

The Color Computer Magazine for 6809 Users

Color Computer News

Issue #18 March 1983





Nanos Systems Corp.

REFERENCE CARDS

For Models I, II, III, Color, Pocket and Apple II & II Plus



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Each card is a complete summary of the reference manuals and the microcomputer. Cards are two or more colors, printed on 80 pound Beckett Antique cover stock or a comparable stock, stretch-wrapped in plastic for shipping. They are accordion-foldup cards, in the same style as the traditional IBM reference cards used on the major computers for years. Fold-up size is eight and one-half by three and three-quarter inches, so they will fit easily into the shirt pocket. These cards provide a complete summary of the manuals plus many extras at your fingertips.

MODEL I

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 5 Panels, 10 Pages
 (For the Classroom)
 Memory Map.
 Easy Graphics.
 Basic Statements.
 Basic Functions.
 Basic Facts.
 Special Characters.
 Basic Commands.
 Edit Subcommands.
 PRINT USING Examples.
 Message & Codes.
 Reserved Words.
 Special Keys.
 Ascii Character Chart, with Space Compression Codes.
 Control Codes.
 Basic Internal Codes.
 Hex/Dec Conversion Chart.
 Screen Line Layout.
BASIC & ASSEMBLER: Buff
 8 Panels, 16 Pages
 (For the Pro)
 Complete Z80 Instructions.
 Assembler Instructions, Commands, Operators.
 Editor/Assembler Commands, and Edit Subcommands.
 Flags, Conditions, & Chart.
 Internal Routines.
 Assembler Error Msgs.
 Plus Most Items in the Basic Card

MODEL II

BASIC & ASSEMBLER: Green
 10 Panels, 20 Pages
 (For the Business)
 Small Memory Map.
 Screen Layout.
 Easy Graphics.
 Complete Z80 Instructions.
 Series-1 Assembler Instr.
 Commands, Operators, and Edit Subcommands.
 Assembler Error Msgs.
 Power-up Error Msgs.
 Flags, Conditions, & Chart.
 Wild Cards, DOS Messages.
 SVC Procedure Panel.
 Host Logon Panel.
 Version 2.0 Lib Command Formats and System Utility Formats.
 Basic Functions & Statements.
 DOS File Naming Convention.
 Basic Commands & Edit Subcommands.
 Special Keys.
 Basic Internal Codes and Reserved Words.
 Basic Msgs. & Codes.
 PRINT USING Examples.
 Special Characters.
 "DO" Utilities & BASIC Command.
 Ascii Character Chart with SVC Names and Numbers.
 Control Codes.

MODEL III

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 6 Panels, 12 Pages
 (For the Classroom)
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 Kana Characters.
 Euro-Characters.
 Memory Map.
 Special Keyboard Functions.
 Ascii Char. Chart w/Space Compression Codes.
 Control Codes.
 Cassette Loading Err Msgs.
 Basic Commands, Edit Subcommands, Special Chars., Basic Statements, Facts, Functions, Derived Functions, Special Operations (POKEs).
 PRINT USING Examples.
 Basic Msgs. & Codes.
 Basic Internal Codes.
 Reserved Words.
 Screen Line Layout.
BASIC & ASSEMBLER: Blue
 10 Panels, 20 Pages
 (For the Pro)
 Complete Z80 Instructions.
 Assembler Instructions, Commands, Operators.
 Series 1 Editor/Assembler Commands & Edit Subcommands.
 Flags, Conditions, & Chart.
 Hex/Dec Conversion Chart.
 Assembler Error Msgs.
 Internal CALL Routines.
 Break Processing Procedure.
 Plus all items in the Basic card.

COLOR

BASIC & EXTENDED:
 Gray + 9 Colors.
 8 Panels 16 pages
 (For the Artist)
 All Color Graphics.
 System Commands.
 PRINT USING Examples.
 Special Characters.
 Special Keys.
 Cassette Loading Err Msgs.
 Basic Functions & Statements.
 Playing Music, Making a Circle, and Drawing Panels.
 Derived Functions.
 Messages & Codes.
 Musical Notes, by Octave, in Color, Including Rests and Time.
 Memory Map.
 Reserved Words.
 Internal Codes.
 A Page of Tips.
 Ascii Char. Codes Chart, Including Inverse Graphics and Color Graphics.
 Control Codes.
 Color Group Chart.
 Pmode Information Summary.
 Screen Line Layout.
 Extended Graphics Pmode Illustrations.

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BASIC: Red & Pink
 7 Panels, 14 Pages
 (For the Classroom)
 48K Memory Map
 APPLESOFT and INTEGER BASIC.
 Basic Statements.
 Basic Functions.
 Derived Functions.
 Special Characters & Operators.
 System & Utility Commands.
 Pokes, Peeks, Calls.
 Monitor Commands.
 Key & Control Functions.
 APPLESOFT Internal Codes.
 APPLESOFT Reserved Words
 Integer Basic Addressing.
 DOS 3.3 Command Summary
 Color Selection Chart.
 Error Msgs & Handling.
 Reading Machine Language.
 Hex/Dec Conversion Chart
 ASCII, Print, Video, 6502, Integer and APPLESOFT Code Reference Chart, 0-255.
Basic & 6602: Red
 8 Panels, 16 Pages
 (For the Pro)
 All features of the Basic Card, Plus:
 6502 Timing.
 6802 Language Simplified.
 Flags & Conditions with Reference Chart.

POCKET

BASIC: Purple
 5 Panels, 10 Pages
 Operating Characteristics
 Memory Types and Limitations.
 Modes of Operation.
 PRO Mode.
 RUN Mode.
 RESERVE Mode.
 DEF Mode.
 Fixed Variable Facts and References.
 System Function Keys.
 Math and Logic Function Keys.
 Normal Character Keys.
 Special Characters and Function Keys.
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REMARKS
by Bill Sias

Our OS9 column has been delayed but in order to keep you informed I've decided to use this column to keep you up to date until the column can begin.

OS9 is one of several UNIX like operating systems. Unix is a disk operating system developed by Bell Labs and was written in the C programming language. One of the major differences between Unix and OS9 is that OS9 was written in assembly language and therefore runs much faster than Unix. OS9 has another advantage in that during timeshare Unix swaps programs in and out of memory (a user's program is only in memory when he is actually using it) which causes a slower multiuser environment since on each timeslice the program and data must be reloaded from disk. If your disk is extremely fast this isn't a problem but most disks available to small businesses and/or hobbyists are far too slow for this sort of action. Therefore the authors of OS9 chose instead to assign each user a unique space in memory.

Some people have expressed a concern that OS9 doesn't have much software available for it. On the application software level that may be true but keep in mind that this operating system is relatively new, remember when the Color Computer was young and there was hardly any software for it and now there is practically all the software a person could desire. From my vantage

point, keeping in mind that my "hobby" is learning new languages, there is an excellent start for OS9. I've been able to purchase all the business software I've needed with the exception of the mailing list we use, which I wouldn't have been able to for any operating system since our mailing list requires so much maintenance. There are however many languages for OS9. Just looking at our advertisers there are at least two BASICs, two or three C compilers, at least three assemblers, two Pascals, a Forth and a number of other things.

A fellow expressed the concern to me the other day that OS9 was "too much" of an operating system for the Color Computer. How can you have too much computing power? I would prefer to have an operating system that was more than I needed than one that was less.

There is perhaps one final point worth mentioning, since Radio Shack has chosen it as "their" operating system software will become available for it because simply by Radio Shack selection it has become the standard disk operating system for the 6809. After all there are more Color Computers in the marketplace than any other 6809 based computer.

I seem to have used up my allotted space so I'll close here and unless our regular column begins by next month I'll have more for you here next month.

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

#spacebar space forward # spaces

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by Jake Commander, Page 45.

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"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.

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The system collects name and address information and then provides mailing labels or reports of the entire list or subgroups within the list upon your request. You can add names, delete names, or change information for a given name at any time, keeping your list accurate at all times.

CC FLEX version: \$149.00





Mail Call

Dear CCN,

Richard Watts had a question concerning what to do about sticky keys in your October Mail Call. When I first bought my Color Computer in September 81, it had a sticky key that I just put up with for a few months. Then one day I spilled some beer on the keyboard; so several keys became (understandably) very troublesome. Without giving it very much thought, I decided to use some petroleum jelly on them.

I touched the tips of the bristles of a toothbrush to the surface of the jelly, and then worked them down between the sticking keys and the surrounding baseboard. This cleared up the problem immediately, including the one that had been sticking ever since I got the computer (which had not had beer spilled on it).

For a while after doing this I was concerned that the jelly would cause dirt to collect more rapidly and lead to long term problems, but it is now a year later and all keys are working fine.

Sincerely,
Les Brown
FPO, NY

10 March 1983

Dear Bill,

In regard to Mr. Watts question about sticky keys "A Big Fat NO to graphite, it is conductive and can cause all kinds of headaches as well as being dirty!" As for tuner cleaners, most of them are a solvent base, all of the people who use it do so at their own risk (you'll know who does by the complaints about disolved keyboards). (Reference October '82 issue, "Mail Call" page 11)

Here is what I use, and how. It works, is readily available, and safe if used in this way:

1. With a slightly damp (NOT WET) rag, clean the keyboard, keys and case. This removes dust, cookie crumbs, late night coffee spills, etc. Let it dry a few minutes, and go back and repeat if you missed any spots. Use a fold of damp material to get between the keys, thoroughly. (up, down and crossways).

2. Spray a small amount of "Pledge" furniture polish into a small throw away container, you only need a little bit. DO NOT SPRAY THE KEYBOARD! If you spray the keyboard, you'll curse those slick keys

MAILCALL

forever. Plus, I don't know what it will do to the works under the keyboard. I'll repeat, watch my lips move "Spray it in a small, throw away container, DO NOT SPRAY THE KEYBOARD!"

3. Dip a cotton swab (Q Tip) in the container, just get it damp, press the excess off by rolling it against the side of the container.

4. Scrub the front, back and sides of all of the keys, and the keyboard backing around them, keep the swab damp, replace it as necessary, it took me 4 or 5 of them to do mine. Don't get any on top of the keys.

5. Depress all keys several times, and repeat the scrubbing.

6. Pledge worked for me, others might do all right too. That's it, I haven't had a sticky key since I treated mine.

Something else I did was to take a fine point indelible marking pen and wrote in the shifted symbols on the arrow keys then laid a square of Scotch "Magic" tape over the top of those keys, I have to replace the tape occasionally, but it makes it more permanent than without it. One advantage to the pledge, just doesn't seem to stick to the plastic now.

Thanks for a good magazine, keep it up.

John Robertson
Olney, IL

Dear Bill,

I have a serial hazeltine terminal that I would like to use as an I/O device for my Color Computer. I have been successful in printing to the terminal by hooking it up to the CC serial port and using PRINT#-2 as if it was a printer; but I have not been able to input characters typed on the terminal keyboard into the CC. Is there any way to do this short of buying a new operating system? Has a program that inputs serially for the CC appeared previously in your magazine? Could you send me a reply or a card saying what month you answer my question in your magazine in case I miss it? Thanks a lot and seasons greetings.

James Hunter
Toronto, ONT

* The easiest way to use a terminal with the Color Computer is by using Star-Kits Remoterm program (check the advertiser's index for the page where the ad appears).

Color Computer News

You mentioned in the October issue of a book of your first year of publications. If there is such a book please advise as to cost and availability: I want one. Is there a possibility to get all past issues from day one? You cover such fantastic stuff in serial articles that I wouldn't want to miss any of it. Since the Shack doesn't want to support this fantastic computer, I turned to their sources, your publication being the best I've found.

I'm heavy into assembly language and building expansion hardware for this 16K Exp CCN. I've built my own PROM burner and use it as a development system for 6809 ML routines, which I download from my EDTASM+ cartridge. I see that a lot of your sponsors will be getting some business from me for hardware and software. Your review of Super Color Writer II has me convinced that it would be a lot better than Color Scriptsit so I can embed code to my DMP-200. Micro Works also looks like a good source for a decent software development system. Computer Accessories of Arizona and Computerware looks like a good source for some hardware goodies.

For those who want to get into machine language (assembly language) very heavily and have a slant toward hardware building, I would highly recommend the Heathkit microprocessor training course. The course takes you through all the registers and develops the math and logic from ground zero to a high enough level to fly on your own when you finish. (I see they have now added to 6809 update to this system).

Keep up the good work

Regards,
Roy Osborne
Council Bluffs, IA

* Most old issues are still in stock except January 82, April 82, and May/June 82. All of 1981 is available in our 1981 Book (however supplies are almost gone). The back issue book is \$9.95 including postage and the back issues are \$2.95 each plus postage. I certainly agree that CCN's advertisers are the very best sources of the items you need for your color computer.

Dear Bill,

My kids and I love our Color Computer but we've experienced a storage keyboard

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problem which you may be able to help us solve; I'd certainly like to know if anyone else has experience it and found a solution.

Color Computer News is widely read in our house, too, and my check for a two year renewal is enclosed.

Our problem is this: Sometimes on power up a few keys, right now it's 1-4 inclusive, and adjacent keys in the next (row) rows will not work at all. After exercising the other keys for a while the problem vanishes. It then reappears, on a random basis on the same keys during operation. Over a few month period it "moves" to other keys.

This is (I think) our second keyboard, we've had it back to Radio Shack twice for a fix during the warranty period, the first time they couldn't get it to act up. They claimed that they replaced the keyboard.

I've had it apart but cannot find anything loose. It is very frustrating especially in the midst of entering a program. Any comments#

Yours Sincerely,
G.R. Peacock
Levittown, PA

* You might check the PIA. I don't really understand what would make it wander. Can any readers help?

Gentlemen,

I have been a subscriber to your magazine for over a year and find that each issue is better than the preceding one. Keep up the good work! I have recently converted my CoCo from cassette to disk and had a rude awakening. I have been very sloppy with documenting my cassette tapes. I would like to offer the following suggestions to your readers to save a lot of grief.

When reviewing unmarked tapes, do not RUN them, merely list them and read the first few lines of code. If you RUN them, you often use a speedup routine so that you cannot CSAVE the program. LISTing is faster and yields the same results, IF you follow the following format.

As an example;

```
1 ' 64K Mem Test
2 ' CCN
3 ' Oct 1982, P. 68
4 ' By Jim Brown
5 ' 31 Richie Drive
```

12 March 1983

6 ' Pleasant Hill, CA 94523

This data allows you to find the original article and write to the author if needed.

The following code is a mod to the above program that increases the utility of the program, which I found to be an excellent addition to my program library.

```
7 ' Modified by K9UQI
```

```
8 ' U = 0
```

```
974 ' U = U + 1
```

```
975 ' CLS: Print at 480, " Pass #"; U; "
Completed"
```

```
98 ' GOTO 740
```

This mod was created by a friend of mine and allows the program to go into a continuous loop and identify the number of times the loop passed. You can then exercise the memory chips at will and know how many passes have occurred.

Yours very truly,

J.E. Greve

4211-7th Avenue

Rock Island, IL 61201

P.S. If you ever list CoCo clubs, ours is "Quad City CoCo Club at the above name and address.

Dear Sir:

I am a recent subscriber to CCN, having both a personal and a professional interest in the Color Computer (we have a student computing facility here in our department which consists entirely of CC's). Your magazine has been of great interest and help to us.

I do have one suggestion that I urge you to consider. I have noticed frequent errors in certain program listings, both in CCN and elsewhere, in the form of garbled program lines that contain disk-system commands. Recent examples are Roger Kilpatrick's "Color Data File" in the October CCN and Jack Aker's "Care and Feeding of RS Disk Drives" in the November CCN. The BASIC interpreter, as you know, stores BASIC functions and commands in tokenized form, and untokenizes the lines to recover their original format when a program is listed. Rather than abort a listing or mess it up with an error message in the event an unrecognizable token is encountered, BASIC substitutes an exclamation mark in place of the offending token and proceeds with the

Color Computer News

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listing. Evidently you are listing people's programs from cassette for publication, and are doing so on a non-disk TRS-80C. The disk-pack ROM adds the disk command and function tokens to BASIC's token table when it is plugged in, and without it of course the disk-system tokens appear to BASIC as garbage. This is the reason one sees so many published listings of Disk BASIC programs with ! symbols scattered throughout. It is important that you, and the other C80 magazines, recognize this fact and make sure you prepare your listings with a disk-pack in place.

Incidentally, I note Andy Phelps' "Comment Corner" is missing from the November issue. This is the most valuable single feature of your magazine to us, so I hope this is just a temporary omission.

One final suggestion: in Aker's disk-maintenance article he recommends polishing the diskpack connectors with a pencil eraser to remove tarnish and help insure a good connection. This is most unwise advice, not only because what plating there is originally will be abraded away, but because some rubbers contain sulfur compounds that can themselves cause tarnish. The correct solution is to use a contact-cleaning compound. I imagine the commercially available TV tuner spray cleaners would do fine; however, we use Gold-Wipes, a product made specifically for cleaning commercial electronic equipment board contacts (Texwipe Co., Upper Saddle River, NJ 07458, \$25 per box of 100). A cleaning every month or two with this product seems to eliminate all trouble due to the cheap tin-plated contacts.

Sincerely,
William C. Clements, Jr.
University, AL 35486

Dear Sirs,

I am writing this letter in the hope that some of your readers will be able to provide some help. I am using the Exatron disk system, and, as is usually my luck, Exatron is now no longer supporting the Color Computer, (not that they supported it even when they still manufactured their device). What I need is some information on CCDOS. Has anyone disassembled this and have

Color Computer News

available the entry points of all the major I/O routines? I cannot get this from Exatron, so I'm hoping that other Exatron users can help.

I am also interested in converting this device to double density through the use of a piggyback adapter such as the Percom or LNW. I think this would be easy, but has anyone got any double density software to run this?

Has anyone achieved compatibility with the Radio Shack DOS? Changing the output "port" addresses to be the same as Radio Shack isn't hard, but again, how about software?

Has anyone modified Cognitec's Telewriter to work with the Exatron Disk?

If any of you Exatron users (are there any other than me?) can answer any of these questions, I would very much appreciate hearing from you.

Rudy Schleinkofer
Cherry Hill, NJ

Dear Bill,

In response to the letter from Frank Hogg in the October 1982 issue, I would like to make the following information available to the CC owner.

Frank says that his 64K modification does not affect normal operation of the CC. This is correct for most but not all operations of the CC.

The modification inhibits write operations to memory addresses \$8000 to \$FEFF. This is necessary to avoid data bus conflicts between RAM and ROM during write operations in map type 1 (64K RAM) mode. The \$8000 to \$BFFF address space is occupied by system (BASIC) ROMS and \$C000 to \$FEFF by ROM and/or RAM installed in the plug in cartridge. A problem occurs in map type 0 (Normal RS BASIC) mode, when a plug in module with I/O or RAM is installed, and the module uses the CTS (pin 32) signal to decode its address space some of the RAM/ROM cards for the CC will not operate properly with RAM on the card and the Hogg mod installed.

This problem can be avoided in future products that use RAM or perform write operations to address \$C000 to \$FEFF. The hardware designer should decode his

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JAN '83

DISK DOUBLE ENTRY - If you have spent hours trying to balance your Debits and Credits, this program is for you! Designed for small business, club, and personal use. Enter transactions in a journal type format. Program will maintain current account balances, produce Trial Balance, Income, and Balance Sheet reports and complete Account Ledgers. Will handle up to 300 accounts including report headings and totals. Up to 1400 average transactions on a diskette. Summary reports and four levels of subtotals available. **REQUIRES 32K** and a user understanding of standard double entry accounting concepts. - \$44.95 in BASIC with Machine Language subroutines.

OCT '82

DISK DATA HANDLER - Will allow you to design disk data files for your specific applications. Provides a powerful facility for on-screen input and update, fast selection and sorting, user defined output of reports to screen or printer, and output to disk files which may be read by your BASIC programs for any computational or special formatting requirements. You define a basic record of up to 14 fields and 246 characters. Sort or select records based on any field or combination of fields in this record. Maximum number of records you may work with at one time will depend on record size (500 - 23 char records, 50 - 246 char records). An optional Extended record linked to the basic record may also be defined. The size of the Extended record is not a factor in determining maximum number of records. Disk Data Handler is the type of tool which will provide the growth capability needed for your increasingly sophisticated applications. **REQUIRES 32K**. - \$44.95 in BASIC with Machine Language subroutines.

JUNE '82

NOW - Also available in a **64K** version. More than three times the number of records shown above plus enhanced performance and report formatting capabilities. Uses standard ROM's - No special operating system required! **DISK DATA HANDLER - 64K - \$54.95**

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TAPE DATE-O-BASE CALENDAR - \$16.95
(max. 400 memos/tape file)

DISK DATE-O-BASE CALENDAR - \$19.95
(over 4,000 memos/disk - max. 300 memos/month)

SEP '82

MATH TUTOR - Five programs that go from math fact (+, -, X, /) drill to full addition, subtraction, multiplication, and division at four levels of difficulty. Provides a step by step approach with error correction and rewards for good performance. - \$13.95 in BASIC.

SEP '82

SPELLING TEACHER - Up to 200 of their spelling words stored on tape or disk are presented in four lively study modes including a scrambled word game. - \$12.95 in BASIC.

AUG '82

ALPHA-DRAW - A subroutine designed to let you easily add characters to your graphic displays. You define X and Y coordinates and a string variable of one or more characters and Alpha-Draw will do the rest. Includes all keyboard characters. Comes with instructions for a true line numbered merge of tape files. Works great with the Screen Print program! - \$8.95 in BASIC.

MAY '82

GRAPHIC SCREEN PRINT PROGRAM - Works in ALL PMODES and lets you shift screen image anywhere on the printed page. Relocatable code lets you use all of your 16K or 32K machine. Available for both Color Basic 1.0 and 1.1. Use EXEC 41175 to see which you have and SPECIFY with order. In Machine Language.

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ALL PROGRAMS require Extended Color Basic and are delivered on cassette. All, except Tape Date-O-Base Calendar, are DISK System compatible.

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address space directly from the address lines on the cartridge connector, and not use the CTS (Cartridge Select) signal.

Although the 64K mod can cause problems with some existing hardware, a method around some of the problems exist. In the case where RAM or ROM/RAM is installed in the port, the contents of the ROMS can be copied to RAM in the 64K mode then executed in an all RAM system.

I bring this problem to the attention of CC users so that they will ask any supplier of cartridge hardware/software if their product will work with the Hogg modification installed.

Finally a word of thanks to Frank Hogg, for opening up the world of FLEX and OS9 to CC users.

Sincerely,
Jim D'Ottavi
Marmora, NJ

* I'm curious which revision circuit board you have. The new boards, which Radio Shack refers to as E1 or EA, doesn't allow writing to RAM in the cartridge slot between \$C000 and \$DFFF.

Dear Mr. Sias,

You have left a great number of "loose ends" in your publications to date. Why is the 6809 processor more versatile than the Z-80? Will the CC ever be able to run sophisticated financial modeling programs (Micro-DSS/Ferrox Microsystems Inc.)? Can the CC take a bite from Apple software? Will CC FLEX software run the Gimix unaltered? Is there a Gimix Users group? Is 6809 software compatible with future 68000 offerings? Please focus on utility! Most 8 bit CPUs are limited to 64K of addressing. Within this constraint it would appear that all other considerations are inconsequential. Why should a user stick to the 6809 in the face of an overwhelming wave of software for the IBM PC? I look forward to some interesting opinions from you and your staff.

The shakeout is coming! Don't hitch your wagon to a falling star.

Arthur Doyle
Bedford, TX

* I guess you are asking for personal opinion so I'll feel free to give you mine. The
Color Computer News

6809 is superior because it was designed to be used by programmers. Some examples are the fact that it has more addressing modes than any other processor (and that's the biggest advantage), two stacks (the thing was designed to have languages written on it). It's hard to speculate what kinds of software will be written for the 6809. The Apple uses a 6502 therefore the software isn't compatible at the machine level, however there are 6809 boards available for the Apple to allow it to run Flex and OS9. I'm not aware of a GIMIX Users Group but there are several SS-50, 6809, Flex and OS9 User's Groups.

CCN,

When I first learned of the POKE location to increase the clock rate the article stated, "Do not use for sound or I/O functions". Well, that was ok because in basic you can return to the slower clock rate before a sound or play statement then return to the fast rate. In a machine language program you can't make those changes. Like I said, that was ok, until a friend I was visiting showed me a new ML game. Before he typed 'EXEC' he POKED in the fast clock rate. To my surprise it didn't lock up on any sound routines. This was the problem I was having in the fast mode. If I used the sound or play statements the computer would lock up with a continuous tone. The only way out of this was to press reset or POKE 65494,0. All other functions worked, except the cassette I/O. I talked to a lot of people trying to see if someone knew why some would work and others didn't. I made a mistake calling Radio Shack in Texas. They would only say that they don't support the fast clock rate. That was as far as the conversation went! I knew it wasn't the chips because I had replaced them with chips I knew worked at the fast rate. After some more circuit tracing it seemed that the problem had to be with the clock itself when at 1.78 mhz. Shortly after this I happened to read an article in 80 MICRO by Dennis Kitz. He was talking about similar problems although not specifically about the sound or play statements causing the computer to lock up. I tried what was suggested and it worked! You remove C73 and C75 and if you have a disk drive remove C85. It's that simple. By

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removing C85 the disk can be left plugged in and I have been using the disk drive successfully with I/O functions at the fast clock rate. ML games can now be sped up if there isn't a routine built into the program to check the CPU's clock rate.

I've had the 'Telewriter' word processor for a year now. I can only say, I feel sorry for those who have anything less. I looked at the Radio Shack Scripsit program after it came out a few months ago. It took about 20 seconds to determine it was grossly over priced. But in all fairness I'd have to say there's no comparison. For those who have the cassette version of 'Telewriter' and don't know, you can change the color set by POKING &H2FDF,240. This will give you a green screen with black text. Do this before you type 'EXEC'. An updated disk version is now available! However, if the information I received from them was correct it would cost half the original price to upgrade my present disk version. That seems to be a bit high.

I hope nobody will do to their computer what Mr. McClenahan did to his. I'm referring to the August issue page 55. If people feel they want a 'real' keyboard (I don't know what I've been using all this time then) they should get a reconditioned Model I keyboard. This one will fit without having your computer looking like it's been taken to the local butcher shop. For more information see 80 MICRO January '82 page 352. I'm getting tired and annoyed at the idea of the TRS-80C being labeled a toy because of it's keyboard of any other reason. The video display chip is the weakest part of the computer. A 40 character line would be a plus and forget the border colors. An example is when your in the text mode, I'd like to have the border green instead of black and in the high res mode when there is a black background you would also have a black border. I can't understand why they would design it that way. The border is totally useless for anything so why not let it's color match the background color. I'm sure there is a reason and it's probably 'money'. Despite this, I'd rather have the TRS-80C than a VIC-20, TI or ATARI to mention a few.

It's not good practice to plug or unplug ROM paks with the power on. Radio Shack did see a problem using ROM paks in that people don't follow directions. So they

designed the ROM paks in such a way that if power is on, the last connection made is the 5 volt supply. This can be seen if you look at the contacts of a ROM pak. One contact is shorter than the rest this is pin #9 if you look at the schematic of the computer you will see this supplies the ROM pak with 5 volts. This may save you from destroying a ROM pak if you accidentally forget to turn power off first, but don't depend on it! Turn the power off first! Be warned some ROM paks aren't designed this way. I've heard of other ways to defeat the ROM paks auto start, one includes a POKE to a memory location, but the power must be on. How many people would take the CPU out of it's socket with the power on? The best way to have control of the ROM pak is to put a small piece of cellophane tape over pins 7 and 8 or cut the trace that connects them on the ROM pak board. This is normally the first set of pins (pins would be facing you) from the left but could be different depending on the requirements of a particular ROM pak. The pins are numbered with odd numbers for the top row and even numbers for the bottom row.

If you would like to keep your computer looking new try some 'ARMORALL' protectant spray. Spray some on a cotton swab to get around the keys. Use sparingly, you don't want a lot to get down in the keys. ARMORALL can be found in the automotive department of most stores.

Businesses that provide fast shipping and excellent service are:

COMPUTERWARE
TOM MIX SOFTWARE
MICROWORKS
MARK DATA PRODUCTS
Verne Winter, Jr.
Des Moines, IA

Dear Bill,

Congratulations on your new look. The January cover was exquisite! The FHL catalogue was very interesting. On page 21 of the catalogue, there are 32K RAM upgrade instructions for a "D" revision circuit board. One of the instructions is incorrect. If you connect a jumper from pin 12 of U4 to pin 17 of U8 you will only get 4K! You must connect a jumper from pin 12 of U4 to pin 16 of U8 to get 32K. My company,

MAILCALL

Spectrum Projects, does 64K upgrades locally and through the mail. If any of your readers wish to make the step up to FLEX but are unable to do the 64K upgrade, they can contact me at (212) 441-2807. We will return their computers via UPS within five working days. Have a HAPPY NEW YEAR and keep up the good work.

Sincerely,
Bob Rosen
Woodhaven, NY

I would like to introduce you and your readers to the PHOENIX COLOR COMPUTER CLUB. Our club is open to anyone and everyone who expresses an interest in the color computer. Our meetings are held twice monthly on the first Tuesday and third Wednesday at the American Legion Post #1 located at 364 N. 7th Avenue, Phoenix. Interested persons may contact myself, Mike Huffman, Secretary/Treasurer, at (602) 939-5666 or Tim Bremser, President, at (602) 939-2047 or Don Hendry, Vice-President, at (602) 386-5126.

Mike Huffman
Glendale, AZ

Editor:

I am pleased to announce the formation of the TRS-80 users group of Charlotte. We are 3 months old with an active membership. Any Color Computer owner in the Charlotte area interested in learning more about their CC and sharing their experiences should contact:

TRS-80 Users Group of Charlotte
6613 Summerlin Place
Charlotte, NC 28211

or call Jon Becker 365-3653 after 6pm.

Dear Bill,

For what it is worth, I continue to be pleased with the service from Computer Plus. I ordered a disk drive the Thursday before Christmas and though they were closed on Friday, I still received it by UPS the following Wednesday, now that's fast service. Just plugged it in and all worked fine. Also I'm impressed with similar service

from Texas Computer Systems on the MX-80FT printer I bought last summer. Another company putting out good products is Custom Software Engineering Company Cocoa Beach, Florida. This group has been particularly responsive to letters and their software works great. I appreciate these companies as others don't respond at all to letters asking simple questions about their products.

Sincerely,
Robert Severin
Oak Ridge, TN

* I like to hear good things about our advertisers, make sure you mention Color Computer News when you order.

Bill,

Just got my November issue of CCN and headed for the REMarks section where I caught your question about Software Piracy. I'll give you my definition in a moment, but first how about considering this: Why don't you be the first publication to call these folks what they are THIEVES. Take a little glory out of their title, quit bringing up pictures of swashbucklers fighting the evil kings men, and call a thief a thief.

What is a software thief? A software thief is anyone who denies a software dealer or author their due royalty. Is that not simple enough a definition? If you "loan" a copy of a program to a "friend" with the full knowledge that they will end up with a copy at their disposal even after they have returned your copy to you, then you are both thieves. Not only that, you have done yourself a dis-service. Software theft is just like shoplifting, the cost of lost sales is eventually made up by higher prices which means that those who purchase the programs legitimately bear the burden of the crime.

The guys I really love to see are the ones who come to me and want a piece of software to "check it out" with the comment "if I like it well enough, then I'll buy a copy." Bullstuff. If they can come to you for documentation (and games usually don't need even that) then why should they buy it? Strange that they never want me to give them a demonstration on my machine, or use it on my machine for enough time to see how

MAILCALL

it works. They want to take a copy home and use it "for a while before making up their mind." If they just ask me, I'll tell them if I think it is worth their money or not right now.

The sneak thief is another common animal around my haunts. You know him. He's (or she's) the person who comes to you asking a how-to question about a modem program or word processor or some other more serious piece of software. Oh, but you say, the answer is right there in the manual, and their reply is "but I don't have a manual." Why not? Because they stole the software but didn't have enough time or guts to steal the documentation which has the author's copyright hanging out there for all the world to see. And when he pulls out his xeroxed copy of the manual at home, anyone who sees it should have the innate common sense to realize that he is in the home of a thief.

Any piece of software that is not placed in the public domain, or published in its entirety in a public source (such as CCN) should not be copied by anyone other than the original purchaser on their computer. Which brings us to the topic of protected software.

The CoCo software trend is going much the same way that the Model I software did when that machine first came out. Only the CoCo trend is moving much faster than did the Model I, probably because of the more widespread computer interest of today. What trend? Why, from cheap, almost laughable software, to better games, to more serious software and hardware. Somewhere along the line someone is going to realize the loss they are taking to software thieves and retaliate the same way that it was done on the Model I and III computers - through "uncopyable" software. This is a real pain to many users, and it detracts from the final quality of the software in question, and always adds to the cost. Program development costs money you know, and if time is spent on protection schemes, then you can bet the cost is in the price somewhere.

I am just as much against software protection schemes as I am against software theft. I hope that if you ever handle advertisements for "protected" software that you at least require the advertisers to

state plainly and clearly that the software can not be backed up by "normal" means. It is my contention that the software purchaser has every right to protect their investment by making a backup of software that is furnished on tape or disk or other volatile media. The user actually purchases the right to use the software, not the software itself, and if their one and only "uncopyable" copy goes crump in the middle of the night and they can't get it replaced for two or three weeks, then they have been denied the right for which they paid good money. If a software distributor elects to "protect" their software that is their right, but they should then provide one free backup copy and have LIBERAL replacement policies for the day that the media becomes unreadable for whatever reason.

Sorry to have gotten so long winded on you, but you hit a nerve when you said pirate. And to specifically answer your questions in that REMarks section: 1) club members swapping? Yes, they are thieves. 2) computer stores selling bootleg copies? Yes, they are thieves. 3) Someone developing and selling a program similar to one available elsewhere on another computer? Well, my personal opinion is that technically they aren't thieves, but Atari will sue their socks off if they get wind of it!

Feel free to publish this letter. I'm not ashamed to call a thief a thief, and maybe it will stop some people from coming to me and asking me to take part in their theft by providing them a "loan" copy "just to check out...if I like it I'll buy a copy." I have yet to lose a friend by telling them no, so I'll keep on doing so. Hope you do the same.

Sincerely,
Jerry L. Latham
Midwest City, OK

Dear Bill,

I would like to recommend Softwrides Battle of Gettysburg wargame for people who are bored with fighting aliens in outerspace. The game is great. (See ad, Dec. '82 page 57) I would like to recommend that companies make some strategy games on modern battles, like VC from Avalon Hill (a Viet Nam game).

Thanks,
Scott Osimtz
Racine, WI

Build performance into your system

with OS-9** software tools

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

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

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

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

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

Over 40 utility commands
Friendly "Shell" command interpreter

Tree-structured multilevel file directories

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

OS-9 PASCAL Language Compiler

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

CIS COBOL *** Compiler

ideal for most demanding business applications
features ISAM, Debug, ACCEPT/DISPLAY and Interprogram Communications modules
retains full compatibility with CP/M software
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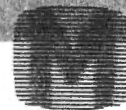
BASIC09** Structured Basic Interactive Compiler

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

C Language Compiler

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

For more information contact your computer supplier, or



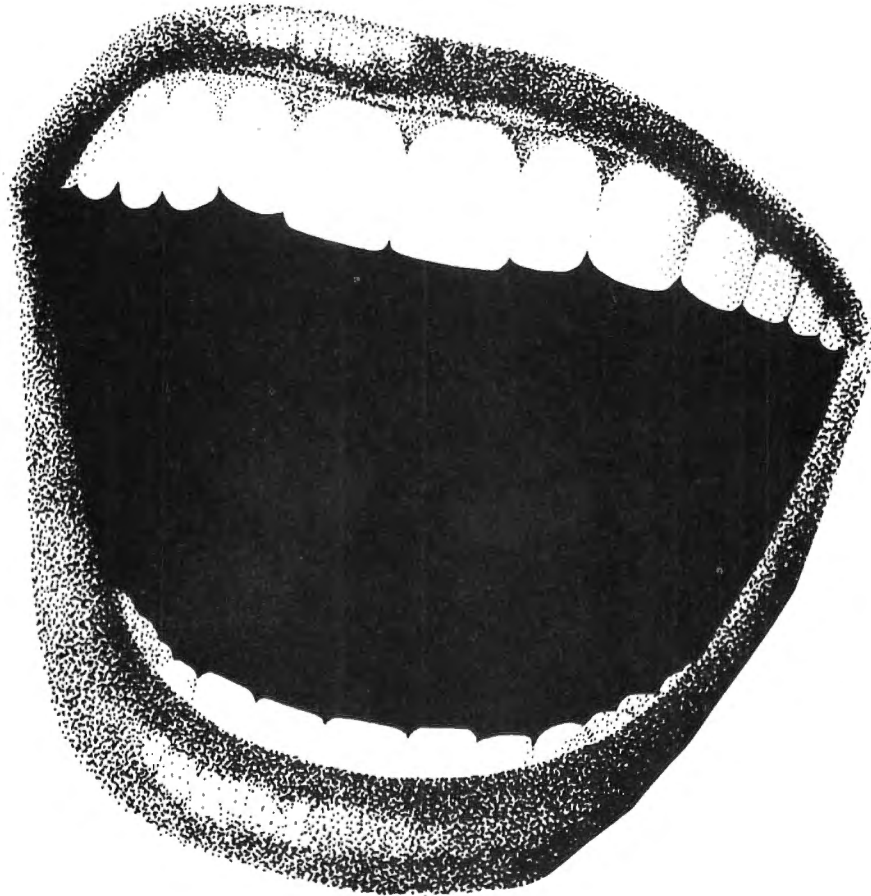
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MICROVOX

An Indepth Review by Larry Grady
999 Ridge Avenue
Manasquan, NJ 08736



Do you want your computer to talk to you? If the answer is yes (or maybe) this article may give you the information that you need to acquire a good voice synthesizer. Because interests vary I have broken the subject into seven sections.

- 1) Why have a computer talk to you?
- 2) Approaches to computer controlled speech.
- 3) Microvox hardware and how it functions.
- 4) Construction (to build or not to build?)
- 5) Using Microvox with COCO.
- 6) Intelligibility and comparison to Type 'N Talk
- 7) Conclusion

I first read of Microvox in the September 1982 issue of BYTE® . BYTE® is one of the oldest of the microcomputer magazines in addition to a few articles it contains a lot of advertisements (recent issues have more than 600 pages! YEHHH Almost none for COCO! BOOOO). It is available from BYTE Subscriber Service, P.O. Box 328, Hancock, NH 03449 and most non RADIO SHACK®

20 March 1983

computer stores. Back issues are usually available from the publisher and most large libraries subscribe to it. BYTE® has a regular feature of hardware construction projects by Steve Ciarcia that over the years I have found to be excellent. Much of my description is based on his articles in the Sept. '82, Oct, '82 and Sept. '81 BYTE® . I strongly recommend that those of you considering Microvox secure copies of these articles.

A completely assembled Microvox is available under the name Intex-Talker from Intex Micro Systems Corporation, Suite 717, 755 West Big Beaver Road. Troy, MI 48084. Telephone (313) 362-4280.

The kit is available from The Micromint Inc. 917 Midway, Woodmere, NY 11598. Telephone for orders only (800)645-3479, for Technical information (516) 374-6793.

1) WHY GIVE THE COCO THE GIFT OF GAB?

Personally I wanted to make the computer

Color Computer News

a better teaching aid for my seven year old daughter. It seemed to me that both math and spelling drill were tasks well suited to a computer. I had found that it was impossible to keep her interest level high with graphics, sound effects and text alone (imagine, jaded at seven). I reasoned that the spoken word was something which would bring back her wandering attention. It would also make possible a Speak and Spell (Texas Instruments® popular game) approach of asking for the answer. However, unlike a preprogrammed game, COCO and a speech synthesizer would be able to keep track-of her progress, use her own vocabulary lists, and deliver personal messages as required. In fact I am writing a program to do just that and, judging by her initial response to early versions of the program, the combination seems to be more effective than I had hoped. If you are interested in the final version please let Bill Sias know and I will publish it. The interest shown by my older children (19, 17, 14) leads me to believe it will be also helpful to them as a foreign language vocabulary builder and to build their interest in computers in general.

There are many other uses as the following indicates. I expect to experiment with them in the future. For now I will be content with discussing them.

A real world job for COCO is to monitor some process and to indicate when some action is required of an operator. One such application is monitoring the development of color film. There are several chemical solutions which have to be used in the correct sequence for a precise time dependent on their temperature. It is easy to monitor temperature (see William Barden Jr.'s article "Putting Real World Interfaces to Work" in the Oct. '82 and Nov. '82 BYTE®) using one of COCO's joystick ports, COCO has a pretty accurate clock, a synthesizer and a basic program (Oct. '82 CCN has an excellent start on this with Peter Ashley's article FILM DEVELOPMENT). Presto! A talking darkroom partner that will let you daydream but at the required moment instruct you to perform the correct next step.

