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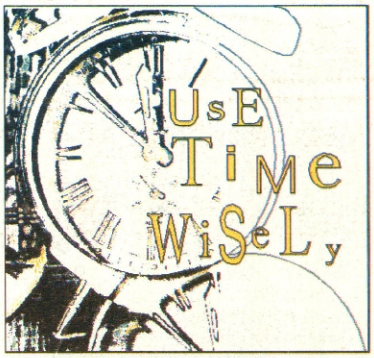
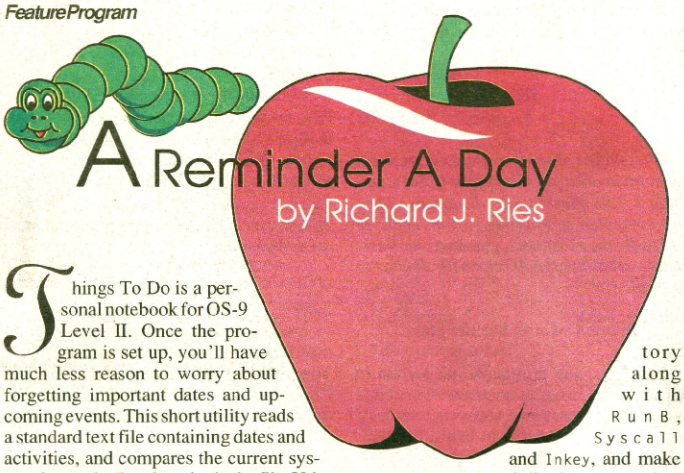


Feature Program



A Reminder A Day

by Richard J. Ries

Things To Do is a personal notebook for OS-9 Level II. Once the program is set up, you'll have much less reason to worry about forgetting important dates and upcoming events. This short utility reads a standard text file containing dates and activities, and compares the current system date to the dated entries in the file. If the dates match, Things To Do prints the associated activity.

To get started, boot OS-9 and start BASIC09. Then enter the two procedures (`ttd` and `LInput`) listed here. Save the source code to the current data directory by entering `save* ttd`, then pack the procedures in the current execution directory by entering `pack* ttd`.

Before you execute Things To Do, you must create the text file with dated entries. Things To Do looks for these entries in a file named `calendar.dat`. Create this file using OS-9's `build` and `edit` commands or any other OS-9 text editor.

When searching for dates in the `calendar.dat` file, Things To Do expects the entries to be in the following format:

```
mm/dd activity
```

That is, the month appears in the first two digits, followed by a slash and the day as two digits. Leading zeroes are required for both the month and day. After the day is a space followed by the activity. The date must be the first five characters in the line — any other format will cause `ttd` to ignore that line.

The `calendar.dat` file may contain as many entries as you need (and have space for), but it is not necessary that you group all the entries for each day. However, since you'll probably want to edit the file occasionally to add new entries and erase old items, you'll find it far easier to keep things clean if you do group items on a date basis.

To use Things To Do, make sure the packed version of `ttd` is in the `CMDS` directory along with `RunB`, `Syscall` and `Inkey`, and make sure `calendar.dat` is in the current data directory. When all is set, simply enter `ttd` to see the entries for the current date. If you want to see what's happening on another date, enter `ttd` followed by the date you want to see. For example, were I to enter `ttd (''02/13'')` on my system, Things To Do would respond by printing

```
Things to do on 02/13:
Get wife flowers for tomorrow.
Press any key to continue...
```

(If you have Shell+, which I do, you could alternatively enter `ttd 02/13`.)

I run the packed version of `ttd` from my `startup` file right after I set the system date. This way, I am reminded of the day's events when I boot the system. To do this, make the last two lines of your `startup` file read:

```
setime </term
ttd
```

(Actually, I use `setdate` in place of `setime`. This is a short utility I wrote that also appears on Page 142 of the February 1989 issue of THE RAINBOW.)

Program Notes

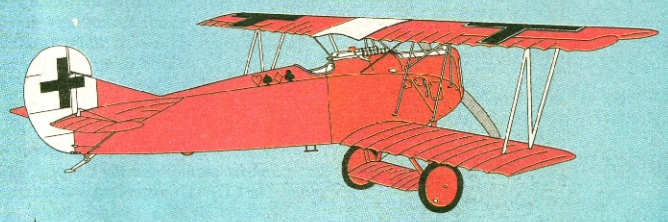
If you supply a date to `ttd` on the command line, it is stored in `CheckDate` and later transferred to `Today`. If no date is given, however, when the program attempts to transfer it, a parameter error occurs and the error handler causes the program to jump down and load the system date. The file `calendar.dat` is opened and read one

See *Reminder* on Page 4

Feature Program

Flying Aces

by George Quellhorst



Aces Up is an easy-to-play (but hard-to-beat) solitaire game for the CoCo 3. When you run the program, four cards from the standard deck are dealt and displayed at the top of the screen. The game is suit-based, so if you find two (or more) cards of the same suit, discard the lower-valued card(s). For purposes of this game, Aces are considered the highest cards in the deck, ranking above Kings. To discard, use the right and left arrows to position the blinking cursor box over the desired card, then press the down arrow. Make sure you check all suits for possible discards.

When you have finished discarding all lower-valued cards, there may be empty spaces. You may fill these locations by moving other cards to them. To move a card, position the cursor on it and press ENTER. Then move the cursor to the new location and press ENTER again. Make sure to check again for possible discards.

When there are no empty spaces and no possible discards, deal four new cards by pressing the up arrow. Since these cards stack on top of the existing piles, remember that the four cards with no other cards on them are the only active cards on the screen. Continue through the deck in this fashion until there are no cards left in the deck. The number of cards remaining in the deck is displayed in the bottom-right corner of the screen. Oh, yes . . . the goal of the game is to discard all the cards in the deck, leaving only the four aces. It may sound easy, but accomplishing this will take some work.

To start a new game at any time, press N. Alternatively, to replay the current game, press S. Because it is so easy to press BREAK while trying to press the up arrow, the program disables BREAK. To return to BASIC, hold the SHIFT key and press BREAK.

See *ACES* Page 9

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Editor and Publisher
Lawrence C. Falk

Managing Editor Cray Augsburg
Associate Editor Sue Fomby
Submission/Reviews Editor Julie Hutchinson
Technical Editor Greg Law
Technical Assistant Ed Ellers
Contributing Editors Tim Kientzle, Martin Goodman, M.D., Eddie Kuns
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Art Director Debbee Diamond
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Advertising:

Western Sales Director
Ira Barsky (312) 587-1818

Eastern Sales Director
Kim Lewis (502) 228-4492

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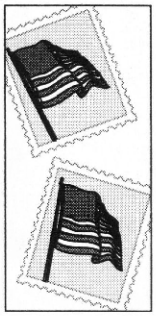

LETTERS

Printer Questions

Editor:

I am fairly new to the CoCo, and I have a few questions. First, why is there no ink-jet printer available for the CoCo 3? Second, is it possible to interface a word processor to the CoCo 3 and use it as a printer? I have in mind the Xerox 645S Memorywriter, which stores its text on a disk. Can a program be written to make the CoCo 3 read the 645S disk and print what is on the disk? How about using the CoCo 3 to create a disk for the 645S Memorywriter?

William Randall
8343 Centre Street NW
Calgary, AB T3K 1J6
Canada

Some years ago, Radio Shack offered a color ink-jet printer for the Color Computer. The CGP-220 is no longer available commercially. With a parallel interface, however, it is possible to use just about any printer with the CoCo; the biggest disadvantage is that no vendors are marketing software to allow printing of graphics with these printers.

Many typewriters/word-processing machines can be used as printers for computer systems. Doing this usually requires that you purchase an optional interface from the manufacturer. Most such machines use disk formats that are foreign to the Color Computer.

Needs Packet Software

Editor:

I am an amateur radio operator who is interested in Packet radio. I also own a CoCo 2 with 64K of memory. Is there any software available for the CoCo 2 that allows it to operate with Packet?

John Gunson
305 Oak Road
Seaford, DE 19973

How 'bout it, hams? Can anyone lend John a helping hand?

ROM Pak Transfer Needs Help

Editor:

I would like to transfer some ROM Paks to tape and eventually to disk. I have the Microcom books and the ROM Pak-transfer programs and, while transfers to tape seem to go without a hitch, the transferred programs won't execute. Microcom's program simply hangs up when I try to perform a transfer to disk. I understand Microcom is no longer supporting the CoCo.

The ROM Paks I'm trying to transfer are *Finance II* and *EDTASM+*. I am wondering if there are special patches for these two ROM Paks. If so, could you provide me with the information?

Charles Latrobe
211 Edgevale Road
Baltimore, MD 21210

Pokes and patches for transferring ROM Paks to disk are available on Delphi for many of the ROM Paks sold by Tandy. For information on using EDTASM+ *without the hardware, see Roger Schrag's articles in the following issues:*

December 1982, Page 29
April 1983, Page 194
September 1983, Page 66
March 1984, Pages 156 and 160

CoCo 3 Shifted Display

Editor:

I am having a problem with my nephew's CoCo 3. Every time I turn the power on, the display is not normal. The display shows the version number properly, but it's shifted over to the left by half a character. Can you tell me what the problem is and how to correct it?

James Ferrett
1806 Jefferson Street S.
Gettysburg, PA 15601

The shifted display reflects a problem inherent in older versions of the Color Computer 3. This effect usually disappears when the computer is upgraded from 128K to 512K. In the meantime, pressing the Reset button a few times will return the display to normal.

Wants CoCo to See the Stars

Editor:

Are there any programs that pertain to astronomy? I am an amateur astronomer and would like to get some software that deals with planet orbits, star charts and astronomical calculations. I have a CoCo 3, a CM-8 monitor, one disk drive and a DMP-132 printer.

Ken Thomason
706 East 200 South
Jerome, ID 83338

See the next letter for some direction.

Help for CoCo Astronomers

Editor:

Please pass on to Bud Helck (whose letter appeared in the October 1992 issue) that one of the best sources for astronomy software is Willmann-Bell, Inc., P.O. Box 35025, Richmond, VA 23235. They do offer a newspaper-type catalog.

But, Bud, don't be put off by the fact that the programs are written for BASIC on a PC-compatible. They are easily converted for the CoCo's BASIC. A lot of the books offered provide only algorithms, which you can insert into your own programs.

John A. Coldwell
McInnes Island Lighthouse
c/o Bag 3670
Prince Rupert, BC V8J 3R1
Canada

Disk BASIC Dynacalc and the CoCo 3

Editor:

I have a 64K CoCo 2 with Disk BASIC 1.1 and a 512K CoCo 3 with Disk BASIC 2.1. I can load and run *Dynacalc, Version 5.1:1* on the CoCo 2, but it won't work on my CoCo 3. Any suggestions?

Larry Giacobbo
208-16 Street
Cold Lake, AB T0A 0V2
Canada

If we're not mistaken, the Disk BASIC *version of* Dynacalc *uses the top block in the 64K memory map — an area that is also used by the CoCo 3 for system control. When you load* Dynacalc *on the CoCo 3, it overwrites the computer's control area, causing the system to crash. We are unaware of any patches to correct this.*

DMP-120 Blues and the 6309

Editor:

I own an old DMP-120 on which the ribbon cable connected to the printer head has been torn. Unfortunately Tandy doesn't have any more. Do you know where I can find one?

I was considering purchasing a 6309 PowerBoost kit from Burke & Burke, but I noticed that it runs in the 6809 Emulation mode. NitrOS-9 runs in the Native mode, which is even faster. Which of these packages do you recommend?

Christian Miller
6079 Buerman Road
Sodus, NY 14551-9555

Sorry, but we don't know of any vendors offering a replacement ribbon cable for the DMP-120 printhead.

We have not yet seen NitrOS-9, so we have no basis for comparing it with Burke & Burke's PowerBoost. On the other hand, Chris Burke continues to update PowerBoost, taking advantage of more and more features of the 6309. You might give him a call to get a more timely update on that product.

In Our Defense . . .

Editor:

Since THE RAINBOW changed its format, I have seen many letters of criticism. There are a lot of things for which I use my CoCo 3, and I consider THE RAINBOW an important source of information.

My point is this: Commodore users recently lost *Run* magazine, which ceased publication with the November/December 1992 issue. Apple II users have lost two magazines: Nibble ceased publication just a few months ago; and A+/Incider has decided to support only the Macintosh as of February. At least we still have our magazine. So instead of complaining, support THE RAINBOW. Otherwise, we may lose it.

Robert Newhart
131 North 32nd Street
Camden, NJ 08105

THE RAINBOW welcomes letters to the editor. Mail should be addressed to: Letters to Rainbow, The Falsoft Building, 9509 U.S. Hwy 42, P.O. Box 385, Prospect, KY 40059. Letters should include the writer's full name and address. Letters may be edited for clarity or to conserve space.

Letters to the editor may also be sent to us through our Delphi CoCo SIG. From the CoCo SIG> prompt, enter RA1 to get to the Rainbow Magazine Services area of the SIG. At the RAINBOW> prompt, enter LET to reach the LETTERS> prompt, then select Letters for Publication. Be sure to include your complete name and address.

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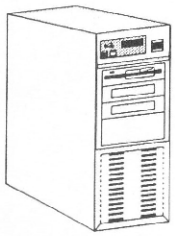

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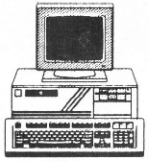

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Reminder from cover

line at a time using the procedure LInput. LInput is used because BASIC09's INPUT command stops at the first comma it sees, and I like to use commas in my messages.

If the line is longer than five characters (so LEFT$ has something to work with), the first five characters are copied into Dat, which is then compared to Today. If the strings are the same, a test is made using Wait to see if the header was printed. Wait starts in the FALSE state and remains that way until a matching date is found. Then because it is FALSE, the header is printed and Wait is set to TRUE. The rest of the line that was read (the actual activity) is then printed on the screen, and the program loops back to read another line. On the next match of dates, the header is not printed since Wait is TRUE. This process continues until the end of calendar.dat, at which point the program closes the file. If any entries were printed, Wait is TRUE and the prompt Press any key to continue... is displayed. At this point, the program waits for a keypress. If on the other hand no date matches are found, the program does not wait but ends immediately.

Enhancements

Things To Do could be made a little more fancy by building in an overlay window and by using differently colored words for messages and activities. I decided against this since I have my system boot with the standard VDG display. (It helps me to appreciate just how far we've come.) Another modification would be to rework the program to eliminate the requirement for Syscall, thus allowing it to be used on OS-9 Level I systems.

