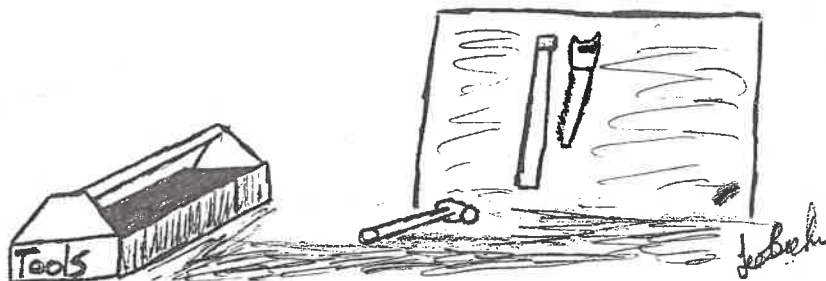UTILITIES ISSUE!

TRS-80 COMPUTING ®

THE BI-MONTHLY MAGAZINE FOR COLOR COMPUTER USERS

COCO UTILITIES!

SEVERAL utility programs.
Some consisting of:

* A program that transfers
  binary picture files to a
  BASIC program listing.

* Customizing BASIC commands
  to suit yourself.

ALSO...

* Special techniques used
  in graphics animation.

* All about disk direct access
  filing on your CoCo.

TRS-80 COMPUTING

TABLE OF CONTENTS

NOTE: "TC" STANDS FOR TRS-80 COMPUTING.
      "REV." MEANS PRODUCT REVIEW.

When you think of the upcoming Christian holiday Easter, you usually think of eggs, or colored Easter eggs. That is where I got the idea for this month's graphics program. The following graphics/animation program demonstrates the technique of flipping between screens using PMODE, to create an animation effect. After RUNing the program, the computer first draws a blue oval-shaped egg on the PMODE 1 screen (the reason I used PMODE 1 is because thats the only PMODE that requires the least amount of pages, along with access of color codes 1-4). It then is given the appearance that the egg is cracking. The egg then cracks, pieces are shot up in the air, and a yellow chick pops out. The program uses all eight pages of graphics memory, therefore a PCLEAR 8 had to be added at the beginning of the listing. I hope those of you who program in BASIC will find this helpful.

THE LISTING: EASTEREG/PRO

```
1 ' HATCHING BIRD EGG
2 ' (C) 1990 TRS-80 COMPUTING
5 PCLEAR 8:PMODE 1,1:PCLS
6 GOSUB 520
10 PMODE 1,3:PCLS:GOSUB520:DRAW"
C4;BM98,148;E6F6E6F6E6F6E6F6E6F6
E2"
12 PMODE 1,5:PCLS:GOSUB 500
14 DRAW"BM92,104;E4R8FR4D6H2G2H2
G4H2G2H2U":PAINT(94,104),3,3
16 DRAW"C3;BM116,100;E8F4D4G4L4H
":PAINT(120,100),3,3
18 DRAW"BM136,104;E6R2F4DFD6GH4L
4H2U":PAINT(140,103),3,3
19 DRAW"BM160,120;E6FDL2R2DL4R4D
L2R2DGH6"
20 PMODE 1,7:PCLS:GOSUB 500
22 DRAW"C2;BM108,146;U8E2U4E2U4D
2L8UH2U8R4F8DG2H6F6E2U4EU4H4U6E6
UE4R6U4R4F2D2R4F4DF6D6G4D4G4L2H2
BU12BL4"
24 DRAW"D2G2L2H2U2BL4BD12G2L3H2B
R28E6R4D8G2DL8U2R2L4U2R2BR2BD2E4
G4D2L2D2F2D4F2D8"
26 CIRCLE(122,102),4,2:CIRCLE(13
4,102),4,2
28 DRAW"C3;BM60,180;E4R8FR4D6H2G
2H2G4H2G2H2U":PAINT(66,180),3,3
30 DRAW"BM84,180;E8F4D4G4L4H":PA
INT(88,180),3,3
31 DRAW"BM168,180;E6R2F4DFD6GH4L
4H2U":PAINT(172,179),3,3
32 DRAW"BM188,180;E6FDL2R2DL4R4D
L2R2DGH6"
35 PMODE 1,1:SCREEN 1,0:FORX=1TO
500:NEXTX
36 PMODE 1,3:SCREEN 1,0:FORX=1TO
500:NEXTX
38 PMODE 1,5:SCREEN 1,0:FORX=1TO
500:NEXTX:PMODE 1,7:SCREEN1,0
40 GOTO 40
500 CIRCLE(128,148),35,3,1.2,0,.
5
502 DRAW"C3;BM98,148;E6F6E6F6E6F
6E6F6E6F6E2":PAINT(128,152),3,3
505 RETURN
520 CIRCLE(128,148),35,3,1.2
522 PAINT(128,148),3,3:RETURN
```

HINT:
Place all printer ribbons in ziplock bags, when not in use. They last much longer that way.

Editor's Notes ...

We're now into a new decade– the '90s. When the year first started off, and we were getting ready to put out the February issue, a few people mentioned to me about changing the magazine's title to TRS-90 Computing instead of TRS-80 Computing. A lot of people think that Tandy's trademark "TRS-80" stands for Tandy – Radio – Shack – made for the '80s. In some sense that might be true, but I don't think Tandy Corporation anticipated it that way.

Anyway, April marks our annual utilities issue. There are several good utility programs in this issue, one of them allows you to transfer a binary picture file (say a CoCoMAX file) into a BASIC program listing. Also, for the conclusion of my high-resolution graphics tutorial, I wrote about a couple techniques on animating graphics that you might want to take a look at.

