a row. It's a great improvement from 1982. I particularly enjoy Flex Corner by Roger Degler and Star-Kibbits by Peter Stark (who did not sign his column in the June issue).

# Who says all the good games are for somebody else's computer?

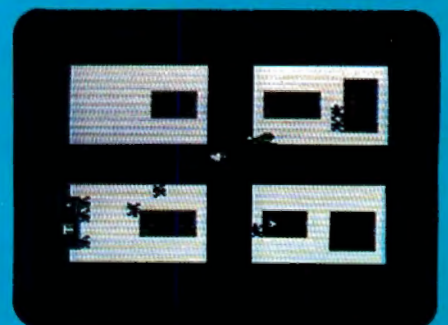
Synapse Software turns your color computer from a micro to a monster!



PROTECTOR II™



SHAMUS™



PICNIC PARANOIA™

Only \$34.95 in disk or cassette at independent software dealers everywhere.



Or buy direct from the Synapse Elite. Send check or Visa/Master-card number. Include \$34.95 for each game plus \$2 for shipping and handling.

## synapse

5221 Central Avenue, Richmond, CA 94804 • (415) 527-7751



Roger's article on the Composite Video was quite timely. I was in the process of doing the same thing myself but achieved the same results in an entirely different way. I have a 12" B/W TV modified to accept a video signal tapped off before the RF modulator (pin 1 of U5), in the computer. Therefore, since I use my Computer on a B/W TV most of the time there is no need for color information being present. The color signal may be disabled by simply adding a .01 capacitor to ground from Pin 8 of U12(MC1372) which is the color TV video modulator. This effectively kills the color signal but allows the B/W signal to pass through undisturbed. By adding a SPST switch this capacitor may be switched in and out to restore color when needed. This addition accomplishes the same result as Rogers circuit using much less hardware.

Sincerely,  
Jim Payette  
Sault Ste Marie

Dear Bill:

Thanks for publishing Color Computer News. It's refreshing to find a magazine devoted to providing information about my computer, and advertisers with items for my computer. It was frustrating subscribing to different magazines hoping to find information about using the Color Computer. Most computer magazines on the magazine stands are either too general, or tend to emphasize Atari and Apple Computers.

I particularly like your Color Computer tips. I found several of them helpful in programming. I wish you would list the pages they appear on in every issue's index. It would make it easier to find them when searching past issues for a specific tip.

When I first began receiving your magazine I didn't understand many of the articles. I'm still having trouble,

but I'm trying to understand the information in Color Computer News. I see all sorts of do-it-yourself articles on how to improve the Color Computer. However, when it comes to doing anything mechanical or electrical, I'm all thumbs. I envy CoCo owners who upgraded their computer to 64K. I'm tired of waiting for Radio Shack to get their act together and make 64K available. Is there a reliable business or company that does work like expanding Color Computer's memory to 64K and changing the keyboard to one of the new keyboards available for the Color Computer?

I'm writing not only to complement you on your great magazine, but to ask if you or your readers could tell me how to disable the clear key on my computer when a program is running. Also, is there a memory location I could POKE to prevent someone from listing out my program on their CRT screen or printer after they've loaded the program and before they've begun running it.

Disabling the clear key would ensure users of my program would not become frustrated and upset because they hit the clear key and destroyed the screen's display. I have also thought about sending a couple programs I've written to some of your advertisers to see if they consider them worth marketing. I would like to prevent anyone from listing out the program.

Earlier I mentioned how helpful Color Computer tips have been. I have one of my own. I've found I can list part of a program in my computer's memory on my Prowriter printer by typing in "LListn-n", with line numbers replacing the n's. I didn't find this information in any of the manuals that came with my computer. I hope it's information other "CoCo" owners can use, and that it works for them. It's handy for debugging part of a program to list out just the section concerned, and not have to contend with the whole

Dear Old Father William,

Thank you for your very kind review of LOWERKIT. The LOWERKIT is now being supplied directly by my company, Green Mountain Micro, Roxbury, Vermont 05669, (802) 485-6112, or from distributors such as Spectrum Projects in Woodhaven, New York. At last the confusion caused by the bankruptcy of my two previous distributors will end; I am relieved that users can look directly to Green Mountain Micro for continuing support. Perhaps your readers would also like to know that I have improved the LOWERKIT in several ways:

1. In response to your suggestion, I agree that a 5x7 dot matrix (fully compatible with Radio Shack's original character set) is more legible on some television and monitors, avoiding any character touching or bleeding.

Therefore, 5x7 versions are now available for all character sets; the standard character set may be ordered at the regular price by specifying "5x7 LOWERKIT".

2. I also agree that an IC puller would be a good idea for removing the 6847 VDG, although I don't own one! (Am I embarrassed? No, I just have lots of nail files to use up). I'll be happy to throw one in with each LOWERKIT as soon as I get a low-cost source. Readers are welcome to lead me in the right direction.

3. The big news from my perspective is the LOWERKIT II, with improved features at the same price. Many users have suggested that I employ the full 8x12 dot matrix instead of the 7x12 that I have programmed in the past. In that way, composite characters (like pointing hands or invading spacecraft) can be printed on the screen. I liked that idea, so all units now being shipped are LOWERKIT II versions with this upgrade in place. LOWERKIT owners wishing to perform the upgrade can do it in about 15 minutes; drop me a self-addressed envelope for instructions.

4. Readers with TDP-100 computers or Color Computer NC-revision circuit boards (4002A and 4004A Color Computers) can install the Lowerkit by removing the plastic post and remodeling the metal shield. Again, instructions are available with the LOWERKIT II, or by sending me a self-addresses envelope.

Once again, thank you for your kind review and for your ever-expanding magazine of Color Computer ideas.

Sincerely,  
Dennis Kitz  
Green Mountain Micro  
Roxbury, VT

\* As I read your last sentence I get the feeling that you think I'm Old Father William and if you have that impression others may also. You can tell us apart because he's a priest and I've got hair.

Dear Sir,  
NEW CLUB; Penn-Jersey Color Computer Club

Now a Color Computer user's group in Eastern Pennsylvania area. We have members from the Allentown, Bethlehem, Easton PA. and Phillipsburg, NJ areas.

For more information call Bill Jones at (215) 253-5733 or Jerry Behler at (215) 434-6387.

Thank You,  
Jerry Behler  
Allentown, PA

We would like to use your magazine to announce the formation of the Billings Color Computer Club in Billings, Montana. We would also like to hear from all the other clubs around the country. Please write to Jayne Kenyon, Secretary, 4306 Phillip, Billings, MT 59101.

Thank you,  
Jayne Kenyon  
Billings, MT

---

---

# HOW TO PAGINATE YOUR LLIStings

By Bill Williams  
1080 Bush Street, Apt. 609  
San Francisco, CA 94109

I don't know about you, but I like my listings paginated, now raw. That means I'd like a margin at the bottom of each page, with no printing across the perforations of my continuous forms. I'd like a title line at the top of each page, and a page number. Also, I'd like a left margin, so I can punch holes in the listing and put it in a three-ring binder.

These seem like elementary requirements, but BASIC's LLISt doesn't satisfy any of them. Neither does my assembler (Microworks SDS80C) nor my disassembler (Microworks). Perhaps you suffer from the same affliction.

One solution is to write the text onto a tape or disk file, then have a format program to read the file and print a nice listing. The advantage of this approach is that, since the text to be listed isn't occupying a fat block of memory, you can have a large and fancy format program, and can do a really swell job of formatting the listing.

Color Scripsit is an example of such a program. It will do the job on a BASIC program that has been saved in ASCII format. It won't read my assembly language source programs, however, because of the different tape format.

And that's just the trouble. You need a different program or routine to handle every different tape format. Ah yes, well

wouldn't it be nice to have some standardization of tape formats, you'll be saying? Yes indeed it would, but I hope they don't standardize on ASCII (Ultra Slow) format.

There is an even bigger drawback to this whole method than incompatible tape formats, however. The biggest drawback is that it involves too cottonpicking much tape copying.

Just consider a typical program development cycle: You're going to edit and debug awhile, then save your work on tape, edit and debug a bit more, adding new features, then save the program again, etc. etc.

Now if you are like me, you will not want to wait for your program to arrive at it's final state of perfection before you list it, but will want to review it to see what you have done. And every time you do it, you will have to:

- a) Save the program on tape.
- b) Load the format program.
- c) Run the listing, and
- d) Reload the program for further testing.

That makes three (3) tape copies!!! At that rate, you could spend 90 percent of your time just doing tape copies. If you are like me, this will lead yu to strongly consider,

a) rushing down to Radio Shack to buy a disk system, or

b) giving up programming altogether.

Instead of going to either of these extremes, however, I have come up with a better solution. It does not require a separate program to read a tape file. It does require a short routine (592 bytes) to remain in a protected area of memory.

The idea is to use a RAM hook to trap every character going to the printer, forcing it to pass through a special routine (the trap routine) on the way.

The trap routine is mainly interested in carriage returns. It allows other characters to pass through unmolested. But when it gets a carriage return, it increments a counter, and when the counter gets to 55, it outputs a form feed and the title line. Also it pumps out several space characters after each carriage return, to give a left margin.

The beauty of this technique is that I don't have to write the instructions that actually format the listing, and I don't have to know anything about tape formats. I simply insert some extra characters into the print stream at strategic spots.

In this article, I show you a trap routine that has been designed for use with BASIC's LLIST. However, you can use basically the same routine with any program you can find a hook into.

Creating the Routine:

You have two choices. If you have an assembler, you can enter and assemble the program PAGINATE, listed below. Or, you can just run the BASIC program BLDPAGIN, also listed below. BLDPAGIN will ask you some questions (run parameters), build the routine in high memory, and then CSAVEM it. If you do assemble PAGINATE, then make sure you save the object code so that the execution starting address is 4 bytes beyond the load point.

Using the PAGINATE Routine:

1. First you have to CLEAR, to protect memory above the load point. So, if the

load point is 15600, for example, then you would CLEAR 20,15600.

2. CLOADM the routine.

3. Now you are all set. Every time you want to LLIST, do an EXEC first. The EXEC will ask you to type in the title line, then it will set the RAM hook, and return to BASIC. A subsequently executed LLIST will be paginated with the indicated title.

4. This might seem obvious, but in order for the routine to work properly, you have to position your printer paper to the top of a page before each listing.

Parameters:

As mentioned above, the execution starting address is 4 bytes beyond the load point. That is because the first 4 bytes are run parameters. Initial values are given below, but you can change them by poking in new values.

Byte 0 - is Line Width, initial value 79. Line longer than this will be continued on a new line.

Byte 1 - is Lines per Page, initial value 56. This tells the routine how many lines to allow on a page before skipping to the next.

Byte 2 - is the Left Margin, initial value 9.

Byte 3 - is the Indentation of Continued Lines, initial value 5. Lines which have to be continued because of their excessive length do not print in the left margin. In fact, they are indented. By this many spaces.

Gory Internal Details:

1. How the RAM Hook Works.

The RAM hook we are using is at location \$167. The three bytes at that location are designed to have either an RTS instruction, or a JMP to some trap routine. BASIC does a call to \$167 just before outputting each character.

Our trap routine being at PTRAP.

When PAGINATE is first called (by the EXEC command), it picks up the three bytes at \$167 and saves them in a place called SAVHKP. Then it puts a JMP instruction into \$167-\$169 that points to

PTRAP. This makes BASIC call PTRAP before outputting each character.

You will notice that the trap routine ends by falling right into SAVHKP, thus transferring control to wherever it was that BASIC originally meant to go.

### 2. Testing the Device Number.

BASIC does a call to location \$167 prior to outputting a character to any device, not just the printer. So we have to exclude from consideration all those characters not destined for the printer. That is why we test the device number at the beginning of PTRAP.

### 3. PAGINATEing your Assembly Listings.

If you want to try and change PAGINATE to work with the Microworks SDS80C, here are a couple of things you should know.

First, SDS80C doesn't call the hook at \$167. It calls \$15E (another RAM hook) instead.

Second, SDS80C calls \$A2BF, not \$A282, to print a character. \$A282 is a general purpose character output routine for all devices. \$A2BF is specifically for printer output. So you can remove the device number test at the front of PTRAP.

```

180 'BUILD ML LLIST PAGINATION
181 'SUBROUTINE
182 '
183 'BY BILL WILLIAMS
184 '
185 '    1080 BUSH ST.
186 '    SAN FRANCISCO, CA 94109
187 '
188 '    (C) BILL WILLIAMS 1983
189 '
200 MT = 256*PEEK(&H74)+PEEK(&H7
5)
210 READ BC,WA
220 LH = MT+2 -BC-WA
230 LL = 256*PEEK(&H1F)+PEEK(&H2
0)+200
300 CLS : PRINT
310 PRINT "NOW ENTER THE LOAD PO
INT"
320 PRINT "FOR THE SUBROUTINE."
```

```

330 PRINT
340 PRINT "IT MUST BE HIGHER"
350 PRINT "THAN ";LL TAB(16) " (
&H"; HEX$(LL);") "
360 PRINT
370 PRINT "BUT NOT HIGHER"
380 PRINT "THAN ";LH TAB(16) " (
&H"; HEX$(LH);") "
390 PRINT
400 INPUT "LOAD POINT: ";SB
410 IF SB <= LL THEN 300
420 IF SB > LH THEN 300
500 'SAVE LOAD PT BEFORE CLEAR
510 LH = INT(SB/256)
520 LL = SB - 256*LH
530 POKE &H9D,LH
540 POKE &H9E,LL
550 CLEAR 20,SB
600 'SET RUN PARAMETERS
610 DIM PN$(4),PV(4)
620 PN$(1) = "LINE WIDTH"
630 PV(1) = 79
640 PN$(2) = "LINES PER PAGE"
650 PV(2) = 56
```

RAINBOW CONNECTION SOFTWARE presents . . .



The ultimate in hi-res graphics text display. Allows your Color Computer to write text on any graphics screen in Rainbow colors.

#### CHECK THESE IMPORTANT FEATURES:

- User definable 224 character set featuring true lowercase with descenders, improved cursor, slashed zero, Greek math symbols, lunar landers, stick figures, tanks, cars, planes, card suits, etc.
- Supplied character generator program allows easy creation of colored, animated figures to save and use in your own character-graphics programs.
- Works in all PMODES. Four-color artifacted characters in PMODE 4 (highest resolution)!
- Two character sets for maximum clarity produce 12 character densities. 32 x 16, 42 x 24, 50 x 24, 64 x 24, plus double widths in PMODE 4.
- Pre-loader allows optimum loading in 16K, 32K or 64K machines. The 64K selection automatically transfers all ROM (including cartridge) to RAM. Uses 4-5K of memory.
- ML extension of BASIC completely interfaced and transparent incorporating direct conversion of all keys and commands including PRINT @.
- Automatic underline, superscript, subscript, reverse video, top and bottom definable scroll protect options.
- User friendly — easy operation via Status/Help screen, simple commands, no messy peeks and pokes.
- Use all day for hi-density screen displays, graph labels and listings, or incorporate into your own marketed BASIC or ML games, word processors, etc.
- Special EDTASM+ command allows instant compatibility with R.S. editor-assembler cartridge.
- Includes demo program, tape/disk conversion instructions, character generator program, and operators manual.
- Large colored letters for children or video recorders direct from keyboard or program.

YES I want to easily create dazzling displays with the best SCREEN Enhancer for my Color Computer. Please RUSH me the incredible RAINBOW - WRITER (16K Extended Basic Required) at the affordable price of \$29.95 Tape - \$32.95 Disk

Shipping \$3.00  
Minnesota residents add 6% Sales Tax  
VISA & Mastercard add 3%  
E-mail

Personal checks welcome - no delay  
Send SASE for catalog

NAME \_\_\_\_\_  
ADDRESS \_\_\_\_\_  
CITY \_\_\_\_\_  
STATE \_\_\_\_\_ ZIP \_\_\_\_\_

TOTAL \_\_\_\_\_

RAINBOW CONNECTION SOFTWARE  
3514 6th Place NW, Suite C  
Rochester, MN 55901  
507-288-4424

RAINBOW CONNECTION SOFTWARE



# SUPER-PRO KEYBOARD\*

- Professional, low profile, finished appearance.
- U.S. made—high quality, quad gold contacts.
- Smooth “Touch Typist” feel—no sagging.
- Original key layout.
- No soldering—fast, simple installation.
- No special software required.
- Individually boxed with full instructions.
- **Only \$69.95.**

AT YOUR FAVORITE DEALER OR DIRECT FROM

# MD

\* Computers produced after approximately October 1982 require an additional keyboard plug adapter. Please add \$4.95.

ALL ORDERS: Please add \$2.00 shipping and handling in the Continental U.S. All others add air shipping and \$3.00 handling. California residents add 6% sales tax. Foreign orders please remit U.S. funds. We accept VISA and MasterCard.

# COLOR COMPUTER SOFTWARE



#### NEW ARCADE GAMES

GLAXXONS / EL BANDITO / COSMIC CLONES / BUMPERS

#### OTHER GREAT ARCADE GAMES

HAYWIRE / ASTRO BLAST / CAVE HUNTER / SPACE RAIDERS  
Arcade Games, Cassettes 24.95—Require 16K / Discs 29.95— Require 32K

#### ADVENTURE GAMES

CALIXTO ISLAND / THE BLACK SANCTUM  
Adventure Game Cassettes 19.95—Require 16K

## Mark Data Products

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

Software Authors—Contact us for exciting program marketing details.

```
660 PN$(3) = "LEFT MARGIN"
670 PV(3) = 9
680 PN$(4) = "CONT'D LINE INDENT
ATION"
690 PV(4) = 5
700 CLS : PRINT : PRINT
710 PRINT "RUN PARAMETERS ARE:"
720 PRINT
730 FOR I = 1 TO 4
740 PRINT PN$(I);TAB(27);PV(I)
750 NEXT I
760 PRINT
800 INPUT "DO YOU WANT TO CHANGE
THEM ";YN$
810 IF YN$ = "Y" THEN 900
820 IF YN$ = "N" THEN 39000
830 PRINT "WHAT??"
840 GOTO 800
900 PRINT
910 FOR I = 1 TO 4
920 PRINT PN$(I);TAB(27);
930 INPUT PV(I)
940 NEXT I
950 GOTO 700
39000 'POKE IN RUN PARAMETERS
39010 SB = 256*PEEK(&H9D)+PEEK(&
H9E)
39020 READ BC,WA
39030 SE = SB+BC
39040 FOR I = 1 TO 4
39050 POKE SB+I-1,PV(I)
39060 NEXT I
39200 CLS
39210 PRINT "NOW LOADING THE SUB
ROUTINE"
39220 PRINT "FROM DATA STATEMENT
S ..."
39230 PRINT
40000 'LOAD ASSEMBLY ROUTINES
40100 C1 = 0
40110 C2 = 0
40120 LG = 0
40130 L = SB+4
40200 READ I$
40210 IF I$ = "END" THEN 40900
40220 IF I$ = "CHKSM" THEN 40800

40300 FOR I = 1 TO LEN(I$) STEP
2
40310 V = VAL("&H"+MID$(I$,I,2))

40320 POKE L,V

40330 V = (C1 OR V) AND NOT (C1
AND V)
40340 C1 = C2
40350 C2 = V
40360 BC = BC-1
40370 IF BC >= 0 THEN 40500
40380 PRINT
40390 PRINT "BYTE COUNT OVERFLOW
"
40400 GOTO 41000
40500 L = L+1
40510 NEXT I
40600 LG = (LG+1) AND 3
40610 IF LG=0 THEN PRINT "LOADIN
G ...",
40620 GOTO 40200
40800 V = 256*C1 + C2
40810 READ I$
40820 IF VAL(I$) = V THEN 40900
40830 PRINT
40840 PRINT "BAD CHECKSUM "; HEX
$(V)
40850 GOTO 41000
40900 IF BC = 0 THEN 42000
40910 PRINT
40920 PRINT "BAD BYTE COUNT ";BC

41000 PRINT
41010 PRINT "PLEASE CHECK YOUR"
41020 PRINT "DATA STATEMENTS FOR
ERRORS"
41030 END
42000 CLS : PRINT : PRINT
42010 PRINT "WHAT DO YOU WANT TO
CALL"
42020 PRINT "THE MACHINE LANGUAG
E"
42030 INPUT "TAPE FILE ";N$
42040 IF N$ = "" GOTO 42000
42200 PRINT : PRINT
42210 PRINT "NOW LOAD AND POSITI
ON YOUR TAPE"
42220 PRINT "AND PREPARE YOUR RE
CORDER"
42230 PRINT "TO RECORD"
42240 PRINT
42250 PRINT "PRESS < ENTER > WHE
N READY ";
42260 INPUT I
42270 CSAVEM N$,SB,SE,SB+4
42280 END
50010 DATA &H01C8,132
```



```

50020 DATA 2013FFFF,FFFFFFFF
50030 DATA FF504147,45202020
50040 DATA 300D200D,00345633
50050 DATA 8CE28D41,86FFA74A
50060 DATA 860CA74C,6F466F4B
50070 DATA 8620A78C,E1A78CDF
50080 DATA 8630A78C,DB1700B2
50090 DATA 9EA66F84,6F016F02
50100 DATA 35D63510,8D026E84
50110 DATA A6802705,BDA30A20
50120 DATA F739BDA1,99BDA1C1
50130 DATA 27F8847F,398DE30D
50140 DATA 48454144,4552204C
50150 DATA 494E4520,41542054
50160 DATA 4F50204F,46205041
50170 DATA 47453F0D,28592F4E
50180 DATA 293A2000,8DCC8159
50190 DATA 270A814E,26F65FE7
50200 DATA 478D4E39,C6018DF7
50210 DATA 8DA80D45,4E544552
50220 DATA 20544845,20484541
50230 DATA 44455220,4C494E45
50240 DATA 3A200D00,BDA393E7
50250 DATA 84E6C4C0,08E042E1
50260 DATA 842402E7,84E08454
50270 DATA 1F982401,5CAB42ED
50280 DATA 48E68033,8D00F1BD
50290 DATA A59A6FC4,338DFF1C

50300 DATA 39BDA30A,860DBDA3
50310 DATA 0A396D8C,61260CB6
50320 DATA 0167A78C,59FC0168
50330 DATA ED8C5486,7EB70167
50340 DATA 308C04BF,01683934
50350 DATA 56338DFE,EFD66FC1
50360 DATA FE2637E6,4CC10C26
50370 DATA 068D36A6,E42004C1
50380 DATA 0D26048D,35A6E481
50390 DATA 0D271B6C,4BE64BE1
50400 DATA C4231534,02860D8D
50410 DATA 32A74CBD,A2BFA643
50420 DATA A7463502,20CD8D23
50430 DATA A74C3261,35540000
50440 DATA 006F4A6D,4727028D
50450 DATA 1D39C601,810D2708
50460 DATA E642EB46,E74B6F46
50470 DATA 8D52396C,4AE64AE1
50480 DATA 41230286,0C398D16
50490 DATA E6488D40,308C498D
50500 DATA 31E6498D,37304D8D
50510 DATA 29C602E7,4A3930C8
50520 DATA 158D0926,068D0526
    
```

```

50530 DATA 028D0139,A6828120
50540 DATA 26048631,20074C81
50550 DATA 39230286,30A78481
50560 DATA 3039A680,2705BDA2
50570 DATA BF20F739,5D270886
50580 DATA 20BDA2BF,5A26FA39
50590 DATA CHKSM,&H3645,END
    
```

```

*****
*** BASIC Compiler ***          $39.95
This new BASIC compiler, called INTBASIC, will become
one of your most used utility programs. Convert BASIC
source code to 6809 machine language programs.
SPECIFICATIONS:
* Syntax- PRINT,PRINT#-2,INPUT,INKEY$,PEEK,POKE,FOR..STEP..
NEXT,IF..THEN,GOTO,GOSUB,RETURN,STOP,END,DATA,
READ,RESTORE,DIM,REM,CLS,EXEC,PMODE,PCOPY,IBSFT,
CHR$ and ASC equivalent.
* Variable types- 26 Scalar integer variables, 26 dimensioned
integer arrays (1 or 2dimensional), and 26 string
arrays.
* INTBASIC allows the use of all 64k bytes of RAM along
with all 32k available ROM in ONE program.
* INTBASIC comes in a 16,32 or 64k RAM version, where
ALL VERSIONS ARE INCLUDED.
* No Disk is needed! No Extended Basic needed.- CLOADM from
tape and EXECute the compiler "In Memory".
Send check or money order          Wasatchware- PO Box 510371
No C.O.D.. Utah res. add 5%        SLC,Utah 84151-0371
*****
    
```

**PROGRAMS OF VALUE!! SAVE TIME?MONEY!!**

**VIKING CC SOFTWARE**

- 1/OWNERSHIP**
  - a. evaluates mortgage; principal, interest, payments, escrow
  - b. records owner information; home specs., deed inf., etc.
  - c. records items owned, date purchased, cost, total
  - d. evaluates item depreciation/per %
  - e. value to insurance records 24.95/tape
- 2/BUDGET**
  - a. records income
  - b. records bills
  - c. evaluates income/expenses 16.95/tape
- 3/CHECKBOOK BALANCE**
  - a. outstanding checks
  - b. deposits
  - c. bank statement
  - d. calculates/records all figures 19.95/tape
- 4/'82 TAXES-form 1040 A**
  - a. record 1040A long form
  - b. calculates all figures
  - c. saves all figures 16.95/tape

All 4 tapes/69.95

**KEEP RECORDS: EASY STORAGE**  
**SEND CHECK OR MONEY ORDER**  
 requires 16k extended basic  
 allow 3-4 weeks delivery



**VIKING CC SOFTWARE**  
 1797 HAWKINSON ROAD  
 OREGON, WI 53575

```

0001 0600          NAM  PAGINATE
                    *
0002 0400  SCREEN EQU  $400
0003 A928  CLRSCR EQU  $A928
0004 A199  CBLINK EQU  $A199
0005 A59A  MOVSTR EQU  $A59A
0006 A393  READLN EQU  $A393
0007 A30A  DSPLCH EQU  $A30A
0008 A1C1  GETKEY EQU  $A1C1
0009 A2BF  OUTBYT EQU  $A2BF

0010 006F  DEVNUM EQU  $6F
0011 00A6  BASBYT EQU  $A6
0012 0167  PHOOK  EQU  $167

0013 007E  JMPOP  EQU  $7E
0014 FFFE  PRINTR EQU  -2
0015 000C  FF      EQU  12
0016 000D  CR      EQU  13
0017 0008  BS      EQU  8
0018 000F  SHFTBS EQU  15
0019 0003  CTLC   EQU  3
0020 0020  SP      EQU  $20

0021 0008  PNUMLN EQU  8          LENGTH OF PAGE NUM

                    * WORK AREA OFFSETS
0022 0000  WIDTH  EQU  0          LINE WIDTH
0023 0001  LPP    EQU  1          LINES PER PAGE
0024 0002  MARGIN EQU  2          LEFT MARGIN
0025 0003  CNTMAR EQU  3          EXTRA CONTIN MARG

                    * 4 AND 5 CONTAIN THE BRA
0026 0006  INDENT EQU  6          EXTRA THIS TIME
0027 0007  HDROPT EQU  7          1-YES, 0-NO
0028 0008  HBEFOR EQU  8          #SPACES BEFORE HD
0029 0009  HAFTER  EQU  9          #SPACES AFTER HDR
0030 000A  LINECT EQU  10         LINE CNT ON PAGE
0031 000B  CHARCT  EQU  11         CHARACTERS ON LINE
0032 000C  PREVCH  EQU  12         PREV CHAR PRINTED
0033 0007  DSIZE  EQU  13-INDENT WKAREA SIZE

```

```

*
* DATA
0034 0600 WKAREA
0035 0600 4F380905 FCB 79,56,9,5
* EXECUTION STARTING ADDRESS
0036 0604 2013 BRA BEGIN
0037 0606 RMB DSIZE
0038 060D 5041474520 PG FCC /PAGE /
0039 0612 202030 PAGECT FCC / 0/
0040 0615 0D200D00 FCB CR,SP,CR,0

0041 0619 BEGIN
0042 0619 3456 PSHS D,X,U

```

PAGINATE - RAM HOOK TRAP ROUTINE TO PAGINATE LLISTINGS PAGE 2

```

0043 061B 338CE2 LEAU (WKAREA,PCR SET BASE
0044 061E 8D41 BSR GETHDR HEADER LINE
* INITIALIZE
0045 0620 86FF LDA #255 FORCE NEW PAGE
0046 0622 A74A STA LINECT,U
0047 0624 860C LDA #FF
0048 0626 A74C STA PREVCH,U
0049 0628 6F46 CLR INDENT,U
0050 062A 6F4B CLR CHARCT,U
0051 062C 8620 LDA #SP INIT PAGE COUNT
0052 062E A78CE1 STA PAGECT,PCR
0053 0631 A78CDF STA PAGECT+1,PCR
0054 0634 8630 LDA #'0
0055 0636 A78CDB STA PAGECT+2,PCR
0056 0639 1700B2 LBSR GETHKP PRINT HOOK
0057 063C 9EA6 LDX BASBYT PUT NULLS AT
0058 063E 6F84 CLR 0,X END OF IPT BUF
0059 0640 6F01 CLR 1,X TO PREVENT
0060 0642 6F02 CLR 2,X "SN ERROR"
0061 0644 35D6 PULS D,X,U,PC

```

```

*
* DISPLAY INLINE STRING ON
* SCREEN
0062 0646          INDIS
0063 0646 3510    PULS X
0064 0648 8D02    BSR  DSPSTR
0065 064A 6E84    JMP  0, X
0066 064C          DSPSTR
0067 064C A680    LDA  , X+
0068 064E 2705    BEQ  Z@
0069 0650 BDA30A  JSR  DSPLCH
0070 0653 20F7    BRA  DSPSTR
0071 0655          Z@
0072 0655 39      RTS

*
* READ CHARACTER FROM KEYBOARD
0073 0656          READCH
0074 0656 BDA199  JSR  CBLINK      BLINK CURSOR
0075 0659 BDA1C1  JSR  GETKEY     TEST KEYBOARD
0076 065C 27F8    BEQ  READCH     GOT A CHAR?
0077 065E 847F    ANDA ##7F
0078 0660 39      RTS

*
*
0079 0661          GETHDR
0080 0661 8DE3    BSR  INDIS
0081 0663 0D      FCB  CR
0082 0664 4845414445 FCC  /HEADER LINE AT /
0083 0673 544F50204F FCC  /TOP OF PAGE?/
0084 067F 0D      FCB  CR
0085 0680 28592F4E29 FCC  $(Y/N): $
0086 0687 00      FCB  0
0087 0688          A@

```

# WANTED

COLOR COMPUTER NEWS

Guilty of being the BEST source of CC info anywhere.

## REWARD

The rewards are endless when you subscribe to

*Color Computer News*

The Color Computer Magazine for 1989-1990

Full of: Hardware projects, Tutorials, Reviews, Letters from readers, Applications, Utilities, Games and the latest New Products.

To receive your REWARD just send \$21.00 for twelve monthly issues to:

REMarkable Software  
1781 Fifth Street  
Muskegon, MI 49441

WARNING: Consider Color Computer News armed (with information) and dangerous (to be without).

If you are a user of Motorola Microprocessors or Unix type operating systems and look like this:

THEN



*Forum SixtyEight* 68

The Magazine For Users of Motorola Micro's

IS FOR YOU!

We uncover Motorola micro's, Unix type operating systems and languages from Assembly to Zenix.

For the next twelve monthly issues send \$21.00 and your name and address to:

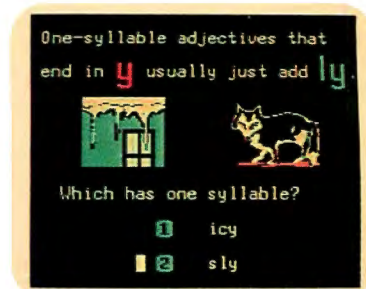
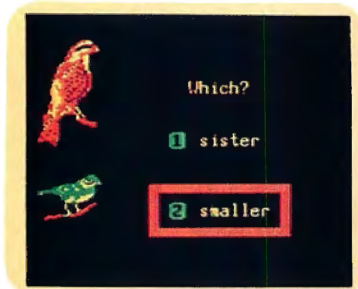
REMarkable Software  
1781 Fifth Street  
Muskegon, MI 49441

We Have What You Need To UNCOVER YOUR TRUE POTENTIAL...

# NEW!

## For Your TRS-80 Color Computer

128 Full-time Audio Talk/Tutor Programs!



## We're Your Educational Software Source

### LANGUAGE ARTS

- Spelling (16 programs)
- Level 3-4 (16 programs)  
(words in context with definitions and synonyms)
- Phonics (16 programs)
- English as a Second Language (32 programs)

### MATHEMATICS

- Levels 1-6 Numbers (16 programs)
- Basic Algebra (16 programs)

### SCIENCE & TECHNOLOGY

- Physics (16 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). \$59.00 for 16 programs (8 cassettes) in an album. Send for a catalog of over 1000 programs for Atari, TRS-80, Apple, etc.

For more information, or to order call:

**TOLL FREE 1-800-654-3871**



# DORSETT

**Educational Systems, Inc.**

**Box 1226, Norman, OK 73070**



## PAGINATE - RAM HOOK TRAP ROUTINE TO PAGINATE LLISTINGS

```

0088 0688 8DCC          BSR  READCH      GET RESPONSE
0089 068A 8159          CMPA  #'Y
0090 068C 270A          BEQ   Y@
0091 068E 814E          CMPA  #'N
0092 0690 26F6          BNE  A@
0093 0692 5F           CLRB          HDROPT=0, NO HEADER
0094 0693              B@
0095 0693 E747          STB  HDROPT,U
0096 0695 8D4E          BSR  ECHO      ECHO CHAR
0097 0697 39           RTS
0098 0698              Y@
0099 0698 C601          LDB  #1        HDROPT=1 SET
0100 069A 8DF7          BSR  B@        HDR OPT = YES
0101 069C 8DAB          BSR  INDIS
0102 069E 0D           FCB  CR
0103 069F 454E544552    FCC  /ENTER THE HEADER /
0104 06B0 4C494E453A    FCC  /LINE: /
0105 06B6 0D00          FCB  CR,0
0106 06B8 BDA393        JSR  READLN
0107 06BB E784          STB  0,X      SAVE LEN(HDR)

* COMPUTE CENTERING FACTORS
* CENTER BETWEEN LEFT MARGIN
* AND PAGE NUMBER
* SPACES BEFORE =
* (LINE'WIDTH - PAGE'NUM'LEN
* - LEN(HDR) - MARGIN) / 2
* + MARGIN

0108 06BD E6C4          LDB  WIDTH,U
0109 06BF C008          SUBB #PNUMLN
0110 06C1 E042          SUBB MARGIN,U
0111 06C3 E184          CMPB 0,X      IF LEN(HDR) >
0112 06C5 2402          BHS  D@        MAXSIZ, THEN SET
0113 06C7 E784          STB  0,X      LEN(HDR)=MAXSIZ
0114 06C9              D@
0115 06C9 E084          SUBB 0,X      B=MAX-LEN-MARGIN
0116 06CB 54           LSRB          B=B/2
0117 06CC 1F98          TFR  B,A
0118 06CE 2401          BCC  E@
0119 06D0 5C           INCB
0120 06D1              E@

```

```

0121 06D1 AB42          ADDA MARGIN, U
0122 06D3 ED48          STD HBEFOR, U
0123 06D5 E680          LDB , X+          GET LEN(HDR)
0124 06D7 338D00F1      LEAU HDRBUF, PCR COPY HDR
0125 06DB BDA59A        JSR MOVSTR        FROM BASIC'S
0126 06DE 6FC4          CLR 0, U          BUF TO MINE
0127 06E0 338DFF1C      LEAU WKAREA, PCR RESTORE U
0128 06E4 39            RTS

```

\* ECHO CHARACTER

```

0129 06E5              ECHO
0130 06E5 BDA30A        JSR DSPLCH
0131 06E8 860D          LDA #CR
0132 06EA BDA30A        JSR DSPLCH
0133 06ED 39            RTS

```

PAGINATE - RAM HOOK TRAP ROUTINE TO PAGINATE LLISTINGS

```

*
* POINT BASIC'S PUT CHARACTER
* RAM HOOK TO MY TRAP ROUTINE
GETHKP
0134 06EE              *
0135 06EE 6D8C61        TST <SAVHKP, PCR
0136 06F1 260C          BNE A@
0137 06F3 B60167        LDA PHOOK
0138 06F6 A78C59        STA <SAVHKP, PCR
0139 06F9 FC0168        LDD PHOOK+1
0140 06FC ED8C54        STD <SAVHKP+1, PCR
0141 06FF              A@
0142 06FF 867E          LDA #JMPDP
0143 0701 B70167        STA PHOOK
0144 0704 308C04        LEAX <PTRAP, PCR
0145 0707 BF0168        STX PHOOK+1
0146 070A              Z@
0147 070A 39            RTS

```

\*  
\* PUT CHARACTER TRAP ROUTINE

From Computer Plus to YOU...

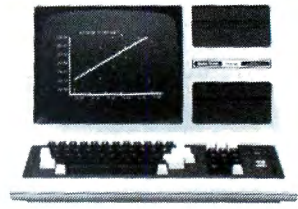
# PLUS after PLUS after PLUS



Model 100 8K \$679  
Model 100 24K \$835



Color Computer 16K \$175  
w/16K Ext. Basic \$255  
w/32K Ext. Basic \$345



Model IV 16K \$849  
Model IV 64K  
2 Disk & RS232 c \$1699



CITOH Prowriter \$375  
CITOH Prowriter II \$649



CoCo Drive 0 \$329  
CoCo Drive 1 \$235



Silver Reed EXP500 \$430  
Silver Reed EXP550 \$665

**BUY DIRECT** Here are just a few of our fine offers...  
call TOLL FREE for full information.

## COMPUTERS

Model IV 16K	\$849
Model IV 64K	
2 Drive & RS232	1699
Color Computer 16K	175
w/16K ext. basic	255
‡ w/32K ext. basic	345
Pocket Computer 2	165
Model 100 8K	679
Model 100 24K	835
Model 12 1 Drive	2699
Model 16B 1 Dr 256K	4249

## MODEMS

Hayes Smartmodem II	235
R.S. AC-3	129
R.S. Modem I	129
R.S. Modem II	199
R.S. DC-1200	565

## PRINTERS

Smith Corona TPI D.W.	545
Silver Reed EXP500 D.W.	475
Silver Reed EXP550 D.W.	695
DWP210	629

CGP115	199
DMP100	315
DMP120	399
DMP200	599
Gemini 10X	319
Gemini 15	435
CITOH Prowriter	375
CITOH Prowriter II	649
Okidata	CALL
Epson	CALL

## ETC.

CoCo Drive 0	329
CoCo Drive 1	235
Disk Drive Controller	119
Extended Basic Kit	89
8K Ser/Par Conv.	155
Botek Ser/Par Conv.	69
64K Ram Chips	75
Superpro Keyboard	69.95
CCR-81 Recorder	52
Kraft Joystick (each)	49.95
R.S. Joysticks (pair)	22
Video Plus	24.95

## SOFTWARE

	(Tape Version)
Zaxxon	39.95
The King	26.95
Colorpede	29.95
Trapfall	27.95
Pac Attack	24.95
Ghost Gobbler	19.95
Lancer	21.95
Color Zap	9.95
Railrunner (Frogger)	21.95
Space Shuttle	28.95
Typing Tutor	19.95
Colorcome	49.95
Telewriter 64	49.95
FHL Flex (disk)	69.95

Order 2 pcs. above, take 10% off.  
R.S. software 10% off list.

Send for complete list.

‡Color Computer 64K requires Drive 0 and FHL Flex D.O.S.

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

# computer plus

P.O. Box 1094  
480 King Street  
Littleton, MA 01460  
617-486-3193

Write for your  
free catalog

We have the lowest possible  
Fully Warranted Prices AND  
a full complement of Radio Shack  
Software.

Prices subject to change without notice.  
Not responsible for typographical errors.  
TRS-80 is a registered trademark of Tandy Corp.





\* COUNTS CR'S TO DETERMINE WHEN  
 \* AT END OF PAGE.

