

Vol. 1 # 2 Nov./Dec. 1987  
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# CoCo Clipboard Magazine

## The Dream Machine

Jim DeStafeno finds the CoCo Dream Machine working hard at a Radio Shack in Delaware

## Product Reviews

Clipboard's Review Crew

## Basic Help

Bill Bernico

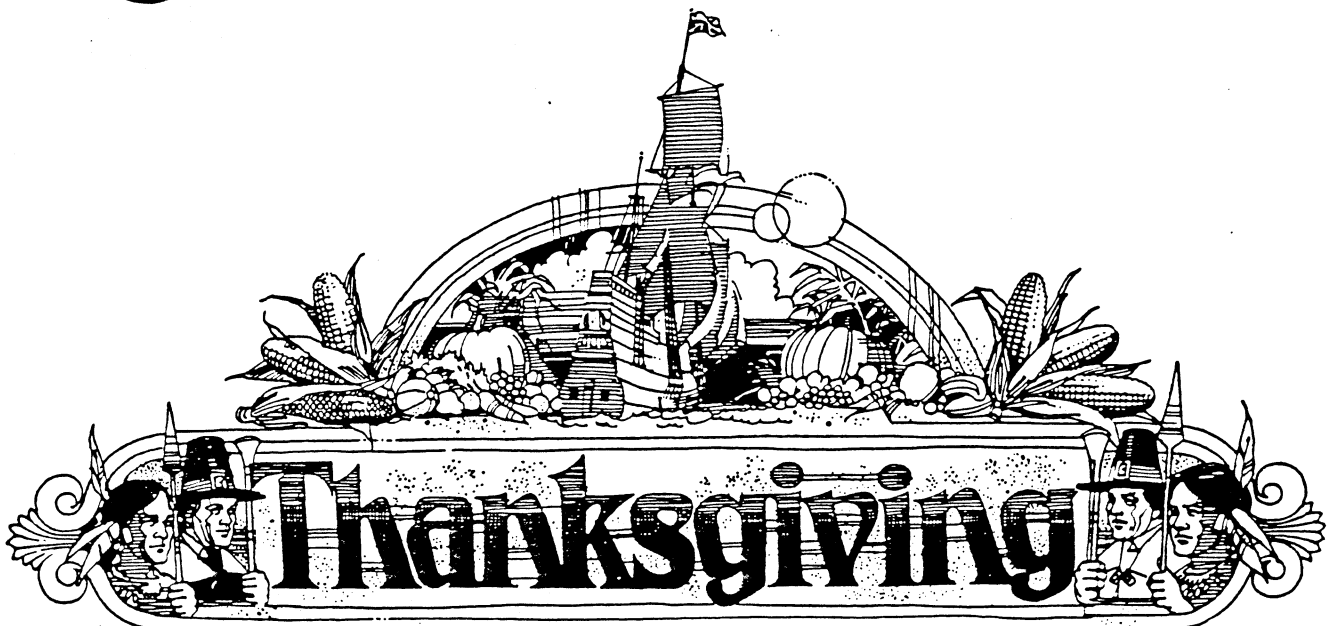
CoCo Club Registration Form

Letters From Readers

CoCo Clipboard Coupons  
Save \$\$\$ on  
Your Holiday Purchases

Also commentary by Paul Bornemann: Are you a computer addict?

Rush Caley wraps up your business needs with a CoCo Solution



**FROM THE DESK OF...**  
**Ted & Darlene Paul**

Milestone. In times past the milestone marked the distances from one village to the next. As you drive in the country you still see many of these markers usually overgrown and worn away by wind and rain.

CoCo Clipboard has now passed two important milestones. The first was Issue # 1. The second is this issue, number 2. Issue # 1 was a milestone for several reasons. First of all was the time frame in which the first C-C-M was conceived, produced, printed and mailed. With the help of the writers, the post office and our printers and advertisers, we were able to bring out issue # 1 in just 70 days. In some respects that short time frame is rather obvious. We had some misspellings slip by and some production problems all of which should be gone in this issue. In future issues ("Yes Virginia we will have future issues") I'll try to bring you the why's and wherefore's of how C-C-M got started.

I would like to explain a little bit about our subscription rates and policies. First of all we publish 6 times a year - every other month. One of the things that always bugs me are magazines that have July on the cover and they're in my mail box the last week of May! We will publish in September, November, January, March, May and July. Your Clipboard will be in your mail box on the first day of those months, or the first mail delivery date of those months. So unless the weather hinders the mailman, or the power drops off for a couple of weeks, we will be the best news you get the first of the month.

A subscription to C-C-M is \$12.00. This rate is good in the U.S. and in Canada (when paid in U.S. funds) and we will hold the \$12.00 rate as long as we can. We do not accept VISA or MasterCard. We had planned on doing so, but our local bank changed their minds about "mail order merchants" after

some of our order forms and notices had been mailed out. Seems they got burned on several "mail order" merchants so we suffered because of it. But after a little thought we decided it was a blessing in disguise. We avoid all the paper work, the discount rates etc. all of which would have made a subscription rate increase a reality.

Coupons. In issue # 1 we premiered CoCo Clipboard Coupons. This is our way of helping you with your purchases, a way for the advertisers to measure response and we feel a way to combat piracy. We are against piracy of software. No matter which way you try to dress up a pig, it's still a pig. Piracy is a pig which eats up the profits needed by software suppliers to continue in business. It's a pig that kills magazines, because magazines need advertisers to help pay the freight. It's a pig that destroys your opportunity to have new and more productive software, hardware and information sources like CoCo Clipboard. If a discount coupon can help you decide to buy your software package from the vendor rather than from a "software pirate" then coupons are worth it.

Finally a question was raised after issue number #1 came out. "Will you just be supporting the CoCo 3 and not the CoCo 1 or 2?" If you'll check the contents page of this issue I think you'll find we not only support the CoCo 3, but the 1 and the 2 as well. We've even decided to give MC-10 users a page or two. We will support the MC-10, the CoCo 1's and 2's, the CoCo 3, the CoCo 4 - 5 - 6 as long as they are used and enjoyed by our readers. We will try to have as good a mix as possible each month. While we will try to avoid "theme" issues because they get too predictable, we will try to center an issue around a particular idea. In issue # 1 we emphasized the CoCo 3, BASIC 09 and Assembly language. We also introduced our CompuServe column, our Ham Radio Column and continuations of the business uses

of the CoCo originally started in Spectrogram.

Your questions, comments and suggestions are appreciated. We read each letter that comes in and we will answer as many as we can. If you have a programming or hardware problem we will pass it on to one of our writers. If you would like a personal answer please include a self addressed stamped envelope. That's it for this edition, I trust you'll enjoy it. We trust that you will be with friends and family during the upcoming holidays. Please try to remember those who are most in need at this time of year with a donation to your local Salvation Army, Toys for Tots or church drive. "God loveth the cheerful giver" and we pray that He will bless you as you give to those in need.

Happy Thanksgiving, a joyous Christmas and Happy Chanuka to you all.

P.S. I almost forgot, we had planned to run our first CoCo Club Corner Column in this issue. However we had to make a decision on what went into the 32 pages budgeted for issue #2, and CoCo Club Corner must wait until January.

We have printed a CoCo Club registration form on page 26. If your CoCo Club would like to register with Clipboard please photocopy this form, fill it out and send it in. If your club has previously registered for CoCo Club Corner (from the old Spectrogram Magazine) you do not have to re-register. However if you've made changes in your club - new BBS or discontinued BBS, new officers, etc. please let us know.

*Ted  
Darlene*

# CoCo Clipboard Magazine:

Nov. / Dec. 1987 Issue 2

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Your comments and suggestions are welcome. We reserve the right to edit and publish all letters received unless requested not to by the writer.

# CoCo Clipboard Magazine

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# The Assembly Line

Kraig Brockschmidt

Color Computer magazines always print BASIC programs in a 32-column format, so when someone types a program in, the listing will match the screen. But what if you want to make listings in this way yourself? It's simple if you have a 32-column printer, but not with 80- or 132-column. Or so I thought... only 67 bytes of machine machine language and a few BASIC ROM routines will do the job.

To use 32-Column Hardcopy, you can either use the EDTASM+ source file or the BASIC program (Listings 1A and 1B). Save a copy of the ML code with (C)SAVEM"LIST32ML", &H7FBD, &H7FFF, &H7FBD. I should note that there is no provision in the program to print only specified lines. If you want to do so you will have to delete the unwanted parts of the program.

To understand how 32-Column Hardcopy works we must first examine the structure of a BASIC program in memory. The starting address (2 bytes) of the BASIC program is always found at \$19. With a PCLEAR4, this address is \$2601 for disk systems and \$1E01 for cassette. The actual start is \$2600 and \$1E00, but these always contain a zero. Regardless of the start address, the structure is as follows (shown here for disk):

\$2600 : Always 0

\$2601-02 : A 2 byte address pointing to the data of the next BASIC line.

\$2603-04 : A 2 byte value for the line number.

For example:

If it contained a \$020C, the line number would be 524.

\$2605-: Data for the BASIC line.

All command words (PMODE, DSKI\$, etc.) have been tokenized so they use only one byte of memory.

The last piece of data in each line is a zero, signalling the end of the line. The next open memory

address is the start of the next line. This address is the one stored in \$2601-02. From there the structure repeats until the end of the program, where three zeros are stored.

Just a quick note on tokens--the ASCII strings for all commands, just like you type them in, are stored in tables in the ROM chips. Each command word has a one-byte token. When you LIST a program, each token is looked up in the tables, and the ASCII is shown, not the token. This saves a large amount of memory when programming in BASIC.

Printing a program in 32 character lines requires five steps:

- 1) Get the start of the BASIC program code from \$19, and set the output switch to the printer (Lines 110-150 in the EDTASM+ source code).

- 2) Translate the line number to ASCII and print it followed by a space. (160-190)

- 3) Translate the tokenized BASIC data to ASCII and store it in a buffer (200).

- 4) Print the ASCII buffer in 32 character lines. (280-500)

- 5) Repeat steps 2-4 until done printing, then return to BASIC. (510-570)

I would like to point out a few interesting things in steps 2-4, specifically lines 180, 220, and 300. The remainder of the program is commented fairly well in Listing 1A.

Line 180 is a JSR \$BDCC instruction, which calls a routine in the BASIC ROM. This useful routine takes the contents of the D register, and converts it into ASCII. For example, if D contains the NUMBER 626, then the routine converts it into three ASCII codes, that for a 6, a 2, and another 6. This routine prints the ASCII codes to the device specified in \$6F. In our case this is \$FE, the printer.

This routine is used to print the line numbers of each BASIC line.

The most important instruction is another ROM call in line 220: JSR \$B7C5. This powerful 91 byte routine translates an entire BASIC line from tokenized code to ASCII. The X register should point to the beginning of the data for the line (like \$2605). The ASCII is stored in a 256-byte buffer located at \$2DD-\$3D6. The last byte of the translated line is a zero, which is usually found before \$3D6.

The last trick used in the program is a SUBB \$9C in line 300. What is at \$9C?? Well, each time a character is sent to a device by a JSR [\$A002] (or JMP) the contents of \$9C is incremented by one. Each time a CHR\$(13) is sent, the number is reset to zero. 32-Column Hardcopy uses this to get the number of characters used in printing the line number, without doing any other calculations. So in printing the first line of BASIC after the line number, we subtract the number at \$9C from 32 to get the number of additional characters to print.

If you're wondering what line 330 does, delete it and try the program. Without it you will get a syntax error when you return to BASIC. Also, note the number 32 in line 290 of Listing 1A and the first number 20 (this is hex) in line 50 of the BASIC program. This is the characters-per-line for the printout. You can change it to 40 or 80 (28 and 50 in hex) for the CoCo III screen.



REMINDER!

Listings:

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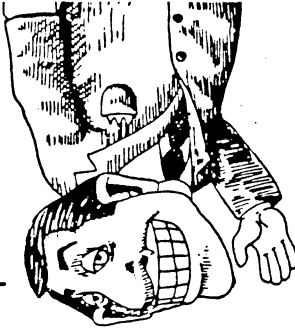
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# The 9th Power

Randy Krippner

No operating system, no matter how powerful, does people any good without applications software. OS9, as powerful as it is, can't balance your check book, can't organize your lists and can't play Mutant Space Invaders From Mars.

Before OS9 can do anything useful, software has to be written that can take advantage of the operating system's capabilities. And that leads us to the topic of today's column, the Basic 09 programming language.

I can't possibly present a complete tutorial on Basic 09. After all, it took Tandy several hundred pages to thoroughly explain all of the language's features in the Basic 09 Reference manual included with the OS9 Level II documentation. But since we're going to begin using BASIC 09 in the next installment of the 9th Power, I thought I should at least give you a brief introduction to the language before we jump in and start using it.

Basic 09 deserves far more attention than it has received in the past. While it is an extremely powerful language, Color Computer owners have largely ignored it for a variety of reasons. First, Tandy chose to include an assembler with OS9 Level 1 for the CoCo 1/2. If OS9 users wanted a high level programming language, they had to spend an additional \$99 for BASIC 09. And since most software for the Color Computer is written by ordinary people who just like to tinker around with BASIC, people couldn't see any advantage in spending almost \$100. for an operating system and then an additional \$100. for a programming language when they already had a perfectly good Basic already built into the computer.

The second problem was the Coco 1/2 itself. OS9 is a big operating system, and Basic 09 took up about 22K of RAM itself. This left a skimpy 14K free for programming on the 64K Coco 1/2. Even less if graphics were used.

But this has all changed. The

OS9 Level II package now includes Basic 09 at no extra cost, and with the Coco 3, memory is no longer a real problem. So it looks like Basic 09 may finally get the exposure it deserves.

Basic 09 has actually been around for a long time. Design of Basic09 began back in 1978. Motorola wanted a sophisticated, high level programming language to show off the power of the then new and unique 6809 microprocessor. So Microware was commissioned to develop BASIC 09 for the 6809 and the OS9 operating system. CoCo history buffs might be interested to know that the major designers of BASIC 09 were Robert Doggett, Terry Ritter, Larry Crane and Ken Kaplan.

The first release of Basic 09 was early in 1980, so the language has been around for almost eight years. This makes it almost ancient in the microcomputer world. But Basic09 is such an advanced language that only now are other versions of Basic beginning to appear that have it's capabilities.

Basic 09 is something of a hybrid. While it has virtually all of the functions you are familiar with from Extended Basic, plus many enhancements, it also has some of the elements of Pascal to provide structure and readable code.