As a big change for TRS-80 Computing, we will be hopefully starting an OS-9 column starting with the June issue. We are not exactly sure what will be going in there, but will have more information about it in that issue. If there is anyone who has any suggestions, or would like to contribute to it, please write to us and we will give you more information on what we plan to have in it.

We have just begun something new this month. We have started a computer (CoCo) club, and we are calling it TRS-80 Computing Club. It is not the type of club where you meet say once or twice a month, and only limited to people living in a certain area. It is a club that allows "anyone" to join. The club is basicly done "through the mail" and current events are discussed through bi-weekly newsletters. For complete information on our new club, see the article written about it in this issue. But remember: we must have enough members to continue.

Also, beginning this month, we will be changing the Classified section on the last page to the Advertising Information section. For the past several months we haven't had anyone advertising in that particular section of the magazine, so we decided to drop the name. The reason being is because many readers will see the title "Classified Section" at the top of the page, but will be wondering, "Where's the ads?". We will still have classified advertising available, we just won't print it unless we have someone advertising within it. The rates per line for Classifieds have been dropped from $1.50 to $.60 as of last month.

A software/hardware company, Kenneth-Leigh Enterprises, has just developed a new computer (something we've all been waiting for!). It is strictly an OS-9 computer, and most CoCoers are referring to it as the new CoCo 4 (some call it the KMA-68). It has already been introduced at the Chicago RainbowFEST, but I cannot tell you the official name or price for it because this article has to be "layed out" before April 6-8 (the dates of the RainbowFEST). If I can find out that info. I will place it either at the bottom of this page or at the bottom of page 1 (Table of Contents). But, there will definitely be a big article explaining all about it in the June issue. Hang in there!

Oh yeah, that picture that you see of me at the top of the page was done on a digitizer program that runs on the Apple IIGS computer. It was printed in color on an Imagewriter printer, and then reduced on a xerox machine. That is why it looks kind of distorted. If I had the DS-69 digitizer from COLORWARE this would have been done on the CoCo. But that is something we're trying to save up for, here at TRS-80 Computing. Well, until next month...

Joe Ahern
Editor/Publisher

REPORTS — PROGRAMS — UTILITIES

```
COCO 2
DISK DRIVE
CASSETTE MODIF.
POSSIBLE
```

THIS MONTH: BINARY PICTURE TRANSFERER

Ever want to print a BASIC listing of a binary picture? Now you can.
Key in the transfer program and save it on to disk or tape. When you RUN it,
type the filename of the binary picture to be transfered and press <ENTER>. The
picture will be loaded and the computer will start creating the BASIC code. It
takes about 10 to 15 minutes to complete and uses about 11 granules on the disk.

NOTE: This program will lock up if you attempt to load a picture that is longer
than one graphics page. Also, the picture that you are loading must have a MAX
extension. If it does not, then you may change it to agree with the extension
your picture has in line 12 of the program.

THE LISTING: TRANSFR.BAS

```
1 ' BINARY PICTURE TRANSFERER
2 ' COPYRIGHT (C) 1990  BY TRS-8
0 COMPUTING
3 CLEAR 2000
4 X=0:L=10
5 CLS
10 PRINT"FILE NAME";:INPUT NAME$
11 PMODE 4,1:PCLS:SCREEN 1,1
12 LOADM NAME$+"/MAX"
15 PRINT"FILENAME TO SAVE AS";:I
NPUT NAME$
18 OPEN"O",#1,NAME$+"/BAS"
19 PRINT#1,"1 PMODE 4,1:PCLS:SCR
EEN 1,1"
20 PRINT#1,"2 FOR I=";PEEK(186)*
256+PEEK(187);"TO";PEEK(183)*256
+PEEK(184)
22 PRINT#1,"4 READ A:POKE I,A:NE
XT"
26 PRINT#1,"8 GOTO 8"
27 A$="DATA "
28 FOR I=PEEK(186)*256+PEEK(187)
 TO PEEK(183)*256+PEEK(184)
30 A$=A$+STR$(PEEK(I))+",":X=X+1
32 IF X=11 THEN 45 ELSE NEXT:GOT
O 45
45 Y$="":FOR U=1 TO LEN(A$):IF M
ID$(A$,U,1)=" "THEN NEXT ELSE IF
 MID$(A$,U,1)<>" " THEN Y$=Y$+MI
D$(A$,U,1):NEXT
46 R$=STR$(L)+" "+LEFT$(Y$,LEN(Y
$)-1):X=0
47 PRINTR$
48 PRINT#1,R$
49 R$="":A$="DATA "
50 L=L+2:IF I>=9728 THEN CLOSE:E
ND ELSE NEXT I
```

CORRECTIONS FOR FEBRUARY 1990 ISSUE

1. ON PAGE 6, ON THE RIGHT SIDE OF THE PAGE WHERE THE DESCRIPTION OF LINE 45 IS,
IT SHOULD READ: "**CHECK TO SEE IF X>100, IF SO GOTO PRINT ROUTINE ELSE
CONTINUE.**"

2. ON PAGE 22, THE PROGRAM IN THE MIDDLE OF THE PAGE HAS AN ERROR. LINE 80 SHOULD
READ: **80 IF A$<>"N" THEN 60**.

THE PROGRAMMER

CUSTOMIZING

BASIC

TOTO = GOTO

FUN = RUN

PILL = KILL

GOTUB = GOSUB

A P R I L

THIS MONTH'S PROGRAM

CUSTOMIZING BASIC FOR YOUR NEEDS

Customizing BASIC for Your Needs
by David McNally

This program allows you to change a BASIC command to what you want by searching through the computer's memory until it finds the command, and then POKEing in the change. After keying in the listing, type <RUN>. The main menu will appear. Choose the option you want. When you are asked what command to change (say GOTO), type it, and press <ENTER>. You will then see the computer scan through its memory searching for the command you picked. When the computer finds the command, it will number each letter of the command, and then lets you pick which letter you want to change. Choose the last option, KILL COMMAND, to kill the command. After the command is changed, you must use the new command or you will get a ?SN ERROR.

