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Color Computer News

Issue #17 February 1983

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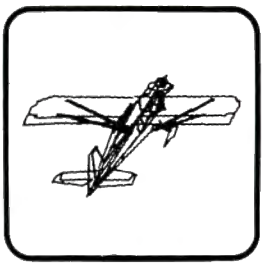

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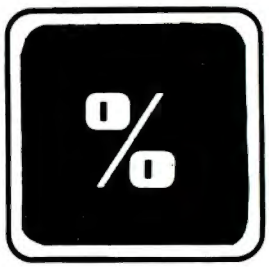

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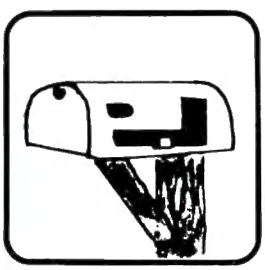

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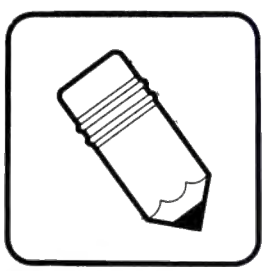

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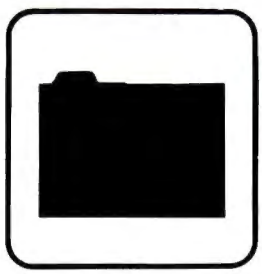

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REMarks

by Bill Sias

I usually hate to go to computer shows, there's nothing for my wife and kids to do while I'm gone all day wandering among all of the amazing new ''do-dads'', but this year I left the kids at home and took my wife to Las Vegas for the Fall Comdex show. The people who promote Comdex must have been surprised by the response this year since they were forced to open the show almost a half hour early due to the tremendous number of people attending. There are some great advantages to a press pass best of which was that I was able to see most of the exibits before the show was opened to the general public.

There really wasn't a great deal of Color Computer items on display other than a 3 inch disk drive system from AMDEK Corp, 2201 Lively Blvd, Elk Grove Village, IL 60007 (312) 364-1180. I was surprised that it used the Radio Shack controller. Wico (Consumer Division, Niles, IL 60648 (800) 323-4014) were showing their joysticks and trackballs for the Color and other computers and Kraft P.O. Box 1268, Vista CA 92083 were showing their joystick as well.

Perhaps the most amazing new ''do-dad'' was the Fujitsu computer 2840 San Tomas Expressway Suite 103, Santa Clara, CA 95051. It contains two 6809s, one as the CPU and another controlling the screen display. I was watching an amazing animated program when the Vice-President hit the break key, sure enough the READY prompt appeared but the stars whizzing past the screen didn't stop! It seems that the last graphics commands continue to execute even though the BASIC interpretter has entered command mode. I was impressed with the speed of the BASIC, the 512 by 492 pixel graphic screen and the ability to mixed high resolution graphics with text. Although none of the people there would verify it for me its rumored that the 64K version will sell for under $600 when the FCC approves it (I suspect it will be approved late summer/early fall). They already have a number of slick peripherals for it, again pending FCC approval, such as digitizers and light pens.

I resently upgraded our GIMIX computer to OS-9 Level II, a 19 MB five inch hard disk and 180K of RAM. This move was phase two of our transition to the new computer. The upgrade went amazingly well, in fact the total down time for installation of everything was less than one afternoon. These changes allow us to use the GIMIX as a multi-user system in a much smoother manner. I'm not sure if it's the speed of the hard disk or the extra memory but most of the time it's impossible to tell the difference between one user on Level I and three on Level II (the only time you can tell is when I've got several processes going that as very disk dependant and I forget to lower their priority). The next step in the transition is to upgrade the RAM memory to 512K and bring the number of users up to 6. Not bad for one 6809!

I dont think this guy uses a 6809 but he was cute.

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IF YOU'RE TIRED OF NO DISK SOFTWARE,

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FLEX is the world's most popular operating system for the 6809 and with over 100 programs, we are the largest supplier of software for FLEX. These programs are NOT games but serious programs for your Color Computer. They range from word processors thru business applications to software development tools. Many Fortune 500 companies use our software.
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Software Catalog

MW OS-9 ASSEMBLER $125.00

A 6809 assembler specially designed for the OS-9 environment using Motorola standard instruction mnemonics.
For OS-9.

MW INTERACTIVE DEBUGGER $50.00

A useful tool for testing and debugging machine language programs or testing hardware.
For OS-9

TSC 6809 CROSS ASSEMBLER $100.00

This assembler runs on 6800 FLEX system with all the features of the 6809 assembler.
For FLEX.

TSC 68000 CROSS ASSEMBLER on 6809 $250.00

An assembler which runs on a 6809 FLEX system and supports full 32 bit math, macros, and conditional assembly.
For FLEX.

TSC DEBUG PACKAGE $75.00

This package is a complete assembler language program debugging tool capable of simulating the functions of the MPU.
For FLEX.

TSC RELOCATING ASSEMBLER/LINKING LOADER:
Just released for FLEX! $150.00

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INFOrmation MAnaGement system designed for any specific application for use by the non-computer expert. Capable of handling almost any collection of data.
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Complete DMS in machine language. Uses include accounting, customer or personnel records, and situations which require data entry, data retrieval and update.

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In TSC XBASIC for FLEX.

MAILING LIST w/source $99.00

Enables the user to define and maintain mailing list oriented data bases.
Written for 6809 FLEX and TSC XBASIC.

DYNACALC Object only $200.00

Faster and more powerful than VisiCalc (tm)! An "electronic" spreadsheet developed to enhance your computer's productivity with a powerful software tool for planning, manipulating data, and probing alternatives.
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TABULA RASA FLEX $100.00
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Provides for the generating and maintenance of tabular computation schemes used for analysis of business sales and economic scenarios.
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INVENTORY W/MATERIAL REQUIREMENT: FLEX $100.00
UniFLEX $150.00

These programs enable the user to define and maintain inventories and include hierarchial materials requirements planning.
Written in 6809 for FLEX.

OSBORNE A/R FLEX $295.00

An open invoice system, will print ageing reports, statements etc.
For FLEX and TSC XBASIC.

OSBORNE A/P FLEX $295.00

An invoice oriented system, will keep track of your vendors and even print checks for you.
For FLEX and TSC XBASIC.

OSBORNE G/L FLEX $295.00

Uses double-entry posting to reduce off-balance situations. Can post to your accounts from A/P, A/R and the Cash Journal.
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Add EDIT to TSC BASIC's, along with DECOMPIL and cross reference.
Written in assembler for 6809 FLEX

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A package of utilities and programs developed to extend the capabilities of the FLEX operating system.
Written in assembler for 6809 FLEX

EXTENDED UTILITIES: Object only $49.95
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A set of 12 utilities that add the final touch to your utilities for FLEX.
Written in assembler for 6809 FLEX

PLOT: w/source $49.95

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Written in TSC XBASIC for 6809 FLEX.

SOME COMMON BASIC PROBLEMS: w/source $69.95

SCBP will allow you to figure income tax, tax depreciation, amortization schedules and more. From the Osborne book by the same name.
Written in TSC XBASIC for FLEX

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SPBP like the above is from the Osborne book. The work of conversion is done for you.
Written in TSC XBASIC for FLEX.

PASSWORD Object only $69.95
w/source $89.95

Will enable you to create a system disk that cannot be booted without knowing the built in password.
Written in assembler for 6809 FLEX

UNIFLEX SIMULATOR FLEX $100.00
UniFLEX $110.00

Debug Uniflex assembler programs using TSC Debug and other facilities of FLEX.
For 6809 FLEX.

OS-9 SIMULATOR for FLEX: FLEX $100.00

Debug OS-9 assembler programs using TSC Debug and other facilities of FLEX. Requires OSM.
For 6809 FLEX.

HELP Object only $29.95
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A data retrieve utility designed to save you time digging through manuals looking for info about computer language commands and statements.
Written in assembler for 6800 or 6809 FLEX

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Allows you to enhance every other program you own.
Written for 6800 or 6809 FLEX

TSC BASIC: PRECOMPILER FOR 6800-6809 $50.00

Allows the user to write BASIC programs in a non-standard BASIC source format.
For FLEX.

TSC FLEX UTILITIES $75.00

A package of additional FLEX utility commands which includes memory dump, prompting delete to name a couple.

TSC FLEX DIAGNOSTICS $75.00

These utilities are designed for FLEX. Included in the memory diagnostics portion are zeroes and ones test, random pattern test and more. Disk examine, modify and test are also included.

TSC SORT/MERGE PACKAGE $75.00

A full-disk sort/merge which allows the contents of any size file to be sorted, including random files.
For FLEX.

READTAPE w/source $54.95
Requires a PIA

Will read TRS-80 Level II BASIC tapes and convert programs to TSC BASIC.
Written for 6809 FLEX.

FULL SCREEN FORMS DISPLAY FLEX $50.00
UniFLEX $75.00

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Written for 6809 FLEX.

GAMES FOR FLEX

ESTHER Object only $39.95
w/source $59.95

An enhanced game of Eliza in fast machine language. Artificial intelligence in pure 68XX code.
Written in assembler for 6800 or 6809 FLEX

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DISK/EDIT: $79.95

Examine and modify OS-9 DISKS with this screen oriented editor.
Written for OS-9.

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For 64K Color Computer

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For FHL Color FLEX only.

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Supports all of the standard BASIC statements and functions as well as many extended capabilities. For FLEX.

TSC EXTENDED BASIC FOR 6800-6809 — $100.00

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TSC PASCAL for 6809 — $200.00

A true native code compiler which produces assembly language mnemonics. For FLEX.

TSC FORTRAN '77: — $275.00

Just released for FLEX - Requires Relocating assembler. $350 with relocating assembler and linking loader. For FLEX.

MW BASIC09 — $200.00

Acclaimed as the most powerful and friendly high-level language available for any microcomputer. For OS-9.

A/BASIC Compiler: — Object only $150.00

Generates pure, fast, efficient 6809 machine code from easy to write BASIC source programs.
Written for 6809 OS-9 or FLEX

X-FORTH — Object only $149.95

An enhanced and extended version of Fig-Forth that runs under FLEX.
For 6800 or 6809 FLEX.

CC-FORTH — $99.95

For the Color Computer DOS, a language that is 5 to 10 times faster than BASIC.

DYNASOFT PASCAL — Object only $69.95; w/source $99.95

A fast integer only P-Code compiler ideal for ROMable applications. Powerful enough for the DynaStar word processor.
Written for 6809 OS-9 ($10 less for FLEX)

MW OS-9 PASCAL COMPILER — $400.00

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For OS-9.

MW CIS COBOL COMPILER — $895.00

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MW FORMS 2 FOR CIS COBOL — $200.00

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Screen Editor: A powerful menu-driven screen editor equally suited to the tasks of program preparation and document processing. Simular to WORDSTAR (tm).
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DYNASPELL — Object only $199.00; w/source $299.00

The most versatile 68XX spelling checker available. Fast and easy to use.
Written in assembler for 6809 OS-9 or FLEX

STYLOGRAPH 2.0: — $295.00

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For 6809 FLEX and OS-9.

READTEST — Object only $54.95; w/source $74.95

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Written in assembler for 6800 or 6809 FLEX

TSC TEXT PROCESSING SYSTEM — $75.00

This system allows the use of over 50 commands for special text formatting applications.
Post processor for FLEX.

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CPM's (CPU Modules) — FLEX $25.00; OS-9 $35.00

Source or binary for the following; 6800, 6801, 6809, 6502, 1802, Z80, and Z8. OS-9 includes 6809 binary.
Will cross assemble source code into object code. (runs on 6809 systems.)
Written for 6809 FLEX and OS-9.

OSM — $125.00

OS-9/FLEX MACRO ASSEMBLER: 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!
Written for 6809 OS-9 or FLEX

SUPER SLEUTH — 6800/6809 w/source $99.00; Z80 w/source $99.00

A set of programs which will enable the user to examine and/or modify binary program files on disk or in memory.
Both written for FLEX, UniFLEX and OS-9.

6502 TRANSLATOR w/source — FLEX $75.00; UniFLEX $80.00; OS-9 $85.00

Enables the user to translate 6502 assembler code into 6809 assembler code.
Written for 6809 FLEX, UniFLEX and OS-9.

DEBUGGING SIMULATORS 6805 or 6502: w/source — FLEX $75.00; UniFLEX $80.00

Programs which enable user to simulate, examine and/or modify object 6805 and 6502 program files on 6800 and 6809 systems under FLEX.
Written for 6809 FLEX and UniFLEX.

PIC/PID 6800 Translator: — FLEX $50.00; UniFLEX $60.00; OS-9 $75.00

Translates 6800 assembler programs to 6809 mnemonics and converts 6809 programs to position independent code and data (Pic/Pid)
Written in assembler for the 6809.

CROSS ASSEMBLER MACROS: — FLEX $50 ea - 3/$100; UniFLEX $60 ea - 5/$120

6800/1, 6502, 6805, 8080/5 and Z80: For use with the TSC Assembler.
A macro text file.

OSM - OS-9/FLEX MACRO ASSEMBLER — $125.00

For FLEX or OS-9, Create FLEX or OS-9 binary files from either FLEX or OS-9. OSM is a MACRO assembler like CRASMB. It is simular to TSC's Assembler, but it has more powerful MACROS. OSM makes it easy to move FLEX programs to OS-9. In OS-9 it gives MACRO capability like TSC's assembler and is compatible with TSC source files. OSM was used by the author to move CRASMB to OS-9.
For OS-9 or FLEX.

EDitor — $50.00

ED has all the features of TSC's editor with the addition of screen type editing, MACRO capability, and a math package. Works with files larger than memory. It has many additional features.
For 6809 FLEX.

ASM - assembler — $50.00

ASM is compatible with TSC's assembler. But with more powerful MACROS and conditionals, than TSC's.
For 6809 FLEX.

MW MACRO TEXT EDITO — $125.00

Combines a minimum keystroke text editor with a macro-driven string processing language. A powerful tool for creation, conversion, or reformatting.
For OS-9.

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DynaStar WORD PROCESSING SYSTEM FOR OS-9

OS-9 USERS:

If your computer has a SCREEN and you're still struggling with an editor that only knows about LINES, then obviously YOU don't know about

DynaStar

DynaStar is a powerful, menu-driven screen editor equally suited to the tasks of program preparation and document processing. With the addition of the optional DynaForm print formatter, it is the best word-processing package you can buy for your OS-9 system.

DynaStar Version II is now available and features no-nonsense "what you see is what you get" editing for virtually any terminal with or without cursor addressing (it must be at least able to go to "home"). To edit, simply place the cursor where you want it, and type. Any printable character you type is entered directly into your text, and any non-printable control character causes immediate execution of an editing command. Single keystroke commands permit movement of the cursor in any direction, by character, tab, word, line, or screen full, and deletion of characters, words (left or right) or a whole line. Two keystroke commands augment this set by moving the cursor to the left margin, top or bottom of the screen, beginning or end of the edit buffer, or the beginning of the next paragraph. You can search for any string, replace with any other, do it again, mark original blocks of text, copy, move or delete blocks, read or write to side-files, set tabs and margins, or center the current line.

DynaStar features automatic word-wrap, and it can right-justify text as you enter it so you will see exactly how it will look *before* you print it. If you later make alterations or change the margins, you can reform the text a paragraph at a time with two keystrokes. For programmers, there is a special automatic indent mode to help you write well-structured code. DynaStar includes a Shell command which lets you do almost anything (including edit another file) without even losing your place in your current document, and it permits editing of large disk files in stages without forcing you to break up your files.

If you want to define more powerful commands, DynaStar includes a macro facility which lets you convert any control character to one or a string of characters of your choice. You can use this feature to create global search-and-replace commands, insert "boiler-plate," or simply re-map your keyboard. You can also provide a special "start-up string" which is automatically executed whenever you enter the editor to set up modes such as auto-justify, display a directory, define your favorite macros, or re-map the keyboard.

For complete word-processing, we offer our DynaForm text formatter which provides all the standard features such as pagination, headers and footers with page numbers, single space, double space, multiple space, **bold face**, **double-strike**, and <u>underline.</u> DynaForm has its own macro facility with string variables, nested include files, a full merge-print capability for generating form letters and mailing lists, and it can generate an index automatically, sorted alphabetically or by page number. You can call it from DynaStar to proof-print the active edit buffer, or by itself to print a disk file while you edit another.

DynaStar II: OS-9 or FLEX	$149.95
CCFLEX Version:	$ 90.00
DynaForm text formatter: OS-9 or FLEX	$149.95
DynaForm CCFLEX Version:	$ 90.00
Both purchased together:	$275.00
Both CCFLEX Versions:	$175.00

AVAILABLE FOR FLEX 9

DynaSpell

From Dale Puckett

FOR OS-9 AND FLEX

DynaSpell is the most versatile 68XX spelling checker available.

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November '82 **MICRO**
"FLEX and the TRS-80 Color Computer"
by Ronald Anderson, Page 23.

November '82 **80 MICRO**
"Color Forth"
by Jake Commander, Page 45.

November '82 **68 MICRO JOURNAL**
"CC FORTH"
by James Perotti, Page 19.

October '82 **RAINBOW**
A comparison of FHL Color Flex to 68 Micro Journal's (Data-Comp) FLEX, Page 64.

February '83 **80 MICRO**
Read the review of our DBASIC for FHL Color FLEX!

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(1 page)
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MAIL CALL

Dear Bill,

Color Computing is pleased to announce that the LA Color Exchange, LA's first Color Bulletin Board is up and running 24 hours a day! The number is (213) 563-7727. Call it up and give it a try!

Sincerely,
Don Brown

Dear CCN,

We just got the November issue here at George Associates and were both suprised and delighted to see the letter by Paula Giese in which she talks about our forthcoming Color Computer Expansion Unit. Yes, such a thing does exist, and it should be available by the time you print this letter. Ms. Giese described our unit rather well, but we thought we should give you a complete rundown on it from the source. Here it is:

The Expansion Unit can be plugged into the cartridge slot of any Color Computer, regardless of internal memory. No modifications are necessary. The unit contains 64K of RAM, a single/double density disk controller, an 80x25 video display with lower case, full video attributes and assorted graphics characters, and a Z-80A. It also contains another serial port, a parallel port, and two expansion busses for additional circuitry. Options include an controller/-talker/listener capability, and a light pen which will work with both our 80x25 and the CoCo's video.

What can an "Expanded" Color Computer do? For starters, you can run the FLEX, OS-9, CP/M, and UCSD p-system operating systems, as well as Color Basic. These are the standard, "big" machine versions, not reduced-memory, shrunken-screen implementations. Running any of these operating systems is as easy as inserting a disk and booting it up. Yes, "any" CP/M software will run on the Expanded Color Computer, without fuss. In fact, this letter is being written on a prototype running WordStar.

Any standard 5.25" disk drives can be used, offering as much as 800k user storage per drive when using an 80 track, double sided dirve. The 64k of RAM we include is in addition to whatever the CoCo has, opening the door to 96 and 128k Color Computers! We are already working on using some of

Mail Call

this extra memory for disk buffering. This, along with an optimized, high speed disk seek algorithm, combines to vastly increase disk access speed. The screen memory and boot ROM are bank switched, so they do not rob from the address space: this is a 64k system which really does have 64k.

The 80x25 display produces composite video with inverted, half-intensity, underlined and blinking characters. A video multiplexer allows either this video or the CoCo video to be displayed on a monitor. Of course, there's no reason why someone couldn't have a TV displaying the CoCo video at the same time a monitor displays the 80x25.

Why add so much power to the Color Computer? We feel the CoCo has a powerful core needing suitable support, which we have designed the Expansion Unit to provide. There is very little a user might need to do that an Expanded Color Computer won't handle, making it perhaps the biggest little computer around.

Sincerely,
Mike Silva
George Associates
PO Box 960
Berkeley, CA 94701

Dear Sirs;

For the Color Computer Users who enjoy their joysticks with games, try this modification to the game "SLITHER" found in the November issue of CCN.

after line 7, insert:

```
8 DEF USR0=&HA9DE
```

replace lines 510-540 with:

```
501 SA=USR0(0)
502 SX=PEEK(&H15A): SY=PEEK(&H15B)
503 IFSY<5THENDY=-1:C=1:GOTO550
504 IFSY>59THENDY=1:C=1:GOTO550
505 IFSX<32THENDX=-1:C=1:GOTO550
506 IFSX>32THENDX=1:C=1:GOTO550
```

Than you for a fine publication;
Hubert Samm, Jr.
Belleville, IL

Dear CCN,

I was very pleased to read my article in September CCN. However, a few things were not clear. The unkown symbol is, as some may have guessed, Omega the symbol for ohms. It is a 33 ohm register that is called for in the modification. Also it is not clear which board revision was used. The modification will work on the revision "D" or revision "E" board. Why bother on the "E" board? So you don't have to remove 8 capacitors from the board. You may use the jumpers for "MEM-SIZE" (between the PIA's) and low/high should be on high.

Then, having discovered that I could no longer use my 8K RAM PACK, because of the 64K mod, I did a little more reviewing and now I have three switches on top of my keyboard (and a pilot light). An on/off switch, a reverse video switch and a 64K/96K switch. With a tiny program in RAM PACK, you can access both pages of 32K RAM from BASIC, and with Disk Extended BASIC (24K ROM), 8K RAM in the PAC, and 64K RAM, the CC has 96K (count 'em) memory.

So when I get all the bugs stomped on, we may see another article here. Questions and suggestions are welcome. Write me,

Chris Hawks
307 Sexauer Ave.
Elgin, Il. 60120

Dear Bill,

Here is another method of improving the utility of the Extended Basic DRAW statement. How often have you wished for an easier way to use variables instead of constants for any DRAW subcommands? I have a lot. Well, guess what! Yesterday I was looking through the messages on the CompuServe Color Computer Special Interest Group, and I came across a message (I don't remember from who, sorry) mentioning how to do it. I looked into it, and I wrote this letter to detail how to do it to the many CCN readers who don't use CompuServe and/or the CoCo SIG.

Its been there all the time, but Radio Shack just never bothered to mention it in the Extended Basic Manual, or any newsletter. I assume the omission was just another error, like the many others you all have undoubtedly found in the manual.

Enough suspense. It simply is this:

Mail Call

wherever you can use a number in a DRAW string, you can instead use an = sign, followed by the variable name, followed by a semicolon. The variable must be numeric, it must be non-negative, it can be subscripted (and the subscript number can be another variable or constant) and its name can be any number of characters long. The semicolon following the variable must always be included. Here are a few examples; the old way on top, and the variable way below:

Example 1:

```
DRAW''C2L16C3D20''
C1=2:C2=3:FL=16:DN=20:
DRAW''C=C1;L=LF;C=C2;D=DN;''
```

Example 2:

```
DRAW''BM50,60;M+15,-60''
Z(1)=50:Z(2)=60:A=15:B=60:
      DRAW''BM=Z(1);,=Z(2);M+=A;-
,-=B;''
```

(Note that if B=-60, DRAW''M+=A;,=B;-'' would give an ?FC ERROR)

I can think of lots of uses for this capability. Among them are the ability to scale shapes in finer gradients than those available with the S command; to make a whole set of shapes (like a graphic alphabet) shorter, wider, taller, etc. By the same amount; and to prevent 'hitches' in lines and corners when using the same shape in 4 and 2 color PMODEs (by using even variables with 4 colors, and even or odd ones for 2 colors).

In reply to Mr. Moade's letter in the October issue, he can find the answer to his disk Vitamin-E deficiency problem in a letter of mine that appeared here a few issues ago, or maybe in 80 Micro. Without going into details, Mr. Moade, unless you are willing to grab a soldering iron and remove C73, C75, and C85 and bypass R73, R74 and R80 (if they aren't dark grey), you'll have to settle with running at normal speed while the disk is attached.

In reply to W.P. Redner's letter, the only way to use as much of 64K as possible with a word processor is to either use a FLEX word processor, or to wait for a 64K version of another word processor, such as Cognitec's Telewriter, which I hear is due out soon. Even with the 64K option installed, unless you can do without all the basic ROM routines, you only have about 30K of free memory.

One final question. I know that Color Computers are going to be sold in department stores as the TDP100, possibly under the RCA label. Does anyone know any specifics on these computers, such as when they'll appear on the shelves, who will sell software for them in the same stores, who will service them, ect.?

Sincerely,
Alexander Benenson
Rochester, NY

, In addition to Telewriter Cer-Comp has a 64K version of their text processor that gives you a 54K text buffer.

Dear Bill,

Please find enclosed a years subscription to your excellent magazine. A good number of the members of our recently formed (3 months) ''Durham 80'C Computer Club'' presently have subscriptions to Color Computer News. Do you have subscription discounts for users groups?

Would much appreciate it if you would advertise the existence of our club to your readers in Canada. I am the secretary of the Durham 80C Computer Club and can be reached at 782 Kenora Avenue Oshawa, Ontario, Canada. Looking forward to more great articles and information.

Regards
Brain Smith
Oshawa, ONT

Color Computer News,

Please warn your readers of the potential trouble which the sockets on the Micro Labs RAM/ROM memory extention board can cause.

Of the 4 sockets on the $24.95 board I purchased - all four had a bad connection in one of the pins.

Its too bad that such an expensive item has to be assembled with such JUNK.

Micro Labs needs a quality assurance program to keep its sales from drooping.

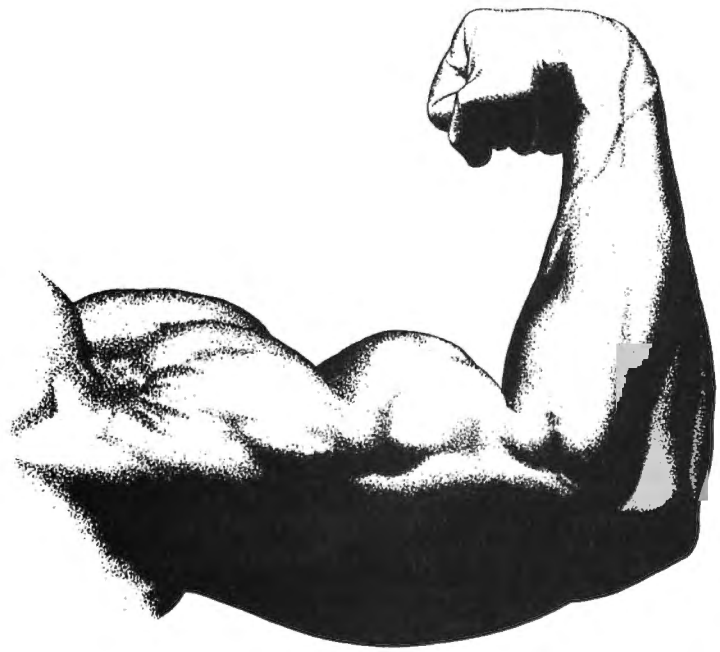
Keep up the good work. The best CC magazine on the market—-BY FAR.

N. Campitell
Syracuse, NY

FLEX CORNER

BOOTING DOS AND DOS COMMANDS

by Roger L. Degler
Micro Technical Products, Inc.
123 N. Sirrine, Suite 106
Mesa, AZ 85201
(602) 834-0283



BOOTING DOS AND DOS COMMANDS

Last month we looked at a few more advantages of a DOS over ROM BASIC and a few disadvantages as well. This month we are going to look at how FLEX is booted from its disk and we'll start looking at the standard FLEX command utility programs.

Sources for FLEX

But first, let's take a look at who is selling FLEX for the Color Computer (just in case you are ready to buy!). As of this date (Nov. 1982) there are three manufacturers producing adaptations of FLEX for our marvelous little gray computer. Each of these adaptations will certainly have some minor differences. Over the next several months I will try to find our what all of these differences are and report them to you. But, bear in mind, the purpose of this column is to study FLEX, which is what all of these adaptations have in common - not their differences. Yet, I feel responsible to inform you of the special advantages (or disadvantages) of each adaptation.

Current vendors are:

Data-Comp
South East Media
P.O. Box 794
Hixson, TN 37343
(615) 842-4601

Frank Hogg Laboratory
The Rgency Tower, Suite 215
770 James Street
Syracuse, NY 13203
(315) 474-7856

Spectal Associates
141 Harvard
Tacoma, WA 98466
(206) 565-8483
(800) 426-1830

Of the three vendors mentioned above, Spectral Associates has been advertising the coming of their version of FLEX for some time now, but still aren't ready to ship it. But, remember, this is being written in November, and so it may be available by the time you read this.

The other two, Data-Comp and Frank

THE ULTIMATE IN COLORCOMPUTING

For the TRS-80 Color Computer and TDP System 100 Personal Computer

Super "Color" Writer II

By Tim Nelson

The Rolls Royce of Word Processors

The **Super "Color" Writer** is a FAST, machine code, full featured, character (screen) oriented word processing system for the TRS-80™ Color Computer and ANY printer. The video display is styled after a professional phosphor (green characters on black background) display for hours of use without eye fatigue (optional orange on black). The unique print WINDOW frees you from 32, 51 or 64 character lines FOREVER! This window can be moved anywhere in the text file, up, down, left or right to display the text as it will be printed without wasting paper. You can create or edit **Super "Color" Terminal** files, ASCII files, BASIC programs or Editor/Assembler source listings. It's simple enough for beginners with 4K and . . . for the professional writer with a 32K disk system and a lot to say, there's plenty of room to say it!

COMPARISON CHART	SUPER COLOR WRITER			THE COMPETITION		
System Size	4K	16K	32K	4K	16K	32K
TAPE: Text space	N/A	7K	23K	N/A	2K	18K
ROMPAK: Text space	2.5K	16K	31K	N/A	N/A	N/A
DISK: Text space	N/A	5.5K	21.5K	N/A	0.5K	16.5K
Right Justify		YES			NO	
Video Window		YES			NO	
Edit any ASCII File		YES			NO	
Programmable Function		YES			NO	

The figures speak for themselves and with professional features like PROGRAMMABLE function string commands to perform up to 28 commands automatically. PROGRAMMABLE text file chaining, PROGRAMMABLE column insert & delete, and right hand JUSTIFICATION with punctuation precedence, the choice is clear but there's still more! In their September '82 issue, "80 MICRO" says, "The Color Computer has finally come of age. Nothing illustrates that coming of age better than this offering (SUPER "COLOR" WRITER) by Nelson Software". The **Super "Color" Writer** takes full advantage of the new breed of "smart printers" with Control codes 1-31, 20 Programmable control codes 0-255 for special needs. Works perfectly with all Epson, Radio Shack, Okidata, NEC, IDS, Centronics, Citoh, Smith Corona, Diablo Etc., Matrix, or Letter Quality Printers.

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User friendly • Easy commands • 32K Compatible • Window • Key beep • HELP table • 128 character ASCII & graphics • Mem left and Mem used • Full cursor control • Quick paging • Scrolling • Word wrap around • Tabs • Repeat all functions • Repeat last command • Insert character & line • Delete character, delete to end of line, line to cursor, line & block • Block move, copy & delete •Global Search, Exchange & Delete • Merge or Append files • Imbed Control Codes in text • Underline • Superscripts • Subscripts • Headers, Footers & 2 Auxiliary footnotes on odd, even or all pages definable position • Flush right • Non-breakable space • 4 centering modes: 5, 8.3, 10 & 16.7 (CPI) • Full page & print formatting in text • Single sheet pause • Set Page length • Line length, Line spacing, Margins, Page numbers • Title pages • Printer baud: 110, 300, 600, 1200, 2400 • Linefeeds after CR • Soft & hard formfeed • Works with 8 bit printer fix • and more!

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The Disk version of the **Super "Color" Writer** works with the TRS-80C Disk System and has all the features listed above plus many more! Use with up to four Disk Drives. Includes an extended HELP table you can access at any time. Call a directory, print FREE space, Kill disk files and SAVE and LOAD text files you've created all from the **Super "Color" Writer.** Print, merge or append any **Super "Color" Terminal** file, ASCII file, BASIC program or Editor/Assembler source listing stored on the Disk or tape. The **Super "Color" Writer Disk** version has additional formatting and print features for more control over your printer and PROGRAMMABLE chaining of disk files for "hands off" operation. Print an entire BOOK without ever touching a thing! Includes comprehensive 90 plus page Tutorial manual.

TAPE $49.95 ROMPAK $74.95 DISK $99.95

Tutorial only $15.00 (Refundable with purchase)

ORDERING INCLUDE $3.00 for shipping in the U.S. & Canada, $6.00 for Foreign orders. C.O.D. add $2.00.

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Super "Color" Terminal

By Dan Nelson

The Ultimate in Smart Terminals

The **Super "Color" Terminal** turns the Color Computer into a Super-smart terminal with all the features of VIDEOTEX™ plus much more. COMMUNICATE with Dow Jones & Compuserve and with computers like the TRS-80™ MODEL I, II, III, APPLE etc., via moden or RS-232 direct! Save the data to tape or print it! Reduces ON-LINE cost to a minimum!

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10 buffer size settings from 2-30K • Buffer full indicator • Prints buffer contents • Full 128 ASCII keyboard • Compatible with **Super "Color" Writer** files • UPLOAD & DOWNLOAD ASCII files, Machine Language & Basic programs • Set RS-232 parameters • Duplex: Half/Full • Baud Rate: 110, 300, 600, 1200, 2400, 4800 • Word Lengths 5, 6, 7 or 8 • Parity: Odd, Even or None • Stop Bits: 1-9 • Local linefeeds to screen • Tape save & load for ASCII files, Machine code & Basic programs • Unique clone feature for copying any tape.

Super "Color" Terminal Disk

The disk version of the **Super "Color" Terminal** works with the TRS-80C Disk system and has all the features listed above plus many more! Use with up to four Disk Drives • Call a directory, print FREE space, kill disk files, save and load text files or BASIC programs • Echo ability in full duplex • Lower case masking • 10 Keystroke Multiplier (MACRO) buffers that can be saved on disk to perform repetitive log-on tasks and send short messages (up to 250 characters each) • Programmable prompt or delay for send next line • Selectable character trapping • Set printer Baud rate to 110, 300, 600, 1200, & 2400 • Operators Manual.

TAPE $39.95 ROMPAK $49.95 DISK $69.95

Operators manual only $10.00 (Refundable with purchase)

NEW!!

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Correspondence-Mailmerge

The **Super "Color" Mailer** is a powerful multi-purpose file merging program that uses files created by the **Super "Color" Writer II.** One of **Super "Color" Mailer's** most popular uses is producing customized form letters — at a fraction of the time and expense of individually typed letters. With **Super "Color" Mailer** you can combine a **Super "Color" Writer II** file containg a form letter with a file containing a list of names and addresses. You can even insert special words and phrases — unique to each addressee — into the body of the letter. Other **Super "Color" Mailer** uses include creating invoices, printing mailing labels, addressing envelopes, and producing "boiler plate" legal documents out of many different paragraphs. Features include: the ability to selectively print mailing lists by any of up to 10 user definable fields • automatically prints current date • address • salutation • closing • P.S. etc. • prints any ASCII file • justification.

TAPE $39.95 DISK $59.95

NEW!!

Super "Color" Disk-ZAP

The Ultimate in Disk Repair Utilities

A must for ALL Color Computer Disk system owners. A high-speed machine code Disk Utility that can copy sectors and tracks • repair directory tracks and smashed disks, etc. **Super "Color" Disk-ZAP** has a special screen display that displays sector, track and memory contents in HEXADECIMAL and ASCII at the same time with double cursors that can be moved in any direction. With **Super "Color" Disk-ZAP** you are able to verify or modify disk sectors at will. You can even type right onto the Disk! You can send sector contents to the printer or any other RS-232 device in either ASCII or HEXADECIMAL listing. Search the entire Diskette for any ASCII or HEXADECIMAL string. Comes complete with comprehensive manual.

DISK ONLY $69.95

COMING SOON!!

Super "Color" Calc

Electronic Spread Sheet

The finest electronic spread sheet and financial modeling program available for the Color Computer — A sophisticated yet easy to use, calculating and planning tool. Project figures into the future to answer the "What if?" questions you face. Create files compatible with the **Super "Color" Writer II.** Combine spread sheet tables with your documents to create ledgers, projections, statistical & financial reports & budgets.

AVAILABLE AT DEALERS EVERYWHERE. IF NOT, ASK WHY!!

TRS-80 is a registered trademark of the Tandy Corp.

Super "Color" Writer II

A "ROLLS ROYCE" FOR YOUR COLOR COMPUTER

If you are contemplating buying a word processor for your TRS-80C Color Computer or TDP System 100 Personal Computer, look no further!! The ***Super "Color" Writer*** is the most powerful and most versatile word processor available. This ***user-friendly*** program gives you many times the power and speed, and **MORE MEMORY** than any other word processor for your computer. The ***Super "Color" Writer*** does it all!

No other program lets you fully use every capability built into your printer, ***AND WITH EASE!*** **Emphasis,** *italics,* **double strike,** normal mode, compressed, **elongated-compressed mode, and** ***ELONGATED EMPHASIZED ITALICS*** are at your fingertips, all within **JUSTIFIED** text. Underlining is a breeze! All the parameters for proper page formatting (margins, page length, etc.) are fully alterable. Yet, without changing a single thing you can print text perfectly the first time.

Don't think for a minute that the ***Super "Color" Writer II*** won't work with your letter quality printer. There's no reason you can't give H_2O its proper name or have footnotes.[1] As for bold print, underlining, proportional spacing, **super bold** or any other printer-controlled function - if your printer has it, the ***Super "Color" Writer II*** can do it! You can also freely exchange thimbles or daisy wheels to change to italics, or to a totally different typeface with the pause print feature.

And the ***Super "Color" Writer II*** has the exclusive **WINDOW** to make your formatting pleasant and perfect. Enter the window to view your whole text as it will be sent to the printer, **whatever your margins, from 1 to 200 or more!** No longer will you be tied to seeing only 32, 51, 64 or whatever number of characters on a line. You can see that your text is centered, headers and footers are always properly placed, and your columns are correct.

With the ***Super "Color" Writer II*** screen editing is a snap; the commands are powerful and hard to forget. You can edit all your BASIC PROGRAMS TOO! With all these features, you must surely agree that this is the **"ROLLS ROYCE"** of word processors. To learn more, refer to the Nelson Software Systems ad in this magazine. And don't forget that the ***Super "Color" Writer II*** is only one important part of the ***Super "Color" Library***, which includes the ***Super "Color" Terminal***, the ***Super "Color" Mailer***, the ***Super "Color" Disk-ZAP*** and the soon to be released ***Super "Color" Calc*** and ***Super "Color" Database.*** No other company gives you such outstanding products and support. **You can buy theirs now and ours later, OR you can save your money and get the best from the very start!**

This document was prepared using a ***TRS-80(TM) Color Computer,*** the ***Super "Color" Writer II,*** an ***Epson MX-80 Graftrax Plus (TM),*** and an ***NEC Spinwriter 3510 (TM)*** to illustrate the great flexibility in formatting allowed by the ***Super "Color" Writer II.***

Spinwriter is a trademark of NEC Information Systems, Inc. MX-80 Graftrax Plus is a trademark of Epson America, Inc.
TRS-80 and TDP System 100 Personal Computer are trademarks of the Tandy Corporation.

Flex Corner

Hogg Laboratory, have been shipping for several months now. I now have both of these versions at my disposal and will soon have a good feel for their abilities.

How FLEX is booted

And now, on with the good stuff. Back in the November 1982 issue I stated that most systems which run FLEX use a Monitor ROM to load it from a disk into RAM. However, the Color Computer has no such ROM. Add to this the fact that FLEX-9 (the "—9" indicates tht we are talking about the 6809 version and not the 6800 version) must load at addresses $C000 thru $DFFF (the dollar signs mean hexidecimal). But, Radio Shack's DISK BASIC ROM resides at these same addresses. So, how is this conflict resolved?

The answer is really quite simple. By switching the system into the 64K RAM mode all of the BASIC ROMs are disabled and RAM is substituted in their place. The ROMs which span memory address $8000 thru $DFFF are replaced with RAM which spans memory addresses $8000 thru $FEFF. Switching into this 64K mode is accomplished by writing any data to address $FFDF. This sets the Map Type bit in the SAM (Synchronous Address Multiplexer) chip selecting the 64K mode (also known as Map Type 1) and deselecting the ROMs. Writing any data to address $FFDE will clear the Map Type bit in the SAM disabling the upper 32K of RAM, and return the ROMs back into the system's domain (also known as Map Type 0).

Take note, however, that although the above could be accomplished with POKE &HFFDF,0 and POKE &HFFDE,0, the earlier of these two statements will undoubtedly cause your system to crash. Not permanently of course, but you will have to press the Reset switch or maybe even turn power off and back on again to regain control. This is because when the ROMs (which contain the BASIC operating system) are disabled and the upper 32K of RAM is enabled in place of the ROMs, what is contained in this RAM% Junk, that's what! And, when the BASIC operating system disappears and Junk is substituted in its place, the system will obviously crash.

And so, it becomes clear that this transition from Map Type 0 to Map Type 1 must be done very carefully. In fact, it must be done by a machine language program which resides in the bottom 32K of RAM. This is because the bottom 32K of RAM is the only section of memory that remains stationary when the Map Type transition is performed.

