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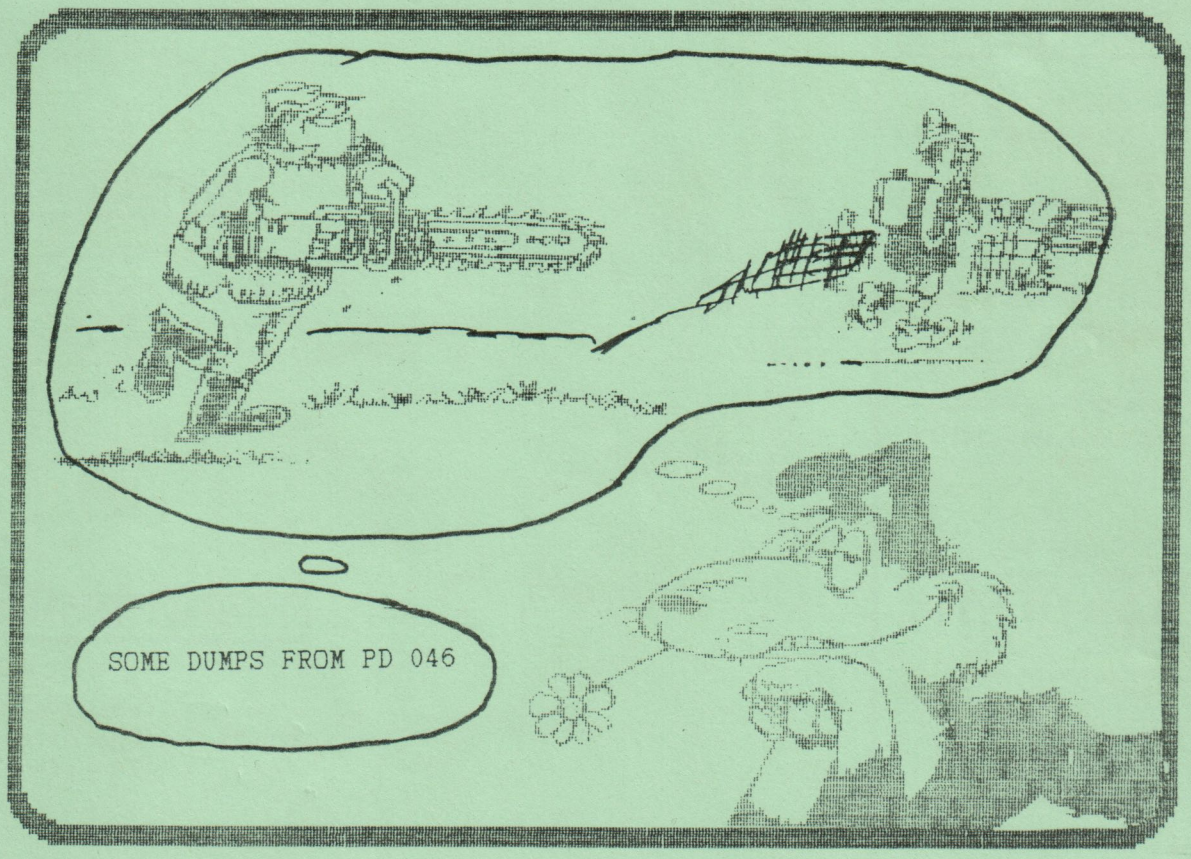
COCO LINK

The Color Computer Magazine



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Basic Animation
Graphics & Utilities

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COCO LINK

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AN IMPORTANT MESSAGE FROM THE EDITOR

From the inception of this magazineI have stated that we would not stop publication without informing our readers 6 months prior to closing down.

Although it comes hard for me to say this.....That time has arrived.

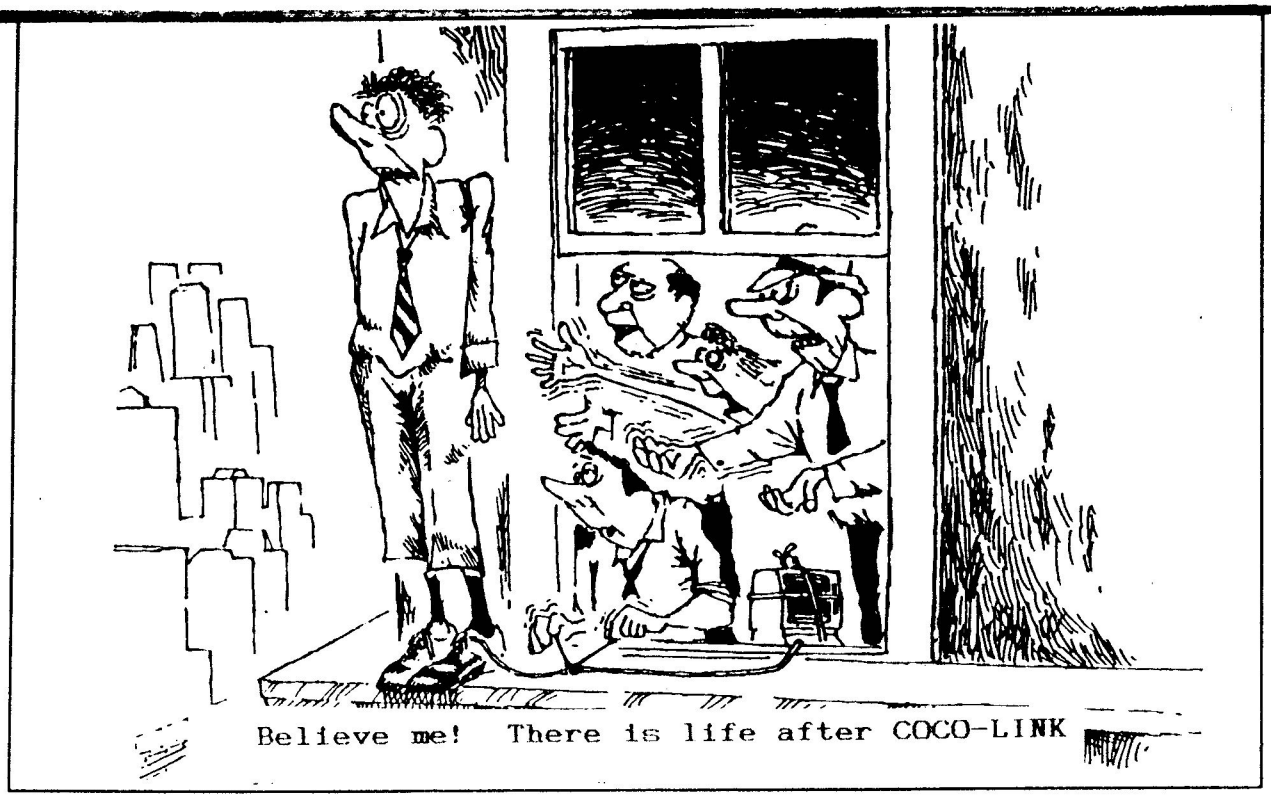
The readership of COCO-LINK over the last six months has deteriorated drastically and we now find ourselves publishing for less than 100 readers.
At the present rate of decline our readership will not be able to financially support the magazine by the end of the year.
On top of that is the fact that as our numbers decline, so do the numbers who submit publishable material. It has been getting harder each issue to come up with interesting material. This situation can only get worse.

Therefore it is with deep regret that I announce that there will only be three more issues of COCO-LINK. Our last issue will be published on December 1992.

Renewal subscriptions will only be solicited for these remaining three magazines.

Thank you for your support over the years.

ROBBIE DALZELL
Editor



CLOSING DOWN

The IMPORTANT MESSAGE on the preceding page says it all. I will not elaborate on the subject at this time except to say that the decision is irrevocable.
However, in the six months left, we would like to carry on as usual and try to give you as much information and pleasure as is possible. This includes having to read the ramblings of your editor.
So here goes.

****

PUBLIC DOMAIN DISKS

I think one of the most successful of COCO-LINK ideas has been the Public Domain Library. Although COCO-LINK makes only a small margin on these disks they have been instrumental in helping to keep the cost of COCO-LINK steady.

As long as we continue we will continue to turn out these popular disks for you. This is no small feat when you consider that most of the material in our library was submitted by COCO-LINK subscribers

All you graphics fiends are in for a feast this issue with the issue of our three graphics disks.

****

THE BIG VIRUS SCARE

Well, the big virus scare hit the Aussie PC Users with a vengeance this year what with the Michealangelo and the Malta viruses.Because of the forewarning there was not as much damage done as might have been expected, still, quite a number of institutions got hit as well as personal users. A school and the Ambulance service were the two most telling in my area. These institutions lost valuable data, some of it irreplaceable.

We, in the Coco community are lucky in that our computer seems to be free of this scourge caused by nitwits with no thought of the damage, and sometimes danger, they cause. We can count ourselves lucky.

I find it difficult to work out how someone with the programming skill to invent these viruses can't find a more productive outlet for their undoubted ability.

I can understand the mentality (or should I say lack of it) of the idiots who help to spread them. These are the sort of people who have no skill or ability of their own and are damned sure that if they can find a way to mess up things for other people with ability, they will do it. On a scale of 1 to 10 they rate a minus 4.

Here's hoping that, as these nonentities get caught, the law will actually do something about punishing them for all the damage and anguish they cause.

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DIGISCAN

This issue contains further details of Nickolas Marentes DIGISCAN
I urge you to study this article and advert carefully. This may be the last important peice of hardware to be produced for the Coco.

For those with video cameras it holds even more potential

Look it over!

****

SUBSCRIBER LIST

In these pages you will find 24 names of subscribers who would like to keep in touch with other Cocoists. in light of the decision to terminate COCO-LINK at the end of this year it may be a good idea for anyone else who would like to keep in touch to add their names to the list. The list will be published again in the December Magazine. So, if you want to be on it, get in touch.

****

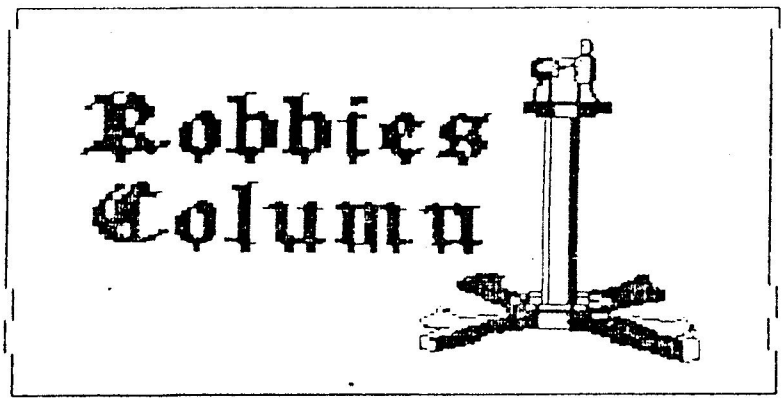
STOP PRESS

I would like to thank all those who sent in graphics submissions for this issue but haven't seen their efforts rewarded here.

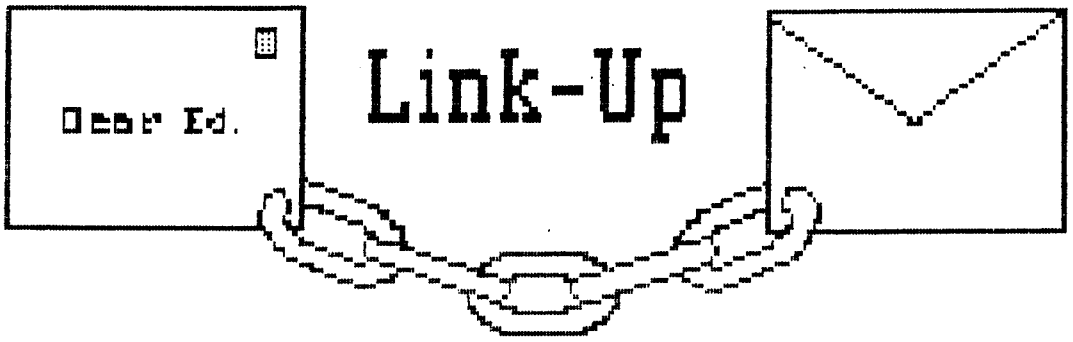
I have enough material to make up another two graphics disks but run out of the time to do it. We will find the time at a later date and will be happy to present you with another two disks for the library.