It is a compiler, but a compiler that is unlike Pascal or C. Each line of code is compiled as soon as it is entered, permitting a Basic 09 program to be executed as soon as it has been typed in or edited. No separate, time consuming separate compilation step is necessary. But the program can be further compacted in size and increased in speed by running it through a separate compilation step, called PACK. So Basic 09 has the ease of use of an interpreted language like Extended Basic, while also providing the speed of execution and compact program size of a compiler.

Basic 09 has many other features that make it an ideal programming language not just for those of us who like to dabble in

programming on a hobby basis, but for the development of commercial software as well. It features independent, named procedures, automatic linking to library routines, long variable names, five different data types: Byte, Integer, Real, String and Boolean, multi-dimensional arrays, user defined complex data types, full access to all of OS 9's functions, syntax error checking on entry of program lines and many other features that make life easier for a programmer. It is a very rich, flexible language.

And while Basic 09 is indeed a derivation of common Basic, it has a much different look and feel than Extended Basic. Look at the Basic 09 program listing below:

```
PROCEDURE demo.1
DIM count:INTEGER
FOR count = 1 to 10
  PRINT "The 9th Power"
NEXT count
END
```

The first thing you'll no doubt notice about this little program is that it has no line numbers. Line numbers are optional with Basic09. They are required only when a line is referenced with a GOTO or GOSUB. Line numbers may be used as they are with Extended Basic, but most Basic 09 programmers don't bother with them. The first line of the program, "PROCEDURE demo.1" is also different from Extended Basic. All Basic 09 programs are called Procedures, and all procedures have names. However, procedures are much more than just simple programs.

Procedures may be complete



REMINDER!

Continued Page 9

# CoCo Clipboard Magazine



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is worth more than gold. All meat articles - no fluff, no filler. Wayne Day on CompuServe! Kraig Brockschmidt, Randy Krippner, Bob van der Poel and Delmar Searles on programming! Jim DeStafeno and Rush Caley on Business and Mike Dooley on Ham Radio! Coming soon - Bill Bernico and BASIC HELP and CoCo Club Corner!

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## Krippner cont.

programs, as is the case above, or they may be subroutines, called by using the RUN statement, followed by the procedure's name.

The advantage of procedures over ordinary subroutines is that procedures are entirely independent from one another. If a procedure uses the variable COUNT, as in the example above, COUNT is local to that procedure. A second procedure which uses a variable with the same name, cannot change the value of COUNT in the first procedure.

Let's look at a quick example:

```
PROCEDURE demo.2
DIM count:INTEGER
count=1
RUN demo.1
PRINT count
END
```

Demo.2, like demo.1, has a variable named COUNT. It sets COUNT equal to 1. Then it calls demo.1 with the RUN statement. Demo.1 will then execute, running through the FOR/NEXT loop. When it is finished, COUNT in demo.1 will be equal to 11. However, when demo.1 ends and control is returned to demo.2 the PRINT COUNT statement will show that COUNT is still equal to 1. This is because in each program COUNT is local to the procedure it is in. Changing the value of COUNT in demo.1 cannot change the value of COUNT in demo.2. Although they have the same name, they are entirely different variables because they are in different procedures.

But what if we did want to know what the value of COUNT was when it ended the loop in demo.1? All we would have to do is pass COUNT to demo.1 as a parameter. Simply change the DIM statement in demo.1 to this line:

```
PARAM count:INTEGER
```

Then change the RUN demo.1 statement in demo.2 to this:

```
RUN demo.1 (count)
```

When demo.2 is now run, it will pass the value contained in COUNT to the demo.1 procedure. The value in COUNT when demo.2 passes it to demo.1 doesn't matter in this case because demo.1 initializes it to 1 when the loop is started. But now, when demo.1 ends, the value in COUNT in demo.1 is automatically passed back to demo.2. When demo.2 prints COUNT, what will appear is not 1, but 11, the value demo.1 passed back to demo.2.

The actual variable names don't matter here. The variables do not need to have the same name when passing parameters between procedures. What matters is that

the value in the variable passed to the new procedure with the RUN statement is accepted by the called procedure and placed into the variable defined by the PARAM statement. When the called procedure ends, the contents of the variable that was defined with the PARAM statement are automatically passed back to the original procedure. This value is then placed in the variable that was in the parentheses following the called procedure's name.

And now that I've succeeded in hopelessly confusing everyone, let's move on.

Look at the "DIM count:INTEGER" statement. Obviously, this line is not dimensioning an array, so what is going on?

What we are doing is telling Basic 09 that we are going to be using a variable called COUNT, and that it is going to be a numeric, integer variable. DIM is used in Basic 09 not only to dimension arrays as in Extended Basic, but also to tell Basic 09 what type of variables we wish to use.

Extended Basic can deal with only two types of data: strings and floating point decimal numbers. Basic 09 has five different types of data, including three types of numbers, Real, Integer and Byte.

Real numbers are floating point decimals, as used in Extended Basic. Integer and Byte are something new, though. Both are numbers. Integer numbers under Basic 09 are whole numbers in the range of -32768 to +32767. Byte numbers must be in the range of 0 to 255. But why are three different types of numbers necessary? After all, the Real type can hold these values as well.

Well, there is a reason, and the reason is speed. It takes an enormous amount of time to do even simple addition with floating point, or real numbers. It takes about 440 cycles (a cycle is a measurement of computer time) to perform a simple addition using real numbers. Performing the same addition using integer numbers takes only 150 cycles. So by using integers for FOR/NEXT loops and whenever speed is essential, you can make a Basic 09 program execute faster than it would if real numbers were used.

We're almost out of room for this installment of The 9th Power. I'm afraid I've hardly even begun to properly introduce Basic 09. But I hope that this brief discussion has at least sparked your interest enough to encourage you to forge ahead on your own and experiment with the language. Don't let the sheer size of the OS 9 and Basic 09 documentation scare you away. The material is actually well written, especially the Basic 09 reference

manual. There are lots of sample programs to illustrate the languages features.

Next time we're going to be jumping into Level 2 with both feet, and have some fun on the way. The biggest fads in the microcomputer industry at the moment are high resolution graphics and mouse driven, "point and click" software. We Coco owners don't have to feel left out of this trend. It turns out that OS9 has just about everything we need to turn the CoCo 3 into a "point and click" graphics machine. And what the CoCo 3 and OS 9 lack, Basic 09 and the Tandy High Resolution Joystick Interface can supply.

So next time, we're going to explore the Coco 3's 640 X 192 graphics capabilities and learn how to access the Tandy High Resolution Joystick Interface (Cat. # 26-3028) with OS9's built in mouse driver routines. The discussion may get a bit dense because we're going to be dealing with OS 9 systems calls. But you don't need to understand the theory to have fun with the graphics program we're going to take a look at next time. And if you do manage to wade through the technical stuff, you'll learn how to go about using the mouse in your own program.

If you have questions, comments or suggestions for future topics, or wish to pass along information to the readers of the column, feel free to write. I can be reached at: Randy Krippner, 1014 W. Hwy 114, Lot 29, Hilbert, WI, 54129. Please include a stamped, self addressed envelope if you wish a reply.



# The Dream Machine

Jim DeStafeno

My wheels may not be red, and the only thing yellow about Delaware 398 is the line down the middle, the city is called Middletown, not Emerald and my name is surely not Dorothy; but right there in a shopping center is there I met the Wizard, Ed Gresick.

Ed runs and manages his Radio Shack, which of course is a retail store, with the "dream machine". A twin CoCo-3 set-up running a self written business management program system.

His hall of power is the back room of the store. One half of the dream machine is back there, while the other half is at the sales counter out front. Ed, an electrical engineer, is fifty plus, of average height, stocky, and carries his extra weight well. He talks slowly with plenty of thought behind his statements; describes himself as a rebel.

His path to the back room and his dream machine has been an interesting one. He didn't detail all, but if you really listen to him talking about the dream machine, you will hear him talking about his early days too. He worked on the fabled UNIVAC-1. From it he moved on to the machine control path. That technology also uses micro computer chips like those used in the CoCo.

One thing lead to another and after a few years he owned a marine electronics store with a lot of unused space. One day a Radio Shack store salesman stopped in. Soon he owned a CoCo.

"I wrote a data base for the CoCo and used it to track the video rentals we had going. This was all around '79-'80. We started to stock RS products in the unused space. Soon we had a RS store. Later we moved it up here."

In this case "we" includes his delightful wife Betty. During busy times she works the sales counter, but her first love is music. Right now she is into the production and musical direction of the local production of "The Student Prince".

Interesting people are attracted to interesting people.

"One day I happened to open up my CoCo, didn't even remember that it had the 6809 series chip. I knew about the chip because that's what's used in a lot of control systems." So the fruits were just waiting for Ed to enjoy, and enjoy he has.

He had the knowledge and experience from his control application days with RCA and his own consulting company, "Oh yea, in the beginning there was only Machine Language. I don't mean Assembler, I mean we put 1s and 0s in memory addresses, something like POKe in BASIC, but even more elementary."

He had the interest and was willing to spend the time. He's still got a lot of the goodies from the CoCo-1 days. It's interesting to see the CoCo third party evolution all in one place.

His first hand experience gives him a good feel for the micro computer industry. "I'm afraid that we are stuck with MS-DOS; there is just so much of it. However, for the micro, I think OS-9 and BASIC-09, maybe "C", is best. (Basic-) 09 is good and its a lot easier to write (than C)." He reflected for a moment and then spoke about the Data Base Program Writers, "There is a new one coming out of Canada. I've got Frank Hogg's Sculpter. It's very good, but its for Level-1. It's best (OS-9), multi user and all that, but there is just too much MS-DOS out there to over come. OS-9 is big in Europe and Japan, but I don't think it will ever take over here. Unix and Xenix just uses too much RAM (for micro use), OS-9 was written for micros, they weren't."

"Just as an example on the MS-Dos thing, I asked Radio Shack if I could display my system (the dream machine) at the dealer's convention this year. They said No, we're going with the MS-DOS machines this year. The old giv'em

what they want philosophy."

You can bet the "Shack" has a love/hate relationship going on with the CoCo. Every time they push it, it pushes their low-end computer into the basement; yielding less profit per machine sold. They are the only ones that have the opportunity to press the clumsy MS-DOS off the market, but the CoCo and OS-9 just doesn't have the public image to do it. It would be foolish for them to try to swim up stream. Right now, the "Shack" is the biggest seller of MS-DOS based machines in the US.

The super micros are going to Unix and Xenix. So as much as I hate to admit it, I guess, we in the know, owe a vote of thanks to the Shack for investing time and bucks into the CoCo-3. Of course they make plenty of bucks on the CoCo, but their question has to be, how long is this up hill battle going to pay off? Well, cream raises to the top, and fellows like Ed writing good programs for the CoCo-3 ain't going to hurt.

So how does one get to be like Ed? Its easy, just spend 30 plus years in micros and give yourself the opportunity to make every mistake possible, and learn from the result. He even teaches a 12 hour course on OS-9 in his back room. Maybe we'll see him doing that in Spectrogram. Now that would be a treat.

And what is this CoCo dream machine? Hold on to your hat. Presently the system is in two separate and independent systems, each is complete and a duplicate of the other. One is out in the front of the store, used by the sales people for order entry and checking inventory. The other system is in the back room, the office. It is used by Ed to do all of the accounting and inventory functions. Each system is driven by its own CoCo-3 running on OS-9, using programs Ed wrote himself in BASIC 09.

Continued Next Page

## DeStafeno cont.

Presently he up-dates the office system by downloading the day's sales activity to a disk. He then uploads it into the office system. The disk method of data transfer was done for the sake of safety while the system was being developed. "That way the store people don't get into the office system; if something happens on the office system I know it was my fault"

Ed says he will be running a wire between the two systems soon with pass word protection. Then the sales data will be transferred electronically, and the sales system inventory data will come from the office system.

Each CoCo-3 has a Multi-Pac that looks like a porcupine; a floppy disk controller, a hard disk interface and two serial port boxes, with two ports each. These are from L&R Tech. The hard disk out front is the system Owl-Ware sells, 20 Mb. The office system has twin 20 Mb hard disks. One for the system and one for back up and utility programs like a word processor, spread sheet, etc.

So far so good? Well, here is the kicker; all of this equipment, including the CoCos, for each system is tucked away. The sales system, under a counter; the office system, on a corner desk. In each system two of the L&R serial ports have wires leading to Wyse DT-100 work stations. These terminals are about the best that can be had for normal use. They have a full "main frame type" keyboard; all kinds of control keys, enough function keys to keep any button pusher happy, numeric pad, the ability to display in 80 or 132 columns (they can read in the 132 column mode too); the whole enchilada.

There are two of these terminals on the sales counter, and the office system has two as well. During the busy season, Ed plans to hook in a third terminal for the sales counter. The fourth serial port on the sales system will transfer the data to the office system. When that is hooked up he will be able to remove the floppy disk from the sales system. That will leave a Multi-Pac slot open for something else.

Each system also has its own printer. The one on the sales system prints out the sales receipt. It's great to watch a salesman write up a sale. He inputs the customer name, item number and quantity; the computer does the rest. The printer takes off, seemingly on its own, and by the time the customer has his change the receipt is waiting. Just like it should be.

The system was begun before the CoCo-3, and therefore was developed on OS-9, level-1. The CoCo-2 for the sales system had a 512K ram disk. "It was twice as fast". But from what I saw from the present system, twice as fast as a split second doesn't make much difference. What he's got now sure isn't slow, however he says, "I plan to write an index file routine for that (problem)."

"I went to level-2 because of memory management problems with level-1. It caused the system to crash once a day. Level-2 has been a big thing here, a big relief." "Because of the lack of crashes?" "Yes, we havn't had one since we went to level-2."

Right here is a tip for anyone thinking of saving a buck by going to OS-9 on CoCo-2s. Its okay to learn on, but if you plan to run a serious program system, you may run into troubles you didn't bargain for.

Ed says the hardware can be duplicated for less than the price of the best IBM personal machines and is multi user on top of that. Each of his systems have four serial ports and a parallel port on the floppy disk controller. A total of 10 ports. Ed's off-the-shelf set-up could hang six terminals, two printers and still have two ports left over to hook the two systems together. If all six terminals were being used at the same time I expect the response time would be bit slow, but how often would that happen in a small retail or job shop situation?

Does Radio Shack know what they have here? Of course they do, the question really is, will the public accept it? Ask your next door neighbor.