Another use is as a house baby sitter and telephone answering machine. A look through BYTE®, RAINBOW or CCN will show a variety of new devices to interface

with the real world. These devices make feasible a degree of awareness for COCO of his surroundings that require clear and immediate communication with his masters. Such as at night reporting a problem or just to remind the kids to close the refrigerator door. Through a modem capable of autodialing calling and speaking to the police to report an emergency is not out of the question. Please note that if you do implement this idea be sure to tell the police what to expect.

Even a small business might find the combination of a voice response unit (VRU) and a Touch Tone® recognition (through the cassette port?) practical in a order entry or inventory query system. The outside salesperson or customer engineer would call into COCO and COCO would respond through Microvox, the caller would respond with the Touch Tone keyboard and COCO would speak the result. Girard bank uses such a system (not with COCO) for its bank by phone service. I have used it for 2 years and find it easy and convenient to use.

Other uses, such as having COCO read hex dumps or long computer derived tables to you, suggest themselves.

A most important application is to provide help for the visually or otherwise handicapped. In most communities there are people that we could help with this technology. A friend of mine combined a Type 'N Talk with a Quasar® pocket computer and a 18V alkaline rechargeable battery pack to aid a person recovering from cancer of the throat to converse (Microvox would work well). There are opportunities for those of us with skills to help.

If you run into other uses for VRU's please let us know, I am sure Bill will publish any letters on the subject.

2) HOW DOES ONE GIVE COMPUTERS THE GIFT OF GAB?

An early approach to voice response units (VRU) was to record individual words on multiple endless tape loops and select the loop with the word (S) you wanted on it for playback. Selecting loops in sequence produced sentences (and a mechanical kluge).

You may not realize it but when you place

MICROVOX

a long distance phone call most likely your voice and the persons voice you are talking with will have been digitalized. That is your speech will have been reduced to computer readable bit sequences and then reconverted at the other end to speech. The sequences representing words could be stored as we store strings in COCO. The VRU unit could then select strings just as tapes were selected in the mechanical example to produce sentences. This approach has a big drawback in that typically over 6000 (24,000 for true 'high fidelity') bytes must be stored for intelligible voice reproduction for each second of speech. This method can provide almost perfect speech as it is rendering an exact reproduction of the persons voice. Many of the messages given by new car systems use this method as intelligibility is important and the number of words in the devices required vocabulary is small. In the quantity required by the automobile makers it is inexpensive to produce custom ROM's (Read Only Memories) containing the entire phrase repertoire on a single 64K or 256K byte chip.

Other techniques have been found to reduce the number of bytes necessary to produce intelligible speech. The most familiar may be the Texas Instruments line of talking learning toys. These devices work by using a special circuit to produce words from a data stream contained in ROM. The data stream is generated from the recorded words or phrases of a human announcer that is processed through a computer using special algorithms that compress the original data in anticipation of the special speech generating circuit. Typically only 200 bytes are required per second of speech. These devices are limited to speaking only the words recorded. For a small (200-1000 words) repertory it is an economical approach. It finds wide use in talking toys, clocks and appliances.

The final method we will discuss is that used by Microvox. I think it is the best method available today to produce speech for use as a general output device for home computer. Here we have the Heathkit® approach to assembling speech from the most basic sounds produced in the human vocal tract. No human announcer is needed and its vocabulary is in theory unlimited.

Operating with a set of rules for pronunciation a microprocessor analyses each word in the context of the phrase it is in. The microprocessor sends to a special circuit the sequence or commands to produce the individual sounds necessary to produce the desired phrase. This circuit is manufactured by Votrax. I first heard of it's predecessor through a advertisement in the Sept. '72 SCIENTIFIC AMERICAN. At that time what is now a single chip was 3 large printed circuit boards costing several thousands of dollars. The combination of digital costing several thousands of dollars. The combination of digital control and the Votrax® circuit has the advantage of requiring little more than plain (more about how plain later) text as input. With this method 700 bytes can produce over 80 seconds of speech. That is at least 100,000 times more efficient than the first method discussed. The penalty you pay for this economy of data and unlimited vocabulary is the use of complex circuits and intelligibility sacrifices. More about this later.

There are two methods to implement this approach. The first uses the home computer for the synthesizers digital control section. To use you must allocate memory for the control program in your computer to drive the speech producing circuits. This is usually 4K to 8K. You must also allocate time to drive the actual speech synthesizer, for without a sophisticated multitask operating system that most of us COCO owners don't have, your computer cannot do anything else while it is speaking.

The Microvox unit uses the second approach and is a self contained unit with a self contained power supply, microprocessor, memory and speech producing circuits. With this approach you send text to it exactly as if it were a printer. The basic Microvox will receive over 60 seconds speech in less than 3 seconds at the 2400 baud rate I use. In theory the teaching program previously described could use this time to set up different responses and to fetch the next word from disk while the student is listening to the question and responding.

3) THE INSIDE, OR HOW THE LITTLE DUDE SPEAKS

NEW!

● **ROML — ROM PAK Loader**

- Save your ROM PAKs (or ANY machine language program) on disk then load and execute with ROML.
- You no longer need to remove your disk controller to execute your ROM PAK software!
- Also allows you to load from disk or tape and execute all machine language programs which are incompatible with the disk system!
- Includes a utility to copy non-protected tapes to disk.
- Note—ROM PAK execution requires good 64K RAM system.
- Copy of article included describing how to access 64K RAM.

Tape: \$25.00 Disk: \$29.00

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.

Tape: \$15.00 Disk: \$19.00

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.
- System stays in the level of BASIC you select even if you press the Reset switch.
- Turning power off and on returns system to original configuration.
- Allows disk-incompatible machine language programs to be loaded and executed from tape without removing the disk controller.

Tape: \$15.00 Disk: \$19.00

NEW!

● **BANNER**

- Make your TV a moving Marquee with Color BANNER!
- Enter any message and have it move across the screen in GIANT letters in the colors of your choice.
- Control speed, delay and pause from within your message!
- Great for parties and exhibitions!

Tape: \$19.00 Disk: \$23.00

FUN!

● **PAC ATTACK — from Computerware**

- The most popular game for the Color Computer!
- Fast action and brilliant colors!
- All the fun of the Arcade without the quarters!

Tape: \$24.95

BEST!

● **Nelson's SUPER "COLOR" WRITER II**

- By far the BEST word processor available for the Color Computer!
- More Features than any other.
- Supports ANY line printer!
- Excellent quality documentation!

ROM PAK: \$74.95 Disk: \$99.95

WOW!

● **LCA-47 — Lower Case Adapter**

- Provides real lowercase letters with true descenders!
- Compatible with ALL Color Computer Software!
- Provides bright characters on a dark background!
- Superb User's Manual included.
- Easy 5 minute installation!
- Uses NO system memory!
- 1 year warranty.
- Hundreds of owners, all happy!

Assembled and Tested: \$75.00

SAVE!

● **SPECIAL — Save \$25.00 when you purchase Super "Color" Writer II and an LCA-47 at the same time! Order NOW!**

GOOD!

● **PP-16 — EPROM Programmer**

- Programs single supply 2516, 2716, and 2758 EPROMs.
- Program—entire or partial. Auto verify after programming.
- Transfer contents to RAM for modifying or duplicating.

Select Documentation for:

6502

6800

6809

8080/8085/Z80

Interface to:

6820 PIA or 6522 VIA

6820 PIA

6820 PIA

8255 PPI

- Comprehensive documentation booklet contains schematic, instructions for construction, check-out and use, and a well commented assembly listing for the specified MPU.
- Note—User must supply the specified parallel interface.
- Specify MPU and computer system when ordering.

Complete Kit (includes ZIF socket): \$45.00

PC board only (with documentation): \$25.00

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MICROVOX

Microvox can interface either through parallel or serial port. The parallel port as well as the control switches use a 8255 PIA (Peripheral Interface Adapter). Since COCO has no parallel port I used the serial RS-232 port. I found out the hard way that COCO uses the receive line to signal to COCO that the printer or Microvox is ready. I first hooked the ready from the printer to the interrupt input. The serial port driver and receiver is a 6850 ACIA (Asynchronous Communications Interface Adapter) and a few level shifting (TTL-LS to and from RS-232 levels) gates. It can run from 150 to 9600 Baud (75 to 19,200 by stretching specifications).

The brains of the unit is a 6502 processor. Yes the same processor used in the APPLE® I and II and ATARI® 400 and 800. It is supported by 8K(K = 1024) bytes of EPROM (Erasable Read Only Memory) which contains among other programs the text to speech program. Also included is 2K bytes of RAM (Random Access Memory) which is used to store the text to be spoken, as well as, among other things the scratch space for the algorithm. A second socket is provided to double RAM memory size but it requires new PROM chips (BOOO) but isn't needed (YEHHH) to do just text to speech.

Thus the digital section forms potentially a general purpose dedicated computer module. One suggestion to COCO hacks — Lets program the 64K EPROM's now available and extra 2K RAM to act as a serial to parallel converter with buffering to drive a printer from the Microvox in addition to making it talk. This should eliminate the switch now needed as COCO has only one RS-232 port. For some reason connecting both the printer (Okidata 82A) and the Microvox and disabling one of them via a software command does not work for me. Perhaps someone could let me know why.

The heart of Microvox is the SC-01A voice synthesizer from Votrax, a company that has pioneered this technology. This little jewel receives 64 different codes, 61 of which call for a specific phoneme (these represent the most basic sounds like -ea- in 'heavy' produced in the human vocal tract). Two are pauses of different duration and one is a stop command. By uttering phonemes one after another the SC-01A produces sound which is

then amplified by a 1 watt audio amplifier. A sequence of these phonemes produces intelligible speech (honest).

The sound output goes to a jack where a speaker or earphones may be connected.

The Microvox unit provides some additional hardware refinement in that it provides for 64 levels of inflection. This is accomplished by varying the clock frequency applied to the SC-01A through a LS-7497 programmable multiplier. To my knowledge other units do not provide this capability. The ability to insert inflection into a sentence improves the overall intelligibility of its speech. For example indicating a question by raising the pitch at the end of a question. Inflection also tends to make the speech sound more lifelike and less like it came from a computer.

Since it is almost free music compatability has been included. Musicians need not fear for their jobs as the quality is about equal to COCO's music. But on the bright(?) side you can have two off key units playing at the same time.

To round the package out a power supply and case are included. I am an experienced engineer and give Steve high marks on this design. It is a sophisticated unit yet the package appears simple. Externally it has one control, a combined off/on and audio volume, one LED (Light Emitting Diode) is the power on indicator. It is a good example of the clever use of state of the art electronic technology.

4) TO BUILD OR NOT TO BUILD - THAT IS THE QUESTION!

As a rule of thumb I propose the following test. If you score less than 75% buy the assembled unit.

1-(30 points) I can solder neatly and have had prior success in constructing projects using integrated circuits.

2-(10 points) I have access to integrated circuits that can be used to trouble shoot by substitution.

3-(20 points) I enjoy and find relaxing the spending of my time doing a neat careful construction job.

4-(10 points) I will be able to follow general construction instructions that are definitely not up to HEATHKIT® standards.

5-(30 points) I can afford when all else fails to send the unit to the factory to be fixed at a bench charge of \$35.00 per hour plus parts damaged.

Yes, as you can see from the above this project is not for the first time circuit builder.

That is not to say that it is difficult either. It is just that there is little margin for error. You have a choice of how to acquire the necessary parts. If your rich Uncle is a comprehensive electronic parts distributor or you own an incredibly rich junk box you may buy just the printed circuit card (absolutely necessary) and the Votrax® SC-01A. Otherwise it is hard to beat the complete kit price of \$215.00. The kit includes all the high quality components (over 100) you need including the case and power transformer.

I kept a log and to give you a feel for the project will excerpt from it.

---Ordered unit over phone on American Express card to be shipped UPS. Advised delivery 10 to 14 days.

---Received unit 11 days later.

---Off and on over two days until Saturday I read the documentation several times. Noted the supplied documentation for the most part hack job. Poor quality and incomplete reproduction of 9/82 and 10/82 BYTE® articles. Went back and read them. You will need to also.

---Saturday - prepared my tools and laid out all parts to check if they were all there. They were, the kit was complete. Parts were all new and all IC chips came with sockets. A good quality printed circuit card is supplied. It features double sided copper traces with plated through holes and silk screened component layout. I put away original shipping container as it is required to safely ship the unit back for repairs.

---10AM I began construction in the suggested sequence. 3:30PM The unit was completely assembled and soldered. Noted the resistors and diode markings poor, colors too close to one another for even the kids and diode markings omitted, I had to use a multimeter to tell values.

---Wired another cable with a RS-232 22 pin connector to the switch box I had previously connected to COCO's lone port.

---Hooked it up to a speaker from the junk box and applied power. Unit started speaking "READY" repeatedly.

Color Computer News

Encouraging. I immediately checked the supply voltages and they were OK.

---At this point I didn't realize it should say "READY" only once then wait for a command from the serial or parallel port. So I hooked it to a switch box connected to COCO's RS-232 I/O port and tried it.

---Gulp... It doesn't do anything but say "READY".

---On Sunday I checked and rechecked the soldering for cold solder joints or shorts. I checked and rechecked for bent IC pins, it is easy to bend a IC pin under when inserting them into their sockets. All OK according to the Ohm meter continuity tester I used.

---Unless you have substitution parts there is just no alternative to sending the unit back to the factory. After talking over the problem with a factory representative Merrill Lauther who was, incidentally, cooperative and concerned, I returned the unit.

---Unbelievably two days later the unit was back. A note was enclosed from Merrill saying the 6502 was bad and that since it had not been physically damaged there would be no charge. NOTE: this excellent service is not what their sternly worded statement clearly says, a quote from their manual

NO WARRANTY FOR KITS

However, given the circumstances of a defective chip, a welcome gesture to maintain good customer relations may have been in order. Since it is not their written policy don't count on it.

---I hooked it up and it said "READY" once and waited. I sent words to it using PRINT#-2 but it sat mute.

---I then checked with a logic probe to see if the signal was reaching the 6805 ACIA (Asynchronous Communications Interface Adapter). It wasn't so I checked the Microvox input jumpers. They were reversed for COCO (COCO is non standard). The unit started speaking when they were reset!

---I received a notice a day after the unit was received from repair that the silk screening for a capacitor polarity was backwards. Merrill had corrected it on my unit but is it a comfort to know MICROMINT stands behind their products.

---There was a noticeable increase in interference on the TV when Microvox is on. When added to the interference generated

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 H₂O its proper name or have footnotes. As for bold print, undefining, 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.

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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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:

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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 modem or RS-232 direct! Save the data to tape or print it! Reduces ON-LINE cost to a minimum!

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TAPE \$39.95 ROMPAK \$49.95 DISK \$69.95
Operators manual only \$10.00 (Refundable with purchase)

NEW!!

Super "Color" Mailer 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 containing 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.

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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.

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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!!

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by the disk controller a poor picture resulted. I have put some shielding around both and improved the picture noticeably. The assembled unit should be free of this problem as it has to pass FCC (Federal Communications Commission) RFI (Radio Frequency Interference) tests. I think the next project is to eliminate the problem by driving the TV through the video amplifier directly. That should also clean up the colors as well as they suffer from the distortion introduced by the modulator.

I now had a working voice for COCO at a cost of \$215.00 plus \$7.80 shipping. I had enjoyed building it and really learning how the hardware works. However, when I sent it back for repair and did not know how much it would cost it crossed my mind that I could have purchased it for \$299 assembled. If you failed the test perhaps purchasing the assembled unit will be the best way.

5) ON (TRYING TO) USING A TALKING COMPUTER

The name of the game is to produce intelligible speech synchronized to a desired response. First lets talk about getting intelligible speech.

The algorithm used by Microvox will pronounce about 80% (see below) of all english words satisfactory. What it does to the other 20% is often understandable if you are accustomed to Microvox but definitely not standard English pronunciation. Therefore it is necessary to edit the text to produce speech which is understandable by casual listeners. The accompanying Basic program is an aid in producing strings of text which will sound correct as well as providing a one to one correspondence with the original test words for display on the TV screen.

I do not have a good ear for the sounds that make up a word. That makes it difficult to create clear speech for me. Others, like my wife, can break a word into the correct phoneme without apparent effort. I guess it is much like playing music, some can and others can't. Using the references below I have managed to muddle through.

The Oct. '82 article on Microvox discusses how the software works. I found two other sources helpful one is two articles by K. Fons and T. Gargagliano entitled "Articulate

Automata - an Overview of Speech Synthesis" (love that title!) in the Feb. '81 BYTE® and "A VOTRAX Vocabulary" in the June '81 BYTE®. These articles promote understanding of how to use the synthesizer. The other reference is currently out of print. I got a copy from University Microfilms but you may find one in your local library. It is by J. Kenyon and T. Knott entitled "A Pronouncing Dictionary of American English" Springfield, MA G and C Merriam Company 1953.

The easiest way to drive Microvox is to use hardware handshaking. This means Microvox will signal COCO when it is ready to receive or that its buffer is full over a physical wire connected to the RS-232 port. Output from COCO is via the PRINT#-2 command just as you would direct output to a printer. This will fill the Microvox buffer just fine. However, there is one command missing from Microvox's control commands: it is a clear buffer command. Once you have loaded the Microvox input buffer it must speak the entire buffer (unless you kill the power). This makes it difficult to synchronize a program in COCO to the users response. Since the PRINT#-2 command cannot receive characters I tried a machine language output driver and software handshaking. Software handshaking involves receiving a control character back from Microvox indicating it has spoken the word (or phrase) and sending to Microvox a command to utter the next. Unfortunately waiting to receive this input completely occupies COCO since the RS-232 port in COCO is driven by software. Until I equip COCO with a hardware RS-232 port it will be necessary to put short messages out more frequently. The combination of these shortcomings makes programming more difficult but it is not impossible to achieve a smooth result.

6) INTELLIGIBILITY OR "WHAT DID IT SAY?"

Listening to and trying to understand Microvox is a lot like listening to a person with a foreign accent speaking on the radio. It takes some time and careful listening to understand what is being said. Soon, though, you find yourself understanding the person without any effort and you become

MICROVOX

less conscious of the accent. The time it takes seems to vary depending on the persons previous experience with distorted speech such as CB or scanner radio. Eventually, however, almost everyone I have seen is able to readily understand what is being said.

The general concensus is that when speaking normally spelled text with inflection on and low pitch Microvox sounds like Sean Connery when he is emphasizing a Scottish brogue. I wonder if this is the result of the Scottish influence on written English. Perhaps a linguist could let me know.

There is another VRU that I am familiar with using the same Votrax® SC-01A that is available in only an assembled version for \$395.00 list (I have seen \$349.95 advertised). In comparison they both are microprocessor controlled but Microvox has a parallel port as well as the RS-232, more powerful processor (6502 vrs. Z-8) and bigger control program. Microvox also provides the additional capability of 64 vrs. 4 levels of inflection. Does all this hardware make it speak better?

I chose two modes to compare. The first is, speaking from normally spelled text. How many words are badly mispronounced. The second is to try to make the speech as clear as possible by sending words coded directly with phonemes. Since the two units process the same phonemes the difference will be the programmed inflection for Microvox. Which unit would be more intelligible to a casual listener?

In the first case we typed in 200 words (there were 119 different words in this sample) from the lead story in our local paper. We figured it was representative of non technical writing. Then we had 6 people who were accustomed to VRU's note the number of words they could not understand. It took a few passes for each as it is not easy to mark and listen. It might also bias the results but it was the same handicap for both units. Three heard Microvox first and three heard Type 'N Talk first. The results are summarized below.

	Std. Deviation
Microvox	2.3
Type 'N Talk	2.9
Missed	% Of Dif. Words
23	19.3%
34	28.6%

There was good agreement on most of the words missed. There were 19 from Microvox and 28 from Type 'N Talk words that were on all lists. I can follow a reading of a Basic program on Microvox and not on Type 'N Talk which would indicate a better algorithm.

The other test involved coding the same phrase with phonemes. The only difference was the use of inflection by Microvox, a feature missing from Type 'N Talk. The phrase used was "Hello would you please answer this question. What is your birthday?" We then set up both units in the local computer store and asked each customer as they walked in to listen to only one of the units. We alternated between units but only counted the first answer from each customer. Each customer was asked three things. First to answer the question if they responded with a date we counted it as correct. The other two questions were did you understand all and most of the word uttered. The results are summarized below. A total of 62 customers participated with 5 declining to take part at all.

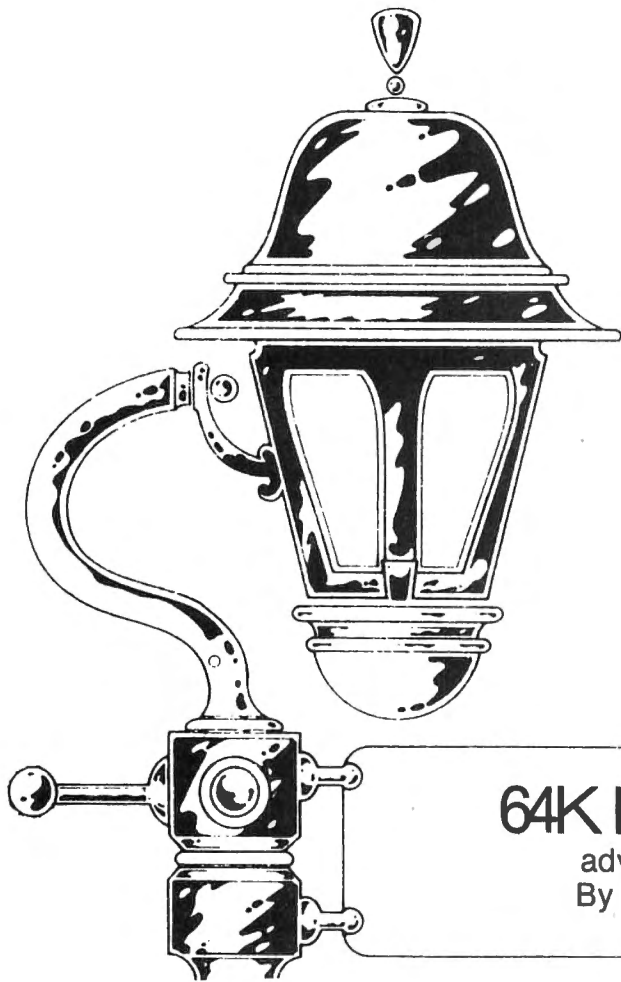
Microvox
Type 'N Talk

# Asked	# All
32	27/84%
30	21/70%
# Gave Day	# Most
31/97%	30/94%
26/87%	25/83%

It would seem that Microvox wins these tests. Inflection does aid in intelligibility.

7) PARTING COMMENTS AND SUCH

Speech is a most natural medium through which to converse with a computer. Someday soon we will be able to speak to COCO as well as listen to him. For the present Microvox is, to my knowledge, the most cost effective general vocabulary speech synthesizer available. It can be of real use and while fun it is not just a toy. The availability for home use of so complex a device is just one of many miracles brought to us through microelectronics. A few generations ago one might have been burned at the stake for indulging such witchcraft.



64K KORNER

advertisement
By Frank Hogg

NEW POLICY:

As you can see by looking at the heading, the 64K Kolumn has gone to an advertisement instead of what it was before. Several advertisers and a few readers have made complaints to Bill Sias and myself about the nature of this column. I have tried to be as informative and helpful with this column as I can while at the same time trying not to 'blow my own horn' too much. This of course has not been possible in every case. I have, however made note of the fact that I sell software to the people that read this column. Lets face it, as of this writing we have over 175 products in our catalog. In the January issue of CCN was our first published catalog with over 150 of the products that we had at that time. No one has ever done anything like that for any 6809 based computer before and no one has more software for any 6809 computer than we do. This was not the case one year ago when the first 64K Kolumn appeared under the name of '32K for FREE'. That article was the beginning of it for everyone out there that

had a CoCo. It showed everyone how to modify their computers to get 64K operation. We have been sending out reprints of that article, for the last 13 months for free, because we feel that once you convert your computer to 64K you might buy some software from us. At the time that article was written, another company was planning to sell the modification information that we gave away. So you might say that we were responsible for giving thousands of CoCo users millions of bytes of free memory! Actually Radio Shack gave you the memory, we just showed you where they hid it.

In the March 1982 issue, we showed you how to move ROM to RAM in your CoCo in order to use the 64K without having to buy anything from us or anybody else. We just recently found out that a company that advertises in CCN has been selling it for \$20.00, the program that we gave away.

We used the column in subsequent issues to answer questions that you guys and gals were flooding our offices with. Most of the

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calls were from people that were having trouble converting their CoCo's and we helped every way we could. Even to this day I spend most of every day answering questions from people about everything to do with the CoCo. We use the questions that people ask us over the phone for material for the column. I felt that for every person that called with a question there had to be many more that needed the same information so I put it in the column. We also used the column to announce bugs and fixes, new updates and other information useful to CoCo users.

But because what started out to be a temporary column has turned into something more or less permanent, and because it has been construed by some to be unfair, Bill and I have decided to treat the column as an advertisement rather than a column. To those that have wondered, I do not now, nor have I ever had any financial interest in CCN. I am an advertiser just like everyone else. I pay for every ad and now I will pay for the space this column takes up. I don't know how long I will be able to afford it, but I will cross that bridge when I come to it.

END OF SOAPBOX

NEW ITEMS: Full size keyboard for CoCo.

Bob Brooks of Micronix Systems Corp. #7 Gibraltar Square, St. Charles, MO 63301. (314) 441-0341 is selling a direct drop in replacement keyboard for the CoCo. I bought one of the first ones and true to their word it just 'drops in'. All you do is to take the top off of the computer and remove the RS keyboard and insert the new keyboard. There is no modification to the CoCo and the whole process takes about 3 minutes. The new keyboard has a nice feel, just like a terminal and in addition it has four extra user keys. These keys occupy the four empty slots in the RS keyboard matrix and need software to be of any value. We are making changes to CC FLEX to make use of the new keys. The keyboard was not available for the 'F' board when this was written but they have plans to have it done soon. My only complaint is the springyness of the keyboard mounting. It is easy to fix though. All I did was to take a 36 inch piece of 3/8 x 3/16 balsa or any other wood, and cut it into two short pieces to put

between the PC board and the metal plate that the keys are mounted in. This stiffened the mounting nicely. The price is \$79.95 and it is well worth it.

NEW ITEMS:

Tiny edit and interactive assembler added to FHL Color FLEX

We have added a Tiny editor called TED and an interactive assembler called ISM to FHL Color FLEX at no additional charge. These were brought about by user request. Several people who bought FLEX from us did not need the power of a full editor like 'ED' but needed an editor for occasional use. This prompted me to create 'TED' which stands for Tiny EDitor. TED is kind of neat if I do say so myself. I have always had a passion for editors, and I have been having a lot of fun creating TED. It is a simple editor with only the ability to edit a file that will fit in memory. But it is also very small and loads in fast. I find it very good for making quick changes to files because of its size. The commands are few, but are enough to do the job. You can find a string of characters in the file, print all or part of the file, insert or delete lines and finally, edit a line.

This last function is patterned after an edit function that was part of the FOCAL language on my KIM-1, vintage 1977. FOCAL had a very simple editor that had only a few commands, but boy was it easy to use. What you do is type 'E' to edit line, then TED prints the line and waits for your input. If you type any characters, they will be inserted in the beginning of the line, or you can type an ESC (BREAK) key followed by a character and TED will print the line up to the first occurrence of that character. You now have several options, you can type another ESC and character to get to another part of the line, or a left arrow (backspace) to delete a character, or any characters to insert where you are. An 'ENTER' will exit the edit with all changes made and a 'down arrow' will chop the line off at the cursor. That's all there is to it, you can learn this editor in 5 minutes. It is nowhere near as powerful as any of our full editors but it does the job and it's free with FLEX.

By the way I wrote it in the ABASIC compiler, because I wanted to do it fast and I

wanted it to run fast without having to use assembly language. We just took on several new compilers and I think I will try to convert it to them as a way of comparing the different compilers.

The interactive assembler is called 'ISM' and is provided by Frank Hoffman of Lloyd I/O. In case you didn't know Frank is the author of CRASMB, OSM, ASM, and ED for both OS-9 and FLEX. I talked Frank into doing 'ISM' as a demo type of program for people who want to play around with assembly language programming but don't want to shell out the cost of a full assembler until they are sure they will like it. ISM will not assemble a file from disk, nor will it save the resultant generated code to disk. (you can use the SAVE command in FLEX for this) But it does have much of the power of ASM, in an interactive mode. This way you can play interactively with assembly language and see the resultant code on the screen as you go. If you decide you like it then you can buy one of the many assemblers available. Of course Frank would like you to buy one of his very excellent assemblers but the choice is yours. ISM has been tied into our machine language monitor that comes with FLEX so that you have a good package to assemble and debug all but the largest programs. If you already have FHL FLEX and you want these programs, then send in your original disk, copy of your invoice and \$10.

Radio Shack 64K CoCo.

I called the RS service center the other day and they said they would do the 64K upgrade for you. It seems that RS has a 64K kit just like the 32K kit but with 64K chips. Didn't get a price though.

RS MARKETING TECHNIQUE

For several years I have been trying to figure out Radio Shacks reasoning behind their marketing philosophy. To date little has made sense to me. The reason I mention this is due to a need to get a 6809 chip that I blew while fooling around with one of our CC's. I called the local store and was informed that they did not have it and that it would take two weeks to get it. Ok, no problem there, let

Color Computer News

me see if I can get one somewhere else. Well after calling around and not finding one, I decided to try the Radio Shack service center, so I called there. I was told that they had the part but couldn't sell it to me. Curious isn't it? I asked how I could get it, and was told that I could bring in the computer and they would insert the chip for \$30.00 plus the cost of the chip. Well it isn't so hard to do that it requires \$30 worth of service, so I tried calling the RS store again figuring that they could probably get the part from the service center for me. Sounded reasonable to me at any rate. Well the store said that they were prevented from ordering things from the service center and had to order from Texas. At this point I gave up in total bewilderment over the whole situation.

MOVING PROGRAMS FROM RADIO SHACK TO FLEX AND BACK:

We are planning to have a utility to do this right from FLEX, but because over 85% of the FLEXs that we sell, go out with DBASIC, we haven't felt the burning need to get it done before some other things. DBASIC gives you the ability to move programs and files back and forth between FLEX and RS DOS. A program called RTF is included for moving any ASCII files from RS to FLEX, but moving machine language files, from RS DOS to FLEX, has to be done with an intermediate cassette tape. First get into DBASIC and read in the tape, then SAVEM the file to FLEX. Going back to RS is done the same way but in reverse. RTF will not copy from FLEX to RS DOS.

James Tucker of Exeter NH sent me a modified version of RTF that would copy machine language files from RS DOS to FLEX, but because RTF is saving the ML code as ASCII and because FLEX does space compression, some of the code may be altered. When FLEX does space compression 2 or more space characters (\$20) are converted to two characters, a tab (\$09) and the number of spaces (1-n). This saves space on disk, but for machine language the space compression should be turned off. DBASIC does not do this with an ASCII file. The best solution is to use tape for now.

TINY 'C'

Mark Schwalenberg called me the other day with a rather interesting problem, that he had a Small C, that Ron Cain and Dan Everhart did, and put into public domain. The information was in Dr. Dobbs. I don't have the address, but I will publish it next month if Mark sends it to me.

The problem is that Ron and Dan sent the disk out with lower case filenames, and although Mark could copy the files he could not execute them because FLEX did not recognize the lower case. FLEX has a flag in memory, to tell it if it should map all lower case filenames to upper case or not. All versions of FLEX with the exception of SWTPC, set this flag to map uppercase only. You guessed it, Ron and Dan have SWTPC computers and used lowercase filenames. If you want to use both upper and lower case filenames all you have to do is set the flag to \$FF, and you got it. A word of warning though, FLEX will then treat the upper case letters as different from the lower case letters. 'CAT' is not the same as 'cat'. I found it to be confusing to use both upper and lower case, and decided long ago to go with upper case only. The address of the flag is \$CC49. The default value is \$60. The following short program, written in ABASIC, will toggle back and forth between the two states.

PAGE 001 ABASIC COMPILER V1.4:6

```

1000 * Program name: SWITCH
1000 *
1000 * ABASIC PROGRAM TO SWITCH THE
1000 * UPPER/LOWER CASE FLAG IN FLEX
1000 *
1000 * The flag at $CC49 tells FLEX if it should
1000 * map all filenames to upper case ($60)
1000 * or to handle upper case characters
    differently
1000 * from lower case ($FF). The default is $60
1000 *
1000 ORG=$C100
C100 BASE=$C600
C100 dim a(1)
C100 A=PEEK($CC49)
C115 PRINT
C118 IF A=$60 THEN 20
C124 POKE($CC49)=$60 :PRINT "Set for
    UPPER case only now."
C15D stop
C160 0020 POKE($CC49)=$FF :PRINT "Set for
    UPPER AND LOWER case now."

```

C19E end
LOAD MAP:
34 March 1983

OUT C1A6

NO ERRORS DETECTED

VARIABLE LENGTH\$0085
PROGRAM LENGTH\$019D
PROGRAM END\$C29C

This took about 20 minutes to write and is only 412 bytes long. I like ABASIC because it is fast and creates small binary files. The same trivial program in assembler would probably be smaller, but it would take much longer to write.

Well as usual with me and this column, it is 3:30 AM in the morning of the day, I have to Fed Express this column out to Bill Sias. A good friend of mine, Ron Anderson, writes for another magazine and gets his column out 3 months in advance. I would settle for 3 days. Why is it that I can never think of what to say until the last day! Oh well I'm glad it's done, I want to get back to the Tiny Editor. I thought of a few things to do to make it a little slicker, while I've been writing this, and to be honest, I've had more fun writing TED, than writing this.

See you next month and remember to send in any questions to me at the Lab. Put '64K Kolumn' on the envelope so it gets to me. Remember the old proverb. If builders built buildings the way programmers wrote programs then the first woodpecker that came along would destroy civilization.

Frank

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A WORD FROM THE SPONSOR

Hi again. This is Month Three in my series of short chats about various Color computer subjects in these Star-Kits ads. Hope you are finding them interesting and useful.

Quite often, after running a machine language program, I find that my CoCo doesn't want to accept Basic programs. The common solution, of course, is to turn the power off and then back on. This does a complete reset of the computer and fixes some of the pointers which the machine language program clobbers.

But here's a better way that doesn't put your computer through the power on/off stress: simply type POKE 113,3 and push the RESET button on the back. The POKE makes Basic forget that it has already been reset before, so pushing the RESET forces it to go through the same complete reset as if power had first been applied.

In fact, I have one Basic program which does several CLEARs and PCLEARs that leave the computer in a state where it won't run other programs unless everything is reset. To avoid the need to manually reset the system after this program is finished, I added one last line which reads POKE 113,3 : EXEC 40999. The EXEC restarts Basic exactly the same as if I had pressed RESET (except for one difference — in a 64K system you must physically press RESET to return from 64K mode back to 32K mode after running a 64K program.)

Are you using a non — Radio Shack tape recorder with your CoCo? If so, then it's quite possible that the motor control relay in your CoCo is not able to handle the recorder motor current. When that happens, the computer can't turn off the motor because the relay contacts have welded together. The new CoCo models have a better motor control relay to fix the problem, but what about the rest of us?

If the relay doesn't get to the point where the contacts are permanently stuck together, then it's possible to solve the problem by adding a simple circuit between the computer and the recorder. It uses just a few parts readily available at your local Radio Shack — send us a self-addressed stamped envelope for a free diagram and instructions. (Hope you don't mind if we enclose a Star-Kits catalog too, while we're at it.)

If you're into engineering or math, you might be interested in our new educational package. Introduction to Numerical Methods is a college sophomore level course which combines a 324-page text with a number of Basic programs which go along with the text and illustrate each topic. Some knowledge of calculus is required, and the package covers a variety of topics in numerical analysis. This is probably the most painless way to learn a very useful topic; at \$75 it's quite a bit cheaper than going to college.

Finally . . . if you have purchased a Star-Kits program, please make sure to return the user registration form from your manual along with an envelope. We periodically send out our Users' Group Newsletter with other hints and kinks, and these forms and envelopes are our only way of keeping you up to date.

See you next month.

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.)

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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.

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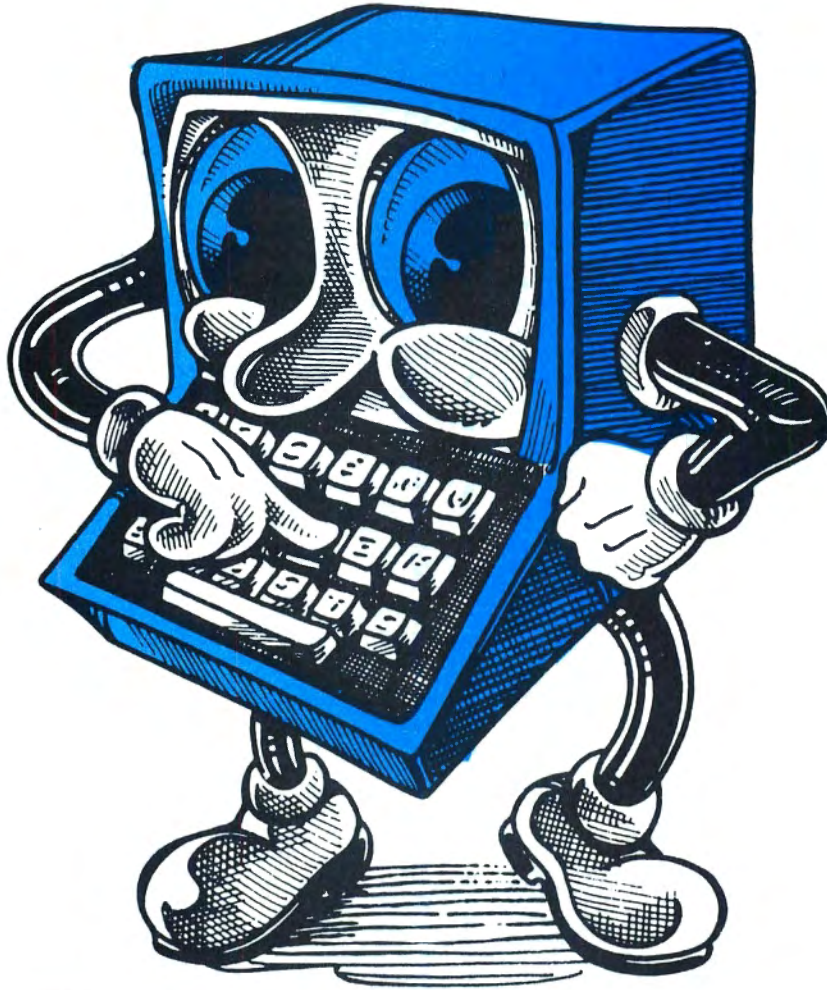
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REVIEW-NEWTALK

by Dennis Doonan
1848 Taylor Avenue
Racine, WI 53403



NEWTALK
Star Kits
PO Box 209
Mt. Kisco, NY 10549
Color Computer cassette
\$20.00

Have you ever had to compare a machine language program in your computer to a printed listing? The constant shifting of your eyes from the TV screen to the listing and back makes it easy to lose your place. When the listing is long, the debugging process can be very frustrating.

NEWTALK comes to the rescue by speaking the address of the memory location to be examined and the value of its contents. Using NEWTALK is like having a helper read the memory values so your eyes never leave the printed listing when you are hunting for those elusive bugs that have crept into a program.

NEWTALK is supplied on cassette for the Color Computer. Other versions are available for SS-50 based 6800 and 6809 systems. The price is a modest \$20.00.

As with all Star Kits products, the documentation is excellent. The user's manual includes both a complete description of loading and using NEWTALK as well as a commented source listing and instructions to help Color Computer users change and modify the program if their systems are upgraded.

NEWTALK loads into memory locations (hexadecimal) 2000 to 396F. It can be relocated almost anywhere in available read/write memory (RAM) or in EPROM. To use NEWTALK to check another program on tape, first load NEWTALK, using the CLOADM command, into a memory area that will not conflict with the program to be checked. If NEWTALK is needed somewhere other than hexadecimal location 2000, it must be loaded with the proper

offset. For example, to load NEWTALK into hexadecimal 5000, simply enter:

CLOADM''NEWTALK'',12288

After NEWTALK is loaded, the program to be checked is loaded. NEWTALK is started by entering:

EXEC &H2000

If it is loaded into its normal area or with the address of its current location. Our example would need:

EXEC &H5000

If the EXEC command is used without the address of NEWTALK, the computer runs the last program loaded which would be the one to be checked.

Once NEWTALK is running, it asks for the address of the first memory location it is to check. When this is entered, the program lists the address and its contents on the TV screen and speaks the value of both on the TV's speaker.