0148 070B	PSHS D,X,U	
0149 070B	LEAU WKAREA,PCR	BASE ADDR
0150 070D	LDB DEVNUM	SKIP IF DEV
0151 0711	CMPB #PRINTR	NOT PRINTER
0152 0713	BNE PTRTN	
0153 0715		
0154 0717		
0155 0717	LDB PREVCH,U	
0156 0719	CMPB #FF	IF PREV CHAR WAS
0157 071B	BNE C@	FORM FEED, THEN
0158 071D	BSR BOPAG	DO BEGIN-PAGE
0159 071F	LDA 0,S	RESTORE CUR CHAR
0160 0721	BRA D@	
0161 0723		
0162 0723	CMPB #CR	IF PREV CHAR WAS
0163 0725	BNE E@	CR, THEN
0164 0727		
0165 0727	BSR BOLIN	DO BEGIN-LINE
0166 0729	LDA 0,S	RESTORE CUR CHAR
0167 072B		
0168 072B	CMPA #CR	
0169 072D	BEQ GOTACR	
0170 072F	INC CHARCT,U	SEE IF LINE
0171 0731	LDB CHARCT,U	WIDTH
0172 0733	CMPB WIDTH,U	EXCEEDED
0173 0735	BLS NEXTCH	
0174 0737		
0175 0739		
0176 073B		
0177 073D		
0178 073F		
0179 0742		
0180 0744		
0181 0746		
0182 0748		
0183 074A		
0184 074A		
0185 074C		
0186 074C		
0187 074E		

\* WRAP AROUND TO NEW LINE

GOTACR	PSHS A	OUTPUT CR OR FF
NEXTCH	LDA #CR	
PTRTN	BSR EOLIN	
	STA PREVCH,U	
	JSR OUTBYT	
	LDA CNTMAR,U	SET INDENT
	STA INDENT,U	
	PULS A	
	BRA A@	
	BSR EOLIN	DO END-LINE
	STA PREVCH,U	

```

0188 074E 3261          LEAS 1,S
0189 0750 3554          PULS B,X,U

0190 0752 000000       SAVHKP FCB 0,0,0

* BEGIN-PAGE
BOPAG
0191 0755              CLR  LINECT,U    RSET LC
0192 0755 6F4A         TST  HDROPT,U    IF THERE
0193 0757 6D47         BEQ  Z@      IS A HEADER, THEN
0194 0759 2702         BSR  PUTHDR    PRINT IT
0195 075B 8D1D
0196 075D              Z@
0197 075D 39          RTS

*
* BEGIN-LINE
* IF LINE IS EMPTY (CUR CHAR IS
* CR) THEN OUTPUT 1 SPACE,
* ELSE OUTPUT MARGIN SPACES
BOLIN
0198 075E
0199 075E C601         LDB  #1
0200 0760 810D         CMPA #CR
0201 0762 2708         BEQ  X@
0202 0764 E642         LDB  MARGIN,U
0203 0766 EB46         ADDB INDENT,U    EXTRA
0204 0768 E74B         STB  CHARCT,U    MARGIN IF
0205 076A 6F46         CLR  INDENT,U    CONTINUED L
0206 076C              X@
0207 076C 8D52         BSR  PUTSPA
0208 076E 39          RTS

*
* END-LINE
* INCR LINE COUNT. IF > LPP,
* THEN SUBSTITUTE FORMFEED FOR
* CURRENT CHARACTER
EOLIN
0209 076F
0210 076F 6C4A         INC  LINECT,U
0211 0771 E64A         LDB  LINECT,U
0212 0773 E141         CMPB LPP,U
0213 0775 2302         BLS  Z@
0214 0777 860C         LDA  #FF
0215 0779              Z@
0216 0779 39          RTS

```

PAGINATE - RAM HOOK TRAP ROUTINE TO PAGINATE LLISTINGS

```

0217 077A          PUTHDR
0218 077A 8D16    BSR  INCPAG
0219 077C E648    LDB  HBEFOR, U
0220 077E 8D40    BSR  PUTSPA
0221 0780 308C49 LEAX  <HDRBUF, PCR
0222 0783 8D31    BSR  PUTSTR
0223 0785 E649    LDB  HAFTER, U
0224 0787 8D37    BSR  PUTSPA
0225 0789 304D    LEAX  PG-WKAREA, U
0226 078B 8D29    BSR  PUTSTR
0227 078D C602    LDB  #2          SET LINE CT = 2
0228 078F E74A    STB  LINECT, U
0229 0791 39      RTS

*
0230 0792          INCPAG
0231 0792 30C815  LEAX  PAGECT+3-WKAREA, U
0232 0795 8D09    BSR  INCDIG      3RD DIGIT
0233 0797 2606    BNE  Z@
0234 0799 8D05    BSR  INCDIG      2ND DIGIT
0235 079B 2602    BNE  Z@
0236 079D 8D01    BSR  INCDIG      1ST DIGIT
0237 079F          Z@
0238 079F 39      RTS

*
0239 07A0          INCDIG
0240 07A0 A682    LDA  , -X
0241 07A2 8120    CMPA #SP
0242 07A4 2604    BNE  B@
0243 07A6 8631    LDA  #' 1
0244 07A8 2007    BRA  X@
0245 07AA          B@
0246 07AA 4C      INCA
0247 07AB 8139    CMPA #' 9
0248 07AD 2302    BLS  X@
0249 07AF 8630    LDA  #' 0
0250 07B1          X@
0251 07B1 A784    STA  , X
0252 07B3 8130    CMPA #' 0      TEST CARRY
0253 07B5 39      RTS

```

\*\*NEW\*\*  
 \*\*Color Computer Memory Map\*\*  
 \*For Radio Shack And TDP-100\*

This is the most complete map of those secretive Ram & ROM areas published to date. References to "Basic-BASIC, Extended BASIC, DISK BASIC, and Low RAM areas in hex and decimal are provided. Differences between 1.0 and 1.1 are documented. The map is a useful Assembly or BASIC language programming tool for beginning as well as advanced users. Attractive volume discounts are available to computer clubs or stores. This map is 44 pages long and complete with an attractive protective cover. It is economically priced at \$9.00 (which includes postage and handling within the US). Please allow two weeks for delivery. Send cash check or money order to:

R. R. Enterprises  
 N5474 Scullwater Court  
 Fredonia, Wisconsin  
 53021

(Wisconsin residents please add 5% sales tax. Foreign requests please include an additional \$2.00 for postage and handling).

```
*
PUTSTR
LDA ,X+
BEQ Z@
JSR OUTBYT
BRA PUTSTR
Z@
RTS
```

```
0254 07B6
0255 07B6 A680
0256 07B8 2705
0257 07BA BDA2BF
0258 07BD 20F7
0259 07BF
0260 07BF 39
```

```
*
PUTSPA
TSTB
BEQ Z@
LDA #SP
A@
JSR OUTBYT
DECB
BNE A@
Z@
RTS
```

```
0261 07C0
0262 07C0 5D
0263 07C1 2708
0264 07C3 8620
0265 07C5
0266 07C5 BDA2BF
0267 07C8 5A
0268 07C9 26FA
0269 07CB
0270 07CB 39
```

```
0271 07CC HDRBUF
* LEAVE ROOM AT TOP OF MEM FOR
* HEADER BUFFER
ENDPRG
0272 07CC
0273 07CC END
```

```
BASBYT 00A6 BEGIN 0619 BOLIN 075E BOPAG 0755
BS 0008 CBLINK A199 CHARCT 000B CLRSCR A928
CNTMAR 0003 CR 000D CTLC 0003 DEVNUM 006F
DSIZE 0007 DSPLCH A30A DSPSTR 064C ECHO 06E5
ENDPRG 07CC EOLIN 076F FF 000C GETHDR 0661
GETHKP 06EE GETKEY A1C1 GOTACR 074A HAFTER 0009
HBEFOR 0008 HDRBUF 07CC HDROPT 0007 INCDIG 07A0
INCPAG 0792 INDENT 0006 INDIS 0646 JMPOP 007E
LINECT 000A LPP 0001 MARGIN 0002 MOVSTR A59A
NEXTCH 074C OUTBYT A2BF PAGECT 0612 PG 060D
PHOOK 0167 PNUMLN 0008 PREVCH 000C PRINTR FFFE
PTRAP 070B PTRTN 074E PUTHDR 077A PUTSPA 07C0
PUTSTR 07B6 READCH 0656 READLN A393 SAVHKP 0752
SCREEN 0400 SHFTBS 000F SP 0020 WIDTH 0000
WKAREA 0600
```

# KEYBOARDS

by Macrotron

*The Premium Keyboard*

**All the features of our popular Professional Keyboard:**

- \* No gluing, soldering, or cutting—plugs right in
- \* Four function keys complete the matrix
- \* High quality construction assures years of trouble-free operation
- \* Complete documentation included

**PLUS these exciting new features:**

- \* Attractive low profile
- \* Extended Radio Shack layout
- \* Silk-smooth feel—  
uses ALPS keyswitches

**Our Versakey software enhances the keyboard's utility**

- \* Auto-repeat, n-key rollover and type-ahead
- \* F1 becomes DEFINE,  
F4 becomes CTRL
- \* May define up to 128 keys (including their SHIFT, CTRL, and SHIFT-CTRL combinations) as strings of up to 80 characters each.

\* Supplied on cassette, may be copied to disk

*"Have Josie ship yours today!"*

<i>The Premium Keyboard</i> .....	\$89.95
The Professional Keyboard (including software) .....	<del>\$59.95</del> 49.95
Versakey software .....	\$9.95

Both keyboards carry a 90-day limited warranty.

Please specify your computer's PC board type if known. Otherwise, specify the complete catalog number and serial number.

## Micronix Systems Corporation

8147 Delmar Blvd. Suite 219  
St. Louis, Missouri 63130  
Telephone (314) 721-7969

Terms: Prepaid check or money order, Mastercard or Visa.  
Shipping Charges: U.S. \$2.00, Canada \$5.00, COD \$3.50 (No COD's to Canada).

---

---

# ZAXXON

From Datasoft  
Reviewed by Stan Shoemake  
6633 13th Place  
Meridian, MS 39301

In ZAXXON you are the pilot of a spacecraft on a strafing mission. You must strafe one fortress, fight an enemy squadron in space and then strafe another fortress. The fortresses are protected by laser batteries and missiles. They also have fuel tanks, radar towers and parked enemy spacecrafts which must be destroyed. Every enemy spacecraft destroyed on the ground is one less that will have to be fought in space combat. After strafing the second fortress you must face the ZAXXON Robot with his homing missile. It takes six hits to destroy the missile. If you should destroy the missile before it leaves the robot you will score an extra bonus. After destroying the robot the game play begins again with play being more difficult.

I know that the above description was not necessary for the arcade buffs out there, but there are a few people around who have never played or seen ZAXXON before. The game play is almost identical to the arcade version, but if you're looking for an exact copy of the arcade game you are going to be disappointed. The game comes in an attractive package consisting of a box with a full color print of one of the fortress scenes from the arcade game. The instructions are well done with a complete

description of the game play along with instructions for a two player game and a point table for destroyed objects. The game also has instructions for stopping and restarting a game in progress and for aborting a game in progress. In addition, there is a free iron on ZAXXON decal available to those who return the enclosed registration card. There's even a little tidbit of things to come, for the game instructions say to type DOS instead of RUN "ZAXXON" if you have version 1.1 or greater of DISK EXTENDED BASIC.

Now down to the important part. Don't look for the terrific graphics that are on the arcade version. While the three dimensional effects are good, the graphics just aren't up to par. They consist of the various walls with their associated force fields and the only other items on the screen are your ship and the items that you are shooting at. The only place that you'll see any buildings and other non-target items from the arcade game are on the box cover. The sound effects also leave something to be desired. They seem to have a lot of static in them and are not clear and crisp as you would expect them to be. They sound as though someone had copied the program from a tape. If you have a disk drive you have

probably experienced the distortion that I'm talking about. There is also a lack of variety in the sound effects, with only a few different sounds being generated.

Game play is identical to the arcade version except that it's very easy to play. There are no difficulty levels and the game is nowhere near the arcade version in difficulty. In fact I was able to play all the way through with no problems on my second or third try. In addition there is a serious flaw in the section between fortresses where you battle the enemy spacecraft. You can go to one location on the screen and proceed to blow every single enemy spacecraft off the screen and not worry about being destroyed at all. The only scoring table is one which shows the high score for the session. This is just another example of the shortcomings of

this program. An excellent arcade game with only a mediocre version for the Color Computer. I had hoped the Datasoft would maintain the same level of quality that they showed in MEGA-BUG.

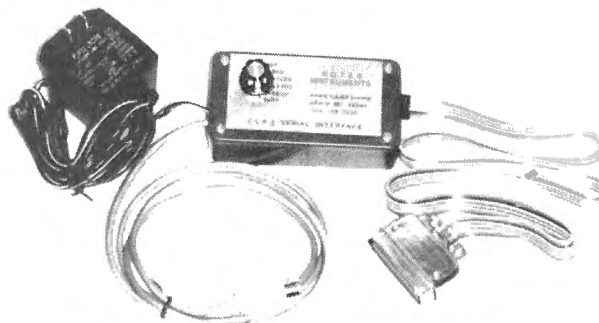
Overall the game is a true version of ZAXXON. However, the program does not utilize the full potential of the Color Computer in either graphics or sound effects. If you've played or seen DONKEY KING you know what I'm talking about. My honest opinion is that Datasoft could have done a better job. Yes, I think it's a good game despite my negative remarks. But, it's very much overpriced and should be selling for a lesser price.

ZAXXON may be purchased from Datasoft, Inc., 19519 Business Center Drive, Northridge, CA 91324. •

## PARALLEL PRINTER INTERFACE

FOR THE RADIO SHACK COLOR COMPUTER  
AND THE TDP 100

- RUN ANY STANDARD PARALLEL PRINTER FROM THE SERIAL I/O PORT
- WORKS WITH: EPSON, NEC, CENTRONICS, C-itech, SMITH CORONA, RADIO SHACK, GEMINI, OR ANY STANDARD PARALLEL PRINTER
- SWITCH SELECTABLE BAUD RATES FROM 300 to 9600
- COMPLETE - ALL CABLES AND CONNECTORS INCLUDED
- PRICE: \$69 plus \$3 for shipping and handling. Canadian orders add \$5 for shipping. Michigan residents add 4% sales tax.



## PRINTERS

C-itech PROWRITER ----- \$ 365  
 GEMINI 10 ----- \$ 299  
 EPSON FX80 ----- \$ 550  
 EPSON RX80----- \$ 370  
 Plus shipping

CALL FOR PRICES ON OTHER MODELS FROM  
THE ABOVE PRINTER MANUFACTURERS

# BOTEK INSTRUMENTS

313-739-2910

Dealer inquiries invited

4949 HAMPSHIRE  
UTICA, MICHIGAN 48087

---

---

# FINGERKEY

By R. Stetter  
17330 Mayfield  
Livonia, Michigan 48152

## PURPOSE

FINGERKEY was written to help students learn the HOME KEYS, the fingers used to type the HOME KEYS, and the fingers used to type the other characters on the keyboard.

## PREREQUISITES

The student should be able to recognize letters, punctuation marks and other characters found in printed text and on the keyboard. The student should understand the meaning of the terms 'UPPER CASE' and 'LOWER CASE'. Demonstrate to the student how the fingers stay near the HOME KEYS. For younger students, explain and demonstrate this program before turning them loose.

## SYSTEM REQUIREMENTS

As it is here, the program is 15520 bytes long. Omitting the REMs shortens it to 8963. Removing the extra spaces brings it to 8794. A 16K system with EXTENDED BASIC is required. The program contains many REMs which can be omitted when typing it to memory.

## PROGRAM DESCRIPTION

All output to screen is in the graphic mode. All text is drawn on screen. A left

hand and right hand are drawn on the screen. Then the row of keys containing the HOME KEYS is drawn on the screen. The characters 'a, s, d, f, j, k, l, ;' are drawn. As they are drawn, the tip of the finger to be used is painted white. The relationship between the finger and the HOME KEY is then clearly established.

Following the overview of the HOME KEY concept, the characters are introduced and practiced in the same order as they are taught in most schools. The 'target letter' is drawn just above the row of keys on the screen. The proper finger to be used is indicated by painting the tip of the finger white. The student is prompted to 'TYPE' and given time to respond. If the correct response is made, the 'target letter' turns white, is erased and a new letter is drawn. If the wrong response is made, a sound is generated, and COMPUTER waits for another response. No incorrect responses are accepted. If no response is made, COMPUTER will enter the correct response and process it. It stays busy!

The following characters are included in this instruction and presented in this order:

f d s a j k l ; g u e h r i c n t . v y b o x p w m  
q , z 3 7 5 9 4 8 2 0 1 6 # ? % \$ ) ! ( ' ' & .

Each new key is paired with its HOME KEY and the two are practiced together. A



test is given after a set of 4 new letters have been practiced. Missed keys are reviewed before new letters are introduced. After each new character has been introduced, practiced, tested and reviewed, the program returns to its beginning.

### SUBROUTINES

Line 490 is a supervisor in that it combines the HOME KEYS, with their associates, into groups of 3; such as frf, juj, preparing them for practice. The string FL\$ contains the HOME KEYS. The string LM\$ contains their associates. They are combined into groups of 3 called M\$ by taking one computer from LM\$. The 3rd letter in M\$ in the same HOME KEY as the 1st. Line 490 also decides which hand is used for the letter being introduced, and counts the characters as they are presented.

Lines 1610 to 1700 decide which finger tips to paint, and when to paint the HOME KEY of that finger. This routine takes a little time, but since the program is not in a race it is sufficient.

Lines 800 to 860 are concerned with testing groups of 4 letters. They must be tested randomly, but an equal number of times. A tally is kept, and when each has been typed correctly 3 times or each error has been corrected twice, it returns control to line 490.

Lines 1000 to 1060 look for keyboard input and count time. Here the student can exit the program by pressing the spacebar twice. If the DEMO option was selected, or after a short wait, COMPUTER enters the correct response. Control is returned to the test routine or to the letter selection routine.

The SHIFT KEYS are explained and demonstrated in lines 600 to 630 and lines 2000 to 2060. This chore caused a lot of grumbling until it was finally worked out. (grumble,grumble)

<b>S.A.T.</b> (College Entrance Exam) 6 16 K Programs 3 Verbal and 3 Math Exercises with Explanations. Cassette only \$19.95	<b>ENGLISH GRAMMAR</b> 6 16 K Programs For Grades 7 - 12 Parts of Speech Prepositions Punctuation Conjunctions Sentence Structure Phrases and Clauses Exercises with explanations Cassette only \$19.95
<b>PSYCHIC</b> 6 Mind Games Develop Your E.S.P. 1 or 2 Players Fun and Exciting Cassette only \$19.95	

**T I 99/4A\* TRS-80 Color Computer\***  
**All 3 Cassettes only \$49.95**  
**Emmons Software**  
 Box 356  
 Salem, NH 03079  
 Tel: (603) 898-2797  
 or ask at your favorite Software Dealer's

## LEVEL IV

THE LEADER IN EXCELLENCE  
FOR YOUR COLOR COMPUTER

DISK DRIVE KITS		MEMORY KITS	
COLOR DRIVE 0 KIT		16K MEMORY KIT 150ns	\$24
Includes: Controller, Cable, and 40 track drive	\$459	32K MEMORY KIT 150ns	\$59
		64K MEMORY KIT 150ns	\$72
SOFTWARE		HARDWARE	
THE KING	\$26.95	EXTENDED BASIC KIT	\$89
COLORBUG	\$24.95	COLOR BASIC 1.1	\$29.50
SPACE SHUTTLE	\$28.95	RS232 SWITCHERS	\$29/\$39
ROBBOTTAK	\$24.95	JOYSTICKS	\$21
TRAPFALL	\$27.95	SERIAL CONVERTER	\$69
THE FROG	\$27.95	REAL FEEL KEYBOARD	\$79
TAPEDUPE	\$21.95	CCR-81 RECORDER	\$54.95
MAILLIST	\$17.95	EPSON FX-80 PRINTER	\$649
FLEX	\$99.00	EPSON MX-100 PRINTER	\$779
FLEX W/DBASIC	\$129.00	SMITH CORONA TP-1	\$549
R/S SOFTWARE 10% OFF		NOVATION J-CAT MODEM	\$139
SUPERCOLORTERMINAL		MODEM I	\$134
CASSETTE	\$49.95	HAYES STACK (300)	\$250
RMPAK	\$59.95	U.S. ROBOTICS 1200	\$499
DISKETTE	\$69.95	NOVATION S-1200	\$495

**FULL LINES OF HARDWARE AND SOFTWARE**  
**AT DISCOUNT PRICES**  
**WE SPECIALIZE IN COLOR DRIVE SYSTEMS**

**TOLL FREE ORDER LINE 1-800-521-3305**  
**LEVEL IV PRODUCTS, INC.**  
 32429 SCHOOLCRAFT RD.  
 LIVONIA, MICHIGAN 48150  
 OTHERS (313) 525-6200

# DO YOU HAVE A BASIC OR ASSEMBLY PROGRAM TO SELL?

... avoid unreliable cassette tapes and recorders  
and EPROM your program!

With EPACK, BASIC and assembly routines for color computer can be read from cassette tape and stored onto 2516, 2716 (single supply), 2732, 2532, 2564 and 2764 styled EPROM (21 and 25 volt). These EPROM are then inserted into MMB, a game packlike cartridge that automatically executes your program when it's inserted into the color computer ... just like the game packs.

EPACK is an excellent alternative to cassettes for programs you want to sell and for personal programs you would like to execute quickly and conveniently from a more reliable medium.

NOTE: 2732, 2764 and 21 volt capability are available optionally and are not included in the standard EPACK. \*\*

**EPACK consists of EPG, BROM and MMB for ..... \$150.00**

The units in EPACK are sold individually as follows:

## BROM

Utility fits any memory size color computer. Its function is to process BASIC source files into a format that can be written out to EPROM by Control Craft Inc.'s EPROM programmer (EPG) ... and still be executed by the BASIC interpreter - but from EPROM, not RAM!

**BROM ..... \$25.00**

## EPROM PROGRAMMER (EPG)

- Zero insertion force socket
- Personality plugs configure programmer to accept 2716 (5 volt supply), 2532 and 2564 style EPROM.
- Programmer's software is included on the programmer board as firmware.
- Program sources:
  - \* read cassette tape files into memory and then write file to EPROM (files are in Radio Shack format)
  - \* write color computer RAM to EPROM
  - \* read EPROM inserted in programmer into RAM
  - \* write color computer ROM to EPROM
- Functions:
  - \* test EPROM to see if it's unprogrammed
  - \* read an EPROM into color computer RAM
  - \* write RAM buffer out to EPROM
  - \* redefine the location of the RAM buffer
  - \* verify the programming of an EPROM
  - \* compare the contents of RAM buffer against an EPROM
  - \* edit the RAM buffer
    1. Examine/change memory locations
    2. Examine/change start buffer address
    3. Fill RAM buffer with FF hex
  - \* read blocks from a cassette file into RAM
- Menu driven operation allows easy use
- Plastic case enclosed circuitry
- Gold plated edge connectors
- Self-contained unit ... no external power supplies are used
- Unit operates on any memory sized TRS-80 color computer

**EPG ..... \$105.00**

## MULTI MEMORY BOARD (MMB)

- Complete with support IC, sockets and decoupling capacitors
- Accepts 2516, 2716, 2532, 2732, 2564 EPROM
- Accepts 2016, 4016, 6116 static RAM\*
- Max capacity of 6 memory chips
- Runs on any size TRS-80 color computer
- Board is jumper addressable to either \$C000 or \$8000
- Provisions for write protect switch, or can jumper the board to write protect RAM

- Jumpers configure the memory type used on the board. Provisions for inserting DIP switches in place of the jumpers
- Gold plated edge connector
- Each IC or IC socket has decoupling cap installed
- Plastic case is available extra, at \$7.50 (pricing is subject to change without notice) (case included in EPACK)

\* RAM may not work with series E or later color computers.

**MMB ..... \$30.00**

### \*\* UPGRADE (optional for EPACK or EPG)

2732-25 volt .....	\$15.00	2732-21 volt .....	\$15.00
2764-25 volt .....	\$15.00	2764-21 volt .....	\$15.00

## SMALL MEMORY BOARD (SMB)

- Provision for decoupling capacitors
- Accepts (1) 2732 eeprom (4K program)  
(1) 2764 eeprom (8K program)  
(1) 2764 eeprom (16K program)
- No jumpers need to be set
- Board will fit into standard Radio Shack cartridge cases
- Control Craft cartridge cases available

(Radio Shack is a trademark)

**SMB (with Control Craft case) ..... \$15.00**

**SMB (board only) ..... \$8.00**

All prices subject to change without notice.

# CONTROL CRAFT INC.

19270B North Hills Drive • Brookfield, WI 53005 • (414) 784-9027

Name \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

City/State \_\_\_\_\_ Zip \_\_\_\_\_

Shipping address (if different from above)

Order Form:

EPACK	_____ @ \$150.00 = _____
BROM	_____ @ \$ 25.00 = _____
EPG	_____ @ \$105.00 = _____
MMB	_____ @ \$ 30.00 = _____
UPGRADE NO.	_____ @ \$ 15.00 = _____
SMB (with case)	_____ @ \$ 15.00 = _____
SMB (board only)	_____ @ \$ 8.00 = _____

Wis. residents add 5% sales tax

Shipping & Handling: # of items \_\_\_\_\_ x \$2.00/item = \_\_\_\_\_

**TOTAL ORDER: \$ \_\_\_\_\_**

TO ORDER BY MAIL: SEND MONEY ORDER, CERTIFIED CHECK, CASHIERS CHECK, MASTERCARD/VISA (include card number, inter-bank number, expiration date and signature).

DEALER INQUIRIES WANTED (minimum dealer order is 5 units)

Converting text characters into graphic draw commands is done in lines 2600 to 2730. The text string is picked apart (2620-2630). Then the ASCII is determined and the proper place in the array A\$(90) is found by subtracting 32 from that ASCII number (2640). Space must be incremented for each letter (2680), color determined, and sound added.

The directions for drawing 84 keyboard characters are contained in data lines 2800 to 3130. Much grumbling was done here also (grumble,grumble), but once written, the data can be used in future programs without grumbling!

Draw directions for the left and right hands are located in 1430 and 1460.

### SUMMARY

This program has been used by students at two middle schools in Livonia, Michigan. Suggestions from teachers have been incorporated. The kids enjoyed the program and stuck to it.

The program was written to do a job, not as an example. It does that job. The program was written by a school counselor, not a professional programmer. It can be improved! Suggestions, questions and constructive criticism are welcome. •

```

5 PMODE3,1:PCLS:SCREEN1,0:E=2:GO
SUB3590
6 REM*** TO DRAW FACE.
10 GOTO2410
11 REM*** TO READ THE DRAW DIRE
C TIONS FOR 84 KEYBOARD CHAR
- ACTERS.
15 CL=3:TL=1:TYS="***Finger*Key*
*":GOSUB3200:E=3:GOSUB3590:REM:*
*** TI DRAW FACE.
16 FORT=1TO1000:NEXT
17 CL=4:LT=0:TYS="oF**Beginners*
r":GOSUB3200:E=2:GOSUB3590:FORT=
1TO2000
18 OD=1:TL=0:LT=0:TYS="abcdefghi

```

```

jklmnopqrstuvwxyz":GOSUB3200:E=1
:GOSUB3590:FORT=1TO2000:NEXT:PCL
S:M$="(C) 1983 R.Stetter":SP=18:
SS=8:LI=30:GOSUB2600:FORT=1TO200
0:NEXT:PCLS
20 SP=16:SS=8:LI=30:M$="Can your
unit run at high speed? Typ
e 'Y' if yes else wait!":GOSUB26
00:T=0
30 IF T>99THEN 40 ELSE IS=INKEYS
:IFIS="Y"THEN POKE65495,0:GOTO40
ELSE T=T+1:PLAY"L255T255O1V20C":
GOTO30
31 REM*** STROBE THE KEYBOARD
99 TIMES OR UNTIL A 'Y' IS
TYPED.
32 REM*** IF 'Y' IS TYPED POKE
THE HIGH SPEED.
40 PCLS:M$="Type 'D'for DEMO,
else wait!":SS=8:SP=16:LI=30:G
OSUB2600
50 IFTI>100 THEN TI=0:HT=2:PT=2:T
W=200:PCLS:GOTO 40 ELSEAS=INKEY
$:PLAY"T255L255O1V20A":IFA$=""TH
ENTI=TI+1:GOTO50
51 REM*** STROBE THE KEYBOARD
100 TIMES OR UNTIL 'D' IS
TYPED.
IF 'D' IS TYPED, COM-
PUTER SUPPLIES THE INPUT
FOR INKEY STROBES AND THE
PROGRAM RUNS ITSELF.
60 IFA$="D"THENDE=1 ELSEAS="":SO
UND1,4:PCLS:GOTO40
70 PCLS:PT=1:HT=2:TW=200:GOTO400
71 REM*** (HT) IS HOW MANY TIME
A LETTERS IS PRACTICED.
400 CL=3:SS=8:SP=18:LI=30:M$="Fi
rst, learn fingersand keys!"
:GOSUB2600:FORT=1TO1200:NEXT:PCL
S
401 REM*** INSTRUCTION STARTS
HERE. (CL) IS COLOR. SS
IS SIZE. SP IS SPACE FOR
EACH CHARACTER. 2600 IS
ONE ROUTINE FOR DRAWING
TEXT.
410 CL=3:SS=8:SP=16:LI=30:M$="HO
ME KEYS are HOME BASE for
fingers!":GOSUB2600:FORT=1TO200
0:NEXT

```

```

420 PCLS:M$="Learn the HOME KEYS first!":GOSUB2600:FORT=1TO190
0:NEXT:PCLS:M$="HOME KEYS
      fdsa      jkl;":GOSUB2600:FORT
=1TO2000:NEXT:PCLS:M$="Watch me!
":GOSUB2600:FORT=1TO600:NEXT:PCL
S
430 GOSUB1420:GOSUB1450
440 M$="fdsajkl;":FORX=1TO8:L$=M
ID$(M$,X,1):CL=3:GOSUB1630:FORQ=
1TOTW:NEXT:CL=1:GOSUB1630:NEXT:
450 FORQ=1TO2000:NEXT:PCLS
460 CL=3:SS=8:SP=18:M$="Use left
!":GOSUB2600:FORT=1TO600:NEXT:YT
=1
470 PCLS:GOSUB1420:GOSUB1210:FOR
Q=1TO500:NEXT
480 M$=M$(1):SS=8:SP=16:HY=80:VY
=40:GOSUB2610:FORT=1TO5:PLAY"T25
5L255V310"+STR$(T)+"AACCDDFF":NE
XT
490 FL$="ffffjjjjfjdjfkjdjflfjfls
;sjaka;djflfks;ajd;fjflaksj":LM$
="fdsajkl;guehricnt.vyboxpwmq,z/
3759482016#" + CHR$(63) + "%' $)! (" + C
HR$(34) + "&":FORQJ=1TO50:LF$=MID$(
FL$,QJ,1):ML$=MID$(LM$,QJ,1):MS
=LF$+ML$+LF$:IF QJ*3/2=INT(QJ*3/
2) THENH=1ELSEH=0
491 REM*** FL$ WILL HOLD THE
      HOME KEYS IN THAT ORDER.
      ML$ WILL HOLD THE
      NEW LETTER BEING PRESENT-
      ED . PICKS THE HOME KEY,
      ADDS THE NEW KEY, ADDS
      THE HOME KEY.
492 REM*** THERE ARE 50 CHARAC-
      TERS PRESENTED .
500 MQ$=MQ$+ML$
501 REM*** MQ$ IS WHERE THE
      MIDDLE LETTERS ARE STORED
      IF 4 LETTERS ARE STORED
      THERE THEN WHEN IT GETS
      TO LINE 550 THAT IS NOTED
      AND TEST ROUTINE STARTS.
510 IFQJ<5THENH=0 ELSEIFQJ<9THEN
H=1
511 REM*** DECIDE WHICH HAND TO
      DRAW ON SCREEN.
520 IFQJ=9THENH=0ELSEQJ=OJ
530 IFQJ>40THENFO=1:FI=1:REM-DRA
W BOTH HANDS FOR SHIFTED CHARACT
ERS
540 GOSUB2210
541 REM*** TO PAINT FINGER-
      NAILS, PRACTICE LETTERS,
      AND BE TESTED.
550 IFQJ=40THEN600 ELSEIFLEN(MQ$
)=4THENH=2:HB=HB+1:Z=1:M$=M$(2):
SP=16:SS=8:HY=85:GOSUB2610::FORT
=1TO5:PLAY"T255L255V310"+STR$(T)
+"AFFDCG":NEXT:M$=MQ$:GOTO800
551 REM*** IF QJ=40 GO TELL
      ABOUT SHIFT KEYS. IF MQ$
      HAS 4 LETTERS THEN DRAW
      THE WORD 'TEST' AND GO TO
      TEST ROUTINE AT 800.
560 NEXT
561 REM*** THIS NEXT REFERS TO
      LINE 490 WHERE IT SAYS
      'FOR QJ=1 TO 50'.
599 REM*** SHIFT KEY ROUTINE
      STARTS NEXT.
600 IFQJ>50THEN2400 ELSEMS$=" Shi
ft keys!":SS=8:SP=16:CL=3:GOSUB2
600:CL=4:FORT=1TO900:NEXT:PCLS::
GOSUB2020:GOSUB2050:GOSUB1420:GO
SUB1450:FORT=1TO900:NEXT:GOTO660
601 REM*** IF 50 HAVE BEEN
      PRACTICED, START OVER,
      ELSE TELL ABOUT SHIFT KEY
610 PCLS:GOSUB1420:GOSUB1450:LIN
E(15,88)-(30,96),PSET,B:LINE(250
,94)-(235,86),PSET,B:FORQ=1TO100
:NEXT
620 VC=0:PAINT(20,92),2,3:PAINT(
235,90),2,3:FORQ=1TO800:NEXT:M$=
" USE ":SS=8:SP=16:HY=20:VY=40:G
OSUB2610:FORTI=1TO5:GOSUB630:FOR
P=1TO9:PLAY"O5L200T200V31GFDA":N
EXT:NEXT:PAINT(35,118),5,3:PAINT
(5,92),5,3:GOTO640
630 PAINT(35,118),5,3:PAINT(235,
90),5,3:GOSUB2000:RETURN
640 M$="-OR ":SS=8:SP=16:HY=120:
VY=40:GOSUB2610:FORTI=1TO5:GOSUB
650:FORP=1TO8:PLAY"O3T200L200V31
ADFG":NEXT:NEXT:PCLS:GOTO560
650 PAINT(225,118),5,3:GOSUB2010
:RETURN
660 PCLS:LI=30:SP=15:CL=3::SS=8:
M$="When you see the shift key":

```

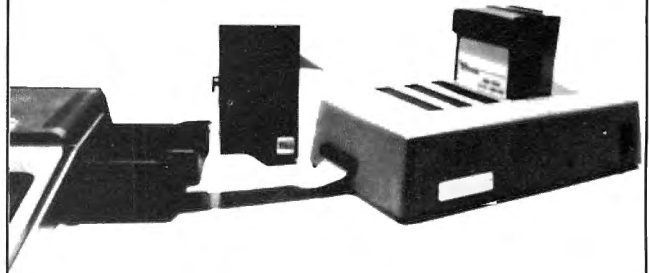
```

GOSUB2600:FORT=1TO200:NEXT:PCLS:
GOSUB2020:GOSUB2050:FORO=1TO900:
NEXT:PCLS:M$="You must      -SHIF
T- while you typethe key!":GOSU
B2600:FORT=1TO2000:NEXT
670 GOTO610
680 M$="":MQ$="":GOTO560
800 FORX=1TO4:TR(X)=0:NEXT:Z=0:F
OR XZ=1TO4:XZ$=MID$(M$,XZ,1)
801 REM***   TEST ROUTINE STARTS
      HERE
802 REM***   4 LETTERS ARE TEST-
      ED EACH TIME THIS ROUTINE
      IS CALLED.
810 Z$(XZ)=XZ$:NEXT
820 Z=0:G=1:FORX=1TO4:TR(X)=0
830 PCLS:FOR X=1TO4:IFTR(X)=G TH
EN NEXT:G=G+1 :IFG=3THEN1200 ELS
E GOTO840
831 REM***   IF EACH IS ANSWERED
      3 TIMES CORRECTLY THEN
      END OF TEST ROUTINE. IF
      ONE IS MISSED IT IS ASKED
      AGAIN TWICE.
840 PLAY"T200L100V3101G":RL=RND(
4):L$=Z$(RL)
850 IF TR(RL)=G THEN 840
860 TR(RL)=TR(RL)+1:GM=GM+1:IFGM
=4THENGM=0
870 GOSUB1600:GOTO1000
999 REM***   STROBE KEYBOARD
      ROUTINE STARTS HERE
1000 IF CZ=80THEN SOUND200,1:SOU
ND100,1:SOUND10,1:CZ=0:RE$=L$:GO
TO1040
1001 REM***   STROBES 80 TIMES OR
      UNTILE A KEY IS PRESSED.
      IF NO KEY, THEN ENTERS
      THE CORRECT KEY ITSELF.
1010 IFUE=2THENGOTO2410 ELSE CL=
3:RE$=INKEY$:IFRE$<> ""THEN CN=A
SC(RE$):IFCN>64 ANDCN<97THENCN=C
N+32:RE$=CHR$(CN)
1011 REM***   IF NO KEY PRESS
      ADD 1 TO THE NOKEY COUNT
      (CZ) AND GO STROBE.
1012 REM***   IF WRONG KEY WAS
      PRESSED, RE$<>L$, MAKE A
      SOUND. AT THIS TIME IF
      Z=0 THEN IT IS A TEST.
      LOWER THE SCORE FOR THAT
      LETTER SO IT WILL BE GET

```

## Switchable Expansion Is Here

### A PERFECT COMPANION FOR COCO



The key to versatility is the new BT-2000 COMPANION. • Load 5 cartridges and enjoy the benefits of Push-Button selection. •SAVE CoCo's connector. Reduce plugging. •Indicator Lights, know at a glance which cartridge is in use. •No more Turn-Offs. Switch to the next cartridge in your COMPANION. •Push a button to RESTART without turning power ON and OFF. \$249.95.

### FOR THE ADVANCED USER OR EXPERIMENTER

- The utmost in expansion power and versatility is the BT-1000 Expansion Interface Unit. \$270.00.
- Large Built-in power supply to power your peripherals and experimenter circuits.
- Space for your ML utilities with optional 8K of RAM. \$300.00

### ALSO NEW FROM BASIC TECHNOLOGY!!

- BT-1010 PPI Parallel Printer Interface. Free-up CoCo's serial port. Run your printer at top speed. Five foot cable with Centronics compatible connector and machine language printer driver are included. \$79.95.
- BT-1020 Real Time Clock/Calendar. Let CoCo keep the time and date for your programs and files. Day-light savings time and leap year keep you on time. Save data or program memory even when power is off with 50 bytes of battery backed memory. Alarm capability to turn on the coffee pot. All for only \$109.00.
- BT-1030 VIP Versatile Interface Port. Connect CoCo to the outside world with two 8-bit parallel ports, two 16-bit timer/counters and a serial shift register. All user programmable. \$69.95.
- WRITE FOR FREE BROCHURE.

For years of trouble-free enjoyment all Basic Technology products use top quality components and are backed by a full 180 day parts and labor warranty. We service what we sell!!!

Add \$5 shipping & handling for BT-1000, \$2.50 for BT-1020. Michigan residents add 4% sales tax. Shipping & handling for residents of Canada, Hawaii, Alaska is \$10. Overseas orders add 15%. Check, money order, VISA, MC (give account no., expiration date, phone no.). Personal checks allow 2-3 weeks to clear. COD charge \$2 (requires certified check or money order).

*"Watch for more peripherals from Basic Technology."*

**basic**

P.O. Box 511 Ortonville, MI 48462

**TECHNOLOGY**

(313) 627-6146

# 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 (LPV7/VIII, DMP-100/200, Epson, Okidata, Centronics, NEC, C. Itoh, Smith-Corona, Terminus, etc).

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

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

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

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

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

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

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

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

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

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

— The RAINBOW, Jan. 1982

### PROFESSIONAL WORD PROCESSING

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

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

To order, send check or money order to:

**Cognitec**  
704 Nob Street  
Del Mar, CA 92014

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

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

```

PRACTICED 2 EXTRA TIMES.
TR(RL)=TR(RL)-2.
1013 REM*** THEN GO BACK AND
      STROBE THE KEYBOARD.
1020 IFRES=CHR$(32)THENSOUND200,
1:UE=UE+1:GOTO1010ELSEIFDE=1THEN
FOR T=1TO20:PLAY"T255L255O1V12G#
":NEXT:RES=L$:GOTO1030 ELSEIFRES
="THENCZ=CZ+1:GOTO1000ELSEIFRES
<>L$THENSOUND20,1:SOUND10,2:IFZ=
0THENTR(RL)=TR(RL)-2:GOTO1000ELS
EGOTO1010
1021 REM*** IF THE STUDENT TYP-
      ED THE SPACEBAR, COUNT
      UE AS BEING 1 MORE. UE=
      UE+1:GOBACK TO STROBE
      KEYBOARD. IF UE=2 THEN
      SPACE BAR WAS PRESSED
      2 TIMES. START PROGRAM
      OVER.
1030 EM=EM+1:IFEM=2THENME=0:EM=0

1040 PLAY"T255L255V31O1GGGF":DRA
W"S12"+"C6BM112,60"+AS(NY):CZ=0:
FORT=1TO200:NEXT:PCLS
1050 IF Z=1THEN RETURN
1060 IF G<5 THEN 830
1061 RE*** IF Z=1 THEN IT IS
      NOT IN TEST MODE, IT IS
      STILL PRACTICING. GO BACK
      TO 1400 WHEREYOU CAME
      FROM.
1062 REM*** IF G<5 THEN KEEP
      TESTING.
1199 REM*** PAINT HAND ROUTINE
      STARTS NEXT.
1200 IF HB >0 THEN680
1210 PAINT(35,185),2,3
1220 REM-PAINTS HAND
1230 RETURN
1240 PAINT(235,160),2,3
1250 RETURN:REM-PAINTS HAND
1400 FORV=1TOLEN(M$):L$=MIDS(M$,
V,1):GOSUB1600:GOSUB1000:NEXT:RE
TURN
1401 REM*** GOES TO GET FINGER
      NAIL PAINTED FOR EACH
      LETTER. THEN GOES TO
      STROBE KEYBOARD FOR A
      RESPONSE.
1402 REM*** AFTER GROUP OF 2
      HOME KEYS AND 1 NEW KEY

```

```

HAS BEEN PRECTICED, RE-
URN TO 2280
1410 RETURN
1420 SS=8:PH=30:PV=195
1421 REM*** DRAW DIRECTIONS
      FOR LEFT HAND START HERE

1430 LH$="C3S"+STR$(SS)+"BM"+STR
$(PH)+","+STR$(PV)+"U38E1BU15U4R
6D4L6BD15R6F1D3NL8D17R2U28E1BU7U
4R6D4L6BD7R6F1D3NL8D25R2U32E1BU3
U4R6D4L6BD3R6F1D3NL8D29R2U28E1BU
7U4R6BR4R6D4L6U4BL4D4L6BD7R6F1D3
NL8D35E12R4F4D2G3NH7G11L45"
1440 DRAWLH$:RETURN
1450 SS=8:PH=227:PV=195
1451 REM*** DRAW DIRECTIONS
      FOR RIGHT HAND STAR HERE

1460 RH$="C3S"+STR$(SS)+"BM"+STR
$(PH)+","+STR$(PV)+"U38H1BU15U4L
6D4R6BD15L6G1D3NR8D17L2U28H1BU7U
4L6D4R6BD7L6G1D3NR8D25L2U32H1BU3
U4L6D4R6BD3L6G1D3NR8D29L2U28H1BU
7BL10U4L6D4R6BR10U4L6D4R6BD7L6G1
D3NR8D35H12L4G4D2F3NE7F11R45"
1470 DRAW RH$:RETURN
1600 IFFO=1ORH=2ORHB>0THENGOSUB1
420:GOSUB1450
1601 REM*** HERE STARTS THE
      ROUTNINE WHERE FINGER
      NAILS ARE PAINTED IF
      THE ASC OF TARGET LETTER
      MATCHES THE SELECTION
      PROCESS.
1610 IFQJ>40 THENIFASC(L$)<(38)
      THENGOSUB2050 ELSE IFL$="&"ORL$
="'"ORL$="("ORL$=")"ORL$="*"ORL$
="="ORL$="+ORL$="?"ORL$="<"ORL$
=">"ORL$=CHR$(63)THENGOSUB2020
1620 IFH=0GOSUB1420 ELSEIFH=1GOS
UB1450
1630 NN=ASC(L$):IFNN=97 ORNN=113
ORNN=122ORNN=49ORNN=33THEN PAINT
(36,118),2,3:IFNN=97THENPAINT(36
,80),2,3
1640 IFNN=115ORNN=120ORNN=119ORN
N=50ORNN=34THENPAINT(52,102),2,3
:IFNN=115THENPAINT(55,80),2,3
1650 IFNN=100 OR NN=101 ORNN=990
RNN=51ORNN=35THENPAINT(73,90),2,
3:IFNN=100THENPAINT(75,80),2,3

```

```
1660 IFNN=102ORNN=103ORNN=114ORNN=116ORNN=118ORNN=98ORNN=52ORNN=53ORNN=36ORNN=37THENPAINT(93,98),2,3:IFNN=102THENPAINT(94,80),2,3
1670 IFNN=112ORNN=59ORNN=63ORNN=48ORNN=45ORNN=61ORNN=42ORNN=64ORNN=58ORNN=47THENPAINT(220,118),2,3:IFNN=59THENPAINT(219,80),2,3
1680 IFNN=108ORNN=111ORNN=57ORNN=41ORNN=46THENPAINT(204,102),2,3:IFNN=108THENPAINT(202,80),2,3
1690 IFNN=107ORNN=105ORNN=44ORNN=56ORNN=40THENPAINT(184,95),2,3:IFNN=107THENPAINT(183,80),2,3
1700 IFNN=106ORNN=117ORNN=104ORNN=110ORNN=121ORNN=109ORNN=55ORNN=54ORNN=39ORNN=38THEN PAINT(157,102),2,3:IFNN=106THENPAINT(157,80),2,3
1800 PLAY"L100V3102A"
1810 IF CR=3THENCL=3
1820 IFNO=1THENGOTO1850 ELSEIFN=1THENM$="New!":SP=16:SS=8::HY=80:VY=40:GOSUB2610:FORQ=1TO5:PLAY"T255L255V310"+STR$(Q)+"G#FFFBBD":NEXT:FORT=1TO50:NEXT:PCLS:YT=1

1821 REM*** IF ITS A NEW LETTER,N=1,GO TO 200 AND DRAW THE WORD 'NEW!'.
1830 NY=ASC(L$)-32.
1831 REM*** FIND THE NUMBER OF THE SHELF WHERE THE DRAW DIRECTIONS ARE STORED.
1850 IFN<>1 ANDYT=1THENDRAW"S8C4BM10,60"+A$(52)+"BR6"+A$(89)+"BL3BU2"+A$(80)+"BR8BD1"+A$(69)+"BR6BD2"+A$(13):FORT=1TO100:NEXT
1851 REM*** IF ITS BEEN CALLED A NEW LETTER,N<>1, THEN DRAW THE WORD 'TYPE-'.
1860 DRAW"S12"+"C"+STR$(CL)+"BM12,60"+A$(NY):IFN=1THENFORQ=1TO300:NEXT
1861 REM*** DRAW THE TARGET LETTER.
1870 RETURN
2000 GOSUB1450:PAINT(35,118),2,3:PAINT(20,92),2,3:RETURN
2001 REM*** PART OF THE SHIFT KEY PAINT PROCESS.

2010 GOSUB1420:PAINT(225,118),2,3:PAINT(238,90),2,3:RETURN
2020 SOUND20,1:SOUND40,2:LINE(15,88)-(30,96),PSET,B:PAINT(20,92),2,3
2030 IFFI=1THENPAINT(20,93),2,3
2040 RETURN
2050 SOUND200,1:SOUND230,2:LINE(250,94)-(235,86),PSET,B:PAINT(238,90),2,3
2060 IF FI=1THENPAINT(235,88),2,3
2070 RETURN
2071 REM*** END OF THE SHIFT KEY PAINT PROCESS.
2200 FORQ=1TOTW:NEXT:PCLS:RETURN

2210 IFB=2THENGOSUB1420:GOSUB1450
2211 REM*** DRAWS BOTH HANDS IN SOME CASES.
2220 IFHB>7THEN2280ELSEHB=0:MT$=M$
2230 FORQ=1TO3:L$=MID$(M$,Q,1):IFQ=2THENN=1:GOSUB1820
2231 REM*** TAKES ONE OF THE 3 LETTERS OF THE STRING, CARRYS IT TO 1820.
2240 NEXT
2250 N=0:M$=MT$:GOSUB2200
2260 IFH=0GOSUB1420ELSEIFH=1GOSUB1450
2261 REM*** TOO DRAW HAND.
2270 IFH<2THENZ=1
2280 FORGT=1TOPT:GOSUB1400:NEXT:CL=3:RETURN
2281 REM*** SENDS SET OF 3 LETTERS TO BE PROCESSED (PT) TIMES. THEN RETURNS TO GET NEW SET OF 3 LETTERS AT LINE 550.
2400 LI=30:SS=8:SP=13:M$="That's the end!":GOSUB2600:FORT=1TO2000:NEXT:PCLS:SP=17:M$="Here is the beginning!":GOSUB2600:FORT=1TO1000:NEXT:T=0:DE=0:PCLS:LT=0:GOTO18
2410 CLEAR900:DIMA$(90):FORX=1TO90:READA$:A$(X)=A$:NEXT
2411 REM*** BUILD 90 SHELVES IN
```



```

A SPACE CALLED A$(90).
READ THE DATA AND COUNT
IT AND NUMBER IT. THE
FIRST DATA IS A$(1), THE
DIRECTIONS FOR THIS CHAR
ACTER. !
PUT IN ON SHELF 1
2412 REM*** THE LAST DATA IS A
LOWER CASE z. CALL IT
A$(90) AND PUT IT ON THE
TOP SHELF, NUMBER 90.
2420 M$(2)="Test":GOTO15
2421 REM*** PUT THIS WORD ON
SHELF M$(2).
2600 HY=1:VY=50
2601 REM*** START OF ROUTINE
FOR DRAWING LETTERS.
2610 IF M$=""THEN RETURN
2620 FORQ=1TOLEN(M$)
2630 LY$=MID$(M$,Q,1)
2640 NY=ASC(LY$)-32
2641 REM*** ASC NUMBER OF THE
STRING CHARACTER MINUS
32 IS NY, THE SHELF
WHERE THE DRAW DIRECTION
FOR THAT CHARACTER ARE
STORED.
2650 DRAW"C3S"+STR$(SS)+"BM"+STR
$(HY)+"", "+STR$(VY)+A$(NY)
2651 IF NY<59 AND NY>32 OR NY<1
5 OR NY=31 THEN DRAW"C2S8BM"+ST
R$(HY)+"", "+STR$(VY)+A$(NY)
2652 REM*** DRAWS SOME WITH
WHITE
2660 IF LY$<>" "THENPLAY"T100V31
05A"
2661 REM*** IF ITS NOT A SPACE,
PLAY THIS NOTE.
2670 LC=10:IFNY>64THENLC=1
2680 HY=HY+LC
2681 REM*** MOVE OVER.
2690 IFLY$="I" OR LY$="i"THENHY=
HY-8
2700 IF LY$="w"THENHY=HY+8
2701 REM*** MORE ROOM FOR WIDE
LETTER.
2710 HY=HY+SP:IFHY>240THENHY=1:V
Y=VY+LI:IFVY>170THENHY=1:VY=40
2720 IF FS=1THEN FOR T=1TO1000:N
EXT:FS=0:PCLS
2730 NEXT
2740 RETURN

```

## UTILITIES AND GAMES FOR THE COLOR COMPUTER

**BACKUP** .....\$9.95  
Speed up disk backups, helps to recover crashed disks. Bypass I/O errors and fix many disk problems.