Ed's program system is quite sophisticated too. He does cyclic inventory counting, has sales history reports by item, salesmen, etc. "I can get (sales) comparative reports for the last five years. Really helps to spot and confirm trends. You know us small business men keep a lot in our heads, but the computer helps me confirm these things. Sometimes it surprises me. The program has a suggested order quantity report. Of course we use our own judgment and modify the suggest quantity, but I've tracked it against the actual sales. Its done pretty good, but most of all, it has saved me time and costly mistakes in every area."

Ed goes on to say, "We don't have to keep hand written records of anything any more. The computer keeps track of what has happened from data generated by the salesmen's input for the sales receipts. Everything else is a result of that. If anything goes wrong with the system, I have it

all the data on back up floppies and the hard disk. The computer reports what has happened and what's needed to be done. Nothing is forgotten, nothing slips through the cracks. A real time saver and gives a good feeling of security."

"In addition to those things, after we finalize the orders, we just modem them up to Boston. If we need to write a letter, we just call up the word processor on one of the terminals, write it, print it and send it out. I've got a spread sheet in there too. At budget time I can call it up if I want, but I don't do formal budgets like I used to. I've discovered the the biggest budget type problem I have involves what to order with the money I have available. We never have all the money we'd like to have for orders. Since we've been using the computer we havn't increased our inventory investment, but I find we're not out of what the customers want as often as we used to be. It didn't happen often before, but you know that hurts anytime it happens."

"My next program will address the what to order with the money I've got problem. The computer now generates a report that tells me what I should order, now I need that report prioritized. With that I could put in the money I want to spend and it will tell what to spend it on. We're thinking about the Christmas season order now. That's a lot of dollars."

Of course Ed is wizard. He has himself a system that would cost \$30,000 at the local computer store, and is going for \$40,000. You know a business of his size just couldn't afford such an investment, but how about plugging in a CoCo and Ed's software for under \$10,000? Now that is something such a business can't afford to be without. CoCo for business, you bet'ya.



# Pascal Programming

Delmar Searles

Last month we looked at a couple of sorting routines and their Pascal implementations. The drawback was that we could only sort integers. This time we're going to take a look at a utility sorting routine that will allow us to sort ASCII text files. We can sort on the basis of the entire record or on the basis of a key field, whichever we want. The sorted file can be displayed on the screen, sent to the printer, or saved on the disk.

## ASCII Text Files

At the lowest level, a computer only understands binary numbers; numbers made up of zeros and ones (e.g. 01101011). For the computer to work with alpha-numeric characters (letters of the alphabet, punctuation, and numerals) a binary code must be assigned to each character.

One of the most common codes is the American Standard Code for Information Interchange, more commonly known as ASCII (pronounced "as-key"). The BASIC manual that came with your Color Computer has an ASCII code table in an appendix (Appendix E in my version). Very likely your Pascal manual also has an ASCII table.

Often, each record in an ASCII file is divided up into fields or categories. For example a budget data file might have the following fields:

Characters -----	Field -----
1-5	Date
6	Blank
7-26	Payee
27	Blank
28	Budget category
29	Blank
30-36	Amount

The blanks are included to make the file easier to modify and update with a word processor.

## Sort Utility

Many operating systems include a utility program to sort ASCII

text files. In the simplest case, you tell the program which file to sort and it replaces that file with the sorted version. The sorting is done on the basis of the entire record.

Our sort utility (Listing 1) is a bit more versatile. If we had a budget data file like the one above, we might want to sort the file alphabetically by payee. On the other hand, we might want to sort the file by category and by payee within each category. Our sort utility will let us do either.

## The Sorting Program

You may recall from last month that a selection sort is a fairly good sorting routine to use when you want to avoid a large number of data transfers. This is exactly the case with text files which often contain rather long records.

The text file is stored in memory as an array of strings. Strings are not a part of standard Pascal. Most versions of Pascal, however, make some provision for working with strings. String variables are declared as follows:

```
var
  StringVar: String(80);
```

The number in parentheses indicates the maximum number of characters that can be stored in StringVar.

If the variable is going to be passed as a parameter, the following declaration should be used:

```
type
  StringType: String(80);
```

```
var
  StringVar: StringType;
```

This is necessary because when formal parameters are declared in a procedure or a function they must be given a predeclared type (or of course a simple type such as integer).

The exact way in which string variables are manipulated will vary from one version of Pascal to

another. In most cases, strings are assigned just about like they are in BASIC:

```
StringVar := 'Hello';
```

This statement would cause the word "Hello" to be stored in the memory location identified by StringVar. Note that single quotes are used in Pascal to indicate a literal string instead of the double quotes used in BASIC.

String concatenation is quite simple in Deft Pascal:

```
StringVar := StringVar + ' and Goodbye';
```

After this statement is executed, StringVar will contain the string, "Hello and Goodbye". Other versions of Pascal perform concatenation using a special function. Here's an example:

```
StringVar := concat(StringVar, ' and Goodbye');
```

Check your manual to see how your version of Pascal works.

Converting the selection sort we used last month for use with strings is really quite simple. We just need to replace the integer data identifiers with string identifiers. The result is the procedure SortOnRecord in Listing 1. You can see for yourself how few changes were necessary.

Modifying the sorting routine to sort on a key field requires a little more work. All comparisons must be made strictly on the basis of the contents of the appropriate



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## Searles cont.

key fields. But when swapping records, the entire record must be used.

The SortOnField procedure (also Listing 1) includes a procedure (FindKeyField) that transfers the contents of the key field to another variable so it can be used in making comparisons. The key is first set to an empty string and then the appropriate characters from the key field of the record are concatenated onto the key from first to last. (The first and last character positions are entered by the user.)

Since only the key field is used in the comparisons, it was necessary to add a temporary variable (TempStr) to facilitate the exchange of two records (after the inner "for" loop).

The input and output modules are fairly routine. Consequently, I'll not discuss them in any detail. You might just note the use of a CASE structure in the "GetInput" module. The optional ELSE clause prints a message to the user if they do not enter a valid character.

### Using the Program

Load the program as normal (LOADM "ASCIISRT") and execute. You will be asked for the name of the file to be sorted. Don't forget to include the file extension and the drive number if the file is not on the default drive. Don't forget that Deft Pascal requires a "/" (slash) as the separator between the file name and the extension. Do NOT try to use a "." (period).

Next you will be asked to identify the location of the keyfield. In particular you will be asked to enter the character position where the key field begins. Enter the appropriate value. If you want to sort the file on the basis of the entire record, enter a value of zero.

If you entered a positive position for the first character of the key field, you will be asked to enter the last position. Again, type in the appropriate value.

You will be given the choice of displaying the sorted file on the screen, sending it to your printer, or saving it on your disk. If you choose to save it, the program will ask for the filename. Include the extension and the drive number if necessary.

The program will then read your file, sort it, and send the results to the device you selected. The longer the file, the longer it will take to finish.

Suppose we want to sort the budget data file described above by category and by payee within each category. This requires two sorts. Sort the file on the basis of payee (First = 7, Last = 26). The sorted file must be saved on the disk. The sorted file is then sorted a second time on the basis of the category field (First = 28, Last = 28). This second sort will produce the desired result.

### Program Limitations

The program was set up to handle a maximum of 400 records with each record containing a maximum of 80 characters. (A string of 80 characters is actually 81 bytes long because byte zero is used to store the actual length of the string.) Thus the storage for the file requires almost a full 32K bytes of memory. As a result you must have at least 64K bytes of RAM to use this program.

You can always reduce the memory requirements by reducing the maximum number of records or by reducing the length of the records. You could also process longer records, if desired, but you might also have to reduce the maximum number of records that can be handled. (It all depends on how much memory you have and any limits your compiler may impose on the size of data structures.)

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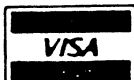
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## Conclusion

I hope this little utility illustrates how a basic sorting algorithm can be adapted for use in different applications.

```
program ASCIISort(input, output);

type
  StringType = String(80);
  StringArray = array [1..400] of StringType;
  FNameType = String(14);
  ChPosType = 1..80; (* Character position type *)

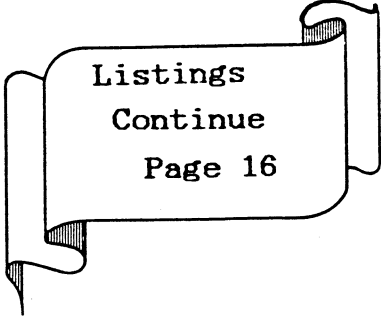
var
  FileData: StringArray; (* Holds data from disk
  file *)
  First, Last: ChPosType; (* Position of key field
  *)
  NumRecords: integer; (* Number of records *)
  InFileName,
  OutFilename: FNameType; (* File names *)

(*****
 *
 * Get name of input file, name of
 * output file, and character positions
 * at start and end of key field
 *
 *****)

procedure GetInput(var InFileName, OutFilename:
FNameType;
var First, Last: ChPosType);

var
  ch: char; (* Input character *)

begin
  Page; (* Deft's version of clear screen *)
  write('INPUT FILE: ');
  readln(InFileName);
  writeln;
  writeln('ENTER POSITION OF FIRST');
  writeln('CHARACTER IN KEY FIELD');
  writeln('(ZERO TO SORT ON ENTIRE RECORD).');
  writeln;
  write('FIRST: ');
  readln(First);
  if First > 0 then begin
    write('LAST: ');
    readln>Last);
  end; (*if*)
  writeln;
  writeln('OUTPUT DEVICE:');
  writeln('  SCREEN');
  writeln('  PRINTER');
  writeln('  DISK');
  repeat
    write('WHICH? ');
    readln(ch);
    case ch of
      's','S': OutFileName := '-3';
      'p','P': OutFileName := '-2';
      'd','D': begin
```



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```
        writeln;
        write('OUT FILE: ');
        readln(OutFilename)
      end
    else writeln('ENTER S, P, or D')
    end (*case*)
  until ch in ['s','S','p','P','d','D']
end; (* Get *)

(*****
 *
 * Read the data file
 *
 *****)

procedure ReadFile(FileName: FNameType;
var FileData: StringArray;
var NumRecords: integer);

var
  Infile: text; (* Logical name of data file *)

begin
  reset(Infile, FileName);
  NumRecords := 0;
  while not eof(Infile) do begin
    NumRecords := NumRecords + 1;
    readln(Infile, FileData[NumRecords])
  end; (* while *)
  close(Infile)
end; (* ReadFile *)

(*****
 *
 * Selection Sort Routine (on records)
 *
 *****)

procedure SortOnRecord(var FileData: StringArray;
Length: integer);

var
  MaxStr: StringType; (* 'Largest' element *)
  IndexOfMax, (* Position of largest element *)
  I, J: integer; (* Indicate position within list
  *)

begin
  for I := Length downto 2 do begin
    MaxStr := FileData[I];
    IndexOfMax := I;
    for J := 2 to I do
      if FileData[J] > MaxStr then begin
        MaxStr := FileData[J];
        IndexOfMax := J
      end; (* if *)
    FileData[IndexOfMax] := FileData[I];
    FileData[I] := MaxStr
  end (* for *)
end; (* SortOnRecord *)
```

# On Line with CompuServe

Wayne Day

Well, winter's here (any time it gets below 50 degrees in Fort Worth, it's officially classed as "Winter" and we broke that mark towards the last part of September) and the programming projects are probably beginning to take some shape in between hitting the books and watching college football (you mean there's life beyond NFL football?).

The fall and winter months have traditionally been when we see a lot of innovative things in the CoCo field, and many of them have shown up on the Color Forum on CompuServe for the first time.

For those of you who weren't with us last month, a quick recap.. CompuServe is the CompuServe Information Service of Columbus, Ohio. CompuServe offers its' 350,000 members various electronic products including The Color Forum - an interactive area that is can be likened to a gigantic community user group that meets 24 hours a day, 7 days a week and includes facilities for leaving messages for other user group members that are not in attendance when you are... a conference area where you can hold a private, or a very public, conversation with members who ARE there at the same time you are.. plus a data library where you can 'check out' reference materials about telecommunications in general, CoCo programming tutorials, ready-to-run programs for the CoCo under BASIC, Extended BASIC, and Disk Extended BASIC as well as speciality programs for the CoCo 3. There's also a data library that's devoted to Operating Systems and Languages, which is where you'll find the forum's OS-9 programming material (though we also sponsor the OS-9 Forum on CompuServe and thus would also like to invite you there, if you're into OS-9).

Of course, CompuServe is much more than just one forum, but for the person who's interested in meeting other CoCo users and watching the budget at the same time, we suggest you take it a

little bit easy at first until you get used to the system... i.e. walk before you run.

Hmmm.... budget... money.. what's CompuServe going to cost? CompuServe charges vary by the baud rate you're using as well as the time of day, in certain circumstances.

Everyone is charged a 'Basic Connection Charge' of \$6.00 per hour if you're using 300 or 450 baud, or \$12.50 per hour if you're calling in at 1200 or 2400 baud. Higher baud rates are available, but those are the most commonly used.

In addition to your Basic Connection Charge, you are also charged a communications surcharge which helps to pay for the network services you're using. If you use CompuServe's own network, the fee is twenty-five cents (\$.25) an hour. For folks who don't live in the many cities where CompuServe has their own network numbers and have to use Telenet or TymeNet, the communications surcharge is \$10.00 per hour during business hours (Monday through Friday) and \$2.00 per hour in the evening, on weekends and on holidays if you're calling from the 48 contiguous United States. Callers from Alaska are charged \$15.00 per hour, \$14.00 per hour from Hawaii and \$11.00 per hour from Puerto Rico.

A Canadian CompuServe user that doesn't have access to a CompuServe network number must use Datapac, and is charged \$8.75 per hour minimum (Datapac to CompuServe via a CompuServe network gateway -- Datapac to Telenet and Datapac to TymeNet access is higher).

What if you're calling from somewhere else.. say, Hong Kong or Australia? The Computer Sciences Corporation maintains an international network that can connect you to CompuServe... you're billed a flat rate of \$20.00 per hour for that service.

Most CoCo Forum members, though, are calling from places

where they have access to the CompuServe network... their total bill would be \$6.25 per hour (300 or 450 baud service) or \$12.75 per hour (1200 or 2400 baud service).

There are several areas on CompuServe where billing charges are reduced or turned off, entirely... in Customer Service areas known as FEEDBACK (where you can send messages to CompuServe Customer Services)... while responding to a CompuServe sponsored survey... or while uploading a file to any of the forums.

In general, we've found that it's much more economical to use 300 or 450 baud (not all terminal programs can support 450 baud, but the most popular one, Mikeyterm, can if you're not using an RS-232 pack) when doing things that cause you to wait... reading messages online (instead of downloading them to a disk file for later perusal)... participating in the online conferences, etc. Save the high speed work for downloading those long files from the data library, when the speed comes in handy.

Speaking of terminal programs... what happens if you don't have a terminal program? Well, you absolutely need one to use your CoCo as a terminal, so plan on getting one. Which one?

There are pros and cons to almost every terminal program in existence, but there's one that we recommend more often than not for two reasons... first off, we know that it works, since it was designed specifically to work on a



**REMINDER!**  
Continued

Next Page

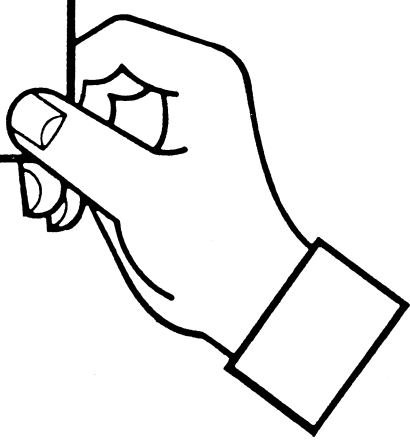
Day Cont.

multi-processing environment like CompuServe or any of the other national information services. Second, we recommend it because Mike Ward, my assistant SYSOP on the CoCo forum, is around to support the program on CompuServe.

MIKEYTERM has been called 'the best terminal program you can't buy' because it's available for downloading on most BBS's and CompuServe. If you don't have a terminal program that's capable of downloading something, though, it's kinda hard to get unless you have a friend that can make you a copy (which is perfectly legal in this case, since MIKEYTERM has been made freely available for non-commercial distribution by the author).

To solve the "chicken or the egg" problem, you can obtain a copy of Mikeyterm directly from the author, for \$10.00. It's available in either tape or diskette, and includes a printed copy of the instructions (definitely recom-

**Messages To**  
**Clipboard Via**  
**CompuServe**  
**User I.D. #**  
**72240, 21**



mended reading!). Be sure and specify whether you want tape or disk when writing...

Mike Ward  
 1807 Cortez  
 Coral Gables, FL 33134

By the way.. speaking of Mike, and his lovely wife Shar.. congratulations are in order for their newest production... Scott Delavan Ward, who made his entrance in Miami the last part of September. Congratulations, guys!

That's it for this month.. next month, we'll start exploring the data libraries to see what kind of goodies are available for you!