It will give something to look forward to.

****



Robbie



Dear Ed,
Although I have mixed feelings about it, I would like to be included in your subscriber listing.
Let me explain; like you, I am a little worried that some people might by-pass COCO-LINK when they write to each other. There will be parts of the letters which would be suitable for inclusion in the magazine. Letters/questions from other readers have been the inspiration for some of my articles.
I wonder if the people who are interested in being on the list, have any idea what could be in store for them?
Let me use someone else's words:-

Help a man when he is in trouble, and he will remember you when he is in trouble again.

There are some ungrateful people in the computer world; sometimes when I had gone to a lot of trouble to find and send programs/information, I would not even get a word of acknowledgement from the recipient.
I read something the other day which is helping me come to terms with that situation:-
Never attribute to malice that which is adequately explained by stupidity(!!!!) (or ignorance).

Not everyone in the computer world is ungrateful, stupid or ignorant. I would be pretty stupid myself to be still prepared to answer letters if there were no "decent" people around!

We know that Robbie has an IBM compatible computer. You know that I have a Tandy 1000HX. I know of at least two other COCO-LINK subscribers who own compatibles. Confession time... how many of you have compatibles?
Do we want COCO-LINK to be more than a CoCo magazine? Robbie has enough to do, so it might be best if you send your answers and ideas to me. I will pass the information in condensed form, to Robbie.

My address is:- Johanna Vagg.
9 Belah Street,
FORBES. NSW 2871
If you would like a personal reply to your letter, please include a stamped self addressed envelope.

I would like to reply to the two main thrusts of your letter, Johanna.
Firstly, I have long been in the situation of posting, phoning and verbally passing on information to other Cocoists. In a large number of cases I have received no notification that the information etc. was of any use. normally in these cases a reply comes when the information has not been of help. Mainly I receive a thank you note for my time spent regardless of the outcome. Those people who do not go to the bother of replying or acknowledging I generally think of as people who are just a little unthinking. I feel that "ignorant" and "stupid" are a bit strong.
Regarding expanding COCO-LINK to cover IBM Compatibles, there has never been, and never will be, any move in this direction.
In fact, you will see from the "AN IMPORTANT MESSAGE FROM THE EDITOR" elswhere in this magazine that COCO-LINK has just about run it's race. We set the ground rules for publication right at the start and I am afraid that we have now reached the cutoff point.

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Dear Ed,
I noted in your column that you have an interest in MIDI music. I am interested in any material you may be able to publish.
I gave my 12 year old son a Yamaha PSR500 keyboard for Christmas. We both think this is a marvellous synthesiser which will satisfy his needs for some time. We started to read about the MIDI interface, and wondered about its usefulness. Then I saw an advertisement in the February issue of COCO-LINK for Australian Peripheral Development. After reading some reviews in THE RAINBOW I rang A.P.D. and ordered COCO MIDI 3, a software and MIDI interface package. Later I ordered LYRA, a program which is compatible with CM3, and LYRA COMPANION, a book which will help our use of the program.
My son (and I) have had much pleasure using these programs, and discovering all the effects his synthesiser can produce (Flight of the Bumble Bee as a drum solo???). Now we are trying to learn about MIDI messages, but this is not a simple task.
I realise this topic has limited appeal, but any knowledge you may have on this topic, will be welcomed.
David Morton. Condobolin NSW

This letter shows that there are still new and exciting things you can do on your Coco.
In these last few months of this magazine I would like you all to let everyone know what subjects can be followed on the Coco to keep ones interest.
I invite anyone who has a knowledge of MIDI on the Coco to write an articlefor the education of other Cocoists on this subject.

****

Dear Ed,
Thank you for sending COCO-LINK. Our Club les COCOphiles, has lost many members to IBM Compatibles. We are now about a dozen members. To compensate for this our BBS service has gone Network. We have joined other Montrteal BBS to correspond.
On top of this we have joined United States BBS Networks. This without long distance telephone charges. To do this, all correspondence is stored on disk at our BBS Headquarters, and at night the computer automatically sends all correspondence to New York, and we receive their correspondence in a matter of minutes. I have recently had the chance to correspond with the U.S.A. in French, Spanish and a bit in English.
One of COCO-LINK's readers asks about a COCO Data Base, as far as I am concerned the OS9 DATA MASTER is the best; it can easily handle 500 files without slowing much of its operation.

Armand Belanger. Quebec. Canada.

Modems, networks and Telecomunications are all possible on your Coco. It may not be fully understood that Coco using a modem and suitable telecomunications software can access Viatel and any other Bulletin Board whether they are run for IBM compats or not.
This is another subject that can enhance your use of the Coco. We will have an article in the next issue which will help to clarify the subject a bit more.

****

Dear Ed,
I am most of the way through a file archiving program for COCO (along the lines of LHARC and ZIP for MS-DOS and AR for OS9), but with menu set. I would like to complete it for use on one of your PD disks. This would help to pack a lot more on the disks.
It uses the LZW compression compression procedure for compressing files, which gives a pretty good compression ratio, (same as LHARC and ZIP, but with a smaller code size). I finally got my own LZW compression to work with IBM (for GIF files), and have converted this for the CoCo.
I am still playing around with the Multiple file bits, and this is taking some time. Have set it up to spread the compressed file over multiple disks. Like MS-DOS BACKUP, but with ability to extract files from any disk in series, and this is adding a bit to the complexity.

I have also tried a hard disc on the CoCo using the Distro 4-in-1 controller card. I have got it working OK under OS9; it is a 20meg drive which gives hex 3880 sectors free after format. However I am not fussed about OS9 and really want it to work under RS DOS. I also got RGB DOS, but as yet haven't been able to get it to work with the hard disk. Any assistance from other readers much appreciated. I see some tedious work in front of me to try to get it working.

Some information on the hard disk. It is a Rodime 652 hard drive; out of an Apple MacIntosh. A simple cable connection (34 wire) from distro 4-in-1, to both ends of the 50 pin connector in the hard drive, and away under OS9. No sweat, no problems. Can only wish it had done the same under RGB DOS, but no such luck.
A word of warning; not all MAC hard drives will work; I also tried a Miniscribe which is freely interchangable with the Rodimes as far as the MAC is concerned, but the Miniscribe won't do. As a possible indication the ADAPTEC didn't record the ident on the ADAPTEC chip in the Miniscribe, but it was not the same.

Assuming I get the thing to work under RGB DOS; I will let you know what is involved.
My intention is to have the File Archiver work with the hard disk, for automatic backup of files will have date stamp on directory along lines of B-DOS.

George McLintock Narrabundah ACT

Thank you again George for this information. This should help those who are considering upgrading to a harddisk. We all look forward to your Archiving project's completion.

****

Dear Ed,
I would like your readers to know that I would be pleased to help with BASIC, communication (modem, software etc) and hardware problems.
I would also like to confirm that my BBs (Peninsula Color Computer Club BBS) and our club of the same name is still alive and kicking. I can be contacted between 6.00pm and 9.30pm for voice and 9.30pm to 7.00am for my BBS.

I have done some calling around and confirmed which BBS's are still supporting the Coco. Unfortunately this list is getting smaller but what remains is good quality! The confirmed list is as follows:

Decadence BBS.....03-794-7949
Happy Hacking.....059-75-3233
J&M Systems BBS.....02-749-1935
Peninsular BBS.....059-77-3326
Peninsula CCC BBS.....03-580-4605 21.30 - 07.00

Continued on page 11

Better Basic.....Part 21

In October 1988 I was asked if it was possible to animate drawings on the CoCo2. I mentioned the obvious GET and PUT but that was met with a frown. I went on to explain 'screen switching', but that was not good enough either -not even when I said that it was possible to 'PCLEAR' more than 8 pages (or 2 PMODE4 screens) on a CoCo with more than 16K.

I had already 'explored' LO-RES animation during 1985 and 1986, but I got the feeling that the person who asked the question was not really interested in the answers I could give him. I am bringing this up because if I had felt that the person asking the question was genuine, it probably wouldn't have taken me 3 years to write a program to demonstrate the other method which came to mind: PCOPY.

Keiran Kenny - one of my penfriends - has shown an interest in animation in his recent letters. When I saw his 'Get Acquainted with PCOPY' in the October/November 1991 issue of CoCoLink, I decided to try my hand at animation using PCOPY. JUST4FUN is the result.

I would also like to demonstrate screen switching. The first program I have for you is SWITCH. It is part of the NEW HAT program which I wrote in 1987. SWITCH switches between 2 PMODE3 screens. A PMODE3 or PMODE4 screen is made up of 4 'pages'. One page, in HIRES terms, is 1536 bytes.

SWITCH is suitable for all CoCos - including the 16K. It has a PCLEAR8. It can run without the PCLEAR8 if you change to PMODE1,1 and PMODE1,3. PMODE1 screens are made up of 2 'pages' each.

Another program - SWITCH8 - is also suitable for all CoCos. It switches between 8 PMODE0 screens. Each PMODE0 screen is only 1536 bytes, or one page. SWITCH8 is not a very exciting program - it is a demo of what can be done. It contains two DRAWstrings for you to try. Take the REM marker out of line 110 and put one in line 100 to see the second drawing.

The third program is the main one. I called it JUST4FUN. It uses 12 graphics pages, or 3 PMODE4 screens. I was able to 'PCLEAR12' with the help of a formula by Bob Delbourgo. It was in January 1984 Australian Rainbow (and the American October 1983 issue). The formula (for tape) is:

```
POKE(N+1)*1536,0:POKE25,(N+1)*6:NEW
```

where N equals the number of graphic pages to be PLEARed. The bad news is that this does not work on a 16K CoCo. The good news is that I have a version of JUST4FUN for the 16K CoCo.

I don't think there were many disk drives in January 1984. I assume that for a disk system, I need to add 8 to the number to be POKEd into 25 because for a PCLEAR0, we POKE25,6 for tape; and POKE25,14 for disk. After about a week of 'fiddling' with my program and the POKEs, I

assume that I should also add 2048 to the first address. For a PCLEAR12 on my disk system, I POKE22016,0:POKE25,86. For tape, you should use POKE19968,0:POKE25,78.
Bob said that 20 pages was the maximum (for tape). This means 5 PMODE4/3 screens, or 10 PMODE2/1 screens, or 20 PMODE0 screens! In April 1985 CoCo, Tino Delbourgo showed that if you had 64K, you could release a further 21 pages (with a different routine). Think of the possibilities!

A 'PCLEAR18' (with disk) does not leave enough memory for JUST4FUN. The more pages you want, the less room there is for the program, but, you can do your drawings - without the POKEs - on the first screen and save them as machine language files. Then you can PCLEAR by POKEing, and then OFFSET LOAD the pictures into the different screen areas. This way you will only need enough memory for the actual animation. If you need more help with saving in machine language and offset loading, then please write to me. If I get enough letters, I will elaborate in another article. If you would like a personal reply, please include a stamped, self addressed envelope.

I am not artistic so I did not do the drawings myself. I have used my son's TV and stick figure, and I chose a rabbit and a bird by Lauren Brown. As Richard and Lauren put the drawings into DRAWstrings, it was easy to extract them from longer programs and place them on the screen wherever I wanted them.
In JUST4FUN the bird is drawn on the first PMODE4 screen - PMODE4,1. Then the 1st page (top quarter of the PMODE4 screen) is PCOPYed to the first page of the third PMODE4 screen - PMODE4,9. After the first screen is cleared, the bird is drawn again in a different screen position. That bird is then PCOPYed to page 2 of the third screen. This is repeated to page 3 and page 4. It is done in a loop - LINES 60 to 170.
Next, the rabbits, the TV and the stick figures are drawn. If you want to watch the drawing, insert SCREEN1,1 after PMODE4,1 in line 180. The pages are copied onto the second PMODE4 screen. The animation starts at line 470 - you should see four rabbits moving around while they are watching a stick figure jumping up and down on a TV screen. You should also see a bird flying across the screen... if you imagine he/she is flapping his/her wings!

