

# **SPECTRUM PROJECTS**

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**CATALOG  
OF  
SOFT AND HARD WARES  
FOR  
COLORFUL COMPUTING**



# Bob Rosen - A Colorful Success Story

When forming an opinion of the Color Computer's success, it would be best to consider the story of Bob Rosen. Bob's claim to Color Computer fame is his bulletin board - the Rainbow Connection. It is a multi-computer bulletin board system exclusively serving the CoCo.

It didn't start out that way. Bob began his BBS in March of 1981 on a Model I providing information on TRS-80 Models I and III. Then he bought a Color Computer. Bob's fascination with the CoCo is similar to that of many other computerists. He was amazed by its power, ease of use and versatility.

"I was kind of surprised there was no support from Radio Shack - very little, like the pocket computer," Bob told 80 Micro. "I started putting things on about the Color Computer and all of a sudden I was getting a lot of out-of-state calls.

"It just mushroomed; it's amazing. I can be here any time of the day and get a call from just about anywhere. I've gotten calls from England, Israel, Alaska, Puerto Rico, Canada, Mexico, Switzerland and all over the United States.

Bob was a Radio Shack employee for seven and a half years. For four straight years, as a retail salesman, he was their area's number one man behind the counter in total sales. Is running a bulletin board a profitable business? To leave behind the salary a number one salesman earns should lead to some positive conclusions.

He was one of the first, if not the very first, New Yorker to buy a Model I TRS-80. His sales receipt is dated August 5, 1977. At the time, Bob was attending New York City Community College as an electrical technology major.

"I was always fascinated by computers. One thing led to another. I met a gentleman by the name of Tom Vande-Stouwe of BT Enterprises at a computer user's group. He started what I believe was the first BBS in the New York City area. He told me all you need is a Model I, two disk drives, an auto-answer modem and a software package. So I bought the package and set up my Model I. At the time it was mainly a hobby."

But let's back up a little more, to where Bob Rosen and the wonderful world

of electronics collided. "It's all because of Roger Maris and Mickey Mantle," Bob confessed. (For the younger hobbyists, Maris and Mantle were not Radio Shack salesman. They were the driving forces behind an almost unstoppable New York Yankee baseball team in the 1960s.)

"I was always a Yankee fan. Listening to the AM radio at night and trying to pick up Yankee games when they were on the road, started me reading articles about short-wave listening. I got into short-wave DXing with my amateur radio license (K82HKO), and that introduced me to electronics."

Today, after a period of evolution, the Rainbow Connection's hardware consists of three 48K Model IIIs with a 20 Meg Corvus hard disk drive.

The bulletin board is accessed more for electronic mail than anything else. "People put on fixes, hints and general information that they have found out for themselves about the CoCo that you can't get anywhere else. Others go on the board asking for a solution to a problem, or something about a software bug.

"What we have here now is a central point, where people can call in and within a reasonable period of time get answers."

To access Bob Rosen and the Rainbow Connection users need a TRS-80, a full duplex 300 baud modem and a phone number: (212) 441-3755, (212) 441-3766 and (212) 441-5719. There is no charge other than what Ma Bell requires. To download from the BBS system, a user also needs a smart terminal communications program like ColorCom/E to control processing.

"If someone calls me from my same area, with the same message rate, they could be on 10 hours and it would only cost them eight cents. That's it."

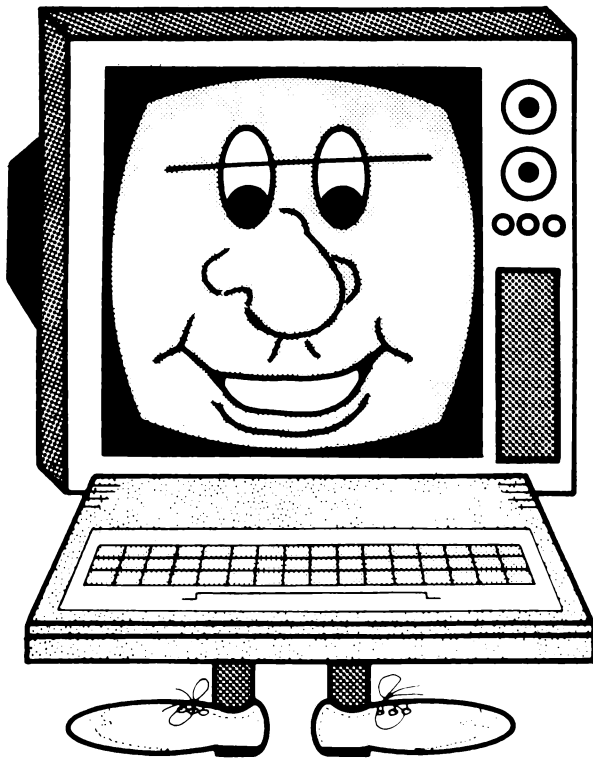
Bob, through his company Spectrum Projects, runs the bulletin board full time. He makes his living by mail order selling many of the products listed on the board's merchandising section.

The Rainbow Connection's future looks bright. When Bob Rosen dreams, he sees a multi-user bulletin board with a toll-free 800 number, no errors and no disk or memory crashes, and everyone who calls up will be able to access it.

***NOW, ANY TALKING APPLICATION  
IN EDUCATION, SPEECH THERAPY,  
GAMES, ROBOTICS OR SECURITY IS  
COST EFFECTIVE AND REALISTIC !***



**THE SPECTRUM VOICE PAK is a complete phoneme based voice system that uses the famous VOTRAX SC01 chip synthesizer in a cartridge style pak. It provides an unlimited vocabulary with automatic or user supplied inflection, plus four programmable levels of pitch. With a single line of code, THE VOICE PAK adds speech to any BASIC program in minutes. The system comes complete with user instructions, software cassette with 16K and 32K - DISK/TAPE versions, a text to speech scanner translator and a Word Manager that constructs and edits custom user dictionaries. The unit is fully assembled, tested and ready to plug in and talk for only \$69.95**



## **“VOICE PAK QUALITY SPEAKS FOR ITSELF”**

My CoCo just said the above title - really! Clearly, distinctly, and very understandably! This magical transformation was accomplished with the addition of Spectrum Projects Voice Pak - Voice Synthesizer. The Voice Pak consists of a ROM Pack containing a VOTRAX SC01 Phoneme synthesizer, a PIA (Peripheral Interface Adapter) chip with a pot to adjust pitch, and a data tape containing a series of programs allowing the Rom Pack to do its thing. 16K Programs are on one side - 32K on the other. Loading and using Voice Pak is very easy. First, like any ROM Pack, insert the pack while the computer is off, then power up and load the cassette. The first program, "SPEAK", is a BASIC program which, when run, loads and executes the machine language "TRANSLATE" program which, is the Pak/computer/dictionary interface program. The first words will be spoken by your computer as it announces it is now ready by saying, "READY" to you. You now are presented with a menu giving the following choices:

1. Direct input from keyboard.
2. Build a text from keyboard.
3. Speak text from tape file.
4. Return to BASIC.

After punching #1, you are in charge of what your CoCo says, and this is almost where this review stopped 'cause at this point, after typing a few test words and sentences, I lost control of the computer. First the kids invaded the sanctity of my office with questions like "What is that?" and "Who's talking?" and "Oh, Wow!" and shortly, "Move over!"

For the next four hours, my CoCo was talking in a slightly Swedish and East Coast U.S. accent saying things like: "E.T. Call home," "Bonnie is a Skunk," "U R A Q T" and even "Peter Piper picked a peck of pickled peppers." No amount of reasoning or pleading about the need to complete this review could pry them away. Even my wife, the computer widow, declared this a time of temporary truce and actually enjoyed the CoCo.