If a comma (,) is entered, the program lists and speaks the next address and its contents. A period (.) allows NEWTALK to list and speak the value of the next sequential location without giving the address. A slash (/) lets the program repeat the address and contents of the current memory location. If any other keys are pressed, control is passed to BASIC. To re-enter NEWTALK, it is again necessary to use the EXEC command.

The program itself is very easy to use. The three keys controlling its operation are located together on the bottom row of the keyboard. There is no need to look at the keyboard when a different key is pressed.

NEWTALK cannot read a previous memory location without returning to BASIC and restarting the program. Most machine language monitors, such as HUMBUG or CBUG, allow this with a single keystroke. NEWTALK also lacks the ability to change a memory location once it is examined. These are minor inconveniences since NEWTALK was not designed to be a full monitor. It is best used to easily check memory locations. The only other complaint is the fact that it takes some time before the user can tell the difference between the spoken 'B' and the 'D'. They sound alike at first.

NEWTALK itself is not a speech synthesis program. The program loads a digitized representation of the sounds of numbers zero through 10 and letters A through F into a

memory table that occupies 90% of its space. When the sound of one of these 16 words is needed, NEWTALK looks up their digital values in the table and uses this information to play back the number or letter through the TV speaker.

Is NEWTALK useful? If you do any amount of machine language program debugging without the help of an assistant, NEWTALK will be a time saver. If nothing else, it is a fun program that demonstrates the powerful capabilities of the Color Computer.

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6809 AWARD

A PORTABLE COMPUTER SYSTEM FOR FIELD DATA ANALYSIS

Michael A. Wolf and John M. Crowell

Health Division

Los Alamos National Laboratory

Los Alamos, NM 87545



Summary

To answer the need for analysis of the data acquired by the new generation of portable instrumentation,¹ we have developed a portable computer system. This system combines a powerful central processor with a printer, digital tape deck, bubble memory, and a battery pack in a compact package weighing less than 5 kg.

Introduction

The increasing sophistication of fieldable data acquisition instrumentation has created a need for complex data processing in the field. This must often be done in a location remote from power outlets. To answer these needs, the Health Division of the Los Alamos National Laboratory has developed a fully portable, battery-operated computer system. This system contains a microprocessor with 63K bytes of random access memory, a bubble memory mass storage system, alphanumeric and graphic liquid crystal displays, a printer, and a digital tape deck.

The system is packaged in a case measuring 31cm x 33 cm x 9cm (Fig. 1) and contains batteries adequate for greater than 8 hours of normal use.

Hardware System Description

The system is shown in block diagram form in Fig. 2. The heart of the system is the processor card containing 6 MHz 6809 microprocessor, 63K bytes of random access memory (RAM), a 2K byte read only memory (EPROM), and a serial RS 232 input/output (I/O) port. This card also drives a backplane I/O bus on which the balance of the system's peripherals reside.

Mass storage in this system is handled by a bubble memory system and a digital tape deck. The bubble memory is currently a 256K bit modular system. This will be upgraded soon to 2M bits when the necessary parts become available. The tape deck is a digital micro cassette drive. It was chosen to be compatible with a commercially available portable pulse height analyzer.² It will be used mainly to download data and



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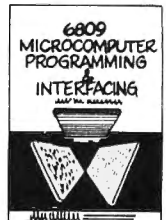
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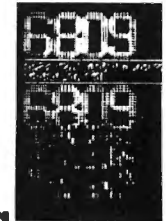
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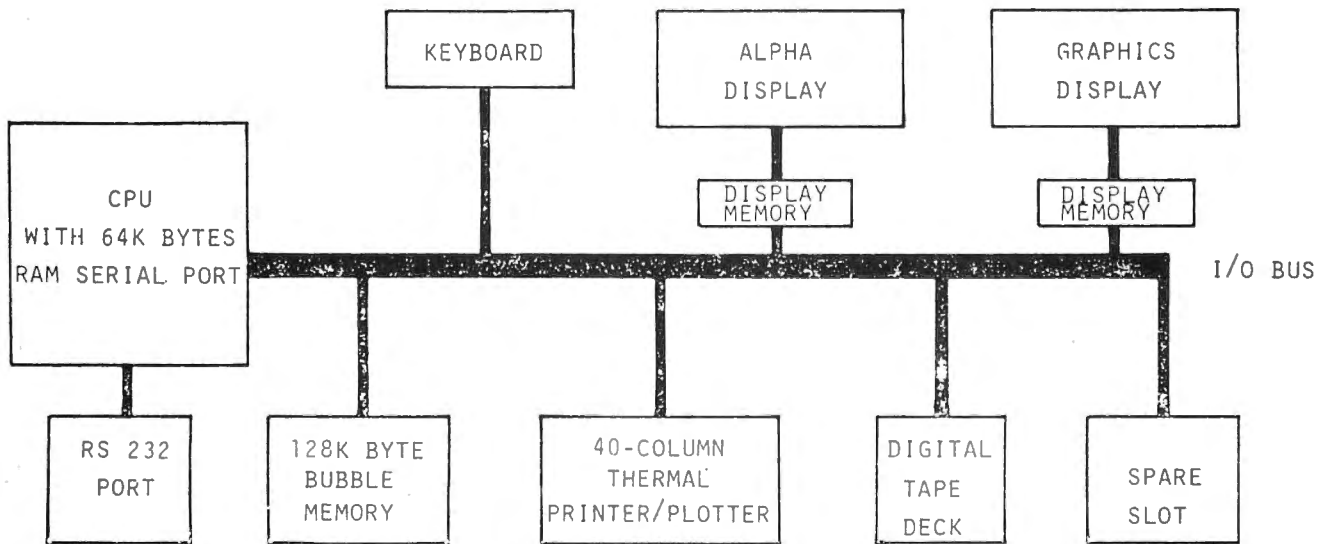
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WC FIELD COMPUTER SYSTEM



special applications programs into the bubble memory and thus will not require a sophisticated operating system. It can hold up to 56K bytes on a single cassette. The computer has a full sized ASCII style keyboard. It uses membrane type switches and is sealed against dust and moisture. It uses audio feedback and has a locating overlay to aid in touch typing. Information is

displayed by a 64 character alpha numeric LCD display and an 80x28 dot matrix graphics LCD display. Hard copy is provided by a thermal printer/plotter which is capable of displaying 40 columns of characters or a 280 x n plot of data. Power consumption of the system in normal operation (no printing or tape operations) is less than 3 watts.

Software Description

The system as described has sufficient power to run most high level languages. Currently, versions of BASIC, PASCAL, and FORTRAN are under development. A simple operating system, compatible with the bubble memory is in operation and a sophisticated system will be developed. The system is too new for much applications software to have been written, but as it is needed it will be developed.

Applications

The system was initially developed for use as a companion to the portable pulse height analyzer. It was intended to be used for identification and qualification of radioactive materials. As the project grew, it was apparent that the potential applications greatly exceeded the original application. The system as it is currently configured is capable of nearly any task required of a medium-powered minicomputer (although it will be slower), and is suited for use as a desktop computer as well as for field use. A typical user might be an IAEA safeguards inspection team equipped with a portable pulse height analyzer, a portable germanium detector, and the portable computer system. One inspector would take data with the analyzer and detector while the other sets up the computer and enters site data for comparisons. When the analyzer had acquired a cassette full of data, it would be entered into the computer and analyzed while more data was being acquired. If questionable data were encountered, the data could be confirmed on sit immediately. At the conclusion of the inspection, a printed summary is immediately available and the inspector can write his trip report on the plane trip home, using the computer as a word processing system. Field health physics, environmental monitoring applications, and many others, are just as easily envisioned.

Future Plans

As most of the software needed for this system is available in a form compatible with a Digital Equipment PDP-11³ computer, *Color Computer News*

future plans call for changing the processing unit to one compatible with that instruction set. This will make available large amounts of software immediately and will enhance the usefulness of the system. In addition, we plan to increase the mass storage size. A spare card slot is available for special I/O applications and a number of compatible cards will be developed, such as IEEE 488 bus interface, A/D and D/A converters, etc.

Conclusion

A powerful, yet small battery-operated, computer system is useful in many applications. It is particularly useful in remote data acquisition applications where it is necessary to verify the data on sit and/or make decisions based on reduced data while in remote locations. The Los Alamos developed Portable Computer System answers these needs and should open up a number of applications where it was not previously feasible to use computers.

Acknowledgement

The authors wish to thank Faustin Trujillo for assisting with the mechanical layout and fabrication of the packaged system.

References

1. A New Ultra Small Battery Operated Portable Multichannel Analyzer, M.A. Wolf and C.J. Umbarger, IEEE Transactions on Nuclear Science, Vol. NS-27, No. 1, February 1980.
2. ND-6 Users Manual, Nuclear Data, Inc. Schaumburg, IL.
3. Digital Equipment Corp., Hudson, MA.

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
```

WORD HUNT

by Jeffrey A. Stipes
1674 Lawnel Avenue
Muskegon, MI 49441

WORD HUNT

COPY 1

U N Z D Y W P F S F G E G M L H W Y N L Y U Q W C M J A B I X S Z L E M R P
Z I Y W T R X Q W X X H W Z Z P Z W U G D Y N V K M M S X C T J O E K N J N
X P R Y Z U N I A Q P J G S T B K W O W Q W B V P R G G V W Q K I C V Y U J
N J L E H H Z L L R G I R F L G U P V M Q T K H K G I G A C P W C C V T P Y
Y W R E T M W M L E M M W A F H Y E W Z C N U B C X X P T H V J R E G A Q Z
B F X Q Q W P I V E F S R I O U R J F R Z T B T B C E T I N G O C C F F M D
V N U I X M P P Z D V W N K M S O F Q X W L C L T S L Q H P E S T H F F W A
K U B L M Y K B J R F M C Y Q D H S L I Z M Z B I Q P Q C K N X E C R V R Z
K N B H E M D W K N Z S U W M B F H O J D E R R I N G E R X & U G U S E D V
V O S O E Q Q E V T P M H E U X A H G E R O T S M A R G G O R P K U T D J G I
K S Z Z F T E T L A K R H T C B R Y W B P B N L T M Y S L N K A L P D K L G
T L L Z Z H H X N T K E O Z Q J Y D O R S M D S F J T P B V W H O X G W Y L
A E I N I C H L K C Z G Y B K I E C G A Y M I Q O D Z J Y G Q K U I A T C Z
R N K I N O N H P F S M H J R L E Z Y L Y D D Z R Q X X O Q F B B B W X Z E
B P C Z T J J C N D Q S Z Y W A A B K B Q R P T F K Y O R K I Ø H T S I U I
H U P E E A R C Q A J R G A A H W N S S U D E X P N T B T W Z Q X M D M N B
T U W Z L N K K O L H K U V D Z C X J D R A T G J X B F R Q U C P W V I B Y
E K F S L I S T I K R A T S S W D Y U C A E S O H M A G J F U J T P K G B X
O R V K E Z Y F C E R C O M P U P L I F J J X Z L R X A Y V E T T Q G Q N N
D H Z R C I O K H W Q L N F G I U E N E V C A U H F R A Q C V S R Z P P R O
Y A A O T R N S T I A C M G C U I B R M U M Q G G Y B N L B H F Y F D T T M
V Y Z W R A V G G I K B E M G O N H D A I Q E D Y V A C G S R U P J L L P G
Q S T O O U Y P P W E R L W K D U O W C B U G C P Y S M V L T B T L R R M G
C G E R N S E T X N S H G A Z A E W R U E Q D U O N I E S M A E E L B M P O
I D Z C I B D I Y G C H D Q F T H O Z W N Q J S E J C B U I Q C P Q X K S H
V A L I C U E M Y S V J H A & Y T Y T H B Z Z T C V T Y Ø C V L N U W G M K
E W Z M S A I R K C V B Y D X E U Z Q D S G G O V T E Q B R W J N U R Y I N
N H W K B I X G F V H E N L C F V E C C Q N J M O C C L Z O C M O K H F C A
Y A M G L E J J P C B E J H B Z B T B D T S T S O I H O Y W M I R C K Z P R
G O P O D E O N A J R N N E P D Y K B Y T L O O J Y N W P A F A L Q S Q W F
D W N O B Q J N I L H I X U C D M Q U R G H B F L V O F Z R P V N F P G A T
U U E R C A M S P B C P Z Y P I W F E Y C P W T C G L F L E K P C U L Q J R
M A T D T K A B W A C Z F B L S Y J M Y Z G K W E W O R K V X Y T X Q X I K
J J I S U H A B L U Z Q B R J N D H D O M H J A G P G C J C Q Q D N G H X B
K Q L Q Z T R I U B Q S X W N T Q K L F J U Z R J I Y B R U P P J X M Q R C
S P B D A J O Z C V N P U L U P B N J D M Y Z E Q V W Y Z V G F U I X I O M
H M K S K O R R F Z X T V J S U L P R E T U P M O C T A M A R K D A T A U H
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Move up to C language

WORD HUNT

Need a special word puzzle for the office newsletter! How about holiday or classmate puzzles for the kids (let them make them). If you teach school then have at those spelling lists, states and capitols or whatever you wish.

Word hunt will create three different size puzzles on your line printer, 38 x 38, 30 x 30, and 20 x 20. The maximum word capacity of each puzzle is 24, 18, and 12 respectively. Should you desire to use fewer words than the puzzle's maximum, you may exit the word input loop by typing XX as your last word. The program will permit you to make multiple copies and answer keys to your puzzles which may be the same or different. You may also create a special name for your puzzle using up to 38 letters, characters and spaces. If you do not desire a special name the puzzle name will default to "Word Hunt....".

This program should give you a good opportunity to polish your understanding of two dimensional arrays and string manipulation. It also incorporates two programming features that will increase the speed of any basic program (of significant size) which you write. Note in line 40 that all variables are declared (arrays are dimensioned in line 570 as they are dependent upon puzzle size and total words), in theory this should speed up program execution as the CPU doesn't need to look for space each time a new variable comes up. Also take close note of where the printing subroutine is located. Maybe if people realized that the CPU starts to look for the subroutine (data statements too) beginning with the first line of code we would see fewer subroutines neatly lined up at the end of programs. The return is direct, so if you want some basic speed put your subroutines up front with the one that is called most often first.

Modification Notes:

Epson Printer - Change CHR\$(31) in line 90 to CHR\$(14) and CHR\$(30) in line 100 to CHR\$(20).

- You may eliminate all PA(paper advance) loops and use your top of form code CHR\$(12) in the printing subroutine.

Create Any Size Puzzles - Change line 370

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through 500.

More Words - Change TW(total word) in lines 470, 480 and 490 but watch out as you may hang up the program.

16K - You will need a cold start, then from the command mode type and enter POKE25,6:POKE31,6 and load and run the program.

Non Ext. BASIC - Change all "lineinputs" to INPUT. Lines 670 and 870.

```
10 '  
20 'DECLARE ALL VARIABLES  
30 '  
40 DIM PS, TW, Z$, I, PN$, SN$, J, SD$,  
TD, A, B, X, Y, SA, SB, PA, PL, S, AW, CC, C  
R, AK$, WN, WL, F, MP$, T  
50 GOTO 190  
60 '  
70 'PUZZLE PRINTOUT SUBROUTINE  
80 '  
90 IF LEFT$(PN$,1)="Y" THEN PRIN  
T#-2,CHR$(31);SN$ ELSE PRINT#-2,  
CHR$(31)"WORD HUNT .....  
"  
100 PRINT#-2,CHR$(30):PRINT#-2  
110 PRINT#-2,"COPY";CC:PRINT#-2  
120 FOR I=1 TO S  
130 FOR J=1 TO S  
140 IF J=1 THEN PRINT#-2,TAB(T)"  
"PG$(I,J);ELSE PRINT#-2," "PG$(  
I,J);  
150 NEXT J  
160 PRINT#-2  
170 NEXT I  
180 RETURN  
190 CLS  
200 PRINT@43,"WORD HUNT"  
210 PRINT@79,"BY"  
220 PRINT@136,"JEFFREY A. STIPES  
"  
230 PRINT@234,"QXCdZDhIPR"  
240 PRINT@266,"PFrNMCOuYW"  
250 PRINT@298,"LoQJIKHLnG"  
260 PRINT@330,"wNDPQXPZSt"  
270 PRINT@362,"OWZJPFBLKR"  
280 PRINT@394,"colorVNUOC"  
290 PRINT@426,"JNNPZGVVWO"  
300 PRINT@458,"KTcomputer"  
310 FOR TD=1 TO 460*2  
320 NEXT TD  
330 '  
340 'CLEAR ADEQUATE STRING SPACE  
350 '  
360 CLEAR 2000:CLS  
370 PRINT@35,"--SELECT A PUZZLE  
SIZE--"
```

```

380 PRINT@130,"1 -20X20 (12 OR L
ESS WORDS)"
390 PRINT@194,"2 -30X30 (18 OR L
ESS WORDS)"
400 PRINT@258,"3 -38X38 (24 OR L
ESS WORDS)"
410 PRINT@293,"NOTE: YOU MUST BE
ABLE TO"
420 PRINT@331,"PRINT 80 COLUMNS.
"
430 PRINT@417,"";:INPUT"ENTER SE
LECTION (1/2/3)";PS
440 '
450 'SET SIZE, TOTAL NO. WORDS A
ND TAB VARIABLES
460 '
470 IF PS=1 THEN S=20:TW=12:T=19
:GOTO 510
480 IF PS=2 THEN S=30:TW=18:T=9:
GOTO 510
490 IF PS=3 THEN S=38:TW=24:T=1:
GOTO 510
500 GOTO 430
510 CLS:PRINT@128,"BE SURE YOUR
PRINTER IS ON LINE AND THAT THE
PAPER IS ADJUSTED"
520 PRINT"TO PRINT APROXIMATELY
ONE-HALF INCH BELOW THE TOP PER
FORATION."
530 PRINT@352,"";:INPUT"PRESS <E
NTER> TO CONTINUE";Z#
540 '
550 'DIMENSION PUZZLE GRID AND W
ORD LIST ARRAYS
560 '
570 DIM PG$(S,S),WR$(TW)
580 CLS
590 PRINT"FOR BEST RESULTS USE W
ORDS OF 12 LETTERS OR LESS AND
NO BLANK SPACES, NUMBERS, OR PU
NCTUATION."
600 PRINT"IF YOU DON'T WANT TO U
SE THE TOTAL NUMBER OF WORDS
AVIAIBLE THEN TYPE XX AS YOUR L
AST WORD."
610 '
620 'WORD INPUT SECTION
630 '
640 PL=256
650 FOR I=1 TO TW
660 PRINT@PL,"WORD#I">;:PRINT
670 PRINT@PL+10,"";:LINEINPUT WR
$(I)
680 IF WR$(I)="" THEN 660
690 IF LEFT$(WR$(I),2)="XX" THEN
WR$(I)="":AW=I-1:I=TW:GOTO 730
700 AW=TW
710 IF PL=>448 THEN PL=224
720 PL=PL+32
730 NEXT I
740 '
750 '# COPIES - ANS. KEY - PUZZL
E NAME
760 '
770 CLS
780 INPUT"HOW MANY COPIES";CR:PR
INT
790 IF CR=1 THEN 830
800 PRINT"DO YOU WISH THE PUZZLE
S TO BE"
810 INPUT"THE SAME OR DIFFERENT
(S/D)";SD#:PRINT
820 IF SD#<>"S" AND SD#<>"D" THE
N 800
830 INPUT"ANSWER KEY (Y/N)";AK#:
PRINT
840 IF AK#<>"Y" AND AK#<>"N" THE
N 830
850 INPUT"DO YOU WANT A SPECIAL
NAME FOR YOUR PUZZLE (Y/N)";PN#
:PRINT
860 IF PN#<>"Y" AND PN#<>"N" THE
N 850
870 IF PN#="Y" THEN PRINT@224,"N
AME (MUST NOT EXCEED 38 TOTAL L
ETTERS, CHARACTERS, AND SPACES."
;:LINEINPUT SN#
880 IF LEN(SN#)<38 THEN 960 ELS
E PRINT@288:PRINT@320,"YOUR TITL
E IS TO LONG-REENTER."
890 FOR TD=1 TO 460*2
900 NEXT TD
910 PRINT@320
920 GOTO 870
930 '
940 'START OF TOTAL COPIES LOOP
950 '
960 FOR CC=1 TO CR
970 IF CC>1 AND SD#="S" THEN 174
0
980 CLS
990 PRINT"PREPARING A BLANK GRID
":PRINT"OF ";S;"X";S;"*";
1000 FOR I=1 TO S
1010 PRINT"-*";
1020 FOR J=1 TO S
1030 PG$(I,J)=" "
1040 NEXT J,I
1050 '
1060 'TOTAL WORDS PLACEMENT LOOP
1070 '
1080 FOR WN=1 TO AW
1090 '
1100 'START POINT FOR TARGET WOR
D

```

WORD HUNT

```

1110 '
1120 A=INT(RND(0)*S+1)
1130 B=INT(RND(0)*S+1)
1140 '
1150 'TARGET WORD DIRECTION
1160 '
1170 X=INT(RND(0)*3+1)-2
1180 Y=INT(RND(0)*3+1)-2
1190 IF X=0 AND Y=0 GOTO 1170
1200 SA=A:SB=B
1210 '
1220 'TARGET WORD PLACEMENT LOOP

1230 '
1240 FOR WL=1 TO LEN(WR$(WN))
1250 '
1260 'SET FLAG FOR WORD FIT CHEC
K
1270 '
1280 F=0
1290 '
1300 'CHECK GRID LOCATION FOR AC
CEPTANCE OF CURRENT LETTER
1310 '
1320 IF PG$(A,B)<>" " AND PG$(A,
B)<>MID$(WR$(WN),WL,1) THEN WL=L
EN(WR$(WN)):GOTO 1430
1330 A=A+X
1340 B=B+Y
1350 '
1360 'CHECK IF CURRENT WORD LENG
TH IS OUT OF GRID
1370 '
1380 IF A<0 OR B<0 OR A>S OR B>S
THEN WL=LEN(WR$(WN)):GOTO 1430
1390 '
1400 'SET FLAG TO INDICATE CURRE
NT WORD FIT IS OK
1410 '
1420 F=1
1430 NEXT WL
1440 '
1450 'CHECK FLAG - 1=OK (RESET F
LAG TO 0) : 0=WON'T FIT (RELACAT
E)
1460 '
1470 IF F<>1 THEN 1120 ELSE F=0
1480 CLS
1490 PRINT"HIDING >"WR$(WN)
1500 FOR WL=1 TO LEN(WR$(WN))
1510 PG$(SA,SB)=MID$(WR$(WN),WL,
1)
1520 SA=SA+X
1530 SB=SB+Y
1540 NEXT WL
1550 NEXT WN
1560 CLS
1570 '

```

```

1580 'CHECK FOR ANSWER KEY RESPO
NSE
1590 '
1600 IF LEFT$(AK$,1)="Y" THEN PR
INT"<*>PRINTING THE ANSWER KEY<*>
>":GOSUB 90 ELSE 1680
1610 '
1620 'ANSWER KEY PAGE ADVANCE
1630 '
1640 FOR PA =1 TO 66-(S+5)
1650 PRINT#-2
1660 NEXT PA
1670 CLS
1680 PRINT"PLACING RANDOM LETTER
S IN THE PUZZLE GRID*";
1690 FOR I=1 TO S
1700 PRINT"-*";
1710 FOR J=1 TO S
1720 IF PG$(I,J)=" " THEN PG$(I,
J)=CHR$(INT(RND(0)*26)+65)
1730 NEXT J,I
1740 CLS:PRINT"PRINTING COPY #";
CC
1750 '
1760 'CALL PUZZLE PRINTOUT SUBRO
UTINE
1770 '
1780 GOSUB 90:PRINT#-2:PRINT#-2
1790 '
1800 'PRINT LOOP FOR TOTAL WORD
LIST
1810 '
1820 FOR I=1 TO TW STEP 3
1830 IF WR$(I)="" THEN I=TW:GOTO
1850
1840 PRINT#-2,TAB(9)WR$(I);TAB(3
3)WR$(I+1);TAB(58)WR$(I+2)
1850 NEXT I
1860 '
1870 'PUZZLE PAGE ADVANCE
1880 '
1890 FOR PA=1 TO 66-(INT(AW/3+.6
7)+7+S)
1900 PRINT#-2
1910 NEXT PA
1920 NEXT CC
1930 CLS:PRINT@227,"ANY MORE PUZ
ZLES (Y/N)";:INPUT MP$:IF MP$="Y
" THEN RUN ELSE END

```

CCN TIP
by Jeffrey Stipes

What ROM do you have? Type and Enter -
EXEC 41175



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JOINT MONEY MARKET ACCOUNTS

Who Gets How Much Interest?

By Old Father William +



10%, 12%, 14%, even 16%! Don't those ads for high interest or money market accounts look tantalizing? But then we see the small print at the bottom of the ad: "\$10,000.00 minimum investment". Tantalized or not, we just cannot take advantage of that high interest.

But wait, there is a way, which many people have found. Several co-workers, neighbors, or family members can put some of their savings together into one pot, and come up with that minimum investment, so all can share in that inflation catching interest.

"Share in that interest" another problem. How do we figure out who gets what? Unless everyone puts in exactly the same principle amount and leaves it there the same length of time, figuring the interest gets really complicated.

Aha! Now there's a problem just made for the Color Computer. Think so? Don't count on it! It runs out that only with considerable difficulty can the CC be "made" to work this "made for the CC" problem.

We ran into this problem at St. Gregory's

Episcopal Church, in Muskegon, Michigan, in January of 1982. Several of our people had given their entire 1982 pledges in advance, before the end of 1981, in order to take a special tax advantage. We wanted to draw the best possible interest until the funds were consumed during the year. By adding the Memorial Fund, the Organ Fund, and a few other small reserves, we reached the magical \$10,000.00 requirement.

When we found something called the Cash Fund at Paine, Webber, Jackson, and Curtis, our search for our ideal account ended. The interest is high, monthly reports during the first 6 months of 1982 averaged 13.4%. Even more important for our purposes, though, is the fact that the account, once established, may be drawn down below the \$10,000.00 minimum without penalty.

We may have gotten a bit carried away, but we soon found that we had eleven different sub-accounts lumped together into the Cash Fund. It seems that the news about the high interest got around to the Altar Guild, the Youth Group, etc.

Count 'em, 11 accounts, some starting at

JOINT MONEY MARKET ACCOUNTS

different times, having widely disparate principal amounts and making deposits and withdrawals at odd times. There was no way that our Treasurer was going to have the time (or the inclination!) to work all that out with a calculator on interest crediting day each month.

Admittedly, a lot of you who have neighborhood joint accounts would not have that much "traffic" in the account, but my program, JNT ACCT, should be able to save a good bit of time and not a few arguments about your interest distributions.

I struggled with writing this program. Every time I got one thing figured out, someone would do something different with one of the accounts. In fact the Vestry waited none too patiently until May for even a rough report on the account. They get them on time now, though, and so can your family or neighborhood group, by using JNT ACCT, the cassette based program listed below.

JNT ACCT has a routine for entering the account name and number when the account is opened, along with the names of sub-accounts and their initial deposits. After that, the program permits deposits and

withdrawals for one or more sub-accounts on a given day; transfers from one sub-account to another; crediting of interest at the end of the month, quarter, or whatever; starting a new sub-account; deleting a sub-account; and saving data on cassette tape or entering it from tape.

The routine for transferring from one account to another has been very useful. Paine-Webber requires a minimum of \$500.00 for any deposit or withdrawal. However, with the transfer routine, Mr. A, who wants \$123.45 from his sub-account may be able to find Ms. B, who has a similar amount to deposit. We transfer the agreed upon sum from account A to account B in the CC's handling of the Cash Fund, Ms. B gives Mr. A the amount out of the funds she wished to deposit, and everyone is happy, especially Paine-Webber, for not having to bother with a small deposit. The transfer routine is also available for use in opening or closing a sub-account.

Crediting interest was one of the most challenging parts of the program to write, but it is quite easy to use. The challenging part was that every time there is a

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transaction, whether deposit, withdrawal, or transfer, some of the sub-account principals change, and this, of course, is the base upon which the interest is figured. Therefore, we had to create an extra variable, IT(X), which holds the running Interest Total earned by each sub-account from the previous interest crediting day to the date of the latest completed transaction, and another, RT(X), which holds the Running Total of the principal in each sub-account. On each succeeding transaction date, the proper number of days' worth of interest earned by each RT is added to its IT, and the RT's affected by that transaction are changed. Finally, on the next interest crediting day, the IT's are increased by the interest earned since the last transaction, and this figure is recorded as each sub-account's portion of the lump sum interest reported by Paine-Webber. It is added to the current RT in each sub-account, and the IT's are all set to 0 as we enter a new interest period.

A word about the interest routines. Paine-Webber gives you only the total amount of interest credited to the account each month. The rate of interest may vary

from day to day, but usually only very slightly. JNT ACCT takes the interest amount, asks for any changes in the account principal and the time between changes, and calculates the effective average interest for the period. If your account has a fixed rate of interest, change the routine at 10000 to ask for that rate for the current period and to set R equal to that rate, in decimal form, multiplied by the time in the period (number of days, divided by 365).

It never ceases to amaze me that after I plod along entering a set of figures, the CC only seems to blink before it prints out the results of some very complicated calculations. Going from hours of calculator work to minutes of data entering and split-seconds of computer time is a change I like a lot!

As it is written, JNT ACCT is quite satisfactory for your use, whether or not you have a printer. After each transaction is entered, the screen displays each sub-account's experience. You see and can copy the sub-account name, the date/code string (the transaction date, plus a 3 digit code for transaction type: DEP, WDL, TFR,

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Chromasette MAGAZINE

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PRO-COLOR-FILE[©]

NOW a Data Base development program that was only available for large computers has been developed for the TRS-80 32K Color Computer Disk system. NOW you can develop any Data Base on your Color Computer to keep track of any kind of information and not write one line of code! PRO-COLOR-FILE will do it all for you!

60 DATA FIELDS

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

4 DATA ENTRY SCREENS

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

14 MATH EQUATIONS

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

ALPHABETIZED INDEX

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

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

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

5 REPORT FORMATS

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

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etc.), the total in that account before this transaction, the amount by which this transaction increased or decreased the sub-account, and the new total. If you have more than five sub-accounts, ENTER gives you the next "page" of display.

If you do have a printer, you can enjoy my favorite part of the program. The printer routine fits itself to the capacities of your printer. It asks you the column-width of your printer, and then divides the printout accordingly. After the heading is printed, of a transaction, and the effects of that transaction on the first two to nine sub-accounts, however many 13 space comma fields your printer can handle. The next line prints the new totals after this transaction. After printing all the desired transactions, the printer goes on to the next "page" of account columns, if you have more sub-accounts than your printer width can accommodate. Each "page" of the printout contains the date/code column again, and the last page has a column showing the Cash Fund grand totals.

Line 7205 sets the comma field width to 13 and triggers my printer, an Okidata M80, to 132 column compressed type (CHR\$(29)) and 6 lines per inch (27-29). The POKEs in line 7209 format the CC's printer output for columns of figures.

The printer routine permits selecting a starting date other than the beginning of the account. You may also review a screenfull of date/codes, and select which ones you want in your printout. Saving transaction data on cassette tape for future use provides similar flexibility. All transactions currently in memory; only the final balances; or a set of transactions, from a selected starting date to the present, may be saved on tape.

One feature of JNT ACCT which you may like is the display format, which is used whenever it is necessary to select from a list, either of sub-account titles or of date/codes. When you are presented with the list, you enter the number of the item you want. The screen immediately reprints the display, with a blank space in the place of the one you selected. The same flag which causes the selection to "disappear" is used in the following activities of the routine at hand, after the selecting is completed.

About three months into our use of the

program, we needed to spend the remaining amount in one of the sub-accounts and to close it permanently. All we would need to do would be to find the running total (RT) for that account and either withdraw it or transfer it to another account, right? Wrong! This happened in the middle of an interest period, so the funds in that account had earned some interest in the current period. What the program does is to load the information about that residual interest into two variables and a flag, and hold the data until the next interest crediting date, at which time we are asked whether we want to withdraw the reserved amount or transfer it to another sub-account. This meant forcing the CC to look for that flag in the interest crediting, tape in, and tape out routines. That's just one of the ways the CC had to be "made" to handle everything right.

Adding an account is quite a bit simpler, and can be done at any time. JNT ACCT only permits one new account to be added each time the program is RUN, however. In order to save as much memory as possible, lines 50 and 70 DIMension the pertinent variables only to one more than is needed for the current list of accounts each time it is RUN. If you need more, you may change line 50 to read +2, +3, or whatever before you start. Alternatively, after adding one account in a data entry session, you may save all data to tape, press BREAK, enter RUN, and answer line 40's question with the new number of sub-accounts before reloading data. There would then be room to add one account again.

One very important caution: If for any reason you encounter an error message during any routine, DO NOT type RUN to re-enter, or all current data will be lost. Type GOTO 80 ENTER. The menu will reappear, and all string and numerical data will be present and addressable.

One way in which the BREAK GOTO 80 is useful: Normally, data entry sessions will be done after you have received notice of interest being credited to the account. After that session, the data saved on tape will show R=0, because you won't know the interest rate for the future period. If, during that next period, you want to re-enter the data to get some printouts, line 5410 will demand to know the interest amount for the

next period. Pressing BREAK, then entering GOTO 80, will get you free to get your printouts.

If you hate to lose data as badly as I do, you might want to follow my procedure every time I type out data. First, I force myself to take the time to make a backup tape of the data, then I press BREAK and check the "reloadability" of both tapes with the SKIPF command. That way, if either or both of the tapes should be defective, I can still enter GOTO 80 and try again.

The program, as listed, is very long nearly 18K itself. It works quite well with a 32K CC. I have used it with 11 sub-accounts and 75 transactions without overloading memory. For maximum memory availability, use CCN's PCLEAR0 routine, POKE 25,6:NEW ENTER, before CLOADing JNT ACCT.

For 16K CC owners, I have another form, which has two programs on the tape. The second program need only be used to add or delete a sub-account. As you see it, JNT ACCT is fully protected from the ravages of Old Father Fumblefingers' typing skills. Almost every entry provides a chance to edit to try again if the entry is wrong. These escapes are largely omitted from the 16K version.

If you do not want to type in the entire program, I would be happy to provide a copy of either form of the program for \$8.00 per copy, sent to: OFW+ Software, 2061 Carter Drive, Muskegon, MI 49441. If you do not specify which form you want, the 32K version will be sent.

A version of JNT ACCT adapted for disk will sell for \$12.00 per copy.

```

1  '          JNT ACCT
2  '
3  '
4  '          JOINT ACCOUNT
5  '    RECORD-KEEPING SYSTEM
6  '
7  '    BY OLD FATHER WILLIAM+
8  '
9  '          OFW+ SOFTWARE
10 '    2061 CARTER DRIVE
11 '    MUSKEGON, MI 49441
12 '
13 '          COPYRIGHT 1982
14 '    ALL RIGHTS RESERVED
25 CLEAR 2000,32767
30 CLS:PRINT"          INITIAL INP
UTS":PRINT:PRINT:PRINT

```

```

40 INPUT"HOW MANY SUB-ACCOUNTS A
RE NEEDED";D
50 M=D+1:L=M+1
60 PRINT:PRINT:INPUT"HOW MANY SE
PARATE TRANSACTIONS DO YOU WANT
TO PROVIDE FOR";W
70 DIM A(L,W),T$(L),RT(L),IT(L),
A$(W),I1(L),C(W),C1(W)
80 CLS:PRINT"          MENU"
90 PRINT@55,"X ="X:PRINT" 1. DEP
OSITS"
100 PRINT" 2. INTEREST ADDITIONS
"
110 PRINT" 3. WITHDRAWALS"
120 PRINT" 4. TRANSFER OF FUNDS
BETWEEN          SUB-ACCOUNTS"
130 PRINT" 5. ADD OR DELETE A SU
B-ACCOUNT"
140 PRINT" 6. ENTER RECORDS FROM
TAPE"
150 PRINT" 7. SAVE RECORDS ON TA
PE"
155 PRINT" 8. OUTPUT RECORDS TO
PRINTER"
165 PRINT" 9. END SESSION
170 PRINT:INPUT"          MAKE YOU
R CHOICE";Q
180 IF Q<1 OR Q>10 THEN 80
190 ON Q GOTO 200,1200,2200,3200
,4200,5200,6200,7200,8200
200 'DEPOSITS ROUTINE
230 CLS:PRINT"          DEPOSITS
MENU":PRINT:PRINT:PRINT" 1. INIT
IAL DEPOSITS AT THE          BEG
INNING OF THE ACCOUNT":PRINT" 2.
REGULAR SUBSEQUENT DEPOSITS"
232 PRINT" 3. RETURN TO OTHER PR
OCEDURES":PRINT:INPUT"MAKE YOUR
CHOICE";Q
240 IF Q<1 OR Q>3 THEN GOTO 230
250 ON Q GOTO 260,800,80
260 CLS:INPUT"DO YOU WANT TO ENT
ER INITIAL          DEPOSITS Y/N";YN$
262 IF YN$<>"Y" THEN GOTO 230
268 INPUT"ACCOUNT NAME";N$
270 IF N$="" THEN PRINT Z$:GOTO
290
280 Z$=N$
290 INPUT"ACCOUNT NUMBER";N$
300 IF N$="" THEN PRINT Y$:GOTO
320
310 Y$=N$
320 INPUT"EFFECTIVE DATE OF INIT
IAL          DEPOSITS";N$
330 IF N$="" THEN PRINT DT$:GOTO
350
340 X=1:DT$=N$
350 PRINT:PRINT:INPUT"NEED TO ED

```

JOINT MONEY MARKET ACCOUNTS

```

IT Y/N";YN#
360 IF YN#="N" THEN GOTO 390
370 IF YN#<>"Y" THEN GOTO 350
380 PRINT"ENTER CORRECTED ITEMS,
  BUT      PRESS <ENTER> FOR ITEM
6 ALREADY CORRECT":PRINT:GOTO 26
8
390 CLS:PRINT"SUB-ACCOUNT TITLES
  OR NAMES ARE LIMITED TO 12 CHAR
ACTERS":PRINT
400 FOR I=1 TO D
410 PRINT"SUB-ACC'T TITLE" I;:INP
UT T*(I):NEXT I
420 T*(M)="TOTAL"
430 CLS:PRINT"SUB-ACCOUNT TITLES
, AS RECEIVED:":PRINT
440 FOR I=1 TO M:PRINT I;T*(I),:
NEXT I
450 PRINT@384,"NEED TO EDIT Y/N"
;:INPUT YN#
460 IF YN#="N" THEN GOSUB 512:GO
TO 520
470 IF YN#<>"Y" THEN GOTO 430
480 PRINT@384,"ENTER WRONG ITEM"
;:INPUT N#
490 FOR I=1 TO D:IF T*(I)=N# THE
N GOTO 510
500 NEXT I:GOTO 430
510 PRINT@384,"":PRINT@416,"":PR
INT@448,"":PRINT@384,"ENTER CORR
ECTED ITEM";:INPUT T*(I):GOTO430

511 GOSUB 512:GOTO 520
512 CLS:INPUT"DO YOU WANT A PRIN
TOUT OF THE SUB-ACCOUNT TITLES
, FOR YOUR REFERENCE Y/N";YN
#
514 IF YN#="N" THEN RETURN
516 IF YN#<>"Y" THEN GOTO 512
518 FOR I=1 TO M:PRINT#-2,I;T*(I
):NEXT I:PRINT#-2," ";CHR*(13):R
ETURN
520 CD#="DEP":A*(X)=DT#+CD#
530 FOR I=1 TO D:C(I)=1:NEXT I
540 GOSUB 9000:FOR I=1 TO M:RT(I
)=A(I,1):C(I)=0:NEXT I
560 X=3:A*(2)=DT#+ "IDP":GOSUB 13
50:X=1:A*(2)="":GOSUB 10000:GOTO
80
800 'SUBSEQUENT DEPOSITS ROUTINE

810 CLS:INPUT"DO YOU WANT TO ENT
ER A DEPOSIT Y/N";YN#
820 IF YN#="N" THEN GOTO 230
830 IF YN#<>"Y" THEN GOTO 810
835 X=X+1:CD#="DEP"
840 GOSUB 11000:GOSUB 1330:GOSUB
920:GOTO 80

```