Now things are really going to get deep. We all know from reading the FLEX ads that FLEX can be booted (that is loaded and executed) by simply typing RUN "FLEX". We also know that when we use the RUN command to load a program, this program MUST be written in BASIC. So, what about the machine language program we mentioned above? Simple — the BASIC program which we loaded via the RUN command loads the machine language program from the disk and starts it executing.

This machine language program must consist of at least the following:

1) The necessary logic to make the transition from Map Type 0 to Map Type 1.

2) A disk driver routine. That is to say a routine to read data from the disk, since the routine to do this in the BASIC system disappears when the ROMs are disabled.

3) The logic necessary to load FLEX from the disk into RAM addresses $C000 thru $DFFF, plus whatever extra each particular adaptation may require, and to start FLEX executing after it has been loaded.

We now have FLEX up and running. But, there is another problem to overcome — the ROM BASIC disk format is not the same as the FLEX disk format. In other words, ROM BASIC writes data, including the disk directory, on the disk differently than the way FLEX does. This makes the two systems incompatible, yet they both must reside on the disk in order for ROM BASIC to carry out the RUN "FLEX" command and for FLEX to be loaded and execute correctly. How is this done?

It is indeed fortunate that the two systems are different. ROM BASIC stores its system information and disk directory on track 17. FLEX stores its system information and directory on track 0. Because of this difference it is possible for both systems to

utilize parts of the same diskette. It is, however, still necessary to take additional steps to keep the two systems out of each others hair. This is done in a two fold manner.

First, ROM BASIC's File Allocation Table (FAT) on track 17 of the disk is dummied up so that ROM BASIC thinks that the entire disk is full, even though, in actuality, it is not. If, under ROM BASIC, you execute the DIR command you will see only 1 or 2 small files on the disk. However, since ROM BASIC thinks there is no more available room on the disk it will respond with a DF (Disk Full) error if you try to write any new files to this disk. This keeps ROM BASIC from encroaching upon FLEX's area of the disk.

Secondly, FLEX is kept apart from ROM BASIC's area of the diskette by modifying FLEX's free chain. As we discovered before, FLEX keeps track of disk space by individual sectors instead of by granuals like ROM BASIC does. Files longer than one sector are created by 'linking' two or more sectors together into a chain. The first two bytes of every sector are used by the FLEX system as a 'pointer' to the next sector in the chain. If this pointer equals $0000 then this is the last sector in the chain.

All unused sectors on a FLEX disk are linked together into a chain called the 'free chain'. On a freshly formatted FLEX disk every sector on the disk is linked into the free chain except for the system information sectors and the directory. Therefore, the entire disk contains only one chain consisting of all the sectors on the disk (except those mentioned) with each sector's pointer set to point to the next physical sector on the disk — and this entire chain becomes the free chain. It becomes the free chain because on a freshly formatted disk all of these sectors are available for allocation to new files.

Since the free chain is the source from which FLEX gets all of the sectors it will allocate to various files, it is possible to keep FLEX out of ROM BASIC's section of the disk. This is done by breaking the free chain at the end of track 16 and setting the pointer in this sector to point to the beginning of track 18, thereby eliminating the entire track 17 from the pool of sectors available to FLEX.

And there you have it. FLEX and ROM BASIC can now reside on the same diskette and not interfere with one another. Also, the ROM BASIC portion of the disk may be used to boot FLEX into memory and start it executing.

Comparison of commands

As an introduction to our discussion of FLEX's commands, let's compare ROM BASIC's available disk commands with FLEX's. The following is a list of these commands. Obviously, ROM BASIC has many more commands, but, they are not directly relevant to the disk drive. The list indicates which commands in the two systems compare most favorably in terms of disired effect.

ROM BASIC	FLEX
DRIVE	ASN
DIR	CAT/DIR/FILES
?FREE	CAT/DIR/FREE
DSKINI	NEWDISK
BACKUP	COPY/BACKUP
COPY	COPY
KILL	DELETE
LOAD	*
LOADM	GET
MERGE	APPEND
RENAME	RENAME
SAVE	*
SAVEM	SAVE
VERIFY	VERIFY
	BUILD
	DATE
	EXEC
	I
	O
	P
	JUMP
	LINK
	LIST
	PRINT
	PROT
	QCHECK
	TTYSET
	VERSION
	XOUT
	MON
	/DUMP

Flex Corner

/ECHO
/EXTRACT
/FIND
/HECHO
/MAP
/MEMEND
/RUN
/ZAP

Note: any command name following a slash (/) is an optional program — most of which are included in the optional Utilities package — and all of which are useful. Also note that an asterisk (,) indicates that this command is available under TSC's BASIC or XBASIC which runs under FLEX.

The FLEX commands

We are now going to begin an in-depth look at FLEX's command utilities. We are going to include the standard utilities that come with all adaptations of FLEX and several optional ones which I find extremely useful as well.

In the dialog that follows, and in my examples, I have used the comma as the delimeter (or separator) between fields (or items). In most cases a space may be used instead of the comma, and so the decision of which to use is left up to you and your preferences.

Command: CAT

We have talked about the CAT command to some degree before. You should recall that it is quite similar to ROM BASIC's DIR command. But, there are many features to the CAT command which we have not yet uncovered. The general syntax of the CAT command is:

CAT[,'drive list'][,'match list']

where 'drive list' can be one or more drive numbers separated by commas, and 'match list' is a set of name and extension characters to be matched against names in the directory. Note that the items shown within square brackets ([]) are optional, and need be specified only if you desire their corresponding features.

The drive list specification can be handy if you want to list the names of files from more than one disk at a time. For instance:

+ + + CAT 0,1

will produce a full directory listing of the disks in both drive 0 and in drive 1.

The 'match list' specification is extremely handy for selecting only certain files of interest. For instance, if you wanted to see only those programs beginning with the letter A, then you could enter;

+ + + CAT A
+ + + CAT 1,A
+ + + CAT 0,1,A

Each example would produce a listing of only those files beginning with the letter A. The first would list files from the current Working drive (we will discuss the concept of the Working drive menu when we discuss the ASN command), the second would list files only from drive 1, and the third would list the files from drives 0 and 1.

To list only the files which are made up of ASCII text, you might type the following;

+ + + CAT .TXT

Or, to list all BASIC programs which begin with the letters XY, you would enter;

+ + + CAT XY.BAS

This example would list files with names like XYZ.BAS, XY1.BAS, XY2.BAS, and XYPROG.BAS.

No matter what you specify for the 'drive list' and the 'match list', when the listing is produced, it looks like this:

CATALOG OF DRIVE NUMBER 0
DISK:disk-name #num

NAME	TYPE	SIZE	PRT
FLEX	. SYS	30	WD
PRINT	. SYS	01	D
ERRORS	. SYS	09	W
CAT	. CMD	03	
COPY	. CMD	06	

Flex Corner

```
LETTER      . TXT     04
PROG1       . BAS     02
PROG2       . BIN     01
```

SECTORS LEFT = xxx

Where 'xxx' is the number of free sectors remaining on the disk and 'disk-name' and 'num' were specified at the time the disk was formatted via the NEWDISK command. SIZE is the number (in decimal) of sectors assigned to the file. PRT is an indication of protection attributes assigned to the file. W indicates that the file is write protected and D indicates that the file is delete protected.

Command: DIR (optional)

The DIR command is similar to the CAT command. The general syntax of the DIR command is:

DIR[,'drive list'][,'match list']

where 'drive list' and 'match list' follow the description given in the CAT command exactly. DIR lists the following information about every file it displays:

File name and extension
File number
Random access indicator
Starting disk address in hex (track-sector)
Ending disk address in hex (track-sector)
File size in sectors
Creation date
Protection attributes

In order for the display to look decent you must use a display screen at least 64 characters wide. This wide screen is provided by both vendors now shipping FLEX for the Color Computer. If you use a screen width of less than 64 characters then each line of the DIR listing will wrap onto a second line. The display looks as follows:

```
DIRECTORY OF DRIVE NUMBER 0
     DISK:disk-name   #num CREATED:
17-JUL-82

FILE#  NAME     TYPE   R  BEGIN  END    SIZE  DATE        PRT
    1  FLEX     . SYS     01-01  02-0C  30    17-JUL-82   WD
    2  PRINT    . SYS  R  02-0D  02-OD  01    17-JUL-82   D
    3  ERRORS   . SYS     02-0E  03-04  09    17-JUL-82   W
    4  CAT      . CMD     03-05  03-07  03    17-JUL-82
    5  COPY     . CMD     03-08  03-0C  05    17-JUL-82

FILES = 5, SECTORS = xxx, LARGEST = 30, FREE = yyy
```

Command: FILES

The FILES command is similar to the CAT command except that it only lists the file names and extensions. The file names are listed in a columnar form, showing 5 names per line. It does require an 80 character wide display to look good, and so you will probably only use the files command to produce directory listings to your printer. It is handy for generating shorter directory listings than are created by the CAT or DIR commands. The general syntax of the FILES command is:

+ + + FILES[,'drive list'][,'match list']

where 'drive list' and 'match list' follow the description given in the CAT command exactly.

Command: DATE

The DATE command is used to display or update FLEX's date information. The general syntax of the DATE command is:

+ + + DATE[,'month,day,year]

where 'month' is the number of the current month (1 thru 12), 'day' is the number of the day within the month (1 thru 31), and 'year' is the last two digits of the current year. As an example:

+ + + DATE 11,29,82

If you enter the DATE command followed immediately by the ENTER key instead of the date numbers, then the current system date information will be displayed. As an example:

```
+ + + DATE
NOV 11, 1982
```

FLEX CORNER

Next Month....

Well, that's about enough for this month. After all, we don't want to get a headache. Next month we will continue looking in detail at FLEX's commands. 'Til next month....

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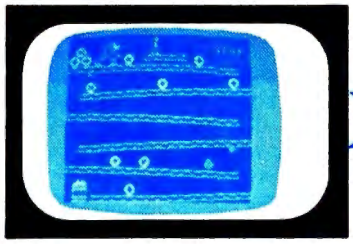

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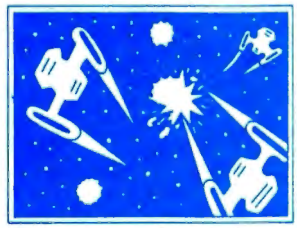

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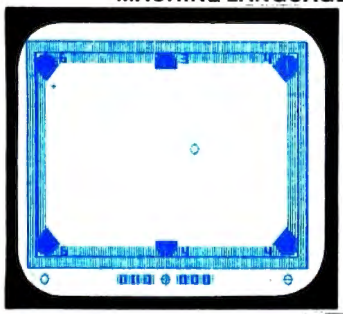

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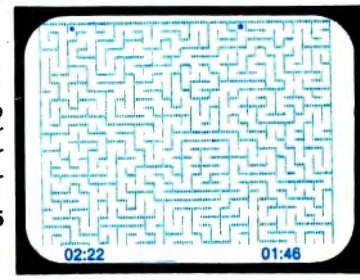

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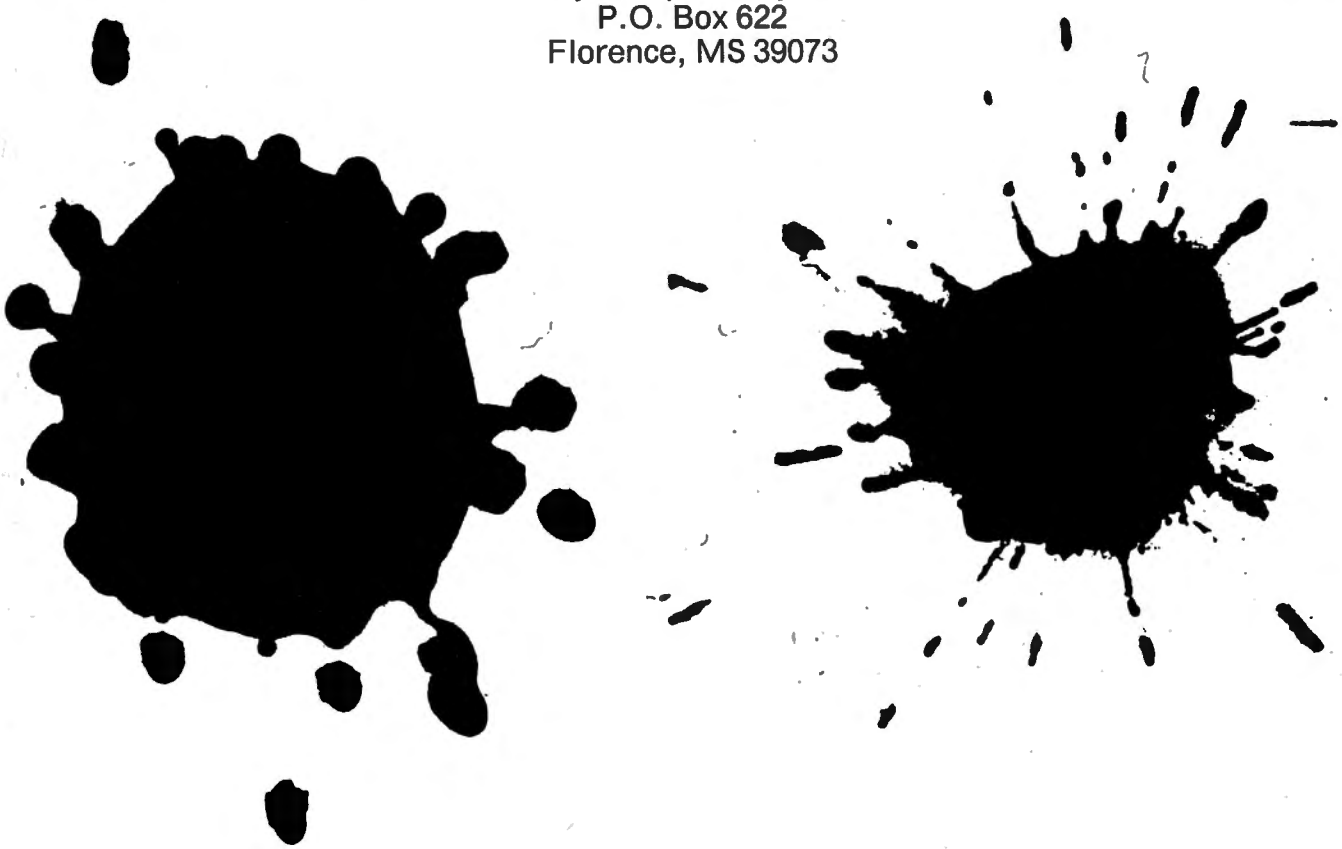

For those with the TANDY Corp. LINE PRINTER VII this could save MONEY. We all know that the going price for the cassette ribbon for the L.P. VII is $8.65 (plus any taxes), and, as you've all noticed, the suppliers that offer discount prices on cassette ribbons for other printers (both TANDY'S and others), seem to leave out of their listing the L.P. VII printer. Well, you don't have to wait until the ribbon gets dim and then start applying 3-in-1 oil, etc., to the ribbon. No sir.... The cassette comes apart and there is a re-inkable roller inside one of the two cassettes.

First, remove the cassettes, as you are instructed to do, and before laying it on the table - turn 'em over. Now, the cassette on YOUR lefthand side (the one installed nearest the Printhead rest position) has a small gear and a foam wheel inside. Examine this cassette carefuly and you'll notice that the bottom (the top now that it's turned over) can be removed by the carefull use of a small screwdriver, or knife blade. Pry gently, as the top is held on by two tits that fit into two holes in the base. When loose, carefully remove and lay aside.

Inside you will see that, as the ribbon enters the cassette (after passing the printhead), it goes around a small plastic gear. This gear, in turn, presses against a larger foam wheel. That's the re-inker (you didn't think the short ribbon had all that ink in it, did you). Lift the foam wheel out and apply some inkpad ink (I used CARTER'S #442 numbering machine ink) to it at the top and around the side of the foam. Don't soak it, just a few drops from the brush that comes in the ink bottle will do. It will slowly sink into the foam.

Now, replace the wheel in the cassette by settling the wheel hub into it's cup in the cassette. The top can now be replaced CAREFULLY. When about to snap the top and bottom together take a small knife blade, or a piece of wire, and insert it between the two pieces to assist the other half of the foam wheel hub into the other cup on the top piece. Now you can snap it together. Thats it!

The other cassette, that is installed and removed first (according to the instructions printed on the heel-I mean printer) contains a spring-loaded pressure plate around which

Re-Inking Ribbons

the ribbon is pulled and merely supplies tension to the ribbon cassette system. What happens during operation, is that, as the ribbon is printed on, it is pulled past the advancing printhead and into the lefthand cassette. There, due to the tension on the ribbon, it turns the little gear you saw in the lefthand cassette. This little gear, in turn, both turns the foam, ink-loaded, wheel and in doing so, picks up some ink and applies it to the ribbon itself. Clever, eh?

Now, as long as the ribbon itself (which is probably made out of nylon) doesn't fray, which will eventually happen due to pounding of the printhead pins, you can, when necessary, re-ink again. You won't have to re-ink any more often then you would have to go out and BUY a new ribbon, and depending on the amount you print, could certainly be MUCH cheaper than dipping into the 'ole wallet. Just remember, you don't need more than enough ink to coat the top and bottom of the wheel and brush around the circumference. Too much ink and you may blot your paper, etc., so be stingy with the ink - if its too little, next time apply a little more. Also, save those old cassettes, if you haven't thrown them out, and you can re-ink them and save them (I wrap my spares in Plastic Wrap so the ink doesn't dry out in the exposed ribbon).

Thats it. I hope in these hard economic times I've helped someone with this hardware idea.

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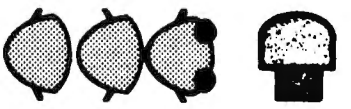

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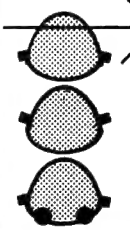

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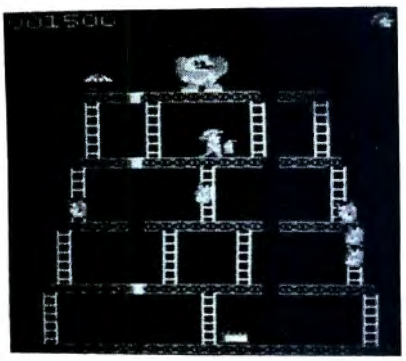

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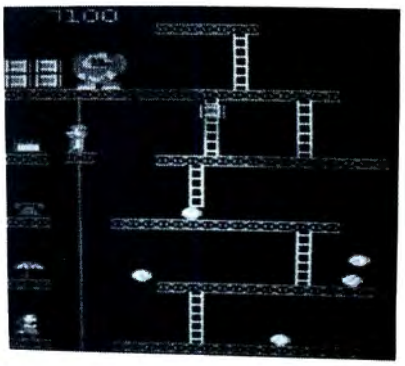

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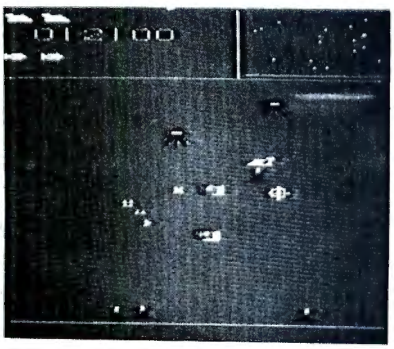

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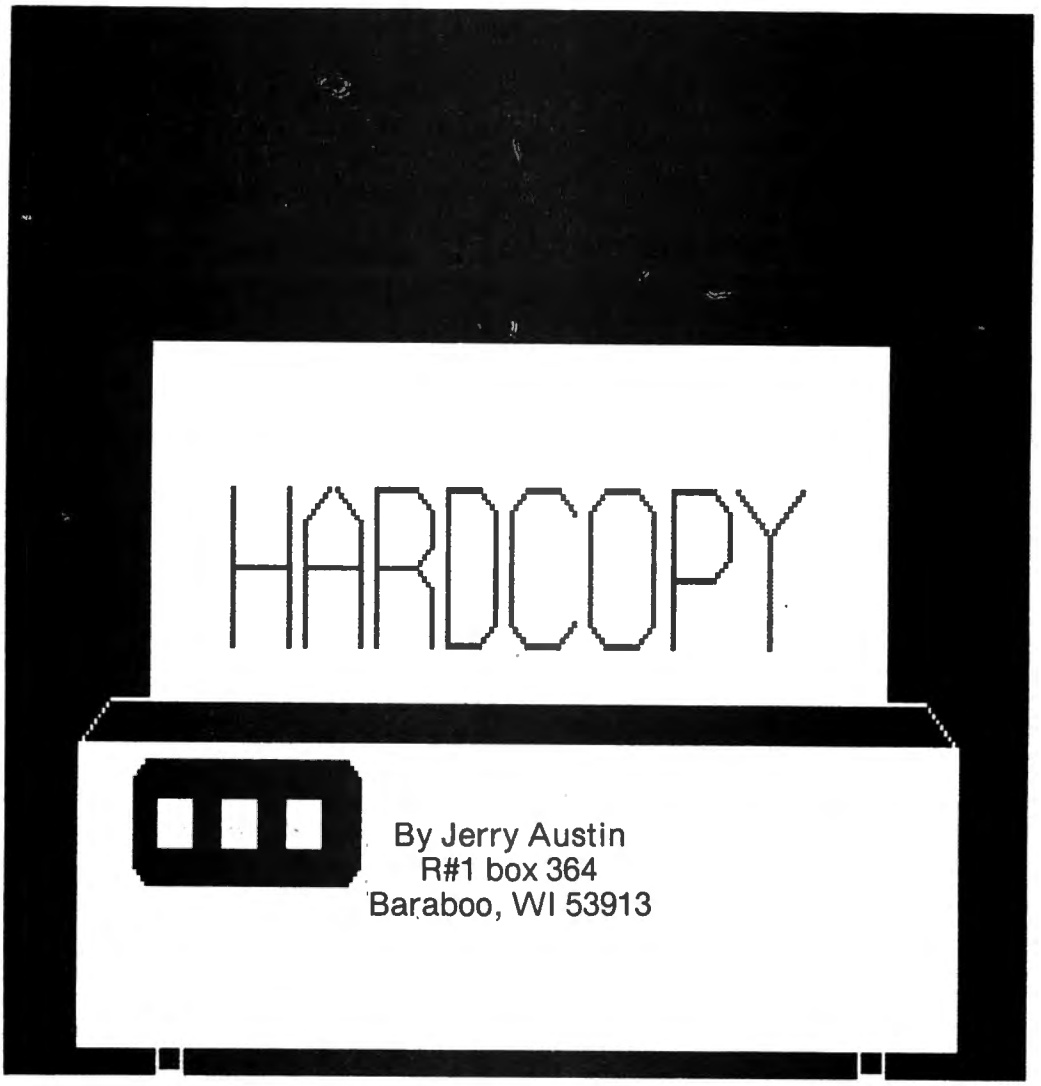

By Jerry Austin
R#1 box 364
Baraboo, WI 53913

The purpose of this program is to print the 80C graphics screen on a line printer. What is different is that it does not require the printer to have a graphics ROM. It only needs to be able to print Model I graphics characters that are standard in many popular printers. In order to do this it takes the 49,152 screen pixels on PMODE 3 or 4 and converts them into 8,192 Model I graphics characters. The common denominator used is 24 for this conversion. The reason for this is that the screen is by bytes and the Model I graphic characters are ASCII.

Each byte of screen memory displays eight pixels in PMODE 4 or four double width pixels in PMODE 3. A Model I graphic character is made up of six pixels arranged as two across by three down. In order to convert from screen pixels to graphic characters we take the first two bits of the first screen bytes, then the first two bits of first byte in the next line (+32 bytes), then the first two bits in the first byte in the third line (+64 bytes) to make up one graphic character. We then do this again with the next two bits in each of the bytes until we have changed twenty-four bits into four graphic characters of six pixels each. The count of the rows is done in Basic and four characters are converted with each count. They are passed to Basic by PEEKing them out of high memory.

The main body of the program is in Basic and provides a cover page and display for a sample printout and also provides the driver for the machine code. It also allows for easy conversion to Disk as the screen memory is in a different location when the Disk system is in use. Also by using Basic in sending the characters to the printer it makes it simple to send a carriage return when it is required.

I used EDTASM+ to write the machine code. There are two parts to this code. The first is a sound routine for the cover page that is 100 bytes long. The second part does the conversions for the printout. The printout

takes about 4 minutes and prints at about 30 cps. The printout is about the same size as the screen display if you have a thirteen inch monitor. The copy produced is not exactly proportional to the screen but gives a faithful reproduction of its content.

If you do not wish to type and assemble the program yourself I will supply it on tape for $4.50 to cover postage and handling.

```
1 '   ************************
2 '   *      HARDCOPY        *
3 '   *         BY           *
4 '   *    JERRY AUSTIN      *
5 '   *    RTE 1 BOX 364     *
6 '   *  BARABOO,WI.53913    *
7 '   ************************
10 PCLEAR4
20 CLS
30 CLEAR 540,15500
40 DS=PEEK(188)
50 IF DS>6 THEN GOTO 950
60 PRINT@231,"ONE MOMENT PLEASE"

70 DIM F(50),G(50),H(50),I(50)
80 PMODE 4,1
90 DEFUSR0=15500
100 DEFUSR1=15601
110 'DRAW HARDCOPY
120 PCLS
130 LINE(0,0)-(150,32),PSET,BF
140 DRAW"C0;BM3,2;D14ND14R14NU14
D14BR4U22NE6D8R14U8NH6D22BR4U28R
10F4D6G4NL10F4D10BR4U28R8F4D20G4
NL8BR12H4U20E4R8F4BD20G4NL8BR12H
4U20E4R8F4D20G4NL8BR9U28R10F4D8G
4NL10BR14U8NH8NE8D20
150 'PUT IT AWAY
160 GET(0,0)-(150,8),F,G
170 GET(0,8)-(150,16),G,G
180 GET(0,16)-(150,24),H,G
190 GET(0,24)-(150,32),I,G
200 'DRAW PRINTER
210 PCLS
220 PMODE 4,1
230 DRAW"BM18,186;U54E8R204F8D54
L220BR20D6R6U5R170D5R6U5
240 DRAW"BM35,134;R50F4D16G4L50H
4U16E4
250 LINE(20,132)-(238,132),PSET
260 LINE(20,160)-(238,160),PSET
270 PAINT(22,134),5,5
280 LINE(38,142)-(46,150),PSET,B
F
290 LINE(54,142)-(62,150),PSET,B
F:LINE(70,142)-(78,150),PSET,BF
300 SCREEN 1,1
310 'START PAPER DISPLAY
320 GOSUB 710
330 LINE(36,124)-(220,112),PSET,
BF
340 GOSUB 710
350 LINE(36,112)-(220,100),PSET,
BF
360 GOSUB 710
370 LINE(36,100)-(220,92),PSET,B
F
380 PUT(53,116)-(203,124),F,AND
390 GOSUB 710
400 LINE(36,124)-(220,84),PSET,B
F
410 PUT(53,116)-(203,124),G,AND
420 PUT(53,108)-(203,116),F,AND
430 GOSUB 710
440 LINE(36,124)-(220,76),PSET,B
F
450 PUT(53,116)-(203,124),H,AND
460 PUT(53,108)-(203,116),G,AND
470 PUT(53,100)-(203,108),F,AND
480 GOSUB 710
490 LINE(36,124)-(220,68),PSET,B
F
500 PUT(53,116)-(203,124),I,AND
510 PUT(53,108)-(203,116),H,AND
520 PUT(53,100)-(203,108),G,AND
530 PUT(53,92)-(203,100),F,AND
540 GOSUB 710
550 LINE(36,124)-(220,60),PSET,B
F
560 PUT(53,108)-(203,116),I,AND
570 PUT(53,100)-(203,108),H,AND
580 PUT(53,92)-(203,100),G,AND
590 PUT(53,84)-(203,92),F,AND
600 FOR D=1 TO 3000:NEXT
610 'MAIN LOOP
620 PRINT@226,"DO YOU WISH INSTR
UCTIONS Y/N"
630 INPUT A$:IF A$="Y" THEN GOSU
B 730
640 CLS:PRINT:PRINT" DO YOU WISH
 TO LOAD A FILE Y/N"
650 INPUT S$:IF S$="Y" THEN GOSU
B 1000
660 PRINT:PRINT"    HAVE PRINTER
READY OR YOU        WILL HANG UP"
:GOSUB 980
670 GOTO 840
680 CLS:PRINT:PRINT"  DO YOU WIS
H TO CONTINUE Y/N":INPUT R$:IF R
$="Y" THEN GOTO 640
690 END
700 'PRINTER SOUND ROUTINE
710 Y=USR0(0):RETURN
```

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```
720 'INSTRUCTION DISPLAY
730 CLS:PRINT:PRINT"   HARDCOPY
MAKES PRINTOUTS OF   THE GRAPHIC
S SCREEN. YOU MAY    USE PMODE 3
 OR 4 WHEN PRINTING."
740 PRINT"   THIS PROGRAM CHANGE
S THE       GRAPHICS SCREEN INTO
TRS-80      GRAPHIC CHARACTERS TH
AT CAN      BE PRINTED BY MANY PR
INTERS.     YOU MAY HAVE TO CHANG
E THE       CONTROL CODES TO SUIT
 YOUR       PRINTER."
750 GOSUB 980
760 PRINT:PRINT"  THE CORRECT CO
DES ARE THOSE    THAT SET THE PR
INTER TO 8LPI,   16.5 CPI, AND C
HARACTER SET     SHIFTED OUT. IF
 YOU HAVE A      NEWER 80C WITH
AN EIGHT BIT     DRIVER YOU DO N
OT NEED TO       SHIFT OUT THE C
HARACTER SET."
770 PRINT:PRINT" THE LAST CODE I
S A CARRIAGE     RETURN. THIS AL
LOWS THE PROPER  NUMBER OF CHARA
CTERS PER LINE."
780 GOSUB 980
790 PRINT:PRINT"  YOU MAY SAVE T
HE SCREEN THAT   YOU WISH TO PRI
NT AS A MACHINE  FILE BY *CSAVEM
'FILENAME',1536, 7679,1536* THEN
 ENTER THE       FILENAME WHEN A
SKED."
800 PRINT:PRINT:PRINT"    DO YOU
 WISH A REVUE Y/N"
810 INPUT S$:IF S$="Y" THEN 730
820 RETURN
830 'PRINTER ROUTINE SET FOR MIC
ROLINE 82A
840 PCLEAR4:PMODE4:SCREEN 1,1
850 PRINT#-2,CHR$(27);CHR$(56);C
HR$(29);CHR$(14);
860 FOR SS=1536 TO 7584 STEP 96
870 FOR X=SS TO SS+31
880 Y=USR1(X)
890 A=PEEK(16030):B=PEEK(16031):
C=PEEK(16032):D=PEEK(16033)
900 PRINT#-2,CHR$(A);CHR$(B);CHR
$(C);CHR$(D);
910 NEXT X
920 PRINT#-2,CHR$(13);
930 NEXT SS
940 GOTO 680
950 'CORRECT GRAPHICS START FOR
DISK  SYSTEM
960 PRINT:PRINT:PRINT" YOU MUST
CHANGE VALUES IN LINE  880 TO 35
84 AND 9632 FOR THE    PROGRAM T
O WORK WITH A DISK     SYSTEM (T
```


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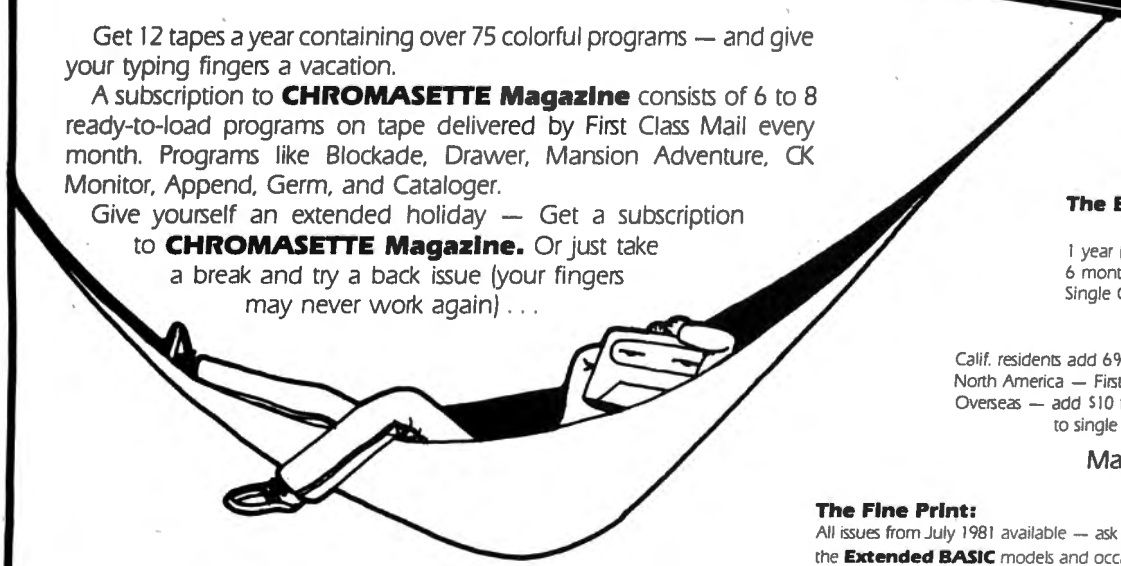

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Hard Copy

```
HEN DELETE LINE 50)":END
970 'DELAY
980 PRINT:PRINT"     HIT<ENTER> T
O CONTINUE":INPUT R$:CLS:RETURN
990 'FILE LOADER
1000 PRINT:PRINT"  ENTER FILENAM
E":INPUTF$
1010 PRINT:PRINT"  PRESS <ENTER>
 WHEN RECORDER     READY":INPUT
S$
1020 CLS:PRINT@230,"LOADING ";F$
:CLOADM"F$":RETURN
```

```
3C8C                    00100          ORG     15500
                        00110 * SOUND ROUTINE FOR COVER
3C8C 8E   0000          00120          LDX     #0000    START COUNT
3C8F B6   FF23          00130 LOOP2    LDA     $FF23
3C92 8A   08            00140          ORA     #8
3C94 B7   FF23          00150          STA     $FF23    ENABLE SOUND
3C97 86   0F            00160          LDA     #$0F
3C99 8A   02            00170          ORA     #02
3C9B B7   FF20          00180          STA     $FF20    SEND OUT
3C9E 108E 01DE          00190          LDY     #$01DE
3CA2 31   3F            00200 LOOP1    LEAY    -1,Y     DELAY
3CA4 26   FC            00210          BNE     LOOP1
3CA6 86   FF            00220          LDA     #$FF
3CA8 B7   FF20          00230          STA     $FF20    SEND OUT
3CAB B6   FF23          00240          LDA     $FF23
3CAE 80   08            00250          SUBA    #08
3CB0 B7   FF23          00260          STA     $FF23    TOGGLE SOUND
3CB3 E6   80            00270          LDB     ,X+
3CB5 8C   00C8          00280          CMPX    #$00C8
3CB8 2D   D5            00290          BLT     LOOP2    COUNTER
3CBA 108E 60FF          00300          LDY     #$60FF
3CBE 31   3F            00310 LOOP3    LEAY    -01,Y    DELAY
3CC0 26   FC            00320          BNE     LOOP3
3CC2 8E   0000          00330          LDX     #0000    START COUNT
3CC5 B6   FF23          00340 LOOP5    LDA     $FF23
3CC8 8A   08            00350          ORA     #$8
3CCA B7   FF23          00360          STA     $FF23    ENABLE SOUND
3CCD 86   0F            00370          LDA     #$0F
3CCF 8A   02            00380          ORA     #02
3CD1 B7   FF20          00390          STA     $FF20    SOUND OUT
3CD4 108E 02D7          00400          LDY     #$02D7   DELAY
3CD8 31   3F            00410 LOOP4    LEAY    -01,Y
3CDA 26   FC            00420          BNE     LOOP4
3CDC 86   FF            00430          LDA     #$FF
3CDE B7   FF20          00440          STA     $FF20    SOUND OUT
3CE1 B6   FF23          00450          LDA     $FF23
3CE4 80   08            00460          SUBA    #08
3CE6 B7   FF23          00470          STA     $FF23    TOGGLE SOUND
3CE9 E6   80            00480          LDB     ,X+
3CEB 8C   0096          00490          CMPX    #$0096   COUNTER
3CEE 2D   D5            00500          BLT     LOOP5
3CF0 39                 00510          RTS
                        00520 * ROUTINE TO CHANGE 3 BYTES OF SCREEN TO 4 TRS-80 GRAPH
IC CHARACTERS
3CF1 BD   B3ED          00530          JSR     $B3ED    GET ADDRESS FROM BASIC
3CF4 1F   01            00540          TFR     D,X      PUT IN X REGISTER
3CF6 108E 3E80          00550          LDY     #16000   CLEAR MEMORY
3CFA 6F   A0            00560 LP1      CLR     ,Y+
```

Hard Copy

```
3CFC 108C 3EA8      00570           CMPY    #16040
3D00 26   F8        00580           BNE     LP1
3D02 108E 3E80      00590           LDY     #16000  TABLE START POINTER
3D06 4F             00600           CLRA
3D07 5F             00610           CLRB
3D08 86   01        00620           LDA     #1      SET BIT 1
3D0A A7   A0        00630 SETMEM    STA     ,Y+     START TABLE
3D0C 48             00640           ASLA            MOVE BIT 1 TO LEFT
3D0D 108C 3E88      00650           CMPY    #16008
3D11 26   F7        00660           BNE     SETMEM  LOOP TILL TABLE DONE
3D13 108E 3E80      00670           LDY     #16000  SET POINTER TABLE START
3D17 A6   00        00680           LDA     0,X     GET SCREEN BYTE
3D19 85   80        00690           BITA    #128    TEST BIT 7
3D1B 26   02        00700           BNE     SKIP1   SKIP IF NOT SET
3D1D EA   20        00710           ORB     0,Y     SET BIT 0 IF BIT 7 SET
3D1F 85   40        00720 SKIP1     BITA    #64     TEST BIT 6
3D21 26   02        00730           BNE     SKIP2
3D23 EA   21        00740           ORB     1,Y     SET BIT 1
3D25 A6   88 20     00750 SKIP2     LDA     32,X    GET NEXT SCREEN BYTE
3D28 85   80        00760           BITA    #128    TEST BIT 7
3D2A 26   02        00770           BNE     SKIP3
3D2C EA   22        00780           ORB     2,Y     SET BIT 2
3D2E 85   40        00790 SKIP3     BITA    #64     TEST BIT 6
3D30 26   02        00800           BNE     SKIP4
3D32 EA   23        00810           ORB     3,Y     SET BIT 3
3D34 A6   88 40     00820 SKIP4     LDA     64,X    GET NEXT SCREEN BYTE
3D37 85   80        00830           BITA    #128    TEST BIT 7
3D39 26   02        00840           BNE     SKIP5
3D3B EA   24        00850           ORB     4,Y     SET BIT 4
3D3D 85   40        00860 SKIP5     BITA    #64     TEST BIT 6
3D3F 26   02        00870           BNE     SKIP6
3D41 EA   25        00880           ORB     5,Y     SET BIT 5
3D43 34   04        00890 SKIP6     PSHS    B       SAVE FIRST CODE TO STACK
3D45 5F             00900           CLRB
                    00910 * DO AGAIN BUT TEST BITS 4&5 OF SCREEN
3D46 A6   00        00920           LDA     0,X
3D48 85   20        00930           BITA    #32
3D4A 26   02        00940           BNE     SKIP7
3D4C EA   20        00950           ORB     0,Y
3D4E 85   10        00960 SKIP7     BITA    #16
3D50 26   02        00970           BNE     SKIP8
3D52 EA   21        00980           ORB     1,Y
3D54 A6   88 20     00990 SKIP8     LDA     32,X
3D57 85   20        01000           BITA    #32
3D59 26   02        01010           BNE     SKIP9
3D5B EA   22        01020           ORB     2,Y
3D5D 85   10        01030 SKIP9     BITA    #16
3D5F 26   02        01040           BNE     SKIP10
3D61 EA   23        01050           ORB     3,Y
3D63 A6   88 40     01060 SKIP10    LDA     64,X
3D66 85   20        01070           BITA    #32
3D68 26   02        01080           BNE     SKIP11
3D6A EA   24        01090           ORB     4,Y
3D6C 85   10        01100 SKIP11    BITA    #16
3D6E 26   02        01110           BNE     SKIP12
3D70 EA   25        01120           ORB     5,Y
3D72 34   04        01130 SKIP12    PSHS    B       SAVE 2ND CODE TO STACK
3D74 5F             01140           CLRB
                    01150 * DO AGAIN TESTING BITS 2&3 OF SCREEN
3D75 A6   00        01160           LDA     0,X
3D77 85   08        01170           BITA    #8
3D79 26   02        01180           BNE     SKIP13
```

Hard Copy