```

(*****
*                               *
* Selection Sort Routine (on key field) *
*                               *
*****
procedure SortOnField(var FileData: StringArray;
                    Length, First, Last: integer);

var
    MaxKey,           (* Largest key field element *)
    Key,             (* Contents of key field *)
    TempStr: StringType; (* Temporary storage during
swap *)
    IndexOfMax,      (* Position of largest element *)
    I, J: integer;  (* Indicate position within list
*)

(*-----*)
-
- Return the value of the key field.
- The field limits (First and Last) are
- accessed globally to reduce execution
- time.
-
-
-----*)

procedure FindKeyField(var OneRecord,
Key:StringType);

var
    I: integer; (* Loop counter *)

begin
    Key := '';
    for I := First to Last do
        Key := Key + OneRecord[I]
    end; (* FindKeyField *)
(*-----*)

begin (* SortOnField *)
    for I := Length downto 2 do begin
        FindKeyField(FileData[I], MaxKey);
        IndexOfMax := I;
        for J := 2 to I do begin (* compare by key field
*)
            FindKeyField(FileData[J], Key);
            if Key > MaxKey then begin
                MaxKey := Key;
                    IndexOfMax := J
                end (* if *)
            end; (* for *)
            TempStr := FileData[IndexOfMax];
            FileData[IndexOfMax] := FileData[I];
            FileData[I] := TempStr
        end (* for *)
    end; (* SortOnField *)

(*****
*                               *
* Print the sorted data *
*                               *
*****
procedure PrintFile(FileName: FNameType;
                    var FileData: StringArray;
                    Length: integer);

var
    I: integer; (* Loop counter *)
    Outfile: text; (* Logical name of output file *)

begin
    if FileName <> '-3' then begin
        rewrite(Outfile, FileName);
        for I := 1 to Length do
            writeln(Outfile, FileData[I]);
        close(Outfile)
    end (* if *)
    else
        for I := 1 to Length do
            writeln(FileData[I])
        end;

(*-----*)
M A I N D R I V E R
-----*)

begin
    GetInput(InFileName, OutFileName, First, Last);
    ReadFile(InFileName, FileData, NumRecords);
    if First = 0 then
        SortOnRecord(FileData, NumRecords)
    else
        SortOnField(FileData, NumRecords, First, Last);
    PrintFile(OutFileName, FileData, NumRecords)
end.

```



# Product Reviews

## Clipboard's Review Crew

### FKeys III

There is yet another macro utility for the finger-weary CoCo owner which is compatible with all models, even the CoCo III. FKEYS III, which is quite similar to the original FKEYS, is a well thought out and designed utility which can aid the user by executing often used commands with only one or two keystrokes. Although FKEYS III is useful, it does have its' limitations.

FKEYS III is invoked by running a BASIC program named "MENU". "MENU", as the name implies, is the main menu from which the user may configure new FKEYS, load in a custom version, accept the pre-defined configuration, disable the FKEYS software, or modify DOS. The programs functions are pretty much self-explanatory although four pages of documentation have been supplied. The user may configure up to twenty custom macros which can then be saved to disk and reloaded at a later date. The software also allows the user to save a complete version of the modified DOS so that it may be burned into an EPROM if desired.

Although I feel that FKEYS III may be a helpful addition to ones utilities library, the software does have its' shortcomings. Macros are limited to 25 characters maximum in length, not quite long enough for what I consider to be a helpful macro. I'm sure that this was done mainly to hold the program size to a minimum. In addition, there is no way to save your DOS modifications along with your custom FKEYS aside from the EPROM.BIN file. One item which wasn't mentioned in the documentation is the fact that a CoCo III user can simply LOADM\*EPROM.BIN" and EXEC once a custom version of EPROM.BIN has been saved to disk, thus eliminating the use of the menu program. I am quite sure that EPROM.BIN could be loaded into a 64K machine after switching to the

64K all RAM mode in order to install a complete DOS modification as well. One option which should have been included in the menu program is the ability to edit a single macro without having to re-enter all twenty custom macros.

Aside from the few problems which I have pointed out, FKEYS III should prove to be a worthy addition to your utilities collection. I feel that the average user would be quite satisfied with this software. FKEYS III is available through SPECTRUM PROJECTS, P.O. Box 264, Howard Beach, NY 11414.

Ralph Dahlgren

### BIGPIX

When I first began working with the BIGPIX graphics editor from Tothian Software, I was not too impressed. It is a BASIC program making it slower than most other graphics editors that I have worked with and it depends a great deal on keyboard input making it a little cumbersome to get used to. But once the user does become more familiar with the program some real advantages become apparent.

One main advantage of BIGPIX over most other graphics editors is the maximum picture size. BIGPIX can produce a picture 456 pixels wide and 565 pixels high. This gives about nine times the overall picture area of a standard PMODE 4 graphics screen and fills almost a complete 8-1/2 x 11 page. BIGPIX can also load and edit CoCo MAX and Graphicom files. This makes it possible to load in small parts of a picture created on another editor and create an even larger picture than you could create with either of the other editors.

One other feature of BIGPIX is that it is windowed so that you can view any portion of the overall picture that will fit into a standard PMODE 4 screen size. What the documentation doesn't explain

completely is that you can also print just what is within the window using the joystick. Position the window to the screen position you would like to print and then work through the hard copy option.

Another unique option is the GET/PUT option. BIGPIX can do "PUT's" in any of the ways that BASIC can (i.e. using pset, preset, and, or, not). This allows for, with a little practice, a wider range of creativity.

BIGPIX comes complete with its own font editor and is available from Tothian Software, Inc., Box 663, Rimersburg, PA 16248. In my opinion BIGPIX should be a welcome addition to the COCO artist's software library.

Norm Reynolds

### Font Bonanza

COCO III FONT BANANZA from Spectrum Projects is a compilation of high resolution text files for the CoCo III. The package comes complete with 39 font files as well as a demo program and a multiplexer program for combining up to eight font files into one large file. There is also a modifier program included so that you can edit existing fonts or construct your own.

The author, Prakash Mishra, has put a considerable amount of thought into this package. He has gone so far as to include an



REMINDER!

Continued Page 19

# NEW FROM ARK ROYAL!

NEW	Pro Football: Strategy Gridiron game (CC3 128K HR B)	\$20
NEW	Okinawa: The Big Invasion (CC64K D HR ML)	\$27
NEW	Blitzkrieg West: A Bigger Bulge (CC64K D HR ML)	\$27
NEW	Bataan: Historical & Hypothetical games in one (CC64K D HR ML)	\$29
NEW	Desert Fox: Rommel (CC64K D HR MLS)	\$27
NEW	Task Force: Modern Naval War in the Med (CC64K D HR MLS)	\$27
UPGRADED	D DAY: The 6th of June (CC64K HR ML)	\$25
UPGRADED	Battle Hymn: Battle of Gettysburg (CC64K D HR ML)	\$25
UPGRADED	Company Commander: Squad level Wargame (CC32K SG MLS) (House to House Module included in Company Commander) Additional Models for Company Commander 3.0 River Crossing	\$17
NEW	Gemini	\$17
NEW	Cauldron	\$17
NEW	Beach Head	\$17
	Fire One! Submarine Simulation (CC3 D HR B)	\$25
	Luftflotte: Battle of Britain (CC32K SG MLS)	\$25
	Stalingrad: The turning point. (CC64K HR ML)	\$25
	Final Frontier: War in Space (CC32K D HR MLS)	\$25
	Fire & Steel: Waterloo Campaign (CC64K D HR MLS)	\$22
	Barbarossa: The War in Russia (CC64K HR ML)	\$22
	RedStar: Nato vs Warsaw Pact (CC32K D HR ML)	\$22
	DarkHorse: RedStar Sequel (CC64K D HR ML)	\$22
	Midway: The Turning Point in the Pacific (CC32K HR MLS)	\$20
	Escape From Denna: Dungeons! (CC32K SG MLS)	\$15
	Tunis: War in the Desert (CC32K SG B)	\$15
	Battle of the Bulge 1 or 2 player (CC32K SG B)	\$15
	Phalanx: Alexander the Great (CC32K HR ML)	\$15
	Rubicon II: Invasion game (CC32K SG B)	\$10
	Guadalcanal: America Strikes Back (CC32K SG MLS)	\$10
	Waterloo: Napoleon (CC32K SG MLS)	\$10
	Bomber Command: Strategic Bombing Mission (CC32K SG MLS)	\$10
	Kamikaze: Naval War in the Pacific (CC32K HR B)	\$10
	Starblazer: Strategy Star Trek (CC32K SG MLS)	\$10
	Mission Empire: Build an Empire in Space (CC32K SG B)	\$10
	Galactic Taipan: Economics in Space (CC32K SG B)	\$10
	Keyboard General: Bi-monthly newsletter yearly sub	\$15
	Barbarossa, Luftflotte, Battle Hymn (256K) available Tandy 1000	
	<b>New for the Tandy 1000:</b>	
	Gray Storm Rising: War in the North Atlantic	\$25
	Codes CC — Color Computer, all versions    CC3 CoCo 3 only	
	D — Disk only (no D means program available tape or disk)	
	HR — High Resolution    SG — Semigraphics    ML — Machine Language	
	MLS — Machine Language Subroutines    B — Basic	

## Write for free catalog!

(Upgrades may be acquired for \$5. Original tape or disk must be returned with order.)

Prices on all programs include shipping costs to USA and Canada. Others add \$3.00. COD's available in USA only, add \$3.50. Personal Checks accepted with no delays in USA. Others send M.O. or Bank Draft in US funds. Programs shipped within 24 hours except on weekends. Color Computer and Tandy 1000, TM Tandy Corp. Florida residents add 5% sales tax.

Canadians may order direct from: **M & M Software**, #203 818 Watson Cres., Dawson Creek, B.C. V1G 1N8. Write M & M Software for information.

**ARK ROYAL GAMES**  
P.O. Box 14806  
Jacksonville, FL 32238  
(904) 786-8603



## Reviews cont.

example which demonstrates how the high resolution text fonts can be used with assembly language. The five pages of documentation are adequate for even a novice computerist, although more documentation would be welcomed.

The font modifier is quite easy to use and is very versatile. A complete font set can be displayed onscreen in either the 40 or 80 column modes. A font set may even be sent to your printer for examination or for archival purposes. I can't foresee the need for additional fonts as there are 39 included, but it is nice to know that they could be readily constructed should the need arise.

Upon receiving COCO III FONT BONANZA I was not all that enthused. However, after playing with the package for a short time, I was hooked on the idea of high resolution text fonts. Although I do like the standard 40 and 80 column text screens, I believe that most programs would look much more impressive using the COCO III FONT BONANZA. I would definitely recommend this addition to the COCO III programmers library.

Ralph Dahlgren

## TW - 80

"TW-80" by Doug Masten, I feel, is the best patch for "TW-64" I have seen.

To use "TW-80", you need a CoCo 3, one disk drive, a monochrome or RGB monitor (I use a B/W TV with no problems), "Telewriter-64" (unmodified version; available from Cognitec), "TW-80" diskette, and a 512K upgrade to use the RAM disk.

A few of "TW-80's" features that complement "Telewriter-64" are:

A status line in the main menu that tells you how many words and lines are in the file, the file name, and the free text memory (over 45K available.)

The edit mode has: 1) a status line telling you what line and column the cursor is in, whether you're in insert or overstrike mode, whether wordwrap is on or off, the current filename if any, and free text memory available; 2) a readable 80 x 24 screen with your choice of 7 character fonts; 3) Visible carriage returns; 4) the use of the Alt key for brackets and braces; 5) Overstrike mode; 6) Word yank; 7) Keyboard buffer - takes all key strokes including F1, F2, Ctrl, Alt, and key repeats; 8)

quick exit to Disk I/O menu.

In the format menu, when you print a file, everything goes into a 32K printer spooler allowing you to do something else while the file is printing; even if the One Page pause option is selected.

"TW-80" has an entirely new disk I/O driver that's easy to get along with. If you choose Read, Append, same change, or Kill file, the default directory comes up with a cursor bar to choose your file.

I have only two minor gripes about "TW-80." First, the manual on the program diskette) doesn't list all the additional commands incorporated in "TW-80." It assumes the buyer is familiar with Telepatch's commands. Second, although the manual says "TW-80" will work under ADOS, it will not support double-sided drives. Apparently, its disk I/O routines overwrite the ADOS routines for accessing D2 and D3.

A few program bugs need fixing. 1) When you load a text file into a buffer, the "Line" in the status line reads "24" instead of "1". This corrects itself as you use the program. 2) While in the insert mode, if you insert enough words to push the CR to the next line, that line disappears from the screen and the following line is duplicated. Both problems correct themselves if you Align the text. 3) In the format menu, when you press "J" for justify, the cursor appears under the number by "One page". This offers some confusion, at least when a number other than 0 is selected, the number will appear in the right place.

With the 80 column screen, font selection, and the new disk driver package, "TW-80" beats anything I've seen for the CoCo even with its bugs. It is well worth the \$9.95 Spectrum Projects is asking.

Lee Parker

## 300 Peeks

### 'n Pokes

This is the companion book to "500 POKES, PEEKS 'N EXECs for the COLOR COMPUTER" and "Supplement to 500 POKES, PEEKS 'N EXECs". It was written by Kishore M. Santwani and is distributed by MICROCOM SOFTWARE, PO Box 214, Fairport NY 14450 and by SPECTRUM PROJECTS, P.O. Box 264, Howard Beach, NY 11414

Commands are written with the CoCo III user in mind. It is a valuable addition to your library.

How do you save a new DOS to disk (page 3)? How about palette commands (page 22)? A text screen dump (page 29). Scroll protection (page

36). ROM change preserver (page 43).

What does EXEC &H8C1B do? You can find out on page 2.

This book should be on every shelf along with the first two of the series. I think you will find it a valuable addition to your library. One that will become very well worn as you look up commands to help with your programming.

Leon Wilson

## Rickeyterm

Leon Wilson

Rickeyterm (written by Rick Adams and distributed by Spectrum Projects, PO Box 264, Howard Beach NY 11414) is a communications program for the CoCo III with a disk drive and a modem. A printer, Deluxe RS-232 Pak and a color monitor are also nice but not required to use the program.

The program lets you communicate with other computers and to upload and download using ASCII or XMODEM protocol.

When you first use the package, you should load the BASIC program and look to see what parameters are used. You can change these to suit your needs.

There are two (2) baudrate settings that are set by the BASIC program. BAUD sets the baud rate for using the RS-232 Pak. BBAUD sets the 'bitbanger' baud rate for the serial port. The setting of user definable step rate for your disk drive is also supported.

To use the commands, press the ALT key while typing one of the command letters:

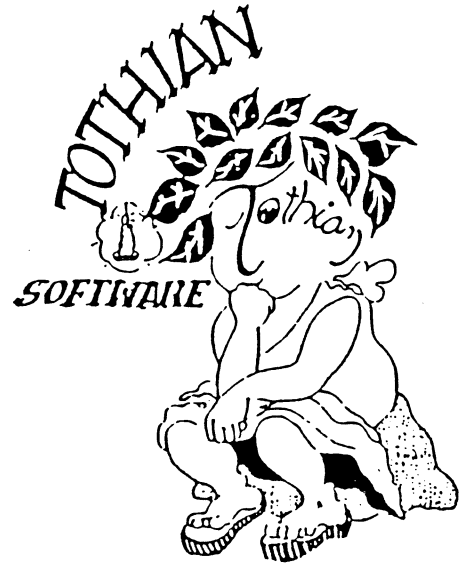
H=Help  
C=Conference Mode on/off  
U=Xmodem Upload  
D=Xmodem Download  
R=Read Buffer from disk  
W=Write Buffer to disk  
B=Transmit Buffer  
O=Open/Close Buffer  
S=Send Macro  
P=Print Buffer  
L=List Available Macros  
F=List Available Files  
Z=Send True Line Break  
K=Kill Buffer  
V=View Buffer  
M=Mark Buffer

There are seven pages of documentation with the package that will allow you to get the program up and running in a short time. I found the documentation to be well written and fairly comprehensive.

While I personally do not recommend Rickeyterm for the first time telecommunication user I believe that it should be in your files for later use as you become more adept.

# "Toil less with Tothian"

Create a BIG PICTURE with BIGPIX, Tothian Software's versatile 64K graphics creation program. It is capable of hugh 456x565 pictures as well as the standard 256x192 size. And to make things even better, it is compatible with all other non-OS9 PMODE4 graphics creation programs that we have encountered. Included in the package are screen dumps for both picture sizes, two fonts, and an easy-to-use font generator program. It requires two joysticks, at least one disk drive, and preferably a R.S. dot matrix printer (though any dot matrix printer with an appropriate screen dump can print the 256x192 pictures). Use the coupon found elsewhere in this magazine and save \$3.00.



BIGPIX - 64K disk - - - - - \$24.95

TOTHIAN SOFTWARE, INC.  
Box 663  
Rimersburg, PA 16248

Add \$3.00 for UPS or COD. PA residents add 6% sales tax. Immediate shipment.

LISTING 1A: EDTASM+ SOURCE CODE FILE

