



Editorial

Even more products have appeared on my desk this month, and I'd like to share some of this information with you!

I recently received a catalog from **Dorsett Educational Systems of California**. You may remember some of Dorsett's products, which mainly consist of tape driven programs that provide a graphically oriented learning experience. Along with those tapes, the company plans to expand its product offerings to include multimedia interactive disk technology, 'Talk/Tutor' videotapes, and advanced teaching machines. The company can be contacted at the following address and telephone number:

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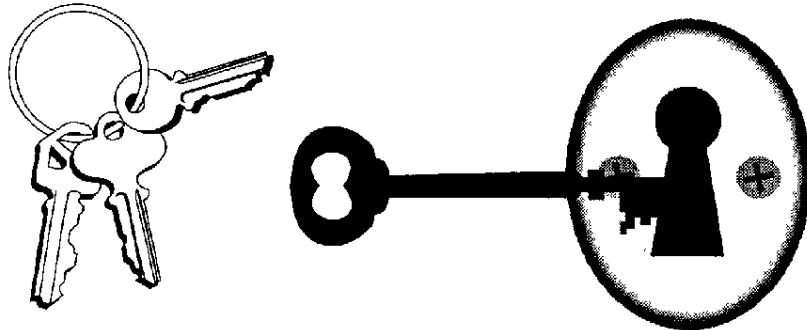
If you request a catalog and mention that you saw this information in *UpTime*, they will also send you a free program!

Rick's Computer Enterprises has gotten an overwhelming response to their CoCo Registry disk. The disk will contain a slick interface which lets you view other CoCo'ers along with their address, interests, system types, and supporting interests. For the price of \$12, you'll receive three disks over the next nine months, which is one heck of a deal

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considering how important these contacts are. In addition, the flip side of the disk will contain advertisements from over 20 different companies supporting the Color Computer. For more information or to place an order, write to:

The CoCo Registry
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On another note, I'd like to make a final clarification concerning the *Planet Engine* program. At one point, we made the statement that the Mid Iowa and Country CoCo Club was distributing the program. This is not the case and never was. If you would like more information about the program, contact *David Wordell* at 833 Woodhaven Lane, Grand Prairie, TX, 75051. I would like to apologize for the confusion surrounding this much sought after program!

That's about it for this month... the July issue should be making it to you shortly!

-Jordan Tsvetkoff

Life on the Internet

This month, we'll look at a question from Allen Huffman, owner of Sub-Etha Software. Allen writes: "If all Internet address names can be represented as numbers, can a mail message be addressed as *joe@128.2.50.22*, for example?"

Well, in theory, it seems like a perfectly logical thing to do. The part of the address after the at '@' sign does signify which host the message is destined for, so using the actual address rather than just a name should work fine. However, most mailers are not written to accept this form of an address. A valid Internet mailing address consists of a name reference rather than an actual number. Let's examine why the mail system was designed this way.

As a network grows, a system administrator may need to move computers around or even assign

UpTime

Editor: Jordan Tsvetkoff

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different tasks to different computers to handle different load conditions. If the computer was specified by network address alone, that address would have to follow the computer around forever, or you would run the risk of somebody trying to use an out of date mail address, which can wreck havoc on other system administrators and users who no longer know how to properly send the mail. By binding a name and the address together, a mailer can always deliver the mail even if the computer that receives the mail changes. The system administrator at the destination simply changes how the name resolves into an address, and the mail can now simply be redirected to another machine. In fact, it is possible to have several names point to the same machine.

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Later, the site expands, as does the mail load, and the mail server needs to be moved to a separate machine. The system administrator simply changes the name binding of the original machine's address on the domain name server, and the problem is solved.

-Jordan Tsvetkoff

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Basic09 in ?? Easy Steps

Remember the program listing I gave in part 4? Did you wonder why the variables had such little meaning and hard to remember names? Well the truth is that I did not write the original program. The original is a MS-DOS Qbasic listing I came across in a magazine.

I am not sure whether there are actually a lot of these sort of programs out there written in Basic09, but I do know that there are books literally full of MSDOS basic programs and I presume a good deal of DECB programs as well that are worth converting to Basic09. So that is what we are going to do this time around.

I have included listings of an MSDOS Basic and DECB program that will draw the exact same picture as the listing in part 4. In these programs, I have kept all variable names equal, which makes it easier for you to compare the listings.