**CATALOG** .....\$9.95  
An automatic disk file cataloging system. File the directories of your disks.

**COPYTAPE** .....\$9.95  
Copy, merge, and backup your tape based software. Works even with most popular pre-loader tapes.

**CZAP** .....\$9.95  
A disk inspect and modify routine. Learn how disks work, fix problems on your disks.

**CCRPM** .....\$12.95  
A disk drive speed checking routine. Displays on your screen the current, average, high, and low speeds of your drive. Complete with instructions for correcting the speed of your disk drive.

**NEATDIR** .....\$6.95  
Places the file names of your disk directory into alphabetical order. Makes finding programs on your disks easy. Keeps your disks in order.

**OFFLOAD** .....\$9.95  
Create tape backups of your disks. A disk to tape, tape to disk backup system.

**ONERR** .....\$12.95  
An error handler for BASIC programs. Allows your program to receive control whenever any error occurs. Take control and fix your problems.

**TAPEDIR** .....\$9.95  
Create a directory of your tapes. Lists program name, length of program, start, end, and transfer addresses for all programs on your tapes.

**TAPELIB** .....\$12.95  
A BASIC tape subroutine append routine and a starter library of 5 subroutines. Create your own subroutine library on tape to append to your programs.

**TAPEXFER** .....\$9.95  
Load your tape programs to disk automatically. Great for Chromasette subscribers, automatically loads an entire issue to disk.

**TREK80C** .....\$14.95  
The classic Star Trek computer game. A real time game with moving Klingons and action graphics.

Please add \$1.00 shipping and handling on all orders. Pa. residents add 6% sales tax. Canada orders must be paid in American funds. No COD or charge cards, send check or money order only to:

**A.M. HEARN SOFTWARE**  
602 S. 48th Street  
Philadelphia, Pa. 19143

Write for a free catalog of these and other products.  
Dealer inquiries invited.

```
2750 'GOTO460
2799 REM*** DATA FOR DRAWING
      LETTERS STARTS HERE.
2800 DATA BR3L1U1R1D1BU3U5L1D5R1
      ,BR3BU5U1R1D2U1L1BL4U1R1D2U1L1,B
      R2BU1U6BR2D6BL4BU2NR6BU2R6,R6U4L
      6U4R6L3D8,E8BL6L2D2R2U2BD8BR4U2R
      2D2L2,BR5E3G3L4H1U1E5U1H1L2G1D1F
      6,BR2BU5U3R1D3L1
2810 REM*** !"#$$%&'
2820 DATA BR2H2U4E2,BR2E2U4H2
2830 REM*** ( )
2840 DATA BR4BU2U6BD3NE2NF2NG2NH
      2,BU4R8L4U4D8,BR3L1U1R1D3,BU4BR2
      R6,BR2U1R1D1L1,BR1E7,U8R8G8E8D8L
      8,BR2R4L2U8G2E2BD8,BR8L8U4R8U4L6
      BR6BD8,BR1R7U4L4BR4U4L7BR7BD8BL4
      ,BR1BR6U8G6E6D6L6R7L1D2,R7U4L7U4
      R6BD8
2850 REM*** *+,-./ 012345
2860 DATA U8NR6D4R8D4NL8,BU8R8G8
      BR12,U8R8D4NL8D4NL8,R8U8L8D4R8D4

2870 REM*** 6789
2880 DATA BR2BU1U1R1D1L1BU4U1R1D
      1L1,BR2U1R1D3U2L1BU2U1R1D1L1,BU4
      NE3F3
2890 REM*** ;;<
2900 DATA BU6BR1R8L8BD4R8,BR5BU4
      NH3G3,BR3U1R1D1L1BU3U1R4U4L6D1,B
      R3L1H2U2E2R2F2D3L2U2L1D1R1
2910 REM*** =>?@
2920 DATA U8R8D4L8BR8D4,U8R6F1D2
      G1L6BR6F1D2G1L6,U8R8BD8L8,U8R6F2
      D4G2L6,U8R8BD4BL2L6BD4R8,U8R8BD4
      BL2L6,U8R8BD4L4BR4D4L8
2930 REM*** ABCDEFG
2940 DATA U8BR8D8BU4L8,BU8BR2R4L
      2D8L2R4,U4BU4BR8D8L8,U8BR8G4L4BR
      4F4,U8BD8R8,U8F4E4D8,U8F8U8
2950 REM*** HIJKLMN
2960 DATA U8R8D8L8,U8R8D4L8BD4,U
      8R8D8H4BG4R8,U8R8D4L8BR4F4,BU4U4
      R8BD4L8BR8D4L8,BU8R8BL4D8
2970 REM*** OPQRST
2980 DATA BU8D8R8U8,BU8D4F4E4U4,
      U8BR8D8H4G4,E8BL8F8,BU8F4E4BL4BD
      4D4,BU8R8G8R8,BR0,BR0
2990 REM*** UVWXYZ PLACE HOLDER
      PLACE HOLDER
3000 DATA BR0,BR0,BR0,BR0
3010 REM*** 4 PLACE HOLDERS

3020 DATABU5E1R3F1D5U1G1L3H1U2E1
      R3F1BD3R1,U8D3E1R3F1D4G1L3H1BD1,
      BU1U4E1R3F1BD4G1L3H1,BR5U8D3H1L3
      G1D4F1R3E1
3030 REM*** abcd
3040 DATA BU1U4E1R3F1D1G1L4BR5BD
      2G1L3H1,BR3U5L1R3L2U2E1R1F1,BR4D
      2G1L3R3E1U7H1L3G1D4F1R3E1,U8D3E1
      R3F1D5
3050 RE*** efgh
3060 DATA U6BU1U1BD8,BR2BU8D1BD1
      D6G1L1R1,U8D5R2NE3F3BR4,BR2R1U8L
      1R1BD8R2,U5NH1E1R1F1ND5E1R1F1D5
3070 REM*** ijklm
3080 DATAU5NH1E1R2F1D5,BU1U4E1R3
      F1D4G1L3H1,BR1ND3U5NH1E1R3F1D4G1
      L3H1,BR4ND3U5NE1H1L3G1D4F1R3E1,B
      R1U5NH1R3F1
3090 REM*** nopqr
3100 DATA BU1F1R3E1U1H1L3H1UE1R3
      F1,BR2BU1U6D1L2R5L3D5F1R1E1,BU1U
      5D5F1R3E1U5D5F1R1
3110 REM*** stu
3120 DATABR3H3U3D3F3E3U3,BR2H2U4
      D4F2E2U2D2F2E2U4,E6BD6H6,BR2H2U4
      D4F2R1E2U4D4G2G2L1BR11,BU6R5G6R6

3130 REM*** vwxyz
3200 NY=64:PMODE3,1:PCLS:SCREEN1
      ,0
3210 REM*** START OF ROUTINE
      FOR DRAWING LETTERS IN
      A CIRCLE.
3220 PI=3.14159
3230 A1=0:A2=2*PI
3240 N=360:A=170
3250 REM*** (A) IS BOTTOM OF
      SCREEN AND CIRCLE.
3260 X=(A2-A1)/N
3270 IF TL=1THENFORI=A2 TO A1 ST
      EP-(12*X) ELSE FORI=A2 TO A1 STE
      P-(7*X)
3280 REM*** A2 TO A1 FOR CLOCK
      WISE MOVE ELSE A1 TO A2
      FOR COUNTERCLOCKWISE.
3290 REM*** STEP 12*X FOR 15
      POSITIONS. INCREASE 12
      FOR LESS POINTS AROUND
      THE CIRCLE. DECREASE 12
      FOR MORE POINTS TO USE
      FOR DRAW POSITIONS.
3300 R=A*COS(1*I)
```

```

3310 X=R*SIN(I)
3320 LT=LT+1:NY=ASC(MID$(TYS,LT)
)-32
3330 REM*** LT IS COUNTER OF
LETTERS.
3340 Y=R*COS(I)
3350 DRAW"C3S8BM124,96"+A$(NY):P
LAY"T250L25005V31AAAFFFGGEEEE":D
RAW"C1S8BM124,96"+A$(NY)
3360 REM*** DRAW THE LETTER IN
THE CENTER. MAKE A SOUND
THEN ERASE IT.
3370 COLOR3,1:LINE(128,96)-(128+
X-10,6+Y),PSET
3380 REM*** DRAW A LINE FROM
CENTER TO PERIMETER.
3390 LINE(128,96)-(128+X-10,6+Y)
,PRESET
3400 REM*** ERASE THE LINE.
3410 P=INT(118+X):L=INT(6+Y)
3420 REM*** WE WANT P AND L
TO BE INTEGERS.
3430 NY=ASC(MID$(TYS,LT1))-32
3440 REM*** NY IS THE SHELF
NUMBER WHERE THE DRAW
DIRECTIONS CAN BE FOUND
IN THE STORAGE AREA
CALLED AS.
3449 IF OD=1THEN IF LT/2=INT(LT/
2)THEN CL=2 ELSE IF LT/3=INT(LT/
3)THEN CL=3 ELSE CL=4
3450 DRAW"C"+STR$(CL)+"S8BM"+STR
$(P)+", "+STR$(L+12)+A$(NY)
3451 IF NY<59 THENDRAW"C2S8BM"+S
TR$(P)+", "+STR$(L+12)+A$(NY)
3460 REM*** COLOR3,SIZE 8, DRAW
A$(NY) AT P,L+12
3470 PLAY"T100L100V3105A"
3480 IFLT=LEN(TYS) THENRETURN
3490 REM*** IF AS MANY LETTERS
WERE DRAWN AS THERE ARE
IN THE STRING THEN GO
BACK TO THE LINE THAT
SENT YOU.
3500 NEXTI
3510 GOTO3220
3590 IF E=1THEN RE=100:LE=100 EL
SE IF E=2 THEN RE=100:LE=110 ELS
E IF E=3 THEN RE=110:LE=100
3591 REM*** START DRAWING FACE
POSITION OF EYES CHANGES
WITH RE)RIGHT EYE, LE.

```

```

3600 CIRCLE(78,RE),18,3,.7:CIRC
LE(78,RE),30,3,.5,.65,.95:PLAY"T
255L25505V31G#G#DDDDDDDDDEEEEE":
CIRCLE(168,LE),18,3,.7:CIRCLE(16
8,LE),30,3,.5,.55,.85:PAINT(78,R
E),2,3:PAINT(158,LE),2,3
3602 CIRCLE(115,120),2,3:CIRCLE(
131,120),2,3:CIRCLE(120,100),70
,2,.6,.12,.38
3603 CIRCLE(120,100),55,2,.9,.14
,.38
3604 CIRCLE(78,RE),5,3:CIRCLE(16
8,LE),5,3
3608 PAINT(120,145),2,2
3610 PLAY"T255L25503V11AAAEV20
04AAAAAEV3105AAAAAEV2000"
3800 FORT=1TO2000:NEXT:T=0:RETUR
N

```

## NEW FOR THE COLOR COMPUTER

# GRAF PLOT

### HIGH RESOLUTION DATA GRAPHING

GRAF PLOT turns your COLOR COMPUTER into a sophisticated data plotter, producing professional quality graphs of any type of X-Y data. GRAF PLOT is perfect for personal, business, statistical, scientific and engineering applications. Includes features not found in any other COLOR COMPUTER graphing system:

- 222x174 pixel on-screen data plotting area.
- Complete on-screen labeling for two Y-axes w/200 data points per axis (even more points by chaining data files).
- 9 graphing options: 3 symbols w/2 line types or points only.
- Full function data editing: add, change, delete and sort.
- Hardcopy w/standard screenprint programs (not supplied) - includes interface for Tandy SCRPRT w/instructions for interfacing other printers and screenprint programs.
- Unlimited overlays - plot 9 or more data sets per graph.
- Graphs output to screen, printer, tape or disk.
- Plots any user-defined function, edit 4 program lines.
- Built-in data smoothing (moving binomial average).
- Built-in integration - calculate areas or evaluate integrals of user-defined functions.
- Lists data and integrals to screen or printer.
- Saves completed graphs for instant reloading.
- Menu-driven w/auto-prompt option for fast throughput.
- Complete error trapping - GRAF PLOT won't let you make a mistake, practically impossible to crash.
- Comprehensive manual w/tutorials and sample data.

GRAF PLOT is available for 16K E.C.B. on cassette (\$35) and 32K-1 disk (\$45). Easy upgrade to disk for difference in price (disk version reads and writes tape data files). Send check or money order to: HAWKES RESEARCH SERVICES, 1442 Sixth St., Berkeley, CA, 94710. Include \$3 S/H on all orders. Manual available separately for \$10+S/H, refundable with purchase of GRAF PLOT. CA residents add state sales tax. Dealer inquiries welcome. Quantity discounts available.

---

# FLEX Corner

Still more BASIC  
By Roger L. Degler  
Micro Technical Products, Inc.  
123 N. Surrine, Suite 106  
Mesa, AZ 85201

Last month we began looking at seven different BASICs - five of which run under FLEX, one of which runs under OS-9, and the last being good ol' ROM BASIC. We examined the direct mode commands and saw that there are some substantial differences.

This month we are going to continue looking at these same BASICs by comparing their graphics, audio, input/output, and control transfer statements. Like last month, I'll present all these statements in tabular form for your easy comparison.

## Graphics and audio statements

Table 2 is a listing of all the graphics and audio statements available in each of the different BASICs. (Don't worry, table 1 is not missing - it was presented last month). As you can see, only those BASICs which use the existing ROMs in your computer offer any graphics or audio capabilities. This is because such capabilities are directly linked to the hardware configuration of the computer, and therefore require the BASIC to be written specifically for the particular computer. This is, of course, the case with the built in ROM BASIC. That is, ROM BASIC was designed to work with the hardware

configuration of the Color Computer.

XBASIC, RBASIC, and BASIC09 are general BASIC packages, adaptable to any computer system. For this reason they cannot make use of any of the hardware features which are unique to the Color Computer. Whether or not this is important to you depends upon whether or not you are writing programs which require these graphic or sound functions. If not, then these other BASICs should serve your purpose quite handily.

## CRT and keyboard I/O

Table 3 lists the input/output statements for each of the BASICs which deals with reading characters from the keyboard or writing characters to the CRT.

Note that all versions include the standard statements INPUT and PRINT. The syntax for using these statements in each version of BASIC is essentially the same. So, for simple programming tasks you should have no problems adapting to any of these BASICs.

All seven BASICs provide PRINT USING capability to allow for formatted output. The first six versions are similar in syntax. However, BASIC09 is substantially different. If you have ever programmed in FORTRAN then you will recognize the

# \$29.95 (TAPE) COLOR TERM + PLUS + \$39.95 (DISK)

Now even more +PLUS+ features than before!!!  
PLUS a \$10.00 discount!\*

Others claim they "didn't wait for the competition to catch up ..." but we're so far ahead we didn't even know there *was* competition! We have *always* had a buffer editor, complete up and down load support, on-line cassette reads and writes, off-line and on-line scrolling, pre-entry of data before calling, word-wrap, the ability to transmit, receive, save, and load machine code, BASIC programs, and ASCII files, buffer printing, to select all parameters in order to communicate with *any* other computer, to change the BAUD rate, parity, duplex, word length, stop bits, and turn off lower case letters (no more blotchy screen).

This means that you can communicate with the local BBS's, Compuserve, The Source, Dow Jones, The main-frame at work or school, other Color Computers, Apples, IBM PCs, TRS-80 I/ II/III/12/16 or any other computer via RS-232.

And now, because we have listened to *your* suggestions, we have added even more +PLUS+ features. The following list summarizes *everything* our COLOR TERM +PLUS+ version 2.2 (tape) and 3.2 (disk) can do for you, and without taking up large amounts of your precious buffer or wiping out your pocket book!

- + Communications BAUD rate: 110-19200
- New!** + Change printer BAUD rate: 600-9600
- New!** + Select printer line feeds if needed
- + Select Half or Full Duplex
- + Select Odd, Even, or No Parity
- + Select 7 or 8 Bit Words
- + Select 1 or 2 Stop Bits
- + Send Control Characters
- + Separate Keys for Escape & Delete (Rubout)
- + Turn off those UGLY Lower-case letters (no more blotchy screen!)
- Improved!!** + Word Wrap — eliminate all split words
- New!** + Selectable Reverse or Normal Video (no more tired eyes — black on green or green on black)
- New!** + Scroll protect up to nine lines (save important lines for reference)
- New!** + Automatic capture of incoming files
- Improved!!** + Send one line at a time from your buffer (makes sending messages or files to main frames or BBS's even easier than before)
- Improved!!** + Has programmable prompt for "send next line"
- New!** + Disk version extras: List Directory, Granules
- New!** + Buffer Size Indicator
- + *Complete* up and down load support
- Improved!!** + Improved buffer editor in both versions
- + On/Off Line Cassette/Disk Reads & Writes
- + Save & Load Machine Code, BASIC Programs or Files
- + On/Off Line Scrolling of Buffer
- + Pre-enter Data before going on line
- + Easy to read manual is included with each program — you'll be communicating in minutes!



**New and Improved!**

**If your local software dealer does not carry our products ask why not!**

+PLUS+  
64K  
version

**Dealer inquiries invited.**

\*We are so sure *we* have the *finest* terminal package you can buy, we will give you a \$10.00 credit toward either the tape or disk version when you send in a tape, disk, or ROM pack from *ANY* of our competitors. The original program & documentation must be sent in order to get credit toward COLOR TERM +PLUS+. Note: All present owners of COLOR TERM +PLUS+ versions 1.0, 2.0, 2.1, 3.0, & 3.1 may up-grade to either version 2.2 (tape) or 3.2 (disk) for \$12.54.\*\* Just send your original tape or disk to us, we will ship your new program immediately! This offer expires August 31, 1983. THE PRICE IS STILL \$29.95 (tape) \$39.95 (Disk) An offer you can't refuse!

\*\*Note: If you now own a tape version send \$17.54 for disk version. 16k or 32k required.

## COLOR KEY COMMAND

☆☆☆☆☆☆☆☆☆☆  
Looking for a powerful programmer's aid, but you don't have a fortune to spend? This program is for you! Look at these features: two keystroke entry of more than 80 Basic, Extended Basic, and Disk Basic commands. Select the color of your cursor. Select the prompt you want — no more "OK" when a program bombs! Automatic line numbering — you select the start line and increment! 4 custom programmable keys for a total of 64 characters each — enter whole lines with two key presses! Copy any line with the copy command. Merge tape programs together automatically. Redefine any or all keys with a short basic program we supply. How can you get all this and more for so little? Because you make the keyboard overlay! We give you a template with all commands printed on it — you cut it out and use it. That is all there is to it! Note: Not all features are available on every machine; some require Extended or Disk Basic to work properly.  
16K or 32K Req. PRICE \$18.95 (tape)\* D

\$2.00 shipping and handling on all orders. No extra charge on COD orders, Mastercard and VISA accepted. Texas residents add 5% sales tax. Allow two weeks for personal checks. Send 20 cent stamp for free catalog.

COLOR COMPUTER/TDP-100 **Save!!**  
**SUPER-PRO**  
REPLACEMENT KEYBOARD KIT \$64.95  
COLOR DISK SAVER

Saves a disk to tape. Reloads disk from saved tape. Also has tape verify command! 32k Ext. BASIC Req.  
PRICE \$12.95 (tape)\*\* D

**COLOR BIORHYTHM** Are you up or down today, tomorrow, or years from now? Find out with COLOR BIORHYTHM. Uses high res graphics. Send the chart to printer. 16k or 32k Ext. BASIC Req.  
PRICE \$14.95 (tape) D

**AUTO LOAD** Auto Load will put *any* program or file from tape to disk! All machine language programs that load below the top of your disk system are modified so that they will operate properly with a disk system!  
16k or 32k Ext. BASIC Req  
PRICE \$12.95 (tape)\*

\* All machine code D Disk Compatible  
\*\* BASIC with machine code subroutines

## Double Density Software



920 Baldwin Street  
Denton, Texas 76201  
Phone 817/566-2004.



**ADVENTURERS  
-WANTED-**  
"Now only \$19.95  
for 6 adventures"

## NOTICE

If you are seriously into adventures, just like playing them, or if you never played an adventure game before then we have an exciting club for you.

When you join our Adventure Club you will receive six quality adventures, one every other month for the next year for just \$19.95. Every adventure is an all new challenging adventure which has never been sold anywhere else before and can be yours for just a little more than \$3.00 per adventure. For the low price of \$19.95, the price you'd expect to pay for just one of our adventures, you can climb the tallest mountain, cross the hottest desert, escape the darkest cave and much more for a whole year. You will also receive a 10 per cent discount on all software and blank tapes we sell.

System required - 16K Color Computer

### OTHER PROGRAMS

**LOST CITY, U.S.A.** - you find yourself lost in a city with very little gas. You have to find your way home safely.

Save \$4.00 Now only \$.895

**INTEREST CALCULATOR**  
- Calculates monthly payments, interest earned and much more.

Reg. \$9.95 Now only \$.495

### QUALITY C-60 CASSETTES

W/O With  
Boxes Boxes

1 dozen \$4.95 \$6.95

2 dozen \$9.50 \$13.50

3 dozen \$13.50 \$18.95

Each additional  
dozen \$3.75 \$5.75

Money back guaranteed if your not completely satisfied. Just return them within 90 days for a complete refund.

All Programs require 16K. Send check or money order to -

## SOFTWARE UNLIMITED

115 Cedar Lake Rd. Chester, CT 06412

We pay for shipping, NO C.O.D.s

similarity between BASIC09's PRINT USING syntax and that of FORTRAN's FORMAT statement. Suffice it at this time to say that BASIC09's method of producing formatted output is very simple to use and offers great power and versatility. I hope we can go into this more at a later time.

XBASIC's INCH\$(0) function and BASIC09's GET #0 statement are similar to ROM BASIC's INKEY\$ function. They may be used to read individual keys from the keyboard.

### Line Printer Output

Table 4 lists the output statements pertaining to the line printer. For the most part, all the versions are similar. XBASIC and BASIC09 require you to open a channel to the printer before you can send data to it.

Table 5 shows input and output statements for use with the cassette. As you can see, only those versions of BASIC which make use of the internal BASIC ROMs allow you to use your cassette in any way, shape or form. Again, this is because only the internal ROMs know about the hardware configuration of the Color Computer. So, if you need to write BASIC programs that will need to use either CCBASIC, CBASIC, or DBASIC.

### DisK I/O

Although the comparison of cassette I/O was black and white, table 6 reveals a much more complex comparison of available disk commands. Note first off that CCBASIC and CBASIC do not support the disk at all. ROM BASIC, DBASIC, and XBASIC are the most similar, while RBASIC and BASIC09 contain substantial differences.

XBASIC's CVTF\$, CVT %, CVT\$F, and CVT\$ % functions are used to convert floating point or integer numbers to or from fixed length strings. This is comparable to ROM BASIC's CVN and MKN\$

functions, and is handy for outputting number into fixed locations of random access files.

The DIM # statement allows for a very nice feature of XBASIC, that of disk resident virtual arrays. In other BASICs all arrays must be stored in RAM. XBASIC allows you to store arrays on the disk and use them just as if they were loaded into RAM, but, they don't take up any memory space. Additionally, arrays may be much larger on the disk than available RAM would allow. Once an array is opened and dimensioned, it is used exactly as if it were a normal RAM resident array. Of course, your program may operate somewhat slower than if the array were actually located in RAM, but, the advantages to be gained far outweigh the disadvantages.

STOP PLAYING GAMES NEW TRS-80 Color

- Calculate odds on HORSE RACES with ANY COMPUTER using BASIC.
- SCIENTIFICALLY DERIVED SYSTEM really works. TV Station WLKY of Louisville, Kentucky used this system to predict the odds of the 1980 Kentucky Derby. See the Wall Street Journal (June 6, 1980) article on Horse-Handicapping. This system was written and used by computer experts and is now being made available to home computer owners. This method is based on storing data from a large number of races on a high speed, large scale computer. 23 factors taken from the "Daily Racing Form" were then analyzed by the computer to see how they influenced race results. From these 23 factors, ten were found to be the most vital in determining winners. NUMERICAL PROBABILITIES of each of these 10 factors were then computed and this forms the basis of this REVOLUTIONARY NEW PROGRAM.
- SIMPLE TO USE: Obtain "Daily Racing Form" the day before the races and answer the 10 questions about each horse. Run the program and your computer will print out the odds for all horses in each race. COMPUTER POWER gives you the advantage!
- YOU GET: 1) Cassette.  
2) Listing of BASIC program for use with any computer.  
3) Instructions on how to get the needed data from the "Daily Racing Form"  
4) Tips on using the odds generated by the program.  
5) Sample form to simplify entering data for each race.



MAIL COUPON OR CALL TODAY

**3G COMPANY, INC. DEPT. C**  
**RT. 3, BOX 28A, GASTON, OR 97119**

Yes, I want to use my computer for FUN and PROFIT. Please send me \_\_\_\_\_ programs at \$24.95 each. Circle the cassette you need:  PET/CBM,  VIC-20,  Commodore 64,  Sinclair Timex 1000,  Atari,  TRS-80,  Color Computer, or  Apple (Apple Disk available—add \$5.00)

Enclosed is:  check or money order  MasterCard  Visa

Card No. \_\_\_\_\_ Exp. date \_\_\_\_\_

NAME \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_ STATE \_\_\_\_\_ ZIP \_\_\_\_\_

**(503) 357-5607**

START USING YOUR COMPUTER FOR  
FUN and PROFIT!

RBASIC's disk file handling technique is substantially different than that of the ROM BASIC compatible versions.

An example of this difference is the fact that random access files created under a Microsoft compatible BASIC (such as ROM BASIC and XBASIC) may be expanded in size at any time simply by writing to a record beyond the current end of file. RBASIC requires you to use the EXPAND statement in order to increase the size of a file.

The FCHK function is used to determine whether or not a particular file exists on the disk without the risk of causing a BASIC error of the sort "File not found".

RECNO is used either as a function or as a statement. As a function, it returns the number of the currently accessible record of an open random file. As a statement, it is used with the word SET to seek to any record within a random file. The RESTORE statement is used to reset any open file back to its beginning.

RSIZE is a function which returns the number of records within a random file. RNEXT returns the record number of the last used record in the file plus one. That is, the numbr of the next available record.

The SCRATCH statement is used only with open sequential files to temporarily delete the file from the disk directory and then create a new file of the same name, open only for output (writing).

The STATUS function is used to obtain the current file status from the Disk Operating System.

Notice in RBASIC that the INPUT and PRINT statements may not be used to read from or write to the disk. Instead you must use READ, WRITE, GET, or PUT.

Notice also an absence of LSET and RSET functions to pack data into records. Whenever a random file is created, you must inform RBASIC of the exact size that the records are going to be. When writing data to a record in a random file you must make certain that you write only the

proper amount of data. Likewise for reading.

BASIC09 looks quite familiar, but has several unique features. Sequential files are handled with the INPUT, PRINT, READ, and WRITE statements, much like ROM BASIC. Also like ROM BASIC, records within a random file are only accessed via the GET and PUT statements.

The real power of BASIC09's random file I/O capabilities stems from BASIC09's ability to define data structures. As an example we might wish to define an employee record as consisting of the following:

- 1) Employee number: Integer
- 2) Name : String (len=20)
- 3) Address : String (len=30)
- 4) City : String (len=15)
- 5) State : String (len=2)
- 6) Zip Code : Real
- 7) Age : Integer
- 8) Sex : String (len=1)

We could define this structure as EMPLOYEE\_REC and create a variable named EMPLOYEE which was of this structure. We would do this by:

```
TYPE EMPLOYEE_REC =  
    EMP_NBR:INTEGER;  
    NAME:STRING [20];  
    ADDRESS:STRING [30];  
    CITY:STRING [15];  
    STATE:STRING [2];  
    ZIP_CODE:REAL;  
    AGE:INTEGER;  
    SEX:STRING [1]  
DIM EMPLOYEE : EMPLOYEE_REC
```

We could then read an entire employee record from an open file simply by:

```
GET #ilenbr,EMPLOYEE
```

or could write an entire record by:

```
PUT #ilenbr,EMPLOYEE
```

---



With each of the read and write statements above, all 8 fields of a record are automatically transferred.

BASIC09's SEEK statement is used to access any given record within a file. However, unlike most versions of BASIC, instead of specifying a record number to seek to, you specify a byte number within the file to seek to. Byte number zero is the first byte within a file. Therefore, you must know exactly how long the records are within the file in order to seek to, for instance, the fifth record. But, by using the SIZE function, this is very easy to do. Following our employee example above, to seek to the fifth record:

```
SEEK #filenbr,SIZE(EMPLOYEE)* 5
```

Don't strain yourself now, but, if you think about it, this is a very powerful feature, as it allows you to mix records of differing sizes within a single file. You do have to be very careful when doing this so as not to get lost in the file, but, it is a simple thing to do.

### Control Transfer Statements

Table 7 presents a comparison of the statements which cause a branching effect to occur within your programs. In other words, they transfer the control of your program from one place to another.

Of the seven versions of BASIC shown, the first six (ROM BASIC through RBASIC) are almost identical. We'll look at the small differences in these six versions, and then we'll look at the extreme differences of BASIC09.

XBASIC's CHAIN and RUN statements are used to load and execute additional programs. The program currently running in memory is overwritten. The EXEC, statement (the comma is part of the statement) is used to load and execute FLEX's utility programs. For instance, if you wanted to list the catalog of drive 1, you could do the following:  
100 EXEC, "CAT 1"

# COLOR COMPUTER SOFTWARE

Eigen  
Systems

## DISK COLORCOM/E

### The Intelligent Communications Package

COLORCOM/E, the most popular smart terminal program for the Color Computer, has just gotten smarter. In fact, from now on, we're going to call it The Intelligent Terminal program.

The new DISK COLORCOM/E contains a unique COMMAND MODE that allows you to set up complete communications sessions in advance. Anything you normally do from the keyboard DISK COLORCOM/E can do all by itself. Log-on, log-off, read and store messages, disconnect, transmit and receive files, dial auto-dial modems, — anything! DISK COLORCOM/E will even make decisions based upon how the host responds.

Here are some examples of how YOU might want to use the new DISK COLORCOM/E.

- Call your favorite bulletin board, download all messages addressed to you, log off, and write the messages to a disk file. AND do all of this with one keystroke!
- Call Dow Jones, log on and get the latest prices on your favorite stocks, and then log off. Again all with ONE keystroke.
- With an Autodial modem let COLORCOM/E Make your calls for you at 3:00 A.M. when rates are cheap. Then read the results with your morning coffee.

In addition we've added 64K support and your choice of number of characters per line. Of course you still get the regular COLORCOM/E features such as upload/download, graphics, easy storing and printing of data, and much more. For 16, 32 or 64K disk systems.

COLORCOM/E Disk \$49.95

## COMPLETE YOUR WORD PROCESSOR

### SPELL — RITE

THE Cassette Spelling Verifier

You've got the best word processor. Now complete your system with the best spelling verifier. Spell-Rite is a convenient, fast way to insure that all of your documents are letter perfect. Spell-Rite was designed specifically for cassette-based word processors. Like Yours!

**Spell-Rite** is EASY to use, completely menu driven.

**Spell-Rite** is FAST! You can verify a 1000 word document in under 9 minutes - including cassette I/O.

**Spell-Rite** is COMPLETE. It comes with its own 10,000+ word dictionary which you can expand. Also included is a superb manual.

**Spell-Rite** works with any word processor that generates ASCII tape files, such as Color Scripsit, Super Color Writer and Telewriter 64. 32K of RAM and Extended Basic are required.

Cassettes and manual \$59.95

Send check or money order for total purchase price, plus \$1.50 S&H. Charge cards: Include all embossed information.

Spell-Rite  Send Free Catalog

Disk Colorcom/E

SEND TO

Eigen  
Systems

P.O. Box 180006  
Austin, Texas 78718  
(512) 837-4665

Name \_\_\_\_\_

Address \_\_\_\_\_

# Build performance into your system

## with OS-9\*\* software tools

Unix\*-based, multitasking, modular, and versatile: these key features are some of the reasons why more 6809 computer manufacturers have selected OS-9 as their standard operating system than any other. And OS-9 has been put to work by thousands of users in almost every conceivable computer application in business, science, industry, education, and government.

Your operating system should not be a barrier between you and your computer. OS-9 is very friendly and easy to use. Its modular structure makes it easy to customize, plus its comprehensive documentation shows you exactly how to interface it to just about any I/O device.

OS-9's advanced features unleash the performance potential of almost any 6809 computer — large or small. In many respects the OS-9/6809 combination is more powerful than many *minicomputers!*

There are two basic versions of OS-9. Both have the same basic features and capabilities. OS-9 Level One runs on small to medium sized systems having up to 64K memory. The Level Two version runs on medium to large size systems having memory management hardware and up to 1 megabyte of memory, and includes record and file locking for multiuser database applications.

Here are just a few reasons why you should insist on OS-9 for your microcomputer system.

- Over 40 utility commands
- Friendly "Shell" command interpreter
- Tree-structured multilevel file directories

- Full timesharing support with log-in and file security
- Fast, secure random and sequential access files
- Comprehensive English language error messages
- Compact real-time multitasking executive
- Hardware or software memory management
- Device independent interrupt-driven I/O
- Fully ROMable for small control systems
- Standard versions available from manufacturers of most popular 6809 computers

### OS-9 PASCAL Language Compiler

- most complete and versatile PASCAL available for the 6809
- capable of generating P-code for interpretive execution while debugging OR
- highly optimized 6809 assembly language source code output for maximum speed
- "virtual memory" P-code interpreter lets you run large PASCAL programs

### CIS COBOL \*\*\* Compiler

- ideal for most demanding business applications
- features ISAM, Debug, ACCEPT/DISPLAY and Interprogram Communications modules
- retains full compatibility with CPM software
- meets ANSI 1974 Level One COBOL standard and is GSA certified
- Also available-FORMS 2 automatic program generator for easy interactive design of screen oriented applications.

### BASIC09\*\* Structured Basic Interactive Compiler

- fastest and most comprehensive full Basic language available for the 6809
- combines standard Basic with the best features of PASCAL
- features compiler speed, interpreter friendliness and superlative debugging facilities
- option available: Run B...a ROMable run-time system for compiled Basic 09

### C Language Compiler

- complete implementation of the UNIX version 7 C language
- includes INT, CHAR, SIGNED, UNSIGNED, FLOAT AND LONG data types, structures, unions, standard C library and a full preprocessor with macro definitions
- generates fully reentrant 6809 assembly language source code output

For more information contact your computer supplier, or



## MICROWARE

Microware Systems Corporation  
5835 Grand Avenue, Des Moines,  
Iowa 50312 515-279-8844 • Telex  
910-520-2535

\*Unix is a trademark of Bell Laboratories. \*\*\*CIS Cobol is a trademark of Micro Focus, Inc. OS-9\*\* and Basic09 are trademarks of Microware and Motorola, Inc.

One very nice feature of XBASIC is the inclusion of the ON...ERROR and RESUME statements, which is a painful short coming of ROM BASIC. These statements allow you to 'trap' any BASIC errors which may occur while your program is running, such as /O, AE, BS, DF, NE, SN, ..., etc. (Please note, XBASIC does not report errors via the above two-letter codes as ROM BASIC does. Instead, it displays error numbers. I have used these codes here to display the type of errors which may be trapped, since we are all familiar with this terminology). This is a very powerful feature which allows you to write programs which cannot be 'crashed' by a user - a very important aspect of every program which you may intend to sell.

In the category of Control Transfer Statements, RBASIC is pretty much like ROM BASIC and XBASIC. Its CALL and USER statements are used to call machine language subroutines. The CHAIN statement is used to load and execute another BASIC program from the disk. The DO statement is similar to XBASIC's EXEC, statement in that it allows you to execute most of FLEX's command utility programs from within BASIC. Unlike EXEC, however, DO may be used while in the Direct mode. RBASIC also contains the ON...ERROR statement. The WAIT statement is used to pause processing for a predetermined amount of time. This is a handy short cut as this normally must be done with a FOR...NEXT loop.

And now for BASIC09. This is another area in which BASIC09 really shines. For the most part you can write ordinary programs and BASIC09 will execute them just fine. However, BASIC 09 also supports structured programming.

Structured programming is a method, utilizing relatively strict rules, of writing programs using constructs. Constructs are essentially building blocks from which to construct larger, more complex programs.

One such construct which we are all familiar with is the FOR...NEXT loop. BASIC09 supports the FOR...NEXT loop the same as do the other versions of BASIC discussed. Other constructs supported by BASIC09 are:

**\* \* \* IF...THEN / ELSE / ENDIF**

```
IF condition THEN
  statement 1
  statement 2
  etc.
ELSE
  statement n
  statement n +
  etc.
ENDIF
```

**\* \* \* REPEAT / UNTIL**

```
REPEAT
  statement 1
  statement 2
  etc.
UNTIL CONDITION
```

**\* \* \* WHILE...DO / ENDWHILE**

```
WHILE condition DO
  statement 1
  statement 2
  etc.
ENDWHILE
```

**\* \* \* LOOP / ENDLOOP**

```
LOOP
  statement 1
  statement 2
  etc.
ENDLOOP
```

While most of these constructs should be self explanatory, let me give you an explanation of LOOP / ENDLOOP. This construct creates an infinite loop, much the same as using a GOTO statement at

# FINALLY!

## A REAL SPREAD-SHEET PROGRAM FOR THE COLOR COMPUTER

# DYNACALC™

Business people use spread-sheets to organize columns and rows of figures. DYNACALC simulates the operation of a spread-sheet without the mess of paper and pencil. Of course, corrections and changes are a snap. Changing any entered value causes the whole spread-sheet to be re-calculated based on the new constants. This means that you can play, 'what if?' to your heart's content.

But DYNACALC isn't just for accountants. DYNACALC can be used for just about any type of job. Not only numbers, but alphanumeric messages can be handled. Engineers and other technical users will love DYNACALC's sixteen-digit math and built-in scientific functions. There's even a built-in sort command, so you can use DYNACALC to manage small data bases - up to 256 records.

DYNACALC will let your computer do just about anything you can imagine. Ask your friends who have VisiCalc, or a similar program, just how useful an electronic spread-sheet program can be for all types of household, business, engineering, and scientific applications.

DYNACALC is designed to be used by non-programmers, but even a Ph.D. in Computer Science can understand it. Built-in HELP messages are provided for quick reference to operating instructions.

DYNACALC has a beautifully simple method of reading and writing FLEX data files, so you can communicate both ways with other programs on your system, such as the Text Editor, Text Processor, Sort/Merge, RMS data base system, or other programs written in BASIC, C, PASCAL, FORTRAN, and so on.

Except for a few seldom-used commands, DYNACALC is memory-resident, so there is little disk I/O to slow things down. The whole data array (worksheet) is in memory, so access to any point is instantaneous. DYNACALC is 100% 6809 machine code for blistering speed.

Color Computer DYNACALC works with the FLEX operating system from Frank Hogg Laboratory (64k required). If you aren't already using this powerful operating system, we have a special deal for you: order DYNACALC (regularly \$200) and FHL Color FLEX (regularly \$99) together for only \$250.

To order, see your local DYNACALC 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. Be sure to specify that you want the Color Computer version.

## ORDER YOUR DYNACALC TODAY!

Computer Systems Center  
13461 Olive Blvd.  
Chesterfield, MO 63017  
(314) 576-5020



the bottom of the construct to always branch back to the top.

Two things to notice about these examples: 1) BASIC09 does not require every line to have a line number, and 2) there is no limit on the number of statements that may be inserted within any given complexity.

Let's take just a moment here and talk about line numbers. Have you ever stopped to think that most of the BASIC programs you have ever written contain an awful lot of unnecessary line numbers? The only statement that actually need to have line numbers on them are those statements referenced by a GOTO or GOSUB statement. In other words, if you say GOTO 100, then line number 100 must exist. But, what about line number 110? Indeed, the statement on line 110 must exist, as it is part of your program. But, as long as you don't every reference line number 110, then this line number is frivolous, and can be done without. The only thing these extra line numbers do is to place all of your statements into the proper order.

With BASIC09's advanced editor it is a simple matter to enter your program statements in the proper order, and once entered, they will stay in that order unless you change them. Therefore line numbers need not be present on every line - only those lines referenced by GOTO and GOSUB statements.

In fact, believe it or not, structured programming will almost allow you to throw the GOTO statement away. Since branching is so effectively handled by the IF...THEN / ELSE / ENDIF construct, and looping by the other constructs, you very rarely ever need to use a GOTO statement. One of the places where the GOTO statement is still of great value is in the computed goto statement, ON...GOTO.

Another useful BASIC09 statement is EXITIF...ENDEXIT. This allows you to

HORSE

# RACING

"HORSE SENSE"  
HORSE SENSE IS A PROGRAM THAT USES PERTINENT DATA FROM THE RACING FORM TO ANALYZE THROUGHbred HORSE RACING. FOR EACH HORSE IT WILL SHOW YOU THE PROBABILITY OF WINNING AND THE ODDS THE HORSE SHOULD GO OFF AT. INFORMATION WILL ALSO BE INCLUDED ON HOW TO READ THE RACING FORM. PUT THE ODDS IN YOUR FAVOR!!!!!