```

00010 *****
00020 * 32 COLUMN HARDCOPY *
00030 * COPYRIGHT (C)1987 *
00040 *BY KRAIG BROCKSCHMIDT*
00050 *14024 152ND AVE. S.E.*
00060 *RENTON, WA 98056-7313*
00070 * FOR THE 'CLIPBOARD' *
00080 *****
00100 ORG $7FBD
00110 START
00120 LDX $19
00130 TST ,X
00140 BEQ OUT-3
00150 LDA #$FE
00160 STA $6F
00170 LDD 2,X
00180 PSHS X
00190 JSR $BDCC
00200 PULS X
00210 LDA #32
00220 BSR OUT
00230 JSR $B7C5
00240 *THIS ROUTINE IN THE BASIC ROM WILL TAKE THE NEXT BASIC LINE,
00250 *(THE BEGINNING ADDRESS IS IN X+4) AND TRANSLATE IT INTO ASCII.
00260 *THE ASCII CODE IS STORED IN LOCATIONS $2DD THROUGH $3D6
00270 *WHICH CONTAINS 256 BYTES, AND THAT IS WHY YOU CANNOT ENTER
00280 *BASIC LINES LONGER THAN 256 CHARACTERS!
00290 LDU ##2DD
00300 LDB #32
00310 SUBB #9C
00320 LDA ,U
00330 BEQ NO
00340 CLR ,U+
00350 *THIS CLEARS THE LOCATION FROM WHERE A WAS LOADED.
00360 *THIS IS SO WHEN WE RETURN TO BASIC, IT DOESN'T GIVE AN
00370 *?SN ERROR.
00380 BSR OUT
00390 DEC B
00400 BNE RGS
00410 TST ,U
00420 *THIS TESTS IF THE LAST CHARACTER PRINTED
00430 *IS AT THE END OF THE COLUMN. IF THIS IS NOT
00440 *CHECKED, TWO LINES FEEDS WILL OCCUR RESULTING
00450 *IN A SPACE BETWEEN TWO SUCCESSIVE LINES IF THE
00460 *FIRST ENDED AT THE RIGHTMOST EDGE OF THE COLUMN.
00470 BEQ NO
00480 BSR OUT-2
00490 LDB #32
00500 BRA RGS
00510 BSR ALWAYS TO RGS
00520 NO
00530 TST ,X
00540 *THIS CHECKS IF THE X REGISTER HAS
00550 *REACHED THE END OF THE BASIC PROGRAM. THE END
00560 *OF THE BASIC PROGRAM IS A TWO BYTE ADDRESS AND
00570 *IS STORED AT $1B. THESE LOCATIONS CONTAIN ZEROS.
00580 BNE XZX
00590 RTS
00600 LDA #13
00610 JMP [$A002]
00620 *SEND CONTENTS OF A TO PRINTER VIA CHROUT ROUTINE
00630 *TOGGLED TO PRINTER. BY USING THE JMP
00640 *COMMAND, THERE IS NO NEED TO HAVE AN RTS AT THE
00650 *END HERE. CHROUT HAS ONE ON IT!
00660 END $7FBD

```

# CoCo-izing Your Business

Rush T. Caley

Last month in part three, we looked at the two major influences on software choices: the user influences and the software design influences. This time I would like to discuss general software types in relation to specific tasks.

Obviously, I am now treading the waters of personal commentary rather than hard and fast rules. I will be discussing general applications programs and how they can help in an office. I will assume that most readers are familiar with much of the terminology and have some experience with them. In future columns, we could delve into more depth in a specific area in a tutorial-like fashion if response shows that readers desire it. If you have any questions regarding any of the following material, or desire information on specific software for specific applications, address correspondence to me at 8289 Banner Road S.E. \* Port Orchard, WA. 98366. The best way to reach me is by phone at (206) 857-7878 or via MCI MAIL. User name RCALEY.

## A.) WORD PROCESSORS

I'm going to address Word Processing programs first for two reasons. First, Word Processing programs are truly one of the most welcome improvements to any well functioning office. They can also be one of the most efficient boosters of productivity in relation to task; and consequently, have become very popular.

My second reason for discussion of Word Processing programs first is to get them "out of the way". Right up front I'm going to say that I will not fall into the trap of implying that one program is "better" than another. Word processing is one endeavor that is very personal and criteria of evaluation can be extremely subjective. It is true that interfaces, general capabilities, and niceties of Word processing programs can be compared feature by feature, but when it comes to the bottom line, people use what they like - and are not covetous of

features and capabilities of other programs. The best recommendation - try a number of Word processors available for the CoCo, find one that "feels" right for you, and stick with it if it does the job. Probably the only true requirement I might suggest is that it be capable of saving a document in ASCII format.

## B.) SPREADSHEETS

Spreadsheets are also extremely popular programs found in and about the workplace. They cannot be beat when it comes to assistance in the areas of budgeting and forecasting. Nearly any task that involves analysis of figures is a natural for a spreadsheet. Tracking sales, inventory, P&L sheets, past performance analysis, future projections, etc. are some uses of spreadsheets. They can also be used for financial calculations such as principal and interest, future value, present value, net present value and internal rate of return. However, a sophisticated business analyst calculator is easier for those applications, and take no time for template design and learning complicated formulas.

This however, does bring up the concept of templates. A template is a worksheet that has been designed and tested to perform a specific function. If you load the template into your spreadsheet program, you can input your own data, and merely calculate the results. For a novice in the use of spreadsheets, templates are ideal for saving time (why re-invent the wheel?) and excellent learning tools. Templates for certain functions abound on the SIGS in BBS's. For example, at tax time, there is always a dandy spreadsheet template available for doing your own taxes. It is usually, designed by an expert in the field. These templates can be downloaded and run on your spreadsheet program. Check and see if there is a users group that specializes in your spreadsheet program. It can save you hours and hours of valuable time.

Finally, in relation to spreadsheets, there are some features that are definitely needed for any serious spreadsheet use. If you never do anything more complicated than simple row and column quickies like "C=A+B", then the following need not apply. For dedicated spreadsheet enthusiasts, the program MUST be able to "replicate" formulas. This is the ability to type in a formula ONE time, and reproduce the formula across a row or down or up a column WITHOUT having to re-type it. And when this is accomplished, the formulas make proper reference to the rows and columns to which they were copied. Secondly, the program MUST have the ability to address a SINGLE CELL or reference it. Radio Shack's SPECTACULATOR, for example, does not have this capability and takes it out of the serious spreadsheet category. Finally, once again, the program should have the ability to save entire or partial spreadsheet files in ASCII format. This is especially important if you want to paste a portion of a worksheet into a word processing document.

## C.) DATABASE (DBMS)

A good database manager can supply the solution to a number of office functions. They can be used to handle large mail lists, inventory, accounting, invoicing... the list can go on and on. A database file is one which holds many "records" or items about which certain information for each record is stored. The bits of information are stored in "fields".



**REMINDER!**  
Continued Next  
Page

## Caley cont.

The database file can be sorted on any field, and records can be selected by a specific criteria for updating or printing. An example might be: Select all records of people who live in Washington state; then sort them by zip code and alphabetically by last name. You can then examine, modify, or print the selected records. Another example might be from a customer database. Select all customers who have a current balance more than 30 days old, add a late charge, and print a formletter that reminds them their account is past due. Once more, look to the users groups, SIGS, and companies that offer custom database templates. They save time and provide excellent models during your own learning stages.

Although database management is a study in itself, with practice and patience anyone can become DBMS-literate. These programs are some of the most powerful and useful available for the CoCo and very handy in a business environment. There are so many types of database programs and capabilities, that they cannot be discussed in detail here. However, there will be future columns devoted specifically to this subject if interest is high.

### D.) DEDICATED SOFTWARE PROGRAMS

There are a host of "dedicated" software packages available for the CoCo. Although it is true that good business packages are not as plentiful as they might be. There are vendors supplying ACCOUNTS RECEIVABLE, ACCOUNTS PAYABLE, GENERAL LEDGER, PAYROLL, INVENTORY, and other dedicated accounting software. For many users, these packages will have distinct advantages over spreadsheets and database programs. They come ready to run and the learning curve is not so steep. Their main disadvantages are that they are "canned". IE You must follow program design and adjust your business accordingly. Secondly, in some cases, amassing sufficient modules to meet all your requirements can be expensive. The best results can be reached by knowing your requirements in depth and then asking questions of the vendors to see if their software can fill them.

### E.) "BUSINESS UTILITIES"

The last category, I refer to as "Business Utilities" because there are many times we need a quick solution to a business application and we don't want to get into anything elaborate. These are the programs that fill that void. For example, time and money programs. There are those that can

do quick loan amortizations, depreciation schedules, investment analysis, and so on. Also there are programs that will allow the user to design his own business forms such as invoices, statements, purchase orders and the like. I even have a program that analyzes "jobs in progress" for a construction company so that it can plug proper numbers into its balance sheet when dealing with lenders. Calendar / Scheduling programs also fall into this category. If you have been following our business section you will notice Jim DeStafeno has been writing an on-going series of business utility programs dealing with trend analysis. Randy Krippner contributed a program to help analyze the effectiveness of advertising campaigns. These types of programs are very handy for many "Q & D" jobs around an office.

#### *(Editors notes)*

*Starting in the next issue Rush will be starting the first of a multipart article on Relational Databases. As part of our commitment to further the use of CoCo we will be exploring just how well the CoCo can handle a database, even one which is fairly complicated. Rush will be using "real world" examples in these tutorials. If you are currently using, or thinking of using a CoCo for your business, you won't want to miss this upcoming series.*

## Assembly Line Listing cont.

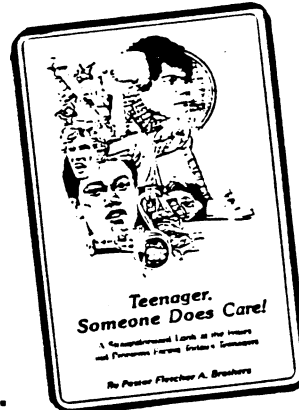
LISTING 1B: BASIC PROGRAM TO GENERATE ML FOR 32-COLUMN HARDCOPY