EXAMPLE: Say you changed the RUN command to FUN. You would have to type FUN in order to run a program, otherwise you'll get the syntax error.

NOTE: Because of conflicts with the computer's instructions on how to carry out a command, you can't change the last letter of the command. Pressing the <RESET> button will put all the changes back to normal. Pressing the <BREAK> key at any time will cancel the option and return you to the main menu. Pressing <BREAK> at the main menu quits the program.

THE LISTING: CUSTMBAS

```
1 ' CUSTOMIZING BASIC
2 ' COPYRIGHT (C) 1990
3 ' BY TRS-80 COMPUTING
5 CLS:GOSUB 90
10 CLS:PRINT"LOOK FOR:":INPUT A$
15 ON BRK GOTO 90
18 IF A$="DIR" THEN LPOKE 508217
,18
20 PRINT:PRINT"SEARCHING FOR ";A
$;"..."
25 IF LEN(A$)<3 THEN CLS:PRINT"I
 CAN'T CHANGE THAT COMMAND!!":FO
R Y=1 TO 1050:NEXT Y:GOTO 90
30 FOR T=S TO E
35 A=LEN(A$)
40 FOR L=1 TO A-1:C=LPEEK((T+L)-
1):PRINTCHR$(C);:IF ASC(MID$(A$,
L,1))=C THEN GOSUB 80:NEXT L ELS
E NEXT T
45 CLS:PRINT"I CAN'T FIND THAT W
ORD!!":FOR Y=1 TO 1000:NEXT Y:CL
S:GOTO 90
50 FOR W=1 TO A-1
55 PRINTW;"  ";MID$(A$,W,1)
60 NEXT W
62 PRINTW;" KILL COMMAND"
65 PRINT"CHANGE WHAT #":INPUT B:
IF B>A+1 OR B<1 THEN 65
67 IF B=A THEN PRINTA$;" WAS KIL
LED.":PRINT"TYPE LPOKE";T;",";LP
EEK(T):PRINT" TO ENABLE ";A$;"."
:LPOKE T,18:IF A$="DIR"THEN LPOK
E 208216,85:END ELSE END
70 Q=B-1:PRINT:PRINT"CHANGE TO:"
:INPUT C$:IF C$<"A" OR C$>"Z" OR
 C$="" OR C$=" " THEN GOTO 90
75 LPOKE T+Q,ASC(C$):CLS:GOTO 16
0
80 IF L=LEN(A$)-1 AND LPEEK(T+L)
<>ASC(RIGHT$(A$,1)) THEN FOR Y=1
 TO 1000:NEXT Y:CLS:GOTO 50
85 RETURN
90 CLS:PRINT@12,"UTILITY":PRINT"
CUSTOMIZING BASIC FOR YOUR NEEDS
";:PRINTTAB(7)"BY DAVID MCNALLY"
95 ON BRK GOTO 160
100 PRINT:PRINT"A. EDIT A BASIC
COMMAND"
105 PRINT:PRINT"B. EDIT AN EXTEN
DED BASIC          COMMAND":PRIN
T
110 PRINT"C. EDIT A DISK BASIC C
OMMAND"
115 PRINT:PRINT"D. EDIT SUPER EX
TENDED BASIC         COMMAND":PRIN
T
125 AA$=INKEY$:IF AA$=""THEN 125
130 IF AA$>"D" OR AA$<"A" THEN S
OUND 100,1:CLS:GOTO 90
135 IF AA$="A" THEN S=499712:E=5
07903:GOTO 10
140 IF AA$="B" THEN S=491520:E=4
99711:CLS:GOTO 10
145 IF AA$="C" AND PEEK(188)=14
THEN S=507904:E=516095:GOTO 10:E
LSE IF PEEK(188)<>14 THEN CLS:PR
INT"YOU DON'T HAVE DISK BASIC!!"
:FOR I=1 TO 2000:NEXT I:GOTO 90
150 IF AA$="D" THEN S=516096:E=5
23775:GOTO 10
160 CLS:END
```

Letter Reader
by Anton P. Milardovic

LETTER READER is a program with which you can read data files. The reason I call it LETTER READER is because this is the program I use when I send my Pen Pals letters. Write the letter in 31 columns using a Word Processor, such as Tele-Writer-64, then save it in ASCII. Use this program to later read the letter, without having to load the word processor you used to write it.

POSSIBLE MODIFICATION: For CoCo3 users, add a WIDTH 40 or WIDTH 80 command if you want to use letters wider than 31 characters.