If you would like to look at the second and third PMODE4 screens, press BREAK, then POKE359,57 and type PMODE4,5:SCREEN1. While you are still looking at the screen, you can type PMODE4,9:SCREEN1. To get out of this type POKE359,126.
There is another way to look at the screens. Leave out the POKE to 359 and just type:

```
PMODE4,5:SCREEN1:EXEC44539   or
PMODE4,9:SCREEN1:EXEC44539
```

When you press a key you will be returned to SCREEN0.

FUN16K is the 16K version of JUST4FUN. The only thing missing is the bird. It is such a nice bird, that you should look at it... you could even move it with GET and PUT.

To get the 16K version, change the DIM in line 10 to PCLEAR8 and leave out lines 30 to 180. Also leave out lines 470, 510, and 560 to 590. Then add 560 GOTO 480.

As I said, the bird is such a nice bird... the rabbit is also such a nice rabbit, that I have converted both of them to 'direct to printer' pictures. These are for Tandy printers. Use them to 'dress up' your letters.
These will appear in the next issue of COCO-LINK.

As I mentioned, I had already explored LO-RES animation in 1985/86. The program I wrote in 1986 is SKIPPING. It is submitted not as a great colour cartoon, but as proof that LO-RES animation is possible fairly simply. It consists of only two pictures POKEd to five 'pages', which are then 'flipped'. Many more pages are available.

When I wrote this in 1986, my kids were involved in JUMP ROPE for HEART. During Education Week Year 6 put on a display of skipping routines. This program shows two types of skipping. First I POKEd the two pictures (largely the same) on to the 'ordinary' screen, or page 2. Each page in LO-RES terms is 512 bytes long, ie one screen of LO-RES characters. Page 0 takes the first 512 bytes, ie 0 to 511; page 1 takes from 512 to 1023; and page 2 - the one we normally use - 1024 to 1535. This takes us to 1536 for the start of graphics on a tape-based CoCo.
Use the PRINT@ locations to draw your picture. To POKE on to page 2, POKE to the PRINT@ position + 1024. To POKE to another page, add 512 for each page. To put the whole picture higher on the screen, subtract 32 for each line; to put it lower, add 32 per line. To move sideways, add or subtract 2 or 3.
So in SKIPPING, I POKEd to pages 9 through 13. The girl is placed in four different positions, but only in two different poses. Then the program flips pages 9 and 10 several times, then it flips through pages 10 to 13 inclusive.

This article is about the CoCo2. The programs work on a CoCo3, but there are additional methods available. Hopefully, if enough interest is shown, I will submit some material on this aspect of animation on the Coco.

Continued overleaf

```
1 'SCREEN SWITCHING DEMO
   BY JOHANNA VAGG
   9 BELAH STREET FORBES 2871
5 'THIS COULD BE DONE WITHOUT
   THE PCLEAR8 BY USING
   PMODE1,1 AND PMODE1,3
10 CLS
11 PRINT@358,"DRAWING THE HATS..
..";
12 PRINT@488,"BY JOHANNA VAGG";
13 PCLEAR8'2 PMODE3 PAGES
14 'C=COLOR:S=SCREEN
   R1 ETC=RADII:X,X2 ETC=CENTRES
15 DL=300:C=0:S=0:R1=50:R2=25:R3
=70:R4=35:X=178:X2=77:Y=58:Y2=13
4
16 PMODE3:PCLS
17 FORR=1TOR1 STEP4
18 CIRCLE(X,Y),R,C,.2,.84,.68
19 NEXT
20 FOR R=1TOR2
21 CIRCLE(X,Y),R,C,2,.5,1
22 NEXT
23 CIRCLE(X2,Y2),R3,C,.2,.84,.68
24 CIRCLE(X2,Y2),R4,C,2,.5,1
25 PAINT(X2,Y2),C+2,C
26 PMODE3,5:PCLS'SECOND PAGE
27 CIRCLE(X2,Y),R1,C,.2,.84,.68
28 CIRCLE(X2,Y),R2,C,2,.5,1
29 PAINT(X2,Y),C+2,C
30 FORR=1 TO R3 STEP4:CIRCLE(X,Y
2),R,C,.2,.84,.68:NEXT
31 FORR=1TOR4:CIRCLE(X,Y2),R,C,2
,.5,1:NEXT
33 PMODE3:SCREEN1,S'FIRST PAGE
34 FOR T=1 TO DL:NEXT
35 PMODE3,5:SCREEN1,S'2ND PAGE
36 FOR T=1 TO DL:NEXT
37 DL=DL-25
38 IF DL<100 THEN DL=300
39 GOTO 33
```

```
5 'FOR ANY COCO
10 'PMODE0 SCREEN SWITCHING DEMO
     BY JOHANNA VAGG
        9 BELAH STREET
        FORBES NSW 2871
15 'TAKE THE REM MARKER OUT OF
    LINE 110 AND PUT ONE IN LINE
    100 FOR A DIFFERENT STRING
20 PCLEAR8:CLS
30 JM=70
40 TV$="R17D10L17U10H1R17F1H1L17
D10F1;BM+1,-1;U8R11D8L11;BM+12,+
0;R3U8L3D8BE1BURULDBU2RULDBU2RUL
D"
50 A$="E4R4F4D4G4L4H4U4"
60 FOR S=4 TO 32 STEP 4
70 X=S*3:Y=S*3
80 DRAW"S=S;"
90 PMODE0,S/4:PCLS
100 DRAW "BM=X;,=Y;"+A$
110 'DRAW"BM=X;,=Y;"+TV$
120 NEXT
130 FOR J=1 TO 8
140 PMODE0,J:SCREEN1,1
150 FOR JV=1 TO JM:NEXT
160 NEXT
170 FOR J=8 TO 1 STEP-1
180 PMODE0,J:SCREEN1
190 FOR JV=1 TO JM:NEXT
200 NEXT
210 GOTO 130
```

```
0 'PCOPY ANIMATION DEMONSTRATION
          BY JOHANNA VAGG
5 'GRAPHICS BY LAUREN BROWN
   AND RICHARD VAGG
7 'REMEMBER TO PCLEAR12 FIRST
  WITH POKE22016,0:POKE25,86 FOR
  DISK AND POKE19968,0:POKE25,78
  FOR TAPE
8 'PCLEAR12 WILL NOT WORK ON A
   16K COCO
9 'SEE ARTICLE FOR ADJUSTMENTS
   FOR 16K VERSION
10 DIMK(65):CLS:PRINT:PRINT"PATI
ENCE PLEASE...."
20 PMODE4,1:PCLS1:COLOR0,1
30 GET(0,0)-(63,40),K
40 TT=9
50 Y=20
60 FOR X=30 TO 254 STEP 66
70 B1$="BM=X;,=Y;"
80 BA$="M-3,-2L3M-4,-3M-3,-4M-2,
-10LM-1,+3D4M+1,+2BM-1,-2LDM+3,+
5BM-2,-2D2F4BH2D3M+2,+3E2M+2,-1M
+3,-1BM-7,+4G5M-4,-3M+1,+3M-4,-3
M-5,-1F4L5M+6,+3M-5,+2M+5,+1M+7,
-1R3"
90 BB$="M+6,-1M+1,+2M+3,+1M+2,-1
BR3L2UEM-2,-1M+1,-2L2UE2BM+5,+2G
2FR2M-1,+2RM+2,-1BL21BDM+2,+1F2M
+3,+1M+4,+1R2M+3,-1M+4,-2E2BGM+2
,+1E2M+1,-2BM-1,+2R2E5M+4,-7M-4,
+3M-5,+3L4M-4,-2"
100 BC$="BM+2,-1HM+1,-2M+2,-1M-4
,-2M-1,-2M+1,-2M+2,-1BF3LDRUBM-1
,+11M+4,-3M+2,-4U4M+3,+1M-2,+1M+
2,+1M-3,+1BU4M-2,-4M-4,-3M-4,-1M
-4,+1M-4,+3M-2,+4D3"
110 DRAW B1$+BA$
120 DRAW BB$
```

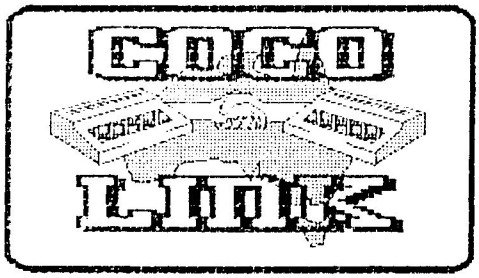
```
130 DRAW BC$
140 PCOPY 1 TO TT
150 PCLS
160 TT=TT+1
170 NEXT
180 PMODE4,1:COLOR0,1
190 'RABBIT
200 R1$="BM99,154"
210 R2$="BM109,100"
220 R3$="BM140,150"
230 R4$="BM190,110"
240 RA$="L3M-3,+1G2M-1,+3D3M-4,+
2M-4,+4M-1,+2FR4E5M+2,-4BM+1,+2M
-3,+4G3D2BM+8,-11M-1,+4M-1,+5M-1
,+3M-2,+1 L3M-2,-1U3BLG2M-1,+2D3
M-2,+1D2M+2,+1R2EU2M-2,-1LBM+2,+
4M+3,+2R3M+3,-1M+4,-2"
250 RB$="R2M+2,+1M-1,+2M-7,+2L2H
UBM+7,-3M+2,-1M+1,-2M-1,-2M-2,-1
LM-2,+1BM+6,+2M+2,+1R2EUM-1,-2M-
3,-2M-2,-3BM+2,+3M+1,-2U3H2M-1,-
2BM+1,+2R2M+2,-1M+2,-3U2RULDBUM-
1,-2H3M-3,-1BM+3,+5DRUL"
260 DRAW R1$+RA$
270 DRAW RB$
280 DRAW R2$+RA$
290 DRAW RB$
300 DRAW R3$+RA$
310 DRAW RB$
320 DRAW R4$+RA$
330 DRAW RB$
340 TV$="R17D10L17U10H1R17F1H1L1
7D10F1;BM+1,-1;U8R11D8L11;BM+12,
+0;R3U8L3D8BE1BURULDBU2RULDBU2RU
LD"
350 F$="S8RDLUD2G3E3F3H3D3G3E3F3
360 F2$="RDLUD3L2D2U2R2D3U3R2D2U
2L2D3LD3U3R2D3
370 DRAW"BM175,54S16"+TV$
380 DRAW"BM200,64"+F$
390 PMODE4,5:PCLS1
400 PCOPY 2 TO 5
410 PCOPY 6 TO 2:PMODE4,1:COLOR0
,1
420 DRAW"BM175,54S16"+TV$
430 DRAW"BM 200,70S8"+F2$
440 PCOPY 2 TO 6
450 PCOPY 3 TO 7:PCOPY 4 TO 8
460 PMODE4,1:SCREEN1,1
470 FOR JV=9 TO 12
480 JM=RND(2)+4
490 RV=RND(2)+6
500 KK=RND(2)+6
510 PCOPY JV TO 1
520 PCOPY JM TO 2
530 PCOPY RV TO 3
540 PCOPY KK TO 4
550 FOR AW=1 TO 50:NEXT
560 NEXT
570 PUT(192,0)-(255,40),K
580 FOR AW=1 TO 250:NEXT
590 GOTO 470
```