```
3D7B EA   20       01190          ORB     0,Y
3D7D 85   04       01200 SKIP13   BITA    #4
3D7F 26   02       01210          BNE     SKIP14
3D81 EA   21       01220          ORB     1,Y
3D83 A6   88 20    01230 SKIP14   LDA     32,X
3D86 85   08       01240          BITA    #8
3D88 26   02       01250          BNE     SKIP15
3D8A EA   22       01260          ORB     2,Y
3D8C 85   04       01270 SKIP15   BITA    #4
3D8E 26   02       01280          BNE     SKIP16
3D90 EA   23       01290          ORB     3,Y
3D92 A6   88 40    01300 SKIP16   LDA     64,X
3D95 85   08       01310          BITA    #8
3D97 26   02       01320          BNE     SKIP17
3D99 EA   24       01330          ORB     4,Y
3D9B 85   04       01340 SKIP17   BITA    #4
3D9D 26   02       01350          BNE     SKIP18
3D9F EA   25       01360          ORB     5,Y
3DA1 34   04       01370 SKIP18   PSHS    B       SAVE 3RD CODE TO STACK
3DA3 5F            01380          CLRB
                   01390 * DO AGAIN TESTING BITS 0&1 OF SCREEN
3DA4 A6   00       01400          LDA     0,X
3DA6 85   02       01410          BITA    #2
3DA8 26   02       01420          BNE     SKIP19
3DAA EA   20       01430          ORB     0,Y
3DAC 85   01       01440 SKIP19   BITA    #1
3DAE 26   02       01450          BNE     SKIP20
3DB0 EA   21       01460          ORB     1,Y
3DB2 A6   88 20    01470 SKIP20   LDA     32,X
3DB5 85   02       01480          BITA    #2
3DB7 26   02       01490          BNE     SKIP21
3DB9 EA   22       01500          ORB     2,Y
3DBB 85   01       01510 SKIP21   BITA    #1
3DBD 26   02       01520          BNE     SKIP22
3DBF EA   23       01530          ORB     3,Y
3DC1 A6   88 40    01540 SKIP22   LDA     64,X
3DC4 85   02       01550          BITA    #2
3DC6 26   02       01560          BNE     SKIP23
3DC8 EA   24       01570          ORB     4,Y
3DCA 85   01       01580 SKIP23   BITA    #1
3DCC 26   02       01590          BNE     SKIP24
3DCE EA   25       01600          ORB     5,Y
3DD0 34   04       01610 SKIP24   PSHS    B       SAVE 4TH CODE TO STACK
3DD2 8E   3EA2     01620          LDX     #16034  SET POINTER FOR GRAPIC CODES ST
ORAGE
3DD5 35   04       01630 LP2      PULS    B       PULL BACK FROM STACK IN REVERSE
 ORDER
3DD7 C1   20       01640          CMPB    #32     LOWEST VALID CODE 32 OR GREATER
3DD9 25   0A       01650          BLO     ADDER   MAKE ASCII IF 31 OR LESS
3DDB EA   27       01660 LP3      ORB     7,Y     ADD BIT 8 FOR PRINTER
3DDD E7   82       01670          STB     ,-X     PUT WHERE BASIC CAN GET IT
3DDF 8C   3E9E     01680          CMPX    #16030  SEE IF DONE
3DE2 26   F1       01690          BNE     LP2     GET NEXT IF NOT
3DE4 39            01700          RTS             BACK TO BASIC
3DE5 EA   26       01710 ADDER    ORB     6,Y     ADD 64 IF LESS THAN 32
3DE7 20   F2       01720          BRA     LP3
          0000     01730          END
00000 TOTAL ERRORS
```

MINE INTRUDER

by Bill Franks
4939 Tunlaw Street
Alex, VA 22312

Mine Intruder is a game which gives you a break from the same old kind of "shoot 'em up" games. Instead of being in outer space or another planet, you stay on earth in a small country town which has a very rich emerald mine. You must get past the perilous boulders and angry miners with deadly picks in order to claim your prize of a very large emerald. This game moves very quickly for a BASIC program because it utilizes the extended BASIC commands of GET and PUT. The exciting arcade type sound effects are made using the PLAY command. The sound effects, however, slow the game execution down about 2 or 3 times slower than possible without them. I prefer the sound effects to the faster speed without them. If you would like the speed then delete all PLAYF$, PLAYG$, and PLAYH$ statements. If you think it is too hard to have to make it back up to the top level after you get the emerald then change the end of line 515 to THEN GOSUB 525:GOTO 645. This will make you win just by getting the emerald. The neat effects at the end of a game (they're especially neat when you win) are created by going from SCREEN1,1 to SCREEN1,0 rapidly. So far, all my friends and family who have played it have really enjoyed it. I hope you do too.

INSTRUCTIONS

The object of this game is to climb up and down the ladders, get the emerald at the bottom, and get back to the top without being killed 4 times. Each time you are killed, you start at the left side of the level you were on and one of the little men in the bottom corner disappears. When you're out of men, you lose. Use the joystick to move. In order to go up or down a ladder, get right under or over it and press up or down with the joystick. If you or one of the hazzards goes off to the left, it will reappear on the right and visa-versa. To reset the game at the end just press R on the keyboard. Have fun!!!!!!!!

Mine Intruder

```
10 ' MINE INTRUDER
11 '   BY
15 ' BILL FRANKS
20 ' 4939 TUNLAW ST.
25 ' ALEXANDRIA,VA.
26 '            22312
30 GOSUB575:DIMA(25),B(25),C(25)
,D(25),E(25),F(25),G(25),H(25)
35 PMODE3,1:PCLS:SCREEN1,1:COLOR
6,5
40 FOR X=25TO180STEP25:LINE(0,X)
-(255,X),PSET:NEXT
45 DRAW"BM50,25;D8 U4R10D4U8 L10
D8 R10"
50 GET(50,25)-(61,50),A,G
55 A$= "E6F6H6U7F6H6G6"
60 COLOR7,5:DRAW"BM10,24;XA$;":A
=10:B=9 :GET(A,B)-(A+15,B+15),D,
G
65 DRAW"BM25,190;E4F4H4U5F4H4G4"
:DRAW"BM40,190;E4F4H4U5F4H4G4":D
RAW"BM55,190;E4F4H4U5F4H4G4"
70 COLOR7,5:DRAW"BM50,74;H3R3H3E
5F3E3R2F3D2G3R2G3L6":PAINT(51,73
),7,7
75 GET(68,61)-(85,74),B,G
80 GET(45,63)-(65,74),C,G
85 COLOR6,5:DRAW"BM40 ,99 ;XA$;"
:DRAW"BM55 ,90 ;R4H3F3G3":DRAW"B
M150,99;XA$;":DRAW"BM148,90;L4E3
G3F3"
86 GET(140,86)-(165,99),F,G
90 PUT(150,50)-(161,75),A,PSET:P
UT(90,75)-(101,100),A,PSET
95 PUT(40,100)-(51,125),A,PSET:P
UT(180,100)-(191,125),A,PSET
100 PUT(110,125)-(121,150),A,PSE
T:PUT(60,150)-(71,175),A,PSET
105 PUT(190,150)-(201,175),A,PSE
T
110 M=70:N=113:PUT(M,N)-(M+20,N+
11),C,PSET
115 K=130:L=113:PUT(K,L)-(K+20,L
+11),C,PSET
120 G=40:H=86:GET(G,H)-(G+25,H+1
3),E,G
125 I=140:J=86:PUT(I,J)-(I+25,J+
13),F,PSET
130 PUT(47,59)-(67,74),B,PSET
135 C=120:D=36:PUT(C,D)-(C+25,D+
13),F,PSET
140 E=60:F=63:PUT(E,F)-(E+20,F+1
1),C,PSET
145 Q=60:R=138:PUT(Q,R)-(Q+20,R+
11),C,PSET
150 O=160:P=136:PUT(O,P)-(O+25,P
+13),F,PSET
155 COLOR6,5:DRAW"BM120,174;H3R3
H3E5F3E3R2F3D2G3R2G3L6":PAINT(12
0,173),6,6
165 GOSUB170:GOTO175
170 PUT(A,B)-(A+15,B+15),D,PSET:
RETURN
175 S=JOYSTK(0):T=JOYSTK(1)
180 IF S<5 THEN PUT(A,B)-(A+18,B
+15),B,PSET:A=A-5 :IF A<10 THEN
A=230 ELSE PUT(A,B)-(A+15,B+15),
D,PSET:PLAYG$
185 IF S>58 THEN PUT(A,B)-(A+18,
B+15),B,PSET:A=A+5 :IF A>240 THE
N A=10  ELSE PUT(A,B)-(A+15,B+15
),D,PSET:PLAYG$
190 IF T>58 AND A>45 AND A<55 TH
EN PUT(A,B)-(A+18,B+15),B,PSET:B
=B+25:PUT(A,B)-(A+15,B+15),D,PSE
T:PLAYD$:GOTO205
195 IF SS=1 THEN GOSUB645
200 GOTO175
205 S=JOYSTK(0):T=JOYSTK(1)
210 IF S<5 THEN PUT(A,B)-(A+18,B
+15),B,PSET:A=A-5:IF A<10 THEN A
=230ELSE PUT(A,B)-(A+15,B+15),D,
PSET:PLAYG$
215 IF S>58 THEN PUT(A,B)-(A+18,
B+15),B,PSET:A=A+5:IF A>230 THEN
 A=10  ELSE PUT(A,B)-(A+15,B+15)
,D,PSET:PLAYG$
220 IF T<5 AND A>45 AND A<55 THE
N PUT(A,B)-(A+18,B+15),B,PSET:B=
B-25:PUT(A,B)-(A+15,B+15),D,PSET
:PLAYE$:GOTO175
225 IF T>58 AND A>145 AND A<155
THEN PUT(A,B)-(A+18,B+15),B,PSET
:B=B+25:PUT(A,B)-(A+15,B+15),D,P
SET:PLAYD$:GOTO255
230 U=RND(4)
235 IF U=1 OR U=3 THEN PUT(C,D)-
(C+26,D+13),G,PSET:C=C+5:IF C>23
0 THEN C=10 ELSE IFC>230 THEN C=
10  ELSE PUT(C,D)-(C+25,D+13),E,
PSET:PLAYF$
240 IF U=2 OR U=4 THEN PUT(C,D)-
(C+26,D+13),G,PSET:C=C-5:IF C<10
 THEN C=230 ELSE PUT(C,D)-(C+25,
D+13),F,PSET:PLAYF$
245 IF C-5=A+10 OR C+20=A-5 OR C
=A+10OR C+20=A THEN PLAYI$:GOSUB
 545:A=10:B=B :GOSUB170:GOTO205
250 GOTO205
255 S=JOYSTK(0):T=JOYSTK(1)
260 IF S<5 THEN PUT(A,B)-(A+18,B
+15),B,PSET:A=A-5:IF A<10 THEN A
=230 ELSE PUT(A,B)-(A+15,B+15),D
,PSET:PLAYG$
```

Mine Intruder

```
265 IF S>58 THEN PUT(A,B)-(A+18,
B+15),B,PSET:A=A+5:IF A>230THEN
A=10  ELSE PUT(A,B)-(A+15,B+15),
D,PSET:PLAYG$
270 IF T<5 AND A>145 AND A<155 T
HEN PUT(A,B)-(A+18,B+15),B,PSET:
B=B-25:PUT(A,B)-(A+15,B+15),D,PS
ET:PLAYE$:GOTO205
275 IF T>58 AND A>85  AND A<95
THEN PUT(A,B)-(A+18,B+15),B,PSET
:B=B+25:PUT(A,B)-(A+15,B+15),D,P
SET:PLAYD$:GOTO305
280 U=RND(4)
285 IF U=1 OR U=3 THEN PUT(E,F)-
(E+18,F+11),B,PSET:E=E+5:IF E>23
0 THEN E=10 ELSE PUT(E,F)-(E+20,
F+11),C,PSET:PLAYH$
290 IF U=2 OR U=4 THEN PUT(E,F)-
(E+18,F+11),B,PSET:E=E-5:IF E>23
0 THEN E=10 ELSE PUT(E,F)-(E+20,
F+11),C,PSET:PLAYH$
295 IF E-5=A+10 OR E+15=A-5 OR E
-0=A+10 OR E+10=A-5 THEN PLAYI$:
GOSUB545:A=10:B=B:GOSUB170:GOTO2
55
300 GOTO255
305 S=JOYSTK(0):T=JOYSTK(1)
310 IF S<5 THEN PUT(A,B)-(A+18,B
+15),B,PSET:A=A-5:IF A<10 THEN A
=230 ELSE PUT(A,B)-(A+15,B+15),D
,PSET:PLAYG$
315 IF S>58 THEN PUT(A,B)-(A+18,
B+15),B,PSET:A=A+5:IF A>230 THEN
 A=10  ELSE PUT(A,B)-(A+15,B+15)
,D,PSET:PLAYG$
320 IF T<5 AND A>85 AND A<95 THE
N PUT(A,B)-(A+18,B+15),B,PSET:B=
B-25:PUT(A,B)-(A+15,B+15),D,PSET
:PLAYE$:GOTO255
325 IF T>58 AND A>35 AND A<45 OR
 T>58 AND A>175 AND A<185 THEN P
UT(A,B)-(A+18,B+15),B,PSET:B=B+2
5:PUT(A,B)-(A+15,B+15),D,PSET:PL
AYD$:GOTO365
330 U=RND(4):V=RND(4)
335 IF U=1OR U=3 THEN PUT(G,H)-(
G+26,H+13),G,PSET:G=G+5:IF G>230
THEN G=10  ELSE PUT(G,H)-(G+25,H
+13),E,PSET:PLAYF$
340 IF V=1 OR V=3 THEN PUT(I,J)-
(I+26,J+13),G,PSET:I=I+5:IF I>23
0 THEN I=10 ELSE PUT(I,J)-(I+25,
J+13),E,PSET:PLAYH$
345 IF U=2 OR U=4 THEN PUT(G,H)-
(G+26,H+13),G,PSET:G=G-5:IF G<10
 THEN G=230 ELSE PUT(G,H)-(G+25,
H+13),F,PSET:PLAYF$
350 IF V=2 OR V=4 THEN PUT(I,J)-
(I+26,J+13),G,PSET:I=I-5:IF I<10
 THEN I=230 ELSE PUT(I,J)-(I+25,
J+13),F,PSET:PLAYH$
355 IF G-5=A+10 OR G+10=A-5 OR G
+15=A-5 OR G-0=A+10 OR I-5=A+10
OR I+15=A-5 OR I+10=A-5 OR I-0=A
+10 THEN PLAYI$:GOSUB545:A=10:B=
B:GOSUB170:GOTO305
360 GOTO305
365 S=JOYSTK(0):T=JOYSTK(1)
370 IF S<5 THEN PUT(A,B)-(A+18,B
+15),B,PSET:A=A-5:IF A<10 THEN A
=230 ELSE PUT(A,B)-(A+15,B+15),D
,PSET:PLAYG$
375 IF S>58 THEN PUT(A,B)-(A+18,
B+15),B,PSET:A=A+5:IF A>230 THEN
 A=10  ELSE PUT(A,B)-(A+15,B+15)
,D,PSET:PLAYG$
380 IF T<5 AND A>35 AND A<45 OR
T<5 AND A>175 AND A<185 THEN PUT
(A,B)-(A+18,B+15),B,PSET:B=B-25:
PUT(A,B)-(A+15,B+15),D,PSET:PLAY
E$:GOTO305
385 IF T>58 AND A>105 AND A<115
THEN PUT(A,B)-(A+18,B+15),B,PSET
:B=B+25:PUT(A,B)-(A+15,B+15),D,P
SET:PLAYD$:GOTO430
390 U=RND(4):V=RND(4)
395 IF U=1 OR U=3 THEN PUT(K,L)-
(K+18,L+11),B,PSET:K=K-5:IF K<10
 THEN K=230 ELSE PUT(K,L)-(K+20,
L+11),C,PSET:PLAYF$
400 IF U=2 OR U=4 THEN PUT(K,L)-
(K+18,L+11),B,PSET:K=K+5:IF K>23
0 THEN K=10 ELSE PUT(K,L)-(K+20,
L+11),C,PSET:PLAYF$
405 IF V=1 OR V=3 THEN PUT(M,N)-
(M+18,N+11),B,PSET:M=M-5:IF M<10
 THEN M=230 ELSE PUT(M,N)-(M+20,
N+11),C,PSET:PLAYH$
410 IF V=2 OR V=4 THEN PUT(M,N)-
(M+18,N+11),B,PSET:M=M+5:IF M>23
0 THEN M=10 ELSE PUT(M,N)-(M+20,
N+11),C,PSET:PLAYH$
415 IF K-5=A+10 OR K+15=A-5 OR K
-0=A+10 OR K+10=A-5 THEN PLAYI$:
GOSUB545:A=10:B=B :GOSUB170:GOTO
365
420 IF M-5=A+10 OR M+15=A-5 OR M
-0=A+10 OR M+10=A-5THEN PLAYI$:G
OSUB545:A=10:B=B:GOSUB170:GOTO36
5
425 GOTO 365
430 S=JOYSTK(0):T=JOYSTK(1)
435 IF S<5 THEN PUT(A,B)-(A+18,B
+15),B,PSET:A=A-5:IF A<10 THEN A
```

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CO-RES9 is a Co-resident Editor/Assembler that will allow you to create, edit and assemble machine language programs for the color computer. It will quickly and efficiently convert assembly language programs into machine code files. It will output machine object code to either cassette tape in a 'CLOADM' compatible format or directly to memory for direct execution.

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TRSMON is a 2K machine language monitor program for use in any color computer system. A Monitor is a program which allows the user to directly manipulate the computer. Small programs may be hand assembled and entered into ram and executed. Program execution can be stopped at any point by using breakpoints to see if it is functioning properly or check its status. TRSMON provides all of the standard functions found in most system monitor programs as well as a printer/terminal driver package. Printer and Terminal modes can be used at rates varying from 300 to 9600 baud and can be changed at any time.

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We also have a disk version available called "DISKPACK." It includes all the commands mentioned plus commands for disk control. They include: Disk Load, Disk Save, Directory, Send Disk File and Kill Disk File. As usual all files are Basic Compatible ASCII formatted files which are also compatible with our Text Editor and Word Processor programs.

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Mine Intruder

```
=230 ELSE PUT(A,B)-(A+15,B+15),D
,PSET:PLAYG$
440 IF S>58 THEN PUT(A,B)-(A+18,
B+15),B,PSET:A=A+5:IF A>230 THEN
 A=10  ELSE PUT(A,B)-(A+15,B+15)
,D,PSET:PLAYG$
445 IF T<5 AND A>105 AND A<115 T
HEN PUT(A,B)-(A+18,B+15),B,PSET:
B=B-25:PUT(A,B)-(A+15,B+15),D,PS
ET:PLAYE$:GOTO365
450 IF T>58 AND A>55 AND A<65 OR
 T>58 AND A>185 AND A<195 THEN P
UT(A,B)-(A+18,B+15),B,PSET:B=B+2
5:PUT(A,B)-(A+15,B+15),D,PSET:PL
AYD$:GOTO495
455 U=RND(4):V=RND(4)
460 IF U=1 OR U=3 THEN PUT(Q,R)-
(Q+18,R+11),B,PSET:Q=Q+5:IF Q>23
0 THEN Q=10 ELSE PUT(Q,R)-(Q+20,
R+11),C,PSET:PLAYF$
465 IF U=2 OR U=4 THEN PUT(Q,R)-
(Q+18,R+11),B,PSET:Q=Q-5:IF Q<10
 THEN Q=230 ELSE PUT(Q,R)-(Q+20,
R+11),C,PSET:PLAYF$
470 IF V=1 OR V=3 THEN PUT(O,P)-
(O+26,P+13),G,PSET:O=O+5:IF O>23
0 THEN O=10 ELSE PUT(O,P)-(O+25,
P+13),E,PSET:PLAYH$
475 IF V=2 OR V=4 THEN PUT(O,P)-
(O+26,P+13),G,PSET:O=O-5:IF O<10
 THEN O=230 ELSE PUT(O,P)-(O+25,
P+13),F,PSET:PLAYH$
480 IF Q-5=A+10 OR Q+15=A-5 OR Q
-0=A+10 OR Q+10=A-5 THEN PLAYI$:
GOSUB545:A=10:B=B:GOSUB170:GOTO4
30
485 IF O-5=A+10 OR O+20=A-5 OR O
=A+10 OR O+20=A THEN PLAYI$:GOSU
B 545:A=10:B=B:GOSUB170:GOTO430
490 GOTO430
495 S=JOYSTK(0):T=JOYSTK(1)
500 IF S<5 THEN PUT(A,B)-(A+18,B
+15),B,PSET:A=A-5:IF A<10 THEN A
=230 ELSE PUT(A,B)-(A+15,B+15),D
,PSET:PLAYG$
505 IF S>58 THEN PUT(A,B)-(A+18,
B+15),B,PSET:A=A+5:IF A>230 THEN
 A=10  ELSE PUT(A,B)-(A+15,B+15)
,D,PSET:PLAYG$
510 IF T<5 AND A>55 AND A<65 OR
T<5 AND A>185 AND A<195 THEN PUT
(A,B)-(A+18,B+15),B,PSET:B=B-25:
PUT(A,B)-(A+15,B+15),D,PSET:PLAY
E$:GOTO430
515 IF SS=0 THEN IF A-15<130 AND
 A-15>110 THEN GOSUB525 ELSE IF
A+10>100 AND A+10<130 THEN GOSUB
525
520 GOTO495
525 GOSUB625
530 PUT(115,159)-(140,174),B,PSE
T
535 COLOR6,5:DRAW"BM80 ,192;H3R3
H3E5F3E3R2F3D2G3R2G3L6":PAINT(80
 ,189),6,6
540 SS=1:RETURN
545 FORXC=1TO1000:NEXT:IF ZZ>0 T
HEN 550 ELSE COLOR5,5:DRAW"BM25,
190;E4F4H4U5F4H4G4":ZZ=1:PUT(A,B
)-(A+18,B+15),B,PSET:RETURN
550 IF ZZ>1 THEN 555 ELSE COLOR5
,5:DRAW"BM40,190;E4F4H4U5F4H4G4"
:ZZ=2:PUT(A,B)-(A+18,B+15),B,PSE
T:RETURN
555 IF ZZ>2 THEN 560 ELSE ZZ=3:C
OLOR5,5:DRAW"BM55,190;E4F4H4U5F4
H4G4":ZZ=3:PUT(A,B)-(A+18,B+15),
B,PSET:RETURN
560 COLOR8,5:PUT(A,B)-(A+15,B+15
),D,PSET:PUT(G,H)-(G+26,H+13),G,
PSET:PUT(I,J)-(I+26,J+13),G,PSET
:SCREEN1,0:DRAW"BM40 ,95;U8R8BD4
L4BR4D4L8BR12;BM60 ,95;U8R8D4L8B
R8D4BR4;BM80 ,95;U8F4E4D8BR4;BM1
00,95;U8R8BD4L8BD4R8BR4"
565 DRAW"BM130,95;U8R8D8L8BR12;B
M150,95;BU8D4F4E4U4BD8BR4;BM170,
95;U8R8BD4L8BD4R8BR4;BM190,95;U8
R8D4L8BR4F4BR4"
570 GOTO690
575 D$="T65 ;05;GFEDCBA04GFEDCBA
03GFEDCB"
580 E$="T65 ;03ABCDEFG04ABCDEFG0
5ABCDEFG"
585 F$="T255;05CDEFGAB"
590 G$="T255;03CDEFGAB"
595 H$="T255;04CDEFGAB"
600 J$="T255;V22;05BAGFEDC04;V10
;BAGFEDC03;V5;BAGFEDC"
605 I$="T255;V25;05GFEDC04BAGFED
C03BAGFED02BAGFEDC01BAGFEDC"
610 RETURN
615 FOR X=1TO10:SCREEN1,0:FORY=1
TO50 :NEXT Y:SCREEN1,1:FORY=1TO5
0 :NEXT Y:NEXT X
620 GOTO615
625 FORX=1TO10
630 PLAY"T255;V22;05BAGFEDC":PLA
Y"05CDEFGAB"
635 NEXT
640 RETURN
645 COLOR8,7:FOR X=1TO10
650 PLAYF$:PLAYG$:PLAYH$
655 SCREEN1,0
```

Mine Intruder

```
660 FOR Y=1TO30:NEXTY
665 SCREEN1,1
670 NEXT
675 PUT(G,H)-(G+26,H+13),G,PSET:
PUT(I,J)-(I+26,J+13),G,PSET
680 DRAW"BM40,95;BU8F4E4BG4D4BR8
;BM60 ,95;U8R8D8L8BR12;BM80 ,95;
U8BR8D8L8BR12;BM110,95;U8BR8D8H4
G4BR12;BM130,95;BU8R8BL4D8BL4R8B
R4;BM150,95;U8F8U8BD8BR4;BM170,9
5;U1;BM170,92;U7"
685 SCREEN1,0:GOTO690
690 COLOR6,5:CC$=INKEY$
695 IF CC$="R" THEN SS=0:ZZ=0:GO
TO35
700 GOTO690
```

CCN TIP

Some Color Computers are capable of running at higher clock speeds. To use the higher speed type POKE 65495,0. To turn-off the fast clock type POKE 65494,0. This doesn't work with all Color Computers.

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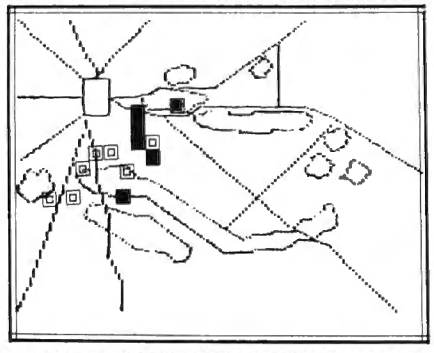

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a sensational and educational version of a popular party game for the TRS-80* Color Computer...

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. Silly Syntax requires 16K Extended Basic (32K for disk version). For $19.95, you get a user guide and a tape containing the Silly Syntax game and 2 stories. You can create your own stories or order story tapes from the selection below.

Silly Syntax stories — Ten stories per tape.

SS-001 - Fairy Tales
SS-002 - Sing Along
SS-003 - X-Rated
SS-004 - Current Events
SS-006 - Adventure/Sci-Fi
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Each story tape is $9.95. 10% off for 3 or more story tapes. Disk is $24.95 for Silly Syntax and 2 stories or $49.95 for Silly Syntax and all 62 stories.

*TRS-80 is a trademark of Tandy Corp.

Auto Run

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 create a tape which will consist of a machine language loader followed by your Basic or machine language program. With this tape, a simple CLOADM command will load and start the loader which will load and start your program. You may design a title screen with the graphics editor which will display as your program loads. 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 $600 (the PCLEAR 0 page).

Software authors: The Auto Run prefix may be appended to your software products.

Auto Run is $14.95 and includes complete documentation and an assembly source listing.

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a user-oriented, easy to use personal database management system with these outstanding features:

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THE CRYPTANALYST'S ASSISTANT

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

This program is useful in solving the most common kind of cryptogram puzzle, the simple substitution cipher. In this kind of cipher, every letter of the alphabet has exactly one substitute letter, and the cipher is produced by replacing every letter of the original message (the plaintext) with its substitute.

One of the methods for attacking ciphers of this kind is letter frequency analysis. This is based on the principle that frequently occuring letters of the cryptogram probably stand for frequently occuring letters or ordinary English text (ETAONIRSH) and conversely.

One thing the Cryptanalyst's Assistant does for you is take the frequency count of every cryptogram you type in.

The way the program works is this:

1. First you type in a cryptogram (which you have to get from a newspaper, or a puzzle magazine, or from a friend who has made one up with an enciphering program on the Color Computer).

Cryptanalyst

2. Then the frequency count is displayed.
3. The ciphertext is displayed, double spaced, and you start making trial substitutions, which appear beneath the letters of the ciphertext.
4. You can change the substitute for a letter as often as you like.
5. You can even change the ciphertext if you discover you've made a mistake, and the program will remember and redisplay the substitutes you've made so far.
6. The frequency chart will not fit on the same page as the cryptogram, but you can flip over to another page to see it, and then flip back.
7. When you are finished with one cryptogram, you can do another one.

PROGRAM NOTES:

The Cryptanalyst's Assistant requires either a 16K or 32K Color Computer, with Extended BASIC.

If you run it on a 16K machine, then you must PCLEAR 1 before CLOAD'ing.

If you run it on a 32K machine, you can alter the load point for the machine language subroutines, by changing the '15800' in lines 500 and 40010 to a bigger number.

Happy cipher busting!

```
1 ' CRYPTANALYST'S ASSISTANT
2 '
3 '            BY
4 '
5 '       BILL WILLIAMS
6 '
7 '       SAN FRANCISCO
8 '       AUGUST, 1982
9 '
200 '
202 ' SYNOPSIS OF VARIABLES:
204 '
206 ' C$(6)  LINES OF CRYPTOGRAM
208 ' CL(6)  LEN OF CRYPTG LINES
210 ' NL     # LINES IN CRYPTOGM
212 ' C      SUBSCRIPT FOR
214 '          CRYPTOGRAM LINES
216 '
218 ' I$     LINE OF TYPED OR
220 '          READ INPUT
222 ' IL     LEN OF INPUT LINE
224 ' IK$    INKEY$ RESPONSE
226 '
228 ' X      HORIZONTAL SCR POS
230 ' Y      VERTICAL SCREEN POS
232 ' P      COMPUTED PRINT@ POS
234 '
236 ' SB     LOAD POINT FOR
238 '          MACH. LANG. SBRS
240 ' PM     LOCATION TO POKE
242 '          INPUTS TO MACHINE
244 '          LANG. SUBROUTINES
246 ' FT     MEMORY LOCATION OF
248 '          FREQUENCY TABLE
250 ' FE     END OF FREQ. TABLE
252 '
254 ' L      LOAD POINT FOR ONE
256 '          MACH. LANG. BYTE
258 ' V      VALUE TO LOAD
260 ' LG     COUNTER FOR
262 '          "LOADING... " MSG
264 '
266 ' F1     FIRST BYTE
267 '          EXTRACTED FROM
268 '          FREQUENCY TABLE,
270 '          THE COUNT
272 ' F2     SECOND BYTE, THE
274 '          LETTER COUNTED
276 '
278 ' F$     FIRST CHAR OF
280 '          SUBSTITUTION CMD,
282 '          THE 'FROM' LETTER
284 ' T$     SECOND CHAR OF
286 '          SUBSTITUTION CMD,
288 '          THE 'TO' LETTER
290 '
292 ' ZZ     ONE TIME SWITCH FOR
294 '          INSTRUCTIONS
296 '
500 CLEAR 500,15800
510 CLS
520 PRINT "HELLO,"
530 PRINT
540 PRINT "    I'M THE CRYPTANAL
YST'S"
550 PRINT "ASSISTANT."
560 PRINT
570 PRINT "    BEFORE WE BEGIN,
I HAVE TO"
580 PRINT "LOAD SOME SUBROUTINES
."
590 PRINT
600 PRINT "    PLEASE BE PATIENT
."
610 PRINT
700 GOSUB 40000
710 CLS
720 PRINT : PRINT
740 PRINT "NOW WE CAN GET STARTE
D."
750 PRINT
760 GOSUB 13900
800 DIM C$(6)
```

Cryptanalyst

```
810 DIM CL(6)
1000 GOSUB 8000
1010 PRINT : PRINT
1020 PRINT "ANY CORRECTIONS TO M
AKE?"
1030 PRINT " Y) YES"
1040 PRINT " N) NO"
1050 PRINT "TYPE CHOICE:";
1060 IK$=INKEY$
1070 IF IK$="N" THEN 1100
1080 IF IK$<>"Y" THEN 1060
1090 GOSUB 9010
1100 'FREQ COUNT
1110 GOSUB 6200
1120 GOSUB 6300
1130 GOSUB 6400
1200 GOSUB 12000
1210 IF IK$ = "N" THEN 1320
1300 GOSUB 14200
1310 GOSUB 13110
1320 CLS
1330 GOSUB 4000
1400 X=0 : Y=13
1410 GOSUB 5000
1420 FOR I = 0 TO 10 STEP 2
1430 F1=PEEK(FT+I)
1440 F2=PEEK(FT+I+1)
1450 PRINT @P,CHR$(F2);"-";
1460 PRINT USING "##";F1;
1470 P=P+5
1480 NEXT I
2000 'MAIN LOOP
2010 X=0 : Y=14
2020 GOSUB 5000
2030 PRINT @P,"SUBSTITUTION (OR
OPTION):        (@=OPTIONS) (ENTE
R=FREQ-TAB)";
2040 X=26
2050 GOSUB 5000
2060 PRINT @P,"";
2070 LINE INPUT I$
2080 IL=LEN(I$)
2090 IF IL>0 THEN 2200
2100 GOSUB ^6100
2110 IF INKEY$="" THEN 2110
2120 GOSUB 6000
2130 GOTO 2050
2200 IF I$="@" THEN 3000
2210 F$=LEFT$(I$,1)
2220 IF IL>1 THEN 2240
2230 T$=" " : GOTO 2300
2240 I = 2
2250 IF MID$(F$,I,1)="=" THEN I=
3
2260 T$=MID$(I$,I,1)
2300 POKE PM,ASC(F$)
2310 POKE PM+1,ASC(T$)
2320 I = USR5(0)
2330 GOSUB 4000
2340 GOTO 2010
3000 CLS
3010 PRINT : PRINT
3020 PRINT "DO YOU WANT TO:"
3030 PRINT " C) CORRECT THE PLAI
NTEXT?"
3040 PRINT " N) ENTER A NEW CRYP
TOGRAM?"
3050 PRINT " I) LOOK AT THE INST
RUCTIONS?"
3060 PRINT " B) CONTINUE WHERE Y
OU WERE?"
3100 PRINT "TYPE CHOICE: ";
3110 IK$ = INKEY$
3120 IF IK$ = "C" THEN 1090
3130 IF IK$ = "N" THEN 1000
3140 IF IK$ = "I" THEN 1310
3150 IF IK$ = "B" THEN 1320
3160 GOTO 3110
4000 'DISPLAY CIPHER
4010 FOR C = 1 TO NL
4020 POKE PM,2*(C-1)
4030 I = USR6(VARPTR(C$(C)))
4040 NEXT C
4050 RETURN
5000 P=32*Y+X
5010 RETURN
6000 'SET VIDEO BASE TO $400
6010 I = USR1(&H04)
6020 RETURN
6100 'SET VIDEO BASE TO $600
6110 I = USR1(&H06)
6120 RETURN
6200 'TAKE FREQUENCY COUNT
6210 FT = SB + USR2(0)
6220 FOR C=1 TO NL
6230 I=USR3(VARPTR(C$(C)))
6240 NEXT C
6250 RETURN
6300 'SORT FREQUENCY TABLE
6310 I = USR4(0)
6320 RETURN
6400 'DISPLAY FREQUENCY
6410 CLS
6420 PRINT TAB(7) "FREQUENCY COU
NT"
6430 I = FT : FE = FT+52
6440 FOR X=0 TO 24 STEP 8
6450 FOR Y=2 TO 8
6460 IF I>=FE THEN 6600
6470 F1=PEEK(I)
6480 F2=PEEK(I+1)
6490 GOSUB 5000
6500 PRINT @P,CHR$(F2);
6510 PRINT USING "####";F1;
```

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Cryptanalyst

```
6520 I = I+2
6530 NEXT Y
6540 NEXT X
6600 X=0 : Y=12
6610 GOSUB 5000
6620 PRINT @P,"TO CONTINUE, PRES
S ANY KEY"
6630 GOSUB 6910
6640 IF INKEY$="" THEN 6640
6650 RETURN
6900 'MOVE &H400-&H5FF TO &H600
6910 POKE PM,&H04
6920 POKE PM+1,0
6930 POKE PM+2,&H06
6940 POKE PM+3,0
6950 POKE PM+4,&H06
6960 POKE PM+5,0
6970 I = USR0(0)
6980 RETURN
8000 'ENTER NEW CRYPTOGRAM
8010 CLS
8020 I = USR2(1)
8030 PRINT "OK, TYPE IN THE CIPH
ER NOW."
8040 PRINT
8050 PRINT "YOU MAY INCLUDE PERI
ODS, COMMAS,ETC., IN THE CIPHERT
EXT, BUT"
8070 PRINT "DO NOT USE LOWER CAS
E LETTERS."
8080 PRINT
8090 PRINT "ALSO, DO NOT TYPE MO
RE THAN"
8100 PRINT "31 CHARACTERS PER LI
NE."
8110 PRINT
8120 PRINT "YOU CAN ENTER"
8130 PRINT "A MAXIMUM OF 6 LINES
."
8140 PRINT
8150 PRINT "TYPE A NULL LINE (JU
ST"
8160 PRINT "PRESS ENTER) WHEN YO
U ARE DONE."
8170 PRINT
8300 'ENTER NEW LINES
8310 C = 1
8320 IF C>6 THEN 8440
8330 LINE INPUT I$
8340 IF LEN(I$) = 0 THEN 8460
8350 IF LEN(I$) < 32 THEN 8390
8360 PRINT "*** FIRST 31 CHARACT
ERS TAKEN."
8370 I$ = LEFT$(I$,31)
8380 PRINT I$
8390 C$(C) = I$
8400 CL(C) = LEN(I$)
8410 C=C+1
8420 GOTO 8320
8430 'MAX LINES ENTERED
8440 PRINT "6 LINES IS THE MAXIM
UM"
8450 FOR I=1 TO 500:NEXT I
8460 NL=C-1
8470 RETURN
9000 'DO CORRECTIONS
9010 CLS
9020 FOR C=1 TO 6
9030 IF C<=NL THEN 9050
9040 PRINT: GOTO 9060
9050 PRINT C$(C)
9060 NEXT C
9100 PRINT
9110 PRINT "CORRECTIONS?"
9120 PRINT " A) ADD MORE LINES"
9130 PRINT " C) CHANGE A LINE"
9140 PRINT " D) DELETE A LINE"
9150 PRINT " N) NO MORE CORRECTI
ONS"
9200 PRINT "TYPE CHOICE:";
9210 IK$=INKEY$
9220 IF IK$="N" THEN RETURN
9230 IF IK$="C" THEN 10000
9240 IF IK$="D" THEN 10000
9250 IF IK$="A" THEN 9500
9260 GOTO 9210
9500 'ADD MORE LINES
9510 PRINT
9520 IF NL<6 THEN 9570
9530 PRINT "YOU ALREADY HAVE 6 L
INES, AND"
9540 PRINT "THAT'S THE MAXIMUM"
9550 FOR I=1 TO 500: NEXT I
9560 GOTO 9010
9570 C=NL+1
9580 PRINT "TYPE NEW LINES:"
9590 GOSUB 8320
9600 GOTO 9010
10000 'CHANGE LINES
10010 CLS
10020 PRINT "NOW I'M GOING TO DI
SPLAY EACH"
10030 PRINT "LINE AGAIN."
10040 PRINT
10050 PRINT "AFTER EACH LINE, I'
LL PUT"
10060 PRINT "THE CURSOR ON THE N
EXT LINE"
10070 PRINT "SO YOU CAN RETYPE T
HAT LINE."
10080 PRINT
10090 PRINT "IF A LINE DOESN'T N
EED TO BE"
10100 PRINT "RETYPED, JUST PRESS
```

Cryptanalyst

```
 ENTER."
10110 PRINT
10120 PRINT "IF YOU WANT TO DELE
TE A LINE"
10130 PRINT "TYPE '@'"
10140 PRINT
10150 PRINT "WHEN YOU'RE READY,
PRESS ANY    KEY";
10160 IF INKEY$="" THEN 10160
10170 PRINT
10400 C=0
10410 C=C+1
10420 IF C>NL THEN 9010
10430 PRINT C$(C)
10440 LINE INPUT I$
10450 IF LEN(I$) = 0 THEN 10410
10460 IF LEN(I$) < 32 THEN 10500

10470 PRINT "*** TOO LONG. RETYP
E. ***"
10480 GOTO 10430
10500 IF I$="@" THEN 10600
10510 C$(C)=I$
10520 CL(C)=LEN(I$)
10530 GOTO 10410
10600 I=C
10610 IF I>=NL THEN 10660
10620 C$(I)=C$(I+1)
10630 CL(I)=CL(I+1)
10640 I=I+1
10650 GOTO 10610
10660 NL=NL-1
10670 GOTO 10420
12000 'INSTRUCTIONS
12010 IK$ = "N"
12020 IF ZZ<>0 THEN RETURN
12030 ZZ=1
12040 CLS : PRINT : PRINT
12050 PRINT "NEED INSTRUCTIONS?"