HORSE SENSE(16k EXT)-----\$21.95  
CASSETTE ONLY

SEND CHECK OR M.O. TO  
B.F. SOFTWARE  
PO BOX 6141  
LYNNWOOD, WASHINGTON 98036

FANS

## STAT'S \*\*EXPANDED\*\*

A STATISTICAL ANALYSIS PROGRAM, THAT CALCULATES-MEAN,--VARIANCE AND STANDARD DEVIATION FOR BOTH SAMPLES OR POPULATION PERMUTATION AND COMBINATIONS, F and T TESTS, CURVE FITTING, LINEAR, EXP., LOG., POWER. EASY MODIFICATION OF STORED DATA, COMBINE TWO FILES, ETC. USER FRIENDLY? CASSETTE \$24.95

### COLOR GRAPHIC PRINTER UTILITIES

UTILITIES FOR RADIO SHACKS CGP-115, COLOR GRAPHIC PRINTER/PLOTTER WORD PROCESSOR--SUPPORTS EMBEDDED CONTROLS FOR PRINT SIZE OR COLOR RIGHT JUSTIFICATION. DESIGNED JUST FOR THE CGP-115

SCREEN PRINT PROGRAM---TRUE FOUR COLOR PRINT OUT, WORKS IN MODE 3 OR 4 YOU WON'T BELIEVE THE DETAILS

DRAWING BOARD---ETCH-A-SKETCH FOR THE PRINTER. ANY COLOR, EASY CORRECTIONS CASSETTE \$24.95  
REQ. EXT. BASIC

### RELOCATE

RELOCATE MAKES AUTOMATIC TAPE COPIES OF ANY COLOR COMPUTER CARTRIDGE. ALLOWS CHANGES TO BE MADE TO THE PROGRAM SUCH AS (PRINT-OUT AVIDEOTEK, CHANGE BAUD RATE IN \$SCRIPST, ETC.) REQUIRES EITHER A 84K HDD. OR A 16K OR LARGER COMPUTER WITH A CARTRIDGE MEMORY EXPANSION OF 4K OR LARGER. VERY EASY TO USE! ONCE FAMILIAR WITH THE PROGRAM, COPIES CAN BE MADE IN LESS THEN FOUR MINUTES CASSETTE \$24.95

### COMPUTERIZED ALARM SYSTEMS

LET CoCo WATCH YOUR HOUSE WHILE YOU ARE AWAY. LESS THAN TWENTY DOLLARS OF RADIO SHACK COMPONENTS. PLANS AND SOFTWARE. WRITE FOR DETAILS

(THIS AD TYPESET WITH THE COLOR GRAPHIC PRINTER)

## TRANSITION TECHNOLOGY

1458 W. BIRCHWOOD AVE.  
CHICAGO IL 60626

PLEASE SPECIFY  
SYSTEM  
16K-RIN

\*1.50 SHIPPING AND HANDLING C.O.D. EXTRA \*TANDY Corp

test for any condition that meets your needs and exit the domain of any of the above mentioned constructs. This is of particular merit since, in any version of BASIC, you should NEVER branch out of a FOR...NEXT loop as this can confuse the BASIC interpreter.

Note also that BASIC09 contains the ON ERROR GOTO statement, which we have already discussed. The KILL statement is used to delete procedures from memory, not disk files (remember last month's discussion?). The PAUSE statement is used to suspend program execution and enter the debug mode. The SHELL statement is similar to XBASIC's EXEC,

statement, allowing you to invoke ANY OS-9 command utility program without having to worry about that program overwriting BASIC09.

Closing...

I hope you are enjoying this comparison. Again, I wish we could go into more detail, but, time and space won't allow it. Let me know if you would like to see more of this sort of thing in the future.

Next month I hope to take time out from our study of BASICs and present reviews of STAR-DOS and the WORD-PAK 80-by-24 CRT controller board. The following month we'll look further into BASIC again. 'Til then...

## Table 2.

Graphics/Audio/Sound

ROM Disk BASIC	Data-Comp CCBASIC	FHL CBASIC	FHL DBASIC	TSC XBASIC	Computerware RBASIC	Microware BASIC09
AUDIO	AUDIO	AUDIO	AUDIO			
CIRCLE	CIRCLE	CIRCLE	CIRCLE			
CLS	CLS	CLS	CLS			
COLOR	COLOR	COLOR	COLOR			
DRAW	DRAW	DRAW	DRAW			
GET	GET	GET	GET			
LINE	LINE	LINE	LINE			
PAINT	PAINT	PAINT	PAINT			
PCLEAR	PCLEAR	PCLEAR	PCLEAR			
PCLS	PCLS	PCLS	PCLS			
PCOPY	PCOPY	PCOPY	PCOPY			
PLAY	PLAY	PLAY	PLAY			
PMODE	PMODE	PMODE	PMODE			
POINT	POINT	POINT	POINT			
PPOINT	PPOINT	PPOINT	PPOINT			
PRESET	PRESET	PRESET	PRESET			
PSET	PSET	PSET	PSET			
PUT	PUT	PUT	PUT			
RESET	RESET	RESET	RESET			
SCREEN	SCREEN	SCREEN	SCREEN			
SET	SET	SET	SET			
SOUND	SOUND	SOUND	SOUND			

CRT/Keyboard Input/Output

Table 3

ROM Disk BASIC	Data-Comp CCBASIC	FHL CBASIC	FHL DBASIC	TSC XBASIC	Computerware RBASIC	Microware BASIC09
INKEY\$ INPUT	INKEY\$ INPUT	INKEY\$ INPUT	INKEY\$ INPUT	INCH\$(0)  INPUT INPUT LINE	INPUT	GET #0  INPUT
LINE INPUT PRINT PRINT _USING	LINE INPUT PRINT PRINT _USING	LINE INPUT PRINT PRINT _USING	LINE INPUT PRINT PRINT _USING	PRINT PRINT _USING	PRINT PRINT _USING	PRINT PRINT _USING PUT #0 READ #0 WRITE
WRITE						

Line Printer Input/Output

Table 4.

ROM Disk BASIC	Data-Comp CCBASIC	FHL CBASIC	FHL DBASIC	TSC XBASIC	Computerware RBASIC	Microware BASIC09
PRINT #-2 PRINT #-2, _USING WRITE #-2	PRINT #-2 PRINT #2, _USING WRITE #-2	PRINT #-2 PRINT #2, _USING WRITE #-2	PRINT #-2 PRINT #2, _USING WRITE #-2	CLOSE #0 OPEN"PRINT" _AS 0 PRINT #0 PRINT #0, _USING	PRINT # PRINT #X, _USING	OPEN #  PRINT # PRINT #, _USING WRITE #

Cassette Data File Input/Output

Table 5.

ROM Disk BASIC	Data-Comp CCBASIC	FHL CBASIC	FHL DBASIC	TSC XBASIC	Computerware RBASIC	Microware BASIC09
AUDIO CLOSE #-1 INPUT #-1 LINE INPUT _#-1 MOTOR OPEN PRINT #-1 PRINT #-1, _USING WRITE #-1	AUDIO CLOSE #-1 INPUT #-1 LINE INPUT _#-1 MOTOR OPEN PRINT #-1 PRINT #-1, _USING WRITE #-1	AUDIO CLOSE #-1 INPUT #-1 LINE INPUT _#-1 MOTOR OPEN PRINT #-1 PRINT #-1, _USING WRITE #-1	AUDIO CLOSE #-1 INPUT #-1 LINE INPUT _#-1 MOTOR OPEN PRINT #-1 PRINT #-1, _USING WRITE #-1			

Note: \* in FHL DBASIC column means that, although these commands are available, they are generally only used in conjunction with random files (which DBASIC does not support) and, hence, are probably of little value.

Disk Data File Input/Output

Table 6.

ROM Disk BASIC	Data-Comp CCBASIC	FHL CBASIC	FHL DBASIC	TSC XBASIC	Computerware RBASIC	Microware BASIC09
CLOSE #			CLOSE #	CLOSE	CLOSE #	CLOSE #
CVN			CVN *		CREATE #	CREATE #
				CVTF\$ CVTZ\$ CVT\$F CVT\$X		
				DIM #		DELETE
DSKI\$ DSKO\$ EOF			DSKI\$ DSKO\$ EOF			EOF
					EXPAND # FCHK	
FIELD FILES FREE GET #			FILES FREE	FIELD		
				GET # INCH\$(#) INPUT # INPUT _LINE #	FREE GET #	GET #
INPUT #			INPUT #			INPUT #
LINE _INPUT #			LINE _INPUT #			
LOC LOF			LOC * LOF			
LSET				LSET		
MKN\$			MKN\$ *			
OPEN			OPEN	OPEN	OPEN #	OPEN #
PRINT #			PRINT #	PRINT #		PRINT #
PRINT #, _USING PUT #			PRINT #, _USING	PRINT #, _USING		PRINT #, _USING
					PUT # READ # RECNO # RESTORE # RNEXT #	PUT # READ #
RSET				RSET		
					RSIZE # SCRATCH #	SEEK #
WRITE #			WRITE #		SET STATUS # WRITE #	WRITE #



Table 7.

## Control Transfer Statements

ROM Disk BASIC	Data-Comp CCBASIC	FHL CBASIC	FHL DBASIC	TSC XBASIC	Computerware RBASIC	Microware BASIC09
DEF FN DEFUSR	DEF FN DEFUSR	DEF FN DEFUSR	DEF FN DEFUSR	CHAIN DEF FN	CALL CHAIN DEF FN	
END	END	END	END	END	DO END	ELSE END ENDIF ENDWHILE ERROR
EXEC	EXEC	EXEC	EXEC	EXEC,		EXITIF.. _ENDEXIT
FOR..TO.. _STEP GOSUB GOTO	FOR..TO.. _STEP GOSUB GOTO	FOR..TO.. _STEP GOSUB GOTO	FOR..TO.. _STEP GOSUB GOTO	FOR..TO.. _STEP GOSUB GOTO IF..GOTO	FOR..TO.. _STEP GOSUB GOTO	FOR..TO.. _STEP GOSUB GOTO
IF..THEN.. _ELSE	IF..THEN.. _ELSE	IF..THEN.. _ELSE	IF..THEN.. _ELSE	IF..THEN.. _ELSE	IF..THEN.. _ELSE	IF..THEN KILL LOOP.. _ENDLOOP
NEXT	NEXT	NEXT	NEXT	NEXT ON ERROR _GOTO	NEXT ON ERROR	NEXT ON ERROR _GOTO
ON..GOSUB ON..GOTO	ON..GOSUB ON..GOTO	ON..GOSUB ON..GOTO	ON..GOSUB ON..GOTO	ON..GOSUB ON..GOTO	ON..GOSUB ON..GOTO	ON..GOSUB ON..GOTO PAUSE REPEAT.. _UNTIL
RETURN RUN	RETURN RUN	RETURN RUN	RETURN RUN	RESUME RETURN RUN	RETURN RUN	RETURN RUN SHELL
STOP USRn()	STOP USRn()	STOP USRn()	STOP USRn()	STOP	STOP USER WAIT	STOP WHILE..DO

---

---

## CRYSTAL REVENGE

Have you ever wondered what the final stand will be when old Darth and the Empire run out of gas? If so, you may get a hint from the imperialists of the "Crystal World". You see they have retreated home and are attempting to protect their planet against the rebellion forces.

As a defender of a planet sector (your sector is displayed, with cities, on the right side of the screen) you must destroy ten ships of each incoming wave with your laser cannon. To do this you use your targeting sight to lock onto each ship (they come one at a time from left to right and lasers are controlled via the right joystick. You need to protect your base, keep the enemy from scoring hits on your sector and do all this without exhausting your laser fuel (30 shots per wave). Beat back a wave and you'll be refueled for the next, otherwise sit back and watch the red circle of annihilation. The program permits you to set a difficulty factor by determining how many attack waves you must deal with and how many hits your sector can sustain (three and five are the lower and upper limits). Along with this you can enter a previous high score for comparison. This feature makes competitive play possible. Scoring is complex at best, based on ships destroyed, fuel conserved, cities saved, etc.

The game is promoted as being

"Beatable", yet don't underestimate the invaders. Each attacking wave becomes more sophisticated and elusive.

All in all Owl-Ware has a very enjoyable game in Crystal Revenge. Not only are the graphics, sound and action good but the "false color" you are hearing so much about recently is under complete control. Also note worthy is that the program is divided into three sections: 1-Instructions, 2-Data and 3-Revenge which enables running in 16K. Crystal Revenge sells for \$16.95 (tape)

Owl-Ware  
PO Box 116  
Martztown, PA 19539

**NEW** **CRYSTAL REVENGE**

**SOFTWARE 16K EXTENDED**

HI-RES Space War game. The first fully controlled color in PMODE 4! You must defend the CRYSTAL HOME world from the robot attackers. Planet and multicolor attackers remain the same color every game.

**\$16.95**  
+ \$1.25  
postage & handling

**DEALERS INQUIRES INVITED**

**See Reviews...**



**OWL-WARE**  
P.O. Box 116 M  
Martztown, PA.  
19539  
PA. Res. Include 6% Tax

April RAINBOW, sept CCN

# COMPUTERWARE<sup>®</sup> has it all...



## BIO DETECTOR™

Learn about yourself & others using today's technology & your CoCo! Finger sensors lead to the Bio Detector that plugs into a joystick slot. Just load the program & wrap the finger-grips on the subject. Results will be graphic!

The Bio Feedback Program graphs galvanic skin response on the screen. Watch yourself key-up & relax! The Anxiety Attack Game is fun for all ages. You can't lie to Bio Detector! (Based on current lie detector techniques).

Bio Detector includes all hardware, software & instructions. Silver contacts give greater contact. Adjustable grips fit anyone. Be the first on your block to "hook up"!



\$34<sup>95</sup>

[Disclaimer This is a toy Results not admissible in court]

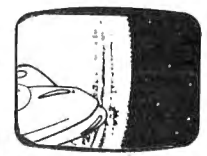
## THE SOURCERER



Produces symbolic source code that can be assembled. Disassembles to disk, tape, printer, or screen. Position independent code. User defined symbol/label buffer area. 4 formats: hex dump, ASCII dump, full listing & symbolic mode. And more!! A programmer's dream! **FAST!**

16K Cassette \$34<sup>95</sup>  
16K Disk \$39<sup>95</sup>

## G • A • M • E • S



### TIME PATROL

Travel thru a time warp, meeting unique foes & friends.

32K Cass \$26<sup>95</sup>  
32K Disk \$29<sup>95</sup>



### JUNIOR'S REVENGE

Climb vines, avoid obstacles & creatures to save your father from the zookeeper.

32K Cass \$28<sup>95</sup>  
32K Disk \$31<sup>95</sup>



### MOON HOPPER

Traverse terrain, hills & craters while shooting off enemies.

32K Cass \$24<sup>95</sup>  
32K Disk \$27<sup>95</sup>



### DOODLE BUG

No. 1 Best Seller has great graphics, sound, & play.

16K Cass \$26<sup>95</sup>  
16K Disk \$29<sup>95</sup>

## Video Plus

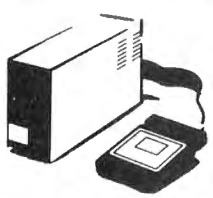
connects the Color Computer to a composite video monitor (color or monochrome) with NO SOLDERING! \$24<sup>95</sup>

## MONITORS



Hi-Res Green Screen \$104<sup>95</sup>  
Taxan Amber Screen \$154<sup>95</sup>  
Amdek Color I \$349<sup>95</sup>

## SPECIALS DISK SYSTEMS



Our disk systems use top-quality drives plus cables, controller, Radio Shack DOS & manual. New half-size drives available for only \$30 extra per drive.

Single drive, single sided	\$449
Single drive, double sided	\$549
Dual drives, single sided	\$725
Dual drives, double sided	\$895
AMDISK: NEW 3 1/2" dual drives	
Drives only	\$499
Complete system	\$665

## ...FOR FLEX

New LOW PRICE for FLEX  
FLEX from Frank Hogg \$69<sup>00</sup>  
Random BASIC Editor \$75<sup>00</sup>  
Macro Assembler \$50<sup>00</sup>

**NEW KRAFT JOYSTICK**  
New switching joystick \$18<sup>95</sup>  
(requires our WICO adapter)




### BLOC HEAD

Hop atop pyramids of cubes, dodging the evils.

16K Cass \$26<sup>95</sup>  
16K Disk \$29<sup>95</sup>



### HYPER ZONE

Way out 3D graphics from the cockpit of your spaceship!

32K Cass \$26<sup>95</sup>  
32K Disk \$29<sup>95</sup>

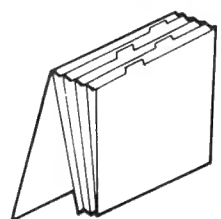
## MACRO ASSEMBLER

Tops in the reviews! Complete macro conditional assembler (2 pass) with library files, repeat sequences, cross reference and FIND programs. Uses standard ASCII source files of any size.

32K Disk w/RSDOS... \$49<sup>95</sup> 64K Disk w/FLEX... \$50<sup>00</sup>

## Flexi-File™

A comprehensive & flexible data base system



**Collect:** up to 35 elements per record, up to 240 characters per record. Unlimited file size. 5 data types.  
**Organize:** you choose how data is stored & displayed.  
**Select:** a subset using <, >, =, and, or with 36 different criteria.  
**Sort:** ascending or descending by any field.  
**Report:** custom design reports & labels incl. page numbers, titles & column headers. Numeric fields can be automatically totaled.  
**Manual:** extensive & easy to use.

32K Disk w/RSDOS \$64<sup>95</sup>

Computerware is a trademark of Computerware

**COMPUTERWARE<sup>®</sup>** P.O. Box 668 • Encinitas, CA 92024 (619) 436-3512

Mail to: **COMPUTERWARE<sup>®</sup>**  
P.O. Box 668 • Dept. B3  
Encinitas, CA 92024 • (619) 436-3512

DESCRIPTION	QUANT.	PRICE	TOTAL
*SHIP. & TAX TOTAL			

VISA  MASTERCARD  CHECK   
CARD # \_\_\_\_\_ EXP. \_\_\_\_\_  
NAME \_\_\_\_\_  
ADDRESS \_\_\_\_\_  
CITY \_\_\_\_\_ STATE \_\_\_\_\_ ZIP \_\_\_\_\_  
SIGNATURE \_\_\_\_\_

\*Shipping: Under \$100 — add \$2 surface, \$5 air/Canada  
Over \$100 — add 2% surface, 5% air/Canada  
Calif. residents add 6% sales tax.

# There's more — call or write for a complete catalog

More Software, More Hardware, and Books and Supplies and...

---

---

# TAPEUTIL HAS USEFUL COMMANDS

A Quickie Review  
By Old Father William +  
From: Spectrum Projects  
93-15 86th. Drive  
Woodhaven, NY 11421  
(212) 441-2807  
\$24.95 on Tape or Disk

TAPEUTIL is a relatively brief ML program which adds very nicely to the user's control over both programs and data files stored on tape or on disk. The complete program is provided either on tape or on disk, but tape-only user finds all the disk commands locked out, to avoid error. TAPEUTIL will send a directory of the files on a tape either to screen or printer, complete with type (BAS, ML, DAT), mode (ASCII or BIN), and start, end, and execute addresses (valid only for ML programs). The COP command will simply load everything in any tape file into memory and make a new tape of that file. That's not much of a feat just for a BASIC program, but it saves a good bit of investigation for a ML program, and a lot of formatting, etc., for a data file!

For those with disk systems, several additional routines are available. DIR and PDR list a disk directory to the screen or printer respectively. The directory doesn't have individual file sizes as BASIC'S DIR

does, but it does automatically show the free space remaining on the disk. DDT and TTD write program or data files from Disk-to-Tape or Tape-to-Disk, with the same ease as the tape-to-tape COP command.

BAC is a very interesting routine. With a clean tape in the recorder, this command will automatically make a tape backup of all the files of any sort on the disk. For a disk with very many file granules filled, the tape must be larger than the usual 6 minute type most of us use. The the TTD command can transfer all the files to a clean disk. This sounds like a good one-drive way to clean up a disk with some files which have been added to numerous times, so that the file allocation table has become scattered.

Naturally, there are some protected programs which cannot be copied by TAPEUTIL, but a very high percentage can be. •

---

---

# COMMENT CORNER

By Andrew Hubbell

This month we are going to examine your computer's digital to analog conversion (DAC) circuit and some of the commands which use it: SOUND, AUDIO, and JOYSTK. (It is also used for cassette output, covered in January 1982's Comment Corner, and the PLAY command, which will be the subject of next month's column).

The DAC consists of a voltage divider made up of six parallel resistors which converts the output signal appearing in the six most significant bits of data register A of U4, a 6821 peripheral interface adaptor (PIA), into a voltage level between 0.25 and 4.75 volts. Since I'm not an engineer, my description of the hardware may be a bit sketchy, so I'll refer you to Radio Shack's CC Technical Manual for more complete technical information about the hardware involved. Lance Leventhal's "6809 Assembly Language Programming" also contains a very helpful chapter on using the PIA.

From a software viewpoint all we really have to know is that writing a value to address \$FF20 will produce the corresponding voltage output on the DAC circuit. However, there is one complication, while the computer's data bus registers are 8 bits wide, the DAC circuit is only 6 bits wide. Furthermore, it occupies the 6 most significant ones. Although your available value range is 0-63, each value must be multiplied by four before being written to the PIA. Bit 0 of this same PIA register is used for

cassette input and need not concern us at this time. Bit 1 of the PIA register is used for RS-232 (printer) output. All of the ROM DAC routines maintain this bit in an 'on' state, equivalent to sending a continuous stream of stop bits to your printer. I have seen some games which apparently have their own sound output routines and ignore this precaution. The result is that your printer produces a stream of garbage and/or paper if you happen to have it online when the game outputs any sound.

Device selection is controlled by U9, a 14529 dual 4-channel analog multiplexer chip (MUX). The two select inputs to this chip come from the secondary interrupt lines (CA2 and CB2) of PIA U8. Although Motorola has defined these as being interrupt lines, Radio Shack has utilized them as additional output ports: Bits 5 and 4 of each control register (addresses \$FF01 and \$FF03) are set on the system's restart routine and never again altered. This defines the corresponding interrupt line as being a continuous output signal with its level determined by the value in bit #3 of the same register. Thus bit #3 is effectively an output port and bit #6, the interrupt flag, becomes meaningless. Note that care is taken when updating any PIA control register to preserve all bits except the one being altered.

Similarly, bit #3 of PIA U4's control register B (\$FF23) is used U5, the 1285-8 modulator. (And line CA2 from PIA U4, at \$FF21, controls the cassette motor in the

same fashion). According to the technical manual, disabling the MUX sound output, by clearing bit #3 of location \$FF23, enables the lower level 1-bit sound source, bit #1 of \$FF22, to be utilized, but has nothing to do with the joysticks. They are always available, but attempting to read one with the sound enabled would produce undesired noise. (The 1-bit sound output has no supporting software in any of the ROMs. In fact, this port is defined as an input by the reset routine and would have to be redefined as an output if you wished to use it). For practical purposes we have the following table for device selection:

Bit 3 of address:			Device Selected
\$FF23	\$FF01	\$FF03	
0	0	0	JOYSTK 0 (right horizontal)
0	0	1	JOYSTK 1 (right vertical)
0	1	0	JOYSTK 2 (left horizontal)
0	1	1	JOYSTK 3 (left vertical)
1	0	0	SOUND (6-bit DAC output)
1	0	1	1AUDIO (cassette input sound)
1	1	0	Sound input from cartridge pin #35
1	1	1	Not used

SOUND output consists of a four part sine wave: mid, hi, mid, low. The tone parameter you supply with the SOUND command is used as a quarter-wave delay count by the delay loop at \$A98C-\$A98D; it simply holds the DAC circuit at its present level for a specified length of time. The loop increments to zero, rather than decrementing, so that a larger parameter will produce a higher tone: Larger parameter = Shorter delay = Shorter wave length = Higher frequency = Higher tone.

Sound's device selection is accomplished in a rather ambiguous manner: Multiplying the duration parameter by 4 assures that the two LSB's of register B are zeros, thus selecting device #0. As far as I know, the "CLR" instruction at

\$A95E serves no real purpose. The sound wave generation loop, \$A964-\$A972, loops continuously, outputting the same wave shape, until its 2-byte timer becomes zero. This timer is not altered within this loop, however, it is decremented by an IRQ interrupt processing subroutine at \$A9B3. Note that this makes a potential trap for errant machine language programs.

The vertical sync IRQ occurs every 16.67 milliseconds, after each screen of data is printed on your TV, while the electron beam is being realigned to the upper left corner of the screen. A horizontal sync IRQ, occurring every 63.5 microseconds, or after each screen line is printed, is also available at the PIA's control register A, \$FF01, but is never enabled or used. However, the IRQ processing subroutine still checks to be sure it has the right interrupt before processing it. (An IRQ from one source could theoretically occur while the computer was processing one from a different source. Since a PIA will maintain the interrupt until its data register is read, the computer would see the second IRQ as soon as the RTI instruction reenables interrupt recognition). The Extended BASIC ROM uses the vertical sync interrupt for TIMER and PLAY and so enables it as part of the reset routine. The Color ROM does not enable, it until the first time it is needed by SOUND. Once enabled, it is never again disabled (though IRQ is inhibited during time critical functions such as cassette and RS-232 I/O) and it continues to generate interrupts 60 times per second. When it is not needed by SOUND, the IRQ processor simply clears the PIA's interrupt status and returns. (The Extended and Disk ROMs, of course, have their own IRQ processors which normally return to the Color ROM at \$A9BB)

While one half of the multiplexer selects the sound output source, the other half uses the same two inputs to select one of

# INTERNATIONAL COLOR COMPUTER CLUB, INC.

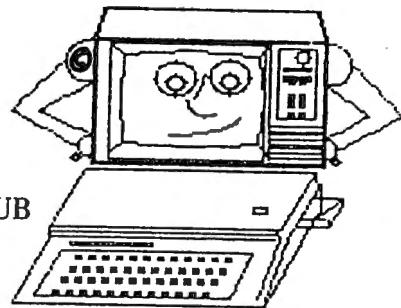
A Non-Profit Educational Corporation

Main Office

2101 E. Main St., Henderson, Texas 75652

Canadian Branch

P.O. Box 7498, Saskatoon, SK S7K-4L4



WORLD'S LARGEST COLOR COMPUTER CLUB

HERE ARE SOME GOOD REASONS TO JOIN OUR CLUB

- 1). **FREE PROGRAMS:** Good programs written by our members are contained in our library, in the newsletter, and on the new member tape.
- 2). **NEWSLETTER.** A "magazine" sized newsletter (last issue was 80 pages), with programs, tips, data, reviews, articles and much more.
- 3). **NEWSLETTER Tape.** A tape of all the programs appearing in the newsletter is available from the library for \$2.00 (to members) or \$4.50 (to non-members).
- 4). **CLUB LIBRARY.** The club maintains a library of programs, books, and Radio Shack ROM-packs. The programs are member written and come six program to a tape or disk. They are yours to keep; however, there is a small fee to cover the postage and tape (or disk) of \$2.00 (\$4.50 for disk). The books and ROM-packs may be checked out for 3 weeks at a time (extensions possible).
- 5). **DISCOUNTS.** You can get large discounts on many software and hardware items for the Color Computer from some of the MAJOR companies. Also discounts on subscriptions to the RAINBOW, Color Computer News, Color Computer Magazine, Chromasette Magazine, and CoCocassette Magazine (up to 25%).
- 6). **ADVERTISE FREE.** Members may place ads up to ¼ page (classified type) per issue during their entire membership in the newsletter FREE. Display ads at 25% off. These ads must be computer related; however.
- 7). **BORROW PARTS.** Don't wait weeks for the parts to come in from Radio Shack! Just check them out from the Club's Parts library and return them when yours arrive.
- 8). **SURPRISE.** You receive a "New Member" package containing many useful items.
- 9). **GET HELP.** This is the world's largest Color Computer Club. With members in almost every field of expertise. So if you have a problem with the Color Computer, we can almost always get you the answer. Put your problem on the Club's Bulletin Board, write, or call. Telephone No. (214) 657-7834.
- 10). **FIND FRIENDS.** As a new member, you will receive a list of the members in your area on a quarterly basis whom you may contact for CoCo talk.

## HOW TO BECOME A MEMBER:::

Write to the club for an application, there are no conditions for membership other than agreeing to obey the rules and by-laws, being interested and paying the dues. The membership dues are \$30.00 (\$50.00 outside the U.S. (In Canada it is in Canadian funds) in U.S. funds) per year and we believe you get more than your moneys worth. You can save more than the membership dues in discounts the club offers to you. Example : Subscription to the RAINBOW, 25% off of the regular subscription rates. Some members have told me that the new member tape alone is worth the membership dues. It contains 10 very good programs. Some of the programs contained in the library are Accounts Receivable, General Ledger, Inventory, Sales File and ticket program with automatic Inventory update (for 32K with 2disk ). There is over 72 programs in the library to choose from ranging from 4K to 64K w/disk.



the four joystick potentiometers. Technically speaking, the joysticks are not read in through the DAC circuit. This is an output device. And, since the joystick's pots are analog devices, what is required to read them is an analog to digital input circuit, something the Color Computer does not have. The joysticks are evaluated by outputting a test value on the DAC circuit and comparing this, via U14, a 339 comparator IC, to the actual voltage of the joystick. The comparison algorithm starts with the most significant bit only set, then adds or subtracts the next most significant bit, depending on the comparison result, which is found at bit #7 of address \$FF00. The adjusting bit is then shifted right one bit position and the comparison and adjustment repeated. Since the DAC circuit has only six lines, six such comparisons are sufficient to determine the joystick's position to the system's accuracy limit. Just in case you were moving the stick at the time the reading was being taken, it is repeated to recheck the results. (Your movement is extremely slow compared to the computer's input routine, but still could cause a misreading). As soon as two successive readings match the routine exits and the computer goes on to the next joystick. After 10 mismatches it decides that you have a bum joystick and gives up, returning whatever value it found last.

Although the AUDIO command does not use the DAC circuit, it does use the MUX, and certainly seems to fit in this month's column. AUDIO ON routes the input from the cassette, which is already an analog signal, through the MUX to the modulator for output, knowing that the next command will select the input source it requires.

A COUPLE FINAL NOTES: First, at \$A975 and \$A9FE we have examples of a programming trick which you will encounter numerous times in the Color Basic ROM. The instruction is assembled as an

"FCB \$8C", which disassembles as a "CMPX Immediate". Since the CMPX is a 3-byte instruction, what this really accomplishes is to cause the 6809 to ignore the 2-byte instruction immediately following. The results of the comparison are never used; this simply saves one byte over a 2-byte "BRA" instruction (and makes it a little harder for us to disassemble the code). Second, adjectives such as "always" and "never" should be regarded with some caution. They indicate that I contradict the statement. But that does not guarantee that I didn't miss something or that the next version of a ROM will follow the same rules. And there is certainly no guarantee that someone else's program will not alter a supposedly static parameter. •

## PUT MORE FUN IN YOUR COLOR COMPUTER

New! MICRO Series designed to run on all color computers, including the new MC-10.

Fast action, full-color graphics and sound!  
Just \$14.95 each or 3 for \$34.95

- BRICKOUT** - Destroy layers of colored bricks with skillful paddle movement - includes autopilot mode!
- B-17 BOMBER** - Flying over enemy territory, you drop low for your bombs run, but watch out for enemy fighters - realistic trajectories.
- BLACKJACK** - 1 to 3 players versus computer - betting, shuffling, full deck, graphics!
- COMPUMIND** - Guess the secret number from clues provided - ratings, logic, skill levels - highly addictive.
- JACKPOT** - Pull the lever and watch the wheels turn to produce a jackpot.
- STARFIGHTER-4** - Zero in on enemy lighters before firing your phasers - difficulty increases as you enter warp drive.
- TIC-TAC-TOE** - Beat the computer playing this age-old favorite - or lose to a calculating opponent.
- BIORHYTHM** - Display graphs of your physical, emotional and intellectual cycles - determine good, bad, critical days (printer optional).
- MINEFIELD** - Cross the minefield aided by your mine detector - trace steps and hidden mines.
- COMPUTRATION** - Match the words behind the numbered squares to complete the puzzle - win the game!
- CHUCK-A-LUCK** - Watch the computer roll 3 graphic dice across the screen - hit your number and you win.
- LUNAR LANDER** - Pilot your craft to a safe landing on the moon's rocky surface - watch your gauges or you'll crash.



**RAINBOW-WRITER SCREEN ENHANCER**

Introducing the ultimate in hi-res graphics text display. Allows your color computer to write text on any graphics screen in Rainbow colors. 18K Extended Basic required. \$29.95 Cass - \$32.95 Disk. 12 sizes to 64 x 24.



**PIGSKIN PREDICTIONS**  
Available in August **3.0**

- Enhanced version of last year's best seller featuring:
  - Simple menu driven selection of schedules, ratings, division races, predictions or results by team or week. 7 different types of reports to screen or printer (optional) available each week
  - Easy one-a-week entry of scores - no complex stats.
  - Predicts all games for remainder of season each week.
  - Calculates projected win-loss records for all weeks.
  - Maintains home field advantage rating as well as power rating for each team for accurate predictions.
  - Allows user schedule entry. 1983 schedule and ratings info included free-ready to run.
  - Tracks computer's accuracy by team and week.
- 32K enhanced version features dazzling Rainbow-Writer screen displays. 18K abridged version included free. 16.32K Extended Basic required. 2 tape cassette \$29.95; 16.32K Disk \$32.95. Previous owners call for upgrade plus data tape.



**CONQUEST OF KZIRGLA & SCEPTER OF KZIRGLA**

Dungeons, wizards, treasure chests, hidden trap doors and more. If you enjoy challenge and complexity, these adventure games are for you. Featuring real-time graphics with arcade sound for your color computer. "Scepter" requires 16K Extended Basic; \$16.95 Cass - \$19.95 Disk. Hi-res sequel "Conquest" 16K Extended Basic Cass \$21.95. 32K Disk \$24.95

Discover the Rainbow in your Color Computer!

ITEM	CASSETTE-DISK	PRICE	NAME
			ADDRESS
			CITY
			STATE
			ZIP
Sub Total			
Shipping		\$2.00	
Minnesota residents add 6% Sales Tax			
Personal checks welcome - no delay			
Dealer inquiries invited			
Send SASE for catalog			
Via M & C add 3%			
Exp			
		<b>TOTAL</b>	

**RAINBOW CONNECTION SOFTWARE**  
3514 6th Place NW, Suite C  
Rochester, MN 55901  
507-288-4424



# READ THE FINE PRINT.

## It's worth your time. This is good stuff.

### SYSTEMS SOFTWARE

#### MACRO-80C

This is a **disk-based editor, macro assembler and monitor**, written for Color Computer by Andy Phelps. THIS IS IT — The ultimate programming tool!

The powerful 2-pass macro assembler features conditional assembly, local labels, include files and cross referenced symbol tables. MACRO-80C supports the complete Motorola 6809 instruction set in standard source format. There are no changes, constraints or shortcuts in the source language definition. Incorporating all of the features of our Rompack-based assembler (SDS80C), MACRO-80C contains many more useful instructions and pseudo-ops which aid the programmer and add power and flexibility.

The screen-oriented text editor is designed for efficient and easy editing of assembly language programs. The "Help Key" feature makes it simple and fun to learn to use the editor. As the editor requires no line numbers, you can use the arrow keys to position the cursor anywhere in the file. MACRO-80C allows global changes and moving/copying blocks of text. You can edit lines of assembly source which are longer than 32 characters.

DCBUG is a machine language monitor which allows examining and altering of memory, setting break points, etc.

The editor, assembler and monitor — as well as sample programs — come on one Radio Shack compatible disk. Extensive documentation included. **MACRO-80C Price: \$99.95**

#### SOFTWARE DEVELOPMENT SYSTEM

The Micro Works Software Development System (SDS80C) is a complete 6809 editor, assembler and monitor package contained in one Color Computer program pack! Vastly superior to RAM-based assemblers/editors, the SDS80C is non-volatile, meaning that if your application program bombs, it can't destroy your editor/assembler. Plus it leaves almost all of 16K or 32K RAM free for your program. Since all three programs, editor, assembler and monitor are co-resident, we eliminate tedious program loading when going back and forth from editing to assembly and debugging!

The powerful screen-oriented Editor features finds, changes, moves, copies and much more. All keys have convenient auto repeat (typamatic), and since no line numbers are required, the full width of the screen may be used to generate well commented code.

The Assembler features all of the following: complete 6809 instruction set; conditional assembly; local labels; assembly to cassette tape or to memory; listing to screen or printer; and mnemonic error codes instead of numbers.

The versatile monitor is tailored for debugging programs generated by the Assembler and Editor. It features examine/change of memory or registers, cassette load and save, breakpoints and more. **SDS80C Price: \$89.95**

#### MICRO WORKS COLOR FORTH

- Forth is faster to program in than Basic
- Forth is easier to learn than Assembly Language
- Forth executes in less time than Basic

Forth is a highly interactive language like Basic, with structure like Pascal and execution speed close to that of Assembly Language. The Micro Works Color Forth is a Rompack containing everything you need to run Forth on your Color Computer.

Color Forth consists of the standard FORTH Interest Group (FIG) implementation of the language plus

most of FORTH-79. It has a super screen editor with split screen display. Mass storage is on cassette. Color Forth also contains a decompiler and other aids for learning the inner workings of this fascinating language. It will run on 4K, 16K, and 32K computers. Color Forth contains 10K of ROM, leaving your RAM for your programs! There are simple words to effectively use the Hi-Res Color Computer graphics, joysticks, and sound. The 112-page manual includes a glossary of the system-specific words, a full standard FIG glossary and complete source listing. **COLOR FORTH ... THE BEST!** From the leader in Forth, Talbot Microsystems. **Price: \$109.95**

#### MICROTEXT: COMMUNICATIONS VIA YOUR MODEM!

Make your Color Computer an intelligent printing terminal with off-line storage! The Microtext module is just what you'll need for:

- Talking to a timeshare system or information service
- Printing out what is received as it is received
- Saving received text to cassette tape
- Re-displaying the received text even while on-line
- Communications with other computers
- Using your computer as a general-purpose 300-baud terminal
- Downloading programs from other computers

The Microtext module is a program pack containing not only firmware but a second serial port so that both your printer and modem can be connected at the same time. Microtext can be configured for any serial printer that will work with the Color Computer, even if it requires line feeds! But even if you don't have a printer, you can keep a permanent copy of your data by storing to cassette tape. Also, any Radio Shack/Centronics-compatible parallel printer may be used by adding the Micro Works' PI80C parallel interface.

For those of you with special terminal applications, Microtext has selectable parity; it sends odd, even, mark or space. With mark parity (which is default) you can send to computers requiring either seven or eight bits. All 128 ASCII codes can be sent. Exchange programs with other Color Computer users! Basic programs may be downloaded from other computers or timesharing systems.

You'll find many uses for this versatile module! Available in ROMPACK, ready-to-use, for **\$59.95**.

#### MACHINE LANGUAGE

**MONITOR TAPE:** A cassette tape which allows you to directly access memory, I/O and registers with a formatted hex display. Great for machine language programming, debugging and learning. It can also send/receive RS232 at up to 9600 baud, including host system download/upload. 19 commands in all. Relocatable and reentrant. **CBUG Tape Price: \$29.95**

**MONITOR ROM:** The same program as above, supplied in 2716 EPROM. This allows you to use the entire RAM space. And you don't need to re-load the monitor each time you use it. The EPROM plugs into the Extended Basic ROM Socket or the Romless Pak I. **CBUG ROM Price: \$39.95**

**SOURCE GENERATOR:** This package is a disassembler which runs on the color computer and generates your own source listing of the BASIC interpreter ROM. Also included is a documentation package which gives useful ROM entry points, complete memory map, I/O hardware details and more. A 16K system is required for the use of this cassette. **80C Disassembler Price: \$49.95**

### BOOKS

*6809 Assembly Language Programming*, by Lance Leventhal, **\$16.95**

*TRS-80 Color Computer Graphics*, by Don Inman, **\$14.95**

*Assembly Language Graphics for the TRS-80 Color Computer*, by Don Inman, **\$14.95**

*Starting Forth*, by L. Brodie, **\$19.95**

### GAMES

**Star Blaster** — Blast your way through an asteroid field in this action-packed Hi-Res graphics game. Available in ROMPACK; requires 16K. **Price: \$39.95**

**Pac Attack** — Try your hand at this challenging game by Computerware, with fantastic graphics, sound and action! Cassette requires 16K. **Price: \$24.95**

**Haywire** — Have fun zapping robots with this Hi-Res game by Mark Data Products. Cassette requires 16K. **\$24.95**

**Dunkey Munkey** — Arcade excitement awaits those who dare to conquer the Munkey! Joystick and 32K required, by Intellectronics. Cassette: **\$24.95**

**Colorpede** — Great graphics, two-player option, and pause control in this exciting game by Intracolor Communication. Cassette requires 16K: **\$29.95**

**Adventure** — *Black Sanctum* and *Calixto Island* by Mark Data Products. Each cassette requires 16K: **\$19.95** each.

**Cave Hunter** — Experience vivid colors, bizarre sounds and eerie creatures in hot pursuit as you wind your way through a cave maze in search of gold treasures. This exciting Hi-Res game by Mark Data Products requires 16K for cassette version. **\$24.95**

**Starfire** — Fly around the planet defending Earthlings from being snatched up by aliens in this challenging game from Intellectronics. Cassette requires 16K: **\$21.95**

**Doodle Bug** — Joystick-controlled Doodle Bugs must move quickly through mazes while being chased by enemy bugs in Hi-Res game by Computerware. Cassette requires 16K: **\$24.95**

**Astro Blast** — You'll need to act fast as you protect Earth from wave after wave of alien invaders in this Hi-Res game by Mark Data. Cassette requires 16K: **\$24.95**

### HARDWARE

**PARALLEL PRINTER INTERFACE** — Serial to parallel converter allows use of all standard parallel printers. PI80C plugs into the serial output port, leaving your Rompack slot free. You supply the printer cable. **PI80C Price: \$69.95**

**MEMORY UPGRADE KITS:** Consisting of 4116 200ns., integrated circuits, with instructions for installation. **4K-16K Kit Price: \$39.95. 16K-32K Kit** (requires soldering experience) **Price: \$39.95.** For Rev. level E, ET, NC and TDP-100s, we carry 64K chips; upgrading is easy! Eight prime **64K chips** and instructions: **\$64.95**

**Romless Packs** for your custom EPROMs — call or write for information.

THE **MICRO WORKS**

MasterCharge/Visa Accepted  
California residents add 6% tax.

P.O. BOX 1110, DEL MAR, CA 92014 [619] 942-2400

# PLAY IT COOL THIS YEAR!

Get in on a honey of a deal!! Let the Color Computer News Magna-Zine deliver you from clawing your way through a forest of unbearable syntax errors. Each month, the calm and relaxed Magna-Zine subscribers are sent a ready to load cassette of the programs printed here in Color Computer News. At less than 50 cents per program, can you bear to do without the Magna-Zine any longer?!? By sending in a personal check or money order for a paltry \$54.00 (US\$66.00 overseas), the first of 12 monthly tapes will be rushed out to relieve your tired paws. Non-subscribers can get any single issue they want for just \$7.50 post paid. (US\$8.50 overseas) So quit your growling, and get in on one of the very best software buys anywhere! Send your subscription check to the address below today!!!