```

920 GOSUB 9420:GOSUB 9000:FOR I=
1 TO M:C(I)=0:NEXT I:GOSUB 9400:
GOSUB 1350:RETURN
1200 'INTEREST CREDITING ROUTINE

1210 CLS:INPUT"DO YOU WANT TO CR
EDIT INTEREST Y/N";YN#
1220 IF YN#="N" THEN GOTO 80
1230 IF YN#<>"Y" THEN GOTO 1210
1250 X=X+1:CD#="INT"
1260 GOSUB 11000
1320 GOSUB 1330:GOSUB 1340:GOTO
1500
1330 IF TM=0 THEN RETURN ELSE FO
R I=1 TO D:I1(I)=RT(I)*TM*R/365:
IT(M)=IT(M)+I1(I):IT(I)=IT(I)+I1
(I):NEXT I:RETURN
1340 FOR I=1 TO M:A(I,X)=IT(I):I
T(I)=0:NEXT I:I1(M)=0:R=0:GOSUB
9400
1350 GOSUB 1360:GOSUB 1370:RETUR
N
1360 CLS:PRINT"DISPLAY: ACC'T TI
TLE, DATE/CODE,PREVIOUS TOTAL,TH
IS TRANSACTION,AND NEW TOTAL":RE
TURN
1370 FOR I=1 TO M:IF I>1 AND (I-
1)/5=INT((I-1)/5) THEN GOSUB 140
0
1380 PRINT T*(I),A*(X-1):PRINT U
SING"###,###.##";A(I,X-2);A(I,X-
1);A(I,X)
1390 NEXT I:PRINT@448,"PRESS <EN
TER> FOR NEXT PROCEDURE";:INPUT
E#:GOSUB 1360:RETURN
1400 PRINT@448,"PRESS <ENTER> FO
R NEXT PAGE";:INPUT E#:GOSUB 136
0:RETURN
1500 'CONCLUDE INTEREST CREDITIN
G ROUTINE
1505 CLS:PRINT" 1. TRANSACTIONS
COMPLETED FOR THIS SESSION
. RETURN TO MAIN MENU FO
R TAPING AND PRINTING."
1510 PRINT:PRINT" 2. MORE TRANSA
CTIONS TO ENTER DETERMINE
INTEREST RATE FOR NEXT P
ERIOD."
1515 PRINT:PRINT:INPUT"MAKE YOUR
CHOICE";Q
1518 IF Q<1 OR Q>2 THEN GOTO 150
5
1520 ON Q GOTO 1530,1535
1530 GOTO 1540
1535 GOSUB 10000
1540 IF IC=1 THEN GOTO 4583
1550 GOTO 80
2200 'WITHDRAWALS ROUTINE

```

Color Computer News



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```

2220 CLS:INPUT"DO YOU WANT TO EN
TER WITHDRAWAL Y/N";YN$
2230 IF YN$="N" THEN GOTO 80
2240 IF YN$<>"Y" THEN GOTO 2220
2260 X=X+1:CD$="WDL"
2270 GOSUB 11000
2340 GOSUB 1330
2350 CLS:GOSUB 920:GOTO 80
3200 'TRANSFERS ROUTINE
3210 CLS:INPUT"DO YOU WANT TO EN
TER A TRANSFER FROM ONE ACCOUNT
TO ANOTHER Y/N ";YN$
3220 IF YN$="N" THEN GOTO 80
3230 IF YN$<>"Y" THEN GOTO 3210
3250 X=X+1:CD$="TFR"
3260 GOSUB 11000
3320 GOSUB 1330:GOSUB 920:GOTO 8
0
4200 'ADD OR DELETE ONE SUB-ACCO
UNT ROUTINE
4202 CLS:INPUT"TO ASSURE SAFETY
OF YOUR ACCOUNTRECORDS, ALWAYS S
AVE EVERYTHING IN MEMORY ON TAPE
BEFORE ADDING OR DELETING AN AC
COUNT. HAVE YOU JUST DONE THI
S? Y/N";YN$:IF YN$<>"Y" THEN 80
4210 CLS:PRINT" 1. ADD A SUB-ACC
OUNT"
4220 PRINT" 2. DELETE A SUB-ACCO
UNT"
4230 PRINT" 3. RETURN TO OTHER P
ROCEDURES"
4240 PRINT:PRINT:INPUT"MAKE YOUR
CHOICE";Q
4250 IF Q<1 OR Q>3 THEN GOTO 424
0
4260 ON Q GOTO 4400,4500,80
4400 ' ADD A SUB-ACCOUNT ROUTINE
4410 CLS:INPUT"DO YOU WANT TO AD
D A SUB-ACCOUNT Y/N";YN$
4420 IF YN$<>"Y" THEN GOTO 4210
4430 D=D+1:M=M+1
4440 FOR I=1 TO X:A(M,I)=A(D,I):
A(D,I)=0:NEXT I
4450 RT(M)=RT(D):RT(D)=0:IT(M)=I
T(D):IT(D)=0
4460 T$(M)=T$(D)
4470 CLS:INPUT"ENTER NAME OF NEW
SUB-ACCOUNT ";T$(D)
4480 PRINT:PRINT"PRESS <ENTER> T
O SEE DISPLAY OF SUB-ACCOUNT TIT
LES, WHICH WILL NOW INCLUDE; ";
D:T$(D):PRINT:PRINT"AFTER YOU CO
PY, ENTER <30> TO CONTINUE ADD
-ACCOUNT PROCEDURE ":INPUT E$
4485 GOSUB 9420:GOSUB 512:X=X+1:
CD$="IDP":GOSUB 11000:GOSUB 1330
4490 CLS:PRINT"ENTER INITIAL DEP
OSIT FOR":PRINT T$(D)" ACCOUNT:"
;:INPUT A(D,X):A(M,X)=A(D,X)
4491 INPUT"IS THIS DEPOSIT COMIN
G FROM: 1. CASH DEPOSIT TO P
AINE-WEBBER 2. TRANSFER FROM OTH
ER SUB-ACCOUNT(S)";
Q:IF Q<1 OR Q>2 THEN 4491
4492 ON Q GOTO 4494,4496
4494 GOSUB 9200
4495 GOSUB 9400:GOSUB 1350:FOR I
=1 TO M:C(I)=0:NEXT:GOTO 80
4496 INPUT"PRESS <ENTER> FOR TIT
LES MENU. CHOOSE ACCOUNT(S) FRO
M WHICH TRANSFER(S) WILL COME
, THEN ENTER <30> TO CONTINU
E";E$:C(D)=2:GOSUB 9420:GOSUB 90
00:C(D)=0:GOTO 4495
4500 'DELETE A SUB-ACCOUNT ROUTI
NE
4502 CLS:PRINT" DELETE A SUB-
ACCOUNT MENU"
4504 PRINT:PRINT:PRINT" 1. DELET
E ACCOUNT ON THE EFFE
CTIVE DATE OF INTEREST CRED
ITING"
4506 PRINT:PRINT" 2. DELETE ACCO
UNT BETWEEN INTEREST C
REDITING DAYS"
4508 PRINT:PRINT" 3. RETURN TO A
DD/DELETE MENU"
4510 PRINT:PRINT:INPUT"MAKE YOUR
CHOICE";Q
4512 IF Q<1 OR Q>3 THEN GOTO 450
2
4514 ON Q GOTO 4520,4525,4210
4520 CLS:INPUT"YOU MUST RUN THE
INTEREST CREDITING ROUTINE
(MAIN MENU OPTION #2) BEFORE
DELETING THE ACCOUNT. HAVE YO
U JUST DONE THIS? Y/N";YN$
4522 IF YN$="Y" THEN IC=1:X=X+1:
CD$="DEL":A$(X)=DT$+CD$:GOTO 452
7
4523 IF YN$<>"N" THEN GOTO 4520
4524 GOTO 80
4525 X=X+1:CD$="DEL":GOTO 4560
4527 CLS:INPUT"PRESS <ENTER> FOR
SUB-ACCOUNTS MENU. ENTER NUMB
ER OF THE ACCOUNT TO BE CON
LETED, THEN ENTER <30> TO CON
TINUE DELETION PROCEDURE.":E$:80
SUB 9420
4528 FOR I=1 TO D:IF C(I)=1 THEN
C(I)=2:GOTO 4532
4530 NEXT I
4532 CLS:PRINT"THE BALANCE IN TH
E "T$(I):PRINT"ACCOUNT IS "RT(I)

```



```
:PRINT"THIS BALANCE INCLUDES ALL
THE INTEREST EARNED BY THIS A
CCOUNT TO DATE. PLEASE COPY THIS
AMOUNT AND CHOOSE WITHDRAWAL OPT
ION:"
```

```
4534 PRINT" 1. WITHDRAW IN CASH
FROM PAINE-WEBBER":PR
INT" 2. TRANSFER TOTAL AMOUNT TO
OTHER SUB-ACCOUNT(S)":P
RINT:PRINT
```

```
4536 INPUT"MAKE YOUR CHOICE";Q
4538 IF Q<1 OR Q>2 THEN 4532
4540 ON Q GOTO 4542,4556
4542 N=I:A(I,X)=-RT(I):A(M,X)=A(
I,X):C(I)=0:GOSUB 9400:GOSUB 135
0:GOSUB 4544:GOTO 4552
```

```
4544 CLS:PRINT"THIS IS YOUR LAST
CHANCE TO TAPE OR PRINT OUT RECO
RDS OF THIS ACCOUNT. YOUR OP
TIONS ARE:"
```

```
4546 PRINT:PRINT" 1. GOTO PRINTO
UT ROUTINES 2. GOTO SAVE-O
N-TAPE ROUTINES 3. CONTINUE AC
COUNT-DELETION PROCEDURE"
:PRINT:PRINT:INPUT"MAKE YOUR CHO
ICE";Q
```

```
4548 IF Q<1 OR Q>3 THEN 4544
4550 ON Q GOTO 7200,6200
```

```
4551 RETURN
```

```
4552 GOSUB 4598:M=D:D=D-1:IC=0
4554 CLS:INPUT"PRESS <ENTER> FOR
TITLES MENU, WHICH NO LONGER C
ONTAINS DELETEDACCOUNT. AFTER YO
U COPY, ENTER <30> TO CONTINUE.
";E#:GOSUB 9420:GOSUB 512:GOTO 8
0
```

```
4556 A(I,X)=-RT(I):A(M,X)=A(I,X)
:CLS:INPUT"PRESS <ENTER> FOR TIT
LES MENU. CHOOSE ACCOUNT(S) REC
EIVING THE PRINCIPAL OF DELETED
ACCOUNT, THEN ENTER <30> TO AS
SIGN THE INDIVIDUAL TRANSFER A
MOUNT(S).";E#
```

```
4558 GOSUB 920:FOR I=1 TO M:C(I)
=0:NEXT I:IC=1:GOSUB 4544:GOTO 4
552
```

```
4560 GOSUB 11000:GOSUB 1330:CLS:
INPUT"PRESS <ENTER> FOR TITLES M
ENU. ENTER NUMBER OF ACCOUNT TO
BE DELETED, THEN ENTER <30> T
O CONTINUE DELETION PROCEDUR
E.";E#:GOSUB 9420
```

```
4562 FOR I=1 TO D:IF C(I)=1 THEN
C(I)=2:GOTO 4566
```

```
4564 NEXT I
```

```
4566 CLS:PRINT"THE PRINCIPAL BAL
ANCE IN THE "T*(I)" ACCOUNT I
S":PRINTRT(I)". THIS AMOUNT DOES
```

```
":PRINT"NOT INCLUDE ACCRUED INTE
REST, WHICH WILL NOT BE AVAILA
BLE UNTIL NEXT INTEREST-CRED
ITING DATE."
```

```
4568 PRINT"PLEASE COPY THIS AMOU
NT AND CHOOSE WITHDRAWAL OPT
ION":PRINT:PRINT" 1. CASH WITHD
RAWAL FROM PAINE-WEB
BER":PRINT" 2. TRANSFER OF PRINC
IPAL AMOUNT TO OTHER SUB-ACC
OUNT(S)"
```

```
4570 PRINT:INPUT"MAKE YOUR CHOIC
E";Q
```

```
4572 IF Q<1 OR Q>2 THEN 4566
```

```
4574 ON Q GOTO 4575,4576
```

```
4575 N=I:A(I,X)=-RT(I):A(M,X)=A(
I,X):GOTO 4577
```

```
4576 N=I:CLS:A(I,X)=-RT(I):A(M,X
)=A(I,X):INPUT"PRESS <ENTER> FOR
TITLES MENU. CHOOSE THE ACCOUN
T(S) DUE TO RECEIVE PRINCIPAL
OF THE DELETEDACCOUNT. THEN ENT
ER <30> TO ASSIGN THE INDIVI
DUAL TRANSFERS.";E#:GOSUB 9420:G
OSUB 9000:I=N
```

```
4577 DI=IT(I):DI*=T*(I):GOSUB 94
00:GOSUB 1350:IC=1:GOSUB 4544:G0
SUB 4598:M=D:D=D-1
```

```
4578 FOR I=1 TO M:C(I)=0:NEXT I:
CLS:INPUT"PRESS <ENTER> FOR TITL
ES MENU, WHICH NO LONGER INCLUD
ES DELETEDACCOUNT. AFTER YOU CO
PY, ENTER <30> TO CONTINUE.";E#:
GOSUB 9420:GOSUB 512
```

```
4580 CLS:PRINT"PLEASE NOTE THAT
"DI",":PRINT"WHICH IS THE INTERE
ST ACCRUED TODATE ON THE DELETED
ACCOUNT, WILL BE HELD IN RES
ERVE UNTIL THE NEXT INTEREST-C
REDITING DATE"
```

```
4582 PRINT:PRINT"AT THAT TIME, Y
OU WILL BE ASKED TO CHOOSE WHICH
SUB-ACCOUNT WILL RECEIVE TH
E TRANSFER OF THIS SUM.":PRIN
T:PRINT:INPUT"PRESS <ENTER> FOR
NEXT PROCEDURE";E#:GOTO 80
```

```
4583 CLS:PRINT"THE SUM OF "DI:PR
INT"IS IN RESERVE FROM THE DELET
ION OF THE "DI*" ACCOUNT.":INPUT
"PRESS <ENTER> FOR TITLES MENU,
ENTER NUMBER OF ACCOUNT CHOSEN
TO RECEIVE THIS SUM, THEN ENTER
<30> TO COMPLETE FUND TRANSFER.
";E#:GOSUB 9420
```

```
4584 FOR I=1 TO D:IF C(I)=1 THEN
4586
```

```
4585 NEXT I
```

```
4586 X=X+1:A*(X)=DT*+"TFI":A(I,X
```

```

)=DI:A(M,X)=A(I,X):DI=0:IC=0:DI#
="":C(I)=0:GOSUB 9400:GOSUB 1350
:GOTO 80
4598 I=N:FOR K=1 TO X:A(M,K)=A(M
,K)-A(I,K):NEXT K:IT(M)=IT(M)-IT
(I)
4600 FOR J=1 TO D:RT(J)=RT(J+1):
IT(J)=IT(J+1):T*(J)=T*(J+1)
4610 FOR K=1 TO X:A(J,K)=A(J+1,K
):NEXT K
4620 NEXT J
4630 FOR K=1 TO X:A(M,X)=0:NEXT
K:RT(M)=0:IT(M)=0:N=0:RETURN
5200 'ENTER FROM TAPE ROUTINES
5210 CLS:INPUT"DO YOU WISH TO LO
AD DATA FROM TAPEFILE? Y/N";Y
N#
5220 IF YN#="N" THEN 80
5230 IF YN#<>"Y" THEN 5210
5240 CLS:INPUT"NAME OF TAPEFILE"
;TN#
5320 PRINT:PRINT:PRINT"SET UP TA
PE AND RECORDER PRESS <EN
TER> TO BEGIN LOADING ";:INPUT
E#
5330 OPEN"I",-1,TN#
5340 INPUT#-1,D,W,Z#,Y#,X,R,M,IC
,DT#
5345 IF IC=1 THEN INPUT#-1,DI,DI
#
5350 FOR I=1 TO M
5360 INPUT#-1,T*(I),RT(I),IT(I)
5370 FOR J=1 TO X
5380 INPUT#-1,A(I,J)
5390 NEXT J
5400 NEXT I
5405 FOR J=1 TO X:INPUT#-1,A*(J)
:NEXT J
5410 CLOSE-1:IF R=0 THEN GOSUB 1
0000
5420 GOTO 80
6200 'SAVE ON TAPE ROUTINES
6210 CLS:PRINT" SAVE ON TA
PE MENU":PRINT:PRINT
6220 PRINT" 1. SAVE ALL TRANSACT
IONS NOW IN MEMORY"
6230 PRINT" 2. SAVE ONLY FINAL B
ALANCES IN ALL ACCOUNTS"
6240 PRINT" 3. SAVE TRANSACTIONS
, FROM ONE SELECTED TO LATE
ST TRANSACTION"
6250 PRINT" 4. RETURN TO OTHER P
ROCEDURES"
6260 PRINT:PRINT:INPUT" M
AKE YOUR CHOICE";Q
6270 IF Q<1 OR Q>4 THEN GOTO 621
0
6280 ON Q GOTO 6290,6500,6570

```

```

6282 IF IC=1 THEN 4544
6286 FOR I=1 TO X:C(I)=0:NEXT I:
GOTO 80
6290 CLS:PRINT"THIS ROUTINE WILL
ALLOW YOU TO SAVE ON TAPE ALL
TRANSACTIONS AND SUBTOTALS NOW
IN MEMORY. PRESS <ENTER> TO
CONTINUE. ENTER ANY OTHER K
EY TO ESCAPE."
6300 INPUT E#
6310 IF E#<>" " THEN GOTO 6210
6320 K=1:S=X:TN#="ALL"+STR*(X):G
OSUB 6330:GOTO 6210
6330 CLS:PRINT"SET UP RECORDER A
ND TAPE IN THE RECORD MODE. MAKE
NOTE OF START TAPECOUNT FOR FUT
URE REFERENCE.":PRINT:PRINT:PRIN
T"PRESS <ENTER> TO CONTINUE."
6340 PRINT:PRINT"PLEASE MAKE A N
OTE: THE NAME OF THI
S TAPEFILE IS:"
6350 PRINTTAB(10),TN#:PRINT"NOTE
ALSO TAPE NUMBER AND TAPE COUN
TER NUMBER":PRINT:INPUT"PRESS <E
NTER> TO CONTINUE";E#
6360 OPEN"O",-1,TN#
6370 PRINT#-1,D,W,Z#,Y#,X,R,M,IC
,DT#
6375 IF IC=1 THEN PRINT#-1,DI,DI
#
6380 FOR I=1 TO M
6390 PRINT#-1,T*(I),RT(I),IT(I)
6400 FOR J=K TO S
6410 PRINT#-1,A(I,J)
6420 NEXT J
6430 NEXT I
6435 FOR J=K TO S:PRINT#-1,A*(J)
:NEXT J
6440 CLOSE-1
6450 MOTORON:FOR I=1 TO 1600:NEX
T I:MOTOROFF
6460 CLS:PRINT"FILE "TN#" IS SAV
ED.":PRINT"PLEASE NOTE TAPECOUNT
FOR FUTUREREFFERENCE.":PRINT:INP
UT"DO YOU WANT A BACKUP TAPE Y/N
";YN#
6470 IF YN#="N" THEN RETURN
6480 IF YN#<>"Y" THEN GOTO 6460
6490 GOTO 6330
6500 CLS:PRINT"THIS ROUTINE WILL
ALLOW YOU TO SAVE ON TAPE ONLY
THE FINAL BALANCES IN EACH
SUB-ACCOUNT AND THE FINAL BAL
ANCE IN THE ENTIRE ACCOUNT.":
PRINT:PRINT"PRESS <ENTER> TO CON
TINUE.":PRINT"ENTER ANY KEY TO E
SCAPE."
6510 INPUT E#

```

Telewriter-64™

the Color Computer Word Processor

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THE ORIGINAL

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

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

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

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

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

— Color Computer News, Jan. 1982

TELEWRITER-64

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

64K COMPATIBLE

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

64 COLUMNS (AND 85!)

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

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

RIGHT JUSTIFICATION & HYPHENATION

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

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

FEATURES & SPECIFICATIONS:

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

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

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

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

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

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

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

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

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

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

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

— The RAINBOW, Jan. 1982

PROFESSIONAL WORD PROCESSING

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

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

To order, send check or money order to:

Cognitec
704 Nob Street
Del Mar, CA 92014

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

(Add \$2 for shipping. Californians add 6% state tax. Allow 2 weeks for personal checks. Send self-addressed stamped envelope for Telewriter reviews from CCN, RAINBOW, 80-Micro, 80-U.S. Telewriter owners: send SASE or call for information on upgrading to Telewriter-64. Telewriter-compatible spelling checker (Spell 'n Fix) and Smart Terminal program (Colorcom/E) also available. Call or write for more information.)

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

```

6520 IF E*(<>)" THEN GOTO 6210
6530 TN*="ONLY"+STR*(X):K=X:S=X:
XX=X:X=1
6540 GOSUB 6330:X=XX:XX=0:GOTO 6
210
6570 CLS:PRINT"THIS ROUTINE WILL
ALLOW YOU TO SAVE ON TAPE A SE
T OF TRANS- ACTIONS, AFTER YO
U CHOOSE START TRANSACTION NUMBE
R"
6580 PRINT:PRINT"PRESS <ENTER> T
O CONTINUE.":PRINT:INPUT"ENTER A
NY KEY TO ESCAPE";E*
6590 IF E*(<>)" THEN GOTO 6210
6600 CLS:INPUT"DO YOU KNOW THE N
UMBER OF YOUR START TRANSACTIO
N? Y/N ";YN*
6610 IF YN*="N" THEN GOSUB 9600:
GOTO 6630
6620 IF YN*(<>)"Y" THEN GOTO 6600
6630 INPUT"ENTER START TRANSACTI
ON NUMBER ";K:S=X
6650 TN*=STR*(K)+"-"+STR*(S)
6660 GOSUB 6330:GOTO 6210
7200 'OUTPUT TO PRINTER ROUTINE
7205 POKE153,13:PRINT#-2,CHR*(29
);CHR*(27);CHR*(54)
7209 CLS:INPUT"COLUMN WIDTH OF P
RINTER";PW:SZ=INT((PW-LEN(Z*))/2
):SY=INT((PW-LEN(Y*)-10)/2):SW=I
NT((PW-22)/2):POKE154,PW-10:POKE
155,PW:FA=INT(PW/13)
7210 CLS:PRINT" PRINTER ROUT
INES MENU":PRINT:PRINT
7220 PRINT" 1. PRINT ALL ITEMS N
OW IN MEMORY"
7230 PRINT" 2. PRINT LATEST (#)
ITEMS"
7240 PRINT" 3. PRINT SELECTED IT
EMS"
7250 PRINT" 4. RETURN TO OTHER P
ROCEDURES":PRINT:PRINT:INPUT Q
7260 IF Q<1 OR Q>4 THEN 7210
7270 ON Q GOTO 7280,7310,7380
7272 IF IC=1 THEN 4544
7276 POKE153,16:FOR I=1 TO X:C(I
)=0:NEXT I:GOTO 80
7280 CLS:INPUT"DO YOU WANT TO PR
INT ALL ITEMS NOW IN MEMORY Y/N
";YN*
7290 IF YN*(<>)"Y" THEN 7210
7300 B=1:H=X:FOR I=B TO H:C(I)=1
:NEXT I:GOSUB 12030:FOR I=1 TO X
:C(I)=0:NEXT I:GOTO 7210
7310 'PRINT LATEST FEW TRANSACTI
ONS ROUTINE
7320 CLS:INPUT"DO YOU WANT TO PR
INT THE LATEST TRANSACTION(S) Y/

```

```

N";YN*
7330 IF YN*(<>)"Y" THEN 7210
7340 CLS:INPUT"PRESS <ENTER> TO
SEE MENU OF ALL TRANSACTIONS
IN MEMORY NOW. MAKE A NOTE OF TH
E NUMBER OF THE ITEM YOU WANT THE
PRINTOUT TO START WITH, THEN
ENTER <30> TO CONTINUE PRINTER
ROUTINE.";E*
7350 GOSUB 9600
7360 CLS:INPUT"ENTER THE NUMBER
OF THE ITEM WITH WHICH YOU WA
NT TO START THE PRINTOUT.";B
7370 H=X:B=B:FOR I=B TO H:C(I)=1
:NEXT I:GOSUB 12030
7372 INPUT"REPEAT LIST? Y/N";YN*
7374 IF YN*="Y" THEN 7370 ELSE F
OR I=1 TO X:C1(I)=0:C(I)=0:NEXT
I:GOTO 7210
7380 'PRINT SELECTED SET OF TRAN
SACTIONS
7390 CLS:INPUT"DO YOU WANT TO PR
INT SELECTED TRANSACTIONS ONLY
Y/N";YN*
7400 IF YN*(<>)"Y" THEN 7210
7410 CLS:PRINT"PRESS <ENTER> FOR
TRANSACTIONS MENU, OR ANY OTHE
R KEY TO ESCAPE ENTER THEN THE NU
MBERS OF THE TRANSACTIONS YOU
WANT TO PRINT. IF THE PROMPT FOR
'NEXT PAGE' APPEARS, YOU MAY
NEED TO"
7420 INPUT"USE IT TO FIND THE TR
ANSACTIONS YOU NEED TO PRINT. WH
EN YOU ENTER <F> TO ESCAPE T
HE MENU, THE PRINTER ROUTINE W
ILL BEGIN. ";E*
7430 IF E*(<>)" THEN 7410
7440 GOSUB 9600:FOR I=1 TO X:IF
C1(I)=1 THEN C(I)=1
7443 NEXT I
7445 B=1:H=X:GOSUB 12030
7450 INPUT"REPEAT LIST? Y/N";YN*
7460 IF YN*="Y" THEN 7445 ELSE F
OR I=1 TO X:C1(I)=0:C(I)=0:NEXT
I:GOTO 7210
8200 'END SESSION ROUTINE
8210 INPUT"DO YOU WANT TO END SE
SSION Y/N";YN*
8220 IF Y/N*="N" THEN GOTO 80
8230 IF YN*(<>)"Y" THEN GOTO 8210
8240 END
9000 'INPUT ITEMS ROUTINE
9005 CLS:PRINT"IF ENTRY ITEM IS
A WITHDRAWAL OR A TRANSFER OUT, B
E SURE TO ENTER (-) SIGN FIRST."

```

```

9010 FOR I=1 TO D:IF C(I)<>1 THE
N GOTO 9020
9012 PRINT CD$ FOR "T$(I);:INPU
T A(I,X)
9015 A(M,X)=A(M,X)+A(I,X)
9020 NEXT I:GOSUB 9200:RETURN
9200 'EDIT ITEMS-INPUT ROUTINE
9210 CLS:PRINT"LIST OF ITEMS, AS
RECEIVED:":PRINT
9220 FOR I=1 TO M:PRINT I;:PRINT
USING"###.##";A(I,X);:PRIN
T";:NEXT I
9230 PRINT@384,"NEED TO EDIT Y/N
";:INPUT YN$
9240 IF YN$="N" THEN RETURN
9250 IF YN$<>"Y" THEN GOTO 9210
9260 PRINT@384,"ENTER NUMBER OF
WRONG ITEM ";:INPUT NX
9270 A(M,X)=A(M,X)-A(NX,X)
9290 PRINT@384,"":PRINT@416,"":P
RINT@384,CD$ FOR "T$(NX);:INPUT
A(NX,X):A(M,X)=A(M,X)+A(NX,X):G
OTO 9210
9400 'TOTAL-LAST-TWO-ITEMS ROUTI
NE
9410 X=X+1:A$(X)=DT$+"TOT":FOR I
=1 TO M:A(I,X)=A(I,X-1)+A(I,X-2)
:RT(I)=A(I,X):NEXT I:RETURN
9420 'TITLE MENU ROUTINE
9425 GOSUB 9430:GOTO 9440
9430 CLS:PRINTTAB(10)"TITLE MENU
":PRINT:RETURN
9440 FOR I=1 TO M:IF C(I)=0 THEN
PRINT I;T$(I), ELSE PRINT "":G
OTO 9460
9460 NEXT I
9470 PRINT@384,"ENTER # OF EACH
ACCOUNT CHANGED ENTER <30>TO END
SELECTING ENTER <55> TO ST
ART OVER";:INPUT B
9480 IF B>0 AND B<21 THEN GOTO 9
520
9490 IF B=30 THEN RETURN
9500 IF B=55 THEN FOR I=1 TO M:C
(I)=0:NEXT I:GOSUB 9430:GOTO 944
0
9510 GOTO 9470
9520 C(B)=1:GOSUB 9430:GOTO 9440
9600 'TRANSACTIONS MENU ROUTINE
9610 F=1:GOSUB 9620:GOTO 9630
9620 CLS:PRINT"CHOOSE TRANSACTIO
NS NEEDED":PRINT:RETURN
9630 FOR I=F TO X:IF C1(I)=1 THE
N PRINT";:GOTO 9650
9640 PRINT I;A$(I);",
9650 IF INT(I/20)=I/20 AND X>I T
HEN QQ=1:GOTO 9670

```

```

9660 NEXT I
9670 PRINT@384,"":PRINT@384,"OPT
IONS:<#>=CHOICE <F>=FINISHED<A>
=RESTART CHOICES ";:IF QQ=1
THEN GOSUB 9760
9680 INPUT B$
9700 IF B$="/" THEN F=F+20:GOSUB
9620:GOTO 9660
9710 IF B$="A" THEN FOR I=1 TO X
:C1(I)=0:NEXT I:GOTO 9610
9720 IF B$="F" THEN RETURN
9740 IF VAL(B$)<F OR VAL(B$)>F+1
9 THEN GOSUB 9620:GOTO 9630
9750 NC=VAL(B$):C1(NC)=1:I=F:GOS
UB 9620:GOTO 9630
9760 PRINT@448,"</>=NEXT PAGE
";:QQ=0:RETURN
10000 'INTEREST RATE DETERMINING
ROUTINE
10005 O=A(M,X)
10010 CLS:INPUT"TOTAL INTEREST C
REDITED ON NEXT STATEMENT";IN
10020 INPUT"NUMBER OF TRANSACTIO
NS WHICH CHANGED ACCOUNT TOTA
L UP TO AND INCLUDING CREDITING
OF INTEREST AT END OF NEXT PERIO
D";TX
10030 FOR I=1 TO TX:INPUT"NUMBER
OF DAYS ACCOUNT TOTAL STAYED
THE SAME BEFORE NEXT TRANSA
CTION";TM
10040 PT=O*TM/365
10050 IF I=TX THEN 10070
10055 INPUT"AMOUNT OF NEXT CHANG
E IN ACCOUNTTOTAL: (USE <-> SIGN
, IF NEG.) ";CH
10060 O=O+CH
10070 PZ=PZ+PT:NEXT I
10090 R=IN/PZ:PZ=0
10100 CLS:PRINT"INTEREST RATE FO
R THIS PERIOD IS";R
10110 INPUT"PRESS <ENTER> FOR OT
HER PROCEDURES";E$:RETUR
N
11000 'DT$ AND TM ENTRY ROUTINE
11010 CLS:PRINT:PRINT:PRINT"EFFC
TIVE DATE OF "CD$;:INPUT N$
11020 IF N$=""THEN PRINT DT$:GOT
O11040
11030 DT$=N$
11040 PRINT:INPUT"NUMBER OF DAYS
SINCE LAST TRANSACTION";N
$
11050 IF N$=""THEN PRINT TM:GOTO
11070
11060 TM=VAL(N$)
11070 PRINT:PRINT:INPUT"NEED TO
EDIT Y/N";YN$

```

```

11080 IF YN$="Y" THEN GOTO 11010
11090 IF YN$<>"N" THEN GOTO 11070
11100 A$(X)=DT$+CD$:RETURN
12000 'PRINTOUT ROUTINE
12030 INPUT"IS PRINTER READY? ENTER ANY KEY TO ESCAPE. PRESS <ENTER> TO BEGIN PRINTING";E$
12040 IF E$<>" " THEN 7210
12043 PRINT#-2,STRING$(SZ," ");Z$
12045 PRINT#-2,STRING$(SY," ");ACCOUNT # ";Y$
12047 PRINT#-2,STRING$(SW," ");REPORT DATE: ";DT$:PRINT#-2,CHR$(10)
12050 F=FA-1:S=1
12060 IF M<F THEN F=M:U=1:V=1:GO TO 12100
12070 U=INT(M/F)
12080 IF U=M/F THEN V=U ELSE V=U+1
12090 DC$="DATE/CODE"
12100 FOR K=1 TO V:IF K=U+1 THEN F=M
12110 PRINT#-2,DC$,
12120 FOR I=S TO F:PRINT#-2,STRING$(11-LEN(T$(I)), " ");T$(I);NEXT I:PRINT#-2,CHR$(13)
12130 FOR J=0 TO H:IF C(J)<>1 THEN 12140
12140 PRINT#-2,A$(J),
12150 FOR I=S TO F
12160 PRINT#-2, USING"###.###.#";A(I,J);:PRINT#-2," ",
12170 NEXT I
12180 PRINT#-2
12190 NEXT J
12200 PRINT#-2:PRINT#-2," ";CHR$(13)
12210 S=F+1:F=F+F
12220 NEXT K:RETURN
    
```

CCN TIP
by Jeffrey Stipes

Want to know the Address of a Machine Language Program?

1. CLOADM the program
2. Do NOT EXEC
3. Using the command mode
 - A) PRINT PEEK(487)* 256 + PEEK(488) - Start Add.
 - B) PRINT PEEK(126)* 256 + PEEK(127) - 1 - End Add.
 - C) PRINT PEEK(157)* 256 + PEEK(158) - Exec Add.

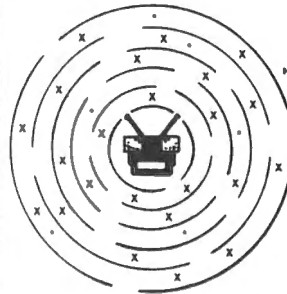
COLOR COMPUTER SOFTWARE

STINGER

A Color Computer Original

Can YOU raid the hive without being stung? Watch out! Everything moves in this game. Even the different levels of the hive rotate.

This fast machine language game has high resolution color graphics and sound. Works on any 16K or larger Color Computer. Joystick required.



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The Cassette Spelling Verifier

Finds all of your misspelled words and typing errors. Designed specifically for cassette operation. Works with Color Scripts, Telewriter and other major word processors.

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At last, the development tools you need! All available instantly at power-up.

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- Send all 127 ASCII characters
- Word Mode eliminates split words
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CCEED: This 8K Basic Program supports cassette files, has full cursor control, line insertion/deletion, and much more. Two pass assembler supports full 6809 instruction set & addressing modes, lists to screen or printer. Debugger allows memory examine/modify, program execution. If not delighted return within 2 weeks for a full refund. You get fully commented Basic source & complete instructions. Requires Ext. Basic & 16K.....CASSETTE \$6.95

Send check, money order, or Visa/MC Number Include \$1.50 for postage and Handling; Visa/MC: Phone for fast service



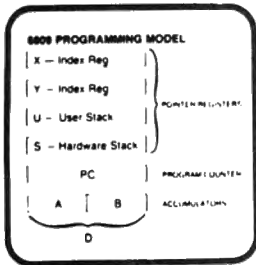
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PROGRAMMING TOOLS



DISK MACRO ASSEMBLER

Macro conditional assembler supports all standard 6809 mnemonics & directives and also conditional assembly, repeat sequences, library files, & a cross reference program. It can handle any size source input file. Radio Shack disk. . \$49.95
FLEX disk. . \$50.00



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These time saving programs also teach you more about the disk. REPAIR fixes deleted or garbaged files. FIND displays starting, ending, & transfer addresses. VIEW displays the contents of an ASCII file. PRINT gives a neat disk directory. MASDEL deletes all files per request. disk only. . \$24.95

RANDOM BASIC for FLEX

Extraordinary file handling capabilities make this BASIC, a standard on most 6809 machines already, a programmer's choice! ISAM, Random, & Sequential file structures. Flexible user input commands and easy output formatting. Extended variable names. Line editor. FLEX disk. . \$75.00

SCRIBE EDITOR for FLEX

A complete program editor for serious programmers. Includes find, search, change, delete, insert commands for characters,



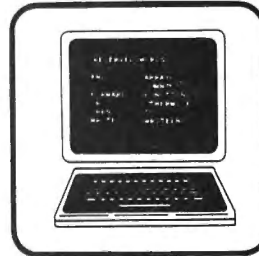
lines, or blocks. Macros and merge capabilities. Editor files larger than memory. Interfaces with text processor for word processing. Great with our Macro Assembler. FLEX disk. . \$50.00

COLOR EDITOR

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. cassette. . \$29.95

COLOR ASSEMBLER

This complete 6809 machine code assembler supports all 6809 mnemonics & addressing modes along with standard assembler options & directives. As a two pass assembler, it allows both forward and backward references. Learn assembly language programming! cassette. . \$29.95



PASCAL

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. cassette. . \$49.95
disk. . \$59.95

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. cassette. . \$17.95
disk. . \$22.95

COLOR MONITOR

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. cassette. . \$24.95
disk. . \$29.95



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. cassette. . \$29.95
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By Robert P. Bussell

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 City, town or post office, State and ZIP code
Lexington Park, MD 20653

Last winter when I received the February issue of Color Computer News, I read Warren Napier's 1981 TAX program with interest but I had already prepared my IRS forms for that year. This week I received my dreaded 1982 1040 tax packet in the mail. I decided that this year I would let my computer do the drudgery work for me. I went into my automated filing system (a cardboard box filled with back issues of magazines I am going to index) and retrieved Warren's fine program. After looking it over for a while I decided to make use of the 32K and Extended BASIC capabilities of my computer. I wanted my version of this program to assist me in easily performing "What if?" analysis.

Every year I ask myself the same questions. Should I take the standard deduction? Should I file a joint return or should my wife and I file separate returns? Many hours later I usually have the answer and a heck of a headache. The changes I make to Warren's program are small but they did require quite a bit of additional memory. First I revised the program to reflect the changes between the 1981 Form 1040 and the 1982 form. In doing the analysis for these changes I was astounded by the very subtle changes made in tax laws which were in most cases to the advantage of the IRS. I choose not to implement the processing of the Schedule G Income Averaging because for me it has been of little use. If you need this function, it can be easily added by including it in the main menu and adding the subroutine entry line number to the jump table in line 180. This version of the



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, copies and much more. All keys have convenient auto repeat (typamatic), and since no line numbers are required, the full width of the screen may be used to generate well commented code.

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

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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**

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TAX

program includes tax computation for all five filing statuses. Another change I made was the addition of an entry for every line included in either the 1040 Form or Schedule A. A subroutine has been made to produce a hardcopy of all entries made during a run of the program. All data entries made during a run have been saved in one of two tables Table L contains all entries for the 1040 Form and table A contains all entries for Schedule A.

This program is very simple to use. Load the program using the CLOAD command and when you receive the prompt OK execute the command RUN. In about 30 seconds the Menu will be displayed. The Menu is shown below:

MENU

1. ALL
2. INCOME
3. TAX COMPUTATION
4. SCHEDULE A
5. PRINT SUMMARIES
6. END PROGRAM

SELECT FROM MENU (1-6)

The function 'ALL' will step you through

the entire process of preparing your 1982 income tax. You will be asked to declare your filing status, number of exemptions, and your income figures. There are 20 income entries so after the completion of this section, a summary of the entries made is displayed on the display screen. If all of the entries are to your satisfaction you may continue on to the next entry. If, however, you want to make changes to the income section you can by answering Y to the prompt ANY CHANGES Y/N. You will receive the prompt SELECT LINE NO. TO CHANGE. If you select a legal line number you will receive the prompt PRESENT VALUE IS 1234.56 NEW VALUE? After entering the new value the income figures will be recomputed and displayed. Some values like line 9C are computed and can't be changed. It would be changed by changing either line 9A or line 9B. After computing gross income you are asked if you wish to enter any income adjustments. An answer of "Y" will allow you to enter any adjustments. If you answer "N" your adjusted gross income will be displayed. Next you will be asked if you want to itemize deductions. If

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TAX

you answer "Y" to this prompt the program will jump to the Schedule A subroutine. Upon completion of the deductions subroutine the program will begin the tax computation processing. You will continue through this phase of processing until your tax computation is completed and your refund or amount owed is computed. At this time you are returned to the menu.

Rather than perform the entire tax process at one time you may elect to run just one function by selecting that function from the menu. One feature of Mr. Napier's program that I particularly liked and have retained is the ability to use data from one section of the program in another section of the program. One way I used this feature was to determine the effect on my taxes if my eldest son was no longer a dependent. To do this I selected the ALL function and computed my taxes with all of my exemptions. I saved these results on the printer. Next, I reran the program and selected the TAX COMPUTATION function. Since this time I did not run the full program, I was asked to enter data from other sections when it was needed. I used the same figures I had used previously but changed the number of exemptions. This whole process took about a minute which was faster than I had ever been able to do this before.

Data entered into this program may be in whole dollars or dollars and cents. Internally, data is handled as decimal data with two decimal places. Data is rounded to the nearest cent. There is a quirk in BASIC when converting data from decimal to the BASIC's floating point format. For example the number 234.76-200 will print the result 34.7600001. To correct for this quirk I use the algorithm $A = \text{INT}(A * 100 + .5) / 100$. This not only corrects for this problem, it performs the rounding function for cents.