THE LISTING: LETTREAD

```
1 ' COPYRIGHT (C) 1990          0
2 ' BY TRS-80 COMPUTING
10 '***********************
20 '*     LETTER READER    *
30 '*                       *
40 '*   BY: mILARDOVIC     *
50 '*      aNTON           *
60 '*      pETER           *
70 '*                       *
80 '*  FEBRUARY 15, 1990   *
90 '***********************
100 CLS:PRINT:INPUT"FILE NAME TO
    READ FROM";A$:IFLEN(A$)>8THEN100
110 IFA$=""THEN190
120 CLS:POKE359,57:POKE65314,55
130 OPEN"D",#1,A$,1:FIELD#1,1ASX
$
140 X=X+1:IFLOF(1)<X THEN180
150 GET#1:PRINTX$;
160 IFX$=CHR$(13)THENCR=CR+1:IFC
R/15=INT(CR/15)THENEXEC44539
170 GOTO140
180 EXEC44539:CLOSE:GOTO100
190 END
```

END OF PROGRAM

8

FILER

by Anton P. Milardovic

This program is the answer to last issue's article on "The CoCo as a Filing Cabinet". Actually, this is just one program that can be used, and there are no wrong answers. The important thing is that the program does what you want it to do. Feel free to make any modifications you feel necessary. The way the program stands now, you can only input 100 items. That can easily be changed if you need more.

THE LISTING: FILER

```
10 '******************************
20 '*   SIMPLE FILER PROGRAM   *
30 '*                          *
40 '* CREATED BY: mILARDOVIC   *
50 '*             aNTON        *
60 '*             pETER        *
70 '*                          *
80 '* THURSDAY MARCH 22 1990   *
90 '******************************
100 CLEAR10000:DIMI$(100)
110 CLS:PRINT"       SIMPLE FILING
 PROGRAM"
120 PRINT:PRINT:PRINT"      1 - M
AKE A NEW LIST"
130 PRINT"       2 - LOAD OLD LIST
"
140 PRINT"       3 - MAKE ADDITION
S"
150 PRINT"       4 - MAKE DELETION
S"
160 PRINT"       5 - VIEW LIST"
170 PRINT"       6 - PRINT LIST"
180 PRINT"       7 - SAVE LIST"
190 PRINT"       8 - VIEW DIRECTOR
Y"
200 PRINT"       9 - EXIT PROGRAM"
210 PRINT:PRINTTAB(10)"YOUR CHOI
CE"
220 EXEC44539:A=VAL(INKEY$):IFA<
1ORA>9THEN220
230 ONA GOTO270,360,440,540,610,
700,790,890
240 PRINT:PRINT"ARE YOU SURE (Y/
N)?";:SOUND150,10
250 EXEC44539:A$=INKEY$:IFA$="N"
THEN110ELSEIFA$<>"Y"THEN250
260 CLS:END
270 CLS:PRINTTAB(8)"MAKE A NEW L
IST":PRINT
280 IFI$(1)=""THEN310
290 PRINT"THERE IS A LIST IN MEM
ORY. OKAY TO ERASE (Y/N)?"
300 EXEC44539:A$=INKEY$:IFA$="N"
340 NEXTX
350 X=X-1:GOTO110
360 CLS:PRINTTAB(10)"LOAD OLD LI
ST"
370 PRINT:INPUT"FILENAME TO LOAD
 FROM";A$
380 IFA$=""THEN110
390 IFLEN(A$)>8THEN370
400 OPEN"I",#1,A$:X=0
410 IFEOF(1)THEN430
420 X=X+1:INPUT#1,I$(X):GOTO410
430 CLOSE:PRINTX;"RECORDS READ."
:EXEC44539:GOTO110
440 CLS:PRINTTAB(8)"MAKE ADDITIO
NS":PRINT
450 IFI$(1)=""THENPRINT"THERE IS
N'T ANY LIST IN MEMORY!!":FORX=1
TO1000:NEXT:GOTO110
460 FORX=100TO1STEP-1
470 IFI$(X)<>""THEN490
480 NEXTX
490 X=X+1:IFX>100THEN530
500 PRINTUSING"###>";X;:LINEINPU
TI$(X)
510 IFI$(X)=""THEN110
520 GOTO490
530 PRINT"MEMORY FULL!!":FORX=1T
O1000:NEXT:GOTO110
540 CLS:PRINTTAB(9)"MAKE DELETIO
NS"
550 PRINT:INPUT"DELETE WHICH ITE
M NUMBER";Y:IFY=0THEN110
560 IFY>100THEN550ELSEIFY=100THE
N590
570 FORX=Y TO99
580 I$(X)=I$(X+1):NEXT
590 I$(100)=""
600 GOTO110
610 CLS:PRINTTAB(12)"VIEW LIST"
620 FORX=1TO100
630 IFI$(X)=""THEN680
640 PRINT@32+32*(X-INT((X-1)/12)
*12),;
```

```
THEN110ELSEIFA$<>"Y"THEN300
310 PRINT"YOU CAN HAVE UP TO 100
 ITEMS IN THIS LIST. PRESS <ENTE
R> TO END INPUT.":PRINT
320 FORX=1TO100:PRINTUSING"###>"
;X;:LINEINPUTI$(X)
330 IFI$(X)=""THENX=X-1:GOTO110
X
)*12)),13);
690 EXEC44539:GOTO110
700 CLS:PRINTTAB(10)"PRINT LIST"
710 PRINT:LINEINPUT"POKE150,";A$
:A=VAL(A$):IFA$=""THEN110
720 POKE150,A
730 LINEINPUT"LIST TITLE=>";A$
740 PRINT#-2,A$:PRINT#-2
750 FORX=1TO100
760 IFI$(X)=""THEN780
770 PRINT#-2,USING"###. ";X;:PRI
NT#-2,I$(X):NEXTX
780 GOTO110
790 CLS:PRINTTAB(12)"SAVE LIST"
800 IFI$(1)=""THENPRINT:PRINT"TH
ERE IS NOTHING TO SAVE!!":FORX=1
TO1000:NEXT:GOTO110
650 PRINTUSING"###. ";X;:PRINTI$
(X)
660 IFX/12=INT(X/12)THENEXEC4453
9
670 NEXTX
680 PRINT@32+32*(X-INT((X-1)/12)
*12),STRING$((13-(X-INT((X-1)/12

810 PRINT:PRINT:INPUT"FILENAME T
O SAVE TO";A$
820 IFA$=""THEN110
830 IFLEN(A$)>8THEN810
840 OPEN"O",#1,A$
850 FORX=1TO100
860 IFI$(X)=""THEN880
870 WRITE#1,I$(X):NEXT
880 CLOSE:PRINTX-1;"RECORDS TRAN
SFERED.":EXEC44539:GOTO110
890 CLS:PRINTTAB(9)"VIEW DIRECTO
RY"
900 DIR:X=FREE(0):PRINTX"FREE GR
ANULE";:IFX=1THEN910ELSEPRINT"S"
;
910 PRINT".":EXEC44539:GOTO110
```