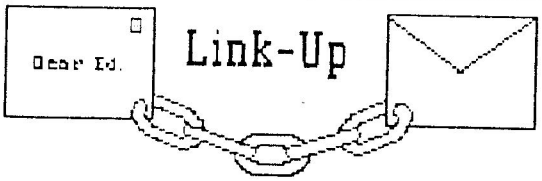
```
0 'PCOPY ANIMATION DEMONSTRATION
        BY JOHANNA VAGG
5 'GRAPHICS BY LAUREN BROWN
   AND RICHARD VAGG
7 'REMEMBER TO PCLEAR12 FIRST
  WITH POKE22016,0:POKE25,86 FOR
  DISK AND POKE19968,0:POKE25,78
  FOR TAPE
8 'PCLEAR12 WILL NOT WORK ON A
   16K COCO
9 'SEE ARTICLE FOR ADJUSTMENTS
   FOR 16K VERSION
10 PCLEAR8:CLS:PRINT:PRINT"PATIE
NCE PLEASE...."
20 PMODE4,1:PCLS1:COLOR0,1
190 'RABBIT
200 R1$="BM99,154"
210 R2$="BM109,100"
220 R3$="BM140,150"
230 R4$="BM190,110"
240 RA$="L3M-3,+1G2M-1,+3D3M-4,+
2M-4,+4M-1,+2FR4E5M+2,-4BM+1,+2M
-3,+4G3D2BM+8,-11M-1,+4M-1,+5M-1
,+3M-2,+1 L3M-2,-1U3BLG2M-1,+2D3
M-2,+1D2M+2,+1R2EU2M-2,-1LBM+2,+
4M+3,+2R3M+3,-1M+4,-2"
250 RB$="R2M+2,+1M-1,+2M-7,+2L2H
UBM+7,-3M+2,-1M+1,-2M-1,-2M-2,-1
LM-2,+1BM+6,+2M+2,+1R2EUM-1,-2M-
3,-2M-2,-3BM+2,+3M+1,-2U3H2M-1,-
2BM+1,+2R2M+2,-1M+2,-3U2RULDBUM-
1,-2H3M-3,-1BM+3,+5DRUL"
260 DRAW R1$+RA$
270 DRAW RB$
280 DRAW R2$+RA$
290 DRAW RB$
300 DRAW R3$+RA$
310 DRAW RB$
320 DRAW R4$+RA$
330 DRAW RB$
340 TV$="R17D10L17U10H1R17F1H1L1
7D10F1;BM+1,-1;U8R11D8L11;BM+12,
+0;R3U8L3D8BE1BURULDBU2RULDBU2RU
LD"
350 F$="S8RDLUD2G3E3F3H3D3G3E3F3
360 F2$="RDLUD3L2D2U2R2D3U3R2D2U
2L2D3LD3U3R2D3
370 DRAW"BM175,54S16"+TV$
380 DRAW"BM200,64"+F$
390 PMODE4,5:PCLS1
```

```
400 PCOPY 2 TO 5
410 PCOPY 6 TO 2:PMODE4,1:COLOR0
,1
420 DRAW"BM175,54S16"+TV$
430 DRAW"BM 200,70S8"+F2$
440 PCOPY 2 TO 6
450 PCOPY 3 TO 7:PCOPY 4 TO 8
460 PMODE4,1:SCREEN1,1
480 JM=RND(2)+4
490 RV=RND(2)+6
500 KK=RND(2)+6
520 PCOPY JM TO 2
530 PCOPY RV TO 3
540 PCOPY KK TO 4
550 FOR AW=1 TO 50:NEXT
560 GOTO 480
```

```
10 '****JOHANNA VAGG
    ****9 BELAH STREET
    ****FORBES NSW 2871
30 'ANIMATE:THIS ONLY TAKES FIVE
LO-RES PAGES.     MANY MORE ARE
AVAILABLE.  SEE NOVEMBER 1985
COCO...ARTICLE WRONGLY NAMED HI-
RES ANIMATION.
40 CLS2:PRINT@230,"jump rope for
 heart";
50 PRINT@392,"HANG ON A TICK";
60 ' PAGEFLIP ROUTINE
     THANKS AGAIN TINO
65 ' FLIP ROUTINE CAN BE MOVED
     UP 16K FOR 32K MACHINES
70 CLEAR200,16376:FORI=1TO7:READ
B$:POKEI+16376,VAL("&H"+B$):NEXT
I:DEFUSR0=16377:DATABD,B3,ED,44,
7E,96,0F
80 'BLACKEN THE FIVE PAGES
90 FOR X=4608 TO 7167:POKEX,128:
NEXT
100 PRINT@458,"NOT QUITE";
110 FOR X=1 TO 83
120 READA,B
130 'POKE FIRST PICTURE
140 POKE9*512-64+A,B
150 'ALSO POKE THE THIRD PICTURE
160 POKE11*512-62+A,B
170 'ALSO POKE THE FIFTH PICTURE
180 POKE13*512-62+A,B
190 NEXT
200 PRINT" FINISHED";
210 DATA 144,243,145,243,176,239
,177,239,206,131,207,131,208,135
,209,139,210,131,211,131
220 DATA 236,131,237,140,238,143
,239,143,240,143,241,143,242,143
,243,143
230 DATA 297,236,266,131,267,140
240 DATA 244,140,245,131,278,140
,279,131,312,236,270,132,271,143
,272,143,273,143,274,143,275,136
250 DATA 303,183,304,191,305,191
,306,187,334,183,335,191,336,191
,337,191,338,191,339,187,365,181
,366,191,367,191,368,191,369,191
,370,191,371,191,372,186,399,229
,400,234,401,229,402,234
260 DATA 431,229,432,234,433,229
,434,234,463,199,464,203,465,199
,466,203
270 DATA 296,149,329,154,361,149
,394,153,427,153,460,153,493,153
,494,147,495,147,496,147,497,147
,498,147,498,147,499,147,500,150
280 DATA 469,150,438,150,407,150
,376,154,344,149,313,154
290 FOR X=1 TO 78
300 READA,B
310 'POKE SECOND PICTURE
320 POKE10*512+32+A,B
330 'AND THE FOURTH
340 POKE12*512+36+A,B
350 NEXT
360 DATA 47,147,48,147,49,147,50
,147,77,147,78,156,83,156,84,147
,108,150,117,153
370 DATA 139,150,144,243,145,243
,150,153,170,150,176,239,177,239
,183,153,201,149,206,131,207,131
,208,135,209,139,210,131,211,131
,216,154
380 DATA 233,228,234,140,235,140
,236,140,237,140,238,143,239,143
,240,143,241,143,242,143,243,143
390 DATA 244,140,245,140,246,140
,247,140,248,232,270,132,271,143
,272,143,273,143,274,143,275,136
400 DATA 303,183,304,191,305,191
,306,187,334,183,335,191,336,191
,337,191,338,191,339,187,365,181
,366,191,367,191,368,191,369,191
,370,191,371,191,372,186,399,229
,400,234,401,229,402,234
410 DATA 431,229,432,234,433,229
,434,234,463,199,464,203,465,199
,466,203
420 'FLIP THE FIRST AND SECOND
     PICTURES (PAGES 9 AND 10)
430 TM=200
440 FORK=4608 TO 5120 STEP512:A=
USR0(K)
450 FORT=1 TO TM:NEXT
460 NEXT
470 TM=TM-10
480 IF TM<50 THEN 510
490 GOTO440
500 'FLIP PAGES 10 THROUGH 13
```

```
    (2ND, 3RD, 4TH AND 5TH PICS)
510 TM=180
520 FORK=5120 TO 6656 STEP512:A=
USR0(K)
530 FOR T=1 TO TM:NEXT
540 NEXT
570 GOTO520
580 REM ONCE THE PICTURES HAVE
BEEN POKED YOU NEED ONLY RUN THE
PAGE FLIP SECTION TO SEE THE
SKIPPING AGAIN.
```





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1200 baud only

Stan Blazejewski Parkdale Vic.

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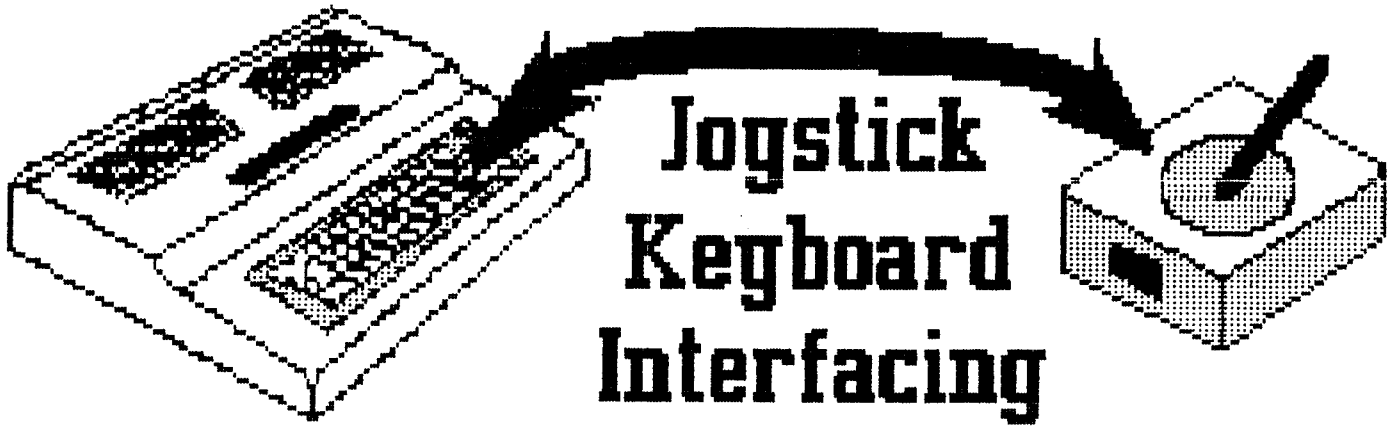


Joystick Keyboard Interfacing

By George McLintock

The comment by Richard Schmidt in his text with Solitaire (CoCo Link Feb 92) on how the joystick routines slow down the game, reminded me of an approach I've used to overcome a similar problem. It uses some ML routines to speed things up a bit.
The general approach is based on the fact that you normally want a value from the joystick or keyboard which you then use in an ON VAL GOSUB instruction to take some action. The actions are normally associated with a direction (arrow keys) and event (fire button/spacebar). The ML routines here allow you to use a main control loop like

```
50 EXEC M 'Read keyboard/joystick
60 ON A GOSUB 100,200,300,400,500
70 GOTO 50
```

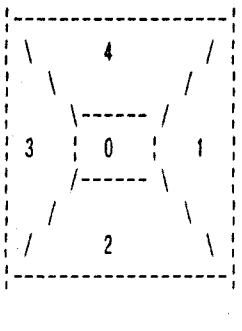
The code at 500 handles the fire button / spacebar, while the routines at 100 - 400 handle the 4 arrow keys / joystick positions. This is provided by the JOY4 routine. A similar routine, JOY8, provides 8 directions from the joystick, with the shift arrow keys providing the extra 4 directions from the keyboard.

As usual with these things, an initial set up of the ML routines and selected parameters is required at the start of the program. But once set up, it provides a quick response to any input, and automatically accepts input from either a joystick or the keyboard. The ML routine sets the value of the variable A to what is required for the ON GOSUB instruction. It incorporates the INKEY$ and INSTR instructions for the keyboard, and the JOYSTK and IF tests for reading the joystick.
The ML routines are provided as DATA statements to be poked into memory. They are relocatable and can be put anywhere. They will fit in the cassette buffer and that is where the example programs put them. If you want to put them elsewhere, just change the value of BF. (Start of routine in memory)

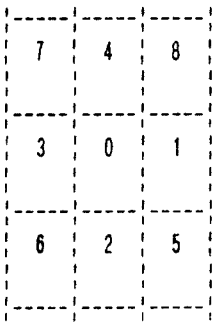
A word about the variable 'A'. This MUST be the first simple variable defined in the program (It can have any name). ie immediately after any CLEAR or PLEAR command, use A=0. The ML routines find it from its offset from location 27. This is one way of avoiding the need to pass a parameter to a ML routine.

Reading a joystick requires two parameters to specify the 'dead' area at the centre that is regarded as 'no movement'. ie the central point is around 32,32 but you need a margin of around plus and minus 10 to allow for variations. This can be expressed as from 22 to 42 in both directions. The parameters to specify these two values are held at BF+0 (low value) and BF+1 (high value). The default for both ML routines are 21 and 42, but can be altered by pokes.

Values returned by JOY4 are



JOY8 are



In both cases the 'centre area' of zero is between 21,21 and 42,42. In JOY4 you can vary this quite a bit without problems, but with JOY8 the areas for each number returned will change with the dead area. The value for

button pressed / spacebar is 5 for JOY4 and 9 for JOY8.

