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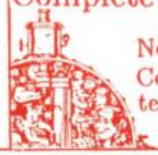

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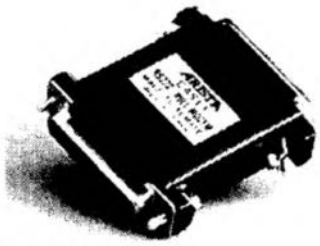

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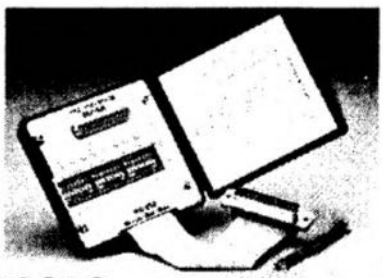

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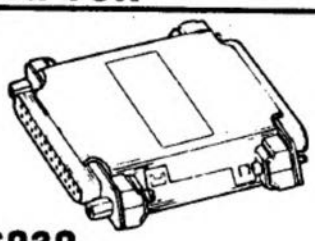

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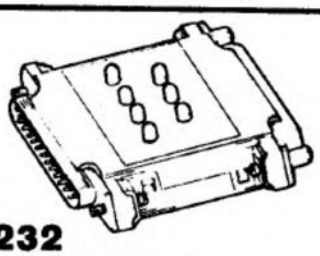

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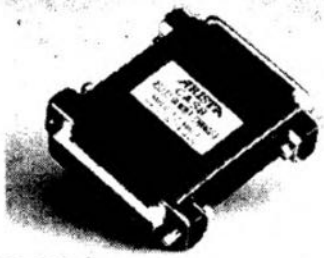

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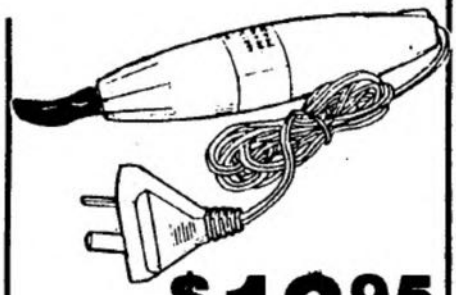

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SPECIAL THANKS TO:
Bob Horne, Michael Turk, Johanna Vagg and Martha Gritwhistle.

GOLDSOFT

Published by:
GOLDSOFT, PO Box 1742, Southport, Q'ld, 4215
Registered Publication QBC 4009.
Telephone: (075) 39 6177.

Printed by:
The Warwick Newspaper, 50 Albion St, Warwick.
Telephone: (076) 61 1355.

DEADLINES:
7th of the preceding month.

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IN A NUT SHELL

Ahh ... back to 'normality'. For the uninitiated, last month's edition of 'Nutshell' was written one-and-a-half months earlier than normal, because we were to go on holidays a few weeks later.

For the initiated, welcome back to the new year! I hope everyone had a great Chrissy!

The power of the CoCo

Yes, CoCo is the best thing since sliced cheese! Do you really realise what power your CoCo has, and what it is capable of?

Just to mention a few things:

* It runs high-level languages like OS-9, Forth, Pascal, Flex, Cobol (soon), C, Logo, and a few more I can't think of.
* It also runs 4GL (Fourth Generation Language) programs; one currently very popular is Sculptor.
* It can run very good database programs (contrary to other peoples' beliefs) compared to other machines running database programs.
* At the other extreme, you can play a challenging game of chess, or play a great game of Moon Patrol, or play a great game of whatever game you like.
* You can talk to it, and it will respond, by either speaking to you, or execute a process (imagine: instead of typing in your program, you can speak the commands).
* It supports true multi-tasking and multi-user, unlike other machines which claim they can multi-task (mind you, they don't even mention a multi-user environment),
* You can play your organ (with a MIDI interface) and your CoCo will record the notes you play.

It then plays these notes back to you, in stereo, and with up to 12 chords playing simultaneously!

* You can design almost anything graphically using nothing more than a mouse (or a joystick).
* You can connect a house alarm or anything electrical for that matter, to your CoCo, via a CoCoConnection.
* You can use the joystick ports of your CoCo for a light pen - all you need is the software.
* ... and you can even learn, with the greatest of ease, the Basic language.

Mind you, you can do a lot more things than I have listed above.

For example, WE run our subscription database off a CoCo 3, and I run the submissions database off a CoCo 3. Both databases can be very easily expanded, and no great effort has to be made in writing the extra code. (A program which has been structured and well-written in the first place demonstrates that almost any program can be expanded and/or modified.)

We're happy with the CoCo and what it can do for us - and we're sticking to it! We believe it is the best machine for the beginner and for the expert.

Paris Radio

Paris Radio Electronics have a large range of software and hardware for the amatuer/expert user of the CoCo. They specialize in that "advanced" language like Sculptor, OS-9 Level 2, and more recently, the OS-9 developers package.

See them for any hardware you might want as well.

Paris Radio Electronics' person to talk to is Jackie Cockinos.

Pursuit and Craig Stewart

At last year's Conference, Craig Stewart won the Games competition - and the offer to sell the winning game via Tandy stores throughout Australia.

Since Christmas (which was the date it was going to be released through the Tandy stores) Tandy has sold thousands of Pursuit games.

That says a lot - thousands have gone out the door, and it's only been a month! Must say something for the game.

Pursuit is for the CoCo 3 and can be found at any Tandy store for $19.95.

Alex

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COCO NEWS

WITH GRAHAM MORPHETT

Its good to have a column in Australian CoCo Magazine again!

Over the last year or so, I've concentrated on getting Softgold together, as a magazine entity. Its been a lot of hard work, but a lot of fun too.

Now that Softgold's future is assured and it has such a capable Editor in Deon, I'm going to spend more time once more with my CoCo and this magazine.

The CoCo really is a computer that just keeps turning up the surprises in performance and reliability.

For example just this week we learned that the program "Where in the World is Carmen Sandiago" - probably THE definitive educational game, has become available for the CoCo 3 from Blaxland Computer Services.

And there are other things too - the CoCo's ability to multi task, its ability to do efficiently and quickly things that "faster" computers really spend time doing. These make the CoCo a real gem.

The Year of the Hard Drive

1988 may well become the year of the hard drive - we've heard so many of you mention that you are planning to purchase them this year!

We've just purchased one from Blaxland and we'll be reporting on it, and the uses we put it to next month.

I can hardly wait to start playing with it - imagine being able to log all our CoCo's into it to get files - no need for the rest of them to save to tape or disk any more!

Paris Radio

Both this month's magazines are full of Blaxland Computer Services news - and so they should - Blaxland have released a heap of product onto the market this month! But don't forget that Paris Radio have a heap of gear in their store at Kingsford, NSW, for all of you with a technical interest in CoCo's and 68000 computers.

Jacky Cockinos is the owner and he has been involved with CoCo right from the early days, so he can certainly get you the right help!

Melbourne

Alex and I will be in Melbourne on the week of the 7th March.

We will be attending a meeting of the Ringwood Users Group on Wednesday night (9th March) and will be going to a dinner with anyone interested on the Friday night.

On the Saturday night, we'll be at the Viatel Bash.

More details of each of these events can be obtained by phoning or by accessing page 642901 on Viatel.

Alex and I are anxious to meet with other CoCo users whilst we are in Melbourne, so if you can make it to one of these events, that would be great!

Blaxland Computers

Blaxland Computer Services are moving into the T1000 / compatibles area, and if they do the job they've been doing for CoCo owners for the last five years for the compatibles owners, then other stores had better watch out!

The first program to be released by them is DOS Help - a memory resident program which provides instant on screen help for anyone who has less than a working knowledge of MS DOS (which is just about all of us! G.)

The program is written by Peter Feldtman who wrote a similar program "Wordstar Help" for Wordstar users and which is now sold all around the world. Peter started his programming career writing programs for this magazine - so it is with special pride that we announce this new release.

DOS Help gives other commands which can be used, correlates other commands with the one you are attempting to use and provides hints, tips and cross references to books.

DOS Help is thorough, quick, and the 200 K disk file compacts to 70 K in memory to ensure that your computer is not overloaded by its presence.

Whilst on Blaxland, they have both the LT 1400 and the T1000TX on demo in the shop, along with a lot of software for the machines that you can't get anywhere else as of yet.

One of these packages is Microsoft Works - an integrated package which works like a more advanced Deskmate. At $370 it comes with a 3 disk tutorial for the very new user - a real feature for very new users.

Blaxland also sell ASI Clones, which have 12 months warranty and 24 hour service in Sydney. The PC/XT, 640K RAM with 2 drives, and RS232 clock calendar card is $1450, whilst the XT with a 20meg hard drive costs an additional $920 (Mini Scribe Drive).

Blaxland will be specialising in CAD packages for the Education Dept. They recommend the ProDesign package which has appeared in these pages before.

CoCo 3's sold very strongly for Blaxland over the Christmas rush - hardly surprising really, Blaxland are the pre-eminant CoCo 3 experts!

Now that you have your CoCo 3, Blaxland have 20 Mg hard drives for $1599, which run OS9 L2 very fast and store heaps!

Blaxland still supply CoCo 2 packages. They will buy old CoCo's as trade ins for people upgrading to CoCo 3's. The CoCo 2's are serviced and then resold to people requiring a CoCo 2.

Don't forget that the 2 is a very powerful machine. It can multitask, run electrical gadgets and do most of what the CoCo 3 can do.

Bye!

That's it for my news this month.

If you live in Melbourne I do hope you'll come and say "hi" on at least the Wednesday night. If not, have fun - see you on Viatel!

Graham

GOLDLINK ViaOn 6429839A
003
The OS9 Users Board
MON 18 JAN 1988 22:52
Member 785471278
Sponsored by Paris Radio

) Where in the World is Carmen Sandiego is a triffic game. I'd would reccomend it to adults and children. It combines education with entertainment, which is very rare in a game nowdays, but also it shows off the capabilities of the Coco3.

Jeff (Impressed)

WHEN DID THAT BECOME AVAILABLE FOR THE3
3 Clubroom 5 Mbrs Msg 6 Vis Msg 30c
<< 8 8 Menu 7 Your MB 9 >>

=====End of Frame=====

GOLDLINK ViaOn 6429834A
003
The OS9 Users Board
TUE 12 JAN 1988 22:08
Member 648230658
Sponsored by Paris Radio

) Happy new year to all who have seen t he light!!

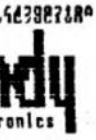
For anyone who bought the highres. mo use/joystick adapter for the coco. There is a programme in book complete rainbow guide to os9 level 2. It is in basic09 a nd uses syscall.

Byee.
Ross.

3 Clubroom 5 Mbrs Msg 6 Vis Msg 30c
<< 8 8 Menu 7 Your MB 9 >>

=====End of Frame=====

²␣GOLDLINK ␣V&aO-␣6429827A°
002
The Tandy Users Board
FRI 08 JAN 1988 08:05
Visitor 627311188



) G'Day my name is Fred Remin,adress 1 Yera Ct AranaHill Bris, ph3511378.I am runing a CoCo3 with FD500 drive0,modem and a DMP130.If anyone in the area just starting on the CoCo or has any problem s with the little devil,give me a call o r drop around I willbe happy to help as much as I can.

Fred.

3 Clubroom 5 Mbrs Msg 6 Vis Msg 28c
<< 8 8 Menu 7 Your MB 9 >>

=====End of Frame=====

GOLDLINK ViaOn 6429832A
003
The OS9 Users Board
WED 20 JAN 1988 22:47
Member 254327788
Sponsored by Paris Radio

) G. No I got it thru tandy at Miranda. Very good store and always helpful.
BIRTBAG
PS I think it might be in most stores now (at least in Syd.) but I'm not sure.

Thank you, Birtbag! G

3 Clubroom 5 Mbrs Msg 6 Vis Msg 30c
<< 8 8 Menu 7 Your MB 9 >>

=====End of Frame=====

GOLDLINK ViaTw 6429838A
003
The OS9 Users Board
SAT 16 JAN 1988 08:44
Member 275997278
Sponsored by Paris Radio

) HI TO ALL, I AM NOW THE PROUD OWNER OF A PROGRAM CALLED MULTI-VUE.

YES TANDY FINELY RELEASED THE PROGRAM AND I BOUGHT A COPY YESTERDAY. STILL ONLY PLAYING WITH THE PROGRAM AT THE MOMENT BUT WILL CHECK WHAT MAKES IT TICK SOON.

IF ANYONE WANT TO ASK ME QUESTIONS MB 275997278 TO MICHAEL AND I'LL GET BACK TO YOU

3 Clubroom 5 Mbrs Msg 6 Vis Msg 30c
<< 8 8 Menu 7 Your MB 9 >>

=====End of Frame=====

GOLDLINK ViaTw 6429833A
003
The OS9 Users Board
MON 11 JAN 1988 22:21
Member 785471278
Sponsored by Paris Radio

) I've had my hard disk working now for two days and it's great. It didn't work at first cause I had some of the cables on back to front, and then it wouldn't format properly. I have discovered that OS9 is much more fussy about the way disks format. Not like that other operat ing system starting with an "M".

Jeff

3 Clubroom 5 Mbrs Msg 6 Vis Msg 30c
<< 8 8 Menu 7 Your MB 9 >>

=====End of Frame=====

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DR COCO

Dear Dr CoCo,

I saw a program in the February 1987 CoCo, page 51, called "Address Book", by Wayne Kely.

The parts I needed were to stop anyone using the tape unless the correct password was put in. At the beginning of my program I changed lines 130 to 210. At the end of the program I added an extra line:

POKE113,0:EXEC40999

This works very well, but if someone finds the password, OK appears on the screen and all they have to do is type in LIST and they get the listing of the program as well as the password.

Is there some suitable program I can invent to stop 'undesireables' from getting into the program - something so that when the correct password is put in, the game starts automatically, like the Tandy tapes, and even if you press <break> it does not stop the game to enable you to get the listing.

Malcolm Reid
Ingleburn, NSW

Malcolm,

The question I would raise concerning 'password protection schemes' is, "is it really worth it?".

In other words, what do you want this password protection scheme (PPS) to protect? If it is to stop people from using your games, then the best thing is to hide the games somewhere.

On the other hand, the PPS that Tandy use (for an example) is an auto-start program ie, as soon as it loads, it runs.

To find out where Tandy get theirs from, it would be a good idea to ring up Tandy and ask them.

The only problem is that if you put a game (or any other program) under a PPS, you couldn't enhance that particular program (if you wanted to), because it's under a PPS.

*

Dear Dr CoCo,

While looking through the November 1985 back issue of Aussie Rainbow, I noticed a program by the name of "Moonbase Amphibia". After reading the write-up and becoming excited, I began typing this program into my CoCo. This excitement did not last long because when I came to line 1000 I noticed the end of it was missing. I looked through the rest of the program and began pulling my hair out at the sight of several other lines missing their ends.

I hope you can help me before I go bald.

Neil Etheridge
Pomona QLD

Neil,

It sounds like to me that the author of the program packed his program. How do you do that? Simple - write your line of code until you reach the end. When that happens, press enter and then edit the same line. You can get an extra 3-5 characters.

Now, we don't encourage doing this, mainly for the reasons mentioned above in your letter.

As for helping you, I can only recommend filling in those spaces with what you think would logically go there.

We haven't seen any corrections for it, either.

*

Dear Dr CoCo,

Does anyone out there have ...

1) A printer utility like "Calligrapher", only with normal bold block letters, and

2) the draw statements or a screen utility that draws large block letters on the screen.

All the utilities I have either draw in fancy writing or stick writing. Can you assist me in this area?

Tony Taraborelli
Wilston, QLD

Tony,

I personally don't know anybody out there who does, but I don't see any problem in making one - it would probably be faster and cheaper, too!

Can anyone out there help?

*

Dear Dr CoCo,

I am having trouble with a program called "Bigtext" from the June edition of CoCo. There seems to be a problem in the ML section of the program, but I can't find any typing errors. I wonder if you have a fix.

The Basic program run okay, but when the ML routine is entered some random graphics appear at the top of the graphics screen then control is returned to the Basic program.

I hope you can help. Bye for now,

Geoff Mackie
Niagra Park, NSW

Geoff,

After just running the program, I have found that it works. The "Random graphics" that you mention, appear in my version (or the magazines version) as well, so it must be part of the program.

As for the control being returned to Basic, I would suspect that there may be something wrong with the Basic program or the Basic Machine Language program that you have.

May I suggest that you check the ML program?

*

Dear Dr CoCo,

I had received two disk that I ordered - Best of #3 - Utilities and Best of #4 - Business a little while ago.

Now before I go on any further, can you please let me know if all the programs on disk #3 can be used straight from the disk without having to disconnect the controller?

I was really disappointed to find that, even when ordering the disk, most games and business programs have to be used from tape and have to have the controller disconnected.

C.W. Escabacke
Seaview Downs, SA

Mr(s) C.W.Escabacke,

Sorry to inform you, but not all programs on the Best of #3 disk can be used directly from the disk. Why?

On the games tape there are a few programs that will not work with the disk controller in on

the side of the computer.

One of these programs, called "Chomper", a few commands inside the Basic program that stop the program from working properly.

All in all, some programs will either crash or not work properly if you have the controller attached.

*

Dear Dr CoCo,

When I read "What's on CoCoOz 1-33" in the January editon of CoCo, I find some programs which I would not mind getting my hands on. The problem is, that they're on different tapes.

What I would like to know is can you copy the ones that I am after?

Also, can you tell me if there are any word-processing programs on tape or disk and what features they have. Also, will they work on a DMP-105 printer?

Michael Dobesch
Childers, QLD

Michael,

We can't custom-make tapes for you - if we did, we'd be here all month just making tapes. (Another good reason to look at the Best of Series - they are a compilation of the best programs. For example, Best of # 2.1 - 16K games - are a compilation of games that will suit a 16K CoCo.)

There are a number of word-processing programs for your CoCo. They are:

1. Telewriter/ Telepatch/ Ultra-Telepatch: These are all the same style of wor-processor, except that each one is a little more advanced than the one previous.
2. VIP-Writer
3. Scripsit
4. Deskmate 2/3
5. Pen-Pal

They all have numerous features, depending on what you want out of them. To find out all the features, the best thing to do is to call a software agent and ask for a brochure.

Any printer will work on any word-processor; therefore your printer (the DMP-105) will work with any of the above word-processors.

*

Dear Dr CoCo,

In the April Softgold magazine, there is a program called "Fraction Action" by Bob Horne. This particular program has an FC error in line 170.

I have tried to fix it myself, but to no avail. Can you please give me some advice on how to make the program run?

Apropos programs; there is a program called "CoCo Runner" by Max Bettridge. When we CSAVE the game it sounds like it has been CSAVEM-ed and when it is listed it only says 'ok'. Can you fix it up as to make the data sound like it has been CSAVE-ed and not CSAVEM-ed, and to not make it say 'OK' when it is being listed.

Graham Freak,
West Croydon, SA

Graham,

Looking at line 170, it appears that the only problem in the program could be that the variable 'F1' is at fault. To find this out, try the following:

1. RUN the program.
2. When you get the error, type PRINTF1

If F1 is a number less than 0, then F1 is the problem.

Your next thing to do is to find where F1 originates from. Looking at the program, F1 is created in line 160, via an ASCII of a string.

3. Type PRINT Z

By doing this, Z will tell you the position of the string.

4. Type PRINT C$

This will tell you what the computer is trying to print on the graphics screen.

Your option is now this:

Check what the computer is trying to draw on the graphics screen by typing (immediately after the error) DRAW CH$(F1) - if you get an error here, then the 'F1'st draw-string is wrong and you'll have to check lines 2360-2390.

The above procedure is my standard policy on checking errors such as the one you have encountered. Try it - it will work and in most cases, it's a typing mistake in the draw strings.

I'm afraid I have insufficient information to be able to help you on your last problem - if you could tell me more, (or send me the tape, c/o Goldsoft, PO Box 1742, Southport, 4215) I could help you out further.

*

Dear Dr CoCo,

I have a problem with the Scripsit program that I have on tape. It operates on 600 baud and my printer after being returned from service will not operate at this baud rate. It will work well on 240 baud which is an advantage.

What I would like it to do is to alter the Scripsit program to run on 2400 baud (or 4800), but I don't seem to have much success.

Could you help?
Les Hillel

Les,

There are two ways that you could try:

1. Load the main loader program (by typeing CLOAD). In the front of the program, enter this line: POKE150,41 and re-save the modified version.
2. Take the printer back to the service department and say to them, "It doesn't work/ The baud rate is faulty/ Fix it, or else". Printers are supposed to work at 600 baud; if they don't after coming back from the service department, then (in my opinion) they haven't been fixed.

Please address all correspondence to:

Dr CoCo,
PO Box 1742,
Southport, Qld., 4215.

Letters

Dear Graham,

I'm writing to you for some information regarding the interfacing of a Tandy Color Computer to an electric train set.

I've had a Color Computer now for five years that started out as a 16K model and has been upgraded to a 64K model.

At present it is not getting a great deal of use and I thought there must be a way of using it to run an electric train set.

I've never practised any electronics before and know absolutely nothing about how to go about interfacing - I think that's the word.

I believe I can use the games port of the Color Computer to achieve what I have in mind. I would appreciate it if you could offer me some assistance in where to look for the necessary information, what equipment I need and anything else you may think I need to know.

The more I think about it, the more involved I think it will be, particularly how to supply the power to a section of track gradually, as it cannot be just an off/on type of operation.

G. O'Brien
Balcatta, WA

Mr O'Brien

Thank you for the enquiry regarding connecting a model Railway to the CoCo.

I'm in the throes of completing an article on the subject for our magazine "Australian CoCo Magazine", so I was surprised to receive your letter!

I'm assuming you have at least read "HO Primer" (or "N Primer"), and a good selection of other model railway magazines/books.

If not, I suggest that before you go too far, you bone up on some theory of operation. Before a model railway gets this sort of sophisticated control, you really do need to understand what you are doing and why.

By the way, "sophistication" need not equal "hard"!

The job is a complex one but once the principles are understood, it need not be seen to be difficult - and the results are stunning!

You need a CoCo 1 or 2, a CoCoConnection (CoCoConnection is available from us for $216.00), relays, wire and time!

The CoCoConnection was designed by us specifically to operate model railways, but it has found a number of other uses including the control of the lights at Sydney Cricket Ground.

The CoCo can be disk or tape - we suggest you eventually purchase a second hand CoCo to run just the railway - leaving your own free. The program can be left in the computer most days so you wont need to load it all that often. The tape deck you have for your other computer will then be sufficent.

The CoCoConnection has sufficient instructions to indicate how to get a relay to switch under its control.

Basically, with the CoCoConnection in place, you POKE a memory location to effect a change and POKE it again to change it back.

You purchase 5 volt relays - either double pole double throw, or single pole single throw, from Tandy. These are controlled by the CoCoConnection and these in turn control points, on/off buttons and train controllers.

The best train controller to use is the Locomotion Controller, which has the push brake control on the panel - ie, it does not have a slider brake - you hold the button to stop the train.

All train movement under the CoCoConnection is controlled by a relay which can override this button. Again a DPDT relay attached in series to this controller effects forward/reverse.

The CoCoConnection can also sense its environment by reading inputs to it.

It can read a change from an open to a closed circuit and vice versa.

You PEEK set memory locations to see if changes have occured.

Simple switches such as pressure switches, press buttons and so on can then control various actions.

More sophisticated use of this feature can be made by employing the Twin T train detector (described in the American Model Railroading magazine) or the one available from Traintasia.

Other train detectors have been made utilising Infra Red detectors and light sensing diodes. Simple detectors can be made which feed AC thru one of the DC rails, but this system is not all that reliable and plays havoc with other things.

It is therefore easy to see a model which will report the position of a moving train, and where the computer will control, as a result of the train movement a series of signals, points and other trains to protect the progress of your train.

We have had a test line running here for a while to find components to operate under this system.

As a result of these tests, I am about to embark on a project I would not attempt if computer control were not available - at least not on a 12 volt system in HO!

I have designed a garden railway, which is being built in stages in my back yard.

In the first stage, it is a simple out to a loop and back line with the main sidings in my garage, and some 100 yards of track to the loop.

The computer in this phase must control 2 reversing switches, a minimum of one point motor, and the speed of the train.

The trick to it all is that from the first day of operation, the computer will be sending out at regular intervals, a track cleaning car/train.

As we live on the coast, the salt spray here is a real problem for any track - even though it will be nickel silver.

With a regular track cleaning car/train operating, I'm hopeful that many of the problems I might otherwise experience will not occur.

There is a learning curve involved for you initially - but they never hurt anyone - and we've already been rewarded by seeing our test bed do some pretty tricky things

The boys at the Perth Users Group will know little about this aspect of operating a CoCo, but they will be able to help with many general principles. Talk to Ian MacLeod - he's a good guy.

You are welcome to phone me too, should you decide to take the matter further. Graham

The Right Chemistry

Teaching the basics for early high school students

by Nicholas Fuller

CoCo3
EDUCATION

CHEMISTRY IS A PROGRAM that I wrote some time ago to help teach the basics of chemistry to early high school students.

When RUN, you are presented with a title page. The title page was created using HDRAW's and each letter was placed in a string. The title is drawn in an offset of 5 by 5 to obtain the shadow effect and in a different colour. The helium atoms rotating around electrons and nucleus are a result of simply changing palettes between the 2 colours they were drawn in.

After the title page, there will be a menu. The four options on this menu are:

1. Start again
2. Quit
3. Glossary
4. Save program

Choosing 'start again' will lead you to part one: "Atoms and Molecules", which explains the nucleus and so on.

Pressing a key brings a picture of the different parts of an atom. Following that, there is the "Periodic Table of the Elements".

A description about the table follows, with a very brief tutorial on balancing equations. You will also find the option of returning to the title page or the menu.

Choosing the quit option, option 2, shows a brief bibliography. Here the program ends.

Choosing the third option will lead you to a glossary. This shows the meanings of each scientific word used in the program, and the electronic configuration for the first twenty elements of the periodic table, with their symbols.

Option four, or 'save program', will do exactly that - save the program onto tape or disk under the name of "Chemistry".

Please note that this program should only be used as a guide to explain chemistry. Don't hesitate to replace my information with yours.

If you are *not* a chemistry fan, then you should enjoy the title page. The line numbers involved in the title page are from 10 to 490.

Anatomy of Program

Line:	Description:
0- 490	Title page
500 -	Menu
520- 590	Quit/Bibliography
600- 630	Save option
650- 750	Atom molecules
760- 800	Atom Picture
824-1000	Periodic table
1030-1236	Bonds, equations, info on table.
1250-1280	Glossary
1290-1340	List of elements
1380-1510	Tables data statements

Enjoy the program. See you in the lab!

The Listing:

```
0 GOTO10
3 SAVE"100A:3":END'2
10 HBUFF1,1583:HBUFF2,1583
15 D=0
20 '******************
30 '**CHEMISTRY-1987**
40 '******************
50 '*NICHOLAS FULLER**
60 '=(02)-5161518=====
70 '******************
80 'PCLEAR1 BEFORE LOADING
90 PALETTERGB:POKE65497,0
100 'ON BRK GOTO 1000
110 HSCREEN2
120 PALETTE0,15:PALETTE1,63:PALETTE2,25:PALETTE3,57:PALETTE4,32:PALETTE5,52:PALETTE6,18:PALETTE7,15:PALETTE8,63
130 AA$="R20F2D8G2L10G2D14F2R10F2D8G2L20H2U38E2"
140 AB$="R6F2D12F2R2E2U12E2R6F2D38G2L6H2U12H2L2G2D12G2L6H2U38E2"
150 AC$="R20F2D5G2L10G2D4F2R8F2D4G2L8G2D4F2R10F2D5G2L20H2U38E2"
160 AD$="E2R9F4E4R9F2D38G2L4H2U15H2G2D5G2L2H2U5H2G2D15G2L4H2U38"
170 AE$="E2R10F2D38G2L10H2U38"
180 AF$="E2R20F2D5G2L10G2D5F2R10F2D20G2L20H2U5E2R10E2U3H2L10H2U22"
190 AG$="E2R23F2D10G2L5G2D25G2L5H2U25H2L5H2U10"
200 AH$="G2D38F2R6E2U20E2R2F2D20F2R6E2U20H2E2U15H2L22BR8BD10D3R4E2U2H2L4D2"
210 AI$="G2D18F2R5F2D18F2R5E2U18E2R5E2U18H2L5G2D10G2L5H2U10H2L5"
220 HDRAW"BM15,5;C2"+AA$:HPAINT(25,6),2,2:HDRAW"BM20,10;C1"+AA$:HPAINT(26,15),3,1:HDRAW"BM45,5;C2"+AB$:HPAINT(47,6),2,2:HDRAW"BM50,10;C1"+AB$:HPAINT(52,11),3,1
230 HDRAW"BM78,5;C2"+AC$:HPAINT(84,7),2,2:HDRAW"BM83,10;C1"+AC$:HPAINT(84,12),3,1:HDRAW"BM108,7;C2"+AD$:HPAINT(109,10),2,2:HDRAW"BM113,12;C1"+AD$:HPAINT(115,15),3,1
240 HDRAW"BM145,7;C2"+AE$:HPAINT(147,11),2,2:HDRAW"BM150,12;C1"+AE$:HPAINT(155,15),3,1:HDRAW"BM165,7;C2"+AF$:HPAINT(177,9),2,2:HDRAW"BM170,12;C1"+AF$:HPAINT(177,11),3,1
250 HDRAW"BM195,7;C2"+AG$:HPAINT(197,9),2,2:HDRAW"BM200,12;C1"+AG$:HPAINT(205,14),3,1
260 HDRAW"BM230,6;C2"+AH$:HPAINT(232,8),2,2:HDRAW"BM235,11;C1"+AH$:HPAINT(237,13),3,1:HDRAW"BM263,5;C2"+AI$:HPAINT(265,7),2,2:HDRAW"BM268,10;C1"+AI$:HPAINT(270,12),3,1
270 HCIRCLE(70,110),10,4:HPAINT(70,110),4,4:HCIRCLE(65,95),10,5:HPAINT(65,95),5,5:HCIRCLE(50,100),10,4:HPAINT(50,100),4,4:HCIRCLE(55,115),10,5:HPAINT(55,110),5,5
280 HCIRCLE(60,140),7,6:HPAINT(60,140),6,6:HCIRCLE(20,100),7,6:HPAINT(20,100),6,6:HCIRCLE(60,65),7,7:HPAINT(60,65),7,7:HCIRCLE(100,100),7,7:HPAINT(100,100),7,7
290 HCIRCLE(60,105),40,8,.5:HCIRCLE(60,105),20,8,2
```

```
300 HCOLOR3:HPRINT(3,20),"Writte
n by Nicholas Fuller *1987*":HCO
LOR2:HLINE(150,60)-(300,150),PSE
T,BF:HGET(157,73)-(227,116),2
310 HCOLOR10:HLINE(180,80)-(210,
80),PSET:HLINE-(220,100),PSET:HL
INE-(200,110),PSET:HLINE-(175,11
0),PSET:HLINE-(165,95),PSET:HLIN
E-(180,80),PSET:HCIRCLE(180,80),
6,9:HPAINT(180,80),9,9:HCIRCLE(2
10,80),6,9:HPAINT(210,80),9,9:HC
IRCLE(200,110),6,9
320 HCIRCLE(165,95),6,9:HPAINT(1
65,95),9,9:HCIRCLE(175,110),6,9:
HPAINT(175,110),9,9:HCIRCLE(200,
110),6,9:HPAINT(200,110),9,9:HCI
RCLE(220,100),6,9:HPAINT(220,100
),9,9
330 HPRINT(20,11),"C":HPRINT(27,
12),"C":HPRINT(25,13),"C":HPRINT
(21,13),"C":HPRINT(22,10),"C":HP
RINT(26,10),"C"
360 HPRINT(20,7),"molecule of ca
rbon":HPRINT(5,7),"helium atom"
370 HGET(157,73)-(227,116),1:GOS
UB470:HPUT(157,73)-(227,116),2:H
PUT(170,100)-(240,143),1:GOSUB47
0:HPUT(170,100)-(240,143),2:HPUT
(200,100)-(270,143),1:GOSUB470:H
PUT(200,100)-(270,143),2:HPUT(16
5,75)-(235,118),1:GOSUB470:HPUT(
165,75)-(235,118),2
380 HPUT(230,100)-(300,143),1:GO
SUB470:HPUT(230,100)-(300,143),2
:HPUT(200,65)-(270,108),1:GOSUB4
70:HPUT(200,65)-(270,108),2:HPUT
(173,74)-(243,117),1:GOSUB470
390 PALETTE0,0:PALETTE10,63:FORV
=1TO10:HPUT(173,74)-(243,117),2:
HPUT(157,73)-(227,116),1:GOSUB41
0:HPUT(157,73)-(227,116),2:HPUT(
200,100)-(270,143),1:GOSUB410:HP
UT(200,100)-(270,143),2:HPUT(180
,70)-(250,113),1
400 GOSUB410:HPUT(180,70)-(250,1
13),2:NEXTV
410 FORX=1TO7:PALETTE1,RND(63):P
ALETTE2,RND(63):PALETTE4,52:PALE
TTE5,32:PALETTE9,RND(63):PALETTE
6,0:PALETTE7,18:FORT=1TO80:NEXTT
420 PALETTE1,RND(63):PALETTE2,RN
D(63):PALETTE9,RND(63):PALETTE4,
32:PALETTE5,52:PALETTE6,18:PALET
TE7,0:FORG=1TO80:NEXTG:NEXTX
430 FORYY=1TO500:NEXTYY:PALETTE0
,15:PALETTE1,63:PALETTE2,25:PALE
TTE3,57:PALETTE4,32:PALETTE5,52:
PALETTE6,18:PALETTE7,15:PALETTE8
,63
440 FORP=1TO3:PLAY"T10O2DADADACA
CACCDCDCCFGEO4L2EEADL1AADAL10EED
DF#":NEXTP:PLAY"L1.FGDL20EEAFF":
HPRINT(3,22),"PRESS ANY KEY"
450 EXEC44539
460 GOTO490
470 FORT=1TO7:PALETTE1,RND(63):P
ALETTE2,RND(63):PALETTE9,RND(63)
:PALETTE3,RND(63):PALETTE4,52:PA
LETTE5,32:PALETTE6,15:PALETTE7,1
8:FORQ=1TO80:NEXTQ
480 PALETTE1,63:PALETTE2,RND(63)
:PALETTE3,RND(63):PALETTE4,32:PA
```

MENU:

1. **Start again.**
2. **Quit.**
3. **Glossary.**
4. **Save Program.**

```
LETTE5,52:PALETTE6,18:PALETTE7,1
5:FORG=1TO80:NEXTG:NEXTT:RETURN
490 WIDTH40:PALETTERGB:CLS2:ATTR
0,1:LOCATE12,0:PRINT"CHEMISTRY";
:LOCATE14,2:ATTR4,5,B:PRINT"MENU
";:ATTR0,1:PRINT:ATTR3,3:PRINT:P
RINT"1)START AGAIN":PRINT"2)QUIT
":PRINT"3)GLOSSARY":PRINT"4)SAVE
 PROGRAM"
500 INPUTA:ON A GOSUB 650,520,12
50,600
510 GOTO 510
520 WIDTH40:PALETTERGB:LOCATE12,
0:PRINT"EXIT  OUT OF PROGRAM":PR
INT:PRINT:ATTR3,3,B:PRINT"ARE YO
U SURE YES / NO";:INPUTA$:IF A$=
"Y" OR A$="YES" THEN 530ELSEIF A
$="N" OR A$="NO" THEN 490 ELSE 5
20
530 CLS:LOCATE12,0:ATTR3,3:PRINT
"CHEMISTRY summary";:PRINT:PRINT
"Thank you for running this prog
ram, I hope that it has been of
some use and that you have learn
t something from it(I know I did
!)":PRINT"Chemistry as you have
 seen is a really ";
540 PRINT"fascinating subject. I
t is all around us all the time
from the kitchen to the laborato
ry":PRINT"press any key"
550 EXEC44539
560 CLS5:PRINTTAB(10)"BIBLIOGRAP
HY":PRINT"THE ENCYCLOPAEDIA BRIT
TANICA":PRINT"WORLD BOOK ENCYCLO
PAEDIA":PRINT"CONCEPTS OF SCIENC
E-book 2 R.G CULL & W.A DRAKE":P
RINT"ILLUSTRATED ENCYCLOPAEDIA O
F SCIENCE-VARIOUS":PRINT:PRINT:A
TTR3,3:PRINT"PRESS ANY KEY"
570 EXEC44539
580 CLS:PRINT:PRINT:PRINT"CHEMIS
TRY-was written by NICHOLAS FULL
ER 1987 ON A CO CO3 AND SANYO 34
cm t.v ":ATTR0,1:PRINT"Another S
olar Software program":PRINT"HAV
E A NICE DAY!!"
590 FORT=1TO2000:NEXTT:PALETTERG
B:POKE65496,0:STOP
600 WIDTH40:LOCATE12,0:ATTR3,2,B
,U:PRINT"CHEMISTRY";:ATTR3,6:PRI
NT:PRINT"SAVING PROGRAM":POKE654
96,0:INPUT"Tape or Disk";SA$
610 IF SA$="T" THEN 620 ELSE IF
SA$="D" THEN 630 ELSE 600
620 CLS:INPUT"ENTER FILENAME";F$
:PRINT"PRESS DOWN RECORD & PLAY
BUTTONS ENTER A SUITABLE TAPE AN
D PRESS <ENTER>":INPUTA$:CSAVE F
$:GOTO 10
630 CLS:INPUT"ENTER FILENAME";F$
:PRINT"ENTER SUITABLE DISK AND P
RESS <ENTER>":'SAVE F$:GOTO10
640 GOTO 10
650 'START OF THE BODY OF THE PR
OGRAM
660 WIDTH80:PALETTERGB:CLS6:ATTR
4,4,B,U:LOCATE12,0:PRINT"CHEMIST
RY";:ATTR6,5:PRINT
670 ATTR3,3:PRINT"Part One:";:AT
TR5,5:PRINT:ATTR3,2:PRINT"ATOMS
AND MOLECULES";
680 PRINT:ATTR0,1:PRINT"All matt
er is made up of tiny building b
locks called ";:ATTR3,3:PRINT"At
oms.";:ATTR0,1:PRINT" These atom
s all correspond with the 92 nat
urally occuring ";:ATTR3,3:PRINT
"Elements";:ATTR0,1:
690 PRINT" found on the planet e
arth and 14 man made elements":A
TTR3,6:PRINT"WHAT ARE ATOMS MADE
 OF ?";:ATTR0,1:PRINT
700 ATTR0,1:PRINT"Atoms consist
of a postively charged and heavy
 ";:ATTR3,3:PRINT"nucleus";:ATTR
0,1:PRINT" which contains ";:ATT
R3,3:PRINT"protons and neutrons"
;:ATTR0,1:PRINT" Orbiting around
 the nucleus are lighter ";:ATTR
3,3:PRINT"electrons";:ATTR0,1
710 PRINT"The proton has a (+) p
ositive electrical charge while
the electron carries a (-) negat
ive charge.The neutron has no el
ecrical charge ":PRINT"The proto
ns attract the electrons because
 of their opposite charges and t
he atom is electrically ";
720 PRINT"neutral due to the fac
t that the negative charges of t
he protons cancel out the positi
ve charges of the electrons ";:P
RINT"The number of protons in an
 atom determines what it is -for
 example an oxygen atom has 8 pr
otons 8 neutrons and 8 ";
730 PRINT"electrons ";:PRINT"As
you can see the number of proton
s equal the number of electrons-
in a helium atom it has 2 electr
ons 2 protons and 2 neutrons ";:
PRINT"All atoms have the same pa
rticles, only the numbers differ
"
740 ATTR4,4,B:PRINT"PRESS ANY KE
Y";
750 L$=INKEY$:IF L$=""THEN750
760 HSCREEN2:PALETTERGB:PALETTE5
,63:HCOLOR5
770 HPRINT(15,0),"THE ATOM":HCOL
OR1:PALETTE0,0:PALETTE1,63:PALET
TE2,32:PALETTE3,52:HCIRCLE(100,4
```

```
5),8,2:HPAINT(100,45),2,2:HCIRCL
E(108,58),8,3:HPAINT(108,58),3,3
:HCIRCLE(96,58),8,2:HPAINT(96,58
),2,2:PALETTE4,16:HCIRCLE(120,80
),8,4:PALETTE5,63
780 HPAINT(120,80),4,4:HCIRCLE(8
8,50),8,3:HPAINT(88,50),3,3:HDRA
W"BM116,58;C1R30":HDRAW"BM128,80
;F20":HDRAW"BM112,45;R30":HPRINT
(18,4),"POSITIVE PROTON <+>":HPR
INT(19,14),"NEGATIVE ELECTRON <-
>":HPRINT(19,7),"NEUTRAL NEUTRON
"
790 HPRINT(5,10),"NUCLEUS":HDRAW
"BM70,70;E10":HCOLOR5:HPRINT(20,
20),"ANY KEY"
800 V$=INKEY$:PALETTE5,0:FORT=1T
O20:NEXTT:PALETTE5,63:FORT=1TO20
:NEXTT:IF V$="" THEN GOTO 800 EL
SE 801
801 GOTO 810
810 PALETTERGB:WIDTH40
820 CLS:LOCATE12,0:PRINT"CHEMIST
RY":ATTR4,5
830 PRINT"CHEMISTRY":PRINT"An el
ement is a substance that cannot
 be broken down chemically into
something simpler. There are 106
  of these and they are displaye
d in a chart called the PERODIC
TABLE where each of the elements
 is given a ";
840 PRINT"symbol to represent th
e elements":PRINT"press any key"
850 EXEC44539
860 HSCREEN4:PALETTERGB:PALETTE0
,27:PALETTE2,0:HCOLOR2:HPRINT(20
,0),"THE PERODIC TABLE OF THE EL
EMENTS"
870 FORT=20 TO 600 STEP 30:FORV=
20 TO160 STEP 20:HLINE(T,V)-(T+3
0,V),PSET:NEXTV:NEXTT
880 FORYY=20TO600 STEP 30:X=20:Z
=160:HLINE(YY,X)-(YY,Z),PSET:NEX
TYY:HLINE(620,20)-(620,160),PSET
:PALETTE3,27:HCOLOR3:FORA=110TO3
50 STEP30:H=20:V=80:HLINE(A,H)-(
A,V),PSET:NEXTA
890 FORP=1TO3:D=D+20:HLINE(80,D)
-(379,D),PSET:NEXTP:HLINE(379,20
)-(629,39),PSET,BF:HLINE(561,30)
-(620,180),PSET,BF:HDRAW"BM530,6
0;C2U40R30D40":HPAINT(0,0),1,2
900 HLINE(140,160)-(560,160),PSE
T:HDRAW"BM140,160;D32U32R420D40"
:FORT=140TO560STEP30:HLINE(T,160
)-(T,195),PSET
910 NEXTT:HLINE(140,175)-(560,17
5),PSET:HDRAW"BM108,160;U40L1D40
"
920 FORT=1TO57:READ Z,Y:HPRINT(Z
,Y), T:NEXT
930 FORH=72TO89:READ F,G:HPRINT(
F,G),H:NEXT
940 FORJ=58TO71:READ Q,W:HPRINT(
Q,W),J:NEXTJ:FORE=90TO103:READ C
,V:HPRINT(C,V),E:NEXT
950 FORB=104 TO106:READ M,N:HPRI
NT(M,N),B:NEXT
960 HPRINT(3,4),"H":HPRINT(67,4)
,"He":FORQQ=1TO104:READS,D,F$:HP
RINT(S,D),F$:NEXT
```