I hope you find *Things To Do* to be of use to you. It sure helps me remember important dates and events.

Richard Ries is an embedded-systems programmer who works with many different processors. He currently works for an alarm manufacturer on Long Island, and he is the president of the Long Island Color Computer Club. Richard may be contacted at 32 Halycon Rd., Lindenhurst, NY 11757. Please include an SASE when requesting a reply.

OS-9 Level II

The Listing: ttd.b09

```
PROCEDURE ttd
0000      PARAM CheckDate:STRING
0007
0008      DIM Today,Dat:STRING[5]
0018      DIM Wait:BOOLEAN
001F      DIM What:STRING[80]
002B      DIM IPath:BYTE
0032      DIM Key:STRING[1]
003E
003F      (* Reads a file "calendar.dat" and if the date (mm/dd)      *)
007F      (* matches the system date, prints the rest of the line.    *)
00BF      (* *)
00C4      (* If the file "calendar.dat" has a line:                   *)
0104      (* *)
0109      (* 02/18 Long Island Color Computer Club meeting - 7:30P.M. *)
0147      (* *)
014C      (* then when ttd is run on Feb. 18, it will print           *)
018C      (* *)
0191      (* Long Island Color Computer Club meeting - 7:30P.M.      *)
01CD      (* *)
01D2
01D3      PRINT CHR$($0C) \ PRINT  \ PRINT
01DD      ON ERROR GOTO 10
01E3      Today:=LEFT$(CheckDate,5) \(* See if a date other than *)
020C      (* today's is wanted.       *)
022A      GOTO 20
022E 10
0232      Today:=MID$(DATE$,4,5) \(* get today's date          *)
025B 20
025F      ON ERROR  \(* turn off error handler   *)
0280      Wait:=FALSE
0286
0287      OPEN #IPath,"calendar.dat":READ
029E      WHILE NOT(EOF(#IPath)) DO
02A9        RUN LInput(IPath,What)
02B8        IF LEN(What)>5 THEN
02C5          Dat:=LEFT$(What,5)
02D0          IF Dat=Today THEN
02DD            IF Wait=FALSE THEN
02E8              PRINT "    Things to do on "; Today; ":"
0308              PRINT
030A              Wait:=TRUE
0310            ENDIF
0312            PRINT "      "; MID$(What,6,80)
0325          ENDIF
0327        ENDIF
0329      ENDWHILE
032D      CLOSE #IPath
0333
0334      IF Wait=TRUE THEN
033F        PRINT
0341        PRINT "    Press a key to continue...":
0364        REPEAT
0366          RUN inkey(Key)
0370        UNTIL Key<>""
037B        PRINT
037D      ENDIF
037F      END
0381
0382

PROCEDURE LInput
0000      PARAM IPath:BYTE
0007      PARAM Str:STRING[80]
0013
0014      TYPE regarray=CC,A,B,DP:BYTE; X,Y,U:INTEGER
0039      DIM R:regarray
0042
0043      R.A:=IPath
004F      R.X:=ADDR(Str)
005D      R.Y:=80
0068
0069      RUN syscall($8B,R) \(* I$ReadLn *)
0085
0086      END
```

Feature Program

Keep Track of Refunds

by Trevor Boehm

Collecting universal product codes (UPCs) from grocery packages and mailing them back for refunds is a great way to save money. If you become serious about refunding, however, and start a large collection of UPCs, you may find yourself losing track of exactly what you have. This is precisely why I wrote *Refunder*.

Refunder is a BASIC program designed to keep track of the UPCs in your collection. The program requires at least 16K and a disk drive. To use *Refunder*, first enter the program as shown in the listing, then save it to disk as REFUNDER.BAS. Now type RUN"REFUNDER" at the OK prompt to start the program. Onscreen, you see the Main menu, from which you can add and edit the data, view it, print it, see the disk directory or quit.

Refunder allows you to track up to 500 products. You can increase this value if necessary by altering the DIM statements in Line 10. Also, when you save or load data, enter the full filename if you don't want to use the default extension of .DAT. Finally, when you look up a product by name (Option 3), you can enter the full product name or just a portion of it. This is handy if you forget exactly how you originally entered the product.

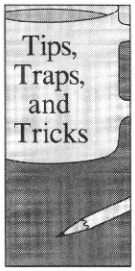
I hope *Refunder* helps you organize your collection of UPCs. If you have comments about or problems with the program, please feel free to write to me.

Trevor Boehm is a high-school student who attends Silver Heights Collegiate in Winnipeg. His interests include computer programming, applied science and reading science-fiction novels. He may be contacted at 77 Inwood Cres., Winnipeg, MB R2Y 1A2, Canada. Please include an SASE when requesting a reply.

16K Disk

The Listing: REFUNDER

```
1 'REFUNDER
2 'BY TREVOR BOEHM
3 'COPYRIGHT (C) 1992
4 'BY FALSOFT, INC.
5 'RAINBOW MAGAZINE
10 CLEAR 500:DIM I$(500),I(500)
20 CLS:PRINT"REFUNDER 1.0"
30 PRINT"(C) 1992 BY TREVOR BOEHM"
40 PRINT"AND FALSOFT, INC."
50 PRINT:PRINT"MENU:"
60 PRINT"1. ADD ITEM"
70 PRINT"2. UPDATE"
80 PRINT"3. LOOK-UP"
90 PRINT"4. SAVE"
100 PRINT"5. LOAD"
110 PRINT"6. LIST TO SCREEN"
120 PRINT"7. LIST TO PRINTER"
130 PRINT"8. DIRECTORY"
140 PRINT"9. QUIT"
150 PRINT:INPUT"CHOICE==>";C
160 IF C<1 OR C>9 THEN GOTO 20
170 ON C GOTO 180,210,240,280,340,400,430,470,480
180 CLS:PRINT"ADD ITEM...":PRINT
190 NI=NI+1:INPUT"NAME==>";I$(NI):INPUT"AMOUNT==>";I(NI)
200 GOTO 20
210 CLS:PRINT"UPDATE...":PRINT
220 INPUT"NAME==>";N$:FOR IN=1 TO NI:IF INSTR(I$(IN),N$)=0 THEN NEXT:PRINT:PRINT"NOT FOUND...":EXEC44539:GOTO20
230 PRINT:PRINT"YOU CURRENTLY HAVE";I(IN);"UPCS FOR";CHR$(13);I$(IN);"...":PRINT:INPUT"AMOUNT==>";I(IN):GOTO 20
240 CLS:PRINT"LOOK-UP...":PRINT
250 INPUT"NAME==>";N$
260 PRINT:FOR IN=1 TO NI:IF INSTR (I$(IN),N$)=0 THEN NEXT:PRINT"NOT FOUND...":EXEC44539:GOTO 20
270 PRINT"FOUND ";I$(IN):PRINT:PRINT"YOU CURRENTLY HAVE";I(IN);"UPCS":EXEC44539:GOTO20
280 CLS:PRINT"SAVE...":PRINT
290 INPUT"FILENAME==>";F$:PRINT:PRINT"READY DISK...":EXEC44539
300 OPEN"O",1,F$
310 PRINT#1,NI:FOR IN=1 TO NI:PRINT#1,I$(IN):PRINT#1,I(IN):NEXT:CLOSE
320 PRINT:PRINT"SAVED AS";F$
330 EXEC44539:GOTO 20
340 CLS:PRINT"LOAD...":PRINT
350 INPUT"FILENAME==>";F$:PRINT:PRINT"READY DISK...":EXEC44539
360 OPEN "I",1,F$
370 INPUT#1,NI
380 FOR IN=1 TO NI:INPUT#1,I$(IN):INPUT#1,I(IN):NEXT:CLOSE
390 PRINT:PRINT"LOADED...":EXEC44539:GOTO20
400 CLS:PRINT"LIST TO SCREEN...":PRINT:PRINT"PRESS ANY KEY TO STEP..."
410 EXEC44539:CLS
420 FOR IN=1 TO NI:CLS:PRINT"ENTRY: ";IN:PRINT"NAME: ";I$(IN):PRINT"NUMBER OF UPCS: ";I(IN):EXEC44539:NEXT:GOTO 20
430 CLS:PRINT"LIST TO PRINTER...":PRINT"READY PRINTER...":EXEC44539
440 PRINT:PRINT"PRINTING..."
450 FOR IN=1 TO NI:PRINT#-2,USING"%          %###";I$(IN);I(IN):NEXT
460 PRINT:PRINT"PRINTING COMPLETE...":EXEC44539:GOTO20
470 CLS:PRINT"DIRECTORY...":PRINT:INPUT"DRIVE==>";D:DIR D:EXEC44539:GOTO20
480 CLS:PRINT"TYPE GOTO 20 TO RESTART"
```



TIM KIENTZLE

How to Manage Strings, Part I

Among the nicest features of BASIC are its built-in string operations. When programming in C, you lose much of this power; so you must decide whether the C-library string functions are sufficient or whether you should use a more-sophisticated approach. With assembly language, you lose pre-fab string functions altogether, in which case you must decide how to create the functions you need. This month and next, we'll discuss some different approaches to the problem.

The Problem with Malloc

Many C programmers use the library routine `malloc` to allocate space for each string, then manipulate the strings by using the `str` functions and release the space with the library routine `free` when the space is no longer needed. This approach works fine when there are only a few strings, and you're not performing extensive operations on them. Unfortunately `malloc` and `free` can be slow, especially when there are a lot of strings or the heap is badly fragmented by the frequent creation and destruction of strings. So even though C programmers do have some 'built-in" string-handling capability, it's a good idea to consider other approaches in situations where you need to handle a lot of strings.

How Will You Use It?

Before developing a strategy for handling any sort of object, you need to carefully consider how you'll be using that kind of object. Some of the questions you should consider are:

☞ How many strings will I need? If you need only a few, you can probably get by using a much simpler approach.

☞ How "long-lived" will the strings be? If you need to create a lot of strings but need each one for only a short time (i.e., the strings are "short-lived"), you should consider an approach that re-uses the same areas of memory. Ideally the method you choose will not take too long to create new strings or recycle the space no longer needed by an old one.

☞ Do the strings need to be handled individually? Sometimes what you really need is a method that can handle a lot of strings together. A good example would be a symbol table, where new strings are added one at a time, but the only way you'll be freeing them is by destroying the entire symbol table at once.

☞ Will the strings be changing very much? In the symbol table example, once a new string is added, it is never changed. In other cases, strings may need to be changed frequently.

☞ Is there a convenient maximum size? If you can reasonably limit *all* the strings in your routine to, say, 32 characters, handling them will be much simpler than if you allow strings of any size.

The answers to these questions help you determine the best approach for your particular situation. For instance, if your answer to the last question indicates that all you'll need are a specific number of strings of the same size, you can develop a much faster and simpler approach than if your program requires an unknown number of strings of any size.

Handling One String

How you store a single string also depends on your needs. There are two widely-used approaches; which is best depends on your particular situation. One approach is to use some special marker to indicate the end of the string. C programmers have pretty much standardized by using null-terminated strings, where the last byte of the string is always a zero. OS-9 stores many names by setting the high-order bit on the last character. Copying strings stored in this format is usually very fast, since there's no need to keep track of the size. On the other hand, it takes a long time to find the size of such a string, and you are prevented from putting certain characters in the string.

Another approach is to use what are sometimes called "dimensioned" strings, where the length is stored as part of the string. This is the standard method in Forth and is also used in many Pascal implementations. As suggested above, it is often less efficient to copy these strings, but there is no restriction on what characters you can include in such a string. Clearly, finding the size of such a string is very fast. As always, you should think about the operations your routine will be performing most often before you decide which implementation is most suited to your application.

Fixed-Length Strings Are Often Enough

If you can reasonably limit the size of the strings you plan to use, life will be much simpler. For a few strings, just set aside enough space for each string, then use either pointers to the strings or simply the number of the string (i.e., treat the block of memory as an array of strings).

In some situations you don't know exactly how many such strings you'll need, in which case you'll need to set up some sort of dynamic allocation, creating new strings from a block of free memory as they are needed. In C this is accomplished with the `malloc` function.

An important thing to consider is how to release unneeded space when you are done with the strings. If you are likely to be allocating strings as often as you free them, it might make sense to free a string by storing a pointer in a list of "available" strings — recycling a string from such a list is much faster than freeing the string storage and calling `malloc` to reclaim it. This takes advantage of our assumption that all strings are the same length. For strings of different length, recycling is usually not reasonable.

Variable Length Strings

If your application requires that you use variable-length strings, consider using a "string pool." If the strings will never be destroyed, it is quite easy to set aside a block of memory and store strings in it, one after the other. The only requirement is that you keep a pointer to the next available byte in the storage pool. (See Figure 1 for an illustration of how this approach works.)

Sometimes a combination of the previous two approaches is the best. By allocating most strings as fixed length, you gain the speed and simplicity of that approach for short strings. Then use a string pool to store the few longer strings.