If you don't have a joystick physically attached to your machine, reading values from the port will return approx 0,0 (Val 7 for JOY8). To allow this to be bypassed, poke any non-zero value into BF+2 to bypass reading the joysticks. It must be zero to read them. In use, the joystick is read first. If it returns a non-zero parameter, the keyboard is not read.

The parameter values returned from the keyboard are set up by a table starting at BF+3. These are the key scan codes in descending order from the top. ie the value at BF+3 is 32 (Hex 20), which is the code returned by the spacebar. If you want to replace it with the 'F' key for 'fire' then poke BF+3,70. Where 70 is the scan code for 'F'. For JOY8, the shift arrow values come next if you want to change these as well. The general logic for JOY8 is that the arrow keys are the same as for JOY4, with the shift arrow keys rotated 45 degrees. As there are two shift keys on the CoCo keyboard, you can chose to do the extra four directions as a one or two handed operation. As the keys are offset on the keyboard, there is no convenient grouping of 9 keys to give all 8 directions as you get with the numeric keypad on an IBM.

There is another table starting immediately after the key scan one, which contains the byte values required to define the floating point numbers that can be returned. (two bytes each is sufficient). Because of the limited number of possible values, the integer floating point conversion is done by table lookup.
The entry point for the ML code follows immediately after this second table. It is different for the two routines because of the different table sizes. These routines were done as two separate programs and I've left them that way. If I was doing it now I would probably combine them into a single program. It doesn't really make much difference.

A point to note with using the ROM POLCAT routine (get character from keyboard) in this way is that you have to allow for Basic's 'check break' routine which is executed after each instruction. The check break resets the keyboard switches and stores any key press at Hex 87. The bit of code in these routines show how this is done. It follows Basic's INKEY$ routine.

With JOY8, you may get a 'wrong' value as you move from the zero zone to a corner zone (eg 5). You can avoid this by reading the value twice to ensure it remains the same. eg replace line 50 with

```
50 EXEC M: T=A: EXEC M: IF T <> A THAN 50
```

This form is restricted to joystick only. The routine uses POLCAT to read the keyboard, so this form of line 50 would hang on keyboard input.

The ML routines read the 'first' joystick. This seems to have changed from 'left' to 'right' (as marked on the case) over the life of the CoCo. It is the one read by JOYSTK(0)

```
10 'DEMO JOY 4 - BY GEORGE MCLIN
TOCK
20 A=0:GOSUB 2000
30 CLS:PRINT "DEMONSTRATION OF R
OUTINE TO READ EITHER JOYSTICK O
R KEYBOARD"
40 PRINT:PRINT "USES 4 ARROW KEY
S & SPACE BAR   FOR BUTTON"
50 PRINT"WRITTEN FOR 32 COL SCN"
60 INPUT "PRESS ENTER TO CONTINU
E";A:WIDTH 32:CLS:PRINT@12*32,"P
RESS ARROW KEY OR MOVE JOYSTICK"
:IF JS<>0 THEN PRINT "JOYSTICK N
OT PRESENT"
70 '
80 EXEC M: ON A GOSUB 100,200,30
0,400,500
90 GOTO 80
95 '
100 PRINT@A*32+2,"RIGHT ARROW OR
 JOYSTICK 90 DEG"
110 IF A<>T THEN PRINT@T*32+2,ST
RING$(31,32); 'REMOVE OLD
120 T=A:RETURN
130 '
200 PRINT@A*32+2,"DOWN ARROW OR
JOYSTICK 180 DEG"
210 IF T <> A THEN PRINT@T*32+2,
STRING$(31,32);
220 T=A:RETURN
230 '
300 PRINT@A*32+2,"LEFT ARROW OR
JOYSTICK 270 DEG";
310 IF T<>A THEN PRINT@T*32+2,ST
RING$(31,32);
320 T=A:RETURN
330 '
400 PRINT@A*32+2,"UP ARROW OR JO
YSTICK AT 360";
410 IF T <> A THEN PRINT@T*32+2,
STRING$(31,32);
420 T=A:RETURN
430 '
500 PRINT@A*32+2,"SPACE BAR OR F
IRE BUTTON";
510 IF T<>A THEN PRINT@T*32+2,ST
RING$(31,32);
520 T=A:RETURN
530 '
2000 PRINT "SETTING UP ML FOR JO
YSTICK 4"
2010 BF=&H1DA 'IN CASSETTE BUFFE
R
```

```
2020 LN=58000:FOR X=0 TO 162 STE
P 50:IF X<149 THEN N=50 ELSE N=1
2
2030 PRINT LN;:LN=LN+10:A=0:FOR
Y=0 TO N-1:READ C$:B=VAL("&H"+C$
): A=A+B
2040 POKE BF+X+Y,VAL("&H"+C$):NE
XT Y:READ C$:IF A <> VAL("&H"+C$
) THEN PRINT "ERROR IN LINE NUMB
ER ";LN:STOP
2050 NEXT X
2060 M=BF+18 'EXEC ADDRESS - BF=
START DATA AREAS
2070 PRINT:INPUT "IS JOYSTICH CO
NNECTED (Y/N) ";A$
2080 IF A$="N" THEN JS=1 ELSE JS
=0
2090 POKE BF+2,JS 'DONT READ JOY
STICH IF NOT ATTACHED
2100 RETURN
58000 DATA 15,2A,0,20,5E,8,A,9,8
1,0,82,0,82,40,83,0,83,20,9E,1B,
6F,2,30,8C,E7,5F,6D,2,26,56,B6,F
F,0,84,1,4D,26,4,C6,5,20,4A,AD,9
F,A0,A,30,8C,CF,B6,FF7
58010 DATA 1,5A,5F,A1,84,2D,5,A1
,1,2E,1,5C,B6,1,5B,A1,84,2D,A,A1
,1,2E,6,5D,27,3,5F,20,25,86,3F,B
0,1,5A,F6,1,5B,F1,1,5A,2D,D,B1,1
,5B,2D,4,C6,3,20,E7C
58020 DATA F,C6,2,20,B,B1,1,5B,2
D,4,C6,4,20,2,C6,1,C1,0,26,1C,96
,87,26,4,AD,9F,A0,0,F,87,81,0,27
,D,30,8D,FF,79,C6,5,A1,80,27,4,5
A,26,F9,39,30,8D,102F
58030 DATA FF,70,5A,58,3A,DE,1B,
EC,84,ED,42,39,62C
```

```
10 'DEMO JOY 8 - BY GEORGE MCLIN
TOCK
20 A=0:GOSUB 2000
30 CLS:PRINT "DEMONSTRATION OF R
OUTINE TO READ EITHER JOYSTICK O
R KEYBOARD"
40 PRINT:PRINT "USES 8 ARROW KEY
S & SPACE BAR    FOR BUTTON"
50 PRINT"WRITTEN FOR 32 COL SCN"
60 INPUT "PRESS ENTER TO CONTINU
E";A:WIDTH 32:CLS:PRINT@12*32,"P
RESS ARROW KEY OR MOVE JOYSTICK"
:IF JS<>0 THEN PRINT "JOYSTICK N
OT PRESENT"
70 '
80 EXEC M: ON A GOSUB 100,200,30
0,400,500,600,700,800,900
90 GOTO 80
95 '
100 PRINT@A*32+2,"RIGHT ARROW OR
 JOYSTICK 90 DEG"
110 IF A<>T THEN PRINT@T*32+2,ST
RING$(31,32); 'REMOVE OLD
120 T=A:RETURN
130 '
200 PRINT@A*32+2,"DOWN ARROW OR
JOYSTICK 180 DEG"
210 IF T <> A THEN PRINT@T*32+2,
STRING$(31,32);
220 T=A:RETURN
230 '
300 PRINT@A*32+2,"LEFT ARROW OR
JOYSTICK 270 DEG";
310 IF T<>A THEN PRINT@T*32+2,ST
RING$(31,32);
320 T=A:RETURN
330 '
400 PRINT@A*32+2,"UP ARROW OR JO
YSTICK AT 360";
410 IF T <> A THEN PRINT@T*32+2,
STRING$(31,32);
420 T=A:RETURN
430 '
500 PRINT@A*32+2,"SHIFT LEFT OR
135 DEGS"
510 IF T<>A THEN PRINT@T*32+2,ST
RING$(31,32);
520 T=A:RETURN
530 '
600 PRINT@A*32+2,"SHIFT DOWN OR
225 DEGS"
610 IF T<>A THEN PRINT @ T*32+2,
STRING$(31,32);
620 T=A:RETURN
630 '
700 PRINT@A*32+2,"SHIFT LEFT OR
315 DEGS";
710 IF T<>A THEN PRINT@T*32+2,ST
RING$(31,32);
720 T=A:RETURN
730 '
800 PRINT@A*32+2,"SHIFT UP OR 45
 DEGS"
810 IF T<> A THEN PRINT@T*32+2,S
TRING$(31,32);
820 T=A:RETURN
830 '
900 PRINT@A*32+2,"SPACE BAR OR F
IRE BUTTON";
910 IF T<> A THEN PRINT@T*32+2,S
TRING$(31,32);
920 T=A:RETURN
930 '
```

```
2000 PRINT "SETTING UP ML FOR JO
YSTICK 4"
2010 BF=&H1DA 'IN CASSETTE BUFFE
R
2020 LN=58000:FOR X=0 TO 176 STE
P 50:IF X<149 THEN N=50 ELSE N=2
6
2030 PRINT LN;:LN=LN+10:A=0:FOR
Y=0 TO N-1:READ C$:B=VAL("&H"+C$
): A=A+B
2040 POKE BF+X+Y,VAL("&H"+C$):NE
XT Y:READ C$:IF A <> VAL("&H"+C$
) THEN PRINT "ERROR IN LINE NUMB
ER ";LN:STOP
2050 NEXT X
2060 M=BF+30 'EXEC ADDRESS - BF=
START DATA AREAS
2070 PRINT:INPUT "IS JOYSTICK CO
NNECTED (Y/N) ";A$
2080 IF A$="N" THEN JS=1 ELSE JS
=0
2090 POKE BF+2,JS 'DONT READ JOY
STICH IF NOT ATTACHED
2100 RETURN
58000 DATA 15,2A,0,20,5F,15,5B,5
D,5E,8,A,9,81,0,82,0,82,40,83,0,
83,20,83,40,83,60,84,0,84,10,9E,
1B,6F,2,30,8C,DB,5F,6D,2,26,58,B
6,FF,0,84,1,4D,26,4,E6B
58010 DATA C6,9,20,4C,AD,9F,A0,A
,30,8C,C3,FC,1,5A,A1,84,2E,14,E1
,84,2E,4,C6,7,20,36,E1,1,2E,4,C6
,3,20,2E,C6,6,20,2A,A1,1,2E,14,E
1,84,2E,4,C6,4,20,1E,10EC
58020 DATA E1,1,2E,4,C6,0,20,16,
C6,2,20,12,E1,84,2E,4,C6,8,20,A,
E1,1,2E,4,C6,1,20,2,C6,5,C1,0,26
,1C,96,87,26,4,AD,9F,A0,0,F,87,8
1,0,27,D,30,8D,E9F
58030 DATA FF,6B,C6,9,A1,80,27,4
,5A,26,F9,39,30,8D,FF,66,5A,58,3
A,DE,1B,EC,84,ED,42,39,C16
```

END

COCO FRIENDS DISK MAGAZINE

A Review by Garry Holder

CCFDM is a disk magazine for CoCo users and has similarities to COCO-LINK such as programs, editorial, letters to editor, tutorials etc. With this version of magazine all correspondence to subscriber and information and queries going to the editor are on disk only. The disk has its own wordprocessor for the subscriber to write what they like, such as letters, queries, how their submitted program works etc.

The disk comes as a flippy so that people with a drive of one side access can get all info; the programs are all on flip side. It is a menu driven magazine going to all the different sections and putting the material on the screen with a maximum of 3 screen pages for each item, letter etc.
One item I found of interest was the "Family Tree" section in which subscribers can give details of their particular interests and life style life if they wish.
Another was the graphics section which gave some fine Coco graphics by a few discerning artists.

Subscribers who like to RUN the programs as soon as they get a computer mag will like this format. Those who like to type listings so as to learn a bit about programming could be a bit disappointed; they would need to do a printout of the program and learn from reading that.