Please note: This program should only be used as a guide to explain chemistry. Don't hesitate to replace any information that may update or enhance this program.

```
 to get rid of its elctron ";
1080 PRINT"so it will 'give' its
 electron to the chlorine atom t
o form a MOLECULE of hydrochlori
c acid-so the valency of chlorin
e is 1. Similiary the valency of
 BERYILIUM is 2, BORON 3 CARBON
4 etc "
1090 PRINT"PRESS ANY KEY":EXEC44
539
1100 CLS:LOCATE20,0:PRINT"DIFERE
NT TYPES OF BONDS":PRINT"THE ION
IC BOND is a bond caused by a st
rong electromagnatic effect such
 as when sodium chloride is form
ed":PRINT"The sodium atom readil
y loses its single outer electro
n to the chlorine atom which "
1110 PRINT"accepts the electron
to complete its outer shell-also
 as a result the sodium atom now
 has a full outer shell. The sod
ium atom is now a positively cha
rged ion as the nucleus is not f
ully balanced by the electrons--
simarily the chlorine ";
1120 PRINT"is now negatively cha
rged due to the extra electron.
As opposite charges attract the
two atoms become a single molecu
le of sodium chloride-types of m
aterals that are held together b
y this bond are usually solids w
ith the ions being held ";
1130 PRINT"in a stable crystal l
atice":PRINT"CONVALENT BONDS are
 bonds that rely on the sharing
of electrons rather than the giv
ing of electrons. In the example
 of the gas METHANE a carbon ato
m has four electrons in its oute
r shell and each of the four "
1140 PRINT"Hydrogen atoms that s
urround the carbon atom each hav
e one electron each so that at a
ny one time the carbon atom has
a full outer complement of eight
 while the hydrogen atoms also h
ave a full outer shell of two":P
RINT"press any key"
1150 EXEC44539
1151 HSCREEN2:PALETTE1,63:HPRINT
(10,0),"MOLECULAR BONDS":HPRINT(
20,5),"convalent bonds":HPRINT(0
,5),"ionic bonds"
1152 HPRINT(20,9),"** **":HPRINT
(19,10),"* C* C*":HPRINT(19,11),
"*  *  *":HPRINT(20,12),"** **":
970 HPRINT(0,22),"PRESS ANY KEY"
:HDRAW"BM90,25;R436G5E5H5":HDRAW
"BM105,160;C2G10R15H10F10L7D5R30
":HPAINT(105,167),2,2
980 HPRINT(3,1),"IA":HPRINT(6,1)
,"IIA":HPRINT(10,9),"IIIB":HPRIN
T(14,9),"IVB":HPRINT(18,9),"VB":
HPRINT(21,9),"VIB":HPRINT(25,9),
"VIIB":HPRINT(33,8),"VIII":HPRIN
T(40,9),"IB":HPRINT(43,9),"IIB"
990 HDRAW"BM250,80;U5R50D5":HPRI
NT(46,4),"IIIA":HPRINT(51,4),"IV
A":HPRINT(55,4),"VA":HPRINT(58,4
),"VIA":HPRINT(62,4),"VIIA":HPRI
NT(67,1),"VIIIA"
1000 EXEC44539
1010 FORE=1TO10:PALETTE1,RND(63)
:FORG=1TO100:NEXTG:NEXTE:WIDTH80
:ATTR4,4
1020 PALETTERGB:LOCATE20,0:PRINT
"ELEMENTS IN THE PERODIC TABLE"
1030 PRINT"The Perodic Table has
 several important features that
 can be noted. The number given
to each element is called their
ATOMIC NUMBER and represents how
 many protons they have in their
 nucleus. It is this factor whic
h determines the difference ";
1040 PRINT"between the elements.
 The electrons which surround th
e nucleus are partioned into con
centric shells or orbits the fir
st shell may contain a maximum o
f only 2. The second shell is ma
de up of 4 shells each containin
g a maximum of 2 electrons, ";
1050 PRINT"therefore the second
shell contains a total of eight.
 The third shell is the same. Th
e bigger atomic number the great
er number of shells-the order of
 shells for the first 20 element
s is 2,8,8,2.":PRINT"Each elemen
t would like to get the maximu
1060 PRINT"number of electrons i
n their outer shell as this way
they are stable similar to the i
nert gases of HELIUM NEON ARGON
KRYPTON etc each of who have the
ir outer shells full.""
1070 PRINT"The valency is the nu
mber of Hydrogen atoms needed to
 combine with the atom to make i
t have a complete outer shell ie
 chlorine has 7 electrons in its
 outer shell and would like one
more, a Hydrogen atom would like
```

```
HPRINT(0,9),"  +    -":HPRINT(0,1
0),"NA +Cl"
1153 HPRINT(20,20),"any key"
1154 EXEC44539
1155 WIDTH80:PALETTERGB
1160 CLS:LOCATE20,0:PRINT"EQUATI
ONS AND FORMULAES":PRINT"A chemi
cal equation is a convenient way
 of representing a chemical equa
tion between elements and compou
nds-to explain the processes inv
olved with understanding and wri
ting equations let us ";
1170 PRINT"look at some examples
- Zn + HCL > ZnCl2 + H2^"
1180  PRINT"First let us look at
 the formulaes for hydrochloric
acid HCL it is written that way
 as the valency for both hydrogen
 and chlorine is one, Zinc Cholr
ide (ZnCl2) is like that because
 the ";
1190 PRINT"valency of zinc is 2
and chlorine 1. The reason hydro
gen is written with a two is bec
ause the smallest amount of hydr
ogen that can exist alone is as
a molecule H2 the arrow represen
ts a gas":PRINT"However matter i
s neither created or ";
1200 PRINT"destroyed but as we h
ave it there is more matter on t
he right than the left. We recti
fy this problem by balancing the
 equation. This is done by doubl
ing the amount of matter on the
left until it matches that on th
e right ie by adding a 2 ";
1210 PRINT"infront of the hydroc
hloric acid":PRINT"Zn + 2HCl > Z
nCl2 + H2"
1220 PRINT"press any key"
1230 EXEC44539
1235 RESTORE:D=0
1236 INPUT"DO YOU WISH a TO VIEW
 THE TITLE PAGE OR b GO STRAIGHT
 TO THE MENU";HH$:IF HH$="A"OR H
H$="a" THEN 10 ELSE IF HH$="B" O
R HH$="b" THEN 490
1240 GOTO 490
1250 WIDTH40:PALETTERGB:ATTR3,3,
B:LOCATE12,0:PRINT"GLOSSARY OF T
ERMS";:ATTR3,2:PRINT:PRINT"ATOM-
A particle that is the building
block for all elements":PRINT"EL
EMENT-substances that can't be b
roken down chemically into simpl
er matter":PRINT"COMPOUND-2";
1260 PRINT" or more elements che
mically united in a fixed propor
tion by weight"
1270 PRINT"ELECTRON-negatively c
harged particle":PRINT"PROTON-po
sitively charged particle":PRINT
"NEUTRON-particle with no charge
":PRINT"NUCLEUS-positively charg
edwith protons and neutrons":PRI
NT"PERODIC TABLE-table with deta
ils & symbols of elements"
1280 PRINT"PRESS ANY KEY"
1290 EXEC44539
1300 CLS:LOCATE12,0:PRINT"FIRST
20 ELEMENTS":ATTR4,5:PRINT"No.Na
me       Symbol    structure":PRIN
T"1  HYDROGEN      H       1":PRIN
T"2  HELIUM        He      2"
1310 PRINT"3  LITHIUM       Li
  2,1":PRINT"4  BERYLIUM      Be
    2,2":PRINT"5  BORON         B
      2,3":PRINT"6  CARBON
 C       2,4":PRINT"7  NITROGEN
   N       2,5":PRINT"8  OXYGEN
     O       2,6":PRINT"9  FLUORI
NE     F       2,7"
1320 PRINT"10 NEON          Ne
  2,8":PRINT"11 SODIUM        Na
    2,8,1":PRINT"12 MAGNESIUM
 Mg      2,8,2":PRINT"13 ALUMINIU
M    Al      2,8,3":PRINT"14 SILI
CON      Si      2,8,4":PRINT"15
PHOSPHOROS   P       2,8,5"
1330 PRINT"16 SULPHUR       S
  2,8,6":PRINT"17 CHLORINE      C
l      2,8,7":PRINT"18 ARGON
   Ar.     2,8,8":PRINT"19 POTASS
IUM    K       2,8,8,1":PRINT"20
CALCIUM      Ca      2,8,8,2"
1340 PRINT"PRESS ANY KEY"
1350 EXEC44539
1360 GOTO 490
1370 GOTO 10
1380 DATA 2,3,66,3,2,5,6,5,47,5,
51,5,55,5,58,5,62,5,66,5
1390 DATA 2,8,6,8,47,8,51,8,55,8
,58,8,62,8,66,8
1400 DATA 2,10,6,10,10,10,13,10,
17,10,21,10,25,10,28,10,32,10,36
,10,39,10,43,10,47,10,51,10,55,1
0,58,10,62,10,66,10
1410 DATA 2,13,6,13,10,13,13,13,
17,13,21,13,25,13,28,13,32,13,36
,13,39,13,43,13,47,13,51,13,55,1
3,58,13,62,13,66,13
1420 DATA 2,15,6,15,10,15
1430 DATA 13,15,17,15,21,15,25,1
5,28,15,32,15,36,15,39,15,43,15,
47,15,51,15,55,15,58,15,62,15,66
,15
1440 DATA 2,18,6,18,10,18
1450 DATA 17,20,21,20,25,20,28,2
0,32,20,36,20,39,20,43,20,47,20,
51,20,55,20,58,20,62,20,66,20,17
,22,21,22,25,22,28,22,32,22,36,2
2,39,22,43,22,47,22,51,22,55,22,
58,22,62,22,66,22
1460 DATA 13,18,17,18,21,18
1470 DATA 3,6,Li,7,6,Be,48,6,B,5
2,6,C,56,6,N,59,6,O,63,6,F,67,6,
Ne,3,9,Na,7,9,Mg,48,9,Al,52,9,Si
,56,9,P,59,9,S,63,9,Cl,67,9,Ar
1480 DATA 3,11,K,7,11,Ca,11,11,S
c,14,11,Ti,18,11,V,22,11,Cr,26,1
1,Mn,29,11,Fe,33,11,Co,37,11,Ni,
40,11,Cu,44,11,Zn,48,11,Ga,52,11
,Ge,56,11,As,59,11,Se,63,11,Br,6
7,11,Kr,3,14,Rb,7,14,Sr,11,14,Y,
14,14,Zr,18,14,Nb,22,14,Mo,26,14
,Tc,29,14,Ru,33,14,Rh
1490 DATA 37,14,Pd,40,14,Ag,44,1
4,Cd,48,14,In,52,14,Sn,56,14,Sb,
59,14,Te,63,14,I,67,14,Xe,3,16,C
s,7,16,Ba,11,16,La,14,16,Hf,18,1
6,Ta,22,16,W,26,16,Re,29,16,Os,3
3,16,Ir,37,16,Pt,40,16,Au,44,16,
Hg,48,16,Tl,52,16,Pb,56,16,Bi,59
,16,Po,63,16,At,67,16,Rn
1500 DATA 3,19,Fr,7,19,Ra,11,19,
Ac,14,19,Unq,18,19,Unp,22,19,Unh
,18,21,Ce,22,21,Pr,26,21,Nd,29,2
1,Pm,33,21,Sm,37,21,Eu,40,21,Gd,
44,21,Tb,48,21,Dy,52,21,Ho,56,21
,Er,59,21,Tm,63,21,Yb,67,21,Lu
1510 DATA 18,23,Th,22,23,Pa,26,2
3,U,29,23,Np,33,23,Pu,37,23,Am,4
0,23,Cm,44,23,Bk,48,23,Cf,52,23,
Es,56,23,Fm,59,23,Md,63,23,No,67
,23,Lr
```

If you are not a chemistry fan, you should enjoy the title page!

Just type in lines 10 to 490.

The helium atoms rotating around electrons and nucleus are the result of simply changing palettes between the 2 colours they were drawn in.

Advance Australia with your CoCo

by Chris Rowe & Jayson Sagnol

GRAPHICS
32K ECB

```
C;L3;E;L8;C;L3;D;O3;L8;B;O4;L2;C
50 GOTO 50
100 PMODE3,1:PCLS:SCREEN1,0
105 COLOR3,1
110 LINE(105,50)-(126,50),PSET
120 LINE(134,50)-(142,50),PSET
130 LINE(148,50)-(169,50),PSET
140 LINE(172,52)-(189,79),PSET
150 LINE(191,79)-(220,20),PSET
160 LINE-(230,45),PSET
170 LINE(233,53)-(236,62),PSET
180 LINE(240,71)-(260,95),PSET
190 LINE-(205,170),PSET
200 LINE-(193,161),PSET
210 LINE(187,157)-(183,153),PSET
220 LINE(178,149)-(164,138),PSET
230 LINE(163,137)-(141,120),PSET
240 LINE(115,165)-(105,154),PSET
250 LINE(100,149)-(95,142),PSET
260 LINE(90,137)-(75,120),PSET
270 LINE-(105,50),PSET
280 LINE(90,137)-(126,50),PSET
290 LINE(95,142)-(134,50),PSET
300 LINE(100,149)-(142,50),PSET
320 LINE(148,50)-(105,154),PSET
330 LINE(169,50)-(115,165),PSET
340 LINE(172,52)-(141,120),PSET
360 LINE(189,80)-(164,137),PSET
370 LINE(188,84)-(163,136),PSET
380 COLOR3,1
390 LINE(230,45)-(178,149),PSET
400 LINE(233,53)-(183,153),PSET
410 LINE(236,62)-(188,157),PSET
430 LINE(240,71)-(193,161),PSET
440 COLOR3,1:PAINT(1,1)
445 COLOR2,1
```

WE WOULD LIKE to enter this program in the graphics competition you are running.

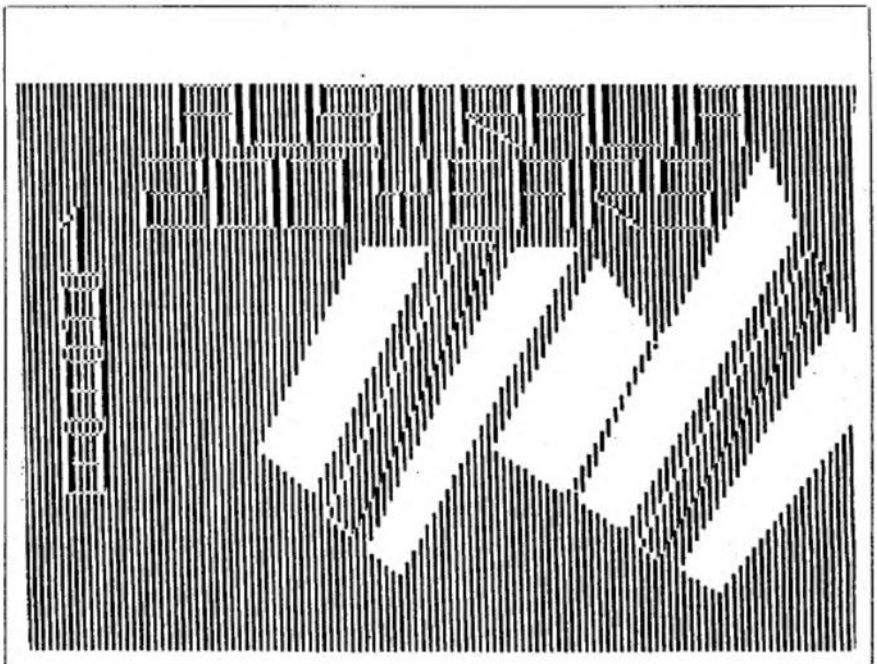
Our program shows the Bicentennial logo and a ship representing one of those from the first fleet, which sails across the bottom.

All to the tune of "Advance Australia Fair".

It took us many hours to design this program on a CoCo 2.

The Listing:

```
1 '*****************************
2 '******ADVANCE AUSTRALIA******
3 '********BY CHRIS ROWE********
4 '********& JAYSON SAGNOL*******
5 '************AGE  13***********
6 '*****************************
7 GOTO9
8 SAVE"72:3":END'5
9 GOSUB 100
10 PLAY"V31;T2;G;O4;C;O3;GEG;O4;
L3;C;L8;C;L4;CEDC;O3;B;O4;C;L2;D
;L4;O3;P4;G;O4;C;O3;GEC
20 PLAY"V31;L3;G;L8;G;L4;G;O4;ED
C;O3;BA;L2;G;P4;L4;G
30 PLAY"V31;L3A;L8;B;L4;O4;C;O3;
A;L3;G;L8;E;L4;EGA;O4;CFE;L2;D;O
3;L4;P4;G
35 PLAY"V31;O3;L3;A;L8;B;O4;L4;C
;O3;A;L3;G;O4;L8;C;L4;CD;L3;E;L8
;C;L3;D;O3;L8;B;O4;L2;C;L4;P4;E
40 PLAY"V31;O4;L4;FEDC;O3;B&G;O4
```



This is a PMODE 3 graphics program showing our bicentennial logo.

```
450 LINE(134,50)-(95,142),PSET
460 LINE(142,50)-(100,149),PSET
470 LINE(134,50)-(142,50),PSET
480 LINE(100,149)-(95,142),PSET
490 PAINT(115,105),2
500 LINE(233,53)-(236,62),PSET
510 LINE(187,157)-(183,153),PSET
520 LINE(233,53)-(183,153),PSET
530 LINE(236,62)-(187,157),PSET
540 PAINT(208,110),2
550 DRAW"BM55,20;U20R15D20U10L15
"
560 DRAW"BM75,0;D20R15U20
570 DRAW"BM110,0;L15D10R15D10L15
580 DRAW"BM122,20;U20L7R15
590 DRAW"BM135,20;U20R15D10L15
600 LINE(135,10)-(150,20),PSET
610 DRAW"BM155,20;U20R15D20U10L1
5
620 DRAW"BM190,20;L15U20
630 DRAW"BM195,0;D20
640 DRAW"BM200,20;U20R15D20U10L1
5
660 DRAW"BM45,25;R15D10L15D10R15
670 DRAW"BM65,25;R15D20L15U20
680 DRAW"BM85,25;R15D20L15U20
690 DRAW"BM110,25;D10R7D10U10R8U
10
700 DRAW"BM145,25;L15D10R10L10D1
0R15
710 DRAW"BM150,45;U20R15D10L15R1
5D10
720 DRAW"BM170,45;U20R15D10L15
730 LINE(170,35)-(185,45),PSET
740 DRAW"BM190,45;R15U10L15U10R1
5
750 DRAW"BM25,40;D20L5R10
760 LINE(25,40)-(20,45),PSET
770 DRAW"BM20,80;D5R10U20L10D10R
10
780 DRAW"BM20,90;D20R10U10L10R10
U10L10
790 DRAW"BM20,115;D20R10U10L10R1
0U10L10
800 FOR A=1 TO 700:NEXT A
810 LINE(15,185)-(30,185),PSET
820 LINE(30,185)-(30,180),PSET
830 LINE(30,180)-(25,181),PSET
840 LINE(25,181)-(20,181),PSET
850 LINE(20,181)-(15,180),PSET
860 LINE(15,180)-(15,185),PSET
870 LINE(15,184)-(14,185),PSET
880 LINE(14,185)-(11,185),PSET
890 LINE(11,185)-(10,184),PSET
900 LINE(10,184)-(10,180),PSET
910 LINE(10,180)-(15,180),PSET
920 LINE(15,183)-(30,183),PSET
930 LINE(26,181)-(26,179),PSET
940 LINE(27,181)-(27,179),PSET
950 LINE(25,175)-(30,175),PSET
960 LINE(30,175)-(29,179),PSET
970 LINE(29,179)-(25,179),PSET
980 LINE(25,179)-(25,175),PSET
990 LINE(30,175)-(31,173),PSET
1000 LINE(31,173)-(31,170),PSET
1010 LINE(31,170)-(30,169),PSET
1020 LINE(30,169)-(25,170),PSET
1030 LINE(25,170)-(25,175),PSET
1040 LINE(27,169)-(27,167),PSET
1050 LINE(29,169)-(29,167),PSET
1060 LINE(20,181)-(20,179),PSET
1070 LINE(19,181)-(19,179),PSET
1080 LINE(18,179)-(24,178),PSET
1090 LINE(24,178)-(23,174),PSET
1100 LINE(23,174)-(18,174),PSET
1110 LINE(18,174)-(18,179),PSET
1120 LINE(23,173)-(23,170),PSET
1130 LINE(23,170)-(17,170),PSET
1140 LINE(17,170)-(18,172),PSET
1150 LINE(18,172)-(18,175),PSET
1160 LINE(17,169)-(22,169),PSET
1170 LINE(17,169)-(17,167),PSET
1180 LINE(17,167)-(21,166),PSET
1190 LINE(21,166)-(22,169),PSET
1200 LINE(19,167)-(19,164),PSET
1210 LINE(12,180)-(12,178),PSET
1220 LINE(14,180)-(14,178),PSET
1230 LINE(9,178)-(16,178),PSET
1240 LINE(9,178)-(13,170),PSET
1250 LINE(13,170)-(16,170),PSET
1255 FOR A=1 TO 800:NEXTA
1260 LINE(50,185)-(70,185),PSET
1270 LINE(70,185)-(70,180),PSET
1280 LINE(55,185)-(55,180),PSET
1290 LINE(50,185)-(50,180),PSET
1300 LINE(50,180)-(55,180),PSET
1310 LINE(55,180)-(57,181),PSET
1320 LINE(57,181)-(68,181),PSET
1330 LINE(68,181)-(70,180),PSET
1340 LINE(55,183)-(70,183),PSET
1350 LINE(66,181)-(66,179),PSET
1360 LINE(67,181)-(67,179),PSET
1370 LINE(64,179)-(69,179),PSET
1380 LINE(69,179)-(69,174),PSET
1390 LINE(69,174)-(64,174),PSET
1400 LINE(64,174)-(64,179),PSET
1410 LINE(69,174)-(69,169),PSET
1420 LINE(69,169)-(63,169),PSET
1430 LINE(64,169)-(64,174),PSET
1440 LINE(66,169)-(66,167),PSET
1450 LINE(60,181)-(60,179),PSET
1460 LINE(57,179)-(62,179),PSET
1470 LINE(62,179)-(62,174),PSET
1480 LINE(62,174)-(56,174),PSET
1490 LINE(56,174)-(57,179),PSET
1500 LINE(62,174)-(61,169),PSET
1510 LINE(61,169)-(56,170),PSET
1520 LINE(56,170)-(56,174),PSET
1530 LINE(60,169)-(60,166),PSET
1540 LINE(60,166)-(56,166),PSET
1550 LINE(56,166)-(56,170),PSET
1560 LINE(58,166)-(58,163),PSET
1570 PSET(49,179)
1580 LINE(50,179)-(52,170),PSET
1590 LINE(52,170)-(56,174),PSET
1600 COLOR 3,1
1610 LINE(15,185)-(30,185),PSET
1620 LINE(30,185)-(30,180),PSET
1630 LINE(30,180)-(25,181),PSET
1640 LINE(25,181)-(20,181),PSET
1650 LINE(20,181)-(15,180),PSET
1660 LINE(15,180)-(15,185),PSET
1670 LINE(15,184)-(14,185),PSET
1680 LINE(14,185)-(11,185),PSET
1690 LINE(11,185)-(10,184),PSET
1700 LINE(10,184)-(10,180),PSET
1710 LINE(10,180)-(15,180),PSET
1720 LINE(15,183)-(30,183),PSET
1730 LINE(26,181)-(26,179),PSET
1740 LINE(27,181)-(27,179),PSET
1750 LINE(25,175)-(30,175),PSET
1760 LINE(30,175)-(29,179),PSET
1770 LINE(29,179)-(25,179),PSET
1780 LINE(25,179)-(25,175),PSET
1790 LINE(30,175)-(31,173),PSET
1800 LINE(31,173)-(31,170),PSET
1810 LINE(31,170)-(30,169),PSET
1820 LINE(30,169)-(25,170),PSET
1830 LINE(25,170)-(25,175),PSET
1840 LINE(27,169)-(27,167),PSET
1850 LINE(29,167)-(29,167),PSET
1860 LINE(20,181)-(20,181),PSET
1870 LINE(19,181)-(19,179),PSET
1880 LINE(18,179)-(24,178),PSET
1890 LINE(24,178)-(23,174),PSET
1900 LINE(23,174)-(18,174),PSET
1910 LINE(18,174)-(18,179),PSET
1920 LINE(23,173)-(23,170),PSET
1930 LINE(23,170)-(17,170),PSET
1940 LINE(17,170)-(18,172),PSET
1950 LINE(18,172)-(18,175),PSET
1960 LINE(17,169)-(22,169),PSET
1970 LINE(17,169)-(17,167),PSET
1980 LINE(17,167)-(21,166),PSET
1990 LINE(21,166)-(22,169),PSET
2000 LINE(19,167)-(19,164),PSET
2010 LINE(12,180)-(12,178),PSET
2020 LINE(14,180)-(14,178),PSET
2030 LINE(9,178)-(16,178),PSET
2040 LINE(9,178)-(13,170),PSET
2050 LINE(13,170)-(16,170),PSET
2051 PSET(20,180):PSET(28,168)
2055 COLOR2,1
2056 FOR A=1 TO 800:NEXT A
2060 LINE(95,185)-(115,185),PSET
2070 LINE(115,185)-(115,180),PSE
T
2080 LINE(115,180)-(112,181),PSE
T
2090 LINE(111,181)-(102,181),PSE
T
2100 LINE(102,181)-(100,180),PSE
T
2120 LINE(100,180)-(100,185),PSE
T
2130 LINE(95,185)-(95,180),PSET
2140 LINE(95,180)-(100,180),PSET
2150 LINE(100,183)-(115,183),PSE
T
2160 LINE(112,181)-(112,179),PSE
T
2170 LINE(110,179)-(114,179),PSE
T
2180 LINE(114,179)-(113,174),PSE
T
2190 LINE(113,174)-(112,170),PSE
T
2200 LINE(112,170)-(108,170),PSE
T
2210 LINE(108,170)-(109,175),PSE
T
2220 LINE(109,175)-(113,174),PSE
T
2230 LINE(109,175)-(109,180),PSE
T
2240 LINE(105,181)-(105,179),PSE
T
2250 LINE(102,179)-(107,179),PSE
T
2260 LINE(107,179)-(106,174),PSE
T
2270 LINE(106,174)-(105,170),PSE
T
2280 LINE(104,170)-(103,167),PSE
T
2290 LINE(103,167)-(100,168),PSE
T
2300 LINE(100,168)-(100,170),PSE
T
2310 LINE(100,170)-(105,170),PSE
T
2320 LINE(100,170)-(101,175),PSE
T
2330 LINE(101,175)-(106,175),PSE
T
```

```
2340 LINE(101,175)-(102,179),PSE
T
2350 LINE(110,170)-(110,168),PSE
T
2360 LINE(101,167)-(101,164),PSE
T
2370 LINE(97,180)-(97,179),PSET
2380 LINE(94,179)-(100,179),PSET
2390 LINE(95,179)-(97,170),PSET
2400 LINE(97,170)-(101,175),PSET
2410 COLOR3,1
2420 LINE(50,185)-(70,185),PSET
2430 LINE(70,185)-(70,180),PSET
2440 LINE(55,185)-(55,180),PSET
2450 LINE(50,185)-(50,180),PSET
2460 LINE(50,180)-(55,180),PSET
2470 LINE(55,180)-(57,181),PSET
2480 LINE(57,181)-(68,181),PSET
2490 LINE(68,181)-(70,180),PSET
2500 LINE(55,183)-(70,183),PSET
2510 LINE(66,181)-(66,179),PSET
2520 LINE(67,181)-(67,179),PSET
2530 LINE(64,179)-(69,179),PSET
2540 LINE(69,179)-(69,174),PSET
2550 LINE(69,174)-(64,174),PSET
2560 LINE(64,174)-(64,179),PSET
2570 LINE(69,174)-(69,169),PSET
2580 LINE(69,169)-(63,169),PSET
2590 LINE(64,169)-(64,174),PSET
2600 LINE(66,169)-(66,167),PSET
2610 LINE(60,181)-(60,179),PSET
2620 LINE(57,179)-(62,179),PSET
2630 LINE(62,179)-(62,174),PSET
2640 LINE(62,174)-(56,174),PSET
2650 LINE(56,174)-(57,179),PSET
2660 LINE(62,174)-(61,169),PSET
2670 LINE(61,169)-(56,170),PSET
2680 LINE(56,170)-(56,174),PSET
2690 LINE(60,169)-(60,166),PSET
2700 LINE(60,166)-(56,166),PSET
2710 LINE(56,166)-(56,170),PSET
2720 LINE(58,166)-(58,163),PSET
2730 PSET(49,179)
2740 LINE(50,179)-(52,170),PSET
2750 LINE(52,170)-(56,174),PSET
2760 COLOR2,1
2770 FORA=1 TO 800:NEXT A
2780 LINE(135,185)-(155,185),PSE
T
2790 LINE(155,185)-(155,180),PSE
T
2800 LINE(155,180)-(153,181),PSE
T
2810 LINE(153,181)-(142,181),PSE
T
2820 LINE(142,181)-(140,180),PSE
T
2830 LINE(140,180)-(140,185),PSE
T
2840 LINE(140,180)-(135,180),PSE
T
2850 LINE(135,180)-(135,185),PSE
T
2860 LINE(140,183)-(155,183),PSE
T
2870 LINE(151,181)-(151,179),PSE
T
2880 LINE(149,179)-(154,179),PSE
T
2890 LINE(154,179)-(153,174),PSE
T
2900 LINE(153,174)-(149,174),PSE
T
2910 LINE(149,174)-(149,179),PSE
T
2920 LINE(149,174)-(148,170),PSE
T
2930 LINE(148,170)-(153,170),PSE
T
2940 LINE(153,170)-(153,174),PSE
T
2950 LINE(150,170)-(150,168),PSE
T
2960 LINE(142,179)-(147,179),PSE
T
2970 LINE(144,181)-(144,179),PSE
T
2980 LINE(147,179)-(146,174),PSE
T
2990 LINE(146,174)-(141,175),PSE
T
3000 LINE(141,175)-(142,179),PSE
T
3010 LINE(142,179)-(146,170),PSE
T
3020 LINE(146,170)-(141,170),PSE
T
3030 LINE(141,170)-(141,175),PSE
T
3040 LINE(145,170)-(144,166),PSE
T
3050 LINE(144,166)-(140,166),PSE
T
3060 LINE(140,166)-(141,170),PSE
T
3070 LINE(142,166)-(142,164),PSE
T
3080 LINE(137,180)-(137,179),PSE
T
3090 LINE(134,179)-(141,179),PSE
T
3100 LINE(134,179)-(138,170),PSE
T
3110 LINE(138,170)-(141,175),PSE
T
3120 COLOR3,1
3130 LINE(95,185)-(115,185),PSET
3140 LINE(115,185)-(115,180),PSE
T
3150 LINE(115,180)-(112,181),PSE
T
3160 LINE(111,181)-(102,181),PSE
T
3170 LINE(102,181)-(100,180),PSE
T
3180 LINE(95,185)-(95,180),PSET
3190 LINE(75,180)-(100,180),PSET
3200 LINE(100,183)-(115,183),PSE
T
3210 LINE(112,181)-(112,179),PSE
T
3220 LINE(110,179)-(114,179),PSE
T
3230 LINE(114,179)-(113,174),PSE
T
3240 LINE(113,174)-(112,170),PSE
T
3250 LINE(112,170)-(108,170),PSE
T
3260 LINE(108,170)-(109,175),PSE
T
3270 LINE(109,175)-(113,174),PSE
T
3280 LINE(109,175)-(109,180),PSE
T
3290 LINE(105,181)-(105,179),PSE
T
3300 LINE(102,179)-(107,179),PSE
T
3310 LINE(107,179)-(106,174),PSE
T
3320 LINE(106,174)-(105,170),PSE
T
3330 LINE(104,170)-(103,167),PSE
T
3340 LINE(103,167)-(100,168),PSE
T
3350 LINE(100,168)-(100,170),PSE
T
3360 LINE(100,170)-(105,170),PSE
T
3370 LINE(100,170)-(101,175),PSE
T
3380 LINE(101,175)-(106,175),PSE
T
3390 LINE(101,175)-(102,179),PSE
T
3400 LINE(110,170)-(110,168),PSE
T
3410 LINE(101,167)-(101,164),PSE
T
3420 LINE(97,180)-(97,179),PSET
3430 LINE(94,179)-(100,179),PSET
3440 LINE(95,179)-(97,170),PSET
3450 LINE(97,170)-(101,175),PSET
3460 LINE(100,170)-(100,185),PSE
T
3470 FOR A=1 TO800:NEXT A
3480 COLOR 2,1
3490 LINE(175,185)-(195,185),PSE
T
3500 LINE(195,185)-(195,180),PSE
T
3510 LINE(180,185)-(180,180),PSE
T
3520 LINE(180,180)-(175,180),PSE
T
3530 LINE(175,180)-(175,185),PSE
T
3540 LINE(180,183)-(195,183),PSE
T
3550 LINE(193,181)-(195,180),PSE
T
3560 LINE(193,181)-(182,181),PSE
T
3570 LINE(182,181)-(180,180),PSE
T
3580 LINE(191,181)-(191,179),PSE
T
3590 LINE(190,179)-(194,179),PSE
T
3600 LINE(194,179)-(193,175),PSE
T
3610 LINE(193,175)-(192,170),PSE
T
3620 LINE(192,170)-(188,171),PSE
T
3630 LINE(188,171)-(190,175),PSE
T
3640 LINE(190,175)-(190,179),PSE
T
3650 LINE(190,175)-(193,175),PSE
T
3660 LINE(184,181)-(184,179),PSE
T
3670 LINE(182,179)-(187,179),PSE
T
3680 LINE(187,179)-(186,174),PSE
T
3690 LINE(186,174)-(185,168),PSE
T
3700 LINE(185,168)-(182,165),PSE
T
3710 LINE(182,165)-(179,167),PSE
T
3720 LINE(179,167)-(180,170),PSE
```

```
T
3730 LINE(180,170)-(185,168),PSE
T
3740 LINE(182,174)-(186,174),PSE
T
3750 LINE(180,170)-(182,174),PSE
T
3760 LINE(182,174)-(183,179),PSE
T
3770 LINE(190,171)-(190,169),PSE
T
3780 LINE(181,166)-(181,163),PSE
T
3790 PSET(177,180)
3800 LINE(173,179)-(181,179),PSE
T
3810 LINE(173,179)-(177,170),PSE
T
3820 LINE(177,170)-(182,175),PSE
T
3830 COLOR 3,1
3840 LINE(135,185)-(155,185),PSE
T
3850 LINE(155,185)-(155,180),PSE
T
3860 LINE(155,180)-(153,181),PSE
T
3870 LINE(153,181)-(142,181),PSE
T
3880 LINE(142,181)-(140,180),PSE
T
3890 LINE(140,180)-(140,185),PSE
T
3900 LINE(140,180)-(135,180),PSE
T
3910 LINE(135,180)-(135,185),PSE
T
3920 LINE(140,183)-(155,183),PSE
T
3930 LINE(151,181)-(151,179),PSE
T
3940 LINE(149,179)-(154,179),PSE
T
3950 LINE(154,179)-(153,174),PSE
T
3960 LINE(153,174)-(149,174),PSE
T
3970 LINE(149,174)-(149,179),PSE
T
3980 LINE(149,174)-(148,170),PSE
T
3990 LINE(148,170)-(153,170),PSE
T
4000 LINE(153,170)-(153,174),PSE
T
4010 LINE(150,170)-(150,168),PSE
T
4020 LINE(142,179)-(147,179),PSE
T
4030 LINE(144,181)-(144,179),PSE
T
4040 LINE(147,179)-(146,174),PSE
T
4050 LINE(146,174)-(141,175),PSE
T
4060 LINE(141,175)-(142,179),PSE
T
4070 LINE(142,179)-(146,170),PSE
T
4080 LINE(141,170)-(141,175),PSE
T
4090 LINE(146,170)-(141,170),PSE
T
4100 LINE(145,170)-(144,166),PSE
T
4110 LINE(144,166)-(140,166),PSE
T
4120 LINE(140,166)-(141,170),PSE
T
4130 LINE(142,166)-(142,164),PSE
T
4140 LINE(137,180)-(137,179),PSE
T
4150 LINE(134,179)-(141,179),PSE
T
4160 LINE(134,179)-(138,170),PSE
T
4170 LINE(138,170)-(141,175),PSE
T
4180 COLOR2,1
4190 FOR A=1 TO 800:NEXT A
4200 LINE(210,185)-(230,185),PSE
T
4210 LINE(230,185)-(230,180),PSE
T
4220 LINE(230,180)-(228,181),PSE
T
4230 LINE(228,181)-(217,181),PSE
T
4240 LINE(217,181)-(215,180),PSE
T
4250 LINE(215,180)-(210,180),PSE
T
4260 LINE(210,180)-(210,185),PSE
T
4270 LINE(210,185)-(215,185),PSE
T
4280 LINE(215,183)-(230,183),PSE
T
4290 LINE(215,180)-(215,185),PSE
T
4300 LINE(226,181)-(226,179),PSE
T
4310 LINE(225,179)-(230,179),PSE
T
4320 LINE(230,179)-(229,170),PSE
T
4330 LINE(229,170)-(225,170),PSE
T
4340 LINE(225,170)-(225,175),PSE
T
4350 LINE(225,175)-(230,175),PSE
T
4360 LINE(225,175)-(225,179),PSE
T
4370 LINE(227,170)-(227,168),PSE
T
4380 LINE(220,181)-(220,179),PSE
T
4390 LINE(217,179)-(221,179),PSE
T
4400 LINE(221,179)-(220,170),PSE
T
4410 LINE(220,170)-(218,166),PSE
T
4420 LINE(218,166)-(215,166),PSE
T
4430 LINE(215,166)-(216,170),PSE
T
4440 LINE(216,170)-(220,170),PSE
T
4450 LINE(216,170)-(216,174),PSE
T
4460 LINE(216,174)-(221,174),PSE
T
4470 LINE(216,174)-(217,179),PSE
T
4480 LINE(217,166)-(217,163),PSE
T
4490 PSET(212,179)
4500 LINE(208,178)-(216,178),PSE
T
4510 LINE(208,178)-(210,170),PSE
T
4520 LINE(212,170)-(217,174),PSE
T
4530 COLOR3,1
4540 LINE(175,185)-(195,185),PSE
T
4550 LINE(195,185)-(195,180),PSE
T
4560 LINE(180,185)-(180,180),PSE
T
4570 LINE(180,180)-(175,180),PSE
T
4580 LINE(175,180)-(175,185),PSE
T
4590 LINE(180,183)-(195,183),PSE
T
4600 LINE(193,181)-(195,180),PSE
T
4610 LINE(193,181)-(182,181),PSE
T
4620 LINE(182,181)-(180,180),PSE
T
4630 LINE(191,181)-(191,179),PSE
T
4640 LINE(190,179)-(194,179),PSE
T
4650 LINE(194,179)-(193,175),PSE
T
4660 LINE(193,175)-(192,170),PSE
T
4670 LINE(192,170)-(188,171),PSE
T
4680 LINE(188,171)-(190,175),PSE
T
4690 LINE(190,175)-(190,179),PSE
T
4700 LINE(190,175)-(193,175),PSE
T
4710 LINE(184,181)-(184,179),PSE
T
4720 LINE(182,179)-(187,179),PSE
T
4730 LINE(187,179)-(186,174),PSE
T
4740 LINE(186,174)-(185,168),PSE
T
4750 LINE(185,168)-(182,165),PSE
T
4760 LINE(182,165)-(179,167),PSE
T
4770 LINE(179,167)-(180,170),PSE
T
4780 LINE(180,170)-(185,168),PSE
T
4790 LINE(182,174)-(186,174),PSE
T
4800 LINE(180,170)-(182,174),PSE
T
4810 LINE(182,174)-(183,179),PSE
T
4820 LINE(190,171)-(190,169),PSE
T
4830 LINE(181,166)-(181,163),PSE
T
4840 LINE(173,179)-(181,179),PSE
T
4850 PSET(177,180)
4860 LINE(173,179)-(177,170),PSE
T
4870 LINE(177,170)-(182,175),PSE
T
4880 RETURN
```

The Colour Computer Pokies

Try and get the better of CoCo's very own one-arm bandit.

by Nick Kostarelas

32K ECB GAME

THIS IS A simulation of the good old pokies. You play the same way, only you bet in chips rather than money. One chip is a dollar.

You start off with 200 chips, and the maximum bet is 1,000,000 chips. If you ever get over a million chips and you want to bet more, then you can take a gamble and type ALL when it asks you for 'CHIPS TO BET'.

When you do make a bet, it displays your bet, the least and most you can win. If you hit ENTER when you make a bet, it will take your last bet as the current bet (if you have enough money).

After your first play, it will display how many times you played, how many you've won, and a percentage of wins.

The game is easy to play, once you know how many chips to bet each time. You can get to a million chips within 15 minutes. The most I have ever had was 110 million, after sore eyes and a sore bum. I gambled it all and lost it as well.

Line 100 disables the break key and speeds up the program by 30%.

The Listing:

```
0 GOTO10
3 SAVE"93:3":END'1
10 '*****************************
20 '*                           *
30 '*          POKIES           *
40 '*                           *
50 '*    BY NICK KOSTARELAS     *
60 '*         17/09/84          *
70 '*                           *
80 '*****************************
90 CLS:PMODE0,1:PCLEAR2
100 POKE248,50:POKE249,98:POKE25
0,28:POKE251,175:POKE252,126:POK
E253,173:POKE254,165:POKE410,126
:POKE411,0:POKE412,248
110 POKE65495,0:CLEAR500:B$="":P
=14:DIMDL(67),AP(67),PR(67),OO(6
7),CH(67),LM(67),PC(67),Z1(67),Z
2(143),Z3(220):PMODE1,1:FORDU=1T
O7:CLS(DU+1):PCLS:GOSUB1050:NEXT
:CLS
120 PCLS3:GET(0,0)-(52,95),Z1:GE
T(0,0)-(116,95),Z2:GET(0,0)-(180
,95),Z3
130 POKE65494,0
140 T$="###,###":MI$="#,###,###,
###"
150 PRINT@13,"pokies":PRINT:PRIN
TTAB(6)"NICK KOSTARELAS 1984"
160 PRINT:PRINT:PRINT"SIGN OR FR
UIT  ANY 2     ANY 3"
170 PRINT:PRINT"    DOLLAR
100        300"
180 PRINT"    APPLE          50
    150"
190 PRINT"    PEACH          20
     60"
200 PRINT"    PEAR           10
     30"
210 PRINT"    ORANGE          5
     15"
220 PRINT"    CHERRY          3
      9"
230 PRINT"    LEMON           2
      6"
240 PRINT@484,"PRESS enter TO CO
NTINUE";
250 X=RND(-TIMER):IFINKEY$<>CHR$
(13)THEN250
260 CLS
270 PRINT"  ANY 2      AND A
 CHIPS":PRINT
280 PRINT"  DOLLAR     APPLE
  200"
290 PRINT"  DOLLAR     PEACH
  160"
300 PRINT"  DOLLAR     PEAR
  120"
310 PRINT"  APPLE      DOLLAR
  110"
320 PRINT"  APPLE      PEACH
   90"
330 PRINT"  APPLE      PEAR
   70"
340 PRINT"  PEACH      DOLLAR
   50"
350 PRINT"  PEACH      APPLE
   40"
360 PRINT"  PEACH      PEAR
   30"
370 PRINT:PRINT" YOU START OFF W
ITH 200 CHIPS."
380 PRINT"      1 BOMB = 10000 CH
IPS."
390 PRINT@484,"PRESS enter TO CO
NTINUE";
400 X=RND(-TIMER):IFINKEY$<>CHR$
(13)THEN400
410 PMODE1:PCLS:CLS:NG=1
420 'MAIN GAME
430 CH=200:BM=0:ML=100:TP=0:TW=0
440 GOSUB1080
450 PRINT@13,"pokies"
460 PRINT@320,STRING$(32,140)
470 PRINTTAB(9)"CHIPS :";:PRINTU
SINGT$;CH
480 PRINTTAB(9)"BOMBS :";:PRINTU
SINGT$;BM
490 PRINT:PRINTUSING"       total
 :"+MI$;BM*10000+CH;
500 IFNG=1THEN530
510 W$="plays :"+STR$(TP)+"  win
s :"+STR$(TW)+"   %"+STR$(INT(TW
/TP*100))
520 PRINT@304-INT(LEN(W$)/2),W$;
530 IFCH<1ANDBM<1THEN2790
540 DM=M
550 PRINT@69,"";:LINEINPUT"CHIPS
 TO BET => ";M$
560 IFM$="ALL"THENM=BM*10000+CH:
GOTO600
570 M=ABS(INT(VAL(M$)))
580 IFM=0THENIFM$=""THENM=DM ELS
E550
590 IFM>CH+BM*10000ORM>1000000TH
ENPRINT:PRINTTAB(10)"too much !!
!":FORI=1TO1000:NEXT:CLS:GOTO450
600 TP=TP+1
610 PRINT@165,"BET   :";:PRINTUS
INGMI$;M
620 PRINT@197,"LEAST :";:PRINTUS
INGMI$;M*2
630 PRINT@229,"MOST  :";:PRINTUS
INGMI$;M*300
640 IFNG=0THENFORI=1TO2000:NEXT:
GOTO670
650 PRINT@292,"PRESS enter TO CO
NTINUE"
660 IFINKEY$<>CHR$(13)THEN660ELS
ENG=0
670 GOSUB1430
680 FORV=0TO19
690 IFV<10THENA=RND(12):GOSUB264
0:IFA=D THEN690
700 IFV<15THENB=RND(12):GOSUB269
0:IFB=E THEN700ELSEIFRND(5)=2THE
NB=1+INT(RND(13-B)/RND(3)):GOSUB
2690:IFB=E THEN700
710 C=RND(12):GOSUB2740:IFC=F TH
EN710ELSEIFRND(5)=2THENC=1+INT(R
ND(13-C)/RND(3)):GOSUB2740:IFC=F
```

```
 THEN710
720 D=A:E=B:F=C:G=INT(V/5):IFG=0
THENG=1
730 COLOR3
740 ONG GOSUB3190,3200,3210
750 FORJ=G TO3
760 ZZ=(J-1)*64+16:ZX=ZZ+52
770 ONJ GOSUB1020,1030,1040
780 NEXTJ,V
790 FORI=1TO1500:NEXT
800 FORI=0TO288STEP32:PRINT@I,ST
RING$(31,32):NEXT
810 'work out how much won or
lost
820 POKE65494,0
830 IFA=B ANDB=C THEN2330
840 IFA=B ORA=C ORB=C THEN2410
850 PRINT@43,"you lose :"
860 W$=STR$(M)+" CHIPS":PRINT:PR
INTTAB(15-(INT(LEN(W$)/2)));W$
870 CH=CH-M
880 IFM$="ALL"THENBM=0:CH=0:GOTO
970
890 IFCH<0ANDBM>0THENBM=BM-1:CH=
10000+CH:GOTO890
900 IFCH+BM*10000<(ML-100)*10000
THENML=ML-100
910 GOTO970
920 PRINT@42,"you win !!!"
930 TW=TW+1:T=W*M:W$=STR$(W)+" X
"+STR$(M)+" ="+STR$(T)
940 PRINT:PRINTTAB(15-(INT(LEN(W
$)/2)));W$
950 CH=CH+T
960 IFCH>10000THENDU=INT(CH/1000
0)*10000:CH=CH-DU:BM=BM+DU/10000
:GOTO960
970 FORI=1TO2000:NEXT:MM=0
980 IFBM=>ML THENGOSUB2820:MM=1:
GOTO980
990 IFMM=1THENFORI=1TO1000:NEXT
1000 CLS
1010 GOTO450
1020 DU=A:GOSUB3100:RETURN
1030 DU=B:GOSUB3100:RETURN
1040 DU=C:GOSUB3100:RETURN
1050 ONDU GOSUB1600,1710,1890,19
10,2050,2120,2260
1060 RETURN
1070 'DRAW UP MACHINE
1080 COLOR3
1090 LINE(0,0)-(216,104),PSET,BF
1100 'HANDLE
1110 COLOR4
1120 LINE(223,4)-(248,20),PSET,B
F
1130 LINE(230,20)-(241,148),PSET
,BF
1140 'POKIES
1150 COLOR2
1160 LINE(19,116)-(25,156),PSET,
BF
1170 LINE(38,116)-(44,136),PSET,
BF
1180 LINE(51,116)-(57,156),PSET,
BF
1190 LINE(70,116)-(76,156),PSET,
BF
1200 LINE(82,116)-(89,156),PSET,
BF
1210 LINE(121,116)-(127,156),PSE
T,BF
1220 LINE(140,116)-(146,156),PSE
T,BF
1230 LINE(172,116)-(178,136),PSE
T,BF
1240 LINE(191,132)-(197,156),PSE
T,BF
1250 LINE(25,116)-(38,120),PSET,
BF
1260 LINE(25,132)-(38,136),PSET,
BF
1270 LINE(57,116)-(70,120),PSET,
BF
1280 LINE(57,148)-(70,156),PSET,
BF
1290 LINE(114,116)-(133,120),PSE
T,BF
1300 LINE(114,148)-(133,156),PSE
T,BF
1310 LINE(146,116)-(165,120),PSE
T,BF
1320 LINE(146,132)-(159,136),PSE
T,BF
1330 LINE(146,148)-(165,156),PSE
T,BF
1340 LINE(178,116)-(197,120),PSE
T,BF
1350 LINE(178,132)-(191,136),PSE
T,BF
1360 LINE(172,148)-(191,156),PSE
T,BF
1370 FORI=100TO108STEP2
1380 LINE(I,116)-(I-18,138),PSET
1390 LINE(I,156)-(I-18,130),PSET
1400 NEXT
1410 RETURN
1420 'PULL DOWN HANDLE
1430 SCREEN1,0:POKE65495,0
1440 FORI=1TO350:NEXT
1450 A=21:COLOR4
1460 FORI=4TO121STEP3
1470 LINE(223,I+17)-(248,I+19),P
SET,BF
1480 LINE(223,I)-(248,I+2),PRESE
T,BF
1490 NEXT
1500 FORI=124TO4STEP-6
1510 LINE(223,I)-(248,I+5),PSET,
BF
1520 LINE(223,I+17)-(228,I+22),P
RESET,BF:LINE(243,I+17)-(248,I+2
2),PRESET,BF
1530 NEXT
1540 RETURN
1550 '*********
1560 '* FRUIT *
1570 '*********
1580 '
1590 'dollar
1600 COLOR2
1610 LINE(P,32)-(P+6,48),PSET,BF
1620 LINE(P+36,60)-(P+40,76),PSE
T,BF
1630 FORI=12TO24STEP12:LINE(P+I,
16)-(P+I+6,92),PSET,BF:NEXT
1640 FORI=28TO76STEP48:LINE(P+6,
I)-(P+36,I+4),PSET,BF:NEXT
1650 FORI=44TO48:LINE(P,I)-(P+40
,I+16),PSET:NEXT
1660 FORI=32TO38STEP1.5:LINE(P,I
)-(P+I-26,28),PSET:LINE(P+40,I+3
2)-(P+I,80),PSET:NEXT
1670 FORI=0TO6STEP2:LINE(P+I,68)
-(P+I+3,80),PSET:LINE(P+I+33,28)
-(P+I+36,40),PSET:NEXT
1680 GET(12,5)-(64,99),DL
1690 RETURN
1700 'apple
1710 S=4
1720 COLOR3
1730 LINE(P+18,40)-(P+15,32),PSE
T
1740 LINE-(P+15,24),PSET:LINE-(P
+27,16),PSET
1750 LINE-(P+30,24),PSET:LINE-(P
+18,40),PSET
1760 COLOR5
1770 LINE(P+18,40)-(P+9,36),PSET
1780 LINE-(P+6,40),PSET:LINE-(P,
52),PSET
1790 LINE-(P,68),PSET:LINE-(P+5,
80),PSET
1800 LINE-(P+12,84),PSET:LINE-(P
+24,84),PSET
1810 LINE-(P+36,80),PSET:LINE-(P
+40,68),PSET
1820 LINE-(P+40,48),PSET:LINE-(P
+36,36),PSET
1830 LINE-(P+33,36),PSET:LINE-(P
+27,40),PSET:LINE-(P+18,40),PSET
1840 PAINT(P+18,60),S,S
1850 IFS=2THENRETURN
1860 GET(12,5)-(64,99),AP
1870 RETURN
1880 'peach
1890 S=2:GOSUB1720:GET(12,5)-(64
,99),PC:RETURN
1900 'pear
1910 COLOR3:LINE(P+36,16)-(P+30,
20),PSET
1920 LINE-(P+24,28),PSET:LINE-(P
+24,40),PSET
1930 LINE-(P+18,40),PSET:LINE-(P
+18,28),PSET
1940 LINE-(P+24,20),PSET:LINE-(P
+30,16),PSET:LINE-(P+36,16),PSET
1950 COLOR2
1960 LINE(P+16,32)-(P+15,32),PSE
T
1970 LINE-(P,56),PSET:LINE-(P,68
),PSET
1980 LINE-(P+6,78),PSET:LINE-(P+
18,80),PSET
1990 LINE-(P+24,80),PSET:LINE-(P
+36,72),PSET
2000 LINE-(P+40,64),PSET:LINE-(P
+40,56),PSET
2010 LINE-(P+36,52),PSET:LINE-(P
+27,36),PSET:LINE-(P+26,36),PSET
2020 GET(12,5)-(64,99),PR
2030 RETURN
2040 'orange
2050 S=2
2060 GOSUB1760
2070 CIRCLE(P+21,44),4,1
2080 PAINT(P+21,44),1,1
2090 GET(12,5)-(64,99),OO
2100 RETURN
2110 'cherries
2120 COLOR4
2130 FORI=P+8 TO P+32 STEP20
2140 CIRCLE(I,70),10
2150 PAINT(I,70),4,4:NEXT
2160 COLOR3
2170 LINE(P+8,60)-(P+14,40),PSET
```

```
2180 LINE-(P+24,24),PSET:LINE-(P
+36,16),PSET
2190 LINE-(P+33,40),PSET:LINE-(P
+32,62),PSET
2200 LINE(P+28,60)-(P+30,40),PSE
T
2210 LINE-(P+34,18),PSET:LINE-(P
+24,28),PSET
2220 LINE-(P+17,44),PSET:LINE-(P
+12,62),PSET
2230 GET(12,5)-(64,99),CH
2240 RETURN
2250 'lemon
2260 CIRCLE(P+20,51),20,2,1.7
2270 PAINT(P+20,46),2,2
2280 CIRCLE(P+20,26),5,1
2290 PAINT(P+20,26),1,1
2300 GET(12,5)-(64,99),LM
2310 RETURN
2320 'all the same
2330 IFA=1THENW=300:GOTO920
2340 IFA=2THENW=150:GOTO920
2350 IFA=3THENW=60:GOTO920
2360 IFA=4THENW=30:GOTO920
2370 IFA=5THENW=15:GOTO920
2380 IFA=6THENW=9:GOTO920
2390 W=6:GOTO920
2400 'two the same
2410 D=A+B+C
2420 IFA=1ANDB=1ORA=1ANDC=1ORB=1
ANDC=1THEN2500
2430 IFA=2ANDB=2ORA=2ANDC=2ORB=2
ANDC=2THEN2550
2440 IFA=3ANDB=3ORA=3ANDC=3ORB=3
ANDC=3THEN2600
2450 IFA=4ANDB=4ORA=4ANDC=4ORB=4
ANDC=4THENW=10:GOTO920
2460 IFA=5ANDB=5ORA=5ANDC=5ORB=5
ANDC=5THENW=5:GOTO920
2470 IFA=6ANDB=6ORA=6ANDC=6ORB=6
ANDC=6THENW=3:GOTO920
2480 W=2:GOTO920
2490 '2 $ and a ?
2500 IFD=4THENW=200:GOTO920
2510 IFD=5THENW=160:GOTO920
2520 IFD=6THENW=120:GOTO920
2530 W=100:GOTO920
2540 '2 apples and a ?
2550 IFD=5THENW=110:GOTO920
2560 IFD=7THENW=90:GOTO920
2570 IFD=8THENW=70:GOTO920
2580 W=50:GOTO920
2590 '2 peaches and a ?
2600 IFD=7THENW=50:GOTO920
2610 IFD=8THENW=40:GOTO920
2620 IFD=10THENW=30:GOTO920
2630 W=20:GOTO920
2640 IFA<4THENRETURN
2650 IFA<6THENA=4:RETURN
2660 IFA<8THENA=5:RETURN
2670 IFA<10THENA=6ELSEA=7
2680 RETURN
2690 IFB<4THENRETURN
2700 IFB<6THENB=4:RETURN
2710 IFB<8THENB=5:RETURN
2720 IFB<10THENB=6:ELSEB=7
2730 RETURN
2740 IFC<4THENRETURN
2750 IFC<6THENC=4:RETURN
2760 IFC<8THENC=5:RETURN
2770 IFC<10THENC=6ELSEC=7
2780 RETURN
2790 PRINT@102,"ANOTHER GAME (Y/
N) ?"
2800 A$=INKEY$:IFA$="Y"THEN410
2810 IFA$<>"N"THEN2810ELSECLS:EN
D
2820 'millionaire
2830 ML$="you're a ":POKE65495,0
:TM=1
2840 IFML=100THENML$=ML$+"mi"
2850 IFML=200THENML$=ML$+"bi"
2860 IFML=300THENML$=ML$+"tri"
2870 IFML=400THENML$=ML$+"quadri
"
2880 IFML=500THENML$=ML$+"pentam
i"
2890 IFML=600THENML$=ML$+"hexami
"
2900 IFML=700THENML$=ML$+"septam
i"
2910 IFML=800THENML$=ML$+"octomi
"
2920 IFML=900THENML$=ML$+"nimi"
2930 IFML<1000THENTM=6:GOTO2950
2940 ML$=ML$+STR$(ML/100)+"  mi"
2950 ML$=ML$+"llionaire !!!"
2960 DU$="":IFML>900THEN3010
2970 FORI=1TOLEN(ML$)
2980 AS=ASC(MID$(ML$,I,1))
2990 IFAS<97THENDU$=DU$+CHR$(AS)
ELSEDU$=DU$+CHR$(AS-32)
3000 NEXT
3010 TB=16-(INT(LEN(ML$)/2))
3020 CLS
3030 FORI=2TOTM+1
3040 PRINT@224,TAB(TB);
3050 IF1/2=INT(I/2)THENPRINTML$E
LSEPRINTDU$
3060 PRINT:PRINTTAB(11)"KEEP GOI
NG"
3070 FORJ=1TOTM*40:NEXTJ,I
3080 ML=ML+100:POKE65494,0
3090 RETURN
3100 ONDU GOSUB3120,3130,3140,31
50,3160,3170,3180
3110 RETURN
3120 PUT(ZZ,5)-(ZX,99),DL:RETURN
3130 PUT(ZZ,5)-(ZX,99),AP:RETURN
3140 PUT(ZZ,5)-(ZX,99),PC:RETURN
3150 PUT(ZZ,5)-(ZX,99),PR:RETURN
3160 PUT(ZZ,5)-(ZX,99),OO:RETURN
3170 PUT(ZZ,5)-(ZX,99),CH:RETURN
3180 PUT(ZZ,5)-(ZX,99),LM:RETURN
3190 PUT(16,5)-(198,99),Z3:RETUR
N
3200 PUT(80,5)-(198,99),Z2:RETUR
N
3210 PUT(144,5)-(198,99),Z1:RETU
RN
65535 'NICK KOSTARELAS 1984
```