The MSDOS program is written in Qbasic. If you use or have listings in an older version of MSDOS Basic, you may have to change some statements. Since the older MSDOS Basics look a lot like DECB, this shouldn't be a really big problem. Later on we will discuss some of the finer points of the conversion, most notably the screen types and the WINDOW function of Qbasic.

DECB listing:

```
5 POKE 65497,0
10 HSCREEN 4
```

```
15 PALETTE 0,0: HCOLOR 1,0
20 P=10: DIM R(P),X(P),Y(P),Z(P)
30 C=.5 :E=SQR(C)
40 FOR I=0 TO P: READ COL(I): NEXT
   I
50 DATA
   0,9,1,10,2,12,4,14,9,1,10,2,12,4,14
60 X=0:Y=1:M=0:G=0:R=C
100 IF G>=P THEN 150
110 M=M+1: G=G+1: GOSUB 200
120 X=X1: Y=Y1: R=E*R
130 X(M)=X2: Y(M)=Y2: Z(M)=G:
   R(M)=R
140 GOTO 170
150 X=X(M): Y=Y(M): G=Z(M):
   R=R(M)
160 M=M-1
170 IF M>-1 THEN 100
180 POKE 65496,0: END
200 X1=C*(X-Y+1)-1: Y1=C*(X+Y+1)
210 X2=C*(X+Y-1)+1: Y2=C*(-
   X+Y+1)
220 X3=320+X1*640/4.8
230 Y3=116-Y1*192/3.6
240 X4=320+X2*640/4.8
250 Y4=116-Y2*192/3.6
260 HCIRCLE (X3,Y3),130*R,COL(G)
270 HCIRCLE (X4,Y4),130*R,COL(G)
280 RETURN
```

Qbasic listing:

```
SCREEN 12 : CLS
P=10 : DIM R(P),X(P),Y(P),Z(P)
C=.5 : E=SQR(C)
WINDOW (-2.4,-1.2)-(2.4,2.4)
FOR I=0 TO P : READ COL(I) :
  NEXT I
DATA
  0,9,1,10,2,12,4,14,9,1,10,2,12,4,14
X=0 : Y=1 : M=0 : G=0 : R=C
DO
IF G<P THEN
M=M+1 : G=G+1 : GOSUB trafo
X=X1 : Y=Y1 : R=E*R
X(M)=X2 : Y(M)=Y2 : Z(M)=G :
  R(M)=R
ELSE
X=X(M) : Y=Y(M) : G=Z(M) :
  R=R(M)
M=M-1
END IF
LOOP UNTIL M<0
END
trafo:
X1=C*(X-Y+1)-1 : Y1=C*(X+Y+1)
X2=C*(X+Y-1)+1 : Y2=C*(-X+Y+1)
CIRCLE (X1,Y1),R,COL(G)
CIRCLE (X2,Y2),R,COL(G) RETURN
```

I am not going to go through the listings line by line. If you put

the three side by side, you can see the likeness and differences for yourself. I do however want to draw your attention to a number of things.

First of all, you can see that Basic09 has a different way of DIMensioning its variables. It doesn't take kindly (in fact not at all) to the way you can dimension variables in DECB and Qbasic. You must give it solid numbers to work with. I added the BASE 0 in Basic09 so I could keep the equations inside the program comparable to those in the other programs. This also causes the addition of the 11th record for some variables. If you omit these steps you will keep getting error 55 messages.

I know it seems like Basic09 is unnecessarily picky in these areas, but you must keep two things in mind. One is that if you write your own programs, you don't have to add a BASE 0 and extra records to make your program work. Secondly, once you get your basics straight, you will spend a lot less time tracking down errors when debugging your programs.

Now screen types. If you want to convert a graphics program you must first find out what type of screen the original uses, then try to find a screen type that closely matches the original and set up that screen.

Keep in mind that for conversions from DECB to Basic09, both programs will be running on the same hardware and therefore you only have to match the correct window type to the HSCREEN number. Conversions from MSDOS are a little more difficult since there is a greater

variety of screens available, and some have much higher resolutions. This means that you may have to rewrite some of the formulas. On the other hand, the final results usually don't look a whole lot different on a monitor- just don't send them to a laser printer.

Following is a short list of the various screen types you can encounter and how they are defined. Type is the Basic09 screen type:

Res	Cols	Type	DECB
640x192	2	5	HSCREEN 3
320x192	4	6	HSCREEN 1
640x192	4	7	HSCREEN 4
320x192	16	8	HSCREEN 2
40-column text	1		WIDTH 40
80-column text	2		WIDTH 80

Qbasic:

Res	Cols	SCREEN
320x200	16	1/7
640x200	16	2/8
720x348	2	3
640x400	2	4
640x350	16/64	9
640x350	2	10
640x480	<256K	11/12
320x200	<256K	13
40/80-col	text	0

Whether one or more of these modes is available on an MSDOS computer or not is determined by the graphics adapter installed and/or the amount of memory it has available. It should, however, give you an idea of what type of screen a program expects.