I feel, as did one of the subscribers who wrote in the letters section, that it would be great to be able to press a key while reading something of interest and get a hard copy whenever you like; this may be something that Rick Cooper will do in the future. He seems to be willing to change things if he and others can see improvements, and looks forward to constructive criticism that will help subscribers in the long run.

Overall a very good magazine with plenty of offerings to subscribers. The CoCo users who have no intention of changing to MS DOS need people like Rick to keep the interest information hungry users happy now that Tandy have abandoned us all.

We had originally thought of taking orders for this service through COCO-LINK but with the changing fortunes of this magazine we no longer consider this as a good idea.
We THOROUGHLY RECOMMEND this product and advise all those interested to contact Rick Cooper as soon as possible so as to get a subscription. He will be pleased to give you full details of the service and subscription rates for his Disk Magazine.
The address to contact is:

RICK'S COMPUTER ENTERPRISE
PO Box 276
Liberty
KY. 42539
USA
Tel. (606) 787-5783

Color Fun

By Keiran Kenny

When you run COLORFUN, the title and credit are displayed in 15 characters, each colored separately. Color slots 0 to 7 are the default colors for HSCREEN2. The routine in line 30 pokes the palette values in line 40 into slots 8 to 15. Slot 15 is black.
The color bar displays the colors and the keys to be pressed: 0 to 9 and A to F, to HPAINT your picture in these colors.

Press any key and the short routine in lines 150 to 240 puts random rectangles and circles on the screen. A flashing cursor appears at the screen center.

Hold down an arrow key to move the cursor up, down, left or right. To move diagonally up and right, hold down the up- and right-arrow together and so on. Hold down X together with arrow keys to speed up the cursor movement.

Line 5130 changes the color of the cursor to ensure that it remains visible against any fill color. If you change the palette values in line 40, some changes in this line may be necessary.

When you have the cursor positioned in an element to be painted, press a color key to paint it in the key color. If you want to check on the available colors, press the spacebar. The colorbar will be imposed on the screen.

If you press a color key, the element where the cursor is will be painted in that color. Or you can press any other key, except the spacebar, to return to the graphic screen without painting.
The outlines are in color 0. You can paint a picture element in color 0 but then you cannot change the color. However, any other color can be changed simply by pressing the key for another color.
You could experiment by putting your own graphics in the space beginning at line 150. However, I would suggest you first insert a line:

```
4990 K$=INKEY$:IFK$()"P"THEN4990
```

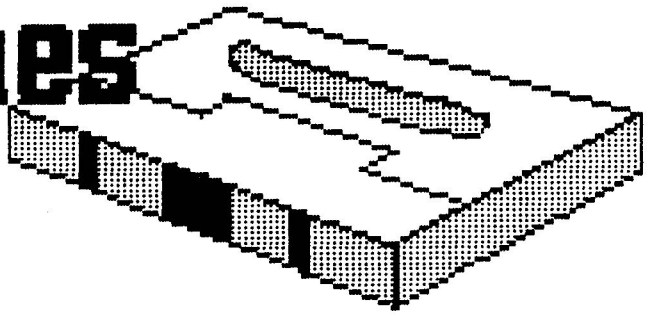
When you have entered a few graphic elements in your listing, run and press P if you want to experient with coloring. Then BREAK and return to typing your masterpiece.

```
0 'COLORFUN' COPYRIGHT KEIRAN
   KENNY, SYDNEY 1991.
10 CLEAR 1000
20 POKE65497,0:RGB
30 FORCL=8TO15:READPL:PALETTECL,
PL:NEXT
40 DATA 20,53,11,32,55,44,34,0
50 ONERRGOTO5170
60 ONBRKGOTO5180
70 A$="0123456789ABCDEF"
80 HSCREEN2:HCLS15:HCOLOR0
90 HBUFF1,2552:HBUFF2,2552
100 B$="***COLOR FUN***":B=9:CL=
0:FORT=1TO15:HCOLORCL:HPRINT(B,3
),MID$(B$,T,1):B=B+1:CL=CL+1:NEX
T
110 C$="by Keiran Kenny":B=9:CL=
0:FORT=1TO15:HCOLORCL:HPRINT(B,5
),MID$(C$,T,1):B=B+1:CL=CL+1:NEX
T
120 HCOLOR0:HPRINT(11,9),"YOUR C
OLORS:"
130 HLINE(14,87)-(264,103),PSET,
B
140 B=2:FORT=1TO16:HPRINT(B,11),
MID$(A$,T,1):B=B+2:NEXT
150 CR=0:FORL=15TO263STEP16:HCOL
ORCR:HLINE(L,96)-(L+8,102),PSET,
BF:CR=CR+1:NEXT
```

Continued on page 19

Coco 1,2&3 Tape **Utility**

Programmes for Tape



By Stephen Miller

Here we have a small selection of short programmes mainly for those of you who are still using tape based machines. The programmes were supplied by one of our staunch subscribers but were written by:

Stephen Miller.
P.O.Box 5000..
Penetanguishene..
Ontario
Canada, LOK 1P0.

Any queries should be directed to Stephen at the above address.

KEYBEEP

This is a simple bells and whistles programme. When you press the keys they make different sounds. It might make for more ineresting typing.

```
10 FORT=&HE00 TO&HE00+76:READA:P
OKET,A:NEXT:EXEC&HE00
20 DATA 182,255,35,132,243,183,2
55,35,182,255,34,138,2,183,255,3
4,182,255,35,138,4,183,255,35,19
0,1,107,175,141,0,38,49,141,0,4,
16,191,1,107,52,6,198,10,134,2,1
86,255,34,183,255,34,141,18,134,
253,180,255,34,183,255,34,141,8,
90,38,233,53,6,126
30 DATA 0,0,134,100,74,38,253,57
```

BINARY CONVERTER

This programme converts binary to decimal and decimal to binary.

```
10 DIMA(16)
20 FORT=1TO16:READA(T):NEXT
30 DATA 32768,16384,8192,4096,20
48,1024,512,256,128,64,32,16,8,4
,2,1
40 CLS:INPUT"WHICH DO YOU REQUIR
E?
                1)BINARY TO DECIMA
L OR            2)DECIMAL TO BINAR
Y";A:ON A GOTO 60,110
50 GOTO 40
60 PRINT:PRINT:INPUT"enter BINAR
Y CODE";BC$:Y=1
70 IF LEN(BC$)=0 THEN 40 ELSE IF
 LEN(BC$)>16 THEN PRINT"BINARY W
ORD IS 16 BITS LONG":GOTO 60
80 FORT=LEN(BC$) TO 1 STEP-1:B$=
MID$(BC$,T,1)
90 IF B$="1" THEN TT= TT+Y
100 Y=Y*2:NEXT:PRINT:PRINT"DECIM
AL EQUIVALENT=";HEX$(TT):GOTO160
110 PRINT:PRINT:INPUT"enter DECI
MAL NUMBER(0-65535)
          ";DN:A$="":ND=DN:IF D
N>65535 THEN 110
120 IF DN=0 THEN 40 ELSE FORT=1
TO 16
130 IF DN=> A(T) THEN DN=DN-A(T)
:A$=A$+"1":NEXT:GOTO 150
140 A$=A$+"0":NEXT
150 PRINT:PRINT"BINARY EQUIVALEN
T=":PRINTTAB(16);A$:PRINT"HEX EQ
UIVALENT =";HEX$(ND)
160 EXEC44539:GOTO 40
```

JOYSTICK TESTER

This programme shows a picture of two joysticks and the numbers show the position of the joysticks. It is good for checking to ensure that the joysyicks are working properly.

```
0 'JOYSTICK TEST
1 '*************************
2 '*  JOYSTICK TEST PROGRAM *
3 '*  BY STEPHEN MILLER     *
4 '*  PO BOX 5000,          *
5 '*  PENETANGUISHENE,      *
6 '*  ONTARIO,CANADA,L0K 1P0*
7 '*   AUGUST 22ND 1990     *
8 '*                        *
9 '*************************
10 CLS:R$=CHR$(172)+CHR$(172):T$
=CHR$(188)+CHR$(188):E$=CHR$(252
)+CHR$(252):FORA=&H400 TO&H5FF:R
EADI$:POKEA,VAL("&H"+I$):NEXT
20 A=JOYSTK(0):B=JOYSTK(1):C=JOY
STK(2):D=JOYSTK(3):E=PEEK(65280)
30 PRINT@272,USING"##";A;:PRINT@
373,USING"##";B;:PRINT@257,USING
"##";C;:PRINT@358,USING"##";D;
40 IFE=254ORE=126THENPRINT@182,R
$;ELSEPRINT@182,T$;
50 IFE=253ORE=125THENPRINT@167,R
$;ELSEPRINT@167,T$;
60 IFE=251ORE=123THENPRINT@178,R
$;ELSEPRINT@178,E$;
70 IFE=247ORE=119THENPRINT@163,R
$;ELSEPRINT@163,E$;
80 IFE=250ORE=122THENPRINT@211,"
BOTH";ELSEPRINT@211,STRING$(4,12
8);
90 IFE=245ORE=117THENPRINT@196,"
BOTH";ELSEPRINT@196,STRING$(4,12
8);
100 GOTO20
110 DATA 80,80,80,80,80,80,80,80
,80,A,F,19,13,14,9,3,B,80,14,5,1
3,14,80,80,80,80,80,80,80,80,80,
80,AF,AF,AF,AF,AF,AF,AF,AF,AF,AF
,AF,AF,AF,AF,AF,AF,AF,AF,AF,AF,A
F,AF,AF,AF,AF,AF,AF,AF,AF,AF,AF,
AF,AF,AF,AF,AF,AF
120 DATA AF,AF,AF,AF,AF,AF,AF,AF
,AF,AF,AF,AF,AF,AF,AF,AF,AF,AF,A
F,AF,AF,AF,AF,AF,AF,AF,AF,AF,AF,
AF,AF,AF,AF,AF,AF,AF,AF,AF,AF,AF
,AF,AF,AF,AF,AF,AF,AF,AF,AF,AF,A
F,AF,AF,AF,AF,AF,AF,AF,AF,AF,AF,
AF,AF,AF,AF,AF,AF
130 DATA AF,AF,AF,AF,AF,AF,AF,AF
,AF,AF,AF,AF,AF,AF,AF,AF,AF,AF,A
F,AF,AF,AF,AF,AF,AF,AF,AF,AF,BC,
BC,AF,AF,AF,AF,AF,AF,AF,AF,AF,AF
,AF,AF,AF,BC,BC,AF,AF,AF,AF,AF,A
F,AF,AF,AF,AF,AF,80,80,80,80,80,
80,80,80,80,80,AF,AF,AF,AF
140 DATA AF,80,80,80,80,80,80,80
,80,80,80,AF,AF,20,30,AF,AF,AF,8
0,91,93,93,93,93,93,93,92,80,AF,
AF,AF,AF,AF,80,91,93,93,93,93,93
,93,92,80,AF,AF,AF,AF,AF,AF,AF,8
0,95,9F,9F,C,14,9F,9F,9A,80,AF,A
F,AF,AF,AF,80,95,9F,9F,12
150 DATA 14,9F,9F,9A,80,AF,AF,33
,31,AF,AF,AF,80,95,9F,9F,9F,9F,9
F,9F,9A,80,AF,AF,AF,AF,AF,80,95,
9F,9F,9F,9F,9F,9F,9A,80,AF,AF,AF
,AF,AF,AF,AF,80,80,80,80,80,80,8
0,80,80,80,AF,AF,AF,AF,AF,80,80,
80,80,80,80,80,80,80,80,80,AF
160 DATA AF,36,33,AF,AF,AF,AF,AF
,AF,AF,AF,A5,AF,AF,AF,AF,AF,AF,A
F,AF,AF,AF,AF,AF,AF,AF,AF,A5,AF,
AF,AF,AF,AF,AF,AF,AF,AF,AF,AF,AF
,AF,AF,AA,AF,AF,AF,AF,AF,AF,AF,A
F,AF,AF,AF,AF,AF,AF,AF,AA,AF,AF,
AF,AF,AF,AF,AF,AF,AF,AF,AF
170 DATA AF,AF,AF,AF,A5,AF,AF,AF
,AF,AF,AF,AF,AF,AF,AF,AF,AF,AF,A
F,AF,AF,A5,AF,AF,AF,AF,AF,AF,AF,
AF,AF,AF,AF,AF,AF,AA,AF,AF,AF,AF
,AF,AF,AF,AF,AF,AF,AF,AF,AF,AF,A
F,AF,AF,AA,AF,AF,AF,AF,AF,AF,AF,
AF,AF,AF,AF,AF,AF,A5,AF,AF
180 DATA AF,AF,20,30,AF,33,31,AF
,36,33,AF,AF,AF,AF,AF,AF,A5,AF,A
F,AF,AF,AF,AF
190 END
```