DON'T FORGET

In Edit mode, K = Kill. It is the opposite of hack. It "kills" everything up to the character you specify.

Eg:

```
50 DATA EGGS, BACON
```

K,

```
50 BACON
```

DON'T FORGET

*

DON'T FORGET

RENUM's format is:

RENUM newline, startline, increment

DON'T FORGET

*

DON'T FORGET

VAL (string) gives the numeric value of the string.

EG

```
10 A$=10
20 INPUT B$
30 PRINT VAL(A$) + VAL(B$)
```

DON'T FORGET

*

DON'T FORGET

Your variables can be stored in more than one dimension.

DON'T FORGET

This is handy when you wish to assign a number of attributes to one entity.

Extra Mem with M/L

Here's a way of accessing CoCo's upper 32K.

by George McLintock

A 64K COCO (1 OR 2) has 64K of RAM, but only 32K of it is available for normal Basic programs. Likewise, the 128K CoCo 3 does in fact have 128K of RAM, but again only 32K of it is available for normal Basic programs.

I have developed a series of ML routines to allow a normal Basic program to use this extra memory for data storage (they will be submitted shortly).

The basis for these routines were developed for a 64K CoCo 1, but I have also developed a simple variation which allows the same functions to be performed on a CoCo 3.

The normal memory map for a 64K CoCo is 32K of RAM for the addresses from Hex 0 to 7FFF, with 32K of ROM from Hex 8000 to FFFF.

If you store any value to address Hex FFDF, this changes the memory map to all RAM from Hex 0 to FFFF.

The CoCo memory from FF00 to FFFF is used by hardware as well as for special functions and does not change.

To restore the machine to the normal memory map, you store any value in address Hex FFDE.

Before you change the memory map, you MUST mask all interrupts (with an ORCC #$50 instruction), otherwise the machine will hang up.

This is because all interrupts cause a branch to a ROM routine which handles them. If you are in memory map 1 when they occur, then the ROM code is not available to handle them.

When you reset the memory map to normal, you can allow interrupts again with an ANDCC #$AF instruction.

The memory map arrangement with the CoCo 3 is quite different, and I don't know much about how to use it.

However, I have worked out a method which allows you to access the 32K RAM provided for the hi-res graphic screen in much the same way as the extra 32K for the old CoCo.

Memory locations from Hex FFA0 to FFA7 are used to hold the high order bits of the complete CoCo 3 memory space (from Hex 0 to 7FFFF).

For the 'normal' CoCo 3 map these contain the values from Hex 38 to 3F respectively, when everything else required is set to address actual memory from Hex 70000 to 7FFFF.

For normal use, it appears to be sufficient to simply change the value in these locations to access any part of the extra memory available, eg with Hex 38 in location Hex FFA0, the CPU will access actual memory from Hex 70000 to 71FFF when using the normal addresses of from Hex 0 to 1FFF.

However, if you store Hex 30 in location Hex FFA0, then the normal addresses of Hex 0 to 1FFF will then access actual memory from Hex 60000 to 61FFF.

Each register in the range FFA0 to FFA7 controls a block of 8K in normal address space.

The high order values required to access actual memory from Hex 60000 to 67FFF (the high res graphic screen) are from Hex 30 to 33.

To have this memory mapped into the address space normally occupied by the ROM (ie, to achieve the same effective memory layout as provided by map 1 of the old CoCo) requires Hex 30 to 33 to be stored into Hex FFA4 to FFA7, eg Hex FFA4 contains Hex 30, Hex FFA5 contains Hex 31, Hex FFA6 contains Hex 32 and Hex FFA7 contains Hex 33.

Again, you MUST mask all interrupts before changing these locations in this way, because once you change them, the ROM code is no longer available to handle any interrupts.

Also, before leaving your ML routine, you must restore the values in Hex FFA4 to FFA7 to the original values of from hex 3C to 3F, and do this before unmasking interrupts.

There are other registers in the CoCo 3 (at Hex FF90 and FF91) which appear to allow you to use the locations from FFA8 to FFAF to set up an alternative memory map arrangement and switch between them, but I haven't been able to work out how to use them in this way.

The method described above is sufficient to provide what I require at this stage, so I haven't persued it any further.

For the routines I am currently working on, I have

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HINT:

When you are renaming a program on disk, don't forget to add the extension and drive number inside the quotes. i.e.

```
RENAME "COCO/BIN:1" TO
       "DEMO/BIN:1"
```

(if you only have a single drive, then you don't have to worry about including the drive number)

CoCo3 Keycodes

Here's more info for our OS9 users.

by Ken Wagnitz **OS9 Level 2**

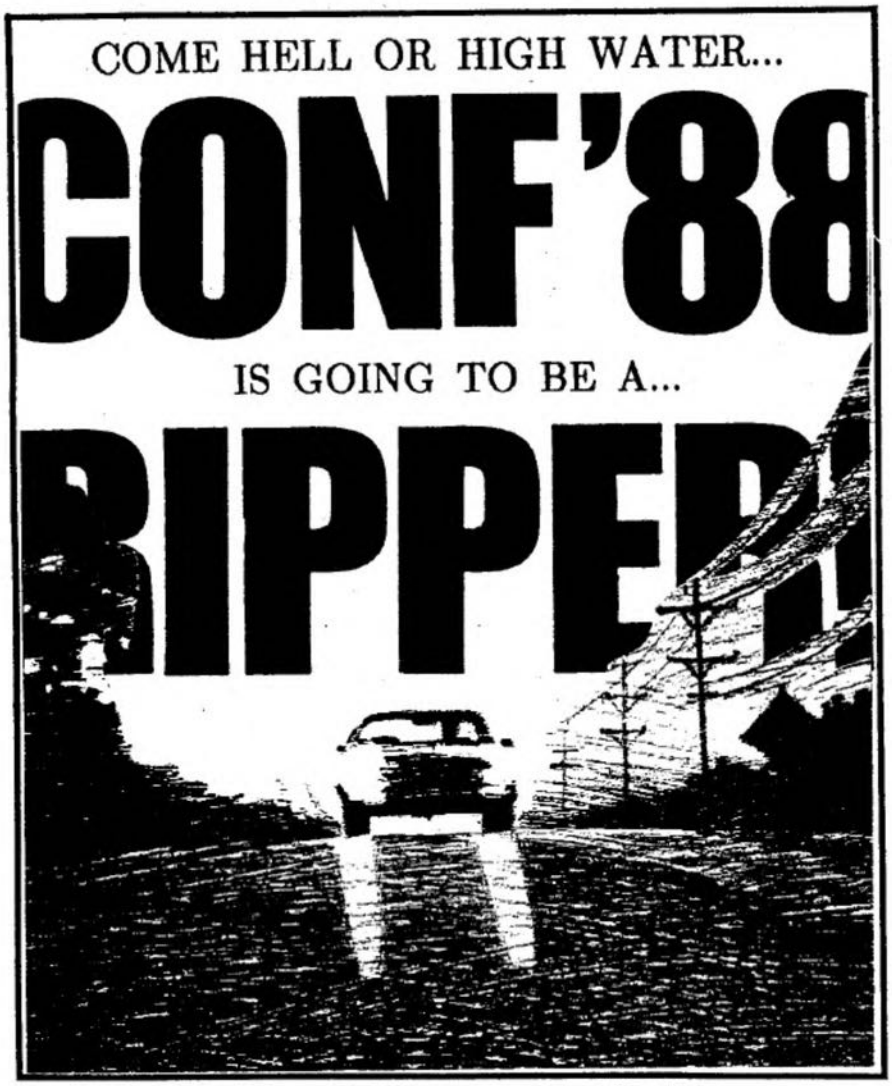
I RECENTLY WANTED to use my CoCo as a terminal off a Unix computer, and screen edit on it. That meant the Unix machine had to know both what my CoCo would send for various commands, and what codes my CoCo needs to move the screen cursor around, clear the screen etc.

The OS9 screen control codes are listed in the LEVEL 2 book. But what codes the various keys produce is not so obvious To find out, I used the following command line:

```
dump < /term
```

The 'dump' command is not supplied with Level 2, but the Level 1 version works fine.

What it does is list the contents of a file, in both hex and ASCII. In this case I used I/O redirection to feed it from the terminal, ie keyboard, instead of a file.



The output goes to the screen (Standard Out). The characters produced by various key combinations are given below in hex. Where the control key is used with other keys to produce characters which are not on the keyboard, I have given the character, eg Ctrl / = ' '.

Note that some combinations produce two characters!

CoCo 3 Key Codes under
OS9 Level II

I feel, after checking that list, somewhat disappointed.

The alt key simply sets the 8th bit (in most cases); while that gives lots of extra characters to a program running on the CoCo, they are of limited value over a serial link.

Some computers either use the 8th bit for parity, or strip it off anyway. Remember that the ASCII code is only defined for the lower 7 bits. That also writes off the two function keys.

Every permutation of them has the 8th bit set.

The other problem is that the arrow keys all generate codes which are universally defined as screen controls unrelated to cursor movement!

Left Arrow gives $08 - a destructive Backspace; Right Arrow gives $09 - a Tab; Down Arrow gives $0A - a Line Feed; Up Arrow gives $0C - a Form Feed (clears the screen).

The receiving computer in this case will not allow me to tell it that I want to send these codes, but as cursor move commands!

Conclusion: To do what I intended, is out. Now I have to write a program which will translate the key presses on the CoCo into different characters, to send to the host.

In other words, I need a VT100 emulator. Does anyone out there have one?

Table One.

Key	UnSh	Sh	Ctrl	Alt	Key	UnSh	Sh	Ctrl	Alt
Sp	20	20	20	A0	P		50	10	EBEF
!		21	21	A1	Q		51	11	F1
"		22	22	A2	R		52	12	F2
#		23	23	A3A7	S		53	13	F3F7
$		24	2427	A4	T		54	1417	F4
%		25	25	A5	U		55	15	F5
&		26	26	A6	V		56	16	F6
'		27	2427	A3A7	W		57	1417	F3F7
(		28	28	A8	X		58	18	F8
)		29	29	A9	Y		59	19	F9
*		2A	2A	AA	Z		5A	1A	FA
+		2B	2B	ABBF					
,	2C		7B	AC					
-	2D		5F	AD					
.	2E		7D	AE					
/	2F		5C	AF					
0	30	30		B0					
1	31		7C	B1	a	61	41	01	E1
2	32			B2	b	62	42	02	E2
3	33		7E	B3	c	63	43	03	E3
4	34			B4	d	64	44	04	E4
5	35			B5	e	65	45	05	E5
6	36			B6	f	66	46	06	E6
7	37		5E @	B7	g	67	47	07	E7
8	38		5B [	B8	h	68	48	08	E8
9	39		5D]	B9	i	69	49	09	E9
:	3A			BA	j	6A	4A	0A	EA
;	3B		7Fdel	BB	k	6B	4B	0B	EB
<		3C	3C3F	BC	l	6C	4C	0C	EC
=		3D	3D	BD	m	6D	4D	0D	ED
>		3E	3E	BE	n	6E	4E	0E	EE
?		3F	3C3F	ABBF	o	6F	4F	0F	EF
@	40	60		E0	p	70	50	10	F0
A		41	01	E1	q	71	51	11	F1
B		42	02	E2	r	72	52	12	F2
C		43	03	E3E7	s	73	53	13	F3
D		44	0407	E4	t	74	54	14	F4
E		45	05	E5	u	75	55	15	F5
F		46	06	E6	v	76	56	16	F6
G		47	0407	E3E7	w	77	57	17	F7
H		48	08	E8	x	78	58	18	F8
I		49	09	E9	y	79	59	19	F9
J		4A	0A	EA	z	7A	5A	1A	FA
K		4B	0B	EBEF					
L		4C	0C0F	EC					
M		4D	0D	ED					
N		4E	0E	EE					
O		4F	0C0F	EBEF					
Lft	08	18	10	88	F1	B1	B3	B5	B1
Rgt	09	19	11	89	F2	B2	B4	B6	B2
Dwn	0A	1A	12	8A	Brk	05	03	1B	85
Up	0C	1C	13	8C					

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adopted a procedure which allows me to use the same programs in either a CoCo 3 or the old CoCo by changing two bytes of the ML code by POKE's from within the Basic program itself. This avoids the requirement to have separate versions of the same program for the different machines.

The routines are set up so that they all call a single routine to change the memory map as required, eg SETRAM to change to all RAM, and RBASIC to return things to normal.

An outline of the code used is as follows:

```
SETRAM ORCC  #$50
S1     BRN   COCO3
       CLR   $FFDE
       RTS
COCO3  LDD   #$3031
       STD   $FFA4
       LDD   #$3233
       STD   $FFA6
       RTS

RBASIC BRN   COCO3X
       CLR   $FFDF
RX     ANDCC #$AF
       RTS
COCO3X LDD   #$3C3D
       STD   $FFA4
       LDD   #$3E3F
       STD   $FFA6
       BRA   RX
```

These routines are coded to suit a 64K CoCo. For it to operate on a CoCo 3, the Basic program tests for a CoCo 3, and if it is, then it POKE's Hex 20 into location S1 and RBASIC.

This converts the BRN (branch never) instruction into a BRA (branch always) instruction.

Other Points for ML routines in the upper 32K.

In general, ML routines which access data in the upper 32K of RAM require no special coding procedures.

However, you do have to ensure that for any comparisons of addresses you use the BLO, BHI series of branch instructions, rather than the BGT, BLT series.

For addresses in the lower 32K of memory, both series have the same effect because the addresses are positive values in twos compliment form.

However, for addresses greater than Hex 7FFF, the BGT, BLT series will treat them as negative numbers and this produces an incorrect result.

Colour Computer Castle

Once a Knight is enough.

by Nicholas Fuller

CoCo3 ADVENTURE

THE YEAR IS 1600AD and you as the fearless Welsh Knight, Sir Nicholas, roam the countryside, in desparate need for money and a suit of armour after being thrown out of your own castle.

You decide to travel to the Welsh mountains in search of the famous Norman Sword that went missing over 500 years ago, and find yourself admiring Colour Computer Castle from a distance.

This totally silly outline is the basic plot of this program. After a rather attractive title page, you move closer to the castle. To gain entrance to the castle, you must enter a security code for the drawbridge to come down.

If you enter the wrong security code you get a second chance, but failing that, you're banished to the countryside.

Once you have passed the security code just sign the visitors book and your adventure will begin.

In the game the Amiga Knights hand is to the left while yours is to the right. The Amiga Knights' hand is displayed first. Simply place a bet (up to $100) that you will beat its hand with yours.

Press any key to begin a new hand. Everything is controlled by the computer. Once $1000 is reached, you begin the trek down the castles dungeons to look for the sword, but watch out for the dragons, spiders, and trapdoors.

The Dangerous Doors

Here you must choose one door. If you choose the wrong one, you might not come back.

Orange door: "He who chooseth me shall get what they deserve"

White door: "He who chooses me shall get many surprises"

Blue door: "A treasure of pleasure lies behind this door."

If you happen to die during the "game", the computer will arrange your funeral for you! If you succeed, you are given your life story and then go back to the title page for another person to try.

NB, to see the title page *only*, type in lines 0 to 500.

If you like, you can alter the adventure to your liking. I hope you like it!

The Listing:

```
0 GOTO10
3 SAVE"100:3":END'6
10 'COLOUR COMPUTER CASTLE
20 'BY NICHOLAS FULLER 1987
30 'for the coco3***SOLAR SOFTWA
RE
40 'TITLE PAGE
50 PALETTERGB:POKE65497,0
60 HSCREEN2:PALETTE0,27:PALETTE1
,0:PALETTE2,18:PALETTE3,4:PALETT
E4,16:PALETTE5,8:PALETTE6,24:PAL
ETTE7,34:PALETTE8,7:PALETTE9,32:
PALETTE10,3:PALETTE11,22:PALETTE
12,63
70 PALETTE13,6:PALETTE14,RND(63)
:PALETTE15,15
80 HCLS0
90 HDRAW"BM0,150;C1F10R50E5F2E4F
10D4E2R4E1R1E1R1E1R1E1R1E1R1E1R1
E1R1E1":HLINE-(150,140),PSET:HLI
NE-(175,120),PSET:HLINE-(320,117
),PSET:HPAINT(0,190),2,1
100 HCOLOR15:HLINE(0,15)-(320,15
),PSET:HPAINT(1,10),15,1:HCOLOR1
110 HLINE(190,125)-(170,170),PSE
T:HLINE(170,140)-(140,165),PSET:
HLINE(200,127)-(198,170),PSET:HL
INE(220,130)-(230,180),PSET:HLIN
E(260,122)-(275,150),PSET:HLINE(
230,125)-(245,160),PSET:HLINE(24
0,126)-(250,145),PSET
120 HLINE(0,140)-(85,120),PSET:H
LINE-(140,145),PSET:HPAINT(1,141
),11,1
130 HLINE(310,120)-(320,140),PSE
T:HLINE(290,130)-(320,190),PSET:
HLINE(289,129)-(319,189),PSET:HL
INE(250,160)-(255,190),PSET:HLIN
E(265,165)-(275,180),PSET
140 HCIRCLE(20,170),7,4,2:HPAINT
(20,170),4,4:A$="D12R1U12R1D12":
HDRAW"BM19,180;C3"+A$
150 HCIRCLE(40,160),7,4,2:HPAINT
(40,160),4,4:HDRAW"BM39,170;C3"+
A$:HCIRCLE(60,170),6,4,2:HPAINT(
60,170),4,4:HDRAW"BM59,178;C3"+A
$:HCIRCLE(10,165),7,4,2:HPAINT(1
0,165),4,4:HDRAW"BM9,175;C3"+A$
160 HCIRCLE(70,178),6,4,2:HPAINT
(70,178),4,4:HDRAW"BM69,186;C3"+
A$:HCIRCLE(90,180),7,4,2:HPAINT(
90,180),4,4:HDRAW"BM89,186;C3"+A
$
170 HLINE(80,165)-(75,195),PSET:
HLINE(80,165)-(84,164),PSET:HLIN
E(83,164)-(83,195),PSET:HPAINT(8
0,192),5,3
180 HLINE(100,160)-(110,170),PSE
T:HLINE-(160,175),PSET:HLINE-(22
0,182),PSET:HLINE-(230,192),PSET
:HLINE(90,165)-(100,180),PSET:HL
INE-(150,185),PSET:HLINE-(210,19
2),PSET
190 HLINE(90,165)-(100,160),PSET
:HPAINT(208,189),3,3
200 FORV=175TO320STEP.5:A=RND(12
0)+120:HSET(V,A,4):HSET(V+2,A,4)
:NEXT
210 B$="U15R2D2R2U2R2D2R2U2R2D15
":HDRAW"BM175,120;C1"+B$:HDRAW"B
M200,119;C1"+B$:HDRAW"BM240,119"
+B$:HDRAW"BM280,118"+B$:HDRAW"BM
309,117"+B$
220 HDRAW"BM185,108;R2D2R2U2R2D2
R2U2R2D2R2U2R2":HDRAW"BM211,107;
R2D2R2U2R2D2R2U2R2D2R2U2R2D2R2U2
R2D2R2U2R2D2R2U2R2D2R2U2R1":HDRA
W"BM251,106;R2D2R2U2R2D2R2U2R2D2
R2U2R2D2R2U2R2D2R2U2R2D2R2U2R2D2
R2"
230 HDRAW"BM291,105;R2D2R2U2R2D2
R2U2R2D2R2U2R2D2R2U2R2":HCOLOR6:
HPAINT(292,110),,1:HPAINT(200,11
0),,1:HPAINT(222,110),,1:HPAINT(
190,110),,1:HPAINT(260,110),,1
240 HCOLOR1:HPAINT(177,110),7,1:
HPAINT(203,112),7,1:HPAINT(243,1
10),7,1:HPAINT(283,110),7,1:HPAI
NT(318,110),7,1
250 C$="D4U2L1R2":HDRAW"BM180,11
0"+C$:HDRAW"BM202,109"+C$:HDRAW"
BM208,109"+C$:HDRAW"BM242,108"+C
$:HDRAW"BM248,109"+C$:HDRAW"BM28
2,109"+C$:HDRAW"BM288,109"+C$
260 HDRAW"BM312,108"+C$:HDRAW"BM
318,108"+C$
270 HDRAW"BM304,107;U55L2D2L2U2L
2D2L2U2L2D2L2U2L2D2L2U2L2D2L2U2L
```

```
2D2L2U2L2D2L2U2L2D2L2U2L2D2L2U2L
2D55U60L2D2L2U2L2D2L2U2L2D60":HD
RAW"BM304,107;U60R2D2R2U2R2D2R2U
2R2D55"
280 HLINE(304,52)-(283,44),PSET:
HLINE-(264,52),PSET:HPAINT(306,8
0),8,1:HPAINT(280,80),8,1:HPAINT
(260,80),8,1:HPAINT(283,45),6,1:
HDRAW"BM265,52;U30G5F5":HPAINT(2
64,26),9,1
290 HDRAW"BM304,105;U20L14BL10L1
4U20R14BR10R14BL25U13D55U30BR12U
23D55":HDRAW"BM261,90"+C$:HDRAW"
BM261,70"+C$:HDRAW"BM261,50"+C$:
HDRAW"BM310,50"+C$:HDRAW"BM310,7
0"+C$:HDRAW"BM310,90"+C$
300 D$="D7R1U7R1D7"
310 HPAINT(280,80),10,1:HDRAW"BM
271,70"+D$:HDRAW"BM271,90"+D$:HD
RAW"BM296,90"+D$:HDRAW"BM296,70"
+D$:HDRAW"BM296,58;D4R1U4":HDRAW
"BM271,58;D4R1U4"
320 HLINE(0,140)-(85,120),PSET:H
LINE-(140,145),PSET:HLINE(120,13
5)-(175,120),PSET:HLINE(0,110)-(
10,100),PSET:HLINE-(35,55),PSET:
HDRAW"F2":HLINE-(50,20),PSET
330 HLINE-(65,50),PSET:HLINE-(80
,70),PSET:HLINE-(110,130),PSET:H
LINE(80,70)-(110,25),PSET:HLINE-
(120,14),PSET:HLINE-(195,110),PS
ET:HLINE(165,70)-(190,53),PSET
340 HLINE-(210,31),PSET:HLINE-(2
20,40),PSET:HLINE-(255,60),PSET:
HLINE(315,50)-(320,40),PSET:HLIN
E(0,45)-(40,50),PSET:HLINE(90,90
)-(120,70),PSET:HLINE-(165,125),
PSET
350 HLINE(38,53)-(45,57),PSET:HL
INE-(55,60),PSET:HLINE-(65,50),P
SET:HPAINT(55,58),12,1:HPAINT(55
,88),6,1:HPAINT(320,90),12,1
360 HLINE(40,60)-(30,85),PSET:HL
INE-(10,115),PSET:HLINE(55,65)-(
45,92),PSET:HLINE-(40,120),PSET:
HLINE(65,65)-(95,115),PSET:HPAIN
T(155,135),7,1
370 HLINE(115,30)-(85,70),PSET:H
LINE(115,40)-(100,80),PSET:HLINE
(125,40)-(140,80),PSET:HLINE(145
,60)-(170,100),PSET:HLINE(195,65
)-(185,85),PSET
380 HLINE(210,65)-(200,93),PSET:
HLINE(220,65)-(250,75),PSET:HLIN
E(218,70)-(235,90),PSET:HLINE(21
3,68)-(218,96),PSET:HLINE(180,60
)-(185,64),PSET
390 HDRAW"E[illegible]2F1R4F3R5E4R4":HLIN
E-(253,60),PSET:HPAINT(213,50),1
2,1:HDRAW"BM120,30;R3E6G6L3U2H6"
:HPAINT(120,27),12,1
400 HPAINT(220,80),10,1:HPAINT(0
,90),7,1:HPAINT(155,115),4,1:HPA
INT(155,100),13,1
410 HPRINT(9,0),"Color Computer-
":HCOLOR9:HPRINT(25,40),"NICHOLA
S FULLER"
420 HLINE(93,25)-(80,25),PSET:HL
INE-(70,55),PSET:HLINE-(85,55),P
SET:HLINE-(86,50),PSET:HLINE-(78
,50),PSET:HLINE-(85,30),PSET:HLI
NE-(92,30),PSET:HLINE-(93,25),PS
ET:HLINE(100,25)-(90,55),PSET:HL
INE-(108,55),PSET:HLINE-(100,25)
,PSET
430 HLINE(100,35)-(97,50),PSET:H
LINE-(103,50),PSET:HLINE-(100,35
),PSET:HLINE(120,25)-(115,40),PS
ET:HLINE-(125,40),PSET:HLINE-(12
2,50),PSET:HLINE-(113,50),PSET:H
LINE-(110,55),PSET:HLINE-(127,55
),PSET:HLINE-(132,35),PSET:HLINE
-(122,35),PSET
440 HLINE-(125,30),PSET:HLINE-(1
33,30),PSET:HLINE-(135,25),PSET:
HLINE-(120,25),PSET
450 HLINE(140,25)-(160,25),PSET:
HLINE-(157,30),PSET:HLINE-(154,3
0),PSET:HLINE-(144,55),PSET:HLIN
E-(137,55),PSET:HLINE-(147,30),P
SET:HLINE-(137,30),PSET:HLINE-(1
40,25),PSET
460 HLINE(165,25)-(155,55),PSET:
HLINE-(167,55),PSET:HLINE-(170,5
0),PSET:HLINE-(162,50),PSET:HLIN
E-(170,25),PSET:HLINE-(165,25),P
SET:HLINE(183,25)-(173,55),PSET:
HLINE-(185,55),PSET:HLINE-(187,5
0),PSET:HLINE-(181,50),PSET
470 HLINE-(183,45),PSET:HLINE-(1
88,45),PSET:HLINE-(191,40),PSET:
HLINE-(184,40),PSET:HLINE-(187,3
0),PSET:HLINE-(194,30),PSET:HLIN
E-(196,25),PSET:HLINE-(183,25),P
SET
480 HPAINT(83,27),9,9:HPAINT(96,
53),9,9:HPAINT(104,53),9,9:HPAIN
T(119,53),9,9:HPAINT(139,53),9,9
:HPAINT(165,53),9,9:HPAINT(185,5
3),9,9
490 'PALETTE SWITCHING
500 FORQ=1TO3:PALETTE0,27:PALETT
E15,15:GOSUB390:PALETTE0,40:PALE
TTE15,41:GOSUB890:PALETTE0,44:PA
LETTE15,45:GOSUB890:PALETTE0,10:
PALETTE15,11:GOSUB890:PALETTE0,5
0:PALETTE15,52:GOSUB890:PALETTE0
,60:PALETTE15,61:GOSUB890
510 'CASTLE CLOSE UP
520 HSCREEN2:PALETTERGB:PALETTE1
,0:PALETTE0,34:PALETTE2,8:PALETT
E3,4:PALETTE4,7
530 HCLS0
540 HDRAW"BM0,15;C1R6D6R6U6R6D6R
6U6R6D6R6U6R6D6R6U6R6D6R6U6R6D6R
6U6R6D6R6U6U10R7D7R7U7R7D7R7U7R7
D7R7U7R7D190L49U180D180R49U155"
550 HDRAW"R7U7R7D7R7U7R7D7R7U7R7
D7R7U7R7D7R7U7R7D7R7U7R7D7R7U7R7
D7R7U7R7D7R7U7R7D7R7U7R7D7R7U7R7
D7R7U7R7D7R7U7R12"
560 WI$="U10E4R2F4D10L10":HDRAW"
BM10,50"+WI$:HDRAW"BM60,50"+WI$:
HDRAW"BM0,70;R85":HDRAW"BM0,65;R
85":CR$="R5D10R5D5L5D10L5U10L5U5
R5U10":HDRAW"BM105,30"+CR$:HDRAW
"BM105,80"+CR$:HDRAW"BM0,180":HL
INE-(20,100),PSET:HDRAW"H10F10":
HDRAW"R50H10L47R47F10"
570 HLINE-(50,192),PSET:HPRINT(1
8,5),"Color Computer Castle":FOR
Q=1TO10:C=C+10:HLINE(134,90+C)-(
320,90+C),PSET:NEXTQ:HLINE(134,5
0)-(320,50),PSET
580 FORXX=134TO320STEP26:HLINE(
X,100)-(XX,100),PSET:HDRAW"BD10D
10BD10D10BD10D10BD10D10":NEXTXX:
FORXZ=134TO320STEP40:HLINE(XZ,11
0)-(XZ,110),PSET:HDRAW"BD10D10BD
10D10BD10D10BD10D10BD10D10"
590 NEXTXZ:HPAINT(0,0),2,1:HPAIN
T(63,47),1,1:HPAINT(12,47),1,1:H
PAINT(106,31),1,1:HPAINT(106,82)
,1,1:HPAINT(104,82),3,1:HPAINT(1
93,47),7,1:HPAINT(0,20),4,1:HPAI
NT(320,70),4,1:HPAINT(0,170),4,1
:HPAINT(30,180),7,1
600 HPRINT(17,7),"The draw-bridg
e is up^":HPRINT(17,8),"enter yo
ur castle code":INPUTA$:IF A$="C
Oco"THEN690ELSE610
610 WIDTH40:PALETTERGB:ATTR3,3,B
:PRINT"COLOR COMPUTER CASTLE":AT
TR3,2,U:PRINT"  ";:PRINT"This no
te is to hereby give you notice
that you failed to gain entry in
to this most fascinating of cast
les. If you made a mistake enter
 the code now or beware"
620 INPUTA$:IF A$="COco"THEN720E
LSE630
630 PRINT"Unfortunately you do n
ot know the code you are therefo
re banished to the harsh and des
olate countryside forever. Thee
bid thou fareyee well. (and watc
h out for the dragons!)"
640 FORQ=1TO10:INPUT"YOU ARE IN
A FOREST YOU SEE NOTHING A)WEST
B)NORTH C)SOUTH D)EAST";SS$:T=T+
1:IF T=10THEN650ELSEGOTO640
650 ATTR3,3,B:PRINT"YOU'RE GETTI
NG MIGHTY HUNGRY":ATTR4,5:INPUT"
DO YOU A)STEAL FROM THE FOREST B
)GATHER NUTS C)PRAY D)DIE";SS$:I
F SS$="D" THEN970:IF SS$="D"THEN
970:IF SS$="B" THEN 660:IF SS$="
C"THEN660
660 CLS:PRINT"YOU CHOSE THE RIGH
T ONE YOUR PRAYS ARE ANSWERED UP
 AHEAD IS A COTTAGE A)GO INSIDE
B)WALK PAST":INPUTO$:IF O$="B" T
HEN 680 ELSE 670
670 FORT=1TO10:PRINT"YOU SEE NOT
HING":EXEC44539:NEXTT:INPUT"A)PR
AY B)STAY C)LEAVE";L$:IFL$="A"GO
TO680ORIFL$="B"THEN670ELSE970
680 GOTO640
690 HCOLOR4:HLINE(0,180)-(20,100
),PSET:HDRAW"H10F10R50H10L47R47F
10":HLINE-(50,192),PSET:HPAINT(5
0,170),4,1:HCOLOR1:HLINE(20,100)
-(30,192),PSET:HLINE(70,100)-(90
,192),PSET:HLINE(20,100)-(70,190
),PSET,BF:HPRINT(18,9),"THE BRID
GE IS DOWN ANY"
700 HPRINT(18,10),"KEY TO ENTER"
:EXEC44539:WIDTH40
710 ' BEGINNING OF ADVENTURE
720 PALETTERGB:ATTR3,3,B:PRINT"W
ELCOME TO COLOR COMPUTER CASTLE"
:ATTR4,5:INPUT"PLEASE SIGN THE V
ISITORS BOOK";Y$:PRINT"YOU AS TH
E FEARLESS WELSH KNIGHT MUST OBT
AIN MONEY TO RECOVER THE GREAT L
OST SWORD WHICH MERLIN ONCE HAD"
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730 PRINT"(IF YOU PUT IT IN THE
SIDE OF THE COMPUTER IT REALLY M
AKES IT PERFORM)":PRINT"HOWEVER
BEWARE OF THE Amiga Knight WHO I
S ALSO AFTER IT":PRINT"YOU NEED
1000 CROWNS TO START YOUR ADVENT
URE"
740 PRINT"BE AWARE OF MANY OTHER
 DANGERS THAT LURK BEHIND CORNER
S etc etc":PRINT"press any key":
EXEC44539
750 HSCREEN2:PALETTE0,0:HCLS0:PA
LETTE1,63:HPRINT(0,5),"YOU ENTER
 A DARK CORRIDOR ":FORE=1TO2500:
NEXTE:HPRINT(0,6),"YOU COME TO A
 DOOR AND ENTER INSIDE THE":HPRI
NT(0,7),"ROOM":FORT=1TO1000:NEXT
T
760 HSCREEN2:PALETTERGB:PALETTE0
,4:HCLS0:PALETTE1,0:PALETTE2,0:P
ALETTE4,63:PALETTE5,48:PALETTE6,
12:PALETTE7,3:PALETTE8,33
770 HCOLOR2:FORQ=1TO15:X=RND(320
):Y=RND(100):HLINE(X,Y)-(X+10,Y+
5),PSET,BF:NEXTQ:HCOLOR1
780 HDRAW"BM0,110;C1R319L260U45E
15D58U58F15D45G81E81L30G60":HCOL
OR4:HPRINT(0,0),"COLOR COMPUTER
CASTLE-  *card duel*"
790 HCOLOR6:POKE&HEFC9,&HFA:POKE
&HEFCA,&H10:FORE=0TO42STEP3:HPRI
NT(E,2),+CHR$(110):NEXTE
800 HPAINT(80,90),5,1:HPAINT(320
,180),7,1:HPAINT(1,190),8,1:HPAI
NT(0,150),7,1:HCOLOR1:HLINE(150,
110)-(125,192),PSET:HLINE(230,11
0)-(240,190),PSET:HLINE(280,110)
-(320,160),PSET
810 POKE&HEFC9,240:POKE&HEFCA,15
7
820 FORA=1TO25:PALETTE4,4:PALETT
E6,RND(63):FORY=1TO50:NEXTY:PALE
TTE4,63:PALETTE6,RND(63):FORU=1T
O50:NEXTU:NEXTA:HCOLOR7:HLINE(10
0,30)-(300,100),PSET,BF:PALETTE4
,63:HCOLOR4:HPRINT(12,4),"YOU MO
VE TO THE CARD TABLE":HPRINT(12,
5),"A MAN ASKS YOU :"
830 HPRINT(12,6),"Do you wish to
 play ? (y/n)":A$=INKEY$:IF A$="
Y" OR A$="y" THEN 870 ELSE IF A$
="N" OR A$="n" THEN 840 ELSE 830
840 HPRINT(12,7),"HE FORCES YOU
TO PLAY"
850 FORT=1TO2500:NEXTT
860 'CARD DUEL
870 HSCREEN4:B=100:PALETTERGB
880 GOTO 900
890 FORX=1TO50:PALETTE9,RND(64)-
1:FORT=1TO100:NEXTT:NEXTX:RETURN
900 PALETTERGB:PALETTE1,63:HCOLO
R1,4:HBUFF1,1512:HLINE(27,52)-(1
19,114),PSET,BF:HGET(27,52)-(119
,114),1:X=119:FORN=1TO4:HPUT(X+2
7,52)-(X+119,114),1,PSET:X=X+119
:NEXT:HCOLOR3,0:HDRAW"BM73,88E8H
8G8F8"
910 HPAINT(73,82),3,3:HGET(27,52
)-(119,114),1:HBUFF2,1512:HDRAW"
BM192,88E9U2H4L2G3L1H3L2G4D2FF9"
:HPAINT(192,82),3,3:HGET(146,52)
-(238,114),2:HCOLOR2,0:HBUFF3,15
12:HCIRCLE(311,76),6,2,1,.3,1.2
920 HCIRCLE(304,81),6,2,1,.15,.9
:HCIRCLE(318,81),6,2,1,.6,1.4:HD
RAW"BM314,84D4L6U4":HPAINT(311,7
7),2,2:HGET(265,52)-(357,114),3:
HBUFF4,1512
930 HDRAW"BM435,88U6F2R3E2U2H9G9
D2F2R3E2D6R3":HPAINT(435,80),2,2
:HGET(384,52)-(476,114),4:HCOLOR
1,3
940 HBUFF5,1512:FORX=507TO595STE
P6:HLINE(X,52)-(X,114),PRESET:NE
XT:X=540:Y=72:FORC=1TO3:HCIRCLE(
X,Y),8,2,1,.1,.9:HCIRCLE(X,Y),9,
2,1,.4,.6:X=X+10:Y=Y+10:NEXT
950 HGET(503,52)-(595,114),5:HCO
LOR2,4:HPRINT(10,0),"CO CO CARD
DUEL":HPRINT(10,1),"PRESS ANY KE
Y":EXEC44539:HCLS
```

'Quick, the drawbridge is about to be lowered!'