This is a great way to bring the family together even if you don't want to. In mode 1, you type and enter short phrases and sentences that will be spoken upon hitting the <ENTER> key. After the computer speaks out the phrase an arrow prompt appears for the next line of input. This mode is ideal for getting used to the sound of computer speech and for trying out new words. What makes the computer

speech so understandable is a phoneme dictionary which is loaded into memory with the ML program. It contains about 200 words with their correct pronunciation stored. When a word in the dictionary is encountered, the accurate pronunciation is then recited; if the word is not in the dictionary, it reverts to the phonetic rules stored in the chip. This results in a very understandable output which is enhanced by your spelling some words as they sound rather than as they are spelled. Thus "Peter Piper picked" becomes "Peter Pyper pyked", etc. Words in the dictionary are virtually perfect; "One" is pronounced "one." You don't have to redo it as "une" to get a proper sound. If you use a word often, you have the option of adding this word to the dictionary with the correct pronunciation. Thereafter it will be caught in the dictionary before reverting to the chip's pronunciation rules.

A pleasant surprise is that numbers and special characters are recognized by the ML program and will be spoken out. Numbers as high as 999,999,999,999,999,999 will be understood and spoken as trillions, billions, millions, thousands, hundreds, etc. The number 23 is pronounced twenty-three, not two-three. The phrase  $100 \times 3 = 300$  is spoken as "One hundred times three equals three hundred." If you put a \$ in front of a number the program assumes that you are talking about money. "\$123.45" is spoken as "One hundred twenty three dollars and forty-five cents."

Quotation marks are spoken as "Quote" and the # sign is pronounced as "number." Each comma, space and period produces a pause. Numbers can be pronounced individually by either putting a space between or by putting the "!" control code before the number.

The resulting statements contain inflection and human-like intonation in the sentences similar to what you would have in a normal conversation. I have no idea how these are added, but it's there.

Inflection can be changed via a pot-on the ROM pack or through keyboard commands. Four speech tones are available. By changing tones you can have four different voices.

In no time at all, your CoCo is talking like your Uncle Bill - assuming your Uncle Bill was born in Sweden and is currently living in New York.

After beating the kids and wife away, I was able to advance to choice two of the menu: Build text from keyboard. This mode allows you to input more than one line of text at a time. Using this, you can create long messages. Ever hear a computer say the Gettysburg Address? I have! You have the opportunity to save this text on tape or disk for later retrieval.

Choice three of the menu allows you to load and hear text which was saved in an ASCII file on tape or disk, and choice four returns you to BASIC.

Disk users have to use Radio Shack's Multi-Pack Interface (#26-3024) to use both the disk controller and the ROM pack at the same time. The disk controller goes in slot four; the voice unit goes in slot three.

Making nifty sentences with your CoCo is fun, but how do you use it for "practical" purposes? The Translate program can be easily merged with BASIC programs (or ML clear programs less easily) adding speech to programs. A typical addendum would be:

```
10 PCLEAR 1 (Clear video RAM unless needed.)
```

```
20 CLEAR 5000,&H5FFF (Reserve high RAM for ML)
```

```
30 CLOADM "TRANSLATE" (load ML program stored at end of BASIC program)
```

```
50 DEFUSR1=&H6005 (entry point for speech)
```

```
130 PHRASE$ = "This is some speech text" (insert text)
```

```
340 X$=USR1 (PHRASE$)
```

Voila! Your BASIC Program now talks! Full details of merging the ML "Translate" program with BASIC programs to use the Voice Pak are included in the two operations manuals included with the package.

The dictionary section contains a dictionary manager program which allows you to:

- Add Words to the dictionary - with their desired phoneme pronunciation.

- Delete a word.

- List the dictionary and pronunciations to the screen or printer.

What are the uses for this program? Absolutely astounding! The uses are limited only by your imagination.

People with speech problems now have an inexpensive voice which allows them to talk to anyone on the phone. Conversations are as simple as typing in responses and hitting <ENTER>.

Any programs can now be voice-prompting. Educational programs can now include pronunciation of spelling words. Foreign languages can be taught with the correct pronunciation. Adventure games can yell "Look out" and any other hints the author wishes to include. Arcade games can now include the voices of the control tower or you can hear the Aliens attacking.

Bob Rosen of Spectrum Projects is out to make this the standard in CoCo Voice Paks. His chances of succeeding are high. First, the verbal results are great. Second, the price is right. He is betting on low margins and high volume. Third, and most important, complementing

programs are being developed by software houses. Computer Island, Prickly Pear, Jarb Software and Aardvark are in development or have released programs which utilize the Voice Pak. More will be coming.

I had the opportunity to run the French Foreign Language Program from Computer Island. It displays the French word - pronounces it - and then asks for the English translation. Congratulations are spoken for the correct answer; the correct word is given if the answer was incorrect.

Spectrum Projects is developing a smart terminal program using the Voice Pak to announce the data received from a BBS or other information source.

This advancement, at this price (\$69.95) is a breakthrough adding immeasurably to the utility of the Color Computer.

Get One!



## **TERMTALK - A SMART TERMINAL PROGRAM FOR YOUR COCO WITH ALL THE FEATURES OF AN INTELLIGENT COMMUNICATIONS PACKAGE:**

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- ⊕ **CONTROL XMIT PROTOCOLS**
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**TAPE \$39.95      DISK \$49.95**



# MAYBE, AN ALUMINUM BACKSCRATCHER ?

## We Hadn't The Remotest Idea - Now We Have Five

Among the burning questions facing those in the CoCo World today is this: Do I, or don't I need a SPECTRUM REMOTE RESET?

To this pressing query, I can honestly answer: No, I don't need one. That's because after testing out a review sample, I called Bob Rosen and ordered four more.

You say you're surprised? Let me tell you, I'm probably even more surprised. The SPECTRUM REMOTE RESET is the perfect answer to a question I'd never thought to ask. In fact, when I first saw a SPECTRUM REMOTE RESET, I laughed and said something akin to, "What in the expletive is that?" Upon showing it around the office, I could find no one who had the slightest idea what it was.

In the ensuing weeks since being introduced to this new gadget, I have tried to think of something to liken it unto; I'm still at a loss. An aluminum backscratcher? A burglar's tool? A croupier's rake? Ronco's newest TV offer?

Whatever you compare the REMOTE RESET to, I believe you'll agree that it works splendidly and should last a lifetime. For those of you who've somehow missed the full page ad, the SPECTRUM REMOTE RESET is a hardware device that lets you press the reset button from the front, a "warm restart" trigger that's right at your fingertips when you're using the keyboard. Not the top item on your want list? Well read on.

While there are many who can appreciate the benefit of having a REMOTE RESET, I believe most of us need a little reminder of what it can do. I've come to think of it as a relief valve. You see, while the reset is within arm's reach - unless you have a really compact installation, in which case your need for the REMOTE RESET is readily apparent - there's something about reaching to the back that amounts to admitting defeat. Reaching to the back breaks your concentration and can wreck your whole attitude. But not if you have the REMOTE RESET.

Yes, you say, but EXEC 40999 accomplishes the same thing as hitting the reset button. True enough, but it seems by the time I'm thinking (RESET) the keyboard is locked up anyway. With the REMOTE RESET, you can sort of "sneak in" a reset with your pinky without ever lifting your hands from the keyboard. Thus the REMOTE RESET is sort of a composure preservation device - and I can use all of those I come across in this business. That's why we have five REMOTE RESETs at the RAINBOW now.

A brief physical description is in order. The REMOTE RESET is all aluminum and is essentially a long, sturdy slat with three bends in it, a pin to hold it in position on the underside of the computer and a small hollow reamed out in the back to make it fit snugly over the reset button. It installs readily. It comes off easily, too, but I predict that, once installed, it'll have a permanent home.

Bob Rosen will be happy to know that the SPECTRUM REMOTE RESET fits the new 64K Color Computer as well as the vintage CoCo. On the other hand, I had to do a bit of custom bending to get it to work on the TDP-100. Perhaps there should be a TDP-100 model of the REMOTE RESET.

If you're still not convinced and I can imagine some of you are saying, "I'll just make myself one out of scrap metal or coat hanger wire," let's try and recall how successful you were the last time you used a coat hanger to roast marshmallows. Maybe you could fashion a dandy imitation, but, with too vivid memories of creating crude candy dishes out of tin cans in junior high school metal shop, I'll gladly leave the engineering to someone else.