FAULTY

This is a little gem of a programme. It creates a ML utility in memory. Load a BASIC programme and you will see a black bar growing as it reads the programme. If an I/O error occurs, the programme willload and you will end up with your BASIC programme minus the faulty parts.

```
0 '*************************
1 '     STEPHEN MILLER      *
2 '*    P.O.BOX 5000,       *
3 '*
4 '*    ONTARIO,CANADA,     *
5 '*    L0K 1P0             *
6 '*    DECEMBER 1990       *
7 '*************************
10 'I0-FREE.BASIC
20 CLS:PRINT@101,CHR$(34)"I/O FR
EE"CHR$(34)" TAPE LOADS":PRINTTA
B(6)STRING$(8,131)
30 CLEAR999
40 DATA 26,80,190,128,0,183,255,
222,166,128,183,255,223,167,31,1
40,224,0,37,241,57
50 FORT=1TO21:READA:A$=A$+CHR$(A
):NEXT
60 P=VARPTR(A$)+1
70 POKEP,126
80 EXECP
90 FORX=0TO9:POKE&H9D00+X,PEEK(&
```

```
HA7E9+X):NEXT:'relocates MOTOROF
F
100 POKE&HA7E9,&H7E:POKE&H7EA,&H
9D:POKE&HA7EB,&H00:'branch to re
set counter ON motor off
110 DATA 9F,76,9E,F3,86,9F,A7,80
,9F,F3,76,39,:FORX=0TO12:READR$:
POKE&H9F00+X,(VAL("&H"+R$)):NEXT
120 POKE&H9E00,&H9F:POKE&H9E01,&
H76:POKE&H9E02,&H9E:POKE&H9E03,&
HF3:POKE&H9E04,&H86:POKE&H9E05,&
H80:POKE&H9E06,&HA7:POKE&H9E07,&
H80:POKE&H9E08,&H9F:POKE&H9E09,&
HF3:POKE&H9E0A,&H9E:POKE&H9E0B,&
H76:POKE&H9E0C,&H39:'black
130 POKE&HA740,4:POKE&HA745,&H7E
:POKE&HA746,&H9F:POKE&HA747,0:PO
KE&HA741,&H7E:POKE&HA742,&H9E:PO
KE&HA743,0:'branch to routines t
o put square
140 POKE&H9D0A,&H8E:POKE&HD0B,&H
04:POKE&H9D0C,&HC0:POKE&H9D0D,&H
9F:POKE&H9D0E,&HF3:POKE&H9D0F,&H
39:'routine to reset counter on
motor off
150 POKE&HF3,&H04:POKE&HF4,&HC0:
POKE&HA531,&H12:POKE&HA532,&H12:
POKE&HA4E3,&H12:POKE&HA434,&H12
160 CLS:PRINT"  TAPE I/O FREE LO
ADER ROUTINE        VR 01.00.01
(C)  1990":PRINT:PRINT"ready:"
170 NEW
```

END

MURPHIES

Taken from a program called "MURPHY".

Some laws of computing:-

2. Any given program costs more and takes longer.
3. If a program is useful it will have to be changed.
4. If a program is useless, it will have to be documented.
5. Any program will expand to fill available memory.
6. The value of a program is proportional to the weight of its output.
7. Program complexity grows until it exceeds the capabilities of the programmer, who must maintain it.
8. Any non-trivial program, contains at least one bug.
9. Undetectable errors are infinite in variety, in contrast to detectable errors, which by definition are limited.
10. Adding manpower to a late software project makes it later.

I can't think of the first law, perhaps it is:-
When all else fails read the instructions.
Or: it works better if you plug it in.

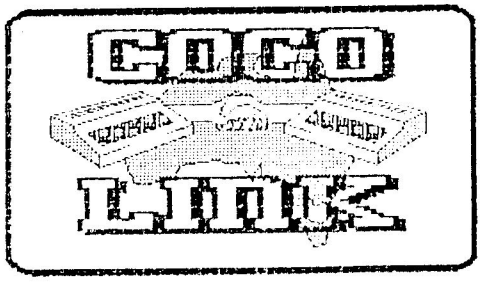
J.VAGG

Color Fun

Continued

```
160 HGET(14,87)-(264,103),1
170 HCOLOR0:HPRINT(10,14),"PRESS
 ANY KEY"::EXEC44539:K$=INKEY$:H
CLS15
180 HLINE(0,0)-(319,191),PSET,B
190 FORZ=1TO10
200 A=60+RND(160):B=30+RND(130):
R=20+RND(80)
210 HCIRCLE(A,B),R
220 A=5+RND(155):B=5+RND(91)
230 HLINE(A,B)-(A+RND(155),B+RND
(91)),PSET,B
240 NEXT
5000 N=1:X=160:Y=96
5010 IFPEEK(341)=247THENY=Y-N
5020 IFPEEK(342)=247THENY=Y+N
5030 IFPEEK(343)=247THENX=X-N
5040 IFPEEK(344)=247THENX=X+N
5050 IFPEEK(338)=247THENN=4ELSEN
=1
5060 IFPEEK(135)=32THENHGET(14,8
7)-(264,103),2:HPUT(14,87)-(264,
103),1:EXEC44539:HPUT(14,87)-(26
4,103),2
5070 PK=PEEK(135):IFPK>47ANDPK<5
8THENCN=PK-48:GOTO5150ELSEIFPK>6
4ANDPK<71THENCN=PK-55:GOTO5150
5080 IFX<1THENX=1
5090 IFX>318THENX=318
5100 IFY<1THENY=1
5110 IFY>190THENY=190
5120 DR=HPOINT(X,Y)
5130 IFDR=3ORDR=6ORDR=10ORDR=11O
RDR=13ORDR=7ORDR=14ORDR=15THENCL
=1ELSECL=3
5140 HSET(X,Y,CL):FORD=1TO100:NE
XT:HSET(X,Y,DR):GOTO5160
5150 POKE135,0:HPAINT(X,Y),CN,0
5160 GOTO5010
5170 POKE65496,0:RGB:CLS:PRINT@2
24,"ERROR #"ERNO"IN LINE"ERLIN":
END
5180 POKE65496,0:RGB:CLS:END
```

END



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3 Marion St

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****

COCO 3 (128k or 512K)

contact: Garry Holder

Phone: 08 386 1139

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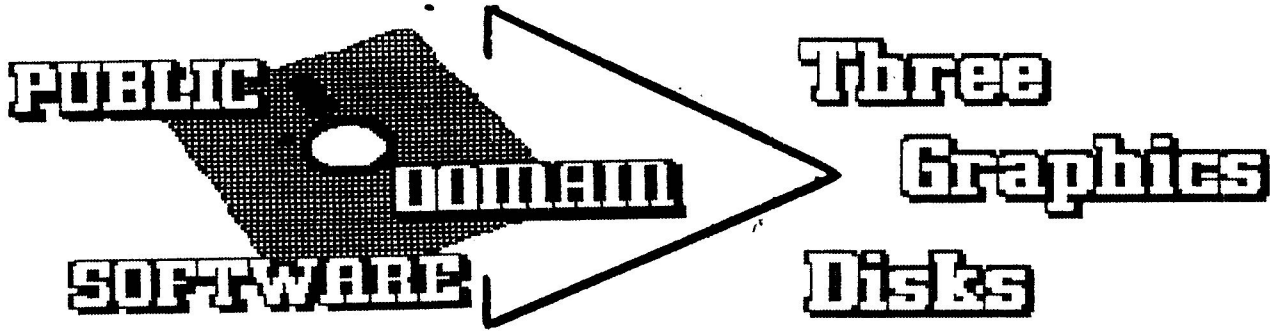

For this special graphics edition of COCO-LINK we are issueing Three (3) Public Domain disks.

These three disks cover quite a range of different styles of graphics and a similar range of means of producing them.

Some of the material on the disks is of a complexity that some explanation may be requested by some of our readers. To circumvent this, we are including some additional details pertaining to certain of the disks as well as a general description of the disk. Some of this additional information may not be of interest to those who are only interested in the end result.

DISK 044

SCREEN DUMPS
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This flippy disk contains screen dumps for Coco2 and 3. This double sided disk is written by George McLintock and, as is his usual style, full text accompanies the programmes. This gives everything from instructions to technical details on the various programmes.

I have added the PRINTDOC routine to the disk to allow you to either read the text files to screen or printer. When entering a file, please remember to include the EXTension.

DISK 045

HEADS and VAGG & BELL
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This double sided flippy disk contains Jonanna Vagg's HEADS on the first side and a compendium of graphic programmes on the reverse side compiled by the Vagg and Bell families.

HEADS, which is distributed as Public Domain in the USA, is a programme which prints headings and borders to make your correspondence more individual.
Included on the disks are designs for Xmas, Computers, school.....you name it and I am sure you will find something on this disk.

DISK 046

SCANNED PICTURES
****

This is another double sided flippy from George McLintock. This disk comprises of scanned pictures (I will leave George to explain it all) and a routine to dump them to printer.

The following article by George will explain how the pictures were created and the finer details of the dumps etc.

SOME GRAPHIC SCREENS FOR SCREEN DUMPS
****
By George McLintock

This disk contains a number of two color graphic screen pictures that can be dumped with any of my CoCo 3 screen

dump programs. They are a convenient size to fill the top half a page when dumped and can be used as pictures on a monthly calendar.
The pictures were generated by a low price, hand held scanner on an IBM compatable and then transferred to the CoCo. (which is reason for the 'odd' size and shape). The original pictures were scanned into the 640 x 350 x 16 color EGA screen (IBM) as monocrome. The 'common' size is within the area (40,0)-(425,320) [some are larger] of this screen. This gives a convenient size and shape when dumped at 60 dots per inch horizontal x 72 dots per inch vertical on a printer. After a bit of processing in the IBM they were transferred to the HSCREEN 3 for the CoCo 3.
To load and dump the pictures first RUN "GRAPHICS". It is all plain sailing from there on in.

Some bits about the pictures and programs:
The pictures on disk are set to load into the HSCREEN 3 on CoCo 3. They are 640 x 384 x 2 colors. As such they are two display screens deep and cannot be displayed in full on that screen. They also look a bit distorted

The program to load the screens includes some ML routines to scroll the picture up and down the display screen area (by arrow keys). It also includes a compress routine that will convert the HSCREEN 3, (640 x 384) picture to a HSCREEN 1, (320 x 192) picture. The picture looks 'normal' at this resolution and can be dumped from this screen if preferred.

The scanner produces a simple grey scale dither to represent colors on a monocrome screen. To reflect some of this through to the HSCREEN 1 picture, I've included an option for how the compress routine works. The 'normal' procedure for 'half sizing' a picture is to test each group of 4 pixils that are to be replaced by a single dot, and if any one of them is on, to set the single dot 'on'. The option included here is to set the dot on, if 1, 2, 3, or 4 dots are on. This allows a variable amount of the dither to come through to the compressed picture. For coding convenience, the color of the pixils 'on' for HSCREEN 1 is palette # 2.

A related ML routine is to save and restore the HSCREEN picture to the 'extra' memory to avoid the need to reload the original picture each time. This means you can load the picture once, save it to extra memory, and then restore it to the HSCREEN directly from memory as often as necessary. These pictures occupy 32K of graphic memory, so it requires another 32K of memory to hold the copy. To keep it all in the extra memory, this means you cannot use the 40 or 80 column text screens with this option, you must use the 32 column screen.