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960 HCOLOR2:HPRINT(10,0),"COLOR
COMPUTER CASTLE CARD CHALLENGE"
970 HLINE(0,15)-(640,15),PSET:HL
INE(320,15)-(320,192),PSET:HLINE
(0,20)-(310,20),PSET:HLINE-(310,
20),PSET:HLINE(330,20)-(640,20),
PSET:HLINE(330,20)-(330,192),PSE
T:HLINE(310,20)-(310,192),PSET
980 HPAINT(0,17),3,2:HPAINT(640,
17),3,2:HLINE(310,20)-(320,15),P
SET:HLINE-(330,20),PSET:HPRINT(5
,3),"AMIGA KNIGHT":HPRINT(35,3),
"VS":HPRINT(60,3),+Y$
990 HCOLOR3:HPRINT(14,20),+B:CC=
RND(4):IF CC>2 THEN HCOLOR2,1 EL
SE HCOLOR3,1
1000 HPUT(27,52)-(119,114),CC
1010 GOSUB 1280
1020 Y=Z:RR$=Z$:HPRINT(3,7),RR$:
HPRINT(12,13),+RR$
1030 HDRAW"BM30,180;C3D12R215U12
L215":HCOLOR2:HPRINT(4,30),"P L
A C E  Y O U R  B E T!"
1040 HDRAW"BM50,140;C2D30R100U15
L100R100U15L100E5R100G5E5D30G5":
HPRINT(7,18),"BET $":HPRINT(7,20
),"TOTAL $":HCOLOR3:
1050 HCOLOR3:INPUTS:IF S>100 THE
N 1050:HPRINT(12,18),+S
1055 Q=RND(4):IF Q>2 THEN HCOLOR
2,1 ELSE HCOLOR3,1
1056 HPUT(374,52)-(466,114),Q
1060 GOSUB1280:X=Z:EE$=Z$:HPRINT
(48,7),+EE$:HPRINT(56,13),+EE$
1070 IF X>Y THEN 1080 ELSE 1090
1080 HCOLOR3:B=B+S:GOTO 1100
1090 HCOLOR3:B=B-S
1100 HCOLOR3:HPAINT(100,147),1,2
:HPAINT(100,167),1,2:HPRINT(14,2
0),+B:HPRINT(50,30),"ANY KEY":EX
EC44539:HPAINT(100,147),1,2
1110 IF B>=1000 THEN 1140
1120 IF B<=-1000 THEN 1780
1130 G=G+1:GOTO 990
1140 WIDTH40:CLS2
1150 'STATUS REPORT
1160 ATTR3,3,B:PRINT"**********
**";:ATTR3,2,U:PRINT" Status Rep
ort ";:ATTR3,3,B:PRINT"*********
***";:ATTR4,5:PRINT:PRINT" You p
layed";G "number of goes to obta
in the money":PRINT"YOU HAVE NOW
 BOUGHT SOME ARMOUR WITH THE MON
EY YOU WON!!"
1170 ATTR2,0:PRINT"UNFORTUNATELY
 THTE AMIGA KNIGHT HAS LOST HIS
TEMPER WITH YOU AS YOU HAVE STRI
PPED HIM OF HIS MONEY BUT MORE I
MPORTANTLY HIS PRIDE!!":ATTR2,1:
PRINT"THOU HAST ANGERED ME WITH
YE CARDS..ENOUGH OF PLAY ..DEAR
SIR I CHALLENGE THY TO DUEL ";
1180 PRINT"...A REAL GAME IN ORD
ER TO SEE JUST WHO IS THE BRAVES
T KNIGHT IN THE PROVINCE OF COMP
UTER CASTLE!":PRINT"the amiga kn
ight said":PRINT"you as a courag
eous knight have no option but t
o accept the offer and say":ATTR
5,2:PRINT"ON GUARD FIENDISH";
1190 PRINT" KNIGHT- and fighting
 begins"
1200 PRINT"PRESS ANY KEY":EXEC44
539
1210 CLS:A=RND(5):PRINT"The figh
t commences and at first he gain
s the upper hand but you retalia
te and meet him back in the midd
le of the room-quick type in <wo
osh>"
1220 X$=INKEY$:IF X$="W" THEN123
0ELSE IF X$="" THEN 1220
1230 C$=INKEY$:C=C+1:IF C$="H" T
HEN 1240 ELSE 1230
1240 IF C<450 THEN GOTO 1260 OR
IF C>450 THEN 1250
1250 PRINT"BAD LUCK YOU WERE NOT
 QUICK ENOUGH ON THE DRAW!! UNFO
RTUNATELY YOU WERE SLAYED AND NO
W LYE ON THE GROUND WITH YOUR HE
AD ROLLING ON THE FLOOR":GOTO 18
00
1260 PRINT"GREAT STROKE!!"
1270 GOTO 1350
1280 Z=RND(13):IF Z=1 OR Z=0 THE
N Z=5
1290 IF Z<10 THEN Z$=STR$(Z)
1300 IF Z=10 THEN Z$="J"
1310 IF Z=11 THEN Z$="Q"
1320 IF Z=12 THEN Z$="K"
1330 IF Z=13 THEN Z$="A"
1340 RETURN
1350 CLS:PRINT"INTO THE DUNGEON"
:PRINT"METHODICALLY YOU VENTURE
DOWN INTO THE MURKY DEPTHS OF TH
E CASTLE .YOU COME TO A SET OF F
OUR DOORS,OPENING THE WRONG DOOR
 WIL LEAD TO DEATH [with the aid
 of the map chose the correct do
or and follow the path to ";
1360 PRINT"the secret cabin":PRI
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NT"press any key":EXEC44539
1370 HSCREEN2:PALETTE0,1:HCLS0:P
ALETTE2,63:HCOLOR2:HPRINT(10,0),
"THE DANGEROUS DOORS":PALETTE3,2
7:HCOLOR3:HLINE(70,20)-(110,130)
,PSET,BF:HCOLOR4:HLINE(140,20)-(
180,130),PSET,BF:HCOLOR7
1380 HLINE(210,20)-(250,130),PSE
T,BF:HDRAW"BM30,0;C12D130G30E30R
260F30H30U130"
1390 PALETTE11,RND(63):HPAINT(0,
10),11,12:HPAINT(320,10),11,12:P
ALETTE10,21:HPAINT(150,190),10,1
2:HCOLOR2:HPRINT(2,20),"REFER TO
 THE SECTION ON THE DOORS FOR":H
PRINT(2,21),"MORE INFORMATION BE
FORE CHOOSING"
1400 HPRINT(2,22),"WHAT DOOR DO
YOU CHOOSE":HPRINT(2,23),"(B)lue
 (W)hite (O)range"
1410 INPUTP$:IF P$="B" OR P$="W"
 THEN 1420 ELSE IF P$="O" THEN 1
440
1420 WIDTH40:PALETTERGB:PALETTE1
2,0:PALETTE13,63:PRINT"Suddenly
as you enter the passage way the
 door behind you closes and you
cannot get back the other way. Y
ou have no option but to continu
e down this passage that could l
ead you to the sword"
1430 INPUT"You hear a distant so
und do you a) run down the passa
ge b)stay where you are c)panic"
;X$:CLS:GOTO1790
1440 WIDTH40:PALETTERGB:PRINT"CO
NGRATULATIONS YOU CHOOSE THE COR
RECT DOOR!!":PRINT"YOU ARE WALKI
NG DOWN THE PASSAGE UNTIL YOU CO
ME TO AN INTERSECTION":INPUT"LEF
T OR RIGHT (L) or (R)";D$:IF D$=
"L" THEN 1450 ELSE IF D$="R" THE
N 1480
1450 CLS:ATTR3,2,B,U:PRINT"THE R
OOM OF MIRRORS":PRINT"YOU HAVE E
NTERED THE ROOM OF MIRRORS. DO Y
OU WISH TO GO BACK?":INPUT"Y/N";
K$:IF K$="Y" THEN 1440:INPUT"LEF
T OR RIGHT (L/R)";J$:IF J$="R" T
HEN 1460 ELSE IF J$="L" THEN 147
0
1460 PRINT"YOU HAVE FOUND THE WI
ZARDS KEY!":PRINT"PRESS ANY KEY"
:EXEC44539
1470 PRINT"YOU HAVE NOW COME TO
A DOOR WITH A CODE ON IT. YOU MU
ST UNJUMBLE THE LETTERS TO ENTER
 THE NEXT ROOM. YOU ONLY GET ONE
 CHANCE!!":PRINT"RTLOCUMOCOPRE":
INPUT"----- --------";KK$:IF KK$
="COLOR COMPUTER" THEN 1520 IF E
LSE THEN 1790
1480 CLS:ATTR3,3,B:PRINT"THE ROO
M OF DEATH!":ATTR4,5:PRINT"DO YO
U WISH TO GO BACK Y/N":INPUTC$:I
F C$="Y" THEN 1440 ELSE IF C$="N
" THEN 1490
1490 PRINT"THE PASSAGE IS FILLED
 WITH FIRE AND YOU QUICKLY REALI
ZE THAT YOU HAVE MET THE VICIOUS
 DREADED DRAGON OF THE DUNGEON!"
:PRINT"YOU DRAW YOUR SWORD AND F
IGHT":INPUT"QUICK TYPE SLASH";K$
:V=RND(10):IF V>5 THEN 1510 ELSE
 IF V<5 THEN 1500
1500 PRINT"YOU WERE NOT QUICK EN
OUGH AND UNFORTUNATELY WERE SLAY
ED. THE MYSTERY OF COLOR COMPUTE
R CASTLE REMAINS UNSOLVED!":PRIN
T"YOUR BODY WILL JOIN THE MANY O
THERS WHO ROT AWAY IN THE ROOM!"
:PRINT"PRESS ANY KEY":EXEC44539:
GOTO1800
1510 PRINT"WELL DONE YOU HAVE SU
CCEEDED IN KILLING THE DRAGON!!"
:PRINT"AS A REWARD COLLECT 1000
PIECES OF GOLD THAT THE DRAGON U
SED TO GUARD":PRINT"PRESS ANY KE
Y":EXEC44539
```

Oopps! _ I think I just managed to kill myself.

```
1520 CLS:ATTR4,5,B:PRINT"THE SIL
ICON WARP":ATTR3,2:PRINT"YOU TRA
VEL INTO THIS MISTY ROOM WITH ON
LY LIMITED VISION-AWARE OF THE F
ACT THAT A FALSE MOVE WILL LEAD
TO DEATH!":PRINT"YOU CAN SEE A C
ODE ON THE WALL WHICH MIGHT CONT
AIN VALUABLE INFORMATION ";
1530 PRINT" YOU CAN GET TO IT YO
U HAVE TO FIND A SPECIAL KEY TO
UNLOCK THE SQUARES OF DOOM SO IT
 IS SAFE TO CROSS BUT YOU CAN RI
SK CROSSING IT YOURSELF, HOWEVER
 YOU WILL ONLY HAVE A 20% CHANCE
 OF SURVIVAL IF YOU DO THIS"
1540 INPUT"WILL YOU A) CROSS OR
B)LOOK FOR THE KEY";CD$:IF CD$="
B" THEN 1550 ELSE 1590
1550 INPUT"WHERE WILL YOU LOOK F
OR THE KEY a) in the secret tomb
 b)the wall of wishes or c)the g
olden box";PP$:IF PP$="B" THEN 1
560 ELSE IF PP$="B"THEN1570ELSE
IF PP$="A" THEN 1580
1560 CLS:PRINT"You were most unf
ortunate to look in the wrong pl
ace-a hand reached up and strang
led you.You lie dead on the floo
r being eaten by funnel-web spid
ers!":GOTO1800
1570 CLS:PRINT"YOU HAVE FOUND 10
00 PIECES OF GOLD-unfortunately
you did not find the key so must
 try to cross the 'squares of do
om' without the key":PRINT"PRESS
 ANY KEY":EXEC44539:GOTO1590
1580 PRINT"YOU HAVE FOUND THE KE
Y AND YOU CAN SAFELY CROSS THE '
SQUARES OF DOOM'":PRINT"YOU ARE
NOW AT THE OTHER SIDE OF THE ROO
M AND ARE LOOKING AT THE WALL":P
RINT"PRESS ANY KEY":EXEC44539:A=
123:GOTO1630
1590 CLS:PRINT"YOU START TO CROS
S THE 'SQUARES OF DOOM'":P=RND(1
00):IF P<20 THEN GOTO1610 ELSE I
F P>20 THEN GOTO 1600
1600 PRINT"I AM SORRY BUT YOU DI
D NOT SUCCESSFULLY CROSS THE 'SQ
UARES OF DOOM'-YOU WERE UNMERCIF
ULLY DUMPED IN A ROOM AND LEFT T
O STARVE!":PRINT"PRESS ANY KEY":
EXEC44539:GOTO1800
1610 PRINT"YOU SUCCESSFULLY MADE
 IT ACROSS THE OTHER SIDE!! IT I
S A PITY THOUGH THAT YOU NEEDED
THE KEY WHICH WAS USED TO DEACTI
VATE THE 'SQUARES OF DOOM' TO BR
EAK THE CODE-YOU WILL HAVE TO BE
 VERY LUCKY TO GET OUT OF THIS O
NE":PRINT"PRESS ANY KEY"
1620 EXEC44539:GOTO1630
1630 HSCREEN2:PALETTERGB:PALETTE
0,0:PALETTE1,63:HCLS0:HCOLOR1:HP
RINT(0,0),"BREAKING THE CODE!!":
HPRINT(0,1),"You have come to th
e wall of codes":HPRINT(0,2),"YO
U MUST TURN THE KEY IN THE LOCK"
:HPRINT(0,3),"TO BREAK THE LOCK!
"
1640 POKE&HEFC9,&HFA:POKE&HEFCA,
&H10:HPRINT(0,6),"DO NOT TURN RI
GHT AT THE NEXT TURN ":HPRINT(0,
7),"OR IT WILL BE THE LAST TURN
YOU":HPRINT(0,8),"WILL MAKE"
1650 IF A=0 THEN GOTO1680 ELSE G
OTO 1660
1660 POKE&HEFC9,240:POKE&HEFCA,1
57
1670 HPRINT(0,11),"DO NOT TURN R
IGHT OR IT WILL BE THE":HPRINT(0
,12),"LAST TURN YOU'LL EVER MAKE
":HPRINT(0,14),"PRESS ANY KEY TO
 CONTINUE":EXEC44539
1680 POKE&HEFC9,240:POKE&HEFCA,1
57:HPRINT(0,14),"PRESS ANY KEY":
EXEC44539:WIDTH40
1690 INPUT"WILL YOU TURN LEFT OR
 RIGHT (L/R)";JF$:IF JF$="R" THE
N 1800 IF JF$="L" THEN 1700 IF E
LSE THEN 1800
1700 INPUT"WILL YOU TURN LEFT OR
 RIGHT (L/R)";HH$:IF HH$="R" THE
N 1800 IF HH$="L" THEN 1730 IF E
LSE THEN 1800
1710 INPUT"DO YOU WISH TO GO BAC
K";FF$:IF FF$="Y" OR FF$="YES" T
HEN 1720 ELSE IF FF$="N" OR FF$=
"NO"THEN 1730
1720 PRINT"YOU WERE SLAYED BY A
DRAGON.....AND YOUR BODY LEFT TO
 ROT!!":PRINT"PRESS ANY KEY":EXE
C44539:GOTO1800
1730 PRINT"YOU ENTER THE ROOM AN
D FINALLY LAY YOUR HANDS ON THE
'MAGICAL NORMAN SWORD OF 600 ad"
:FORR=1TO5:PRINT"CONGRATULATIONS
!":NEXTR
1740 PRINT"PRESS ANY KEY FOR YOU
R LIFE STORY":EXEC44539:CLS:ATTR
3,3,B:PRINT"YOUR LIFE STORY":ATT
```

Continued on p40

Carn 'Berries

Keeping up with your favourite footy code.

by Damien Clarke

CoCo3/CoCo2 (with mods)
OSO + Pascal

WITH THE FOOTBALL season over, wouldn't it be nice to be able to keep a personal record of the last season, or find out who is in the top 5 next year?

Well, if you have a CoCo 3 (or CoCo 2 with program modifications) and OS-9 PASCAL you can see an up-to-date football ladder by just typing in the exact results for each week, every week.

This program is setup for the Sydney Rugby League competition, but can be changed by adding, deleting, and the changing of the constants at the start of the program, eg to change this program for next year's competition of the Sydney competition, you would have to make the constant noofteams 16, and noofgames 8.

Also you would have to add 3 more team string constants, eg...

```
team14='Brisbane
```

... and finally add 3 other such statements to the enterdata procedure. To change this program for OS-9 level I, delete all references to the procedures invert and uninvert, and also shorten some of the WRITELN statements, and break up long messages.

If you are adventureous enough, you could add a feature that calculates the amount of money you won on footy tab or even calculate who will win the next premiership.

This program uses two records. The first record 'inforecs' stores the actual football ladder, and 'weekdata' stores the actual draw.

These 2 records are passed in and out various procedures, making the whole program work. If you did not understand that, you don't really have to worry, all you have to worry about is bribing someone to type this program in, or you could even type it in.

But the safest bet is to support your favourite magazine and lash out and by the disk from Goldsoft. This program is bit long, but I am sure you will find a use for it one day.

(Ed's note: The source for this program will on the next OS9 disk, which appears quarterly. See 'In a Nutshell' for details.)

Now, because I wrote this program, I have finally found out how to use OS-9 PASCAL, a position, I am sure many people are still in. OS-9 rules OK!

The Listing:

```
PROGRAM footy_ladder;
CONST noofteams=13;
      noofgames=6;
      team1='Manly       ';
      team2='Easts       ';
      team3='Balmain     ';
      team4='Canberra    ';
      team5='Canterbury  ';
      team6='Souths      ';
      team7='Cronulla    ';
      team8='Parramatta  ';
      team9='St. George  ';
      team10='Norths      ';
      team11='Illawarra   ';
      team12='Penrith     ';
      team13='Wests       ';

TYPE info=RECORD
  won,byes,lost,drawn,against,pfor,points,team:INTEGER;
  percent:REAL;
END;
  inforecs=ARRAY[1..noofteams] OF INFO;
  weekdata=RECORD
    teamn1,scoren1,teamn2,scoren2:ARRAY[1..noofgames] OF INTEGER;
    e:ARRAY[1..noofteams] OF CHAR;
  END;

VAR ladder:INFORECS;
    response:INTEGER;
    ladderdata:FILE OF INFORECS;
    weekdraw:WEEKDATA;
    blah:CHAR;


FUNCTION bye (test:WEEKDATA):INTEGER;

VAR loop,position:INTEGER;

BEGIN
  position:=0;
  FOR loop:=1 to noofteams DO
    IF test.e[loop]=' ' THEN
      position:=loop;
  bye:=position;
END;


PROCEDURE printstring(pos:INTEGER);

BEGIN
  CASE pos OF
    1:WRITE(team1);
    2:WRITE(team2);
```

```
    3:WRITE(team3);
    4:WRITE(team4);
    5:WRITE(team5);
    6:WRITE(team6);
    7:WRITE(team7);
    8:WRITE(team8);
    9:WRITE(team9);
    10:WRITE(team10);
    11:WRITE(team11);
    12:WRITE(team12);
    13:WRITE(team13);
  END;
END;


PROCEDURE printdraw(testdata:WEEKDATA);

VAR loop,byeteam:INTEGER;

BEGIN
  FOR loop:=1 to noofgames DO
    WITH testdata DO
      IF (scoren1[loop]>=0) AND (scoren2[loop]>=0) THEN
        BEGIN
          printstring(teamn1[loop]);
          WRITE(scoren1[loop]:3,'   ');
          printstring(teamn2[loop]);
          WRITELN(scoren2[loop]:3);
        END;
  byeteam:=bye(testdata);
  IF byeteam>0 THEN
    BEGIN
      printstring(byeteam);
      WRITELN('bye');
    END;
END;


PROCEDURE invert;

BEGIN
  WRITE(CHR(31),CHR(32));
END;


PROCEDURE uninvert;

BEGIN
  WRITE(CHR(31),CHR(33));
END;


PROCEDURE clrscr;

BEGIN
  WRITELN(CHR(12));
END;


PROCEDURE reporterror;

BEGIN
  invert;
  WRITELN('You have entered a team number that has already been entered.');
  WRITELN('Enter the team number again, please.');
  uninvert;
END;


PROCEDURE loadata(VAR data:INFORECS);

BEGIN
  RESET(ladderdata);
  READ(ladderdata,data);
  CLOSE(ladderdata);
END;


PROCEDURE savedata(VAR data:INFORECS);

BEGIN
  REWRITE(ladderdata);
  WRITE(ladderdata,data);
  CLOSE(ladderdata);
END;


PROCEDURE initrecs(VAR data:INFORECS);
```

Tax Rebate

by Duncan Bourne

CoCo3
BUSINESS

TAX REBATE WILL show the user the amount of tax return he/she may expect, in accordance with the 1986/1987 formulae. Follow the prompts and press enter at each entry.

It is rather late for this financial year, depending on changes, if any, for the 1987/1988 year, although it may be useful with minor adjustments.

The Listing:

```
1 GOTO10
2 '3REBTAX BY DUNCAN BOURNE
3 SAVE"102:3":END'3
4 ' SEPTEMBER 1987
5 'HIT ENTER AFTER NUMBER INPUT
6 'CHARACTERS FROM PROGRAM 'DIST
ANCE' BY BILL BERNICO. RAINBOW MA
Y 87
7 CSAVE"3REBTAX:3":END
10 CLEAR500:DIMA$(90):A$(32)="BR
6":A$(48)="BDD4FU6R3D6NL3EU4BUBR
3":A$(49)="BDED6RU6BR3":A$(50)="
BDRUR2DRG4DNE4R4BU6BR3":A$(51)="
R5LD2NL3D4L3HBR5U2BU3BR3
20 A$(52)="BR3G3DR6L2U4D6RU6BR3"
:A$(53)="ND2R5L4D2R3D4L3HBR5U2BU
3BR3":A$(54)="BR4L2DLGD3FNU4R3U3
NL3FDBU5BR3":A$(86)="D6RNU6R2EU5
RND4BR3":A$(87)="D6RNU6R3U6RD6R2
EU5RND4BR3":A$(89)="D2FNU3RD3RU3
RU3RND2BR3":A$(85)="D5FNU6R3U6RN
D5BR3":A$(84)="R2D6RU6R2B
30 A$(55)="R5DRG4DNRE4U2BR3":A$(
56)="BRNR3D6HUBU2UF2R2D3NL3EUBU2
UHND6BR4":A$(57)="BRNR3D3HNUFR3U
3D4G2LR2E2U3BUBR3":A$(58)="BDDBD
2DRUBU2UBUBR3":A$(59)="DBD2D2BGR
U2BU2UBR3":A$(60)="BR3G3F3RH3E3N
R3":A$(61)="BD2R4BD2L4BU4BR7":A$
(62)="F3G3RE3H3BR6
40 A$(63)="BDER3DG2DE3DG2BD2LBU6
BR6":A$(65)="BDD5RU6R3D4NL3D2RU5
BUBR3":A$(66)="D6RU6R3DRNDLD2NL3
DRNDLD2L3BU6BR7":A$(67)="BDD4RDU
6R2FBD4GL2BU6BR6":A$(68)="D6RU6R
3D6ENU4GL3BU6BR7":A$(69)="D6RU6R
3BD3BLL2D3R3BU6BR3":A$(70)="D6RU
6NR3D3R2BU3BR4
```

```
50 A$(71)="BDD4FU6R3FBD2D3LNU3L3
BU6BR7":A$(72)="D6RU6D3R3U3D6RU6
BR3":A$(73)="NLD6NLRNRU6RBR3":A$
(76)="D6RNU6R2BU6BR3":A$(77)="ND
6RD2ED2ED2E3D5RU6BR3":A$(78)="ND
6FD2ED2ED2FU6BR3":A$(83)="BDDFRF
2NH3DL3ULBR5UHDH3UR3DRBUBR3":A$(
80)="D6RU6R3D3NL3EUBUBR3
60 A$(79)="BDD4FU6R3D6NL3EU4BUBR
3":A$(82)="D6RU6R3D3L2F3RH3REUBU
BR3":A$(88)="F6L1H6BR6G6R1E6BR3"
:A$(75)="D6R1BU6L1BR1D6BR4H3R1F3
R1BH4E2L1G2BE2BR4":A$(46)="BD5R1
D1L1U1BR6BU5":GOSUB2000
75 HDRAW"S12;BM318,5":A$="A":GOS
UB1000
80 HDRAW"S12;BM100,35":A$="PROGR
AM TO CALCULATE":GOSUB1000
90 HDRAW"S12;BM100,65":A$="TAX O
N TAXABLE INCOME":GOSUB1000
100 HDRAW"S12;BM300,95":A$="AND"
:GOSUB1000
110 HDRAW"S12;BM130,125":A$="REB
ATE OR TAX DUE":GOSUB1000
115 HPRINT(36,19),"1987-1988"
120 HDRAW"S8;BM120,170":A$="PRES
S ANY KEY TO CONTINUE...":GOSUB1
000
130 A$=INKEY$:IFA$=""THEN130
140 IF A$<>"" THEN150
150 HSCREEN0:CLS:WIDTH40
160 LOCATE6,2:PRINT"** TAX ON TA
XABLE INCOME **"
170 LOCATE6,3:PRINTSTRING$(27,"-
")
180 LOCATE4,5:PRINT"TABLE A - us
e this table if you:
190 LOCATE6,7:PRINT"* ticked NO
at question 45,and          you a
re entitled to the full
   $4890  tax-free amount.
200 LOCATE9,12:PRINT"FOR TABLE A
 PRESS <ENTER>"
205 LOCATE4,18:PRINT"PRESS <B> I
F YOU REQUIRE TABLE B"
210 A$=INKEY$:IFA$=""THEN 210 EL
SE IFA$="B" THEN 220 ELSE 230
220 CLS:GOTO250
230 LOCATE6,16:INPUT"Enter taxab
le income $";TA
232 IF TA<4890 THEN TB=0
234 IF TA>4889 AND TA<12500 THEN
 TB=((TA-4890)*.2442)
235 IF TA>12499 AND TA<12600 THE
N TB=((TA-12500)*.2650)+1858.36
236 IF TA>12599 AND TA<19500 THE
N TB=(((TA-12600)*29.42)/100)+18
84.86
237 IF TA>19499 AND TA<28000 THE
N TB=(((TA-19500)*44.25)/100)+39
14.84
238 IF TA>27999 AND TA<35000 THE
N TB=(((TA-28000)*46.83)/100)+76
76.09
239 IF TA>34999 THEN TB=(((TA-34
999)*57.08)/100)+10954.19
240 LOCATE 2,18:PRINT"TAX ON $";
TA;"Taxable income is "
242 LOCATE 10,20:PRINTUSING"$###
##.##";TB
```

Continued next page

```
VAR loop:INTEGER;

BEGIN
  FOR loop:=1 TO noofteams DO
    WITH data[loop] DO
      BEGIN
        won:=0;
        lost:=0;
        drawn:=0;
        against:=0;
        pfor:=0;
        byes:=0;
        points:=0;
        percent:=0;
        team:=loop;
      END;
END;


PROCEDURE calcs(VAR data:INFORECS;week:WEEKDATA);

VAR loop,teambye:INTEGER;

BEGIN
  FOR loop:=1 TO noofgames DO
    IF (week.score1[loop]>=0) OR (week.score2[loop]>=0) THEN
      BEGIN
        IF week.score1[loop]>week.score2[loop] THEN
          BEGIN
            WITH data[week.team1[loop]] DO
              BEGIN
                won:=won+1;
                points:=points+2;
              END;
            WITH data[week.team2[loop]] DO
              lost:=lost+1;
data[week.team1[loop]].pfor:=data[week.team1[loop]].pfor+week.score1[loop];
data[week.team1[loop]].against:=data[week.team1[loop]].against+week.score2[loop];
data[week.team2[loop]].pfor:=data[week.team2[loop]].pfor+week.score2[loop];
data[week.team2[loop]].against:=data[week.team2[loop]].against+week.score1[loop];
          END;
        IF week.score1[loop]<week.score2[loop] THEN
          BEGIN
            WITH data[week.team2[loop]] DO
              BEGIN
                won:=won+1;
                points:=points+2;
              END;
            WITH data[week.team1[loop]] DO
              lost:=lost+1;
data[week.team2[loop]].pfor:=data[week.team2[loop]].pfor+week.score2[loop];
data[week.team2[loop]].against:=data[week.team2[loop]].against+week.score1[loop];
data[week.team1[loop]].pfor:=data[week.team1[loop]].pfor+week.score1[loop];
data[week.team1[loop]].against:=data[week.team1[loop]].against+week.score2[loop];
          END;
        IF week.score1[loop]=week.score2[loop] THEN
          BEGIN
            WITH data[week.team1[loop]] DO
              BEGIN
                drawn:=drawn+1;
                points:=points+1;
              END;
            WITH data[week.team2[loop]] DO
              BEGIN
                drawn:=drawn+1;
                points:=points+1;
              END;
data[week.team1[loop]].pfor:=data[week.team1[loop]].pfor+week.score1[loop];
data[week.team2[loop]].pfor:=data[week.team2[loop]].pfor+week.score1[loop];
data[week.team2[loop]].against:=data[week.team2[loop]].against+week.score1[loop];
data[week.team1[loop]].against:=data[week.team1[loop]].against+week.score1[loop];
      END;
        WITH data[week.team1[loop]] DO
          BEGIN
            IF (pfor<>0) AND (against>0) THEN percent:=(pfor/against)*100
                                         ELSE percent:=0;
            IF (pfor>0) AND (against=0) THEN percent:=30000;
          END;
        WITH data[week.team2[loop]] DO
          BEGIN
            IF (pfor<>0) AND (against>0) THEN percent:=(pfor/against)*100
                                          ELSE percent:=0;
            IF (pfor>0) AND (against=0) THEN percent:=30000;
          END;
  END;
  teambye:=bye(week);
  IF teambye>0 THEN
    WITH data[teambye] DO
      BEGIN
```

```
        points:=points+2;
        byes:=byes+1;
      END;
END;


PROCEDURE enterdata(fdata:INFORECS;VAR draw:WEEKDATA);

VAR error:BOOLEAN;
    loop:INTEGER;

BEGIN
  REPEAT
    FOR loop:=1 TO noofteams DO
      WITH draw DO e[loop]:=' ';
    WRITELN;
    FOR loop:=1 to noofgames DO
      BEGIN
        clrscr;
        WRITELN('Enter the draw for this week.');
        invert;
        WRITELN('Enter two team numbers without a ''*'' and their scores.');
        WRITELN('If a team had a bye for the week do not type it''s team number.');
        WRITELN('If 2 teams didn''t play (semi & grand finals) enter both team no.''s -');
        WRITELN(' with a negative number for each team''s score.');
        uninvert;
        WRITELN;
        WITH draw DO
          BEGIN
            WRITELN(' .1 ',e[1],team1,' .2 ',e[2],team2,' .3 ',e[3],team3
            ,' .4 ',e[4],team4);
            WRITELN(' .5 ',e[5],team5,' .6 ',e[6],team6,' .7 ',e[7],team7
            ,' .8 ',e[8],team8);
            WRITELN(' .9 ',e[9],team9,' .10 ',e[10],team10,' .11 ',e[11],team11
            ,' .12 ',e[12],team12);
            WRITELN(' .13 ',e[13],team13);
          END;
        WRITELN;
        REPEAT
          IF error=true THEN reporterror;
          error:=false;
          WRITELN('Enter the number of the first team:');
          WITH draw DO
            BEGIN
              READ(teamn1[loop]);
              printstring(teamn1[loop]);
              WRITELN;
            END;
          IF draw.e[draw.teamn1[loop]]='*' THEN error:=true;
        UNTIL draw.e[draw.teamn1[loop]]=' ';
        WRITELN('Enter the team''s score:');
        WITH draw DO
          BEGIN
            READLN(score1[loop]);
            e[teamn1[loop]]:='*';
          END;
        REPEAT
          IF error=true THEN reporterror;
          error:=false;
          WRITELN('Enter the number of the second team:');
          WITH draw DO
            BEGIN
              READ(teamn2[loop]);
              printstring(teamn2[loop]);
              WRITELN;
            END;
          IF draw.e[draw.teamn2[loop]]='*' THEN error:=true;
        UNTIL draw.e[draw.teamn2[loop]]=' ';
        WRITELN('Enter the team''s score:');
        WITH draw DO
          BEGIN
            READLN(score2[loop]);
            e[teamn2[loop]]:='*';
          END;
      END;
      WRITELN;
      printdraw(draw);
      WRITELN;
      WRITELN(' .1 Go back to the main menu without making changes.');
      WRITELN(' .2 Enter the information in again.');
      READLN(response);
    UNTIL response=1;
END;


PROCEDURE sortdata(VAR data:INFORECS);

VAR loop1,loop2:INTEGER;
    dummy:INFO;

BEGIN
  FOR loop1:=1 TO (noofteams-1) DO
    FOR loop2:=noofteams DOWNTO (loop1+1) DO
      IF (data[loop2].percent>data[loop2-1].percent) THEN
        BEGIN
```


Cont. from previous page

```
243 LOCATE10,21:PRINTSTRING$(9,"
=")
244 LOCATE6,23:PRINT"Press any k
ey to continue!!"
245 A$=INKEY$:IF A$="" THEN 245
ELSE 400
250 CLS:LOCATE6,2:PRINT"** TAX O
N TAXABLE INCOME **"
260 LOCATE6,3:PRINTSTRING$(27,"-
")
270 LOCATE4,5:PRINT"TABLE B - us
e this table if you:
280 LOCATE6,7:PRINT"* ticked YES
 at question 45 AND   you are no
t entitled to the full $4890  ta
x-free amount."
285 LOCATE6,16:INPUT"Enter taxab
le income $";TA
290 LOCATE1,18:PRINT"Enter reduc
ed tax - free threshold"
295 LOCATE 9,21:INPUT"see Note 4
5.";C
300 D=(12500-C)*24.42/100
310 IF TA=>1 AND TA<C THEN TB=0
315 IF TA=>C AND TA<12500 THEN T
B=((TA-C)*.2442)
320 IF TA>12499 AND TA<12600 THE
N TB=((TA-12500)*.265)+D
325 IF TA>12599 AND TA<19500 THE
N TB=((TA-12600)*.2942)+D+26.50
330 IF TA>19499 AND TA<28000 THE
N TB=((TA-19500)*.4425)+D+2056.4
8
335 IF TA>27999 AND TA <35000 TH
EN TB=((TA-28000)*.4683)+D+5817.
73
340 IF TA>34999 THEN TB=((TA-350
00)*.5708)+D+9095.83
400 HSCREEN3:GOSUB2000:HCOLOR1,0
410 PALETTE0,54:PALETTE1,0
420 HDRAW"S8;BM145,5":A$="REBATE
 OR TAX PAYABLE":GOSUB1000
430 HLINE(145,22)-(460,22),PSET
440 HLINE(540,31)-(620,41),PSET,
B
450 HPRINT(25,4),"Tax on your ta
xable income."
470 HPRINT(69,4),INT(TB)
480 HPRINT(5,6),"Total rebates t
hat you claimed at Q.44."
490 HLINE(460,46)-(540,56),PSET,
B
500 INPUT RA:HPRINT(58,6),RA
510 HPRINT(25,8),"Pension or Ben
eficiary Rebate"
520 HPRINT(3,9),"If you have bot
h,use the one which gives you th
e most"
530 HPRINT(30,10),"See Notes 13
and 14"
540 HLINE(460,71)-(540,81),PSET,
B
550 INPUT RB:HPRINT(58,9),RB
560 HPRINT(1,12),"Rebate on leav
e payments & eligible terminatio
n payments."
570 HPRINT(30,13),"See Notes 15
and 17"
580 HLINE(460,94)-(540,104),PSET
,B
```

```
590 INPUT RD:HPRINT(58,12),RD
600 HPRINT(20,15),"Rebate on Com
monwealth Loan Interest."
610 HPRINT(35,16),"See Note 22"
620 HLINE(460,119)-(540,129),PSE
T,B
630 INPUT RE:HPRINT(58,15),RE
640 HPRINT(25,18),"Rebate on lif
e insurance bonuses."
650 HPRINT(35,19),"See Note 24"
655 HLINE(460,143)-(540,153),PSE
T,B
660 INPUT RF:HPRINT(58,18),RF
670 HPRINT(25,21),"TOTAL REBATES
"
680 HLINE(540,165)-(620,175),PSE
T,B
690 HPRINT(20,23),"Press any key
 to continue"
695 RT=RA+RB+RC+RE+RF:HPRINT(69,
21),RT
700 A$=INKEY$:IF A$="" THEN700 E
LSE710
710 HCLS:HDRAW"S8;BM145,10":A$="
REBATE OR TAX OWED":GOSUB1000
720 HLINE(145,26)-(430,26),PSET
730 HPRINT(20,7),"Tax on your ta
xable income"
740 HLINE(460,55)-(540,65),PSET,
B
750 HPRINT(59,7),INT(TB)
760 HPRINT(20,9),"Total Rebate"
770 HLINE(460,70)-(540,80),PSET,
B
780 HPRINT(59,9),RT
790 HPRINT(20,11),"Net tax payab
le"
800 HLINE(460,85)-(540,95),PSET,
B
810 NT=TB-RT:HPRINT(59,11),INT(N
T)
820 HPRINT(20,13),"Your Medicare
 levy"
830 HLINE(460,102)-(540,112),PSE
T,B
840 INPUT MC:HPRINT(59,13),MC
850 HPRINT(20,15),"Total Tax + M
edicare levy"
860 HLINE(460,119)-(540,129),PSE
T,B
870 TM=NT+MC:HPRINT(59,15),INT(T
M)
880 HPRINT(20,17),"Tax already p
aid"
890 HLINE(460,135)-(540,145),PSE
T,B
900 INPUTTP:HPRINT(59,17),TP
910 X=TM-TP:IFSGN(X)=>1 THEN R$=
"TAX OWING $"
920 IF SGN(X)<1 THEN R$="REFUND
DUE $"
930 HPRINT(20,20),R$
935 Y=ABS(X)
940 HPRINT(32,20),INT(Y)
950 HPRINT(20,21),"==========
====="
970 HPRINT(20,23)," To continue
 (Y/N)?"
980 I$=INKEY$:IFI$="" THEN 980
```

Continued on p40

```
        dummy:=data[loop2-1];
        data[loop2-1]:=data[loop2];
        data[loop2]:=dummy;
      END;
  FOR loop1:=1 TO (noofteams-1) DO
    FOR loop2:=noofteams DOWNTO (loop1+1) DO
      IF (data[loop2].points>data[loop2-1].points) THEN
        BEGIN
          dummy:=data[loop2-1];
          data[loop2-1]:=data[loop2];
          data[loop2]:=dummy;
        END;
END;
PROCEDURE printdata(fdata:INFORECS);

VAR temp:INFORECS;
    loop:INTEGER;
    answer:CHAR;

BEGIN
  clrscr;
  temp:=fdata;
  sortdata(temp);
  WRITELN(' The NSWFL Ladder');
  WRITELN;
  invert;
  WRITELN('Team          W  L  D  B     F    A    %   Pts');
  uninvert;
  FOR loop:=1 TO noofteams DO
    BEGIN
      IF loop=6 THEN WRITELN('##########################################');
      printstring(temp[loop].team);
      WITH temp[loop] DO
        BEGIN
          WRITE(' ',won:2,' ',lost:2,' ',drawn:2,' ',byes:2,' '
          ,' ',pfor:4,' ',against:4,'  ');
          IF (pfor>=0) AND (against=0) THEN WRITE(' N/A')
                                       ELSE WRITE(percent:4:0);
          WRITELN(points:3);
        END;
    END;
  WRITELN;
  WRITELN('# N/A means that the percentage is currently unavailable.');
  WRITELN;
  WRITELN('Press <ENTER> to return to the main menu.');
  READLN(answer);
END;
BEGIN
  REPEAT
    clrscr;
    invert;
    WRITELN(' NSWFL Ladder Calculator');
    WRITELN('  By Damien Clarke');
    uninvert;
    WRITELN;
    initrecs(ladder);
    WRITELN(' .1 Start new file.');
    WRITELN(' .2 Update old file.');
    WRITELN(' .3 Print current ladder.');
    WRITELN(' .4 Print current draw.');
    WRITELN(' .5 End.');
    WRITELN;
    WRITELN('Enter 1,2,3,4, or 5:');
    READLN(response);
    CASE response OF
      1:BEGIN
          enterdata(ladder,weekdraw);
          calcs(ladder,weekdraw);
          savedata(ladder);
        END;
      2:BEGIN
          loadata(ladder);
          enterdata(ladder,weekdraw);
          calcs(ladder,weekdraw);
          savedata(ladder);
        END;
      3:BEGIN
          loadata(ladder);
          printdata(ladder);
        END;
      4:BEGIN
          clrscr;
          invert;
          WRITELN(' Current NSWFL Draw');
          uninvert;
          printdraw(weekdraw);
          WRITELN('Press <ENTER> to return to the main menu.');
          READLN(blah);
        END;
      5:BEGIN
        END;
    END;
  UNTIL response=5;
  WRITELN('Thank you for using this program. Have a nice day.');
END.
```

Border Graphics

Create any size borders with this handy CoCo3 program!

by Frank Buttigieg

CoCo3
UTILITY

EVER SINCE I got Telewriter-64 some 2 and a half years ago, I've always looked for a utility that'll help me create some fancy border lines, but I've had no luck.

So finally I decided to write one myself. I did and this is it!!!

I'll try to explain how it works. The border is a GRID to help you calculate where you want the BLOCKs to be placed on the sheet, and to create any sized borders.

Let me explain.

First of all, it is done on a DMP-110, which uses a total of 960 dots to draw a line across the paper. It will not allow you to draw more than 256 Dots. It's all explained in the manual, so study it.

Here's how I worked it out:

BLOCK = 16 dots (DMP-110's elongated mode) or 8 (for 480 dots).
SECTORS [0 to 2] = 16 BLOCKS = 256 dots/sector [3] = 12 BLOCKS = 192 dots 1st BLOCK in 'any' SECTOR. It's Starts on the [0] position. Last BLOCK in SECTORS [0 to 2], starts on [240] position. Last BLOCK in SECTOR [3], starts on [176] position.

OK, here's how I formed a border to use as a kind of GRID.

1>- CLOAD & RUN program. You are greeted by a MENU of 5 choices.

2>- Select Number 4 and press <enter> to create a new design.

3>- Now, for those who are not too familiar with printer graphics, I suggest they pick up Australian CoCo, 12/87, on page 29.

There is an excellent article by Mal McLaughlan on this subject.

For those who can't be bothered, or don't have a copy of the mag, just type in a 3 digit number between (128 & 255) when prompted, or use these numbers:

255 - 193 - 201 - 221
201 - 193 - 255 - 128

4>- You're back on the main menu. Select No.5

5>- Here comes the nitty gritty! You're prompted by:

"Start @ SECTOR...?" <type 0>
"Start @ POS...?" <type 0>
"End @ SECTOR...?" <type 3>
"End @ POS...? <press> 176

By now it should be clear what the last 4 prompts are about. The next prompt is ...

"How many <BLOCKs> across...? <type 60>

This number is calculated as such:

SECTOR 0, POSition 0 to
SECTOR 2, POSition 255
= 3(SECTORs) X 256 = 768.
SECTOR 3 = 192.
Add 192 + 768 = 960.
Divide 960 / 16 = 60 BLOCKS

"BLOCKs per columns ...? 87

... pure guessing! Hence why it's important to create this GRID first. It is a good ruler to use.

So now the printer takes over...

6>- When the printing is done, you're back to the main menu.

7>- Before you type 3, make sure that the text printing is going to sit snuggly under the bottom line, but not on the perforated line.

If it does, don't worry, adjust the paper to sit on top of the next sheet, making sure the GRID sits in position on paper, and type <1>.

This time you don't have to punch in all those numbers again. This you can do as many times as you want to.

Now, presuming all is done right, press <3> and you'll get a printout of the 3 digit numbers you punched in earlier, for later reference.

Also, because the text format is 80 columns (BLOCKs) across, and my format is 60 columns (BLOCKS) across, you can use the text below the GRID as a guide, to work cohesively with "BORDER GRAPHICS".

I hope you find this program interesting and helpful for you as it is for me.

Cheers to you all!

The Listing:

```
1 GOTO10
2 '...BRDRGRAF...Frank Buttigieg
   10/12/87...(c)...FXB.
3 SAVE"111:3":END '7
10 POKE150,41
15 POKE359,57:POKE65314,88
20 ONBRKGOTO370
30 GOSUB50
40 GOTO270
50 CLS:PRINT@3,"$$$$$$$$$$$$$$$$
$$$$$$$$$$      $BORDER GRAPHICS
 UTILITY $      $By Frank Buttig
ieg 12/87$     $$$$$$$$$$$$$$$$
$$$$$$$$$$"
60 PRINT#-2,CHR$(18);CHR$(27)CHR
$(14);CHR$(27)CHR$(19);
70 RETURN
80 PRINTTAB(9):INPUT"1ST.#";N1:I
FN1<128GOSUB350:GOTO80ELSEIFN1>2
55GOSUB360:GOTO80
90 PRINTTAB(9):INPUT"2ND.#";N2:I
FN2<128GOSUB350:GOTO90ELSEIFN2>2
55GOSUB360:GOTO90
100 PRINTTAB(9):INPUT"3RD.#";N3:
IFN3<128GOSUB350:GOTO100ELSEIFN3
```

```
>255GOSUB360:GOTO100
110 PRINTTAB(9):INPUT"4TH.#";N4:
IFN4<128GOSUB350:GOTO110ELSEIFN4
>255GOSUB360:GOTO110
120 PRINTTAB(9):INPUT"5TH.#";N5:
IFN5<128GOSUB350:GOTO120ELSEIFN5
>255GOSUB360:GOTO120
130 PRINTTAB(9):INPUT"6TH.#";N6:
IFN6<128GOSUB350:GOTO130ELSEIFN6
>255GOSUB360:GOTO130
140 PRINTTAB(9):INPUT"7TH.#";N7:
IFN7<128GOSUB350:GOTO140ELSEIFN7
>255GOSUB360:GOTO140
150 PRINTTAB(9):INPUT"8TH.#";N8:
IFN8<128GOSUB350:GOTO150ELSEIFN8
>255GOSUB360:GOTO150
160 RETURN
170 PRINTTAB(2)"Start @ SECTOR..
.";:INPUTS1'...960 Dots into 4 S
ECTORS (0-3)...0 to 2 =256ea. 3=
192...
180 PRINTTAB(2)"Start @ POS.(0-2
40)...";:INPUTX1:IFX1>236THENX1=
240'...8(dots)*2(Elong.Mode)/256
=16(Blocks(EXACTLY)):240=START O
F 16TH BLOCK IN SECTORS 0-2...
190 PRINTTAB(2)"End @ SECTOR..."
;:INPUTS2
200 PRINTTAB(2)"End @ POS.(<=240
)...";:INPUTX2:IFS2=3THENX2=176
210 PRINTTAB(6)"How many <BLOCKs
> across          [Max...60]..."
;:INPUTCH
220 PRINTTAB(2)"BLOCKs per Colum
n...";:INPUTLN
230 GOTO260
240 PRINT#-2,CHR$(27)CHR$(16)CHR
$(S1)CHR$(X1);:FORR=1 TOCH:PRINT
#-2,CHR$(N1)CHR$(N2)CHR$(N3)CHR$
(N4)CHR$(N5)CHR$(N6)CHR$(N7)CHR$
(N8);:NEXT:RETURN
250 PRINT#-2,CHR$(N1)CHR$(N2)CHR
$(N3)CHR$(N4)CHR$(N5)CHR$(N6)CHR
$(N7)CHR$(N8);:RETURN
260 GOSUB240:PRINT#-2,CHR$(10);C
HR$(26);:FORL=1TOLN:PRINT#-2,CHR
$(27)CHR$(16)CHR$(S1);CHR$(X1);:
GOSUB250:PRINT#-2,CHR$(27)CHR$(1
6)CHR$(S2);CHR$(X2);:GOSUB250:PR
INT#-2,CHR$(13);:NEXT:GOSUB240:P
RINT#-2,CHR$(13)
270 GOSUB50:PRINT:PRINTTAB(1):IN
PUT"<1> - Same again...
    <2> - Design Sample only...
    <3> - Print above's CHR(#)'s
... <4> - Create a new Design...
    <5> - Same design, new Borde
r.. Select...";AP
280 IFAP<1ORAP>5GOTO270
290 IFAP=1GOTO230
300 IFAP=2THENS1=0:X1=0:CH=60:GO
SUB240:GOTO270
310 IFAP=3GOSUB340:GOTO270
320 IFAP=4GOSUB80:GOTO270
330 IFAP=5THENCH=0:GOTO170
335 GOTO270
340 PRINT#-2,CHR$(30);CHR$(19);C
HR$(15);CHR$(27)CHR$(19);CHR$(27
```

Continued on p40

Labels

Printouts for standard labels

by Barry Sidebottom

CoCo3
UTILITY

LABEL IS for the CoCo 3 prints out labels on standard 3.5 X 9 cm labels.

By using colour codes you can see which lines are formatted and how, ie emphasised, enlarged, condensed, italicised, normal and all underlined or not.

The program is straight forward with a copule of notes: the "e", "n" & "c" on the screen during input show the length available for enlarged, normal and condensed print.

You may have to change your printer codes - I use an AMUST 80DT and the codes are listed below:

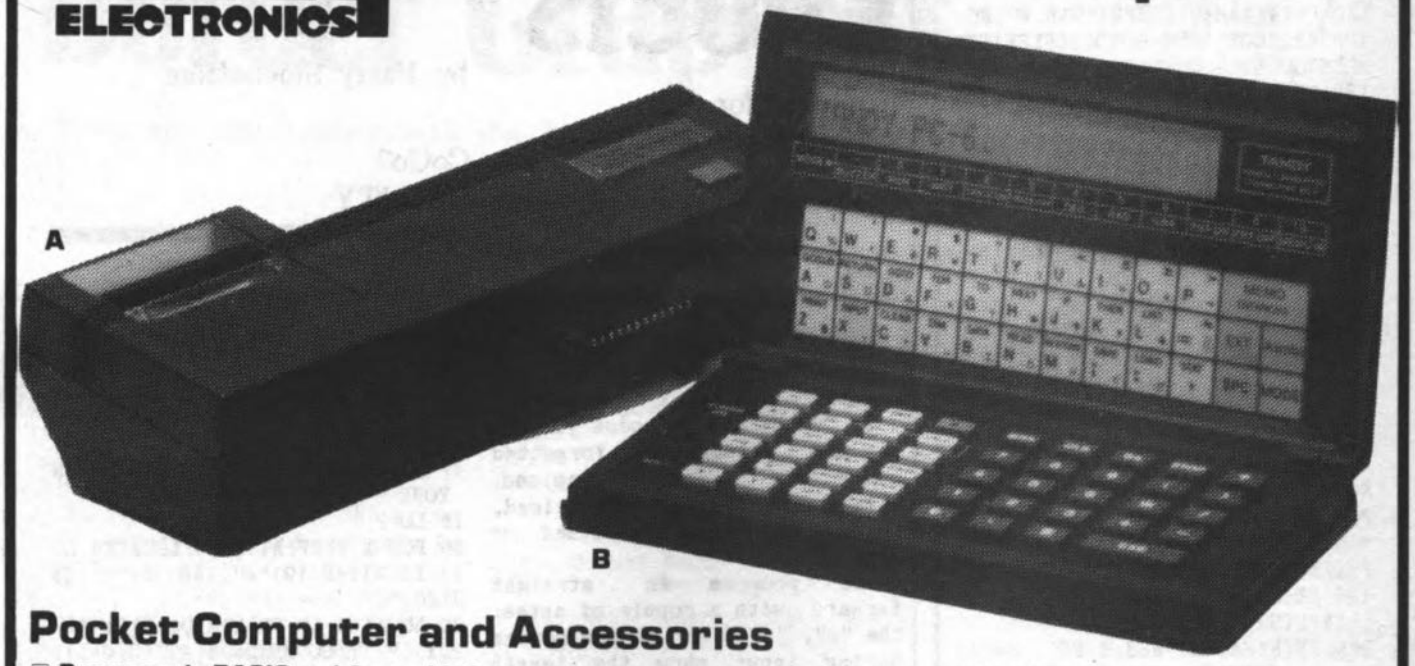
line	code	function
112	27;45;1	underlining on
112	27;45;0	underlining off
116	27;14	enlarged on for 1
118	27;15	condensed on
118	27;18	condensed off
120	27;52	italics on
120	27;53	italics off
122	27;"E"	emphasised on
122	27;"F"	emphasised off

Hope you can use it. If you have any problems, call me (03) 744-6281.