Yes, the REMOTE RESET is just a hunk of metal with no moving parts at all, but it works without a hitch, does exactly what it's supposed to every time, would be difficult to improve on, and couldn't be more durable. For a piece of hardware, that's a combination that's hard to beat.

# Basic Aid is a Fine Programming Tool

Probably the most frustrating thing about programming in BASIC is that it requires you to repeat the commands over and over again. Now, there is help for that problem, and some other frustrating things as well.

BASIC AID, a ROM pack (also available on disk) comes with a great number of features which let you enter BASIC commands by pressing just two keys on the keyboard. For instance, if you want to enter a command such as CHR\$(, all you have to press is the down arrow and the up arrow key. The down arrow acts as a "control" key that allows you to tap into most of EXTENDED COLOR BASIC's commands while the up arrow is the symbol for CHR\$(.

This program even includes the open parentheses for those commands which require them (such as RIGHT\$, LEFT\$ and the like) and gives you an option of whether to have spaces between commands or not. In other words, if you want program lines in a "condensed" format to save memory, you just press a key and the commands from BASIC AID will be written that way.

In these respects, BASIC AID is very similar to the MASTER CONTROL program which has been available for the past year or so. BASIC AID is on ROM and DISK, while MASTER CONTROL is on TAPE. As far as things go, this is about the only difference between the programs thus far, including a keyboard overlay which both supply so that you do not have to try to remember what key the program uses to invoke a specific command.

Both programs also allow automatic line numbering, an extremely handy utility that was left out of the Color Computer's BASIC. That is too bad, because an automatic numbering utility is an excellent addition - particularly when you are typing in line after line of data statements. And, with these systems, it is even easier to do that sort of thing because they have a two-key entry for the command DATA as well.

BASIC AID has the added ability to allow you to redefine all the keys. You do

have programmable key ability in MASTER CONTROL, but you cannot re-define them all. And, BASIC AID will also allow you to save your re-definitions to tape, so that you can load and use them again as you wish.

Redefinition is valuable because some programs (such as adventures, data bases and the like) often require series of IF/THEN lines, with only a small change in the variables. You could save literally hours of programming time by self-programming a few keys.

BASIC AID does not stop there. It has two other excellent utilities which, alone, make it extremely worthwhile. First, it allows cassette based systems to MERGE programs (as can be done on disk) and it makes it possible to MOVE segments of programs from one place to another.

Yes, there is a merge technique for cassette programs, but it requires some fairly extensive keyboard input and also ignores line numbers completely. Say you have a subroutine which you wish to merge into several BASIC programs. You must be sure the line numbers do not conflict with those already in the computer's memory, and you have to add in the subroutine at exactly the place you want it, taking care that the line numbers are always higher than the resident program so you can "tack it on" the end of the code already in memory.

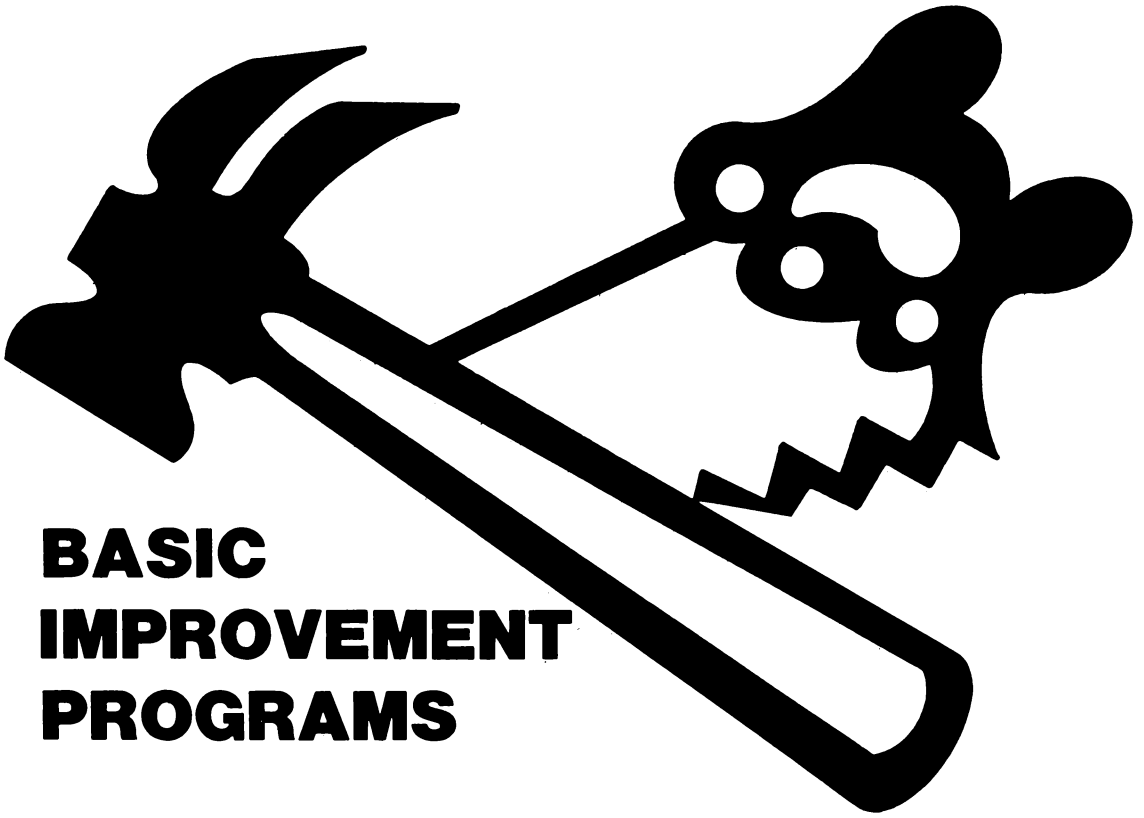
BASIC AID also requires that you pay attention to line numbers so they do not conflict, but it allows you to set the line numbers while making the merge, so that there is no manipulation necessary with the programs themselves. And, therefore, you really don't have to worry what the line numbers in your subroutines might be. You merely set them when you load them to anything you want.

Finally, BASIC AID provides a utility that many a programmer has dreamed about - the ability to move program lines in memory! Not only are the lines moved, but the references to those lines are changed as well. This, all by itself, makes BASIC AID an excellent buy.

The program is easy to use, the instructions are clear and concise and we could not discover a single flaw in operation. It works with all Color Computers, 4K to 32K, and disk systems.

In a word, an excellent program and fine utility.





## **BASIC IMPROVEMENT PROGRAMS**

**BASIC AID** – Speed program entry by single key input of 43 common BASIC commands. Redefine any or all keys. Merge, move and renumber any part of your program. Comes with a plastic keyboard overlay. ROMPAK \$34.95/DISK \$49.95

**THE STRIPPER** – a machine language utility designed to cut the size of BASIC programs for run time efficiency. All remarks are removed and any branch references to the lines are changed. Individual commands are packed into multiple statement lines where possible for dramatic savings of memory, and all unnecessary spaces are removed from the code. Get more performance for \$19.95

**BASIC COMPILER** – Convert BASIC programs into efficient machine language. Produces code more compact and up to 50X faster than BASIC. Integer compiler with no Extended BASIC needed. 16-64K versions included. TAPE \$39.95

**PRITTY PRINTER** – Disassemble complex, multiple line statements of BASIC code with this professional program lister. Simple commands control printer baud rates, maximum line length, lines per page and disable form feeds. DISK/TAPE \$19.95

# GREEN GORILLAS

## and

# VIDEO PLUS

A number of years ago, when photography was my life, I read all the popular and professional photography magazines. When I got hold of a new issue, the first place I always looked was at the Spiratone ad. Spiratone, a New York mail order house, always had page after page of things to make a photographer's life easier. And, each month, there were always new items - a cross screen filter, a clever new paper safe, this attachment, that accessory - all holding the promise of making it a bit easier to get that great picture we all aimed for. I was a Spiratone addict.