12060 PRINT " Y) YES"
12070 PRINT " N) NO"
12080 PRINT "TYPE CHOICE:";
12090 IK$=INKEY$
12100 IF IK$="N" THEN RETURN
12110 IF IK$<>"Y" THEN 12090
12120 RETURN
13100 'DISPLAY INSTRUCTIONS
13110 GOSUB 14500
13120 GOSUB 14800
13130 GOSUB 15000
13140 GOSUB 15200
13150 RETURN
13800 'CONTINUE MESSAGE
13810 PRINT "THERE ARE MORE INST
RUCTIONS."
13820 PRINT "TO CONTINUE, PRESS
ANY KEY";
13830 IF INKEY$="" THEN 13830
13840 RETURN
13900 'PRESS ENTER WHEN RDY MSG
13910 PRINT "WHEN YOU'RE READY T
O BEGIN,"
13920 PRINT "PRESS ANY KEY";
13930 IF INKEY$ = "" THEN 13930
13940 RETURN
14200 'INSTRUCTIONS PAGE 1
14210 CLS
14220 PRINT "THE FREQUENCY CHART
 HAS BEEN"
14230 PRINT "SAVED, AND CAN BE R
EDISPLAYED"
14240 PRINT "WHENEVER YOU WANT T
O."
14250 PRINT
14260 PRINT "THE NEXT THING THAT
 WILL HAPPEN IS:"
14265 PRINT
14270 PRINT "THE CRYPTOGRAM WILL
 BE SHOWN,"
14280 PRINT "DOUBLE SPACED, AT T
HE TOP OF THESCREEN."
14300 PRINT "YOU WILL BE ABLE TO
 PUT TRIAL"
14310 PRINT "SUBSTITUTIONS UNDER
NEATH"
14320 PRINT "THE CIPHERTEXT LETT
ERS."
14330 PRINT
14340 GOSUB 13800
14350 RETURN
14500 'INSTRUCTIONS PAGE 2
14510 CLS
14520 PRINT "WHEN YOU SEE THE"
14530 PRINT "PROMPTING MESSAGE:"

14540 PRINT
14550 PRINT "substitution (or op
tion):"
14560 PRINT
14565 PRINT "AT THE BOTTOM OF TH
E SCREEN,"
14570 PRINT "YOU CAN TYPE TWO LE
TTERS,"
14580 PRINT "(FOLLOWED BY ENTER,
 OF COURSE)"
14590 PRINT "IF YOU TYPE 'QA', F
OR INSTANCE,"
14600 PRINT "THE COMPUTER WILL P
UT AN 'A'"
14610 PRINT "UNDER EVERY 'Q' IN
THE"
14620 PRINT "CRYPTOGRAM."
14660 PRINT
```

Cryptanalyst

```
14670 GOSUB 13820
14680 RETURN
14800 'INSTRUCTIONS PAGE 3
14810 CLS
14820 PRINT "AFTER THE 'QA', IF
YOU"
14830 PRINT "DO A 'QB', THE COMP
UTER WILL"
14840 PRINT "CHANGE ALL THE A'S
THAT ARE NOW UNDER Q'S TO B'S"
14850 PRINT
14860 PRINT "IF YOU DECIDE YOU D
ON'T WANT"
14870 PRINT "ANYTHING UNDER THOS
E Q'S,"
14880 PRINT "THEN DO 'Q ', WHICH
 WILL MAKE"
14890 PRINT "THE COMPUTER PUT A
SPACE"
14900 PRINT "UNDER EACH Q."
14910 PRINT
14920 GOSUB 13820
14930 RETURN
15000 'INSTRUCTIONS PAGE 4
15010 CLS
15020 PRINT "IF YOU WANT TO SEE
THE"
15030 PRINT "FREQUENCY TABLE, JU
ST PRESS"
15040 PRINT "THE ENTER KEY, INST
EAD OF"
15050 PRINT "TYPING TWO LETTERS.
"
15060 PRINT
15070 PRINT "WHEN YOU ARE FINISH
ED WITH"
15080 PRINT "THIS CRYPTOGRAM,  O
R"
15090 PRINT "IF YOU WANT TO CHAN
GE"
15100 PRINT "THE CIPHERTEXT,   O
R"
15110 PRINT "IF YOU WANT TO SEE"

15120 PRINT "THE INSTRUCTIONS AG
AIN,"
15130 PRINT
15140 PRINT "THEN YOU TYPE '@',
AND THIS WILL";
15150 PRINT "GET YOU A MENU OF C
HOICES."
15160 PRINT
15170 GOSUB 13820
15180 RETURN
15200 'INSTRUCTIONS LAST PAGE 5
15210 CLS
15220 PRINT "SUMMARY OF RESPONSE
S TO THE     PROMPTING MESSAGE:"

15230 PRINT "substitution (or op
tion):"
15240 PRINT
15250 PRINT "IF YOU WANT" TAB(20
) "THEN TYPE:"
15260 PRINT
15270 PRINT "SUBSTITUTION" TAB(2
0) "2 LETTERS"
15280 PRINT "FREQUENCY TABLE" TA
B(20) "ENTER KEY"
15290 PRINT "MENU OF OPTIONS" TA
B(20) "'@'"
15300 PRINT
15310 GOSUB 13900
15330 RETURN
40000 'LOAD ASSEMBLY ROUTINES
40010 SB = 15800 : L = SB
40020 LG = 0
40100 READ I$
40110 IF I$ = "END" THEN 40300
40120 FOR I = 1 TO LEN(I$) STEP
2
40130 V = VAL("&H" + MID$(I$,I,2
))
40140 POKE L,V
40150 L = L+1
40160 NEXT I
40170 LG = (LG+1) AND 7
40180 IF LG=0 THEN PRINT "LOADIN
G ...",
40190 GOTO 40100
40300 DEFUSR0 = SB
40320 I = USR0(SB)
40330 IF I <> 0 THEN 40400
40340 PRINT "NOT ENOUGH MEMORY F
OR SUBS"
40350 STOP
40400 PM = SB + I
40410 RETURN
50010 DATA 308D01EF,CC00009C
50020 DATA 74223130,8C38BF01
50030 DATA 3E308C45,BF014030
50040 DATA 8C52BF01,42308D00
50050 DATA 8DBF0144,308D00AC
50060 DATA BF014630,8D00D2BF
50070 DATA 0148308D,00E5BF01
50080 DATA 4ACC0040,BDB4F439
50090 DATA 00000000,00003440
50100 DATA AE8CF5EE,8CF4EC81
50110 DATA EDC1AC8C,EF25F735
50120 DATA C0BDB3ED,8EFFD24F
50130 DATA 5849A786,301E8CFF
50140 DATA C624F439,BDB3ED10
50150 DATA 83000027,0D108300
50160 DATA 012721CC,0000BDB4
```

Cryptanalyst

```
50170 DATA F439308D,0153AF8C
50180 DATA B7308D01,18C641ED
50190 DATA 815CAC8C,AB25F8CC
50200 DATA 01A520E2,308D0139
50210 DATA 8660C61A,A7805A26
50220 DATA FBCC01D9,20D03420
50230 DATA BDB3ED1F,01318D00
50240 DATA ECE684AE,025C5A26
50250 DATA 0235A0A6,8080412B
50260 DATA F5811922,F1486CA6
50270 DATA 20EC0000,34603308D
50280 DATA 00FFAF8C,F5318D00
50290 DATA C43022AC,8CEC2502
50300 DATA 35E0ECA4,A1812408
50310 DATA EE1EED1E,EFA4ECA4
50320 DATA AC8CD725,EF312220
50330 DATA E0A68DFF,3B8D6926
50340 DATA 0E1F8930,8D00CAA6
50350 DATA 8DFF2E8D,77A78539
50360 DATA 00000034,60BDB3ED
50370 DATA 1F02A68D,FF1A5F47
50380 DATA 56475647,56C30400
50390 DATA 1F01E6A4,10AE2233
50400 DATA 8820EF8C,DB338D00
50410 DATA 985CE78C,D56A8CD2
50420 DATA 2716A6A0,8D222605
50430 DATA E6C64C20,04C6608D
50440 DATA 33E78820,A78020E5
50450 DATA 86602005,A78820A7
50460 DATA 80AC8CAC,25F635E0
50470 DATA 81412515,815A2204
50480 DATA 8041200A,81612509
50490 DATA 817A2205,80611A04
50500 DATA 391CFB39,81202403
50510 DATA 86603981,4024038B
50520 DATA 40398160,25068180
50530 DATA 24028060,39
50900 DATA END
```

```
10 ' CRYPTANALYST'S ASSISTANT
20 ' PROGRAM NOTES:
30 '
40 '
60 '      BILL WILLIAMS
70 '
80 '      SAN FRANCISCO
90 '      AUGUST, 1982
100 '
110 '
200 ' THIS PROGRAM REQUIRES
210 ' A 16K OR 32K COLOR
220 ' COMPUTER.
230 '
240 ' FOR A 16K MACHINE,
250 ' YOU MUST PCLEAR 1
260 ' BEFORE CLOADING.
270 '
280 '
290 '
300 ' SYNOPSIS OF VARIABLES:
310 '
320 ' C$(6)  LINES OF CRYPTOGRAM
330 ' CL(6)  LEN OF CRYPTG LINES
340 ' NL     # LINES IN CRYPTOGM
350 ' C      SUBSCRIPT FOR
360 '          CRYPTOGRAM LINES
370 '
380 ' I$     LINE OF TYPED OR
390 '          READ INPUT
400 ' IL     LEN OF INPUT LINE
410 ' IK$    INKEY$ RESPONSE
420 '
430 ' X      HORIZONTAL SCR POS
440 ' Y      VERTICAL SCREEN POS
450 ' P      COMPUTED PRINT@ POS
460 '
470 ' SB     LOAD POINT FOR
480 '          MACH. LANG. SBRS
490 ' PM     LOCATION TO POKE
500 '          INPUTS TO MACHINE
510 '          LANG. SUBROUTINES
520 ' FT     MEMORY LOCATION OF
530 '          FREQUENCY TABLE
540 ' FE     END OF FREQ. TABLE
550 '
560 ' L      LOAD POINT FOR ONE
570 '          MACH. LANG. BYTE
580 ' V      VALUE TO LOAD
590 ' LG     COUNTER FOR
600 '          "LOADING... " MSG
610 '
620 ' F1     FIRST BYTE
630 '          EXTRACTED FROM
640 '          FREQUENCY TABLE,
650 '          THE COUNT
660 ' F2     SECOND BYTE, THE
670 '          LETTER COUNTED
680 '
690 ' F$     FIRST CHAR OF
700 '          SUBSTITUTION CMD,
710 '          THE 'FROM' LETTER
720 ' T$     SECOND CHAR OF
730 '          SUBSTITUTION CMD,
740 '          THE 'TO' LETTER
750 '
760 ' ZZ     ONE TIME SWITCH FOR
770 '          INSTRUCTIONS
780 '
790 '
800 '
810 ' MAJOR SUBROUTINES:
820 '
830 '    1000 BEGINNING OF NEW
```

Cryptanalyst

```
840 '          CRYPTOGRAM
850 '    2000 MAIN LOOP:
860 '          SUBSTITUTION OR
870 '          OPTION COMMAND
880 '    3000 DISPLAY OPTIONS
890 '          MENU
900 '    4000 DISPLAY CIPHER
910 '          DOUBLE SPACED,
920 '          WITH SUBSTITUTES
930 '    5000 COMPUTE SCREEN POS
940 '          FROM X AND Y
950 '    6000 SWITCH VIDEO PAGE
960 '          BASE ADDRESS
970 '          TO $0400
980 '    6100 SWITCH VIDEO PAGE
990 '          BASE ADDRESS
1000 '          TO $0600
1010 '    6200 TAKE FREQ. COUNT
1020 '    6300 SORT FREQ. COUNT
1030 '    6400 DISPLAY FREQ. CNT
1040 '    6900 COPY VIDEO PAGE
1050 '          ($400-$5FF)
1060 '          TO $600
1070 '    8000 ENTER CRYPTOGRAM
1080 '    9000 MAKE CORRECTIONS
1090 '          TO CIPHERTEXT
1100 '    9500 ADD NEW LINES
1110 '          TO CIPHER
1120 '   10000 CHANGE OR DELETE
1130 '          OLD LINES OF
1140 '          CIPHER
1150 '   12000 ASK IF YOU NEED
1160 '          INSTRUCTIONS
1170 '   13100 DISPLAY PAGES 2-5
1180 '          OF INSTRUCTIONS
1190 '   13800 PRESS ENTER TO
1200 '          CONTINUE
1210 '   13900 PRESS ENTER WHEN
1220 '          READY TO BEGIN
1230 ' INSTRUCTIONS:
1240 '    14200 PAGE 1
1250 '    14500 PAGE 2
1260 '    14800 PAGE 3
1270 '    15000 PAGE 4
1280 '    15200 PAGE 5
1290 '
1300 '
          NAM CRYPTSUB

*
* THESE ROUTINES ARE CALLED BY
* CRYPTANA
*
*
* USR0 INITIALIZE
*      SET UP OTHER USR CALLS
```


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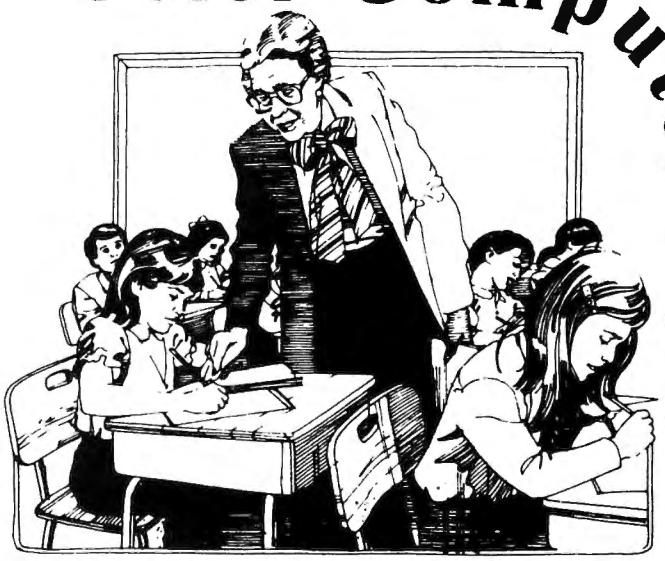
Color Computer News



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Cryptanalyst

```
                        * USRØ MOVE BLOCK OF BYTES
                        * USR1 SWITCH A/N VIDEO PAGE
                        * USR2 INIT TABLE
                        *      Ø FREQUENCY COUNT TABLE
                        *      1 SUBSTITUTION TABLE
                        * USR3 COUNT FREQUENCY (1 LINE)
                        * USR4 SORT FREQUENCY TABLE
                        * USR5 SAVE SUBSTITUTION
                        * USR6 DISPLAY CIPHER AND SUBS
                        *
                        *
0002 0074               MEMTOP EQU $74
0003 0400               SCREEN EQU $400
0004 B3ED               GETINT EQU $B3ED
0005 B4F4               RTNINT EQU $B4F4
                        *
0006 0020               STRSP  EQU $20          SPACE IN A STRING
0007 0060               SCRSP  EQU $60          SPACE ON SCREEN
                        *
0008 013E               USRØ   EQU $013E
0009 0140               USR1   EQU $0140
0010 0142               USR2   EQU $0142
0011 0144               USR3   EQU $0144
0012 0146               USR4   EQU $0146
0013 0148               USR5   EQU $0148
0014 014A               USR6   EQU $014A
                        *
                        *
                        * INITIALIZE
0015 0600               INIT
0016 0600 308D01EF              LEAX ENDUSE,PCR MAKE SURE
0017 0604 CC0000                LDD  #Ø         WE HAVE ROOM
0018 0607 9C74                  CMPX MEMTOP     IN MEMORY
0019 0609 2231                  BHI  INIBAK     FOR CRYPTSUB
0020 060B 308C38                LEAX <MOVBYT,PCR SET USRØ
0021 060E BF013E                STX  USRØ       ADDRESS
0022 0611 308C45                LEAX <SWTPAG,PCR SET USR1
0023 0614 BF0140                STX  USR1       ADDRESS
0024 0617 308C52                LEAX <INITAB,PCR SET USR2
0025 061A BF0142                STX  USR2       ADDRESS
0026 061D 308D008D              LEAX FRQCNT,PCR SET USR3
0027 0621 BF0144                STX  USR3       ADDRESS
0028 0624 308D00AC              LEAX FRQSRT,PCR SET USR4
0029 0628 BF0146                STX  USR4       ADDRESS
0030 062B 308D00D2              LEAX MAKSUB,PCR SET USR5
0031 062F BF0148                STX  USR5       ADDRESS
0032 0632 308D00E5              LEAX DISPLY,PCR SET USR6
0033 0636 BF014A                STX  USR6       ADDRESS
                        *
0034 0639 CC0040                LDD  #PARMS-INIT  RTN PARM
                        *
0035 063C BDB4F4        INIBAK  JSR  RTNINT     ADDRESS
0036 063F 39                    RTS
                        *
                        *
0037 0640 0000000000    PARMS   FDB  Ø,Ø,Ø
0038 0640               FROM    EQU  PARMS
```

```
0039 0642                TO      EQU  PARMS+2
0040 0644                MOVEND  EQU  PARMS+4
                         *

                         * MOVE BLOCK OF BYTES
0041 0646                MOVBYT
0042 0646 3440                   PSHS U
0043 0648 AE8CF5                 LDX  FROM,PCR
0044 064B EE8CF4                 LDU  TO,PCR
0045 064E                A@
0046 064E EC81                   LDD  ,X++
0047 0650 EDC1                   STD  ,U++
0048 0652 AC8CEF                 CMPX MOVEND,PCR
0049 0655 25F7                   BLO  A@
0050 0657 35C0                   PULS U,PC

                         *
                         * SWITCH ALPHANUMERIC VIDEO PAGE
0051 0659                SWTPAG
                         * USER BASIC ARG IS PAGE #
                         * PAGE # IS MEM ADDR / $100
0052 0659 BDB3ED                 JSR  GETINT      GET USER ARG
0053 065C 8EFFD2                 LDX  #$FFD2
0054 065F                A@
0055 065F 4F                     CLRA
0056 0660 58                     ASLB
0057 0661 49                     ROLA
0058 0662 A786                   STA  A,X
0059 0664 301E                   LEAX -2,X
0060 0666 8CFFC6                 CMPX #$FFC6
0061 0669 24F4                   BHS  A@
0062 066B 39                     RTS

                         *
                         * INITIALIZE TABLE
0063 0640                FQEND1  EQU  FROM
0064 066C                INITAB
0065 066C BDB3ED                 JSR  GETINT      GET USER ARG
0066 066F 10830000               CMPD #0          IS IT FREQ TAB?
0067 0673 270D                   BEQ  INIFRQ
0068 0675 10830001               CMPD #1          IS IT SUBST TAB?
0069 0679 2721                   BEQ  INISUB
0070 067B CC0000                 LDD  #0
0071 067E                TABAK
0072 067E BDB4F4                 JSR  RTNINT
0073 0681 39                     RTS

0074 0682                INIFRQ
0075 0682 308D0153               LEAX FRQEND,PCR
0076 0686 AF8CB7                 STX  FQEND1,PCR
0077 0689 308D0118               LEAX FRQTAB,PCR
0078 068D C641                   LDB  #'A
0079 068F                A@
0080 068F ED81                   STD  ,X++
0081 0691 5C                     INCB             NEXT LETTER
0082 0692 AC8CAB                 CMPX FQEND1,PCR
0083 0695 25F8                   BLO  A@
```

Cryptanalyst

```
0084 0697 CC01A5            LDD  #FRQTAB-INIT
0085 069A 20E2              BRA  TABAK

                        * INITIALIZE SUBSTITUTION TABLE
0086 069C               INISUB
0087 069C 308D0139          LEAX SUBTAB,PCR
0088 06A0 8660              LDA  #$60       SET ALL SUBS
0089 06A2 C61A              LDB  #26        TO BLANK
0090 06A4               A@
0091 06A4 A780              STA  ,X+
0092 06A6 5A                DECB
0093 06A7 26FB              BNE  A@
0094 06A9 CC01D9            LDD  #SUBTAB-INIT
0095 06AC 20D0              BRA  TABAK

                        * TAKE FREQUENCY COUNT 1 LINE
0096 06AE               FRQCNT
0097 06AE 3420              PSHS Y
0098 06B0 BDB3ED            JSR  GETINT     GET STRING
0099 06B3 1F01              TFR  D,X        VARPTR
0100 06B5 318D00EC          LEAY FRQTAB,PCR
0101 06B9 E684              LDB  ,X         GET STRING LEN
0102 06BB AE02              LDX  2,X        GET STRING ADDR
0103 06BD 5C                INCB
0104 06BE               A@
0105 06BE 5A                DECB
0106 06BF 2602              BNE  B@
0107 06C1 35A0              PULS Y,PC
0108 06C3               B@
0109 06C3 A680              LDA  ,X+        GET NEXT CHAR
0110 06C5 8041              SUBA #'A        IS IT A-Z?
0111 06C7 2BF5              BMI  A@
0112 06C9 8119              CMPA #25
0113 06CB 22F1              BHI  A@
0114 06CD 48                ASLA
0115 06CE 6CA6              INC  A,Y
0116 06D0 20EC              BRA  A@

                        * SORT FREQUENCY TABLE
0117 06D2 0000          FQEND2 FDB  0
0118 06D4               FRQSRT
0119 06D4 3460              PSHS U,Y
0120 06D6 308D00FF          LEAX FRQEND,PCR
0121 06DA AF8CF5            STX  FQEND2,PCR
0122 06DD 318D00C4          LEAY FRQTAB,PCR
0123 06E1               A@
0124 06E1 3022              LEAX 2,Y
0125 06E3 AC8CEC            CMPX FQEND2,PCR
0126 06E6 2502              BLO  B@
0127 06E8 35E0              PULS U,Y,PC
0128 06EA               B@
0129 06EA ECA4              LDD  ,Y
0130 06EC               C@
0131 06EC A181              CMPA ,X++
0132 06EE 2408              BHS  D@
```

Cryptanalyst

```
0133 06F0 EE1E                  LDU  -2,X
0134 06F2 ED1E                  STD  -2,X
0135 06F4 EFA4                  STU  ,Y
0136 06F6 ECA4                  LDD  ,Y
0137 06F8                  D@
0138 06F8 AC8CD7                CMPX FQEND2,PCR
0139 06FB 25EF                  BLO  C@
0140 06FD 3122                  LEAY 2,Y
0141 06FF 20E0                  BRA  A@

                           * MAKE A SUBSTITUTION
                           * STORE SUBSTITUTE VALUE IN TABL
0142 0640                  LET1 EQU  PARMS
0143 0641                  LET2 EQU  PARMS+1
0144 0701                  MAKSUB
0145 0701 A68DFF3B              LDA  LET1,PCR   GET LETTER1
0146 0705 8D69                  BSR  TSTALF     IS IT A-Z?
0147 0707 260E                  BNE  Z@
0148 0709 1F89                  TFR  A,B
0149 070B 308D00CA              LEAX SUBTAB,PCR
0150 070F A68DFF2E              LDA  LET2,PCR   GET LETTER2
0151 0713 8D77                  BSR  CNVCOD     CONV FOR SCR
0152 0715 A785                  STA  B,X        INTO SUBST TABLE
0153 0717 39               Z@   RTS


                           * DISPLAY CIPHER (1 LINE),
                           * AND TRIAL PLAINTEXT (1 LINE).
0154 0640                  SCRLIN EQU PARMS
0155 0718 0000             LINEND FDB 0
0156 071A 00               BYTCNT FCB 0
0157 071B                  DISPLY
0158 071B 3460                  PSHS U,Y
0159 071D BDB3ED                JSR  GETINT     GET STRING
0160 0720 1F02                  TFR  D,Y        VARPTR
0161 0722 A68DFF1A              LDA  SCRLIN,PCR GET LINE
0162 0726 5F                    CLRB            COMPUTE SCREEN ADDR
0163 0727 47                    ASRA
0164 0728 56                    RORB
0165 0729 47                    ASRA
0166 072A 56                    RORB
0167 072B 47                    ASRA
0168 072C 56                    RORB
0169 072D C30400                ADDD #SCREEN
0170 0730 1F01                  TFR  D,X
0171 0732 E6A4                  LDB  ,Y         GET STRING LEN
0172 0734 10AE22                LDY  2,Y        GET STRING ADDR
0173 0737 338820                LEAU 32,X       SAVE END OF
0174 073A EF8CDB                STU  LINEND,PCR LINE ADDR
0175 073D 338D0098              LEAU SUBTAB,PCR
0176 0741 5C                    INCB
0177 0742 E78CD5                STB  BYTCNT,PCR
0178 0745                  DSPLOO
0179 0745 6A8CD2                DEC  BYTCNT,PCR
0180 0748 2716                  BEQ  DSPFIL
0181 074A A6A0                  LDA  ,Y+        GET CHARACTER
0182 074C 8D22                  BSR  TSTALF     IS IT A-Z?
```

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```
0183 074E 2605              BNE  DSPNA
0184 0750 E6C6              LDB  A,U          GET SUBST CHAR
0185 0752 4C                INCA              INVERSE VIDEO
0186 0753 2004              BRA  DSPSTA
0187 0755             DSPNA
0188 0755 C660              LDB  #SCRSP       BLANK CHAR
0189 0757 8D33              BSR  CNVCOD
0190 0759             DSPSTA
0191 0759 E78820            STB  32,X
0192 075C A780              STA  ,X+
0193 075E 20E5              BRA  DSPLOO
0194 0760             DSPFIL
0195 0760 8660              LDA  #SCRSP
0196 0762 2005              BRA  C@
0197 0764             B@
0198 0764 A78820            STA  32,X
0199 0767 A780              STA  ,X+
0200 0769             C@
0201 0769 AC8CAC            CMPX LINEND,PCR
0202 076C 25F6              BLO  B@
0203 076E 35E0              PULS U,Y,PC

0204 0041             UPCASA EQU  $41
0205 0061             LOCASA EQU  $61
                      * IF CHAR IN ACCA IS EITHER
                      * UPPER OR LOWER CASE ALPHA
                      * RETURN VALUE 0-25 IN ACCA
                      * AND SET Z FLAG.
                      * IF CHAR IN ACCA IS NOT ALPHA
                      * THEN LEAVE ACCA UNCHANGED,
                      * AND RESET Z FLAG.
0206 0770             TSTALF
0207 0770 8141              CMPA #UPCASA
0208 0772 2515              BLO  Z@
0209 0774 815A              CMPA #UPCASA+25
0210 0776 2204              BHI  B@
0211 0778 8041              SUBA #UPCASA
0212 077A 200A              BRA  Y@
0213 077C             B@
0214 077C 8161              CMPA #LOCASA
0215 077E 2509              BLO  Z@
0216 0780 817A              CMPA #LOCASA+25
0217 0782 2205              BHI  Z@
0218 0784 8061              SUBA #LOCASA
0219 0786             Y@
0220 0786 1A04              ORCC #4           SET Z FLAG
0221 0788 39                RTS
0222 0789             Z@
0223 0789 1CFB              ANDCC #$FB        RESET Z FLAG
0224 078B 39                RTS

                      * CONVERT CHAR IN ACCA FROM
                      * ASCII TO SCREEN.
0225 078C             CNVCOD
0226 078C 8120              CMPA #$20
0227 078E 2403              BHS  A@
0228 0790 8660              LDA  #$60
```

Cryptanalyst

```
0229 0792 39              RTS
0230 0793           A@
0231 0793 8140            CMPA #$40
0232 0795 2403            BHS  B@
0233 0797 8B40            ADDA #$40
0234 0799 39              RTS
0235 079A           B@
0236 079A 8160            CMPA #$60
0237 079C 2506            BLO  Z@
0238 079E 8180            CMPA #$80
0239 07A0 2402            BHS  Z@
0240 07A2 8060            SUBA #$60
0241 07A4           Z@
0242 07A4 39              RTS

0243 07A5           ENDCOD EQU  *
                    *
0244 07A5           FRQTAB EQU  ENDCOD
0245 07D9           FRQEND EQU  FRQTAB+52
0246 07D9           SUBTAB EQU  FRQEND
0247 07F3           SUBEND EQU  SUBTAB+26
0248 07F3           ENDUSE EQU  SUBEND

0249 07A5                 END
```


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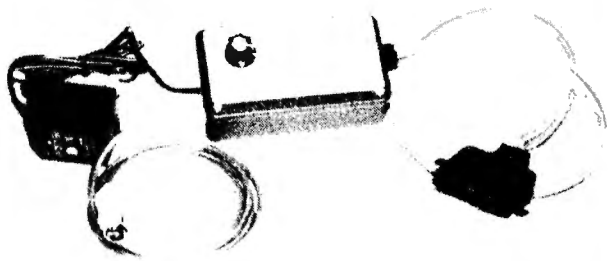

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REVIEW-POL RGEIST

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POLTERGEIST
From Radio Shack
Cartridge $34.95
16K and joysticks required

Poltergeist is a great arcade type game based on the 71 million dollar grossing movie of the same name. Unfortunately it doesn't appear in the RSC-8CC catalog or in the program catalog for the Color Computer, and therefore may be little known. The first place I saw it advertised was in Radio Shack's Pre-Christmas Sale flyer, about three weeks after I got the cartridge. At $34.95 its well worth it. My friends and family have spent hours playing it.

In general the object of the game is to save Carrol Anne from the Poltergeist. To do so you must survive three levels of game play, with only 3 men, or lives, to do it in.

Level 1

"Can you gather the things you need to rescue Carrol Anne?"

The screen displays the top view of a neighborhood of 62 houses, known as the Westhaven development. You (a little man) appear in the upper left corner of the screen and must maneuver yourself around the streets and pick up the things you need to rescue Carrol Anne. The items you must collect are: a red ribbon, tennis balls, handkerchiefs, towels and a rope. These items appear as black rectangles in the red houses. To pick up the items you must go to the driveway of the house they appear in and press the joystick button. You will receive 15 points for each item you collect. After you have collected all five items you must go to the driveway of the house containing a flashing blue box and press the joystick button. The flashing box moves randomly to adjacent houses. To complicate things, the streets are traveled by cars. You must duck into driveways and hide around corners to escape their deadly clutches.

You have 30 time units to complete this level. Upon completion you will receive BONUS points. Bonus is awarded as follows: BONUS = time units left on clock times 10 times the number of men you have left.

If you run out of time or are hit by a car, you lose a man. If you have any men left you must return to this level again, and forfeit all

items previously collected.

There are a couple of flaws with this level. One, sometimes you don't have to be in a driveway to collect an item. Two, if you hold the fire button down, no cars will come out. These are minor flaws and do not adversely affect game play.

Level 2

"Can You Get Past The Stairs?

The screen now displays a twelve step staircase with you appearing as two feet at the bottom. You must climb all the way to the top step without hitting any obstacles or letting the Poltergeist get you. Each step has an obstacle on it, either a block or a face, which moves randomly back and forth. The Poltergeist starts at the top of the stairs and can travel in any direction, but is delayed when it runs into any of the obstacles. With some tricky maneuvering you can lure it into a group of obstacles and then make a mad dash to the top and receive BONUS points as in level 1, then its off to level 3! If you die, the screen goes black and your feet spiral into the darkness, and you lose a man. If you have any men left you will return to level 1.

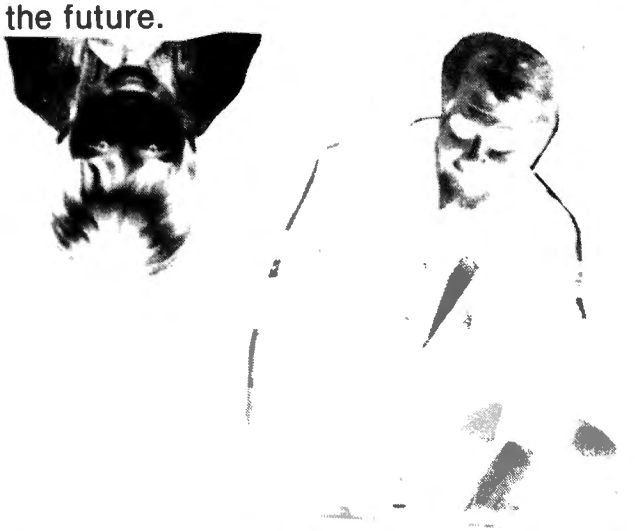
I might add, upon entering this level it is a good idea to have your joystick pulled back so that you don't accidentally walk forward right into an obstacle.

Level 3

"Can You Help Carrol Anne Escape?"

You are now in an energy field and the screen displays multicolored lines shooting past you from the distance. You control a "+" on the screen which acts as your site. Ghostly figures will come towards you one at a time and if its a Poltergeist you must shoot it by lining it up with your site and pressing the joystick button. If however it is Carrol Anne you must wait for her to disappear. You get 15 points for each Poltergeist you kill and you must kill eight to complete the level, which isn't easy. Each figure moves toward you faster than the last and you have less time to decide what to do. If you shoot Carrol Anne, miss a Poltergeist or run out of time, you lose a man and if you have any men left, its again back to level 1. If you complete this level you get a special BONUS. 60 time units are added to the time left on the clock and then bonus points are awarded as in the previous levels. The message "This house is clean!" will appear, and the game is over.

The graphics, sound and game theme add up to make a spectacular game. In fact this is my favorite game cartridge available so far and I hope its an example of the kind of game software we can expect from Radio Shack in the future.



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Telewriter-64™

the Color Computer Word Processor

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

THE ORIGINAL

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

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

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

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

...one of the best programs for the Color Computer I have seen...
— Color Computer News, Jan. 1982

TELEWRITER-64

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

64K COMPATIBLE

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

64 COLUMNS (AND 85!)

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

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

RIGHT JUSTIFICATION & HYPHENATION

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

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

FEATURES & SPECIFICATIONS:

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

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

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

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

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

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

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

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

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

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

...truly a state of the art word processor... outstanding in every respect.
— The RAINBOW, Jan. 1982

PROFESSIONAL WORD PROCESSING

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

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

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(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.)

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USING GRAPHICS WITH THE MICROWORKS ASSEMBLER

by Jim Moss
519 Whitmore Road
Hastings, MI. 49058

If you've purchased the Micro Works Assembler (SDS80C), you've got a very efficient system for writing 6809 code. While developing your program, all of the following are in the Color Computer at once: an editor program, an assembler, a monitor, your source program, and your object code.

You can enter a program, assemble it, then return to the editor, and repeat the process until the code is debugged. You are not required to use the cassette anywhere in the debugging process, but you will usually want to save your source before testing to protect against a bug in your program destroying the text buffer.

The SDS80C design puts everything that can be in ROM, and uses RAM efficiently by not storing unnecessary blanks. I can fit about 700 program statements into a 16K machine, and that's with reserving 3K for graphics. To use graphics, you've got to find a place for the graphics page. It's possible to protect high memory from the assembler by changing the stack pointer and putting it there (see p.34 of the SDS80C Owner's Manual). But it's easier to just leave the video window where it will be on entering your program, which is at $400.

This means that there will not be separate text and graphics screens, as under BASIC, but they will both start at $400. The text screen ends at $5FF, but a graphics screen will be longer. A screen for PMODE 1 will occupy $400 to $FFF. Since the editor normally puts your source code at $610, we'll have to change this before typing in text, or loading it from tape.

Enter ''='' to go to the monitor. Then enter ''M0000'' to view memory location 0. Refer to p.24 of the Owner's Manual for an explanation of these fields. Change the ''06100610'' to ''10101010'', then enter ''* '' to return to the editor. The text buffer now starts at $1010, so $400 thru $FFF can be used for graphics memory.

After I figured this out, I cheerfully proceeded to write programs using graphics. I put in the SWI (software interrupt) instruction, as explained on p.23, but when the program reached the SWI, I didn't see the familiar display of registers. My program was interrrupted, and the monitor was entered, but I was still in graphics mode! This means you must return to text mode in

AARDVARK

TRS-80 COLOR OSI VIC-64 VIC-20 SINCLAIR TIMEX

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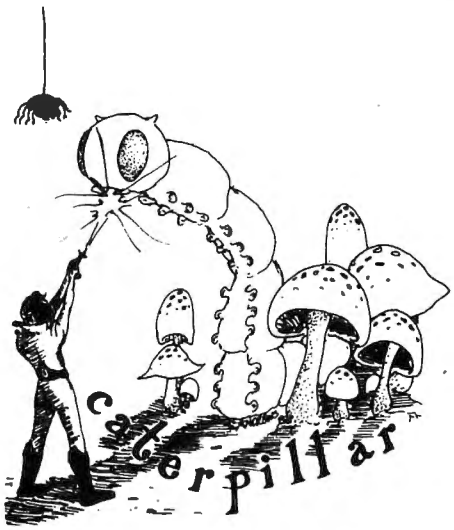

CATERPILLAR

O.K., the Caterpillar does look a lot like a Centipede. We have spiders, falling fleas, monsters traipsing across the screen, poison mushrooms, and a lot of other familiar stuff. COLOR 80 requires 16k and Joysticks. This is Edson's best game to date. $19.95 for TRS 80 COLOR.

PROGRAMMERS!
SEE YOUR PROGRAM IN THIS SPACE!!
Aardvark traditionally pays the highest commissions in the industry and gives programs the widest possible coverage. Quality is the keyword. If your program is good and you want it presented by the best, send it to Aardvark.

ADVENTURES!!!

These Adventures are written in BASIC, are full featured, fast action, full plotted adventures that take 30-50 hours to play. (Adventures are interactive fantasies. It's like reading a book except that you are the main character as you give the computer commands like "Look in the Coffin" and "Light the torch.")

Adventures require 16k on TRS80, TRS80 color, and Sinclair. They require 8k on OSI and 13k on Vic-20. Derelict takes 12k on OSI. $14.95 each.

ESCAPE FROM MARS
(by Rodger Olsen)
This ADVENTURE takes place on the RED PLANET. You'll have to explore a Martian city and deal with possibly hostile aliens to survive this one. A good first adventure.

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This is our most challenging ADVENTURE. It is a treasure hunt in a pyramid full of problems. Exciting and tough!

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It's a real adventure—with ghosts and ghouls and goblins and treasures and problems — but it is for kids. Designed for the 8 to 12 year old population and those who haven't tried Adventure before and want to start out real easy.

DERELICT
(by Rodger Olsen & Bob Anderson)
New winner in the toughest adventure from Aardvark sweepstakes. This one takes place on an alien ship that has been deserted for a thousand years — and is still dangerous!

TUBE FRENZY
(by Dave Edson)
This is an almost indescribably fast action arcade game. It has fast action, an all new concept in play, simple rules, and 63 levels of difficulty. All machine code, requires Joysticks. Another great game by Dave Edson. TRS 80 COLOR ONLY. 16k and Joysticks required. $19.95.

CATCH'EM
(by Dave Edson)
One of our simplest, fastest, funnest, all machine code arcade games. Raindrops and an incredibe variety of other things come falling down on your head. Use the Joysticks to Catch'em. It's a BALL! — and a flying saucer! — and a Flying Y!— and so on. TRS 80 COLOR. $19.95.

BASIC THAT ZOOOMMS!!
AT LAST AN AFFORDABLE COMPILER!
The compiler allows you to write your programs in easy BASIC and then automatically generates a machine code equivalent that runs 50 to 150 times faster.

It does have some limitations. It takes at least 8k of RAM to run the compiler and it does only support a subset of BASIC– about 20 commands including FOR, NEXT, END, GOSUB, GOTO, IF, THEN, RETURN, END, PRINT, STOP, USR (X), PEEK, POKE, *, /, +, -, >, <, =, VARIABLE NAMES A-Z, SUBSCRIPTED VARIABLES, and INTEGER NUMBERS FORM 0-64K.

TINY COMPILER is written in BASIC. It generates native, relocatable 6502 or 6809 code. It comes with a 20-page manual and can be modified or augmented by the user. $24.95 on tape or disk for OSI, TRS-80 Color, or VIC.

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Assembler Graphics

your program, before you use an SWI.

The sample program shows how to get into and out of graphics, how use SWI while in graphics mode, and how to use the info in "COMMENT CORNER". The April, '82 issue explained that the routine to draw a line is at $94A1 in the Extended ROM. This program sets PMODE 1, clears the screen, draws a line with the coordinates in LINTBL each time a key is pressed, then again waits for a key to be pressed. If it's BREAK, the program ends, otherwise, it clears the screen and draws the lines again. It's not a useful program by itself, it just demonstrates how to use graphics. (Note: Make the ORG statement, line 2, a comment before using "").

To use the breakpoint (SWI) feature, insert "JSR SWI" instead of just "SWI". The program will then save the registers on the stack, reset to text mode, restore the registers and enter the monitor. You will be able to see all the register, except the program counter, then do anything you would normally do with the monitor (examine memory, etc.) Enter "G" to return to your program. The program will then resume graphics mode, and return to the statement following the "JSR SWI".

With this set-up, you will see part of the graphics screen has been clobbered. If this is not acceptable, start your graphics screen at $600, and adjust the start of the editor's text buffer accordingly. This is accomplished by storing "12101210" at memory location 0. Then load the program and change statement 12 to "SCSTRT EQU $0600" and add "STA $FFC7" after line 67. Now there are separate graphics and text screens, as in COLOR BASIC, but this costs another 512 bytes of memory.