```
0 GOTO10
1 '------------------------
2 '      LABEL PRINTER
3 '            by
4 '     Barry Sidebottom
5 '------------------------
6 '   version 1.0(3)  1987
7 '------------------------
8 SAVE"107C:3":END'7
9 '
10 CLEAR2000
11 ON BRK GOTO175
12 POKE65497,0
13 GOSUB14:GOTO16
14 WIDTH80:PALETTE10,60:PALETTE6
,5:PALETTE0,0:CLS1:ATTR3,0:CLS:A
TTR3,0,U
15 PRINT"LABELLER by Barry Sideb
ottom. ver 1.0(3) 1987";:RETURN
16 ATTR5,0:LOCATE0,18:PRINT"YOU
 HAVE 7 LINES. IN NORMAL MODE YOU
 HAVE 36 CHR's, EMPHASIZED 18 CH
R's &       CONDENSED 64 CHR's P
ER LINE."
17 LOCATE0,22:PRINT"PLEASE ENTER
 YOUR 7 LINES."
18 LO=2
19 FOR X=1TO7:ATTR2,0:LOCATE0,LO
+1:PRINTTAB(19)"e";TAB(18)"n";TA
B(26)"c"
20 LOCATE0,LO:PRINTMID$(STR$(X),
2,1);".";:SOUND220,1:ATTR3,0:LIN
EINPUT LN$(X)
21 LO=LO+1:LOCATE0,LO:PRINT:NEXT
22 PRINT:PRINT"DO YOU WISH ANY S
PECIAL FORMATTING ? (Y/N)":SOUND
220,1
23 Z$=INKEY$
24 IF Z$="Y"THEN26ELSE IF Z$="N"
THEN25ELSE23
25 GOSUB27:GOTO57
26 GOSUB27:GOTO31
27 GOSUB14:ATTR3,0
28 LO=2
29 FOR X=1TO7:LOCATE0,LO:ATTR2,0
:PRINTMID$(STR$(X),2,1);".";:ATT
R3,0:PRINTLN$(X)
30 LO=LO+2:NEXT:RETURN
31 LOCATE0,18:PRINT"DO YOU WISH
TO:"
32 PRINT"ENLARGE ?":SOUND220,1
33 Z$=INKEY$
34 IF Z$="Y"THEN35ELSE IF Z$="N"
THEN37ELSE33
35 F=1:GOSUB139
36 GOSUB157
37 LOCATE0,19:PRINT"CONDENSE ?
 ":SOUND220,1
38 Z$=INKEY$
39 IF Z$="Y"THEN40ELSE IF Z$="N"
THEN42ELSE38
40 F=2:GOSUB139
41 GOSUB157
42 LOCATE0,19:PRINT"ITALICIZE  ?
":SOUND220,1
43 Z$=INKEY$
44 IF Z$="Y"THEN45ELSE IF Z$="N"
THEN47ELSE43
45 F=3:GOSUB139
46 GOSUB157
47 LOCATE0,19:PRINT"EMPHASIZE ?"
:SOUND220,1
48 Z$=INKEY$
49 IF Z$="Y"THEN50ELSE IF Z$="N"
```

Tandy ELECTRONICS

Handy Pocket Computer



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```
THEN52ELSE48
50 F=4:GOSUB139
51 GOSUB157
52 LOCATE0,19:PRINT"UNDERLINE ?"
:SOUND220,1
53 Z$=INKEY$
54 IF Z$="Y"THEN55ELSE IF Z$="N"
THEN57ELSE53
55 GOSUB147
56 GOSUB157
57 LOCATE0,16:ATTR2,0:PRINTTAB(1
9)"e";TAB(18)"n";TAB(26)"c"
58 LOCATE0,18:PRINT:LOCATE0,17:P
RINT"KEY:"
59 ATTR3,2:PRINT"ENLARGED.  ";:L
OCATE15,18:ATTR3,3:PRINT"CONDENS
ED. ";
60 LOCATE30,18:ATTR3,7:PRINT"ITA
LICIZED.";:LOCATE45,18:ATTR3,6:P
RINT"EMPHASIZED.";:LOCATE60,18:A
TTR3,0,U:PRINT"UNDERLINED.";
61 LOCATE0,19:ATTR3,0:PRINT:LOCA
TE0,20:PRINT"'E'dit or 'P'rint ?
";:SOUND220,1
62 Z$=INKEY$:IF Z$=""THEN62
63 IF Z$="E"THEN68ELSE IF Z$="P"
THEN97ELSE62
64 '
65 '
66 '
67 '
68 ' ** EDIT
69 LOCATE0,20:PRINT"EDIT - 'L'in
e, 'F'ormatting, 'E'verything or
 'A'bort ?";:SOUND220,1
70 Z$=INKEY$:IF Z$=""THEN70
71 IF Z$="L"THEN72ELSE IF Z$="F"
THEN79ELSE IF Z$="E"THEN133ELSE
IF Z$="A"THEN LOCATE0,20:PRINT:G
OTO61ELSE70
72 LOCATE0,20:PRINT:LOCATE0,21:P
RINT"(0 TO ABORT)"
73 LOCATE0,20:SOUND220,1:INPUT"L
INE #:";X
74 IF X=0THEN LOCATE0,21:PRINT:G
OTO61
75 IF X<1OR X>7THEN73
76 LOCATE0,X*2:PRINTMID$(STR$(X)
,2,1);".":LOCATE2,X*2:LINEINPUT
LN$(X)
77 GOSUB157
78 GOTO72
79 LOCATE0,20:PRINT"'F'ormat,  '
U'nformat  or  'A'bort ?":SOUND2
20,1
80 Z$=INKEY$:IF Z$=""THEN80
81 IF Z$="F"THEN82ELSE IF Z$="U"
THEN85ELSE IF Z$="A"THEN LOCATE0
,20:PRINT:GOTO61ELSE80
82 GOSUB88
83 IF F<5THEN GOSUB139 ELSE GOSU
B147
84 GOSUB157:GOTO82
85 LOCATE0,20:PRINT"LINE #:":LOC
ATE0,21:PRINT"(0 TO ABORT)":LOCA
TE8,20:INPUT X
86 IF X=0THEN LOCATE0,21:PRINT:G
OTO61
87 L(X)=0:GOSUB157:GOTO85
88 LOCATE0,19:PRINT"1";TAB(14)"2
";TAB(14)"3";TAB(14)"4";TAB(14)"
5"
89 PRINT"CHOOSE (1-5) OR 0 TO AB
ORT   ==> ";:SOUND220,1
90 INPUT F
91 IF F=0THEN92ELSE IF F<1OR F>5
THEN88ELSE RETURN
92 LOCATE0,19:PRINT:PRINT:GOTO61
93 '
94 '
95 '
96 '
97 ' **PRINTOUT
98 LOCATE0,20:PRINT"HOW MANY ? (
0 TO ABORT) ==> ";:SOUND220,1:IN
PUT P
99 IF P=0THEN125ELSE IF P<1THEN9
8
100 LOCATE0,21:PRINT"LINE FEED ?
 ==> ";:SOUND220,1:INPUT LF
101 IF LF<1THEN100
102 POKE 65496,0
103 FOR Q=1TO P
104 PP=PEEK(65314)
105 IF PP/2=INT(PP/2)THEN107
106 LOCATE0,18:ATTR3,0,B:PRINT"P
RINTER OFF-LINE":SOUND100,1:GOTO
104
107 FOR X=1TO7
108 P=L(X):IF P>5THEN115ELSE IF
P=0THEN109ELSE110
109 P$=LEFT$(LN$(X),36):GOTO111
110 ON P GOSUB 116,118,120,122,1
24
111 IF L(X)>4THEN112ELSE113
112 PRINT#-2,TAB(34)CHR$(27);CHR
$(45);CHR$(1);P$;CHR$(27);CHR$(4
5);CHR$(0):GOTO114
113 PRINT#-2,TAB(34)P$
114 NEXT X:FOR Y=1TO LF:PRINT#-2
:NEXT Y,Q:GOTO125
115 P=P-5:GOTO110
116 P$=CHR$(27)+CHR$(14)+LEFT$(L
N$(X),18)
117 RETURN
118 P$=CHR$(27)+CHR$(15)+LEFT$(L
N$(X),64)+CHR$(27)+CHR$(18)
119 RETURN
120 P$=CHR$(27)+CHR$(52)+LEFT$(L
N$(X),36)+CHR$(27)+CHR$(53)
121 RETURN
122 P$=CHR$(27)+"E"+LEFT$(LN$(X)
,36)+CHR$(27)+"F"
123 RETURN
124 P$=LEFT$(LN$(X),36):RETURN
125 LOCATE0,21:PRINT"AGAIN ? (Y/
N)";:SOUND220,1
126 Z$=INKEY$:IF Z$=""THEN126
127 IF Z$="Y"THEN LOCATE0,21:PRI
NT:GOTO97ELSE IF Z$="N"THEN128EL
SE126
128 LOCATE0,21:PRINT:LOCATE0,21:
PRINT"MORE ? (Y/N)";:SOUND220,1
129 Z$=INKEY$:IF Z$=""THEN129
130 IF Z$="Y"THEN131ELSE IF Z$="
N"THEN132ELSE129
131 FOR X=1TO7:LN$(X)="":L(X)=0:
P$="":NEXT:GOTO11
132 POKE113,0:EXEC40999
133 FOR X=1TO7:LN$(X)="":L(X)=0:
P$="":NEXT:GOTO11
134 '
135 '
136 '
137 '
138 ' ** SPECIAL FORMATTER
139 LOCATE0,22:PRINT"(0 TO END)"
:LOCATE0,21:PRINT"WHICH LINE:";:
SOUND220,1:INPUT X
140 IF X=0THEN142
141 L(X)=F:GOTO139
142 LOCATE0,22:PRINT:LOCATE0,21:
PRINT:RETURN
143 '
144 '
145 '
146 '
147 ' ** ADD UNDERLINING
148 LOCATE0,22:PRINT"(0 TO END)"
:LOCATE0,21:PRINT"WHICH LINE:";:
SOUND220,1:INPUT X
149 IF X=0THEN152
150 P=L(X)
151 L(X)=L(X)+5:GOTO147
152 LOCATE0,22:PRINT:LOCATE0,21:
PRINT:RETURN
153 '
154 '
155 '
156 '
157 ' ** REPRINT WITH FORMATTING
158 LO=2
159 FOR X=1TO7:LOCATE0,LO:IF L(X
)=0THEN ATTR3,0:GOTO163ELSE160
160 P=L(X)
161 IF L(X)>5THEN173
162 ON P GOSUB165,167,169,171,17
4
163 PRINTMID$(STR$(X),2,1);".";L
N$(X);
164 LO=LO+2:NEXT:ATTR3,0:RETURN
165 IF L(X)>4THEN ATTR3,2,U ELSE
 ATTR3,2
166 RETURN
167 IF L(X)>4THEN ATTR3,3,U ELSE
 ATTR3,3
168 RETURN
169 IF L(X)>4THEN ATTR3,7,U ELSE
 ATTR3,7
170 RETURN
171 IF L(X)>4THEN ATTR3,6,U ELSE
 ATTR3,6
172 RETURN
173 P=L(X)-5:GOTO162
174 ATTR3,0,U:RETURN
175 GOTO11
```

'c', 'n' and 'c' denote the length available

OS9 Level 2:
Customising your System Disk

by Ken Wagnitz

OS9

HERE ARE THE things you may like to do with your System disk to customise it for your particular hardware setup.

But first, write protect both supplied OS9 disks then make copies of them and put them away in a safe place. You can BACKUP the disks as if they were normal RSDOS 35 track disks, ie using DSKINI to format disks, then BACKUP.

The Clock

The clock module is responsible for maintaining the current time, being incremented by the an interrupt from the vertical sync pulse, which in Oz is 50Hz, but 60Hz in the USA.

Consequently when you boot the bought OS9 or DESKMATE, the screen may roll, and the clock will lose time. (It also loses time with disk accesses, but that's another story).

If you have a Philips colour TV you will not be able to correct the rolling if it occurs. Other people can reach for the Vertical Hold. It is important to have the time roughly correct because it "date/time" stamps files so that a DIR E shows the date/time of last modification of a file.

Fortunately a 50Hz clock module is supplied, along with other modules, on the Boot/Config disk.

To use it, run the CONFIG command, as follows:

1. Assuming two disk drives- Boot with the COPY of the system disk in d0.
2. Format a disk in d1, leave it there.
3. Place your COPY of the CONFIG disk in d0.
4. Type 'chx /d0/cmds ; chd /d0'. (The ';' is a command separator.)
5. Type 'config' and follow the prompts as per the 2-drive description in the manual (OS9 Commands, page 6-18).

5a. Include all of the window descriptors (w.dw - w7.dw), and d0-35s.dd, d1-35s.dd, ddd0-35s.dd drive descriptors, and every other option, and TERM-WIN type terminal.

5b. If you have three disk drives, include d2-40d.dd.

6. Config will write a bootfile on the blank disk in d1 then ask what commands you want on that disk. Type 'i' to add a couple of command files. Select 'grfdrv' and 'shell' only. Now replace the disk in d0 with the one from d1, and press the RESET button to boot from the new disk.
7. You should have a 50Hz clock.
8. Then put the system disk back into d0 and type 'chx /d0/cmds ; chd /d0'.
9. Type 'setime' and enter the time and date.

Printer Characteristics

Type 'xmode /p' to see the current printer settings. Change any of these as per the xmode command description (OS9 Commands, page 6-100). In particular, the baud rate will probably need changing.

Disk Drive Characteristics

When a drive is used, its descriptor is read to see what the drive's characteristics are. So somewhere in the module 'd0' (which is in memory), is a byte which determines what stepping rate should be used for drive 0.

We can modify the descriptors to reflect what the drives look like. (Use the command MDIR to see what modules are in memory.)

Type 'help modpatch' to see the usage of a command which was for some reason not documented in the Commands descriptions. It is used to patch modules in memory.

Now turn to page 5-9 of the Technical Reference section. There you will find a description of the relevant parts of a disk drive descriptor module, referenced by their offset from the start of the module (ie byte address, relative to the 1st byte of the module at address 0).

Note that the offsets (Relative Address) and all numbers that follow, are in hexadecimal.

Type 'modpatch'. No prompt is issued. Then type the following, not including the * or past it (these are comments).

```
1 d0

* the 'current address' is now the 1st byte of d0.

c 14 0 3

* this changes the step rate from 0 (30ms) to 3 (6ms).
* use 1 for 20ms, 2 for 12ms, or leave this line out for 35ms.

c 18 23 28

* changes the number of tracks from 35 to 40 - use 50 if an 80 track drive, or leave out for 35.

c 19 1 2

* changes the number of sides from 1 to 2 - leave out if drive is single sided.

y

* fixes the module crc which is incorrect after changing bytes.

1 d1

* repeat the above 4 lines (after '1 d0') for the 2nd drive (d1), putting in the new bytes applicable. Then repeat for dd.
```

making it the same as d0. Patch d2 also if you have 3 drives.

The Terminal Screen

When you booted, you got a 32 column by 16 line screen. Disappointed? That can be changed, but at the expense of memory. It will cost an extra 16K of RAM to have a 40 or 80 by 24 screen.

The device descriptor for the terminal has to be patched ('Term').

Turn to the Technical Reference section, pages 6-7,6-8. That is the detail of a device descriptor such as 'Term' which determines the features of the Terminal screen. Now let's customise it!

You should still have 'modpatch' active.

```
 1 term

* this points to the descriptor
we want to change now.

 c 2c 28 50

* change number of columns to
80 (use 28 for 40 columns).

 c 30 1 2

* change window type to 80
column text (see wcreate
command).

* if you wish, the colours can
be changed also - here I choose
white on black.

 c 33 2 0

* choose white foreground

 c 34 3 2

* choose black background

 c 35 3 2

* choose black border

 v

* fix up the crc.
```

Now press CTRL BREAK (Escape) to end the modpatch session.

Place the new boot disk you created, in /d1. Type 'cobbler /d1'. The current modules in memory are used to create a new bootfile on that disk. Put that disk into d0 and press RESET.

It should boot giving you a nice 80 or 40 column screen. You will have heard disk accesses speed up (if you put in faster stepping rates) after the bootfile loaded, as the shell file and GrfDrv load.

If it didn't work as you expected, start all over again! If it did work OK, place your system disk copy in d0, and type...

```
'chx /d0/cmds ; chd /d0'
```

... then type 'cobbler /d0'. You now have a customised system disk! You can re-use the boot disk created, since it is no longer needed.

Of course the system disk is not a 40 track double sided. To get that, format a disk (which will be 40TDS), then DSAVE all of the system disk onto it.

Memory

Booting on a 128K CoCo leaves 56K of RAM free. The above changes to the initial Terminal display reduce that to 40K.

Opening more windows will reduce that more. The answer is to purchase a 512K RAM board.

Read the magazines to find out where to get one, or contact me.

Contrary to what the last CoCo magazine suggested, changing the makeup of the file 'shell', which actually contains a lot of utilities, will not increase available memory. As long as a SHELL (memory module) needs to be loaded, it may as well be merged with just less than 8K of utilities, since any file loaded on its own will occupy 8K of RAM space!

Continued from p28

```
R3,3:PRINT"AFTER YOU ESCAPED FRO
M THE CASTLES DUNGEON YOU LIVED
 A HAPPY AND FORTUNOUS LIFE..":PR
INT"THIS QUEST EARNED YOU A PLAC
E ON ARTHURS' ";
1750 PRINT"ROUND TABLE AND YOU "
;
1760 PRINT"LIVED THE REST OF YOU
R LIFE GOING ON EXCITING QUESTS.
..YOU LIVED TO BE 70 AND MARRIED
 TWICE (BOTH BEAUTIFUL FAIR MAID
ENS!!)..":PRINT"YOU DIED IN YOUR
 SLEEP PEACEFULLY":PRINT"PRESS A
NY KEY":EXEC44539
1770 CLS:PALETTERGB:GOTO10
1780 PRINT"THE AMIGA KNIGHT GOT
VERY ANGRY AND DECIDED TO KILL Y
OU (THAT'S HOW IT IS IN ADVENTUR
ES)":PRINT"PRESS ANY KEY":EXEC44
539:GOTO 1800
1790 WIDTH40:CLS:PRINT"YOU WERE
UNFORTUNATELY DEVOURED BY A HUGE
 MONSTER....AND SUFFERED A PAINF
UL DEATH":FORT=1TO2500:NEXTT
1800 WIDTH40:ATTR3,3,B:INPUT"WOU
LD YOU LIKE A FUNERAL Y/N";DD$:I
F DD$="Y" THEN 1810 ELSE IF DD$=
"N" THEN 1840
1810 INPUT"WOULD YOU LIKE FLOWER
S Y/N";GF$:INPUT"WHAT IS YOUR RE
LIGION";F$:INPUT"WOULD YOU LIKE
YOUR ASHES SCATTERED OR WOULD YO
U LIKE TO BE BURIED A/B";HS$:INP
UT"WHERE WOULD YOU LIKE TOE BURI
ED/CREMATED";E$
1820 CLS:PRINT"ASHES TO ASHES":P
RINT"DUST TO DUST-THE MYSTERY IS
 STILL NOT SOLVED- THAT'S FOR SU
RE-REST IN PEACE FOR EVERMORE!!"
:PRINT"ps. your funeral was very
 touching!!":PRINT"press any key
":EXEC44539
1830 GOTO 10
1840 PRINT"YOUR BODY WAS LEFT TO
 BE EATEN BY THE RATS IN THE CAS
TLES DUNGEON!! THE MYSTERY IS ST
ILL TO BE SOLVED !":PRINT"PRESS
ANY KEY":EXEC44539:GOTO 10
```

Continued from p33

```
990 IF I$="Y" THEN 150 ELSE 995
995 HSCREEN0:CLS:END
999 GOTO999
1000 FORX=1TO LEN(A$):Y=ASC(MID$
(A$,X,1)):HDRAWA$(Y):NEXT:RETURN
1010 'HLINE(20,145)-(240,180),PR
ESET,BF:HDRAW"BM26,150":RETURN
2000 CLS:HSCREEN3
2010 PALETTE0,54:PALETTE1,17:RET
URN
```

Continued from p35

```
)CHR$(15);:PRINT#-2,TAB(2)"Your
CHR$(s) are ("N1");("N2");("N3")
;("N4");("N5");("N6");("N7");("N
8")":PRINT#-2,CHR$(14);CHR$(18);
CHR$(27)CHR$(14);:GOTO270
350 PRINTTAB(6)"No less than [12
8]":RETURN
360 PRINTTAB(6)"No more than [25
5]":RETURN
370 PRINT#-2,CHR$(30);CHR$(19);C
HR$(14);CHR$(27)CHR$(15);:END
```

BEWARE! there's a Snake in your CoCo

Here's a chance to score some points.

By Nick Kostarelas

GAME: 32K ECB

THE INSTRUCTIONS to this game are in the program, but I will define the words RUN and SPACE which appear at the bottom of the screen.

A "RUN" is a person's turn which means a screen. If you get an extra "RUN", you have to complete that "RUN".

There is a high scoring routine which is cleared every time you run the program. The scores can be stored permanently on disk if you insert the following lines:

```
2475 OPEN"I",#1,"SNAKEHI":FORI=
1TO10:INPUT#1,HS$(I),HS(I):NEXT
:CLOSE
2665 OPEN"O",#1,"SNAKEHI":FORI=
1TO10:WRITE#1,HS$(I),HS(I):NEXT
:CLOSE
```

If you are running SNAKE for the first time, save it first, then run the following little program to initialize the high scoring file:

```
10 OPEN"O",#1,"SNAKEHI":FORI=1
TO10:WRITE#1,".....",0:NEXT
:CLOSE
```

This is one of the first programs that I wrote for the CoCo, so the program may look sloppy and primitive in some places.

When I upgraded to 64K, I rewrote some parts to make it run a bit faster.

The Listing:

```
0 GOTO10
3 SAVE"53D:3":END'1
10 '*****************************
20 '*                           *
30 '*          SNAKE.           *
40 '*                           *
50 '*    BY NICK KOSTARELAS     *
60 '*         21/11/83          *
70 '*                           *
80 '*****************************
90 PMODE0,1:PCLEAR1
100 CLS0:CLEAR1000:BL$=CHR$(128)
:POKE65495,0
110 DIMHS(10),HS$(10),N(5),G(3),
J(3),CL(3),TI(3),TM(3),A(3),F(3)
,BL(320),BK(320),BM(320):X=RND(-
TIMER)
120 A=492:B=508:C=0:D=0:E=3:R=1:
J=17
130 X1=100000:X2=100000
140 BB$=STRING$(30,128)
150 IFCG=1THEN180
160 PRINT@46,"snake";:PRINT@102,
"NICK KOSTARELAS 1983";:PRINT@23
0,"INSTRUCTIONS (Y/N) ?";
170 A$=INKEY$:IFA$="Y"THENGOSUB2
400ELSEIFA$<>"N"THEN170
180 CLS0
190 PRINT@0,STRING$(32,252);
200 PRINT@352,STRING$(32,243);
210 FORV=0TO352STEP32
220 PRINT@V,CHR$(255);:PRINT@V+3
1,CHR$(255);
230 NEXT
240 PRINT@480,"player1:";
250 PRINT@496,"player2:";
260 V=384:U=0
270 FORH=2TO27STEP4
280 C$=CHR$(143+U)
290 PRINT@V+H,C$;C$;C$;
300 U=U+16
310 NEXT
320 PRINT@418,"100 200 300 400 5
00 600 ???";
330 V=416
340 FORH=5TO28STEP4
350 PRINT@V+H,BL$;
360 NEXT
370 PRINT@163,"HOW MANY PLAYERS
(1 OR 2)?";
380 P$=INKEY$:IFP$=""THEN380
390 P=VAL(P$):PP=1
400 IFP=1ORP=2THEN420
410 GOTO370
420 CF=1
430 GOSUB1110
440 CF=0
450 SP=0:Q=0:S=1
460 PRINT@453,"run :";R;
470 SP=0
480 PRINT@462,"space :";BL$;SP;"
%";
490 T=0:QV=0:NM=243:FI=3
500 SD=50:BO=0:BU=0
510 FORI=1TO3
520 G(I)=0:A(I)=50:F(I)=50
530 NEXTI
540 GOSUB1540
```

Submit your program to be eligible for one of the prizes at Conf '88.

Categories include The Tandy Programming Contest for Machine Language games; CoCo 3 Games; CoCo 2 Games; Utilities; OS 9; MS DOS programs; Applications; and many more.

Prizes range from a contract with Tandy to produce your software to printers, computers, disk drives, modems and software.

Entries close 31st August 1988, so plan now to get your work to us by then. The address to send your program to is:

Goldsoft Pty Ltd
Freepost 5
Southport. Qld. 4215.

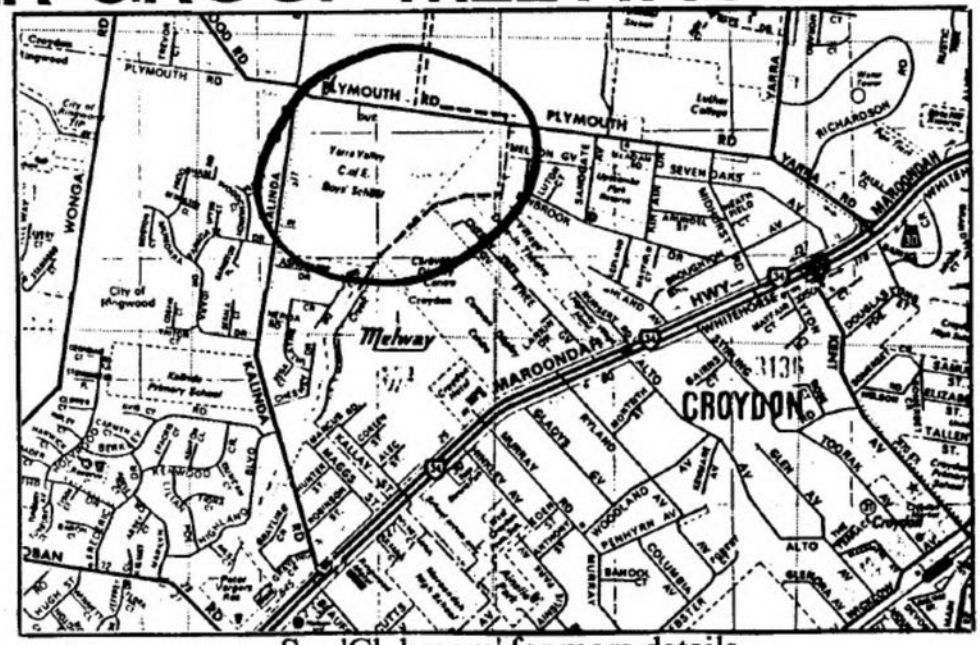
```
550 FORI=1TO10
560 H=RND(40)+12:V=RND(12)+6
570 SET(H,V,8):SOUNDRND(255),11-
I
580 IFI=10THEN600
590 RESET(H,V)
600 NEXT
610 PRINT@A,C;
620 IFP=2THENPRINT@B,D;
630 PRINT@487,":";:PRINT@503,":"
;
640 D$=INKEY$
650 IFD$=CHR$(94)THENE=1
660 IFD$=CHR$(10)THENE=2
670 IFD$=CHR$(8)THENE=3
680 IFD$=CHR$(9)THENE=4
690 IFE=1THENV=V-1
700 IFE=2THENV=V+1
710 IFE=3THENH=H-1
720 IFE=4THENH=H+1
730 IFPOINT(H,V)=8THEN880
740 FORM=1TO3
750 IFG(M)=0ANDA(M)=F(M)THENGOSU
B1290
760 NEXT
770 T=T+1
780 FORI=1TO3
790 IFT=TM(I)+TI(I)THENGOSUB1570
800 NEXT
810 FORI=1TO3:A(I)=A(I)+1:NEXT
820 FORI=1TO7
830 IFPOINT(H,V)=I THENBO=BO+1:G
OSUB1630:GOTO850
840 NEXT:N2=0
850 S5=SP*4+1:IFS5>255THENS5=255
860 SOUNDS5,1:SET(H,V,8):GOSUB14
80
870 GOSUB2170:GOTO640
880 SOUND1,10
890 BU=1
900 BP$="BONUS POINTS"+STR$(BO*1
00)
910 PR=80-INT(LEN(BP$)/2):PRINT@
PR,BP$;
920 GOSUB1630:FORI=1TO500:NEXT
930 PRINT@PR,STRING$(LEN(BP$),12
8);
940 BP$="SPACE"+STR$(SP*100)
950 PR=80-INT(LEN(BP$)/2):PRINT@
PR,BP$;
960 BO=SP:GOSUB1630
970 PRINT@PR,STRING$(LEN(BP$),12
8);
980 IFER>0THENER=ER-1:PRINT@39,"
CONGRATULATIONS!!!";:PRINT@67,"Y
OU HAVE GOT AN EXTRA run!";:GOTO
1030
990 PP=PP+1:IFPP>P THENPP=1:R=R+
1
1000 IFC>HS THENHS=C
1010 IFD>HS THENHS=D
1020 IFR=4THENRE=1:GOTO1110
1030 PRINT@236,"READY !";
1040 PRINT@171,"PLAYER"PP;
1050 FORXX=1TO10
1060 IFPP=2THENPRINT@504,STRING$
(7,128);:FORI=1TO100:NEXT:PRINT@
B,D;:GOTO1080
1070 PRINT@488,STRING$(7,128);:F
ORI=1TO100:NEXT:PRINT@A,C;
1080 FORI=1TO150:NEXT
1090 PRINT@487,":";:PRINT@503,":
";
1100 NEXTXX
1110 FORW=33TO321STEP32
1120 PRINT@W,BB$;
1130 NEXT
1140 FORW=2TO61
1150 RESET(W,1):RESET(W,22)
1160 NEXT
1170 IFCF=1THENRETURN
1180 IFRE=1THEN1200
1190 GOTO460
1200 PRINT@171,"game";BL$;"over"
;
1210 RE=0
1220 FORI=1TO1500:NEXT
1230 GOSUB2470
1240 PRINT@486,"ANOTHER GAME (Y/
N) ?";
1250 W$=INKEY$:IFW$=""THEN1250
1260 IFW$="N"THENCLS:POKE65494,0
:END
1270 IFW$<>"Y"THENSOUND100,1:GOT
O1250
1280 CG=1:GOTO120
1290 REM  making colored blocks
1300 N8=RND(N7)
1310 G(M)=BL(BK(N8)):J(M)=INT(G(
M)/32):GS=G(M)-INT(G(M)/32)*32
1320 IFN7<3THEN2090
1330 FORN=0TO5
1340 IFPOINT(GS*2+N,J(M)*2)=8ORP
OINT(GS*2+N,J(M)*2+1)=8THEN2360
1350 NEXTN
1360 TM(M)=RND(75)+5
1370 CL(M)=(RND(7)-1)*16
1380 FORN=1TO3
1390 IFM=N THEN1410
1400 IFCL(M)=CL(N)THEN1370
1410 NEXTN
1420 TI(M)=T
1430 C$=CHR$(143+CL(M))
1440 PRINT@G(M),C$;C$;C$;
1450 FORXX=210TO250STEP10:SOUNDX
X,1:NEXT
1460 RETURN
1470 ' check placing for blocks
1480 PE=INT(H/2)+INT(V/2)*32-32
1490 IFPE<1ORPE>320THENRETURN
1500 IFBL(PE)=0THENRETURNELSEBL(
PE)=0
1510 BK(BM(PE))=BK(N7):BM(BK(N7)
)=BM(PE)
1520 N7=N7-1:RETURN
1530 ' initialize screen
1540 N7=320:FORI=1TON7
1550 N1=0
1560 BM(I)=I:BK(I)=I:BL(I)=I+31:
NEXT:RETURN
1570 'check time
1580 FORXX=50TO10STEP-10:SOUNDXX
,1:NEXT
1590 PRINT@G(I),BL$;BL$;BL$;
1600 F(I)=RND(20):A(I)=0
1610 G(I)=0
1620 RETURN
1630 'give points
1640 LP=1:NT=1
1650 FT=I
1660 IFI=7THENGH=I:I=RND(30)
1670 IFBU=1THENI=BO:GOSUB2250
1680 IFBO=0THENFORKL=50TO5STEP-5
:SOUNDKL,1:NEXT:RETURN
1690 FORK=LP TOI
1700 FG=0
1710 IFBU=1ANDBO>9THENFG=1:FORL=
10TO100STEP10:SOUNDL,1
1720 IFPP=2THEN1940
1730 A=492
1740 C=C+100
1750 A=A-2
1760 IFC>900THENA=A-1
1770 IFC>9900THENA=A-1
1780 IFC>99900THENA=A-1
1790 IFC>999990THENC=0:A=492:PRI
NT@487,STRING$(8,128);:X1=100000
1800 PRINT@A,C;
1810 PRINT@487,":";
1820 IFC=40000THENGOSUB2220
1830 IFC=X1 THENX1=X1+100000:GOS
UB2220
1840 IFBU=1ANDBO>9THENNEXTL:BO=B
O-10:IFFG=1THEN1870
1850 FORL=SP+150TOSP+170STEP5
1860 SOUNDL,1:NEXTL
1870 NEXTK
1880 IFBU=1THENRETURN
1890 IFGH=7THENI=GH
1900 FORK=1TO3
1910 IFFT=(CL(K)+16)/16THEN2060
1920 NEXT
1930 RETURN
1940 B=508
1950 D=D+100
1960 B=B-2
1970 IFD>900THENB=B-1
1980 IFD>9900THENB=B-1
1990 IFD>99900THENB=B-1
2000 IFD>999990THEND=0:B=508:PRI
NT@502,STRING$(8,128);:X2=100000
2010 PRINT@B,D;
2020 PRINT@503,":";
2030 IFD=40000THENGOSUB2220
2040 IFD=X2 THENX2=X2+100000:GOS
UB2220
2050 GOTO1840
2060 PRINT@G(K),BL$;BL$;BL$;
2070 G(K)=0:F(K)=0:A(K)=0
2080 GOTO1930
2090 BO=BO+50
2100 PRINT@45,"EXTRA";
2110 FORTR=1TO4
2120 FORTY=255TO100STEP-10
2130 SOUNDTY,1
2140 NEXTTY,TR
2150 GOSUB2220
2160 GOTO880
2170 S1=SP:BN=469
2180 SP=INT(T/1320*100)
2190 IFSP<10THENBN=BN+1
2200 IFSP>S1 THENPRINT@BN,SP;
2210 RETURN
2220 ER=ER+1
2230 FORRT=200TO255STEP5
2240 SOUNDRT,1:NEXT:RETURN
2250 IFBO<10THENRETURN
2260 JN=0
2270 I=I-10:JN=JN+1
2280 IFI>9THEN2270
2290 I=I+JN
2300 FG=1
2310 RETURN
2320 BO=BO-10
2330 FORL=5TO50STEP5
2340 SOUNDL,1
2350 RETURN
2360 PE=BK(N8):BL(PE)=0
2370 BK(BM(PE))=BK(N7)
2380 BM(BK(N7))=BM(PE)
2390 N7=N7-1:GOTO1300
2400 CLS:PRINT"   THE OBJECT OF
THE GAME IS TO OBTAIN AS MANY PO
INTS AS POSS-  IBLE BY DRAINING
POINTS OUT OF  THE COLORED SQUAR
```

```
ES THAT APPEAR RANDOMLY ON THE S
CREEN.  YOU","MUST PLOT A SUITAB
LE COURSE","AROUND THE SCREEN IN
 ORDER TO   PREVENT THE";
2410 PRINT" COLORED SQUARES IN
APPEARING IN AWKWARD, HARD AND
NEVER ABLE TO GET AT SPOTS.":GOS
UB2450
2420 CLS:PRINT"   THE SNAKE STAR
TS OFF QUITE   SMALL AND GROWS B
IGGER AND","BIGGER UNTIL THE WHO
LE SCREEN   IS VIRTUALLY FILLED
WITH AN","ORANGE SNAKE.  YOU CAN
NOT GUIDE YOUR SNAKE ONTO ANY PA
RT OF THE SCREEN WHICH IS ORANGE
 .  TO"
2430 PRINT"GUIDE YOUR SNAKE, USE
 THE FOUR  ARROWS ON THE KEYBOAR
D.  THE","ARROW ONLY HAS TO BE D
EPRESSED  ONCE FOR A CHANGE IN D
IRECTION. BE CAREFUL NOT TO CHAN
GE IN THE OPPOSITE DIRECTION.":G
OSUB2450
2440 CLS:PRINT"   EACH COLOR HAS
 A DIFFERENT   SCORE, WHILE THE
PINK COLOR HAS A MYSTERY SCORE."
,,,"   EXTRA run AT:","40000, 10
0000, EVERY 100000,","AND/OR IF
YOU GET EXTRA BONUS."
2450 PRINT@484,"PRESS enter TO C
ONTINUE";
2460 IFINKEY$<>CHR$(13)THEN2460E
LSERETURN
2470 CLS:PRINT@10,"high scores":
PRINT@69,"rank    name    score"
:HS$="##   %      % ######":SX=0
2480 SC(1)=C:SC(2)=D
2490 FORZQ=1TOP:FORZZ=1TO10:IFSC
(ZQ)>HS(ZZ)THENSX=1:GOTO2530
2500 NEXTZZ
2510 PRINT@480,STRING$(31,32);:N
EXTZQ:IFSX=0THENGOSUB2680
2520 POKE65495,0:RETURN
2530 IFP>1THENPRINT@484,"PLAYER"
ZQ"ENTER YOUR NAME";
2540 IFZZ=10THEN2570
2550 FORI=10TOZZ+1STEP-1
2560 HS$(I)=HS$(I-1):HS(I)=HS(I-
1):NEXT
2570 HS$(ZZ)="          ":HS(ZZ)
=SC(ZQ):GOSUB2680
2580 X=ZZ*32+75:Y=X:HS$(ZZ)=""
2590 PRINT@X,CHR$(175);
2600 FORI=1TO30:I$=INKEY$:IFI$="
"THENNEXT:PRINT@X," ";:FORI=1TO3
0:I$=INKEY$:IFI$=""THENNEXT:GOTO
2590
2610 IFI$=CHR$(8)THENIFHS$(ZZ)="
"THEN2600ELSEHS$(ZZ)=LEFT$(HS$(Z
Z),LEN(HS$(ZZ))-1):PRINT@X," ";:
X=X-1:GOTO2590
2620 IFI$=CHR$(13)THEN2660
2630 IFI$<" "ORI$>"Z"THEN2600
2640 HS$(ZZ)=HS$(ZZ)+I$:PRINT@X,
I$;
2650 X=X+1:IFX<Y+8THEN2590
2660 IFLEN(HS$(ZZ))<>8THENPRINT@
X,STRING$(8-LEN(HS$(ZZ)),32);
2670 GOTO2510
2680 J=102:FORI=1TO10:PRINT@J,US
INGHS$;I;HS$(I);HS(I):IFI<10THEN
PRINT@J,"0";
2690 J=J+32:NEXT
2700 POKE65494,0:RETURN
65535 'NICK KOSTARELAS 1983
```

USER GROUP MEETING

WEDNESDAY
the 9th
7PM

YARRA
VALLEY
HIGH
SCHOOL



See 'Clubroom' for more details

The Headless Knight

by Pat Place

32K ECB GRAPHICS

I WOULD LIKE to submit a graphics program which I have called "KNIGHT" (short for "Headless Knight" as you will see when you run the program), in this year's graphics competition.

As far as I am aware, the program will work on any CoCo with 32K or more. As can be seen in the listing I have acknowleged a utility program called "LINEMAST", by Tom Lehane which appeared in June, 1987 Australian CoCo Magazine.

An easy way to utilize this program (and explaining the way I drew this picture) is to trace the required picture onto clear plastic with a felt-tip pen and then place the picture on the screen of your TV or monitor and then re-trace the picture with the cursor, using the "LINEMAST" program.

The program then reads the x-y coordinates on the screen and records them in the form of DATA statements.

It then is imbedded in the program, which can then be SAVEd or CSAVEd to disk or tape.