**CCN Magna-zine Service  
Box 68  
Safety Harbor, FL 33572**

*Send a SASE for  
a complete listing  
of all programs*



COMMENT CORNER, SEPTEMBER 1983: D/A CIRCUIT ROUTINES

Addr Comment

0008	ARRAY INHIBIT FLAG-USED AS DUMMY	A9B3	SOUND'S IRQ PROCESSOR
0053	F.P.ACCUM LSB / 1-BYTE PARAM VAL	A9C6	JOYSTK FUNCTION PROCESSOR
008C	SOUND'S TONE PARAMETER	A9DE	READ ALL JOYSTICKS
008D	SOUND DURATION PARAMETER		
008E	..LSB		
015A	JOYSTICK VALUE TABLE:JOYSTK 0	A93F	CHK FOR & SKIP OVER COMMA
015E	..END OF TABLE +1	A942	GET PARAMETER
		A945	CHECK PARAMETER:
FF00	PIA U8, DATA REG A:	A946	..IF NON-0, OK, RETURN
BIT 7	= JOYSTICK COMPARISON INPUT	A948	GOTO FC ERROR HALT
FF01	PIA U8, CTRL REG A:		
BIT 7	= HORIZ SYNC INTERRUPT FLAG	A948	GET TONE PARAMETER
BITS 5-4	= ALWAYS SET	A94D	..& STORE IT
BIT 3	= ANALOG MUX CNTRL, HI BIT	A94F	GET DURATION PARAMETER
FF02	PIA U8, DATA REG B	A951	MULTIPLY IT BY 4
FF03	PIA U8, CTRL REG B:	A953	..
BIT 7	= VERT SYNC INTERRUPT FLAG	A954	..& STORE IT AS 16-BITS
BITS 5-4	= ALWAYS SET	A956	ENABLE VERTICAL SYNC CLOCK
BIT 3	= ANALOG MUX CNTRL, LOW BIT	A959	..(60 HZ) IRQ INTERRUPT
FF20	PIA U4, DATA REG A:	A95B	..
BITS 7-2	= DAC OUTPUT	A95E	CLEAR CARRY FLAG
BIT 1	= RS-232 OUTPUT	A960	SET MUX TO 6-BIT SOUND SOURCE
FF22	PIA U4, DATA REG B:	A962	ENABLE AUDIO OUTPUT
BIT 1	= 1-BIT SOUND OUTPUT	A964	OUTPUT MID VALUE (\$7C)
FF23	PIA U4, CTRL REG B:	A966	OUTPUT HI VALUE (\$FC)
BITS 5-4	= ALWAYS SET	A968	..(PLUS RS-232 BIT)
BIT 3	= 6-BIT SOUND ENABLE	A96A	OUTPUT MID VALUE (\$7C)
		A96C	OUTPUT LOW VALUE (\$00)
A00A	ADDR OF JOYSTICK INPUT ROUTINE	A96E	..(PLUS RS-232 BIT)
A93F	GET PARAMS FROM BASIC CMMND LINE	A970	CHECK TIMER (DECREMENTED BY IRQ)
A94B	SOUND COMMAND PROCESSOR	A972	..IF NON-0, THEN LOOP
A964	SOUND WAVE GENERATION LOOP		
A974	DISABLE AUDIO OUTPUT	A974	SET CNTRL BIT IN A REG: 0 = OFF
A976	ENABLE AUDIO OUTPUT	A975	(IGNORE NEXT INSTR)
A965	SOUND OUTPUT SUBROUTINE	A976	SET CNTRL BIT = 1 FOR ON
A990	AUDIO COMMAND PROCESSOR	A978	SAVE CONTROL BIT MASK ON STACK
A9A2	SET ANALOG MULTIPLEXER	A97A	LOAD SOUND PIA CONTROL REG

IF YOU OWN A COLOR COMPUTER  
THEN YOU NEED  
THE COLOR COMPUTER TOOLKITS

The software development tools that let you put even more POWER into the already super powerful COLOR COMPUTER. They're full of tools, aids, bells and whistles useful to the BASIC/MACHINE CODE programmer, in friendly, easy to use software packages.

All tools are in the COLORKIT; \* tools not in the MICROKIT.

- . LIGHT Characters on DARK Background with CURRENT LINE HIGH-LIGHTING ; or Normal Dark Characters
- . FULL SCREEN EDITOR with: Arrow Key controlled Cursor ; open up space / delete and close up space
- . Enabling selective line RENUMBER / COPY / MOVE / MERGE ; or use Normal EXT. BASIC's line editor
- . PROTECT the current BASIC Program from being wiped out by CLOAD, NEW, etc; or from being LISTed.
- . RESTORE a protected BASIC program / APPEND any number of BASIC programs together easily
- . KLICK on Keypress ; or Normal Silent Keys ( Klick Tone modifiable by use of SOUNDn,n Command )
- . GLOBAL SEARCH of COMMAND or TEXT strings in BASIC programs, with WILDCARD character and NEXT ".
- . 9 SCREEN PRINT DELAY's with keyboard override ( for slow READABLE LISTing's / DISK Directories! )
- . VARIABLE NAME LIST / String-Byte Memory Usage / Range of FREE MEM / Top of Memory Address Display
- . FAST Machine Code to BASIC DATA Statement CONVERTER for storing Machine Code visibly in BASIC
- . (C)SAVEM Address / Backup Tool (Last Filename, Start, End, Execute)
- . Recovery of LOST BASIC Programs after NEW, BACKUP, DSKINI, etc
- . BREAK KEY DISABLE / ENABLE ( Pause keys still available )
- . Modified TRON Display ( .LN. replaces [LN] )

- \*. MERGE BASIC with Machine Code Routines so Machine Code "invisible" & (C)SAVE/(C)LOADable
- \*. 9 BASIC RUN DELAY's with keyboard override ; SINGLE STEP(S) Mode with Current Line Number display
- \*. MEMORY EXAMINE / MODIFY with HEX / ASCII / DEC / DOUBLE DECIMAL output and HEX / ASCII input
- \*. Memory BLOCK-MOVE for relocating Machine Code Programs, DATA blocks, etc ; or the KIT itself
- \*. TEN USER DEFINED FUNCTION KEYS accessible with <@> ; <NUMBER> ( BASIC MACRO's / Block Storage )
- \*. Automatic Linefeed for Printer's that don't / double space LISTings, or Normal PRINT
- \*. DELETE all Spaces ( not in PRINT Strings, DATA or REMARK Lines )
- \*. ASCII / HEX Memory DUMPS to Screen or Printer
- \*. DELETE all REMARK's ( either REM or ' type )
- \*. Parallel ECHO of Screen Output to Printer

- . TRANSPARENT to the User, Install it and forget about it until you need it
- . BASIC Runs up to 1/3 FASTER through the Toolkit (5-10% typical)
- . HELP Command Lists all Kit Commands and Current Kit Address
- . Same Program works on TAPE and / or DISK and in 16 / 32 K
- . Entire System Totally REMOVABLE anytime
- . COMPATIBLE with other Utility Packages
- . Green / Orange Text Screen Capability
- . Easily MODIFIABLE Command Syntax

THE KIT's are RELOCATABLE programs that load anytime without bothering your BASIC program or variables or top of memory address. All the tools may be turned on and off at will including the KIT itself.

The tools are available with simple 3 or 4 letter commands entered in direct mode, with the entire instruction set viewable by use of the .HELP command:

.VAR	.OLD	.MMRG	.MPRG	.BRON	.BROF	.SCON	.SCOF	.KLON	.KLOF	.BROF	.DARK
.LITE	.PROT	.REST	.TXON	.TXOF	.RDLY	.PDLY	.DELR	.DELS	.SNLF	.DLF	.DUMP
.MEN	.BYE	.BLOC	.ECON	.ECOF	.MADD	.FNIN	.HELP	.GBL	.(next)		

The COLORKIT is 5 K-bytes with all the tools for \$29.95

The MICROKIT is 2.5 K-bytes minus \* tools for \$27.95

On DISK with handy BASIC KIT loader for additional \$5.00

\*\*\*\*\*

- |   |   |                                     |
|---|---|-------------------------------------|
| THE GOOD LIFE \$16.95                       | THE DISK COMMANDER \$19.95                  | DEER HUNT \$15.95                   |
| The CLASSIC Game of LIFE, with:             | DISK FILE UTILITY with:                     | ARCADE Shoot-em-up SKILL Game       |
| . 64 x 64 4-COLOR symmetrical display (GIC) | . Single Key VIEW / COPY / LOAD(M) of Files | . Aim for ONLY the DEER             |
| . 3 Selectable Birth and Old Age Colors     | . Double Key KILL / RENAME of Files         | . Avoid hitting people, cars, train |
| . 15 Modifiable Pre-programmed Patterns     | . SORT DIRECTORY on Name / Extension        | . Will NOT Cause Tension Headaches  |
| . Save/Load Life Screens to Tape/Disk       | . PACK DIRECTORY so new files put at end    | . BASIC / Machine Code Hybrid       |
| . Speeds from 8 gen/sec to 1 a second       | . DIRECTORY KEYWORD SEARCH of Filenames     | . Tape / Disk Compatible            |
| . JOYSTICK and / or ARROW Key Input         | . PRINT DIR w/ MACHINE CODE addresses       |                                     |
| . Written in User Modifiable Basic          | . RECOVER KILLED Files                      |                                     |
| . With Machine Code LIFE processor          |   |                                     |
| . HELP Screen Command List                  |   |                                     |
| . Tape / Disk Compatible                    |   |                                     |
| . Selectable Color Sets                     |   |                                     |
| . X & Y Axis Wraparound                     |   |                                     |

ARIZIN INC.  
P. O. BOX 8825  
SCOTTSDALE, ARIZONA 85252

```

A97D CLEAR 6-BIT SOUND CONTROL BIT
A97F OR WITH SAVED CONTROL BIT
A981 STORE UPDATED PIA REG
A984 RETURN

A985 SET-UP FOR MID-PNT VALUE OUTPUT
A987 OUTPUT VALUE ON DAC CIRCUIT
A98A LOAD DELAY PARAMETER
A98C LOOP UNTIL A (TONE) INCS TO 0
A98D ..(LARGER PARAM = HIGHER FREQ)
A98F RETURN

A990 SAVE OFF/ON TOKEN
A992 UPDATE BASIC PROG PNTR
A994 IF TOKEN WAS 'OFF',
A996 ..THEN GO DISABLE AUDIO OUTPUT
A998 NOT 'OFF', SO MUST BE 'ON'
A99A ..OR HAVE SN ERROR
A99D SET ANALOG MUX TO INPUT #1
A99E ..(CASSETTE INPUT SOUND)
A9A0 GO ENABLE AUDIO OUTPUT

A9A2 POINT TO CNTRL REG A (MSB)
A9A5 DO FOLLOWING FOR BOTH CTRL REGS
A9A7 LOAD PIA CONTROL REG
A9A9 CLEAR MUX CONTROL BIT
A9AB SHIFT SELECT BIT TO CARRY
A9AC IF BIT SET,
A9AE ..THEN SET MUX CONTROL BIT
A9B0 STORE UPDATED PIA & PNT TO NXT
A9B2 REPEAT FOR LSB, THEN RETURN

A9B3 CHK FOR VERT-SYNC INTERRUPT
A9B6 IF NOT, THEN RETURN
A9B8 RESET PIA'S INTERRUPT STATUS
A9BB CHECK SOUND TIMER
A9BE ..IF ALREADY 0, JUST RETURN
A9C0 ..ELSE DECREMENT IT
A9C2 ..
A9C5 RETURN

A9C9 GET JOYSTICK NO. FROM PROG

```

```

A9CB IF STICK NO. > 3,
A9CB ..THEN GOTO FC ERROR HALT
A9CF IF STICK NO. > 0,
A9D0 ..JUST RETURN TABLE VALUE
A9D2 ON 0, FIRST READ-IN NEW VALUES
A9D4 PNT TO START OF JSTK VALUE TABLE
A9D7 LOAD STICK NO.
A9D9 LOAD CORRESPONDING POT VALUE
A9DB CONVERT TO FLTNG PNT & RETURN

A9DE AUDIO OFF SO JOYSTKS CAN USE DAC
A9E0 PNT TO JSTICK VALUE TABLE END +1
A9E3 SET STICK NO. = 3 (READ 3 - 0)
A9E5 SET SAMPLE COUNT = 10
A9E7 SAVE SAMPLE COUNT & STICK NO.
A9E9 SET MUX INPUT TO STICK NO.
A9EB INIT COMPR LEVEL & TEST VALUE
A9EE SAVE COMPARISON LEVEL
A9F0 HOLD RS-232 OUTPUT HI
A9F2 OUTPUT CUR TEST VALUE ON DAC
A9F5 CLEAR RS-232 BIT FROM TEST VAL
A9F7 INPUT COMPARISON RESULT (BIT 7)
A9FA ..& SELECT ADJUSTMENT DIRECTION
A9FC TOO HI, DECREASE TEST VALUE
A9FE (IGNORE NEXT INSTR)
A9FF TOO LOW, INCREASE TEST VALUE
AA01 RETRIEVE COMRARISON LEVEL
AA03 HALVE IT (NEXT LESS SIGNIF BIT)
AA04 ..& COUNT DOWN COMPARISONS
AA06 ..REPEAT UNTIL 6 COMPARES DONE
AA08 SHIFT 6-BIT DIGITAL VALUE
AA09 ..TO LEAST SIGNIFICANT BITS
AA0A CHK FOR STABILIZATION
AA0C ..DONE IF SAME AS LAST SAMPLE
AA0E ELSE COUNT DOWN SAMPLES
AA10 ..& RE-READ UP TO 10 TIMES
AA12 STORE READING IN TABL & INC PNTR
AA14 RETRIEVE STICK NO. & CLEAN STACK
AA16 COUNT DOWN JOYSTICK POTS
AA17 ..& REPEAT THRU STICK 0
AA19 RETURN

```

---

---

# THE ORACLE

By Ralph Tenny  
P.O. Box 545  
Richardson, TX 75080

Until the ORACLE came along, most assembly language debug monitors would not allow the programmer much flexibility to work with extensive amounts of graphics. The ORACLE allows the user to save his graphics screens or to toggle between the normal CoCo display screen and a graphics screen. Commands in Oracle can be divided into two groups: the normal debug monitor commands and those specially developed for graphics work.

The following commands are provided in THE ORACLE:

A - Alter memory. Entry of a 4-digit hex number causes the screen to update to the specified address, with the addressed byte displayed in inverted video. The arrow keys allow scanning around in memory, then entry of a 2-digit hex byte will change memory at the indicated location. BREAK will return you to command mode.

B - Breakpoint and C - Clear commands allow entry or clearing of up to three breakpoints. F - Fix breakpoint will restore the code in a breakpoint which has just halted program operation, thus allowing the program to be restarted.

D - Display memory. Entry of a 4-digit hex code will update the screen to the specified location.

G - Go with breakpoints is used to re-enter a program which was stopped by a breakpoint, and has an ARE YOU SURE prompt to remind you that inappropriate use can be dangerous to the health of your program. "G" also has special uses in the

graphics mode.

H - Hex to decimal conversion and I - Decimal to hex conversion; these commands are helpful during assembly language programming.

J - Jump to a specified address; this should be used for most debugging except for breakpoint testing.

L - Load from disk to tape (disk version). This routine has built-in protection against over-writing ORACLE, and will abort any load which loads too low in memory.

M - Move memory. Some debuggers will not handle moves where the new code location overlaps the old, but ORACLE moves code from anywhere to anywhere in read/write memory. Experienced assembly language operators will appreciate the ability to "open up" a section of code to insert a missing command. This can allow modifying a program for testing without having to do a full edit/assemble pass.

N - Name of program. This command will read a tape and identify the name, transfer address, and start and end addresses.

P - Page select. This is one of the special graphics commands to allow direct edit of video pages.

Q - Stop the debug session. EXEC(address) will allow a restart.

R - Register change. Allows full access to processor registers for extra debugging flexibility.

S - Search memory for up to a ten-byte string.

T - Tape to disk transfer (disk version)



only).

U - Upper RAM transfer (transfer ROM-based programs to read/write memory located above BASIC). This is useful for machine with 64K memory or ones expanded by adding read/write memory in the expansion port.

V - Video select. Allows selection of any low or high-density graphics modes; that is, display programming is accomplished automatically.

W - Write machine language program (equivalent of CSAVEM) or SAVEM).

X - Monitor page select. Another special graphics command.

Z - Zap any amount of memory (fill memory with a specified byte value).

This is an impressive list of commands, and ORACLE may well be the most flexible monitor for the graphics programmer. It is only fair to put all this in perspective with the following comments. The screen display is probably the most informative and "comfortable" of any of the better monitors available for CoCo, and the single-letter commands are slightly faster than two-letter commands. Execution of a command is immediate upon receipt of the fourth hex character of an address (ENTER not required).

This places a premium on accuracy in entry, but speeds operation considerably.

What's not there? Unlike most debug monitors except BUGOUT (Also by Spectral Associates), no listing is furnished. The operational documentation is quite adequate, except that examples could be used to good advantage, especially for the graphics commands. However, most serious programmers will tailor monitors for their own special uses, and while a lack of listing does not prevent this, it drastically increases the time required.

Also, no printer output is available. This is a serious lack also shared by BUGOUT. Any documentation efforts for new programs are incomplete without a record of ys viewed by using the debugger.

What's the bottom line? THE ORACLE is easy to use and works very well; it will meet the needs of most programmers, and has extra features just for the graphics programmer.

It works very well as a companion to ULTRA80CC, which is a top editor/assembler package from Spectral Associates. The lack of listing and print capability, compared to other similarly priced monitors with comparable capability, may make it overpriced unless you have need for the special graphics capability. In this case, there are good arguments for both sides, and each programmer will have to decide for himself. THE ORACLE is available for \$29.95 from Spectral Associates, 141 Harvard Ave., Tacoma, WA 98466.

<b>W</b>	<b>WEST BAY</b>	<b>B</b>
	ROUTE 1 BOX 666 WHITE STONE VIRGINIA 22578	
<p>"INVENTORY ONE" - (BY ALAN ROUSE) EFFICIENT, EASY TO USE INVENTORY PROGRAM; SMALL BUSINESS, HOMES, CLUBS. 40 RECORDS 16K, 148 32K. PRINTS INVENTORY STATUS AND REORDER REPORTS. BE RIGHT! 16-32K EXT TAPE \$20.00</p>		
<p>"GRAPH ONE" - COLOR SCREEN BARGRAPHS IN SECONDS. MAKE BUSINESS PLANS COME ALIVE. 16-32K EXT TAPE \$ 8.00</p>		
<p>"KWIK-GRAF" -PRINT BARGRAPHS, EPSON OR OKIDATA PRINTER, 3 MINUTES. NO SCREEN PRINT PROGRAM NEEDED. PRODUCES PHOTOREADY GRAPHS, MODIFIABLE. 8-32K EXT TAPE \$12.50</p>		
<p>"FILE ONE" - SMALL DATABASE PROGRAM FOR FILES, RECIPES, ADDRESSES. PRINTS MAIL LABELS.16-32K EXT TAPE \$12.50</p>		
<p>"FAMILY PACK ONE" - FUN, EDUCATION, NO GAMES. USEFUL AT HOME, BUSINESS. SHOW FRIENDS. 16-32K EXT TAPE \$12.50</p>		
<p>"IDOTHINK" - DO COMPUTERS THINK? 3 PROGRAMS WILL MAKE YOU WONDER, PONDER, GUESS. 16-32K EXT TAPE \$12.50</p>		
<p>"SPANISH ONE" - WORDS, PHRASES, SPANISH OR ENGLISH, HAS SOUNDING GUIDES FOR SPEAKING. 16-32K EXT TAPE \$ 8.00</p>		
<p>"SPANISH TWO" - MORE ADVANCED. 16-32K EXT TAPE \$ 8.00</p>		
<p>"MONITOR ONE" - SMALL MONITOR. 16-32K EXT TAPE \$ 6.00 FOR EDUCATION, PRE-SCHOOL. 16-32K EXT TAPE, EACH \$ 6.00</p>		
<p>"LETTERS ONE" - ALPHABET WITH COLORS AND SOUND CUES.</p>		
<p>"NUMBERS ONE" - NUMBER LEARNING (1-12). AS ABOVE.</p>		
<p>INCLUDES POSTAGE COSTS. IF VIRGINIA, ADD 4% SALES TAX.</p>		



---

---

# PRINTER LINE WIDTH CONTROL FOR THE COLOR COMPUTER

By Arnold H. Kahn  
2706 Ross Road  
Chevy Chase, MD 20815

How many of you have tried changing the printer output width to 60 characters by POKE & H9B,60; or to any other non-default value? According to the Radio Shack manuals, the location \$009B contains the printer width limit. Yet nothing noticeable seems to happen when you alter the contents of this address. What is going on here, and what can be done about it? That is the topic of this article.

It would be very useful to have some adjustable parameter which could control the width of the printed line when we do a LLIST or any general printing. I have the Epson MX-100 printer, which takes 15 inch wide paper. If I use the common 9 inch paper I am always in danger of having long program lines listed on the platen, where they are hard to read. My printer has no adjustable width setting; the print width is dependent on computer software. What Radio Shack has given us at location \$9B is a method of introducing a pause for the carriage return delay needed by some printers. You POKE the printer width at \$9B and the desired 2 byte delay at \$97-\$98, and the computer will hold back the output at the end of each line, for a time long enough for the print head to get back for the start of the next line. What we would like is to modify this routine to force a line feed when the print

head reaches OUR assigned width limit (in addition giving any needed return delay).

There is a fix available to those who have 64K Color Computers. You alter the send-to-printer routine in the Color BASIC 1.1 ROM, as shown in the programs at the end of this article. If you don't have a 64K machine this will not help you, since your ROM is not modifiable; the program modifies a copy in RAM. You had best wait for Color BASIC 1.2 and hope. (There is a possibility of accomplishing this using RAM hooks). However, if you have a recent factory-issued 32K Color Computer you should try to run the Frank Hogg 64K program, or my XFER64 which recently appeared in Color Computer News. You probably have 64K accessible but may not yet know it. RS does now incorporate the Frank Hogg modification.

A partial disassembly of the send-to-printer routine is presented below. On following the steps, we see that after each character is sent to the D/A converter (to the printer) the program asks (at \$A2E3) if the print head is at the width limit. If not, it waits for a handshake (bit 0 of PIA1 at \$FF22) saying the printer is ready, and returns to the program, perhaps for more characters to print. If it is at the limit. It resets the counter to zero, delays for the CR, gets the handshake, and then returns

If you are a user of Motorola  
Microprocessors or Unix type  
operating systems and look like this:

THEN

---

*Forum SixtyEight* 68

---

The Magazine For Users of Motorola Micro's

IS FOR YOU!

We uncover Motorola micro's,  
Unix type operating systems and  
languages from Assembly to Zenix.

For the next twelve monthly issues  
send \$21.00 and your name and address to:

REMarkable Software, Inc.  
1853 Ruddiman Drive  
North Muskegon, MI 49445  
(616) 744-4796

We Have What You Need To  
**UNCOVER YOUR TRUE POTENTIAL...**

# WANTED

COLOR COMPUTER NEWS

Guilty of being the BEST  
source of CC info anywhere.

REWARD

The rewards are endless when you subscribe to

---

*ColorComputer* **News**

---

The Color Computer Magazine for 6809 Users.

Full of: Hardware projects, Tutorials, Reviews,  
Letters from readers, Applications, Utilities,  
Games and the latest New Products.

To receive your REWARD,  
just send \$21.00 for twelve  
monthly issues to:

REMarkable Software, Inc.  
1853 Ruddiman Drive  
North Muskegon, MI 49445  
(616) 744-4796

**WARNING:** Consider Color Computer News armed (with  
information) and dangerous (to be without).

# PRO-COLOR-FILE<sup>©</sup>

**If you're through playing games and are ready to get serious about software, then PRO-COLOR-FILE is for you. Turn your TRS-80 32k Color Computer Disk System into a powerful data base manager.**

## 60 DATA FIELDS

These fields are defined by you along with how many spaces to allow for data entry and are broken into 4 segments of 15 fields each. Define from 1 to 15 fields per segment and indicate separate disk drives for segments if you have them.

## 4 DATA ENTRY SCREENS

Don't bother with PRINT @ statements anymore. PRO-COLOR-FILE lets you custom design your screens that will be used for entering your data with full color. Type headings, notes and titles to suit your needs and specify your fields as being alphanumeric, whole number, or decimal entry. Switch through screens while entering data or reviewing records. You can even define a password for any screen for limited access.

## 14 MATH EQUATIONS

Set up math equations to apply the operations of add, subtract, multiply, or divide to the data you enter on each record. In a Job Quote program you could set up the equations to multiply the hourly rate by the number of hours, add all the expenses together and then apply sales tax.

## ALPHABETIZED INDEX

An index will allow you to scan through your file or obtain a hard copy report in an alphabetical order by any of your fields. An index will also allow access to any record within a 1000 record file in less than 10 seconds. Tag up to 2 additional fields to create an index within an index within an index. This means that you could alphabetize a mailing list first by STATE then within each STATE by CITY and then within each CITY by LAST NAME.

Select records for indexing by using AND/OR options and relationship indicators such as =, <, >, <=, >=, <>.

Re-Index a file at any time when new records are added or when a different index is desired.

## 5 REPORT FORMATS

PRO-COLOR-FILE gives you the freedom to design report formats that will produce hard copy reports of your data formatted to your needs. The versatile report formatter will let you design report formats with column width selectable from 32 to 255 spaces. Indicate up to 5 ASCII codes to be sent to the printer to take advantage of different font sizes on printers with that capability. Define report title and column headings, create vertical lines, obtain totals on numeric fields and even design label formats.

Select records for reporting from the index list by using the same AND/OR options and relationship indicators as mentioned.

A custom menu lets you name each report format to indicate the type of report it will generate. Password protect any format to allow limited access.

## NEW VERSION - 2.0

PRO-COLOR-FILE 2.0 has added features that offer even more flexibility and added Data management capabilities.

## SCREEN REPORT FORMATS

If you need to review records and/or obtain totals for numeric fields without wanting to produce a hard copy, you will be able to do so with the screen report feature.

## ASCENDING / DESCENDING

Have your hard copy or soft copy reports printed out in ascending or descending order.

## SELECT A RANGE

PRO-COLOR-FILE 2.0 gives you the ability to select a range of records for indexing or reporting by two fields at the same time. In a mailing list program you could select only those records that fall within a certain zip code range and that have last names within a certain range of the alphabet.

Design as many programs as you can think of: Mailing List, Inventory, Job Quotes, Expenses, Student Records. Any application that requires information to be stored, updated and reported can be created with PRO-COLOR-FILE. Fully documented with examples of data base programs created using PRO-COLOR-FILE.

VERSION 1.0 - \$59.95 (limited copies available)

VERSION 2.0 - \$79.95

Upgrade copies and new manuals available for owners of the 1.0 version for \$20.00. Send serial number when ordering!

(Check, money order, Visa or Master Charge - allow 2 to 3 weeks for delivery. Add \$2.00 for Shipping and Handling.)

NAME \_\_\_\_\_  
ADDRESS \_\_\_\_\_  
CITY \_\_\_\_\_ STATE \_\_\_\_\_ ZIP \_\_\_\_\_  
PHONE \_\_\_\_\_  
VISA \_\_\_\_\_  
MC \_\_\_\_\_  
EXPIRATION DATE \_\_\_\_\_  
SIGNATURE \_\_\_\_\_

Derringer Software, Post Office Box 5300, Florence, S.C. 29502.  
Phone: 803 665 5676 after 6:00 p.m., Monday - Friday.  
Before 10:00 p.m. on weekends.

PRO-COLOR-FILE ©1982 Dennis Derringer  
(TRS-80 is a trademark of TANDY Corp.)

to the caller. At \$A2F5 there is a series of six 00's, probably left over from conversion of the old 1.0 ROM. This "hold" gives us a lucky break, allowing an escape with a minimal rewrite of the code.

Now we alter the program, taking advantage of the "hole". We change the instruction at \$A2E5 to BRA FIX1, where FIX1 is in the "hole". The entire fix can't fit in the "hole", but it does give us a change to do a LBRA FIX, and FIX is at \$D800, where there is lots of room. There we force a line feed, mimic the original ROM code a bit, and return to the routine at \$A2BF as if the extra line feed had come from the text in the print buffer.

To use this, just assemble the new code to disk or tape. Go into 64K, however you will. Then load the assembled material into RAM. DO NOT EXECUTE. It has become a part of 1.1 Color BASIC and will operate when called. I prefer to put this into my program XFER64 (pronounced Transfer 64) along with other goodies such as a prompter change, 2400 Baud setup, button RESET to 64K, etc. You could have the one setup program change the default width at the same time if you commonly use non-standard paper or an unusual printer.

Now for one last little difficulty. If you have the popular SDS-80C assembler the simple program will not work because SDS handles ORG's so badly. When there are forward ORG's the intermediate space is filled with \$39's, giving not only a very long tape, but one which will overwrite much of the code we copied from ROM. Yuk! The way to get around this is to write a substitute program which you do EXECute. This program, while executing, will store the literal assembled code which replaces the original. Because people are becoming interested in ROM modification I am including this variation too.

# YORK 10™ CASSETTES DISKETTES



- LOWER PRICES
- LONGER LENGTHS

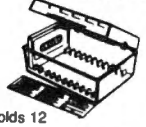
DATA TRAC C-06, C-12, C-24

From the leading supplier of Computer Grade Cassettes, new, longer length C-12's (6 minutes per side) provide the extra few feet needed for some 16K programs.

- Premium 5-screw shell with leader — BASF tape
- Internationally acclaimed. Thousands of repeat users.
- Error Free • Money back Guarantee

**SPECIAL 500 C-12's 38¢ each**  
Shipping \$17.00/500  
w/labels add 4¢ w/boxes add 15¢

CASSETTE STORAGE CADDY



Holds 12 cassettes w/o boxes  
Includes edge labels and index card



TRACTOR FEED  
• DIE-CUT BLANK CASSETTE LABELS

BASF Qualimetric Flexi-Disc—Lifetime Warranty.  
5 1/4" Single Side. Double Density, Soft-Sectored.

**NEW! MICRO CASSETTES** in convenient short lengths.  
MC-10 Same superior tape in premium shell  
MC-20 WITH LEADERS. Supplied complete with  
MC-30 box (fits Epson & Sharp micro drives)

Call: 213/710-1430 for IMMEDIATE SHIPMENT on Credit Card Orders.

**ORDER NOW... MAIL TO: YORK 10™ Computerware**  
24573 Kittridge St., #cc, Canoga Park, CA 91307

## ORDER FORM

ITEM	1 DOZEN	2 DOZEN	TOTAL
C-06	<input type="checkbox"/> 7 00	<input type="checkbox"/> 13 00	
C-12	<input type="checkbox"/> 7 50	<input type="checkbox"/> 14 00	
C-24	<input type="checkbox"/> 9 00	<input type="checkbox"/> 17 00	
Hard Box	<input type="checkbox"/> 2 50	<input type="checkbox"/> 4 00	
Blank labels	<input type="checkbox"/> 3.00/100	<input type="checkbox"/> 20.00/1000	
Storage Caddy @ \$2 95 ea Qty _____			
Flexi-Disc	<input type="checkbox"/> 26 95/10	<input type="checkbox"/> 120 00/50	
<b>MICRO CASS.</b>	<b>1 DOZEN</b>	<b>2 DOZEN</b>	
MC-10	<input type="checkbox"/> 16 50	<input type="checkbox"/> 32 50	
MC-20	<input type="checkbox"/> 18 00	<input type="checkbox"/> 34 50	
MC-30	<input type="checkbox"/> 19 00	<input type="checkbox"/> 36 00	
	<b>SUB TOTAL</b>		
Calif residents add sales tax			
SHIPPING/HANDLING (any quant., except for Special)			3.50
Outside 48 Continental States—Additional \$1 per caddy, per doz. cassettes or boxes; per 10 discs			
	<b>TOTAL</b>		

Each std. cassette includes two YORK 10 labels only. Boxes are sold separately. We prefer to ship by UPS as being the fastest and safest. If you need shipment by Parcel Post, check here

NOTE: Additional charges outside 48 Continental States. Shipments to AK, HI, and USA possessions go by Priority Mail; Canada & Mexico—Airmail; All others—Sea Mail

Check or M.O. enclosed  Charge to Credit Card  VISA  MASTERCARD   
 PLEASE SEND QUANTITY DISCOUNTS

# CC

Card No. \_\_\_\_\_ Exp. \_\_\_\_\_

Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State/Zip \_\_\_\_\_

Signature \_\_\_\_\_ Phone \_\_\_\_\_

Computer make & model \_\_\_\_\_ Disk? (y/n) \_\_\_\_\_

DISASSEMBLY OF 1.1 ROM \$A2BF-\$A307  
 SEND CHARACTER IN ACCUMULATOR A TO PRINTER

	ORG	\$A2BF	
A2BF	PSHS	CC, A, B, X	SAVE REGISTERS
A2C1	ORCC	##50	DISABLE INTERRUPTS
.	.	.	
.	.	.	SEND 8 BIT CHR TO D/A REG
.	.	.	
A2D7	BSR	PA2FB	SEND 2 STOP BITS
A2D9	PULS	CC, A	
A2DB	CMPA	##0D	IS IT CR?
A2DD	BEQ	NEWLIN	YES
A2DF	INC	<\$9C	NO, INCR COUNTER
A2E1	LDB	<\$9C	GET UPDATED CTR
A2E3	CMPB	<\$9B	CMP WITH LINEWID
A2E5	BCS	HDSHAK	NOT END OF LINE
A2E7	NEWLIN CLR	<\$9C	END, ZERO CTR
A2E9	BSR	DELAY	GO DELAY, RETURN
A2EB	BSR	DELAY	AGAIN
A2ED	HDSHAK LDB	\$FF22	WAIT FOR HDSHAK
A2F0	LSRB		BIT 0 TO CARRY
A2F1	BCS	HDSHAK	NOT YET, LOOP
A2F3	PULS	B, X, PC	NOW! RETURN.
A2F5	FDB	0000	6 BYTES OF 00'S,
A2F7	FDB	0000	A BIG HOLE IN
A2F9	FDB	0000	THE CODE.
A2FB	PA2FB LDB	#2	SET RS232 HI
A2FD	PA2FD STB	\$FF20	SEND TO D/A
A300	BSR	PA302	
A302	FA302 LDX	<\$95	GET BAUD RATE
A304	FCB	\$8C	DUMB SKIP 2 BYT=CMPX
A305	DELAY LDX	<\$97	GET CR DELAY
A307	JMP	\$A7D3	DELAY, THEN RTS.

\* NAM PRTWIDTH  
 \* BY A.H.KAHN (K) JUNE 1983

# COLOR COMPUTER | FLEX\* | OS-9† USERS

DO YOU WANT faster running programs (over 100 times faster than BASIC)? A high level language that is also a low level language? A compiler that runs in less than 32K? Assembly language output? Position independent code? Extensive library functions in source assembly code? Periodic newsletters with new library functions? An aid in learning assembly language? Liberal version updates?

C is the language of the eighties; accepted by IBM and Bell Labs for system development: a compact, highly versatile, easy to use language, excellent to use to build games, applications, utilities, operating systems, etc.

DUGGER'S GROWING SYSTEMS with over 21 years of experience in computing was first on the market with a 6809 C compiler. The compiler has been extensively tested, revised, and proven.

DUGGER'S GROWING SYSTEMS C is a growing subset of the standard C. Version 1 contains all the necessary C commands (while, if, if else, int, char, etc.). Version 2 contains additional features (float, long, for, goto, etc.).

AN EXTENSIVE LIBRARY in assembly language source is provided (char, I/O, formatted print, filehandling, string manipulating, etc.) Color Computer version also has additional functions which use the BASIC ROM

functions (cls, polcat, floating point, etc.).

## ORDER NOW (new low prices)

Color Computer C Compiler  
Version 1.2 (disk version) . . \$49.95

Flex C Compiler  
Version 2.3 . . . . . 120.00

OS-9 C Compiler  
Version 1.2 . . . . . 95.00

C Programming Language  
by Kernighan & Ritchie  
(a must) . . . . . 19.95

Computerware  
disk assembler . . . . . 49.95

Computerware Scribe  
(Disk editor-text formatter) . 49.95

Shipping add \$3.00  
C.O.D. and Foreign handling  
add 15%

*MasterCard and Visa accepted.*

**DUGGER'S GROWING SYSTEMS**

Post Office Box 305 • Solana Beach  
California 92075 • (619) 755-4373

DEALER INQUIRIES INVITED

# Move up to **C** language compiler

\*OS-9 is a trademark of Microware, Inc.  
†FLEX is a trademark of Technical Systems Consultants, Inc.

\* ASSEMBLES ON EDTASM+  
 \* LOAD ML PROG AFTER GOING INTO 64K.  
 \* DO NOT EXEC! IT ONLY REPLACES CODE.  
 \*

```

PA2ED      EQU      $A2ED      BOUNCE BACK TO 1.1

          ORG      $A2E5
          BRA      FIX1

          ORG      $A2F5      "HOLE" ADDR FOR
FIX1      LBRA     FIX          REFUELING STOPOVER

          ORG      $D800      PLACE FOR NEW CODE
FIX       LBCS     PA2ED      GO BACK IF NOT CR

HDSHAK    LDB      $FF22      WAIT FOR HDSHAK
          LSRB
          BCS      HDSHAK      BIT 0 INTO CARRY

          LDA      #$0D      LOAD CR
          PSHS     CC,A      FIX STACK
          JMP      $A2BF+2    RE-ENTER PROG
          END

0001 0600                                NAM PRTWIDTH

          *
          * BY A.H.KAHN (K) JUNE 1983
          * ASSEMBLES ON SDS-80C
          * PROGRAM LIMITS PRINTED LINE
          * LENGTH TO VALUE POKED AT $9B.
          * EXEC AFTER GOING INTO 64K.

0002 0600                                ORG $6000      RELOCATABLE
0003 A2ED                                PA2ED EQU $A2ED  BOUNCE BACK ADD

0004 6000 BE200E                          LDX ##200E    CODE: BRA
0005 6003 BFA2E5                          STX $A2E5     CHANGE CODE

0006 6006 B67E                             LDA ##7E      CODE: LBRA
0007 6008 BED800                          LDX ##D800    ADDR
0008 600B B7A2F5                          STA $A2F5     CHANGE IT
0009 600E BFA2F6                          STX $A2F6     AND AGAIN
  
```

\* GET WISE; LET PROG MOVE ITSELF



```

0010 6011 2013          BRA AUTO          GOTO MOVER

          * PROG TO BE MOVED:
0011 6013 2403        FIX      BCC HDSHAK          CAN'T DO LBOS
0012 6015 7EA2ED      HDSHAK  JMP $A2ED          IF IT'S MOVED
0013 6018 F6FF22      HDSHAK  LDB $FF22
0014 601B 54          LSRB
0015 601C 25FA        BCS HDSHAK
0016 601E 860D        LDA ##0D
0017 6020 3403        PSHS CC,A
0018 6022 7EA2C1      JMP $A2BF+2
0019 6025 39          RTS

          * END OF CODE TO BE MOVED.
0020 6026 308CEA      AUTO    LEAX FIX,PCR      GET START
0021 6029 108ED800    LDY ##D800              DESTINATION
0022 602D A680        MOVE    LDA ,X+          GET BYT TO MOVE
0023 602F A7A0        STA ,Y+                  INSTALL BYT
0024 6031 B139        CMPA ##39               IS IT RTS
0025 6033 26F8        BNE MOVE
0026 6035 39          RTS

0027 6036          END
AUTO    6026  FIX      6013  HDSHAK 6018  MOVE    602D
PA2ED  A2ED

```

## We Sell

# CHALLENGES

Wargames / Strategy Games  
for your CoCo



P.O. BOX 382  
WEST POINT, PA 19486

Specify game and version desired.  
All programs shipped on tape. If you  
want it on disk add \$3. Price includes  
shipping. PA residents add 6% sales  
tax. MASTERCARD/VISA welcome.  
Include card #, expiration date and  
SIGN order.

### **GALACTIC TAIPAN** ★★ NEW ★★ **19.95**

Can you overcome space pirates, space storms, taxes and competition and STILL make a profit? You must plan your strategy in this single player trading game. 32K Cassette.

### **RUBICON - II** ★★ NEW ★★ **24.95**

Vastly expanded version of ACROSS THE RUBICON. Includes limited intelligence about German positions, mortars, scouts and more. 32K Cassette.

### **ACROSS THE RUBICON** **19.95**

The popular WWII wargame. Break through the Huertgen Forest using infantry, paratroops, tanks, air and artillery strikes. Requiring 1 to 4 hours to play, variations in terrain and German reaction make each run different. 16K Cassette, does NOT need Extended BASIC.

### **MISSION:EMPIRE!** **19.95**

A strategic wargame/strategy game. Starting with one planet, incomplete intelligence and limited resources, you must conquer the galaxy. Play takes 2-5 hours and is DIFFERENT EVERY TIME! All versions offer a game save option. Specify 32K Disk or 32K Cassette.

### **MISSION:EMPIRE - 16** **19.95**

Missing only the advanced game. 16K Non-Extended BASIC.

### **ROMPAC BACKUP** **15.95**

Can't run your ROMPACS with your disk in or just want backups? This program makes it easy. Requires 64K. Shipped on tape.

---

---

# SUPERCARGER

Review by William F. Estep  
4918 E. 4th Street  
Anchorage, AK 90504

I own a 32K E board Color Computer. I've read for quite some time about the 64K modification that can easily be made to my computer, but since I have no electronic experience I would not even think of trying to do it. There are companies that advertise that they will do the modification for you at a price of around \$100.00. The problems that I could see with this are that I would have to send off my computer (the thought of being without my computer for a couple of weeks does not appeal to me), the modification would not be recognized by Radio Shack, and the price involved for what is actually a very simple piece of work is high. From the information that I've read, Radio Shack will soon start supporting the 64K modification with the OS9 DOS. They will then have to start making the 64K modification available. I personally would prefer to have the modification that they approve so if something ever goes wrong, I can easily take it to any Radio Shack for service. I know that to many readers think this is a ridiculous attitude, but since I don't have any electronic knowledge I don't want to get into a situation that will cost me even more money than going with Radio Shack.

I don't have a disk drive so the reason for me wanting 64K of RAM is not for FLEX DOS. I will personally wait to see what will be the best supported DOS system before I commit myself. The main reason I want the 64K modification is for the extra RAM. There are many programs now coming out for cassette based systems that make use of the extra RAM, ie. Telewriter 64 by Cognitec, Super 'Color' Library by Nelson Software Systems, and Cer-Comp's new Cores-64 Editor/Assembler. Also, Spectrum Projects has a program that moves Extended BASIC above Disk BASIC so that with four pages of graphics reserved you still have 31015 of memory left. I also could fix any documentation problems with ROM since mine would be in RAM. The last reason that I would like to have the 64K modification is so I could develop programs for the Color BASIC users since I could simply not copy Extended BASIC to RAM.

Since I would like to have 64K but I don't want to make a hardware modification to my computer, I was very interested in the 'Supercarger' board by Spectral Associates. It is advertised as allowing access to the full 64K of RAM

Are you at the End of your rope trying to  
Unravel the Secrets of the  
Color Computer ROM?

PRESENTING

Unraveling the Color ROM.

Featuring

Commented Source Code for the Color Computer

Including

Entry points for valuable subroutines  
and detailed description of scratchpad

To reserve your copy in advance  
Send \$16.95 or upon publication  
you can send \$19.95

To: REMarkable Software, Inc.  
1853 Ruddiman Drive  
North Muskegon, MI 49445  
(616) 744-4796

Price Includes Shipping

Projected Publication Date August 1

Dealer Inquiries Invited

Coming soon: Unraveling the Disk ROM



without modifying your computer and voiding the warranty. The price is \$39.95 which is \$60.00 less than most companies charge for making the 64K modification and you don't have to send away your computer. With my 'wait and see' type attitude as far as making the 64K modification this seemed perfect for me. I ordered the 'Supercharger' board and waited to receive it. I waited and waited and waited. It took several weeks to receive it. In fairness to Spectral Associates they did have problems with a manufacturer making defective parts. Apparently they had to wait for a new shipment. I have ordered other products from Spectral Associates and have always received very prompt service.

When I received the 'Supercharger' I found in the box the 'Supercharger', a cassette with a RAM test to check the top 32K of RAM, the assembly listing of the RAM test, a sheet with the assembly listing of their program to move ROM to RAM, and a one page instruction sheet. The instructions WARN to never install or remove the 'Supercharger' board with the power to the computer on. The 'Supercharger' board plugs into the ROM pack port of the Color Computer. I personally wish that it was in some type of case, since it is a bare board that you simply plug in. The 'Supercharger' does not extend outside of the computer so this probably isn't really a problem. You can plug in any additional accessories into the 'Supercharger', ie. ROM packs, Disc controller, and apparently anything you normally would want to.

A word concerning the assembly listings, they are well commented, which is very nice for someone like me who is only beginning to understand assembly language.

I plugged in the 'Supercharger' and loaded the RAM test from the cassette. I executed it and all my RAM checked out ok. From the assembly listing, it looks as if

you do have a problem that the program will print which RAM chips are bad, otherwise you get a 'no errors detected' message. Since my RAM was ok I turned off the computer and then turned it back on and proceeded to load Telewriter 64. I typed in 'RUN' so the program would automatically configure itself to take the optimum advantage of the memory available (hopefully 64K). But instead of getting the result that I hoped for, the computer locked up. I turned off the computer and loaded Spectral Associates' program for moving ROM to RAM. It worked ok, so what was the problem? When all else fails - read the instructions.

Listing number 1 contains the listing that appeared in the April issue of Color Computer News of Frank Hogg's MOVE-ROM program. It works by switching back and forth between the ROM and 64K RAM modes and loading what is in ROM into the same location in RAM. By loading data into \$FFDF you are in 64K RAM mode and by loading data into \$FFDE you revert to ROM mode. The instructions for the 'Supercharger' WARN that after you enable the 'Supercharger' by reading or writing data into \$FFDF that a memory reference to \$FFDE will NOT disable the 64K mode. I studied the MOVEROM program supplied by Spectral Associates and saw that they copy ROM to RAM beginning at \$2000, switch to the 64K mode, and then copy the copy of ROM at \$2000 to the appropriate place in the 64K memory map. The Spectral Associates version also makes some changes in the memory end routine in BASIC so that BASIC is forced to recognize \$7FFF as the end of RAM. Since I could not switch back to ROM it made a copy of the garbage that was in the upper RAM.