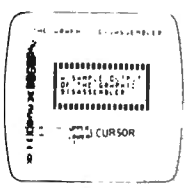
You now have the basics for developing fast action graphics games in 6809 code. Write some game programs and liberate COLOR COMPUTER owners from slow BASIC games.

CC GRAPHICS DISASSEMBLER AND ARCADE GAME EDITOR

Use up and down arrows to scan through memory and display data tables as a band of graphic pictures. Right and left arrows change byte scan width to frame graphics. Use two horizontal cursor lines to block in desired graphic - program then returns:

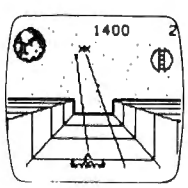
- Data table beginning address
- Data table ending address
- Byte width of picture data

Learn ML programming by seeing how your professional games are written. Takes the mystery out of ML animation techniques. Change graphics by modfying small blocks of data. Put a hat on Pac Man, give Orville some teeth, or change your Space Invaders to Cowboy and Indian Raiders. You'll have fun learning. Know where the graphic data tables are. Ideal complement to a MNEMONICS disassembler. Eliminate garbage mnemonics resulting from false code disassembly of data. Tutorial explains how to use **$19.95**



3-D TRENCH MASTER

A fast action graphic arcade game featuring 3-D ships eye view of a deathstar in motion. You fly around the rotating deathstar and fight 6 kinds of alien menaces (16K E. B.) **$14.95**



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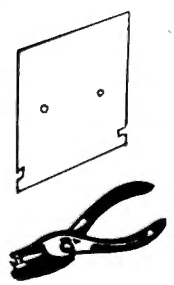

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COLOR COMPUTER NEW!

MACRO-80C

The Micro Works is pleased to announce the release of its **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**

YOU NEED COLOR FORTH!!

Why?

- 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**

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, copys 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**

MICROTEXT: COMMUNICATIONS VIA YOUR MODEM!

Now you **can** use your printer with your modem! Your computer can be an intelligent printing terminal. Talk to timeshare services or to other personal computers; print simultaneously through a second printer port; and redisplay text stored in memory. Dump to a cassette tape, or printer, or both. Microtext can be used with any printer or no printer at all. It features user-configurable duplex/parity for special applications, and can send any ASCII character. You'll find many uses for this general purpose module! Microtext is available in ROMPACK, ready-to-use, for **$59.95.**

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**

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**
Berserk — Have fun zapping robots with this Hi-Res game by Mark Data Products. Cassette requires 16K. **Price: $24.95**
Adventure — *Black Sanctum* and *Calixto Island* by Mark Data Products. Each cassette requires 16K. **Price: $19.95** each.
Cave Hunter — Experience vivid colors, bizarre sounds and errie 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. **Price: $24.95**

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SO WHAT'S A BBS?

By Shawn Jipp
555 E. El Camino Real #409
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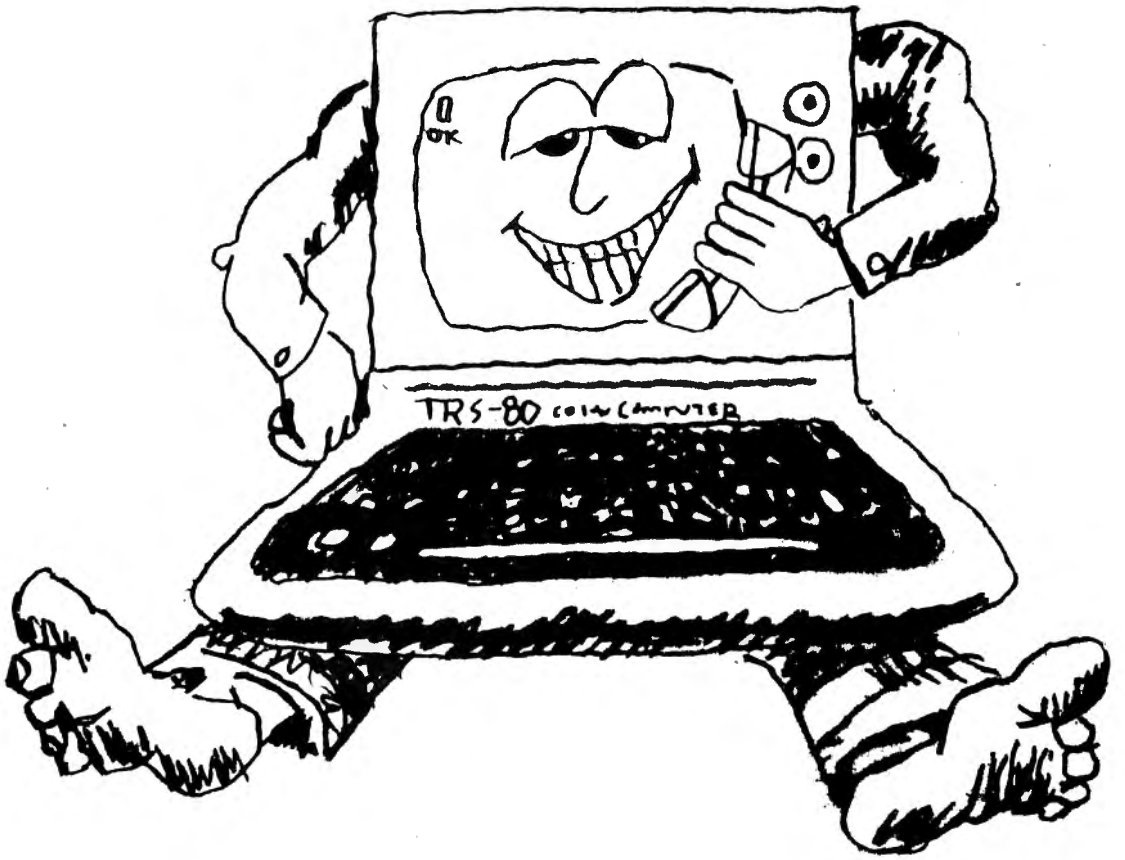

A BBS by definition means a 'Bulletin Board System'. A computer BBS, then, is a means whereby computer hobbyists may advertise items for sale, exchange information and knowledge, leave electronic mail for one another, post announcements, and more, all via the miracle of Ma Bell, a modem, some communication software, and of course your good old computer and/or terminal. The best thing about all this is that accessing a BBS only costs you the amount of the phone call!

There are many different types of computer bulletin boards out there, each with their own unique personality. Some may specialize in certain topics such as general aviation, genealogy, or even limericks. Others may cater to one type of computer. Some of the more common BBS names are: Connection-80, Comnet-80, Bullet-80, Forum-80, PMS, Conference-Tree, ABBS, CBBS, Living BBS and several others that are less common. There are even some that use CoCo's and other 6809 systems!

Most bulletin boards are written in BASIC with an assembly language driver handling the I/O through the modem, although some may be written entirely in assembly language.

The standard BBS computer systems include a modem with some sort of auto-answer capability, two to four floppy disk drives (some are lucky enough to have a hard disk drive!), and of course, the computer, which can be anything from a TRS-80 Color Computer to an IBM mainframe.

A BBS is provided as a free service to you, the user, since electricity, diskettes, extra telephone lines, printer paper, and one's time all cost money, the 'SYSOP' (System Operator), of the BBS may sell software and/or hardware through his board to help finance his hobby. This can prove to be excellent source of computer products.

The hours of operation of a BBS may range from 24 hours each day for 365 days each year to just a few hours or so, whenever the SYSOP feels like putting his system "ONLINE". Most however, are online 24

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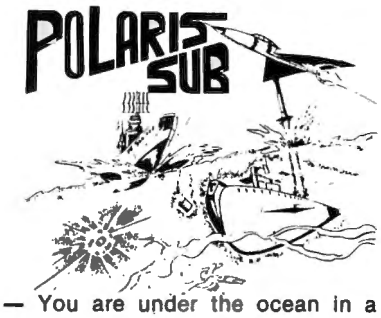
BLACKJACK — A casino game that puts two players against the beady-eyed dealer of the house. This dealer deals the cards as good or even better than Intellivision. If you have any gambling blood at all this game is a must! Same rules as any Las Vegas casino. High resolution graphics. Only $12.95.



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 an extremely fast action machine language program with high resolution graphics. Only $14.95

SUPER ZAP — Enemy spaceships are attacking from all sides and your mission, should you choose to accept it, is to defend your starbase from the deadly Armada of Pyruss. This will be a dangerous mission since the Pryuss Armada has never been defeated by any humanoid. Action increases as the game progresses. Only $14.95.

BUSINESS PROGRAMS

INVENTORY CONTROL — This program contains all the necessary features required for all types of inventories, such as sorting of inventory by stock number. This program will list stock number, description, amount in stock, cost, wholesale, profits. Minimum 16K disk required. Only $39.95.

PROPERTY INVENTORY FOR YOUR BUSINESS — This program lists inventory by department, date purchased, property numbers. Gives line list of inventory to your line printer, also this program has the ability to add and delete items. Minimum 16K disk required. Only $29.95.

ACCOUNTS PAYABLE — This program inputs outgoing accounts (name, address, city, state), expenditure payed and balance owed. You can also list one account or all accounts to the printer. Minimum 16K disk required. Only $29.95.

ACCOUNTS RECEIVABLE — This program inputs incoming accounts (name, address, city, state), capital received, credit limit, date of last payment and lists one or all accounts to the printer. You can also insert or delete accounts. Minimum 16K disk required. Only $29.95.

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. Minimum 16K disk required. Only $14.95.

ALL GAME PROGRAMS — require 16K extended and joysticks (prices are set for cassette, add $4.00 for disk).

PROGRAMMERS!!! — K & K pays the highest royalties for your programs. If your program is good, send it to K & K and receive the best possible coverage!

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What's a BBS?

hours every day. The hours of operation are usually listed somewhere on the BBS itself.

To access a BBS you will need a modem, computer and/or terminal, telephone, and some sort of communications software.

The word modem is an abbreviation of ''Modulator - Demodulator''. This is a device that converts the binary electrical signals from the computer into audio signals that are then sent over the telephone lines. Several different types are available and the price range varies from $89 to over $700. A direct connect modem has a cord that plugs directly into the phone companies modular jack, whereas an ''acoustically coupled'' modem requires one to place the standard telephone's headset into two rubber ''cups'' on the modem itself. One of these cups is a speaker, the other a microphone. I suggest that you purchase the direct-connect type as acoustically coupled ones tend to be somewhat more sensitive to room noise and are more clumsy to use.

If you are going to be using an acoustically coupled modem then you will need a standard, old-fashioned telephone. If you plan to use a direct-connect type then you will need a modular jack (consult the phone company if you don't have one already).

As for communications software, there are two major types: ''dumb'' or ''intelligent''. An example of a dumb type is Radio Shack's very own videotext. Videotext allows you to communicate with a host computer or BBS, and then after 'logging off', to scroll thru the memory buffer to re-read everything that was displayed during the call. An intelligent program on the other hand, allows you not only to do the above, but also to dump the buffer to a printer after logoff; automatically upload or download basic programs; save programs in the buffer to either disk or cassette; send pre-entered messages to the host computer; save selected portions of the buffer; and more. Very versatile indeed! An example of an intelligent communications program for the Color Computer is Eigen System's Colorcom/E. I personally recommend paying a few dollars more and buying an intelligent one. Color Computer Communication programs range in price from $29 to $99.

When you get all the 'goodies' together you will want to try calling a BBS yourself. To call a BBS, simply load in your communications software, dial the proper telephone number, and after your modem detects the distant modem's 'carrier' frequency (CR LIGHT ON), hit the ENTER key a couple of time. After asking for your name, the BBS will then prompt you, displaying menus of what your options are from time-to-time. If you should get lost, try the 'H', '?', or 'HELP' commands. If you don't have a BBS number to call, then you may call mine at (408)-SEE-6809 any time of the day. It is running on a 64K Color Computer with two drives.

After a short time you will be an 'old pro' at bulletin board usage. Don't forget to have fun and.....Happy Hacking!

CCN TIP

To PCLEAR 0 type POKE 25,6:NEW

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CASSETTE BOX LABELS

By Richard L. Scales
550 Sommers Avenue
Wabash, IN 46992

Recently, I saw a program that produces label inserts for cassette boxes. It caught my eye because I am constantly aware of how messy (ugly) my box labels are. Let's face it, I just cannot print legibly. Unfortunately the labeling program was for another computer and the printing routines only vaguely resembled something I recognized. Consequently, I sat down and wrote my own program for the Color Computer and Line Printer VII.

It soon became apparent that there could be two concepts as to what is "right side up". This caused me to write two versions so you can take your pick. Choose the one you like best. Listing 1 (see Figure 1), produces a label insert for those of you who store boxes vertically. It permits you to lift the box to see if a particular program is on the tape. Listing 2, (see Figure 2) produces an insert for those of you who store cassette boxes horizontally (flat). You can pull the box out as you would open a drawer and read the program names.

The two programs are the same except for the lines being rearranged. Therefore I will discuss Listing 1 and refer to those line numbers. Comments will apply to both (except for the line numbers).

Program Listing 1:

Line 40; The spaces after the quote are merely to make a more attractive screen display.

Lines 50-70; The assumption is that your printer is set for 10 characters per inch. If you don't have 10 c.p.i, adjust for your printer. Also adjust Lines 160-200.

Lines 80-90; All those PRINTs are for screen appearance. Two lines are used so the GOTO statement in Line 130 will send you to Line 90, instead of 80. Either will work.

Line 100; Spaces are for screen appearance.

Line 110; LINE INPUT was chosen to permit using punctuation when typing the label. If you do not have Extended Basic, change to INPUT, but you won't be able to use commas, etc. The spaces are for appearance (centering on screen) AND to force the cursor down to the next line so your typing

Cassette Box Labels

will not wrap-around.
Lines 120-140; This routine limits length to 20 characters and centers the copy. CHR$(31) sets the printer to 5 characters per inch. If you don't have the LPVII, change this to the appropriate value.
Line 150; Note the ";:" after L$. The ";" suppresses a line feed to maintain proper print-out spacing. The CHR$(30) returns the LPVII to 10 characters per inch. Again, check your Printer Manual if you have a different printer. In the interest of brevity, the programs lack some routines you may feel are needed. As written, you MUST have your printer connected and ON before typing RUN. You can add the following lines if you wish:
45 PRINT:PRINT" PRINTER MUST BE ON AND READY"
46 PRINT:PRINT" (PRESS ANY KEY TO CONTINUE)"
47 X$=INKEY$:IF X$="" THEN 47

The programs do not provide for printing individual program names. You simply write them down as you store them on the tape. My intent was to improve the appearance of stored boxes. I can live with my awful printing as long as others don't normally see it.

NOW, STUDENTS...your homework assignment is to write a routine (for program 1) that permits printing the individual program names (SIDE A and SIDE B) on the box label. Send your listing to me:

Dick Scales
550 Sommers Avenue
Wabash, IN 46992

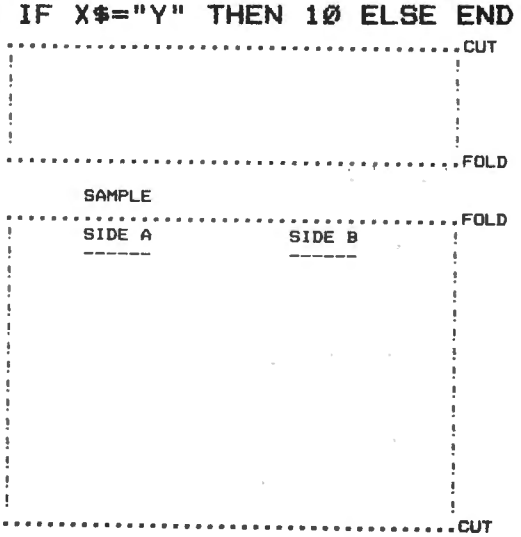
DO NOT send me tapes or disks...just LLISTings. I will review your work and send the one(s) I like best to this magazine in the hopes that they will print it (them) in a future edition.

The author of the winning entry may be rewarded with the knowledge that his/her name appeared in print. If you want your LLISTing back or wish me to comment, enclose a SASE.

ARE YOU READY?...YOU CAN DO IT!...GO FOR IT!

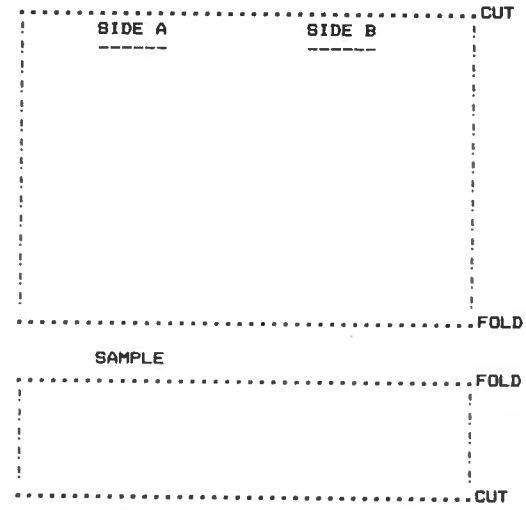
HINT: You may find it easier to print Side B program BELOW rather than beside Side A programs.

```
10 CLS 'FOR BOXES STORED VERTICA
LLY
20 PRINT@196,"CASSETTE BOX LABEL
 MAKER":FORZ=1 TO 900:NEXTZ
30 CLS:PRINT@193,"THIS PROGRAM M
AKES INSERTS FOR"
40 PRINT"       YOUR CASSETTE BOX
ES"
50 PRINT#-2,STRING$(40,".");"CUT
"
60 FOR X=1 TO 5:PRINT#-2,"!";TAB
(39);"!":NEXT X
70 PRINT#-2,STRING$(40,".");"FOL
D"
80 CLS:PRINT:PRINT
90 PRINT:PRINT
100 PRINT"        ENTER LABEL NAM
E"
110 LINE INPUT"      (MAXIMUM 20
SPACES):          ";L$
120 N=LEN(L$)
130 IF N>20 THEN PRINT:PRINT"
TOO LONG!":GOTO 90
140 T=INT((20-N)/2):PRINT#-2,CHR
$(31)
150 PRINT#-2,TAB(T);L$;:PRINT#-2
,CHR$(30)
160 PRINT#-2,STRING$(40,".");"FO
LD"
170 PRINT#-2,"!";TAB(7);"SIDE A"
;TAB(25);"SIDE B";TAB(39);"!"
180 PRINT#-2,"!";TAB(7);"------"
;TAB(25);"------";TAB(39);"!"
190 FOR Z=1 TO 13:PRINT#-2,"!";T
AB(39);"!":NEXTZ
200 PRINT#-2,STRING$(40,".");"CU
T"
210 CLS:PRINT@166,"DO AGAIN?  (Y
 OR N)"
220 X$=INKEY$:IF X$="" THEN 220
230 IF X$="Y" THEN 10 ELSE END
```



Cassette Box Labels

```
10 CLS'FOR BOXES STORED FLAT
20 PRINT@196,"CASSETTE BOX LABEL
 MAKER":FOR Z=1 TO 900:NEXTZ
30 CLS:PRINT@193,"THIS PROGRAM M
AKES INSERTS FOR"
40 PRINT"       YOUR CASSETTE BOX
ES"
50 PRINT#-2,STRING$(40,".");"CUT
"
60 PRINT #-2,"!";TAB(7);"SIDE A"
;TAB(25);"SIDE B";TAB(39);"!"
70 PRINT#-2,"!";TAB(7);"------";
TAB(25);"------";TAB(39);"!"
80 FOR Z=1 TO 13:PRINT#-2,"!";TA
B(39);"!":NEXTZ
90 PRINT#-2,STRING$(40,".");"FOL
D"
100 CLS:PRINT:PRINT
110 PRINT:PRINT
120 PRINT"        ENTER LABEL NAM
E"
130 LINE INPUT"      (MAXIMUM 20
SPACES)          ";L$
140 N=LEN(L$)
150 IF N>20 THEN PRINT:PRINT"
TOO LONG!":GOTO 110
160 T=INT((20-N)/2):PRINT#-2,CHR
$(31)
170 PRINT#-2,TAB(T);L$;:PRINT#-2
,CHR$(30)
180 PRINT#-2,STRING$(40,".");"FO
LD"
190 FORX=1 TO 5:PRINT#-2,"!";TAB
(39);"!":NEXT X
200 PRINT#-2,STRING$(40,".");"CU
T"
210 CLS:PRINT@166,"DO AGAIN?  (Y
 OR N)"
220 X$=INKEY$:IF X$="" THEN 220
230 IF X$="Y" THEN 30 ELSE END
```



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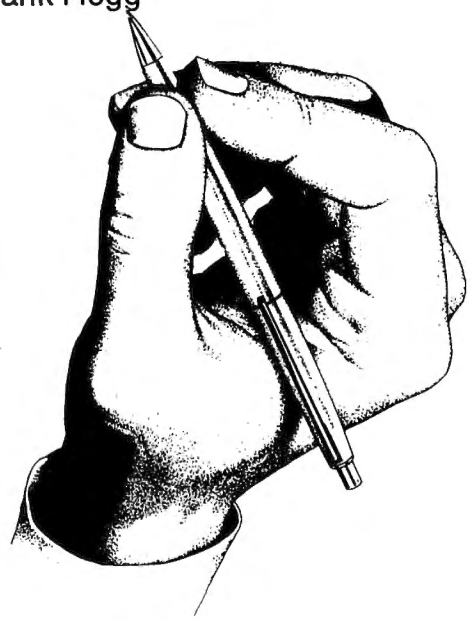
Specify 32K disk, 32K cassette or 16K version - the 32K versions require Extended BASIC, the 16K version does not. The disk version is normally shipped on a cassette with instructions for transferring to disk. If you want the program shipped on a disk add $3.00.

Send check, money order or Mastercard/Visa number (including expiration date and SIGN order). Price includes shipping. PA residents include 6% sales tax.

*All programs require Color Computer™ (Tandy Corp.) or TDP System 100 Computer™ (RCA Corp.).

64K Korner

by Frank Hogg



Dateline: Syracuse New York, December 22, 1982
Time: Midnight
Place: Den
Subject: Desperate attempt to write 64K Korner for February 1983

I called Bill Sias earlier today to find out how much time I had for the deadline for the February issue. He told me that he was hoping that my column was coming in todays mail. When I asked when I absolutely, positively had to have it to him I received all of one extra day. So that is why I'm burning the midnight oil, trying to put this together. I have to send it by overnight mail tomorrow. Oh well, another rush job.

Did you realize that this column started one year ago this month? Time sure flies doesn't it? By the way Kent Myers is the unknown author in last months column, sorry Kent, for not giving you credit.

In the January issue of "Microcomputing" on page 80 of an article for the TI99/4a is a benchmark between the TI and Atari computers. They also listed the times for TSC BASIC, here they are. Atari 10.8 seconds, TI console 17.7 seconds, TI extended 12.5 seconds, TI latest vs 9.9 seconds and TSC BASIC 3.2 seconds. Horray for the 6809 and TSC. By the way the TI machine is a 16 bitter, an old design 16 bit but a 16 bit just the same. The Atari is a 6502.

Things have been really hopping at the lab. It seems that the $299 sale on the CoCo along with the Christmas buying spree has really spurred sales of Color Computers and the resultant new owners have been calling for software to run on their new computers. After over 5 years of listening to Z-80 and 6502 users brag about how great their machines are, it sure is nice to have everybody jumping on the 6809 bandwagon. Now they all know why we had 6809's while they were running their rather slow, antiquated computers.

That reminds me. Today I received a call from a fellow, like many calls I've received in the past along this very line. It seems that this guy wanted to buy CoCo's for his school and he had opposition from other teachers that were pushing Apples. He wanted to get some help in convincing his opponents that the CoCo with a 6809 was a better computer than the Apple. As happens in cases like these the other fellows were sold on the Apple, and didn't want to listen to what he had to say.

This is one very hard nut to crack. Apple has been doing one heck of a job selling their computer. The fact that it is based on old

Arcade Action & Adventure

For The TRS-80 Color Computer

rep•u•ta•tion: *a place in the public esteem or regard; a good name.*

The Program Store, one of *the* original software companies of the '70s, began to develop its solid reputation for selection and service right from the start. Today, it offers the largest selection of software in America, and backs every piece of inventory with the trusted Program Store name.

Voyager I

From Avalon Hill

You're on board a spaceship infested with killer robots in this graphic science fiction game. You must clear the 4-level 144-location ship of robots and arm it to self-destruct. Can you do it and escape before you, too, are blown up? High-speed graphics are represented in 3-D perspective representing your eye's view; with instant switching to floor plan maps. Extended BASIC required.

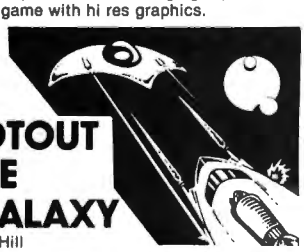
16K Tape, $19.95

VC

From Avalon Hill

Can you change history? You command the South Vietnam army; the computer controls the Viet Cong (VC) and North Vietnamese Army. Can you win the hearts and minds of the people, and destroy the VC units in your province? Challenging operational level combat game with hi res graphics.

16K Tape, $19.95



SHOOTOUT AT THE OK GALAXY

From Avalon Hill

This exciting new game requires fast arcade response and well-thought-out strategy. ***Thirty alien warships*** have entered your Patrol Zone—can you handle your defense? Are your shields up? Have you checked your energy level? Is your azimuth set? OK then...***Good Luck!***

16K Tape, $19.95

Death Planet: The Dog Star Adventure

By Lance Micklus from Adventure International

The beautiful Princess Leya has been captured by the evil General Doom. Can you save her, and the Royal Treasury, from Doom and his army? Extended BASIC required.

16K Tape, $19.95

Avenger

From Cornsoft

Pest control in space is ***not easy!*** Your Pesticraft is armed with laser and pesticide bombs to vaporize the almost-endless wave of pests. Watch for the AVENGER that tries to stop you. And the birds—filled with attacking droids. Get an extra Pesticraft for each 10,000 points. Requires 2 joysticks.

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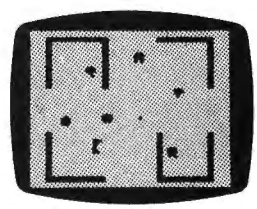
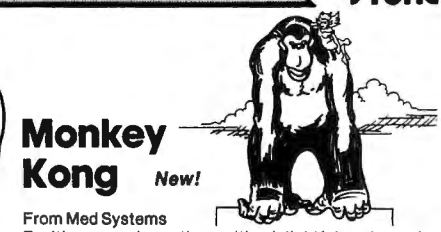


Robot Battle

From Spectral Associates

Can you dodge the never-ending horde of robots while avoiding the fatal touch of the Android? Realistic voices and 16 skill levels provide a tremendous arcade type challenge. Does not require Extended BASIC; joysticks.

16K Tape, $21.95



Monkey Kong *New!*

From Med Systems

Exciting arcade action with delightful animated graphics. You'll need all your speed, skill and manual dexterity for this one! With increasing levels of difficulty, so you won't get bored. For 1 or 2 players, or 2-player split control.

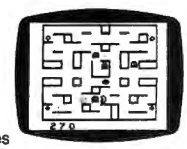
16K Tape, $24.95

Color Haywire

From Mark Data Products

Hostile robots await you in a series of dangerous rooms. As you fire your laser gun to destroy the robots, be sure not to touch the walls or any objects you find—they are all ***electrified!*** Don't relax for a moment...the Indestructible Menace is lurking somewhere, ready to demolish everything in his path ...and he cannot be destroyed. Fast-paced 1 or 2 player game with great colors and sound. Requires joystick for each player.

16K Tape, $24.95

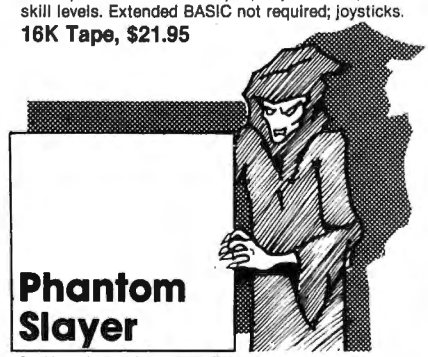


Ghost Gobbler

From Spectral Associates

In this new and exciting version of the popular arcade game, use your joysticks to move your Ghost Gobbler through the maze, eating dots and power pills to score points. 8 bonus shapes, super sound, and 16 skill levels. Extended BASIC not required; joysticks.

16K Tape, $21.95



Phantom Slayer

By Ken Kalish from Med Systems.

You are the Phantom Slayer, assigned to enter the deadly Catacombs and destroy the mutant Phantoms. You're armed with a laser pistol and proximity detector, but be careful—the Phantoms' touch is ***fatal!*** Real-time machine language game with hi-res 3-D graphics and sound. Multiple skill levels; extended BASIC not required.

16K Tape, $19.95

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64K Korner

technology, runs 3 times slower, and costs several times more than the CoCo doesn't seem to get through to proponents of the Apple.

The only thing I can suggest to say to people like that is this. "If you want to spend three times as much money to buy a computer based on obsolete technology, that runs three times slower, and is harder to program and upgrade, then I have some swampland in Florida I think you may be interested in." What else can you do! Those commercials can brainwash them if they don't watch out and it's impossible to talk someone out of something once they have made their mind up. The only thing you can do is plant a seed of doubt. Maybe they will take off the rose colored glasses and compare the two computers. Most people like this just want you to agree with them, they don't want their applecart upset (pun intended).

I would like to see everyone buy a CoCo, and it's not just for business reasons. The real reason is I'm getting tired of hearing the same old story from people who bought Apples, VICs, TIs and others. They all say the same thing, "Why didn't you tell me what the CoCo could do, I wouldn't have bought this piece of junk". Well what can I say, sooner or later they all come around. Lets hope it's sooner.

NEW COCO PRICE

By now the word should be out that RS has announced the 64K CoCo at the list price of $549.00. That includes extended Basic too. The 16K regular Basic CoCo will stay at the $299.95 sale price. Computer Plus is selling them at $420.00 and $249. Now that's value for you. Computer Plus had the drive 0 Disk Systems on sale for $385 in December and if that's still in effect that means that you can get a 64K CoCo with FLEX and Disk system for about $900 from them. By the way they are dealers for FHL FLEX, as is LEVEL IV. That price is all the more interesting when you stop to think that RS was selling the 32K CoCo for $750 just a short while ago, and that didn't include the disk system! I guess the pressure from competition got them on the ball. Horray for RS.

TO Radio Shack from FHL

Several people have asked if Radio Shack paid us for using our modification to access the 64K in the CoCo in the new 64K Color Computers. Well the answer is no they didn't and as a matter of fact they didn't even ask. But that's OK with us. I hereby give Radio Shack the rights to use our modification in their 64K Color Computers absolutely free of charge.

NEW 64K SOFTWARE

From SPECTRUM PRODUCTS

64K DISK UTILITY PACKAGE $21.95 on Disk.

In response to this column, Bob Rosen from Spectrum Products, 9315 86 Drive, Woodhaven, NY 11421, (212) 441-2807, sent me a copy of their new disk utility package. I haven't had time with the Christmas rush to do little more than give it a quick once over but read on, here is one of those, "Why didn't I think of that" kind of things.

The package consists of three programs, the first of which is the important one. With the "40K" program your CoCo can have 40K of user RAM instead of 32K! How about that! What it does is to relocate the 8K Basic that resides from &H8000 to &H9FFF up above Disk Basic to the &HE000 area. After performing a moverom it then moves the lower 8K to &HE000 and modifies whatever vectors needed and your up and running with 40K. A ?MEM returns 31015 instead of the usual 22823. Of course you need 64K for this to work but it does seem to work very nicely.

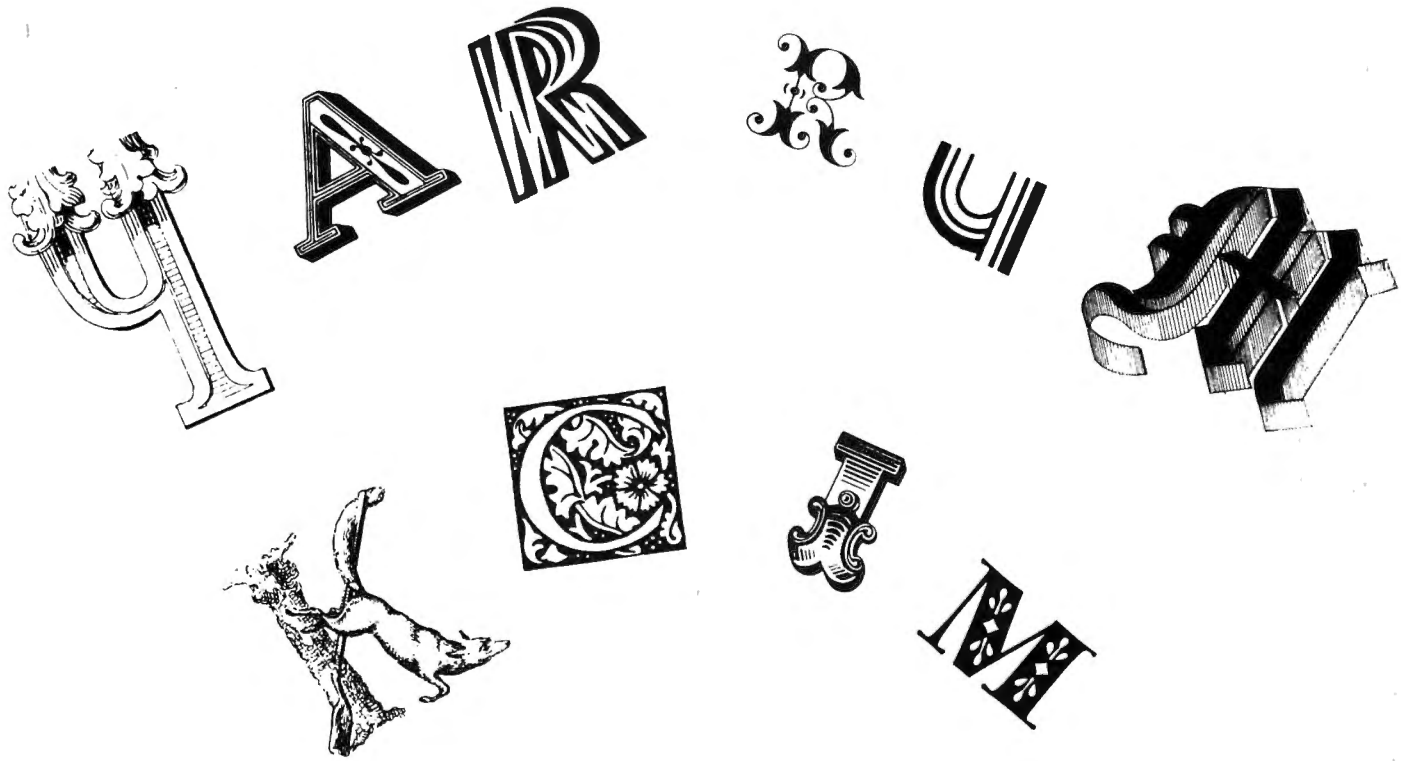
The other two programs are a software print spooler that uses the upper 32K RAM as a buffer. I didn't run this but it sounds like it should work fine. This would be better than a Disk spooler because of time saved by not having to write things to disk first, and not having to modify existing program. A PRINT #-2 sends it thru the spooler so programs will run as usual.

The last program is a utility to copy ROM packs, and although it doesn't say, I assume that it runs the ROM pack in RAM after switching to 64K. This should work for any ROM packs that don't have protection (self modifying code that crashes RAM versions). Many of RS ROM packs don't have protection.

Well it's getting close to 2AM and we have a Christmas party at the office that I have to be prepared for. So until next month this is a very tired Frank Hogg signing off.

JUMBLY

By Mick Murray
9730 W. Richard
Franklin Park, IL. 60131



Anyone who has played the popular syndicated game ''Jumble'' is already familiar with this game. The rules are simple: unscramble the scrambled word in as few tries as possible! There is no time limit involved, but the computer does keep track of attempts at reconstructing the word. One main advantage of this program is the fact that you can rearrange the scrambled letters in any fashion, and have that new arrangement displayed each time automatically. The computer uses the ''Inkey'' function to check each letter pressed and ignores characters which are not part of the word, while replacing the character location in the original jumbled word the a ''-''. This aids the player in keeping track of where he is.

One or more players can use this program. The first thing the computer prompts for is whether you want one of the internal data based words, or wish to input your own. Any word between two and eighteen letters are accepted when inputted manually. If the internal data based words are chosen, you are then prompted to input a difficulty level (from 1 (easiest) to 5 (most difficult)). The computer then will randomly select a word from the data set, check the number of characters and compare this to the difficulty level. If not the requested difficulty level, it will again randomly select another word, and continue this until a word of the proper length is found. This method will allow non-repeatability for the single player who, say, always chooses the same difficulty level.

Once the word is chosen, either data based or manually, the jumbled word then appears on the screen and the player is asked to make his guess. To avoid a quiet and static screen during the wait for input ''moving character'' sequence is run along the bottom of the screen, accompanied by a soft ''tick tock'' effect. It is enough of a subroutine to keep the game interesting during the players thinking process, yet subtle enough to not disturb the player while he is reviewing the jumbled word.

Two options are always open to a player, he may at any time choose to ''give up'' and type a ''?'' for the correct word, and he may also type a ''* '' to automatically get a new

Jumbly

word of the same difficulty level. The latter choice was installed into the program in the event that the player recognizes the jumbled word as one he has already played, and wishes a new one.

"Play" and "Sound" routines are used extensively in this program, from each "Inkey" function to "win music". This gives some extra variety in the game.

If the player wishes to delete existing words and input his own in the data file, the program allows for modification. The two important factors in modifying existing words are 1) the player must know exactly how many words he has in the data set, and, 2) he will probably want to include some words from each degree of difficulty. The "RND(N)" command just before the data set is the reason the player must know how many words he has in the data set. The computer will, as stated earlier, randomly select a word by reading, from 1 to RND(N), ("N" being the total number of words in the data set), and using the last word read as the one to be tested for degree of difficulty.