Photography is just an occasional, vocational necessity now, and I don't know if Spiratone is still around or not; now, I'm tuned in to Spectrum Projects for the same sort of reasons. It seems that if I've just acquired say, a widget, Bob Rosen at Spectrum is the advertiser most likely to have a widget-to-CoCo interface and the necessary cable to attach it to my whatsit. A deluxe model will have an LED and an extra switch that is "user-programmable." Now, I'm a Spectrum junkie. You can tell Rosen is both a "user" and a "hacker". As soon as you decide you need something, he already has it in stock waiting for you to call.

This time he beat me to the punch entirely. Again, he sent me something before I even realized I needed it. Not that Bob Rosen invented green screen monitors, but he foresaw my need before I did.

Color Computer owners go through this cycle, you see. First, it's "I'll use the computer when the rest of the family isn't watching TV." Then, they say to themselves, "Well, I'll just take over the old TV in the bedroom all the time." Of course, to get the full-blown effect of a CoCo, eventually you decide "Let the kid pay his own way through college - it'll be better that way - I've got to have a brand new color TV set or I simply can't live another minute." And, in the back of your

head there's this persistent, "Wonder what it'd be like to play STARTRENCH WARFARE on a giant projection screen?"

Bob Rosen doesn't stock giant projection TVs because he knows you really don't need one. He does stock the Gorilla 12" green screen high resolution monitor because he knows you want one, or soon will.

Initially, I was pleased with the looks of the Gorilla monitor, but unimpressed with the resolution on the screen; that was because I hadn't yet changed the color signal to monochrome; that made a huge difference. Then I loaded a full-screen word processor. Wow! Even in the 85 X 24 high density display - used mainly for formatting a page - I could still read the display. On my 19" Sylvania Color TV, by way of contrast, in the 85 X 24 character set, even with the color turned all the way off and the sharpness control turned to maximum resolution, I still could only guess at some of the blurred words.

Now, I'm not saying I would want to write copy in the 85 X 24 mode, even with the Gorilla monitor, but I could if necessary. In the 64 columns by 24 lines mode, I could write all day with the Gorilla monitor, but I'd be blind if I tried that more than a couple of minutes with my big color TV. With the 51 column screen, both the green screen monitor and the color TV are easily readable. But the color TV's character set has halos while the Gorilla is markedly clear.

In a few weeks of use, I've found myself squinting and uncomfortable using the same color TV set I once thought was so terrifically sharp. I think I've developed another habit. The Gorilla green screen is so good, don't even try it once.

The truth is, before I compared the 12" Gorilla and my 19" Sylvania, I worried that I was being unfair. After all, how could a little \$100 monitor compare with my brand-name 19" pride and joy? Now that they're side by side - operating from the same signal thanks to Computerware's Video Plus interface - I keep reaching over to make absolutely sure the sharpness is at maximum on my Sylvania. It is, but it no longer "gets it" in comparison to the Gorilla. For one thing, on my color TV, when I use a word processing program the words tend to get "crunched up" if you're typing at the very

bottom of the screen. Not so with the Gorilla, with this Hi-Res screen the words at the bottom are as clean and clear as those in the middle.

By the way, you do need some sort of video interface such as Video Plus to connect a composite video monitor such as the Gorilla to your CoCo. Naturally, Spectrum sells Video Plus, too.

I called on Dr. Doom to help me install the Video Plus. As is often his way, he took over completely and told me to shut up and take notes, "or whatever it is you writers do." Among Doom's comments on Video Plus: "This gizmo is a bit delicate. It could have been sturdier." After managing to pull one wire loose just inspecting the Video Plus board, Doom allowed as how, "WE have to be real careful now." He did the obligatory lining up the notches, etc., diverting his attention momentarily to "straighten up your heat sink for you."

In order to have both a color signal for my TV and a monochrome signal for the Gorilla monitor, Doom had to add a switch to the Video Plus circuit. That went without a hitch, thanks to quite adequate instructions. Still, given a choice, I would have opted to simply pay a little more and get a switch installed by the elves at the factory.

No soldering is necessary with Video Plus - if you don't need both a color and a monochrome signal. We wanted both, so we located a U-shaped "wire loop" that Doom then snipped, soldering a single-pole, single-throw slide switch from Radio Shack across the cut ends. There was also a potentiometer that needed adjusting - easy enough given the good documentation - before we replaced the cover on the CoCo.

On replacing the cover, we faced a decision on whether to cut holes for the four new wires or just to route them out any available opening. We chose the latter, running the bigger wires out the video port and the thin wires out the 3/4 channel selection switch. Not the neatest installation, but practical.

The non-glare tube on the Gorilla does eliminate many reflections. Certainly, the green phosphor is easy on the eyes and graphics games, though not in color, do have a crisper display with the Gorilla monitor.

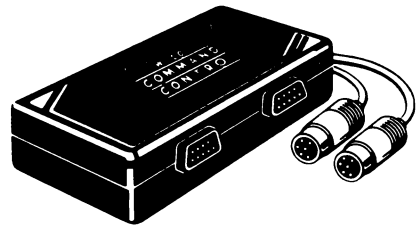
The Gorilla has only three control

knobs on the front (on/off, brightness and contrast) and three more on the back (image width, image height and stabilizer). By the way, the Gorilla does not have sound capability. (The audio cable from the Video Plus interface can be simply plugged into a mini amplifier speaker for sound.)

On a thorough reading of the manual, I find that there is indeed a tilt bracket on the bottom of the monitor to facilitate a laid-back viewing position. And in addition to several other telephone numbers for Leading Edge Products, Inc., which makes the Gorilla, there is a "service hot line" 800 number printed in red. I called it and got no answer, but then it was 3 a.m. I'm a night owl; this number must be for day owls.

As a last note, one of the showiest modes for the green screen monitor is with inverse video. This is not a built-in feature, but I pop in a software terminal program with this feature and it is very dramatic. I make a note to use it next time I want to impress someone. This Gorilla has found a home. As for Bob Rosen, I can see the handwriting on the wall; next month he'll be advertising a second keyboard/OS-9 package so that I can timeshare with myself now that I have two screens.

## **WICO COMMAND CONTROL™**



**Now hookup two digital type joysticks to your CoCo for only \$19.95. The ADAPTOR with two Atari joysticks for \$39.95.**

# Machine Language Development – CCEAD Packs Power For Low Price

One piece of the standard software equipment imbedded in the CoCo's ROM is a BASIC interpreter which translates BASIC statements into sequences of 6809E machine instructions. While BASIC is suitable for many applications, it seems that there are just as many situations where it proves to be unsatisfactory. This may be due to the relatively inefficient use of memory space by BASIC, the speed, or lack thereof, which BASIC routines execute or the need for an operation or function which BASIC cannot provide. The most obvious alternative is to code directly in machine language where each line of code corresponds to a single 6809E instruction. This is where CCEAD comes in.

CCEAD, an acronym for Color Computer Editor Assembler Debugger, provides three essential tools for the development of machine language routines in one neat package. The Editor allows for entry and modification of assembly language source code, the Assembler takes the source code and produces 6809E machine code and the Debugger is a tool for checking out the machine language routines.

When my copy of CCEAD arrived, I was pleasantly surprised by the quality of the documentation and the product itself. The cassette on which the program was delivered contained two versions of CCEAD's source code, one fully documented and formatted for readability and the other, stripped of comments and superfluous blanks. The stripped version, which is the one normally used, occupies about 7600 bytes of memory as opposed to the verbose version which requires approximately 12300. This program requires 16K EXTENDED BASIC to run.

Prior to CLOADing CCEAD, the user is instructed to use the PCLEAR command to allocate one or more graphics pages for use as buffer space by the Assembler. It is here that the generated machine object code will eventually be placed. Space not used by CCEAD and not reserved via the

PCLEAR command is used as text storage for the assembly source code. So it pays to PCLEAR as few graphics pages as possible.