END OF PROGRAM

TEXT CENTER UTILITY

BY DAVID MCNALLY

This program allows you to center text on the screen perfectly, without wrap-around. Enter up to 14 lines and the computer will center it for you and display the "@" position of each line.

THE LISTING: TEXTCNTR

```
1 ' TEXT CENTER UTILITY
2 ' COPYRIGHT (C) 1990
3 ' BY TRS-80 COMPUTING
5 CLS
10 DIM L$(16),PO(16)
12 PRINT@6,"TEXT CENTER UTILITY!
"
14 PRINT@40,"BY DAVID MCNALLY"
16 PRINT:PRINT"     THIS PROGRAM
 WILL CENTER    TEXT ON THE SCREE
N.   ENTER UP TO14 LINES AND THE
COMPUTER WILL  CENTER IT FOR YOU
 AND DISPLAY    THE @ POSITION OF
 EACH LINE."
18 PRINT:PRINT"     PRESS ANY KE
Y TO GO ON"
20 A$=INKEY$:IF A$="" THEN 20
22 CLS
24 FOR X=1 TO 16
25 CLS
26 PRINT"ENTER LINE #";X
27 PRINT:PRINT"<ENTER> WHEN DONE
.":PRINT"<XX> TO QUIT ENTERING."
:PRINT
28 INPUT L$(X)
30 IF L$(X)="XX" THEN 35 ELSE NE
XT X
35 X=X-1
36 I=X/2
37 IF I<>INT(I) THEN I=I+.5
38 TC=256-(I*32)
39 FOR Y=1 TO X
40 K=(INT(16-LEN(L$(Y))/2))
42 PO(Y)=TC+K+(32*Y)
46 NEXT Y
47 CLS
48 FOR Y=1 TO X
50 PRINT@PO(Y)+1,L$(Y):NEXT Y
52 FOR E=1 TO 2000:NEXT E
53 CLS
54 FOR E=1 TO X
56 PRINT"PRINT@";PO(E)+1;",";CHR
$(34);L$(E);CHR$(34)
60 NEXT:END
```

(END OF PROGRAM)

THE COLOR
COMPUTER AS A FILING CABINET

Part II: Direct Access Filing   *by Anton P. Milardovic*

If you read my article in the February edition, you would have seen the start of this tutorial. It started off with a bit about saving data on a tape or disk. For those of you who missed it, see your manuals for more information. For tape users, see Chapter 25 of "Getting Started With Extended Color BASIC", disk users see Chapters five and six of the disk drive manual.

This month's article will deal only with DISK. That is only because the options for filing which will be discussed here are only available for disk users.

What I will be discussing is called DIRECT ACCESS FILING. Using this method, you can jump to any point in your data list, change it, erase it, or add more items to the list, and you will not have to rewrite the file.

Type in the following program:

```
10 OPEN"D",#1,"DIRECT.DAT"          *******************
20 WRITE #1,"THIS IS A TEST"        *   Notice we use *
30 PUT#1, 1                         *    "D" not "O"   *
40 WRITE #1,"SO IS THIS."           *******************
50 PUT#1, 2
60 CLOSE #1
```

Try it out? Okay, the disk drive spun for a while. Now what? Check the directory. There's a new entry there - DIRECT.DAT.

I will explain the program one line at a time.

Line 10 OPENs buffer 1 for DIRECT ACCESS to a file called DIRECT.DAT.

Line 20 WRITEs "THIS IS A TEST" to buffer 1. When the buffer gets filled (256 characters) or when the file is CLOSEd (as in line 60) the contents of the buffer are dumped to disk.

Line 30 PUTs a label (what was written in the previous line) as the first record in this Direct Access File.

Line 40 WRITEs "SO IS THIS." to buffer one also.

Line 50 PUTs a label "SO IS THIS." as the second record in the file.

Line 60 CLOSEs the buffer.

Why the labels? In direct access, since you should be able to access any item in the data file, they must be labeled somehow. If the labels were omitted, the two lines would NOT have been written to disk, even though they were sitting in the buffer.