The program has been designed to do tax computations for returns with dollar values up to \$499,999.99. However, to save room on screen displays, only numbers up to 99,999.99 will display on one line without wraparound to the next line. Although every effort has been made to debug this program it has been designed as an analysis tool and you should still carefully check your return before sending it in. I hope you all find this program as useful as I have.

```
10 CLS:POKE150,41:CLEAR 1000:RES
TORE
20 PRINT@71,"1982 INCOME TAX"
30 PRINT@423,"BY WARREN S. NAPIE
R"
40 DIM L$(80),L(80),A$(36),A(36)
,WN(13,2),SV(13,2),WX(14,2),SX(1
4,2),WZ(13,2),SZ(13,2),WY(13,2),
SY(13,2)
50 PRINT@452,"MODIFIED BY R. P.
BUSSELL":PRINT@490," 12/27/82"
;
60 FORX=1 TO 2000:NEXT:GOSUB 344
0:GOSUB3720
70 CLS:PRINT TAB(8)"1982 INCOME
TAX"
80 PRINT:PRINTTAB(13)"MENU"
90 PRINT:PRINT"1. ALL"
100 PRINT"2. INCOME"
110 PRINT"3. TAX COMPUTATION"
120 PRINT"4. SCHEDULE A"
130 PRINT"5. PRINT SUMMARIES"
140 PRINT"6. END PROGRAM"
150 PRINT:PRINT"SELECT FROM MENU
(1-6)"
160 Q$=INKEY$:IF Q$=""THEN160
170 I=VAL(Q$):IF I<1 OR I>6 THEN
160
180 ON I GOSUB 210,640,1170,2050
,2820,200
190 GOTO 70
200 CLS:PRINT@32,"PROGRAM TERMIN
ATED":END
210 FOR X=1 TO 80:L(X)=0:NEXT X:
FOR X=1 TO 36:A(X)=0:NEXT X' FIL
ING STATUS*
220 SOUND75,2:CLS:PRINT@73,"FILI
NG STATUS"
230 PRINT:PRINT"1. SINGLE"
240 PRINT"2. MARRIED-JOINT"
250 PRINT"3. MARRIED-SEPARATE"
260 PRINT"4. HEAD OF HOUSEHOLD"

270 PRINT"5. QUALIFYING WIDOW(E
R)"
280 PRINT:PRINT" YOUR STATUS
(1-5)"
290 Q$=INKEY$:IFQ$=""THEN290
300 FS=VAL(Q$):IF FS<1 OR FS>5 T
HEN 290
310 IF FS=5 THEN E=100:FS$="QUAL
IFYING WIDOW":L(5)=1
320 IF FS=1 THEN E=100:FS$="SING
LE":L(1)=1
330 IF FS=2 THEN E=200:FS$="MARR
IED-JOINT":L(2)=1
340 IF FS=3 THEN E=100:FS$="MARR
IED-SEPARATE":L(3)=1
```

```

350 IF FS=4 THEN E=100:FS$="HEAD
  OF HOUSEHOLD":L(4)=1
360 PRINT:PRINT"YOUR STATUS: "FS
  $
370 PRINT"CHANGE STATUS Y/N"
380 Q$=INKEY$:IF Q$="N" THEN 390
  ELSE IF Q$="Y"THEN220 ELSE 380
390 '*EXEMPTIONS*
400 SOUND75,2:CLS:PRINT@42,"EXEM
  PTIONS"
410 PRINT@69,"TYPE <1> IF EXEMPT
  ION          APPLIES, <0> IF
  NOT"
420 PRINT@160,"1.  SELF";
430 GOSUB 3690:BA=X:PRINTBA:L(6)
  =BA
440 PRINT@192,"2.  SPOUSE";
450 GOSUB 3690:BB=X:PRINTBB:L(7)
  =BB
460 PRINT@224,"3.  SELF--OVER 65
  ";
470 GOSUB3690:BC=X:PRINTBC:L(6)=
  BC+L(6)
480 PRINT@256,"4.  SPOUSE--OVER
  65";
490 GOSUB 3690:BD=X:PRINTBD:L(7)
  =L(7)+BD
500 PRINT@288,"5.  SELF--BLIND";

510 GOSUB3690:BE=X:PRINTBE:L(6)=
  L(6)+BE
520 PRINT@320,"6.  SPOUSE--BLIND
  ";
530 GOSUB3690:BF=X:PRINTBF:L(7)=
  L(7)+BF
540 PRINT@352,"7.  DEPENDENT CHI
  LDREN";
550 Q$=INKEY$:IF Q$=""THEN 550 E
  LSE X=VAL(Q$)
560 IF X<0 OR X>9 THEN 550 ELSE
  BG=X:PRINT BG:L(8)=BG
570 PRINT@384,"8.  OTHER DEPENDE
  NTS";
580 Q$=INKEY$:IF Q$=""THEN 580 E
  LSE X=VAL(Q$)
590 IF X<0 OR X>9 THEN 580 ELSE
  BH=X:PRINT BH:L(9)=BH
600 ET=BA+BB+BC+BD+BE+BF+BG+BH:L
  (10)=ET
610 PRINT@416,"NO. EXEMPTIONS =
  "L(10)
620 PRINT"ANY CHANGES Y/N"
630 Q$=INKEY$:IF Q$="Y"THEN390 E
  LSE IF Q$="N"THEN 640 ELSE 630
640 'CALCULATE GROSS INCOME
650 IF E=0THENCLS:PRINT"AMOUNT O
  F INTEREST/DIVIDEND EX- CLUSIONS
  (SEE FILING STATUS";:INPUT E:L(

```

```

14)=E
660 SOUND75,2:CLS:PRINT@12,"INCO
  ME "
670 PRINT:PRINT"IF A LOSS IS SHO
  WN, USE <-> IN FRONT OF THE FIG
  URE"
680 PRINT:PRINT"LINE 7--WAGES,SA
  LARIES,TIPS,ETC.":;INPUT L(11)
690 PRINT"LINE 8--INTEREST INCOM
  E":;INPUT L(12)
700 PRINT"LINE 9A--DIVIDENDS":;I
  NPUT L(13)
710 L(14)=E:L(15)=L(13)-L(14):IF
  L(15)<0 THEN L(15)=0
720 L(15)=INT(L(15)*100+.5)/100
730 PRINT"LINE 9C--TOTAL = "L(15
  )
740 PRINT"LINE 9B--EXCLUSIONS =
  "L(14)
750 CE=CD-E:IFCE<0 THEN CE=0
760 PRINT"LINE 10--REFUNDS: STAT
  E/LOCAL          TAXES":;INP
  UT L(16)
770 PRINT"LINE 11--ALIMONY RECEI
  VED          ";:INPUT L(17)
780 PRINT"LINE 12--BUSINESS INCO
  ME/LOSS          SCHED C":;I
  NPUT L(18)
790 PRINT"LINE 13--CAPITAL GAIN/
  LOSS          SCHED D":;I
  NPUT L(19)
800 PRINT"LINE 14--40% CAP. GAIN
  DISTR.          ";:INPUT L(20)
810 PRINT"LINE 15--SUPP. GAINS/L
  OSES          ";:INPUT L(21)
820 PRINT"LINE 16--TAXABLE PENSI
  ONS (NOT          ON LINE 17)
  ";:INPUT L(22)
830 PRINT"LINE 17A--OTHER PENSIO
  NS/ANNUI-          TIES":;IN
  PUT L(23)
840 PRINT"LINE 17B--TAXABLE FROM
  P.10          WORKSHEET;
  :INPUT L(24)
850 PRINT"LINE 18--RENT,ROYALTIE
  S, ETC.          SCHED E":;
  INPUT L(25)
860 PRINT"LINE 19--FARM INCOME/L
  OSS          ";:INPUT L(26)
870 PRINT"LINE 20A--UNEMPLOYMENT
  COMP.          ";:INPUT L(27)
880 PRINT"LINE 20B--TAXABLE UNEM
  P. COMP.          FROM P.10"
  ;:INPUT L(28)
890 PRINT"LINE 21--OTHER INCOME
  P.10          ";:INPUT L(29):GOSUB 9
  00:GOTO910
900 L(30)=L(11)+L(12)+L(15)+L(16

```

SOMETHING NEW IS COMING OUT

The CCN Magna-zine SamplerSeries!!!

The CCN Magna-zine Service announces the birth of six new volumes of the *SamplerSeries* software tapes. Since last Summer we have been licensed by Color Computer News to publish the magazine's "loader" software tapes (*see separate subscription information below*) and now are making this wealth of previously published programs easily available to everyone. No longer do you have to order a complete set of tapes (we do go back to the first issue) just to get all the programs you are particularly interested in. For an average of just about a dollar per program, one or two of the tapes described below should cover most people's needs! So just browse through our list and send off for your own *SamplerSeries* tape today!!

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PROGRAMMER'S TOOLBOX — This volume will be a boon to anyone writing or modifying their own software! There is something for *everyone*: utilities, applications, subroutines, program patches and several modification programs. Includes supplemental printed "mini-documentation" so even those who *don't* have a full set of back issues of Color Computer News magazine can make use of all the programs. (\$19.95 plus \$1.50 postage and handling)

WORDS & NUMBERS — You guessed it!! This volume contains word processors and data base management programs. But there is also a mailing list, tax information, check book file, mortgage computation, a shopping list generator and more!! (\$14.95 plus \$1.00 postage and handling)

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TAX

```

)+L(17)+L(18)+L(19)+L(20)+L(21)+
L(22)+L(24)+L(25)+L(26)+L(28)+L(
29):L(30)=INT(L(30)*100+.5)/100:
RETURN
910 GOSUB 3970
920 CLS:PRINT@32,"ARE THERE ANY
ADJUSTMENTS TO YOUR INCOME Y/
N"
930 Q$=INKEY$:IF Q$="Y"THEN980 E
LSE IF Q$<>"N"THEN 930
940 FOR X=31 TO 39
950 L(X)=0:NEXT X
960 L(40)=L(30)
970 CLS:PRINTTAB(5)"ADJUSTED GRO
SS INCOME":GOTO1130
980 '*ADJUSTMENTS TO GROSS INCOM
E
990 SOUND75,2:CLS:PRINTTAB(2)"AD
JUSTMENTS TO GROSS INCOME"
1000 PRINT:PRINT"LINE23--MOVING
EXPENSE";:INPUT L(31)
1010 PRINT"LINE 24--EMPLOYEE BUS
INESS EX- PENSES FORM 210
6";:INPUT L(32)
1020 PRINT"LINE 25--IRA PAYMENTS
";:INPUT L(33)
1030 PRINT"LINE 26--KEOGH PAYMEN
TS";:INPUT L(34)
1040 PRINT"LINE 27--INTEREST PEN
ALTY";:INPUT L(35)
1050 PRINT"LINE 28--ALIMONY PAID
";:INPUT L(36)
1060 PRINT"LINE 29--DEDUCTION FO
R MARRIED COUPLE";:INPUT L(37)
1070 PRINT"LINE 30--DISABILITY I
NCOME EX- CLUSION";:
INPUT L(38)
1080 L(39)=0:FOR X=31 TO 38
1090 L(39)=L(39)+L(X):NEXT X:L(3
9)=INT(L(39)*100+.5)/100
1100 PRINT"LINE 31--TOTAL ADJUST
MENTS =";L(39)
1110 GOSUB 4120
1120 '*CALCULATE ADJUSTED INCOME
*
1130 L(40)=L(30)-L(39):L(40)=INT
(L(40)*100+.5)/100
1140 PRINT:PRINT"ADJUSTED INCOME
=";L(40)
1150 IF L(40)<10000 THEN PRINT"S
EE 'EARNED INCOME TAX CREDIT', L
INE 62--P.15"
1160 PRINT:INPUT"PRESS <ENTER> T
O CONTINUE";Q$
1170 '*TAX COMPUTATION*
1180 SOUND75,2:CLS:PRINTTAB(8)"T
AX COMPUTATION"
1190 PRINT:PRINT"DO YOU WANT TO

```

```

ITEMIZE Y/N)"
1200 Q$=INKEY$:IF Q$=""THEN 1200
ELSE IF Q$="Y" THEN GOSUB 2050 E
LSE IF Q$<>"N"THEN 1200
1210 IF L(40)=0 THEN 1220 ELSE 1
230
1220 PRINT"ENTER YOUR ADJUSTED I
NCOME FROM LINE 32":INPUT L(40)
1230 L(41)=L(40):IF A(36)=0THEN
1240 ELSE 1250
1240 PRINT"IF USING STANDARD DED
UCTION ENTER A ZERO HERE.":I
NPUT"DEDUCTIONS FROM SCHED A";A(
36)
1250 L(42)=A(36)'FROM LINE 30-A
1260 PRINT"LINE 34A--DEDUCTIONS"
;L(42)
1270 IF L(42)=0 THEN INPUT"LINE
34B--ALLOWABLE CHARI
TIES";L(43)
1280 IF L(42)<>0 THEN L(44)=L(41
)-L(42) ELSE L(44)=L(41)-L(43)
1290 PRINT"LINE 35--ADJ INCOME ";
L(44)
1300 IF L(10)=0THEN1310 ELSE 133
0
1310 INPUT"NO. OF EXEMPTIONS";L(
10)
1320 IF FS=0THEN INPUT"FILING ST
ATUS 1-5";FS:L(FS)=1
1330 L(45)=1000*L(10):PRINT"LINE
36--EXEMPTIONS = ";L(45)
1340 L(46)=L(44)-L(45):IF L(46)<
0THEN L(46)=0:PRINT"LINE 37--TAX
ABLE INCOME = ";L(46) ELSE
PRINT"LINE 37--TAXABLE INCOME =
";L(46)
1350 PRINT"USE TAX TABLES Y/N"
1360 Q$=INKEY$:IF Q$=""THEN1360
ELSE IF Q$="N"THEN1400 ELSE IF Q
$<>"Y"THEN1360
1370 V=L(46):GOSUB 3080
1380 L(47)=VA+((L(46)-WN)*SN):L(
47)=INT(L(47)*100+.5)/100
1390 PRINT"LINE 38--TAX = ";L(47
):GOTO1430
1400 PRINT"COMPUTE TAX FROM TABL
E/SCHED ANDENTER ON LINE 38"
1410 PRINT:INPUT"ENTER TAX";L(47
):GOTO1430
1420 GOSUB 2820:L(47)=FD
1430 INPUT"LINE 39--ADDITIONAL T
AXES";L(48)
1440 L(49)=L(47)+L(48)
1450 PRINT"LINE 40--TOTAL TAXES
=";L(49)
1460 PRINT"ADJUST FOR CREDITS Y/
N"

```

TAX

```

1470 Q#=INKEY$: IF Q#="" THEN 1470
ELSE IF Q#="N" THEN 1600 ELSE IF
Q#<>"Y" THEN 1470
1480 CLS:PRINT@10,"CREDITS":INPU
T"LINE 41--CREDIT FOR ELDERLY
";L(50)
1490 INPUT"LINE 42--FOREIGN TAX
CREDIT ";L(51)
1500 INPUT"LINE 43--INVESTMENT C
REDIT ";L(52)
1510 INPUT"LINE 44--POLITICAL CO
NTRIBUTIONS";L(53)
1520 INPUT"LINE 45--DEPENDENT CA
RE ";L(54)
1530 INPUT"LINE 46--JOBS CREDIT"
;L(55)
1540 INPUT"LINE 47--ENERGY CREDI
T";L(56)
1550 INPUT"LINE 48--OTHER CREDIT
S";L(57)
1560 L(58)=L(50)+L(51)+L(52)+L(5
3)+L(54)+L(55)+L(56)+L(57):L(58)
=INT(L(58)*100+.5)/100
1570 PRINT"LINE 49--TOTAL CREDIT
S ";L(58)
1580 PRINT"CHANGES TO CREDITS Y/
N"
1590 Q#=INKEY$: IF Q#="" THEN 1590
ELSE IF Q#="N" THEN 1610 ELSE I
F Q#="Y" THEN 1480 ELSE 1590
1600 FOR X=50 TO 58:L(X)=0:NEXT
X
1610 L(59)=L(49)-L(58):IF L(59)<
0 THEN L(59)=0
1620 L(59)=INT(L(59)*100+.5)/100

1630 PRINT"LINE 50--BALANCE ";L(
59)
1640 PRINT"ADJUST FOR OTHER TAXE
S Y/N"
1650 Q#=INKEY$: IF Q#="" THEN 1650
ELSE IF Q#="N" THEN 1770 ELSE I
F Q#<>"Y" THEN 1650
1660 CLS:PRINT@6,"OTHER TAXES":I
NPUT"LINE 51--SELF EMPLOYMENT
";L(60)
1670 INPUT"LINE 52--MINIMUM TAX"
;L(61)
1680 INPUT"LINE 54--TAX FROM INV
EST. CREDIT";L(63)
1690 INPUT"LINE 55--FICA ON TIPS
";L(64)
1700 INPUT"LINE 56--UNCOLLECTED
FICA ";L(65)
1710 INPUT"LINE 57--TAX ON IRA";
L(66)
1720 INPUT"LINE 58--ADVANCE EARN
ED INCOME ";L(67)

```

```

1730 WK=L(60)+L(61)+L(62)+L(63)+
L(64)+L(65)+L(66)+L(67):WK=INT(W
K*100+.5)/100
1740 PRINT"TOTAL OTHER TAXES ="
;WK
1750 PRINT"CHANGES TO OTHER TAXE
S Y/N"
1760 Q#=INKEY$: IF Q#="" THEN 176
0 ELSE IF Q#="Y" THEN 1660 ELSE
IF Q#="N" THEN 1780 ELSE 1760
1770 FOR X=60 TO 67:L(X)=0:NEXTX
:WK=0
1780 L(68)=L(59)+WK
1790 PRINT"LINE 59--TOTAL TAX ="
;L(68)
1800 CLS:PRINT@4,"PAYMENTS MADE"

1810 INPUT"LINE 60--FED. TAXES W
ITHHELD ";L(69)
1820 INPUT"LINE 61--EST. TAX PAY
MENTS ";L(70)
1830 INPUT"LINE 62--EARNED INCOM
E CREDIT ";L(71)
1840 INPUT"LINE 63--FORM 4868 PA
YMENTS ";L(72)
1850 INPUT"LINE 64--EXCESS FICA
& RRTA ";L(73)
1860 INPUT"LINE 65--FUEL TAX CRE
DIT";L(74)
1870 INPUT"LINE 66--REG. INVESTM
ENT CREDIT ";L(75)
1880 L(76)=L(69)+L(70)+L(71)+L(7
2)+L(73)+L(74)+L(75):L(76)=INT(L
(76)*100+.5)/100
1890 PRINT"LINE 67--TOTAL TAXES
PAID ";L(76)
1900 PRINT"CHANGES TO TAXES PAID
Y/N"
1910 Q#=INKEY$: IF Q#="" THEN 191
0 ELSE IF Q#="Y" THEN 1800 ELSE
IF Q#<>"N" THEN 1910
1920 IF L(68)=L(76) THEN L(77)=0
:L(78)=0:L(79)=0:L(80)=0
1930 IF L(76) < L(68) THEN 2000
1940 L(77)=L(76)-L(68):L(77)=INT
(L(77)*100+.5)/100
1950 PRINT"LINE 68--AMOUNT OVERP
AID BY YOU ";L(77)
1960 INPUT"LINE 69--AMOUNT OF LI
NE 68 TO BE REFUNDED TO YOU";L
(78)
1970 IF INT(L(78)*100)>INT(L(77)
*100) THEN PRINT L(78);" IS GREA
TER THAN THE REFUND":GOTO 1960
1980 L(79)=L(77)-L(78):L(79)=INT
(L(79)*100+.5)/100
1990 PRINT"LINE 70--APPLY TO 198
3 TAX ";L(79):GOTO 2020

```

TAX

```

2000 L(80)=L(68)-L(76):L(80)=INT
(L(80)*100+.5)/100
2010 PRINT"LINE 71--AMOUNT YOU O
WE IRS = *** $";L(80)
2020 INPUT"PRESS <ENTER> TO CONT
INUE";Q$
2030 GOTO 70
2040 STOP
2050 *SCHEDULE A*
2060 SOUND75,2:CLS:PRINT@10,"SCH
EDULE A"
2070 IF L(40)=0 THEN2080 ELSE 20
90
2080 INPUT"ENTER ADJUSTED GROSS
INCOME FROM LINE 33";L(40)
2090 INPUT"LINE 1--MEDICINE/DRUG
S";A(1)
2100 A(2)=INT((L(40)*.01)+.5)
2110 PRINT"LINE 2--1% INCOME";A(
2)
2120 A(3)=A(1)-A(2):IF A(3)<0THE
NA(3)=0
2130 A(3)=INT(A(3)*100+.5)/100
2140 PRINT"LINE 3--DRUG DEDUCTIO
N ";A(3)
2150 INPUT"LINE 4--TOTAL MEDICAL
INSURANCE PREMIUMS";A(4)
2160 INPUT"LINE 5A--MEDICAL SERV
ICES ";A(5)
2170 INPUT"LINE 5B--MEDICAL TRAN
SPORTATION ";A(6)
2180 INPUT"LINE 5C--OTHER MEDICA
L";A(7)
2190 A(8)=A(3)+A(4)+A(5)+A(6)+A(
7):A(8)=INT(A(8)*100+.5)/100
2200 PRINT"LINE 6--TOTAL LINES 3
-5C";A(8)
2210 A(9)=INT((L(40)*.03)+.5)
2220 PRINT"LINE 7--3% OF EARNING
S ";A(9)
2230 A(10)=A(8)-A(9):IF A(10)<0
THEN A(10)=0
2240 A(10)=INT(A(10)*100+.5)/100

2250 PRINT"LINE 8--SUB TOTAL ";A
(10)
2260 A(11)=INT((A(4)*.5)*100)/10
0:IF A(11)>150 THEN A(11)=150
2270 PRINT"LINE 9--1/2 OF INSURA
NCE ";A(11)
2280 IF A(10) => A(11) THEN A(12
)=A(10) ELSE A(12)=A(11)
2290 PRINT"LINE 10--TOTAL MEDICA
L ";A(12)
2300 PRINT:PRINT"CHANGE MEDICAL
DEDUCTIONS Y/N"
2310 Q$=INKEY$:IF Q$=""THEN 2310
ELSE IF Q$="Y" THEN 2050 ELSE I

```

```

F Q$<>"N"THEN 2310
2320 CLS:PRINT@12,"TAXES"
2330 PRINT:INPUT"LINE 11--STATE/
LOCAL";A(13)
2340 INPUT"LINE 12--REAL ESTATE"
;A(14)
2350 INPUT"LINE 13A--GENERAL SAL
ES SEE THE TAXTABLES";A(15)
2360 INPUT"LINE 16B--GENERAL SAL
ES AUTO,ETC.";A(16)
2370 INPUT"OTHER TAXES";A(17)
2380 A(18)=A(13)+A(14)+A(15)+A(1
6)+A(17):A(18)=INT(A(18)*100+.5)
/100
2390 PRINT"LINE 15--TOTAL TAXES
";A(18)
2400 PRINT:PRINT"CHANGES TO TAX
ENTRIES Y/N"
2410 Q$=INKEY$:IF Q$=""THEN 2410
ELSE IF Q$="Y"THEN 2320 ELSE IF
Q$<>"N" THEN 2410
2420 CLS:PRINT@5,"INTEREST EXPEN
SES"
2430 INPUT"LINE 16A--HOME MORTGA
GE INTERESTTO FINANCIAL CO.";A(1
9)
2440 INPUT"LINE 16B--HOME MORTGA
GE INTERESTTO INDIVIDUALS";A(20)
2450 INPUT"LINE 17--CREDIT CARDS
& CHARGE ACCOUNTS";A(21)
2460 INPUT"LINE 18--OTHER";A(22)

2470 A(23)=A(19)+A(20)+A(21)+A(2
2):A(23)=INT(A(23)*100+.5)/100
2480 PRINT"TOTAL INTEREST ";A(23
)
2490 PRINT"CHANGES TO INTEREST Y
/N"
2500 Q$=INKEY$:IF Q$=""THEN 2500
ELSE IF Q$="Y" THEN 2420 ELSE I
F Q$<>"N"THEN 2500
2510 CLS:PRINT@4,"CONTRIBUTIONS"
:INPUT"LINE 20A--CASH CONTRIBUTI
ONS ";A(24)
2520 INPUT"LINE 20B--CASH OVER $
3000 ";A(25)
2530 INPUT"LINE 21--OTHER THAN C
ASH ";A(26)
2540 INPUT"LINE 22--CARRYOVER";A
(27)
2550 A(28)=A(24)+A(25)+A(26)+A(2
7):A(28)=INT(A(28)*100+.5)/100
2560 PRINT"TOTAL CONTRIBUTIONS "
;A(28)
2570 PRINT"CHANGE CONTRIBUTIONS
Y/N"
2580 Q$=INKEY$:IF Q$=""THEN 2580

```


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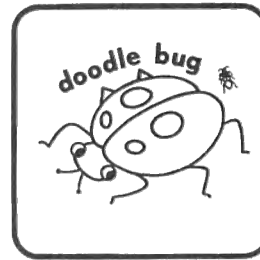
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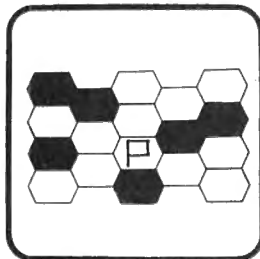
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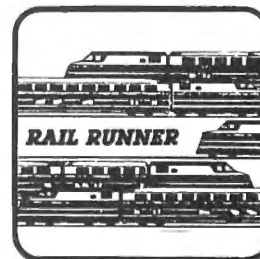
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```
ELSE IF Q#="Y" THEN 2510 ELSE I
F Q#<>"N" THEN 2580
2590 CLS:PRINT"MISC. DEDUCTIONS"
```

```
2600 INPUT"LINE 24--CASUALITY/TH
EFT LOSS ";A(29)
2610 INPUT"LINE 25A--UNION/PROF.
DUES ";A(30)
2620 INPUT"LINE 25B--TAX PREP. F
EE";A(31)
2630 INPUT"LINE 26--OTHER";A(32)
```

```
2640 A(33)=A(29)+A(30)+A(31)+A(3
2):A(33)=INT(A(33)*100+.5)/100
2650 PRINT"TOTAL MISC. ";A(33)
2660 PRINT"CHANGE MISC. Y/N"
2670 Q#=INKEY#: IF Q#="" THEN 267
0 ELSE IF Q#="Y" THEN 2590 ELSE
IF Q#<>"N" THEN 2670
2680 CLS:PRINT@4,"SUMMARY OF DED
UCTIONS"
```

```
2690 A(34)=A(12)+A(18)+A(23)+A(2
8)+A(33):A(34)=INT(A(34)*100+.5)
/100
```

```
2700 PRINT"LINE 28--DEDUCTIONS =
";A(34)
```

```
2710 IF FS=0 THEN INPUT"ENTER FI
LING STATUS 1-5";FS
```

```
2720 IF FS<1 OR FS >5 THEN 2710
2730 IF FS=2 OR FS=5 THEN A(35)=
3400
```

```
2740 IF FS=1 OR FS=4 THEN A(35)=
2300
```

```
2750 IF FS=3 THEN A(35)=1700
2760 PRINT"LINE 29--STD. DEDUCT.
=";A(35)
```

```
2770 A(36)=A(34)-A(35): IF A(36)<
0 THEN A(36)=0
```

```
2780 A(36)=INT(A(36)*100+.5)/100
```

```
2790 PRINT"LINE 30--TOTAL DEDUCT
IONS = ";A(36)
```

```
2800 INPUT"PRESS <ENTER> TO CONT
INUE";Q#
```

```
2810 RETURN
2820 '**PRINT SUMMARY
2830 F#=" LINE %
```

```
#####
#.# "
2840 F1#=" LINE %
```

```
%
## "
2850 PR=-2
```

```
2860 PRINT#PR,TAB(20);"*** IRS F
ORM 1040 SUMMARY ***"
```

```
2870 PRINT#PR,CHR*(10)
2880 INPUT"NAME PREPARED FOR";NA
#: INPUT"DATE PREPARED";DA#
```

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```

2890 PRINT#PR,TAB(10);NA#;TAB(60
);DA#;PRINT#PR,CHR$(10):PRINT#PR
,CHR$(29)
2900 FOR X=1 TO 10 STEP 2:PRINT#
PR,USINGF1#;L$(X);L(X);:PRINT#PR
,USINGF1#;L$(X+1);L(X+1):NEXT X
2910 FOR X=11TO 80 STEP 2
2920 PRINT#PR,USING F#;L$(X);L(X
);
2930 PRINT#PR,USING F#;L$(X+1);L
(X+1)
2940 NEXT X
2950 PRINT#PR,CHR$(30)
2960 PRINT#PR,CHR$(10):PRINT#PR,
STRING$(80,"*")
2970 PRINT#PR,CHR$(12)
2980 PRINT#PR,TAB(20);"*** SCHED
ULE A SUMMARY ***"
2990 PRINT#PR,CHR$(10)
3000 PRINT#PR,TAB(10);NA#;TAB(60
);DA#;PRINT#PR,CHR$(10):PRINT#PR
,CHR$(29)
3010 FOR X=1 TO 36 STEP 2
3020 PRINT#PR,USING F#;A$(X);A(X
);
3030 PRINT#PR,USING F#;A$(X+1);A
(X+1)
3040 NEXT X
3050 PRINT#PR,CHR$(30):PRINT#PR,
CHR$(10):PRINT#PR,STRING$(80,"*")
)
3060 PRINT#PR,CHR$(12)
3070 GOTO 70
3080 'SCHED Y TAX COMPUTATION
3090 IF V>500000 THENPRINT"OOPS.
.I CAN'T HANDLE THIS SEE AN ACCO
UNTANT.":GOTO 1170
3100 DATA 0,3400,3400,5500,5500,
7600,7600,11900,11900,16000,1600
0,20200,20200,24600,24600,29900,
29900,35200,35200,45800,45800,60
000,60000,85600,85600,499999
3110 ON FS GOTO 3190,3130,3310,3
250,3130
3120 PRINT"BAD FILING STATUS":FO
R WA=1TO1600:NEXT WA:GOTO 1320
3130 FOR X=1 TO 13
3140 IF V>WN(X,1) AND V<=WN(X,2)
THEN 3170
3150 NEXTX
3160 CLS:PRINT"NOT FOUND IN TAX
TABLE":FOR WA=1TO1600:NEXT WA:GO
TO1170
3170 WN=WN(X,1):SN=SV(X,1):VA=SV
(X,2)
3180 RETURN
3190 FOR X=1 TO 14
3200 IF V>WX(X,1) AND V<=WX(X,2)

```

```

THEN 3230
3210 NEXT X
3220 CLS:PRINT"NOT FOUND IN TAX
TABLE":FOR WA=1TO1600:NEXT WA:GO
TO1170
3230 WN=WX(X,1):SN=SX(X,1):VA=SX
(X,2)
3240 RETURN
3250 FOR X=1 TO 13
3260 IF V>WZ(X,1) AND V<=WZ(X,2)
THEN 3290
3270 NEXT X
3280 CLS:PRINT"NOT FOUND IN TAX
TABLE":FOR WA=1TO1600:NEXT WA:GO
TO 1170
3290 WN=WZ(X,1):SN=SZ(X,1):VA=SZ
(X,2)
3300 RETURN
3310 FOR X=1 TO 13
3320 IF V>WY(X,1) AND V<=WZ(X,2)
THEN 3350
3330 NEXT X
3340 CLS:PRINT"NOT FOUND IN TAX
TABLE":FOR WA=1TO1600:NEXT WA:GO
TO 1170
3350 WN=WY(X,1):SN=SY(X,1):VA=SY
(X,2)
3360 RETURN
3370 DATA 0,0,.12,0,.14,252,.16,
546,.19,1234,.22,2013,.25,2937,.
29,4037,.33,5574,.39,7323,.44,11
457,.49,17705,.50,30249
3380 DATA 0,2300,2300,3400,3400,
4400,4400,6500,6500,8500,8500,10
800,10800,12900,12900,15000,1500
0,18200,18200,23500,23500,28800,
28800,34100,34100,41500,41500,49
9999
3390 DATA 0,0,.12,0,.14,132,.16,
272,.17,608,.19,948,.22,1385,.23
,1847,.27,2330,.31,3194,.35,4837
,.40,6692,.44,8812,.50,12068
3400 DATA 0,2300,2300,4400,4400,
6500,6500,8700,8700,11800,11800,
15000,15000,18200,18200,23500,23
500,28800,28800,34100,34100,4470
0,44700,60600,60600,499999
3410 DATA 0,0,.12,0,.14,252,.16,
546,.20,898,.22,1518,.23,2222,.2
8,2958,.32,4442,.38,6138,.41,815
2,.49,12498,.50,20289
3420 DATA 0,1700,1700,2750,2750,
3800,3800,5950,5950,8000,8000,10
100,10100,12300,12300,14950,1495
0,17600,17600,22900,22900,30000,
30000,42800,42800,499999
3430 DATA 0,0,.12,0,.14,126,.16,
273,.19,617,.22,1006.5,.25,1468.

```

TAX

```

5, .29, 2018.5, .33, 2787, .39, 3661.5
, .44, 5728.5, .49, 8852.5, .50, 15124
.5
3440 FOR X=1 TO 13
3450 READ WN(X,1), WN(X,2)
3460 NEXT X
3470 FOR X=1 TO 13
3480 READ SV(X,1), SV(X,2)
3490 NEXT X
3500 FOR X=1 TO 14
3510 READ WX(X,1), WX(X,2)
3520 NEXT X
3530 FOR X=1 TO 14
3540 READ SX(X,1), SX(X,2)
3550 NEXT X
3560 FOR X=1 TO 13
3570 READ WZ(X,1), WZ(X,2)
3580 NEXT X
3590 FOR X=1 TO 13
3600 READ SZ(X,1), SZ(X,2)
3610 NEXT X
3620 FOR X=1 TO 13
3630 READ WY(X,1), WY(X,2)
3640 NEXT X
3650 FOR X=1 TO 13
3660 READ SY(X,1), SY(X,2)
3670 NEXT X
3680 RETURN
3690 Q#=INKEY#: IF Q#="" THEN 3690
3700 X=VAL(Q#): IF X<0 OR X>1 THEN 3690
3710 RETURN
3720 FOR X=1 TO 80
3730 READ L*(X)
3740 NEXT X
3750 GOTO 3860
3760 DATA 1 SINGLE, 2 MARRIED
JOINT, 3 MARRIED SEPARATE, 4
HEAD OF HOUSEHOLD, 5 QUALIFYING
WIDOW(ER), 6A YOURSELF, 6B SPOU
SE, 6C DEPENDENT CHILDREN
3770 DATA 6D OTHER DEPENDENTS, 6
E TOTAL EXEMPTIONS, 7 WAGES-SA
LARIES-TIPS, 8 INTEREST INCOME,
9A DIVIDENDS, 9B EXCLUSION, 9C
TOTAL DIVIDENDS, 10 REFUND STATE
& LOCAL TAX, 11 ALIMONY RECEIVE
D, 12 BUSINESS INCOME (LOSS), 13
CAPITAL GAIN (LOSS)
3780 DATA 14 40% CAPITAL GAIN ,
15 SUPPLEMENTAL GAINS (LOSS), 16
TAXABLE PENSIONS-IRA, 17A OTHER
PENSIONS, 17B TAX FROM WORKSHEET
P. 10, 18 RENTS-ROYALTIES, 19 F
ARM INCOME, 20A UNEMPLOYMENT COMP
ENSATION, 20B TAX FROM WORKSHEET
P. 10
3790 DATA 21 OTHER INCOME, 22 T

```

```

OTAL INCOME, 23 MOVING EXPENSE, 2
4 EMPLOYEE BUSINESS EXPENSE, 25
PAYMENT TO IRA, 26 PAYMENT TO K
EOGH, 27 EARLY WITHDRAWAL PENALT
Y, 28 ALIMONY PAID, 29 DEDUCTION
-WORKING COUPLE, 30 DISABILITY I
NCOME EXCLUSION
3800 DATA 31 TOTAL ADJUSTMENTS,
32 ADJUSTED GROSS INCOME
3810 DATA 33 AMOUNT FROM LINE 3
2, 34A DEDUCTION FROM SCHED. A, 34
B CHARITY CONTRIBUTION P. 13, 35
DEDUCTION SUB-TOTAL, 36 EXEMPTI
ONS TOTAL, 37 TAXABLE INCOME, 38
TAX, 39 ADDITIONAL TAXES, 40 TO
TAL
3820 DATA 41 CREDIT FOR ELDERLY
, 42 FOREIGN TAX CREDIT, 43 INVE
STMENT CREDIT, 44 PARTIAL CREDIT
FOR POLITICAL, 45 CREDIT FOR CH
ILD CARE, 46 JOBS CREDIT, 47 RES
IDENTIAL ENERGY CREDIT, 48 OTHER
CREDITS, 49 TOTAL CREDITS, 50 B
ALANCE
3830 DATA 51 SELF-EMPLOYMENT TA
X, 52 MINIMUM TAX, 53 ALTERNATE
MINIMUM TAX, 54 TAX FROM INVESTM
ENT CREDIT, 55 FICA ON TIP INCOM
E, 56 UNCOLLECTED FICA-RRTA TAX,
57 TAX ON IRA, 58 ADVANCED EARN
ED INCOME, 59 TOTAL TAX
3840 DATA 60 TOTAL FEDERAL TAX
WITHHELD, 61 ESTIMATED TAX PAYME
NT, 62 EARNED INCOME CREDIT, 63
AMOUNT PAID WITH FORM 4868, 64 E
XCESS FICA & RRTA TAX, 65 FUEL T
AX CREDIT, 66 REGULATED INVESTME
NT CREDIT, 67 TOTAL PAYMENTS
3850 DATA 68 AMOUNT OVERPAID, 69
AMOUNT REFUNDED TO YOU, 70 APP
LY TO 1983 TAX, 71 AMOUNT YOU OW
E
3860 FOR X=1 TO 36
3870 READ A*(X)
3880 NEXT X
3890 RETURN
3900 DATA 1 MEDICINES & DRUGS,
2 1% OF LINE 33, 3 DEDUCTION
FOR DRUGS, 4 TOTAL INSURANCE PR
EMIUMS, 5A DOCTOR-DENTIST EXPENS
E, 5B TRANSPORTATION, 5C OTHER M
EDICAL, 6 LINES 3 THRU 5C, 7 3
% OF LINE 33, 8 LINE 7 FROM LIN
E 6
3910 DATA 9 HALF OF INSURANCE
PREMIUM, 10 LARGER OF LINE 8 & L
INE 9
3920 DATA 11 STATE & LOCAL INCO

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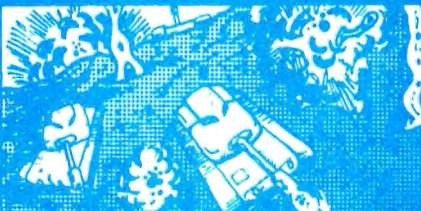
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```

ME,12 REAL ESTATE,13A GENERAL S
ALES,13B GENERAL SALES MOTOR VEH
ICLES,14 OTHER TAXES,15 TOTAL
TAXES
3930 DATA 16A HOME MORTGAGE-FINA
NCIAL CO.,16B HOME MORTGAGE-INDI
VIDUALS,17 CREDIT CARDS,18 OTH
ER INTEREST,19 TOTAL INTEREST E
XPENSES
3940 DATA 20A CASH CONTRIBUTIONS
(UNDER 3000),20B CASH CONTRIBUTI
ONS(OVER 3000),21 OTHER THAN CA
SH,22 CARRYOVER FROM PRIOR YEAR
S,23 TOTAL CONTRIBUTIONS
3950 DATA 24 TOTAL CASUALTY OR
THEFT LOSS,25A UNION & PROFESSIO
NAL DUES,25B TAX PREPARATION FEE
,26 OTHER MISCELLANEOUS,27 TOT
AL MISCELLANEOUS
3960 DATA 28 TOTAL ALL DEDUCTIO
NS,29 FILING STATUS ADJUSTMENT,
30 TOTAL SCHEDULE A DEDUCTIONS
3970 CLS:PRINT@7,"INCOME"
3980 FOR X=11 TO 30 STEP 2
3990 PRINTUSING"LINE% %#####.##
";LEFT$(L$(X),3);L(X);:PRINTUSIN
G"LINE% %#####.##";LEFT$(L$(X+1)
,3);L(X+1)
4000 NEXT X
4010 PRINT"ANY CHANGES Y/N"
4020 Q$=INKEY$:IF Q$=""THEN4020
4030 IF Q$="N"THEN RETURN ELSE I
F Q$<>"Y"THEN 4020
4040 PRINT "SELECT LINE NO. TO C
HANGE":INPUT Q$
4050 FOR X =11 TO 30
4060 IF L$(X)=Q$ THEN 4090