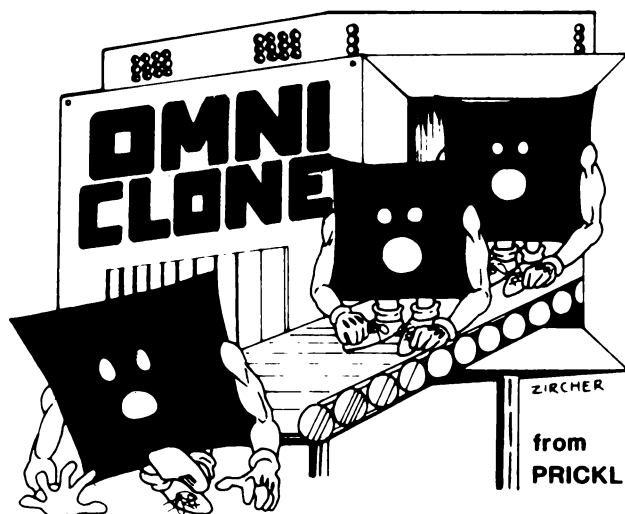
Upon running CCEAD, I was immediately greeted with the master menu, which presents five options. In addition to the options selecting the Editor, Assembler and Debugger, a Tape Read and a Tape Write option are provided to facilitate tape filing of assembly source programs. The option to be selected is specified by entering the option number. Since the two tape options are self explanatory, I will discuss only the three main utilities.

The Editor: CCEAD provides the user with a fancy little screen editor which naturally does all the things one would expect an editor to do. By using the enter, shift, and arrow keys, the user can insert and delete lines, move the cursor left or right within a source line, and scroll the screen up or down by either one line or a screenful of lines. Once all of the source code has been entered or changes have been made, a SHIFT/CLEAR exits the Editor and brings the user back to the main menu where the source can be saved to tape if desired.

The Assembler: Once the source code is in memory as a result of a tape read of the Editor, CCEAD's Assembler may be invoked. Selection for the Assembler on the main menu causes CCEAD to prompt for two items: the listing device (screen or printer), and the memory address at which the first byte of generated object code is to be placed. After the necessary information is provided, CoCo begins to churn away, generating object code and the assembly listing. On the average, CCEAD takes about five seconds to process each source assembly statement, due primarily to its being implemented in BASIC. Upon completion of the assembly, CCEAD returns to the master menu.

Input to the CCEAD Assembler is very similar in syntax, instruction and directive mnemonics, and format to the three other

# BEAT THE BACKUP BLUES AND DO IT ALL !



If you have a disk drive, you know how important it is to back up your disks. Virtually every book on computers tells you to back everything up, and many recommend at least two backups. That is simply good computer practice. However, the **BACKUP** command on the color computer will only handle disks with a standard format, so many disks could not be backed up.

Enter **OMNI CLONE**. This amazing program handles most any non-standard disk with ease. It handles variable sector lengths, non-standard sector and track addresses, deleted address marks, forced CRC errors, un-formatted tracks, any amount of sectors, any number of tracks (up to 80), and single or double density. **OMNI CLONE** is 100% machine language, and it is completely self-contained. It has its own disk drivers and keyboard scan. It uses no ROM calls at all.

Unlike many programs of this type, you don't need to know anything about the disk you want to clone. **OMNI CLONE** does it all for you, including the formatting of the destination disk, and it's all automatic. Don't ever be caught without a backup again! We can't promise that **OMNI CLONE** will back up any color computer disk, but we haven't found any yet that it can't handle. It has even backed up some Model III disks!! **OMNI CLONE** can be used with either one or two drives and requires 32K to run.



## PUT AN END TO NON-STANDARD DISKS FOR ONLY \$29.95

6809 Assemblers with which I am familiar. Of course, all of the instructions and addressing modes inherent to the 6809 are supported. In addition to processing standard assembly statements, CCEAD supports five different assembler directives which tell the assembler to change the current location counter for the generated code (ORG), reserve blocks of memory (RMB), initialize bytes or words of memory (FCB,FDB) and equate values to symbol names (EQU). CCEAD contains all of the functions essential to any good assembler.

The assembly listing produced by CCEAD is also similar in content and format to other common 6809 assemblers. It displays three major pieces of information for each assembly statement: the memory address of the generated code or data. The generated code or data itself and finally the assembler source code. The only thing that is missing and could be useful is a symbol table listing.

The CCEAD Assembler detects six different errors during the assembly process. These are invalid syntax, illegal instruction, illegal indexed instruction, illegal index value, relative branch out of range, and undefined symbol. Any error messages appear on the assembly listing immediately after the offending statement and simply consist of the message "ERR NN" where "NN" identifies one of the six errors. The user is warned in the documentation that "GROSS" source format errors may cause a BASIC error in CCEAD which results in the assembly source code becoming irretrievably lost. The moral of the story is that source code should be saved to tape prior to the first assembly.

While the CCEAD Assembler is very good for its size, the more experienced programmer may wish to add features such as the symbol table listing, enhanced error messages, expression evaluation for arguments and maybe even conditional assembly and macros. Making these enhancements to CCEAD appears to be a relatively straightforward proposition, thanks to the commented source listing and the in-depth program design information in the CCEAD documentation. However, any large scale modification probably requires a 32K CoCo.

The Debugger: After getting an error-free assembly, the user is most likely to specify the Debugger option on the main

menu to try out the new routine. The Debugger, the skimpiest of the CCEAD utilities, is primarily a memory patch tool with which the user may peek and poke at his code and data.

The only program execution control command in the Debugger is the "G" command with which the user causes execution to begin at a given address. To set a breakpoint, one must patch a subroutine return (RTS) into the appropriate place in the code. This is because CCEAD uses the BASIC "USR" function to implement the "G" command. Another unfortunate side effect of the USR implementation is that several of the 6809's registers must be saved by the code under test and must be restored prior to the execution of the breakpoint "RTS." Should this convention not be followed, the 6809 branches off into the wilderness, never to return.

Another very useful function not included in the Debugger is the ability to examine and change the register contents at a breakpoint. I found that the quickest way to initialize register contents is to patch load immediate instructions into the code under test. To examine register contents at breakpoints, patching in push to stack instructions just before the "RTS" seemed to work fairly well.

In light of the delicate nature of the interface between CCEAD and the code being tested, it pays to remember Murphy's Law that says something to the effect that "Anything that can go wrong, will, usually at the least opportune moment." I found the safest and most time efficient debug practice was to use CSAVEM to copy the object code to tape prior to testing so that reassembly of long routines was minimized.

Conclusion: All in all, CCEAD is a high quality program and excellent value. The documentation is clear and thorough and the Editor, Assembler and Debugger work as advertised, although the Debugger did take a little ingenuity to use effectively. When used in conjunction with a 6809 programming book, CCEAD is a ideal tool for learning the basics of assembly language programming. With a 32K machine and a few enhancements, it is well suited for development of large machine language routines. For the price, CCEAD is a tool that no assembly language programmer can afford to be without.

# ***THE STRIPPER GIVES YOU THE BARE ESSENTIALS...***

Sorry guys, this is not an X-rated graphics demonstration, but a handy utility that has been designed to reduce the size of your BASIC programs. This can really be helpful if you have ever been hit with the dreaded "OM ERROR".

The STRIPPER is a machine language program supplied on cassette, and includes two sheets (double-sided text) of excellent instructions. It is menu driven, and the following commands are available: 1)delete REMARKs, 2)pack lines, 3)remove blanks, 4)exit. The program can be loaded into any protected area of memory and the instructions give examples of loading for disk and non-disk users.