Okay. The next step would then be to retreive this data. Type in the following program:

```
10 OPEN"D",#1,"DIRECT.DAT"
20 GET #1, 1
30 INPUT #1,A$
40 PRINT A$
50 CLOSE #1
```

When you RUN it, you see on the screen: THIS IS A TEST. What about the second line? Make the following change:

```
20 GET #1, 2
```

Now RUN it. Now it prints SO IS THIS. See the flexibility of direct access? You might have also noticed that in both cases of input and output we used a "D" in the OPEN command. That is because while the file is open, you can read AND write at the same time, so long as you do the following:

```
1. Use GET before you INPUT something; and
2. Use PUT after you WRITE something.
```

You can use any number to PUT, but you cannot GET a number greater than the largest record number stored, or you will get an Input Past the End of File (IE) Error. For example, in this program you cannot change the number in GET to 15.

To show GET and PUT working at the same time, add this:

```
45 WRITE #1,"THIS IS A THIRD LINE."
46 PUT #1, 3
```

And RUN the program. See? If you don't, delete lines 45 and 46 and change line 20 to: 20 GET #1,3 and reRUN it. Truly awesome.

You can also save more than one variable under each label, for example:

```
10 OPEN"D",#1,"ANOTHER.DAT"
20 WRITE #1,"TESTING NUMBERS",15,"AND STRINGS"
30 PUT#1, 1
40 WRITE #1,"SO IS THIS.",50,"ANOTHER TEST."
50 PUT#1, 2
60 CLOSE #1
```

Then you have to read it similar to the following:

```
10 OPEN"D",#1,"ANOTHER.DAT"
20 GET #1,1
30 INPUT #1,A$,A,B$
40 PRINT A$;A;B$
50 GET #1,2
60 INPUT #1,C$,C,D$
70 PRINT C$;C;D$
80 CLOSE #1
```
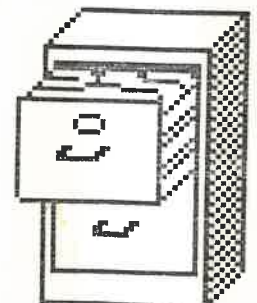
Just remember to read the variables in the proper order.

```
    *     *     *     *     *     *     *     *     *
```

There is, however, one problem to using this form of disk I/O. That is the fact that every time you write a record, it takes up 256 spaces. So, in the previous program, the data was stored as follows (*'s represent spaces):

```
"TESTING NUMBERS", 15,"AND STRINGS"**********************************
*********************************************************************
*********************************************************************
*********************************************************************
*******************
"SO IS THIS.", 50,"ANOTHER TEST."******************************
*********************************************************************
*********************************************************************
*********************************************************************
*******************
```

Therefore, if your records are less than 256 characters long, you may want to shrink them somewhat. This is done by adding a buffer size number to the OPEN statement (eg. to read OPEN"D",#1,"ANOTHER.DAT",50). To get more information before the next installment in two months, I suggest you read Chapter Nine of your Color Computer Disk System manual.

Until the next issue, happy CoCoing!

P.S. For those of you who have tried the "homework" program from the last issue, see my program "FILER" in this issue. Feel free to make changes to it!

Questions or comments about this article can be sent to Anton P. Milardovic, 94 Sunrise Place, Kitchener, Ontario, Canada, N2B 3S9. Please include your full mailing address.

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The following program computes how many issues of TRS-80 Computing you are still going to receive on your subscription.

```
5 CLS:PRINT"ENTER EXP. DATE (XX/
XX)":INPUT A$:IF LEN(A$)<5 THEN RUN
ELSE B$=RIGHT$(A$,2):B=VAL(B$)-90:
C=B*12:D$=LEFT$(A$,2):E=VAL(D$)+C:
F=E/2:IF F<1 THEN PRINT "0" ELSE
PRINT F
```
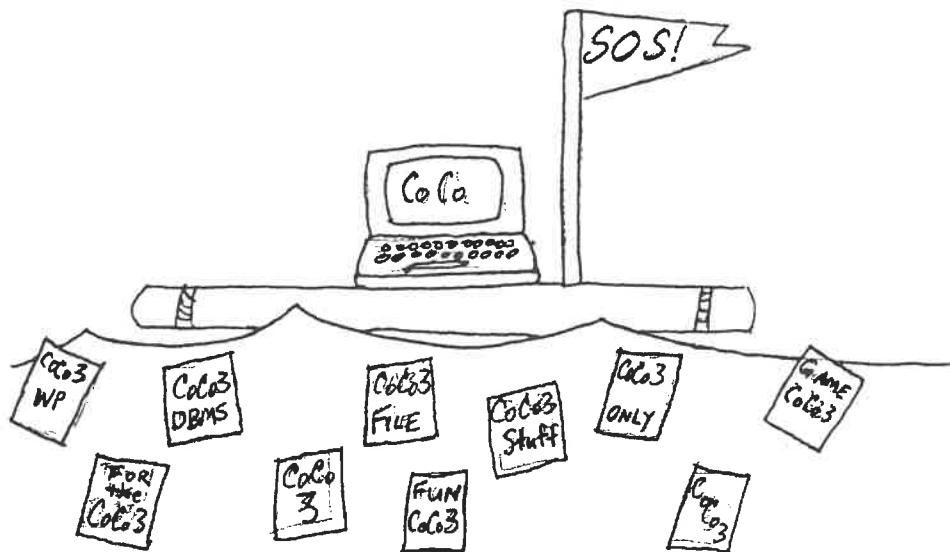
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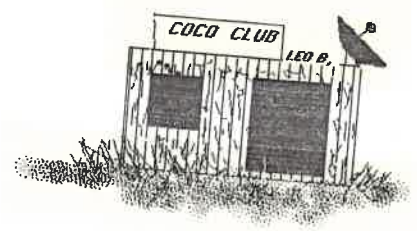KIRKLAND IL 60146