```

```

4070 NEXT X
4080 PRINT@384,"LINE NO. NOT FOU
ND":INPUT Q$:GOTO 4050
4090 PRINT "PRESENT VALUE IS ";L
(X):PRINT"NEW VALUE ";;INPUT L(X
)
4100 IF X=13 OR X=14 OR X=15 THE
N E=L(14):L(15)=L(13)-L(14):IF L
(15)<0 THEN L(15)=0
4110 GOSUB 900:GOTO 3970
4120 CLS:PRINT@6,"ADJUSTMENTS TO
INCOME"
4130 FOR X=31 TO 38 STEP 2
4140 PRINTUSING"LINE% %#####.##
";LEFT$(L$(X),3);L(X);:PRINTUSIN
G"LINE% %#####.##";LEFT$(L$(X+1)
,3);L(X+1)
4150 NEXT X:PRINTUSING"LINE% %##
###.## ";LEFT$(L$(39),3);L(39)
4160 PRINT@354,"ANY CHANGES Y/N"
4170 Q$=INKEY$:IFQ$=""THEN 4170
4180 IF Q$="N" THEN RETURN ELSE
IF Q$<>"Y"THEN 4170
4190 PRINT "SELECT LINE NO. TO C
HANGE":INPUT Q$
4200 FOR X=31 TO 39
4210 IF L$(X)=Q$ THEN 4240
4220 NEXT X
4230 PRINT@384,"LINE NO. NOT FOU
ND":INPUT Q$:GOTO 4200
4240 PRINT"PRESENT VALUE IS ";L(
X):PRINT"NEW VALUE ";;INPUT L(X)
4250 L(39)=0:FOR X=31 TO 38
4260 L(39)=L(39)+L(X):NEXT X
4270 GOTO 4120

```

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BUGS

SDS-80

from February, 1983

```
0001 0600          NAM  LINES
0002 0600          ORG  $1010
0003 00B5          COLOR EQU $B5          DRAWLN COLOR
0004 00B6          PMODE EQU $B6
0005 00B9          BYTLIN EQU $B9          BYTES PER LINE
0006 00BA          GPAGE EQU $BA          GRAPHICS PAGE
0007 00BE          X1    EQU $BE          COORDINATES
0008 00C0          Y1    EQU $C0          FOR DRAWLN,
0009 00C4          X2    EQU $C4          127 X 95.
0010 00C6          Y2    EQU $C6
0011 94A1          DRAWLN EQU $94A1          BASIC LINE RTN
0012 0400          SCSTRT EQU $0400          SCREEN START
0013 1000          SCEND  EQU SCSTRT+$C00  END

0014 1010 BD1059          JSR  INIT
0015 1013 CC0000          START LDD  #$0
0016 1016 BD10A1          JSR  CLRSC          CLEAR SCREEN
0017 1019 BD1035          JSR  LINES          DRAW LINES
0018 101C BD10AC          JSR  WAITKY          WAIT FOR KEY
0019 101F 8103          CMPA #$03          (BREAK)
0020 1021 2702          BEQ  END
0021 1023 20EE          BRA  START          DO IT AGAIN

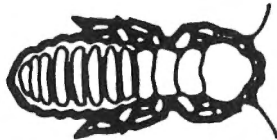
0022 1025 BD108C          END   JSR  TEXTSC          TEXT SCREEN
0023 1028 39          RTS

0024 1029 3477          SWI   PSHS A,B,X,Y,U,CC
0025 102B BD108C          JSR  TEXTSC
0026 102E 3577          PULS A,B,X,Y,U,CC
0027 1030 3F          SWI   GO TO ABUG
0028 1031 BD1076          JSR  HIRES
0029 1034 39          RTS

0030 1035 8E10B3          LINES LDX  #LINTBL
0031 1038 A680          A@   LDA  ,X+          X1
0032 103A 81FF          CMPA #$FF          IF END OF LINES
0033 103C 271A          BEQ  R@          THEN RETURN.
0034 103E 97BE          STA  X1          SET COORDINATES
0035 1040 A680          LDA  ,X+          Y1
0036 1042 97C0          STA  Y1
0037 1044 A680          LDA  ,X+          X2
0038 1046 97C4          STA  X2
0039 1048 A680          LDA  ,X+          Y2
0040 104A 97C6          STA  Y2
0041 104C BD10AC          JSR  WAITKY
0042 104F 3410          PSHS X          DRAWLN USES X.
0043 1051 BD94A1          JSR  DRAWLN
0044 1054 3510          PULS X
0045 1056 20E0          BRA  A@          DO NEXT LINE.
0046 1058 39          R@   RTS

0047 1059 BD1076          INIT  JSR  HIRES
```

BUGS



TERMITE

```

0048 105C 8655      LDA  %#01010101  COLOR 2.
0049 105E 97B5      STA  COLOR
0050 1060 8601      LDA  #1           PMODE 1.
0051 1062 97B6      STA  PMODE
0052 1064 8620      LDA  #$20        32 BYTES/LINE
0053 1066 97B9      STA  BYTLIN
0054 1068 8E0400    LDX  #SCSTRT     SCREEN START
0055 106B 9FBA      STX  GPAGE
0056 106D 0FBD      CLR  X1-1        DRAWLN EXPECTS
0057 106F 0FBF      CLR  Y1-1        TWO BYTES FOR
0058 1071 0FC3      CLR  X2-1        COORDINATES.
0059 1073 0FC5      CLR  Y2-1
0060 1075 39        RTS

```

```

0061 1076 3402      HIRES PSHS A
0062 1078 B7FFC0    STA  $FFC0        PMODE1,1
0063 107B B7FFC2    STA  $FFC2
0064 107E B7FFC5    STA  $FFC5
0065 1081 B6FF22    LDA  $FF22        SCREEN1,0
0066 1084 8AE0      ORA  %#11100000
0067 1086 B7FF22    STA  $FF22
0068 1089 3502      PULS A
0069 108B 39        RTS

```

```

0070 108C B7FFC0    TEXTSC STA  $FFC0        RESET TO
0071 108F B7FFC2    STA  $FFC2        TEXT SCREEN
0072 1092 B7FFC4    STA  $FFC4
0073 1095 B6FF22    LDA  $FF22
0074 1098 8407      ANDA %#00000111
0075 109A B7FF22    STA  $FF22
0076 109D B7FFC6    STA  $FFC6        RESET $400
0077 10A0 39        RTS

```

```

0078 10A1 8E0400    CLRSC LDX  #SCSTRT
0079 10A4 ED81      L@   STD  ,X++     TWO BYTES.
0080 10A6 8C1000    CMPX #SCEND       IF NOT END
0081 10A9 25F9      BLO  L@           THEN LOOP.
0082 10AB 39        RTS

```

```

0083 10AC AD9FA000  WAITKY JSR  [$A000]  WAIT FOR KEY
0084 10B0 27FA      BEQ  WAITKY
0085 10B2 39        RTS

```

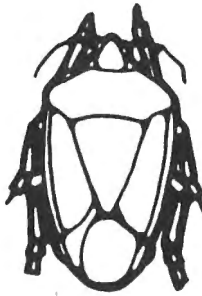
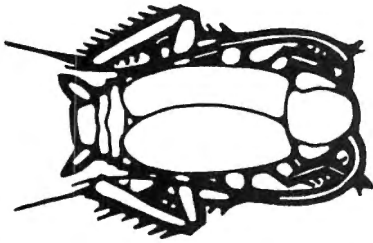
```

0086 10B3 00007F5F  LINTBL FDB  $0000,$7F5F
0087 10B7 10104010 FDB  $1010,$4010
0088 10BB 70107040 FDB  $7010,$7040
0089 10BF FF        FCB  $FF
0090 10C0          END

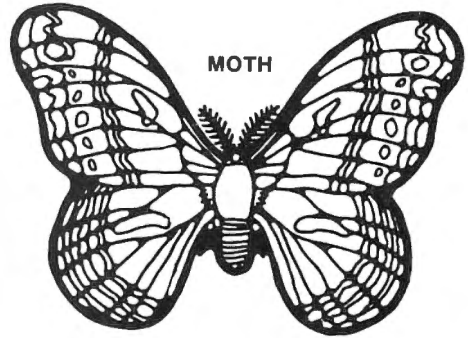
```


BUGS

COCKROACH



STINK BUG



MOTH

Recently we received corrections for the program Disk Care and Feeding, November 1982 from author Jack L. Aker.

50 IF FREE (D) 68 THEN 430

80 VERIFY OFF

310 VERIFY ON

360 DSKO\$ D,T,S,A\$,B\$

380 VERIFY OFF:PRINT AT 312, "FF"

999 VERIFY ON:SAVE "DSKTST";VERIFY OFF

2. Pin# (RS0) To Edge Connector #19 (A0)

3. Pin# (E) To Edge Connector #6 (E)

Without these connections the PIA cannot be initialized and proper circuit operation is not possible.

Phil Sumida

Bumblebee Software

P.O. Box 25427

Chicago, IL 60625

The "Cheap Talker" article as featured in November's issue, had a few omissions the 6821 (PIA) connections;

ADDED 1. Pin#35 (RS1) To Edge Connector #20 (A1)

Correction for "File-Han" program. Sorry for any inconvenience.

Line 2095 IF FLD=0 OR X=1 or Z=8

GOTO2135 "TEST FOR FLD BREAK"

CHANGE TO: 2095 IF FLD=0 OR Z=4

GOTO2135 "TEST FOR FLD BREAK"

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Movement is friendly, in the sense that location doesn't have to be exact in order to turn a corner. Hitting a key for a right turn will move your tank ahead to the corner and then to the right.

There is an unlimited ammunition supply. That is fortunate, because there are random mobile "landmines" running around which absorb shots, but do not themselves damage

the tanks. The street-and-city-blocks display blinks with inverse graphics at each hit, and the running score in the top corners increments. If the tanks both fire at about the same time, the shots can pass without disturbing each other.

There are two errors in the instructions for my copy: the disk does not automatically EXECute, as is stated; and, winning requires 9 hits on your opponent's tank, not the 8 shown.

The game could get really tough to win, as players begin trying to use those unpredictable mines as shields, and to dodge shots. A close game could cause off-screen fireworks, however, because destroying one take re-starts the game without a clear statement of who won the previous game, and it might be very difficult to tell from the last glimpse you had of the gameboard.

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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:;<=>?
@ABCDEFGHIJKLMNPOQRSTUVWXYZ[\]^_
`abcde fghi jklmnopqrstuvwxy z{|}~
!@#$%&'()*+,-./0123456789:;<=>?
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```

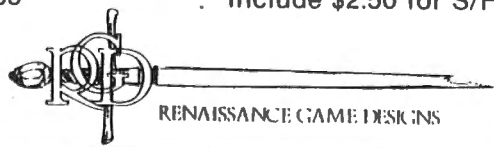
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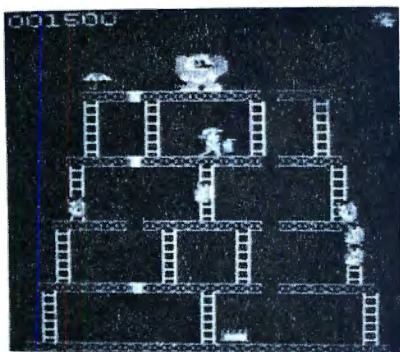
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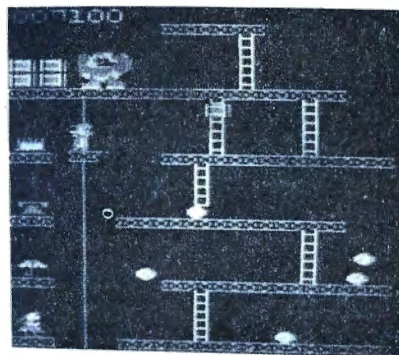
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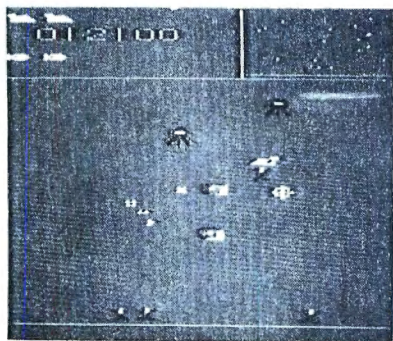
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BENCHMARKING THE COLOR COMPUTER

By Arnold H. Kahn
2706 Ross Road
Chevy Chase, MD 20815
and
Seymour Haber
1106 N. Belgrade Road
Silver Spring, MD 20902



Benchmarking is one method of ranking computers according to speed. It is an arbitrary process. We write what we intend to be a program representative of typical BASIC use (or it could have been a test designed for a specialized application). We run this on any machine we can find, tabulate the results, congratulate the winners, and console the low scorers. Since this article is being published in CCN, you may suspect already that you will find the results pleasing. However, computer design is based on a compromise between many factors such as cost, memory size, instruction set, etc. Speed is not everything,

but like an ice cream cone, it can be nice. Finally, when referring to the table, do remember that the computers listed have widely different BASIC's with varying numbers of significant places for the numerical values.

The listing of PROGRAM 1 given below is our test material. It performs a mix of operations that we have found to be typical of our own work. Inefficient? Certainly. You could speed it up by deleting REM's and spaces, and by packing several statements on a line. But that is not the idea. We want the test to be uniform. You can perform it on your machine. (On some machines line 270

YORK 10

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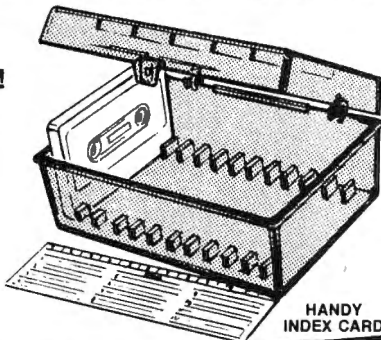
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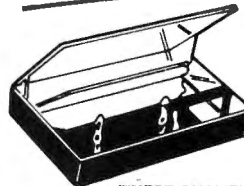
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INDEX CARD

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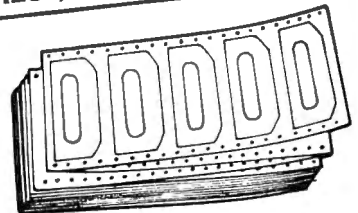
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BENCHMARK

may not be accepted. For those, try $B = \text{sgn}(A)$. The procedure is this: Set N in line 120 to a value, e.g., $N=10$. Run the program, timing it with a stopwatch. Keep changing N and repeating until the execution time takes 30 seconds. The value of N for a 30 second run is the benchmark value given in Table 1. When several entries are given, they correspond to different modes of operation. As you can see, we did get our hands on quite a few machines.

By now everyone is familiar with the so called Vitamin E intermediate speed up: POKE &HFFD7,0 before running; POKE &HFFD6,0 (or RESET) to get back. This gives a good improvement, putting the Color Computer ahead of the Apple II+, the Commodores, and almost all others in the 8-bit class. This mode runs the 6809 Processor at a clock rate of 0.9 MHz (megahertz) when it addresses RAM and 1.8 MHz when it addresses ROM. But the real shocker comes with POKE &HFFD9,0. This puts the Color Computer into the full 1.8 MHz mode. It can be used successfully in most Color Computers, but there is a temporary loss of the video display while the program is running and it is necessary to introduce a small machine language routine to regain control. The speed up is dramatic. The CC passes even the IBM PC which has a 16-bit word! The listing for this speedup ("Vitamin S" perhaps?) is given in PROGRAM 2, which is a set of extra statements to be added to PROGRAM 1. Run the first part once to POKE in the ML data and to define the USR0 address. After the STOP, do a RUN 100 to carry out the benchmark timing. Of course, you can remove the benchmark program and substitute your own. You can even do graphics in this mode, but you can't see the results until the USR call, so it isn't of any use in writing action games. However, it is great for sorting, alphabetizing, or heavy number crunching. For further details on the speed up see the letter by an anonymous author from the University of Utah in the November 1982 issue of '68 Micro Journal.

In Table 1 we show the numerical scores for the machines we have tested. The Color Computer comes out quite respectably. In the intermediate speed mode it passes all the over the counter 8-bit computers. In the

highest speed mode (1.8 MHz) it is competitive with the custom Z-80 systems which run at 4 MHz. If the CC had been constructed to run at 2 MHz rather than the 1.8 MHz required for TV, the extra 10% would put it out on top.

To conclude, the Color Computer outruns all the popular micros when it is put into one of its higher speed modes. It seems that the 6809 is the ultimate in 8-bit processors. Indeed, it is a pity that the machine wasn't designed to run at 1.8 MHz. Present day RAM is fast enough. Perhaps some hardware hacker will come up with a modification which will allow the highest speed option while retaining the screen synchronization.

TABLE 1. Results of the speed test. Numerical value of N for a 30 second run.

Apple II +	114
Apple II + w/Expediter II	195
Atari 800	49
Casio FX702P	11
Creative Microsystems (6809 at 2MHz EXORCISER, TSC XBASIC / Flex)	134
Commodore VIC 20	113
Commodore 64	103
Commodore Pet Basic 4.0	101
Cromemco Z2	97
DEC 10/KL10	101,000
Hewlett-Packard 9845B	280
Hewlett-Packard 9000 (32-bit CPU)	18,500
IBM PC	170
Ithaco (Z-80 at 4MHz, S-100, Microsoft)	180
Sinclair	Slow Mode 9 Fast Mode 62
Smoke Signal Chieftain (6809 at 2MHz, BASIC09/OS9)	500
Tektronix 4054	520

BENCHMARK _____

TI 99/4A		29
TRS 80 Color	Slow	87
	Intermediate	123
	Fast	176

```

100 REM *** PROGRAM 1 ***
120 N= 15
130 A=3.57
140 C=-7.8
150 D = 3
160 E = 2
170 DIM X(5),Y(5,5)
180 DEF FNF(X)=X
190 FOR I= 1 TO 5
200 X(I)=I
210 FOR J= 1 TO 5
220 Y(I,J)=C
230 NEXT J
240 NEXT I
250 FOR I= 1 TO N
260 B=ABS(A)
270 B=(A<0)
280 B=SQR(A)
290 B=EXP(A)
300 B=COS(A)
310 B=RND(1)
320 FOR J= 1 TO 2
330 B=INT(A)
340 IF(B>=A) THEN 330
350 GOTO 360
360 GOSUB 1000
370 NEXT J
380 FOR J= 1 TO 3
390 B=Y(D,E)+X(D)*X(E)+X(D)/X(E)
400 B=FN F(A) + A*D*E
410 B=A + A*C +D*E
420 NEXT J
430 B=A
440 NEXT I
460 PRINT "DONE"
470 END
1000 RETURN
1 REM *** PROGRAM 2 ** HI SPEED ***
2 CLEAR 50,&H3FEF
3 DEF USR0=&H3FF0
4 DATA B7,FF,DB ' STA #FFDB
5 DATA 13 ' SYNC
6 DATA 39 ' RTS
7 FOR I= 0 TO 4
8 READ X# : X=VAL("&H"+X#)
9 POKE &H3FF0+I,X
10 NEXT I
11 '*** ML HAS BEEN ENTERED.***
12 PRINT "RUN 100 WHEN READY FOR TIMING."
13 STOP
15 REM PLACE PROGRAM 1 HERE;
16 REM LINE NOS.100-1000.
450 X=USR0(0)

```

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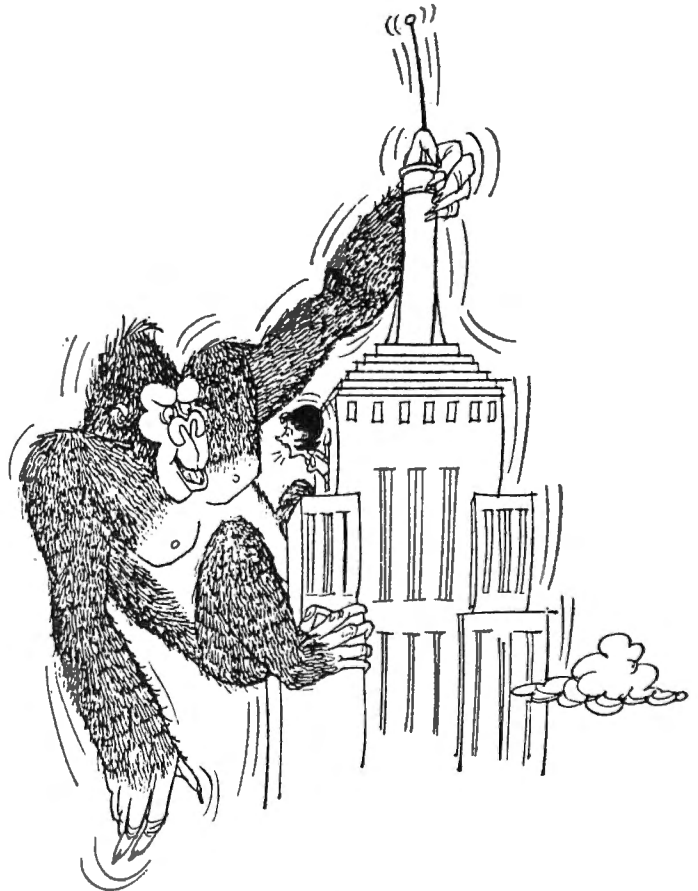
There sure has been a lot of "monkey-ing" around going on in the arcades and living rooms of our country recently — and finally the "Kong" invasion has arrived for our beloved CoCo. As I write this I know of three different versions currently available [with more sure to come!] only two of which will be reviewed herein. The third company, which produces the only version I know of which will run in 16K, was contacted, but declined to have their program reviewed.

The remaining programs come from Tom Mix software and Intellectronics. The Tom Mix entry is known as 'Donkey King' and the Intellectronics program is called 'Dunkey Munkey.' Both are machine language [i.e. use CLOADM] and require a 32K machine, so my own evaluation was somewhat delayed until I upgraded my 16K to the required memory size (what a great excuse a program review assignment is, huh!?!)

At the outset, I would *really* like to commend *both* authors for extremely impressive graphics! I recall my initial impression upon seeing the arcade version of 'Donkey Kong' for the first time — I stood totally amazed at the graphics and smooth animation it displayed. Both of these CoCo versions capture the essence and 'feel' of the quality graphics of the original program they attempt to emulate.

JUST WHO IS DUNKEY DONKEY MUNKEY KING?"

For those of you who just arrived from another planet and are *not* familiar with the original arcade game, let me give a brief recounting on the "Kong" scenerio. It is no surprise that the Donkey Kong game originated in a land famous for their love of



monsters — Japan. It involves the saving of a sweet young thing from the clutches of a gorilla by our hero, Mario. The nasty old simian keeps tossing debris (the barrels) at our intrepid Neopolitian savior. Those barrels can also fall into a fuel barrel causing flames to leap out and randomly seek after Mario to consume him. But all is not lost, for our resourceful rescuer has tools available to him (the hammer) which he can use to destroy the attacking barrels or snuff out the moving flames. The whole point of the game is to gather as many points as possible by leaping over (by hitting the fire button on your joystick) or destroying the obstacles during the rescue of the fair maiden. In the original arcade version, I understand there are three different screens Mario passes through in his contest with Kong; the barrels, rivets and elevators. Each of these screens offer different challenges and demand changes in the rescuer's tactics.

I must admit that my *personal* experience playing arcade games is quite limited at best, however rest assured that I have a fully

competent "panel of experts" in the persons of my three sons and their seemingly endless array of neighborhood buddies — all of whom appear to be champion arcade players! I will voice their composite opinion for you concerning difficulty and playability as I go on, since I am relegated to only expressing the view of the crass novice!

DUNKEY MUNKEY

This was the first of the programs I obtained and therefore the one I have the most experience with and the yardstick I used in comparing the Tom Mix program. It is the version I could recommend those who are occasional players who want the feel of the original without the gut rending frustration that can easily be yours if facing a *really* tough Kong opponent. This version uses a four color high resolution mode and is about 17K in length. It features only two different screens; the "rivets" screen (figure 1 below) and the "elevators/barrels" combination screen shown in figure 2. In this way the author gives the user *most* of what the original game offers, but with some obvious compromises brought on by the shortness of the program.

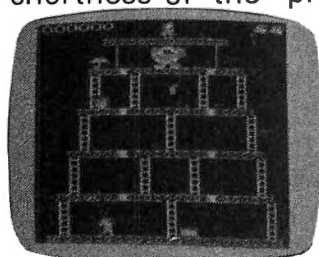


Figure 1, Rivets

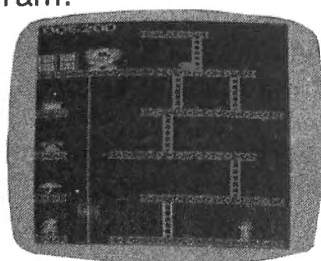


Figure 2

Barrels/Elevators

Even with the low quality of my photos (which were made by hand holding a borrowed camera aimed at my \$59.00 B&W television set and hoping for the best!!) you can see that our hero (called "Luigi" in this program) has a good looking playing field to work on. The game begins with an animated graphics display screen in which the "munkey" climbs up a ladder carrying our damsel in distress. All the graphics are quite smooth and game play joystick response is very reliable even if you are stuck with using the "house brand" joystick.

Color Computer News

The author uses the familiar single voice tone generation to produce a variety of musical themes throughout the program as program segment separations. Initially, I found them to be "cute" but they tended to wear my old nerves thin after awhile. This was especially true if it was a Saturday and my "panel of experts" were taking turns playing the game for 6 hours without interruption!!! Much to his credit, my mentioning this to the author in a follow-up phone conversation brought about an immediate modification of the program. In the revised version now on the market, the music tempo has been speeded up a bit and the user now has the option of pressing the fire button to bypass the music at will.

Dunkey Munkey is a single player game in which you have three "Luigi's" to make two passes on the rivets screen before graduating to the barrel/elevator combination screen. You control Luigi's travel direction by using your joystick and can cause him to jump by hitting the fire button. You get bonus points for passing over the prizes on the first and fifth tiers. In this screen you are given a "fire extinguisher" (instead of a hammer) on the fourth tier which you can use to put out the flames for extra points. In watching my experts play, I noticed that one can use a center screen travel pattern to great advantage and pop the rivets with relative ease and speed. This is done by jumping Luigi over the rivet and pulling back on the joystick which returns him to the point of departure. This way you can run back and forth quickly before the flames get you. There is also a "bug" during the play on this screen. If you jump him a certain way, Luigi can hop right in front of the ape without getting knocked down and being "killed." You take a risk however, because you have to hit it *just right!!*

Life is even easier on the barrels/elevator screen. There are no flames chasing after you and the barrels move fairly slowly and predictably. There is only one elevator car which moves slow enough that my experts can hop on and off grabbing each of the prizes in one pass up or down. Another "bug" is that it is possible to get Luigi to

safely jump back on the elevator car even if he is on the top tier and the car is down at the bottom. This is another one you have to hit "just right" but it can be done regularly. After all the prizes have been taken, the player then takes a stroll up the ladders to grab the girl and move back to the rivets screen. Both of my older boys (ages 14 and 11) were consistently racking up six digit scores within a few weeks of play experience. Since the player gets a new Luigi for each 10,000 points, my experts can easily tie up quite some time in just one game. This is especially true since there is no time limitation on play. Consequently, the arcade experts will begin to outgrow this program after a few hours of play. [Available from Intellectronics, 22 Churchill Lane, Smithtown, NY 11787. The 32K machine language program is only on cassette and costs \$24.95]

DONKEY KING

It is a different story with the Donkey King game from Tom Mix Software. It is a *much* greater challenge even to the "expert" player. You must cycle *back* through the barrels screen (Figure 3) when graduating to the conveyor and jacks screens. This is no mean trick since the barrels screen is a consistently difficult one. There can be as many as 8 barrels and a couple of flames chasing you at one time. When you move to the pins screen (Figure 4) the flames chasing you move very quickly and unpredictably. Once you get good enough to make it to the conveyors, (Figure 5) you have to contend with fast conveyors and a very quick moving "rubber band" which will wipe you out in a flash! None of my panel of experts has been able to get to the jacks screen, (Figure 6) so I cannot begin to speculate on what challenges await us there!!

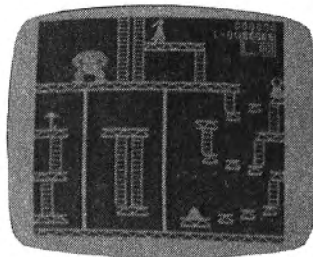


Figure 5, *Conveyors*

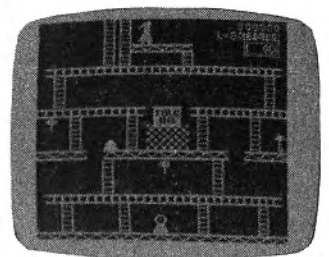


Figure 6, *Jacks*

Not surprisingly, the highest score thus far is only 26,000 points, well below the six figure scores easily made on *Dunkey Munkey*. The "facts of life" in arcade game playing are that the challenges presented are the reasons for continued playing, with interest waning in direct proportion to one's ability to beat the game. My neighborhood arcade aces assure me that this program is much harder to master than the coin operated version and consequently, they enjoy it all the more.

Graphically, *Donkey King* does have an edge on *Dunkey Munkey* which is accounted for in the fact that this author used about 50 percent more code. This program also uses a four color high resolution mode with smooth animation and reliable joystick response. The multi-voice sound routines used are superior to the single tone music of *Dunkey Munkey* and rather than being distracting, they enhance the play nicely.

The game play objective and techniques although somewhat similar to the *Dunkey Munkey* game described above, are much closer to the arcade version. The little hero (no name given, so feel free to make him any nationality you want!) is moved and jumped with your joystick and you get an additional hero for every 10,000 points. In *Donkey King*, he moves a bit slower which partially accounts for the greater difficulty although there was agreement that it would be nicer if he moved just a little faster. The weapon the hero uses in this game is a hammer (a total of six of them on all the screens) which will snuff out flames or destroy barrels. There have been no play "bugs" uncovered.

Donkey King allows for a one or two player mode and has a nice feature for us jumble handed joystick jockeys — a "practice"

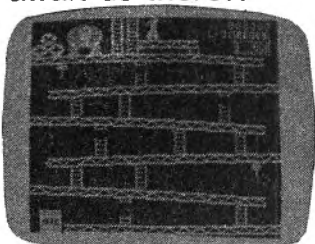


Figure 3, *Barrels*

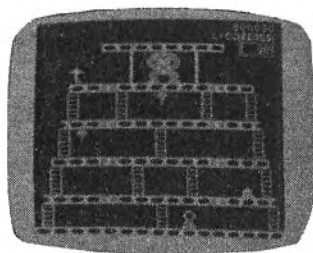


Figure 4, *Pins*

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KING OF THE KONGS _____

game. The practice game gives the novice 12 men instead of the normal three. Even with that assistance, I personally have yet to get off the *first* screen, although with the extra warriors, I have broken the "semi-face saving" 10,000 point barrier! Another Donkey King advantage is that the top scores can be saved to a scoring screen so the session champ will be undisputed. I don't have disks as yet, so I don't know if the disk version has a permanent score saving feature, but I would hope so. [Available from Tom Mix Software, 3424 College N.E., Grand Rapids, MI 49505. The 32K machine language program cassette is \$24.95, disk is \$27.95]

CONCLUSIONS

While both programs are very good and worth the selling price, I would recommend the Intellectronics program mostly for beginners and/or younger players (e.g. my six year old prefers Dunkey Munkey because it is less frustrating.) Using the criteria of lasting challenge and faithfulness to the arcade original, my neighborhood experts and I agreed that Tom Mix's program is clearly the "king of the Kongs" for the Color Computer.

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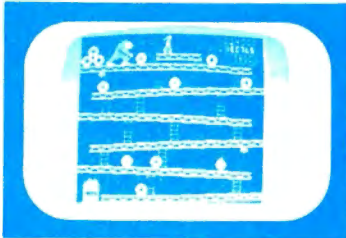
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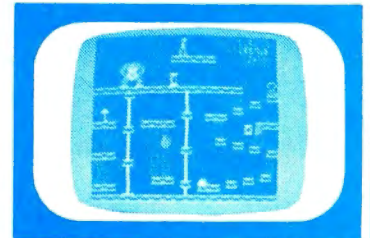
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DONKEY KING

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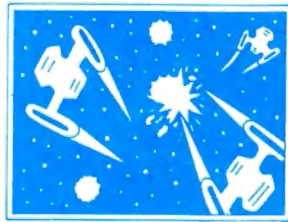
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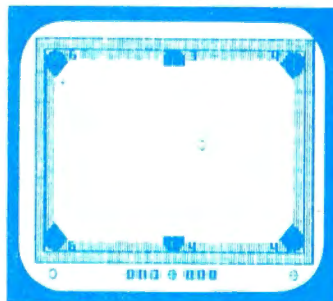
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by Alan Rouse
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For those of you who typed in 'MORTGAGE' from the July issue of CCN, you will merely need to change the following lines:

40-80
290 (delete)
300-500

The major difference between this version and 'MORTGAGE' is that this version requires the interest rate to be given, and is designed for a 30 year mortgage only. The editing features are still the same:

DOWN ARROW: tab to next field
CLEAR: erase to end of field
LEFT ARROW: backspace
RIGHT ARROW: forward space
ENTER: skip to end of screen

I have checked the results of this program against my current mortgage. The results were correct within one cent (roundoff error) for all payment levels. However, I obviously cannot take responsibility for any errors.....

Happy homehunting!!

10 CL5
20 CLEAR200
30 Z*=""

```

34 '
35 ' DEFINE SCREEN POSITIONS AND
  DESCRIPTIONS
36 '
40 F$(1)="ANNUAL INTEREST:":L(1)
  =10
50 F$(2)="MORTGAGE AMT:":L(2)=10

60 F$(3)="INITIAL P+I PMT:":L(3)
  =8
80 FIELDS=3
90 K=0:L=0:FOR C=1 TO FIELDS:KK(
  C)=K+LEN(F$(C)):K=K+32
100 LL=LL+L(C):NEXT:I=0
110 '
111 ' DATA ENTRY AND CORRECTION
112 '
120 GOSUB 510:GOTO 190
160 PRINT@416,"PRESS DOWN ARROW
  TO CHANGE OR UP ARROW TO CALCU
  LATE";
170 Z$=INKEY$:Z$=""
180 Z$=INKEY$:IF Z$=CHR$(10) THE
  N PRINT@416:PRINT@448:GOTO 190 E
  LSE IF Z$=CHR$(94) THEN CLS:GOTO
  250 ELSE 180
190 SOUND 125,1:FOR C=1 TO FIELD
  S:GOSUB590
200 IF A$<>" THEN C$(C)=A$
210 IF I$=CHR$(13) THEN CLS:C=FI
  ELDS
220 PRINT@KK(C),C$(C);A$=""
230 NEXTC:CLS:GOSUB510:GOTO160
240 '
250 ' READ DATA
260 I=VAL(C$(1))/12
270 MO=VAL(C$(2))
280 MP=VAL(C$(3))
300 IF I=0 THEN GOTO 390 ELSE IF
  MO=0 THEN GOTO425 ELSE IF MP=0
  THEN GOTO 430 ELSE SOUND 50,5:GO
  TO 110
310 GOSUB450
320 CLS:PRINT" YEAR MONTHLY
  BEGINNING"
325 PRINT" PAYMENT B
  ALANCE"
329 '
330 PRINT" ==== ===== ==
  ====="
340 FOR II=1 TO 6
345 X=MP*P(II):Y=BAL(II)/BAL(1)*
  MO
350 PRINTUSING" # ###.##
  #####";II;X;Y
360 NEXT
370 X=MP*P(6):PRINTUSING" % %
  #####.##";"7-30";X
372 PRINT:PRINT:PRINT" PRESS A
  NY KEY TO CONTINUE"
375 X$=INKEY$:IF X$="" THEN 375
390 CLS:GOTO 111
399 '
400 ' CALCULATE MORTGAGE AMOUNT M
  O
401 '
405 P(6)=1.075^5: BAL(6)=P(6)*(1-
  (1+I)^-300)/I
410 FOR K=5 TO 1 STEP -1:P(K)=P(
  K+1)/(1.075):BAL(K)=BAL(K+1)
415 FOR M=1 TO 12: BAL(K)=(BAL(K)
  +P(K))/(1+I)
420 NEXT:NEXT
421 RETURN
425 GOSUB405:MO=MP*BAL(1):GOTO31
  0
429 '
430 ' CALCULATE MP
431 '
440 GOSUB405:MP=MO/BAL(1):GOTO31
  0
450 MP=.01*INT(100*MP+.5):C$(3)=
  STR$(MP)
455 MO=INT(MO+.5):C$(2)=STR$(MO)
  :RETURN
459 '
500 '
510 ' DISPLAY FORMAT
520 '
530 FOR C=1 TO FIELDS
540 PRINT@KK(C)-LEN(F$(C)),F$(C)
  :PRINT@KK(C)+L(C),": "
550 PRINT@KK(C),C$(C);
560 NEXT:RETURN
580 '
590 ' INPUT ONE FIELD OF DATA
600 '
601 '
602 ' C$(C) IS THE ORIGINAL VALUE
  OF THE CURRENT FIELD.
603 ' A$ IS THE LEFT-HAND PORT
  ION OF THE REVISED CURRENT FIELD
604 ' L(C) IS THE MAXIMUM LENGTH
  OF THE CURRENT FIELD.
605 ' KK(C) IS THE "PRINT @"-POSI
  TION OF THE CURRENT FIELD.
606 ' Y$ IS THE CURSOR
607 ' Y IS THE ASCII VALUE OF
  THE CURSOR.
608 '
609 '
610 A$=""
617 '
618 ' REVERSE VIDEO CURSOR
619 '

```

```

620 Y=PEEK(KK(C)+1024+LEN(A*)):I
F Y>63 AND Y<96 THEN Y*=CHR*(Y+3
2) ELSE IF Y>96 AND Y<128 THEN Y
*=CHR*(Y-64) ELSE Y*=CHR*(128)
627 '
628 'AUTO TAB AT END OF FIELD
629 '
630 IF LEN(A*)=L(C) THEN 740 ELSE
PRINT@KK(C),A*+Y*!
637 '
638 'REVERSE VIDEO CURSOR
639 '
640 IF Y>96 AND Y<128 THEN POKE
KK(C)+1024+LEN(A*),Y-64
647 '
648 'GET NEXT CHARACTER
649 '
650 I*=INKEY*:IF I*="" THEN 650
660 IF ASC(I*)>13 THEN 720
667 '
668 'RIGHT ARROW
669 '
670 IF I*=CHR*(9) THEN A*=A*+MID
*(C*(C),LEN(A*)+1,1):GOTO 620
677 '
678 'LEFT ARROW-FOR CHANGING EXI
STING DATA (NON-DESTRUCTIVE)
679 '
680 IF I*=CHR*(8) AND LEN(A*)>0
AND LEN(C*(C))=L(C) THEN C*(C)=A
*+RIGHT*(C*(C),LEN(C*(C))-LEN(A*
)):A*=LEFT*(A*,LEN(A*)-1):PRINT@
KK(C),C*(C)::GOTO 620
687 '
688 'LEFT ARROW-FOR INITIAL ENTR
Y (DESTRUCTIVE)
689 '
690 IF I*=CHR*(8) AND LEN(A*)>0
THEN A*=LEFT*(A*,LEN(A*)-1):PRIN
T@KK(C),A*+Y*+" ";:GOTO 650 ELSE
IF I*=CHR*(8) THEN 650
697 '
698 'CLEAR KEY-DELETES RIGHT-HAN
D PORTION OF FIELD AND TABS DOWN
699 '
700 IF I*=CHR*(12) THEN GOTO 750
710 IF I*=CHR*(13) OR I*=CHR*(10
) THEN 740
716 '
717 ' ADD CHARACTER TO A*
718 '
720 IF ASC(I*)<91 THEN A*=A*+I*
730 IF LEN(A*)<L(C) THEN 620
737 '
738 'ADD UNCHANGED RIGHT-HAND PO
RTION TO A*

```

```

739 '
740 IF LEN(C*(C))>LEN(A*) THEN A*
=A*+RIGHT*(C*(C),LEN(C*(C))-LEN(
A*))
746 '
747 'FILL OUT FIELD WITH BLANKS
748 '
750 IF LEN(A*)<L(C) THEN FOR J=L
EN(A*)+1 TO L(C):A*=A*+" ":NEXT
760 C*(C)=A*
770 PRINT@KK(C),A*::SOUND 125,1:
RETURN
1000 X*=INKEY*:IF X*="" THEN 100
0 ELSE PRINT ASC(X*):GOTO 1000

```

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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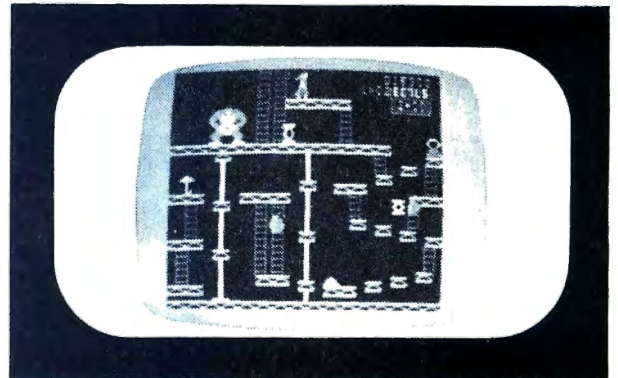
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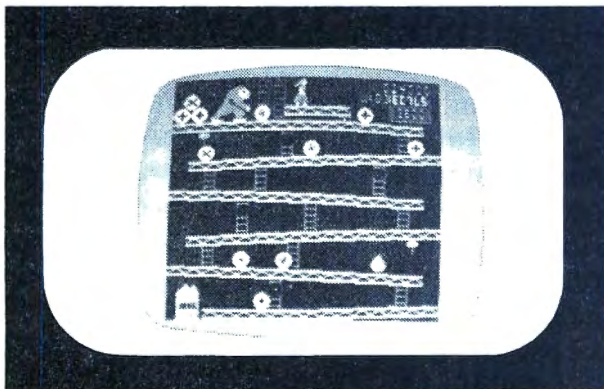
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Over the years I have bought many board type war games. Good war games come with complicated instructions and charts. The instructions tell you how to use the charts to determine troop movement, combat losses, weather conditions, fire power, etc. Because of the complexity of standard war games it is often hard to find another wargamer to play against. Therefore, most of my war games are sitting on a shelf collecting dust. Oh! If I could only find an opponent.