```
10 *****
  * 32 COLUMN HARDCOPY *
  * COPYRIGHT (C)1987 *
  *BY KRAIG BROCKSCHMIDT*
  *14024 152ND AVE. S.E.*
  *RENTON, WA 98056-7313*
  *****
20 CLS: CLEAR200, &H7FBD: FORT=1T06
7: READ A$: X=X+VAL("&H"+A$): NEXT:
IF X<>7585 THEN PRINT "ERROR IN D
ATA.": END
30 RESTORE: FORT=1T067: READ A$: POK
E&H7FBC+T, VAL("&H"+A$): NEXT: PRIN
T "ML DATA IN MEMORY. PROGRAM
CAN BE CALLED BY TYPING:" : PRIN
T: PRINT " EXEC&H7FBD": END
40 DATA 9E, 19, 6D, 84, 27, 36, 86, FE,
97, 6F, EC, 02, 34, 10, BD, BD, CC, 35, 10
, 86, 20, 8D, 28, BD, B7
50 DATA C5, CE, 02, DD, C6, 20, D0, 9C,
A6, C4, 27, 11, 6F, C0, 8D, 16, 5A, 26, F5
, 6D, C4, 27, 06, 8D, 0B
60 DATA C6, 20, 20, EB, 8D, 05, 6D, 84,
26, CE, 39, 86, 0D, 6E, 9F, A0, 02
```

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An answer for America's dying teens!

For your free copy of this dynamic and powerful book, call us today at **1-800-VICTORY.**



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See and hear young people who have already found the answer at Freedom Village, USA in Lakemont, N.Y.

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# CoCo 'N Amateur Radio

Mike Dooley

Well, it appears the time has come for the next installment of this column. This time let's look at the COCO's use with Packet radio.

Now, don't get me wrong... the COCO can't do Packet radio by itself. It needs a radio, and a Terminal Node Controller (TNC for short). The COCO actually acts as a terminal since the TNC takes care of all the packetting.

What is Packet radio? Wellll... Put as simply as possible, Packet radio is the transmission and reception of data via a radio (instead of telephone lines).

If you've been a Ham a while you know the same thing can be done with RTTY (radio teletype). That's true, but there is a difference. With RTTY, when the transmitter is keyed you, and only you, will be transmitting on the selected frequency. The transmitter will stay keyed until you've finished sending the data. Packet radio doesn't transmit continuously. It only transmits when it has a "packet" of data to send.

What is this "packet" of data? Imagine that as you type on your keyboard the data is being put into an envelope. When the envelope is full (up to 255 characters), it is sealed and transmitted to whomever you're communicating with. When you're using RTTY the transmitter is keyed whether data is being sent or not. Packet only sends data when it has a full packet (or if you press the RETURN key).

The speed at which data is sent on Packet is much faster than RTTY. Packet transmits at 1200 bits per second which is quite a bit faster than the 45 baud (about 45 bits per second) used for most RTTY transmissions.

That's enough about bits and packets. Besides, the TNC takes care of building the packets and sending or receiving them (using a radio, of course). Let's see how the COCO fits into this.

In my station I have my COCO connected to the TNC using an RS-232 Program Pak. The cable connecting the two units can be purchased or you can build your own. The required pin connections are:

RS-232 Program Pak	TNC
1	1
2	2
3	3
5	5
6	6
7	7
8	-
20	20

Note that pin 8 is connected to pin 20 on the RS-232 Program Pak end of the cable. The Program Pak won't talk to anything unless pin 8 is high. Tying it to pin 20 is the easiest way to accomplish that.

After you've built the cable use it to connect the TNC and the RS-232 Program Pak together. Make sure you connect the end with pin 8 connected to 20 to the RS-232 Program Pak!

At this point a terminal program is needed. Without a terminal program the COCO cannot communicate with the TNC. Follow the next instructions carefully! Apply power to the COCO. Type EXEC49152 on the keyboard, then press the RETURN Key. TADA!!! A terminal program! (It's built into the Program Pak.)

Our next problem is to set the items on the Menu (the one on the

screen) so the terminal program will allow the COCO to speak to the TNC. I only change two items on the menu. First, is DUPLEX. Press 'D' so the word 'FULL' appears beside it. Second, AUTO LINE FEED needs to be OFF (press the 'L' key). Pressing the 'BREAK' key puts the computer into the terminal mode allowing it to communicate with the outside world via the RS-232 Program Pak.

Now, I realize the RS-232 Program Pak is only operating at 300 bits per second. If you like, you can change yours to 1200 (or higher). I can't read that fast so mine runs at 300. (Don't worry, this won't affect the speed of the packets.)

Setting up the TNC is a different matter. I'm using an MFJ1270. The Serial port on the TNC must operate at 300 bits per second like the COCO is. There's a DIP Switch pack on the rear of the MFJ1270 TNC. To set the baud rate for the serial port (the one the cable's plugged into) for 300 bits per second, set the first five switch positions on the DIP Switch pack as follows:

1	2	3	4	5
300	ON	OFF	OFF	OFF

Now turn on the TNC. A sign on screen of some kind should appear on the display (TV in my case). This screen comes from the TNC which means the COCO and TNC are talking to each other! Stay tuned! 73's



**Subscriptions?**  
**See page 8**

## CBASIC III EDITOR/COMPILER

### The ULTIMATE Color Computer III BASIC COMPILER!!!

If you want to write fast efficient machine language programs and you don't want to spend the next few years trying to learn how to write them in Assembly language or with a cheap compiler, then CBASIC III is the answer!!!

CBASIC III is the only fully integrated Basic Compiler and Program Editing System available for the Color Computer 3. It will allow you to take full advantage of all the capabilities available in your CoCo-3 including 512K RAM, without having to spend years trying to learn assembly language programming. CBASIC III allows you to create, edit and convert programs from a language you are already familiar with Enhanced Disk Color Basic, into fast efficient machine language programs easily and quickly. CBASIC III supports all the enhanced hardware available in the CoCo-3, including Hi-Res Graphics, & Screen displays, Extended Memory and Interrupts (Keyboard, Timer, Serial & Clock). We even added advanced commands not available in Basic to give you a level of control only available to very advanced Machine Language Programmers. Plus we made it exceptionally easy to use, not like some other compilers. CBASIC III is the friendliest and easiest compiler available for the Color Computer III.

CBASIC III is a powerful tool for the Beginner as well as the Advanced Basic or Machine Language programmer. You can write programs without having to worry about the Stack, DP Register, memory allocations and so on, because CBASIC III will handle it for you automatically. For Advanced users, CBASIC III will let you control every aspect of your program, even generating machine code directly in a program easily.

CBASIC III features well over 150 Compiled Basic Commands and Functions that fully support Disk Sequential and Direct access files, Tape, Printer and Screen I/O. It supports ALL the High and Low Resolution Graphics, Sound, Play and String Operations available in Enhanced Color Basic, including Graphics H/GET, H/PUT, H/PLAY and H/DRAW, all with 99.9% syntax compatibility. CBASIC III also supports the built in Serial I/O port with separate programmable printer & serial I/O baud rates. You can send and receive data with ease to use PRINT, INPUT, INKEY, GETCHAR and PUTCHAR commands.

CBASIC makes full use of the powerful and flexible GIMI chip in the Color Computer 3. It will fully utilize the 128K of RAM available and install 2 Ultra Fast Ramdisks if 512K is available, for program Creation, Editing and Compilation. You can easily access all 512K of memory in a Compiled program thru several extended memory commands that can access it in 32K or 8K blocks and single or double bytes.

CBASIC has its own completely integrated Basic Program Editor which allows you to load, edit or create programs for the compiler. It is a full featured editor designed specifically for writing Basic programs. It has block move and copy, program renumbering, automatic line number generation, screen editing, printer control and much more.

The documentation provided with CBASIC III is an 8 1/2 by 11 Spiral Bound book which contains approximately 120 pages of real information. We went to great lengths to provide a manual that is not only easy to use and understand, but complete and comprehensive enough for even the most sophisticated user.

CBASIC III is the most expensive Color Basic Compiler on the market, and well worth the investment. You can buy a less expensive compiler for your CoCo-3, and then find out how difficult it is to use, or how limited its features are. Then you'll wish you had bought CBASIC III in the first place. Dollar for dollar, CBASIC III gives you more than any other compiler available. If you can find a better CoCo-3 Basic Compiler then buy it!!!

Requires 128K & Disk \$149.00

## DATAPACK III PLUS V1.1

### SUPER SMART TERMINAL PROGRAM AUTOPILOT & AUTO-LOG PROCESSORS X-MODEM DIRECT DISK FILE TRANSFER VT-100 & VT-52 TERMINAL EMULATION

- No lost data even at 2400 Baud on the COCO-3 Serial I/O port.
- 8 Display Formats, 32/40/64/80 columns at 192 or 225 Res.
- 50K Text Buffer when using the Hi-Res Text Display & Disk.
- ASCII & BINARY disk file transfer support via XMODEM.
- Directly record receive data to a disk file (Data Logging).
- VT-100 terminal emulation for VAX, UNIX and other systems.
- VT-100/52 cursor keys, position, insert/delete, PF & Alt. keys.
- Programmable Word Length, Parity, Stop Bits and baud rates.
- Complete Full and Half Duplex operation, with no garbled data.
- 9 Variable length, Programmable Macro Key buffers.
- Programmable Printer rates from 110 to 9600 baud.
- Send Files directly from the Buffer, Macro Keys or Disk.
- Display on Screen or Print the contents of the Buffer.
- Freeze Display & Review information On Line with no data loss.
- Built in Command Menu (Help) Display.
- Built in 2 Drive Ramdisk for 512K RAM support and much more.

Supports: R.S. Modem-Pak & Deluxe RS-232 Pak, even with Disk.

Requires 128K & Disk, \$59.95

## EDT/ASM III

### 128/512K DISK EDITOR ASSEMBLER

EDT/ASM III is a Disk based co-resident Text Editor & Assembler. It is designed to take advantage of the new features available in the CoCo-3 with either 128K or 512K of memory. It has 8 display formats from 32/40/64/80 columns by 24 lines in 192 or 225 Resolution, so you use the best display mode whether you are using an RGB or Composite monitor or even a TV for your display. Plus you can select any foreground or background colors or even monochrome display modes. It will even support 512K by adding an automatic 2 drive Ultra Fast Ramdisk for lightning fast assembly of program source code larger than memory. There is also a free standing ML Debug Monitor, to help you debug your assembled programs. EDT/ASM III has the most powerful, easy to use Text Editor available in any Editor/Assembler package for the Color Computer.

- Supports Local and Global string search and/or replace.
  - Full Screen line editing with immediate line update.
  - Easy to use Single keystroke editing commands.
  - Load & Save standard ASCII formatted file formats.
  - Block Move & Copy, Insert, Delete, Overtyping.
  - Create and Edit files larger than memory.
- The Assembler portion of EDT/ASM III features include:
- Supports the full 6809 instruction set & cross assembles 6800 code.
  - Supports Conditional IF/THEN/ELSE assembly.
  - Supports Disk Library file (include) up to 9 levels deep.
  - Supports standard Motorola assembler directives.
  - Allows multiple values for FCB & FDB directives (unlike R.S. EDT/ASM)
  - Allows assembly from the Editor Buffer, Disk or both.

Requires 128K & Disk \$59.95

## TEXTPRO IV

### The ADVANCED COCO-3 Word Processing System\*

- 9 Hi-Res Displays from 58 to 212 columns by 24 lines in 225 Res.
- On Screen Display of Bold, Italic, Underline & Double Width print.
- Up to 8 Proportional Character Sets Supported with Justification.
- Up to 80 Programmable Function Keys & Loadable Function key sets.
- Fully Buffered keyboard accepts data even during disk access.
- Autoexecute Startup files for easy printer & system configuration.
- 8 Pre-Defined Printer function commands & 10 Programmable ones.
- Supports Library files for unlimited printing & configurations.
- Disk file record access for Mail Merge & Boiler Plate printing.
- Completely Automatic Justification, Centering, Flush left & right.
- Change indents, margins, line length, etc. anytime in the text.
- Create and Edit files larger than memory, up to a full disk.
- Easily imbed any number of printer format and control codes.
- Built in Ultra Fast 2 drive RAMDISK for 512K support.

TEXTPRO IV is the most advanced word processing system available for the COCO-3, designed for speed, flexibility and extensive document processing. It is not like most of the other word processing programs available for the Color Computer. If you are looking for a simple word processor to write letters or other short documents, and never expect to use multiple fonts or proportional spacing, then most likely you'll be better off with one of the other simpler word processors. But, if you want a powerful word processor with extensive document formatting features to handle large documents, term papers, manuals, complex formatting problems and letter writing, then TEXTPRO IV is what your looking for. It works in a totally different way than most word processing programs. It uses simple 2 character abbreviations of words or phrases for commands and formatting information that you imbed directly in your text. There are over 70 different formatting commands you can use without ever leaving the text your working on. There are no time consuming, and often frustrating menu chases, you are in total control at all times. You can see what the formatted document will look like before a single word is ever printed on your printer. Including margins, headers, footers, page numbers, page breaks, column formatting, justification, and Bold, Italic, Underline, Double Width, Superscript and Subscript characters right on the screen.

TEXTPRO IV can even support LASER PRINTERS with proportional fonts, take a good look at this AD? It was done with TEXTPRO IV on an OKIDATA LASERLINE-6 laser printer!!! All the character sets used on this AD are proportional spaced characters, all centering, justification, and text printing was performed automatically by TEXTPRO IV.

Requires 128K & Disk \$89.95

## HI-RES III Screen Commander

### The DISPLAY you wanted but didn't get on your CoCo-3

- 54 Different Character Sizes available from 14 to 212 cpl.
- Bold, Italic, Underline, Subscript, Superscript and Plain character styles.
- Double Width, Double Height and Quad width characters.
- Scroll Protect form 1 to 23 lines on the screen.
- Mixed Text & Graphics in HSCREEN 3 mode.
- PRINT @ is available in all character sizes & styles.
- Programmable Automatic Key repeat for fast editing.
- Full Control Code Keyboard supported.
- Selectable Character & Background color.
- Uses only 4K of Extended (2nd 64K) or Basic RAM.
- Written in Ultra Fast Machine Language.

HI-RES III will improve the standard display capabilities of the Color Computer 3, even the 40 and 80 column displays have several features missing. For example, you can't use PRINT @ or have different character sizes on the same screen, even when mixing text and graphics with the HPRINT command. HI-RES III can give you the kind of display you always dreamed about having on your CoCo-3, with a wide variety of display options that you can easily use with your Basic or ML programs.

HI-RES III is totally compatible with Enhanced Color Basic and its operation is invisible to Basic. It simply replaces the normal screen display with an extremely versatile display package. With the full control code keyboard, you can control many of HI-RES III extended functions with just a couple of simple keystrokes.

Requires 128K Tape or Disk \$34.95

## 512K RAMDISK & MEMORY TESTER

RAMDISK is an ALL Machine Language program that will give you 2 ULTRA High Speed Ram Disks in you CoCo-3. It does not need or require the OS-9 operating system. It works with R.S. DOS V1.0 or V1.1 and it is completely compatible with Enhanced Color Disk Basic! Plus it allows your CoCo-3 to run at double speed all the time even for floppy disk access!!! It will not disappear when you press reset like some other ramdisk programs. The MEMORY tester is a fast ML program to test the 512K ram. It performs several bit tests as well as an address test so you know that your 512K of memory is working perfectly.

Requires 512K & Disk \$19.95

## "The SOURCE III"

### DISASSEMBLER & SOURCE CODE GENERATOR

The SOURCE III will allow you to easily Disassemble Color Computer machine language programs Directly from Disk and generate beautiful, Assembler compatible Source code.

- Automatic label generation and allows specifying FCB, FDB and FCC areas.
- Disassemble programs Directly from disk, unlike other disassemblers.
- Automatically locates Begin, End and Execution address.
- Output Disassembled listing with labels to the Printer, Screen or both.
- Generates Assembler source files directly to disk or printer.
- Built in Hex/Ascii dump/display to locate FCB, FCC & FDB areas.
- 8 Selectable Display formats 32/40/64/80 columns in 192 or 225 Res.
- Selectable Foreground & Background colors & Printer Baud rates.
- Built in Disk Directory on a Kill file commands.
- Menu display with single key commands for smooth, Easy operation.
- Written in Ultra Fast Machine Language.

Requires 128K & Disk \$49.95

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Dear Editors:

One article I'd like to see finished from Spectrogram is the one where Rush Caley was describing the "super" CoCo that Tandy decided to trash. I would also like to see:

CoCo III desktop publishing.

CoCo III video digitizer for Hi-Res images.

CoCo III High resolution color screen prints on the Okimate - 20 printer.

Take care, I hope you are successful with the "Clipboard."

Mike Strong

Mike:

Whew! Hope you don't need this all by January <grin>. We're somewhat up in the air about the "super" CoCo article only because our space availability is tight. I'd also like to see a real desktop publishing program for the CoCo 3. There is one listed in the new Tandy catalog but we have not seen it in here in Fredonia, or any place else as of this writing.

Gentlemen:

Enclosed is my check for \$12.00 to cover a one year subscription to your magazine.

The first issue looked fine except for the bad editing errors. These errors put the accuracy of the programs in question. Good luck.

T.F. Devlin, jr.  
Morwalk, OH

T.F.

Boy do we know we made errors. Your letter was not the only to point out our mistakes. We think you'll find this issue much improved in that area. We appreciate your concern for accuracy and invite you to write us if we goof up again.

Excerpted letters:

Good luck on your (our) new magazine. I also plan on taking advantage of one or two coupons on page 16. I like this really good idea. Watch the typo's.

Lee Duval

\*\*\*\*\*

Congratulations on a great first issue! I can honestly say I enjoyed

each of the articles and look forward to seeing more of the same. Your anti-fluff attitude is well appreciated.

Robert J. Sullivan

\*\*\*\*\*

HDIR (Bob van der Poels article in issue 1) is worth \$12.00 to me so I am sending in my subscription. We need a magazine like this..

Hugh M. Betz

\*\*\*\*\*

Please sign me up to CoCo Clipboard Magazine. I have most of your free issue READ and REALLY ENJOYED IT. Please keep up the great work and please don't do like past CoCo magazines have done.

Keith H. March

\*\*\*\*\*

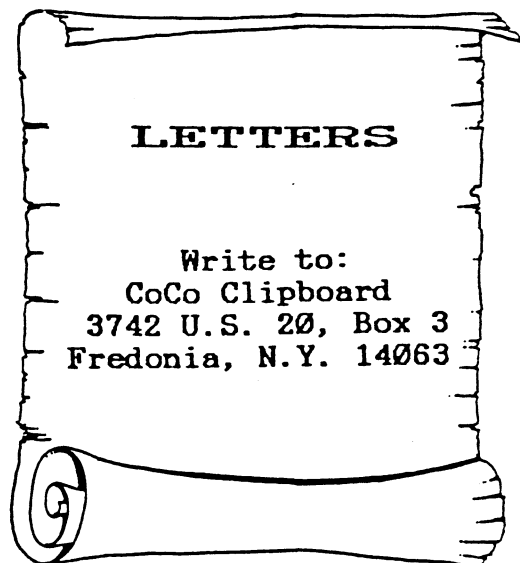
Dear Readers: Boy has this been a great 45 days. Each day brings new letters and subscriptions and your support both in a subscription and in good wishes has taken a lot of the sweat out of bringing a new CoCo magazine to publication.

If we could make one or two requests:

1. When you make a purchase from one of our advertisers please mention Clipboard - and use those coupons!
2. We only accept checks or money orders. Credit cards cost too darn much. Please pass the word at your local CoCo club meetings.
3. Thanks for everything!!

Cordially,

Ted & Darlene



Dear Sirs:

Thank you so much for sending me the first issue of your magazine. It looks like it's going to be a great publication.

I realize this may be too late but if at all possible please start my subscription with the Nov./Dec. issue. My check is enclosed.

Mark Duval  
Medina, N.Y.

Mark:

Thanks for the letter and we hope you enjoy reading your Nov./Dec. issue with your letter in it. It's the first of your subscription!

Dear Pauls:

I wish you success with your new publication "CoCo Clipboard Magazine" and enclose my check for \$12. for your next 6 issues.

I hope that you can keep the emphasis centered around the CoCo II, which I believe is the most common of all the CoCo's. I would also like to see Basic Programs on Business, Finances and Games included.

Looking forward to future issues.

Godfrey J. Moll  
Springfield, MO

Godfrey:

I think you'll enjoy Bill Bernicos' column this month and we'll do everything we can to supply the best articles in BASIC we can. Letters like yours help brighten our day!

REGISTRATION FORM  
FOR COCO CLIPBOARD MAGAZINE'S  
COCO CLUB CORNER

c/o Ted Paul  
3742 U.S. 20, Box 3  
Fredonia, N.Y. 14063

1. NAME OF YOUR CLUB \_\_\_\_\_  
2. MAILING ADDRESS: STREET \_\_\_\_\_  
CITY \_\_\_\_\_  
STATE \_\_\_\_\_ ZIP (POSTAL CODE) \_\_\_\_\_

3. VOICE TELEPHONE : (     ) \_\_\_\_\_ - \_\_\_\_\_  
4. BBS TELEPHONE :   (     ) \_\_\_\_\_ - \_\_\_\_\_

5. EXACT PARAMETERS NEEDED TO ACCESS YOUR BBS:  
HOURS AND DAYS OF OPERATION: MONDAY HOURS FROM \_\_\_\_\_ TO \_\_\_\_\_  
TUESDAY FROM \_\_\_\_\_ TO \_\_\_\_\_  
(TIME ZONE) WEDNESDAY FROM \_\_\_\_\_ TO \_\_\_\_\_  
( eastern ) THURSDAY FROM \_\_\_\_\_ TO \_\_\_\_\_  
( central ) FRIDAY FROM \_\_\_\_\_ TO \_\_\_\_\_  
( mountain ) SATURDAY FROM \_\_\_\_\_ TO \_\_\_\_\_  
( pacific ) SUNDAY FROM \_\_\_\_\_ TO \_\_\_\_\_

6. FULL OR HALF DUPLEX ?           SEVEN BIT ?   EIGHT BIT ?   STOP BITS? \_\_\_\_\_

Do you have a regular time the BBS is off line?   Yes   No   :When \_\_\_\_\_

7. DOES YOUR BBS SUPPORT ANY OF THE FOLLOWING AREAS:

	YES	NO	COMMENTS
A. MESSAGE BASE ----->	_____	_____	_____
B. UPLOADS ----->	_____	_____	_____
C. PASSWORD NEEDED ----->	_____	_____	_____
D. ON LINE REGISTRATION----->	_____	_____	_____
E. MAIL IN REGISTRATION----->	_____	_____	_____
F. S.I.G. SECTIONS----->	_____	_____	_____
G. DOWNLOAD SECTIONS----->	_____	_____	_____
1. GRAPHIC PROGRAM----->	_____	_____	_____
2. GRPAHICS PICTURES----->	_____	_____	_____
3. GAMES PROGRAMS----->	_____	_____	_____
4. ADVENTURE PROGRAMS----->	_____	_____	_____
5. OS-9----->	_____	_____	_____
6. DISK UTILITIES----->	_____	_____	_____
7. TELECOMMUNICATIONS PGMS----->	_____	_____	_____
8. OTHER----->	_____	_____	_____
H. ASCII DOWNLOADS----->	_____	_____	_____
I. XMODEM PROTOCOL----->	_____	_____	_____
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# Basic Help

Bill Bernico

## Editors notes:

We're really pleased to have Bill Bernico writing for us here at Clipboard. His column will answer your questions about programming in BASIC for both the CoCo 2 and the CoCo 3. Letters to Bill can be sent to us here at Clipboard.

Dear Bill:

I have a few BASIC games and programs that use the POKE 178 to get the orange and blue colors on the PHODE 4 screen. Sometimes when I run the program, the colors will be correct and sometimes they will be reversed. How can I make sure the colors will be the way I want them for my program?

Bobby Miller  
Houston, TX

Dear Bobby:

The colors you get depends on how the computer sets itself upon power up. Sometimes they're right and sometimes they're not. Hitting the reset button and starting over is one way, but as you probably know, that can take quite some time for the computer to decide to give you the right color set and it can get frustrating.

The second way is easier, less frustrating, quicker and it doesn't take that much more effort to add it to the beginning of your BASIC program. It's a color test which will help you set the correct color with the use of just two keys - the reset key and the ENTER key. Here's how it works. Upon running this test, your screen will be either blue or red with a small square in the middle containing the word RED.

It will continue flashing until you hit one of the two keys mentioned. If the screen is blue, for example, you'll have to hit the reset button until it turns red. Sometimes it'll turn red on the

first reset, sometimes it takes 20 tries. Don't give up. However, if the screen is already red when you run it, or if it turns red after resetting, simply hit ENTER and you will continue on to the next part

(clrtest routine)