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```
pool    rmb 1000        Set aside 1000 bytes for strings
palloc fdb pool         Pointer to next place to store a string

* Allocate next string in pool
* Size of requested string in D
* Return address of string in X
alloc   ldx  palloc     Address to store string
        pshs x
        leax d,x        Move pointer to start of free space after this string
        stx  palloc
        puls x,pc       Return address in X

* Reset the string pool
* This implicitly frees all strings
reset   pshs x
        ldx  #pool
        stx  palloc
        puls x,pc
```

Figure 1: The String Pool

Compacting String Manager

There are situations where none of these simpler approaches will work. In these cases, you need a method that allows you to work with any size string but avoids the overhead of `malloc` and `free`. An approach that works well is to augment the string pool described above with a *compaction* routine (sometimes referred to as "garbage-collection"), which reclaims unused space from strings that have been freed. The way this is usually accomplished is by moving the strings that are still allocated down to the bottom of the string pool, thus collecting all the free space in one large block at the top of the pool. There are a few hurdles, though. The first is that if the strings are going to move, we can't have pointers to them. We can get around this by setting up a special set of pointers and letting other parts of the program have pointers to *those* pointers. (Such devices are often called "handles.") Since other parts of the program have pointers only to handles (which never move), the pointers to the actual strings can be changed whenever we perform compaction. The other hurdles involve figuring out just what information we need in order to achieve efficient compaction.

Next month I'll show you how to implement a string manager in assembly language. In the meantime, remember that although a string manager is the most general solution, it's not always the best. The methods discussed earlier in this article are faster and work quite well for most of the situations where you need to work with strings.

Tim Kientzle is currently pursuing a doctorate in mathematics at the University of California at Berkeley. He is the author of V-Term *and has worked with the Color Computer since 1982.*

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Feature Program

MONTHLY PAYMENT RECORD

ACCOUNT	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
COM-ED												
NI-GAS												
BELL TELEPHONE												
A. T. & T.												
CULLIGAN												

Chart Your Monthly Bills

by Charles A. Kiedaisch

People may joke about older persons losing their memories, but it really happens. As I have grown older, I find that I sometimes forget which bills I have paid and which ones I haven't. Rather than go through the checkbook comparing entries with bill stubs, I wrote *Bill Chart* to help me keep track of my bills.

Bill Chart is a short BASIC program that prints a chart of the bills I must pay each month. To the right of each bill on the chart are 12 blocks, one for each month of the year. When I pay a bill, I simply put the date in the appropriate block next to the name of the bill. When the column for a given month is filled, I know for sure I have paid all of that month's bills.

Bill Chart should work with any Color Computer and uses printer codes for the Tandy DMP-130 and DMP-133 printers. To use the program, enter the listing as shown, save it to tape or disk, then enter RUN. After printing the header, *Bill Chart* prompts you to enter the account. Enter the name of the first bill at this prompt. The program then prints this entry on the chart and asks you for the next account. To put a blank line between bills, press ENTER by itself at the prompt. When you have entered all the names of your monthly bills, type END and press ENTER.

Bill Chart works well and certainly helps me keep things straight (but you don't have to be older for it to be useful.)

Charles A. Kiedaisch is a retired tool-and-die designer who still does some independent work and uses his CoCo 3 to create master drawings. He enjoys building useful programs for the Color Computer.

4K

The Listing: BILLCHRT

```
1 'BILL CHART
2 'BY CHARLES A. KIEDAISCH
3 'COPYRIGHT (C) 1993
4 'BY FALSOFT, INC.
5 'RAINBOW MAGAZINE
10 CLS
20 PRINT:PRINT"LINE UP PAPER IN
PRINTER"
30 PRINT:PRINT"PRESS <ENTER> TO
START"
40 PRINT:INPUT P$:IF P$=CHR$(13)
THEN 50
50 CLS:PRINT@200,"PRINTING"
60 PRINT#-2,CHR$(27);CHR$(54);CH
R$(27);CHR$(31)
70 PRINT#-2,CHR$(27);CHR$(14);TA
B(12);"MONTHLY PAYMENT RECORD"
80 PRINT#-2,CHR$(27);CHR$(15);TA
B(19);STRING$(50,42)
90 PRINT#-2,TAB(31);"J   F   M
 A   M   J   J   A   S   O   N
  D"
100 PRINT#-2,TAB(31);"A   E   A
  P   A   U   U   U   E   C   O
  E"
110 PRINT#-2,TAB(5);"ACCOUNT";TA
B(31);"N   B   R   R   Y   N   L
   G   P   T   V   C ."
120 X$=CHR$(245):W$=CHR$(244):H$
=CHR$(249):R$=CHR$(241):I$=CHR$(
240):U$=CHR$(248):B$=CHR$(242):T
$=CHR$(246):K$=CHR$(243):J$=CHR$
(250):G$=CHR$(247)
130 PRINT#-2,CHR$(27);CHR$(28);I
$;STRING$(28,R$);
140 FOR L=1 TO 12
150 PRINT#-2,K$;STRING$(3,R$);
160 NEXT L
170 PRINT#-2,B$
180 CLS
190 PRINT"INPUT <END> TO STOP"
200 PRINT
210 PRINT"PRESS <ENTER> FOR BLAN
K SPACE"
220 PRINT
230 INPUT"ACCOUNT ";A$
240 PRINT#-2,X$;STRING$(28,32);
250 FOR N=1 TO 12
260 PRINT#-2,X$;STRING$(3,32);
270 NEXT N
280 PRINT#-2,X$
290 IF A$="END"THEN 410
300 PRINT#-2,X$;A$;TAB(29);
310 FOR Z=1 TO 12
320 PRINT#-2,X$;STRING$(3,32);
330 NEXT Z
340 PRINT#-2,X$
350 PRINT#-2,W$;STRING$(28,R$);
360 FOR M=1 TO 12
370 PRINT#-2,J$;STRING$(3,R$);
380 NEXT M
390 PRINT#-2,H$
400 GOTO 180
410 PRINT#-2,X$;STRING$(28,32);
420 FOR E=1 TO 12
430 PRINT#-2,X$;STRING$(3,32);
440 NEXT E
450 PRINT#-2,X$
460 PRINT#-2,T$;STRING$(28,R$);
470 FOR X=1 TO 12
480 PRINT#-2,U$;STRING$(3,R$);
490 NEXT X
500 PRINT#-2,G$
510 END
```

Product Review

KwikZap: High-Performance Editing

It seems there are more than enough OS-9 utilities to go around — I think I've looked at four or five disk-zap utilities in the past year alone. Out of this multitude of choices, it's sometimes difficult to decide which product you want or need. I hope this review answers your questions about *KwikZap* from Gale Force Enterprises.

KwikZap was written for OS-9 Level II and requires at least 128K of memory. Besides a disk drive or two, you will also need an 80-column monitor (color or monochrome).

Let's get to the bottom line first. Of all the disk zappers I've seen, this has to be the best — in all respects. Let's take a look.

The program status is displayed onscreen at all times, and the different function settings are shown clearly. The sector information appears in two side-by-side windows — one with Hex values, the other with ASCII data — for easy comparison. Also, entire sectors are displayed at once, reducing the amount of searching necessary to find just the location you want. All this goes a long way toward helping you prevent mistakes, as do the program's online Help features.

KwikZap supports single-keystroke help for its various functions, and you can set the program so an abbreviated Help message appears onscreen at all times. This abbreviated help is also intelligent — only the information that applies to the current setup or mode is shown.

Zapping options include the ability to modify the Hex data in byte or nibble mode (yes, you can work with individual Hex digits if you want), or in the ASCII mode. If you want to work with a memory module that has been merged into a larger disk file, the program allows you to "link" to that module alone, limiting your working space to just that module; in other words you won't have to wade through a full sector of data just to modify a small module (very handy for working with device descriptors). When working with a memory module, you can also verify the module's CRC automatically without having to change the CRC manually. Searching for a specific byte pattern or ASCII data is quick and easy since you are allowed to search for just the first occurrence of the pattern; or you tell the program to search repeatedly from one occurrence to the next until you find the sector you're looking for. You can move from sector to sector by using the up and down arrow keys, or you can jump to a specific sector. You can also modify a file's length, which is helpful for such things as stripping the padding from an Xmodem file transfer and extending the length of a file to accommodate inserted bytes.

A dynamic sector stack allows you to change the order of the sectors in the file or on the disk. The stack holds sectors in memory until you are ready to write them to disk, and you can pull sectors from the top or the bottom of the stack, making it easy to rearrange them before writing them. (All sectors put onto the stack go on top, but you can still pull sectors from either the top or bottom.)

KwikZap also features an Undo function, which makes operations in the Modify mode far safer than with some other programs. When selected, the Undo function restores the sector to its original state.

The *KwikZap* documentation is a well-written booklet that clearly explains all of the program's functions. The sector stack is described in its own section, and another section explains how to modify *KwikZap* to suit your individual preferences (the program uses an environment file in your /dd/SYS directory to keep track of these preferences). Telephone support is available if necessary, but I don't think experienced OS-9 users will need more than the included documentation. As I said before, *KwikZap* is in my opinion the best disk zapper available for OS-9. *(Gale Force Enterprises, P.O. Box 66036, Station 'F', Vancouver, BC V5N 5L4, Canada; 604-589-1660; $24.95 U.S.)*

— Bill Budenholzer

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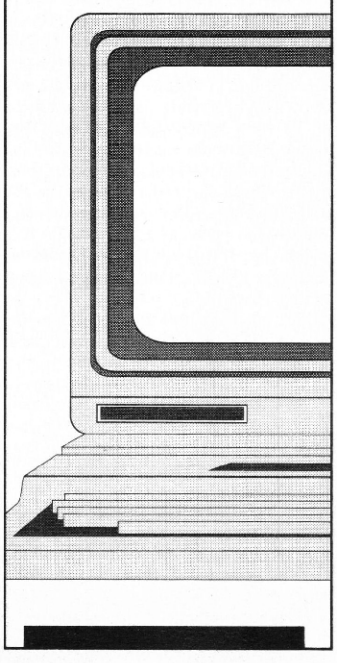
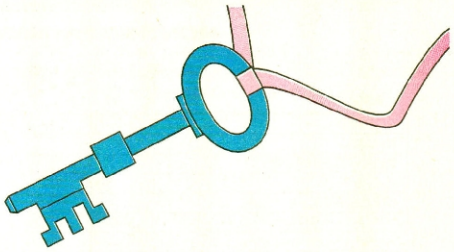


Feature Program

Write a Personal Diary

by Mark Rivera



Diary is a simple CoCo program I wrote to allow me to keep a daily record. However, while it was originally designed as a personal diary, there is no reason the program can't be used to log any series of important events or information.

Each entry in the diary can be up to 249 characters in length and is saved to disk as a separate file. The program is also password-protected to some extent, and the password file is saved to disk. For these reasons, I recommend that you save Diary on a freshly formatted disk and use the disk only for recording entries in the diary.

When you run Diary, you are greeted with a menu offering the following options: start a new diary, make an entry in the diary, view entries and quit. To start your diary, save Diary on its own disk and enter RUN. When the menu appears, press 1 and follow the prompts. You are first asked to enter a password, which may be from one to eight characters in length. After Diary saves the password to disk, you are returned to the menu from which you can select Option 2, where you make new entries in the diary. You will be prompted for the password and date after you select this option. You may enter the date in any format (e.g., 25DEC92 or 122592) as long as the string you enter is no more than eight characters in length. — Diary uses this date string as the filename for each entry. Obviously, then, you cannot use a slash or a period in the date string; otherwise Diary will interpret it as an extension. The main point is that you use the same format for each entry. This helps you avoid confusion later on.

After you enter the date (or other string), you see a blank screen. Just enter the text for your diary entry, making sure you don't press ENTER until you are done. (When you press ENTER, Diary thinks you're finished and saves the entry to disk.) If you don't like the words breaking at the right edge of the screen, format the text by using the space bar. And remember, you are limited to 249 characters, including spaces.

To view entries, press 3 at the Diary menu. Before you are allowed to see any entries, you must correctly enter the password. When prompted, enter the date and that day's entry is displayed. After the entry is displayed, press any key to enter the date for another. If you type the word PASSWORD and press ENTER at this prompt, the program ends.

The password protection offered by Diary is fairly limited. Both the password and the daily entries are saved as data files that can be read using a standard word processor — so it won't stand up to the clever (and very inquisitive) user. However, it does give some protection and may help keep younger siblings from digging where they don't belong.

As I said earlier, Diary can be used to store any type of information. Since there is no checking for the date format, you don't have to enter a date at all — any eight-character string will do.

There are a couple of modifications you might want to make to Diary. First, the program is not designed to print daily entries. It should not be too difficult to add such a feature. Also, there is currently no way to get from the view-entries prompt back to the menu. To change this, replace Line 350 with something like

```
350 IF D$=''MENU'' THEN 30
```

and enter MENU at the prompt to return there. Finally, Diary gives you no way to edit entries. Actually, to do so would be against the idea that a diary is for quick impressions and editing an entry may spoil the feelings you are trying to record. However, perfectionists may choose to add this feature.

Mark Rivera is 15 years old and is a sophomore in high school. He owns an MC-10 and a CoCo 3, and he has written several BASIC programs for personal use. Mark may be contacted at 10839 Cropper Rd., Pleasureville, KY 40057, (502) 461-7519. Please include an SASE when requesting a reply.

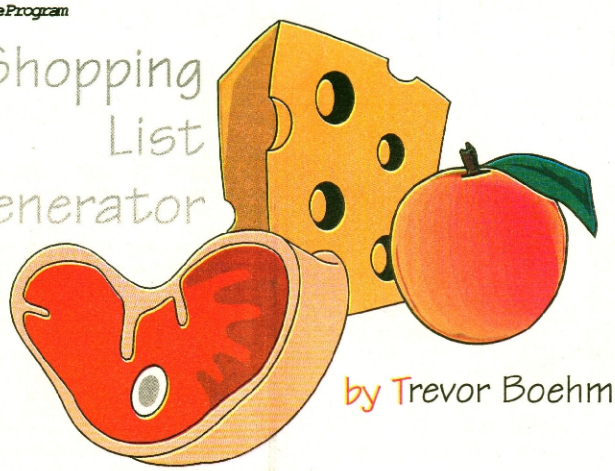
16K Disk

The Listing: DIARY