The Listing:

```
1 GOTO70
3 SAVE"55:3":END'5
10 '*******************************
15 '*    THE HEADLESS KNIGHT    *
20 '*          DRAW BY          *
25 '*     William.P.Place.      *
30 '*     7.PITCAIRN STREET.    *
35 '*     ASHTONFIELD 2323.     *
40 '*          31/8/87.         *
45 '* USING PROGRAM LINEMASTER *
50 '*      BY .TOM LEHANE       *
55 '*       AUGUST 1987         *
60 '*******************************
65 'CSAVE"FOR TAPE AND SAVE FOR
DISK WILL WORK ON ALL COCO 1-11-
111 COMPUTERS
70 CLEAR1000:PMODE4:PCLS5:SCREEN
1,1:COLOR2
75 FORZ=1TO 404
80 READ A,B,C,D
85 LINE(A,B)-(C,D),PSET
90 NEXT
95 DATA 44, 43, 37, 28
100 DATA 37, 28, 37, 25
105 DATA 36, 25, 36, 22
110 DATA 36, 22, 37, 19
115 DATA 37, 19, 38, 17
120 DATA 38, 17, 39, 13
125 DATA 39, 13, 41, 9
130 DATA 41, 9, 43, 7
135 DATA 43, 7, 49, 6
140 DATA 49, 6, 51, 6
145 DATA 51, 6, 53, 8
150 DATA 53, 8, 56, 5
155 DATA 56, 5, 59, 5
160 DATA 59, 5, 63, 7
165 DATA 63, 8, 64, 13
170 DATA 64, 13, 66, 19
175 DATA 66, 19, 66, 22
180 DATA 66, 22, 65, 24
185 DATA 65, 24, 63, 24
190 DATA 63, 24, 62, 24
195 DATA 62, 24, 60, 22
200 DATA 60, 22, 59, 20
205 DATA 59, 20, 58, 18
210 DATA 58, 18, 56, 21
215 DATA 56, 21, 54, 21
220 DATA 54, 21, 53, 21
225 DATA 53, 21, 53, 18
230 DATA 53, 18, 53, 16
235 DATA 53, 16, 50, 22
240 DATA 50, 22, 50, 30
245 DATA 50, 30, 52, 35
250 DATA 52, 35, 45, 43
255 DATA 52, 31, 55, 27
260 DATA 55, 27, 58, 22
265 DATA 58, 22, 65, 34
270 DATA 56, 28, 55, 31
275 DATA 55, 31, 64, 34
280 DATA 64, 34, 73, 37
285 DATA 73, 37, 76, 39
290 DATA 76, 39, 77, 52
295 DATA 77, 52, 65, 80
300 DATA 64, 25, 74, 29
305 DATA 74, 29, 90, 38
310 DATA 90, 38, 107, 54
315 DATA 107, 54, 116, 60
320 DATA 116, 60, 122, 60
325 DATA 122, 60, 122, 58
330 DATA 122, 58, 121, 70
335 DATA 121, 70, 120, 74
340 DATA 120, 74, 116, 70
345 DATA 116, 70, 118, 61
350 DATA 115, 60, 112, 65
355 DATA 114, 69, 92, 49
360 DATA 92, 49, 77, 42
365 DATA 111, 58, 109, 64
370 DATA 109, 64, 105, 60
375 DATA 105, 60, 107, 54
380 DATA 107, 54, 105, 54
385 DATA 96, 52, 98, 46
390 DATA 98, 46, 96, 43
395 DATA 96, 43, 92, 48
400 DATA 92, 48, 83, 45
405 DATA 83, 45, 86, 37
410 DATA 81, 34, 78, 42
415 DATA 78, 42, 79, 37
420 DATA 79, 37, 78, 37
425 DATA 72, 36, 73, 29
430 DATA 73, 29, 71, 29
435 DATA 69, 28, 69, 35
440 DATA 69, 35, 70, 51
445 DATA 70, 51, 68, 66
450 DATA 63, 35, 63, 42
455 DATA 63, 53, 63, 65
460 DATA 58, 33, 55, 42
465 DATA 57, 53, 59, 66
470 DATA 49, 41, 51, 59
475 DATA 51, 59, 52, 71
480 DATA 46, 43, 47, 70
485 DATA 47, 70, 49, 72
490 DATA 49, 72, 52, 72
495 DATA 52, 72, 54, 70
500 DATA 54, 70, 59, 67
505 DATA 59, 67, 64, 65
510 DATA 64, 65, 69, 66
515 DATA 43, 44, 43, 74
520 DATA 43, 74, 43, 77
525 DATA 43, 77, 54, 77
530 DATA 54, 77, 54, 77
535 DATA 51, 77, 51, 77
540 DATA 54, 77, 57, 74
545 DATA 57, 74, 60, 71
550 DATA 60, 71, 64, 69
555 DATA 64, 69, 68, 71
560 DATA 68, 71, 75, 79
565 DATA 73, 74, 84, 50
570 DATA 88, 53, 84, 66
575 DATA 84, 66, 75, 79
580 DATA 75, 79, 85, 80
585 DATA 85, 80, 97, 59
590 DATA 79, 47, 90, 53
595 DATA 90, 53, 96, 59
600 DATA 96, 59, 101, 63
605 DATA 87, 80, 96, 80
610 DATA 96, 80, 107, 79
615 DATA 106, 79, 120, 74
620 DATA 118, 63, 117, 70
625 DATA 111, 72, 109, 78
630 DATA 93, 79, 101, 64
635 DATA 100, 63, 114, 75
640 DATA 115, 70, 119, 75
645 DATA 119, 75, 130, 70
650 DATA 130, 70, 130, 59
655 DATA 130, 59, 124, 59
660 DATA 124, 59, 122, 59
665 DATA 46, 79, 46, 86
670 DATA 46, 86, 48, 90
675 DATA 48, 90, 53, 90
680 DATA 53, 90, 56, 88
685 DATA 56, 88, 58, 85
690 DATA 55, 83, 54, 86
695 DATA 54, 86, 51, 84
700 DATA 51, 84, 52, 82
705 DATA 47, 80, 57, 84
710 DATA 57, 84, 62, 84
715 DATA 62, 84, 102, 84
720 DATA 102, 84, 115, 82
725 DATA 75, 81, 61, 81
730 DATA 61, 81, 61, 76
735 DATA 61, 76, 59, 76
740 DATA 59, 76, 57, 78
745 DATA 59, 82, 61, 81
750 DATA 55, 78, 61, 81
755 DATA 114, 82, 119, 81
760 DATA 119, 81, 137, 69
765 DATA 104, 84, 91, 95
770 DATA 91, 95, 75, 100
775 DATA 112, 84, 101, 97
780 DATA 101, 97, 89, 103
785 DATA 89, 103, 76, 106
790 DATA 128, 76, 125, 88
795 DATA 125, 88, 107, 105
800 DATA 107, 105, 93, 112
805 DATA 93, 112, 75, 115
810 DATA 75, 85, 75, 115
815 DATA 77, 116, 73, 127
820 DATA 73, 127, 67, 134
825 DATA 67, 134, 67, 141
830 DATA 67, 141, 109, 144
835 DATA 109, 144, 138, 149
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840 DATA 138, 149, 159, 149
845 DATA 173, 146, 191, 144
850 DATA 83, 113, 79, 126
855 DATA 95, 112, 92, 126
860 DATA 101, 109, 95, 126
865 DATA 121, 94, 109, 126
870 DATA 126, 87, 117, 126
875 DATA 74, 128, 118, 127
880 DATA 69, 133, 101, 133
885 DATA 101, 133, 128, 135
890 DATA 74, 142, 70, 146
895 DATA 70, 146, 67, 164
900 DATA 67, 164, 65, 175
905 DATA 65, 175, 72, 188
910 DATA 72, 188, 80, 188
915 DATA 80, 188, 80, 182
920 DATA 80, 182, 86, 188
925 DATA 86, 188, 89, 188
930 DATA 89, 188, 89, 172
935 DATA 89, 172, 85, 173
940 DATA 84, 173, 82, 176
945 DATA 82, 176, 81, 182
950 DATA 73, 187, 76, 179
955 DATA 76, 179, 76, 175
960 DATA 76, 175, 73, 169
965 DATA 73, 169, 74, 159
970 DATA 86, 171, 80, 169
975 DATA 80, 169, 75, 164
980 DATA 75, 159, 76, 155
985 DATA 76, 155, 80, 153
990 DATA 80, 153, 110, 153
995 DATA 110, 153, 117, 146
1000 DATA 82, 177, 78, 175
1005 DATA 67, 162, 63, 154
1010 DATA 63, 154, 65, 149
1015 DATA 65, 149, 68, 147
1020 DATA 157, 130, 117, 128
1025 DATA 127, 136, 157, 136
1030 DATA 157, 136, 155, 126
1035 DATA 155, 126, 152, 119
1040 DATA 152, 119, 151, 104
1045 DATA 140, 129, 142, 117
1050 DATA 142, 117, 143, 105
1055 DATA 133, 130, 136, 116
1060 DATA 136, 116, 137, 101
1065 DATA 137, 101, 137, 87
1070 DATA 137, 87, 134, 78
1075 DATA 134, 78, 130, 73
1080 DATA 132, 75, 137, 78
1085 DATA 137, 78, 140, 77
1090 DATA 138, 102, 142, 105
1095 DATA 142, 105, 150, 105
1100 DATA 150, 105, 152, 79
1105 DATA 152, 79, 149, 80
1110 DATA 149, 80, 148, 78
1115 DATA 148, 78, 150, 76
1120 DATA 150, 76, 145, 79
1125 DATA 145, 79, 142, 76
1130 DATA 142, 76, 146, 74
1135 DATA 141, 75, 139, 73
1140 DATA 139, 73, 144, 72
1145 DATA 140, 70, 138, 71
1150 DATA 138, 73, 137, 68
1155 DATA 137, 68, 139, 68
1160 DATA 139, 68, 145, 65
1165 DATA 135, 68, 131, 65
1170 DATA 131, 62, 139, 67
1175 DATA 141, 65, 139, 58
1180 DATA 139, 58, 131, 58
1185 DATA 131, 58, 131, 54
1190 DATA 131, 54, 137, 57
1195 DATA 137, 57, 134, 45
1200 DATA 131, 54, 134, 42
1205 DATA 134, 42, 134, 33
1210 DATA 135, 44, 140, 40
1215 DATA 140, 40, 137, 34
1220 DATA 137, 34, 138, 30
1225 DATA 135, 34, 132, 28
1230 DATA 132, 28, 136, 19
1235 DATA 136, 19, 149, 9
1240 DATA 149, 9, 160, 7
1245 DATA 160, 7, 162, 7
1250 DATA 162, 7, 162, 16
1255 DATA 138, 30, 149, 20
1260 DATA 149, 20, 162, 16
1265 DATA 155, 19, 155, 34
1270 DATA 155, 34, 154, 37
1275 DATA 154, 37, 150, 41
1280 DATA 150, 41, 146, 41
1285 DATA 146, 41, 141, 39
1290 DATA 163, 17, 173, 29
1295 DATA 173, 29, 173, 39
1300 DATA 154, 37, 160, 47
1305 DATA 160, 47, 173, 39
1310 DATA 173, 39, 176, 45
1315 DATA 176, 45, 176, 54
1320 DATA 176, 54, 175, 57
1325 DATA 175, 44, 163, 49
1330 DATA 163, 49, 173, 56
1335 DATA 173, 56, 174, 57
1340 DATA 160, 48, 160, 53
1345 DATA 160, 53, 171, 61
1350 DATA 175, 57, 171, 61
1355 DATA 161, 55, 152, 61
1360 DATA 170, 61, 165, 66
1365 DATA 165, 66, 156, 60
1370 DATA 148, 60, 149, 60
1375 DATA 149, 60, 154, 66
1380 DATA 154, 66, 159, 72
1385 DATA 159, 72, 162, 67
1390 DATA 162, 67, 164, 69
1395 DATA 164, 69, 162, 73
1400 DATA 162, 73, 152, 79
1405 DATA 151, 76, 159, 71
1410 DATA 154, 74, 145, 62
1415 DATA 145, 62, 147, 60
1420 DATA 162, 68, 165, 68
1425 DATA 152, 108, 160, 103
1430 DATA 160, 103, 166, 101
1435 DATA 153, 111, 162, 106
1440 DATA 162, 106, 166, 104
1445 DATA 154, 114, 163, 111
1450 DATA 163, 111, 168, 108
1455 DATA 154, 118, 164, 116
1460 DATA 164, 116, 170, 113
1465 DATA 155, 119, 159, 131
1470 DATA 159, 131, 161, 135
1475 DATA 161, 135, 161, 140
1480 DATA 158, 135, 161, 141
1485 DATA 69, 137, 105, 137
1490 DATA 105, 137, 161, 141
1495 DATA 161, 141, 161, 151
1500 DATA 161, 151, 158, 159
1505 DATA 158, 159, 167, 159
1510 DATA 167, 159, 175, 156
1515 DATA 175, 156, 177, 152
1520 DATA 173, 155, 171, 152
1525 DATA 171, 152, 167, 149
1530 DATA 167, 149, 162, 149
1535 DATA 176, 151, 162, 141
1540 DATA 177, 150, 193, 147
1545 DATA 193, 147, 234, 131
1550 DATA 187, 149, 203, 162
1555 DATA 193, 148, 203, 161
1560 DATA 203, 161, 198, 178
1565 DATA 198, 178, 192, 188
1570 DATA 192, 188, 194, 191
1575 DATA 194, 191, 205, 191
1580 DATA 205, 191, 205, 189
1585 DATA 205, 189, 211, 187
1590 DATA 211, 187, 209, 184
1595 DATA 209, 184, 209, 178
```

Day from Date

ANY CoCo APPLICATION

by John Carmichael

EVER HAD A date before, and you really wanted to know what day that was, ie a Monday or a Saturday etc?

If so, this little application will do the trick.

The Listing:

```
1 'Get the day from the date
2 ' original source not known
3 '
4 ' John Carmichael  P.O. Box 59
5 TAREE
5 ' suitable for CoCo or GW-BASI
C
6 '
10 DATA Saturday, Sunday, Monday
, Tuesday, Wednesday, Thursday,
Friday
20 DIM DAY$(6)
30 FOR N =0 TO 6: READ DAY$(N):
NEXT N
40 INPUT"DATE IN FORM DD MM-YY";
 DT$
45 GOSUB 100 ' GET DAY TO DAY$
48 PRINT DAY$
49 END
50 ' - - - - - - - - - - - - -
94 'DAY from DATE SUBROUTINE
95 '   entry: DT$ in form DD-MM-Y
Y
96 '          DAY$ array 0-6 conta
ins days SAT - SUN
98 '    exit: DAY$ contains day
99 '
100 D = VAL(DT$)
110 M = VAL(MID$(DT$,4))
120 Y = VAL(RIGHT$(DT$,2))
130 LEAPYEAR = 0
140 IF INT(Y/4) = Y/4 THEN LEAPY
EAR = -1 'TRUE
150 IF NOT LEAPYEAR THEN IF M=1
THEN M=10
              ELSE IF M=2 THEN M=3
160 ON M GOSUB 200,203,204,200,2
02,205,200,203,206,201,204,206
170 B  = INT(Y/4) : X = Y+B+K+D
180 DAY = X- INT(X/7)*7     ' DAY
 = X MOD 7
190 DAY$= DAY$(DAY)
195 RETURN
199 ' MODIFIERS
200 K =0:RETURN
201 K=1:RETURN
202 K=2:RETURN
203 K=3:RETURN
204 K=4:RETURN
205 K=5:RETURN
206 K=6:RETURN
209 END
210 SAVE"75:3":END'8
```

```
1600 DATA 209, 178, 214, 158
1605 DATA 214, 158, 203, 183
1610 DATA 203, 183, 207, 183
1615 DATA 202, 183, 202, 191
1620 DATA 202, 191, 204, 191
1625 DATA 204, 191, 201, 189
1630 DATA 200, 189, 200, 190
1635 DATA 200, 183, 197, 183
1640 DATA 213, 157, 208, 142
1645 DATA 172, 144, 172, 131
1650 DATA 172, 131, 169, 114
1655 DATA 173, 137, 203, 134
1660 DATA 203, 134, 230, 120
1665 DATA 174, 131, 203, 125
1670 DATA 203, 125, 209, 126
1675 DATA 209, 126, 209, 122
1680 DATA 209, 122, 224, 113
1685 DATA 230, 120, 225, 113
1690 DATA 225, 113, 219, 90
1695 DATA 219, 90, 213, 73
1700 DATA 213, 73, 206, 68
1705 DATA 206, 68, 221, 107
1710 DATA 178, 129, 174, 95
1715 DATA 173, 100, 166, 100
1720 DATA 166, 100, 179, 100
1725 DATA 179, 100, 185, 129
1730 DATA 203, 124, 170, 91
1735 DATA 170, 91, 165, 100
1740 DATA 169, 91, 158, 76
1745 DATA 163, 74, 209, 121
1750 DATA 210, 120, 193, 68
1755 DATA 200, 110, 185, 70
1760 DATA 182, 92, 182, 83
1765 DATA 182, 83, 178, 72
1770 DATA 174, 83, 175, 73
1775 DATA 175, 73, 171, 61
1780 DATA 176, 72, 192, 68
1785 DATA 192, 68, 206, 68
1790 DATA 231, 121, 214, 130
1795 DATA 21, 130, 17, 129
1800 DATA 17, 129, 12, 130
1805 DATA 12, 130, 8, 132
1810 DATA 22, 131, 25, 137
1815 DATA 9, 131, 6, 136
1820 DATA 6, 136, 5, 144
1825 DATA 25, 137, 19, 133
1830 DATA 19, 133, 15, 137
1835 DATA 15, 137, 14, 143
1840 DATA 26, 137, 27, 140
1845 DATA 27, 140, 20, 142
1850 DATA 15, 140, 15, 144
1855 DATA 20, 142, 15, 144
1860 DATA 5, 145, 7, 154
1865 DATA 27, 140, 30, 144
1870 DATA 30, 144, 32, 148
1875 DATA 32, 148, 27, 145
1880 DATA 27, 145, 22, 147
1885 DATA 22, 147, 27, 147
1890 DATA 27, 147, 29, 149
1895 DATA 29, 149, 32, 153
1900 DATA 7, 154, 10, 161
1905 DATA 24, 149, 30, 153
1910 DATA 23, 150, 29, 155
1915 DATA 29, 155, 32, 155
1920 DATA 32, 155, 38, 155
1925 DATA 38, 155, 45, 158
1930 DATA 28, 156, 23, 161
1935 DATA 10, 161, 19, 167
1940 DATA 23, 161, 21, 165
1945 DATA 21, 165, 21, 170
1950 DATA 19, 167, 20, 167
1955 DATA 30, 162, 36, 160
1960 DATA 36, 160, 43, 163
1965 DATA 43, 163, 47, 157
1970 DATA 33, 160, 30, 161
1975 DATA 30, 161, 25, 166
1980 DATA 25, 166, 25, 171
1985 DATA 25, 171, 25, 178
1990 DATA 21, 170, 23, 180
1995 DATA 31, 162, 31, 170
2000 DATA 33, 161, 30, 169
2005 DATA 30, 169, 28, 180
2010 DATA 35, 161, 29, 187
2015 DATA 28, 180, 28, 187
2020 DATA 25, 178, 25, 182
2025 DATA 23, 179, 28, 186
2030 DATA 43, 163, 42, 169
2035 DATA 42, 169, 51, 173
2040 DATA 51, 173, 47, 177
2045 DATA 47, 177, 45, 176
2050 DATA 45, 176, 43, 180
2055 DATA 43, 180, 39, 180
2060 DATA 39, 180, 39, 190
2065 DATA 39, 190, 29, 186
2070 DATA 50, 186, 60, 186
2075 DATA 60, 186, 62, 184
2080 DATA 62, 184, 65, 180
2085 DATA 65, 180, 61, 175
2090 DATA 61, 175, 58, 175
2095 DATA 58, 175, 55, 177
2100 DATA 55, 177, 55, 179
2105 DATA 55, 179, 53, 182
2110 DATA 53, 182, 49, 186
2115 DRAW"C0BM0,0R255D191L47BU8M
L12BD8L131BU17D1BD17L78U191
2120 DRAW"C0BM59,47NR3ND3NU3NL3B
D55BR105F2DFDFDFDFDFD1BL103BD34E
U1R1":CIRCLE(59,47),6:CIRCLE(59,
47),3
2125 DRAW"C0BM45,78U1
2130 DRAW"BM156,149R4
2135 DRAW"BM124,161R60D27L93U34R
32D6
2140 PAINT(12,137),0:PAINT(85,18
6):PAINT(196,189):PAINT(203,189)
:PAINT(78,186):PAINT(180,90):PAI
NT(140,90):PAINT(176,95):PAINT(1
55,76):PAINT(149,61):PAINT(110,8
0):PAINT(40,30)
2145 'DRAWING TITLE
2150 T$="BU7R4L2D7BR6
2155 H$="BU7D7U4R5NU3D4BR5
2160 E$="BU7NR5D3NR4D4R5BR5
2165 A$="BU7BD1D6U4NR5U2E1R3F1D6
BR5
2170 D$="BU7D7R4E1U5H1L4BD7BR10
2175 L$="BU7D7R5BR5
2180 S$="BU7BD1D1F1R3F1D2G1L3H1B
U5E1R3F1BD6BR5
2185 K$="BU7D7U4R3E2NU1G2F2D2BR5
2190 N$="BU7D1ND6E1R3F1D6BR5
2195 I$="BU7R4L2D7L2R4BR6
2200 G$="BU7BD1D5F1R3E1U2NL2BU2U
1H1L3G1BD6BR10
2205 DRAW"C4BM94,163"+T$+H$+E$
2210 DRAW"BM95,164"+T$+H$+E$
2215 DRAW"C0BM103,175"+H$+E$+A$+
D$+L$+E$+S$+S$
2220 DRAW"C4BM104,176"+H$+E$+A$+
D$+L$+E$+S$+S$
2225 FORT=1TO200:NEXT
2230 DRAW"C0BM113,186"+K$+N$+I$+
G$+H$+T$
2235 DRAW"BM114,187"+K$+N$+I$+G$
+H$+T$
2240 FORT=1TO200:NEXTT
2245 DRAW"C1;BM103,175"+H$+E$+A$
+D$+L$+E$+S$+S$
2250 DRAW"C1BM104,176"+H$+E$+A$+
D$+L$+E$+S$+S$
2255 GOTO2215
```

4096 Colours

by Chris Dent

CoCo3 UTILITY

4096 COLOURS IS A BASIC program to demonstrate one form of colour mixing techniques on the CoCo 3.

The technique used is the most simple available. It simply draws alternating lines of two different colours.

Because the CoCo 3 can only display 16 of its 64 colours at one time, we are restricted to 256 colours (16x16) when colour mixing out of a palette of 4096 (64x64).

When you run the program you will notice that a lot of the 4096 colours look stripey. Despite that, there are still lots which look very good.

To use the program you simply press the arrow keys.

Pressing the left/right arrow keys decrements/increments the vertical palette by 8.

Pressing the up/down arrow keys decrements/increments the horizontal palette by 8.

The Listing:

```
0 GOTO10
1 '***** "4096COL5"
2 '***** CHRIS DENT
3 SAVE"70:3":END'7
10 ONBRKGOTO150
20 POKE65497,0:HSCREEN2:FORA=0TO
7:PALETTEA,A:PALETTEA+8,A:NEXT:F
ORA=0TO7:HCOLORA:HLINE(0,24*A)-(
319,24*A+23),PSET,BF:NEXT:FORA=0
TO7:HCOLORA+8:FORY=0TO191STEP2:H
LINE(A*40,Y)-(A*40+39,Y),PSET:NE
XTY,A
30 XS=INKEY$
40 IFXS=""THEN30
50 IFXS=CHR$(94)THENC1=C1-8:GOTO
100
60 IFXS=CHR$(10)THENC1=C1+8:GOTO
100
70 IFXS=CHR$(8)THENC2=C2-8:GOTO1
00
80 IFXS=CHR$(9)THENC2=C2+8:GOTO1
00
90 GOTO30
100 IFC1<0THENC1=0
110 IFC2<0THENC2=0
120 IFC1>64THENC1=64
130 IFC2>64THENC2=64
140 FORA=0TO7:PALETTEA,A+C1:PALE
TTEA+8,A+C2:NEXT:GOTO30
150 CMP:POKE65496,0:END
```

Asort & Asearch — Corrections

by George McLintock

I MUST APOLOGIZE FOR a couple of errors which are contained in the ML routines which I submitted recently for sorting and searching arrays (titled ASORT & ASEARCH).

They demonstrate that my testing and checking procedures are not as exhaustive as they might be.

In this context, I would note that if anyone has any problems with using or understanding any of the routines which I submit to these magazines, they are welcome to contact me about them and I will respond as best I can.

My phone number is 062-95-6590 (a/h), or write to ...

7 LOGAN ST,
NARRABUNDAH, ACT, 2604

ASORT

The problem with ASORT is that if certain addresses occur for the VARPTR of the pointer array used for the indirect sort, then the sort will not work correctly.

This results from using the switch to show that an indirect sort is required, plus 1, as the switch to show that a swap has occurred in the sort for a list.

While this particular aspect is associated with a number of different parts of the logic, the fix itself is quite simple and demonstrates an interesting bit of trivia about binary numbers.

The switch to show if an indirect sort is required or not is produced by OR'ing the first byte of the 2 byte integer produced by the conversion of P(2), with the second byte. This gives a valid switch for the purpose.

The problem arises when this switch is then used to produce the switch to show that a swap has occurred. Because this second operation is performed in a part of the code which is always executed, and the initial value can be zero, I used the INCA instruction to make it non-zero.

However, if the first operation produces a switch value of HEX FF, then the INCA instruction will bring it back to zero again, and the second switch will not be correct.

The fix for this problem is to change the INCA instruction to a DECA, and this will always produce a correct value for the second switch.

The single exception, of course, is if the original address is Hex 0101, which will not occur because of its position in the Basic communication area.

To apply this correction to the ML routine after it has been incorporated at the end of a Basic program ...

```
POKE M+&H1D2,&H4A.
```

... where ...

```
M=PEEK(27)*256+PEEK(28)-583
```

To make the change to the Basic program as submitted, alter the 4C in line 56180 to 4A and change the checksum for the line from B4A to B48.

ASEARCH

ASEARCH was designed to use the same working storage as ASORT, which is why its use of working storage starts at an offset of 50 from the direct page register.

However, I didn't count correctly and a numeric sort with ASORT actually uses 52 bytes of working storage, not the 46 as stated in the description.

Hence if you use them both together, and mix the EXEC calls for both of them, then a numeric sort will wipe out the first two parameters set by the initialisation routine for ASEARCH. These are the values set from P(4) and P(5) of the parameter array.

While this is only a problem if you do a numeric sort after initialising ASEARCH and before doing a search with the EXEC call, it can happen.

The easy way to fix this is to re-assemble the routine with all working storage positions moved up two places. But this will change all the ML instructions which use the DP register. The minimum number of changes is obtained by moving these two parameters from DP+50 to DP+76 and from DP+51 to DP+77.

To do this after the ML routine has been added to the end of a Basic program requires 7 POKE's at an offset from M1, where the value of M1 is the starting address for the utility, as described in the original submission.

```
POKE 76 into M1+&HC, M1+&H129,
M1+&H142, M1+&H146 and M1+&H158
POKE 77 into M1+&H12 and
M1+&H14D.
```

To change the data statements in the Basic program as submitted, make the following changes:

Line 58000: change the 32 to 4C and the 33 to 4D, and also change the checksum from 7A9 to 7DD.

Line 58110: change the 32 to 4C and the checksum from 924 to 93E.

Line 58120: change the 32 to 4C and change the checksum from 9C7 to 9E1.

Line 58130: change the 2 x 32's to 4C's and the 33 to 4D, and change the checksum from 864 to 898.

This also changes the poke addresses, if you want to alter these switches in this way.

Alphabet Filer

...and you can get a CoCo2 version.

by Lindsay Bradford

CoCo3 BUSINESS

THIS IS THE FIRST program I have sent into CoCo magazine. It was just sitting at home growing old and decrepid, so I thought that I'd send it in to CoCo Magazine.

It was originally designed for the CoCo 2, but after my recent purchase of a CoCo 3, I just could not go past using the CoCo 3's new features.

Now I hear some of you saying, "Great, now I'm going to have to push everything over a bit just to see it!" Fear not, I myself use a TV, so I've used the 64 column screen.

Everything can be seen and I think that it'll be a real help to people like myself without monitors.

The program is pretty well self-explanitory but I'll just run over some of its other features now.

After the sorting has been finished, hit the 'G key to get the 'extras'. They allow you to add titles to the names or to delete any of the names that are wrong.

Another feature that I've found quite useful is the feature to save the names so they can be used in other applications, such as the ability to make multiple copies of the same letter, so that it can be sent to many people.

"FILER's" sorting technique is quite slow, so I've set it up for fast speed operation. If you have any problems with "FILER", then contact me by writing to my address:

14 LOBELIA CRT,
MOOROOBOOL,
CAIRNS, QLD, 4870

If anyone wants a version that is CoCo 2 compatiable then send a tape to this address and I'll put it on the tape for you.

The Listing:

```
5 PALETTERGB:ON BRK GOTO 6:GOTO1
0
6 CLS2:LOCATE24,0:ATTR4,1,B:PRIN
T"ALPHABETICAL FILER":ATTR4,1:IN
PUT"SURE YOU WANT TO QUIT";YN$:I
F YN$="Y" OR YN$="YES" THEN 7 EL
SE IF YN$="N" OR YN$="NO" THEN 4
0 ELSE 6
7 POKE65496,0:END
10 POKE57414,17:POKE63052,64:POK
E63105,64:POKE63112,44:POKE63113
,0:POKE63601,128:POKE63605,43:PO
KE63606,128:WIDTH 64
20 '*****************************
*   *******ALPHABET FILER*******
*   ******LINDSAY BRADFORD******
*   **********29/SEP/87*********
*   *****************************
*
30 DIM A$(2000):
40 CLS2:LOCATE24,0:ATTR4,1,B:PRI
NT"ALPHABETICAL FILER":ATTR4,1:L
INEINPUT"LOAD OLD FILE?(Y/N)";A$
:IF A$="Y" THEN 50 ELSE 130
50 INPUT"LOAD FROM DISK OR TAPE"
;DT$:IF DT$="T" OR DT$="D" THEN
60 ELSE 50
60 IF DT$="T" THEN DT=-1 ELSE DT
=1
70 IF DT=-1 THEN AUDIOON:MOTORON
80 T=1:INPUT"NAME OF FILE(8 CHR)
";FL$:IF LEN(FL$)>8 THEN 80 ELSE
 PRINT"POSITION DEVICE & PRESS A
NY KEY":EXEC44539:OPEN"I",#DT,FL
$
90 IF EOF(-1) THEN 120
100 INPUT#DT,A$(T):T=T+1
110 GOTO90
120 CLOSE#DT:T=T-1:GOTO270
130 CLS:ATTR4,1,B:LOCATE24,0:PRI
NT"ALPHABETICAL FILER":ATTR4,1:I
NPUT"NEW FILE NAME(8 CHR)";FL$:I
F LEN(FL$)>8 THEN130 ELSE 140
140 CLS:LOCATE24,0:ATTR4,1,B:PRI
NT"ALPHABET FILER":ATTR4,1:PRINT
"WHEN ENTERING NAME PLEASE EXCLU
DE ALL TITLES AND PLEASE TYPE TH
ESUJECTS FIRST NAME  eg-[ SMITH-
JOHN ]  . FOR EXTRAS PRESS [^]":P
RINT"                          2000
NAMES MAXIMUM"
150 LOCATE 25,12:ATTR5,1,B:PRINT
"PRESS ANY KEY";:ATTR4,1
160 IFINKEY$=""THEN160
170 POKE65497,0:CLS2:LOCATE24,0:
ATTR4,1,B:PRINT"ALPHABET FILER":
ATTR4,1:INPUT"HOW MANY NAMES TO
BE FILED";X:IF X>2000 THEN 170 E
LSE 180
180 CLS:LOCATE24,0:ATTR4,1,B:PRI
NT"ALPHABET FILER":ATTR4,1:FORA=
1TOX
190 IF A>X THEN 220
200 INPUT"-NAME-";A$(A)
210 IF INSTR(A$(A),"-")=0 THEN P
RINT"NO [-] IN THE NAME":FORH=1T
O1500:GOTO200 ELSE NEXT A
220 CLS:LOCATE24,12:ATTR4,1,B:PR
INT"PLEASE WAIT";:ATTR4,1
230 FORT=1TOX-1:IF A$(T)>A$(T+1)
 THEN M$=A$(T):A$(T)=A$(T+1):A$(
T+1)=M$:GOTO230 ELSE NEXT
240 B$="-":FOR S=1TOT:L=LEN(A$(S
)):I=INSTR(A$(S),B$):FS$=RIGHT$(
A$(S),L-I):LS$=LEFT$(A$(S),I-1):
FS$=FS$+" "+LS$:A$(S)=FS$:NEXT
250 FORA=1TOT:LOCATE0,A:PRINTA;"
";A$(A):NEXT
260 IN$=INKEY$:IF IN$="^" THEN 2
70 ELSE 260
270 POKE65496,0:CLS:LOCATE24,0:A
TTR4,1,B:PRINT"ALPHABET FILER":A
TTR4,1:PRINT"OPTIONS-":ATTR7,1:P
RINT"1. ADD A TITLE":LOCATE24,2:
PRINT"2. DELETE NAME":LOCATE48,2
:PRINT"3. START AGAIN"
280 LOCATE0,3:PRINT"4. VIEW SECT
ION":LOCATE24,3:PRINT"5. END PRO
GRAM":LOCATE48,3:PRINT"6. SAVE N
AMES"
290 PRINT;:INPUT"WHICH";WH:IF WH
<1 OR WH>6 THEN 290 ELSE:ON WH G
OTO 410,360,40,300,350,460
300 CLS:LOCATE24,0:ATTR4,1,B:PRI
NT"ALPHABET FILER":ATTR4,1:INPUT
"SECTION";X
310 FORB=X TO X+13
320 IF B>T THEN 340 ELSE 330
330 PRINTB"."A$(B):NEXT B
340 IFINKEY$=""THEN340 ELSE 270
350 END
360 CLS:LOCATE24,0:ATTR4,1,B:PRI
NT"ALPHABET FILER":ATTR4,1:INPUT
"WHAT IS THE NUMBER ASSIGNED TO
 THE NAME YOU WISH TO DELETE";DE
370 PRINTA$(DE):INPUT"IS THIS TH
E CORRECT NAME YOU    WANT TO DE
LETE";YN$:IF YN$="YES" OR YN$="Y
" THEN 380 ELSE IF YN$="NO" OR Y
N$="N" THEN 360 ELSE 370
```

Continued next page

64 Colours

All 64 colours at once AND in the right position!

by Lindsay Bradford

CoCo3 UTILITY

HOW MANY PEOPLE out there who, like me, have typed in a program that was to give the full 64 colours of the CoCo 3 at once?

Though I have seen a correction to it, all the correction does is reposition the boxes. Until now, no-one that I know of was able to find out what was really wrong.

So I set about finding out what was wrong with the program in the machine-language code.

After searching through the assembly supplied by American Rainbow magazine, I found a section dealing with the beginning of the vertical scan lines.

After altering the values of the beginning, I found a value that really did give all 64 of the colours at once, in the right position, without re-positioning the boxes.

For those of you who still have the original, all you have to do is find the value '70' and change this to a '96'.

For any of you who don't have this very useful program, I have supplied an edited version that needed only the change of one value to get it working.

The Listing:

```
0 GOTO10
1 '***** 3COLOUR
2 '***** LINDSAY BRADFORD
3 SAVE"71A:3":END'7
10 'ORIGIONAL PROGRAM BY RICK
    ADAMS & DALE LEAR, CONVERTED
    TO AUSTRALIAN TELEVISIONS BY
        LINDSAY BRADFORD
20 FOR I=0 TO 15:PALETTE I,0:NEX
T I
30 PALETTE 1,63
40 HSCREEN 2
50 POKE65497,0
60 HPRINT(4,1),"Color Computer 3
 - Color Chart"
70 FOR X=0TO3
80 HLINE(X*80+10,32)-(X*80+40,16
0),PSET,B
90 FOR Y=0 TO15
100 HPRINT (X*10+5,Y+4),X*16+Y
110 HLINE(X*80+10,Y*8+40)-(X*80+
40,Y*8+40),PSET
120 HPAINT(X*80+20,Y*8+36),8+X,1
130 NEXT Y,X
140 FOR I=4096 TO 4160
150 READ A
160 POKE I,A
170 NEXT I
180 EXEC 4096
190 DATA 26,80,198,46,247,255,3,
134
200 DATA 16,142,0,16,206,32,48,1
98
210 DATA 97,125,255,2,125,255,3,
42
220 DATA 251,125,255,0,125,255,1
,42
230 DATA 251,90,38,245,125,255,0
,125
240 DATA 255,1,42,251,191,255,18
4,255
250 DATA 255,186,48,137,1,1,51,2
01
260 DATA 1,1,198,7,74,38,218,32,
198
```

Φ

Cont. from previous page

```
380 IF DE<1 OR DE >T THEN 360
390 FORM=DE TO T-1:A$(M)=A$(M+1)
:NEXT M:A$(T)="":T=T-1
400 GOTO 270
410 CLS:LOCATE24,0:ATTR4,1,B:PRI
NT"ALPHABET FILER":ATTR4,1:INPUT
"WHAT IS THE NUMBER ASSIGNED TO
 THE NAME YOU WISH TO ADD A TITL
E TO";TL:IF TL<1 OR TL>T THEN 41
0
420 PRINTA$(TL):INPUT"IS THIS TH
E CORRECT NAME";YN$:IF YN$="YES"
OR YN$="Y"THEN 430 ELSE IF YN$="
NO" OR YN$="N" THEN 410 ELSE 410
430 INPUT"TITLE-(4 LETTERS MAX)-
";TT$:IF LEN(TT$)>4 THEN 410
440 TT$=TT$+" ":TT$=TT$+A$(TL):A
$(TL)=TT$
450 GOTO270
460 CLS:LOCATE24,0:ATTR4,1,B:PRI
NT"ALPHABET FILER":ATTR4,1:INPUT
"(D)ISK OR (T)APE OR (H)ARDCOPY"
;DT$:IF DT$="D"OR DT$="T" OR DT$
="H" THEN GOTO 470 ELSE GOTO 460
470 IF DT$="D" THEN PRINT"PREPAR
E DRIVE":PRINT"     HIT ENTER WHE
N READY" ELSE 490
480 A$=INKEY$:IFA$=<>CHR$(13)THE
N 480 ELSE OPEN"O",#1,FL$:FORA=1
TOT:PRINT#1,A$(A):NEXT:CLOSE#1:G
OTO 270
490 IF DT$="T" THEN PRINT"PREPAR
E TAPE":PRINT"      HIT ENTER WHE
N READY" ELSE 510
500 A$=INKEY$:IFA$<>CHR$(13)THEN
500 ELSE OPEN"O",#-1,FL$:FORA=1T
OT:  INT#-1,A$(A):NEXT:CLOSE#-1:
GOTO 270
510 PRINT"PREPARE PRINTER":PRINT
"      HIT ENTER WHEN READY"
520 IF INKEY$<>CHR$(13) THEN 520
 ELSE OPEN"O",#-2,FL$:FORA=1TOT:
PRINT#-2,A$(A):NEXT:CLOSE#-2:GOT
O270
```

Φ

COM*STATION *642#

ON VIATEL

HOW CAN I BEGIN TO

TO DESCRIBE IT?

HAVE YOU EVER SEEN

EVIL DEAD 2????

CoCo3 Revealed Part 2

Another look at the CoCo3, plus a few corrections.

by Darren Reed

Ok, these magazines give out awards for the BEST Tandy store each month, but have you ever seen a Victorian store get one of these awards?

Yes, down here the Tandy Salespeople are quite hopeless (except for a few) in selling the CoCo's. It is quite possible to walk into a store and find the CoCo 3 with a CM-8 monitor both OFF! How do they expect to sell them without showing prospective buyers what they can do?!?

Thier first Demo program with the rainbow and the rest was excellant, and could quite easily entice somebody into buying one.

Also, when they have specials, the display card shows nothing but catalogue numbers - how is a person looking at this supposed to know what he is getting if all he is told are catalogue numbers?

I think Tandy have got the products, but not the push to sell them. Is there any way to get this message to the Tandy sales reps.? Enough of complaints.

Since "CoCo 3 REVEALED" I have found some mistakes in the programs (sorry about the delay for the corrections) and some new information.

On the CoCo 3's new ROM.

The corrections first:

In the "POKESYNC" program, there should be a line 13:

```
13 DEFUSR0=&HE0A
```

To then 'fix' the POKE command use A=USR0(0). In the "Font Changer" program (FNTCHANG) then following:

* In line 120 forget the "HLINE-(22" in the listing the end. Instead make a line 121 as follows:

```
121 HLINE-(225,152),PSET
```

Change the following lines to read as they do here also.

```
710 FORI=32TO58:HPRINT(I-18,2),C
HR$(I):NEXT
720 FORI=59TO99:HPRINT(I-59,3),C
HR$(I):NEXT
730 FORI=100TO128:HPRINT(I-100,4
),CHR$(I):NEXT
740 IFAC<128 THENGOSUB950
750 FORI=0TO39STEP2:HPRINT(I,10)
,CHR $(AC)+" ":NEXT:HPRINT(0,14)
,STRING$(40,AC):GOSUB950:HPRINT(
5,20),"Press any key to continue
":HPRINT(0,16),"the quick brown
fox jumps over the lazy":HPRINT(
0,17),"dog.":EXEC44539:WIDTH40:G
OTO230
```

Also two POKEs for switching between two HSCREENs need to be changed. The first should be POKE&HFF9D,200 (for the second screen) and the other should be POKE&HFF9D,192 (for the first screen).

This is needed for 512K machines but work as they are for 128K machines.

Now for the new stuff. After the first two byte of the new ROM, presumably for identification, the next 14 bytes contain the addresses for some new, vital, ROM routines. A summary of what they are is as follows:

* $E002-$E003: contain $E019.
Sets up text screen according to what is in location $E7.
Values for location $E7:
0 - Width 32
1 - Width 40
2 - Width 80
By storing one of these values in $E7 and then doing a JSR $E019 or a JSR [$E002], any of the three text screen modes can be achieved.

* $E003-$E004: contain $E04D.
Sets up a HSCREEN according to what is in location $E6.
Values for location $E6:
0 - No HSCREEN set up.
1 - HSCREEN 1
2 - " 2
3 - " 3
4 - " 4
Use the same method as above to activate or deactivate a HSCREEN.

* $E006-$E007: contains $E097.
Reads MMU data in from locations $E0E1-$E0F0 into $FFA0-$FFAF.

* $E008-$E009: contains $E0B5.
Changes MMU data for WIDTH40+80 screens. Restores data in $E0E1-$E0F0 after it has been moved to $FFA0 - $FFAF.

* $E00A-$E00B: contain $E0A1.
Change value in $FFA0 by reading data from $E0E1- $E0F0 into MMU. New value is put in the B accumulator. B is preserved. Data at $E0E1 is restored also.

* $E00C-$E00D: contain $E0FF.
Sets the TR bit of $FF91 to 0. Returns stack to normal.

* $E00E-$E00F: contain $E119.
Sets the TR bit in $FF91 to one. Moves stack *. * - The return address and the stack pointer are both preserved by being saved at locations $42 - $45. They are saved before the TR bit is altered and restored after. It is therefore advisable to be very careful how you manipulate the block pointing to $0000- $1FFF. The TR is bit 0 of $FF91.

For any of these routines it is recomended that you use the indirect JSR (JSR [$xxxx]) so that if any further revisions of the ROM in which the direct addresses may change, your ROM calls should still work.
For the first 2 routines, A,X,Y are all preserved. For the next three A,B,X,Y are all preserved. For the last two only A,B are preserved by storing them in location $40. Only those registers preserved are used.
Some other routines from 2.0 that are called by these are:

* $E0F1: the major one. This reads data in from a 16 byte data area pointed to by X into the MMU at $FFA0-$FFAF. A,B,X,Y are all used and are not preserved. To use this a direct JSR is required with X pointing to the data. It is advisable to preserve A,B and Y before calling it.

* $E0CB: this routine is identical to the one at $E0B5 except that it sets the MMU up for the HBUFF area instead of for the text screens.
Data for the ROM calls here is literally stored all over the place. The MMU data is between $E0E1 and $E0F1. Data set one is $E0E1-$E0E8 and data set two is $E0E9-$E0F0. Data for the text screens:
32: $E032-$E03A
40: $E03B-$E043
80: $E044-$E04C
Data for the HSCREENS:
1+2: $E070-$E078
3+4: $E079-$E081
For all these data areas, the first byte goes into $FF90 and th next 8 into $FF98-$FF9F.
For the HSCREENS, the data that goes into location $FF99 is stored in locations $E06C-$E06F. HSCREEN 1 uses $E06C, 2 uses $E06D, etc.
This byte is loaded into the other area and then transfered into $FF90, etc.
Now to apply some of that information. Well the ROM routines can only be used by ML so lets see what we can do through BASIC.

For those with *only* 128K

Most of the following cannot be done on your machines due to lack of memory (I have a 512K machine) but read it still and maybe this will give you extra incentive to get the extra memory, you will need it, especially if you want to use OS9 Level II.
512K for the CoCo 3 is like 64K for the CoCo 1&2.
For 512Kers, to obtain extra HSCREENs poke the new block numbers into locations $E0EA- $E0ED. Any number between 0 and $33 is acceptable in any of these locations.
This changes the vertical offset register. A POKE to $FF9D is not sufficent. This is like the old SCREEN command, ie you can be drawing to one screen but looking at another.
After you have stored your new block allocation numbers in the relevant locations, do an EXEC&HE097 to transfer your block to the MMU. Your MMU data image needs to be both in the MMU and between $E0EA- $E0ED. To see the blocks you are drawing in, the following POKE is needed.

POKE x,y

x - $E076 for HSCREENs 1&2,
- $E07F for HSCREENs 3&4.
y - 4 * the block number in location $E0EA. Then do a HSCREEN command and away you go.

N.B. It is possible to draw to *any* 4 blocks, not nessecarily in order, but it is only possible to display 4 consecutive blocks.
Other extras are possible to, extra HBUFF areas thankfully. By POKE-ing the block number for the HBUFF into $E0D4, more HBUFF area is obtained.
To clear the HBUFF area, make it part of the HSCREEN area and HCLS0.
The following program demonstrates the above block switching for the HSCREENs. *Do not try this with 128k, it simply will not work!!*

```
 4 'High speed POKE
 5 POKE 65497,0
 8 '**************
 9 'Disable HCLS when HSCREEN is
 executed
 10 POKE &HE6C6,18:POKE&HE6C7,18
 20 A=0
 30 FOR J=0 TO 11 '12 HSCREENS
 38 '***************************
 39 'Set vertical offset
 40 POKE &HE076,A*4
 48 '****************
 49 'Put block No.s into $E0EA-$
 E0ED
 50 FOR I=A TO A+3:POKE &HE0EA+
 (I-A),I:NEXT
 58 '********
 59 'Transfer into MMU
 60 EXEC &HE097
 70 HSCREEN 2
 80 HCLS J: HCOLOR J+1
 90 FORT=1TO99:HLINE(RND(320)-
 1,RND(192)-1)-(RND(320)-1,RND(1
 92)-1),PSET:NEXT
 100 A=A+4
 110 NEXT J
 120 GOTO 120
```

There is no need for the REM lines except to explain what the next line is doing.
After running this program once insert line 75 below and change line 120 as below.

```
75  GOTO 100
120 RUN
```

Cop that PMODErs!

Some utilities for 512k owners

The "Backup" procedure

The BACKUP procedure is now much easier thanks to the extra RAM. Many 128K backups have been done but here's one for 512K only (or 128K if you must). This one (Listing 1) is quite simple - you input the last track of the disk to be read, the source and destination drives and away you go.

It will even read those mammoth 80TK disks one side at a time. This one allows to go from side one on one side of a DS disk to the other side of another DS diskette. (DS refers to disks that can be read on both sides without extra punctures in the jacket.)

This program doesn't respond to disk errors (they shouldn't be there in the first place) and will keep trying to read it until an I/O error appears (if it gets round to it).

The "Ramtest" program

I wrote this for someone who makes 512k cards to check them. This program checks the RAM's ability to store data and results in an error if the RAM is found not refreshing properly or similar. This sort of RAM is termed *short-term RAM*, ie the data is only retained a short while then lost, drastic for some long power-on performances. The program does a rather long loop after the initial check to allow the RAM to deteriorate (if it is faulty).

Non-Tandy DOSes and the CoCo 3

The combination of non-Tandy DOS and the CoCo 3 is most interesting. It seems that the CoCo 3 interprets the syntax of the extra DOS provided commands as the new CoCo 3 commands and confuses the user with this combination. To get around this problem there are two alternatives:

1. Get a Tandy DOS 1.1 and get it put in your controller case with a switch to switch betweem the two or ...
2. Find out which commands replace what and learn this 'code'.

I had only a non-Tandy DOS when I first got my COCO3 but now have 1.1 as well. For those who still have an 'uncompatable' system, Listing 3 may be what you need. I created a program that contains all the new commands with 1.1 and next to them behind REMs put the command once more. Loading this in with the other ROM, the commands behind the REMs stayed the same but those in the program were changed.

Those unchanged cannot be used as such and required other means. The listing I have included are for POWERDOS/COCO3 (POWERDOS comes from Geelong).

Some of the replacements are also included.

This incompatability only dissallows commands from being entered from processing, those loaded in from programs writen under 1.1 will work fine.

Power DOS Vs. CoCo 3

```
10 ON HIDE GOTO 310 'ON ERR GOTO
20 ON UNHIDE GOTO 340 'ON BRK GOTO
30 SLIST 40 'WIDTH
40 ATTR 0,0,B,U 'ATTR
50 SCOPY 10,10 'LOCATE
60 PRINT"UNDERLINED and blinking";
70 HSTATC,A,X,Y 'HSTAT
80 ATTR0,0 'ATTR
90 SCOPY0,0:PRINTTRK(0);TRK(1); 'BUTTON
100 EXEC44539
110 DPOKE 3,7 'PALETTE
120 A=SYS(&H6C000) 'LPEEK
130 DOS&H6C000,A 'LPOKE
140 AUTO2 'HSCREEN
150 PDIR 15 'HCLS
160 SLOW(0,0)-(320,192),PSET 'HLINE
170 SYSTEM4 'HCOLOR
180 FAST(160,96),50,8 'HCIRCLE
190 RAM(160,80),3,8 'HPAINT
200 LOCK1,7931 'HBUFF
210 BAUD(140,76)-(180,116),1 'HGET
220 OLD(0,151)-(40,191),1,PSET 'HPUT
230 HDRAW"BM160,96;U10R10D10L10" * 'HDRAW
240 SYSTEM8,0 'HCOLOR
250 UNLOCK(0,10),"Upper and LoWeR case" 'HPRINT
260 DPOKE RGB * + 'RGB
270 HSET(160,96,11) 'HSET
280 HRESET(160,96) 'HRESET
290 C=SCAN$(160,96) 'HPOINT
300 GOTO300
310 PRINT"ERROR IN LINE";ERLIN ** 'ERLIN
320 PRINT"ERROR=";ERNO ** 'ERNO
330 END
340 CLEAR
350 ATTR0,0 'ATTR
```

** - These two have NO equivalents.

\+ - although this may seem to work with the DPOKE, the RGB is taken to be the variable RG, and an sn error occurs.

Rainbow Bits 1.4 Vs CoCo 3

```
10 ON ! GOTO 310 'ON ERR GOTO
20 ON ! GOTO 340 'ON BRK GOTO
30 RAM40 'WIDTH
40 ! 0,0,B,U 'ATTR
50 ! 10,10 'LOCATE
60 PRINT "UNDERLINED and blinking";
70 ! C,A,X,Y 'HSTAT
80 !0,0 'ATTR
90 !0,0:PRINT!(0);!(1); 'BUTTON
100 EXEC44539
110 OS9 3,7 'PALETTE
120 A=!(&H6C000) 'LPEEK
130 POF&H6C000,A 'LPOKE
140 PON2 'HSCREEN
150 AUTO 15 'HCLS
160 !(0,0)-(320,192),PSET 'HLINE
170 DUMP4 'HCOLOR
180 FORMAT(160,96),50,8 'HCIRCLE
190 MON(160,80),3,8 'HPAINT
200 ! 1,7931 'HBUFF
210 !(140,76)-(180,116),1 'HGET
220 !(0,151)-(40,191),1,PSET 'HPUT
230 !"BM160,96;U10R10D10L10" 'HDRAW
240 DUMP8,0 'HCOLOR
250 !(0,10),"Text lower and UPPER cAsE" 'HPRINT
260 OS9 ! 'RGB
270 !(160,96,11) 'HSET
280 !(160,96) 'HRESET
290 C=!(160,96) 'HPOINT
300 GOTO300
310 PRINT"ERROR IN LINE";! 'ERLIN
320 PRINT"ERROR=";! 'ERNO
330 END
340 CLEAR
350 !0,0 'ATTR
```

Some alternatives for other Dos users:

ATTR - Poke $FE08 with a value to set the attributes (see JULY '87 Ausi. CoCo for more details).

PALETTE RGB - EXEC &HE676

HSET - EXEC &HE671 (x,y,c) put in brackets following the EXEC, no colon inbetween the x and y co-ordinates and the color.

HRESET - EXEC &HE765 (x,y) as for HSET but no colour code.

HDRAW - EXEC &HF39D "..." put in quotes directly after the EXEC the string of commands you wish to execute.

Some gossip: I have heard that IBM are changing thier DOS format again, from MS-DOS to OS-9.

Yes, this system is compatible with ours, the disk format is the same so we should be able to read their disks.

I am not sure whether this is for a new line of multi - user computers or just another disk format change. Does any one else have any further details on this change?

Finally to the eds., are programs written for the CoCo 3 under the new BASIC09 going to be judged in the same section as normal BASIC?