The 'Supercharger' did everything that it is advertised to do, but I was disappointed because the new 64K RAM programs that are coming out all seem to use the same type MOVEROM program

as the Frank Hogg program. I knew that I could substitute the Spectral Associates version for the one being used in Telewriter 64, but since I have only a very limited ideal of how machine language works, it was just too big of a job for me. It took me a couple of days to figure out the fix for the problem. First I run the Spectral Associates version of MOVEROM. I'm in the 64K mode and ROM is in RAM. When Telewriter 64 makes the POKE to switch back to ROM to copy it, nothing occurs and it ends up making a copy of RAM instead. Since the RAM already has a copy of ROM everything ends up the same. This works with Telewriter 64 and the Frank Hogg MOVEROM program, but as to whether it works with the other new programs I don't know, although I would assume it would.

Listing number 2 is the program that I developed that will allow me to work with just Color BASIC, or Color and Extended BASIC, or Color and Extended and Disk BASIC (although I can't use Disk BASIC since I don't have it). You must have Spectral Associates' MOVEROM program since it is CLOADM'ed in line number 5. By making the appropriate choice I can work with the system that I want. Due to the change that Spectral Associates' MOVEROM program makes to Color BASIC's memory end routine this was a very simple program to write. If you have the 64K modification you might want to try to order a copy of Spectral Associates' MOVEROM program (They don't seem to have a name for it so you should probably just describe it).

**CONCLUSIONS:** The Supercharger board from Spectral Associates is a very good buy. It does everything that it is advertised to do and I have not had any hardware problems with it at all. The one problem with its compatibility with Frank Hogg type MOVEROM programs seem to be easily solved by first running the program supplied by Spectral Associates

### MISSION: DESTROY

YOU have been hired by the government to prevent the launching of Soviet missiles aimed directly at Washington, D.C. YOU must code the main computer at the missile base to self-destruct.

Requires 32K extended basic

\$17.95 cassette including shipping

Creations Unlimited

20 Tilton Lane

Andover, MA 01810

## Aurora Software

49 BROOKLAND AVE.  
AURORA, ONTARIO  
CANADA L4G 2H6

### FAMILY GAMES

FOR 16K AND 32K COLOR COMPUTER

**STOCKBROKER** — Up to 6 players can play the stock market. For 16K or 32K ECB. The 32K is in High-Res Graphics.

**CRIBBAGE** — For 2 or 4 players. In High-Res Graphics! (for 32K).

**BATTLE** — Will you get bombed before you can find all the ships? An extremely entertaining game for the family.

**COLORMIND** — Up to 4 players challenge for hidden colors.

**REMREM** — Challenge your friends. Who can remember the longest color sequence?

**CONCEN** — Challenge the computer or a friend to a good ol' game of concentration.

ALL GAMES only \$20.00 or ANY TWO for \$35.00

ALSO FROM *Aurora Software*:

**MR. COPY** — A quality copier written in M.L. that will make backup tape copies. MR. COPY is capable of making up to 99 copies in one loading! \$25.00

**ROMDISK** — If you have a modified 32K C.C. machine ROMDISK will allow you to load your R.S. Rom Packs from a disk! \$20.00

## THE STEREO COMPOSER



### YOUR COMPUTER NEVER SOUNDED SO GOOD

The **STEREO COMPOSER** music synthesizer was developed for the true music lover. All the features available for the **COMPOSER** described below are also available for the **STEREO COMPOSER**. However, instead of using the single 6 bit digital to analog converter built into the computer and the speaker built into your TV, the **STEREO COMPOSER** uses two 8 bit digital to analog converters which drive two audio power amplifiers. These amplifiers supply enough audio power to easily drive your own external speakers. If you like, the output may be connected to your home stereo system to further increase fidelity. Connection is provided by two phono connectors. If the music is too loud, two built-in volume controls are provided to allow you to control the volume of each of the channels separately. The advantage of being able to use external high quality speakers is obvious. The use of higher quality digital to analog converters serves to further increase music fidelity.

The **STEREO COMPOSER** produces music in stereo. Of the 4 voices produced, 2 are directed to each channel. This ability alone increases the realism of the music. You can even move the voices between speakers as the music plays.

The **STEREO COMPOSER** comes assembled, tested, burned in, with all the software and hardware to allow you to immediately start enjoying your music. A complete manual and examples are provided to give you everything you need.

The **STEREO COMPOSER** is completely compatible with the Radio Shack disk system. Any expansion unit will allow you to have both a disk and the **STEREO COMPOSER** operating.

Requires Extended BASIC and Minimum of 16K

STEREO COMPOSER (Hardware, Cassette and Disk) .....\$89.95



## THE COMPOSER



The **COMPOSER** is a 4 voice music compiler which easily allows one to develop high quality music. Each voice is programmed separately. In addition, each voice uses its own waveshape table which means a unique sound for each of the 4 voices.

The **COMPOSER** features a 7 octave range. It supports dotted and double dotted notes as well as eighth, quarter, and standard triplet notes. Sixteenth and thirty second notes are also supported.

The **COMPOSER** allows the music to be played at any tempo and in any key. And believe it or not, the tempo and key can be modified as the music plays. This gives the user tremendous versatility in developing music. Key modification also allows the user to move the music up or down one or more octaves.

The **COMPOSER** displays a constantly changing random kaleidoscope pattern as the music plays. In addition, the number of the note being played is displayed which aids one in finding sour notes during music development. Both of these displays can be disabled to allow any screen to be displayed while the music is playing. In this way, one can show the words to a song or display a picture as the music plays.

The **COMPOSER** develops a machine language position independent subroutine that can be Saved, Loaded, and Executed independent of all other software. This means that you can share your music with friends. In fact, you can write your own BASIC programs that call and play the music. Software vendors may include the music in their own product.

The **COMPOSER** is menu driven making it extremely easy and friendly to use and operate. A thick operating manual is provided as well as 20 minutes of music. Many examples are given to aid the user in getting started. All you need is provided, no additional hardware is necessary. Don't let the price fool you, the **COMPOSER** has got to be heard to be appreciated. For reviews see June '83 **RAINBOW**, p. 192 and May '83 **Color Computer News**, p. 74.

Requires Extended BASIC and Minimum of 16K

CASSETTE VERSION .....\$24.95  
DISK VERSION (32K) .....\$29.95

## THE VOICE



### WHY PAY \$100 OR \$150 FOR A SPEECH SYNTHESIZER?

Buy the \$29.95 special and find out. Better yet, save your money and read one man's opinion in the August '82 issue of **CCN** on page 53. It's a fact of life that you get what you pay for. You simply can't accurately duplicate a speech synthesizer in software. Software synthesizers will give you either a limited vocabulary, use up a lot of memory, produce poor quality speech, or a combination of all three.

**THE VOICE** is a hardware synthesizer that plugs into the cartridge slot. It uses a sophisticated integrated circuit, the SC-01 by VOTRAX, to reproduce any word in English as well as other languages using phonemes. Phonemes are basic units of speech of which 64 are available at 4 inflections. This chip costs us \$55. If you supply the chip, deduct \$55.

**THE VOICE** has two outputs. Speech may be heard through the TV speaker, or the built-in audio power amplifier may be connected to your own external speaker. If the volume is too high, a built-in volume control is provided.

**THE VOICE** comes assembled, tested, burned in, with all the necessary hardware and software. A complete manual with many examples is provided to get you started in developing your own programs.

**THE VOICE** is completely compatible with the Radio Shack disk system. Any expansion unit will allow you to have both a disk and **THE VOICE** operating.

### Software Included With THE VOICE

**BINGO** The VOICE announces the BINGO titles while you play the game.

**MATH TUTOR** The VOICE tutors your child in learning arithmetic.

**HIGH LOW** The VOICE gives you hints in guessing a number it has picked.

**EDITOR** This utility program will help you develop words phonetically.

THE VOICE (Hardware, Cassette, and Disk) .....\$149.95

THE VOICE (As above without SC-01) .....\$ 94.95

### THE TRANSLATOR

The translator is a machine language program that uses a built-in dictionary and a sophisticated program algorithm developed by Del Software to automatically convert text to speech. For example, A\$ = "THIS IS ALMOST TOO EASY" followed by calling a USR will allow the VOICE to speak. The translator will even allow you to type words in one language (i.e. French) and have the VOICE speak in another (i.e. German). Nobody else gives you that flexibility. For 16K, 32K and 64K machines.

### Software Included With The Translator

**REACTION** Test your reflexes as the VOICE gives you commands.

**SIMON** Test your memory for numbers spoken by the VOICE.

THE TRANSLATOR (Cassette or Disk) .....\$29.95

## HOW TO ORDER

We accept CASH, CHECK, COD, VISA, and MASTER CARD orders.

Shipping and handling for all products in the continental US and Canada .....\$2.00

Shipping and handling for all products outside the continental US and Canada .....\$5.00

COD charge (requires cash, certified check, or money order) .....\$2.00

Illinois residents add 5 1/4% sales tax for the STEREO COMPOSER or THE VOICE.

# Speech Systems

38W255 DEERPATH ROAD  
BATAVIA, ILLINOIS 60510

(312) 879-6880

CALL ANY DAY, ANYTIME TO ORDER. YOU MAY ALSO ORDER BY MAIL.

and then running the Frank Hogg type MOVEROM. The RAM test that they supply has a well commented listing as is their MOVEROM program. With the BASIC program that I developed in listing number 2 and their MOVEROM program you can work with the BASIC that you wish. There are companies that advertise programs that do the same things as these two together that could cost close to \$30.00. I can now develop programs for Color BASIC users and I have 36K of memory with Telewriter 64. I am very satisfied with the 'Supercharger' from Spectral Associates and would recommend it.

```

1 'Copyright 1983 by Frank Hogg
  Permission to use is
2 'given for all but commercial
  use.
10 CLEAR 999
20 DATA 26,80,190,128,0,183,255,
  222,166,128
30 DATA 183,255,223,167,31,140,2
  24,0,37,241,57

40 FOR I=1 TO 21:READ A:A$=A$+CHR$(A):NEXT I
50 P=VARPTR(A$)+1
60 POKE P,126
70 EXEC P
80 PRINT "NOW IN RAM!"

```

```

1 'SUPER 64K MACHINE LANGUAGE PORTION FROM SPECTRAL ASSOCIATES
2 'BASIC PROGRAM BY WILLIAM ESTEP
3 'WITH SPECTRAL ASSOCIATES MOVE ROM PROGRAM YOU CAN CHOOSE WHICH BASIC SYSTEM YOU WISH TO WORK WITH
5 CLOADM:'CLOADM SPECTRAL ASSOCIATES MOVEROM PROGRAM
10 CLS:PRINTTAB(9)"SUPERCHARGER 64K"
11 PRINTTAB(4)"MACHINE LANGUAGE PORTION":PRINTTAB(4)"BY 'SPECTR

```

```

AL ASSOCIATES'"
12 PRINT:PRINT:PRINT"CHOOSE ONE OF THE FOLLOWING:"
13 PRINT"1) COLOR BASIC ONLY"
14 PRINT"2) COLOR & EXTENDED BASIC"
15 PRINT"3) COLOR, EXTENDED, & DISK BASIC"
16 AS=INKEY$:IF AS="" THEN 16
17 A=VAL(AS):ON A GOTO 20,25,30
18 GOTO 16
20 POKE &H1006,&HA0:POKE &H100D,&H3F:POKE &H100E,&HFF:POKE&H101C,&HC0:POKE&H1066,&H9F:EXEC &H1000
25 POKE &H101C,&HC0:EXEC&H1000
30 EXEC &H1000

```

#### COCOCOPY

This all M/L Program will copy BASIC or M/L programs including most Auto Start Programs. It will supply the beginning, ending and offset addresses and allow you to change the load address for M/L programs. I/O errors are ignored so that bad tapes can be corrected. Programs can be renamed and the motor/audio functions are controlled from the keyboard.

CAT. NO. DM004 16K Ext \$12.95

#### DATAMAIL

The ultimate cassette based mailing list program for home or business use. Fully customized data collection screen allows you to set your own field lengths and field titles. Fast machine language sort by any column in any field. Save all or any block of files for letter reading by DATAMAIL or your own letter program. Merge two or more lists, search by record number or key word in any column. One key commands for Input, Kill, Change. Print single records or any block of files, 1, 2, 3, or 4 across. 32 K holds about 300 files.

CAT. NO. DM003 16K Ext \$14.95

#### BLANK KEYBOARD OVERLAYS 99¢ EACH

SEND \$2.00 FOR OUR 25 PAGE CATALOGUE Refunded with first order

We are dealers for the following fine companies: -

- ARK ROYAL GAMES
- COMPUTER ISLAND
- D S L COMPUTER PRODUCTS
- DYNAMIC ELECTRONICS LABORATORIES
- FRANK HOGG LABORATORIES
- HOMEBASE COMPUTER SYSTEMS
- HOME RUN COMPUTER PRODUCTS
- LITTLE BITS COMPUTING SERVICES
- MARK DATA PRODUCTS
- NELSON SOFTWARE SYSTEMS
- RAINBOW CONNECTION SOFTWARE
- SPEECH SYSTEMS GUILD
- SUGAR SOFTWARE
- THE PROGRAMMERS
- TOM MIX SOFTWARE
- WEST BAY COMPANY

BOOKS from  
SYBEX \* BYTE \* OSBORNE \* RESTON

ADD 3% SHIPPING - MINIMUM 2"

THE  
DATAMAN

Box 431, Sta. B  
Hamilton, Ontario  
Canada L8L 7W2  
1-416-529-1319

ALL PRICES  
IN CANADIAN  
DOLLARS

---

---

# LATEST SCORE:

## PROGRAMERS 1 - PIRATES 0

A Software Review by Old Father W lliam-

Much has been written in these pages and in the other computer-hobbiest journals about software 'piracy'. Estimates abound of how many unauthorized copies are sold privately given away for every copy for which the author or distributor is justly paid. Dire predictions are given of a flight of good software authors from our beloved Color Computer if the authors' return on time and effort is not kept high.

With the publication of HIDDEN BASIC by Spectrum Projects, a major portion of this problem may have been solved. Very simply, HIDDEN BASIC is CLOADMed into memory and PCLEAR1 is entered. The BASIC program which is to be protected is CLOADed, the EXEC is entered. With a blank tape set for RECORD/PLAY, the Protect option is chosen, and a very special kind of copy of the program is made.

To use this form of the program, CLOADM is used, followed by RUN - already something looks strange. We are accustomed to either CLOAD-RUN or CLOADM-EXEC with other programs. The program is no longer in BASIC, but it also is not in straight machine language either. The documentation calls it a 'special machine language program referenced by the BASIC interpreter'. I almost understand that, but who cares? It works!

Here is a list of the BASIC commands which will no longer work with the protected program:

CSAVE	CSAVEM	DEL
LLIST	MEM	TRON
EDIT	EXEC	LIST
TROFF	CLOAD	CLOADM

For our purposes in piracy protection, the disabling of CSAVE and CSAVEM is the most important. There appears to be no way for a purchaser to get the computer to make a copy of the protected tape. However, the loss of some of those other commands places additional demands upon the programmer, because the purchaser cannot do any editing to customize for his/her own use.

One demand which occurs to me first is printer compatibility. If the protected program has some kind of printer output, it must either be written in such a way as to be universally recognized by all printers, or there must be provision for the user to enter at RUN time some codes to be sent to the printer. A program which saves data might have to permit the user to re-format the number of data items, their individual lengths, and perhaps any interrelationships between items.

The point is, any programmer interested in using HIDDEN BASIC would have to think carefully about the degree of customizing the customers would want and provide it in INPUT or INKEYS lines, because the customer is not going to be able to LIST your program, figure out



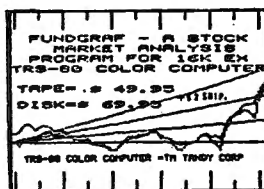
what you did to make it work, and EDIT lines to do particular things he/she wants. I think it is worth noting that writing programs with full freedom for customizing is probably what we should all expect of ourselves anyway, whether we use HIDDEN BASIC or not.

HIDDEN BASIC comes on tape in separate forms, either for 16K or 32K Color Computers, for \$19.95. The user is required to pay Spectrum Projects \$.50 for each tape protected and sold, as a royalty. That sounds to me like a small price to pay, compared to the loss of pirated copies. Users are expected to sign a contract covering the royalty agreement - you know, to prevent piracy!

Spectrum Projects, 93-15 86 Drive, WOODHAVEN, NY 11421, (212) 441-2807. •

### STOCK & FUND INVESTING

**FUNDGRAF** is a stock market analysis program that not only graphs and analyzes funds (or stocks), but makes decisions on when to BUY and SELL.



- GRAPHS fund's progress (200 wks.)
- SUPERIMPOSES for comparison:
  - a line of constant % growth.
  - a graph of another fund.
- CALCULATES over any given time:
  - the percent price change.
  - the moving average (any span)
- FUNDGRAF. TAPE \$49.95 DISK \$69.95
- FUNDFILE. DISK only \$27.95
- ADD \$2.00 postage & handling.

**FUNDFILE** is a portfolio & account management program for funds and stocks. It creates files for up to 900 transactions & 50 securities and reports asset value, realized & unrealized capital gains, adjusted costs (for dividends), and MORE!!

- 16 K ECB Required.
  - Printer Optional.
  - DETAILS? SEND S.A.S.E.
- PARSONS SOFTWARE, DEPT. D**  
118 WOODSHIRE DRIVE  
PARKERSBURG, WV 26101

## COLOR COMPUTER ENHANCEMENTS

(16K or 32K EXTENDED BASIC REQUIRED)

### UPLOAD \$16.95

- \* This is the UPLOAD side of DLOAD and DLOADM in Extended Color Basic.
- \* Send a basic or machine program to another ECB Color Computer.
- \* Programs can be passed directly, thru the RS-232 port, or by phone if both computers are hooked to modems. (not supplied!)
- \* Uploaded program arrives at the receiving end ready to save, run, or execute.
- \* Patch to correct the flaw in DLOADM is supplied as public domain software.
- \* Includes tape and disk version and instructions.
- \* You bought it without a disk? \$6.00 for disk upgrade.

### INDEXER \$14.95

- \* Program produces a sorted list of variables and line numbers used in your basic program. Following each variable or line number will be a listing of the basic lines which contain the variable or line number.
- \* Output is formatted to the screen or an 80 column printer.
- \* Will produce a table of 824 references to 112 variables or line numbers, ready to print, in less than 10 seconds.
- \* Bonus! Global search of basic program for a variable, a text string, or a basic keyword. Automatically in the edit mode when the object of search is found.
- \* Instructions included with this machine code utility for disk or tape.

PROGRAMS SUPPLIED ON CASSETTE.

## ML-US'R SOFTWARE

115 Rising Sun Circle • Ft. Mitchell, Ky. 41017

ADD \$2.00 PER ORDER FOR SHIPPING & HANDLING. MONEY ORDERS PROCESSED IMMEDIATELY.  
CHECKS MUST CLEAR BANK BEFORE SHIPMENT.

---

---

## INTERVIEW WITH LANCE LEVENTHAL

(LANCE) I'll bet a lot of your readers do not realize the significance of those big buying book stores. (BILL) That's right. (LANCE) What they see, not only in popular literature but in computer books and magazines, is that if you are in there you sell a ton. (BILL) If you're not, you don't sell a ton. (LANCE) If your not in there, you don't sell a ton. (BILL) Exactly. (LANCE) Think of those guys as controlling the Harold Robbins but basically in the last year they have gone to the point of really controlling the computer books. (BILL) They do. (LANCE) Because their buys are so large they'll buy 5 or 6 thousand, and I think an interesting point of view is readership. As far as these guys go, they don't know one thing about computers and they don't care. And they certainly don't care wether the book has any quality whatsoever. All they care about is did your magazine move in the first five days. If it didn't move by then it's excess inventory and they don't want it. (BILL) That's right. One of the biggest concerns with magazines I've discovered is what does the cover look like. And that's it! (LANCE) Absolutely! It's going to be interesting to see what effect that has, because how often do you think of readers being relatively undiscerning even the most undiscerning reader is sophisticated compared to the book buyer or the magazine buyer. Not only does he not

know anything but he really doesn't care. That's not their business. They don't want to know what's in there. (BILL) No, their only concern is how much profit they return. The discount that we are giving them returns them a tremendous profit. (LANCE) I wonder what the long term effects would happen to be on the quality of things? (BILL) It's interesting you bring that up. I was talking to a pioneer in this industry the other night, he's totally disgusted with the entire computer industry because its been overrun by three piece suits and he thinks it's going rapidly down hill. (LANCE) Well... (BILL) I think he's biased by the fact that it's not nearly as much fun as it used to be. (LANCE) I think that's true of any industry. I don't see the computer industry as unique. Of course it's a big business now. Big business means you attract the accountants and financial people, you've got to have them. I relate back to the days when everybody in order to raise a dollar and a half had to have at least 6 or 7 computer people in the room. Now they are talking about raising 20 and 50 million dollars casually. That's not the big money that's just your first round venture financing to do one of these start ups. I mean can you imagine six or seven years ago trying to raise some number like 20 million dollars. Trying to raise 20 dollars to survive was a very difficult thing. (BILL) We all started



**\$24.95**

Tape Information  
Management System

A user-oriented, easy to use personal database management system for the TRS-80\* Color Computer with these outstanding features:

- \* keeps files of programs, names, addresses, birthdays, recipes, class or club rosters, etc.
- \* variable record and field lengths
- \* phrase substitution editor
- \* up to 8 user-definable fields
- \* ML sort (up to 3 fields), search and delete functions
- \* user-definable printer format, for any printer
- \* up to 230 characters per record

Price includes the database management system, full documentation including a reference guide and 1981 Bibliography of Color Computer articles.

Requires 16K Extended Basic. 32K recommended.

## 1982 TIMS Bibliography - \$9.95.



**\$19.95**

The TIMSMail mailing list manager has most of the fine features of TIMS as well as these special mailing label features:

- \* user selected label formats
- \* continuous or single sheet
- \* designed for 80 column printer
- \* 1, 2 or 3 labels wide
- \* 2.5, 2.75, 3, 3.5 and 4 inch labels
- \* select fields to print
- \* select records to print
- \* fast ML search, sort (up to 3 fields) and delete routines

Requires 32K Extended Basic



**\$19.95**

Auto Run is a utility program for the TRS-80\* Extended Basic Color Computer. It is used to add convenience and professionalism to your software.

Auto Run will help you create your title screen with the graphics editor. The graphics editor allows you to choose a background color and border style. Using the arrow keys and several other commands you can draw pictures, block letters and also include text.

Auto Run will generate a machine language loader program to precede your program on the tape. Then, to start up your program, simply type CLOADM to load in the Auto Run loader program, which will then automatically start itself up, display your title screen, load your program and then RUN or EXEC it.

Also you may record a vocal or musical introduction preceding your program. The Auto Run loader will control the audio on/off.

Basic programs can be set to load anywhere in memory above the PCLEAR 0 page.

Software authors: The Auto Run prefix may be appended to your software products.

Price includes complete documentation and assembly source listing.

Requires 16K Extended Basic.

## Galactic Hangman \$17.95

A great new twist to the popular educational word guessing game for the Color Computer. Large (700 words) and sophisticated vocabulary. Or enter your own words, your child's spelling list, foreign language vocabulary, etc.



Outstanding high resolution graphics, animation and sound effects.

Price includes both 16K and 32K versions.



## PIRATECTOR!

**\$99.95**

Our disk-based antipiracy applications development system has these features:

- \* Protect your disk software from piracy
- \* Users can create (non-executable) backups
- \* Protects ML or Basic programs
- \* Your program is encrypted, which prevents listing or disassembly
- \* Loader displays graphic title screen, then loads and starts your program
- \* Incrementing serial numbers and other user data supported
- \* Automatic generation of copies from your master for 2 (or more) disk drives
  - Disk initialization
  - Copy all files from master to target
  - Piratect up to 5 programs on target disk
- \* 100% Machine Language
- \* Easy to use full-screen menu oriented
- \* User subroutines
  - User subroutines may be LOADMed
  - Usable by ML or Basic
  - Border drawing routine
  - Keyboard input routine ideal for your programs
  - Position independent
- \* Break key disable for Basic programs
- \* Title screen graphics editor to create your own title screen
  - High resolution
  - Semigraphic modes 8, 12 and 24 (64x64, 64x96 and 64x128)
  - 8 colors
  - Combine text with graphics
  - Load, display, save graphic title screens made with other graphics editors
- \* Protect demo disks you send out



**\$19.95**

**Disk Version - \$24.95**

**Disk version with all 62 stories - \$49.95**

A sensational and educational version of a popular party game for the TRS-80\* Color Computer... For 1 to 10 players. Load a story into the computer. The players are asked to supply a noun, verb, part of body, celebrity, etc. which the program uses to complete the story. The story, which is displayed when all words are entered, will be hilarious.

Price includes Silly Syntax game, user guide and 2 stories.

Requires 16K Extended Basic (32K for disk).

You can create your own stories or order story tapes from the selection below.

Each story tape is \$9.95.

Silly Syntax stories - Ten stories per tape.

SS-001 - Fairy Tales SS-004 - Current Events

SS-002 - Sing Along SS-006 - Adventure/Sci-Fi

SS-003 - X-Rated SS-007 - Potpourri

**NEW**

**PREREADER \$19.95 Disk - \$24.95**

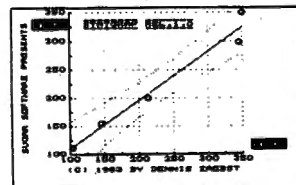
Help your preschool age (3-5) child learn to read with this easy to use menu-driven program. Great high resolution graphics, colors and sound effects. Includes capital and small letters, numbers, shapes and colors, much more! Requires 32K Extended Basic and joysticks.

**NEW**

**STATGRAF \$24.95 Disk - \$29.95**

STATGRAF is a linear regression analysis package combined with sophisticated high resolution plotting/line graphing. Features include: allows entry of up to 250 pairs of (x,y) data, transforms observations using logarithmic, square root, inverse exponential or additive codes, plots any number of data sets on a single graph, type information directly onto the graph in 3 orientations.

Requires 32K Extended Basic.



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



Add \$1.00 per tape or disk for postage and handling. Ohioans add 5.5% sales tax. COD orders are welcome. Dealer inquiries invited.

our businesses differently. I started my business with less money than I have in my pocket right now. (LANCE) I think that's typical. Typical of the people who were in the business years ago. You went to the original shows, the signs were hand made and you knew everyone could only go to the show on Saturdays because they had to have their other two jobs to support their computer company. Now those same guys are wearing the three piece suits and they have accountants that wear three piece suits and they have controllers who are wearing three piece suits. I think alot of the adventure is gone, but it's got to be like any other industry like automobiles or airplanes, those were adventuring industries at one time. Like those industries the computer industry will mature. It's a big business. Look at these shows. One thing I wonder looking at a Comdex, particularly a Comdex, you go up and down the isles and you read the magazines and you've never heard of these people. (BILL) Yes. (LANCE) Who are they? Where did they come from? What were they doing last year? Were they selling real estate? (BILL) I think they were or used cars! (LANCE) Now they're selling 8 bit super micros, with 320 kilobyte floppy disks and dual communication capabilities. Don't ask them any questions about it, that's all they know. I remember one show back, one fellow had a Z80 system, multi-user and he was trying to convince me that you could put 65,536 users on it, and they had told him that he could do this and he was quite sure that he could do this because they had told him that he could. (BILL) You think he would have been a little suspicious. (LANCE) I mean he never questioned the idea that this wasn't true. That maybe, after you have a few users you might degrade your response time a little tiny bit and by the time you are up to around 50,000 users on one Z80 things are going to get a little sluggish. But it's still

an exciting business exchange and I hope the pioneer you mentioned earlier and people like him won't let the three piece suits get in the way of the fact that there is still alot of things to do and alot of fun. Still I think that I'm sorry to see someone like him get a little sour about it just because he can't have the big piece that he once had. There are so many interesting things out there and so many things to show that are really a marvel. For example, last night I went to a demonstration of the Context, that Context MBA? (BILL) I saw the exhibit, but that was as far as it went. (LANCE) That was my feeling, I saw that it existed and I thought, oh well, it's another one that is failing fast. You know, you have on one hand the ability to not only plan your strategy, you also have scraps of what it means. So you don't just have the numbers you have the capability to get data in and out. You can say get data from the Source, CompuServe or from Dow Jones, download it into your spread sheet, manipulate it, put the graphs on your screen and print the graphs. You also have the ability to sort the data and have some data base capabilities. I mean it is really the context of one, two, three, apparently. Or as big an advance over the spread sheet as the spread sheets were originally. And the reason for the attention is for real, these things are phonominal. You think of the term "fighting for your magazine", here you have your circulation, sales figures, blocks of them so that you can look at the spread sheets for the numbers. It's better than nothing. (BILL) But it's boring. (LANCE) Here you can have it plotted and in the same way it's a spread sheet. When you put in a new number not only does the spread sheet change, the plot changes. It really is an exciting capability and I can see for all the kinds of work I do, I'm sure for your magazine. (BILL) That's great. That's the same thing we do now, we do

## STAR-KIBBITS

Welcome to the ninth of my monthly chats. To begin with, a short program and two requests.

When you do a BACKUP on a disk system, the computer is supposed to make an exact copy of a disk. Have you ever wondered whether the copy is really identical to the original? Here is a short program in Basic which allows you to compare two disks (it is written for two drives):

```
10 CLEAR 2000
20 FOR T=0 TO 34 : FOR S=1 TO 18
30 DSKI$ O,T,S,A$,B$
40 DSKI$ 1,T,S,C$,D$
50 IF A$=C$ AND B$=D$ THEN 70
60 PRINT "DIFFERENCE ON";T;S
70 NEXT S : NEXT T
```

This program consists of two loops which repeat for tracks 0 through 34, and sectors 1 through 18 of each track. Lines 30 and 40 read the corresponding sectors from drives 0 and 1, and line 60 prints the track and sector number for those sectors which are different on the two disks. You may find it very useful.

OK, now here's the first request. I'd like you to help me with a simple test. Initialize two disks with the DSKINI command, and then BACKUP one of them to the other. Now use the above program to check whether they are really identical, and let me know. I have an ulterior motive — I have run this test on three different computers (including different disk controllers and different drives). On two of them I got identical errors on sector 13 of tracks 5, 11, 17, 23, and 29. I'm curious to see whether anyone else has the same problem.

### TAX DEDUCTION?

Now for the second request. Do you have any Color Computer hardware or software which you would like to donate to a non-profit school? In the last few years, Star-Kits has donated six Color Computers, as well as several printers, disk drives and cassette recorders, to local schools for computer education. If you have any CoCo equipment or software (such as a color computer, or disk system, or Line Printer VII, or anything else which you no longer need), or else if you just feel up to making a tax deductible contribution of equipment or cash, we'd like to encourage you to do so. Send to the St. Francis School, 12 Green Street, Mt. Kisco NY 10549.

### SALE!

Christmas is slowly approaching, and with it the time for the traditional holiday sales. The following items will be offered at special sale prices until December 24th, 1983:

STAR-DOS 64 is reduced from \$74.90 to \$49.90, the same price as the standard 16/32K STAR-DOS. Actually, for the \$49.90 price you get both versions.

SPELL 'N FIX is reduced from \$69.29 to \$59.29 for the CoCo disk or cassette version, and from \$178.58 to \$125 for the Flex disk version.

HUMBUG-64, the 64K version for Flex or STAR-DOS is reduced from \$59.95 to \$49.95.

Add this to the rebate we announced last month, and you can get Star-Kits software at really bargain prices.

To close, a neat definition (from *The Devil's DP Dictionary* by Stan Kelly-Bootle) of Gershwin's Law: "It ain't necessarily so!"

## SPELL 'N FIX

Regardless of whose text processor you use, let SPELL 'N FIX find and fix your spelling and typing mistakes. It reads text faster than you can, and spots and corrects errors; even experienced proofreaders miss. It is compatible with all Color Computer text processors. \$69.29 in the Radio Shack disk or cassette versions; \$178.58 in the Flex version. (20,000 word dictionary is standard; optional 75,000 word Super Dictionary costs \$50 additional.)

## HUMBUG — THE SUPER MONITOR

A complete monitor and debugging system which lets you input programs and data into memory, list memory contents, insert multiple breakpoints, single-step, test, checksum, and compare memory contents, find data in memory, start and stop programs, upload and download, save to tape, connect the Color Computer to a terminal, printer, or remote computer, and more. HUMBUG on disk or cassette costs just \$39.95, special 64K version for FLEX or STAR-DOS 64 costs \$59.95, MC-10 version \$29.95.

## STAR-DOS

A Disk Operating System specially designed for the Color Computer, STAR-DOS is fully compatible with your present Color Computer disk format — it reads disks written by Extended Disk Basic and vice versa. STAR-DOS for 16K or 32K systems costs \$49.90; STAR-DOS 64 for 64K systems costs \$74.90.

## STAR FLEX

The best implementation of FLEX for the Color Computer. Complete with all utilities, text editor, macro assembler, and HUMBUG debug monitor, \$250.00.

## ALL IN ONE — Editor Etc.

Three programs in one — a full function Editor, a Text Processor and a Mailing List/Label program. All this for just \$50. Requires STAR-DOS and 32K, or STAR-DOS 64, or FLEX, specify which.

## DBLS for Data Bases

DBLS stands for Data Base Lookup System. A super-fast system for searching for a selected record in a sequential disk file. Supplied with SPELL 'N FIX's 20,000 word dictionary as a sample data file — lets you look up the spelling of any word in under FOUR seconds. Priced at \$29.95. Requires STAR-DOS.

## CHECK 'N TAX

Home accounting package combines checkbook maintenance and income tax data collection. Written in Basic for either RS Disk or Flex, \$50.

## REMOTERM

REMOTERM makes your CoCo or MC 10 into a host computer, operated from a remote terminal. \$19.95.

## NEWTALK

NEWTALK a memory examine utility for machine language programmers which reads out memory contents through the TV set speaker. \$20.

## SHRINK

SHRINK — our version of Eliza, in machine language and extremely fast. \$15.

## EDUCATIONAL SOFTWARE

Introduction to Numerical Methods — college level course on computer math, \$75.00.

We accept cash, check, COD, Visa, or Master Card. NY State residents please add appropriate sales tax.

(FLEX is a trademark of Technical Systems Consultants, Inc. Everything else in this ad is a trademark of Star-Kits.)

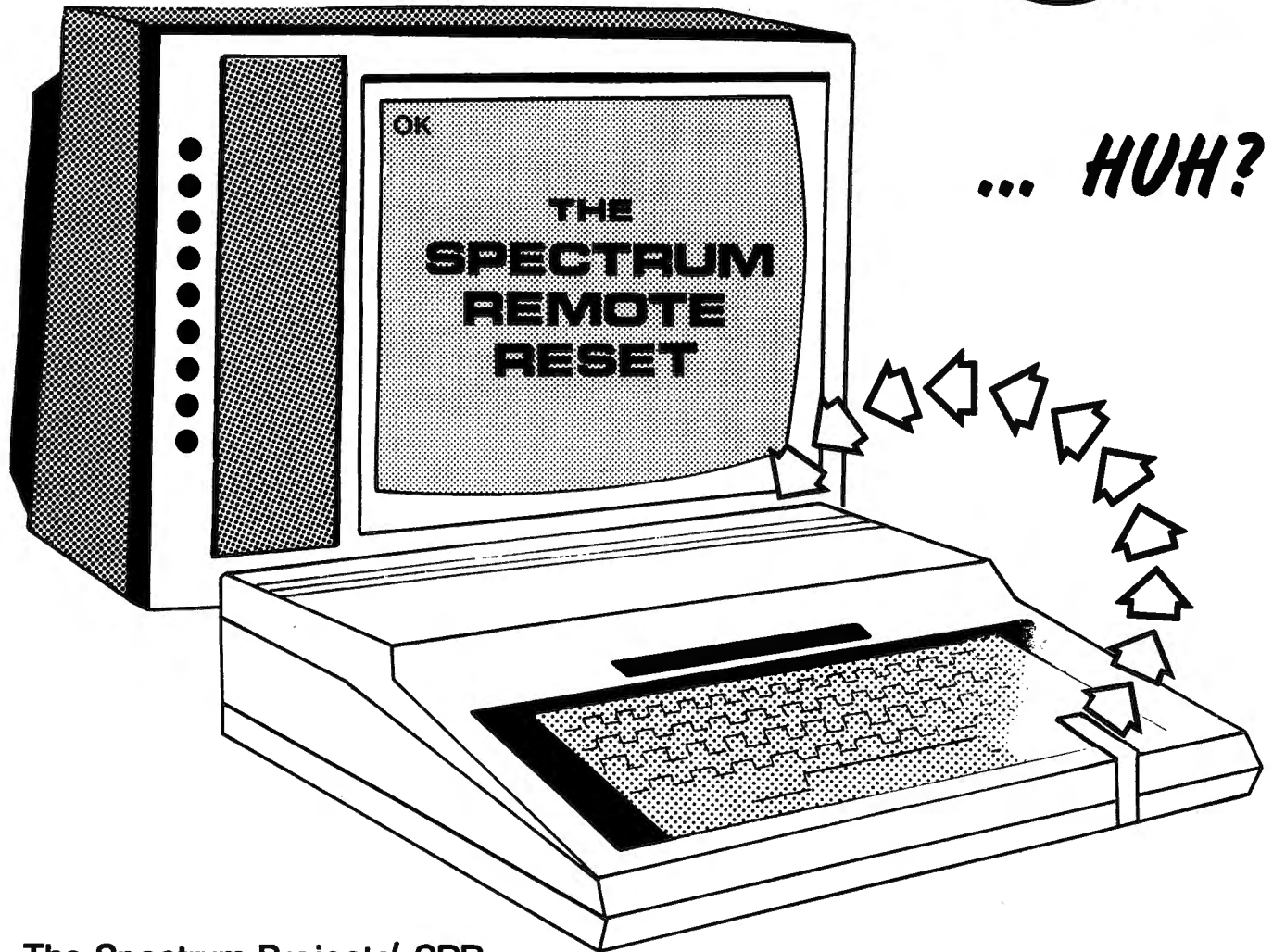
# STAR — KITS

P.O. BOX 209 — N  
MT. KISCO, N.Y. 10549  
(914) 241-0287

the spread sheet and take out the colored pencils. (LANCE) The same as your spread sheet automated. Your calculator and spread sheet automates your colored pencils. I still hate to think of the poor high school teachers ten years down the line. (BILL) My kids and yours. (LANCE) You're right, they will be going into high school with ten years of computer experience. (BILL) Being taught by someone who learned it over the summer. (LANCE) When I think back, how exciting, that's just a product of the last couple of years. We've been doing all these things for kids and suddenly we're seeing the results. There are so many exciting things, I hope that the pioneer will wake up and see there are things that he can contribute, so many things that he can contribute. I don't want him to be sitting on the side lines looking like I won't play this game or there's too many referees out there now and its strike two and all that. The excitement is still there. (BILL) It is still there, but it's changed a bit. It's the type of excitement that has changed. (LANCE) In many ways it's much bigger, in many ways its too big for any one of us, and not that long ago you or I knew all the computer enthusiasts in town. (BILL) Remember them? (LANCE) Yes, and recognized them on the street and called them on the phone. Now you go to the meetings and you don't know anyone because there are thousands of new people, in a sense you feel a little left out. When all these people don't know who you are and you think well I've been around since 1976, their attitude is "who cares". So you know all about memory size and bits and South West Tech., we don't give a darn. We are worried about our problems; one, two, three and molecular computer and SWTP look alike and all that stuff. (BILL) Or where can I buy a \$600 Cray? (LANCE) And they'll be able to. I would like the Contact System. I

thought that was ridiculous to have the ability to do that stuff and there's the first thing that I have seen that really had 16 bit ability and the extra address space. I mean looking at IBM PC or something like that running WORD STAR kind of leaves me cold. You could actually run WORD STAR at about the same pace as an 8 bit machine. It's not phenomenally faster, WORD STAR actually does not use any of the extra features. There isn't the address space, there isn't the memory and 8 bit level to do what really needs the extra power and the extra size. And it's the thing like that context that pulls things together to get rid of some of that problem of well here I've got all these phonominal results but unfortunately I can't do anything with them because the program won't let me and here you have the ability to put the word processing in and mix the word processing with the spread sheet when you're in WORD STAR and you think if only I could do something figuring now. WORD STAR won't let you because it's only a word processor, or when you're in VISICALC and you would like to say something or leave a note, VISICALC won't let you do that because it's only a spread sheet. (BILL) I think that's where the industry is going to its software. (LANCE) Oh yeh, there's no doubt about that! (BILL) It used to be you went out and bought the computer you were currently interested in, you got to the point where a big part of the industry couldn't care less about what kind of computer it is, it's what kind of software can I run. And that's good. (LANCE) Well, some where down the line you are going to spend 5 percent of your money on hardware and 95 percent on software. The big excitement is going to be in the software but you look at most of the hardware and won't see anything that's sensationally exciting. In a sense that's kind of funny because there's so much marvelous hardware it's really

**NOW... RESET THE  
BACK FROM THE FRONT.**



The Spectrum Projects' SRR provides easy access to your system reset and eliminates the need of reaching around cables and components or moving the computer.

Installation of this sturdy device is simple, quick, requires no tools and voids no warranties.

Put control back where it belongs, at your fingertips for only \$12.95 plus \$2.00 S/H.

**YES** PLEASE SEND  
( ) REMOTE RESETs... \$12.95

NAME \_\_\_\_\_  
ADDRESS \_\_\_\_\_  
CITY, STATE, ZIP \_\_\_\_\_

ADD \$2.00 S/H & SALES TAX

**SPECTRUM PROJECTS**  
93-15 86th DR. WOODHAVEN, NY 11421

212 ● 441 ● 2807

outstanding stuff, but its as if they've almost solved most of the problems. Now instead of cramming 768K into this little board that you can barely see they can cram 2 megabytes. I can't even comprehend 768K. I've got my little Sinclair sitting on my desk and if you've seen the cigarette pack 16K comes in for \$50, well you remember when 16K was this huge. (BILL) Wonderful marvel! (LANCE) Yeh! I mean who ever heard of 16K? (BILL) My original Altair still only has 8K; 4K of RAM and 4K of ROM. (LANCE) That's a lot of memory. (BILL) It was. (LANCE) They were selling PDP8's with less memory than that and they were selling them for \$30,000 or \$40,000 dollars. But, of course, they were very hard to use. (BILL) So was the Altair. (LANCE) The P8 had more stuff and was even worse. (BILL) How did you get involved in this whole thing? (LANCE) Oh, originally my degrees are in Electronics and Physics. But I was mainly involved in computer programming. My graduate degrees were in a department that was mixed physics and computers. It really wasn't a computer department because they didn't have such things in the aging days of the 1970's; back in the stone age. My big interest was always in computers. When I worked for the Navy I got involved with a little project where they were doing an 8008, I thought that was kind of neat and impressing. And I worked for a couple of companies in defense research that was sort of boring. How many nuclear radiation heartbeats can you fit on the head of a pin? You can fit about 500 million of them, but who cares? The thing about that kind of work is you do it and then at the end they put all of the results somewhere where no one ever reads them and they promptly commission another study of the same subjects; you then do it all over again. It's not what you'd call a highly progressive business. Well, lets see when did I really get into this kind of thing? I guess it was 1975. I started a few courses

on microcomputers for the local engineering society and I was so impressed I just decided to do that rather than what I was previously doing. So I did courses for the junior college level on the 8080 and 6800. Those courses led to the original assembly language programming books. That was the exercises for those courses. There were no books or anything, so I made up my own based on what I had seen and things that the processors would actually be used for in the industry. I went to a conference in 1976 at Colorado State on Educational Micro Computers in the engineering educational curriculum and the star at that time was Adam Osborne. He had just published his book "An Introduction To Micro Computers". Fairchild had bought approximately 10,000 of them and he was a big star. He talked at that conference and he said now that he was really in the publishing business did anyone have any other material that he could publish? And I had these class exercises. In fact I had to get clearance from my regular publisher to give them to Osborne because they had first right for any related material, but they didn't think anything of it. They said there were no courses out there on 8080 assembly language programming or 6800, there are no college courses, there's nothing in the recommended curriculum, so why would we be interested in those books? And they sent them out to a reviewer and the reviewer said "Gee we can't foresee any market for this kind of thing". So they gave me permission to go to Osborne. Now Osborne is such a big name but at that time he was a very small operation with no money and no book lists other than his one book that was his publishing empire. That was their publishing list. They had one book. One more than everyone else had. But still very much of an amaturish operation it wasn't again like everything else in the personal computer business. Almost all businesses were not what you would call very business like



they were usually run out of someone's garage. I remember one computer store their hours were 1-3 on Mondays and Fridays and 8-11 on Saturday morning. That's when they were open. And I think that was typical of the kind of industry it was, very despondent, you know everyone even the big figures. Apple computers weren't a million dollar company then they were a thousand dollar company! Osborne-McGraw Hill was another of these little companies with a few people and a bunch of big heads who were all sure that they knew all about both publishing and microcomputers. They knew everything there was to know because after all there was no one around who published anything who knew any more. (BILL) And they had the books. (LANCE) No one else did. (BILL) How many books have you written for microcomputers? (LANCE) Fifteen now! That

number is exaggerated because a lot of them are the same books reworked for another computer, so sometimes I feel like I'm in the gothic novel business. When you take a plot with three characters and two horrible themes and one scene where the heroin rushes into the heroes arms and you've got a book. You just put it into your computer, you change the location. This one is in the South of France or the North of Germany or something like that. The characters names are one, two, three, four, five, and aha you have another successful best seller. I think that has been a pretty good formula and I really don't try to push that, I don't try to do a million things, I want to do them right. I want them to be good books where everything's been tested, where everything is done for a particular machine, even if it's the fifth book of the series that

## STYLOGRAPH

### WORD PROCESSING SYSTEM

#### STYLOGRAPH 2.0

The best word processing system on the market is now available for the TRS-80 Color Computer with Color FLEX!!