Thanks to some very good programers a few good war game simulations are beginning to appear on the CoCo market. The CoCo can be an excellent opponent in a war game simulation. Forget about those complicated charts and statistics. Let the CoCo take care of analyzing charts and statistics.

The "Battle of Gettysburg" is one of the good war game simulations available for the CoCo. This game comes with a colorful twelve page instruction manual. Game rules are covered in the first four pages of the manual. The rest of the manual is devoted to hints on playing the game. There are two

maps on the back cover showing the Gettysburg area.

The "Battle of Gettysburg" is a very colorful game. Troops move across a four color PMODE 1 Gettysburg map. This map is a replica of the maps found in the instruction manual. There is also some music and sound effects included in the game.

The Union Army objective is to destroy Confederate firepower. Capturing the Union Army center of command is the Confederate objective. CoCo ably controls the Confederate forces. There are three levels of difficulty: 1) General T.J. Jackson, 2) General R.E. Lee, 3) General G.E. Picket. Level 1 is the most difficult and fastest.

I found the "Battle of Gettysburg" an easy game to play. All you have to do is move your troops, attack, or defend. CoCo will take care of everything else. In the beginning moving troops is a little tricky. The manual tells you exactly how to move Federal divisions using the left joystick. If you follow the manuals instructions concerning movement you will be moving troops around in a short time. Hint, practice road movements; this will

BATTLE OF GETTYSBURG

allow you to move your units over long distances in a short period of time.

At the beginning of the game there are six Confederate divisions attacking two Federal divisions. I found going strictly on the defensive at the beginning of the game will lead to disaster. Use the two Union divisions to attack the flanks of the Confederate forces. Attacking will sometimes break up the Confederate formations; leaving them ripe for attack. Another good tactic is to position your two divisions on high ground in such a way that it forces a single Confederate division to attack your two divisions. Using this tactic may lead to the destruction of the attacking Confederate division. Develop your own tactics for winning. Never attack unless you have at least one to one odds. If you do attack with less than one to one odds your troops may be destroyed. In the beginning of the game you don't have units to throw away. If the tactics you use early in the game work you will delay the Confederate divisions just enough to allow Union reinforcements to arrive.

Attacking a Confederate division is

accomplished by moving a Federal division on top of a Confederate division. All Federal and Confederate divisions adjacent to the attacked unit are used to calculate the battle odds. The more Union divisions surrounding the attacked Confederate division the better your chances of destroying the attacked division. Confederate attacks are initiated when CoCo places a Confederate division on top of a Federal division. Battle odds for a Confederate attack are calculated the same way as those for Union attacks.

Once a beginner masters troop movement and develops some very basic tactical skills he or she will be playing the game with ease. I said playing not winning. The game manual gives some tips on how to modify the software to make the game easier to play for beginners.

So far I have managed to win and lose on all three levels. Win or lose you will know you have been in a battle.

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Game is disk compatible.

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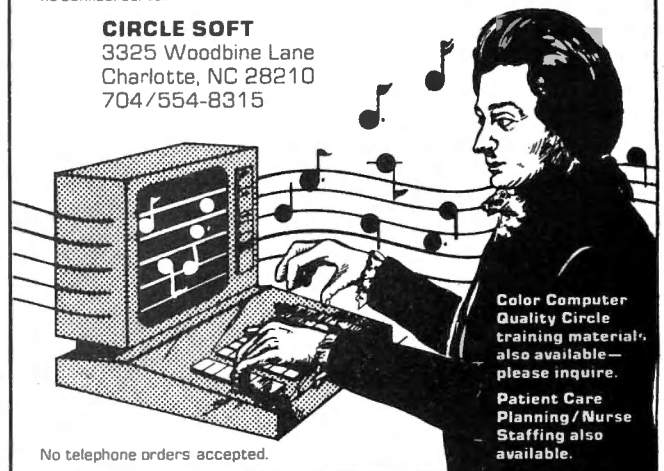
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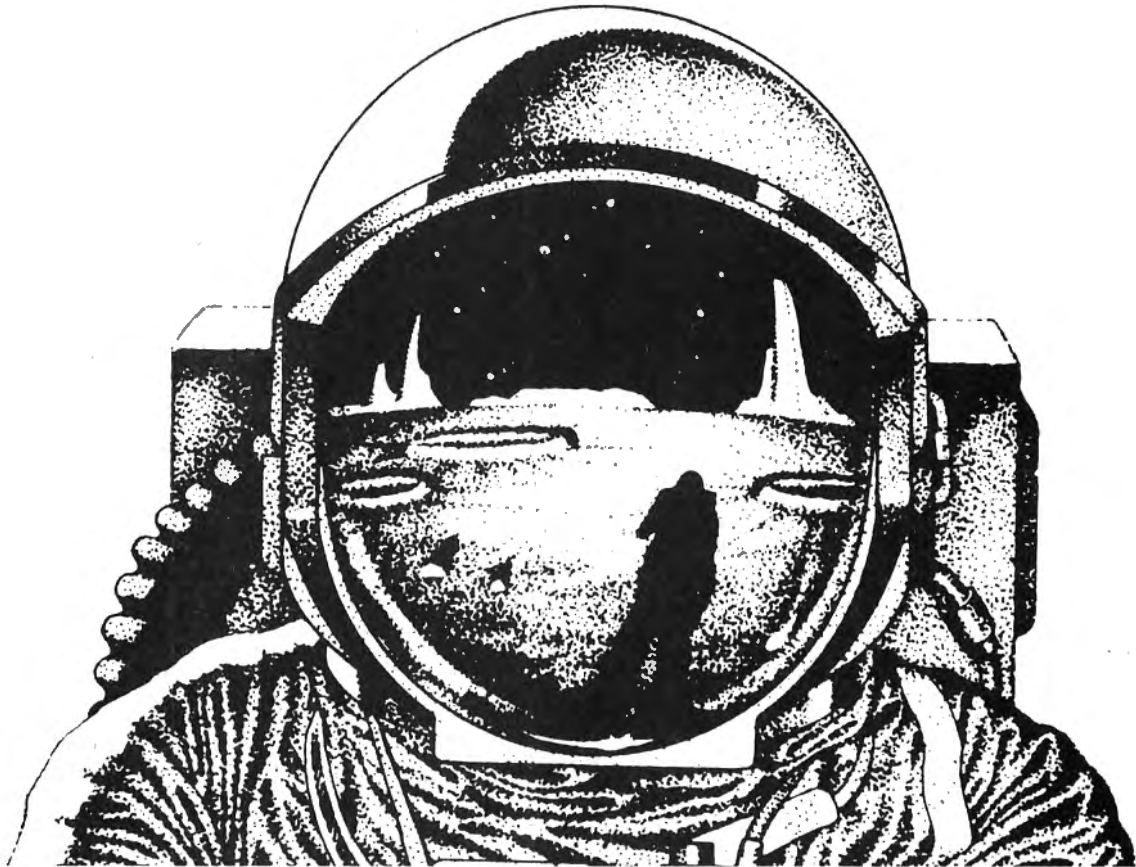


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COLOR TREK

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Have you ever watched a science fiction movie and known you could have done a better job than the spaceship commander did? If so, here's some good news for you...with Color-Trek and your 16K Color Computer you can be the commander of a battle cruiser in a real-time space war.

You say you've never flown a spaceship before? Well don't worry, you'll be thoroughly briefed by the thirteen-page manual that comes with the machine language tape.

If you are as anxious as I was to start playing this simulation, you may want to take a couple of short cuts in learning the rules. Using the list of special keyboard assignments at the end of the manual, you can easily make a paper keyboard overlay. I'm including a copy of the overlay I made. If you want to adopt it, you can photo copy it and cut out the key spaces with a sharp blade. you may also want to compile a mini "cheat-sheat" of vital rules. By including whatever details you are likely to forget when you need them most, you can speed play considerably and save a lot of confusion.

100 March 1983

Ready to go save the galaxy from the evil (and numerous) Darstang? Your ship is only a CLOADM EXEC away.

At the start of the simulation you are given a menu of five levels of difficulty. The first option is subtitled "the easy way out", but it is challenging. Each level higher increases the speed of the Darstang. On the fifth level the Darstang ships dart around the screen like a swarm of gnats! This is not a game to be easily mastered and shoved to the back of a shelf! Choosing a higher option whenever you feel a little too comfortable with your present level should keep you quite challenged. Another way to gauge your prowess is to compete against your own best battle statistics.

The Centurian is a powerful battle cruiser with a wide range of special capabilities under your command. The ship's systems include a cloaking device that renders the ship invisible to all scanners (including your own) and warp engines to move your ship from quadrant to quadrant. Your ship also has rotation engines and impulse engines for maneuvering within a quadrant. Of course

Color Computer News

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Also at your disposal are three special display screens which can each be summoned by a single keystroke. Perhaps the most useful of these is the damage control report. It provides a constantly updated list of your ship's systems and their status. If you try to utilize a system that is damaged by battle, you will get no response. Instead of threatening to push the self-destruct key (cheerfully provided), you can summon a report informing you of how long you'll have to wait for repairs to each damaged system to be completed.

Another special screen is the ship's computer report. This report displays such detailed battle statistics as how many torpedoes have been fired, who fired them, how many hits were made by whom, how many times you've docked to refuel and take on more torpedoes, how much energy you've used, and how long you've been on your mission. This screen may be summoned at any time, and is also automatically displayed at the end of the simulation. At that time you can hit S to print your final statistics. Don't try it without a printer—the program locks. You have to reset the computer and reload the program if this occurs. The same kind of lock-up can happen if you hit P to play another game, and then try to enter your option number before the computer is ready for it. This is probably impossible unless you're as eager to play again as I was. Anyway, it only takes about a second for the menu to form the "bleep" to prompt you for your option input.

The third special screen is the galaxy scan. It displays the sixteen quadrants of the galaxy and any starbases and Darstang within each quadrant. While this (or either of the other special screens) is displayed, your ship cannot be attacked. Before you get too thrilled about that, be warned that your ship

uses energy at twice the normal rate while in this suspended state. Hitting any key will return you to the general screen where the battle will resume immediately.

The general screen shows your quadrant, its contents represented by single letters or characters, an annunciator line that flashes vital information as battle continues, and a status line. The status line keeps you constantly informed of your energy level, the number of torpedoes left, the number of Darstang left in the galaxy, your quadrant number, and a special color-coded status statement.

Color-Trek has a couple of quirks, but they work to the advantage of the player. For example, there's no need to worry about the possibility of destroying your ship by warping into an object. As long as you remember to uncloak your ship, and you have at least one hundred units of energy left, you can warp safely. Another thing I've discovered is that the ship consumes no more energy when using the rotation of impulse engines than it does while immobile. The main energy drains occur when absorbing enemy torpedo hits and when warping to another quadrant.

If you think with all the Centurian's power at your fingertips it will be too easy to save the galaxy, you've got a big surprise coming! I've played at least ten games at each difficulty level. I've experienced varying degrees of success and defeat, but never boredom.

The average number of Darstang I've encountered per game is 123. That's 123 fast little ships with battle strategies and torpedoes, not just a bunch of space-beasties dropping vertically across the screen. It's a challenge! Just when you think you have one of them in your sights, it fires at you, or darts aside as you fire. By the time you've cleared the galaxy of these little creeps, you've earned the right to be proud of your abilities as commander of the Centurian!

Video arcade enthusiasts may be disappointed at the lack of graphics, but I believe the detail of the simulation more than compensates for absent graphics. Color-Trek seemed more realistic to me because of its alpha-numeric displays. I found myself presented with the kinds of data I would expect to use to control a ship in a battle

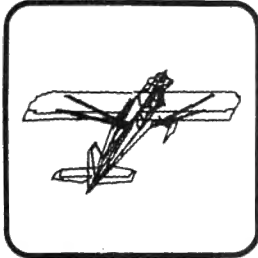
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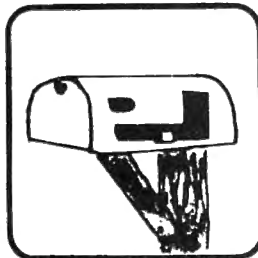
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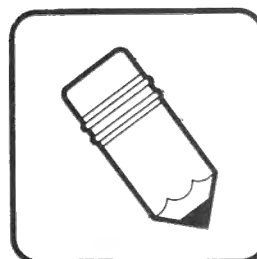


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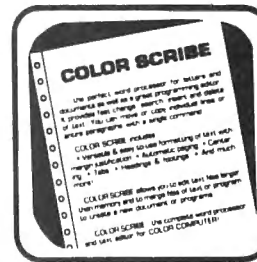
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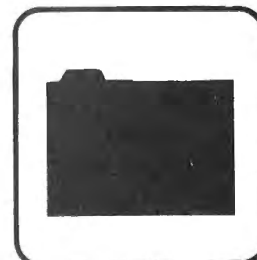
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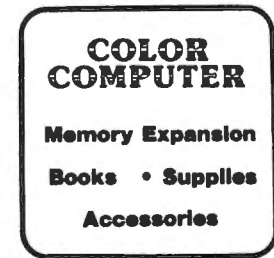
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COLOR TREK

situation. Instead of watching little hi-res spaceships blast each other apart, my imagination could take over and make the simulation realistic on a much more personal level.

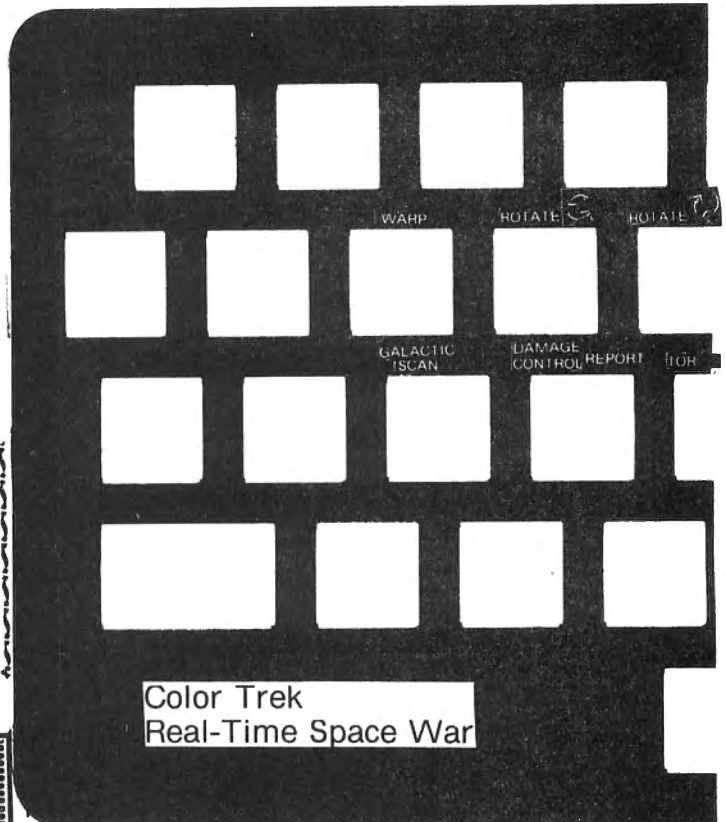
Color-Trek is available from Computerware, 1472 Encinitas Blvd. - Box 668, Encinitas, CA 92924. The 16K machine language tape with thirteen-page manual sells for \$17.95.

CCN TIP

To change the text screen from green to orange type POKE 65314,13. Unfortunately the screen will revert back to green as soon as you PRINT anything.

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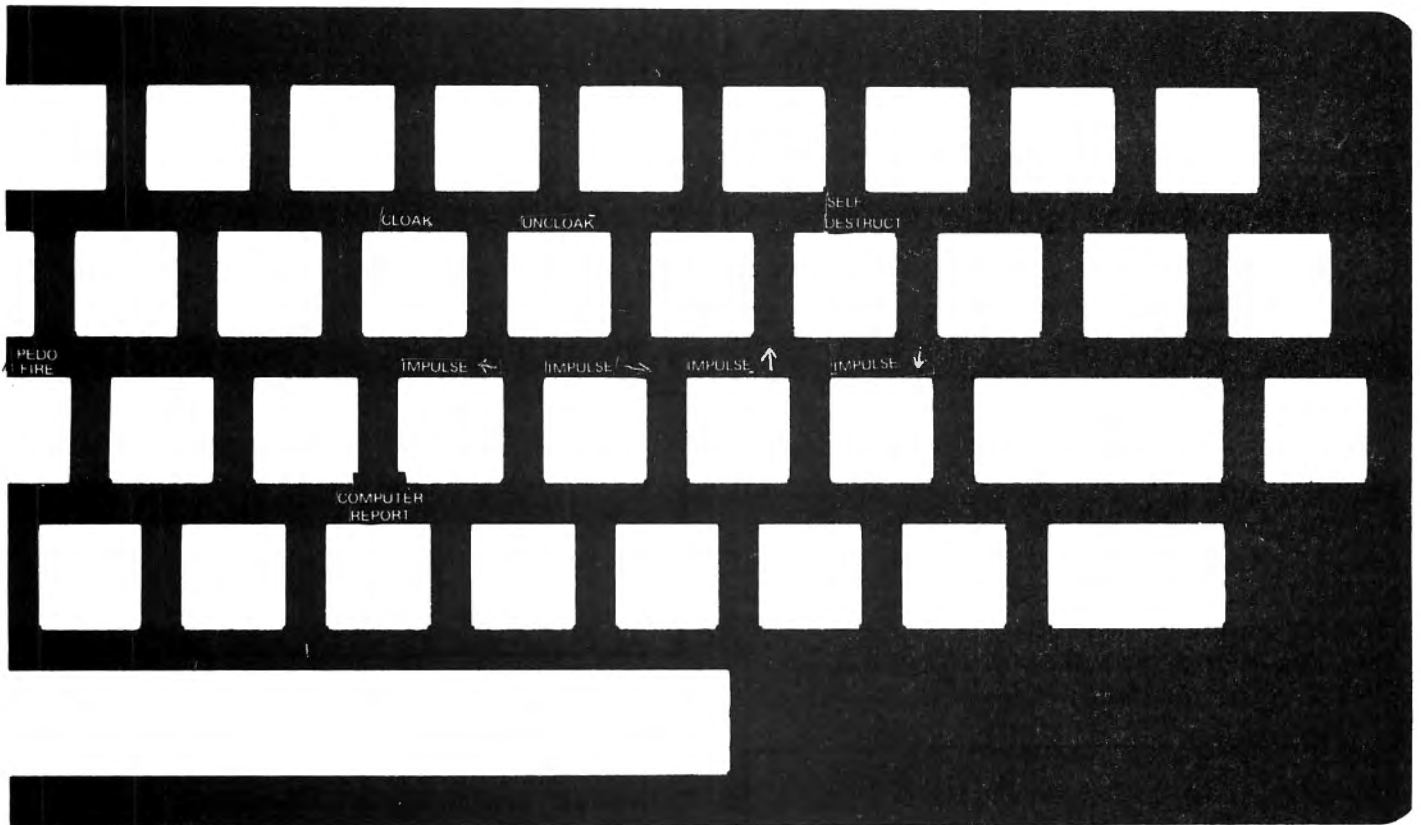
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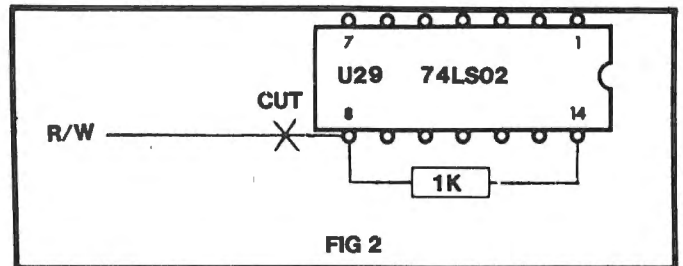
COLOR COMPUTER MOD

by Michael Golden
391 Minnesota
Troy, MI 48084

Frank Hogg's contributions to the color computer users have been appreciated and very beneficial, but in one case I believe he has caused a problem for some of us. The article first appeared in the February 82 issue of CCN entitled "32K RAM FOR FREE." The Radio Shack designers did take note on the revision F board (the latest). The hardware modification that Frank suggested (the addition of a NOR gate) was added to this board. Unfortunately, it has caused a problem with color computer users who wish to use an 8K RAM board in the cartridge slot. The hardware mod has disabled the write capability of memory from \$C000 to \$DFFF to the cartridge.

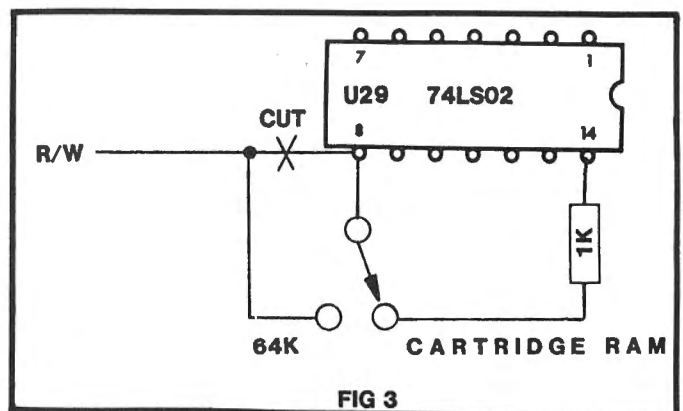
Fortunately, the mod can be changed back very easily and even improved. There are two approaches that will work:

1) This mod will give you the use of 32K of RAM from \$0000 to \$7FFF plus 8K of RAM in the cartridge slot. See figure 2.



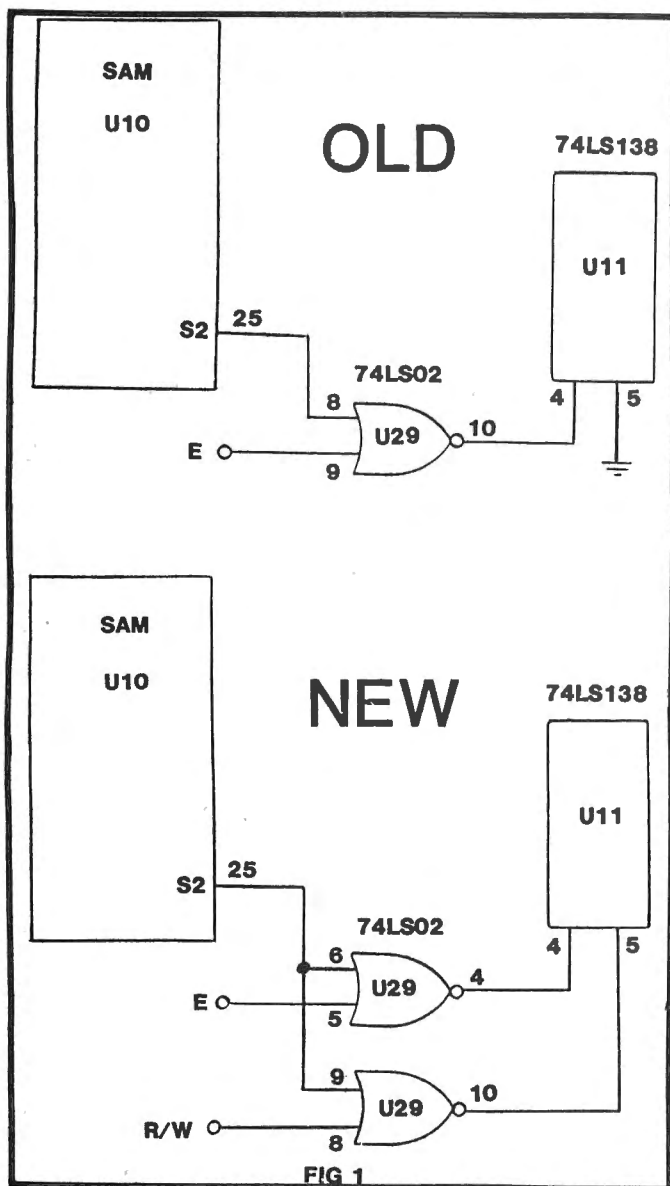
Cut the trace going to pin 8 of the 74LS02 (U29 located close to the 6847 VDG chip) and add a 1K 1/4W resistor soldered from pin 8 to pin 14. This disconnects the R/W line from NOR gate and pulls the output low, enabling you to Read & Write to the cartridge.

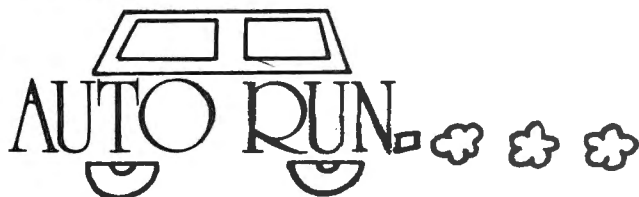
2) Method # will allow you the best of both worlds. A switch selection of 64K RAM (if you have it in your machine) or cartridge RAM. A small switch can be added to the FRONT panel of the computer to select 64K/cartridge. See figure 3.



An additional advantage of this mod is that once the program has been loaded into the cartridge RAM, the switch can be changed to the 64K RAM position and this will give you 8K of write protected RAM. (This makes a great debug tool when debugging machine language programs).

One additional mod that I have made to my 32K machine is the addition of a cartridge





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Basic programs can be set to load anywhere in memory above \$600 (the PCLEAR 0 page).

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disable switch. This allows me to leave my RAM/EPROM card in the cartridge slot at all times without the program in the cartridge taking control of the computer. A simple EXECUTE \$C000 allow's me to jump to the cartridge RAM or EPROM. The modification is made quite simply by cutting pin 7 of the cartridge connector inside the computer and adding a switch. That's it!

The cartridge RAM/EPROM board that I am using is my own design and allows the intermix of 2K x 8 RAM or MOTOROLA 2716 EPROMS without board jumpers. This board is now being made available by:

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TIPS

By Joe F. Sobieski
2277 Menoher Blvd.
Johnstown, PA 1905

Do you have trouble adding or subtracting Hex.?

Let COCO do it for you! Thus;
PRINT HEX\$(#H A + #H A) ENTER
14 (is the answer) in Hex.

To subtract use the - operator. You may also do multiplication with the * operator and the / for divide.

To expotentiate use the up arrow as the operator.

Note, You of course may use line numbers if you are using the above in the conversion program.

To find the number of FREE GRANULES on a disk,

DIR:PRINT FREE(0) ENTER, The directory will list with the number of free granules shown at the bottom.

You may incorporate the above in a program, as an example, let's modify Jack Greb's great "DIR" program to always return the number of free granules at the end of the print out. CCNEWS Oct. 82 page 48.

Change the 4th line in 30,
F\$(3) = "(C)ONTINUE; (S)ELECT" To
F\$(3) = "(C)ONTINUE;(S)ELECT;"

Change line 600,
600 print at 486,F\$(3); to
600 PRINT at 448,F\$(3);:PRINT FREE(0);-
"FREE GRAN."

Now the number of free granules will be shown at the bottom of the directory listing.



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SPECTRAZAP

A BASIC DISK ZAPPER

By David Miner

6307 Tanglewood Lane

Grand Blanc, MI 48439



Spectrazap is a program I created out of a desire to learn more about the structure of the disk files and the data organization. The program is designed for a 16K & 1 drive system. If you have 32K, you may remove the PCLEAR1 at the beginning of the program. If you don't, you will receive an SN ERROR when using the program if a PCLEAR1 has not been performed earlier in the session. I needed a program like this mostly because I had had problems with galloping ghosts in the operating system rampaging across the directory sectors and making some of my precious files unreadable. For this reason, I started out learning about track 17, the directory track. Besides, I reasoned that understanding the directory was the key to understanding the rest of the disk.

So, with my "manual" in hand, I attacked the problem, submerging myself in gran tables and the like. I quickly discovered an error in the manual on page 58. The gran table there is incorrect beyond track 17. A corrected and complete version appears in

Table 1. As I worked, I soon discovered that typing all those DSKI\$'s wasn't for me. I also found that when I wished to change any of the data, finding the correct position was a real chore. The computer could do all of that work easily, and I was sidetracked into writing a direct disk editor. It's full screen, because I am infatuated with full screen editors like my Telewriter. I also added routines to find the location of files on disk, print the gran table, backup disk files, and a few other miscellaneous routines. I now use this very regularly, whenever I want to take a look at what is stored where. I also still have some of those galloping ghosts, but at least now I have some means of dealing with them. Following is a discussion of each routine: what it is, how it works, and any special instructions.

Editor: This routine first asks you for the beginning track and sector for editing. It will not allow any illegal tracks or sectors to be entered. A track number greater than 34 or less than 0 will return you to the main menu, a sector number less than 1 or greater than

18 causes an error message to be flashed, and the track and sector data must be re-entered. Once the program has acceptable data, it retrieves the data from the disk using DSKI\$. The display clears, then the data from the sector is displayed in the following format:

```
TRACK nn SECTOR nn BYTES nnn-  
nnn  
ASCII
```

ASCII bytes
hexadecimal bytes
(blank line)

The ASCII-hex-blank pattern is repeated 3 more times. The track and sector numbers are those that you have input, while the byte numbers will initially be 1-64. The data is displayed one-quarter sector at a time to enhance its readability. The word ASCII indicates that the editor is currently in the ASCII input mode. In this mode, data is accepted directly from the keyboard. Each ASCII character is separated by a space, while its hexadecimal representative begins directly below it. The cursor is a solid black block situated at the beginning of the first blank line, and it is always on one of the 4 blank lines. I suppose this isn't true full-screen editing, but this isn't machine language, either.

There are several commands which can be issued while in editor. These are accessed by pressing first CLEAR and then any of the following keys:

A - the editor is put into the ASCII input mode, which is the default on start-up.

C - this copies the current sector to any track and sector on any drive you specify. This should be used with EXTREME caution, because the program doesn't care what was there, it just writes.

E - exit editor. This command ends the current edit session, returning you to the main menu. Before it does this, however, it first writes the current sector, including any changes you have made, back to the disk.

G - this command moves you forward to the beginning of the next granule on the disk. As with all of the relative move commands, the current sector is written back to the disk.

H - hexadecimal mode. Under this mode, the program assumes that all data entered at the keyboard is in hex notation. The word

HEX is displayed instead of ASCII on the status line. The program will accept any values because it just sticks &H on the front and lets BASIC do the rest. BASIC isn't picky about what you give it, it will just evaluate the number as zero if there are any illegitimate digits present.

M - move. This sends you back to the initial request for track and sector information without writing the current sector back to disk.

N - new. This performs an absolute move like M above, except that the current sector is written back to disk before the move.

Q - quit editor. This is the same as E above, except that the current sector isn't written back to disk.

S - this moves you forward to the beginning of the next sector and writes the current sector back to disk.

T - this moves you forward to the beginning of the next track and writes the current sector back to disk.

'up arrow' - this command moves you backwards to the beginning of the previous granule after writing the current sector back to disk.

'down arrow' - this moves you ahead one-quarter sector, advancing you to the start of the next sector if you are currently in the final quarter of a sector. This routine does no writing to disk unless you are moving to the beginning of a new sector.

In addition to the commands listed above, cursor movement is accomplished by pressing the arrow keys. The right arrow moves you right two spaces (one character), and the left arrow moves you left two spaces. The down arrow moves you down one line on the display, advancing you to the next quarter-sector if you are at the bottom line.

The up arrow deserves special mention, because it has a couple of quirks. It will move you up one line on the display, unless you are on the top line, in which case a test is performed to see if you are at the first quarter of the current sector. If so, you are moved to the beginning of the previous sector. Otherwise, you move to the beginning of the previous quarter-sector. In all cases, no writing to disk is done unless you move outside the boundaries of the beginning sector. Also, the display can only

be advanced by using the up or down arrows, pressing the right or left arrows when you are at a page boundary has no effect. The editor routine is located in line 10 through 43 in the program listing.

Clean Disk: This routine is very murderous, which is why it does nothing until you answer YES to the following question:

ARE YOU SURE (YES REQ'D)?

It is contained in lines 45 and 46 of the program. It simply writes a string of 256 ASCII 255's to every sector on a pre-formatted disk. It will not format a disk, however. It just wipes out all of your data.

Purge Directory: This routine is also a mass-killer, only it's a little more selective. The hit man asks you, for each file, whether it will live or die. All you have to do is type Y 'ENTER' for each file that is to be deleted. He then just uses the simple KILL statement, and the offending file is gone forever, unless you know how to recover killed files (I'm working on a routine for this). The code for this routine is contained in lines 48 through 54. You may exit the routine at any time by responding with Q 'ENTER' to any of the kill queries.

Directory: The directory you find in BASIC is a real disaster, simply because the file you're looking for may scroll past before you can force a pause. As my answer to this tragedy, I offer a two-column format which displays only the files that are on the disk. It is also page-formatted, so you won't get dizzy from the directory whizzing up the screen. This routine is located in lines 56 through 64 of the program.

Kill File: This is a selective assassin I included because I didn't always want to have to go through the whole purge routine to kill a file. It is a routine to perform a BASIC KILL while under program control. However, it is error-trapped, which means that it won't try to kill a file that doesn't exist on the disk. It even gives a file a proper funeral. It is located in lines 66-71 of the program.

Gran Table: During my expeditions on my Verbatims, I got very tired of trying to decode the gran table while fixing disks. So,

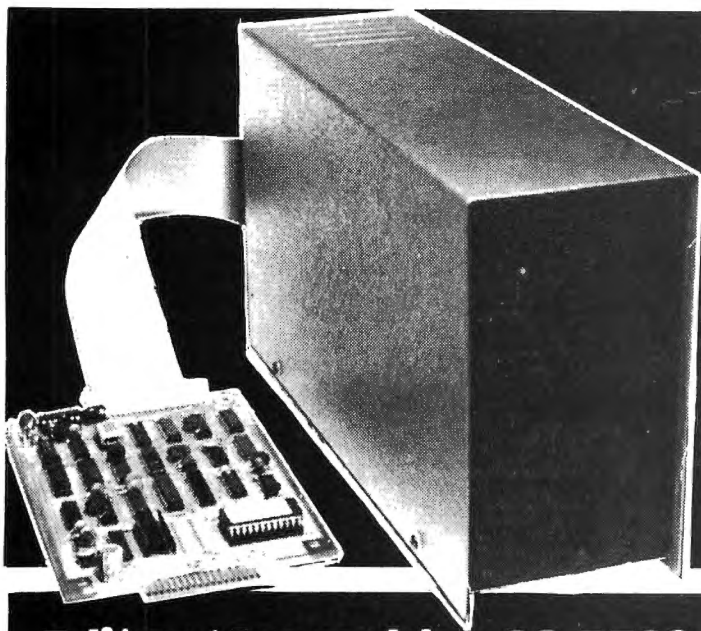
I whipped up a little routine to give it to me in a nice decimal form. A prompt line appears at the bottom of the screen asking which half of the table you wish to see. That half is then printed in a 4-column table, followed by my equations for deriving the track and sector from a gran number. I also included a reference to what \$C0 and \$C9 are (their significance is explained on page 59 of the disk system manual). This routine is located in lines 73-81.

Find File: This is one of the really handy features of this program. It is designed to interface with the editor routine, so it returns the locations as track and sector numbers. It is found in lines 83-94.

Backup File: I wrote this routine because I wanted to be able to copy a single file with one drive. Unfortunately, I found out just the other day that the COPY will do a single drive backup, contrary to what the manual states (see December '82 80 Micro). Anyway, I present it for what it's worth. It will copy any type of file, one granule at a time (since I wrote this while I had 16K, that was all the memory I had left to use). For speed, I definitely recommend using COPY, but if you're stubborn, you can use this. It's located in lines 96-105. It also makes a call to the find file routine, which saved a large chunk of code.

Work Drive: For you multi-drivers, I added this routine in lines 107 & 108. You will notice that in several places in the program I have PEEKed location 3584. This is the reason why: to save memory and increase speed, I cleared the string space every time I entered and exited a routine. This prohibited the use of GOSUBs to call the routines because CLEAR also seems to wipe out the stack (this is merely conjecture on my part). CLEAR also wipes out the values of all of the variables.

In order to use a drive other than 0, I had to have a variable to use in the DSK1\$ and DSK0\$ statements, since DRIVE doesn't affect them. Therefore, I POKEd the current work drive into 3584 because it is the start of the first graphics page and won't be affected by whatever else I do. This is an interesting way of storing numeric variables if you want to maximize your memory with CLEAR tricks and such. If there are any routines you might



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find useful and would like to have them included in a 32K version of this program, drop me a line and I'll be happy to see what I can do. Also, if you write any routines which I might be interest in, let me know about them. I would appreciate any suggestions for improvements to Spectrazap.