To use The STRIPPER you should have a good BASIC program loaded into your computer and have a backup copy of the unstripped version saved. Next, CLOADM and EXECute The STRIPPER. Another nice feature you'll notice as you're presented with the menu is a window showing the amount of memory space the loaded BASIC program is using. This lets you see how much memory you are recovering as the various options are executed. Removing REMARKs and spaces should be done next. This is pretty straightforward and may not result in a significant savings of memory. It's the pack line option that

really gives the most dramatic results in memory savings and program structure. This is done by making multiple statements from lines of individual code in the BASIC program. Of course, line renumbering and proper syntax is taken care of in the now-stripped program. The next step is to execute the exit command. This will get you back to the BASIC operating system and allow you to save the stripped program.

How much memory can you save? Well, to find out, I ran eight randomly selected BASIC programs through The STRIPPER. Some of these were purchased and some were my own creations. They varied in length from approximately 2K to 10K of memory storage. The savings for these programs varied from 4% to 34% reduction in memory requirements, with about a 25% average. Also, since these are now shortened, there may be a slight speed advantage when running.

I find another advantage of this utility is that it helps me write more understandable BASIC programs. Now I can load up my program with REMARKs and spaces, CSAVE it, STRIP it for the working version, and go back to the original six months from now and easily figure out what I was doing.

## **COLORCOM/E SMART TERMINAL PACKAGE**

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Disk version NOW  
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# SAVE TIME WITH TAPE UTILITY

TAPE UTILITY from Spectrum Projects is actually a set of nine operations to make living with a Color Computer a lot easier or, at least, a lot less complicated. To begin with, TAPE UTILITY can be used with a tape or disk system, but using it with a tape-only system will yield only four of the nine operations available on the program.

The program is written in machine language and comes with four pages of documentation which was found to be fairly complete. After a CLOADM and EXEC command a menu appears for the user to select one of the many options. While the program is running, no BASIC or DISK BASIC commands are available. A command is present to return to BASIC and typing EXEC will start up the program again.

I would categorize this utility as one of the "make things easier" variety - that is, a program that will, for the most part, do things that are possible to do without the utility, but take a lot more time to do. With this in mind, I jumped in, as many users would, and used the program without a complete review of the documentation. The results yielded only a few surprises and, upon closer scrutiny of the instructions, I discovered that most of the surprises are covered in the documentation.

What does this program do to make life easier? To begin with, tape users can print a directory, either on the screen or on a line printer of a given tape. The directory will include the name of the file, type (BASIC, MACHINE LANGUAGE or DATA), file mode, start, end and execute addresses of each program.

Surprise number one came when I tried to terminate the reading of data before the tape was completed. TAPE UTILITY will only terminate while reading data and not during a gap or blank section of the tape. Yes, this is all covered in the documentation, but it does create some problems if you read an entire cassette

and want to get back to the TAPE UTILITY menu. You must either restart the program or read some dummy cassette data to enable the break key stop option.

Tape users may also easily make tape-to-tape copies of BASIC, MACHINE LANGUAGE or DATA programs. TAPE UTILITY will not copy some auto-start and most copy-protected disks and tapes.

Disk users are given six more options on TAPE UTILITY. The program will easily copy a file from disk to tape, or tape to disk and do an automatic copy of an entire disk of programs to tape. Those of you who have used the CSAVE and CSAVEM commands will understand how much easier it is to use TAPE UTILITY than continuous peeking for start, end and execute addresses of machine language programs. TAPE UTILITY also includes some disk-only functions such as displaying a two column compressed directory on the screen or line printer and setting default drive numbers other than drive #0. Unfortunately, the disk directory given does not include start, end and execute addresses as the tape directory does. TAPE UTILITY also does not include a simplified disk-to-disk copy routine. The user must return to DISK BASIC to use the COPY command if this needs to be done. Although COPY is easy to use it would be nice to have something like it available while TAPE UTILITY is up and running. TAPE UTILITY also does not "fix" tape programs written in the disk operating area. Attempts to use such programs may result in a crashed disk and a very frustrated user. This surprise (number two!) is not covered in the documentation.

TAPE UTILITY will copy programs up to 10K in length in a 16K machine and 26K in a 32K machine. Users are cautioned in the documentation that TAPE UTILITY will not copy segmented files produced by some assemblers. TAPE UTILITY will recover from errors that are encountered during the read of a tape file. This unique ability is especially valuable if you are doing long tape-to-tape or tape-to-disk copies.

The decision on whether to buy TAPE UTILITY or not is really a matter of the personal preference of the user. The program is straightforward and performs as documented. It is a matter of time savings and convenience. Decide whether



you want your CoCo to do the majority of the busy work involved in copying and cataloging tapes or if you have a few extra hours to do it yourself the hard way. I prefer to have the computer do the busy work and consider this program well worth the price.

## **CORD WILL SOLVE YOUR PLUG-UP PROBLEMS**

Ladies and gentlemen, the hassle of the century, as far as the Color Computer is concerned, is, for all practical purposes, ended.

One of the things which aggravates more people than just about anything we know is the lack of an extra RS-232 port for plugging in, say, a printer and a modem into the computer at the same time. What many people want to do obviously, is to access information off a bulletin board or data base, and then print out the results from the buffer.

To do that, you have to plug the modem into the serial port on the back of the CoCo, read whatever information you wish into the buffer, unplug the modem, plug in the printer, print out what you want and then assuming that you want to get some more information, unplug the printer, re-plug the modem, and repeat the whole thing again.

You don't have to go through all of that any more. Now, with a single cord available from Spectrum Projects, you are able to plug that cord into the RS-232 and connect both the printer and the modem into the other ends of the cord. Works like a charm.

We must confess that we have stayed away from bulletin boards on occasion, simply because we did not want to go through all the plugging and re-plugging time after time. This really does make things a lot easier, and it saves wear and tear on the plugs and sockets.

The cord is well put together and does the job as advertised.

\*\*\*\*\*

## **Color Computer LIBRARY**

<b>TECH MANUAL</b>	<b>\$7.95</b>
<b>MEMORY MAP</b>	<b>9.00</b>
<b>SECRETS REVEALED</b>	<b>14.95</b>
<b>INTERFACING with EXPERIMENTS</b>	<b>14.95</b>

\*\*\*\*\*

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# 64K DISK UTILITIES

Spectrum Projects has produced a number of useful hardware and software items in recent months. Their new 64K DISK UTILITIES package continues the trend. Intended for machines modified to permit access to the other 32K in a bank of 64K RAMs, the disk contains three programs in four files. ROMCRACK - for copying ROM cartridge programs onto disk; 40K - which makes an additional 8K of RAM available to BASIC or machine language programs; and, SPOOL64 - for utilizing the additional 32K as a text buffer for printing.

These may be the first programs that allow people who don't own FLEX to use the additional memory in a 64K system.

ROMCRACK: The relocation of ROMPAK programs is a popular topic among operators of disk based systems. It's convenient, and potentially damaging to the computer, to frequently switch between the disk controller and other cartridges. With ROMCRACK, you can make disk copies of ROM based programs up to 8K long, without finding the start, finish, and transfer addresses associated with the code. The utility takes care of such details, and others.

This is not a trivial matter. Many ROMPAK programs are written in position dependent code, so it isn't enough to save a copy and reload it with the offset needed to put it into RAM. Some of the instructions must be changed to avoid calls to the ROMPAK portion of memory between &HC000 and &HDFFF.

ROMCRACK does all this relocating of ROM code to the high bank of memory. The process requires a cassette recorder to make an intermediate copy, and goes as follows:

Cover the leftmost lead on the card edge connector (as viewed from the end that plugs into the computer), with tape before inserting the PAK. This keeps the ROM program from taking control of the machine when you apply the power. Alternatively, you can turn on the

computer without the PAK, defeat the "takeover" with POKE 65315,54, and carefully insert the PAK while the power is on. I prefer this method, as it avoids the possibility of gunking up the cartridge connector with tape residue.

The contents of the cartridge ROM are then saved to tape with CSAVEM "ROM", &HC000, &HDFFF, &HC000. Note that the tape filename is always "ROM", and an entire 8K of ROM address space is copied; in fact, some of the cartridge programs only occupy the lower 4K of this space.