STYLOGRAPH is an easy to learn efficient way of creating, reviewing, deleting and printing text. A complete array of word processing commands is available. The STYLOGRAPH system is cursor oriented with dynamic screen formatting so the text appears on the screen in the same way it does on the printed copy. Display is continually updated which is a feature normally found only on very expensive word processing systems.

STYLOGRAPH 2.0 COLOR FLEX \$195.

#### MAIL MERGE

This program takes files of names and addresses and inserts them into a STYLOGRAPH text for automated mailing lists.

MAIL MERGE COLOR FLEX \$125.

#### SPELLING CHECKER

A valuable addition to any word processing task. Checks all words against an internal dictionary of over 42,000 words. User expandable.

SPELLING CHECKER COLOR FLEX \$145.

10% discount on  
cash with order.

#### GREAT PLAINS COMPUTER CO.

P.O. BOX 916 / IDAHO FALLS, ID 83402 / PH: (208) 529-3210  
Visa and MasterCard accepted.



book should look like, as far as the reader is concerned, the first book. It should not look like a copy where someone has taken out 6502 or something and put in 6809. (BILL) Right. (LANCE) No, it should look, as far as the reader is concerned, like the kind of book that's the first book of the series. It has the enthusiasm and it has the concern with the particular machines personality. (BILL) You have to come across as being as impressed as with the chip your dealing with as the reader is because he bought it. (LANCE) Yes, and the idea that gee this is an interesting chip, and they are interesting. I mean each one of them has their own personality, has it's own thing it does well, it has its own thing where the designers, didn't quite do it. You know things where you wonder how they could have done it, you know how they did it. Its Friday afternoon and the thing had to be in and they said well ok lets decide on these things, all of the first five will decide A and the second five will decide B. (BILL) And that's the way we're going with it. (LANCE) Yeh, this is why we're gonna do this. I mean it wasn't as if sometimes we think the designers were some kind of superman, heck the designers are just like you and me. Probably knew no more than we do! The guy had been hired by the company and he was told, here you design a microprocessor. His first question was what is a microprocessor? (BILL) And why do I want to do this? (LANCE) No, why you want to do this is because you're making a salary, but I think the depth of the background, is not as if designers foresee more prey. In general the designers were people with very little experience certainly not a great computer background. I think a predominate company business is got to be Intel, and the Intel strength is not in software or computers their strength is in silicon. The most impressive people I've met at Intel are the

guys who can make those chips. You met their software people, the software people are nice fellows but they are like anyone else there isn't exactly a Dykstra or something like that among them or an inventor of Unix but you meet those chip people, and those chip people are impressive. (BILL) They've got to be. (LANCE) And the top of the company are all chip people. They are all people no process that can make chips but that doesn't say anything about designing computers the strength of those companies is those chips and you have to think that way in terms of looking at the results. The guy that did that knows more about NPN transistors and doping and things like that than you and I will ever know. And how to get those things out of the oven, you know make them in large quantities. But as for computer design which registers do you use and what addressing modes. He probably knows less than you and I. And it's true there are other members of a team who do that. But the fact is that the control of the company is in the hands of the chip makers, not only do they not know about these other things but they don't even know people who know. When they go out and hire a computer designer they are in as much of the dark as you or I are, say to go out and hire a printer. We know what printing is but do we really know one printer from the other? Not really. Or to go out and hire someone who is say going to be your circulation manager. Well, you could look at the credentials, but hey, we don't have that kind of experience. It's the same way for them when they look at the computer designers and chip designers, they don't really know one from the other. If you don't know one from the other you end up in mediocraty. You tend not to end up with the real big successful thing. And I think that some of the early designs show it. Like the 8008, the 8080, and the 6800

**NEW** for the Color Computer TRS-80

# 'COCOCASSETTE' SUBSCRIPTION SOFTWARE

\*TRS-80 IS A TRADEMARK OF TANDY COMPANY



**ENJOY A MONTHLY COLLECTION OF 8-10 PROGRAMS!**  
Including games, education, home finance and more;  
on cassette for as low as **\$5.00** a month! Add some ac-  
tion and imagination to your Color Computer. . . Best of  
all, we do the work!

## LOOK AT SOME OF THE LETTERS WE RECEIVED FROM OUR SUBSCRIBERS.

"I just thought I'd let you know that your cassettes arrive in good order, load just fine, and I really enjoy your programs!"

MARION, OHIO

"I was extremely impressed by the first tape I received from you. The added extras are just super."

WILLOW GROVE, PENNSYLVANIA

"Seldom do I ever write a fan letter. Usually if something is good, nothing is ever said. I just renew the subscription or buy the product instead. T&D is an exception. I subscribe to several cassette computer magazines. Yours is certainly the most creative. The covers are original and clever. The material covered is excellent!"

PINE BLUFF, ARKANSAS

"I only entered a six-month trial but am already willing to extend my subscription!"

COLETAH, TENNESSEE

### PRICES

1 YR (12 ISSUES) . .	\$55.00
6 MO (6 ISSUES) . .	\$30.00
SINGLE COPIES . .	\$ 6.00

—MICHIGAN RESIDENTS: ADD 4% TO ORDER

—OVERSEAS: ADD \$10.00 TO SUBSCRIPTION AND \$1.00 TO SINGLE COPIES.

**616 396-7577**

PROGRAMS ARE FOR  
EXTENDED BASIC  
MODEL ONLY. ISSUES  
ARE SENT FIRST CLASS.



SUBSCRIPTION SOFTWARE



**IMMEDIATE SHIPMENT!**  
**PERSONAL CHECKS WELCOMED!**  
**SEND CHECK OR MONEY ORDER TO:**



**T & D SOFTWARE P.O. BOX 256-C • HOLLAND, MICH 49423**

which you have to call rather primitive designs. Look at the 6800 or the 8080 in comparison to 6809. What you really see is the difference of someone who actually knew a lot more about how to design a computer than what registers to do, what addressing modes did you need, what you don't. And I think it's interesting that there is a lot of increased performance. It shows there is tremendous strength, not so much in the chip process but in the design because it's so true that an Apple running a 6502 at 1.2 megahertz will do things much faster than the Z80 running at 4 megahertz and the reason is very simple. The reason is the addressing mode, the fact that the 6502 has the indirect index. And indirect you know things that did not occur to the average semiconductor design but what these index indirect addressing. (BILL) Thinking more dramatically, \$199 Color Computer will outrun the early Model I and the current Model III. (LANCE) And the reason? Again, it's strange that the 6809 addressing, particularly when you're running in high level languages or running complex programs. Those addressing modes are the keys. That's the reason why the 6809 is such a good design, and why things based on 6809 run well and run compilers well. Because they have those constructs, those constructs are not things that a chip designer thinks about. He doesn't think about the idea that you need accumulator index addressing indirect, just doesn't occur! I mean you need an adder, you need a flip-flop, you need a multiplexer, here that occurs to the person. How to do and how to do things to get those. But the idea of addressing modes and things like inconsistency. One of the things that is most noticeable about the 8080 is its total inconsistency, everything is different, every bit of it works differently. If you are in A every thing is different if you are in D

and E then why should this be? It's as if driving in Chicago, follows an entirely different set of rules than driving in New York. Whenever you were driving across country you would have kept a list of what the rules were. You drive on the right in New York and drive on the left in Chicago, down the middle of the road in Detroit. It's just crazy, it just doesn't occur in the rest of the world. Some how it does in the computer business and I think the 6809 is showing the way for the future. Clearly it's a transition to the 68000, but things that are there, the consistency, the depth of the addressing modes, the ideas of doing things in that systematic manner, the idea of intermediate instruction like the LEA instruction of being able to get your hands on an address rather than get your hands on a piece of data. That's a very significant concept because the engineering never thinks of why you would want to get your hands on an address, why would you want to get your hands on something as uninteresting as an address? It doesn't accomplish anything, it doesn't move a piece of data from here to there. (BILL) It sure makes it interesting getting the data out. (LANCE) Yes, and it allows you to deal on a level where the compiler is working. The compiler is working almost indirectly because it's working on the program that will do the job, so its thoughts are almost entirely indirect. It hardly deals with anything directly at all. It should have a proper index where you can actually find something. The index should be cross referenced under anything reasonable. If the reader would want to look it up, it should be on one page. I finally persuaded Osborne to let me do my own indexes. In fact, that started with the 6809 book. The 6809 book is the first one in a series to have a real index, where I think almost anything that you would want to look up would be in the index. I tried very hard,

whenever I had any question, I put in both. Because the readers should be able to, after reading the book, find things in totally different order, to just find one thing that you need. (BILL) That's it, because you keep the book, it's not something that you read through once and totally understand 6809. It's a good book. However, to be an excellent book it has to be something you can refer to even after you become the 'expert'. (LANCE) There are always those little things that you could discover on your own. You're as smart as I am I'm sure, but hey, I've already discovered them and you could go on and spend your time discovering new things. Why should you discover what I've already discovered? (BILL) Exactly. (LANCE) And I've indexed it, so you should be able to look it up. And in a sense I think that promotes the energy in the

industry. Not so much energy is spent rediscovering things that people have already discovered, that's not a lot of fun. There are so many new things to discover, so many interesting things. So I think I'm going to be spending more and more of my time editing, maybe not so much time writing. (BILL) But you're not going to get out of writing all together. (LANCE) One of the problems I think though with editing is that it takes alot of your energy and there's just so much energy to go around. So I am telling everyone, no I'm not going to get out of writing, but it's like, well I'm sure you're in the same situation, you like to do other things and do the magazine. When do you really have the time to do them and do them well? (BILL) I'd like to still be a programmer. (LANCE) Yeh, but do you have the time?

### FILMASTR

The Color Computer has a powerful ally in FILMASTR. This is a DATA MANAGEMENT SYSTEM that you can trust. FILMASTR combines the best features of the big systems to provide a combination of speed, power, and ease of operation that can't be beat.

YOU are in complete control of this friendly program with no programming knowledge required. You design the data screen with up to 20 fields by moving the cursor on screen with the arrow keys and typing in the field names. FILMASTR takes care of all of the rest.

Enter data by just filling in the blanks. This form fill-in is easy and natural to use. You can even copy data from the previous record with one key-stroke. Add records, delete records, change records without fuss.

Tell FILMASTR to sort your file on any field that you want or to retrieve a particular file and the job is done with super-human machine language speed. FILMASTR will find a single file or a group of files that meet your request and will save those records as a separate file if you want to.

Controlled printing formats? Of course! Tell FILMASTR which records to use, which fields to print and in what order. You can control the print location to any position on the page. Mailing labels? You bet! All commands are given to FILMASTR with single keystrokes. Press the HELP key (BREAK), and the available commands are displayed. Make your choice from the menu and let FILMASTR do the work.

FILMASTR can store up to 255 characters in each record and up to 24,000 characters in each file. (9000 with 16K).

<b>FILMASTR</b>	<b>16K or 32K</b>	<b>TAPE \$29.95</b>
	<b>EXT BASIC</b>	<b>DISK \$34.95</b>
		<b>AMDISK \$39.95</b>

Add \$2.00 Postage & Handling • C.O.D. \$2.00 Additional  
PA Residents Add 6% Tax



### THE COMPUTER HOUSE

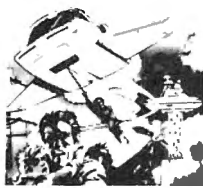
Box 1051 • DuBois, PA • 15801  
Phone (814) 371-4658

(BILL) No. (LANCE) I mean do you tell people that you'd like to do it? (BILL) No, I let them think I still do! (LANCE) Yeh, but realistically the magazine has got to be a full time thing. (BILL) It is. (LANCE) In fact it probably is a double time thing. And in a sense you use all your phsyic energy doing that and even if you were to go and do the program afterwards, hey, you're not working at a hundred percent. When you're working at less than one hundred percent on something it's just not going to be as good. You're not going to be able to compete with the people who are putting one hundred percent into it. You're in a sense a Villiton now, and Villitons can do a certain amount and they can have fun, but they can't really compete with a full time professional. I suspect honestly, that I'm in the same situation. If I do more editing it's got to be less writing. That's being honest with you. In a sense that's too bad, but I think I can do an awful lot of things with editing. I think I can take some of the books that I feel have some imagination and have some good features and make those books into the kind of thing that is really a first class book. I can add the craft and the discipline that alot of the writers lack, and the consistency. The fact that you can't have one good section, you've got to be consistent in everything, you can't depend on one good example and the rest of them are kind of sloppy and I thought of them at the last minute. No, everything has to fit. It has to be a whole unit and every single thing in it has to be done properly. It has to be something reasonable, it has to fit there, it has to be right, and I don't think very many writers have that discipline. (BILL) No, they don't. (LANCE) I think editorially I can provide that discipline. Maybe I can't, but I'm sure gonna try awful hard. (BILL) I think you have an advantage toward it in that you've written a number of successful books. You're not an ivory tower type that is only capable of writing books. You can draw a map to

improve the publishing industry as a whole, because it's time that publishers realize that the people I'm writing magazines for and your writing books for, they are not the same people who were reading magazines or books five years ago. (LANCE) And I think seriously we have an obligation to do the best job not only first of all from our point of view, darn it I don't like to have things out there that I'm not proud of and I'm sure you feel the same way. You like to see that magazine and be proud of it. (BILL) Exactly. (LANCE) And say, I did that; not like, I did that, but don't blame me for it Like I was under financial constraints and I had to do this and I had to do that. (BILL) And my production department wasn't there. (LANCE) You don't want to spend your time apologizing for it, you want to say, I did that, it's not perfect, but I did the best job I could at that time. And I think it's pretty darn nice. Yes, it could be improved and if I do it this month or this year, I am going to learn something and I can do it better and I don't want to be in the position where what I did was perfect, that's crazy. You can write off this business. But still you've got to be proud of that thing, and say, I put my energy in there and I tried to do a good job, and you've got a responsibility to that audience, I'm really going to try to do well by them; make it worth their money. From the practical point of view, if it's not worth their money they won't come back. It's not just from a practical money grubbing point of view, that's the right way to do it. And I think we have to have some ethics about this kind of thing and I think the people without ethics are not really going to survive. The people who are out to make a quick buck and who don't care about the future don't want to be in that kind of business. You don't want to be in that kind of business hey, we want to be around and we want to do things that are worth while for people. And there are alot of worth while things to do. I think it's funny,

# THE PROGRAM STORE

**Guarantee:** We will ship your order for items in this ad within 48 working hours or you get 20% OFF! (Books/non-released items excluded. Gift certificate issued when shipped. Offer expires September 10, 1983)



## PROTECTORS

from Tom Mix Software

You have 4 ships armed with laser cannon and smart bombs. They have waves of enemy fighters; their mother ships have laser and heat-seeking mines. Get a new ship for each 5,000 points you score. Exciting arcade action with hi-res 4-color graphics.

41331 32K Tape \$24.95 \$21.21

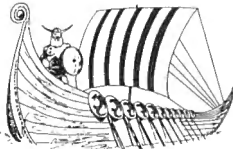
Now 15% off til Sept 10



## FLIGHT

by Dave Hooper and Mark Barnes from Prickly Pear  
Fantastic graphics oriented Hi-Res flight simulator has 2 speeds, 4 difficulty levels, views from top and side, instrument panel and realistic joystick control. Don't crash or have to "go around!" Can you land on the runway to hear the synthesized voice say "perfect landing"?

33556 32K Extended Basic \$19.95



## VIKING

from Prickly Pear

Superb simulation game! Rise through the ranks of a Viking kingdom, increase your economic power and rank until you win the game by becoming ruler of all. 1 to 4 players can complete it in 2 to 4 hours.

35109 16K

Extended Tape \$19.95



## FROGGER

from CornSoft

One of the most popular arcade games ever ... now available for your Color Computer! Just as in the arcade game, you must dodge heavy traffic and jump the moving logs in the stream to get home. Fantastic graphics. One or two players, use keyboard or joystick.

22947 16K Tape \$19.95

## COLOR CATERPILLAR

from Soft Sector Marketing

This is the fast-action arcade game you've been waiting to play at home! You must hit mushrooms and caterpillars — segment by segment — moths and tumble bugs. The challenges: they are all moving; when hit they split into additional segments or metamorphose into different shapes; when you destroy a caterpillar, the new one that replaces it is a segment longer than the original!

36728 16K Tape \$19.95 \$16.96

Now 15% off til Sept 10



## MS GOBBLER

from Spectral Associates

Use your joystick to guide Ms. Gobbler through 4 mazes on a black background with moving shapes to gobble. Avoid ghosts of different colors and personalities. Zip through the teleportation spot and use invisio-maze to make the walls disappear.

32500 32K Tape \$21.95



## WHIRLYBIRD RUN

from Spectral Associates

Pilot a chopper over varying terrain while destroying enemy bases with bombs and missiles. Destroy enemy fuel depots and win their fuel. Hi Res color graphics, machine language arcade game has three screens. Requires joysticks.

32511 16K Tape \$21.95

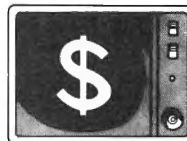


## DOLLARS AND SENSE

from Spectral Associates

Smarten' up! What's more important than learning about money? This new educational game will teach your child about dollars and coins. Easily reinforces coin recognition and value. Let the kids count the change!

27751 16K Extended Basic Tape \$11.95



## MASTER CONTROL II

from Soft Sector Marketing

This is a BASIC language program designed to decrease typing time and error while providing direct control of motor, trace, audio and run. With Automatic Line Numbering and a custom key you can re-use or change at any time; plus 50 preprogrammed command keys. Can be used on a 32K system.

21340 16K/32K Tape \$24.95 \$21.21

Now 15% off til Sept 10

## RAINBOW-WRITER SCREEN FORMATTER

by Rainbow Connection Software

The ultimate hi-res graphics text display. User definable 224 character set, 12 sizes in a multitude of colors with many screen features, including status/help screen. Works in all PMODES — save characters, symbols, and animated figures to use in your own BASIC or ML programs. Easily create dazzling displays — the possible uses are almost unlimited!

33455 16K Extended Basic Tape \$29.95

32757 Disk \$32.95

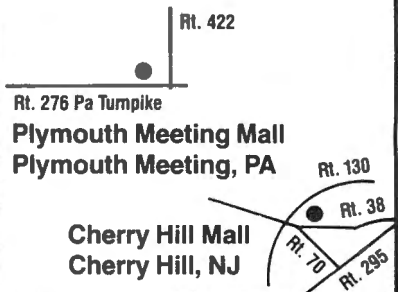
## COLOR COMPUTERS NEWS 1981 BACK ISSUES

This is the complete collection of articles appearing in the first 4 issues of Color Computer News (May to December of '81). 17 different topics are covered plus continuing features like "ReMarks", Kids Page and New Products.

43209 Softcover \$9.95

While they last — quantities limited.

### New Stores Now Open In



Over 2500 Programs for TRS-80, ATARI 400/800, APPLE, IBM & VIC 20.

### Visit our other stores:

829 Bethel Rd., Columbus, Ohio  
Seven Corners Center, Falls Church, VA  
W. Bell Plaza, 6600 Security Blvd., Baltimore, MD  
White Flint Mall, Rockville Pike, Rockville, MD  
Harvard Square, 13 Dunster St., Cambridge, MA

### Opening Soon in Tulsa and Oklahoma City

Westmoreland Mall, Rte. 30 East, Greensburg, PA  
Plymouth Meeting Mall, 500 Germantown Pike, Plymouth Meeting, PA  
Cherry Hill Mall, Rte. 38 & Haddonfield Rd., Cherry Hill, NJ  
Nanuet Mall, Rte. 59 & Middletown Road, Nanuet, NY  
Monmouth Mall, Rte. 35 & Wyckoff Road, Eatontown, NJ

FRANCHISE  
OPENINGS IN  
SELECTED CITIES

© 1983 THE PROGRAM STORE

To Order Call Toll Free 800-424-2738

For Information Call (703) 556-9778

### Mallorders:

Send check or M.O. for total purchase plus \$2.00 shipping and handling. VA add 4% sales tax.  
Charge cards — include all embossed information



THE PROGRAM STORE • Dept. 08-09-3 • Box 9582 • 4200 Wisconsin Avenue, NW • Washington, D.C. 20016

Item #	Title	Tape/Disk/Rom/Book	Price	Postage \$2.00	Name _____
_____	_____	_____	_____	Total _____	Address _____
_____	_____	_____	_____	<input type="checkbox"/> CHECK	City _____ State _____ Zip _____
_____	_____	_____	_____	<input type="checkbox"/> MASTERCARD	Card # _____ Exp _____
_____	_____	_____	_____	Computer _____	For TRS-80 Color Computer


people outside the business ask me how can you write so many books? I think if I had the time I could write a hundred books, I can think of a hundred topics a day practically to write about. They say don't you run out of subjects? I think, run out of subjects? I just go up and down the aisles and think gee, could I write a book about that or look at that new computer and could I write a book about that? And there's certainly no shortage. Like your magazine, I'm sure there's no shortage of subjects to come. (BILL) That's right. Walking through the aisles I will be... (LANCE) Oh, yeh, we're gonna do that too. (BILL) I'm covered with topics for a year, from just having walked through there. (LANCE) And it's certainly not slowing down, not at this time. It has to eventually. The industry has to run out of energy, it has to become a thing like the auto industry but clearly their energy level is what you would call rather low. We have to do that too, but it's not now, its not for the next ten or fifteen years. There's a lot more energy and there's a lot more things. So many things; the educational end, there's graphics, there's color, there's robotics, there's sound, there's music. You know, no matter what you're interested in there's something there. (BILL) That's right. You can see that by looking at how many computer magazines are on the market right now. (LANCE) And they all do well. Or almost all of them. But you know, you keep thinking there can't be another one, then another one pops up and it immediately finds an audience because there are people who are interested in so many different things, so many different aspects of things and I guess that's one of the amazing things about computers. The computer is so flexible and it could be used to do so many different things that you see this from one end to the other. We haven't even begun to explore the idea of the computer in art, a computer in music, we're still primarily

at the word processing financial spread sheet business. And there's no reason why a computer has to be an accountants aid or a word processors aid. It could be just as easily a musicians aid or an artists aid. Right now there is still the fear you're going to be taken over by technology. That's silly because the computer doesn't do anything creative for you, it just makes your work easier. After all a canvas is a product of technology. In earlier times they did it on cave walls and they didn't have canvases but you're not going to reject art just because it's on a product of technology and also doing it on a canvas doesn't make it any better than doing it on a cave wall. Infact sometimes it's much worse. Just because you have technology doesn't mean you have great art. It makes the art easier to produce and you can do so much more in a period of time. And I think alot of those other occupations are going to find that a computer is a nice thing to have. I mean you still at the point in schools where maybe its a math teacher or some business teacher. But that's silly there's no reason why it shouldn't be the social studies teacher, the english teacher, the art teacher and the music teacher. Because the computer is after all just an attempt to model certain parts of human intelligence. Those parts of intelligence are in all professions so we have a long way to go. You know we haven't even begun to see the kinds of things we can see. We haven't even begun to touch the parts of population that we can touch. Touching the accountants is OK but actually they are not the most interesting people in our society either. There is just long, long ways to go. I just can't see that there is less than another fifteen or twenty years of super excitement in the industry, maybe even more. The industry may last even longer than that. The success so far in the future by computers, well that's generations away from us. (BILL) Because after all we've only been here eight years



now. (LANCE) That's true. One of the things I said to a computer club not long ago, is one of the fascinating things about the computer business is how quickly you can become an expert. That you're here for your first meeting, a year or two from now you can be an expert, you have just picked up an Osborne or an IBM or a new machine and within a year you're going to be an established expert on the subject. You now go down to your local chess club or your local bridge club or something like that it's going to take twenty years for you to be recognized by your first name, because there's lots of old timers. You go to your ham radio club and your still going to be on the new member roster the first ten years, they're still going to be telling old war stories. Now when we tell old war stories it was about last year! And that's exciting. That means that no matter wether you're in now or you were in two

years ago it doesn't matter it's not important because you're quickly going to know as much, in fact you're probably going to know more because you and I are carrying around all this access baggage, things that aren't even worth knowing. (BILL) No one cares about it. (LANCE) No one cares, no one cares about the early history of South West Tech. or what happened here or who invented the first add on this board or add on that board we know all that stuff but..(BILL) It doesn't matter anymore. (LANCE) But after we tell the story everybody goes aaawwww. They're screaming for the exit. That's really something when people take one or two years and you are really the expert, you are the local know it all. The negative side of that, the side that I wonder about, is the burn out. In the industry, it requires so much energy and movement just to




## THE GREATEST SOFTWARE DEAL ON EARTH!

Tame your computer without breaking your wallet's spirit! Quality programs on tape or disk for the price of peanuts!


A subscription to **Chromasette Magazine** consists of 6 to 8 ready-to-load useful, practical, and fun programs delivered by First Class Mail every month. Programs like Curve Fit, Diggem, Graph Text, List Mod, Robot Run, House Adventure, and Keep Text.

Treat yourself to a great show — get a subscription to **Chromasette Magazine**. Or catch a single act and try a back issue. You'll be delighted by the tricks your computer will do!



	<b>Disk</b>	<b>Tape</b>	
<b>The Bottom Line:</b>	1 year (12 issues) \$95.00	\$50.00	Calif. residents add 6% to single copies.
	6 months (6 issues) \$55.00	\$30.00	North America — First Class postage included.
	Single Copies \$11.00	\$ 6.00	Overseas — add \$10 to subscriptions and \$1 to single copies. Sent AO rate.

**The Fine Print:** All issues from July 1981 available — ask for list. Programs are for the Extended BASIC model and occasionally for disks.



# Chromasette

MAGAZINE


P.O. Box 1087 Santa Barbara, CA 93102 (805) 963-1066 MasterCard/Visa

keep up, what does that mean later on? Is part of the pioneer's problem the fact that yeh, he's a little older, and he in a sense, I don't want to say it personally, is he running out of gas? (BILL) Yeh, Yeh. (LANCE) Boy that's awful hard, you know the negatives are also that your experience is almost worth nothing. You talk about an experienced lawyer or a doctor with years of experience or an accountant with years of practical experience and it sounds great. And you listen to that guy and boy he's got twenty-five years of experience, but what is twenty-five years of experience in our business mean? It means almost nothing! (BILL) It means nothing except a nervous break-down, a heart attack. That's my fear anyway. (LANCE) You know it's certainly impairing say to the law profession. A lawyer with twenty-five years of experience is able to command, he has skills, he has knowledge, he has a depth that the beginner can't have. Now in the computer business a person with twenty-five years of experience has old habits, old information, old ways of doing things that are probably a detriment. Certainly the half life of his knowledge is not more than three years, so that the stuff that is six years old is actually worthless. Can you imagine picking up a magazine that's six years old? I mean what would there be in it? It would be like an accountant looking at accounting magazine that's one hundred years old, and I wonder about that now, I wonder about that for all of us! The fact that you get to the middle point and you don't have anything. That's kind of scary! In other professions, you can say I have this experience, I'm not as energetic maybe as I was, maybe I don't have as many new ideas, but I do have this experience. But boy, you get to that point in this industry and you've got nothing. Maybe you'd better make your money while you're young, because ... (BILL) And make lots of it, so you can retire. (LANCE) Because what are you going to

do, particularly if you're not the big star; you're not the Adam Osborne or the Steve Jones or the Steve Wosniak What if you're just somebody who tries to do a good job and works at it a certain amount. It's going to be a very significant phenomenon as you look around the computer industry and it looks gray a little bit, it's still a young persons industry. Very much of a young persons industry, because the strain and the stress and the flow is very high. (BILL) It's really true. Take a look, you and I are roughly the same age we're thirty give or take a few years, everybody in this industry is younger than us. (LANCE) Yes, it's scary. You and I are relatively speaking 'old timers', we're the old guard. We're like the dottering eighty year old lawyer, who can just barely get into his office but very experienced, an eagle eye, except for the fact that he really has some assets when you and I, we're in a sense, dragging around old habits. We still think of memory and oh boy, you better save that memory, better not use that extra 4K, extra 4K expensive. You know the new people 4K? does it come in units that small? what would I be worried about a 4K for? Like worrying about 2 bytes. Do you worry about 2 bytes? (BILL) No, but I'd still worry about 4K. (LANCE) But the fact is that the 4K board doesn't even exist anymore. There is no such phenomenon anylonger. The Timex Sinclair thing, with 16K comes with a cigarette pack and you plug it in the back for \$50 dollars, I mean I'm sure they couldn't even make a 4K board if they wanted to. (BILL) They don't have a case small enough to put it in. (LANCE) Yeh, so I think that's a negative side maybe that's the cloud over the things that we have to wonder about. And you get to age fifty let's say and your experience in the industry is not worth very much, and your energy level is lower, how do you survive? Do you survive? We have a case where we simply burn people out and discard them, and have a new phenominal set of twenty

year olds for company presidents. If anything the pace of technological change seems to be going faster. Just seems to me like last year that we were thinking in terms of spread sheets and word processing programs and filers and things like that, now that's all old hat. Now it's integrated packages and user friendly packages whatever that means. I just got accustomed to the old set of new things and I was just beginning to feel comfortable with them and now they're all by me. Here they are in a new generation. I guess that's the question. What is our answer to that, are we in the excitement and in the fast pace which is exciting, are we just gonna burn people out, are we gonna take them and spit them out. You know you're a little older, you're just not worth anything. We've always had that problem with industrial society that older people, and their wisdom is not worth much. (BILL) The change that has happened is that age is now measured in weeks (LANCE) Now we've got a whole new thing. It used to be that a man's knowledge lasted through his life. You went to school you were educated to be an accountant or something and that education lasted. Now you go to school to get a computer science degree that education lasts about three or four years. That's all you learn. Boy you're hitting because by twenty years out of school you're going to have turned over that knowledge at least four or five times to survive. That's not to do well, to survive, just to survive. What happens to people under that kind of stress? We don't know because we've never had it before. (BILL) I think we're moving into that. I think we are seeing it with the people that have been in the business for a long time now. (LANCE) But back then the pace was not as fast. (BILL) Not as fast as it is now. (LANCE) Not nearly as fast. The pace was maybe ten to fifteen years, now the pace is down

to three or four years. I mean we've increased that pace by a factor of three or four we certainly haven't increased the phsyic resilience of people by any factor at all. Eventually we've got to get the phsyic resilience and just bounce off it. There's just so much phsyic resilience to go around. You can move people faster and faster and faster, that's how you break them. You just can't keep doing that. In a sense I think that's the dark side of our industry. (BILL) I think you're right. As we sit here old men of thirty. (LANCE) And really if you look at our ages on the chart of people in this country we are on the downward tail. (BILL) That's true. (LANCE) And the guy at fifty is really out there on that tail. He is really a living fossil.

		<b>CERATEC, INC.</b> P.O. BOX 663 ELGIN, TEXAS 78621-0663 PHONE: 512 285-2620 BBS: 512 285-5028
<small>Incorporated</small>		
<b>CERATEC</b>		
PRINTERS: GORRILLA BANANA 50cps, 5 & 10 cpi, graphics, tractor feed		\$229.00*
PROWRITER 8510A 120cps, 5, 6, 8, 10, 12, 16. 5 cpi plus proportional, graphics, friction & real tractor		\$367.00
SMITH CORONA TP-1 daisy wheel 12cps specify 10 or 12 cpi, serial or parallel		\$475.00
DYNAX DX-15 "The Super Wheeler" 10, 12, 15 cpi plus prop. printing, Atachm. like tractor, sheet feeder and KEYBOARD avail. (call for delivery times)		\$495.00*
Many other printers in stock . . . CALL for prices!		
*Requires Botec interface to run on Coco (if ordered with printer)		\$ 60.00
MODEMS: J-CAT 300 Baud direct connect		\$125.00
Auto Link 300 auto answer		\$199.00
Password 1200/300 auto answer		\$359.00
ColorCom/E if ordered with modem		\$ 39.95
DISK DRIVES by Tandon including case & power supply		
100-1 Single Side/DD 40 track set for Coco		\$239.00
100-2 Double Side/DD 40 track set for Coco		\$299.00
101 DS/DD 80 track		\$382.00
Cable only with drives	2 drives \$21.00	4 drives \$ 32.00
SOFTWARE:		
Mailmaster 1200 the powerful mailing list you were missing for so long. (32K, Ext, Disk)		\$ 49.95
Colorama the BBS program for the Coco. (32K, Ext, Disk)		
<b>3RD PARTY SOFTWARE</b>		
Most software in stock - Get <b>10%</b> on orders over \$60.00, <b>15%</b> on orders over \$120.00		
Diskettes Elephant Single Side/Double Dens.		50 for \$110.00
Prices are CASH Prices F.O.B. Elgin, TX. Texas Res. add 4% sales tax. Add 5% Handling on Visa or Master Card.		

---

## 64K KORNER

### PRODUCT ANNOUNCEMENT

Supplier: Frank Hogg Laboratory, Inc.  
770 James Street  
Syracuse, NY 13203  
315-474-7856

Product : O-PAK  
Price : \$34.95  
System : Radio Shack Color Computer  
64K with OS-9

#### CoCo OS-9 Hi-Res Screen and Utilities Package

FHL, long established leader in the CoCo FLEX market has taken the necessary steps to retain their leadership in the CoCo OS-9 market. FHL has taken their Hi-Resolution screen package from FHL FLEX and added a number of useful utilities to it. This new package, called "O-Pak", is for the Radio Shack OS-9 operating system. O-Pak adds to RS OS-9 the same features that have made FHL FLEX the leader in the market. The predominant utility is the Hi-Res screen. O-Pak's Hi-Res screen for OS-9 has the same control codes and features found on FHL FLEX. This will allow other software producers the same ease of use that they had with FHL FLEX. As of this writing many of the major OS-9 software producers have adopted O-Pak as a necessary utility for their software to run. This is not difficult to understand when you realize that each of their own O-Pak type of program if O-Pak were not available. This way FHL has helped to speed up the introduction

of OS-9 support software for the CoCo OS-9 system.

O-Pak also includes a set of utilities that allows copying files between the suppliers FLEX system and Radio Shack's OS-9 and standard RS DOS disk formats. Other commands in the set allow cataloging the disks and listing the files of the different disk formats. Other utilities may be included but information was not available at press time. O-Pak will be sold for only \$34.95 which is a very good buy for such a powerful and useful package. FHL's president Frank Hogg was quoted as saying that "We want to retain the leadership in the OS-9 CoCo market that we have in the CoCo FLEX and standard FLEX and OS-9 market. Pricing O-Pak at only \$34.95 will insure that position."

FHL has been providing software to the standard OS-9 market for more than two years and is the undisputed leader in that area.

#### Attention OS-9 Software Houses

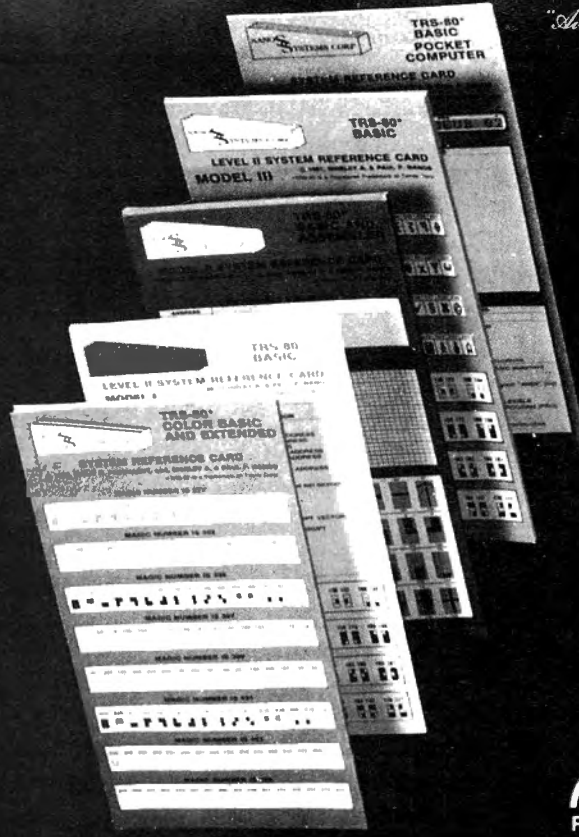
As you know, Radio Shack will soon be providing OS-9 1.2 for the 64K Color Computer, part number 26-3030 with Edit and Asm for \$69.95. This will be a major market for your software products. To give you some idea of the size of this market let me share these observations:

If OS-9 is released on a Tuesday then by Thursday RS will have sold more RS

"Airborne Images"



# Nanos Systems Corp. REFERENCE CARDS For Models I, II, III, Color, Pocket and Apple II & II Plus



\* TRS-80 is a Registered Trademark of Tandy Corp.  
Computer picture reprinted permission Tandy Corp.

APPLE is a registered trademark of Apple Computing, Inc.

Each card is a complete summary of the reference manuals and the microcomputer. Cards are two or more colors, printed on 80 pound Beckett Antique cover stock or a comparable stock, stretch-wrapped in plastic for shipping. They are accordion-foldup cards, in the same style as the traditional IBM reference cards used on the major computers for years. Fold-up size is eight and one-half by three and three-quarter inches, so they will fit easily into the shirt pocket. These cards provide a complete summary of the manuals plus many extras at your fingertips.

MODEL I	MODEL II	MODEL III	COLOR	APPLE II & II PLUS
<b>BASIC: Buff &amp; Blue</b> 5 Panels, 10 Pages (For the Classroom) Memory Map. Easy Graphics. Basic Statements. Basic Functions. Basic Facts. Special Characters. Basic Commands. Edit Subcommands. PRINT USING Examples. Message & Codes. Reserved Words. Special Keys. Ascii Character Chart, with Space Compression Codes. Control Codes. Basic Internal Codes. Hex/Dec Conversion Chart. Screen Line Layout. <b>BASIC &amp; ASSEMBLER: Buff</b> 8 Panels, 16 Pages (For the Pro) Complete Z80 Instructions. Assembler Instructions. Commands, Operators. Editor/Assembler Commands, and Edit Subcommands. Flags, Conditions, & Chart. Internal Routines. Assembler Error Msgs. Plus Most Items in the Basic Card	<b>BASIC &amp; ASSEMBLER: Green</b> 10 Panels, 20 Pages (For the Business) Small Memory Map. Screen Layout. Easy Graphics. Complete Z80 Instructions. Series-1 Assembler Instr. Commands, Operators, and Edit Subcommands. Assembler Error Msgs. Power-up Error Msgs. Flags, Conditions, & Chart. Wild Cards, DOS Messages. SVC Procedure Panel. Host Logon Panel. Version 2.0 Lib Command Formats and System Utility Formats. Basic Functions & Statements. DOS File Naming Convention. Basic Commands & Edit Subcommands. Special Keys. Basic Internal Codes and Reserved Words. Basic Msgs. & Codes. PRINT USING Examples. Special Characters. "DO" Utilities & BASIC Command. Ascii Character Chart with SVC Names and Numbers. Control Codes.	<b>BASIC: Blue &amp; Buff</b> 6 Panels, 12 Pages (For the Classroom) Special Characters. Kana Characters. Euro-Characters. Memory Map. Special Keyboard Functions. Ascii Char. Chart w/Space Compression Codes. Control Codes. Cassette Loading Err Msgs. Basic Commands, Edit Subcommands, Special Chars., Basic Statements, Facts, Functions, Derived Functions, Special Operations (POKES). PRINT USING Examples. Basic Msgs. & Codes. Basic Internal Codes. Reserved Words. Screen Line Layout. <b>BASIC &amp; ASSEMBLER: Blue</b> 10 Panels, 20 Pages (For the Pro) Complete Z80 Instructions. Assembler Instructions, Commands, Operators. Series I Editor/Assembler Commands & Edit Subcommands. Flags, Conditions, & Chart. Hex/Dec Conversion Chart. Assembler Error Msgs. Internal CALL Routines. Break Processing Procedure. Plus all items in the Basic card.	<b>BASIC &amp; EXTENDED:</b> Grey + 9 Colors. 8 Panels 16 pages (For the Artist) <b>All Color Graphics.</b> System Commands. PRINT USING Examples. Special Characters. Special Keys. Cassette Loading Err Msgs. Basic Functions & Statements. Playing Music, Making a Circle, and Drawing Panels. Derived Functions. Messages & Codes. Musical Notes, by Octave, in Color, Including Rests and Time. Memory Map. Reserved Words. Internal Codes. A Page of Tips. Ascii Char. Codes Chart. Including Inverse Graphics and Color Graphics. Control Codes. Color Group Chart. Pmode Information Summary. Screen Line Layout. Extended Graphics Pmode Illustrations.	<b>BASIC: Red &amp; Pink</b> 7 Panels, 14 Pages (For the Classroom) 48K Memory Map APPLESOFT and INTEGER BASIC. Basic Statements. Basic Functions. Derived Functions. Special Characters & Operators. System & Utility Commands. Pokes, Peeks, Calls. Monitor Commands. Key & Control Functions. APPLESOFT Internal Codes. APPLESOFT Reserved Words. Integer Basic Addressing. DOS 3.3 Command Summary. Color Selection Chart. Error Msgs. & Handling. Reading Machine Language. Hex/Dec Conversion Chart ASCII, Print, Video, 6502, Integer and APPLESOFT Code Reference Chart, 0-255. <b>Basic &amp; 6602: Red</b> 8 Panels, 16 Pages (For the Pro) All features of the Basic Card, Plus: 6502 Timing. 6502 Language Simplified. Flags & Conditions with Reference Chart.

POCKET
<b>BASIC: Purple</b> 5 Panels, 10 Pages Operating Characteristics Memory Types and Limitations. Modes of Operation. PRO Mode. RUN Mode. RESERVE Mode. DEF Mode. Fixed Variable Facts and References. System Function Keys. Math and Logic Function Keys. Normal Character Keys. Special Characters and Function Keys. Basic Commands. Cassette Interface Commands. Reserved Words. Math and Numeric Functions. Derived Functions. Basic Statements. Error Messages and Codes. USING Statement Examples and more. . . . ! A pocket card for your pocket computer.

Please send me:	Card	Price	
( )	Copies of MODEL I BASIC & ASSEMBLER	\$4.95	Ask for them at your store or bookstore or order from us.  Wholesale prices available in quantities over 24.  Send Check or Money Order to: NANOS SYSTEMS CORP. P.O. BOX 24344 SPEEDWAY, IN 46224 (317) 244-4078
( )	Copies of MODEL I BASIC-ONLY	2.95	
( )	Copies of MODEL II BASIC & ASSEMBLER	5.95	
( )	Copies of MODEL II SVC	2.95	
( )	Copies of MODEL II COMMANDS & UTILITIES	3.95	
( )	Copies of MODEL III BASIC & ASSEMBLER	5.95	
( )	Copies of MODEL III BASIC-ONLY	3.95	
( )	Copies of COLOR BASIC AND EXTENDED	4.95	
( )	Copies of POCKET BASIC	2.95	
( )	Copies of APPLE II & II PLUS BASIC	3.95	
( )	Copies of APPLE II & II PLUS BASIC & 6502	4.95	
( )	Copies of Z80	4.95	
( )	Copies of ZX80, 81, & TIMEX SINCLAIR-1000	5.95	
( )	Copies of HEALTH/ZENITH HDOS for H8/H89/Z89/Z90	5.95	
NAME: _____			
ADDRESS _____			
CITY _____	STATE _____		ZIP _____

Indiana Residents Add 5 Percent for Indiana Sales Tax

THE ONE  
AND ONLY!