```
1 'PERSONAL DIARY
2 'BY MARK RIVERA
3 'COPRIGHT (C) 1993
4 'BY FALSOFT, INC.
5 'RAINBOW MAGAZINE
10 CLEAR 1000
20 ON BRK GOTO 40
30 CLS:PRINT"      PERSONAL DIARY
"
40 PRINT:PRINT:PRINT:PRINT"    C
HOOSE ONE..."
50 PRINT"1) START A NEW DIARY"
60 PRINT"2) MAKE AN ENTRY"
70 PRINT"3) VIEW ENTRIES"
80 PRINT"4) QUIT
90 K$=INKEY$:IF K$="" THEN 90
100 K=VAL(K$)
110 ON K GOSUB 130,200,330,430
120 GOTO 40
130 CLS:PRINT"ENTER PASSWORD THA
T YOU WILL USE TO ADD AND RETRIE
VE INFORMATION (1-8 CHR)"
140 INPUT P$
150 CLS
160 OPEN "O",#1,"PASSWORD/DAT"
170 WRITE #1, P$
180 CLOSE #1
190 CLS:RETURN
200 CLS
210 GOSUB440
220 PRINT"ENTER DATE"
230 INPUT D$
240 PRINT"MAKE ENTRY"
250 INPUT E$
260 PRINT"READY TO SAVE ENTRY(Y/
N)?"
270 S$=INKEY$:IF S$="" THEN270
280 IF S$<>"Y"THEN 30
290 OPEN"O",#1, D$+ "/DAT"
300 WRITE #1,E$
310 CLOSE #1
320 RETURN
330 GOSUB440
340 CLS:INPUT "ENTER DATE OF ENT
RY YOU WISH TO SEE";D$
350 IF D$="PASSWORD"THEN CLS:END
360 OPEN "I",#1, D$
370 INPUT #1, E$
380 PRINT D$,E$
390 CLOSE #1
400 PRINT:PRINT:PRINT"PRESS ENTE
R"
410 K$=INKEY$:IF K$="" THEN 410
420 GOTO 340
430 END
440 PRINT"ENTER PASSWORD"
450 INPUT F$
460 OPEN"I",#1, "PASSWORD/DAT"
470 INPUT #1,P$
480 CLOSE #1
490 IF P$<>F$ THEN CLS:END
500 RETURN
```

Feature Program

Shopping List Generator



by Trevor Boehm

Do you want a neat, sorted shopping list when you take a trip to the store? Shopping List is a short BASIC program that helps you create just such a list; it works on any CoCo with at least 32K of memory.

To use Shopping List, first enter the program listing and save it to tape or disk as SHOPPING.BAS. Then set your printer to the online mode and run the program. Once Shopping List is running, simply enter the items you want, one at a time, in any order. When you are finished, press ENTER by itself to send the list to the built-in sort routine. After it is sorted, the list is displayed and you are asked whether or not you want a printout; enter Y or N accordingly. Building a list couldn't be easier!

Shopping List is limited to 50 items per list. To increase this, just change the value assigned to Variable N in Line 20.

With a few minor modifications, you can use Shopping List to sort just about any list of items. Simply change all references to "groceries." I have used this program to help me pack for vacations, organize lists of people for my local cadet corps, and prepare for our computer swap meet.

Whether you choose to use the program as is, or modify it to suit your own needs, I hope Shopping List finds a happy home in your software collection.

Trevor Boehm is a high-school student who attends Silver Heights Collegiate in Winnipeg. His interests include computer programming, applied science and reading science-fiction novels. He may be contacted at 77 Inwood Cres., Winnipeg, MB R2Y 1A2, Canada. Please include an SASE when requesting a reply.

32K Extended

The Listing: SHOPPING

```
1 'SHOPPING LIST
2 'BY TREVOR BOEHM
3 'COPYRIGHT (C) 1992
4 'BY FALSOFT, INC.
5 'RAINBOW MAGAZINE
10 CLEAR 800
20 N=50:K=1
30 DIM A$(N): GOSUB 260
40 IF K>N THEN 70
50 PRINT K;">";:LINEINPUT R$: IF
 R$="" THEN 70
60 A$(K)=R$:K=K+1:GOTO 40
70 K=K-1:IF K>0 THEN 110
80 PRINT"** NO INPUT **"
90 GOTO 40
100 PRINT
110 PRINT:PRINT K;"ITEMS ENTERED
.":PRINT
120 IF K=1 THEN 190
130 FOR J=K TO 2 STEP -1
140 R$=A$(1): F=1
150 FOR L=2 TO J
160 IF A$(L)>R$ THEN R$=A$(L): F
=L
170 NEXT:A$(F)=A$(J):A$(J)=R$
180 NEXT
190 FOR J=1 TO K
200 PRINT J;A$(J)
210 FOR L=1 TO 200:NEXT
220 NEXT
230 PRINT:INPUT"PRINT LIST(Y/N)"
;PL$
240 IF PL$="Y" THEN FORJ=1 TOK:P
RINT#-2, J;A$(J):NEXT
250 END
260 CLS
270 PRINTTAB(9)"SHOPING LIST"
280 PRINTTAB(11)"GENERATOR"
290 PRINT
300 PRINT"YOU MAY ENTER";N;"ITEM
S."
310 PRINT"PRESS ENTER AT THE BEG
INNING":PRINT"OF A LINE TO SORT
THE LIST."
320 PRINT
330 RETURN
```

ACES from cover

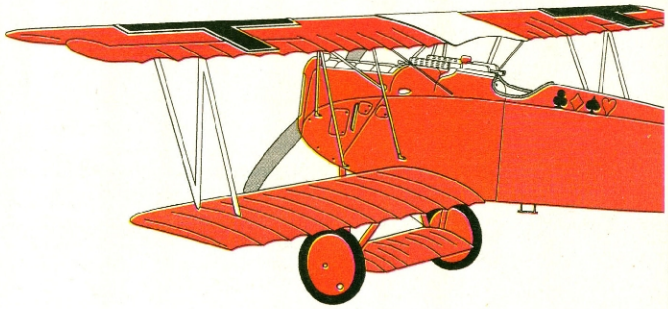
Your chances of winning a game of Aces Up are about one in 25, depending on your skills. If you have any questions about the game, please feel free to call or write to me. Good luck!

George Quellhorst has owned and used Color Computers since their introduction, and he enjoys writing software for his CoCo 3. George may be contacted at 203B Meadows Drive, Painesville, OH 44077-5361, (216) 354-3812. Please include an SASE when requesting a reply.

CoCo 3

The Listing: ACESUP

```
1 'ACES UP
2 'BY GEORGE QUELLHORST
3 'COPYRIGHT (C) 1993
4 'BY FALSOFT, INC.
5 'RAINBOW MAGAZINE
6 DATA 35,1,187,1,339,1,491,1
7 CLEAR2000:HBUFF1,1075:HBUFF2,1
075:HBUFF3,1075:HBUFF4,1075:HBUF
F5,2120:HBUFF6,40:HBUFF7,40:HBUF
F8,40:HBUFF9,40:HBUFF10,1300:POK
E&HF80F,0:POKE&HF84F,0:POKE&HF89
C,0:PALETTE0,63:PALETTE1,60:PALE
TTE2,0:PALETTE3,36:ONBRKGOTO73
8 DIMN$(14),C(52),N(52),S(52),W(
52),PI(4,13),SS(52):POKE&HA27E,&
HFF:CU=1:GOSUB60:POKE282,255:RES
TORE:FORZ=1TO4:READX(Z),Y(Z):NEX
TZ:POKE&HF015,&H21
9 POKE65497,.:WIDTH80:CLS1:POKE&
HFF9A,&H3F:LOCATE27,11:PRINT"PLE
ASE WAIT DRAWING SCREEN":LOCATE3
0,13:PRINT"AND SHUFFLING CARDS":
LOCATE34,15:PRINT"(10 SECONDS)"
10 POKE&HE190,1:EXEC&HA956:R=RND
(-TIMER):GOSUB30:POKE&HE6B9,&H39
:HSCREEN4:POKE&HE6B9,&H20:HCLS0:
HCOLOR3:HLINE(171,168)-(468,182)
,PSET,BF:HGET(171,168)-(468,182)
,10
11 HCLS0:Z=1:FORZ=1TO4:HCOLOR2:H
DRAW"S16BM"+STR$(X(Z))+",1"+C$:N
EXTZ:HGET(35,1)-(144,73),5:GOSUB
37:GOSUB32:T=0:RT=1:GOSUB41
12 GOSUB58:GOSUB74:POKE&HE6E4,&H
E6:HSCREEN4:POKE&HE6E4,&HE7:POKE
&HFF9A,&H3F
13 ' Cursor and Command keys con
trol.
14 P$=INKEY$:IFEN=1 THENPOKE400,
180:EXEC
15 OS=(P(CU)-1)*10+1:IFOS<0 THEN
OS=1
16 HCOLOR2:HDRAW"S16BM"+STR$(X(C
U))+","+STR$(OS)+C$
17 IFP$=CHR$(8) THENCU=CU-1 ELSE
IFP$=CHR$(9)THENCU=CU+1
18 IFCU=>5 THEN CU=1 ELSE IFCU=0
 THENCU=4
19 OS=(P(CU)-1)*10+1:IFOS<0 THEN
OS=1
20 IFP$=CHR$(94)ANDT<52 THENFORZ
=1TO4:P(Z)=P(Z)+1:NEXT:P(5)=P(5)
-4:GOTO41 ELSEIFP$=CHR$(94)ANDT=
52 THENGOSUB74
21 IFP$=CHR$(10)ANDP(CU)<>0 THEN
46 ELSEIFP$=CHR$(10)THENGOSUB74
22 IFEN=0 AND P(CU)>1 AND P$=CHR
$(13)THENEL=1:FORZ=1TO4:IFP(Z)=0
 THENEL=0:GOSUB52ELSENEXTZ:ELSEI
FEN=0 AND P$=CHR$(13)THENGOSUB74
23 IFEN=0 AND EL=1 ANDP(CU)=>1 T
HEN GOSUB74
24 IFEN=1ANDP$=CHR$(13)THENEN=0:
GOTO53
25 IFP$="N" OR P$="S" THEN68
26 IFP(5)=0 THENGOSUB65
27 HCOLOREN:HDRAW"S16BM"+STR$(X(
CU))+","+STR$(OS)+C$
28 GOTO 14
29 ' Shuffle the Deck.
30 FORZ=1TO52:N(Z)=Z:NEXTZ:FORZ=
1TO52:R=RND(52):S=N(R):N(R)=N(Z)
:N(Z)=S:NEXTZ
31 ' Compute suit and value of e
ach card.
32 FORZ=1TO52:W=N(Z)
33 IFW<=13THENQ=Q+1:GOTO34ELSEW=
W-13:Q=Q+1:GOTO33
34 IFQ<3THENC(Z)=3ELSEC(Z)=2
35 S(Z)=Q:SS(Z)=Q+5:W(Z)=W+1:Q=0
:NEXT:RETURN
36 ' Draw row of suits, HGET the
m into the buffer.
37 HCOLOR2:FORZ=1TO4:HDRAW"S16BM
"+STR$(X(Z)+18)+",15"+C$(Z):HDRA
W"S4BM"+STR$(X(Z)+90)+",3"+S$(Z)
:NEXTZ:HPAINT(85,41),3,2:HPAINT(
237,41),3,2:HPAINT(389,41),2,2
38 HPAINT(541,41),2,2:HPAINT(130
,7),3,2:HPAINT(282,7),3,2:HPAINT
(435,5),2,2:HPAINT(586,5),2,2:HP
AINT(583,7),2,2:HPAINT(592,7),2,
2
39 EN=0:HGET(50,14)-(129,64),1:H
GET(202,14)-(282,64),2:HGET(354,
14)-(434,64),3:HGET(505,14)-(586
,64),4:HGET(124,2)-(138,11),6:HG
ET(276,2)-(290,11),7:HGET(428,2)
-(442,11),8:HGET(580,2)-(594,11)
,9:RETURN
40 ' The up arrow. Draw first ro
w of cards.
41 DE$=STR$(P(5)):DE$=RIGHT$(DE$
,LEN(DE$)-1):IFVAL(DE$)<10 THEND
E$="0"+DE$
42 EN=0:FORZ=1TO4:OS=(P(Z)-1)*10
+1
43 T=T+1:HPUT(X(Z),OS)-(X(Z)+110
,OS+70),5:HCOLOR2:HDRAW"S4BM"+ST
R$(X(Z)+5)+","+STR$(OS+2)+N$(W(T
)):HPUT(X(Z)+15,OS+11)-(X(Z)+94,
OS+61),S(T)
44 HDRAW"S4BM"+STR$(X(Z)+90)+","
+STR$(OS+2)+S$(S(T)):PI(Z,P(Z))=
T:HPUT(X(Z)+89,OS+1)-(X(Z)+103,O
S+10),SS(T):NEXT:HPRINT(78,23),D
E$:IFRT=1 THENRT=0:RETURNELSE14
45 ' The down arrow.
46 EN=0:V1=S(PI(CU,P(CU))):V2=N(
PI(CU,P(CU))):FORZ=1TO4:IFV1=S(P
I(Z,P(Z))) AND N(PI(Z,P(Z))) > V
2 THEN47 ELSE NEXTZ:GOSUB74:GOTO
14
47 OS=(P(CU)-1)*10+1:IFOS=0 THEN
OS=1
48 HPUT(X(CU),OS)-(X(CU)+110,OS+
70),5:HCOLOR0:HDRAW"S16BM"+STR$(
X(CU))+","+STR$(OS)+C$:HCOLOR2
49 P(CU)=P(CU)-1:Z=CU:OS=(P(Z)-1
)*10+1:IFOS=0 THENOS=1
50 IFP(CU)=0THEN14ELSEHPUT(X(CU)
+15,OS+11)-(X(CU)+94,OS+61),S(PI
(CU,P(CU))):HDRAW"S16BM"+STR$(X(
CU))+","+STR$(OS)+C$:GOTO14
51 ' Move card to an empty pile.
52 V1=PI(CU,P(CU)):V2=CU:V3=OS:E
N=1:P$="":RETURN
53 IFP(CU)<>0 THENEN=0:GOSUB74:G
OTO14 ELSE P(V2)=P(V2)-1
54 HPUT(X(V2),V3)-(X(V2)+110,V3+
