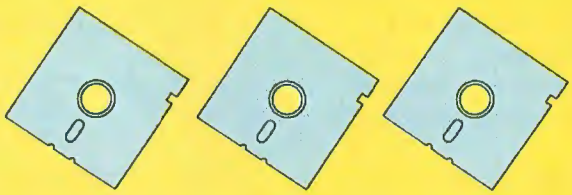
Utilize all of your CoCo 3's memory with these programs

Program a RAM Disk



By Daniel Jimenez

When you got your CoCo 3, you may have been disappointed to find that you still only use 30K of memory from BASIC. You probably wondered about the usefulness of 128K if you can't access it easily. You can easily use all that memory like a disk drive though, by using a RAM disk.

A RAM disk uses your computer's extra memory as if it were another disk drive. It uses your extra RAM (Random Access Memory) instead of floppy disks. With a RAM disk, you can OPEN, CLOSE, KILL, DIR, PRINT#, INPUT — and almost anything you would normally do with a floppy disk drive. RAM disks are also faster than floppies because the computer doesn't have to turn on a disk drive and search for the right place on the disk before information can be exchanged.

Most RAM disks are only available for 512K CoCos at a high price (higher than you paid to read this article). I offer an alternative.

RAMDisk installs a RAM disk in your 128K CoCo 3. To use it, you need a 128K CoCo 3 with at least one floppy disk drive and Disk BASIC. Type in and run Listing 1, RAMDISK. If "Checksum Error" is printed while running, go back and check the program's DATA statements. If the program is correct, you will be prompted for the drive number. For now press 1 and ENTER. You can choose any of the possible CoCo drive numbers (zero through three), but you will still want to be able to use your disk drive(s). When choosing a number for your disk, choose a drive number you don't have. After you type the appropriate drive number and press ENTER, the program will install and format a RAM disk and report which drive number is being used for it.

Now type DIR1 and press ENTER. As no files exist on the RAM disk, you should see a blank line. Type SAVE "RAMDISK:1" and press ENTER. You have just saved a program on your RAM disk. Type DIR1, and the program will appear in a directory listing.

Experiment with it. You can use almost any of the commands available to Disk BASIC with your RAM disk.

What's the catch? A floppy disk can hold 160K of information, *RAMDisk* cannot. Of the 128K in your CoCo, 64K is taken up by BASIC and any variables or programs you have loaded into memory. *RAMDisk* uses the other 64K. This means that it can only hold 27 granules (64 times 1,024 bytes divided by 2,304 bytes per granule, minus about 4,000 bytes for the directory) in files. You can check this by using the FREE function. (For example, if you chose drive 1, type PRINT FREE(1) and press ENTER.)

If you have a 128K computer (as opposed to 512K), *RAMDisk* will use the memory that BASIC uses for WIDTH 40, WIDTH 80, and any of the HSCREEN graphics. Try not to use these features when the program is installed, or you may run into some major problems (like losing everything on the RAM disk). These limitations do not apply to 512K CoCos, but if you have a 512K CoCo, you ought to buy a RAM disk that can take advantage of all the memory.

Since *RAMDisk* does not have the

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memory of a normal disk, do not use the commands BACKUP or DSKINI. Of course, BACKUP and DSKINI will work with any drive number not being used by the program. You can use DSKO$ and DSKI$, but don't specify any track number higher than 31 or lower than 17. The RAM disk doesn't have these, but it may look for them, which will cause problems. You can examine the directory and file allocation table sectors on Track 17 just like you would normally.

Since you can't use the BACKUP command with this program, I have included a program called *Copy* (Listing 2), which will copy all the files from one disk drive to another. It will work whether or not *RAMDisk* is installed (as long as you have two disk drives) but is quite useful. You can copy a complete disk into the RAM disk, work with the programs and files now on the RAM disk faster than you would with a floppy, and use it to copy all the files onto another floppy when you are done.

Because *RAMDisk* is completely in RAM memory, turning off your computer will erase everything on the RAM disk. Pressing RESET will not affect the program's operation.

Remember the high-speed poke (POKE 65497,0) for the CoCo 3, and how using it sometimes garbles your disks? When using the program, you can use the high speed poke with no change in operation except that the RAM disk will work twice as fast. Remember to go back to normal speed (POKE 65496,0) when working with any other drive.

For you hackers, here is some technical information: The RAM disk occupies virtual memory from address $60000 to $6FFFF ($0 to $FFFF for a 512K CoCo). It has 14 tracks numbered from 17 to 31, with 18 sectors per track and the directory and file allocation table on Track 17, just like a regular floppy. Sector 1 of Track 17 starts at virtual address $60000; so Sector 2 of Track 17 is at $60100; Sector three at $60200, etc. Therefore, you can modify these sectors byte by byte with the LPOKE command. The *RAMDisk* program resides in memory from $7EOO to $7F57, and hooks into the DSKCON subroutine at $C004, so you can use it from machine language by calling DSKCON just like you would in any other drive.

RAMDisk should work with all the CoCo 3 programs that play by the above rules; don't use memory from $7E00 to $7F57; don't modify the DSKCON subroutine; and don't use virtual memory. It would be perfect for programs written for the CoCo 2 running on the CoCo 3.

I'll leave you with this thought: Try to think of the RAM disk as a temporary storage device, like a variable, where you can do a large amount of work quickly and then copy your final result to floppy disk.