BASIC09 has a lot of advantages over BASIC including being compiled. Classy BASIC09 programs are going to outclass those BASIC programs for sure.

Because of the different structures used (a type of Pseudo-code vs an unstructured basic), we are going to judge the Basic09 programs separately from the other Basic programs - Ed.

To contact me about anything here, I can be found at the Nth. Eastern CC in Melbourne when it meets. See end of magazine for a phone number.

```
 0 GOTO10
1 '***** BACKUP
2 '***** DARREN REED
3 SAVE"98B:3":END'7
10 ON BRK GOTO 70
20 ON ERR GOTO 200
30 DATA 8E,40,00,86,02,97,EA,C6,
00,86,00,97,EB,7F,00,EC,86,01,97
,ED,9F,EE,AD,9F,C0,04,30,89,01,0
0,8C,60,00,26,07,5C,F7,FF,A2,8E,
40,00,4C,81,13,26,E3
40 DATA 7C,00,EC,96,EC,81,52,27,
05,20,D6,7F,FF,40,86,3A,B7,FF,A2
,39
50 FORI=0 TO 066:READA$:POKE&HE0
0+I,VAL("&H"+A$):NEXT
60 DEFUSR0=&HE00
70 CLS:PRINT"-----512K BACKUP UT
ILITY-----     BY DARREN REED"
80 PRINT"  VERSION 1.1"
90 INPUT"NO. OF TRACKS ON SOURCE
 DISK:";ST
100 INPUT"SOURCE DRIVE";SD
110 INPUT"DESTINATION DRIVE:";DD
120 PRINT"INSERT SOURCE DISK AND
 PRESS ANY KEY":EXEC44539
130 POKE&HE04,2:POKE&HE0A,SD:POK
E&HE35,ST+1
140 A=USR0(0)
150 PRINT"INSERT DESTINATION DIS
K AND     PRESS ANY KEY":EXEC445
39
160 POKE&HE04,3:POKE&HE0A,DD
170 A=USR0(0)
180 PRINT"DONE..."
190 END
200 PRINT"ERROR OCCURED. ERROR N
UMBER=";ERNO:PRINT"
  ERROR LINE=";ERLIN:EXEC44539:R
UN
```

```
0 GOTO5
1 '***** RAMTEST FOR COCO 3
2 '***** DARREN REED
3 SAVE"98A:3":END'7
5 DEFUSR0=&HE00
6 WIDTH32:CLS
7 PRINT@256,;
8 DATA 86,FF,5F,8E,40,00,F7,04,0
0,F7,FF,A2,A7,84,A6,80,81,FF,26,
0D,BF,04,20,8C,60,00,26,F0,5C,C1
,37,26,E2,BD,B4,F4,39
9 FORI=0 TO 036:READA$:POKE&HE00
+I,VAL("&H"+A$):NEXT
10 POKE65497,0
11 TIMER=0:A=USR0(0):PRINTTIMER
12 POKE65496,0
13 A=A-INT(A/256)*256:IF A<>55 T
HEN PRINT"AN ERROR OCCURED IN TH
E RAM TEST" ELSE PRINT"RAM TEST
O.K."
14 FORT=1TO15000:A=A+.001:PRINT@
324,T;:NEXT
15 POKE&HE0C,&H12:POKE&HE0D,&H12
:GOTO10
```

NEW RELEASES

At last! A new series of "Best of's" (12 to 20) is about to be released. As we are still finishing several disks/tapes in this series, we thought we'd whet your appetite by pre-releasing a couple of the complete ones this month

And as a further bonus, we're offering these ones at the old price of $16.00 ea (disk or tape) for February only. In March, all Best Of's go up to $19.50 ea.

The Best of CoCoOz #13. 32K CoCo 2 Games. (CoCo 3 Compatible.)

The best CoCo 2 games of 1987 from Australian CoCo Magazine and Softgold Magazine!

And for the first time we're including three machine language games – Tank Part 2, Dogfight and Gunfight!

The Best of CoCoOz #15. CoCo 2 and 3 16K Utilities.

All the utilities you wanted, but were afraid to ask for!

Included is a screen dump for the DMP130 and DMP 105, a joystick simulator, tape checker, variables lister, program recovery system and many more utilities to make your use of the computer that little less frustrating!

The Best of CoCoOz #18. CoCo2 & 3 Graphics.

Features heaps of graphics programs from Australian CoCo and Softgold Magazines. Programs like "Tartan", "Snoopy", "Monster", "Pink" and a host of others!

Just the thing if you are looking for designs for printouts, or for addition to a program of your own!

The Best of CoCoOz #20. The Drenkald Adventure. by Scott Harvey. (Flippy Disk only.)

An all Basic all graphics adventure!

You are one of the mighty warriors of Yurndor, warriors feared by all the forces of evil because of their great strength and courage. But can you defeat the forces of evil?

For both CoCo 2 and CoCo 3.

M/L Utilities

For special requirement, or may be of some general interest

by George McLintock

32K ECB
UTILITY

I HAVE SUBMITTED a couple of small ML routines which were developed for a specific requirement, but may be of some more general interest.

They are ...

* PCLEAR0 - Performs a PCLEAR 0 from within a Basic program, and
* DELETE - Deletes specified line numbers from within a Basic program without interfering with the program operations, and with all variable definitions retained.

"PCLEAR 0"

CoCo Basic does not support a PCLEAR 0 command. If the graphic screen is not being used, you can do a PCLEAR 1, which means that 1.5K is still reserved for the graphics screen.

It is possible to do the equivalent of a PCLEAR 0 by POKE's from the keyboard which will eliminate all the graphic screens, ie ...

```
POKE 25,PEEK(&HBA)
POKE PEEK(&HBA)*256,0
NEW
```

However, the requirement for a NEW with this procedure means that it cannot be performed as part of a Basic program, and it has to be done before loading the program itself.

I find this aspect rather annoying because I tend to forget to do the POKEs required before loading a program which requires it, which means that you have to find out why the program doesnt work correctly, and then restart it using the correct procedure.

To avoid this problem, I have developed a small ML routine which will perform the equivalent of a PCLEAR 0, as part of the normal program execution.

This avoids any requirement for a special set up procedure to be performed before loading the program.

Program Operation

The program operates by changing the Basic pointers required to achieve a PCLEAR 0. It then moves the Basic program itself up in memory to occupy the new correct memory locations, and then resets other Basic pointers to the new correct values.

The other operation performed is to adjust the value of the Basic pointer at Hex A6 so that control can be returned to the Basic program in the normal way.

Hex A6 contains the address of the next byte in the Basic program to be processed by the interpreter (or the last byte processed, depending on the function performed).

When a ML routine is entered by an EXEC command in Basic, Hex A6 points to the delimeter following the EXEC 'address' command, ie normally to either the zero byte marking the end of line or the ':' marking the end of a statement.

If using this pointer to pass parameters to the ML routine, it will point to the comma used as a delimeter. In this context, a blank is not a delimeter.

When the ML routine returns to Basic with a RTS command, the value in Hex A6 must point to either a zero or ':', ie it must point to a valid end of Basic command token. If not, Basic will generate a syntax error.

Because this ML routine moves the Basic program code in memory, the value in Hex A6 is altered to point to the same relative position in the Basic program at the new memory location, as it was pointing to when the ML routine was entered.

As a general point of interest, the pointer at Hex A6 can also normally be used by a ML routine to change other aspects of how a Basic program will operate.

Each Basic command tends to operate as a completely independent procedure (with some exceptions), so that control can be returned to any part of a Basic program and it will continue to operate normally.

The only problem, of course is that if you change anything at all which effects the way that the interpreter operates, you have to adjust all other pointers, etc to the correct values for Basic.

And the main problem here, is to identify all the other things which must also be altered.

Using the program

The ML routine must be included as part of the Basic program which calls it, for it to be of any use.

The idea being that you can load the original program, and RUN it, and it performs its own PCLEAR 0.

I've included a brief description of two alternative ways of including it with a Basic program.

The routine itself is executed by an EXEC 'start address' command, which is at the begining of the ML code.

The execute command can be located in any part of the program, but would normally be at the logical start of the program.

Any variables defined before the EXEC command will be lost.

After executing the PCLEAR0 utility, a CLEAR statement is required to reset other Basic pointers.

The utility checks if a previous PCLEAR0 has been

The Listing:

```
1 '  SPCLEAR  DOES PCLEAR 0 FROM
     WITHIN A BASIC PROGRAM
       INCLUDED AS A STRING
     BY GEORGE MCLINTOCK
2 GOTO 54000
3 SAVE"83CAA:3":END'7
4 '
5 ' IS SAME AS PCLEAR0 BUT INCLU
DED IN PROGRAM BY A DIFFERENT PR
OCEDURE
6 '
54000 M$="961991BA272D9E19DEBA6F
C0DCA69319D3BAC30001DDA6DF19A680
A7C09C1B26F8DF1B9E191F133004A680
26FCAFC4EC8426F239"
54010 Y=&H1DA:B=0:FOR X=1 TO 104
 STEP 2:N=VAL("&H"+MID$(M$,X,2))
:B=B+N:POKE Y,N:Y=Y+1:NEXT X
54020 IF B<&H19BB THEN PRINT"ERR
OR IN LINE NUMBER 54000":STOP
54030 RETURN
```

The Listing:

```
1 '  SDELETE - DELETE LINES
2 GOTO 53000
3 SAVE"83CBA:3":END'7
4 '
5 'IS SAME AS DELETE BUT INCLUDE
D BY A DIFFERENT PROCEDURE
53000 M$="9E19EC0210B301D12406AE
84275320F2BF01D51F13EC0210B301D3
2408AE8426F21F312004AE8427F8BF01
D7FE01D5A680A7C09C1B26F8DF1B9C1D
2706A680A7C020F6DF1D9C1F2706A680
A7C020F6DF1F9E191F133004A68026FC
AFC4EC8426F239"
53010 Y=&H1DA:B=0:FOR X=1 TO 196
 STEP 2:N=VAL("&H"+MID$(M$,X,2))
:B=B+N:POKE Y,N:Y=Y+1:NEXT X
53020 IF B<&H2B17 THEN PRINT"ERR
OR IN LINE NUMBER 53000":STOP
53030 RETURN
```

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The Listing:

```
1 '**  DELETE LINES IN  PROGRAM
       BY GEORGE MCLINTOCK
       OCTOBER 87
2 GOTO 53000
3 SAVE"83CB:3":END'7
4 'ML ROUTINE TO DELETE LINES FR
OM A BASIC PROGRAM WITHOUT STOPP
ING
5 'ALL VARIABLES RETAIN EXISTING
 VALUES
8 'TO PUT IN FIXED AREA OF MEMOR
Y - DELETE LINES 53110-53150  -
REPACE WITH CLEAR 200,32000:A=32
000
9 '
53000 LN=53500:FOR X=0 TO 117 ST
EP 25:IF X<99 THEN N=25 ELSE N=1
7
53010 GOSUB 53030:NEXT X
53020 RESTORE:GOTO 53110
53030 PRINT LN;:A=0:FOR Y=0 TO N
-1
53040 READ C$:B=VAL("&H"+C$):A=A
+B
53050 NEXT Y:READ C$:IF A<> VAL(
"&H"+C$) THEN PRINT "ERROR IN LI
NE NO";LN:STOP
53060 LN=LN+10:RETURN
53070 '
53080 FOR Y= 0 TO N-1:READ C$:PO
KE A,VAL("&H"+C$)
53090 A=A+1:NEXT Y:READ C$:RETUR
N
53100 '
53110 M$="9E1B308900756F806F806F
809F1B39":Y=&H01DA
53120 B=0:FOR X=1 TO 30 STEP 2:N
=VAL("&H"+MID$(M$,X,2)):B=B+N:PO
KE Y,N:Y=Y+1:NEXT X
53130 IF B <> &H5A7 THEN PRINT "
ERROR IN LINE NO 54110":STOP
53140 EXEC &H1DA:CLEAR
53150 A=PEEK(27)*256+PEEK(28)-12
0:LN=53500
53160 FOR X=0 TO 117 STEP 25:IF
X<99 THEN N=25 ELSE N=17
53170 GOSUB 53080:NEXT X
53180 '
53190 PRINT:PRINT "DELETE ML NOW
 ADDED TO END OF  BASIC PROGRAM
": PRINT "AND EXTRA BASIC CODE D
ELETED"
53200 '
53210 DEL 53000-53600
53500 DATA C6,62,30,8D,0,D,CE,1,
DA,A6,80,A7,C0,5A,26,F9,7E,1,DA,
9E,19,EC,2,10,B3,B62
53510 DATA 1,D1,24,6,AE,84,27,53
,20,F2,BF,1,D5,1F,13,EC,2,10,B3,
1,D3,24,8,AE,84,964
53520 DATA 26,F2,1F,31,20,4,AE,8
4,27,F8,BF,1,D7,FE,1,D5,A6,80,A7
,C0,9C,1B,26,F8,DF,C89
53530 DATA 1B,9C,1D,27,6,A6,80,A
7,C0,20,F6,DF,1D,9C,1F,27,6,A6,8
0,A7,C0,20,F6,DF,1F,B29
53540 DATA 9E,19,1F,13,30,4,A6,8
0,26,FC,AF,C4,EC,84,26,F2,39,799
```

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The Listing:

```
1 '**  PCLEAR0 IN BASIC PROGRAM
       BY GEORGE MCLINTOCK
       OCTOBER 87
2 GOTO 54000
3 SAVE"83CA:3":END'7
4 'ML ROUTINE TO DO PCLEAR0 FROM
 WITHIN A BASIC PROGRAM
8 'TO PUT IN FIXED AREA OF MEMOR
Y - DELETE LINES 54110-54150  -
REPACE WITH CLEAR 200,32000:A=32
000
9 '
54000 LN=54500:FOR X=0 TO 49 STE
P 25:IF X<24 THEN N=25 ELSE N=27
54010 GOSUB 54030:NEXT X
54020 RESTORE:GOTO 54110
54030 PRINT LN;:A=0:FOR Y=0 TO N
-1
54040 READ C$:B=VAL("&H"+C$):A=A
+B
54050 NEXT Y:READ C$:IF A<> VAL(
"&H"+C$) THEN PRINT "ERROR IN LI
NE NO";LN:STOP
54060 LN=LN+10:RETURN
54070 '
54080 FOR Y= 0 TO N-1:READ C$:PO
KE A,VAL("&H"+C$)
54090 A=A+1:NEXT Y:READ C$:RETUR
N
54100 '
54110 M$="9E1B308900346F806F806F
809F1B39":Y=&H01DA
54120 B=0:FOR X=1 TO 30 STEP 2:N
=VAL("&H"+MID$(M$,X,2)):B=B+N:PO
KE Y,N:Y=Y+1:NEXT X
54130 IF B <> &H566 THEN PRINT "
ERROR IN LINE NO 54110":STOP
54140 EXEC &H1DA:CLEAR
54150 A=PEEK(27)*256+PEEK(28)-55
:LN=54500
54160 FOR X=0 TO 49 STEP 25:IF X
<24 THEN N=25 ELSE N=27
54170 GOSUB 54080:NEXT X
```

Continued on p60.

performed and if so, then it exits without doing anything.

For some reason, which I haven't been able to work out, is that if you do a PCLEAR command in the program before calling this utility, you will get a syntax error in the EXEC command line.

However, there is no point in doing a PCLEAR before calling the routine, so it is no real problem.

DELETE

Basic provides the DEL command which can be used to delete specified line numbers from a Basic program.

It is normally used for EDIT'ing a program, but it can also be used as a command within a program to provide a more convenient operating environment, eg to be able to load a single program, execute a part of it and then delete that code as it is no longer required.

For example, to set up a ML routine in memory or to draw a graphic picture that is required once only for the program, and then to delete the code used for the purpose ...

- which avoids the requirement for a separate (C)LOADM of another file to get the binary image into memory,
- normally only used when

The Listing:

```
00100 *CALLED PCLEAR0 - DOES A PCLEAR ZERO FROM WITHIN BASIC PROGRAM
00110 *
00120          ORG     32000
00130 ZXST     LDA     <25       NOT IF EQUAL
00140          CMPA    <$BA
00150          BEQ     NO
00160 *ADJUST RETURN ADDRESS
00170          LDX     <25
00180          LDU     <$BA
00190          CLR     ,U+
00200          LDD     <$A6
00210          SUBD    <25
00220          ADDD    <$BA
00230          ADDD    #1
00240          STD     <$A6
00250          STU     <25
00260 *MOVE PROGRAM IN MEMORY
00270 XST1     LDA     ,X+
00280          STA     ,U+
00290          CMPX    <27
00300          BNE     XST1
00310          STU     <27
00320 *RESET LINE ADDRESSES
00330          LDX     <25
00340 LINE     TFR     X,U
00350          LEAX    4,X
00360 LOOP     LDA     ,X+
00370          BNE     LOOP
00380          STX     ,U
00390          LDD     ,X
00400          BNE     LINE
00410 NO       RTS
00420 *
00430 ZZEND    EQU     *
00440          END     ZXST

00000 TOTAL ERRORS
```

⊕

memory is tight, and you need the space used by that code.

However, the main problem with using it is this way is that you cannot delete these lines from within the Basic program itself, and then have the program continue to operate normally.

The program operation will stop after executing the DEL command, and you have to RUN it again to restart it. This, in turn, limits what code you can delete in this way, and any variables defined before the DEL are lost.

The utility submitted overcomes these limitations by deleting the lines required and then adjusting the other aspects required for the program to continue to operate normally.

The adjustments performed also retains the values of all variables & arrays which have been defined by Basic at that stage, ie you can read a series of DATA statements into an array, and then delete that code, and the DATA statements, from the program, while still retaining the values as set up in the arrays.

Using the Program

This ML routine is best included as part of the Basic program which calls it. While it can be located in any part of memory, there seems little point in having to load it as a separate operation.

I've included a brief description of two alternative ways of including it as part of a Basic program. There are other ways of achieving the same effect, and it is really a matter of personal preference as to which way you do it.

As set up, the line numbers to be deleted must be POKE'd into the cassette file name buffer before executing the routine, ie starting line number to delete at Hex 1D1 and ending line number to delete at Hex 1D3.

For example, if you want to delete lines 1000 to 2000, then you could use code like this:

```
SD=1000
ED=2000
Y=&H1D1
POKE Y,INT(SD/256)
POKE Y+1,SD-INT(SD/256)*256
POKE Y+2,INT(ED/256)
POKE Y+3,ED-INT(ED/256)*256
```

If you want to delete selected groups of lines, eg 1000 to 2000 and 5000 to 6000, then you could set up the POKE's in a subroutine, and GOSUB it.

(If doing this, note the restriction!)

If set up as a sub-routine, then the last group of lines to be deleted could be that subroutine itself.

This command treats line numbers in a different way to the DEL command.

If it cannot find the line numbers specified, then it will operate from the next highest line number, eg if all line numbers are increment of 10, and you delete from 55 to 85, it will in fact delete line numbers 60 to 90 inclusive.

To delete from line number 1000 to end of program use SD=1000 and ED=&HFFFF or some value greater then the highest number used.

The routine operates by finding the addresses in memory of the line numbers to be deleted, and then moves the program code and variable definitions areas up in memory to go over the top of the lines to be deleted.

The procedure used for moving the variables definition areas, retains the definition of all variables, and resets the pointers required by Basic.

The move routines are specifically coded to retain any ML routines or data which is stored at the end of the Basic program, ie routines incorporated in the program like this one can be.

Restrictions for use

The only real restriction with using this routine is that the EXEC command to execute it MUST be contained in a part of the program which is not moved, eg if deleting line numbers 1000 to 2000, then the line number of the EXEC command itself must be less than 1000.

If it is not less than 1000, then you will get a syntax error because the pointer at Hex A6 is not adjusted (see explaination with PCLEAR0).

The other restriction relates to retaining string data, eg if you have a statement like ...

```
1000 A$="FRED"
```

... and you delete line 1000, then the definition of A$ will be lost.

To retain definitions of this nature, use code like ...

```
1000 A$="FRED"+""
```

... which will set up the string data in normal string space.

ADDING THE UTILITIES TO A BASIC PROGRAM

Both routines are submitted as Basic programes, with two variations for including them with another Basic program.

The Listing:

```
00100 *CALLED DELETE - TO ERASE BASIC LINES WITHOUT STOPPING PROGRAM
00110         ORG     32000
00120 *MOVE TO CASSETTE BUFFER FOR EXECUTION
00130 ENTER   LDB     #ZZEND-START
00140         LEAX    START,PCR
00150         LDU     #$1DA
00160 M1      LDA     ,X+
00170         STA     ,U+
00180         DECB
00190         BNE     M1
00200         JMP     $1DA
00210 *
00220 START   LDX     <25     START PROGRAM
00230 *FIND START ADDRESS TO DELETE
00240 *START LINE NUMBER IN $1D1
00250 FX1     LDD     2,X     THIS LNE NO
00260         CMPD    $1D1
00270         BHS     FST
00280         LDX     ,X      NEXT LNE
00290         BEQ     OUT     NOT THERE
00300         BRA     FX1
00310 FST     STX     $1D5    START ADDRESS
00320 *
00330 *FIND ADDRESS FOR DELETE
00340 *END LINE NUMBER IN $1D3
00350 *
00360 FX2     TFR     X,U     IF REQUIRED
00370         LDD     2,X
00380         CMPD    $1D3
00390         BHS     SND
00400         LDX     ,X
00410         BNE     FX2
00420 *END NO NOT FOUND - DELETE TO END OF PROGRAM
00430 NX1     TFR     U,X
00440         BRA     SND1
00450 SND     LDX     ,X
00460         BEQ     NX1
00470 SND1    STX     $1D7
00480 *MOVE PROGRAM UP IN MEMORY
00490         LDU     $1D5
00500 MV1     LDA     ,X+
00510         STA     ,U+
00520         CMPX    <27     END PROGRAM
00530         BNE     MV1
00540         STU     <27     NEW END
00550 *MOVE SIMPLE VARIABLES
00560 MV2     CMPX    <29
00570         BEQ     MV3
00580         LDA     ,X+
00590         STA     ,U+
00600         BRA     MV2
00610 MV3     STU     <29     NEW VALUE
00620 *MOVE ARRAYS
00630 MV4     CMPX    <31
00640         BEQ     MV5
00650         LDA     ,X+
00660         STA     ,U+
00670         BRA     MV4
00680 MV5     STU     <31     NEW END
00690 *RESET LINE ADDRESSES
00700         LDX     <25
00710 LINE    TFR     X,U
00720         LEAX    4,X
00730 LOOP    LDA     ,X+
00740         BNE     LOOP
00750         STX     ,U
00760         LDD     ,X
00770         BNE     LINE
00780 OUT     RTS
00790 *
00800 ZZEND   EQU     *
00810         END     START

00000 TOTAL ERRORS
```

The ML source is also included.

Poked at the end of a Basic program.

For normal use, I consider this to be the most appropriate way of including ML routines within a Basic program.

The versions, PCLEAR0 and DELETE, are set up as Basic programs containing DATA statements which are POKE'd into memory at the end of the program to set up the ML code.

The code used for this purpose is MERGE'd into the original program and RUN.

Executing the code installs the utility and deletes the Basic code used, using the normal Basic DEL command.

This same procedure can be used for installing any number of ML utilities within the same Basic program.

If both these utilities are installed together at the end of the same Basic program, and DELETE is installed first and PCLEAR0 installed last, then the entry point for PCLEAR0 is ...

```
M=PEEK(27)*256+PEEK(28)-55
```

... while the entry point for DELETE will be M1=M-120.

To avoid possible complications, if a number of utilities are installed in this way, then PCLEAR0 should be the last one installed.

This utility moves the program up in memory, and if there is a large ML utility (or data area) installed below it, then it may overwrite itself as part of the move.

If any move does occur, then it will be by at least 1.5K, so other data up to this length can in fact follow it without problems.

The DELETE utility can move data in much smaller increments, to as little as 6 bytes, and to avoid the possibility of the code being overwritten, this version moves the code to be executed to the cassette buffer (from Hex 1DA) where it is actually executed.

As a String to be POKE'd into Memory

Another way of incorporating a ML routine into a Basic program is to set it up as a string of Hex characters which are then POKE'd into memory and executed.

Continued on p60

Clocks Revisited

Keeping your eye on the clock.

by Ken Wagnitz

Ed's note: This article/ hardware modification appeared in the pages of December's CoCo Magazine.

As there were a few things missing (like the circuit diagram and a proper listing of the assembly listing), we have decided to re-publish it. As for the programs and the instructions, see Decembers magazine.

OS9 Level 2 HARDWARE MOD

AN ARTICLE titled 'Clock Chips n Things' appeared in the December 87, Coco magazine. It detailed a clock and I/O add-on for the Coco.

Unfortunately the associated circuit diagram didn't appear with it, and the text was a taken little out of context (from the Adelaide Micro User Group newsletter), making it all very confusing. To redress the error, I present the circuit diagram and some additional information now. Refer back to the December issue as well.

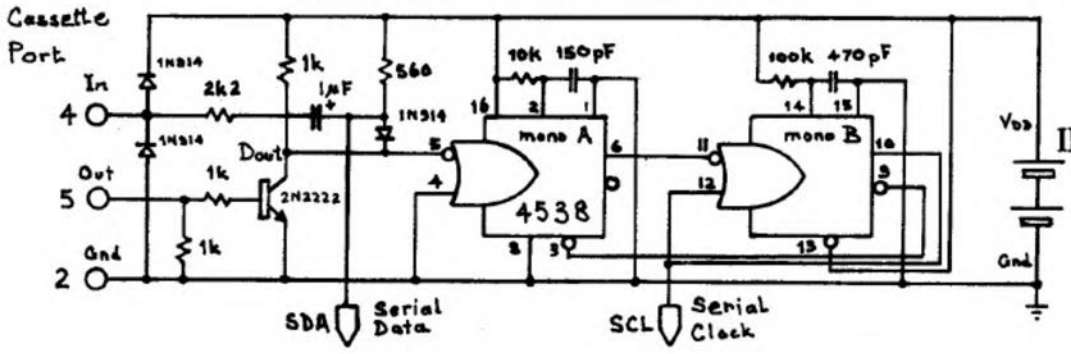
The Hardware

The circuit diagram is in three parts. The first is a dual monostable (one IC) setup which provides the signals needed for the family of ICs I used. That connects to the CoCo (1, 2 or 3) cassette port or indeed the cassette port of any computer.

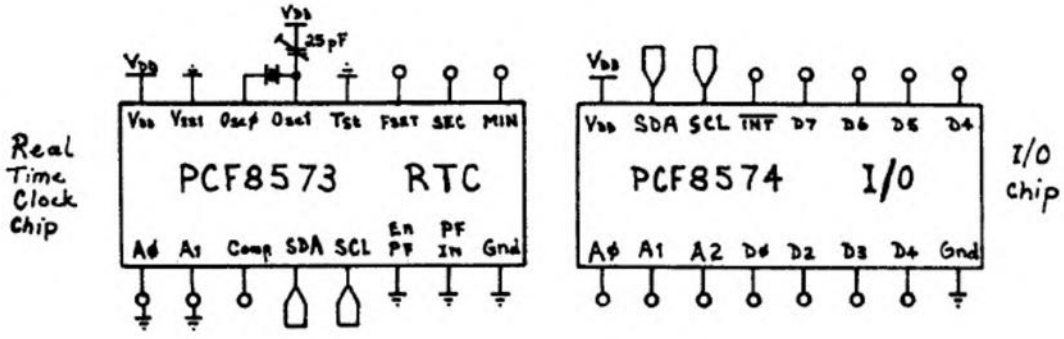
The other parts of the circuit are a Real Time Clock, and an 8 port Input/Output IC. Either or both could be connected, and extra I/O chips can be added, by changing their address strapping, (A0, A1, A2).

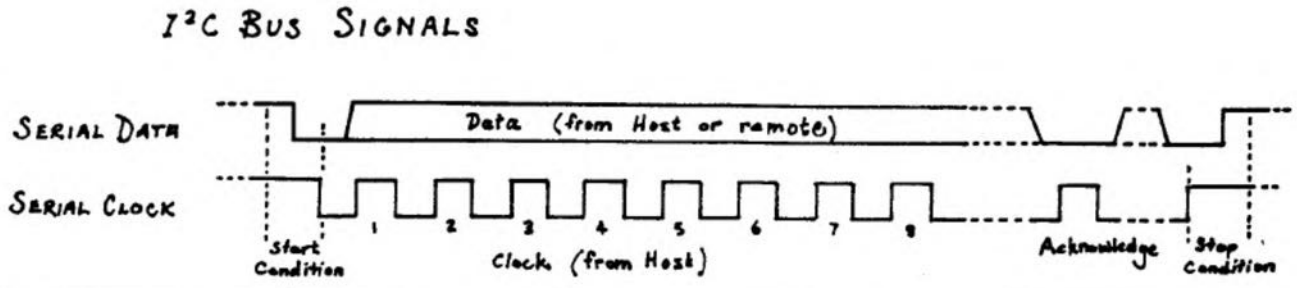
As you can see, all of the complexity is in the generation of the SCL (Serial Clock) signal. The only connections between the three circuit parts are ground, Vdd (+3 volts), SDA and SCL. The whole clock circuit can be built for around $20.

The batteries in my version (which are housed in a Strepsils tin) are two AA cells, and the



REAL TIME CLOCK and INPUT/OUTPUT CIRCUIT





circuit is mounted on 'Veroboard'.

The Machine Code Subroutine (see Dec 87 issue).

For those interested in writing machine code routines to use with Basic09, this subroutine deserves a little explanation.

There is an OS9 module type, 'subroutine'. The example I looked at (to work out how to write it) was 'inkey' which is written for use by Basic09, and is listed in the back of the Basic09 manual. If a subroutine is not in memory when it is called, it is loaded from the current execution directory.

Hence when you run a Basic09 program which needs 'inkey', 'gfx', 'gf2' or 'syscall', you get a disk access while the module is loaded from disk.

I had two reasons for using a machine code subroutine instead of just sticking to Basic09. Firstly Basic09 was too slow. The fastest times in which hardware can be pulsed from Basic09 are measured in milliseconds. Secondly the multitasking aspect of OS9 means that every running program gets interrupted at regular intervals while the DOS checks for other tasks that need time.

Because my circuit is very time critical, I couldn't afford random changes in timing causes by interrupts. The way to stop this (for short periods) is to mask interrupts. Basic09 doesn't have any way to do this.

A subroutine gets no static data space given to it, so local storage space is created by decrementing the stack pointer and using the RAM then free above the stack pointer.

The other thing about a subroutine (normally) is that it has parameters passed to it, and passes parameters back to the calling program. In this case the calling program is in Basic09, but it could be any language, including machine code. (No, Basic09 does not get compiled down to machine code.)

The Basic09 calling line for my subroutine is 'run i2c (string,number)'. So two parameters are passed, a string and an integer. Note that these are passed "by reference", so what actually gets passed are the address of the string and the address of the integer.

Thus the subroutine can both use the string and integer, and in the case of reading the clock or I/O chip, put the bytes read into the string space.

Note how these parameters are in the stack, on entry to the subroutine. I equate names at the beginning of the subroutine code, to offsets from the stack pointer, which give me the passed parameters.

If you make up the circuit and want the assembly source code, let me know, and I can send a disk or put it on a Bulletin Board of your choice. The code as listed in the December CoCo should be correct, because it was photocopied straight from the AMUG newsletter (the AMUG editor wrapped the comment lines unfortunately).

The text of the article however, was retyped by CoCo/Softgold HQ, who added their own flavour to the spelling.

ASSEMBLY LANGUAGE ROUTINE:

```
*** SUBROUTINE I2C for Basic09  by Ken Wagnitz.

Vers equ 1
 mod ModEnd,ModNam,$21,$82,Entry,0
ModNam fcs "i2c"

* Entry: stack offsets as follows:
* (after S is increased by 4 for storage)
Return equ 4 return address of caller
PCount equ 6 # of parameters following
String equ 8 addr of str. 1st byte = address
StrLen equ 10 length of string
BCount equ 12 # of bytes to send/receive

hi set $00 hi value for PIAD
lo set $fc lo value for PIAD
lohi set $fc00
PIAD equ $ff20

*-----------------------------------
* Storage offsets
bits equ 1 bit counter
word equ 2 space to assemble tx/rx byte in
bytes equ 3 # of bytes to tx/rx
*-----------------------------------

Entry leas -4,s create storage for variables
 tfr s,u point to that storage
pshs cc
 orcc #$50 mask interrupts
 ldd PCount,u get the # of parameters
 cmpd #2 right number?
 lbne ParamErr abort if no
 ldd [BCount,u] get # bytes to tx/rx
 stb bytes,u save it
 ldd #lohi
 stb PIAD make sure SDA is hi

*** Write a Start sequence ***
 sta PIAD trigger & hi
 stb PIAD
 lbsr Delay
 sta PIAD go lo
 lbsr Delay
 stb PIAD restore hi

*** Send the device address ***
 ldx String,u point to address byte
 lda ,x get the addr byte
 lbsr WByte send it
 lbcs NoAck exit to Ack error
 lda ,x+ get address again
 rora put r/w bit into carry
 bcc Wrt

*** Read from device into buffer ***
Rd ldb #8 bit count
 stb bits,u

bitlp ldd #lohi
 stb PIAD make sure SDA hi
 sta PIAD trigger & hi
 stb PIAD
 lbsr Delay
 lda PIAD get i/p into lsbit
 lsra put bit into carry
 rol word,u put it in byte receiver
 lbsr Delay
```

```
 dec bits,u dec bit count
 bne bitlp

 lda word,u get the assembled byte
 sta ,x+ put it in buffer
 dec bytes,u dec byte count to read
 bne Ack
 bra Stop no ack for last byte

*** Send an Acknowledge ***
Ack ldd #lohi
 sta PIAD trigger & lo
 lbsr Delay2
 bra Rd

*** Write buffer to device ***
Wrt lda ,x+ get byte from buffer
 bsr WByte send it
 bcs NoAck
 dec bytes,u dec byte count
 bne Wrt

*** Send a stop sequence ***
Stop ldd #lohi
 sta PIAD trigger & lo
 lbsr Delay
 stb PIAD take SDA hi
 lbsr Delay2

*** Done and OK -Exit ***
Exit puls cc
 clrb no errors
 leas 4,s restore stack
Dummy rts exit subroutine

*---------------------------
* Wrong number of parameters
ParamErr ldb #$38 parameter error
 bra EExit

*---------------------------
* No Acknowledge from device
NoAck ldb #$f6 device_not_ready error
 bra EExit
*---------------------------

EExit puls cc
 orcc #1 set the carry
 leas 4,s restore stack
 rts

**********************************************
* Subroutine WByte.  Write the A reg to the port.
WByte sta word,u save send byte
 ldb #8 bit count
 stb bits,u
 ldd #lohi
wblp rol word,u put bit to write into carry
 stb PIAD make sure SDA is hi
 bcc wr0
wr1 sta PIAD trigger & hi
 stb PIAD
 bra wrnxt
wr0 sta PIAD trigger & leave lo
wrnxt lbsr Delay2
 dec bits,u dec bit count
 bne wblp

*** read the acknowledge ***
 stb PIAD make sure SDA is hi
 sta PIAD trigger & hi
 stb PIAD
 lbsr Delay
 lda PIAD get i/p
 lbsr Delay
 rora put bit into carry -expect 0.
 rts
*--------------------------------
Delay2 ldy #25
 bra Dloop

Delay ldy #5
Dloop leay -1,y
 bne Dloop
 rts

 emod
ModEnd equ *
 end
```

Continued from p55.

```
54180 '
54190 PRINT "PCLEAR0 ML NOW ADDE
D TO END OF  BASIC PROGRAM": PRI
NT "AND EXTRA BASIC CODE DELETED
"
54200 '
54210 DEL 54000-54520
54500 DATA 96,19,91,BA,27,2D,9E,
19,DE,BA,6F,C0,DC,A6,93,19,D3,BA
,C3,0,1,DD,A6,DF,19,CC6
54510 DATA A6,80,A7,C0,9C,1B,26,
F8,DF,1B,9E,19,1F,13,30,4,A6,80,
26,FC,AF,C4,EC,84,26,F2,39,CF5
```

Continued from p57

This procedure is used in the programs described above, to incorporate the ML routine which move the Basic pointers required to actually install the ML code there.

I don't normally use this procedure, except for very short routines, because it is more tedeous to set up, and it uses more memory in the Basic program.

Its main advantage is that it does not require any DATA statements, and hence avoids any conflict with the placement of DATA statements in the program.

With particular reference to the DELETE utility, it has another advantage in that once it has been used, the Basic code required can then be deleted from the program anyway.

It is mainly for this reason that I've submitted a second version of the utilities which are set up this way.

These versions are called SPCLEAR and SDELETE (for string version).

These are also set up so that they can be merged into another program and called with a GOSUB.

The ML code is poked into the cassette buffer (at Hex 1DA), and executed from there.

This reduces the size of the utility DELETE, because it removes the requirement for the code which moves it to the cassette buffer for execution.

Directory Printer

Here's a program to sort out those directory blues

by Barry Sidebottom

CoCo3
UTILITY

WHEN I BOUGHT MY CoCo 3, one of my used programs that was no longer compatible was one which manipulated the directory including sorting.

This program does that and then prints out a listing of the contents on a small index which when cut out will fit nicely into the disk jacket.

You can sort alphabetically and/or manually. At the start you are asked for the date, enter it as DD/MM/YY.

At the start of each read, you are asked for the drive enter 0 to 3 or 4 to quit the program.

You may have to change the printer codes to suit your printer. I use an AMUST 80DT which is pretty much an Epson.

Anyway the codes are:

line	code	function
72	27;14	double width for 1
76	27;15	compressed on
79	27;18	compressed off

I haven't had any problems so far, however I suggest you thoroughly test it with a couple of back-ups as it does manipulate your directory and I accept no responsibility for any mis-haps.

Nevertheless it has been very useful.

If any problems phone me on (03) 744-6281 and ask for Barry.

The Listing:

```
0 GOTO10
3 SAVE"107B:3":END'7
10 ' ====================
11 ' : DIRECTORY PRINTER :
12 ' :         by        :
13 ' : Barry  Sidebottom :
14 ' :====================
15 ' : ver.1.1 (3)  1987 :
16 ' :====================
17 '
18 '
19 CLEAR5000
20 'ON BRK GOTO675:ON ERR GOTO68
5
21 DIM DR$(72),E$(72)
22 WIDTH80:PALETTE7,0:PALETTE13,
32:PALETTE15,60:CLS8
23 IF W>0THEN25
24 ATTR5,7:SOUND220,1:PRINT"TODA
Y'S DATE : ";:ATTR1,7:LINEINPUT
TD$:W=1
25 LOCATE0,2:ATTR5,7:PRINT"( Ent
er drive #4 to end program.)"
26 LOCATE0,0:PRINT:LOCATE0,0:ATT
R5,7:SOUND220,1:PRINT"DRIVE #: "
;:ATTR1,7:LINEINPUT DD$:DD=VAL(D
D$):IF DD=4THEN84ELSE IF DD<0OR
DD>4THEN26
27 IF DD$=""THEN DD$="0":LOCATE9
,0:PRINTDD$;
28 LOCATE14,0:ATTR5,7,B:PRINT"(
standby .. )";
29 '
30 ' ** READ DIRECTORY
31 POKE65496,0
32 E=1:FOR Y=3TO11
33 DSKI$ DD,17,Y,A$,B$
34 C$=A$+LEFT$(B$,127)
35 A=1:FOR X=E TO E+7:DR$(X)=MID
$(C$,A,16)
36 TST$=LEFT$(DR$(X),1):TST=ASC(
TST$):IF TST$=CHR$(0)OR TST>127T
HEN E$(X)="":GOTO38
37 E$(X)=MID$(DR$(X),1,8)+" "+MI
D$(DR$(X),9,3):AA=AA+1
38 A=A+32:NEXT X:E=E+8:NEXT Y
39 POKE65497,0
40 LOCATE14,0:PRINT:GOSUB42:GOSU
B47:POKE65497,0:GOTO160
41 '
42 ' ** PRINT TO SCREEN
43 LOCATE0,2:PRINT:P=3:Q=2
44 ATTR7,7:FOR X=1TO68:LOCATE P,
Q:IF E$(X)=""THEN46ELSE PRINTE$(
X):Q=Q+1
45 IF Q>18THEN Q=2:P=P+17
46 NEXT X:RETURN
47 U=68-FREE(DD)
48 LOCATE13,0:ATTR5,7:PRINT"FILE
S :";:ATTR1,7:PRINTAA
49 LOCATE26,0:ATTR5,7:PRINT"GRAN
ULES USED :";:ATTR1,7:PRINTU
50 LOCATE47,0:ATTR5,7:PRINT"GRAN
ULES LEFT :";:ATTR1,7:PRINTFREE(
DD)
51 IF FREE(DD)=0THEN LOCATE65,0:
PRINT"(disk full!!)":RETURN ELSE
 RETURN
52 '
53 ' ** PRINTOUT
54 POKE65496,0
55 LOCATE0,20:ATTR5,7:SOUND220,1
:PRINT"DISK NAME :          ":LOCA
TE12,20:ATTR1,7:LINEINPUTDN$
56 IF LEN(DN$)>18THEN57ELSE59
57 LOCATE12,20:PRINT"TOO LONG !!
!  ( max 18 CHR's )":SOUND100,3:
FOR Q=1TO1000:NEXT
58 LOCATE12,20:PRINTSTRING$(LEN(
DN$)+1," "):GOTO55
59 LOCATE0,21:ATTR5,7:SOUND220,1
:PRINT"DISK #     : ";:ATTR1,7:LI
NEINPUT DM$
60 LOCATE0,22:ATTR5,7:SOUND220,1
:PRINT"BACKED UP? (Y/N)"
61 Z$=INKEY$:IF Z$=""THEN61
62 IF Z$="Y"THEN63ELSE IF Z$="N"
THEN67ELSE61
63 LOCATE18,22:ATTR1,7:PRINT"YES
"
64 LOCATE25,22:ATTR5,7:SOUND220,
1:PRINT"BACKUP DATE : ";:ATTR1,7
:LINEINPUT BD$
65 IF BD$=""THEN BD$="???":LOCAT
E39,22:PRINTBD$
66 GOTO69
67 LOCATE18,22:ATTR1,7:PRINT"NO"
68 BD$="NOT BACKED UP"
69 PP=PEEK(65314):IF PP/2=INT(PP
/2)THEN71
70 LOCATE40,20:PRINT"PRINTER OFF
-LINE !!";:SOUND220,1:LOCATE40,2
0:PRINT"printer off-line !!";:SO
UND220,1:GOTO69
71 LOCATE40,20:PRINT"
          ";:PRINT#-2,STRING$(4
6,157);CHR$(149)
72 PRINT#-2,CHR$(27);CHR$(14);"#
"DM$;TAB(6)DN$
73 PRINT#-2,"FILES :"A;TAB(12);"
GRANS USED :"U;:IF FREE(DD)=0THE
N PRINT#-2,TAB(29)"(DISK FULL.)"
ELSE PRINT#-2,TAB(29)"GRANS FREE
 :"FREE(DD)
74 IF LEFT$(BD$,3)="NOT"THEN PRI
NT#-2,BD$; ELSE PRINT#-2,"BACKUP
 DATE : ";BD$;
75 PRINT#-2,TAB(23)"DIR DATE : "
;TD$
76 PRINT#-2,CHR$(27);CHR$(15):FO
R X=1TO14
77 PRINT#-2,E$(X);TAB(16)E$(X+14
);TAB(32)E$(X+14*2);TAB(48)E$(X+
```

```
14*3);TAB(64)E$(X+14*4)
78 NEXT X
79 PRINT#-2,CHR$(27);CHR$(18)
80 FOR X=1TO10:PRINT#-2:NEXT:PRI
NT#-2,STRING$(46,157);CHR$(154)
81 LOCATE0,21:PRINT:PRINT:POKE65
497,0:GOTO160
82 '
83 ' ** END PROGRAM
84 LOCATE40,2:ATTR5,7:PRINT"ARE
YOU SURE? (Y/N)":SOUND220,1
85 Z$=INKEY$:IF Z$=""THEN85
86 IF Z$="Y"THEN87ELSE IF Z$="N"
THEN22ELSE85
87 PALETTE RGB:POKE113,0:EXEC409
99
88 '
89 ' ** ON BREAK
90 W=0:GOTO22
91 '
92 ' ** ON ERROR
93 CLS8:ATTR1,7:PRINT"WE HAVE EN
COUNTERED AN ERROR. MOST LIKELY
A DISK ERROR. PLEASE CHECK DISK
DRIVESAND PRESS ANY KEY WHEN REA
DY.":SOUND150,2
94 IF INKEY$=""THEN94
95 GOTO22
96 '
97 ' ** ALPHABETISE DIRECTORY
98 LOCATE0,20:PRINT
99 '
100 ' ** SORT
101 AA=0
102 FOR X=1TO72:E$(X)=DR$(X):NEX
T
103 LOCATE0,20:PRINT"SORTING -"
104 G=0:J=0
105 F=0
106 F=F+1
107 G=G+1
108 IF G>72THEN119
109 FOR H=1TO72
110 IF E$(H)<E$(F)THEN F=H
111 NEXT H
112 GOSUB115
113 E$(F)=STRING$(16,127)
114 GOTO105
115 J=J+1
116 DR$(J)=E$(F)
117 LOCATE9,20:PRINTJ;:SOUND220,
1
118 RETURN
119 FOR X=1TO72:IF DR$(X)=STRING
$(16,127)THEN DR$(X)=STRING$(16,
0):E$(X)=""ELSE E$(X)=MID$(DR$(X
),1,8)+" "+MID$(DR$(X),9,3):AA=A
A+1
120 TST$=LEFT$(DR$(X),1):IF TST$
=CHR$(0)THEN E$(X)=""ELSE E$(X)=
MID$(DR$(X),1,8)+" "+MID$(DR$(X)
,9,3):NEXT
121 NEXT
122 GOSUB43
123 GOTO160
124 '
125 ' ** MANUAL SORT
126 LOCATE0,20:PRINT
127 P=0:Q=2:FOR X=1TO AA
128 LOCATE P,Q:PRINT MID$(STR$(X
),2,LEN(STR$(X))-1);:Q=Q+1
129 IF Q>18THEN Q=2:P=P+17
130 NEXT
131 LOCATE1,21:ATTR5,7:PRINT"(A
TO ABORT)":LOCATE0,20:SOUND220,1
:PRINT"MOVE FILE #:";:ATTR3,7:LI
NEINPUTX$:X=VAL(X$)
132 IF X$="A"THEN135ELSE IF X>AA
OR X<1THEN131
133 LOCATE41,21:ATTR5,7:PRINT"(A
TO ABORT)":LOCATE40,20:SOUND220
,1:PRINT"MOVE INTO FILE #:";:ATT
R3,7:LINEINPUTY$:Y=VAL(Y$)
134 IF Y$="A"THEN135ELSE IF Y>AA
OR Y<1THEN133ELSE139
135 LOCATE0,21:PRINT:P=0:Q=2:FOR
X=1TO AA
136 LOCATE P,Q:PRINT"  ";:Q=Q+1
137 IF Q>18THEN Q=2:P=P+17
138 NEXT:GOTO160
139 P$=DR$(Y):DR$(Y)=DR$(X)
140 IF X>Y THEN141ELSE145
141 Y=Y+1:FOR Z=Y TO X
142 Q$=DR$(Z):DR$(Z)=P$:P$=Q$:NE
XT
143 FOR X=1TO AA:E$(X)=MID$(DR$(
X),1,8)+" "+MID$(DR$(X),9,3):NEX
T
144 GOSUB42:GOTO127
145 Y=Y-1:FOR Z=Y TO X STEP-1:GO
TO142
146 '
147 ' ** RE-WRITE DIRECTORY
148 LOCATE0,21:PRINT"ARE YOU SUR
E ? (Y/N)";:SOUND150,1
149 Z$=INKEY$:IF Z$=""THEN149
150 IF Z$="N"THEN151ELSE IF Z$="
Y"THEN152ELSE149
151 LOCATE0,21:PRINT:SOUND220,1:
GOTO162
152 POKE65496,0:A=1:B=5:F$=STRIN
G$(16," ")
153 FOR Y=3TO11:A$="":B$=""
154 FOR X=A TO A+3:A$=A$+DR$(X)+
F$:NEXT X
155 FOR X=B TO B+3:B$=B$+DR$(X)+
F$:NEXT X
156 DSKO$ DD,17,Y,A$,B$
157 A=A+8:B=B+8:NEXT Y
158 POKE65497,0:LOCATE0,21:PRINT
:SOUND220,1:GOTO162
159 '
160 ' ** OPTIONS
161 LOCATE0,20:ATTR3,7:PRINT"'A'
lphabetise, 'M'anual sort, 'R'
e-write dir, 'P'rint or 'N'ex
t disk read?";:SOUND220,1
162 Z$=INKEY$:IF Z$=""THEN162
163 IF Z$="A"THEN97ELSE IF Z$="M
"THEN125ELSE IF Z$="R"THEN147ELS
E IF Z$="P"THEN53ELSE IF Z$="N"T
HEN165ELSE162
164 '
165 ' ** PREPARE FOR ANOTHER REA
D
166 AA=0:Z=0:FOR X=1TO72:DR$(X)=
"":E$(X)="":NEXT:GOTO22
```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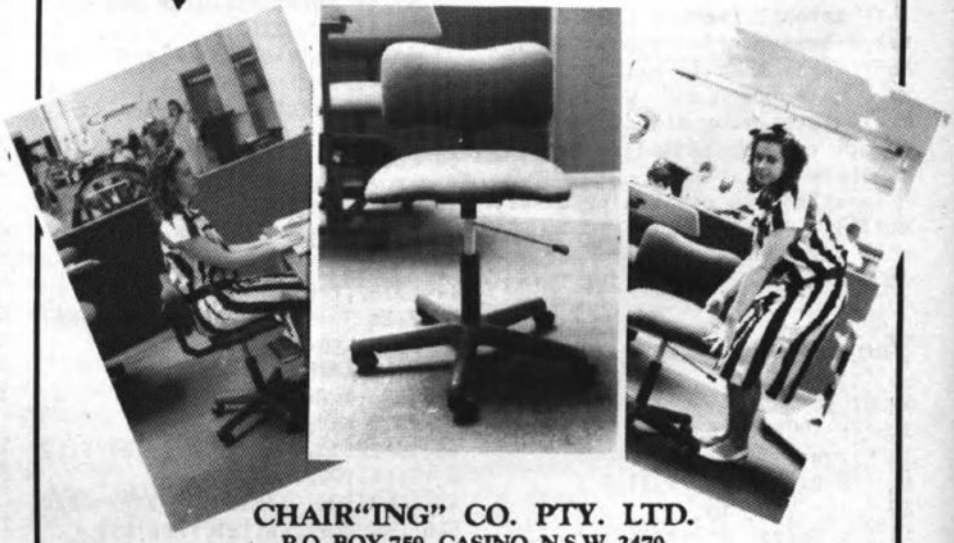
BACK "ING"

Correct posture for computer users



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200 years

Keep those Bi-Centennial programs coming in!

by Frank Buttigieg

CoCo3
GRAPHICS

I AM SUBMITTING THIS Graphic/ Educational and Electronic Birthday card. It shows a map of Australia and how each state was colonized during our 200 years of settlement.