Turn off the computer and replace the ROMPAK with the disk controller. Now, at long last, LOAD "ROMCRACK". Rewind the recorder and put it in playback mode before you run it through.

Replace the utility disk with the disk on which the final copy is to be made, and run ROMCRACK. It loads the ROM file from tape, asks for a new name for the disk file, and makes the recording.

The new disk program can be used with the conventional LOADM and EXEC commands without offsets. I can vouch for ROMCRACK's effectiveness in creating a disk copy of the PROJECT NEBULA game, which is known to have position dependent code. Things went without a hitch. Likewise for COLOR FILE, which seems to be written in position dependent fashion. I suspect that most Radio Shack cartridges can be copied, although Frank Hogg has cautioned that some of them may have self-modifying code which will make any ROM copy crash.

ROMCRACK works well; the cartridge swapping required to make disk copies of your favorite ROMPAK programs may be the last maneuvering you ever have to do.

It shouldn't be necessary to say that the programs had better be your own! But consider it said.

40K: In its normal configuration, a 64K Color Computer uses 32K of address space for RAM and 24K for the three ROMS: STANDARD, EXTENDED and COLOR DISK BASIC. The 8K hole in the 64K address range of the eight-bit microprocessor simply isn't available. The 40K utility rectifies this situation, provided the computer has been modified to permit software access to the other 32K.

40K is a machine language program that copies the EXTENDED COLOR BASIC



# SPECTRUM SPECIALS



<b>DISK Interface/ROMPAK Extender</b>	<b>\$29.95</b>
<b>RS232 Expansion Cable</b>	<b>\$20.00</b>
<b>RS232 Three Position Switcher</b>	<b>\$29.95</b>
<b>CoCo Cooler internal cooling system</b>	<b>\$49.95</b>
<b>MINI-MODEM with RS232 Cable</b>	<b>\$79.95</b>
<b>VIDEO PLUS monitor/video interface</b>	<b>\$24.95</b>
<b>GORILLA Hi-Res Green Monitor</b>	<b>\$99.95</b>
<b>BANANA Printer (same as DMP100)</b>	<b>\$249.95</b>
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<b>The best CoCo Operating System</b>	



ROM to higher memory. Its original location, &H8000-&H9FFF, is subsequently decoded as belonging to RAM. The nicest part is that this memory is available to the BASIC programmer! With four graphics pages reserved, PRINT MEM returns 31015, a full 8192 bytes more than normal. (Just for the record, 35623 bytes are available following a PCLEAR 1.) If a PCLEAR 0 command is simulated with the sequence POKE 25,6:NEW, the available memory tops out at 37159. These numbers compare favorably with the 33778 bytes available in RANDOM BASIC, a non-graphics dialect that runs under FLEX.

40K will be of great value to anyone who pushes the Color Computer's storage capacity. Even the most dedicated COLOR BASIC user, who would never dream of foregoing its convenient graphics for all the vaunted advantages of FLEX, will probably be coerced into admitting an extra 8K would be nice to have - especially at this price.

SPOOL64: If you do much word processing, or have another application that ties up your computer while the printer is running, you can appreciate the value of a spooler; that is, a program that dumps your text to a buffer memory to free the computer for other chores. It is a high speed dump, and the buffer takes over feeding the printer from that point. Many products with separate memories are available for this task, but SPOOL64 does the job with that versatile extra bank of 32K in a modified Color Computer.

There are a couple of hitches: the printer must accept data at 1200 baud or faster, and the SPOOLER routine will only work with BASIC or machine language programs that use the output character routine already present in ROM.

To start, you enter RUN "SPOOL64" and sit back. A one line BASIC program loads and runs; it reserves some memory and calls and executes a machine language routine which is the heart of the spooler. The OK prompt returns, and you can now enter and run your applications program. Any PRINT#-2 commands route output through the SPOOLER. SPOOL64 robs you of 168 bytes of RAM when putting its hooks into the ROM routines.

SUMMARY: This package offers something for everybody. Judicious use of

ROMCRACK will save wear and tear on your computer's ROM port, 40K makes life 25% more pleasant for the loquacious programmer, and SPOOL64 makes an intelligent use of extra memory so readily available to Color Computer users. Spectrum Projects should be congratulated for this package.

## AIR OUT YOUR HOT CHIPS

The one problem that we seem to hear the most about as far as the Color Computer is concerned, hardware-wise, is a problem with heat buildup inside the case. Usually traced to the SAM chip, high heat can cause all sorts of problems, most often when you don't want them.

Enter COCO COOLER, a simple little device that really isn't as simple as it appears. It is a fan setup that you can easily (YES, really easily) install inside the CoCo's case and keep things, hey, I mean, you know, cool.

COCO COOLER is a small fan attached to the top of the RF shield that covers the chips inside the case. You simply pry off the old RF shield cover, snap on the new one with the COCO COOLER, attach a (supplied) electric wire and you are in business.

Why the electric wire? Well, first of all, there is no way to get a plug through the air holes in the CoCo's case, so you have to do that yourself. Second of all, connecting the COCO COOLER to an internal power supply would have required more soldering and would have drained the internal power.

The instructions were simple (fumblefingers Falk did it with ease); the results gratifying. And while we wish it had come with an on/off switch, an online switch can be easily purchased at any Radio Shack store and added in a minute or two. For those with a power strip, a switch isn't needed.

Best of all, COCO COOLER keeps things cool. Our oldest Color Computer had some heating problems, but no more. Not with COCO COOLER COCO COOLING away.

# COLORFUL UTILITIES

**MICROTERM** – A terminal program for the new Radio Shack MC-10 Color Computer. Now you can use your PoCo CoCo as an inexpensive terminal to access bulletin boards, Compuserve and other data lines. TAPE \$19.95

**DOUBLE DOS** – Finally you can use non-RS drives (40/80 TKS & Double Sided) without FLEX! Up to 2,184,000 bytes compatible with RS DOS! Full RESET PROTECTION too. 64K DISK \$24.95

**HIDDEN BASIC** – A protection feature for your BASIC programs. Modify your code so CLOAD, CSAVE, LIST, EDIT, DEL and LLIST will not function. TAPE \$19.95

**DISK MANAGER** – rescue crashed disks, print a Super directory with ML addresses, maintain a catalog of all your disks and sort a collection of up to 300 entries per file. 16K DISK \$29.95

**CCEAD** – Color Computer Editor Assembler Debugger is a cost effective machine language development tool. Quality and value for \$6.95

**TAPEUTILITY** – A powerful package that permits the user to easily maintain backup, and catalog both tape and disk programs. TAPE/DISK \$24.95

**EXTENDED DISK BASIC** – Add new powerful commands to your 64K Disk System – Wild Card Directory, Double Peek and Poke, NSAVE, NLOAD, Inverse video, LDIR, OLD and TYPE. DISK \$24.95

**64K DISK UTILITY** – Take advantage of an expanded 64K machine. Make an additional 8K of RAM available. Copy ROM cartridge programs to disk and create a 32K SPOOL buffer for printing. DISK \$21.95

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# COMMUNICATE

One of the added features of the Color Computer is the built-in RS-232 interface. It can be used to hook up a special printer like the DMP-100. More important, though, it can be used to help you to communicate. Communicate? That's right! There is a whole new world of telecommunications that many CoCo owners are unaware of. Besides playing games and writing programs, you can connect a modem to your RS-232 port. A modem is an electronic device which converts the computer's electrical pulses bit by bit into audible sounds that can be transmitted over the telephone lines. Modem stands for MODulator/DEModulator and there are two types available.