GRANULE TABLE

GRANULE #	TRACK	SECTORS	GRANULE #	TRACK	SECTORS
0	0	1-9	1	0	10-18
2	1	1-9	3	1	10-18
4	2	1-9	5	2	10-18
6	3	1-9	7	3	10-18
8	4	1-9	9	4	10-18
10	5	1-9	11	5	10-18
12	6	1-9	13	6	10-18
14	7	1-9	15	7	10-18
16	8	1-9	17	8	10-18
18	9	1-9	19	9	10-18
20	10	1-9	21	10	10-18
22	11	1-9	23	11	10-18
24	12	1-9	25	12	10-18
26	13	1-9	27	13	10-18
28	14	1-9	29	14	10-18
30	15	1-9	31	15	10-18
32	16	1-9	33	16	10-18
34	18	1-9	35	18	10-18
36	19	1-9	37	19	10-18
38	20	1-9	39	20	10-18
40	21	1-9	41	21	10-18
42	22	1-9	43	22	10-18
44	23	1-9	45	23	10-18
46	24	1-9	47	24	10-18
48	25	1-9	49	25	10-18
50	26	1-9	51	26	10-18
52	27	1-9	53	27	10-18
54	28	1-9	55	28	10-18
56	29	1-9	57	29	10-18
58	30	1-9	59	30	10-18
60	31	1-9	61	31	10-18
62	32	1-9	63	32	10-18
64	33	1-9	65	33	10-18
66	34	1-9	67	34	10-18

```

0 PCLEAR1:CLS:DIMG(67),Q*(4):POK
E3584,0
1 PRINT@233,"***SPECTRAZAP***":P
RINT@260,"NOVEMBER, 1982 DAVE M
INER":PRINT@480,"HIT ANY KEY TO
CONTINUE";
2 IFINKEY*=""THEN2
3 CLEAR00:CLS:PRINTTAB(11)*"MEN
U*":PRINTTAB(11)STRING*(6,"-")
4 PRINTTAB(8)"(E)DIT SECTOR":PRI
NTTAB(8)"(C)LEAN DISK":PRINTTAB(
8)"(P)URGE DIRECTORY":PRINTTAB(8
)"(D)IRECTORY":PRINTTAB(8)"(K)IL
L FILE":PRINTTAB(8)"(G)RAN TABLE
":PRINTTAB(8)"(F)IND FILE
5 PRINTTAB(8)"(B)ACKUP FILE":PRI
NTTAB(8)"(W)ORK DRIVE
6 PRINT@480,"KEY FIRST LETTER OF
SELECTION";
7 Q*=INKEY*:IFQ*=""THEN7
8 P=INSTR("ECPDKQFBW",Q*):ON P G
OTO 10,44,47,55,65,72,82,95,107:
GOTO3
9 ' **EDIT SECTOR**
10 CLEAR00:A=1:D=PEEK(3584)
11 C=128:CLS:INPUT"INPUT TRACK,S
ECTOR (T<0 TO QUIT)":T,S:IFT<0 O
R T>34 THEN3 ELSEIFS<1ORS>18THEN
PRINT"INVALID SECTOR":SOUND50,4:
FORX=1TO300:NEXT:GOTO11
12 DSKI*D,T,S,A*,B*:Q=1:C=128
13 Q*(1)=LEFT*(A*,64):Q*(2)=RIGH
T*(A*,64):Q*(3)=LEFT*(B*,64):Q*(
4)=RIGHT*(B*,64)
14 CLS:PRINT@0,"TRACK" T"SECTOR" S
"BYTES ";:ON Q GOTO15,16,17,18
15 PRINT"1-64":GOTO19
16 PRINT"65-128":GOTO19
17 PRINT"129-192":GOTO19
18 PRINT"193-256"
19 IFA=0THENPRINT@46,"HEX";ELSEP
RINT@45,"ASCII";
20 RESTORE:FORX=64TO352STEP96:RE
ADE:FORY=1TO16:PRINT@X+(Y-1)*2,M
ID*(Q*(Q),FIX(X/E)+Y,1):PRINT@X+
(Y-1)*2+32,HEX*(ASC(MID*(Q*(Q),F
IX(X/E)+Y,1))):NEXTY,X:DATA65,10
,8,7.3
21 IFC<128THENC=128 ELSEIFC=160
ORC=256 ORC=352THENC=C+64 ELSEIF
C>446 THENC=446
22 PRINT@C,CHR*(128);
23 Q*=INKEY*:IFQ*=""THEN23
24 IFQ*=CHR*(12)THENGOSUB33 ELSE
IFQ*=CHR*(8)THEN25 ELSEIFQ*=CHR*(
9)THENPRINT@C,"":C=C+2:GOTO21 E
LSEIFQ*=""^"THEN26 ELSEIFQ*=CHR*(
10)THEN28 ELSEIFA=1 THEN43 ELSE3

```

```

0
25 IFC=224 ORC=320 ORC=416 THENP
RINT@C,"":C=C-66:GOTO21 ELSEPRIN
T@C,"":C=C-2:GOTO21
26 IFC/2<>INT(C/2)THENC=C-1
27 IFC>223THENPRINT@C,"":C=C-96:
GOTO21 ELSE31
28 IFC/2<>INT(C/2)THENC=C-1
29 IFC<416THENPRINT@C,"":C=C+96:
GOTO21 ELSE32
30 PRINT@C,"":IFC/2=FIX(C/2)THEN
J*=Q*:C=C+1:GOTO21 ELSEPRINT@C-3
3,J*+Q*,:E=VAL("&H"+J*+Q*):PRINT
@C-65,CHR*(E):MID*(Q*(Q),(FIX(C
/96)-1)*16+(C-(127+(FIX(C/96)-1)
*96))/2,1)=CHR*(E):C=C+1:GOTO21
31 Q=Q-1:IFQ=0 THENDSKO*D,T,S,Q*(
1)+Q*(2),Q*(3)+Q*(4):Q=4:S=S-1:
IFS=0THENS=18:T=T-1:IFT<0THENT=0
:S=1:Q=1:GOTO21 ELSE12 ELSE12 EL
SE14
32 Q=Q+1:IFQ=5 THENDSKO*D,T,S,Q*(
1)+Q*(2),Q*(3)+Q*(4):Q=1:S=S+1:
IFS=19THENS=1:T=T+1:IFT>34THENT=
34:S=18:Q=4:GOTO21 ELSE12 ELSE12
ELSE14
33 C*=INKEY*:IFC*=""THEN33ELSE P
=INSTR("QACQHMNEST^"+CHR*(10),C*
):IFP=0THENPRINT@480,"INVALID CO
MMAND":SOUND50,10:PRINT@480,"
";:RETURN ELSEONP G
OTO3,42,37,38,39,11,35,34,40,41,
36,32
34 DSKO*D,T,S,Q*(1)+Q*(2),Q*(3)+
Q*(4):GOTO3
35 DSKO*D,T,S,Q*(1)+Q*(2),Q*(3)+
Q*(4):GOTO11
36 IFS>9THENS=1:GOTO12 ELSE S=10:
T=T-1:IFT<0 THENT=0:S=1:GOTO12 E
LSE12
37 PRINT@448,"ENTER DESTINATION
DRIVE,TRACK, SECTOR":INPUTD1,T
1,81:IFD1<0 ORD1>3 ORT1<0 ORT1>3
4 ORS1<1 ORS1>18 THENPRINT@480,"
INVALID DESTINATION":GOTO14 ELS
EDSKO*D1,T1,81,Q*(1)+Q*(2),Q*(3)
+Q*(4):GOTO14
38 IFS<10THENS=10:GOTO12 ELSE S=1
:T=T+1:IFT>34THENT=34:S=18:GOTO1
2 ELSE12
39 A=0:PRINT@45," HEX ";:GOTO23
40 S=S+1:IFS>18 THENT=T+1:S=1:IF
T>34THENT=34:S=18:GOTO12 ELSE12
ELSE12
41 T=T+1:S=1:IFT>34THENT=34:S=18
:GOTO12 ELSE12
42 A=1:PRINT@45,"ASCII":GOTO21
43 PRINT@C,"":PRINT@C-64,Q*,:PRI

```

```

NT@C-32, HEX*(ASC(Q*));:MID*(Q*(Q
), (FIX(C/96)-1)*16+(C-(126+(FIX(
C/96)-1)*96))/2, 1)=Q*:C=C+2:GOTO
21
44 ' **INITIALIZE DISK**
45 CLEAR260:D=PEEK(3584):CLS:PRI
NT@224,"ARE YOU SURE (YES REQ'D)
";:INPUTY*:IFY*<>"YES"THEN GOTO3

46 A*=STRING*(128, CHR*(255)):B*=
A*:FORT=@TO34:FORB=1TO18:DSK@D,
T, S, A*, B*:NEXTS, T:GOTO3
47 ' **CLEAN DIRECTORY**
48 CLEAR1000:D=PEEK(3584):CLS:FO
RS=3TO11:DSKI*D, 17, S, A*, B*:DRIVE
D
49 AB*=A*+LEFT*(B*, 127):FORX=1TO
225STEP32:F*=MID*(AB*, X, 11):IFAS
C(LEFT*(F*, 1))=@ THENNEXTX
50 IFASC(LEFT*(F*, 1))=255THEN GO
TO53
51 PRINT"DELETE "F*,:INPUTQ*:IFQ
*="Q"THEN3 ELSEIFQ*="Y"THEN A*=L
EFT*(F*, 8):B*=RIGHT*(F*, 3):F*=A*
+ "/" + B*:KILL F*
52 NEXTX, S
53 PRINT@480,"HIT ANY KEY TO RET
URN TO MENU";
54 IF INKEY*=""THEN 54 ELSEGOTO3

55 ' **PRINT DIRECTORY**
56 CLEAR1000:D=PEEK(3584):CLS:FO
RS=3TO11:DSKI*D, 17, S, A*, B*:AB*=A
*+LEFT*(B*, 127):FORE=1TO225STEP3
2:ET*((E-1)/32)=MID*(AB*, E, 11)
57 IFASC(ET*((E-1)/32))=255THEN6
2
58 IFASC(ET*((E-1)/32))=@ THENNE
XTE ELSE PRINTET*((E-1)/32), "":
NEXTE
59 IFB=5 OR S=8 THEN60 ELSE NEXT
S
60 PRINT@480,"HIT ANY KEY FOR NE
XT PAGE";
61 IFINKEY*=""THEN61ELSE CLS:NEX
T8
62 PRINT:PRINTFREE(D)"GRANS FREE
"
63 PRINT@480,"HIT ANY KEY TO RET
URN TO MENU";
64 IFINKEY*=""THEN64 ELSE GOTO3
65 ' **KILL FILE**
66 CLEAR1000:D=PEEK(3584):CLS:PR
INT"ENTER FILE NAME ":LINE INPU
TF*:IF F*="Q"THEN GOTO3 ELSEIFLE
N(F*)>12THEN66
67 P=INSTR(F*, "/"):IFP=@THENP=IN
STR(F*, "."):IFP=@THENPRINT"INVAL

```

```

ID FILE NAME":SOUND50, 8:GOTO66
68 F1*=LEFT*(F*, P-1):F1*=F1*+STR
ING*(B-LEN(F1*), " "):F2*=RIGHT*(
F*, LEN(F*)-P)
69 FORS=3TO11:DSKI*D, 17, S, A*, B*:
AB*=A*+LEFT*(B*, 127):FORF=1TO225
STEP32:IFMID*(AB*, F, 8)=F1* AND M
ID*(AB*, F+8, LEN(F2*))=F2*THEN70
ELSENEXTF, S:PRINTF*" IS NOT ON D
ISK":SOUND50, 8:GOTO66
70 DRIVED:KILL F*:PRINT:PRINT"**
F*"** KILLED":PLAY"V2502L28P8L4
G03L1C":PRINT@480,"HIT ANY KEY T
O RETURN TO MENU";
71 IFINKEY*=""THEN71ELSEGOTO3
72 ' **PRINT GRAN TABLE**
73 CLEAR300:D=PEEK(3584):CLS:DSK
I*D, 17, 2, A*, B*
74 PRINT@480,"HALF (1), HALF (2)
OR (Q)UIT";
75 G*=INKEY*:IFG*=""THEN75 ELSEI
FINSTR("12Q", G*)=@THEN75
76 IFG*="Q"THENGOTO3
77 CLS:PRINTTAB(10)"GRAN TABLE":
G=VAL(G*):FORX=(G-1)*34TO(G-1)*3
4+33
78 Q=@-X:G=ASC(MID*(A*, X+1, 1)):P
RINTUSING"##-###%";Q, G, " "":NE
XTX
79 PRINT:PRINT:PRINT"*C0=192, *C
9=201":ONVAL(G*)GOTO80, 81
80 PRINT"TRACK=INT(GRAN/2)", "SEC
TOR=INT(GRAN/2-T+.5)*9+1":GOTO74

81 PRINT"TRACK=INT((GRAN+2)/2)",
"SECTOR=INT((GRAN+2)/2-T+.5)*9+1
":GOTO74
82 ' **FIND FILE**
83 FL=@:CLEAR1000:D=PEEK(3584)
84 CLS:LINEINPUT"ENTER FILE NAME
";F*:IFF*="Q"THENGOTO3
85 P=INSTR(F*, "/"):IFP=@THENP=IN
STR(F*, "."):IFP=@THENPRINT"ILLEG
AL FILE NAME":FORP=1TO300:NEXT:G
OTO84
86 F1*=LEFT*(F*, P-1):F1*=F1*+STR
ING*(B-LEN(F1*), " "):F2*=RIGHT*(
F*, LEN(F*)-P)
87 FORS=3TO11:DSKI*D, 17, S, A*, B*:
AB*=A*+LEFT*(B*, 127):FORF=1TO225
STEP32:IFMID*(AB*, F, LEN(F1*))=F1
* ANDMID*(AB*, F+8, LEN(F2*))=F2*
THENG(0)=ASC(MID*(AB*, F+13, 1)):G
OTO89 ELSENEXTF
88 NEXTS:PRINTF*" IS NOT ON DISK
":GOTO93
89 DSKI*D, 17, 2, A*, B*:FORX=@TO66:
IFASC(MID*(A*, G(X)+1, 1))>67THEN9

```

```

0ELSEG(X+1)=ASC(MID*(A*,G(X)+1,1
)):NEXTX
90 IFFL=1THENRETURN ELSECLS:PRIN
T"LOCATION OF "F*:FORY=0TOX:IF0(
Y)>33THEN91 ELSESET=INT(G(Y)/2):FS
=INT(G(Y)/2-T+.5)*9+1:GOTO92
91 T=INT((G(Y)+2)/2):FS=INT((G(Y
)+2)/2-T+.5)*9+1
92 PRINTUSING"TK### SR###-##! ";
T,0-F8,F8+B," ";NEXTY
93 PRINT@480,"HIT ANY KEY TO RET
URN TO MENU";
94 IFINKEY*=""THEN94 ELSEGOTO3
95 ' **BACKUP FILE**
96 CLS:CLEAR3300:D=0:DIMA*(9),B*
(9):FL=1:INPUT"PRESS ENTER WHEN
SOURCE DISK IN DRIVE";Q*:GOSUB84
:INPUT"INSERT DESTINATION DISK";
Q*:OPEN"D",#1,F*:FIELD#1,128ASX*
,128ASY*:R=1:INPUT"INSERT SOURCE
DISK";Q*
97 FORY=0TOX:IF0(Y)>33THEN98 ELS
ET=INT(G(Y)/2):FS=INT(G(Y)/2-T+.
5)*9+1:GOTO99
98 T=INT((G(Y)+2)/2):FS=INT((G(Y
)+2)/2-T+.5)*9+1
99 FORS=F8 TO F8+B:DSKI*0,T,S,A*
(S-F8),B*(S-F8):NEXTS:CLS:INPUT"
INSERT DESTINATION DISK";Q:FORs=

```

```

F8 TO F8+B:LSETX*=A*(S-F8):LSETY
*=B*(S-F8):PUT#1,R:R=R+1:NEXTS:I
NPUT"INSERT SOURCE DISK";Q:NEXTY
100 FORS=3TO11:DSKI*0,17,S,A*,B*
:AB*=A*+LEFT*(B*,127):FORP=1TO22
58STEP32:IFMID*(AB*,P,LEN(F1*))=F
1* AND MID*(AB*,P+B,LEN(F2*))=F2
*THEN101 ELSENEXTP,S
101 FT=ASC(MID*(AB*(P+11,1)):AF=
ASC(MID*(AB*(P+12,1))
102 CLS:INPUT"INSERT DESTINATION
DISK";Q:FORs=3TO11:DSKI*0,17,S,
A*,B*:AB*=A*+LEFT*(B*,127):FORP=
1TO2258STEP32:IFMID*(AB*,P,LEN(F1
*))=F1* AND MID*(AB*,P+B,LEN(F2*
))=F2* THEN103ELSENEXTP,S
103 MID*(AB*(P+11,1)=CHR*(FT):MI
D*(AB*(P+12,1)=CHR*(AF)
104 A*=LEFT*(AB*,128):B*=RIGHT*(
AB*,127)+CHR*(0):DSKI*0,17,S,A*,
B*:CLOSE#1:PRINT@480,"HIT ANY KE
Y TO RETURN TO MENU";
105 IFINKEY*=""THEN105 ELSEGOTO3
106 ' **CHANGE WORK DRIVE**
107 CLS:PRINT"CURRENT WORK DRIVE
IS #"PEEK(3584):INPUT"ENTER NEW
DRIVE NUMBER";D
108 IFD<0 ORD>3 THEN107 ELSEPOKE
3584,D:GOTO3

```

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Quickie Review of New Software
by Old Father William +

Available now on disk (formerly ROMpack only), is the text processor originally born into the Model I-III family. Color Disk Scripsit is a full featured text processor with a graphics based lower case alphabet system for use during text entry and editing.

Having a disk base allows some previously unavailable functions. Text data may be dumped to separately named files of disk storage whenever memory overload threatens. Even more dramatic is the "spool file" mode, which permits the CC to use its ability to do more than one thing at a time. The operator may use Scripsit to create or edit a file in memory, while the CC is pulling lines of data from another file on the same disk (or in another drive) and outputting that file to the printer.

The block move, copy, and delete routines are quite flexible. The text may be searched for specific strings, including alignment characters, and the string changed singly or as a group. After text is entered, and the line width of the printout is established, the user

may elect to find any words which, if hyphenated, might help compact the printout. Each possible word is presented for a decision and a quick fix.

The Color Disk Scripsit disk must stay in drive 0 while the user is working on text. If the user has only one drive, all text files must be written to unused granules on that disk (or on backup copies of that disk). With two drives, the uses of the second drive are unrestricted. To edit materials not originally written using Scripsit, with only one drive, Basic programs or Basic data must be written to a Scripsit disk, using Scripsit's COPY mode, which works a lot like disk Extended Basic's BACKUP routine.

Owners of 16K CC's will probably have to select the option of turning off the lower case graphics most of the time, because that routine consumes 7200 of the 8643 bytes of memory left after the program is loaded and executed. 32K users have a 17,817 byte buffer, even with the graphics turned on.

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U.S. ROBOTICS ACOUSTIC MODEM	\$119

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DONKEY KING by TOM MIX	\$ 24.95
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FLEX w/DBASIC	\$129.00
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Other Software at Level IV includes: Spectral Associates,
AARDVARK, Intracolor...etc....CALL FOR PRICES!!!!

Level IV Products, Inc. 32429 Schoolcraft Road Livonia, MI 48150

Michigan (313) 525-6200

Others (800) 521-3305

™ TRS80 color

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.

NOTE: This and other interesting and needed articles for the Radio Shack TRS-80 color computer™ are being included monthly in 68 Micro Journal—The Largest specialty computer magazine in the world!

68 MICRO JOURNAL

5900 Cassandra Smith Road
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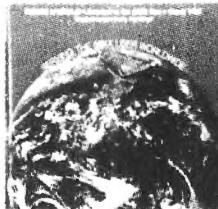
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68 Micro Journal™ was established with one objective in mind; to provide a Magazine FOR 68xx Users BY 68xx Users. Because of a strict advertiser policy, 68 Micro Journal™ has gained a strong following WORLDWIDE because the reader KNOWS what he is getting when purchasing from a 68 Micro Journal™ Advertiser. It has gained a strong User following because most of the material published is contributed BY USERS, and, therefore, is relevant to the Users needs.

Currently, and even before the Color Computer™ hit the stores, 68 Micro Journal™ was devoting more space to the TRS-80C Color Computer™ and information concerning the Motorola 6809 (which is the CPU in the Color Computer™) than ANY OTHER Computer Magazine. Examples include:

REVIEWS of the three major Disk Control Systems for the Color Computer™, most of the Monitors, Assemblers, and Disassemblers, Word Processors and Editors, "Terminal" Programs (for use with Modems, Communications with other Computers, etc.), and of course, Games.

HINTS for Expanding Memory, Power Supply Cooling, repairing sticky keyboards, disabling the ROM PAK "Take Over", hooking up to Printers, etc.

DISCUSSIONS of the 6883 Synchronous Address Multiplexer, using the Color Computer™ with 64K and 96K memory (which it is ALREADY capable of handling), thoughts on Programming, etc.

I suggest that you subscribe to 68 Micro Journal™, SOON, as many back issues are sold-out.

We still, and will continue to, lead in the type information you need to FULLY UTILIZE the POWER of the 6809 in the Radio Shack TRS-80 Color Computer™.

Bob Nay
Bob Nay
Color Computer Editor

The Original FLEX for Color Computers

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Languages Available

Pascal, Fortran, RS Basic, RS Assembler, TSC Basic, TSC Assembler, Relocating Assembler, Macro Assembler, Mumps

If you are tired of playing games on your TRS-80C™ Color Computer, or find that you are handicapped by the limitations of the RS BASIC in trying to write a Program that will allow you to actually USE the Color Computer as a COMPUTER, YOU ARE READY TO MOVE UP TO THE FLEX9™ Operating System. If you want to have REAL PROGRAMMING POWER, using an Extremely Powerful Business BASIC, PASCALS, C Compilers, a full-blown Macro Assembler with a Library capability so you are not continuously "reinventing the wheel", YOU ARE READY TO MOVE UP TO THE FLEX9™ Operating System. If you would like to see if YOU REALLY COULD USE A COMPUTER IN YOUR BUSINESS, or begin to make your Computer start PAYING IT'S OWN WAY by doing some Computer Work for the millions of small businesses around you, such as Wordprocessing, Payroll, Accounting, Inventory, etc., then YOU ARE READY TO MOVE UP TO THE FLEX9™ Operating System. How?? DATA-COMP has the way!

DATA-COMP's FLEX9™ Conversion for the TRS-80C™ Color Computer was designed for the SERIOUS COMPUTER USER; with features like greatly increased Display Screens, WITH Lower Case Letters, so you can put a FULL Menu on ONE Screen, or see SEVERAL Paragraphs at the same time; with features like providing a FULL Keyboard so you have FULL Control of your Computer AND it's Programs NATURALLY, without needing a chart to see what Key Combination will give you what function; with USER ORIENTED functions to make using the Operating System natural, like having the Computer AUTOMATICALLY determine what type of Disk is being used in what type of Disk Drive and working accordingly, rather than you have to specify each and every thing for it, or like having the Computer work with the Printer you have been using all along without you having to tell the new Operating System what is there, etc., etc., etc.

DATA-COMP has everything you need to make your TRS-80C™ Color Computer WORK for YOU; from Parts and Pieces to Full, Ready To Use SYSTEMS. DATA-COMP designs, sells, services, and SUPPORTS Computer SYSTEMS, not just Software. CALL DATA-COMP TODAY to make your Computer WORK FOR YOU!

System Requirements

FLEX9 Special General Version x-Editor & Assembler (which normally sell for \$50.00 ea.) \$150.00
F-MATE(RS) FLEX9 Conversion Rout, for the RS Disk Controller when purchased with Special General FLEX9 Sys. \$69.95
when purchased without the General FLEX9 Sys. \$79.95
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Color Computer with 64K RAM and EXT. BASIC \$549.95
Color Computer with 16K RAM \$375.95
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Now Available Enhanced F-MATE Version 2.1

SPECIAL SYSTEM PACKAGES

64K Radio Shack COLOR COMPUTER, Radio Shack COLOR DISK CONTROLLER, a Disk Drive System, Special General Version of FLEX9™, F-MATE(RS)™ and a Box of 10 Double Density Diskettes; a COMPLETE, ready to run SYSTEM on your Color TV Set. \$1249.95

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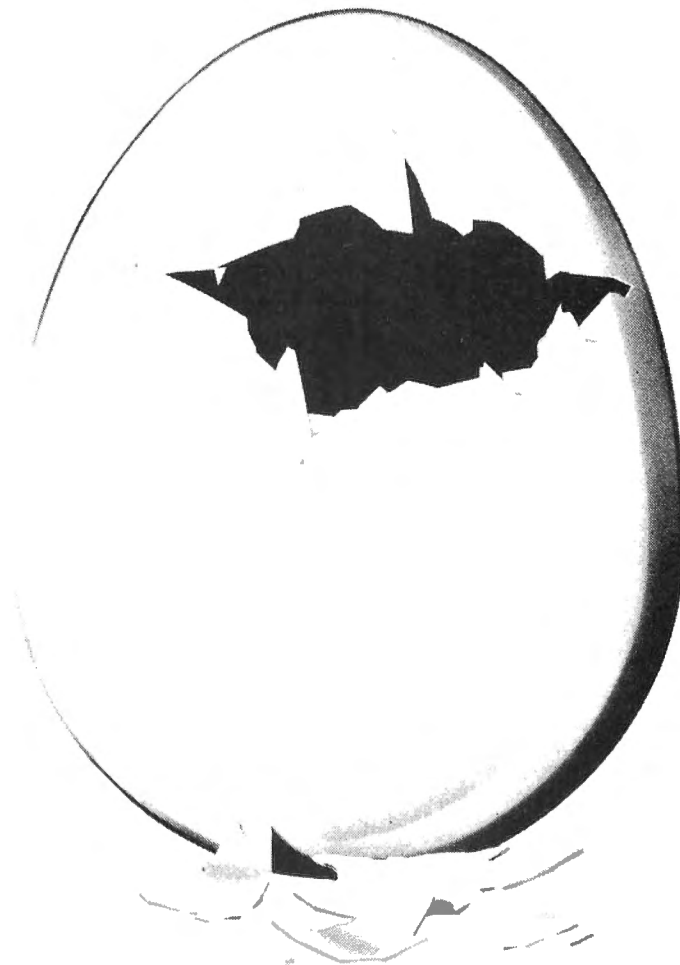
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NEW PRODUCTS



DUAL PORT EXPANDER

TJN Systems is pleased to announce the production of two new products for Radio Shack's TRS-80 Color Computer. The first product is our Y-PAK dual port adaptor. This adaptor changes the single slot Color Computer into a dual slot machine. The Y-PAK was designed to eliminate the need for removing the disk controller each time a game cartridge is used. The 9" x 5" x 7/8" Y-PAK plugs directly into the Color Computer's existing cartridge slot. All Y-PAK connectors provide for the use of the disk ground tabs.

Two LED indicated switches provide control of the Y-PAK's operation. The PORT switch gates the ROM chip select, I/O chip select and auto-start control lines to either the port A or port B expansion slots. The AUTO-START switch enables or disables the auto-start return line from the selected slot.

ROM or RAM PAK

The second new product for the TRS80
Color Computer News

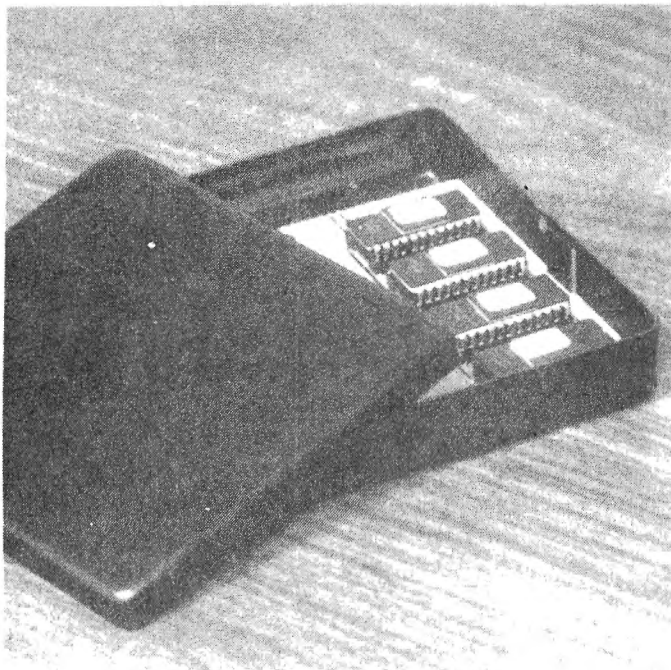
Color Computer is our USER-PAK cartridge system. The USER-PAK is an 8K user selectable cartridge designed to use either 2716 or 2732 EPROMs or to use 6116 RAMs. The USER-PAK comes complete with socketed pc board and a 4 7/8" x 4 1/4" x 7/8" plastic case with a snap lock top (less RAMs or EPROMs).

A diagram is provided inside the cover of the case showing the configuration of USER-PAK jumpers. A single jumper is used to enable the auto-start option. The auto-start jumper should only be installed when using EPROMs.

A 2716 programming service from Color Computer object cassettes is also being provided. Cassettes being sent for this service must load using the CLOADM command and be ORGed at C000 hex.

The retail price of the USER-PAK is \$30.00 and the Y-PAK is \$70.00 when mail ordered from B. Erickson Software, PO Box 11099, Chicago, IL 60611.

Dealer inquires for wholesale pricing should be addressed to TJN Systems, 765 Rt. 83 Suite 111, Bensenville, IL 60106.



the player in an experience which simulates the actual experience of being a race driver. Discussions with the team, choosing cars and tracks to race on, and receiving information on lap times and lap records are all part of REVOLUTION. Plus, REVOLUTION has a unique feature which allows the player to create and save his own race tracks. This means the player has more control over the play of this computer game than any other. Scores (lap records) are permanently retained even after the computer is turned off.

REVOLUTION is completely menu-driven and uses single-key entry wherever possible. Its advanced software design promises maximum user friendliness for both novice and experienced user.

The original REVOLUTION has been developed for 32K, one disk drive, and joysticks. A slightly abridged version will be released for 16K cassette systems.

Disk REVOLUTION sells for \$24.95. The cassette version will be priced at \$22.95. For further information, contact:

Inter + Action
113 Ward Street
New Haven, CT 06519
or call (203) 562-5748.



Inter + Action, of New Haven, Connecticut, announces REVOLUTION, a new high-end computer game for the Radio Shack Color Computer and the TDP-100. REVOLUTION is the first commercially available auto racing game for the Color Computer, and, as its name implies, is very different from conventional computer games.

REVOLUTION uses a series of conversational screens and menus to involve

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MORTTY is a general purpose communications program adaptable to almost any set of conventions in current use. It includes ASCII and Baudot code capabilities at any baud rate of which the equipment is capable. There are 17 parameters for adaptation to particular conventions such as full screen, split screen with type ahead buffer, full or half duplex, and many more. There are 15 disk operations, including disk file send, receive, direct hex upload and download, automatic message storage with file sequencing, and auto answer from disk.

It features an advanced string storage and transfer system with many convenient applications, such as autologon, automatic programming of smart modems, printers,

NEW PRODUCTS

and the like, CW ID, and user definable functions executable by a single key stroke.

Equipment required:

1a. H89 or Z89 with 32K of memory and H88-3 serial interface or

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2. Telephone modem, or equivalent modulators, demodulators, transmitters, receivers, etc., for other types of communications.

Optional equipment:

A printer, extra memory, and extra disk drives all can be used.

Software required: HDOS v.2.0

Price: \$100.00 ppd.

What you get: 5-1/4 hard sectored disk with MORTTY.ABS, a hard copy 60 page user's guide, and any updates issued by the author within one year of purchase date.

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Brief Description:

There are 28 dominoes. Each domino is divided in two ends. Each end has a number. This number varies from zero to six. Dominoes that have the same number at both ends are called doubles. There are seven doubles.

In the arcade version of the game a player plays against the computer. At the beginning each player takes 5 dominoes. Then initially 18 dominoes are in the boneyard. The first domino to be played is a double. A player can play when his turn comes up if he has a domino whose end matches the open ends of the dominoes on the board, otherwise, he must go to the boneyard and continue to draw dominoes until he finds a playable domino. When the boneyard is exhausted the player must pass.

The object of the game is to make the opponent either go to the boneyard or pass. Points are earned when you make your opponent go to the boneyard or pass. At the end of the game points in the opponents

Color Computer News

hands goes to the winner.

For free information write to:

JPR SOFTWARE

Box 4155

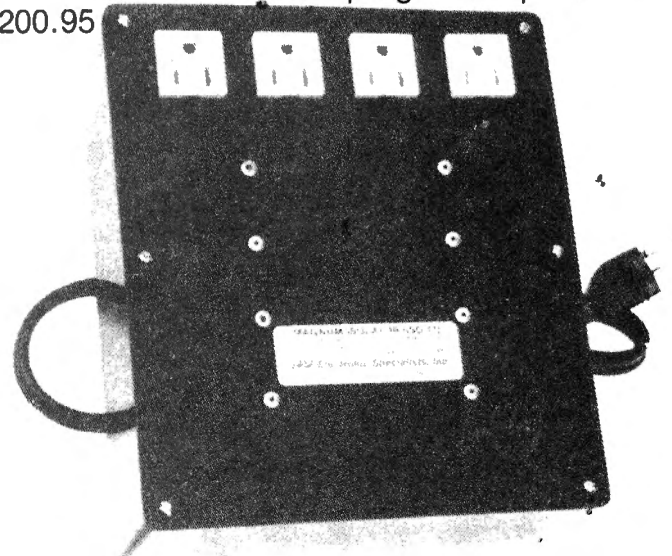
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Electrical pollution drive Micro Programs bananas! Power line electrical noise, hash and spikes often cause erratic computer operation. In addition, severe spikes from lightning or heavy machinery may damage expensive hardware. Many systems create their own pollution! Disks and printers often create enough electrical interference to disrupt an entire program. Nearby electronic equipment is affected as well.

ELECTRONIC SPECIALISTS recently announced MAGNUM ISOLATOR is designed to control severe electrical pollution. Incorporating heavy duty spike/surge suppression, the MAGNUM ISOLATOR features four individually quad-Pi filtered AC sockets. Equipment interactions and eliminated and disruptive/damaging power line pollution is controlled. The MAGNUM ISOLATOR will control pollution for an 1875 watt load. Each socket can handle a 1000 watt load.

The MODEL ISO-17 MAGNUM ISOLATOR eliminates severe AC power line pollution for smooth program operation. \$200.95



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Phone (617) 655-1532

MCOMMAND

MCOMMAND® is a Flex® utility that will convert any disk resident command to a memory resident command. As an example of its use, executing MCOMMAND,CAT will create a memory resident command called CAT that does the same thing as the disk utility CAT. As another example, executing MCOMMAND,LIST,COPY,ASN will create three memory resident commands that perform identically to the standard FLEX utilities LIST, COPY and ASN. There is no restriction on the type of disk resident command that can be converted to memory resident command.

MCOMMAND provides a substantial enhancement to single drive systems, where it makes it unnecessary to keep copies of common utilities on every working disk. Even in multiple drive systems, MCOMMAND can be used to eliminate a certain amount of disk juggling, as in copying from one disk to another, where neither disk contains the COPY command. On any system, memory resident commands execute almost instantaneously since they do not have to be retrieved from disk.

Two additional utilities, CATALOG and DROP, are supplied with MCOMMAND. CATALOG displays a list of memory resident commands. It also displays the amount of memory occupied by each command. DROP allows you to remove memory resident commands in order to make more space available for user programs.

In any operating system, there is an inevitable tradeoff between size on the one hand, and convenience on the other. MCOMMAND and DROP essentially allow you to make this tradeoff for yourself.

A pricing policy for MCOMMAND has not been established. Dealer inquiries are invited. Further information and a list of dealers may be obtained from James Arbuckle, PO Box 328, Ambler, PA 19002 (215) 643-0788.

SOFTWRIDE INTRODUCES BATTLE OF GETTYSBURG

The BATTLE OF GETTYSBURG is a
124 March 1983

strategic simulation wargame. The player must assume the role of the Federal commander and prevent the Confederate army from penetrating the Federal line. The game is played on a four color map in 128 by 92 resolution. The troops are represented by colored rectangles. The Federal commander must use the joystick to move divisions about the field. Battle outcome is calculated on historically based statistics. Knowledge of Civil War tactics and of the Battle of Gettysburg is especially helpful.

The program comes on cassette with a twelve page manual including two maps and is 32K disk compatible. The program plays on a 16K extended basic color computer with joystick. The BATTLE of GETTYSBURG is available from better software stores and directly from SOFTWRIDE, P.O. Box 3504, Austin, Texas 78764 (512) 444-6135. \$20.95 including post and handling or \$19.95 from your favorite dealer.

Computerware® introduces MEGAPEDE on cassette and disk for the Radio Shack Color Computer and TDP System 100.

You've heard of centipedes and caterpillars and all those other bugs. Well, MEGAPEDE is (as the mega suggests) exponentially more challenging! Action is an understatement! Arcade goers will know the difference!

Caught in a jungle of algae, you find yourself attacked by vicious fleas, mean spiders, and of course the relentless centipedes. You must shoot your way out of this predicament, gaining points with every hit. With several levels of difficulty and fast action graphics, this game is addictingly exciting!

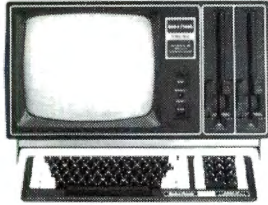
MEGAPEDE costs only \$21.95 on cassette and \$26.95 on disk (plus \$2 shipping and handling) and is available directly from Computerware® at Box 668, 4403 Manchester Ave., Suite 103 Encinitas, CA 92024, (619) 436-3512.

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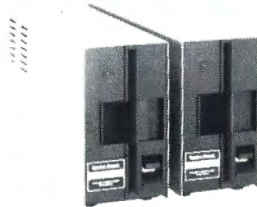
Color Computer 16K \$235
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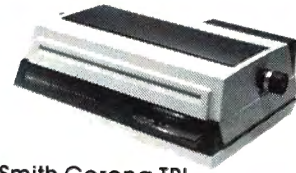
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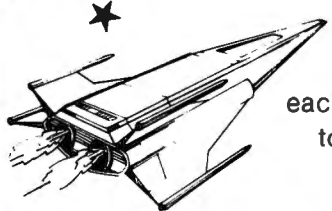
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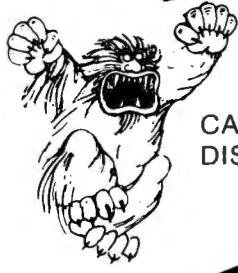
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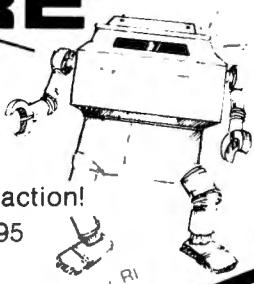
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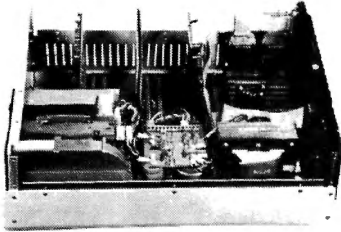
Many software titles, computer K.C. Williams, RI
The ads and reviews were right! Los Angeles, CA



FLEX - OS-9 LEVEL ONE - UNIFLEX - OS-9 LEVEL TWO

ONLY GIMIX Systems can be configured to run any of these.

GIMIX systems utilize the most powerful 6809 operating systems: FLEX, UniFLEX, OS-9 LEVEL ONE and TWO -- the systems the PROs use. This means a wide selection of software to choose from as well the ability to develop sophisticated, multi-user/multi-tasking programs on your GIMIX System.



The GIMIX CLASSY CHASSIS™ consists of a heavy-weight aluminum mainframe cabinet which provides more than ample protection for the electronics and 1 or 2 optional 5 1/4" drives.

Backpanel connectors can be added for convenient connection of terminals, printers, drives and other peripherals.

A 3 position locking keyswitch enables users to disable the front panel reset button to prevent accidental or unauthorized tampering with the system.

The GIMIX system mother board provides fifteen 50 pin slots and eight 30 pin I/O slots -- the most room for expansion of any SS50 system available. The on board baud rate

generator features 11 standard baud rates, 75 to 38.4K, for maximum versatility and compatibility with other systems. Extended address decoding allows the I/O block to be addressed anywhere in the 1 megabyte address space. All components feature Gold plated connectors for a lifetime of solid connections. All boards are fully buffered for maximum system expansion.

Each GIMIX Mainframe System is equipped with an industrial quality power supply featuring a **ferro-resonant constant voltage transformer** to insure against problems caused by adverse power input conditions such as A.C. line voltage fluctuations etc. The supply provides 8 volts at 30 amps and plus or minus 16 volts at 5 amps, more than enough capacity to power a fully loaded system and two internal drives.

The 2MHz GIMIX 6809 PLUS CPU board includes a time of day clock with battery back-up and 6840 programmable timer to provide the programmer with convenient, accurate time reference. Later addition of 9511 or 9512 arithmetic processors is provided for on the board. The unique GIMIX design enables software selection of either OS-9 or FLEX, both included in many complete GIMIX systems.

GIMIX STATIC RAM boards require no complicated refresh timing cycles or clocks for data retention. GIMIX memory boards are guaranteed for 2 MHz operation with no wait state or clock stretching required.

Our low power NMOS RAM requires less than 3/4 amp at 8V for a fully populated 64K board. For critical situations, our non-volatile 64K byte CMOS static RAM boards with built in battery back-up retain data even with system power removed. A fully charged battery will power this board for a minimum of 21 days. A write protect switch permits CMOS boards to be used for PROM/ROM emulation and software debugging.

The GIMIX DMA controller leaves the processor free to perform other tasks during disk transfers - an important feature for multi-user/multi-tasking systems where processor time allocation is critical. The DMA board will accommodate up to 4 drives 5 1/4" or 8" in any combination running single or double density single or double headed. Programmed I/O Disk Controllers are also available.

GIMIX systems are designed with ultimate **RELIABILITY** in mind. You can choose from the below featured systems or select from our wide variety of components to build a custom package to suit your needs.

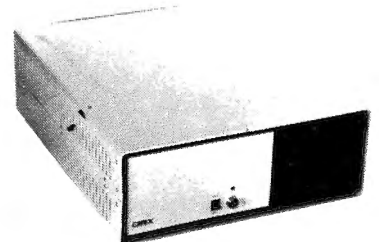
GIMIX 2MHz 6809 System including: CLASSY CHASSIS, 6809 PLUS CPU BOARD, 56KB STATIC RAM, 2 SERIAL PORTS W/CABLES, GMXBUG MONITOR, FLEX, and OS-9 LEVEL 1 \$3248.49
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GIMIX 128KB WINCHESTER SYSTEM including: CLASSY CHASSIS, 6809 PLUS CPU BOARD, 128KB STATIC RAM, 4 SERIAL PORTS W/CABLES, 5 1/4" 80 TRACK DSDD FLOPPY DISK DRIVE, 19MB 5 1/4" WINCHESTER HARD DISK, OS9 LEVEL 2, EDITOR AND ASSEMBLER \$8998.00

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The Sun Never Sets On A GIMIX!

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