As you may or may not know, Basic09 and DECB do not include a WINDOW command. This is a command that is supported by Qbasic and other basics for MSDOS and it is frequently used

in graphics programs. So if you don't know what it does, it is hard to get the program running.

Actually, it is a scaling function. It defines a rectangle that is scaled up or down by Basic to fill the entire screen. For instance, you have a program that only outputs values between 0 and 1 for both X and Y (a certain point being defined as X,Y) and you use the following commands: `SCREEN 12 : WINDOW (0,0)-(1,1)`.

If the program now generates the values {0,0}, a point at {0,0} will be set; however, if the program generates the values {1,1}, this will be translated into screen coordinates {639,479}. In the same way, the values {0.5,0.5} will be translated into {320,240}, etc.

As I said, neither Basic09 nor DECB have this function built-in, so we will have to do the scaling ourselves. This isn't hard: you can accomplish it with a one line formula; you just have to get your values right. In the Qbasic listing, you see the command `WINDOW (-2.4,-1.2)(2.4,2.4)`. We can assume that the values the calculations generate are within that range. First we figure out the scaling factor for the width of the screen: we have 640 pixels to be divided over a range of $-2.4+2.4=4.8$, and to center the image we must add 320 as we can't plot negative values. With X1, the value generated by the program, the formula becomes: $X3=320+X1*640/4.8$

You can make the formula for the Y coordinates in the same way. Note that I used an offset of 116 instead of 96, the screen's center line, to make sure the image wouldn't extend off the top of the screen. This is because the center

line of the window's height is 0.6 and NOT 0 so the entire image has to slide down and $0.6*192$ rounds to 116.

I should note that sometimes you will have to adjust the offsets by trial and error to center an image on the screen, but this is a secondary consideration since you can make these adjustments after you have run the program. The same is true for the scaling factor of the circle's radius (130) which I found by trial and error. Just keep adjusting the value until the images approximately match.

One thing you do have to keep in mind with Basic09 for this type of program is your variable typing. You must do all the calculations with REAL type variables, Basic09's default variable type, to get the required accuracy. INTEGER type divisions discard the remainders with every calculation and won't generate much of an image. The problem with real variables is that you can not use them in calls to Gfx2. This module only accepts integers. If you make a mistake you will see an error 56 show up. I used the line `RI=130*R` instead of passing `130*R` to Gfx2.

If you are good at math (or would like to think so), you probably noticed that in the formulas for calculating y3 and y4 I used a '-' instead of a '+' operator. This is necessary because Qbasic addresses the screen differently than Basic09 or DECB. While the latter use the top left corner as 0,0; Qbasic uses the lower left corner for that purpose so we will have to mirror the image along a horizontal center line to get the same picture.

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mind among you: we first defined our screen as 320 pixels wide and then proceeded by using the number 640 in the formulas for x^3 and x^4 . Why? Well, if OS-9 sets up a window, it will by default switch on a feature called scaling. This means that all windows are scaled on a 640 pixel grid. So if you want to access column 320 on a 320-pixel screen, you must address it with x-coordinate 640, while you access the center column of the screen as 320.

Too difficult to comprehend? You can always insert the following line after you have established the window: `run gfx2(path,"scalesw","off")`. Now all you have to do is adjust the formulas that calculate x^3 and x^4 , and the program will run just fine.

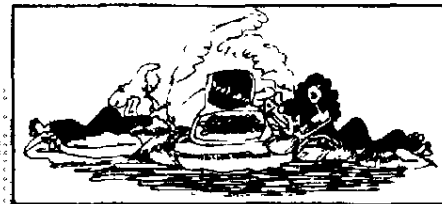
Alternately, you can change

the window from type 8 to type 7 (which is basically what I did in the DECB program by using HSCREEN 4), but then you will have only four colors available.

I hope that this article has given you some insight into how windows work under OS-9/Basic9. I have just dealt with the very basics of it all. Just how deep you will have to dig into the windowing system and the problems that presents depends on the needs of the program you are working on.

If you have any questions about these or related matters please feel free to contact me or the editor. Next time, I will look at converting some specific functions and statements to Basic9.

- Chris Dekker



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