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HIGH-RESOLUTION GRAPHICS TUTORIAL

PART IV: GRAPHICS ANIMATION

By Joe Ahern
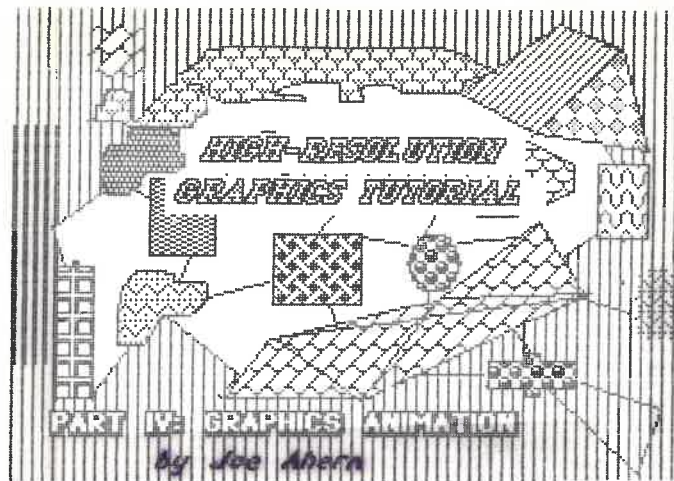
Computer animation is a way of moving pictures on a screen, or movement of characters within a picture. The two most popular ways of animating graphics on the Tandy Color Computer is by the use of the GET and PUT commands, and a method called "Indexing", which I will explain later.

The use of the GET and PUT commands is probably the most popular way of producing animation effects on the CoCo. They can be very complicated, but once you get used to them, it can be a lot of fun.

GET "gets" an area of graphics on the screen, and draws an imaginary rectangle around it. It then stores the "rectangle" into an array (an area in the computer's memory).

PUT "puts" the area of graphics that was stored in the array onto a designated area of the screen.

Both of these commands must be used together in a single program.

For a more clear idea on how GET/PUT works, see Figure 1.

Now before I get into explaining the details of GET and PUT, I am going to show you an example of GET and PUT in a program.

Type and RUN this program:

```
1 DIM S(20,20)
5 PMODE 2,1
10 PCLS:SCREEN 1,0
20 DRAW"BM40,15;G25R50H25"
25 GET(8,11)-(72,55),S,G
30 FOR DLAY=1 TO 400:NEXT DLAY
35 PUT(169,11)-(233,55),S,PSET
40 FOR DLAY=1 TO 400:NEXT DLAY
50 PUT(93,109)-(157,157),X,PSET
100 GOTO 100
```
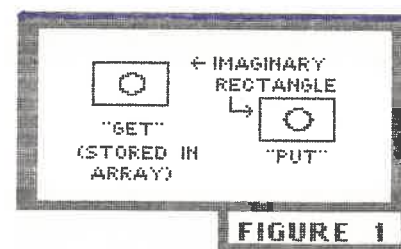

FIGURE 1

Now, first the program draws a triangle on the top-left corner of the screen (line 20). Then it "gets" the triangle by drawing an imaginary rectangle around it, specifying the rectangle's upper left-hand corner and its lower-right hand corner in the GET command (line 25). Also notice at the end of the GET command there is a ",S". Array S is the array that the triangle is stored in. Note that you must dimension a 2-D array as done in line 1; otherwise you'll get a ?BS error.

Now the two PUT statements (in lines 35 and 50) duplicated the triangle drawn (stored in array S) and placed it on the top-right and

the bottem-middle portions of the screen.   See Figure 2 to see how this
is done.
        Now that you have a general idea on how GET/PUT works, lets take a
look at the formats. First, here is the format of GET:

    GET (h1,v1)-(h2,v2),array,G

FIGURE 2
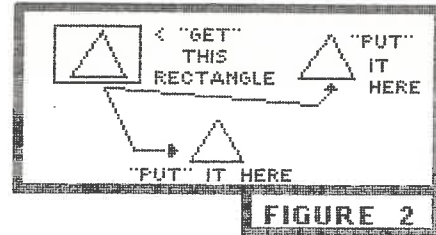
h1,v1 is the imaginary rectangle's upper-left corner.
h2,v2 is the lower right corner.
    "Array" is the area in the computer's memory where the rectangle is
stored (Ex: Array "S" from the example program).
    "G" stores the array in full detail. Notice in the example
program, in line 25; at the very end of the GET statement you see a
",G".   This is not necessary unless you are using the PUT "action"
parameter, or you are using PMODE 3 or 4 with colors. If you take the
",G" out of line 25, the triangle will still come out clear, with no
garbage, as long as you delete the "PSET" at the end of lines 35 and
50.

Now for the PUT statement:

    PUT (h1,v1)-(h2,v2),array,action

h1,v1 is the rectangle's upper left corner.
h2,v2 is the rectangle's lower right corner.
"Array" (same as GET).
"Action" is used if the "G" option has been used at the end of the GET
statement. There are five PUT actions. They are: PSET, PRESET, AND,
OR, and NOT.
        All the PUT actions do different things, especially the AND, OR,
and NOT actions. Try putting "NOT" in the action parameter at the end
of lines 35 and 50 of the example program (make sure you have a "G" at
the end of line 25). Instead of drawing the triangles, the computer
draws 2 filled-in green squares. NOT is supposed to reverse the state
of each point inside the imaginary rectangle.