The computer will automatically count the data based words and give the total number of words in each of the five difficulty levels simply by inserting a ' (or REM) as the first statement in line 140. It reads all the words and tallies the data until a "123" is encountered. Therefore, make sure the last word in the last data statement is "123". If the player puts in all new words and finds for example, he has only one or two level 5 words (using the above method), he may then concentrate soley on inputting a few extra level 5 words! Needless to say keep tabs on available memory while inputting new words; if you run out of memory, chances are you'll lose all you've got!

```
10 '******* 'JUMBLY' **********
15 '
16 '
17 '
20 ' COPYRIGHT 1982, M.L.MURRAY
22 ' 9730 W. RICHARD ST.
24 ' FRANKLIN PARK, ILL. 60131
26 '
30 'A WORD GAME FOR ONE OR MORE
    PLAYERS!!
40 '
50 '
60 'FOR 16K EXTENDED-BASIC
    TRS-80 COLOR COMPUTER!
70 '
80 '
85 'INSERT A --> ' <-- AT THE
    BEGINNING OF LINE 140 TO GET
    A TALLY OF TOTAL DATA WORDS!
86 '
87 X$="?*?*?*?*?*?*?*?*?*?*?*?*?
*?*?*?*"
90 CLS:PRINT @128,X$
100 XX$="********** JUMBLY! ***
*********"
101 PRINT @224,XX$:PRINT @320,X$
112 PRINT @482," MAY, 1982, MICK
 L. MURRAY"
120 FOR T=1 TO 900:NEXT
130 DIM A$(18):DIM C$(18):DIM R$
    (18):DIM D$(18):DIM J(18)
140 GOTO 180 'SEE LINE 85!!!!!!!
142 CLS:PRINT:PRINT:PRINT:PRINT"
# OF LEVEL 1 WORDS =";D1:PRINT"#
 OF LEVEL 2 WORDS =";D2:PRINT"#
OF LEVEL 3 WORDS =";D3:PRINT"# O
F LEVEL 4 WORDS =";D4:PRINT"# OF
 LEVEL 5 WORDS =";D5:PRINT:PRINT
"TOTAL WORDS =";D1+D2+D3+D4+D5
150 READ A$:N=N+1:PRINT N;" ";
    A$;" ";"=";LEN(A$);"LETTERS"
160 FOR T=1 TO 50:NEXT
161 LL=LEN(A$)
162 IF LL<=4 THEN D1=D1+1
163 IF LL=5 OR LL=6 THEN D2=D2+1
164 IF LL=7 OR LL=8 THEN D3=D3+1
165 IF LL=9 OR LL=10 THEN D4=D4+
    1
166 IF LL>=11 THEN D5=D5+1
170 GOTO 142
180 CLS:PRINT:PRINT:PRINT" THIS
IS A WORD JUMBLE GAME!":PRINT
190 PRINT "1.) IF YOU GET STUCK
THEN TYPE      A '?' FOR THE COR
RECT WORD.":PRINT
200 PRINT"2.) TYPE A '*' FOR A N
EW WORD    FROM THE SAME DIFFICU
LTY LEVEL.":PRINT
210 PRINT STRING$(32,"*"):INPUT"
WOULD YOU LIKE ONE OF MY WORDS
(C) OR DO YOU HAVE ONE OF YOUR
OWN (O)";C1$
220 IF C1$<>"O" AND C1$<>"C"
    THEN 210
230 IF C1$="C" THEN GOSUB 1010
240 CLS:PRINT:PRINT XX$:PRINT:PR
INT
245 DD=3
```

Jumbly

```
250 INPUT"YOUR WORD PLEASE";A$
260 CLS:PRINT:PRINT
270 C$="":D$=""
280 FOR X=1 TO 18:J(X)=0:NEXT
290 P=1
300 NT=0
310 L=LEN(A$)
320 '
330 '** START SEQUENTIAL WORDING
340 FOR N=1 TO L
350 C$(N)=MID$(A$,N,1)
360 NEXT N
370 '*** START THE JUMBLING ***
380 SOUND 240,1:FOR T=1 TO 10:
    NEXT:SOUND 240,1
390 X=RND(L)
400 IF J(X)=1 THEN 390
410 J(X)=1
420 D$=D$+C$(X)
430 IF LEN(D$)<LEN(A$) THEN 390
440 IF D$=A$ THEN 270
450 OW$=D$ 'ORIGINAL JUMBLE !!
460 PRINT @192,"====>
470 PRINT @198, D$
480 '*** END OF JUMBLING ***
490 PRINT @198,D$
500 PRINT @130,"NOW, MAKE YOUR G
UESS:"
510 PRINT @256,"---->"
520 PRINT@262,R$:PRINT@198,D$
530 T$=INKEY$
540 IF T$="?" THEN 1460
550 IF T$<>"*" THEN 620
552 CLS:PRINT @226,"SEARCHING FO
R A NEW WORD..."
560 FOR V=30 TO 5 STEP -8
570 V$="V"+STR$(V)+";"
574 O=RND(5):O$="O"+STR$(O)+";"
580 M$=V$+O$+"T55ABCDEFGGGGGFEDC
BA"
590 PLAY M$
600 NEXT V
610 GOTO▲1040
620 IF T$="" THEN 530
640 FOR N=1 TO L
650 IF T$=MID$(D$,N,1) THEN 690
660 NEXT N
670 IF LEN(R$)=L THEN 640
680 GOTO 530
690 R$=R$+T$:PRINT @262,R$
700 MID$(D$,N,1)="*"
710 PRINT@198,D$
720 IF LEN(R$)<L THEN 530
730 D$=R$:R$=""
740 IF D$=A$ THEN 800
750 FORT=1TO3:NEXT
760 O=RND(2):R1=RND(5)+7:R2=R1-4
    :R3=R1-7:RS$="O"+STR$(O)+";"
    +STR$(R1)+";"+STR$(R2)+";"+
    STR$(R3):PLAY"T5;O1;V25;"+RS
    $
770 NT=NT+1 'NT=NUMBER OF TRIALS
780 PRINT @323,"YOU HAVE TRIED "
;NT;"TIMES..        GOOD LUCK!!"
790 GOTO 500
800 '
810 PRINT @415," HOORAY FOR YOU!
!! YOU HAVE WON  THIS MATCH AFTE
R ONLY";NT+1;"TRIES!!!"
815 'WIN MUSIC...
820 FOR N=1 TO 20
830 IF RND(8)<>4 THEN 880
840 X=RND(255):Y=RND(7)
850 FOR Z=1 TO Y
860 SOUND X,1
870 NEXT Z
880 SOUND RND(255),1
890 NEXT N
900 FOR N=1 TO 255 STEP RND(10)+
15
910 SOUND N,1
920 NEXT N
930 FOR N=1 TO 10:SOUND 248,1:
    NEXT N
940 FOR N=255 TO 0 STEP -20
950 SOUND N,1:NEXT N
960 FOR N=1 TO 10:SOUND 1,1:NEXT
    N
970 FOR T=1 TO 300:NEXT T
980 INPUT" MAYBE YOU WOULD LIKE
TO TRY    AGAIN?(Y OR N)";YN$
990 IF YN$="Y" THEN CLS: PRINT:P
RINT"GOOD! HAVE FUN WITH THIS NE
XT   ONE...":FOR T=1 TO 500:NEXT
 T:IF C1$="C" THEN 1020 ELSE 230
1000 PRINT:PRINT"THAT'S OK. A LO
T OF PEOPLE GET  HEADACHES FROM
PLAYING ME! WELL,SEE 'YA!!":END
1010 CLS
1020 PRINT:PRINT:PRINT" WHICH LE
VEL DO YOU PREFER:     PICK FROM
 1 (EASIEST) TO 5 (MOSTDIFFICULT
):":INPUT DD:DD=INT(DD)
1030 IF DD<1 OR DD>5 THEN PRINT"
THE DEGREE OF DIFFICULTY MUST
BE BETWEEN 1 AND 5!! SORRY, BUT
YOU MUST GO BY MY RULES!":GOTO 1
020
1040 IF DD=1 THEN LO=1:HI=4
1050 IF DD=2 THEN LO=5:HI=6
1060 IF DD=3 THEN LO=7:HI=8
1070 IF DD=4 THEN LO=9:HI=10
1080 IF DD=5 THEN LO=11:HI=18
1082 PRINT:PRINT"SEARCHING FOR A
```

Jumbly

```
 LEVEL"DD"WORD..."
1090 RW=RND(331)
1100 FOR F=1 TO RW:READ A$:NEXTF
1110 RESTORE
1120 SOUND240,1:FORT=1TO10:NEXTT
:    SOUND240,1
1130 L=LEN(A$)
1140 IF L<LO OR L>HI THEN 1090
1144 PRINT:PRINT"  I GOT ONE!!!"
1150 FORS=1 TO 5:SOUND 200,1:NEX
T    S
1160 GOTO 260
1170 '
1180 '
1190 '
1200 '
1210 'LINES 1260 TO 1450 ARE
      USED AS DATA STATEMENTS
      FOR THE COMPUTER WORDS!!
      USE LINE 140 FOR A FULL
      COUNT OF HOW MANY TOTAL
      WORDS! THE 'RND' FUNCTION
      IN LINE 1090 IS BASED UPON
      THIS TOTAL-WORD COUNT!
1220 '
1230 '
1240 '
1250 '
1260 DATA BEARD,SING,CLOTHING,DR
UM,SWEATER,WARNING,CROWN,KING,QU
EEN,ALPHABETICAL,SEQUENTIAL,GOLD
,OFFERING
1270 DATA CHICKEN,AMERICA,NOMAD,
ADORE,INFANT,CONSTIPATION,BLOUSE
,ZEBRA,SCHEDULE,GREY,YELLOW,PURP
LE,TROUSERS,LADLE,GIMMICK,COOKIE
S
1280 DATA MUSIC,ORGAN,DRUM,LIGHT
ING,LIGHTNING,STORMY,WEATHER,NIG
HT,SATELLITE,ORBIT,MOUSTACHE,HAI
RDO,HOSE,TUBING,BEER,WINE,BOOZE,
TACO,HAMBURGER,PORK,PARENTHESIS,
NUMERICAL
1290 DATA MUGGY,COLD,WARM,FREEZI
NG,HOT,RAINING,PAINING,VILLAGE,R
IDE,ANIMALS,PICNIC,BASKET,TOMORR
OW,ANGELIC,POLICE,OFFICER,MOUTH,
BISINESS,NUISANCE
1300 DATA OVERCOAT,COFFEE,AIRPOR
T,HORRIBLE,OVERDOSE,MONKEY,ALLIG
ATOR,WATER,GORGEOUS,EYEBROWS,GLA
SSES,AUTOMOBILE,INTERESTING,SURG
EON,GENERAL,CIGARETTE,PIPE,PILE,
PLUSH
1310 DATA OSCILLOSCOPE,COMPUTERI
ZATION,SPONGE,BIOLOGICAL,HYDRAUL
IC,MOTOR,COLOR,FINGER,TONGUE,TOW
EL,TELEVISION,SATURDAY,MICROPHON
E,MICROSCOPE,EMPLOYMENT
1320 DATA FLOWER,TULIP,ENGROSSIN
G,DELUSION,CHILDREN,BUGGY,VIAL,M
ARRIAGE,SOMEDAY,SORRY,UGLY,TROUS
ERS,WORLD,DROOP,VANTAGE,ASHTRAY,
BLUE,BALLOON,WITHOUT
1330 DATA BRONZE,EMERALD,DIAMOND
,EARRINGS,DANDELION,CRABGRASS,LO
BSTER,CASSETTE,VIDEO,AUDIO,PHYSI
CAL,STEREO,INFANT,DIAPER,CARTON,
ELASTIC,KICK,BITE,CHEW,CRAYON,AL
UMINUM
1340 DATA CHAIN,AMAZING,THEATER,
DIALOUGE,EXPLAINATION,VOODOO,GHO
STS,DIRECTOR,ASSISTANT,DESIGNER,
COORDINATION,FURNITURE,FURNISHED
1350 DATA RIVER,OCEAN,BEND,SWEAT
,THOUSAND,MILLION,BILLION,TRILLI
ON,TRUCK,CAT,HI,SWIMMING,POOL,TR
IPLE,PROTECTION,CORROSION,COMPAN
Y
1360 PROTECTION,INCREDIBLE,AWARD
,WINNING,FARM,GIRL,EXCITEMENT,CE
NTURY,PICTURE,MOVIE,RUNNING,RACE
R,BUSH,TREE,HOVER,STEER,AMPHIBIA
N,HINGE,LEAVES
1370 DATA NECKLACE,RADIO,RATIO,W
HEEL,TEETH,PACIFIER,DIRTY,THERMO
STAT,MOUNTAINS,BEAR,ELONGATED,RA
TIO,ADDITIONAL,FUTURISTIC,DEPLOY
MENT,NUCLEAR,ATOMIC,WEAPON,RADAR
,MIXER,DONUT,CEREAL,FARM
1380 DATA TOPCOAT,KEYHOLE,SUSPEN
DERS,PRIDE,THING,ARROGANCE,JOKER
,PRIZE,SENATE,MOTHER,FATHER,BROT
HER,JELLY,JAM,BEND,RIBBON,REALLY
,MAGAZINE,PATENT
1390 DATA NEWSPAPER,DAILY,BLONDE
,ZERO,ANTICIPATION,WINNER,ELEVEN
,ROSE,COLLAR,SHOULDER,FLAG,FRAGR
ANCE,NOCTURNAL,APPLE,ORCHARD,ALF
ALFA,FULFILL,EMPTY,SPINAL,SPINIC
H,FEELING,THOUGHT
1400 DATA EMPLOYMENT,RUN,DAY,COW
,HIM,GIN,WIN,TAG,RUG,DOG,COLLIE,
KITTEN,PET,GOLDFISH,TROUT,RECORD
ING,ELBOW,OLYMPIC,RUNNER,GASOLIN
E,KEROSENE,MASTER
1410 DATA WEALTH,WEATHER,WINTER,
SUMMER,STANDING,SOMETHING,NOTHIN
G,POSSIBLE,IMPOSSIBLE,REMARK,QUI
CK,AGREE,BREATHLESS,THROUGH
1420 DREAMER,EXCITABLE,FIREWORKS
,KNOW,LIKE,MYSELF,YOU,WOW,PITCH,
BALCONY,OFFICE,NURSE,HOSPITALIZA
TION,ADVENTURE,HEART,SPLEEN,BOOG
```

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Jumbly

```
ER,SNOT,LEATHER
1430 DATA PRESENT,SURPRISE,BIRTH
DAY,BASEBALL,FOOTBALL,SOCCER,SUC
KER,BRUISE,GRAIN,CHICKEN,SAVORY,
HOME,PRIDE,HONEY,CREAM,BUTTER,WH
EAT,WHITE,PROGRAM
1440 DATA CAPTAIN,BLACK,INHALE,P
EACE,QUIET,PIPE,MARIJUANA,CARPET
ING,THROW,RUG,PIGLET,HORSE,NATIO
NAL,DEFENSE,PRESIDENT,WARLOCK,WI
TCH,DISASTER,DIESEL,INSTITUTE
1450 DATA DISTRICT,HOURS,PRICES,
LOCATION,LOGARITHM,BUILDING,ANNI
VERSARY,DECORATE,EXTERIOR,WORRY,
BACKYARD,GROVE,NITWIT,STOOGE,SLE
EPY,BORING,SNOUT,SNIP
1460 FOR S=100 TO 1 STEP -10:SOU
ND S,1:NEXT S:FOR S=1 TO 5:SOUND
 1,1:FOR T=1 TO 10:NEXT T:NEXT S
1470 CLS:PRINT:PRINT" ----> ";OW
$;" <-----":PRINT
1480 PRINT X$
1490 PRINT"  HA!! I CAUGHT YOU!!
1500 PRINT"  THE 'MYSTERY' WORD
WAS:
              ----> ";A$;" <----"
1510 PRINT:PRINT"IT IS TOO BAD..
. YOU ONLY MADE   ";NT;"ATTEMPTS
 AT THE WORD!"
1520 PRINT"  BETTER LUCK NEXT TI
ME!!"
1530 PRINT
1540 FOR T=1 TO 1600:NEXT T:GOTO
      980
```

How to read your mailing label.
The top line of your mailing label contains several pieces of information, the first of which is a three character code that is your expiration month coded as YMM.

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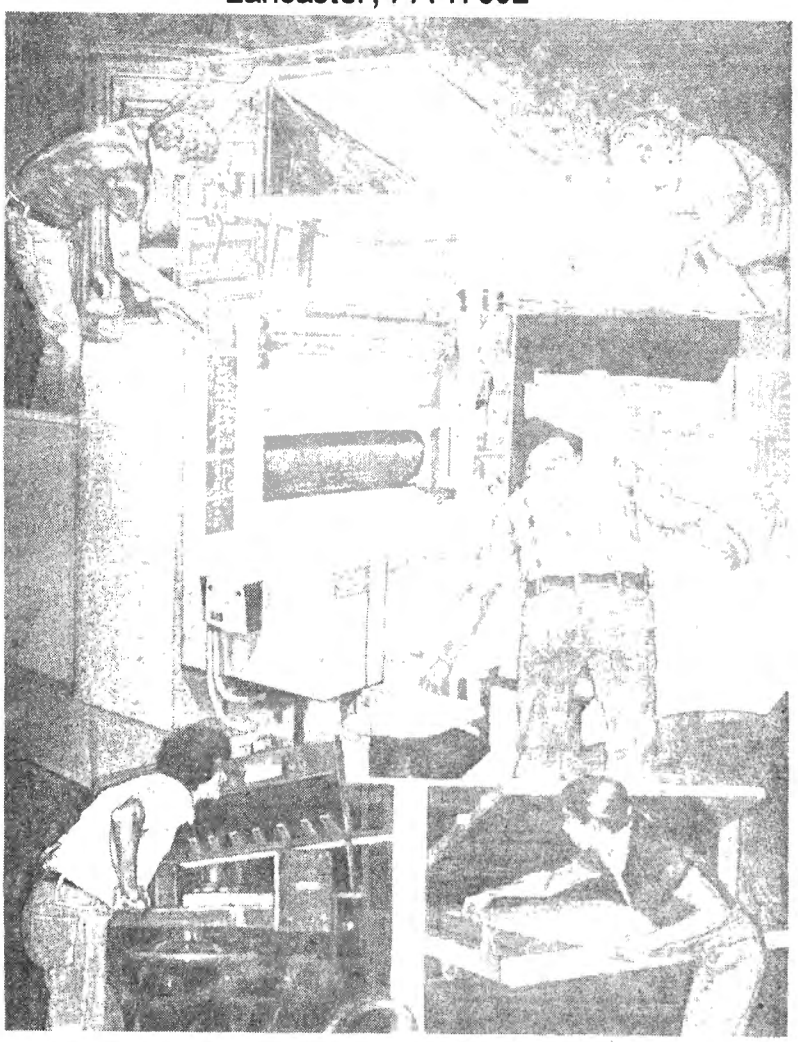

In my search for correct information on the Okigraph option for the Okidata 82A printer, I ran into both good news and bad news.

The good folks at Okidata Technical Support unit in New Jersey were more than happy to be of help. It seems that should someone using the Okidata as the printer for their Color Computer, the Okidata option may or may not be what you are looking for.

First, so we are all on the same topic, the Okigraph option (part #57514901) is a set of proms that convert the Okidata into a ''dot addressable graphic'' printer. The option gives a resolution of 60 horizontal dots by 66 vertical dots. Under program control, this system will produce illustrations, graphs, charts, or any other material displayed on the screen.

However, somehow in the design of the replacement proms, the ''low speed'' serial interface is disabled. If you want to use the option, you might go the route of getting one of the serial to parallel adopter ports; or as suggested by Okidata, use the ''highspeed serial board'' (part #70000604) to accomplish the conversion.

The good news, at least for the new buyers of the Okidata 82A, is that Okidata has developed a totally new ''User's Manual'' for the 82A. Again, the good guys at the Technical Support Unit loaned me a copy of the new manual to read.

This is truley a Manual for the user! The material is written in English and does not suffer from the style of some of the ''translation'' which were written in Japan. The material is well laid out with photos and exploded views of critical areas. The charts are readable and complete.

The Chapter that impressed me the most

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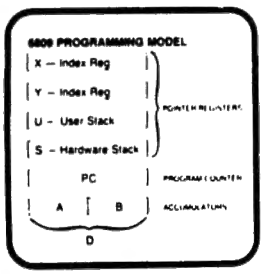
PROGRAMMING TOOLS

PROGRAMMING TOOLS



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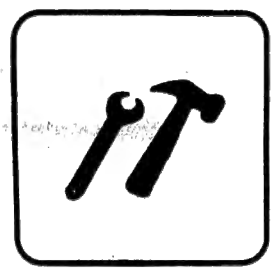

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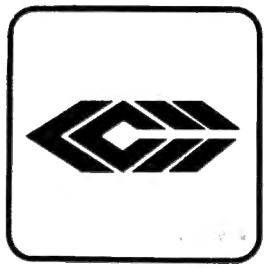

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This cassette package is perfect for small word processing projects or program editing. There are easy commands for search, change, delete, and move, copy, insert for single lines or whole blocks. Your letters or programs can be printed on a printer attached to the RS232 port.
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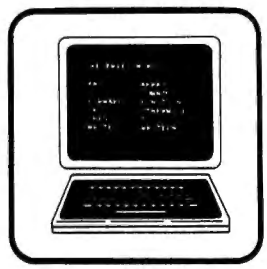

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Dynasoft PASCAL makes this high level language & experience with structured programming available to small systems. Based on a subset of standard PASCAL, it includes most standard control structures but omits floating point arithmetic. Included are the compiler, P-Code interpreter, program editor, supervisor, sample programs, & 2 manuals.
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DIAGNOSTICS

Check the six major functions of the Color Computer: 1) Memory, 2) RS-232 I/O, 3) Joysticks, 4) BASIC ROMs, 5) Tape I/O, 6) Sound.
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This machine level monitor's keyboard commands consist of a single alphabetic character possibly followed by one or more arguments. Any command can be aborted. Functions include examine & change registers, examine & change memory, initialize memory, set and clear break points, jumps & warm start, binary save & load to cassette.
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FOXYGRAF

A complete graphics development package for the assembly language programmer. The very comprehensive manual covers the history of graphics, how the Color Computer graphics work, details Radio Shack & Motorola would not tell. You can program with any mode & in any color combination. Foxygraf is relocatable & includes callable routines.
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was the Chapter on Programming the Okidata. This is the first time I have seen in print just how the program lines are to be written to have the Color Computer forward the commands to achieve "Condensed print", "Bold", or "Wide or expanded" printing. (However, when using Color Scripsit for this task, the extra features can not be called from within the text, there are ways, but that is another article.) It also explains the "secret" of programming vertical tabs (codes to skip lines). For those who might be interested, this Chapter also explains how the user may shift from 7 bit data format to 8 bit (or back) and still be able to utilize the block graphic printing ability of the 82A. (When I first got my 82A, I would have given my eye teeth for such information.)

Another "secret" opened to the user is a very complete section on "Making Your Own Interface cables". If your Okidata dealer is across the street and Computer Center is around the bend, this may not be to interesting or important. However, if you live out in the hinter land, this section can save the new user a lot of headaches (and maybe the cost of some new chips if the plug is the wrong configuration).

I was surprised to see in the new edition, right out in the open, a simple chart explaining how to set the switch to allow the 82A to print in one of the ten LANGUAGES it is able to put on paper. (The switch pattern will call forth either German, French, Swedish, Danish, Dutch, Norweigian, Italian, or use the industry standard ASCII, and believe it or not "Radio Shack TRS-80" is listed for a special switch setting).

Another panel of switches allows the user to work with 7 bit or 8 bit code, provide automatic line feed for systems that only send a carriage return code (not a problem for Color Scripsit), and switch selectable data receiving speed (baud rate).

I was so impressed with this new Manual that I almost wanted to run out and buy another Okidata 82A just to get the new manual. While I do not know what the local dealers may want for a copy of the publication, I will note that this Manual has a blue cover and is printed in standard book style (that is, it is taller than it is wide), this should help you explain what you are looking for in case your dealer does not yet have any in stock. After reading the Manual, I was sure happy that I have the Okidata 82A (and now all I have to do is get my wife to agree that this was a real necessary purchase)!

CCN TIP

The missing edit commands! The following commands can be used with BASIC's editor but are undocumented:

L *List line*
X *eXtend line*
I *Insert characters*
A *Abort editing*
E *Exit*
Q *Quit*
H *Hack then insert*
#D *Delete # characters*
#C *Change # characters*
#Schar *Search for #th char*
#Kchar *Kill all characters up to the #th char*
Shift uparrow *end subcommand*
#backspace *backspace # characters*
#space bar *space forward # spaces*

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  - 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

NEW!

- **PLUS32**
  - Unleash the hidden 32K RAM in your 64K system.
  - 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.

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NEW!

- **ROMKIL — BASIC ROM disable routine**
  - Your choice:
    - Disables DISK BASIC ROM—returning your system to EXTENDED BASIC, or
    - Disables EXTENDED BASIC ROM—returning your system COLOR BASIC.
  - Frees up extra RAM.
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  - Turning power off and on returns system to original configuration.
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  - Make your TV a moving Marquee with Color BANNER!
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- **Nelson's SUPER "COLOR" WRITER II**
  - By far the BEST word processor available for the Color Computer!
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- **LCA-47 — Lower Case Adapter**
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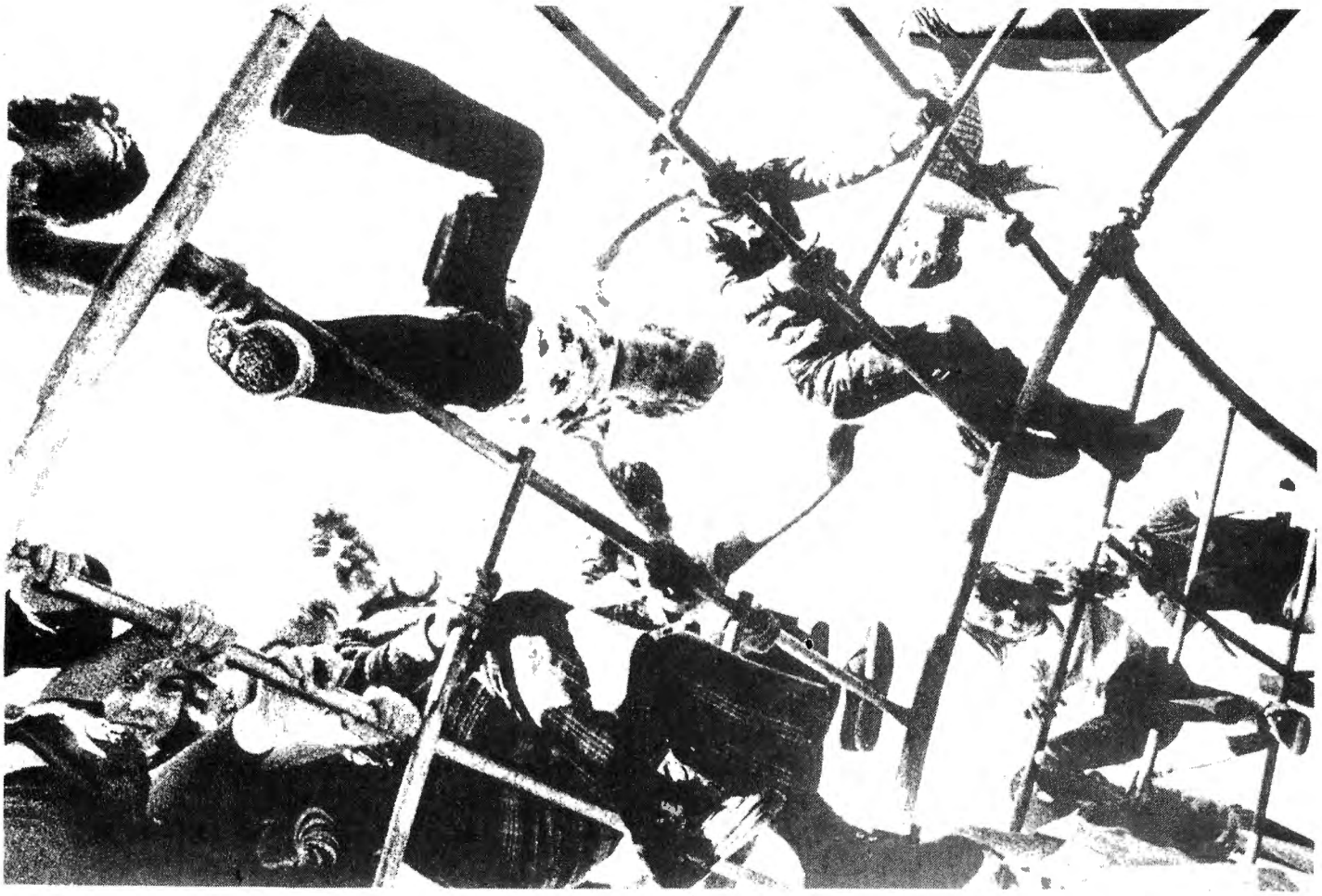
FOLLOW ME GAME

By Charles C. Evans
20 Heywood Road
Westford, MA 01886



As with many buyers, the Color Computer was my first extensive encounter with a personal computer, and I was interested in experimenting with simulation of popular games as a learning project. I wanted a game without complicated rules or arcane complexity, so it could be played with a minimum of continuous instruction by people who have no affinity for computers.

FOLLOW ME is the result of some of these efforts and is a game based on the popular game of Simon (trademark of Milton Bradley Co.) that I have written to run on the Color Computer. SIMON® , in its Milton Bradley implementation, is a round platter with four translucent plastic sectors, each a different color, in each of the quadrants on its top surface. When the play starts, SIMON selects one of the four sectors at random and illuminates it while emitting a tone. After this action, the player must touch whichever sector lit within a certain time, or a tone is sounded signifying the players loss of the round. If the player makes contact in time, then the first sector flashes and sounds again, followed by a second sector flashing and sounding. The players response must, again, be to touch the two sectors in the proper sequence. If the play is successful, then each new turn plays back the same sequence as previously, with one additional color added. Play continues this way until the player forgets the sequence and fails to press the sectors in the proper sequence, within the time limit of the game.

In the simulation of the SIMON® game presented in this article, there are several programming ideas that were devised to solve problems of game simulation that may be helpful to novice game writers. Some elements of the game are easier to implement than they were for the designers of Simon® . All of these elements have to do with the Color Computers ability to display

text on the screen. This makes it convenient to present whatever instructions you might wish to convey to the user, and to report progress and game results. The difficulties that typically arise are those of real time operation making things fast enough. Another that is unique to this particular game is that the colored regions of SIMON® are visible to the player at all times, and the play is shown with lights that are under the colored sectors. Beyond this problem, the SIMON® game has the player touching the colored sectors directly as a response. Some form of substitute input/output methods had to be devised, since the Color Computer has no comparable I/O capability.

The first problem to solve was to resolve the way the colored areas would look on the screen in both their quiescent and illuminated states. Simulation of this the way that SIMON® works is not directly possible because there is no brightness control for colors with Color Basic. The solution I devised to implement the function was to draw an outline of the color around the region (I chose a box) that would represent the colored buttons of the SIMON® Game, and have the computer fill in the area when the color is asserted by the program. I think you will see that it is very effective when you run the program.

The second problem to be addressed was that of accepting the user responses. I elected to use the four upper left keys on the keyboard (1, 2, 3, and 4). Since I didn't want a lengthy set of user instructions on the screen, I decided to present an image of the key below the colored areas that would be visual interactive area of the screen. Once the use of the buttons is explained, play is obvious.

In order for the program to do a good job of simulation, it is necessary for the response speed to be comparable to that of the real game. I tried several schemes for this, and ended up with the technique that is described in Chapter 9 of "Getting Started With Color Basic". It is necessary to print everything on all of the semigraphics lines to maintain the writing speed, and inspection of the program will show how this is done.

The main program loop operates on a table of random numbers that is created in full before the program runs. This accounts for the slight delay before the program starts. The array size is set to 50 numbers, which has not been needed by any player who has played the game on my computer. Creating the random number sequence in advance causes the program to run with more consistent timing, although it does take more memory space than is likely to be needed. If anyone playing your game gets so good that they can remember a sequence of 50 numbers, then increase the size of the array to a larger number by changing the dimension of the M-array at statement 10 and changing the loop counter at statement 880 to the same number (from 50). When the program runs, the system starts with X = 1 in statement 910, displays the first color and sound in the loop at 920 to 940, looks for congruence between player responses and the random number table in the loop at statements 970 to 1040, and then adds 1 to the x-loop so an additional color and sound will be added at the next play. The test value for "t" at statement 1000 determines how long the player has to respond. You can change this number to shorten or lengthen the play time, or add a skill level routine at the beginning of the program to set this value. I chose not to add this complexity, since the player can shoot for longer sequences as the main game challenge. Most of the other loops in the real time control part of the program between statements 850 and 1220 are self explanatory.

A situation that arose as a bit of a surprise was the way that the random number generator of the Color Computer operates. When the program was the first one run after the computer was powered up, the number sequences always stated the same way. Later, I read an article that described how the Random Number Generator routine of the Color Computer operated, and it will give the same sequence of random numbers from power up in the same program. The cure I devised for this is in statement 780. It depends on the timer value that the system is generating from power up. Since it is executed in the program after power up and loading, the user will have a hard time performing all of the sequences of start up to cheat the system and know in advance what

Follow Me

colors are going to appear on the screen. Statement 780 generates a random number from 0 to 10; this number is used to exercise the random number algorithm of the Color Computer quickly until the player causes the system to exit the loop ending at statement 810. Statement 780 is the only statement using a Basic Command from Extended Color Basic. If your computer lacks Extended color Basic, try:

780 Z = N or 780 Z = (any other number)

The looping of the start sequence will still give some randomness to the input sequence, although a persistent player could count the flashes in the input sequence display to determine how many times the system has looped. Played this way, it is possible to memorize the starting pattern, but it would be a fair amount of work for a good memorizer! My scheme, while not mathematically rigorous, should keep the play different and interesting most of the time.

A behavioral difference between SIMON-® and Follow Me that I did not deal with is that when Follow Me is not waiting for keyboard input, any key pressed will be the next input for the user response. It doesn't take much to get confused if a careless touch of the keyboard should happen, even if the button pushed happens to be the right response, so beware.

An "improvement" that I did no experimentation on was to use all 8 colors of the Color Computer in an "experts" version of the game. A second row of color bars could be created, but the real time speed of the program might be adversly affected. Also, a choice would have to be made between continuing the row of keys versus using the keys below 1, 2, 3, and 4. The system would probably "feel" more natural with Q, W, E, and R as the keys for the second row, but their offset from the top row might prove to be a nuisance. Clearly, some experimentation would help if this should be interesting to you.

Permission to copy this program for personal use if granted by the author if the title and copyright remark statements are included.

```
10 'FOLLOW ME GAME
20 'BY CHARLES EVANS
30 'COPYRIGHT 1982
40 '
50 ' BUILD COLOR ARRAYS
60 '
70 CLEAR 2000:DIM M(50):CLS(0)
80 B$=CHR$(128)   'SOLID BLACK
90 G$=CHR$(143)   'SOLID GREEN
100 Y$=CHR$(159)   'SOLID YELLOW
110 U$=CHR$(175)   'SOLID BLUE
120 R$=CHR$(191)   'SOLID RED
130 '
140 ' BUILD COLOR BOXES
150 '
160 FOR X=1 TO 5
170 G1$=G1$+CHR$(140)
180 G2$=G2$+CHR$(131)
190 Y1$=Y1$+CHR$(156)
200 Y2$=Y2$+CHR$(147)
210 B1$=B1$+CHR$(172)
220 B2$=B2$+CHR$(163)
230 R1$=R1$+CHR$(188)
240 R2$=R2$+CHR$(179)
250 B5$=B5$+B$
260 NEXT X
270 '
280 ' NOTATION FOR COLOR EDGES
290 ' T=TOP,M=MIDDLE,B=BOTTOM
300 '
310 GT$=CHR$(142)+G1$+CHR$(141)+
B$
320 GB$=CHR$(139)+G2$+CHR$(135)+
B$
330 GM$=CHR$(138)+B5$+CHR$(133)+
B$
340 YT$=CHR$(158)+Y1$+CHR$(157)+
B$
350 YB$=CHR$(155)+Y2$+CHR$(151)+
B$
360 YM$=CHR$(154)+B5$+CHR$(149)+
B$
370 BM$=CHR$(170)+B5$+CHR$(165)+
B$
380 BB$=CHR$(171)+B2$+CHR$(167)+
B$
390 BT$=CHR$(174)+B1$+CHR$(173)+
B$
400 RT$=CHR$(190)+R1$+CHR$(189)+
B$
410 RM$=CHR$(186)+B5$+CHR$(181)+
B$
420 RB$=CHR$(187)+R2$+CHR$(183)+
B$
430 M$=GM$+YM$+BM$+RM$
440 '
450 ' BUILD SOLID BOXES
460 '
```

Follow Me

```
470 FOR X=1 TO 7
480 GN$=GN$+G$
490 YN$=YN$+Y$
500 UN$=UN$+U$
510 RN$=RN$+R$
520 NEXT X
530 GN$=GN$+B$
540 YN$=YN$+B$
550 UN$=UN$+B$
560 RN$=RN$+B$
570 '
580 ' BUILD STRIPS TO SHOW
590 ' FILLED COLORS SINGLEY
600 '
610 MG$=GN$+YM$+BM$+RM$
620 MY$=GM$+YN$+BM$+RM$
630 MB$=GM$+YM$+UN$+RM$
640 MR$=GM$+YM$+BM$+RN$
650 '
660 ' TITLE BEGINNING
670 '
680 N=1
690 N=N+1:IF N=5 THEN N=1
700 FOR L=1 TO 200:NEXT L
710 CLS(N)
720 PRINT@ 69,"WELCOME TO FOLLOW
 ME";
730 PRINT@ 133, "TYPE ANY KEY TO
 START";
740 PRINT@ 197,"COPR. C.C.EVANS
1982";
750 '
760 ' RANDOMIZE START OF SEQ.
770 '
780 Z=ABS(INT(9.8*SIN(TIMER)))
790 D=RND(Z)
800 A$=INKEY$
810 IF A$="" THEN 690 ELSE 850
820 '
830 'BEGIN GAME
840 '
850 CLS0
860 T=0
870 GOSUB 1260:GOSUB 1380
880 FOR R=1 TO 50
890 M(R)=RND(4)
900 NEXT R
910 X=1
920 FOR I=1 TO X
930 ON M(I) GOSUB 1430,1500,1570
,1640
940 NEXT I
950 I=0
960 FOR J=1 TO X
970 Z$=INKEY$
980 IF Z$<>"" THEN 1020
990 T=T+1
1000 IF T>=100 THEN 1130
1010 GOTO 970
1020 IF VAL(Z$)<>M(J) GOTO 1100
1030 ON M(J) GOSUB 1430,1500,157
0,1640
1040 NEXT J
1050 PRINT @ 355,"GOOD"X"COLORS
SO FAR";
1060 FOR T=1 TO 400:NEXT T
1070 PRINT @ 355,"
                ";
1080 X=X+1:T=0
1090 GOTO 920
1100 CLS(7)
1110 PRINT @ 170,"WRONG COLOR!";

1120 SOUND 1,30:CLS(0):GOTO 1160

1130 CLS(8)
1140 PRINT @ 165,"FASTER, PLEASE
!";
1150 SOUND 7,30:CLS(0)
1160 CLS(6):PRINT @ 136,"TOO BAD
,FELLA!";
1170 PRINT @ 162,"DO YOU WISH AN
OTHER GO?(Y)";
1180 PRINT @ 326, "YOU MANAGED"X
-1"COLORS!";
1190 Y$=INKEY$
1200 IF Y$="" THEN 1190
1210 IF Y$="Y" THEN 650
1220 END
1230 '
1240 ' PRINT KEYPAD GUIDE
1250 '
1260 PRINT @ 258," ! ";
1270 PRINT @ 266," ' ";
1280 PRINT @ 274," # ";
1290 PRINT @ 282," $ ";
1300 PRINT @ 290," 1 ";
1310 PRINT @ 298," 2 ";
1320 PRINT @ 306," 3 ";
1330 PRINT @ 314," 4 ";
1340 RETURN
1350 '
1360 ' DISPLAY EMPTY BOXES
1370 '
1380 PRINT @ 32,GT$+YT$+BT$+RT$+
M$+M$+M$+M$+GB$+YB$+BB$+RB$;
1390 RETURN
1400 '
1410 ' FLASH GREEN BOX
1420 '
1430 PRINT @ 32,GN$+YT$+BT$+RT$+
MG$+MG$+MG$+MG$+GN$+YB$+BB$+RB$;

1440 SOUND 40,5
```

Follow Me

```
1450 GOSUB 1380
1460 RETURN
1470 '
1480 ' FLASH YELLOW BOX
1490 '
1500 PRINT @ 32,GT$+YN$+BT$+RT$+
MY$+MY$+MY$+MY$+GB$+YN$+BB$+RB$;

1510 SOUND 67,5
1520 GOSUB 1380
1530 RETURN
1540 '
1550 ' FLASH BLUE BOX
1560 '
1570 PRINT @ 32,GT$+YT$+UN$+RT$+
MB$+MB$+MB$+MB$+GB$+YB$+UN$+RB$;

1580 SOUND 98,5
1590 GOSUB 1380
1600 RETURN
1610 '
1620 'FLASH RED BOX
1630 '
1640 PRINT @ 32,GT$+YT$+BT$+RN$+
MR$+MR$+MR$+MR$+GB$+YB$+BB$+RN$;

1650 SOUND 134,5
1660 GOSUB 1380
1670 RETURN
```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```
LIST
10 'Demo of COLORED FONTS
20 FORX=1 TO 30 STEP 4
30 CIRCLE(200,96),X
40 NEXT X
50 FORX=32 TO 255
60 PRINTCHR$(X);:NEXT X
70 GOTO 70
OK
```