70),5:HCOLOR0:HDRAW"S16BM"+STR$(
X(V2))+","+STR$(V3)+C$:OS=(P(V2)
-1)*10+1:IFOS<0 THENOS=1
55 HCOLOR2:HDRAW"S16BM"+STR$(X(V
2))+","+STR$(OS)+C$:HPUT(X(V2)+1
5,OS+11)-(X(V2)+94,OS+61),S(PI(V
2,P(V2)))
56 P(CU)=1:PI(CU,P(CU))=V1:HCOLO
R2:HDRAW"S4BM"+STR$(X(CU)+5)+",3
"+N$(W(PI(CU,P(CU)))):HPUT(X(CU)
+89,2)-(X(CU)+103,11),SS(PI(CU,P
(CU))):HPUT(X(CU)+15,12)-(X(CU)+
94,61),S(PI(CU,P(CU))):GOTO14
57 ' Draw the screen for "S" or
"N" game..
58 HCOLOR2:NA$="BY GEORGE QUELLH
ORST ":FORZ=1TO22:HPRINT(0,Z+1),
MID$(NA$,Z,1):NEXTZ:NA$="CARDS L
EFT IN THE DECK":FORZ=1TO22:HPRI
NT(79,Z-1),MID$(NA$,Z,1):NEXTZ:R
ETURN
59 'Define variables.
60 N$(2)="BRR7FD2GL6GD2R8ULDL8U2
ER6EU2HBL6DLUBR14":N$(3)="BRR7FD
GFD2GL7HUBRDFBR5EU2HL38R3EUHBL5G
DBLUEBR14":N$(4)="BR4R4D4R2L2D3L
U7BL2G4R6BL7E4BR10"
61 N$(5)="BR9L9D3RU3BD3R7FD2GL7H
URDFBR5EU2H":N$(6)="BR9L8GD5FR7E
U2HL6BLU2EBGBD2BRGD2FR5EU2H":N$(
8)="BRR7FDGFD2GL7HU2EHUEBRGDFR5B
L5GD2FBR5EU2HEUH":N$(9)="BRR7FD5
GL8BR7EU2BLEU2HBL5GD2FR5BL5BLHU2
E":N$(11)="BR4R5BL2D6GL5HURDFBR3
EU6L2"
62 N$(13)="R2D7LULDRU7LDRBRBD3E4
R2GLG4BEF3R2HLH3":N$(10)="BR2RD7
BR2L5BR2U6GLE2BR8R7FD5GL7HU5EBRG
D5FBR5EU5H":N$(12)="R9D7L9U7BRD7
BR7U7D6LF2R2UL2":N$(14)="BR3R3F3
D4LU4H3LG3D4LU4E3BL2BD5R7":C$="R
Z7D17LZ7U17":N$(7)="R9DG6LE6UBL7
DLU"
63 S$(1)="BR1GD2F4R4E4U2HL3G2H2L
3":S$(2)="BR3G3DF3R6E3UH3L6":S$(
3)="BR4G4D3RE3RD3R2U3RF3RU3H4L4"
:S$(4)="BR5GDFDLHL2GDFR2ERD2R2U2
RFR2EUHL2GLUEUHL2"
64 C$(1)="BR4R2F3E3R2F4G8L2H8E4B
L4":C$(2)="BR7R4FRF5G5LGL4HLH5E5
REBR7":C$(3)="BR9RF8G3LH2L2D2FL4
EU2L2G2LH3E8RBR":C$(4)="BR9F4G3R
2E2RF3G3LH2L2D2FL4EU2L2G2LH3E3RF
2R2H3E4BL9":P(1)=1:P(2)=1:P(3)=1
:P(4)=1:P(5)=48:RETURN
65 IFP(1)=1ANDP(2)=1ANDP(3)=1AND
P(4)=1ANDP(5)=0 THENHCOLOR3:GOSU
B72:FORZ=1TO10:PLAY"O2L10T25FEED
BAG":NEXTZ:GOTO67
66 FORZ=1TO4:D(Z)=S(PI(Z,P(Z))):
IFD(Z)=0 THENRETURNELSENEXTZ:IFD
(1)=D(2)ORD(1)=D(3)ORD(1)=D(4)OR
D(2)=D(3)ORD(2)=D(4)ORD(3)=D(4)T
HENRETURNELSEHCOLOR3:GOSUB71:PLA
Y"L4T501CGAF"
67 P$=INKEY$:IFP$=CHR$(3)THEN73E
LSEIFP$=""THEN67
68 IFP$="N"THENHCLS0:GOSUB58:FOR
Z=1TO4:P(Z)=1:NEXT:P(5)=48:T=0:G
OSUB30:GOSUB41:GOTO14
69 IFP$="S"THENHCLS0:GOSUB58:FOR
Z=1TO4:P(Z)=1:NEXT:P(5)=48:T=0:G
OSUB41:GOTO14
70 GOTO 67
71 POKE&HF015,&HAA:HPUT(171,168)
-(468,182),10:HCOLOR0:HPRINT(28,
21),"GAME IS OVER. YOU LOST !":H
PRINT(22,22),"PRESS <S> FOR SAME
, <N> FOR NEW GAME":POKE&HF015,&
H21:RETURN
72 POKE&HF015,&HAA:HPUT(171,168)
-(468,182),10:HCOLOR0:HPRINT(22,
21),"CONGRATULATIONS.  YOU ARE A
 WINNER !":HPRINT(22,22),"PRESS
<S> FOR SAME, <N> FOR NEW GAME":
POKE&HF015,&H21:RETURN
73 CLS:POKE&HA27E,3:LOCATE25,10:
PRINT"THANK YOU FOR PLAYING ACES
 UP":LOCATE21,12:PRINT"BREAK KEY
 HAS BEEN RESTORED TO NORMAL":PR
INT:PRINT:STOP
74 POKE&H190,1:EL=0:FORZ=1TO10:E
XEC:NEXTZ:RETURN
```



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Icon Basic09 can also be very useful in studying procedures and programs written by others to learn how they operate. The package contains a full set of icons...or, you may edit or create icons using the included icon editor. Icon Basic09 requires a CoCo-3 with at least 256k, mouse or joystick, and OS-9 lv 2.

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COCO CONSULTS

MARTY GOODMAN

Switchable Operating Systems

How can I use a 27256 EPROM to hold one 16K DOS (Extended ADOS) *and two 8K DOSs (Disk* BASIC *and* RGB DOS)*?*

Jim Houtakker
Galena, Illinois

The key to "bank switching" within a large EPROM is control over the high-order address lines — in this case, address lines A13 and A14 (pins 26 and 27 of the EPROM). You must also of course properly burn the DOS information into the EPROM. Let's say the EPROM internally has addresses $0000 through $7FFF. Burn the 16K DOS into locations $0000 through 3FFF in the EPROM, then put the first 8K DOS into locations $4000 through $5FFF and the second 8K DOS into locations $6000 through $7FFF. Note that these addresses are absolute EPROM addresses — you'll have to interpret them to get the proper memory-buffer locations for your particular EPROM burner.

Put the EPROM into your disk controller in the same fashion you would a 27128 (16K) EPROM, but bend up pins 26 (A13) and 27 (A14). Now connect A14 and A13 to two poles of a DPDT switch. In one position, the switch should connect A14 to ground and connect A13 to Pin 26 of the 28-pin EPROM socket in the disk controller. In this position, the lower bank is selected, activating the 16K DOS.

Now for the tricky part: when the DPDT switch is in the other position, A14 from the EPROM must be connected through a 4.7K resistor to a source of +5 volts (such as Pin 28 of the chip). With the switch in this position, A13 of the EPROM should be connected to the center pole of an SPDT switch. One side of this second switch should be grounded and the other side connected to +5 volts via a second 4.7K resistor. Thus, when the DPDT switch is in this second position, the upper half (16K) of the 27256 EPROM is selected, and you use the second switch to select which of the two 8K banks is seen by the CoCo. A schematic for this circuit appears in Figure 1.

Variations of this approach can be used for putting four 8K DOSs or two 16K DOSs into one 32K EPROM. One tip here: if you want to switch between one 16K DOS and only one 8K DOS, you can dispense with the entire circuit on the A13 line — just connect Pin 26 (A13) of the EPROM to Pin 26 of its socket — provided you put two copies of the 8K DOS back-to-back in the appropriate 16K bank of the EPROM. This allows you to use a single SPDT switch to select between the DOSs.

Keyboards and Power Indicators

How can I attach an IBM keyboard to my CoCo? Is there a way to add power-on indicators to my CoCo and disk drive si I'll know they're on?

James Ruth
Newark, New York

A CoCo PRO! in Ypsilanti, MI still sells the Bob Puppo keyboard adapter that allows you to connect an IBM-style keyboard to the CoCo. This accessory is rather expensive ($80 or more) but works quite well.

Adding a power-on LED to the CoCo and a disk drive system is not that difficult, though you must be comfortable with use of several tools and techniques. You will need a LED with appropriate mounting hardware. From Radio shack, try a red (Cat. No. 276-041) or green (Cat. No. 276-022) T-1¾-size LED and a panel mount (Cat. No. 276-080). Or you can by the panel mount with the LED already installed (Cat. No. 276-068 or 276-069). You'll also need to put a resistor in series with these LEDs. Use a 330Ω, 470Ω, or 1KΩ resistor (all ¼-watt) depending on how bright you want the LED.

Now wire the cathode (the short lead) of the LED to ground. In the Coco 3, one ground point is the metal case of the RF modulator (the box that has the jack for the TV set on it). A good ground point in a disk-drive case is on either of the two *center* wires (usually black) of the four-conductor power connector.

Wire the anode (the longer lead) of the LED to the resistor, and connect the other side of the resistor to a source of +5, +10 or +12 volts. Inside the CoCo, a good source of +10 volts is at the junction of the cathodes of D1 and D2. Look for the biggest electrolytic capacitor in the CoCo 3, a cylindrical 4700-µFd, 16-WVDC capacitor (labeled C29) located near the power-regulator transistor. Facing the keyboard, look just to the right of and just a hair back from C29 to find D1 and D2, two black cylindrical devices. On one end of each of those diodes is a band, indicating the lead on that end is the cathode. Connect the wire from the other side of the resistor to the cathode of either D1 or D2.

Inside a disk drive case and power supply, a good source of +12 volts is again on the power connector. The 12-volt line is usually yellow, though sometimes it is blue. It will be one of the two outer wires on the four-wire cable. If you accidentally hook into the 5-volt power wire (usually the red wire), don't worry — the light will work fine, too.

It is up to you exactly where to mount the LED you install. Make sure you use either heat-shrink tubing or electrical tape to keep your connections from shorting together.

Disabling the Clear Key

Those wanting to disable the Clear key from BASIC *on a CoCo 3 might try the following pokes:*

For the 32-column screen, enter