HANDY!

UNIQUE!

USEFUL  
AND FUN!

GREAT!

BEST!

SAVE!  
FOR  
HOBBYISTS!

● **ROML — ROM PAK Loader**

- Save your ROM PAKs (or ANY machine language program) on disk then load and execute with ROML.
- You no longer need to remove your disk controller to execute your ROM PAK software!
- Also allows you to load from disk or tape and execute all machine language programs which are incompatible with the disk system!
- Includes a utility to copy non-protected tapes to disk.
- Note—ROM PAK execution requires good 64K RAM system.
- Copy of article included describing how to access 64K RAM.

Tape: \$25.00      Disk: \$29.00

● **PLUS32 — 64K RAM Enabler**

- Puts your system into the 64k RAM mode. Makes RAM above BASIC available for machine language programs.
- Runs ROM BASIC from RAM where you can modify it!
- Will not crash system if upper 32K is defective or not available.
- Note—Requires good 64K RAM system.

Tape: \$15.00      Disk: \$19.00

● **ROMKIL — BASIC ROM disable routine**

- Frees up extra RAM by:
  - Disabling DISK BASIC ROM—returning your system to EXTENDED BASIC, or
  - Disabling EXTENDED BASIC ROM—returning your system to COLOR BASIC.
- Allows disk-incompatible machine language programs to be loaded and executed from tape without removing the disk controller.

Tape: \$15.00      Disk: \$19.00

● **BANNER — Creates GIANT Moving Messages**

- Make your TV a moving Marquee with Color BANNER!
- Enter any message and have it move across the screen in GIANT letters in the colors of your choice.
- Control speed, delay and pause from within your message!
- Great for parties and exhibitions!

Tape: \$19.00      Disk: \$23.00

● **Nelson's SUPER "COLOR" LIBRARY**

- **Super "Color" Writer II\***      ROM PAK: \$89.95      Disk: \$99.95
  - By far the BEST word processor available for the Color Computer.
- **Super "Color" Mailer**      Tape: \$39.95      Disk: \$59.95
  - Powerful multi-purpose mailing list merging & sorting program. Uses SCWII files.
- **Super "Color" Speller**      Disk Only: \$69.95
  - Fast, proofreading program. Proofs against a stock dictionary, plus one you design.
- **Super "Color" Calc\***      ROM PAK: \$89.95      Disk: \$99.95
  - The finest electronic worksheet you can find for the Color Computer. Rivals VisiCalc.
- **Super "Color" Terminal\***      Tape: \$49.95      ROM PAK: \$59.95      Disk: \$69.95
  - Makes communicating with ANY computer a breeze.
- **Super "Color" Disk-ZAP**      Disk Only: \$49.95
  - The ultimate repair utility for simple and quick repair of all repairable disk errors.
- **Super "Color" Database**      Disk Only: \$79.95
  - Data sorted in records you design. Can be used to: sort, do math, create reports, and much more.

\*Supports four different screen sizes: 32X16 and 51-64-85X21, with lowercase!

● **LCA-47 — Lower Case Adapter**

- Provides real lowercase letters with true descenders!
- Compatible with ALL Color Computer Software!
- Provides bright characters on a dark background!
- Superb User's Manual included.
- Easy 5 minute installation!
- Uses NO system memory!
- 1 year warranty.
- Hundreds of owners, all happy!

Assembled and Tested: \$75.00

● **SPECIAL — Save \$25.00 when you purchase Super "Color" Writer II and an LCA-47 at the same time! Order NOW!**

● **PP-16 — EPROM Programmer**

- Programs single supply 2516, 2716, and 2758 EPROMs.
- Program—entire or partial. Auto verify after programming.
- Transfer contents to RAM for modifying or duplicating.
- Select Documentation for:

6502	Interface to:
6800	6820 PIA or 6522 VIA
6809	6820 PIA
8080/8085/Z80	6820 PIA
	8255 PPI
- Comprehensive documentation booklet contains schematic, instructions for construction, check-out and use, and a well commented assembly listing for the specified MPU.
- Note—User must supply the specified parallel interface.
- Specify MPU and computer system when ordering.

Complete Kit (includes ZIF socket): \$45.00

PC board only (with documentation): \$25.00



**Micro Technical Products, Inc.**

123 N. Serrine, Suite 106-N  
Mesa, Arizona 85201  
Phone: 602-834-0283



Add 5% for shipping, minimum \$2.00. Overseas 10%,  
minimum \$4.00. Arizona, add 5% tax.

OS-9s than ALL of the different CoCo FLEX suppliers including us! By the end of the first week they will have more RS OS-9 users than currently exist for ALL 6809 computers! By Christmas time I expect that there will be in excess of 100,000 RS OS-9 users!

Let that sink in for a while.....

The combined FLEX and OS-9 market probably is less than 20,000 right now, 30,000 tops! Consider the implications of this size of a market. Are you prepared for this type of growth?

FHL has taken our Hi-Res screen from FLEX and we are putting it on the RS OS-9 in order that you may move your software over to RS OS-9 more easily. This product will be called "O-Pak" and will sell for the very low price of \$34.95. It is our feeling that O-Pak will become the standard add-on package for CoCo OS-9 and that is why we are going to be giving it as much play as we have been giving our FLEX for the CoCo. It doesn't take a big percentage of 100,000 to make this a profitable package. Over 8 major software houses are going to use and require O-Pak for their software like they required FHL FLEX for their FLEX software. O-Pak is slated to be in production by the end of September. Because we have this currently running on FLEX I don't anticipate any delays.

O-Pak and other OS-9 software ads will start to appear in the August issues of CCN and the Sept issues of The Rainbow and Hot CoCo. We are planning to add several pages to our already 3 page ads and will probably break a record for the number of pages any software house has had. We will probably reach 20 pages per month by the end of the year!

If we are not now selling some of your OS9 software then by all means get in contact with me. Most software buyers would prefer to buy from a single source; without question FHL is THE source for software for the CoCo.

## Comparing The New 64K CoCo To The Old

At the time of this writing I do not have in my possession a new 64K machine. However, I have found out many things about it that I am sure you are aware of so I won't go into them.

The new CoCo will run FHL FLEX just like the old one. We have a new boot that will allow the use of the "DOS" command in the new ROM also. That way, if you put a FLEX disk in and type "DOS" you will get FLEX, if you put a OS-9 disk in you will get OS-9. Speaking of OS-9, we have over 15 MAJOR programs ready for the OS-9 CoCo. These programs have been in use on larger OS-9 systems and are time proven. We have a large GIMIX OS-9 Level III system that we use everyday in house and we are very familiar with the OS-9 system. We have been providing software for OS-9 for over 2 years and we are the largest single source for OS-9 software in the world.

Attention keyboard fans. The new CoCo keyboard can be purchased from RS for \$39.95. If that is so then you can expect a rash of price reductions from the other keyboard sellers, or you may see them go out of the business. The same can be said for the expansion boxes from several suppliers. Several of them do the same thing as the new RS box but the cost is quite another story. We sell "The Solution", which does NOT do the same thing and therefore does not compete with the RS box. Now that we finally have some support cards for "The Solution" we will be re-introducing it. We also plan to support OS-9 with it and even are going to try to run 6 terminals in a timesharing mode just to show that it can be done. There won't be much memory for each user but there will be enough for each to run a small program. The funny part about it is that the terminals will cost many times more than the computer. The Solution actually could support 8 terminals but we only have 6 in our office that we

can hook up to it at one time. We will write the program in A/Basic because it creates very small modules that take up little memory. A/Basic is a integer BASIC compiler that we have had for OS-9 and FLEX for over a year now and it works very well.

Now that OS-9 is available, many of you may think that FLEX is a dark horse. OS-9 will take over and FLEX will go by the wayside. I have known about the coming of OS-9 for over one year and I have had considerable time to consider the consequences to us as a business if the affect on FLEX is bad. Remember that we have a considerable amount of software for OS-9. Most of the FLEX programs that we have, we also have for OS-9. Right now many of the OS-9 versions are for systems with 24x80 display terminals and will have to be set up for the CoCo OS-9. The first thing that we need to do is create all the neat little things for CoCo OS-9 that we have for CoCo FLEX, like hi-res screens, etc. As soon as this is done (being worked on now - see O-Pak) we can convert the software over to the CoCo OS-9. This should not take too long as we already did this for CoCo FLEX. FLEX is still a viable operating system for the CoCo. It has many virtues that OS-9 does not have and has had a tremendous amount of support for several years. After evaluating the effect that RS OS-9 will have I have come to a conclusion, but first let me give you some background. Before RS announced the 64K CoCo, the only people that knew that the CoCo could be 64K were those that read the CoCo magazines. This amounts to only about 20% of the total CoCo users. Of this 20% the only people that would buy FLEX were those that were willing to modify their computers to 64K operation. This cuts the number down even more to about 2% of the total number of computers sold. Now that RS has announced the 64K CoCo, 100% of the users know that the CoCo is 64K, and with the announcement of OS-9 and the low disk prices many

people will buy disk systems and OS-9. The percentage of people that potentially CAN run FLEX will increase a thousandfold. Because FLEX is such a bargain and has many more programs for it, FLEX users will double or triple in a short time. However, the main reason for using FLEX is the vast software support and the many goodies that it has. I think that many users will opt for both systems, because each system has specific uses that the other doesn't. Even now most users of FLEX are also using RS DOS for certain things. We use GIMIX switching systems that can run both FLEX and OS-9. I use whatever is best suited for the job at hand. Many times my decision is based on available software.

We use CoCo FLEX in the office every day and we know that it has many virtues that are lacking in OS-9. I am not going to even try to convince anyone that is dead set on one system or the other. I just want to point out that FLEX has thousands of happy users and that there is a lot of very good, time proven software available for FLEX, but little for OS-9.

Another point in FLEX's favor is the ease of use. One thing that everyone agrees on is that FLEX is more user friendly than OS-9. This is also true when it comes to writing programs for both. FLEX is easy to write programs for while OS-9 is much more demanding. Please OS-9 users, do not write! I know that once you understand OS-9 it is not THAT difficult to write for but the fact remains that it is more complex than FLEX and therefore more is involved when writing programs for it. For instance, in OS-9 programs MUST be position independant and re-entrant. Not true for FLEX. In OS-9 you have NO control where your program OR data resides. OS-9 puts them where it wants them and you have to allow for that when you program for OS-9. Not true for FLEX. You can run your program wherever you want. This is only of concern if you are writing machine



# Quality Software Is The Number One Priority At K & K COMPUTORS



**LASER TANK** - Pit yourself in a game of strategy and excitement against the computer. You must defend your flag from attacking tanks and destroy them before they destroy your flag or you!!! Only \$15<sup>95</sup>.

**GAZON** - The deadly Gazonians are trying to steal your supplies and you must stop them at all costs. Similar to the popular "RIPOFF" Arcade Game, this game has color and is faster. Machine language. Only \$19<sup>95</sup>.

**MUTATRON** - As the last person alive, you must protect yourself from sadistic robots bent on killing you. Another popular Arcade Game, "ROBOTRON", brought to you by K & K. Machine language. Only \$19<sup>95</sup>.

**SHOOT TO SPELL AND FLASH MATH** - An educational package that helps kids learn to spell and educate them on elementary math. An absolute must for adults with school aged children. Only \$15<sup>95</sup>.

**SPACE HARVEST** - Pilot your spacecraft above the Planetoid Voltar stealing spacefruit and trying to avoid alien guards. Machine language Only \$19<sup>95</sup>.

**SERIAL TO PARELLEL CONVERTER** - Have a printer with a parellel port? Tired of waiting for a line list? With this little hardware device you can make your color computer run at any baud rate between 300 and 9600. Let K & K help your printer to go much faster!!! Only \$67<sup>95</sup>.



**BLACKJACK** - A casino game that puts two players against the beady eyed dealer of the house. This dealer deals the cards as good or even better than Intellivision. If you have any gambling blood at all this game is a must! Same rules as any Las Vegas casino. Only \$15<sup>95</sup>.

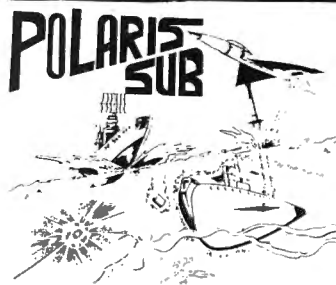
**TAPE INDEX** - Trouble keeping track of what programs are on your tape? Now it's possible to place a directory on your cassette. Only \$15<sup>95</sup>

WE'VE CHANGED OUR NAME: FORMERLY K & K COMPUTORWARE, NOW K & K COMPUTORS.

**ALL GAME PROGRAMS** - require 16K extended(prices are set for cassette, add \$4<sup>00</sup> for disk, except business.)

**PROGRAMMERS!!!** - K & K pays the highest royalties for your programs. If your program is good, send it to K & K

TRS-80 COLOR COMPUTER USERS-New programs are added each week. **SEND \$1<sup>00</sup> FOR OUR COMPLETE CATALOG**



**POLARIS** - You are under the ocean in a submarine, attacking planes and enemy destroyers dropping depth charges attempting to destroy your sub. Can you destroy them before they destroy you? This is a fast action machine language program. Only \$19<sup>95</sup>.



**SUPER ZAP** - Enemy spaceships are attacking from all sides and your mission to defend your starbase from the deadly Armada of Pyrus. This will be a dangerous mission since the Pyrus Armada has never been defeated by any humanoid. Only \$15<sup>95</sup>.

**SKY DESTROY** - Planes and helicopters are coming from all directions, they must be stopped! This game is similar to Atari's and now available to color computer users. Machine language. Only \$19<sup>95</sup>.

**BOWLING SCORED FOR DOLLARS** - Do your leagues bowling averages. This program will keep individual scores, team totals, individual averages, team standings, and print all this information to your line printer. On cassette and disk, specify on order. Only \$19<sup>95</sup>.

**INVENTORY CONTROL** - This program contains all the necessary features required for all types of inventories: sort inventory by stock number, list stock number, description, amount in stock, cost, wholesale, profits. Only \$49<sup>95</sup>.

**CHECK LEDGER** - This bookkeeping system allows the user to have current information on your expenses by any category you wish. Year end tax statements made easy. Disk required. Only \$49<sup>95</sup>.

**ACCOUNTS PAYABLE** - Small businessmen, control your business growth by keeping track of all your cash liabilities and payment history. Only \$49<sup>95</sup>.

**ACCOUNTS RECEIVABLE** - This system keeps track on the status of all customer accounts, all payment histories included. Only \$49<sup>95</sup>.



K & K COMPUTORS  
P.O. BOX 833 • STERLING HEIGHTS, MICHIGAN  
48077



Telephone: (313) 264-7345

language programs, but the system in general is more difficult to learn. Perhaps the added power and/or features are worth it. I will leave it up to the individual to decide for himself. We will support both systems with software and will continue to develop and enhance FHL FLEX for the CoCo.

The important thing to realize is that by pricing the 64K CoCo at only \$399 RS has taken the wind out of the sails of ALL other 64K machines. Did you know that the Commodore 64K hooks the disk drives to the serial port! In order to do a simple disk directory you have to type "LOAD "\$",8" and then after you get a ready message you type list and you get the directory. If you change ANYTHING on the disk then you have to do the thing again from scratch. Also the speed is really slow. According to the review in "InfoWorld", V5 Num29 July 18, 1983, the Commodore 64K took four minutes and 55 seconds to create a data file only 126 sectors long! That's only 14 grams! I did not test the CoCo but I know that something that size should be created in just a few seconds. That is the difference between using a serial port and the much better way RS does it. The same review also stated that it took the Commodore 21 minutes just to copy one disk! After comparing the two computers you would have to be a blithering idiot to buy a Commodore 64K! That kind of technology went out with vacuum tubes! To top it off, the darn thing uses the same old 6502 that the Apple uses. I guess it just goes to prove P.T. Barnum right; There is one born every minute.

You're Right -- Maybe You Can't Afford Not To Buy Radio Shack Drives!

Sure, everyone would like to have a high quality 40 track drive as their Drive Zero, but compare the price (at least of ours) of \$476 for a Tandon Drive Zero and the controller card with Radio Shack selling their Drive Zero and controller card for \$399. How can

you afford not to buy the Radio Shack system? Maybe you can't. What follows is a possible way to take advantage of the low price of the RS system and still end up with a high quality drive.

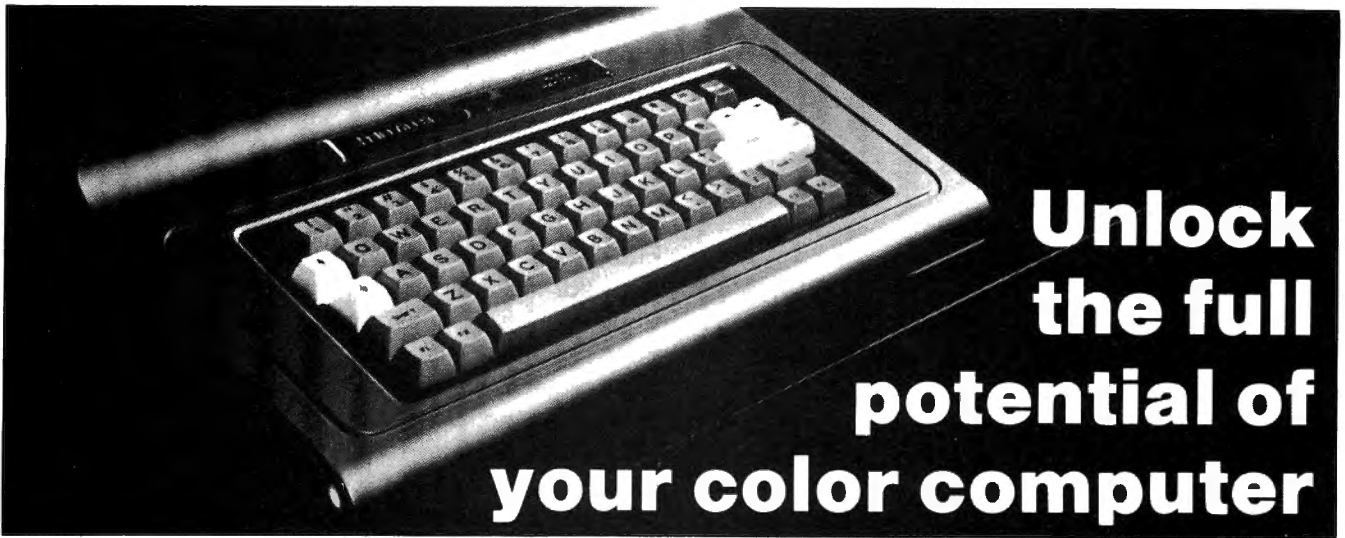
You see Radio Shack has an advantage in the price control department since they ultimately decide what price any dealers will be able to sell the controller card for (I guess that's only fair - after all, they did create the thing). When looking at the prices of RS drives, with drive zero selling for \$399 (which includes the controller card) and drive one selling for \$279, a simple calculation will indicate that they are selling the controller card for \$120. Realize that for the same \$279 that RS charges for their drive, you could buy a better drive (such as a 40 track Tandon).

So, no big deal right? Just go to RS and buy the controller card. Well, unfortunately Radio Shack must be given a bit more credit as far as marketing is concerned. As many of you may already know, Radio Shack will not sell the controller card separately. You can buy it as separate parts from Tandy National Parts. You could buy the Drive Zero system from them, keep the controller, and sell the drive. With the \$279 you would hopefully get, you could buy a better drive. Now if you don't think getting a better drive is worth all this work then you might just be better off to pay the extra and buy the higher quality system to begin with. The choice is yours.

A Note About CC FLEX & 80 Track Drives:

This is in response to a recent letter which asked for clarification in regards to using 80 track drives with CC FLEX.

80 track drives, single or double-sided may be used with FLEX on the CoCo. A single-sided 80 track drive will give you useful storage space of 358,344 bytes. A double-sided 80 track drive will give 716,688 bytes of useful



# Unlock the full potential of your color computer

## It's easy with the right keys.

The HJL-57 professional keyboard instantly upgrades your TRS-80\* Color Computer to a dependable, high-performance machine with all the capabilities of systems costing hundreds more.

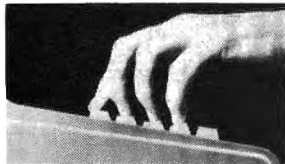
If you've ever tried to enter a major block of data or do word processing, you know that the keyboard is the major limitation of the color computer.

## Designed from scratch

To provide a total solution to the problem, the HJL-57 was designed from the ground up, specifically for the Color Computer (not an adaptation of a stock keyboard). The result is a dependable, high-throughput keyboard that makes input less tedious, less time-consuming, and less distracting.

## State-of-the-art, full-travel technology

A real keyboard with all the feel and response to make you more confident and reduce input errors. Sculptured, low-profile keycaps are ergonomically designed to cut fatigue and improve typing speed.



## Compatible with all TRS-80\* Color Computers

Including the F-version and TDP-100.\* Layout is identical to original CoCo keyboard PLUS four software-definable function keys (one latching), specially positioned to avoid inadvertent actuation.

## Built for heavy use

Manufactured under contract by a leading U.S. OEM, with

\* Trademarks of Tandy Corporation

Compare before you buy			
The HJL-57 was designed with your needs in mind. Why settle for less?			
	HJL-57	Brand X	Brand Y
Switch technology	Full-travel membrane	Mech. contact	Mech. contact
Warranty	Full year	90 days	90 days
Function keys	Four (one latching)	None	Four
Low-profile, sculptured keycaps	Yes	No	No
Spill-proof contacts	Yes	No	No
RF/EMI shielding	Yes	No	No
Contact rating	100 million cycles min.	Not specified	Not specified
Money-back guarantee	Yes	No	No

Compiled from manufacturers' published data available at press time.

contacts rated for 100 million cycles minimum, rigidized aluminum baseplate, and spill-proof construction, the HJL-57 comes with a **full 1-year warranty**.

## Quick and easy installation

Anyone can remove the old keyboard and easily install the HJL-57 in just a few minutes, and the kit includes a new bezel for a totally finished conversion.

## RFI/EMI shielded

Meets FCC Article 15 requirements which become effective on October 1, 1983.

## 15-day money-back guarantee

If you are not completely satisfied, just re-pack it (in original condition, of course) and return it to us within 15 days for a full refund.

## CoCo owners go professional today

The keys to peak performance are yours for **only \$79.95**. Order now to release the hidden potential and full value of your color computer.



**PRODUCTS INC.**

955 Buffalo Road • P.O. Box 24954  
Rochester, New York 14624

To: HJL Products Inc. 1C

Yes. I'm ready to go pro. Ship one HJL-57 keyboard to my address below. . . . . \$79.95

Specify which model color computer you have:

Original (Sold prior to October, 1982)

F-version (after October, 1982) or TDP-100



Shipping and handling . . . . . 2.00

New York residents add 7% sales tax . . . . . \_\_\_\_\_

Total . . . . . \$ \_\_\_\_\_

Payment by:  C.O.D.  Check or money order enclosed

Visa  MasterCard—Interbank No. \_\_\_\_\_

  Card No. \_\_\_\_\_ Expires \_\_\_\_\_

Signature \_\_\_\_\_ Date \_\_\_\_\_

Name \_\_\_\_\_

Street Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

**To order by phone, call (716) 235-8358**

Dealer inquiries invited.

storage. This is pretty straightforward. Where the confusion comes in is how the information is stored on the disk. To put twice as many tracks on the same size disk that 40 tracks is normally put on, the width of the tracks must be half the size of those on a 40 track disk. In other words, the space taken up by one track on a 40 track disk would hold two tracks on an 80 track disk. Since this spacing is different, a 40 track DISK may not be read in an 80 track DRIVE.

The reason I'm mentioning the above is in case you are not currently running a disk-based system but are considering upgrading to one. 80 track drives made accessible through the FLEX system may sound appealing, but you should probably think twice about buying an 80 track drive to use as your drive zero. CC FLEX software (and the operating system itself) is usually sold on disks which have the track width readable by 35 or 40 track drives. Therefore, you would need to borrow a 35 or 40 track drive (or have a program made up on an 80 track disk specially) so that you can format an 80 track disk and copy your programs on it.

The ideal setup here is to have drive zero be a double-sided 40 track drive, and have drive one be 80 tracks for storage. If this is not possible, then here is a suggestion about how to "Change FLEX" so that it will always recognize your first drive as having 80 tracks (upon booting, FLEX defaults to recognizing 40 tracks). Using the SETUP command, create a binary file using the "F" option that has the drive different and then append it to your FLEX.SYS file. This will override any of the drive defaults of the existing FLEX.SYS.

```
+++SETUP FDRIVE80 QT80,D6
+++APPEND FLEX.SYS DRIVE80.BIN
      NEWFLEX.SYS
+++LINK NEWFLEX
```

### Print From RS DOS Without Disconnecting Your Terminal:

If you're using the New External Terminal command (EXT) of FHL Color FLEX V5.0:4, and have your printer hooked up to your terminal then this should be of interest to you. You may not know this but you do not have to disconnect everything and then hook just the printer back up to the CoCo if you want to print from RS DOS. A simple way to get around this is to enable the printer pass-through on your terminal (either by sending out the control codes from the CoCo or by actually enabling it on the terminal). This way everything that you send to the printer will pass-through on the TV925, an ESC' is all that's needed.

```
PRINT #-2,CHR$(27)+"''''''"
```

Now the passthrough is enabled and output from the CoCo will appear on the printer. Remember to set to baud rate for the terminal by poking the proper value into 150. For 9600 baud type: POKE 150,1.

### Another Use For 64K:

Spectrum Projects has another program which makes use of 64K memory while under RS DOS. It's called BACKUP64 and is a convenience for single-drive users. By utilizing the 64K memory, a single-drive backup only requires half the disk swaps. How about some other uses for 64K from some of you other readers?

Well, that's it for this month.

Frank Hogg and Karen Huston

---

---

## NEW PRODUCTS

EVS Engineering of San Diego, California has made available a Database/Mailer and Letter Writer with Mailmerge and Form Letter capability for the Radio Shack Color Computer. Both programs are available as an introductory offer for \$49.95 (normally \$89.90) until sometime in October.

Both tape and disk versions are available for 16K and 32K Extended or non-Extended BASIC. EVS Engineering is located at 9528 Suite 35, Miramar Road, San Diego, CA 92126.

If you have any questions or need more information, please feel free to call Charles J. Krautblatt at (619) 566-6013.

ROCHESTER, NY—A new keyboard, developed to replace the calculator-style keys in the TRS-80 Color Computer, has been introduced by HJL Products, Inc. Designated the HJL-57 Professional Keyboard, the unit is available in two different models: One for the original Color Computer, and one for the TDP-100 and "F" versions, introduced by Tandy Corporation in October, 1982.

The HJL-57 is supplied as a user-installed kit which includes: the

completely assembled keyboard, all mounting hardware, a black plastic bezel, and installation instructions.

With sculptured, low-profile; keycap and full-travel switch movement, the new keyboard is designed to improve typing speed and reduce data entry errors. The three color layout is identical to the original Color Computer keyboard.

Switch contacts are rated for 100 million cycles minimum, and covered by a protective membrane to guard against dust, dirt, and accidental spills. The keyboard meets FCC Article 15 requirements for RFI/EMI shielding, which become effective October 1, 1983.

Installation can be accomplished in just a few minutes with no special tools; no soldering, drilling or gluing. The new keyboard simply plugs in and drops in place on the original mounting posts.

Manufactured under contract by a major U.S. keyboard producer, the HJL-57 is warranted for one full year, and sold with a 15-day money-back guarantee.

Further information on the HJL-57 Professional Keyboard is available from HJL Products, Inc., 955 Buffalo Road, Rochester, New York 14624.



FLEXIBLE COMPUTER SOLUTIONS (F.C.S., 1410 W. North Loop #108, Austin, Texas 78756) will install 64K of memory in your Color Computer for \$89 plus \$5 shipping. This offer applies to 4K, 16K, or 32K "D" or "E" boards or to 16K "F" boards. Add \$30 if you have the BASIC 1.0 ROM. Type EXEC 41175 to see which BASIC ROM you have. F.C.S. will also include a program to copy your ROM(s) to RAM and instructions on how to turn the upper 32K of RAM on and off. Extended BASIC and Disk BASIC are NOT required! Note your upgraded 64K machine will behave like a standard 32K machine as far as BASIC is concerned, except that you can copy the ROM(s) to RAM and then PEEK and POKE to the RAM that BASIC does not sit in, or you can actually modify BASIC, if you wish. Programs that are set up to use 64K such as Flex and Master Writer will have access to the full 64K. F.C.S. will also do repairs

and invites telephone calls at (512) 458-9783 for estimates or more information.

DERRINGER SOFTWARE  
Introduces An Application Program  
For Users of Pro-Color-File;  
PRO-COLOR-FORMS

PRO-COLOR-FORMS will allow you to print data from Pro-Color-File on a preprinted, full page form, such as purchase requisitions and invoices, or will let you generate personalized letters using a mailing list.

You can design up to six (6) forms using embedded printer control codes, and PRO-COLOR-FORMS gives you the ability to design forms from 32 to 133 characters wide and 77 to 66 lines long.

Price is \$39.95 plus \$2.00 Shipping and Handling.

For further information write Derringer Software, PO Box 5300, Florence, S.C. 29502. Or phone (803) 665-5676 after 6:00 pm, Monday-Friday. Before 10:00 pm on weekends.

#### MICROCOMPUTER HARDWARE

##### Color Computer Memory Upgrade Kits

DYNAMIC ELECTRONICS, INC. has developed a complete set of memory ,tf expansion kits for the Radio Shack Color Computer. These kits upgrade the D, E and F series to 16K, 32K, and 64K. The kits are solderless and are warranted for a period of one year. The prices are as follows.

ME-1 4K to 16K \$19.95

ME-2 4K to 32K \$59.95

ME-3 16K to 32K \$39.95

ME-4 D & E Versions to 64K \$99.95

ME-4F F verion to 64K \$89.95

For more information contact:  
DYNAMIC ELECTRONICS INC.

PO Box 896

Hartselle, AL 35640

(205) 773-2758

CHROMASETTE MAGAZINE has announced their Disk Version for the Radio Shack Color and TDP System 100 computers. As in the tape version, six to eight ready-to-run programs, including; tutorials, utilities, practical programs, and games, are delivered each month. Along with the disk comes a written editorial describing the programs and giving programming tips. \$95 for a year's subscription (12 disks), \$55 for 6 months, and \$11 for a single disk. Chromasette Magazine, PO Box 1087, Santa Barbara, CA 93102. (805) 963-1066



#### COMPUFAIR SETS SEPTEMBER DATE

Personal computer product vendors are reserving over 200 exhibits at the Seattle Center Exhibition Hall for COMPUFAIR Seattle, on September 16th through the 18th. COMPUFAIR Seattle will be the most comprehensive personal computer show and seminar series the Pacific Northwest has ever seen.

COMPUFAIR Seattle will feature vendor exhibits of personal computer hardware, software and services currently marketed for a wide range of applications. In addition to product demonstrations for business, home ,tf entertainment and education, COMPUFAIR Seattle will provide presentations and seminars on how personal computers are helpful to children, how to buy a computer that fits your needs, and the future of personal computers.

According to Tom Ikeda, COMPUFAIR Seattle Managing Director, space is filling up nicely with exhibitors anxious to secure prime booths. "We are tackling this show with both the exhibitor and attendee in mind", Ikeda said. "There is a gap between vendors and consumers that we are helping to close in the Pacific Northwest with a well coordinated exhibition and seminar series. COMPUFAIR Seattle addresses the informational needs of the consumer and seeks to match them with suppliers of equipment, software and services."

Prices for standard 10' x 10' booths are \$700. Premium corner and/or entrance booths are \$850. The Seattle Center Exhibition Hall places COMPUFAIR Seattle conveniently close to the Seattle business district. Presentation and seminars will be conducted in Mercer Forum, adjacent to the Exhibition Hall. The exhibitors lounge, a snack bar and seating are on the premises. Fine restaurants are within easy walking distance.

Over 20,000 people are expected to attend the three day exposition which is co-sponsored by the University of Washington Alumni Association, Continuing Education of the University of Washington, and KIRO Inc., operator of the CBS Network TV and radio stations in Seattle.

Admission is \$5 each day, which includes participation at the presentations and seminars. For further information contact.

Mr. Tom Ikeda  
CompuFair, Inc.  
909 NE 43rd St., Suite 302  
PO Box 45128  
Seattle, WA 98105  
(206) 633-FAIR

#### THE CHILDWARE CHALLENGE LEARNING IS THE ULTIMATE GAME

Those who draw a distinction between education and entertainment don't know the first thing about either. -

Marshall McLuhan

While millions of children across the nation sharpen their skills at video arcade, controversy surrounds the role of the electronic game as a molder and shaper of our children's minds.

ChildWare Corporation, in Menlo Park, California, offers a new line of microcomputer based software that blends the fun and fascination of electronic play with the latest learning technologies. The result: products which demonstrate the ChildWare credo that "Learning is the Ultimate Game."

ChildWare games are non-sexist, non-violent, and non-combative. They stress collaboration, cooperation, action, enrichment, intellectual development and entertainment. The first six contracted products, scheduled for Fall, 1983 release, will be geared for the 5-8 and 8-12 year-old age groups. Future products will extend to the 3-5 and 12-16 year-old groups as well.

ChildWare games gently guide young users through the exploration and development of their own intellectual skills. A three-year-old playing a ChildWare game can develop and explore conceptual math skills without formally knowing that  $2+2 = 4$ . A six-year-old can play a word matching game without the complication of typing on a keyboard.

Based on a structured application of numerous learning technologies, ChildWare games take an interactive approach to learning. Game players can determine their own speed, timing, and complexity level, and can freeze game action at any time. Gradual increases in game complexity build upon the skills mastered in earlier levels of play. Maximum sound and graphics techniques capture and hold both interest and attention.

ChildWare continues to research and explore a number of disciplines dealing with the acceleration and



facilitation of learning. The R and D team is currently examining links between demonstrated results in the cognitive sciences, accelerated learning methods, knowledge engineering, creativity and mind/brain research. These linked results are applied not only to the ChildWare games, but also to the software development process itself.

The corporation was founded in February, 1983 by Ramon Zamora, Glenn Sherwood, and Craig Harper. Although ChildWare and its products are new to the market, technical, managerial, and research staff expertise stretches back to the roots of microcomputing.

Craig Harper, ChildWare President, recently served as Assistant Executive Director of People's Computer Company. As Executive Coordinator of PCC's ComputerTown project, he developed a National Science Foundation-sponsored research project into a worldwide computer literacy network with over 450 affiliated groups. Ramon Zamora, Vice President of Research and Development, is a well known author of books on computer literacy, as well as founder of the ComputerTown, USA! computer literacy project. Glenn Sherwood, Vice President of Product Development, has extensive experience in the design, development, and effective implementation of user-oriented computer systems. He has been consultant for Xerox Corporation, SRI International, and Tymshare, Inc., and has been a Research Engineer with Stanford Research Institute.

ChildWare welcomes the interest of parents, teachers, children, publishers, and others eager to explore their belief that "Learning Is the Ultimate Game."

For more information, contact ChildWare, PO Box 2348, Menlo Park, CA 94025.

**KEYSTROKE MANAGEMENT(tm)**

The perfect gift for the executive

who has everything - including a Timex/Sinclair computer! This package of four 2K games will turn the corporate pyramid on its point!

It takes more luck than skill to keep your desk when all about you are losing theirs in Musical Desks, while you must find your way through the invisible corporate maze of Corner Office. Office Automation test your ability to survive in the brave, new electronic workplace, and Go To The Top rewards the successful adventure game player with a key to the executive washroom.

Just let your favorite boss (male or female) try to manage this system. Keystroke Management(tm) is better than a Harvard MBA! Great for Father's Day or any day.

Available for \$14.95 (plus 6 percent tax for CA residents) from 2-BIT SOFTWARE, PO Box 2036, Del Mar, CA 92014. Charge orders accepted by phone (619) 481-3629.

"Canada's First Color Computer Magazine"  
On tape

## Canadian Color

FOR THE TRS-80 COLOR COMPUTER  
DRAGON-32 TDP SYSTEM 100

---

Here it is . . . Canada's First COLOR COMPUTER magazine  
On tape  
Published Monthly and LOADED with . . .

- PROGRAMS
- REVIEWS
- HARDWARE TIPS

- BULLETIN BOARD
- PROGRAMMING TIPS
- EDITORIALS

!!! and much, much more !!!

Order your subscription now and save  
\$12.00 over the newstand price of \$2.95

---

PLEASE SIGN ME UP FOR ONE YEAR (12 ISSUES) OF 'CANADIAN COLOR'

Name .....

Address .....

City .....

Province or State .....

Postal Code .....

Payment enclosed

CHEQUE  MONEY ORDER

SORRY, NO CHARGE CARDS

Subscriptions to CANADIAN COLOR are \$24.00 per year in CANADA,  
\$24.00 for the UNITED STATES and MEXICO, plus \$8.00 per year for postage  
outside of CANADA.

Send to: Canadian Color, 2931 Euclid Street  
Vancouver, B.C. Canada V6R5 6C5  
Phone (604) 438-2864

---

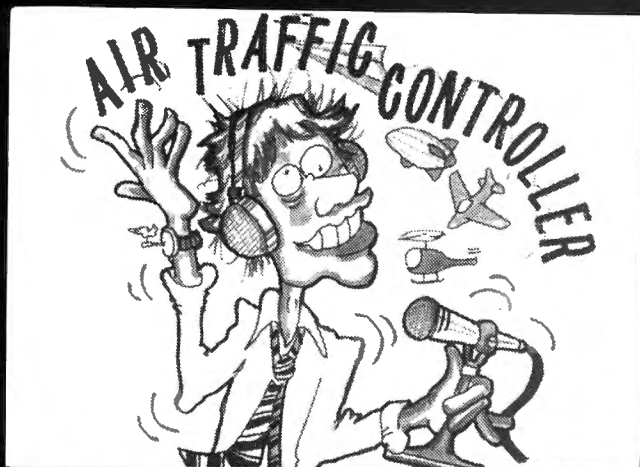


---

## ADVERTISER'S INDEX

Arizin	76	K & K Computers	121
Aurora	93	Leading Edge	Cover IV
BF Software	61	Level IV Products	41
Basic Technology	45	ML-US'R	97
Botek Instruments	39	Mark Data Products	22,23
Canadian Color	129	Micronix Systems	37
Ceratec	115	Micro Technical Products, Inc.	118
Chromasette	113	Microware	58
Cognitec	46	The Micro Works	73
Color Computer Magna-zine	74	Tom Mix Software	Cover III
Color Computer News	29,83	Nanos	117
Color Expo 83	14	Owl-Ware	66
The Computer House	109	Parsons Software	97
Computer Plus	32	The Program Store	111
Computer Systems Center	60	RR Enterprises	36
Computerware	67	The Rainbow	6
Control Craft	42	Rainbow Connection Software	21,72
Creations Unlimited	93	Software Support	79
The Dataman	95	Software Unlimited	54
Derringer	84	Spectrum Projects	103
Dorsett Educational Systems	29	Speech Systems	94
Double Density	53	Star Kits	101
Duggers	87	Strickly Color Software	89
Eigen Systems	57	Sugar Software	99
Emmons Software	41	Synapse	16
Forum Sixty-Eight	29,82	T & D Subscription Software	107
Gimix	Cover II	Transition Technology	61
Great Plains Computer Company	105	Unraveling The Color ROM	71
Hawkes Research Services	51	Viking CC Software	25
A M Hearn	49	Wasatchware	25
HJL Products	123	West Bay	80
Frank Hogg Labs	9,10,11,12	York IO	85
Intellectronics	3	3 G Company	55
International CoCo Club	71	64K Korner	116

---



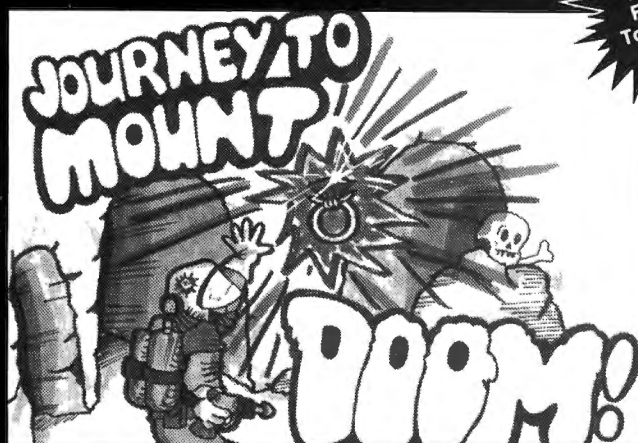
Air Traffic Controller is a computer model of an air traffic control situation in which Remotely Piloted Vehicles (RPV's) are operated by the controller in landing on and taking off from designated runways.

32K Extended Basic  
TAPE 28.95      DISK 31.95



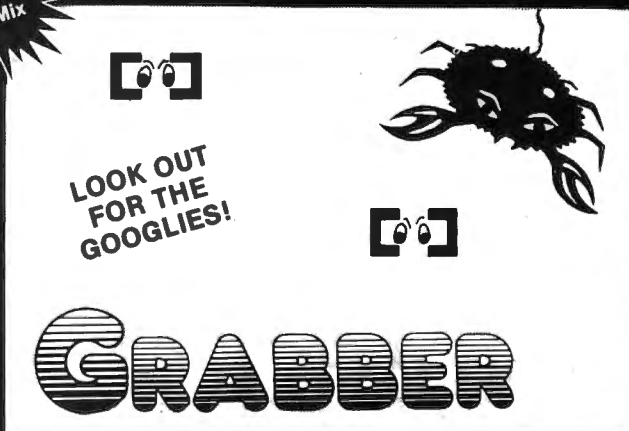
By Ken Kalish  
Devil Assault is a mult-level multi-screen game in which bird-like creatures, robots and the devil himself assault your home base which you must defend.

16K Machine Language  
TAPE 27.95      DISK 30.95



The Necromancer is about to wage war on earth. He needs his lost gold ring to acquire the power to do so. You must find the ring, take it to Mt. Doom and destroy it in the flames from which it came, thus eliminating the Necromancer's evil powers.

32K Machine Language      DISK ONLY 27.95



Arcade Action. Method of play you are the Grabber. The object is to grab the 8 treasures and store them in the center boxes. You start with 3 Grabbers and get extra ones at 20,000 points. Watch out for the googlies! Super high resolution graphics.

32K Machine Language  
TAPE 27.95      DISK 30.95



**TOM MIX SOFTWARE**  
3424 COLLEGE N.E.  
GRAND RAPIDS, MI 49505

To Order Call 364-4791  
To Place Orders After 5:00 P.M.  
Call Our BBS At  
(616)364-8217

- ADD \$1.00 POSTAGE & HANDLING • TOP ROYALTIES PAID •
  - MICHIGAN RESIDENTS ADD 4% SALES TAX •
- LOOKING FOR NEW SOFTWARE



**ARCADE ACTION GAMES**



# TRUNKS FOR THE MEMORIES.



Introducing the most logical place to store Elephant Memory Systems® (or lesser brands of disks): The Trunk.

With its alphabetized library index, you can file or retrieve up to 60 disks, instantly.

The Trunk is made of durable molded plastic with a hinged, one-piece lid, to keep disks safe from dust, dirt, and other detriments which disks despise.

And, it's portable. Because the lid doubles as a carrying handle so your Elephant Memory Systems® disks can go anywhere you do.

There's a model for 5¼" and 8" floppies, as well as a cassette-and-game file and a special Atari® version.

So if you're looking for the best disk storage system on the market . . .

The Trunk is an open-and-shut case.

## THE TRUNK. ENDORSED BY ELEPHANTS.

### Elephant Memory Systems® Disks

*A full line of top-quality floppies, in virtually every 5¼" and 8" model, for compatibility with virtually every computer on the market. Guaranteed to meet or exceed every industry standard, certified 100% error-free and problem-free, and to maintain its quality for at least 12 million passes (or over a life-time of heavy-duty use).*

*Marketed exclusively by Leading Edge Products, Inc., Information Systems and Supplies Division, 55 Providence Highway, Norwood, Massachusetts 02062. Call: toll-free 1-800-343-8413; or in Massachusetts call collect (617) 769-8150. Telex 951-624.*