```
RUN
 !"#$%&'()*+,-./0123456789:;<=>?
@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]↑←
`abcdefghijklmnopqrstuvwxyz{|}~▒
```

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RENAISSANCE GAME DESIGNS

A WORD FROM THE SPONSOR

Hi again. This is Month Two in my series of short chats about various Color Computer subjects in these Star-Kits ads. Hope you will find them interesting and useful.

Judging from several phone calls I've received, there seems to be some confusion as to what a DOS (Disk Operating System) can do for you. One recent caller summarized it best when he said, *I'd like to buy your STAR-DOS. Can you tell me how it will help me write better Basic programs?* My answer must have shocked him, because I told him not to buy *any* DOS. In fact, I myself have talked about a dozen potential STAR-DOS purchasers out of buying it. I don't know whether other DOS vendors have done the same, but I'm convinced that there are many readers among you who have bought a DOS (hopefuly not ours) and have absolutely no use for it whatsoever. Let me explain.

To use a disk you need the hardware (a disk drive and controller) and the software (a disk operating system or DOS). In most computers, the controller can do little by itself except load the DOS from the disk into memory. Hence, without the DOS, the disk system is useless. But the Color Computer is unique — its controller has an 8K ROM (Read Only Memory) which acts as an extension to Basic and lets Basic access the disk directly without needing a separate DOS.

Thus, in other computers, you either need a separate DOS on disk to load Basic in the first place, or at least to tell Basic how to access the disk. In the Color Computer, Basic knows how to use the disk as soon as you plug in the controller. Hence, if you only run Basic programs, you have absolutely no need for a separate DOS. (In fact, a DOS just gets in the way of Basic!) So what does a DOS do, you ask?

A disk operating system lets you run machine language programs which use the disk. These can be purchased programs, or programs you write yourself.

But here's another catch. On most other computers, since you must have a DOS to use the disk, everyone writing disk programs simply uses the DOS for the disk functions, since they just assume that everybody has one. But Color Computer disk operating systems are very new. Hence many software suppliers, figuring you don't have a DOS, have gone to great pains to include enough functions in their programs so that you don't need a DOS to run them. (For example, our own SPELL 'N FIX has its own disk routines and does not need any additional DOS.)

So when should you buy a DOS? There are really only two cases: (1) You intend to write your own programs to use the disk, and need some simple way of interfacing to the disk, or (2) there is some specific program you want to run which requires a DOS. For example, if you want to run our DBLS or Disk Sort-Merge (oops . . . we won't announce that 'till next month), then you will need STAR-DOS.

So, if one of these two cases applies to you, by all means buy one. But don't get one unless you have a real need. And that applies to our STAR-DOS as well as others.

By the way . . . did you hear the one about the program to translate English to Russian? To test it, they translated *The spirit is willing but the flesh is weak.* The Russian translation came out something like *The vodka is amenable, but the meat tastes bad.*

See you next month.

Pete Stark

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, including Telewriter and Radio Shack's Scripsit! (See the review in 80 Micro, November 1982.) $69.29 in the Radio Shack disk or cassette versions; $89.29 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.

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. But with STAR-DOS you can use machine and assembly language programs to do things Basic can't. Just $49.95.

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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.

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Home accounting package combines checkbook maintenance and income tax data collection. Written in Basic for either RS Disk or Flex, $50.

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REMOTERM — allows full operation of the Color Computer from an external terminal. $19.95.

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NEWTALK — a memory examine utility for machine language programmers which reads out memory contents through the TV set speaker. $20.

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SHRINK — our version of Eliza, in machine language and extremely fast. $15.

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OXXO — our version of Othello, also machine language and fast. $15.

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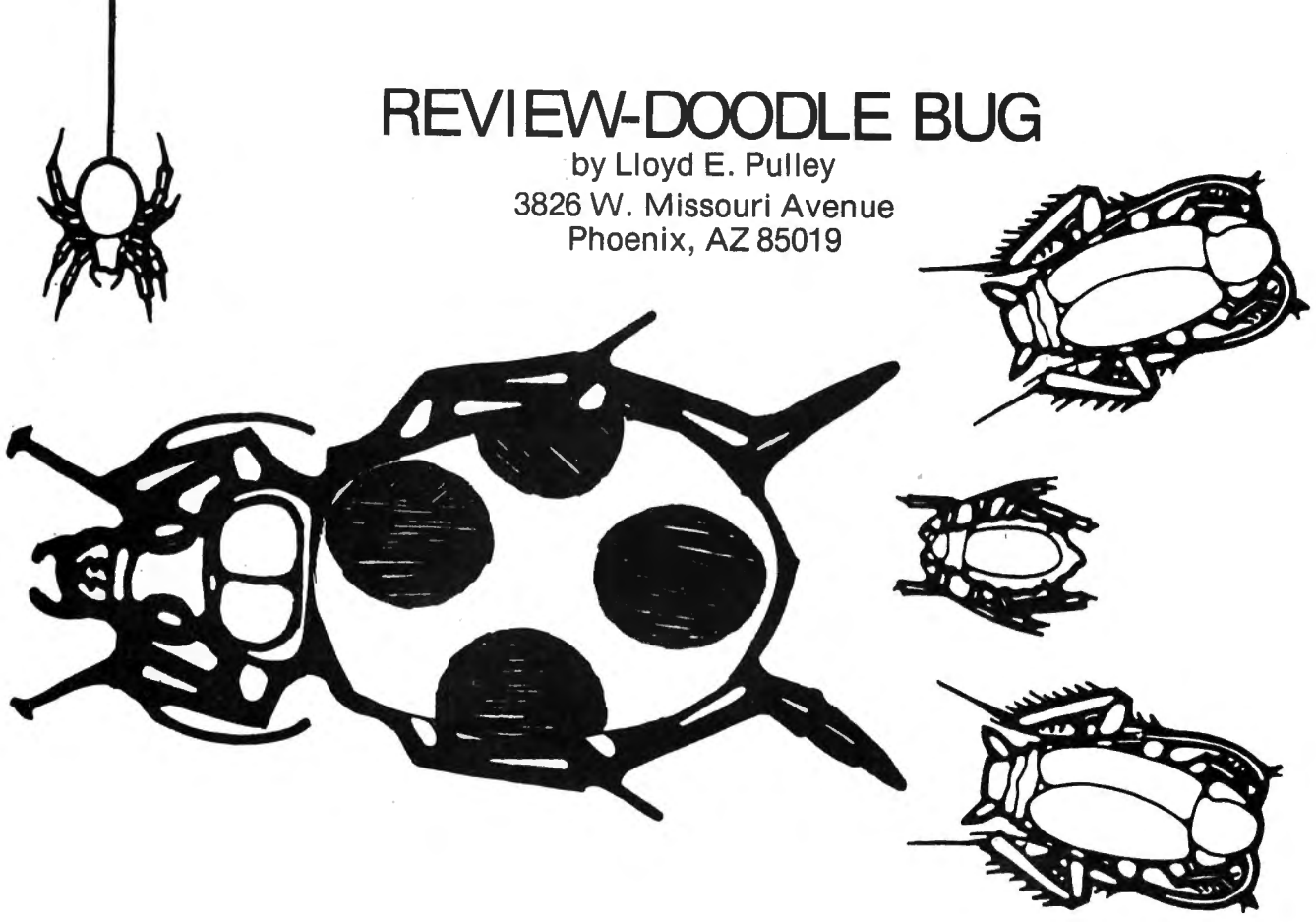
REVIEW-DOODLE BUG

by Lloyd E. Pulley
3826 W. Missouri Avenue
Phoenix, AZ 85019



"Lady Bug, Lady Bug fly away home. Your house is on fire and your kids are alone."

Well in Doodle Bug, there's no house to catch fire, but there are hours of fun and enjoyment. This program, a takeoff of the Arcade game "Lady Bug", is probably one of Computerware's best releases to date.

For those of you who are not familiar with "Lady Bug", a brief synopsis. First you start out with a maze (shades of Pac Man), which your Lady Bug scampers around chomping up "dots", while the "Enemy Bugs" chasing you around trying to eat you. From there the games differ.

In Doodle Bug you have your choice of starting out with from 3 to 6 Lady Bugs. As you move through the maze, you'll run into various items: Letters, Hearts, and Skulls. On each level there are 3 of each in the maze. The letters and hearts change colors throughout the game and are worth varying points and bonus's depending on what color they are when you eat them. By spelling out EXTRA and SPECIAL, you can receive extra Lady Bugs. Eating a skull kills you or an Enemy Bug. Also througout the maze are turnstiles. A Lady Bug can go through turnstiles whether open or closed but an Enemy Bugs can only go through them when they're open. So one of the tricks of the game is knowing which way to leave the turnstiles pointing.

This game combines great speed, graphics and joystick control. It also has a Pause key which will freeze the screen while you answer the phone, door, or whatever. I wish more of the programmers would add this feature to their programs.

The program comes on tape at $24.95 or disk at $29.95. Since I own a Radio Shack disk drive, I always order my programs on tape and load them onto disk myself. (I find that this is a good practice the way my drive can bomb disks). Computerware has attached a Auto-loader onto the program so that it is impossible to load the program onto disk, even though it will run OK with the disk plugged in. (I suppose this is to hold down illegal copies). But with about 5 minutes time and a little knowhow, you can take the selfloader off and put the program onto disk. Since I don't want to take all of the challenge out of life, I'll let you figure out how to accomplish this.

My family found this to be an excellent program, full of fun and action. With this one, Computerware keeps up its excellent reputation.

KOKOMATH

By Michael J. Himowitz
825 William Street
Baltimore, MD 21230

By now everyone knows that a computer is one of the world's best teaching tools, particularly for drilling youngsters in subjects such as math and foreign languages.

The problem is that children often grow tired of a plain screen display or a program that doesn't reward their efforts. I wrote KOKOMATH to solve that problem with low-resolution graphics, music and a game format. I've tried it out on youngsters ranging in age from 5 to 12, and they can't seem to get enough of it.

Here's what happens. When the program starts up, KOKO the math clown appears and asks the child for his name. When he types that in, KOKO asks whether he wants to add, subtract, multiply or divide. Then he asks whether the youngster wants, easy, hard or "Brain Buster" problems.

The gimmick is that KOKO is suspended in the air over a tub of water. If the child gets 10 out of 10 math problems correct, KOKO gets a bath. When a child answers a problem correctly, KOKO smiles, rolls his eyes, plays a happy tune and gives him a running score.

If the child types in the wrong answer, he gets a brief frown, a beep or a sad little tune, and the right answer displayed on the screen (the program does not repeat wrong answers). At the end of 10 problems (if all 10 answers were not correct), KOKO gives him a percentage score and asks if the youngster wants another quiz.

KOKO Math

The program will run on a 16K Extended Color Basic machine. Instrucitons for modifying the difficulty of the problems are listed in remark lines at the end.

This is a fairly long program, and if you don't want to type it in, send $7 to Michael J. Himowitz, 825 William Street, Baltimore, MD 21230, and I'll send you a copy.

```
1 'KOKOMATH
2 'BY MIKE HIMOWITZ
3 '825 WILLIAM ST.
4 'BALTIMORE, MD.
5 'TO MODIFY PROGRAM, SEE NOTE A
T END OF LISTING
6 A=RND(TIMER):B=RND(TIMER)
10 CLS0:GOSUB1700:GOSUB1000:GOSU
B1300
30 GOSUB1100:GOSUB 1600:GOSUB120
0:GOSUB1500
40 PRINT@81, "HI THERE!";:PRINT@
113,"I'M KOKO";:PRINT@143,"THE M
ATH CLOWN";:PRINT@174,"WHAT'S YO
UR NAME?";:PRINT@237,"(TYPE YOUR
 NAME";:PRINT@269,"AND PRESS 'EN
TER')";:PRINT@301," ";:INPUT N$
60 GOSUB1500:GOSUB1200:PRINT@77,
"NICE TO MEET YOU,";:PRINT@113,N
$;:GOSUB 1600:PRINT@141,"I'VE GO
T A SECRET.";
70 GOSUB910:GOSUB910:PRINT@173,"
I HATE THE WATER.";:GOSUB1400:PR
INT@451,"WATER";:GOSUB910:GOSUB9
10:PRINT@449,W$;:GOSUB1610:PRINT
@237,"IF YOU GET ALL 10";:PRINT@
269,"MATH PROBLEMS";:PRINT@301,"
RIGHT, YOU'LL";:PRINT@333,"DUNK
ME!"
75 PRINT@365,"WHEN YOU'RE READY"
;:PRINT@397,"PRESS <ENTER>";:INP
UTQ
80 T=0:GOSUB1300:GOSUB 1500:GOSU
B1200:GOSUB1600:PRINT@111,N$;:PR
INT@143,"DO YOU WANT TO:";:PRINT
@178,"A. ADD      ";:PRINT@210,"B
. SUBTRACT";:PRINT@242,"C. MULTI
PLY";:PRINT@274,"D. DIVIDE  ";
90 A$=INKEY$
95 IF A$="A"THEN2000
96 IF A$="B" THEN 2200
97 IF A$="C" THEN 2300
98 IF A$="D" THEN 2400
99 IF A$=""THEN 90
100 GOTO 90
110 GOSUB 1500:GOSUB1600:PRINT@1
11,"DO YOU WANT:";:PRINT@175,"A.
 EASY PROBLEMS";:PRINT@207,"B. H
ARD PROBLEMS";:PRINT@239,"C. BRA
IN BUSTERS";
130 RETURN
900 FOR X=1TO80:NEXT:RETURN
910 FORX=1TO460:NEXT:RETURN
1000 'PRINT BLANK FACE, HAT AND
FEET
1001 F$=STRING$(7,255):TH$=CHR$(
179)+CHR$(191)+CHR$(179):BH$=CHR
$(179)+STRING$(5,191)+CHR$(179):
FT$=STRING$(2,191)
1010 FORX=98TO258STEP32:PRINT@X,
F$;:NEXT:PRINT@36,TH$;:PRINT@66,
BH$;:PRINT@291,CHR$(191);:PRINT@
295,CHR$(191);:PRINT@322,FT$;:PR
INT@327,FT$;:RETURN
1100 '1ST EYE POSITION
1101 RE=1159:LE=1155:E1=158:E2=1
55:E3=151:E4=157
1105 POKE RE,E1:POKE LE,E1:RETUR
N
1200 'ROLL EYES
1201 POKE 65495,0:GOSUB 1100:GOS
UB900:POKE LE,E2:POKE RE,E2:GOSU
B900:POKE RE,E3:POKE LE,E3:GOSUB
900:POKE RE,E4:POKE LE,E4:GOSUB
900:GOSUB1100:POKE 65494,0:RETUR
N
1300 'PRINT SMILE
1301 SM$=CHR$(244)+STRING$(3,252
)+CHR$(248):PRINT@227,SM$;:RETUR
N
1400 'PRINT FROWN
1401 FM$=CHR$(241)+STRING$(3,243
)+CHR$(242):PRINT@227,FM$;:RETUR
N
1500 'PRINT SCREEN
1501 POKE 65494,0:IF T=0 THEN ZR
=16 ELSE ZR=16*RND(8)
1502 SC$=STRING$(19,127+ZR):FOR
X=45 TO 461 STEP 32:PRINT@X,SC$;
:NEXTX:POKE 65494,0:RETURN
1600 IF RND(3)=1 THEN PLAY "T6;O
3;L8;A;P8;L8;D;F;L4;E;C":RETURN
1605 IF RND(3)=2 THEN PLAY "T7;O
2;L4;C;E;G;03;C":RETURN
1606 IF RND(3)=3 THEN PLAY "T5;O
2;L4.;G;L8;F;L4.;E;L8;D;L4;C":RE
TURN
1607 GOTO 1600
1610 IF RND(2)=1 THEN PLAY "02;L
4.;C;L8;D;L4;E-;L4;C":RETURN
1620 IF RND(2)=2 THEN 1630
1625 GOTO 1610
```

KOKO Math

```
1630 FOR X=1 TO 5:SOUND 50,1:SOU
ND 100,1:NEXT X:RETURN
1700 'PRINT WATER
1701 W$=STRING$(9,175):FORX=353T
0481STEP32:PRINT@X,W$;:NEXT:RETU
RN
2000 GOSUB 110 'ADDITION
2001 CR=0:GOSUB 1300
2005 B$=INKEY$:IFB$=""THEN2005
2010 IF B$="A"THEN A=RND(10):B=R
ND(10)
2011 IF B$="B"THEN A=RND(25):B=R
ND(25)
2012 IF B$="C"THENA=RND(50):B=RN
D(50)
2015 IF B$<>"A" AND B$<>"B"AND B
$<>"C" THEN 2005
2030 T=T+1:GOSUB1300:GOSUB1500:P
RINT@111,"PROBLEM NO. " T;:PRINT
@175,A"+"B" =";:INPUT C
2040 IF C=A+B THEN GOSUB 3000 EL
SE GOSUB 4000
2045 IF C<>A+B THEN PRINT@208,A"
+"B"="A+B;
2047 FORX=1TO900:NEXT
2050 IF T=10 AND CR<10THEN5000
2060 IF T=10 AND CR=10 THEN 6000

2070 GOTO 2010
2200 GOSUB110'SUBTRACT
2201 CR=0:GOSUB1300
2205 B$=INKEY$:IFB$=""THEN2205
2210 IF B$="A"THEN A=RND(10):B=R
ND(10)
2211 IF B$="B"THEN A=RND(25):B=R
ND(25)
2212 IF B$="C"THEN A=RND(50):B=R
ND(50)
2215 IF A<B THEN 2210
2230 T=T+1:GOSUB 1300:GOSUB1500:
PRINT@111,"PROBLEM NO. "T;
2232 PRINT@175,A"-"B" =";
2236 INPUT C
2240 IF C=A-B OR C=B-A THEN GOSU
B 3000 ELSE GOSUB4000
2245 IF C<>A-B THEN PRINT@208,A"
-"B"="A-B;
2247 FOR X=1TO600:NEXT
2250 IF T=10 AND CR<10THEN5000
2260 IF T=10 AND CR=10THEN6000
2270 GOTO 2210
2300 GOSUB 110 'MULTIPLY
2301 CR=0:GOSUB1300
2305 B$=INKEY$:IF B$=""THEN2305
2310 IF B$="A" THEN A=RND(10):B=
RND(10)
2311 IF B$="B" THEN A=RND(15):B=
RND(15)
2312 IF B$="C" THEN A=RND(20):B=
RND(20)
2330 T=T+1:GOSUB1300:GOSUB1500:P
RINT@111,"PROBLEM NO. "T;:PRINT@
173, A" X "B"=";:INPUT C
2340 IF C=A*B THEN GOSUB 3000 EL
SE GOSUB 4000
2345 IF C<>A*B THEN PRINT@208, A
"X"B"="A*B;:FORX=1TO500:NEXT
2350 IF T=10 AND CR<10THEN5000
2360 IF T=10 AND CR=10 THEN 6000

2370 GOTO 2310
2400 GOSUB 110 'DIVIDE
2401 CR=0:GOSUB1300
2405 B$=INKEY$:IF B$=""THEN2405
2410 IF B$="A"THEN A=RND(10):B=R
ND(10)
2411 IF B$="B" OR B$="C"THEN A=R
ND(20):B=RND(20)
2415 IF B$<>"A" AND B$<>"B" AND
B$<>"C" THEN 2405
2430 T=T+1:GOSUB1300:GOSUB1500:P
RINT@111,"PROBLEM NO. "T;:PRINT@
173,A*B"/"B" =";:INPUT C
2440 IF C=A THEN GOSUB 3000 ELSE
 GOSUB4000
2445 IF C<>A THEN PRINT@208,A*B"
/"B"="A;:FORX=1TO500:NEXT
2450 IF T=10 AND CR<10THEN5000
2460 IF T=10 AND CR=10THEN6000
2470 GOTO 2410
3000 CR=CR+1:GOSUB1500:GOSUB1200
:PRINT@142,"CORRECT, " N$"!";:GO
SUB 1600
3010 PRINT@176,"THAT'S";:PRINT@2
08, CR" OUT OF "T;:PRINT@240,"CO
RRECT ANSWERS";
3020 IFCR=9ANDT=9THENGOSUB9000
3030 FOR X=1 TO 600:NEXT:GOSUB13
00:RETURN
4000 GOSUB1500:GOSUB1400:GOSUB12
00:PRINT@144,"SORRY, "N$;:GOSUB
1610:RETURN
5000 'END OF TEST
5010 GOSUB 1500:GOSUB1400:GOSUB1
300:GOSUB1600
5020 PRINT@78, "WELL, "N$","";:PR
INT@110,"YOU DIDN'T";:PRINT@142,
"DUNK ME.  ";:PRINT@174,"BUT YOU
 GOT";:PRINT@206,CR/T*100" PERCE
NT";:PRINT@238,"CORRECT   .";
5030 PRINT@270,"FOR ANOTHER";:PR
INT@302,"QUIZ, PRESS";:PRINT@334
,"<ENTER>";:INPUT K
5040 GOTO 80
```

KOKO Math

```
6000 'PERFFECT SCORE
6010 GOSUB 1500:GOSUB1400:GOSUB1
600:PRINT@142,"UH-OH!";:PRINT@17
4,"YOU GOT ME!";:PRINT@206,"A PE
RFECT SCORE!"
6020 FORX=246 TO 344STEP32:PRINT
@X,"GLUG!";:NEXT
6025 GOSUB 910:GOSUB910
6030 S=200:W$=STRING$(9,175):FOR
X=321TO33STEP-32:PRINT@X,W$;:FOR
Z=1TO50:NEXT Z:SOUND S,2:S=S-10:
NEXT X
6035 GOSUB1100:GOSUB 910:FORX=1T
015:SOUND10,1:SOUND20,1:NEXT X
6040 GOSUB1200
6050 PRINT@368,"FOR ANOTHER QUIZ
";:PRINT@400,"PRESS <ENTER>";:IN
PUT R
6055 CLS0:GOSUB 1700:GOSUB 1000:
GOSUB1100:GOSUB1300
6060 GOTO 80
9000 GOSUB1400:PRINT@272,"YOU'VE
 GOT ME";:PRINT@304,"WORRIED NOW
!":RETURN
10000 'TO MAKE PROBLEMS EASIER O
R HARDER, MODIFY THE RANDOM NUMB
ERS FROM WHICH THEY ARE SELECTED
 IN THE ROUTINES BEGINNING AT LI
NES 2000,2200,2300 AND 2400.
```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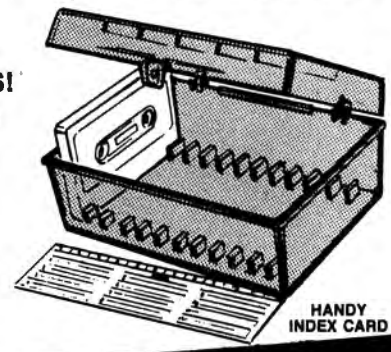
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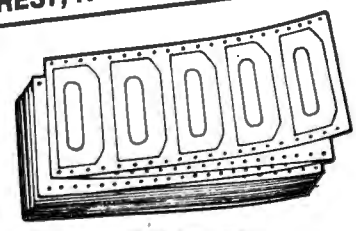
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HELP!!

by Dave Clark
11657 Summerhaven
St Louis, MO 63141

Disk users beware!! ''$%&'()* '' is not a good program name. Sure it works and once you see it I'm sure you will remember its that jewel that simply would not work no matter what you did. Use descriptive file names - like ''TEST1'', ''TEST2'', ETC.

How descriptive can you get in eight characters? No matter how hard you try - you will not remember every file name. And your buddy will not have any idea of what that program does.

The solution is HELP!! This program is a basic version of a scheme provided by Frank Hogg with FLEX. The concept is so simple it hurts. The program simply reads a file looking for a keyword. Once it finds the keyword it displays on the screen each line of text until it finds the next keyword.

The data file is constructed with the keywords starting in position one of the line. Lines with non-keywords must contain a blank. A line of data is a string of characters ending with the ENTER key. If the lines are kept to less than 32 characters the HELP text file can easily be listed if desired. (see LIST program)

The HELP text file can be prepared with any text editor that saves data in text format. SCRIBE from COMPUTERWARE works very well for this purpose. If you don't have a text editor use the BUILD program. But don't make any errors! You can't change the line once it is entered.

What are HELP's disadvantages? Simple! IF the HELP file becomes too large the access time becomes long. But a 4679 byte file with 50 file names described took less than 15 seconds. Not bad for a 16 line program.

```
10 ' HELP
20 ' D CLARK
100 GOTO30000
1000 INPUT"KEYWORD";KW$
1010 OPEN"I",1,"HELP/TXT"
1020 IFEOF(1)GOTO1900
1030 LINEINPUT#1,L$
1040 IFLEFT$(L$,1)<>" "GOTO1100
1050 IFFS=0GOTO1020
1060 PRINT#P,L$:GOTO1020
1100 K=INSTR(1,L$," "):IFK=0THEN
K1$=L$ELSEK1$=LEFT$(L$,K-1)
1105 IFFS=1THEN1910
```

HELP!

```
1110 IFKW$<>K1$THEN1020
1130 FS=1:CLS:GOTO1060
1900 IFFS=0THENPRINTKW$;" NOT FO
UND"
1910 CLOSE:END
30000 WD=1
30100 GOTO1000
```

```
1 ' LIST
2 ' DCLARK
10 CLS
20 INPUT"FILENAME";F$
30 INPUT"PRINTER(Y/N)";P$
40 IF P$="Y"THENP=-2:POKE150,18E
LSEP=0
50 OPEN"I",#1,F$
60 PRINT#P,"FILENAME=";F$
70 IFEOF(1)=-1THEN200
80 LINE INPUT#1,L$
90 LC=LC+10
100 PRINT#P,LC;">";L$
110 L=L+LEN(L$):GOTO70
200 CLOSE#1
210 PRINT#P,"END OF FILE-"L"BYTE
S"
```

```
1 ' BUILD
2 ' DCLARK
3 ' USE ENTER TO END LINE.
4 ' USE ENTER AS THE ONLY CHARAC
TER
5 ' TO END THE FILE.
10 CLS
20 INPUT"FILENAME";F$
50 OPEN"O",#1,F$
80 LINE INPUTL$
90 LC=LC+10
100 PRINT#1,L$
110 L=L+LEN(L$):GOTO80
200 CLOSE#1
210 PRINT#P,"END OF FILE-"L"BYTE
S"
```

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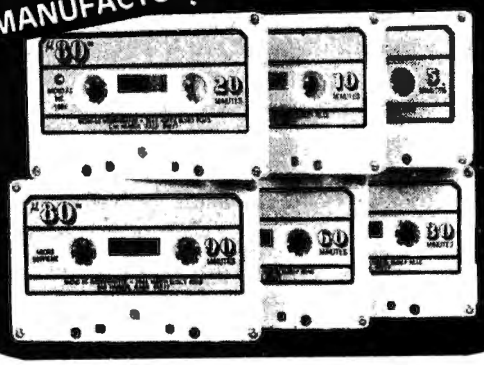

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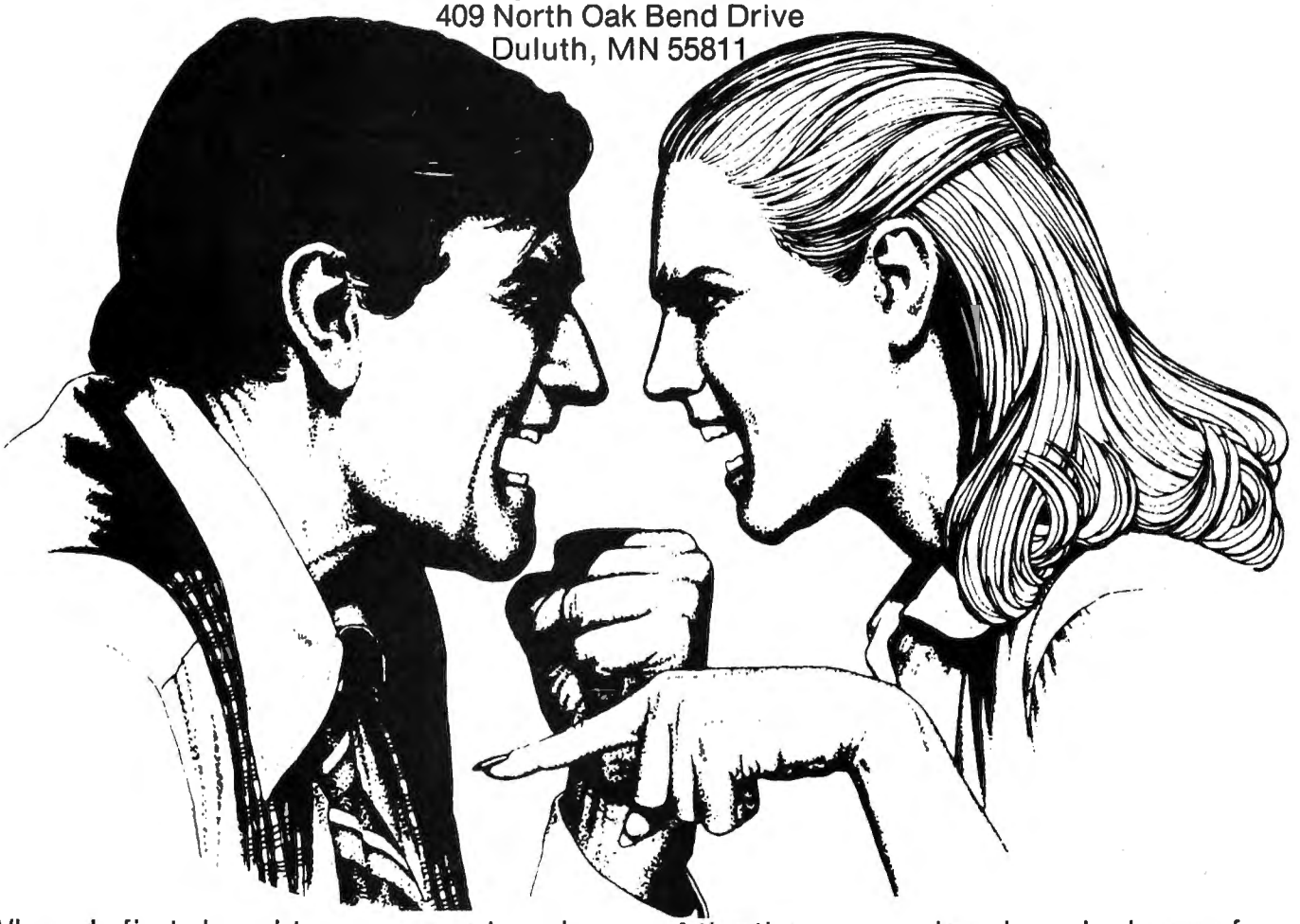

When I first bought my computer, in November, 1981, there was not a great deal of software to be had. I had not ''discovered'' CCN yet and felt that I was alone in the quest for good software. Then one day I happened upon an ad for Chromasette Magazine.

Since the day I received my first issue, I have been ''hooked'' on Chromasette.

It may be that some of you are not familiar with what I'm talking about. Once a month, a cassette arrives with a number of programs on it. These are ''ready to run'', that is NO TYPING. Just load and run.

There are now three companies (that I know of) that are in this field. One I've already mentioned, Chromasette. The other two are T & D Software and The Programmer's Institute. (See addresses below).

Now, with software of this order you don't get to chose what programs you get, it's a surprise every month. This is an inexpensive way to purchase good software. Say, you need to purchase a database program. Two of the three magazines have had some form of database program in the past few months. While these programs may not be exactly what you want, you can rewrite or change the program to fit your needs. This is far cheaper than spending $20 for a very similar program that you might have to customize anyway. Another plus is the great variety of the programs you receive. Something to please everyone. While you may not need a particular program you get one month you may find a use for it in the future.

All three companies try to give you a happy balance between game, practical, utility, and home use programs. Something to please everyone. The prices vary, ranging from $45 to $50 for one year. (Single copies are also available.).

Chromasette, is by far my favorite. Dave Lagerquist is the friendly editor, and provides an excellant product each month. Each program is written by a different individual. This provides for a lot of variety, something which I greatly appreciate. The programs are always excellent, and 99% of

Cassette Magazines

the time bug free. (You are always given the fix in the next issue if there was a bug in the last one). Some of the programs are in machine language, this is a real plus and adds to the quality of the product. The programs always load easily, but just in case Chromasette will replace any defective cassette. There are two copies of each program on the cassette.

This is the best of the bunch.

I'm only luke warm on TRC magazine from The Programmer's Institute. On each issue they place a "teaching program". These are a good idea but are done far more efficiently in a news letter. The teaching program is usually 90% text, which is a waste of good tape that another more useful program could use. The other programs are games or home use/budget, although beginning with issue number 7 there will be a utility program included each month. The programs themselves are very well written, using at time very complex code. But there are bugs in the programs whether these are programming errors or typing errors I don't know, but I do know that on many occasions many of their programs crash and cannot be recovered. There are also a number of spelling errors. TRC is also available on disk.

Coco-cassette by T & D Software is very well done. The programs are very well written and are almost bug free. The programs load easily, and there are three copies of each program on the cassette. The graphics are very good. The first issue contains a graphic calendar program that is excellant. Coco-cassette contains mostly game and fun programs (10 on the first issue and 9 on the second). The programs are very entertaining and are a joy to run.

All of the above contain some type of documentation from the editor. Chromasette in it's news letter also gives programming hints and tips.

Single issues are available of all three magazines as well as six month and one year subscriptions.

Cassette magazines such as these can help to make your program library complete and well rounded.

Happy Computing!!

(T&D Software, P.O. BOX 256-C, Holland, MI 49423)

(The Programmer's Institute, P.O. Box 3191, Chaple Hill, NC 57514)

(Chromasette Magazine, P.O. Box 1087, Santa Barbara, CA 93102

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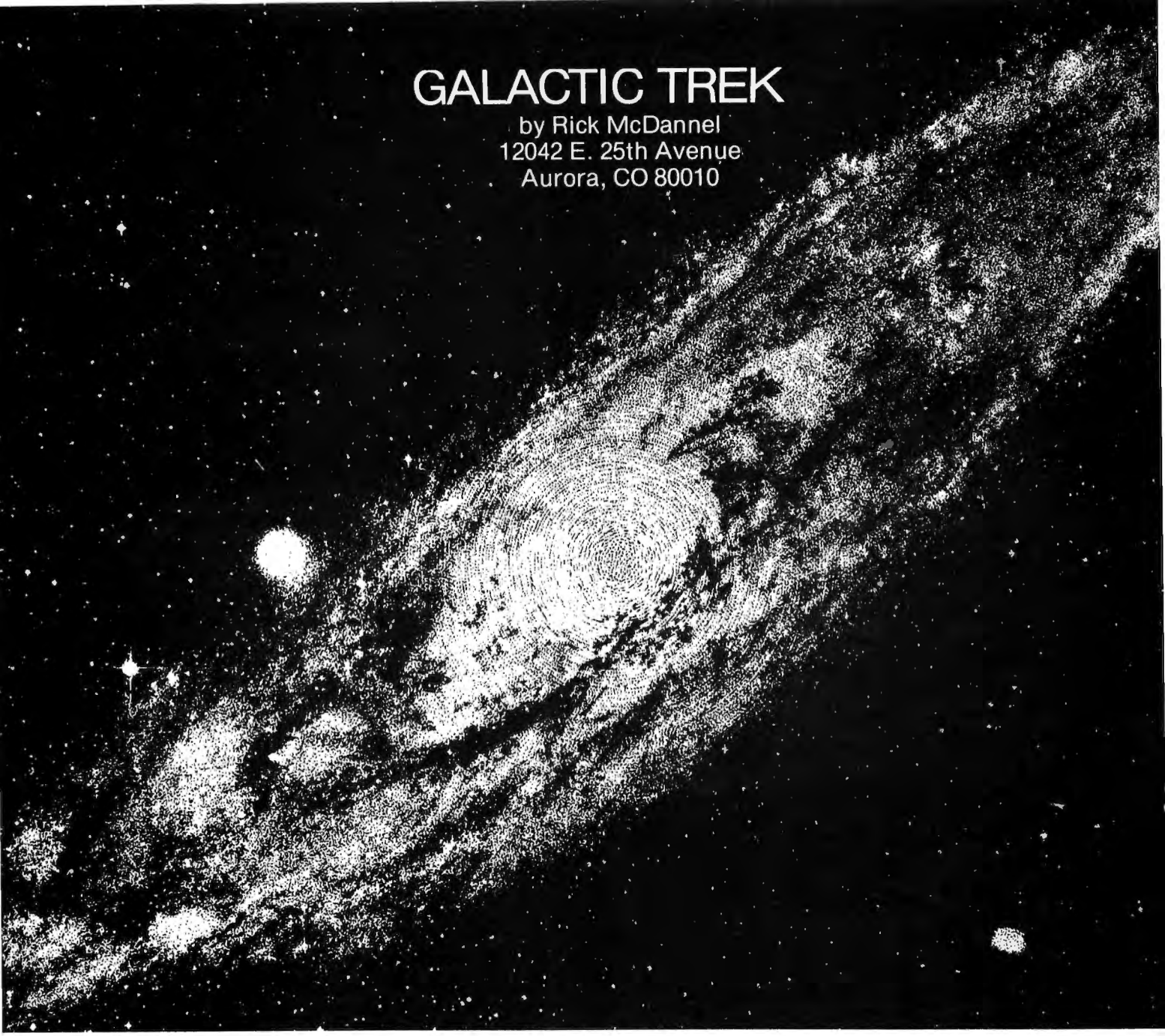

GALACTIC TREK

by Rick McDannel
12042 E. 25th Avenue
Aurora, CO 80010

I am sure I am not the only one who has spent hours and hours hacking away at a game written in BASIC only to find out that the result was much to slow to be exciting. Hopefully, with this program I can show one way to make BASIC games more dramatic. I think you will be pleasantly surprised at what a thirteen byte machine language subroutine can do.

The function of the ML subroutine is to scroll everything on the graphic screen to the bottom except the top eight lines which will be used to display the score. The program uses PMODE 1 which requires two pages of memory, in this case memory positions 1536-3072. In PMODE 1 each byte contains four horizontal graphic elements and each graphic line is thirty-two bytes long giving us a 128x96 resolution. The basic procedure for scrolling would be to start with the last byte in the second line from the bottom and put that byte in the same position in the last line. In other words, get the byte in memory position 3040 and put that byte in 3040+32 or memory position 3072. After that it is just a matter of decrementing and repeating this process until the last point to be scrolled is reached. This works fine but the result is just not fast enough for this game. To get twice the speed all that needs to be done is to put the bytes two lines down instead of one. The other difference between the basic procedure described above and the subroutine used in "GALACTIC TREK" is that instead of moving one byte at a time, the 16 bit accumulator is used and two bytes are

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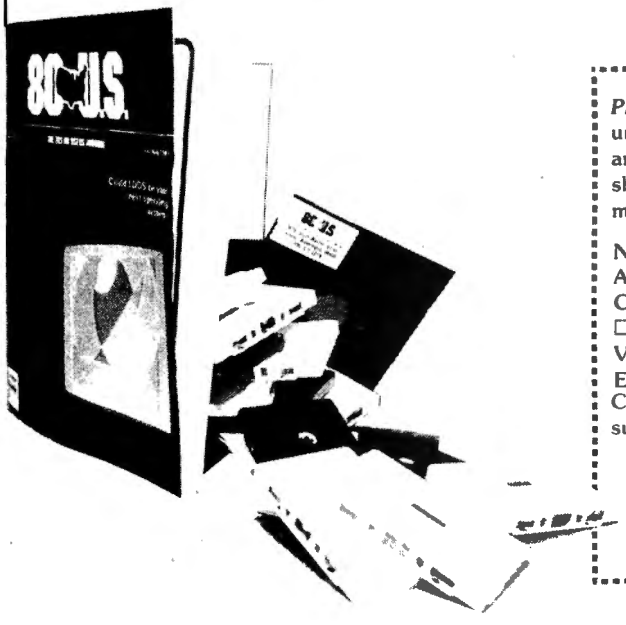

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Galactic Trek

moved. The following is the complete listing of the scroll routine used in the program:

```
0001 0600                      ORG 15000
0002 3A98 8E11C0     START     LDX #4544        Get start addr
0003 3A9B EC83       LOOP      LDD ,--X         Get 2 bytes and
                     *dec address pointer
0004 3A9D A78840               STA 64,X         Put 2 bytes 2
                     *lines dowm
0005 3AA0 8C0700               CMPX #1792       Check for last
                     *byte to scroll
0006 3AA3 26F6                 BNE LOOP         No, then again
0007 3AA5 39                   RTS              Yes, return to basic

0008 3AA6                      END

LOOP   3A9B  START  3A98
```

After running "GALACTIC TREK", the first evidence of the ML subroutine will be seen as the title page scrolls down the screen. Press the fire button on the right joystick to begin the game. The right joystick will control the horizontal movement of the ship. The player starts the game with four ships and is awarded a bonus ship for each complete "TREK". Each completion of the three phases of the game is considered to be a "TREK". The ship's lasers are fired by pushing the fire button. A thousand points must be obtained in each phase in order to proceed to the next.

In the first phase, the player is required to travel through a Zymanian minefield. Twenty-five points are awarded for each mine blown up. The amount of mines on the screen will increase with every one hundred points. The second phase is a little more difficult. The object of this phase is to obtain the precious Zymanian Ore that are also worth twenty-five points a piece. In this phase, the laser acts in the capacity of a tractor beam. To make it a little more interesting the ship will have to travel through a passageway that narrows with every one hundred points. In the final phase the player will meet the Zymanians themselves in the form of a fleet of ships. They may not be very accurate with their lasers, but like the other phases with each one hundred points the difficulty level increases. In this case the frequency of Zymanian's shots is stepped up. The strategy is to shoot the ships as quickly as possible since each ship shot will be one less that can fire back and less waves of attackers will have to be taken on. The player is awarded fifty points for each ship blown up.

You may notice that many of the objects fired upon will not blowup with the first hit. This is not a flaw, it was put in the program intentionally to make it more challenging. Also, the debris from blown up objects can be just as fatal as the objects themselves. Besides the level of difficulty increasing with every one hundred points, with each "TREK" the difficulty level will increase faster than the preceding "TREK".

After losing all the ships a "GAME OVER" message will be displayed, to play again just press the fire button. The high score will be displayed in the upper right hand corner of the screen.

I think you will find "GALACTIC TREK" an enjoyable and challenging game. If there are any comments or questions, please write to me at the above address. Also for those of you who do not like to type send $4.95 to cover my costs and I will send you a copy of "GALACTIC TREK" on cassette. A 16K Extended Computer is required for this game.

Galactic Trek

VARIABLE LIST

CT = Counter for 3rd phase
D = Difficulty level
EX$ = Explosion sound
F-F5 = Flags for 3rd phase
FX = Firing point for Zymanian ship
G = Debris for 1st phase
HS = High score value
HS$ = High score string
J = Joystick value
L = Length of score strings
L1$ = Ship's laser sound
L2$ = Zymanian's laser sound
MX = Mine's horizontal position
N = Variable used in calculation of difficulty level
N$() = Array that contains digits for score display
PH = Phase counter
RF = Determines when a Zymanian ship will fire
SC = Player's score value
SC$ = Player's score string
SX = Ship's horizontal position
TR = Trek counter
UF = Zymanian ships
W = Width of passageway in 2nd phase
X = Loop counter
X1 = Leftside of passageway in 2nd phase
X2 = Rightside of passageway in 2nd phase