```
POKE &HA928,&H39
```

For a 40- or 80-column screen, enter

```
POKE &HF6E0,&H39
```

A better approach would be to use `POKE &HA38D,&H8C`. *This single poke disables the Clear key in all screen widths yet leaves the* `CLS` *command operational in addition to leaving the Clear key available for other uses.*

Art Flexser
Miami, Florida

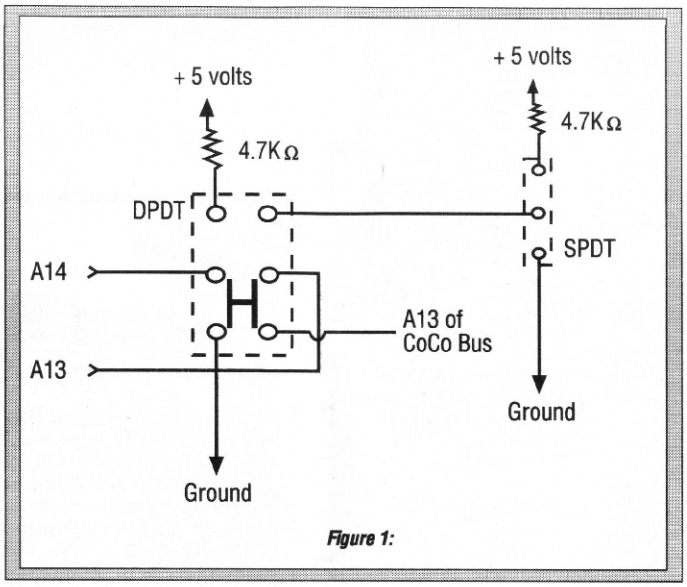


Figure 1:

Changing Widths in ML

How can I execute a `WIDTH 40` *or* `WIDTH 80` *from within an assembly-language program?*

Robert Allen Turner
Double Springs, Alabama

The CoCo 3 technical manual, available from Tandy via National Parts, supplies the specifications for the GIME chip. Part of this information details the video modes of the GIME chip and which registers affect them. After studying this information, you should be able to "talk" directly to the GIME chip, putting it into different video modes and pointing video memory wherever you like within the memory map of the CoCo 3. One note: horizontal scrolling can cause a computer crash if your Coco 3 has an older (1986-version) GIME chip.

RGB, Fast Disk and Surplus Equipment

Is there a way to connect an RGB monitor to a Commodore-64 RF output? I saved some files to disk while my CoCo was in the high-speed mode, and now all I get is an I/O error when I enter `DIR` *with that disk in the drive. Is there a way I can recover the data on the disk? Where can I get a 512K CoCo upgrade, a 1-meg upgrade, an FD-502 disk drive and extra color computers?*

Brandon Broyles
The Colony, Texas

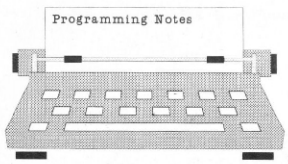
While it is theoretically possible to convert an RF signal to an NTSC composite-video signal, then finally to separate R,G, and B signals, such a project would be expensive and elaborate. In this case it would probably also be pointless because such a widget would take a great deal of time to design and build, and end up costing more than a used color TV.

How much you can recover of your files depends on just how much of the disk's information was destroyed when it was written to with the 6809 running at 1.87 MHz. To recover the data, you'll need a good understanding of Disk BASIC's file structure (read Chapter 11 of the disk manual), a disk editor (there are some good ones on Delphi), a fair amount of luck, and a lot of time and patience before proceeding. Cer-Comp sells an outstanding set of utilities, called *CoCo Tools*, that are specifically geared to helping you recover files from a crashed disk. However, even with a full understanding of the disk file structure and a good disk editor, you may still be unable to recover any data from the files. For future reference, consider buying *ADOS 3* and having it burned into an EPROM. This modified operating system permits reliable disk operation even when the CoCo is operating at high speed.

Sadly, there are very few remaining sources from which to buy accessories for the Color Computer. Computer Plus may still have some 512K memory boards for the CoCo, but I hear CoCo PRO! is indefinately out of them. The CoCo SIG on Delphi has a Classified Ads section where Color Computers and accessories are constantly being offered for sale. That is probably your best bet when looking for these items.

Martin H. Goodman, M.D., a physician trained in anesthesiology, is a longtime electronics tinkerer and outspoken commentator — sort of the Howard Cosell of the CoCo world. On Delphi, Marty is the SIGop of THE RAINBOW's CoCo SIG. His non-computer passions include running, mountaineering and outdoor photography. Marty lives in San Pablo, California.

CALL FOR . . .

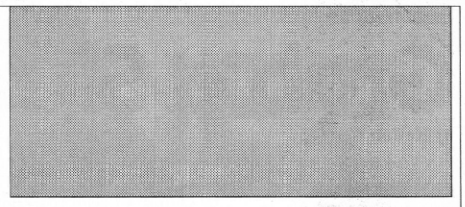


Our guess is that few (if any) CoCo users have *never* written a program of their own. While each of us has probably experienced the sense of accomplishment (and hours of frustration before the fact) of seeing our creations work, some have more experience than others. Let's share that experience and relieve some of the frustration newer programmers must face.

We are now making tentative plans for the June 1993 issue of THE RAINBOW and are accepting program submissions appropriate for that issue's theme, Programming. (Most programmers have a utility or two that they just can't live without.) We are also interested in general-interest articles discussing any aspect of the subject. All submissions must be received by us no later than February 28, 1992, and must follow our standard submission guidelines (see Page 15 for details and address).

We'd also like to see any other programs you have written (submitted material must be the original work of the submitting party, or submitted with written permission). All submissions are evaluated and considered for publication in future issues.

Received & Certified



The following products have recently been received by THE RAINBOW, examined by our staff and issued the Rainbow Seal of Certification, your assurance that we have seen the product and have ascertained that it is what it purports to be.

CoCo-C Compiler 1.0, a complete C programming environment that works under Disk BASIC on the CoCo 1, 2 or 3. Included are an editor, a C compiler, an assembler and a library linker. The compiler is capable of producing position-independent code or absolute (ROMable) code. All programs created with *CoCo-C* are in machine language and do not require a runtime package for execution. The *CoCo-C* function library supports many standard library functions along with several functions unique to the Color Computer. Mixed programming (combining C, assembly language and BASIC) is also supported. Requires at least 64K and one disk drive. *Infinitum Technology, P.O. Box 356, Saddler River, NJ 07458; (914) 356-7688; introductory price $59.95 plus $4 S/H.*

The following products were received from FARNA Systems, 904 2nd Avenue, Warner Robins, GA 31098, (912) 328-7859:

The CoCo Family Recorder 1.1, a genealogy system designed for the CoCo 3. The database is capable of tracking up to 550 individual people and up to 250 marriages. There is no practical limit to the number of generations that can be recorded. Requires a CoCo 3, an 80-column monitor and two disk drives; a printer is optional. *$24.95 plus $1.50 S/H; Canadian residents add $4; upgrades available to existing owners for $6 plus original disk; demo version available for $5.*

Little Black Book 1.0, a personal database for names, telephone numbers and addresses. Supports up to 300 entries and can be used to print address labels and telephone lists. Requires at least 32K and one disk drive. *$7.50 plus $1.50 S/H.*

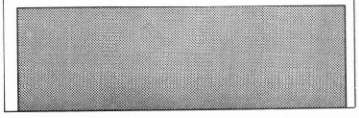
Video Tape Organizer, a database for storing information about video and audio tapes. Prints labels on standard address labels. *$7.50 plus $1.50 S/H; combo offer:* Little Black Book *and* Video Tape Organizer *$12.95 plus $1.50 S/H.*

OS-9 Invoice/Inventory Manager, a tracking system that allows you to create invoices by entering customer information and selecting item numbers from an inventory list. BASIC09 source code is included. *$24.95 plus $1.50 S/H.*

OS-9 Quick Reference and Programmer's Guide, a 44-page desktop book detailing OS-9 system commands, system calls, windowing and editor commands, error codes and more. *$7.95 plus $1.50 S/H.*

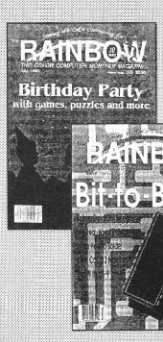
PatchOS9, a two-disk set of the most-needed patches and utilities for OS-9 Level II. An auto-patch utility is included for use with CoCo 3 systems having 512K and 40-track, double-sided drives. *$7.50 plus $1.50 S/H, or $5 with purchase of* OS-9 Quick Reference and Programmer's Guide.

The Rainbow Seal of Certification is open to all manufacturers of products applicable to the Tandy Color Computer, regardless of whether or not those companies advertise in THE RAINBOW. By awarding the Seal, we certify the product exists — we have a sample copy and have examined it. However, this does not constitute any guarantee of satisfaction. As soon as possible, these products will be forwarded to reviewers for evaluation.



Yes! They're still available!

RAINBOW Back Issues



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Feature Program

Grab a Shape

by Keiran Kenny

32K Extended

Grabbit could be seen as an easy game or as an exercise to help children learn to distinguish different between shapes. When you run the program, you are asked to choose a speed; press 1 (fast), 2 or 3 (slow) accordingly. After this, *Grabbit* sets itself up by drawing several shapes. The program then displays a single shape in the left-middle portion of the screen, at the same time "flashing" all the drawn shapes one at a time on the right side. When the shape on the right is the same as the shape on the left, press the space bar. You'll see how well you did, and you'll have the option to try again. *Grabbit* requires at least 32K of memory and Extended BASIC.

The speed setting you select determines how fast the shapes are flashed. By adult standards, fast is not very fast and slow could be a bit too slow. To speed things up a bit for quicker children, reduce the value 1000 in the delay loops in lines 440 and 490 (Variable SF is used to store whatever number the user selects).

Lines 630 to 720 draw the 10 easily distinguishable shapes in a square at the top center of the screen to set up the program. The GET statements store each square and figure in dimensioned arrays B through K.

The shapes are randomly displayed in 48-by-48 squares — an area of 2304 total pixels. The program uses "speed" GET/PUT statements — the values at the upper-left corner in the LINE statement in Line 260 are multiples of eight, and the values at the lower-right corner are one less than multiples of eight. All subsequent GET/PUT statements use the same protocol, and a PSET option is not required.

The values (72) in the DIM statements in Line 40 were arrived at by dividing the total area (2304) by 32, not by 4 as my programs usually do. DIMA(72) uses a lot less memory than my original DIMA(576). Using this approach, it is possible to dimension enough space for a whole PMODE4 screen (an area of 49152 pixels). This area divided by 32 is actually 1536, but I was able to reduce it further still to 1228. For an example, enter and run the short listing shown in Figure 1.

This approach seems to work with all areas where the speed GET/PUT protocols are observed, but it appears to be unreliable in experiments where they did not apply. I began reducing my DIM values step-by-step because I was working with *ADOS 3* and that system tends to freeze when you get near the maximum area you can dimension. In any case, it is good practice to try reducing the values used in DIM and CLEAR statements — you might need the extra memory as your program grows.

Line 20 of *Grabbit* establishes the variables SP and SL according to whether you are using a CoCo 3 or an earlier model. If you press N at the ANOTHER? prompt (Line 590), the program returns the computer's operating speed to normal.

Keiran Kenny's interests lie mainly with the Color Computer's graphics and math capabilities. But in his own words, "I like to try everything." He may be contacted at van Montfoortlaan 31, 2596 SP The Hague, Holland. Please include an SASE when requesting a reply.

The Listing: GRABBIT

```
1 'GRAB A SHAPE
2 'BY KEIRAN KENNY
3 'COPYRIGHT (C) 1993
4 'BY FALSOFT, INC.
5 'RAINBOW MAGAZINE
10 CLS
20 IFPEEK(&HFFFE)*256+PEEK(&HFFF
F)=&H8C1B THENSP=65497:SL=65496E
LSESP=65495:SL=65494
30 POKESP,0
40 DIMA(72),B(72),C(72),D(72),E(
72),F(72),G(72),H(72),I(72),J(72
),K(72)
50 PRINT@105,"*** GRAB ***"
60 PRINT:PRINT"BY KEIRAN KENNY,
THE HAGUE, 1992":
70 PRINT:PRINT"SPEED:",,,TAB(1)
"1 (FAST); 2 (MEDIUM); 3 (SLOW)"
80 PRINT:PRINTTAB(7)"PRESS 1, 2
OR 3"
90 K$=INKEY$:IFK$<"1"ORK$>"3"THE
N90
100 SF=VAL(K$)
110 GOTO240
120 POKE178,2:PAINT(128,24),,0:C
OLOR0:RETURN
130 FORDL=1TO500:NEXT:PUT(X1,Y1)
-(X2,Y2),A:RETURN
140 PUT(H1,V1)-(H2,V2),B:RETURN
150 PUT(H1,V1)-(H2,V2),C:RETURN
160 PUT(H1,V1)-(H2,V2),D:RETURN
170 PUT(H1,V1)-(H2,V2),E:RETURN
180 PUT(H1,V1)-(H2,V2),F:RETURN
190 PUT(H1,V1)-(H2,V2),G:RETURN
200 PUT(H1,V1)-(H2,V2),H:RETURN
210 PUT(H1,V1)-(H2,V2),I:RETURN
220 PUT(H1,V1)-(H2,V2),J:RETURN
230 PUT(H1,V1)-(H2,V2),K:RETURN
240 PMODE4,1:COLOR0,5:PCLS:SCREE
N1,1
250 X1=104:Y1=0:X2=151:Y2=47
260 LINE(X1,Y1)-(X2,Y2),PSET,B
270 GET(X1,Y1)-(X2,Y2),A
280 GOTO630
290 POKE135,0
300 H1=X1-56:H2=X2-56:V1=Y1+72:V
2=Y2+72
310 FORM=1TO10:LR(M)=M:NEXT
320 FORX=1TO10
330 RL=RND(10)
340 RV(RL)=LR(RL)
350 IFLR(RL)=0THEN330
360 ONRL GOSUB140,150,160,170,18
0,190,200,210,220,230
370 FORDL=1TO1000:NEXT
380 FORN=1TO10:RR(N)=N:NEXT
390 H1=X1+56:H2=X2+56
400 FORY=1TO10
410 R=RND(10)
420 IFRR(R)=0THEN410
430 ONR GOSUB140,150,160,170,180
,190,200,210,220,230
440 FORZ=1TO1000*SF:NEXT
450 VR(R)=RR(R):RR(R)=0
460 IFPEEK(135)=32THEN520
470 NEXT
480 LR(RL)=0
490 FORZ=1TO1000*SF:NEXT
500 IFPEEK(135)<>32THEN520
510 NEXT
520 TR=TR+1:CLS
530 IFPEEK(135)=32ANDVR(R)=RV(RL
) THENRT=RT+1:PRINT@139,"RIGHT!"
  ELSEIFPEEK(135)=32THENWR=WR+1:P
RINT@139,"WRONG!"
540 IFPEEK(135)<>32THENMS=MS+1:P
RINT@135,"YOU MISSED IT!"
550 PRINT@202,"TRIES:"+STR$(TR)
560 IFRT THENPRINTTAB(10)"RIGHT:
"+STR$(RT)
570 IFWR THENPRINTTAB(10)"WRONG:
"+STR$(WR)
580 IFMS THENPRINTTAB(9)"MISSED:
"+STR$(MS)
590 PRINT:PRINTTAB(8)"ANOTHER? Y
/N"
600 K$=INKEY$:IFK$<>"Y"ANDK$<>"N
"THEN600
610 IFK$="Y"THENPCLS:SCREEN1,1:G
OTO300
620 POKESL,0:PRINT:PRINT"THANKS
FOR TRYING! I HOPE YOU   LIKED T
HE GAME.":END
630 DRAW"BM112,24E15F15G15H15":G
OSUB120:GET(X1,Y1)-(X2,Y2),B:GOS
UB130
640 CIRCLE(128,24),15:GOSUB120:G
ET(X1,Y1)-(X2,Y2),C:GOSUB130
650 DRAW"BM112,24U5R10U10R10D10R
10D10L10D10L10U10L10U5":GOSUB120
:GET(X1,Y1)-(X2,Y2),D:GOSUB130
660 DRAW"BM112,24M+15,-15M+15,+1
5M-10,+0M+0,+15M-10,+0U15L10":GO
SUB120:GET(X1,Y1)-(X2,Y2),E:GOSU
B130
670 DRAW"BM112,39U32R32D32L5U27L
8D27L6U27L8D27L5":GOSUB120:GET(X
1,Y1)-(X2,Y2),F:GOSUB130
680 DRAW"BM112,24U15M+16,+10M+16
,-10D15M-16,+16M-16,-16":GOSUB12
0:GET(X1,Y1)-(X2,Y2),G:GOSUB130
690 DRAW"BM112,24M+5,-5M-5,-5M+5
,-5R22M+5,+5M-5,+5M+5,+5M-5,+5M+
5,+5M-5,+5L22M-5,-5M+5,-5M-5,-5"
:GOSUB120:GET(X1,Y1)-(X2,Y2),H:G
OSUB130
700 DRAW"BM112,39U32R8D12R16U12R
8D32L8U12L16D12L8":GOSUB120:GET(
X1,Y1)-(X2,Y2),I:GOSUB130
710 DRAW"BM112,39M+10,-16M-10,-1
6R32M-10,+16M+10,+16L32":GOSUB12
0:GET(X1,Y1)-(X2,Y2),J:GOSUB130
720 DRAW"BM112,32U16E8R16F8D16G8
L16H8":GOSUB120:GET(X1,Y1)-(X2,Y
2),K:GOSUB130
730 LINE(X1,Y1)-(X2,Y2),PRESET,B
740 GOTO290
```