TIP- As I stated before, GET/PUT is a complicated function to learn
on the CoCo. If you ever get "garbage" on your screen using GET/PUT,
it may result from the following:
1. Your "rectangle" is not big enough for your picture that you want to
"get".
2. The length and width of your PUT rectangle is not the same as your
GET rectangle.
3. You have a "G" at the end of GET, but nothing in the action
parameter of PUT (or vice-versa).

INDEXING

        Indexing is an animation technique used by some programmers. It
is done by drawing a figure using an Extended Color BASIC graphics
command (LINE, CIRCLE, etc...), then moving it to a destination point
using a FOR...TO...STEP loop. To give the effect of animation, the
figure is either drawn and erased by using PCLS, or by overwriting the
picture with the backround color.

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Follow the short steps below to write a graphics program having animation, and using the Indexing technique:
1. Initialization (PMODE, SCREEN, PCLS)
2. Start a FOR...TO...STEP loop from 0 to the ending value.
3. Draw your figure at the starting position + the index value (variable used in loop).
4. Erase your figure by PCLS or drawing over the figure with the current backround.
5. Continue until the final position has been reached.

Take a look at the example program below to see how the Indexing method is done:

```
5 PMODE 4,1
8 PCLS:SCREEN 1,1
10 FOR S=0 TO 215
11 COLOR 5,0
12 LINE(4+S,92)-(32+S,112),PSET,B
14 COLOR 0,0
16 LINE(4+S,92)-(32+S,112),PSET,B
18 NEXT S
19 COLOR 5,0:LINE(220,92)-(248,112),PSET,B
20 GOTO 20
```
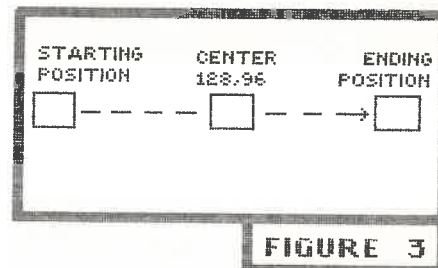

FIGURE 3

The program draws a small box at the far left of the screen and has it move across the screen until it gets to the far right of the screen (see Figure 3).
As you may notice, the box moves fairly slow. To make it go quicker, add a STEP value at the end of line 10.
(Ex. FOR S=0 TO 215 STEP 4)

This article concludes the four-part series on programming high-resolution graphics on the Tandy Color Computer. You have learned the different resolutions (graphics, pixels), how to initialize using PMODE, SCREEN, and PCLS, some of the main graphics commands such as LINE, PSET, DRAW, and finally graphics animation.
My aim was to teach you more on CoCo graphics by using diagrams, many program examples, and hints/tips. I hope you have learned more in this complicated feature of the computer. Happy Programming!!

The MAP Super Disk Filer

The Map Super Disk Filer is a disk utility program that runs on any CoCo with at least 32k of memory (Disk ECB is also required).

This program lets you catalog all your disks by just simply "popping" the disk into the drive and the computer will take over. You also have the option of giving a description of each file on the disk directory. After finishing you can make a hardcopy of your disk catalog onto a printer.

Before RUNing the program you have to initialize the disk you are going to store your disk catalog on by running a BOOT program that puts two (2) data files onto the disk: DIR FILE and DISKLIST.

When RUNing the main program, you will see the main menu come onto the screen with 7 options: Add a disk, Change file, Print out list, Print small list, View files, Label disk, and Exit program.

If you were using the program without the manual, you would think the first option to choose would be "Add A Disk". Actually, you have to "label" the disk before you add it to the main disk list. Thanks to good organization of the program, it tells you that you have to choose the "Label Disk" option before adding.

"Label Disk" allows you to give a name to a certain disk or "label" it. You also enter what side of the disk it is on. After doing so, the computer saves a file onto the disk that you are cataloging. This is the label or the disk's name.

The "Add a Disk" option lists the directory of the disk, tells you how many granules each file has, and then finally lets you give a small description of each file on the disk. When entering the the description, any letters that you type in lowercase on the screen will appear as "true lowercase" rather than the reverse video letters.

"Change File" is one of the good features of the program. It allows you to "edit" a file by deleting, moving, changing the value of the granules of a file, and changing or "re-writing" the description of the program. This is all done very neatly, giving you full information on the file you are editing (name, granules, disk its on, side, etc...)

After labeling, adding, and making any changes to your directories, you may want to choose the "View Files" option. This lists the name of the file, granules, and the description you gave for it.

When completely finished, the PRINT options are what you would choose last. "Print Out List" lets you print the entire main disk list onto your printer (whether you have 10 disks or only one).

"Print Small List" prints only a portion of your main list, or what particular disks you want a hardcopy of. Below I have printed an example printout of how it sets it up. It was printed on a DMP-105 printer.

When finished using the program, you can quit or "exit" by choosing the last option at the main menu.

I have only noticed two weaknesses in the program. One of them being, if you had a file that you added to the disk, you couldn't simply add it to the main list without recataloging the whole disk (re-typing descriptions, etc...) Also, it only allows you to catalog a disk that has files with BAS/BIN extensions.

Overall, the program is very well-written, and does not look like something that was thrown together in 2 minutes. I definitely recommend that you add this to your library of utility programs.

(MAPSTER COCO SOFTWARE, 94 SUNRISE PLACE, KITCHENER, ONTARIO, CANADA. N2B 3S9; FOR PRICE OF PROGRAM, WRITE TO MAPSTER COCO SOFTWARE FOR A COMPLETE CATALOG.)

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