```
10 CLS3:A=PEEK(116)*256+PEEK(117)
)-20:X=INT(A/256):Y=A-(X*256):PO
KE113,85:POKE114,X:POKE115,Y:FOR
I=A TO A+17:READ B:POKE I,B:NEXT
I:DATA18,182,255,3,138,1,183,255
,3,189,173,33,189,172,239,126,17
3,158:PMODE4,1:PCLS0:SCREEN1,1:P
MODE3:PCLS2
20 PMODE4:COLOR0,1:LINE(108,90)-
(134,100),PRESET,BF:DRAW"C0BM112
,98U6R3FDGL3R2F2DBR3NR4U3NR3U3R4
BD6BR4NR3U6R3FD4G":IFINKEY$<>CHR
$(13)THEN20
30 CLS:PRINT"YOUR PROGRAM BEGINS
HERE AFTER LINE 20. ALSO,
DELETE LINE 30.
```

of the program, probably that game you mentioned. Now the colors should be correct.

The following short program is a listing of the color test. Make sure when you add it to your program that these line numbers are lower than the start of your program. You may want to renumber your program first by loading it, then typing RENUM 100,10,10 and hitting ENTER. This will start your program at line 100 and you can number the color test from 10 to 90.

Dear Bill:

Can you tell me the difference between INPUT and LINE INPUT? They seem to do the same thing when I try them. Also, I know how to make musical sounds, but how would I go about making the sound of an explosion or a gunshot or some other non-musical sound?

Tony LaDuca  
Mesa, AZ

Dear Tony:

To answer your first question, INPUT accepts data from the keyboard, as does LINE INPUT. The difference, however, is that LINE

INPUT will accept all characters (except the ENTER key) as valid entries. INPUT, on the other hand will not allow commas, combining numeric and text entries, or substituting one for the other. See the example below for a demonstration. There are two examples of simple word processors. Try them both with a printer. Input your last name, a comma and your first name and see what happens. If you don't have a printer, change line 30 in each of the to read 30 PRINT A\$ and it will print on the screen instead.

(lineinput routine)

```
1 ' example of a simple word
processor using 'LINE INPUT'
2 '
10 CLS
20 LINE INPUT A$
30 PRINT # -2, A$
40 GOTO 20
```

As for your second question, those sounds are still made with the musical values, except that those values are usually so short and combined in such a way that when mixed together in a string, they don't sound like music at all, but rather like an explosion or gunshot or whatever it is you're trying to create. Experiment with different combinations to see what you get from it. Make a note of the results and keep a file. Sooner or later you'll come across a sound that you'll want to use elsewhere. Try my example to get that gunshot sound you're looking for.

(gunshot routine)

```
10 FOR X=1 TO 10
20 PLAY"T15001V31CDCGABV25CV20CV
15DV10DV5EV1E
30 FOR G=1 TO 200:NEXT G
40 NEXT X
```

# Thorns in Basic 09

Bob van der Poel

In the last issue of CoCo Clipboard we presented the full-blown BASIC09 program HDIR. We thought it would be a pretty good introduction to BASIC09 - what better way to demonstrate the concepts of structured programming, recursion and meaningful variable names than with a real-life example? So okay, now you're sold on this great language. Does that mean that everything is rosey? Of course not.

There are lots of subtle traps for the unwary in BASIC09 land. In the process of writing two major applications programs (a character set editor and disk based mailing list manager) we've fallen into our share of them. There are probably many more, but hopefully we can steer you around a few of them in this article.

## Getting More Workspace Memory

When you start BASIC09 you have 8191 bytes (8K) of workspace. According to the BASIC09 manual, 1200 of these bytes are for BASIC 09's use, leaving you 6992 bytes for your programs and variables. You can find out the current workspace area by typing:

```
MEM <ENTER>.
```

Getting more workspace memory is easy too, in command mode type:

```
MEM 12000 <ENTER>.
```

Doing another MEM tells you that there are now 12031 bytes available (BASIC09 rounds off the memory requests to multiples of 256, hence the difference.)

Now try typing:

```
MEM 40000 <ENTER>.
```

This should give you 40,192 of workspace memory, but all we get is a cryptic "WHAT?" After some experimentation we discovered that the maximum value BASIC09 recognizes for a memory request is 32767. If you want more memory than that you must use the OS-9 memory size option when starting BASIC09:

```
BASIC09 #40k <ENTER>.
```

This time when you do a MEM you'll be greeted with a comfortable 40,959. Incidentally, 40K is the maximum memory size you can use with BASIC09, a CoCo 3 and Level 2 OS-9. Remember, all memory allocations are done in 8K blocks. BASIC09 itself is just under 24K (3, 8K blocks) leaving a maximum of 40K (5, 8K blocks). No single process can access more than 64K at one time--this limitation can be worked around, but for now just accept 64K as an absolute.

## Memory Block Problems

The 8K block allocation causes its share of elusive problems. By way of example, let's say that you are working on a moderately large program containing ten small procedures and one large one (let's call it GraphEd). Once you have the smaller ones debugged you decide to use the BASIC09 "PACK" command to make them a tad faster to load. Because you may want to change one or more of the small procedures you've decided to pack them one at a time, rather than as a merged set of modules. Running "GraphEd" with the recently packed procedures works perfectly, so you shut things down for the night. It's the next time you do some editing that strange things start to happen.

Now you get BASIC09 running again and allocate 32K of memory. Next you load "GraphEd" and run it. Everything churns along until a "RUN" command is encountered. Let's pretend that it's:

```
RUN toupper(text).
```

BASIC09 first checks its module directory to see if it knows about the procedure "toupper." But you didn't load "toupper" into memory, so OS-9 is asked to load it. Since a copy of the packed procedure is in your current execution directory, OS-9 obliges by loading the program. BASIC09 now runs the procedure and everything continues on till another RUN is encountered:

```
RUN tolower (text).
```

Once again BASIC09 asks OS-9 to find and load the new procedure. You notice that the disk drive

light comes on--good, OS-9 is loading "tolower." Then everything stops and you find yourself staring at an "ERROR 43" message. A quick look in your manual informs you that "ERROR 43" is BASIC09 shorthand for "Unknown Procedure." But this is where the strangeness starts--you hit the <ENTER> key to get a directory of the procedures and "tolower" is listed there along with "toupper" and "GraphEd."

To understand what's going on you'll have to think about those darn 8K blocks again. Recall that BASIC09 itself is using three of them, plus the four blocks (32K) being used by "GraphEd." This leaves one free block (8K) which can be mapped into BASIC09's memory area. When OS-9 loaded "toupper," it loaded into its very own 8K block of memory, even though the program was less than a 100 bytes long. When "toupper" was run that block of memory was mapped into BASIC09's workspace. Now, when "tolower" is loaded another 8K of memory is allocated by OS-9. The problem comes when BASIC09 tries to run "tolower" after it has been loaded into memory. Since eight blocks have already been assigned to BASIC09, the one containing "tolower" cannot be found. Hence the "unknown procedure" error.

There are two ways around this dilemmatic spot: First we could remove the first procedure with the command "KILL toupper." This will return the memory used by "toupper" back to BASIC09; however it will also mean that the next time the procedure is called it will once more need to be loaded from disk. This is fine for large code segments used only occasionally, but we're going to be using this one quite a bit--loading from disk every time it's needed will slow things down too much.

The solution is to combine all of the short procedures into one file which will load into its own 8K block. When we were writing our mailing list we packed the modules as they were written and debugged into a directory called MODULES on

Continued Next Page

## van der Poel cont.

our working disk in drive 1; then we used the following procedure script to link all the short utility modules into one file:

```
t
tmode -pause </1
*
* Making DML command module
*
* First deleting old modules
*
-x
chd /d0/cmds
del dmlcmds
x
*
* Now merging modules
*
chd /d1/modules
*
merge DMLzipindex
DMLnameindex DMLprint DMLlogic
DMLmfix DMLtouppe DMLmsg DMLget
DMLput DMLed DMLmenu DMLonekey
DMLcls DMLrevid DMLblink
DMLgotoxy DMLinkey
DMLsyscall>/d0/cmds/DMLcmds
*
*
* Changing new modules
attributes
*
attr /d0/cmds/DML9 e pe
*
*
tmode pause </1
-t
```

This script first deleted the old DMLcmds file in the CMDS directory on drive 0, next the various modules were merged into one file called DMLcmds, finally the attributes of this new file were set so it could be loaded into memory. If each module had been loaded separately we would have used 18, 8K blocks; when merged into one file the whole lot loads comfortably into one block. Now the main program being worked on can call the various modules and never have to worry about killing one or running out of memory. This file must be loaded into memory with:

```
LOAD DMLcmds <ENTER>
```

before BASIC09 is executed. When you wish to delete the modules from memory simply use:

```
UNLINK DMLzipindex <ENTER>
```

Note that to unlink the entire set of modules we must use the name of the first module in the file. CAUTION: Never unlink a module which is still in BASIC09's workspace--the module will be removed from main memory, but BASIC09 will think it still exists. When BASIC09 tries to run a non-existent program like this, the results are not nice.

### Picking Names for Procedures

If you examine the script above you'll notice that all the

modules start with "DML." When we started working on the program we weren't using this convention--and discovered an other thorn. Our procedure "touppe" worked fine before it was packed. But when we loaded our merged file and then ran the main program the program came to an abrupt halt when the first "RUN touppe(text)" was encountered. A bit of head scratching later (actually it was a lot of head scratching!) we found the problem. We had already loaded another program called "touppe" into memory. Unfortunately, this program expected entirely different parameters than the BASIC09 module. But wasn't the new module loaded? No! Both modules had the same name and revision number, so the second one (the one we wanted) was never loaded.

Our suggestion for picking names is to use a program identifier with all the modules you'll be using unless you are absolutely sure that no other programs will be in memory at the same time as your program is being run. That way you'll avoid the potential conflict caused by having two programs with the name.

### More Memory Problems

The following listing is another "let's pretend" program. This time imagine that the first one (Initprogram) is a procedure which you wish to use to initialize the main program. Perhaps it asks for a filename or or sets up a graphics screen. The second procedure (MainProg) is supposed to be the main program which does . . . whatever you want. Just note that it has a substantial memory requirement.

```
PROCEDURE Initprogram
DIM text:STRING[100]
INPUT "Enter some text: ";
text
RUN some more code goes here
RUN MainProg (text)
END
```

```
PROCEDURE MainProg
PRAM text:STRING[100]
DIM array(20000):BYTE
PRINT "You entered: "; text
REM lots more code goes here
END
```

If you get real ambitious you can type these programs in and run them. You'll find that they "work" perfectly after you use MEM to give BASIC09 about 22K of memory. Now use "PACK\*" to convert them into a compiled program, exit BASIC09 and type:

```
InitProgram <ENTER>
```

After a brief delay you'll be given the "Enter some text:" prompt. Type something real important and press <ENTER>. What's this? An error 32? Hmm, looking in the good old

reference guide we find that this means that memory is full. What happened?

It appears that when RUNB (the program which runs compiled BASIC09 modules) is initialized it reserves enough memory for the module which called it into action (in this case "InitProgram"). The easiest fix is to change the programs a bit so that "InitProgram" is called from the main program, but there is another way. The optional memory specifier may be used with compiled programs as follows:

```
InitProgram #22K <ENTER>
```

This way RUNB knows how much memory to grab for the processes. It seems that with OS-9 there is always at least one way around a problem--and usually more; thanks Microware, we appreciate it.

Next issue we'll cover a few more BASIC09 quirks, as well as presenting one or two handy sub-routines you can use in your own programs. If you have any suggestions for future columns please write. My address is:

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# Paul Bornemann Comments...

How many of you out there realize that using your computer day in and day out could become hazardous to your well-being? I am not making reference to eye strain or finger cramps, I'm referring to "Family Strain" or "Cramped Relationships". Yes, you too can fall victim to -- Computer Addiction--. It can strike anyone without exception, the only provision being you own a computer and you love it.

If you feel inclined to snicker at this concept as nonsense you are either just entering the computer world or you may be knee deep or chin deep in it already. If a snicker did not appear, then you can relate to "Computer Addiction" as being real and perhaps you and I have something in common.

Let me list a few warning signs if I may:

1) Do you find yourself delaying as long as you can from arriving at the dinner table until you are assured (a) the table is completely set and (b) the food is placed on the table. Your family groans in unison, "Dad! Supper", for the fifth time. Now with one ear you listen for the opening line of family grace and with one last glimpse at the monitor screen you make a mad dash to the dinner table. And

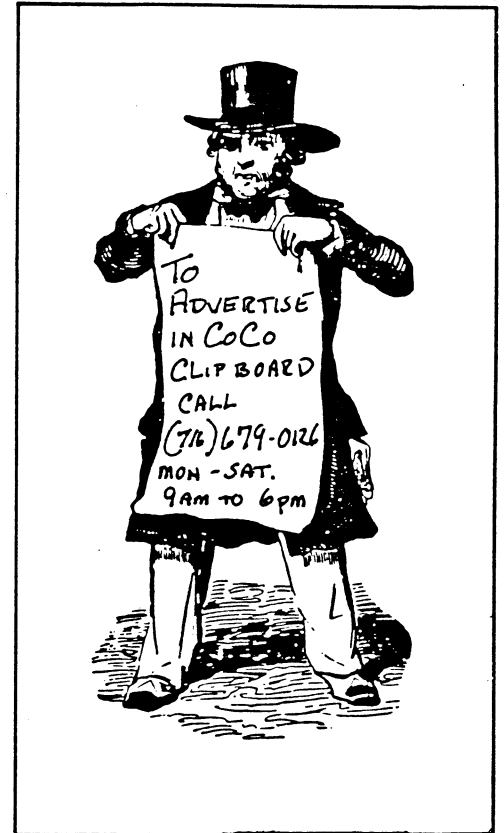
you're greeted with cold stares and cold chow, you think, "Don't they realize I'm working on the computer not folling around"?

2) Your children (spouse, girlfriend, boyfriend) start to believe they have taken a back seat to the computer. You hear yourself explaining the importance of your work at the computer - "Hey, I'm working here, not fooling around. Give me a break, kids, we'll play ball later". All the while knowing later means much later like next year later. GOOD OLD DADS example glued to their screen - GOOD OLD T.V. "Hey, lets play ball!"; "Later Dad".

3) Computer addiction leads to altered sleep habits also. Finding the time to sleep is hard when you are possessed. Time flies when you're having fun working. However when sleep does finally overtake you it's impossible to clear the computer data from flashing around in your own memory bank. Have you experienced the 3:00 AM rush to the computer with the solution to the bug in your programming from earlier in the evening? It's unbelievable how loud a printer is at that time of night - but "Hey, I'm working, not fooling around, right!?" - "I'm hooked!" - Right!

Sound familiar? Let me leave you with a few words of encouragement from a reformed "Compu-Nut". You don't have to forfeit your high spirited computing desires. Never! Just pace yourself out a little, work out a coop-

erative schedule. Share your computer with others. After all one of the most attractive elements of the computer is the magic that it truly provides us with. But the magic of the computer weighs little to the wonders of a valued relationship with your close ones.



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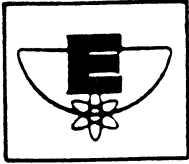
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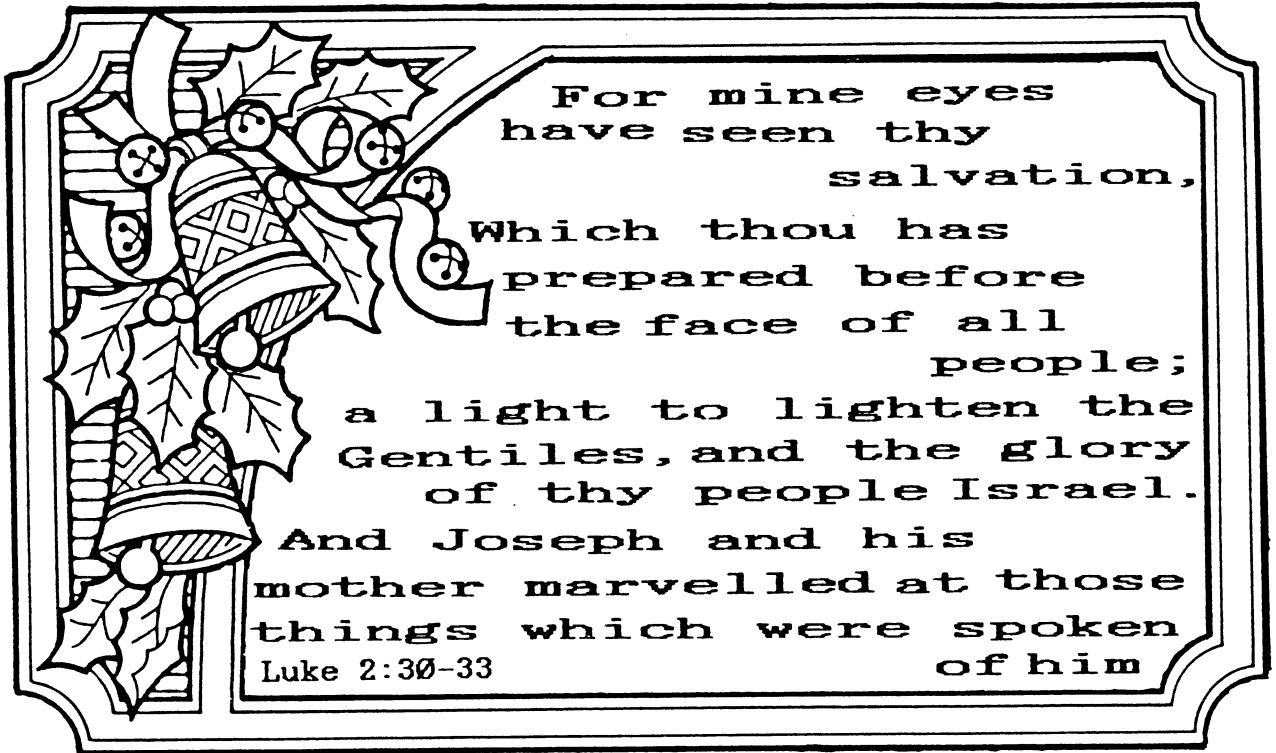
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