```
10 DIMA(1228),B(1228)
20 PMODE4,1:COLOR0,5:PCLS:SCREEN
1,1
30 CIRCLE(128,96),95
40 GET(0,0)-(255,191),A
50 FORDL=1TO500:NEXT
60 PCLS:CIRCLE(128,96),126,,.5
70 GET(0,0)-(255,191),B
80 FORDL=1TO500:NEXT
90 PUT(0,0)-(255,191),A
100 FORDL=1TO500:NEXT
110 PUT(0,0)-(255,191),B
120 GOTO120
```

Figure 1: Dimensioning Example

Product Review

CoCo Friends Disk Magazine

One of the things I've always enjoyed about reading THE RAINBOW is the exchange of information between CoCo users. Now that Tandy is no longer supporting the CoCo, it seems more important than ever to build connections with other users. *CoCo Friends Disk Magazine* from Rick's Computer Enterprise looks like a great way to do just this. *CoCo Friends Disk Magazine* (*CFDM*) is unlike any other disk magazine I've ever seen. Sure, it includes good advice and interesting programs (some of them are great examples of the CoCo 3's capabilities); but more importantly, you get those connections that help us keep our CoCos alive.

CFDM is distributed on double-sided "flippy" disks (you don't have to have double-sided drives) and can be used on any CoCo 3 with a disk drive. In fact, one of the requirements Rick Cooper has for submissions is that they work with 128K machines. Accompanying the disk is a booklet that explains all the features of *CFDM* as well as how to "turn the pages."

The "magazine" starts from a Disk BASIC program, and the "cover" includes some beautiful CoCo 3 artwork. After starting the magazine, you are presented with a menu that shows all the sections in the issue. The material in *CFDM* is organized into logical sections, and you can easily move from section to section using the CoCo 3 keyboard. Once you move into a section, a sub menu shows the contents of that section. Selecting an item from this menu tells the system to display a specific article or topic.

Side 1 of the *CFDM* disk includes editorial comments, articles, advertising, letters, etc. The articles discuss just about everything that has anything to do with the CoCo and CoCo users. Most of the articles are short, well-written and easy to read. Although graphics aren't supported in the actual articles (there's plenty of room for graphics on Side 2), you can change the screen colors for easier reading. One of my favorite columns allows readers to introduce themselves to the other readers. A want-ad section gives readers a way to request things they want for their CoCos and offer things they are willing to sell to other users.

CFDM also includes sections for reviews, programs, suggestions for new ways of using your CoCo 3, news about the CoCo, letters from CoCo clubs and more. But the really unique thing about *CFDM* is that each section includes an easy-to-use text editor. This allows you not only to make notes about the articles but also to add your two cents to make the magazine better. Readers are encouraged to add their comments and contribute to the magazine using this method; once you make your comments, you save them to disk and send them back to Rick's Computer Enterprise.

The flip side of *CFDM* contains more artwork as well as programs, including games, graphics demonstrations and utilities. The graphics are in a standardized format, and programs are included that allow you to view the images on your computer. I've always enjoyed the graphics capabilities of my CoCo 3, and this is a great way to share your talents with others.

All of the functions of the *CFDM* program performed flawlessly. For instance, included is a program for printing the magazine on paper. It works really well.

Even though information for OS-9 users is a bit limited, I believe all CoCo users can benefit from *CFDM*'s method of communication. Each issue is crammed full of helpful hints, interesting programs, beautiful artwork and friendly information. Besides, the programs and techniques discussed in the review copies I received could be adapted for OS-9. But the free exchange of opinions and contributions can only help those who use a CoCo 3. *(Rick's Computer Enterprise, P.O. Box 276, Liberty, KY 42539; $6 per issue, $16 for 3 issues or $30 for 6 issues; published monthly)*

— Bill Budenholzer

Feature Program

A Matter of Principal

by Ralph D. Miller

While in the process of purchasing a home, I had various financing schemes to consider. In order to evaluate each approach properly, I needed an amortization program. As always, the CoCo came to the rescue.

Amortize is a short BASIC program that prints complete amortization schedules for the loan configurations you enter. The printer speed is set to 2400 in Line 2. If you use the default speed of 600 baud, just delete Line 2. Otherwise edit the line to reflect the speed you use.

When you run *Amortize*, you are asked for the annual interest rate in percent (e.g., enter 8.5 instead of .085), the number of interest periods annually (if the interest rate is compounded daily, you would enter 365; for interest compounded monthly, enter 12, etc.), the number of payments per year, the amount of the loan in dollars and the term of the loan in years. When answering these questions, you need only enter the digits; no %, $, etc., are needed.

The program then checks to be sure your printer is online and notifies you if it is not. After determining that the printer is online, *Amortize* prints a header describing the loan and the computed installment amount, then details each payment by the amount of the payment applied to interest, the amount applied to principal and the amount of debt outstanding. These tables really come in handy when you decide to prepay principal payments in order to save interest. After printing the last payment, *Amortize* returns to allow you to run another table.

The installment amount is printed in Line 19, and the table is started at Line 20. If you don't need the complete table but want to see what your "monthly" payment would be for a given loan configuration, add

```
STOP'
```

to the beginning of Line 20.

A word of caution, which I learned through experience: If you let it be known among your friends that you can run amortization tables, you'd better shop around for a good price on extra printer paper. ❑

16K Extended

The Listing: AMORTIZE

```
1 'AMORTIZE
2 'BY RALPH D. MILLER
3 'COPYRIGHT (C) 1992
4 'BY FALSOFT, INC.
5 'RAINBOW MAGAZINE
10 POKE149,0:POKE150,17
20 CLS
30 PRINT:PRINT"ENTER THE ANNUAL
INTEREST":INPUT"RATE, IN PERCENT
: ";JU
40 M=JU/100
50 PRINT:PRINT"ENTER THE NUMBER
OF INTEREST":INPUT"PERIODS PER Y
EAR: ";Q
60 PRINT:PRINT"ENTER THE NUMBER
OF PAYMENTS":INPUT"PER YEAR: ";S
70 PRINT:PRINT"ENTER THE LOAN AM
OUNT":INPUT"IN DOLLARS: ";A
80 PRINT:PRINT"ENTER THE PERIOD
OF THE LOAN":INPUT"IN YEARS: ";B
90 D=(1+M/Q)^(Q/S)-1
100 F=((1-(1+D)^(-S*B))^-1)*D*A
110 C1=F:GOSUB510:F$=C1$
120 C1=A:GOSUB510:A$=C1$
130 SP=PEEK(65314)AND1
140 IF SP>0 THEN GOSUB570
150 CLS:PRINT@200,"printing tabl
e"
160 PRINT#-2,"THE AMORTIZATION T
ABLE FOLLOWS FOR A $";A"LOAN AT"
JU"PERCENT ANNUALLY.":PRINT#-2,"
INTEREST COMPOUNDED"Q"TIMES ANNU
ALLY AND PAYMENTS MADE"S"TIMES A
NNUALLY"CHR$(13)"FOR"B"YEARS ("S
*B"PAYMENTS ): "CHR$(13)CHR$(13)
170 GOSUB610
180 PRINT#-2,"INSTALLMENT AMOUNT
:";F$;CHR$(13)CHR$(13)
190 PRINT#-2,"PAYMENT","INTEREST
","PAYMENT","OUTSTANDING"
200 PRINT#-2,"NUMBER","ON  DEBT"
,"ON PRINC","   DEBT"
210 PRINT#-2,"-------","--------
","---------","----------"CHR$(13
)CHR$(13)
220 DC=A:WY=0
230 FOR Y=(WY+1) TO (WY+10)
240 HM=DC*D
250 C1=HM:GOSUB510:HM$=C1$
260 RT=F-HM
270 C1=RT:GOSUB510:RT$=C1$
280 LF=DC-RT
290 C1=LF:GOSUB510:LF$=C1$
300 GOSUB630
310 C1=Y:GOSUB550:PRINT#-2,C1$,H
M$,RT$,LF$
320 IF LF>=F THEN 440
330 Y=Y+1:HM=LF*D
340 C1=HM:GOSUB510:HM$=C1$
350 RI=LF-HM
360 C1=Y:GOSUB550:PRINT#-2,C1$,
370 C1=HM:GOSUB510:GOSUB680:PRIN
T#-2,C1$,
380 C1=LF:GOSUB510:GOSUB680:PRIN
T#-2,C1$,
390 PRINT#-2,"NIL"
400 C1=HM+LF:GOSUB510
410 IF F$<>C1$ THEN PRINT#-2,"LA
ST PAY'T: ";C1$
420 PRINT#-2,CHR$(12)CHR$(12)
430 GOTO 20
440 DC=LF
450 NEXT Y
460 IF (S*B)>Y THEN 480
470 GOTO 500
480 WY=WY+10
490 GOTO 230
500 RETURN
510 C2=INT(100*C1+.5)/100
520 C1$="$"+MID$(STR$(C2),2)
530 IF C2=INT(C2) THEN C1$=C1$+"
.00"
540 RETURN
550 C1$=MID$(STR$(C1),2)
560 RETURN
570 CLS:PRINT@198,"printer off l
ine"
580 SP=PEEK(65314) AND 1
590 IF SP<>0 THEN 580
600 RETURN
610 JF$=RIGHT$(F$,3):IG$=LEFT$(J
F$,1):IF IG$<>"." THEN F$=F$+"0"
620 RETURN
630 GOSUB680
640 JF$=RIGHT$(HM$,3):IG$=LEFT$(
JF$,1):IF IG$<>"." THEN HM$=HM$+
"0"
650 JF$=RIGHT$(RT$,3):IG$=LEFT$(
JF$,1):IF IG$<>"." THEN RT$=RT$+
"0"
660 JF$=RIGHT$(LF$,3):IG$=LEFT$(
JF$,1):IF IG$<>"." THEN LF$=LF$+
"0"
670 RETURN
680 JF$=RIGHT$(C1$,3):IG$=LEFT$(
JF$,1):IF IG$<>"." THEN C1$=C1$+
"0"
690 RETURN
```


The Contras

2 years in the making.
A cast of 3 all-star programmers.
THE game. Here at last...

Once upon a time, Sundog Systems announced a new 512k game called *The Contras*. It took two years and three programmers to complete this, the most ambitious game ever created for the CoCo-3. Jeff Steidl, accomplished author of *Photon* and *GrafExpress 2.0*, led the effort to produce this technological marvel. In doing so, he proved that the CoCo can match –or surpass– any home game system.

The Contras features a two-player cooperative mode, 512k filled with incredible graphics, super-smooth animation and scrolling, an outstanding background music score, sizzling sound effects, and lightning-fast arcade action.

This is paramilitary combat at its best. Play alone or with a friend as you take on the evil alien invaders. Blow away the enemy while travelling thru multiple levels and powering up with ever more destructive weapons. *The Contras* will keep you playing for hours; it is quite possibly the best CoCo game ever! Requires 512k CoCo-3, disk drive, & joystick.

$34.95

Super Sundog Sale!

For this holiday season, Sundog is cutting prices on even our most popular products. Give more to your favorite CoCo gamer for less! You **must mention this ad** when ordering to get these very special prices! See our full-page ad elsewhere in this issue for prices & shipping info.

10% off 2 or more	10% off	50% off
GrafExpress 2.0	War Monger	Hall/King 1,2, or 3
Photon	Soundtrax	Paladin's Legacy
Kyum-Gai (either ver.)	Warrior King	Kung-Fu Dude
Zenix	Quest/Starlord	Champion
Crystal City	All hint books	Dragon Blade
Sinistaar		White Fire/Eternity
Quest for Thelda		

Sundog systems

WHAT THEY'RE SAYING ABOUT COCO FRIENDS DISK MAGAZINE

...I received the CFDM the other day, and all I can say is that it is the best thing since sliced bread...Rick I am impressed.
–Colin North, Australia

...I was impressed by the STARTUP disk and then really impressed by the first month's issue of CFDM.
–Clarence Bower, OH

...I like it! I like it!...
–John Pendleton, MO

...I am...years old and just a beginner with CoCo 3...You have so much on one little floppy disk–I can't believe all the wonderful things you have on it! I spend hours going over and over...
–Harold Moenich, PA

...Looks great...have made many new CoCo Friends, thanks to your mag. Am currently corresponding with "4 NEW CoCo Friends." Thanks.
–George Quellhorst, OH

...Material & Format: In a word–FUN. It is interesting to find out about other CoCo users and what they do with their machines.
–Daniel M., MD

...Last night I sat down at my CoCo and read Issue #2 from "cover to cover," and realized what a terrific idea the CDFM really is, and much too good to pass up. So, I am enclosing a money order...to cover issues #2-#7.
–Gordon C. Matthews, Canada

...Congratulations, Rick, on your first issue of CFDM!! You deserve an A+. It has been a long time since I derived so much pleasure from reading a computer magazine. Your first issue bodes well for the SURVIVAL and REVIVAL of interest in the CoCo 3.
–H. Allen Curtis, VA

...I wrote the driver and have edited the "Mid Iowa & Country CoCo's UPGRADE newsletter on disk since 1990. While each of our disk letters have their own style, let me say "YOURS REALLY LOOKS GREAT!"
–Terry Simons, IA

...You put together an interesting variety of programs each month, and I enjoy them all. I'm glad to see a variety of new contributors in each issue.
–Norm Barson, NJ

...Let me know if I miscalculated on my subscription, the LAST thing I want to do is miss a copy of CFDM!!!
–Dann "Mac" McConnell, ID

...You have created a great medium for all the users to get together and express their views and ideas. It feels like family. Please keep up the good work.
–Michael Gavar, MI

COCO FRIENDS DISK MAGAZINE 1 ISSUE $6 – 3 FOR $16 OR 6 FOR $30

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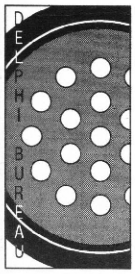
SEE REVIEW THIS ISSUE



EDDIE KUNS

Using Workspace

Several times in the past couple of years, I've mentioned your Delphi Workspace as a place to store files. But we've never really looked at what Workspace is. How do you get there, and what does it cost you?

Simply put, your Workspace is a special storage space on Delphi where you can keep *private* files only you can access — your Workspace is your "own" disk area. Each user is assigned his own Workspace when he joins Delphi; although you may belong to many different SIGs on Delphi, you have only one Workspace.

To get to your private Workspace, enter WO at any SIG's main menu. (WO is a Delphi abbreviation for WORKSPACE.) You should soon after see the WS> prompt, indicating you are now in your Workspace area. When you press CTRL-Z or enter the EXIT command, you are returned to the menu from which you entered Workspace.

As I mentioned before, your Workspace is an area in which you can store files you don't want others to see. It is also the area on Delphi to which you first upload files you want to later submit to the public databases. In addition, all your Mail messages and folders are stored (automatically by the system) in your Workspace. Sounds a little like a great big mass-storage device in the sky, doesn't it? But watch out — the files you keep in Workspace could cost you money. Every Delphi user has 50 free (no-cost) disk blocks for file storage. Each block is 512 bytes, so you have about 25K of free storage space (about 11 disk granules for Disk BASIC users). Any disk usage beyond these 50 blocks may be charged to your Delphi account, depending on how long you use that extra storage space. Make sure you keep track of any files you place in your Workspace, and remember to delete the files you don't need.

Since Delphi runs on VAX/VMS, it uses the VAX/VMS file system. Each filename includes three parts: a name, an extension and a version number. A typical filename might be SEND_TO_TIM.LZH;2. In this case, SEND_TO_TIM is the actual filename, .LZH is the file extension, and ;2 is the version number. VAX/VMS filenames are case-insensitive and will appear in uppercase no matter whether you use uppercase or lowercase when naming them. Filenames and extensions can each be 40 characters in length, though most people rarely use filenames that long!

The concept of version numbers might be new to most CoCo users, especially those who use mostly Disk BASIC. The version number is one more part of a filename that helps it stay unique. You can have two or more files with the same filename and extension as long as each filename has a different version number. This is great when you repeatedly edit a file but want to keep the older versions. You do not normally need to specify the version number when working with files; the latest version of a file is the one with the highest version number, and this is the default version number used by the system. Version numbers can range from 1 to 32767.

If you create or upload a file using a filename that is already used by another file in your Workspace, the current version of the file is not overwritten. Delphi automatically creates a "new version" of the file, using the next-highest available version number. Thus, if you do a directory of your Workspace, you will see two versions of this file; the filename and extension will be the same, but the version number will be different. Of course, both versions of the file count toward your overall Workspace disk usage.

Workspace Commands

The commands available to you in the Workspace area are shown in Figure 1. Many of these commands, such as COPY, DELETE, EXIT and LIST, have obvious functions. Some operating notes are in order, however.