The files on disk are compressed in MAC format and the ML calls the MAC format as well. The MAC files have the same header as MGE files. The MGE compression is a form of run length encoding, where each group of data is two bytes. The first byte is a control code that specifies the number of times (1-255) that the second byte is repeated in graphics screen memory.

The MAC compression is based on a compression procedure used by the Apple Macintosh. Data is still grouped, but there are two types of groups of varying length. A control code is used at the start of each group of data. A control code of 1 to 127 specifies the number of bytes that follow which are uncompressed data. ie the bytes are transferred directly to screen memory. A control code of 129 to 255 is normal run length encoding where the low order 7 bits specify the number of times the following byte is repeated. A code of zero specifies the end of data, the code of 128 is not used.
As an example a series like 4, 20, 40, 60, 80, 132, 96 would be placed in screen memory as 20, 40, 60, 80, 96, 96, 96, 96. The 132 means (132 - 128) times.

The files on disk here were compressed on an IBM, so I have not developed a CoCo routine to do this compression. The routines are coded in Quick Basic, and if anyone is interested they can contact me. The screens were compressed using all three procedures (MGE, MAC, and uncompressed), and the smallest file produced was then transferred to the CoCo. In general, the MAC consistantly produced the smallest files. Note: All graphic files have the extension MAC (to distinguish them from the normal MGE files). The compress code in the header specifies the compression procedure used. The routines here will load a normal MGE file OK, but my earlier MGE program won't load a MAC file correctly

The routines here are set up for a disk system only. They could be easily modified for tape operations (along the lines of the standard MGE routines), but I have not done so.

The Basic program also includes my graphics SCNPNT routines (screen dump in GOSUB). (These appear on PD Disk 044). These are the same as submitted with some minor changes. It is set for a Tandy printer, and changes for an Epson are noted in the program. (Change PT=7 to PT=8). It also includes a switch to show when there are no dots in a line to be printed. This speeds up a dump with blank lines.

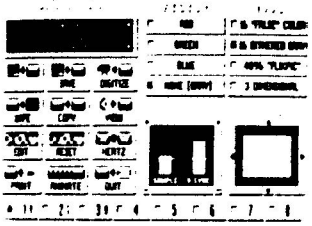
You can also use my full screen dump for 384 lines deep from HSCREEN 1 & 3 if you wish. To replace the 200 line deep option with 384 deep, replace the A=200 in line # 2480 with A=384 (or lesser value).

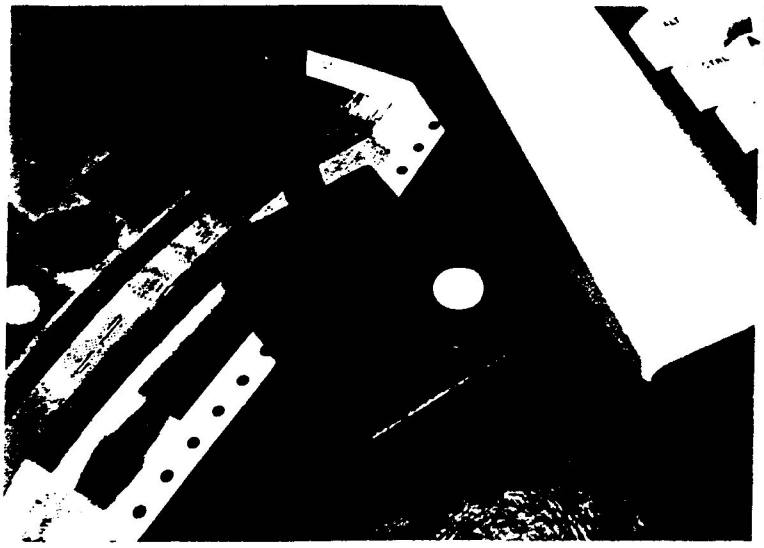
The menu and file selection routines may seem over elaborate for this type of thing, but were done mainly as an exercise to retain familarity with the CoCo.

ALL these disks are available from COCO-LINK at the usual price of $5.00 each.

Digi-Scan

Video Digitizer





LOW COST VIDEO DIGITIZER FOR THE TANDY
COLOUR COMPUTER 3 WITH 512K RAM AND A DISK DRIVE

* Easy-to Use and professional control panel user interface.
* No Multi-Pak required. Plugs into joystick and cassette ports.
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* Captures 320x200 16 level dithered gray and colour images.
* Captures 4096 apparent colour and 3-D images (needs colour filters).
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* Save images to disk as IMG format or convert them to CoCoMax3.
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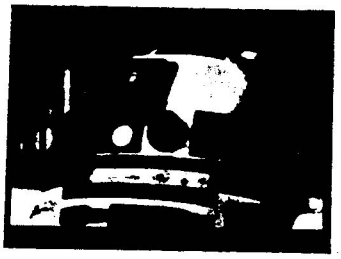

DigiScan hardware, Software and Manual..... $99.95
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Nickolas Marentes, P.O. Box 6551, Upper Mt. Gravatt, 4122.

* Please allow 7 days clearance for cheque payments *

WHAT IS A VIDEO DIGITIZER AND WHERE CAN I USE IT?

A video digitizer takes a video image from a video camera or video recorder and converts it to a string of numbers. These numbers are then reconstructed back into a video image and displayed on the computer's screen. The quality of the reconstructed screen depends on the graphics capabilities of the computer. Once the image is in the computer, it can be processed in many ways. The most popular use for a video digitizer is simply for creating picture slide shows. More useful applications include the creation of clip art or pictures for desktop publishing, title graphics for programs or amateur video, and graphic animation.

HOW DOES IT WORK?

Digi-Scan consists of two main components.

The HARDWARE which consists of a small compact box with two adjustable dials on top. This box has four cables coming out the back. Two of these connect to the joystick ports of the computer, another to the cassette port and the last has a socket in which a video signal is fed into. The entire unit runs off an internal alkaline 9 volt battery and is switched on and off by the computer so the unit can never be left on accidentally.

The other main component is the SOFTWARE. When the software is loaded, the user is presented with a professional control panel display. On this screen the user selects the video display mode, colour filter setting, image offset position and a variety of functions such as load/save image data, erase/copy image data, editing of palette colours and of course, digitize an image.

HOW GOOD ARE THE DIGITIZED IMAGES?

It is important to note that no matter how good the digitizer is, the quality of the reconstructed images will depend on the graphic display capabilities of the computer being used. The CoCo3 can only display 16 colours from a total colour palette of 64 colours. A video image coming from a video camera or video recorder contains thousands of colours and hues to produce a picture. It is therefore impossible to produce photo quality images on the CoCo3. Having said that, Digi-Scan does use a few interesting techniques to produce more colors than what the CoCo's hardware actually allows. Digi-Scan supports a technique of image flipping to produce images with up to 4096 apparent colours. Unfortunately, to create such displays, a trade-off must occur. When displaying these type of images, a flickering effect can be seen. We have named these images "FlikPics". In order to create any of these images, a video camera with red, green and blue optical filters is needed.

HOW FAST DOES IT DIGITIZE?

Digi-Scan is what's termed, a frame sampler. Digi-Scan "samples" an image many times and gradually compiles the image onto the CoCo's screen. It takes approximately 15 seconds to capture a complete 16 level gray or color image. Three images are needed for the 4096 colour images and two for the 3-D images.

Windows for PMODE 4

By Keiran Kenny

If you are a CoCo2 user, you may sometimes envy those clever windows available in some CoCo3 programs, but you can use GET and PUT to produce a similar effect on the PMODE4 screen.

The GET statement in line 50 stores an area of blank screen 255 x 16 labelled A. Lines 60 - 80 put a simple graphic display on the screen. The GET statement in line 90 stores the screen section 0,80 - 255,111 labelled B.

Press any key and array A is put onto the screen in the area 0.80 - 255,111 in line 110.

A simpler, if slower method of clearing a space on the screen is the LINE statement in line 170. The two DIM statements in line 20 take a massive 20K plus of memory which won't leave much over for your program. Thus it would be preferable to use the line statement and omit the DIMA(2048) statement from line.

Press a key and line 150 restores the graphic by putting array B back onto the screen. Keep on pressing keys to flip the windows on and off.

The hi-speed poke in line 10 is for the CoCo2. Change this to POKE65497,0 for the CoCo3.

```
0 'PM4WNDOW' COPYRIGHT KEIRAN
   KENNY, SYDNEY 1991.
10 POKE65495,0
20 DIMA(2048),B(2048)
30 A$="NU12E5F5NU12BR6NU12BR6U12
F10NU10D2BR6U12R8F2D8G2NL8BR8BR2
H2U8E2R6F2D8G2NL6BR8NU12E5F5NU12
"
40 PMODE4,1:COLOR0,5:PCLS:SCREEN
1,1
50 GET(0,0)-(255,31),A
60 LINE(0,0)-(255,191),PSET,B
70 CIRCLE(128,96),95
80 PAINT(128,96),0,0:POKE178,RND
(255):PAINT(30,96),,0:PAINT(225,
96),,0:COLOR0
90 GET(0,80)-(255,111),B
100 EXEC44539
110 PUT(0,80)-(255,111),A
120 LINE(0,80)-(255,111),PSET,B
130 DRAW"BM90,102"+A$
140 EXEC 44539
150 PUT(0,80)-(255,111),B
160 EXEC44539
170 COLOR5:LINE(15,80)-(105,111)
,PSET,BF:COLOR0
180 DRAW"BM20,102"+A$
190 EXEC44539
200 PUT(0,80)-(255,111),B
210 EXEC44539
220 GOTO110
```

COCO-LINK PD SOFTWARE

DISK 001 EDUCATION

Australian Geography
Australian Explorers
Fractutor
Decimal
Spellit
Times Table

DISK 002 EDUCATION #2

Binary	Mathsmt
Cocohome	Memory
Coindemo	Numfun
Formula	Puzzle
Matchem	Trigshow
Math	Word

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(Takes up 2 sides of disk)

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Centrit	Cypher
Germ	Life
Max	Maze
Reversi	Tanks
Yancc	

DISK 015 BASIC GAMES

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LANDER	LIFE
MAX	POKER
BIORITHM	BLACKBOX
BLOCKADE	BUSJUMP
CHUTE	GO
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FLASH	BAGEL
OREGON	MULTIPLY
RUBIC	FRACTAL
KALSCOPE	TARTUS
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NUDE	LIFE
STARTREK	ADVENT
HURKLE	REVERSE
GUESSFR	SCRAMBLE
PIZZA	CINQUAIN
AANDAN	

DISK 021 UTILITIES

3CLMLIST	3HBUFF
3PRNTDOC	3QKMEN40
3QKMEN80	3VIPCOCO
CATLOGUE	DIRSORT
DSKDET	GOSUBBER
HASH	MENU
MULTUTIL	PRNTDOC
QKMEN32	

DISK 022 McLINTOCK UTILITIES

XCOM	ERASE
COMSBUF	DIVERT
MKI	TRANSFER
MGEFILES	PRINTDOC

DISK 023 UTILITIES NO 3

Util	Progutil/Doc
Copycat	Copycat/Doc
Dir-back	Dirprot
Diskcert	Ramlist
Varmap	Varslist

DISK 031 HOME APPLICATIONS

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Will	

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BOUNCING BALL	WORLDMAP
NUDE	

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2 sides full of Cocomax pictures.

DISK 043 RASCAN DEMO

Showing what the Rascan Digitiser can do. With it's own picture scanner.

DISK 051 FORTH83 DEMO

Demonstration of the FORTH83 language.

NEW THIS ISSUE
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DISK 044 SCREEN DUMPS

A collection of screen dumps for Coco 2 & 3 with full documentation.

DISK 045 HEADS + VAGG & BELL

Side 1 contains a programme for making borders plus including a selection of designs.
Side 2 contains a compendium of graphic programmes and pictures by the Vagg and Bell families.

DISK 046 SCANNED PICTURES

This disk contains a multitude of scanned line drawings along with a pro-gramme to screen and dump to printer. This Flippy disk by George McLintock contains full instructions and technical details.

ALL DISKS $5.00 inc P&P

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