(Questions or comments concerning this program may be directed to the author at 3600 Falls Creed, San Antonio, TX 78230. Please include an SASE when requesting a reply.) □

Listing 1: RAMDISK

```
10 'RAMDISK.BAS
20 'COPYRIGHT (C) 1988
30 'BY DANIEL JIMENEZ
40 '3600 FALLS CREEK
50 'SAN ANTONIO, TX 78230
60 CLEAR 200,&H7DFF
70 C=0
80 FOR X=&H7E00 TO &H7F75
90 READ A$
100 A=VAL("&H"+A$)
110 C=C+A
120 POKE X,A
130 NEXT X
140 IF C<>41025 THEN PRINT"CHECK
SUM ERROR.":END
150 DEF USR0=&H7E00
160 INPUT"DRIVE NUMBER";B
170 A=USR0(B)
180 END
190 DATA 9E,72,8C,7E,7A,26,E,8E,
7F,3A
200 DATA A6,80,27,6,AD,9F,A0,2,2
0,F6
210 DATA 39,BD,B3,ED,C4,3,F7,7E,
8A,BE
220 DATA C0,4,86,7E,A7,84,CC,7E,
8C,ED
230 DATA 1,30,4,BF,7E,99,B6,FF,A
1,34
240 DATA 2,7F,FF,A1,8E,21,0,6F,8
0,8C
250 DATA 22,0,25,F9,8E,21,21,86,
FF,A7
260 DATA 80,8C,21,3C,25,F9,8E,22
,0,A7
270 DATA 80,8C,3F,FF,25,F9,35,2,
B7,FF
280 DATA A1,9E,72,BF,7E,88,8E,7E
,7A,9F
290 DATA 72,8E,7F,56,BD,7E,A,B6,
7E,8A
300 DATA 8B,30,AD,9F,A0,2,8E,7F,
73,7E
310 DATA 7E,A,12,BE,C0,4,86,7E,A
7,84
320 DATA CC,7E,8C,ED,1,7E,AB,CD,
0,0
330 DATA B6,0,EB,B1,7E,8A,27,7,3
4,76
340 DATA 86,5,7E,D7,63,34,76,F,F
0,10
350 DATA DF,0,10,CE,FE,F0,96,EA,
27,9
360 DATA 4A,27,6,4A,27,8,4A,27,3
1,10
370 DATA DE,0,35,F6,8D,52,DE,EE,
10,8E
380 DATA 1,0,FC,FF,A1,34,6,F6,7E
,8B
390 DATA F7,FF,A1,5C,F7,FF,A2,A6
,80,34
400 DATA 2,EC,61,FD,FF,A1,35,2,A
7,C0
410 DATA 31,3F,26,E5,32,62,20,CF
,8D,26
```

```
42Ø DATA DE,EE,1Ø,8E,1,Ø,FC,FF,A
1,34
43Ø DATA 6,A6,CØ,F6,7E,8B,F7,FF,
A1,5C
44Ø DATA F7,FF,A2,A7,8Ø,EC,E4,FD
,FF,A1
45Ø DATA 31,3F,26,E9,32,62,2Ø,A7
,8E,Ø
46Ø DATA Ø,96,EC,8Ø,11,27,7,3Ø,8
9,12
47Ø DATA Ø,4A,2Ø,F7,34,1Ø,96,ED,
8Ø,1
48Ø DATA 5F,E3,E1,34,2,44,44,44,
44,44
49Ø DATA B7,7E,8B,35,2,84,1F,1F,
1,3Ø
5ØØ DATA 89,2Ø,Ø,39,52,41,4D,2Ø,
44,49
51Ø DATA 53,4B,2Ø,41,4C,52,45,41
,44,59
52Ø DATA 2Ø,49,4E,53,54,41,4C,4C
,45,44
53Ø DATA 2E,Ø,52,41,4D,2Ø,44,49,
53,4B
54Ø DATA 2Ø,49,4E,53,54,41,4C,4C
,45,44
55Ø DATA 2Ø,41,53,2Ø,44,52,49,56
,45,2Ø
56Ø DATA Ø,2E,D,Ø
```

Listing 2: COPY

```
1Ø CLEAR 2ØØØ
2Ø INPUT"SOURCE DRIVE";SO
3Ø INPUT"TARGET DRIVE";OB
4Ø SC=3
5Ø FL=Ø
6Ø F=-1
7Ø IF F=Ø THEN 19Ø
8Ø DSKI$ SO,17,SC,A$(1),A$(2)
9Ø FOR X=1 TO 2
1ØØ A$=A$(X)
11Ø FOR Y=1 TO 128 STEP 32
12Ø T$=MID$(A$,Y,8)+"."+MID$(A$,
Y+8,3)
13Ø IF MID$(T$,1,1)=CHR$(255) TH
EN F=Ø:GOTO 15Ø
14Ø IF MID$(T$,1,1)<>CHR$(Ø) THE
N PRINT"COPYING ";T$:COPY T$+":"
+MID$(STR$(SO),2) TO T$+":"+MID$
(STR$(OB),2):FL=FL+1
15Ø NEXT Y
16Ø NEXT X
17Ø SC=SC+1
18Ø GOTO 7Ø
19Ø PRINT FL;"FILES COPIED."
```