The two main categories of modems currently on the market are the direct connect type and the acoustic coupled modem. Both have their advantages. The direct connect unit hooks right into the phone lines. For instance, Spectrum Project's Mini-Modem allows you to unplug your phone from the jack and hook it into the unit. Then, you can plug the cable from the Mini-Modem back into your phone jack. This assumes that your phone and jack are modular. If not, Radio Shack sells two adapters, 279-393 and 279-351, that will convert your hook-up to modular. Since the direct connect unit hooks right into the line, virtually no external noise can be detected which means someone else in the room can be watching TV or listening to a stereo. The acoustic coupled modem is even easier to hook up. The attachment is the same as adding a telephone answering machine. If you have no extra jacks, Radio Shack sells two "Y" adapters, 279-357 and 279-370, for modular and four-prong systems. The acoustic coupled modem is more susceptible to line noise as you are placing your phone's receiver into the unit's two cups, or "synthetic ears." This can be a problem if you are calling long distance and the signal on the other end is weak. Another problem is that today's

modern phones might not fit into the modem's circular cups (Slim line phones, for example). One advantage to this type of modem is that it is more flexible to use with multi-line phone systems than a direct connect because all you have to do is push buttons to use the modem on another line.

The only other piece of hardware you will need for your modem is a serial cable to hook it up to the RS-232 port. For the Mini-Modem you will need a 4-pin to DB25 cable. There are two other cables which can be very handy. One is a printer/modem extension cable, which allows you to place your modem in another location. It extends your three-foot Radio Shack cable another fifteen feet. The second cable is the RS-232 expansion cable. This is a "Y" adapter cable which allows you to attach your printer and modem inline, independently, at the same time. This eliminates constant swapping out of cables, since the Color Computer has only one RS-232 port. Also, as you will see later on, it will come in handy when using a smart terminal program.

Now that you have the hardware situation taken care of, you will need software. As with modems, there are two types of software. The first is known as "dumb terminal software." Radio Shack sells a version under the Videotex name. It is catalog number 26-2222 and includes one free hour on the Dow Jones and CompuServe Networks. The software allows access to these networks, but that's about all it does. It lacks the desired features that a smart terminal program contains.

Now you might ask, what can a "smart terminal program" do for me that a dumb one doesn't? The smart terminal program can take the information you access from a telecommunications system and store it into your computer's memory. After you go off line from a system, you have the option of printing it out or writing it as a cassette or disk file. Or, you can type a message off line and then upload it with a single keystroke to the host computer.

Since networks such as CompuServe and The Source charge for their services, this can save you money as it can transmit it faster than you can type and it allows you to examine it for errors while off line.

Another nice feature of a smart

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(212) 441-2807**

terminal program is that it enables you to change any RS-232 or printer parameters. For example, it allows you to access half duplex systems and use 1200 Baud modems. You can run your printer at 1200 Baud and insert a carriage return after a linefeed. With this type of program, you can modify the terminal video display to scroll on line or off line up to 12 lines at a time.

Now that you know more about the hardware and software which is involved, you may ask, "What else can I access besides large data bases which charge for the use of their systems?" The answer is the growing phenomena called Bulletin Board Services which are mushrooming all over the United States. A Bulletin Board Service, or BBS for short, consists of a individual with a personal computer and an auto-answer modem set up to have outside callers access their computer. (Yes, your own mini CompuServe!) Aside from the auto-answer modem, one needs special BBS software to run the system. For example Spectrum Projects owns and operates three BBSs which totally support the Color Computer. The three systems can be accessed by dialing (212) 441-3755, (212) 441-3766 and (212) 441-5719. These are operated and run on three Model IIIs with a Corvus 20 Meg hard disk drive. The system is free and no passwords are needed to gain access. Some features of the BBS are a message retrieval section, the Rainbow Tape section which contains over 300 programs from the pages of the Rainbow, a merchandise section, and a Rainbow Review section with over 100 evaluations of hardware and software. Using a smart terminal program, you can dial into the system and capture files from the download section. These files consist of games and utilities which you can run on your Color Computer. In the message retrieval section you can leave or recover messages with other users of the system. It is a way to get info on the CoCo that is not readily available through other channels. You can ask technical questions, get opinions on Color Computer hardware or software, and even place an ad. In the merchandise section is a list and description of products for your Color Computer.

There is one last thing you can do with your modem. Become a CoCo sysop! Sysop stands for SYStem OPERator. The

minimum requirements to run a BBS on a Color Computer are 64K of RAM, a disk drive, an auto-answer modem and the driver BBS software!

Bulletin Boards have proven to be very profitable investments as you can imagine. Just think of sitting in front of your CoCo BBS and watching it being accessed by a complete stranger at any time of day or night from anywhere in the world! Make way for the Bulletin Board System - the wave of the future!

## **THIS CABLE WILL MAKE YOUR LIFE A LOT EASIER**

The one thing we simply hate about the Color Computer's disk system is that the ROM pack extends so far out of the side of the machine.

If you are like us and are a little cramped for space, then a new DISK INTERFACE/ROMPACK EXTENDER is just the ticket.

We know that many of you have bought the work station sold by Radio Shack as an easy way to keep as much as possible in one place. But, the back of the CoCo fits under an enclosure, and that means it is hard to get to when you want to plug the disk controller (or any ROM pack) in or out.

This excellent product fits into the ROM port of your Color Computer in place of the disk controller which connects to the other end. It has the advantage of giving you three additional feet of space and of saving a lot of wear and tear on the ROM port pins as well.

This is a good product. As with any cable, you must be careful not to pull on the cable itself rather than the socket. But, with this minor caution you will eliminate a great deal of hassle and save your expansion port pins in the process.

We have been running our disk and ROM packs with this cable for a period of time now and have had no problems with it whatsoever. If cramped quarters are a problem for you, this product may be the answer.



# Hidden Basic is Pirates' Peeve

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"PIRACY" is much more common today than in the 16TH century when the term originated. Whether it is an otherwise honest computer hobbyist sharing a good game with a friend, or a very dishonest dealer stocking his shelves with illegal copies, software piracy is a recognized industry-wide problem. The number of "Doublings" lost through illegal copying is enough to discourage many from entering the software market. This has forced software distributors into building copy protection into their products. There are coding techniques which offer a measure of protection for programs written in machine code, but there has been little copy protection available for programs written in Color Computer BASIC. The reason for this is simple. The philosophy behind the design of the BASIC operating system used in the CoCo is that of simplicity. Simplicity to the point of allowing accessibility to even a young child. In doing so, much flexibility with respect to copy protection is compromised.

HIDDEN BASIC 1.0 is a new tool marketed by Spectrum Projects which can help to protect a BASIC program from being copied. This is a machine language program that is appended to a BASIC program that you would like to protect. The resulting composite program, which is loaded as a machine language program, disables several commands normally found in BASIC. These are such as LIST, LLIST, CSAVE, CSAVEM, EDIT, CLOAD, CLOADM, TRON and TROFF, which presumably could allow either direct duplication or listings of BASIC code which could be entered manually.

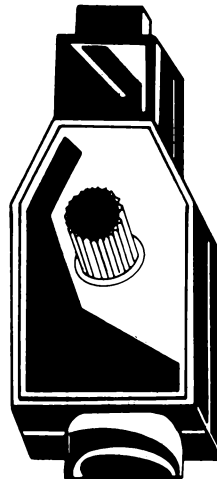
HIDDEN BASIC is very easy to use. It is loaded, the program to be protected is loaded, then the new program is saved automatically to tape. When loading, the protected program is treated as a machine language program, ie., CLOADM, but it is RUN not EXECuted. The protection provided for with this program

is very effective.

Not mentioned in the advertising or the instructions, is that this program also appears to protect against copying with DISK BASIC. The SAVE, SAVEM, LOAD and LOADM commands do not work, therefore, a program cannot be taken apart by the added power allowed with the disk operating system. It is important to note that this program is sold only in a format designed to operate with cassette storage.

I recommend HIDDEN BASIC to anyone who has a reason to protect a BASIC program. It is straightforward, easy to use, and works as advertised. There is a small matter of a royalty agreement with Spectrum Projects if you market a program using HIDDEN BASIC for protection. I called Spectrum Projects to obtain details relating to royalty agreements on their "voice line", but only talked to a friendly tape recorder, waiting to take my order. If you have any questions you should write or contact them via the data communications number given on the instruction sheet.

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