```
APPEND to File   LIST File
CATALOG Files    PUBLISH File
COPY File        PURGE Old Versions
COUNT Words      RENAME File
CREATE File      SETTINGS
DELETE File      SUBMIT File
DOWNLOAD File    UNPROTECT File
EDIT File        UPLOAD File
EXIT             KERMIT-Server
HELP             Other Commands
```

Figure 1: The Workspace Menu

When you use LIST to list a file in your Workspace, you can use XOFF (CTRL-S) and XON (CTRL-Q) to pause the listing and restart it, respectively. You can use wildcards with the DELETE command; for example, to delete all the files in your Workspace that have a .TXT extension, you would enter DELETE *.TXT. The DELETE command prompts you to make sure you want to delete the file(s) you specified on the command line. A separate prompt appears for each file. If you don't want to be prompted, add /NOCONFIRM to the end of the command line.

If you have several versions of different files in your Workspace and you want to keep only the highest (latest) version, use the PURGE command. This command causes all lower-numbered versions of all files to be deleted. You can also purge old versions of a specific file by entering the filename after the PURGE command.

Another useful command is CATALOG, or DIRECTORY. If you enter DIRECTORY (or DIR for short), Delphi shows you a listing of the files in your Workspace, including each filename, the file size in blocks, and the date and time the file was created. The DIRECTORY command supports several options, which I'll cover next month.

If you receive and store a lot of mail, you'll see many files with the extension .MAI when you enter DIR in Workspace. These files are mail files and, under ordinary circumstances, *you should not delete them.* To keep from confusing the Mail system, any mail messages should be deleted only from within Mail. The safety rule to remember is that, if you want to work with mail messages, do it from within Mail. As far as disk usage is concerned, Delphi counts only the part of your MAIL.MAI file that is currently used to hold mail messages.

For safety's sake, all mail files are *protected.* That is, they are automatically created in such a way that you cannot delete them. If you decide to delete *all* mail files from your Workspace, you need to first unprotect them. Not surprisingly, you use the UNPROTECT command to do this. If you enter UNPROTECT MAIL.MAI, you will be able to delete the file MAIL.MAI. (Again, you would do this only if you wanted to delete *all* of your mail without entering Mail and deleting all the messages.) Similarly, if you want to protect a file against being accidentally deleted, you can enter PROTECT MYFILE.TXT. If you later decide you want to delete this file, you must first unprotect it.

The PUBLISH and SUBMIT commands both perform the same function. Either of these commands can be used to submit a file or group of files to the databases of the SIG from which you entered your Workspace. However, using SUBMIT *from within your Workspace* is the old Delphi method of uploading files and is discouraged. A better way to submit a file to the databases is to enter the database to which you want to submit the file(s), then enter SUBMIT at *that* prompt. Remember that you are not charged for uploading files when you are inside the SUBMIT menus.

As a last tidbit before we end this month, if you want to find out how long a text file in Workspace is, use the COUNT command. An example, using the text file for last month's "Delphi Bureau," is shown in Figure 2.

Next month we'll look at the rest of the Workspace commands. We'll also see how to upload and download files using your Workspace area.

Eddie Kuns is pursuing a doctorate in physics at Rutgers University. He lives in Aurora, Illinois, and works as a programmer and researcher at Fermilab. Eddie is the database manager of the OS9 Online SIG and can be reached online as EDDIEKUNS.

```
WS> count report.txt
File REPORT.TXT: 10016 characters, 95 lines, 1688 words, longest word
      "low-number:high-number" (23), longest hyphenated word
      "low-number:high-number" (23).
```

Figure 2: Sample Output of COUNT Command

Uploads At a Glance

In the OS9 Online Applications (6809) database, Steve Mylonas (SAM35) released WDD, a program which allows you to change the default disk drive (/DD) to another device on the fly. He also contributed two programs that repeatedly unlink a module until the module is no longer in memory or deiniz a device until it is completely deinitialized. These utilities can often save a lot of typing. Ken Scales (**KENSCALES**) uploaded a demo program by Alan DeKok that shows off an OS-9 Level II C graphic-sprite library Alan is developing. Darren Kindberg (DKINDBERG) released the latest version of gcal, a calendar and appointment-keeping program for use with *MultiVue* and gshell.

In the Telecom (6809) database, John Eng (**JENG**) uploaded the latest version of an ADQ offline reader. Some BBSs allow you to download all of your BBS mail to your local system in a particular format; this program allows you to read this mail.

Shawn Driscoll (EARTHER) released into the Games & Graphics database a new version of *Stranded and Out of Gas*, an adventure game. In the Programmers Den database, Shawn also released the latest version of guib, a GUI (Graphics User Interface) toolkit for the CoCo 3. Tim Kientzle (TIMKIENTZLE) ported his popular version of make for the OS-9/68000 machines. In my opinion, Tim's version is superior to the Microware version. Jim McDowell (JMLSOFT) uploaded two utilities for C-source programs. One program, xtndln, allows you to use the backslash (\) to extend source lines across several lines. The second program, trigraph, performs tri-graph substitutions according to the ANSI standard.

In the OSK System Modules database, Tim Kientzle uploaded a new version of SysGo; Kevin Darling and Scott Griepentrog have worked on earlier versions of this module. This version of SysGo is customizable and includes assembly source. This allows you to turn definitions on and off in the source, recompile the module, and have SysGo boot your system the way you want. Jim Lalone (TERMITE) contributed a tutorial for OS-9 beginners to the Tutorials & Education database.

In the CoCo SIG CoCo 3 Graphics database, Eric Crichlow (HYPERTECH) released a clipboard file for *Image Master* that contains several 16-color icons. Don Joyce (REDCOAT) updated the setup file for *Bowling Stats, Version 5.3*. This setup file is necessary only for people using unmodified Disk BASIC; if you use *ADOS*, you don't need this update. Mike Nelson (MICHAELJN) uploaded a cassette-labeling program for printing the contents of your music tapes.

In the Hardware Hacking database, Marty Goodman (MARTYGOODMAN) provided data initially posted by Francis Swygert (DSRTFOX) about the Super NES RGB and audio connectors. This file also describes how to interface the Super NES to various monitors. Marty also posted a Forum message originally written by Art Flexser (ARTFLEXSER) that describes the unexpected way in which the GIME memory mapping handles ROM mapping.

In the Games database, Johnny Williams (DRILLMASTER) released a game database for chess. He also released a puzzle program that takes a graphics image, rearranges it, and gives you five minutes to piece it back together. In the Telecommunications database, Andrew Jackson (AJACK) uploaded a program that creates macros for *DelphiTerm 4.1*. Art Flexser contributed in the Soapbox (chitchat) database a description of his experiences during hurricane Andrew in the Miama area.

DATABASE REPORT

OS9 SIG:

General Information:
KIX/30 ANNOUNCEMENT
FHOGG Frank Hogg
KEEPER INFORMATION
FHOGG Frank Hogg
COCO LIST (JULY 1992)
GREGL Greg Law
SEPTEMBER '92 NETNEWS
OS9CN Tom Birt

Applications (6809):
WDD: CHANGE DEFAULT DRIVE
SAM35 Steve Mylonas
CLRMEM: NEW UNLINK AND DEINIZ
SAM35 Steve Mylonas
DIRECT: DIRECTORY COPYING UTIL
COMPER Glen Hathaway
VED 2.3 HELP PATCH
SAM35 Steve Mylonas
RENAME PATCH FOR FULL PATHNAMES
DONTHRASH Donald Thrash
CMDGEN: COMMAND GENERATOR
DEANHOLDER Dean Holder
BOUNCEIT DEMO FOR DEKOK'S GLIB.L
KSCALES Ken Scales
PSF: TEXT TO POSTSCRIPT (LEV 2)
JIMBM Jim Manning
START GCAL BEFORE MULTIVUE
DKINDBERG Darren Kindberg
GCAL 1.2 FOR MULTIVUE
DKINDBERG Darren Kindberg

Telecom (6809):
ADQWK 3.0: ADQ OFF LINE READER
JENG John Eng
SUPERCOMM V2.2 ICON & AIF
BLAINET Blaine Tempest
SUPERCOMM VERSION 2.2
RANDYKWILSON Randy Wilson

Games & Graphics:
MGESHOW - MM/1 MGE VIEWER
BRUCEGERST Bruce Gerst
EL BBS AD. (GIF)
GRAPHICSPUB Bob Montowski
RAYSHADE DEMO PICTURES (GIF)
THEFERRET Philip Brown
STRANDED: ADVENTURE GAME
EARTHER Shawn Driscoll
EDPTR: EDIT GRAPHIC POINTERS
RICKMAC Richard McNabb
CROGUE 5.3: ROGUE CLONE FOR OSK
VAXELF John Donaldson

Music & Sound:
EQUINOX6.IFF: STEREO IFF SOUND
JOHNBAER John Baer

Programmers Den:
LIFE SIMULATION
PAGAN Stephen Carville
MAKE FOR OSK
TIMKIENTZLE Tim Kientzle
TRIGRAPH & XTNDLN C UTILITIES
JMLSOFT Jim McDowell
GUIB 2.1
EARTHER Shawn Driscoll

OSK Applications:
HELP FOR OS9/68K
TIMKIENTZLE Tim Kientzle
3D GRAPHICS PICTURE (GIF)
VAXELF John Donaldson
PR: PAGINATE FILES
COMPER Glen Hathaway
DATADEX V1.05 DEMO
EDELMAR Ed Gresick

OSK Telecom:
TSTART: TASCOM STARTUP UTIL
COMPER Glen Hathaway

OSK System Modules:
SYSGO ED #8: REPLACEMENT SYSGO
TIMKIENTZLE Tim Kientzle

Tutorials & Education:
KICKSTARTING OS9 (COCO)
TERMITE Jim Lalone

CoCo SIG:

CoCo 3 Graphics:
IMAGE MASTER GRAPHICS (ICONS)
HYPERTECH Eric Crichlow
BEATLES ALBUMS IN IMG
DEANHOLDER Dean Holder

Utilities & Applications:
BOWLING STATS V5.3 UPDATE
REDCOAT Don Joyce
CASSETTE LABELER
MICHAELJN Mike Nelson

Hardware Hacking:
SUPER NES RGB / AUDIO
MARTYGOODMAN Marty Goodman
THE MMU AND THE ROM
MARTYGOODMAN Marty Goodman

Games:
CHESS KEEPER V. 2.1
DRILLMASTER Johnny Williams
MORE PUZZLER PUZZLE FILES
DRILLMASTER Johnny Williams
COCO 3 PUZZLER
DRILLMASTER Johnny Williams

Telecommunications:
AUTOMACROW 2.0
AJACK Andrew Jackson

Soapbox (chitchat):
HURRICANE ANDREW JOURNAL
ARTFLEXSER Art Flexser

Submitting Material To Rainbow

Contributions to THE RAINBOW are welcome from everyone. We like to run a variety of programs that are useful, helpful and fun for other CoCo owners.

WHAT TO WRITE: We are interested in what you want to tell our readers. We accept for consideration anything that is well-written and has a practical application for the Tandy Color Computer. If it interests you, it will probably interest lots of others. However, we vastly prefer articles with accompanying programs that can be entered and run. The more unique the idea, the more the appeal. We have a continuing need for short articles with short listings. These are especially appealing to our many beginners.

FORMAT: Program submissions must be on tape or disk, and it is best to make several saves, at least one of them in ASCII format. We're sorry, but we do not have time to key in programs and debug our typing errors. All programs should be supported by some editorial commentary explaining how the program works. We also prefer that editorial copy be included in ASCII format on the tape or disk, using any of the word processors currently available for the Color Computer. Also, please include a double-spaced printout of your editorial material and program listing. Do not send text in all capital letters; use upper- and lowercase.

COMPENSATION: We do pay for submissions, based on a number of criteria. Those wishing remuneration should *so state* when making submissions.

For the benefit of those wanting more detailed information on making submissions, please send a self-addressed, stamped envelope (SASE) to: Submission Guidelines, THE RAINBOW, The Falsoft Building, P.O. Box 385, Prospect, KY 40059. We will send you comprehensive guidelines.

Please do not submit material currently submitted to another publication.

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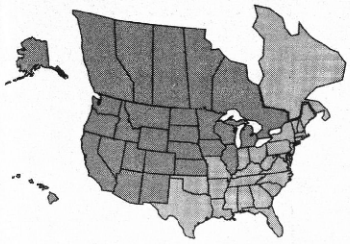

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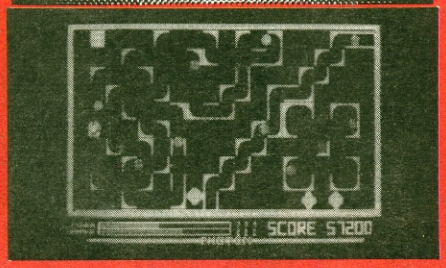

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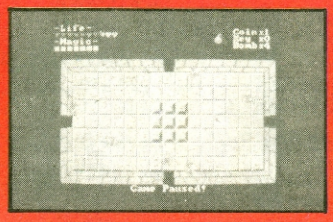

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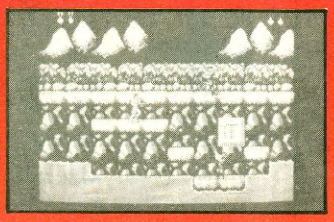

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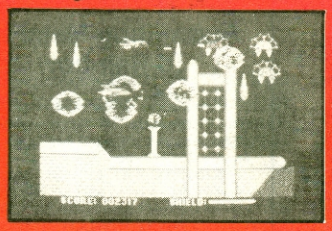

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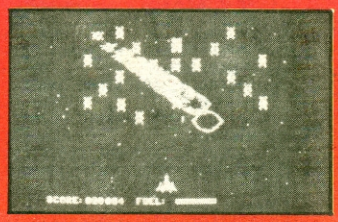

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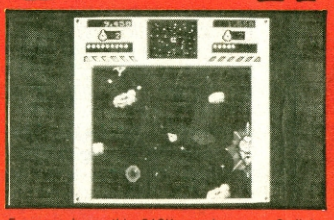

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