```
10 ' ** GALACTIC TREK **
20 ' BY RICK MCDANNEL
30 ' 12042 E. 25TH AVE.
40 ' AURORA, CO  80010
50 ' (C) RICK MCDANNEL 1982
60 '
70 CLS0:HS=0:DIM S(2),G(12),UFO(
10)
80 EX$="L255T25501V31;7;3;3;5;1;
2;7;5;5;4;5;7;V25;5;5;7;3;7;4;5;
2;V20;3;5;7;7;1;1;2;7;4;V15;3;5;
3;2;1;2;2;5;5;V10;1;7;4;2;5;8;1;
3;5;7;3;5;3;V5;4;6;7;2;7;3;7;2;8
"
90 L1$="L255T25502V31CBAGFED02C"
:L2$="V31T255L25501CECECECE"
100 POKE65495,0:PMODE1,1:COLOR2,
3:PCLS3
110 DRAW"BM40,10;C2;NF4;NG4;U2;D
6":GET(34,8)-(47,14),S,G
120 CIRCLE(108,16),8,1:COLOR1,3:
LINE(100,10)-(102,0),PSET,BF:LIN
E(115,10)-(117,0),PSET,BF:COLOR2
,3:PAINT(108,16),4,1:GET(100,0)-
(118,24),UFO,G
130 FORX=1TO20:PSET(RND(30),RND(
30),1):NEXTX:GET(0,0)-(30,30),G,
G:PCLS3
140 FORX=15000TO15013:READZ:POKE
X,Z:NEXTX:DEFUSR0=15000
150 DATA 142,17,192,236,131,237,
136,64,140,7,0,38,246,57
160 FORX=0TO9:READN$(X):NEXTX
170 DATA "BM+1,0;H1;U4;E1;R2;F1;
D4;G1;L2;BM+6,0"
180 DATA "BM+1,0;R1;NR1;U6;G1;BM
+6,+5"
190 DATA "NR4;U1;E1;R1;E2;U1;H1;
L2;G1;BM+7,+5"
200 DATA "BM+0,-1;F1;R2;E1;H2;E2
;H1;L3;BM+7,6"
210 DATA "BM+3,0;U2;NR1;L3;U1;E3
;D3;BM+4,3"
220 DATA "BM+0,-1;F1;R2;E1;U2;H1
;L3;U2;R4;BM+3,+6"
230 DATA "BM+4,-5;H1;L2;G1;D4;F1
;R2;E1;U1;H1;L3;BM+7,+3"
240 DATA "U1;E4;U1;L4;BM+7,+6"
250 DATA "BM+1,-0;H1;U1;E1;H1;U1
;E1;R2;F1;D1;G1;NL2;F1;D1;G1;L2;
BM+6,0"
260 DATA "BM+0,-1;F1;R2;E1;U4;H1
;L2;G1;D1;F1;R2;BM+4,+3"
270 SC=0:SH=4:D=20:SX=128:X1=80:
PH=1:F=0:F1=0:F2=0:F3=0:F4=0:F5=
0:CT=0:N=0:TR=0
280 PCLS3:GOSUB990:GOSUB900
290 ' *** MAIN LOOP
300 ON PH GOSUB 440,470,570
310 J=JOYSTK(0):IFJ>53THENSX=SX+
5ELSEIFJ<9THENSX=SX-5
320 IFSX<10THENSX=10ELSEIFSX>243
THENSX=243
330 PUT(SX-6,181)-(SX+7,191),S,P
SET
340 A=USR(0)
350 IFPEEK(339)<>255THENGOSUB400

360 IFPPOINT(SX-6,183)=1ORPPOINT
(SX-6,183)=4ORPPOINT(SX,181)=1OR
PPOINT(SX,181)=4ORPPOINT(SX+6,18
3)=1ORPPOINT(SX+6,183)=4THENGOSU
B870
370 IFRND(2)=1THENPSET(RND(255),
30,2)
380 GOTO300
390 ' *** SHOOT & CHECK
400 FORY=180TO35STEP-8:PP=PPOINT
(SX,Y):IFPP=3ORPP=2THENNEXTY
410 LINE(SX,183)-(SX,Y+2),PSET:P
LAYL1$:LINE(SX,183)-(SX,Y+2),PRE
SET:IFPP=4THEN ON PH GOSUB700,76
0,790
420 RETURN
430 ' *** 1ST PHASE
```

Galactic Trek

```
440 IFRND(D)<>1THENRETURN
450 MX=RND(220)+15:IFPPOINT(MX,3
5)<>3THEN450
460 DRAW"S"+STR$(RND(6)+4)+"C2;B
M"+STR$(MX)+",35;NU6;NR6;ND6;NL6
;C1;NE4;NF4;NG4;NH4":CIRCLE(MX,3
5),4,4:PSET(MX,35,1):RETURN
470 ' *** 2ND PHASE
480 IFRND(8)=1THENMX=X1+RND(W)EL
SE510
490 IFPPOINT(MX,34)=4THEN510
500 CIRCLE(MX,36),7,4:PAINT(MX,3
6),4,4:PSET(MX,36,1)
510 IFRND(2)<>1THENRETURN
520 IFRND(2)=1THENX1=X1+8ELSEX1=
X1-8
530 W=52+(D*2):X2=X1+W
540 IFX1<9THENX1=X1+8ELSEIFX2>24
5THENX1=X1-8
550 COLOR1,3:LINE(0,RND(30)+22)-
(X1,22+RND(30)),PSET:LINE(X2,22+
RND(30))-(255,RND(30)+22),PSET:C
OLOR2,3:RETURN
560 ' *** 3RD PHASE
570 IF F THEN580ELSEPUT(27,30)-(
45,54),UFO,PSET:PUT(72,38)-(90,6
2),UFO,PSET:PUT(117,46)-(135,70)
,UFO,PSET:PUT(162,38)-(180,62),U
FO,PSET:PUT(207,30)-(225,54),UFO
,PSET:F=1:CT=0
580 FX=SX-75+RND(150):IFFX<0ORFX
>255THEN580ELSECT=CT+4:IFCT>=180
THENGOSUB680
590 IF CT>=120 THEN RETURN
600 RF=RND(20+D):IFRF>5THENRETUR
NELSE ON RF GOTO610,620,630,640,
650
610 IF F1 THENRETURNELSELINE(35,
50+CT)-(FX,188),PSET:PLAYL2$:LIN
E(35,50+CT)-(FX,188),PRESET:GOTO
660
620 IF F2 THENRETURNELSELINE(81,
59+CT)-(FX,188),PSET:PLAYL2$:LIN
E(81,59+CT)-(FX,188),PRESET:GOTO
660
630 IF F3 THENRETURNELSELINE(122
,68+CT)-(FX,188),PSET:PLAYL2$:LI
NE(122,68+CT)-(FX,188),PRESET:GO
TO660
640 IF F4 THENRETURNELSELINE(171
,58+CT)-(FX,188),PRESET:GOTO660
650 IF F5 THENRETURNELSELINE(216
,50+CT)-(FX,188),PSET:PLAYL2$:LI
NE(216,50+CT)-(FX,188),PRESET
660 IFFX>SX-5ANDFX<SX+5THENGOSUB
870:GOSUB680
670 RETURN
680 F=0:F1=0:F2=0:F3=0:F4=0:F5=0
:RETURN
690 ' *** 1ST PHASE BLOWUP
700 SCREEN1,1:PLAY"L255T2550IV31
;5;5;7;4"
710 SCREEN1,0:PLAY"O1V28;7;4;3;5
;5"
720 SCREEN1,1:PUT(SX-15,Y+14)-(S
X+15,Y-16),G,PSET
730 SCREEN1,0:PLAYEX$:SC=SC+25:G
OSUB950:GOSUB830:IFSC>=(1000+(TR
*3000))THENPH=PH+1:N=N+1000:D=20
:FORX=1TO5:PLAY"V31L255T2550"+ST
R$(X)+";1;2;3;4;5;6;7;8;9;10;11;
12":NEXTX:GOSUB900
740 RETURN
750 ' *** 2ND PHASE BLOWUP
760 CIRCLE(SX,Y),13,3:PAINT(SX,Y
),3,3:PLAY"V31T255L2550O5;6;O4;6;
O3;6;O2;6;O1;6":SC=SC+25:GOSUB95
0:GOSUB830:IFSC=>(2000+(TR*3000)
)THENPLAY"T100L100V3103;1;4;8;7;
5;3;2;6;10;10;10;10;10;10":GOSUB
900:PH=PH+1:N=N+1000:D=20:GOSUB5
70
770 RETURN
780 ' *** 3RD PHASE BLOWUP
790 FORX=1TO25STEP4:CIRCLE(SX,Y)
,X,RND(2):NEXTX:PLAYEX$:FORX=25T
O1STEP-4:CIRCLE(SX,Y),X,3:NEXTX
800 SC=SC+50:GOSUB950:GOSUB830:I
FSC=>(3000+(TR*3000))THENPH=1:N=
N+1000:D=20:FORX=1TO5:PLAY"T255L
255V3103CCCCCCDEFGAB":NEXTX:SH=S
H+1:TR=TR+1:GOSUB900:GOSUB680:RE
TURN
810 IFSX<46THENF1=1ELSEIFSX<90TH
ENF2=1ELSEIFSX<136THENF3=1ELSEIF
SX<181THENF4=1ELSEF5=1
820 RETURN
830 ' *** DIFFICULTY LEVEL
840 D=20-(INT(((SC-N)/100)*2)*(T
R+1)):IFD<2THEND=2
850 RETURN
860 ' *** SHIP BLOWUP
870 FORX=1TO6:FORY=2TO3:DRAW"C"+
STR$(Y)+"S"+STR$(X*2)+"BM"+STR$(
SX)+",180;BG4;E2;BR2;R2;BD4;G2;B
U2;E2;BH2;H2":NEXTY:NEXTX
880 PLAYEX$:SH=SH-1:IFSH=0THEN11
40
890 ' *** DRAW SCORE
900 SCREEN0,0:PCLS3:IFSH=1THEN91
0ELSEFORX=85TO(70+((SH-1)*15))ST
EP15:PUT(X-6,10)-(X+7,4),S,PSET:
NEXTX
910 FORX=1TO30:PSET(RND(255),RND
```

Galactic Trek

```
(160)+30,2):NEXTX
920 HS$=STR$(HS)
930 L=LEN(HS$):IFL<5THENHS$="0"+
HS$:GOTO930
940 HS$=RIGHT$(HS$,5):DRAW"S8;C1
;BM187,15":FORX=1TO5:TP=VAL(MID$
(HS$,X,1)):DRAWN$(TP):NEXTX
950 SC$=STR$(SC)
960 L=LEN(SC$):IFL<5THENSC$="0"+
SC$:GOTO960
970 SC$=RIGHT$(SC$,5):LINE(0,0)-
(70,15),PRESET,BF:DRAW"S8;C2;BM5
,15":FORX=1TO5:TP=VAL(MID$(SC$,X
,1)):DRAWN$(TP):NEXTX:SCREEN1,0:
RETURN
980 ' *** TITLE PAGE
990 PCLS3:COLOR1,3:LINE(0,0)-(25
6,14),PSET,BF:FORX=1TO30:PSET(RN
D(255),RND(166)+24,2):NEXTX
1000 SCREEN1,0:C=4:Y1=116:Y2=67:
FORX=1TO4:Y1=Y1-16:Y2=Y2+16:IFX=
4THENC=1
1010 IFX=1THENNEXTX
1020 DRAW"BM128,"+STR$(Y1)+"S"+S
TR$(X)+"C"+STR$(C)
1030 DRAW"BM-86,0;U6;L18;D26;R18
;U8;L6;BM+16,+8;U14;NR16;U6;E6;R
4;F6;D20;BM+8,-26;D26;R18;BM+8,0
;U14;NR16;U6;E6;R4;F6;D20;BM+28,
-4;D4;L18;U26;R18;D4;BM+8,-4;R10
;NR10;D26;BM+18,0;R8;NR8;U26;NL8
;R8;BM+28,+4;U4;L18;D26;R18;U4"
1040 PLAY"L255T25502V31;12;11;10
;9;8;7;6;5;4;3;2;1":DRAW"BM128,"
+STR$(Y2)+"S"+STR$(X)+"C"+STR$(C
)
1050 DRAW"BM-52,0;R10;NR10;D26;B
M+18,0;U26;R16;D12;L12;NL2;F14;B
M+26,0;L18;U14;NR12;U12;R18;BM+8
,0;D14;E2;NF14;NE12;G2;D12":NEXT
X
1060 COLOR2,3:FORX=1TO2000:NEXTX

1070 FORX=1TO46:PLAY"L255T2550"+
STR$(RND(5))+"V"+STR$(RND(31))+"
CGCGCG":IFX<>32THEN1110
1080 LINE(29,20)-(222,58),PSET,B
:COLOR4,1:LINE(32,22)-(220,56),P
SET,BF:COLOR3,2
1090 DRAW"C1BM42,30;D16;R6;U6;NL
4;BR4;D4;F4;E4;NU4;G10;BM+20,-8;
U14;R6;D6;L4;F4;D4;BR6;U8;BU4;U2
;BM+12,+6;L6;D8;R6;BR6;U6;NE6;NF
6;U6;BM+18,+12;U14;F4;E4;D14;BR1
2;L6;U8;R6;BM+8,+8;U14;R4;F2;D10
;G2;L2;BM+10,0;U8;R4;F2;D4;NF2;G
2;L2"
```


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Galactic Trek

```
1100 DRAW"BM+12,0;U4;NU4;E4;R2;D
8;BR6;U4;NU4;E4;R2;D8;BM+6,-4;R6
;U2;H2;L2;G2;D4;F2;R4;BR6;U14"
1110 PSET(RND(255),20,2):A=USR(0
):NEXTX
1120 IFPEEK(65280)<>254ANDPEEK(6
5280)<>126THEN1120
1130 COLOR2,3:SCREEN0,1:PCLS3:RE
TURN
1140 ' *** GAME OVER
1150 LINE(80,0)-(110,20),PRESET,
BF:LINE(76,95)-(170,80),PRESET,B
F
1160 SCREEN1,1:DRAW"S4;C5;BM86,8
2;L6;D10;R6;U4;NL2;BM+4,+4;U8;E2
;R2;F2;D4;;NL4;D4;BR4;U10;F2;R2;
E2;D10;BR4;NR6;U6;NR4;U4;R6;BR16
;R6;D10;L6;U8;BM+10,-2;D8;F2;R2;
E2;U8;BR4;NR6;D4;NR4;D6;R6;BR4;U
10;R4;F2;D2;G2;L2;F4"
1170 POKE65494,0
1180 IFPEEK(65280)<>254ANDPEEK(6
5280)<>126THEN1180
1190 IF SC>HS THEN HS=SC
1200 POKE65495,0:SCREEN0,1:GOTO2
70
```


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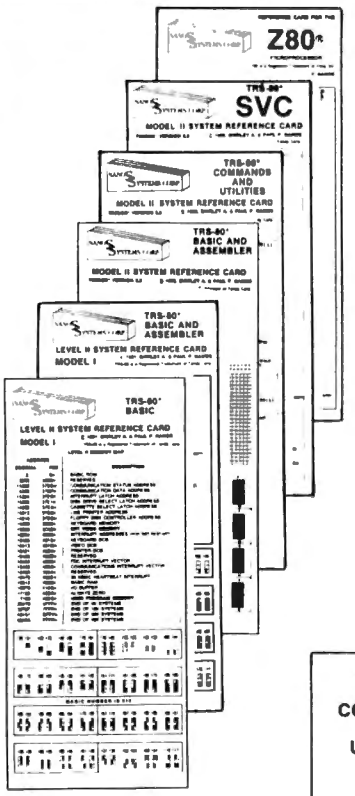

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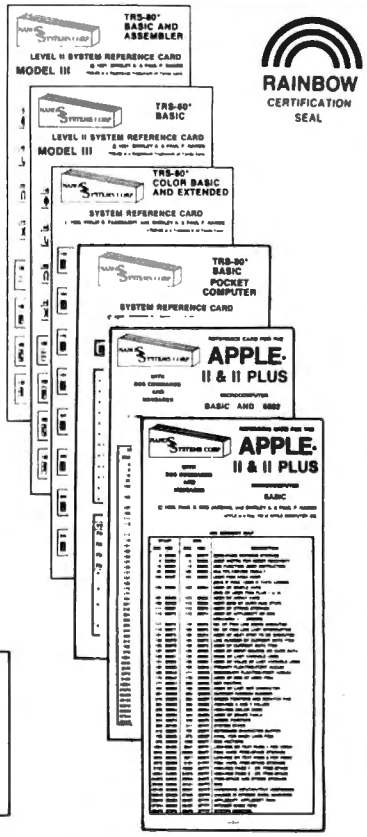

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REVIEW-HUMBUG

by Ralph Tenny
PO Box 545
Richardson, TX 75080

The most basic tool available for the assembly language programmer is the debug monitor program. Depending upon the capabilities of your debugger, freshly written programs can be simply tested for operation, or, with a really good debug monitor the program can be patched, run in breakpoint or single-step mode, and analyzed thoroughly. Compared with the clumsy and inefficient operations available with BASIC, the debug monitor is almost a miracle.

HUMBUG is an exceptionally complete and well written assembly language debug monitor for the Color Computer. 32 two character commands operate in a straight forward manner, requiring no ENTER key (typical of 6809-based monitors). The user is prompted for any required parameters, and illegal commands or non-hex parameters cancel the entry. HUMBUG requires 4K of read-write memory anywhere in the machine and is totally position independent. It can reside in ROM, and then uses approximately 60 bytes of read-write memory for workspace and 256 bytes for separate stacks.

Let's examine the commands available from HUMBUG, so we can more fully appreciate what all it can do for us:

AD Formatted ASCII dump, sixteen bytes to a line with each line's starting address printed.

AI ASCII Input. Allows direct ASCII data input from keyboard into memory.

AO ASCII Output. Memory contents are dumped to the screen in ASCII format.

AT Analyze Tape. Analyze Color Computer format tapes and list program name, type of program or data, where in memory it loads, number of bytes and whether it is in ASCII format.

BA Set baud rate to one of five standard speeds.

BR Breakpoint set/reset. Up to four breakpoints can be set or reset, giving exceptionally flexible breakpoint operation.

CO Continue program operation in either breakpoint or single step mode.

CS Checksum is computed over a specified memory area.

DE Disassemble. Object code is dumped in assembly format.

EN End of tape. Sends "S9" over serial port to signal end of S1-S9 checksummed transmission.

FI Find a specified one, two, or three byte number and prints all memory locations

Humbug

where the number is found.
FM Fill specified memory range with a specified character.
HD Hex Dump. Prints a memory dump in hexadecimal, with eight bytes per line and each line preceeded by the start address for that line.
HE Help. Prints a menu of commands.
JU Jump. Execute another program with a jump to its start address.
LO Load tape. Upload from another computer over serial port using Motorola S1-S9 checksummed format.
MC Memory compare. Compare two specified memory areas (such as to verify a data move).
ME Memory examine/change. Examine and/or change memory contents from keyboard.
MH Move HUMBUG. Move HUMBUG to another read-write memory location.
MM Move memory. Copy a block of memory to a specified location.
MT Memory test. Performs a simple non-destructive memory test.
MV Memory view. Display any 512 byte block of memory which starts on an even 512 byte memory boundary.
PR Printer. Toggle printer on or off.
PU Punch tape. Send data over serial port in Motorola S1-S9 checksummed format.
RC Register change. Used with RE command to examine and change contents of the 6809 processor registers.
RE Register examine. Prints the contents of all 6809 registers as maintained in the user stack following a breakpoint or single step operation.
RT Remote terminal. Allows the computer to be controlled by a remote computer or terminal, or to control a remote computer or terminal.
SA Save to cassette. Essentially identical to the BASIC CSAVEM command.
SI Serial input. One of three commands used with a remote terminal.
SS Single step. Operate machine language programs one instruction at a time, thus allowing the user to visually trace program operation. Will not work with programs in ROM, and cannot be used in time critical assembly language programs involving software timing loops.
ST Start single step operation.
TF,TH Set terminal mode to full or half duplex operation.
WH Where is HUMBUG? Locate current version of HUMBUG after use of MH command.

Almost any reasonably experienced Color Computer user will be able to learn how to use HUMBUG quickly, thanks to a 30 page handbook which provides a full listing and covers HUMBUG operation in great detail. In addition, there are instructions and commentary on memory usage, compatibility with BASIC and how to protect HUMBUG when BASIC is running. This documentation is superb and very thorough, especially considering the low price.

An experienced assembly language programmer will derive the most benefit from this program, but any diligent user trying to learn assembly language programming will derive much from regular use of the program and careful study of the documentation. In particular, the full listing allows study of virtually all modes of 6809 programming, and the abundance of commands allows a much more thorough understanding of what is happening.

HUMBUG is available for $39.95 from STAR-KITS, PO Box 209, Mt. Kisco, NY 10549. If you have a Radio Shack disk system, load the tape in the usual fashion, SAVEM it to disk, and run it from there.

I heartily commend STAR-KITS for furnishing a full listing of HUMBUG and for facing the software piracy issue head on. In effect, they say "Here's how to copy HUMBUG; don't give copies away or we will sue you!" Since the user has the listing and very complete documentation, he will derive maximum value from his investment, and the software is much more durable and valuable.

CCN TIP

The following program will disable the break key:

```
 10 FOR X=&HF8 TO &HFE: READ A:
POKE X,A: NEXT X
 20 FOR X=&H19A TO &H19C: READ A:
POKE X,A: NEXT X
 30 DATA 50,98,28,175,126,173,165
 40 DATA 126,0,248
```

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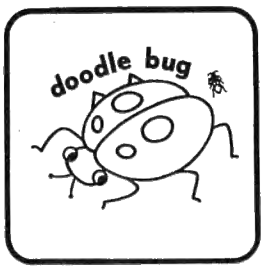

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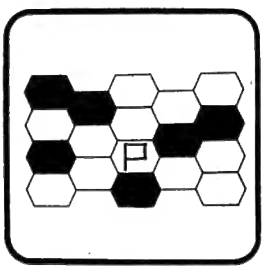

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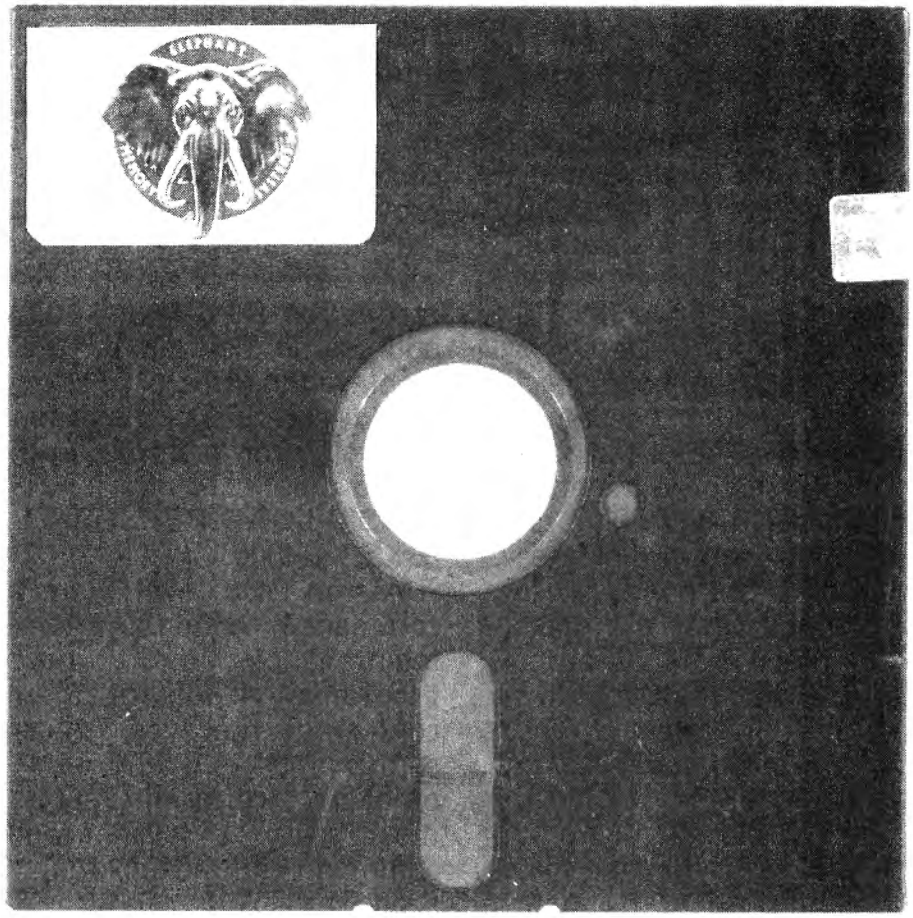
CCMD Review

By Andrew Hubbell



CCMD+, produced and marketed by Cer-Comp, is a disk operating system, (DOS) for the Radio Shack Color Computer utilizing Tall Grass Technologies' disk controller. Physically the system consists of a circuit board approximately 6 inches by 4 inches. One end of the board plugs into the Rom Pac expansion slot on the side of the computer, while the other end has an edge connector structured for the attachment of a cable running to one or more disk drives. The disk drive(s) and connecting cable must be obtained separately you can order them from Cer-Comp along with the controller, use Radio Shack's Color Disk cable and drive, or obtain them from another source, several of which have advertisements in this magazine. In my case, I am using a Heathkit H-17 dual disk drive unit. I had to obtain a cable separately and reprogram the drive jumper plugs, since Heath normally uses different connectors and drive select signals, but the modifications required conform to standard Radio Shack usage for the Models I and II, as well as the Color Computer, so my local computer dealer was able to provide all the necessary parts and information. With these modifications installed, I plugged in the board, turned it on, and started to run. No problems. I have since discovered, however, that the disk drive cable plugs into the CCMD+9 circuit board upside down when compared to Radio Shack's controller. If you do attach it the wrong way, your disk drives will start to run continuously as soon as the equipment is powered up. It doesn't hurt the equipment, but I would recommend testing first without a disk in the drive. If you get it wrong the first time, just power down and switch it around.

A couple points should be noted about the Tall Grass/Cer-Comp controller board: First, it comes without a case. The equipment runs fine and I have had absolutely no problems from dust, fingers, or anything else contacting the components. However, it does generate some interference with my television, so I am currently looking for a shielded case in hopes of eliminating this problem. Cer-Comp has just recently come out with an optional plexi-glass case, and, though I doubt that its really necessary, I will

probably order one soon just to feel more secure.

The second point is that this system uses hard sectored diskettes. (These are the same size as the soft sectored variety used by Radio Shack, but have 11 index holes rather than just 1. This locks the system into a 10 sector per track format. CCMD+9's double density is achieved by using 51 bytes per sector, as opposed to Radio Shack's 256 bytes per sector). Although there is generally no price difference between hard and soft sectored floppies, the hard sectored variety are not as readily available. For me, the nearest vendor of hard sectored media is 50 miles away, while I have several local sources for obtaining soft sectored diskettes (including two Radio Shack stores) at up to 40% less. I can, of course, order the disks from Cer-Comp, or any of several mail-order houses, at a better price, but that wouldn't help if I ever need one right away. The difference in media also guarantees that you will not be able to use any D.E.B. compatable disks under CCMD+9. You may be able to dump the programs to tape and reload under the other system or transmit from one CC to another via the RS-232 ports, but no one will be coming out with a translator program which will read one system's disks while operating under the other. Products like FLEX and OS9, which incorporate their own disk drivers, are simply not available unless/until somebody specifically writes them for CCMD+9.

CCMC+9's software exists essentially on two levels, DOS and BASIC. If you have Extended Basic, as I do, your machine will start at the DOS level. Without Extended Basic, you must first EXEC 49152 to install the CCMD+9 software into your operating system. Typing BASIC at the DOS level returns you to the control of the BASIC ROMs with CCMD+9's additional commands now available.

The BASIC level commands, which may be used either in command mode or within a BASIC program, tend to be rather limited. Essentially they extend the cassette functions to disk. LOAD, SAVE, and OPEN are rather obvious extensions. INPUT, PRINT, EOF, and CLOSE may now be used with positive values to reference disk files. Two new commands are CHAIN (LOAD and RUN a BASIC program) and REWIND (close a file and reopen it for input). Additionally, any of the DOS level commands can be used by passing it as a CDOS (Call DOS) command string. However, there are no provisions for random access files or machine language programs. The latter could be loaded, saved, and, in some cases, run at the DOS level, but since the EXEC address is neither passed to BASIC nor displayed in directory listings, I have to keep a manual record of it and feed it in to use the program. For example, to play BERSERK, I would type:

```
CDOS"LOAD BERSERK"
EXEC&H600
```

At the DOS level there are a number of commands available for handling disk maintenance and machine language programs. A few of them can be a bit confusing, however, since they have the same names as BASIC level commands (but, of course, different results). Probably the most scary is NEW. Under BASIC this command initializes the BASIC program space in RAM. Under CCMD+9's DOS, however, this command initializes a disk. I haven't made a mistake with it yet, but it is possible to do so. LOAD and SAVE at the DOS level refer to machine language programs. (In fact, the DOS can not directly locate a BASIC binary formatted program, which can be a real nuisance when I want to REMOVE one from disk). GOTO and GOSUB can be used to transfer control to a machine language program or subroutine, or even into the ROMs. CHANGE will change a program name. ANALYZE is used to display the disk directory, and BASIC returns you to BASIC ROM control. OK checks files for errors. SCMP toggles control of the automatic readback check on disk writes. STRACK alters the logical (though not the physical) characteristics of a disk drive, and can be used to experiment or achieve compatibility with other equipment. Disk drive selection is accomplished by following a command with :N, where N is the number of the desired drive, or the name (up to six characters) of a disk. Incidentally, as I found out by making a few spelling errors, any of these commands can be abbreviated by its

first two letters. Subject to this complication, (ie. typing BACKUP gets you BASIC) any command not within the standard set is interpreted as begin the name of a machine language program to be loaded from disk and executed.

The disk directory format consists of: Program name and extension, sector count, link address (used only if a file is fragmented), (RAM) load address and end address, and disk address of the first sector. The program name is limited to six characters, or a slash terminating the name, function as "wild cards", causing some of the commands and utility programs to process any program matching the remaining characters on the name/extension. The sector count, link address and disk address are decimal values, while the two RAM addresses are hexadecimal. (Most numeric input at the DOS level is also in hexadecimal.) The directory very nicely fills up the 32 character screen, but does not show the EXEC address, even though one is retained on disk with the program. The directory can be dumped to a printer, in this same format, by typing ?AN.

Unfortunately about half of the machine language programs I have seen, both games and utilities, fail to run at the DOS level. In fact, some will not even load at the DOS level. (They can, however, be loaded and run at the BASIC level, using the command sequence mentioned earlier.) CCMD+9 points both the User stack and the Direct Page registers to high RAM, where it maintains its scratchpad, and insists that any program to be run at the DOS level restore these registers to these values. Programs which expect to find the DP register pointing to BASIC's scratchpad on page 0, therefore, fail immediately. Furthermore, CCMD+9 appears to use the IRQ interrupt for its own timing control, and several programs hang-up the when they try to generate sound.

Bill Vergona, at Cer-Comp, is currently developing a newer version of the CCMD+9 DOS which emulates Radio Shack's Disk Extended Basic. I have obtained a preliminary copy, on disk, for review purposes. The finished product should be available by the time you read this article, but I am not sure just how it will be marketed or whether it will totally replace, or simply extend, the present controller ROM. The version I have at this point is not fully complete, and it seems to have a few bugs in it yet, but overall it seems to run fairly well.

To implement the new DOS, I simply insert the disk and type DSKEXT.U. The CCMD+9 prompt then gives way to Radio Shack's familiar copyright notice, with an interrupt driven clock residing in the upper right corner of the text screen. I don't know how to kill the clock other than by going to a graphics screen the documentation for the new DOS is not developed yet. It is stopped, however, during cassette operations. And, probably, also during disk, keyboard, etc. operations which disable interrupts. SOUND doesn't seem to bother it, however. Assuming that it works like Cer-Comp's CLOCK utility program, there will be an adjustable parameter which compensates for these occasional short termed lapses.

Under this newer DOS there is only the BASIC level of operation. LOADM and SAVEM handle machine language programs, which can now be EXEC'd after loading without specifying an address. DIR, KILL, and RENAME now manage the disk directory. Some of the R.S. commands, such as BACKUP, COPY, and DISKI are not implemented in the version I have, though they may be included in the finished version. Cer-Comp's Utility Disk, however, does cover these functions. The commands to manage random access files (FIELD, GET, PUT, RSET, LSET, etc.) have been implemented, however, and seem to work exactly like the similar commands I have seen on other Radio Shack computers.

The documentation for CCMD+9 tends to be a bit concise, but fairly complete. It contains no reference to the physical aspects of the hardware of connections, but does contain a one or two paragraph description and at least one example of each command. It could benefit from a proofreader since there are occasional spelling and grammar errors, along with repeated or missing words and phrases. Some points of command syntax are not clear on an initial reading, but, working from the examples, I was able

to get through it all without too much difficulty. A large portion of the manual is devoted to somewhat more technical information about the DOS's internal subroutines and disk interface. Overall, the manual (in fact, the whole system) seems oriented more toward a machine language programmer than a BASIC user. Since the newer, enhanced version of the DOS appears directed more toward BASIC programmers and novice users, this situation may change. It is nice, however, to have the technical information available without having to disassemble ROM's. Bill Vergona also seems quite helpful and willing to share information when questions do arise. Fortunately, he can only be reached in the evening, when the phone rates are lower.

How does CCMD+9 compare with the other DOS's which are available, particularly Radio Shack's Disk Extended Basic? Disk Extended Basic uses 35 track disk drives. CCMD+9, like some of the other non R.S. DOS's allows you to use 40 and 80 track drives, single or double sided. (Of course, the higher capacity drives do cost considerably more.) Its data storage format of 10 sectors per track with 512 bytes per sector yields 200K of storage on a typical 40 track drive or 175K on Radio Shack's Color Disk drives. By allocating file space in sectors instead of granules, the available space is made to go even further. To provide a more meaningful illustration of capacity I loaded a collection of machine language games, ranging in size from 2K to 19K and averaging about 7 or 8K each, onto disk. Under CCMD+9 I was able to fit the first 28 games on a single disk. Radio Shack's Disk Extended Basic, on the other hand, could hold only 19 of these same games on a disk.

What I like best about CCMD+9, however, is that I do not have to give up all of my cassette based software to use disks. Many of the earlier machine language programs either ORG at $0600 or utilize a graphics screen at the location. (This was originally the start of "user area" RAM, as documented in the Extended Basic Manual.) Since Radio Shack's Disk Extended Basic now uses this location as the start of its scratchpad, the DOS and ML programs destroy each other. Approximately one half of the games I checked out, and a few of the utilities, simply will not run under D.E.B. CCMD+9, on the other hand, locates its scratchpad at the high end of RAM, and out of the 30 ML games I tested, only Aardvark's Venturer failed to run properly. (I did, however, have to write a short block move header to get Cornsoft's Scarfman onto disk. I also have removed all auto execution headers from the programs. These fixes were required to allow me to make tape backups, as well as to load the programs onto either disk system.) As I mentioned earlier, only about half of these programs can be run at the DOS level. Some of them also fail to run with the new version of the DOS installed apparently in emulating Radio Shack's system Bill Vergona also acquired some of its shortcomings. (The fact that I have only the preliminary version of the DOS may also be relevant here.) But, at least I can make them run, even if the procedure required is a bit inconvenient.

Although I would expect hard sectored disks to be less sensitive to timing differences between drives than are soft sectored ones, CCMD+9's encoding technique seems to be even more sensitive than other systems I have seen. I have experienced some difficulty when trying to read disks on a different drive than that on which they were written. Reversing the order of my two drives eliminated loading problems on my computer, but I still have some difficulty reading the disks on someone else's system. Over the course of several months I have lost a few programs (they get a "DCODe" error when I try to load them) for unexplained reasons, but I have always been able to recopy the same program to the same place on the disk with no other ill effects. I do not know enough about Radio Shack's D.E.B. to tell you its reliability rate, but, judging from what I have read in this and other magazines, it certainly doesn't sound any better. With the Model I's I have worked with, it was not too unusual to lose entire disks, generally as a result of spurious disk writes caused by line voltage transients, static electricity, or turning equipment off while the disk was in the drive. I often forget to pull the disks out before switching power off or on, but have never seen or heard any

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extraneous disk activity under CCMD+9.

In summary, the choice of a particular disk controller and DOS must be made on the basis of each individual's requirements. CCMD+9 is not a perfect system, but it is a viable choice. Compatibility is both its strongest and its weakest feature. At the present time Cer-Comp has more software available for its disk system than Radio Shack does, though outside vendors, including Cer-Comp, will probably tip the balance in Radio Shack's favor. If we include all existing cassette software, however, Disk Extended Basic again falls considerably behind. At the present time I am waiting for Bill Vergona and Cer-Comp to release the new DOS. (Hopefully, it will be an option, rather than the only system.) Unless I decide to run FLEX or OS9, however, I see no need to acquire Radio Shack's disk system.

Editor's Note: After discussing software with Bill Vergona I discovered that Andrew's copy of the documentation didn't include the command "TIME OFF" which turns off the clock display. I also discovered that Bill and Andrew don't agree on the definition of the term Random access.

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From the January 1981 issue of the CSRA Computer Club newsletter:

> There was some amusement at the November meeting when the Radio Shack representatives stated that the software in the ROM cartridges could not be copied. This month's 68 Micro Journal reported they had disassembled the programs on ROM by covering some of the connector pins with tape. They promise details next month. Never tell a hobbyist something can't be done! This magazine seems to be the only source so far of technical informations on the TRS-80 color computer™. Devoted to SS-50 6800 and 6809 machines up to now, 68 Micro Journal plans to include the TRS-80 6809 unit in future issues.

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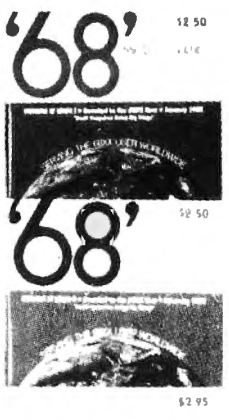

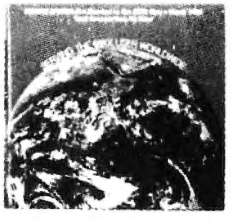

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Color Computer Editor

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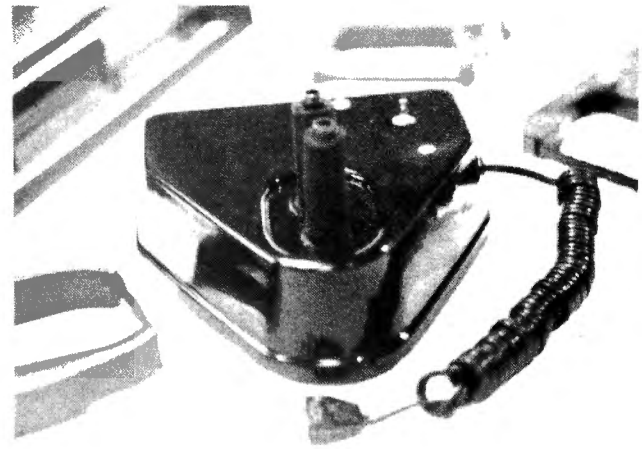

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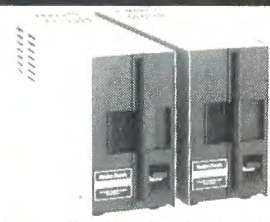

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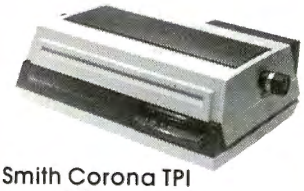

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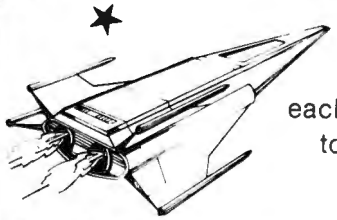

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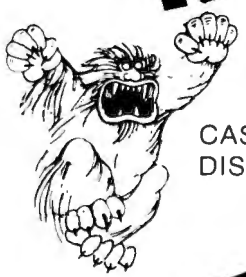

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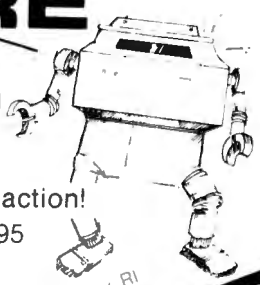

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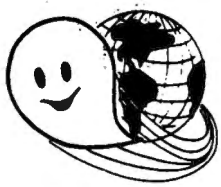

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