Just follow the prompts and you'll be lead to the story of your Austrlia!

The Listing:

```
0 GOTO20
3 SAVE"111A:3":END'5
10 'AUSCOCO3...VERSION 1.3
15 ' Australian Heritage and my
own designed Flag        for the
competition ...by Frank Buttigie
g          c...1987...tel.03-741
6482...5 Kea crt Werribee      Vi
c...
20 POKE65497,0:WIDTH40:CLEAR500:
HBUFF1,800:HBUFF2,3402:HBUFF3,35
00:ONERRGOTO885:ONBRKGOTO890
22 HSCREEN2:PALETTECMP
25 HSCREEN0:POKE&HE6,2:HCLS2:CLS
6:LOCATE15,1:ATTR2,5:PRINT"H A P
 P Y";:LOCATE12,3:PRINT"B I R T
H D A Y";:LOCATE11,6:ATTR3,2,B:P
RINT"A U S T R A L I A";:ATTR2,5
30 LOCATE17,10:PRINT"From,";:LOC
ATE17,12:PRINT"T H E";:LOCATE11,
14:ATTR3,3,B:PRINT"B U T T I G I
 E G";:ATTR2,5:LOCATE14,16:PRINT
"F A M I L Y";:LOCATE6,19:ATTR2,
5,U:PRINT"Frank, Rita, Kym and M
elissa";:ATTR2,5:GOTO785
35 GOSUB630:GOTO113
40 HCOLOR5:HLINE(245,0)-(225,191
),PSET
45 HLINE(173,0)-(167,191),PSET
50 HLINE(101,0)-(110,156),PSET
55 HLINE(33,0)-(56,191),PSET'
    120'
60 HLINE(0,74)-(42,68),PSET
65 HLINE-(104,62),PSET
70 HLINE-(172,62),PSET
75 HLINE-(238,66),PSET
80 HLINE-(255,68),PSET
85 HLINE(0,138)-(49,131),PSET
90 HLINE-(108,126),PSET
95 HLINE-(169,126),PSET
100 HLINE-(230,131),PSET
105 HLINE-(255,133),PSET
110 HLINE(88,160)-(128,162),PSET
:HLINE-(136,163),PSET:HLINE(129,
156)-(124,191),PSET:RETURN
113 HSCREEN0:POKE&HE6,2:HCLS2:PA
LETTE0,1:CLS3:LOCATE11,11:ATTR5,
2,B:PRINT"\\\Moment please///":A
TTR2,5
115 HCOLOR4:HDRAW"BM254,106D3GD2
GDGFRD5GD6GD2GFLGD2GDGDGDGD2GLGD
2G3D2G2GLD2G2D2LG2DLG3D2FDG2DF2D
G2D":HLINE(225,180)-(220,184),PS
ET:HLINE-(212,183),PSET:HLINE-(2
06,187),PSET
120 HDRAW"BM206,187L2F2DL2H4E2H2
GDLHE2H2G3DL2DR3LGLGHL":HLINE(18
8,186)-(177,182),PSET
125 HDRAW"BM177,182DFLH2U2GLBM17
2,179LH3LHU6LULHL4E2R2U3LU2LU2HU
LGLD4LDL3UL2U"
130 HDRAW"BM155,146D2GD2FDGD2BM1
56,144G2DLDLDLD2LBM145,159U2EUE3
REBM139,156FR3DRDBM140,156EU4LUL
UH3ULUE2UL3UL4UL3UL3UL4UHG2L4DL3
"
135 HDRAW"BM150,160UR2URU4;BM156
,165L4DL2UL2DFDFRUR2DR2EU2":HDRA
W"BM1,106U3"
140 HDRAW"BM100,140ER2UR2URFDR4B
M86,142R3UFR3UR2UR2UR3BM76,148R3
UR2U2E2RURBM71,156EUR2URURU4BM55
,156R4UR4UR3FR4DBM45,161DFE2U3RU
RUR4BM36,168RURUR2E5BM24,159LHLD
3RG2F2R3DF2R2EDFR4"
145 HLINE(25,148)-(24,159),PSET:
HLINE(17,136)-(25,148),PSET:HDRA
W"BM17,136U2E":HLINE(9,123)-(18,
133),PSET:HDRAW"BM9,123U2E":HLIN
E(1,110)-(10,120),PSET:HDRAW"BM1
,110U2"
150 HLINE(1,108)-(6,114),PSET:HD
RAW"BM6,114R2":HLINE(8,114)-(4,1
10),PSET:HDRAW"BM4,110U2":HLINE(
4,108)-(8,112),PSET:HDRAW"BM8,11
2REUHFU":HLINE(2,100)-(10,108),P
SET:HDRAW"BM2,100RU2RU3RU3LU3LU2
LURUE2D2RDEU3"
155 HDRAW"BM8,81EURER3ERURURUR4U
R3FU2R3URURU2ERFUEDR2UR2DR2ER2UR
3U4E3U2E2LULU5RURUR3EURUF":HLINE
(59,43)-(64,51),PSET:HDRAW"BM64,
51U5LU2D2R2H4URUR2FDR3U2DRUH3U2E
2DF2RUH2EDF2EULULUER2U2DRDEULURE
F2RURUFE2U2R"
160 HDRAW"BM115,9DL2UL2DLDLU2LUL
UDR2D2FDR2UR2UEBL11LDLDRDR4ULUL"
165 HDRAW"BM86,22LF2R2D2F2RGFD5R
EU2EU2ERDRF3RH2R2DRDRU2RL3HURURU
2HU3FURUE2ULURE2F2H3URUR5UR5EUHU
L5H2U2R2DR2UEF2RFR2DF2R2EUDF4URF
4UE3R3FRDR2ULHURUR2FRDRDLDL2D2LD
2RDL4HD4R3D2L3D2LDL2DL2DF"
170 HDRAW"BM154,20F2GFR2L3GUL2UE
RUEBM156,32F3DLH2U2BM168,40FRDR5
H3L2G2":HSET(171,45,1):HSET(145,
9,1):HSET(148,8,1):HSET(149,8,1)
:HSET(150,6,1):HSET(152,5,1)
175 HLINE(139,27)-(168,44),PSET:
HDRAW"BM168,44D3R2DR2DR3UR4U3RU2
RU2RU3RU7E4RUHLU11RURULUE2U2RURU
2LURUR2DR2ERD2;L2D2R2D2GD2FR2DGD
RDRD3FGD2RFD4R2DURU2DRERF3D2RFD4
RD2LDLRLGDRDF2"
180 HLINE(214,44)-(216,56),PSET:
HLINE-(234,70),PSET:HDRAW"BM234,
70L3HF5DF2D3RD2RD2EU3DDF2RDR2DRD
2GDRDL2DF3U2":HLINE(244,89)-(254
,106),PSET
185 FORSL=30TO140:HSET(100,SL):N
EXT
190 FORSL=100TO177:HSET(SL,98):N
EXT
195 HLINE(177,98)-(172,181),PSET
200 FORSL=40TO98:HSET(160,SL):NE
XT
205 HLINE(176,120)-(228,124),PSE
T
210 HPRINT(29,22),"VIC"
215 HLINE(174,154)-(180,156),PSE
T:HDRAW"BM180,156DR2DF3DF3R3FD2F
2;BM195,170U2RUEUR4DRE2FR2DR3DR2
UF2DGDF2GDF":HLINE(215,176)-(225
,180),PSET'
220 HDRAW"BM228,124URURUR3UF3E2R
DRD2F2U2ERURDR2U2R2DR2"
225 HLINE(88,156)-(136,191),PSET
,B
230 HLINE(98,164)-(100,172),PSET
:HDRAW"BM100,172F3DLH":HLINE(100
,176)-(104,184),PSET:HDRAW"BM104
,184R3F2E2URULFDFG2RURURDLDE2":H
LINE(116,184)-(119,167),PSET:HDR
AW"BM119,167L3HDLDL3RDD3UHUL2DL3
UL2UHUL2ULHUE"
235 HDRAW"BM95,157D3GFE2H2URBM11
7,159FDFDRULHUHBM117,164R3FLHL"
240 PALETTE14,44:HPAINT(32,164),
14,4:HPRINT(5,12),"W.A."
245 PALETTE12,47:HPAINT(124,16),
12,4:HPRINT(14,7),"N.T."
250 HPAINT(166,156),7,4:HCOLOR8:
HPRINT(14,15),"S.A."
```

```
255 HPAINT(192,16),1,4:HCOLOR8:H
PRINT(23,9),"QLD."
260 HPAINT(184,128),9,4:HPRINT(2
3,17),"N.S.W."
265 HPAINT(180,172),5,4
270 PALETTE11,42:HPAINT(106,175)
,11,4:HCOLOR4:HPRINT(16,20),"T":
HPRINT(16,21),"A":HPRINT(16,22),
"S"
275 HPRINT(0,23),"AUSTRALIA"
280 HCOLOR8:HLINE(114,13)-(117,1
6),PSET,BF:HPRINT(15,2),"1"
285 HCOLOR8:HLINE(249,112)-(252,
115),PSET,BF:HPRINT(30,14),"2" '
Brisbane
290 HLINE(232,156)-(235,159),PSE
T,BF:HPRINT(29,18),"3"
295 HCOLOR8:HLINE(194,177)-(197,
180),PSET,BF:HPRINT(23,22),"4"
300 HLINE(161,158)-(164,161),PSE
T,BF:HPRINT(20,18),"5"
305 HLINE(25,148)-(28,151),PSET,
BF:HPRINT(4,18),"6"
310 HLINE(110,180)-(113,183),PSE
T,BF:HCOLOR4:HPRINT(12,23),"7"
315 HCOLOR8:HLINE(218,166)-(221,
169),PSET,BF:HPRINT(27,20),"8"
317 POKE&HE6C6,18:POKE&HE6C7,18:
HSCREEN2
320 I$=INKEY$:HCOLOR4:HPRINT(25,
0),"(0 = New Flag)":HPRINT(25,1)
,"Hit<SPACE-BAR>":EXEC44539:IFI$
=""THEN320ELSEIFI$="0"THEN750ELS
EHCOLOR2:HLINE(200,0)-(319,16),P
SET,BF:GOTO325
325 I$=INKEY$:HCOLOR4:HPRINT(25,
0),"Pick from (1-9)":IF I$<"1" O
R I$>"9" THEN325 ELSE HCOLOR2:HL
INE(200,0)-(319,16),PSET,BF:ON V
AL(I$) GOTO330,360,390,430,465,5
00,520,540,575
330 GOSUB705:HCOLOR5:HPRINT(0,0)
,"<1>Darwin NT":HPRINT(20,0),"Da
rwin is the chief":HPRINT(0,1),"
town of the":HPRINT(20,1),"North
ern Territory."
335 HPRINT(0,2),"and it is":HPRI
NT(20,2),"important as a point":
HPRINT(0,3),"of entry to":HPRINT
(20,3),"AUSTRALIA for all":HPRIN
T(0,4),"travellers,":HPRINT(20,4
),"as well as being a"
340 HPRINT(0,5),"center of":HPRI
NT(20,5),"agriculter & mining":H
PRINT(0,6),"in 1839 it":HPRINT(2
0,6),"was named after":HPRINT(0,
7),"the famous":HPRINT(20,7),"Ch
arles Darwin..."
345 HPRINT(0,8),"Darwin had":HPR
INT(20,8),"its real beginnings"
350 HPRINT(0,9),"in 1870's,":HPR
INT(20,9),"gradually the area op
ened":HPRINT(0,10),"up with the"
:HPRINT(20,10),"introduction of
the":HPRINT(0,11),"Telegragh":HP
RINT(20,11),"line, Railways and"
:HPRINT(0,13),"later with airway
 links."
355 HPRINT(0,14),"Darwin became
strategic as a military":HPRINT(
0,15),"base during  the war and
flourished":HPRINT(0,16),"again
when Uranium ore was discovered
in":HPRINT(0,17),"the 1950's at
Rum Jungle...":GOSUB620:GOTO113
360 GOSUB700:HCOLOR5:HPRINT(0,0)
,"No.2 is Brisbane, Qld.":HPRINT
(0,1),"Brisbane was founded":HPR
INT(0,2),"in 1834 then as part":
HPRINT(0,3),"of N.S.W. when a":H
PRINT(0,4),"seperation from":HPR
INT(0,5),"N.S.W. was achieved"
365 HPRINT(0,6),"In 1859, brisba
ne":HPRINT(0,7),"was declared th
en":HPRINT(0,8),"Capital City of
 the"
370 HPRINT(0,9),"newly created s
tate":HPRINT(0,10),"of Queenslan
d.":HPRINT(0,11),"In 1925 the ci
ty of":HPRINT(0,12),"Greater Bri
sbane":HPRINT(0,13),"was establi
shed,"
375 HPRINT(0,14),"Joining togeth
er":HPRINT(0,15),"The original t
own and":HPRINT(0,16),"the newer
 settlement at South Brisbane."
380 HPRINT(0,17),"In 6th June 18
59. the first Governor,":HPRINT(
0,18),"Sir George Ferguson Bowen
, landed at"
385 HPRINT(0,19),"Brisbane and p
roclaimed Queensland a new":HPRI
NT(0,20),"colony on the 10th Dec
ember 1859.":HPRINT(0,21),"From
1901, Queensland has been a Stat
e.":GOSUB620:GOTO113
390 GOSUB670:HCOLOR5:HPRINT(0,0)
,"No.3 is Sydney N.S.W.":HPRINT(
0,1),"Sydney ranks as one of the
 world's best":HPRINT(0,2),"site
d cities, with its spectacular":
HPRINT(0,3),"harbour ocean beach
es and backdrop of":HPRINT(0,4),
"vividly coloured mountai
395 HPRINT(0,5),"Its population
of over 2 3/4 million is":HPRINT
(0,6),"spread over nearly 700 Sq
uare miles of":HPRINT(0,7),"subu
rbs. First settled by Captain":H
PRINT(0,8),"Arthur Phillip and h
is first fleet of"
400 HPRINT(0,9),"11 ships in 188
7, at a spot he called":HPRINT(0
,10),"Sydney Cove. The City grew
 gradually"
405 HPRINT(0,11),"from a tiny pe
nal colony into a well":HPRINT(0
,12),"established town by the mi
d-1800's.":HPRINT(0,13),"the gol
d-rush of the 1850's,"
410 HPRINT(0,14),"greatly to the
 size it is now."
415 HPRINT(0,15),"The name 'New
South Wales' was":HPRINT(0,16),"
given to the eastern part of":HP
RINT(0,17),"Australia, then know
n as"
420 HPRINT(0,18),"New Holland, o
n its discovery"
425 HPRINT(0,19),"by Captain Jam
es Cook in 1770.":HPRINT(0,20),"
Until 1827 all australian":HPRIN
T(0,21),"territory east of the 1
35th":HPRINT(0,22),"meridian was
 known by that name.":GOSUB620:G
OTO113
430 GOSUB685:HCOLOR4:HPRINT(29,2
2),"VIC"
435 HCOLOR5:HPRINT(0,0),"No.4 is
 Melbourne Victoria.":HPRINT(0,1
),"Melbourne, the capital of Vic
toria, is":HPRINT(0,2),"a well-p
lanned, spacious city situated":
HPRINT(0,3),"on the Yarra River,
at the head of Port":HPRINT(0,4)
,"Phillip Bay."
440 HPRINT(0,5),"The first settl
ement by white men was":HPRINT(0
,6),"made by John Batman and Joh
n P Fawkner":HPRINT(0,7),"a smal
l corporated town until the gold
":HPRINT(0,8),"rush of 1850's fr
om then on, the people"
445 HPRINT(0,9),"been agitating
for seperation from NSW.,":HPRIN
T(0,10),"and this was finally ac
hieved in 1851.":HPRINT(0,11),"I
ts flourishing population contin
ued":HPRINT(0,12),"into the 1870
's and 80's, which saw the"
450 HPRINT(0,13),"foundation of
the present City, such as"
455 HPRINT(0,14),"the beautiful
laid out parks and gardens,":HPR
INT(0,15),"when the gold fever p
etered out,Melbourne":HPRINT(0,1
6),"expanded still more to becom
e"
460 HPRINT(0,17),"an industrial
and financial centre.":HPRINT(0,
18),"Until Canberra was chosen f
or the":HPRINT(0,19),"national c
apital in":HPRINT(0,20),"1927, t
he Federal":HPRINT(0,21),"Parlia
ment sat in":HPRINT(0,22),"Melbo
urne.":GOSUB620:GOTO113
465 GOSUB710:HCOLOR5
470 HPRINT(0,0),"No.5 is Adelaid
e Sth. Aust.":HPRINT(0,1),"The c
olonisation of Sth. Australia wa
s":HPRINT(0,2),"a change in the
British colonial policy.":HPRINT
(0,3),"Although American sealers
 and runaway":HPRINT(0,4),"convi
cts had been forming
475 HPRINT(0,5),"settlements fro
m 1804 onwards, it was":HPRINT(0
,6),"not until 1836 that Col. Wi
lliam Light":HPRINT(0,7),"select
ed a site for Adelaide on the":H
PRINT(0,8),"River Torrens, and t
he first governor of"
480 HPRINT(0,9),"the colony, Cap
t. John Hindmarsh,":HPRINT(0,10)
,"proclaimed the new Colony on 2
8/12/1836.":HPRINT(0,11),"Adelai
de was incorporated in 1840 thus
"
485 HPRINT(0,12),"making it the
oldest":HPRINT(0,13),"municipali
ty in Australia.":HPRINT(0,14),"
Heavy immigration followed the":
HPRINT(0,15),"discovery of coppe
```

```
r in 1843":HPRINT(0,16),"and con
tinued until the Vic."
490 HPRINT(0,17),"gold-rush in 1
851.Wheat became":HPRINT(0,18),"
the principal export and S.A.":H
PRINT(0,19),"became self-support
ing and"
495 HPRINT(0,20),"attained self-
government in 1856.":GOSUB620:GO
TO113
500 GOSUB725:HCOLOR5:HPRINT(0,0)
,"No.6 is Perth W.A.":HPRINT(12,
1),"Dirk Hartog in the Eindracht
,":HPRINT(13,2),"a Dutch sailing
 ship,explored":HPRINT(13,3),"Sh
ark Bay in October 1616."
505 HPRINT(13,4),"the following
years rapid"
510 HPRINT(13,5),"visits were ma
de until 1827,":HPRINT(13,6),"wh
en James Stirling, in the":HPRIN
T(13,7),"H.M.S Success, examined
 the":HPRINT(13,8),"Swan River.
In May, 1829,":HPRINT(13,9),"Cap
t.Freemantle took formal"
515 HPRINT(13,10),"possession of
 western Third":HPRINT(13,11),"o
f the Australian Continent.":HPR
INT(13,12),"Perth was founded in
 1829":HPRINT(13,13),"and was cr
eated the capital":HPRINT(13,14)
,"of Western Australia...":GOSUB
620:GOTO113
520 GOSUB740:HCOLOR5:HPRINT(0,0)
,"No.7 is Hobart Tasmania:":HPRI
NT(0,2),"In 1642 Captain Abel Ta
sman landed on":HPRINT(0,3),"the
 east coast at Blackmans Bay, na
ming":HPRINT(0,4),"it Van Dieman
's land."
525 HPRINT(0,5),"the first settl
ement was made by":HPRINT(0,6),"
Lt.John Bowen at Risdon Cove on
the 11th."
530 HPRINT(0,7),"September 1803.
 Hobart was":HPRINT(0,8),"founde
d as a penal colony in 1804 and"
:HPRINT(0,9),"named Hobart Town
for the british":HPRINT(0,10),"s
tateman Lord Robert Hobart.":HPR
INT(0,11),"It became the capital
 of Tasmania"
535 HPRINT(0,12),"in 1825,was ch
artered as a City in 1857.":GOSU
B620:GOTO113
540 GOSUB670:HCOLOR5:HPRINT(0,0)
,"No.8 is Canberra A.C.T.":HPRIN
T(0,1),"The capital city of Aust
ralia, is":HPRINT(0,2),"located
in the Australian Capital":HPRIN
T(0,3),"Territory, within the St
ate of  N.S.W.,"
545 HPRINT(0,4),"about 300 km.,
SW of Sydney, and 658 km.":HPRIN
T(0,5),"NE of Melbourne, Victori
a."
550 HPRINT(0,6),"Located on an e
levated plateau,the City":HPRINT
(0,7),"is the site of the Capita
l known as the":HPRINT(0,8),"Par
liament House. a major World-wid
e":HPRINT(0,9),"competition was
held to choose an"
555 HPRINT(0,10),"Architect, and
 Walter Burley Griffon,":HPRINT(
0,11),"an American, was chosen i
n 1911.
560 HPRINT(0,12),"Construction w
as delayed due to W.W/1,":HPRINT
(0,13),"and it was not until 192
7":HPRINT(0,14),"that the Parlia
ment House":HPRINT(0,15),"was of
ficially opened.":GOSUB620:GOTO1
13
565 HCOLOR1:HPRINT(26,2),"Press
ANYKEY":EXEC44539:HPRINT(26,2),"
                ":GOTO113
570 LOCATE13,23:FORC=1TO7:LOCATE
13,23:ATTR3,C:PRINT"Press ANY KE
Y.";:NEXT:EXEC44539:IFINKEY$=""T
HEN570ELSEATTR2,5:GOTO113
575 GOSUB40:HCOLOR8:HPRINT(9,11)
,"Long/Lat.Display"
580 HCOLOR9:HPRINT(27,0),"150'":
HPRINT(19,0),"140':HPRINT(9,0),
"130'":HPRINT(0,0),"120'":HPRINT
(0,8),"20'":HPRINT(0,18),"30':H
PRINT(8,20),"40':HPRINT(12,18),
"150'"
585 GOTO565
590 P$="O1GO2CO1GEGO2L3CP80L8CP5
0L3CL4EDCO1BO2CL2DL4"
595 P1$="O1GO2CO1GECL3GP40L10GP8
0L4GO2EDCO1BAL2G"
600 P2$="O1GL3AL6BO2L4CO1AL3GL8E
P40L4EGAO2CFEL2DO1L4GL3AL6BO2L4C
O1AL3GO2L6P80CL4C"
605 P3$="L4DL3EL6CL3DO1L6BO2L2C
610 P4$="L4O2EFEDCO1L3BL6AL3GO2T
3"+P3$
615 PLAY"V31T3L4"+P$+P1$+P2$+P3$
+P4$
620 FORC=0TO15:HCOLORC:HPRINT(11
,23),"press ANY Key":NEXT:EXEC44
539
625 RETURN
630 WIDTH40:CLS6
635 LOCATE11,0:ATTR3,6,B:PRINT"A
USTRALIAN HERITAGE";:ATTR2,5
640 LOCATE11,1:ATTR2,0,U:PRINT"B
y: FRANK BUTTIGIEG";:ATTR2,5
644 LOCATE1,2
645 ATTR4,5:PRINT"AUSTRALIA...Aa
h! a wonderful Country...INDEED.
..and so the story goes like thi
s";:PRINT" It was the 23rd.of Au
gust 1770 when thehistory of Aus
tralia was brought into a defini
te political connection with the
  Western civilisation...
650 PRINT" On that date Captain
James Cook took  possession of
the whole eastern coast,  from l
atitude 38'S.to this lat.10 1/2'
S.in right of HM King George the
 Third..."
655 PRINT" This covered an area
of what is now theeastern coasts
 of New South Wales,  Victor
ia and Queensland...
   Britain took formal possessio
n of the  known regions of Austr
alia on 26/1/1788.";
660 PRINT" Captain Phillip's com
mission was first issued to him
in 1786,  it was amplified in 178
7,and he read it to the people o
f the 1st.fleet on 26th. January
 1788,  the date we now celebr
ate as..."
665 LOCATE2,23:FORI=1TO50:FORC=1
 TO 7:LOCATE2,22:ATTR3,C:PRINT"*
****A U S T R A L I A  D A Y***
**";:SOUND1+RND(100),1:NEXTC,I:L
OCATE2,22:ATTR3,2,B:PRINT"*****A
 U S T R A L I A  D A Y*****";:A
TTR2,5:GOTO570
670 HCOLOR2:HLINE(0,0)-(255,118)
,PSET,BF:HLINE(0,118)-(172,191),
PSET,BF
675 FORX=156TO191:HLINE(168,X)-(
232,191),PSET:NEXT
680 HGET(172,116)-(255,188),2:HL
INE(172,116)-(256,188),PSET,BF:H
PUT(236,116)-(319,188),2:RETURN
685 HCOLOR2:HLINE(0,0)-(255,148)
,PSET,BF:HLINE(0,148)-(168,191),
PSET,BF
690 FORY=148TO188:HLINE(168,144)
-(255,Y),PSET:NEXT
695 RETURN 'Vic display only
700 HCOLOR2:HLINE(0,128)-(255,19
1),PSET,BF:HLINE(0,0)-(156,191),
PSET,BF:RETURN
705 HCOLOR2:HLINE(160,0)-(255,19
1),PSET,BF:HLINE(0,104)-(255,191
),PSET,BF:HLINE(0,0)-(92,191),PS
ET,BF:RETURN
710 HCOLOR2:HLINE(0,0)-(255,96),
PSET,BF:HLINE(0,96)-(96,191),PSE
T,BF:HLINE(180,96)-(255,191),PSE
T,BF
715 HLINE(88,156)-(136,191),PSET
,BF
720 HGET(100,96)-(176,182),3:HLI
NE(96,96)-(179,184),PSET,BF:HPUT
(243,96)-(319,182),3:RETURN
725 HCOLOR2:HLINE(103,0)-(255,19
1),PSET,BF
730 HLINE(88,156)-(136,191),PSET
,BF:RETURN
740 HCOLOR2:HLINE(0,0)-(255,156)
,PSET,BF:HLINE(0,156)-(88,191),P
SET,BF:HLINE(136,156)-(255,191),
PSET,BF:HLINE(0,191)-(255,191),P
SET:RETURN
745 'H8UFF4,900:HGET(88,156)-(13
6,191),4:LINE(88,156)-(136,191),
PSET,BF:HPUT(88,132)-(136,167),4
:RETURN
750 HSCREEN2:CLS0:HCLS8:HCOLOR2:
HLINE(0,0)-(275,100),PSET,BF
755 HCOLOR3:HLINE(0,100)-(275,14
4),PSET,BF
760 HCOLOR1:HLINE(0,144)-(275,19
1),PSET,BF
765 HDRAW"C4BM44,12M54,22M66,22M
64,34M74,46M60,52M58,66M44,60M30
,66M28,52M14,46M24,34M22,22M34,2
2M44,12":HPAINT(44,20),4,4
770 HCIRCLE(46,26),3,2:HPAINT(46
,26),2,2:HCIRCLE(54,34),3,2:HPAI
NT(54,34),2,2:HCIRCLE(50,42),2,2
```

Continued next page

Music, Music, Music

If you're into music, this hits the right note

by Nick Kostarelas

32K ECB
MUSIC

A LONG TIME back, when my brother brought home an IBM-PC from his work, I was interested in the machine, and played around with the few programs that came with it.

I liked a BASIC program called Music and wondered if it could run on my CoCo.

Since my brother had the computer only for the weekend, I printed out several BASIC programs, including the music program.

After about a year, I cleaned the dust off the listings and try to do what I intended to do a year back.

After I typed the program in my CoCo and a lot of playing around, I finally got the music as accurate as possible.

There are two programs - the first one, "MUSIC 1", is a selection type music program, where the music is played on a piano with a musical note.

The second program, "MUSIC 2", draws a chicken with the appropriate song, and plays all songs.

This program has better music quality, since it does not have to redraw every note, like in the first program.

Both programs are originals from IBM, as well as the music composure.

I only converted the programs to run on a CoCo, so the copyright still remains with IBM.

The Listing:

```
 0 GOTO10
3 SAVE"93F:3":END'6
10 '*****************************
20 '*                           *
30 '*     MUSIC VERSION 1.2     *
40 '*  (C) COPYRIGHT IBM 1981   *
50 '* MODIFIED NICK KOSTARELAS *
60 '*          05/07/85         *
70 '*                           *
80 '*****************************
90 CLS:PMODE0,1:PCLEAR4
100 CLEAR1000
110 PLAY"V30"
120 PRINT@105,"color computer"
130 PRINT:PRINTTAB(7)"MUSIC VERS
ION 1.2"
140 PRINT:PRINTTAB(10)"MODIFIED
BY:":PRINTTAB(6)"NICK KOSTARELAS
 1985"
150 PRINT@482,"(C) COPYRIGHT IBM
 CORP. 1981";
160 PMODE3,1:PCLS:DIMG(202)
170 CIRCLE(171,31),4,2:CIRCLE(16
5,33),4,2:PSET(171,31,3):PSET(16
5,33,3)
180 FORQ=1TO12:READJ,C,X1,Y1:COL
ORC:LINE(X1,Y1)-(X1,Y1),PSET:FOR
I=1TOJ:READX2,Y2:LINE-(X2,Y2),PS
ET:NEXTI,Q
190 FORT=1TO9:READX,Y,Z:PAINT(X,
```

From previous page

```
:HCIRCLE(48,54),3,2:HPAINT(48,54
),2,2:HCIRCLE(38,38),3,2:HPAINT(
38,38),2,2
775 GOSUB590
780 GOTO113
785 HCOLOR8:HLINE(276,0)-(319,19
1),PSET,BF:HCOLOR5:HPRINT(35,4),
"A":HPRINT(35,6),"D":HPRINT(35,8
),"V":HPRINT(35,10),"A"
786 HPRINT(35,12),"N":HPRINT(35,
14),"C":HPRINT(35,16),"E"
787 HPRINT(37,3),"A":HPRINT(37,5
),"U":HPRINT(37,7),"S":HPRINT(37
,9),"T":HPRINT(37,11),"R":HPRINT
(37,13),"A":HPRINT(37,15),"L":HP
RINT(37,17),"I":HPRINT(37,19),"A
"
788 HPRINT(39,4),"F":HPRINT(39,6
),"A":HPRINT(39,8),"I":HPRINT(39
,10),"R":HPRINT(39,12),"*":HPRIN
T(39,14),"*":HPRINT(39,16),"*"
790 HDRAW"C4BM0,0M0,4M36,36M0,36
M0,40M56,40M56,0M52,0M52,28M20,0
M16,0M52,32M52,36M40,36M0,0":HPA
INT(54,38),4,4:HDRAW"BM38,36M0,2
BM52,30M18,0"
795 HDRAW"C4BM72,0M72,40M128,40M
128,36M92,36M128,4M128,0M88,36M7
6,36M76,32M112,0M108,0M76,28M76,
0M72,0":HPAINT(74,38),4,4:HDRAW"
BM76,30M110,0BM90,36M128,2"
800 HDRAW"C4BM128,56M72,56M72,96
M76,96M76,68M108,96M112,96M76,64
M76,60M88,60M128,96M128,92M92,60
M128,60M128,56":HPAINT(74,58),4,
4:HDRAW"BM76,66M110,96BM90,60M12
8,94"
805 HDRAW"C4BM0,56M56,56M56,96M5
2,96M52,68M20,96M16,96M52,64M52,
60M40,60M0,96M0,91M35,60M0,60M0,
56":HPAINT(54,58),4,4:HDRAW"BM38
,60M0,94BM50,68M18,96"
810 HDRAW"C3BM57,0M71,0M71,41M12
8,41M128,55M71,55M71,96M57,96M57
,55M0,55M0,41M57,41M57,0":HPAINT
(64,4),3
815 HDRAW"C3BM1,96M41,61M51,61M5
1,63M15,96M1,96BM127,96M113,96M7
7,63M77,61M87,61M127,96"
820 HPAINT(12,4),3,4:HPAINT(84,6
4),3,3:HPAINT(116,4),3,4:HPAINT(
44,64),3,3
825 HCOLOR4,2:HDRAW"BM156,71M161
,76M168,76M167,83M172,88M165,91M
164,100M156,96M148,100M147,91M14
0,88M145,83M144,76M151,76M156,71
":HPAINT(156,76),4,4
830 HGET(140,71)-(172,100),1
835 HPUT(140,72)-(172,100),1,PSE
T
840 HPUT(176,16)-(208,44),1,PSET
845 HPUT(216,64)-(248,92),1,PSET
850 HPUT(188,152)-(220,180),1,PS
ET
855 HDRAW"BM216,108M218,114M224,
114M220,118M222,124M216,120M210,
124M212,118M208,114M214,114M216,
108"
860 HPAINT(216,116),4,4
865 HDRAW"C4BM64,116M74,126M90,1
26M86,142M96,152M82,158M80,172M6
4,166M48,172M46,158M32,152M42,14
2M38,126M54,126M64,116":HPAINT(6
4,128),4,4
869 POKE&HE6,2:POKE&HE6C6,18:POK
E&HE6C7,18:HSCREEN2
870 GOSUB590
875 EXEC44539
880 GOTO35
885 WIDTH32:PALETTECMP:ATTR2,5:P
RINT"ERROR";ERNO;"IN LINE";ERLIN
:STOP
890 WIDTH32:PALETTECMP:ATTR2,5:S
TOP
```

```
Y),Z,2:NEXTT
200 COLOR1:READX1,Y1:LINE(X1,Y1)
-(X1,Y1),PSET:FORI=1TO7:READX2,Y
2:LINE-(X2,Y2),PSET:NEXTI
210 'mouth and beak
220 DATA 9,2,185,43,192,44,196,4
7,198,40,198,35,197,33,195,31,19
1,29,179,30,174,31
230 'crest
240 DATA 31,2,168,30,160,21,159,
18,158,16,158,13,156,10,155,11,1
54,15,154,23,150,20,146,14,145,1
5,144,17,144,20,146,23,141,22,13
9,22,138,23,138,25,139,27,141,30
,137,29,134,30,132,32,132,34,135
,37,138,39,141,38,150,35,155,33,
159,31,162,30
250 'top of head
260 DATA 5,2,179,30,176,26,174,2
5,172,24,166,24,164,25
270 'back of head
280 DATA 16,2,149,35,148,40,148,
47,149,51,150,54,151,55,153,56,1
54,56,157,57,165,57,168,56,170,5
5,175,53,177,51,179,50,181,48,18
5,43290 DATA 6,2,175,52,172,50,1
70,49,166,45,165,43,165,38,166,3
6
300 'left wing
310 DATA 22,2,157,57,156,60,153,
63,152,64,148,65,144,66,140,67,1
37,68,134,69,130,72,131,74,133,7
5,137,74,139,72,142,74,144,74,14
7,71,149,73,151,72,153,70,155,71
,158,70,160,68
320 'stomach
330 DATA 15,2,149,73,148,76,148,
77,149,79,150,80,152,81,155,81,1
60,80,161,80,165,78,169,74
340 DATA 171,72,172,70,172,65,17
1,62,169,56
350 'right wing
360 DATA 19,2,169,57,175,59,179,
58,185,55,192,51,192,53,190,57,1
83,59,185,60,186,62,183,65,183,6
6,182,67,180,67,177,65,179,67,18
0,69,177,71,175,71,171,70
370 'tail
380 DATA 18,2,148,76,126,85,125,
87,126,88,130,88,134,86,130,90,1
31,92,133,93,140,90,138,93,140,9
5,141,95,145,92,146,93,149,93,15
0,92,151,89,151,81
390 'legs
400 DATA 8,2,152,81,154,86,154,9
9,154,86,156,81,158,86,160,80,15
8,86,158,100
410 'left foot
420 DATA 5,2,154,99,146,101,154,
99,150,101,154,99,150,102
430 'right foot
440 DATA 5,2,158,100,164,99,158,
100,162,101,158,100,162,102
450 'paint coordinates
460 DATA 150,30,3,168,28,3,185,3
7,2,155,45,3,165,70,3,180,63,3,1
40,85,3,154,82,3,158,82,3,169,41
,174,38,172,39,172,41,173,43,175
,45,178,45,185,43
470 GET(125,10)-(210,103),G,G:PC
LS:SCREEN1,0
480 FORP=1TO11
490 POKE65495,0:PCLS:PUT(125,10)
-(210,103),G,PSET:POKE65494,0
500 ONP GOSUB530,640,800,920,105
0,1190,1330,1480,1580,1710,1780
510 NEXTP
520 FORI=1TO500:NEXT:CLS:END
530 'la cucaracha - mexican folk
 song
540 GOSUB1910:PAINT(195,93),3,2:
CIRCLE(185,87),1,0:LINE(183,90)-
(185,88),PSET:PAINT(185,87),0,0
550 DATA 9,21,2,207,93,207,92,20
5,91,190,91,189,87,188,85,186,84
,188,81,186,84,184,84,184,80,184
,84,181,87,182,89,183,90,185,90,
185,92,184,93,185,95,205,95,207,
94,207,93
560 DATA 1,2,186,95,184,99,1,2,1
87,95,187,99,1,2,192,95,190,99,1
,2,192,95,194,99,1,2,198,95,197,
99,1,2,201,95,202,99,1,2,206,95,
204,99,1,2,206,95,208,99
570 A$="T5L16O2DP16L16DP16L16DP1
6L12GL12.P6BP6"
580 B$="L16O2DP16L16DP16L16DP16L
12GL12.P6BP6"
590 C$="O1L16DP16DP16GL16.P8L16O
2GP16GP16F#P16F#P16EP16EP16L2.D"
600 D$="L16DP16L16DP16L16DP16L12
F#L12.P6AP6"
610 F$="O1L16AP16AP16DL16.P8O3L8
DEDCO2BAL2.G"
620 PLAY"XA$;XB$;XC$;XD$;XD$;XF$
;"
630 RETURN
640 'blue danube waltz by j.s.st
rauss
650 GOSUB1910:FORJ=1TO6:READX,Y:
PAINT(X,Y),1,2:NEXTJ
660 DATA 3,9,2,192,53,193,60,192
,67,186,80,180,86,170,92,165,94,
160,95,155,96,140,95,2,2,132,82,
130,76,130,72
670 DATA 14,2,163,59,166,57,169,
52,169,55,170,59,171,61,167,59,1
63,59,159,60,154,61,156,59,157,5
7,156,52,159,57,163,59,165,85,15
6,90,150,94,140,77,167,58,158,58
680 A$="T4O2L6DF#AL6AP6L6O3AAP6F
#F#P6"
690 B$="O2L6DDF#AL6AP6L6O3AAP6GG
P6"
700 C$="O2L6C#C#EL6BBP6L6O3BBP6G
GP6"
710 D$="O2L6C#C#EL6BBP6L6O3BBP6F
#F#P6"
720 E$="O2L6DDF#AO3DP6O4DDP6O3AA
P6"
730 F$=LEFT$(E$,22)+"BBP6"
740 G$="O2L6EEGBL3..BL6G#AO3L3..
F#"
750 H$="L6DO2F#L6..F#EL6EL6..BL6
ADP12L12DL12.DP6"
760 I$="L6AGP6AGP6AL3O3L6..F#L6E
O2AF#P6AF#P6AL3..O3E"
770 J$="L6DO2AGP6AGP6AL3..O3F#L6
EO2AO3DEF#L3AL6GL12F#F#L5F#ED"
780 PLAY"XA$;XB$;XC$;XD$;XE$;XF$
;XG$;XH$;XI$;XJ$;"
790 RETURN
800 'humoresque by dvorak
810 DATA 31,2,168,30,160,21,159,
18,158,16,158,13,156,10,155,11,1
54,15,154,23,150,20,146,14,145,1
5,144,17,144,20,146,23,141,22,13
9,22,138,23,138,25,139,27,141,30
,137,29,134,30,132,32,132,34,135
,37,138,39,141,38,150,35,155,33,
159,31,162,30
820 DATA 5,2,179,30,176,26,174,2
5,172,24,166,24,164,25
830 GOSUB1880
840 GOSUB1910:LINE(149,35)-(148,
40),PRESET
850 DATA 3,11,2,147,3,145,2,145,
4,144,5,144,7,145,8,146,7,149,6,
151,4,152,2,148,2,147,3,13,2,149
,6,145,30,149,6,167,18,145,30,14
3,32,140,35,139,36,139,38,142,40
,145,43,151,40,155,36,162,34
860 DATA 11,2,173,29,176,26,178,
22,178,18,175,15,173,17,172,15,1
70,15,164,20,158,22,157,25,145,3
0
870 PAINT(147,5),4,2:PAINT(150,2
0),3,2:PAINT(160,30),4,2:CIRCLE(
153,17),4,2:PAINT(153,17),4,2
880 A$="T4O2L8GP16L16AL8GP16L16A
L8BP16O3L16DL8EP16L16DL8GP16L16F
#L8AP16L16GL8F#P16L16AL8GP16L16E
L8DP16L16DL8EP16L16DL8GP16L16EL8
DP16O2L16BL2.A"
890 B$=LEFT$(A$,100)+"GP16O2L16G
L4AO3DO2L2.G"
900 PLAY"XA$;XB$;"
910 RETURN
920 'pop! goes the weasel - anon
ymous
930 GOSUB1910:PAINT(225,85),1,2:
PAINT(223,60),2,2:PAINT(223,66),
4,2:CIRCLE(220,47),1,3:CIRCLE(22
5,47),1,3:PSET(222,50,3):COLOR3:
FORI=1TO5:READX1,X2,Y2:LINE(X1,5
0)-(X2,Y2),PSET:NEXT
940 DATA 2,7,2,205,70,205,100,24
0,100,240,70,232,63,213,63,205,7
0,240,70,27,2,213,70,213,69,220,
65,221,64,221,55,218,51,217,48,2
16,48,214,46,214,44,215,43,216,4
3
950 DATA 218,45,220,43,225,43,22
7,45,229,43,230,43,232,44,232,46
,230,47,228,48,227,51,225,55,225
,64,226,65,232,69,232,70,219,217
,54,218,215,52,218,213,49,225,23
2,52,226,228,54
960 A$="T3O2L16GP16GAP16AL18BO3D
O2BL16GP16"
970 B$="DGP16GAP16AL9.BL16GP16"
980 C$="DL16GP16GAP16AL18BO3DO2B
L16GP8"
990 D$="O3L16.EP16O2AP16O3L16CO2
L9.BL12GP16"
1000 E$="O3L16GP16GEP16L16GF#AF#
DP16"
1010 F$=LEFT$(E$,14)+"GL9.F#L9DP
12"
1020 G$="L16CP16O2BO3CP16DEP16F#
GL16.P12EL16P12O2L16.AL16P16O3CO
2L9.BL9GP16"
1030 PLAY"XA$;XB$;XC$;XD$;XE$;XF
```

```
$;XG$;"
1040 RETURN
1050 'symphony #40 by mozart
1060 GOSUB1910:PAINT(215,60),1,2
1070 DATA 5,4,2,205,55,241,40,23
6,53,194,70,205,55,6,2,210,65,21
0,96,204,102,210,96,211,102,210,
96,216,102,1,2,210,75,223,60,1,2
,192,53,225,32,1,2,192,54,225,33
1080 A$="T5O3L8E-DL4DL8E-DL4DL8E
-DL4DL4DL4B-P4"
1090 B$="L8B-AL4GL8GFL4GL8GFL4E-
L8E-DL4CCP4"
1100 C$="L8DCL4CL8DCL4CL8DCL4CAP
4"
1110 D$="L8AGL4G-L8G-E-L4DL8DCO2
L4B-B-4"
1120 E$="O3L8B-AL4AO4CO3G-AGDP4"
1130 F$="O3L8B-AL4AO4CO3G-AGB-"
1140 G$="L8AGFE-L4DO2F#GAB-O3L8C
O2B-L4AGO3DP4"
1150 H$="O4L2C#L4DP4"
1160 J$="O4L2C#L8DP8C#P8DP8C#P8D
P8"
1170 PLAY"XA$;XB$;XC$;XD$;XE$;XF
$;XG$;XH$;XH$;XJ$;"
1180 RETURN
1190 'yankee doodle - anonymous
1200 DATA 31,2,168,30,160,21,159
,18,158,16,158,13,156,10,155,11,
154,15,154,23,150,20,146,14,145,
15,144,17,144,20,146,23,141,22,1
39,22,138,23,138,25,139,27,141,3
0,137,29,134,30,132,32,132,34,13
5,37,138,39,141,38,150,35,155,33
,159,31,162,30
1210 DATA 5,2,179,30,176,26,174,
25,172,24,166,24,164,25
1220 GOSUB1880
1230 GOSUB1910
1240 DATA 4,1,2,133,70,115,36,11
,2,125,54,120,55,115,57,105,63,1
01,66,98,55,93,43,95,45,99,45,10
5,43,110,41,115,36,11,2,148,48,1
45,49,141,49,140,48,140,46,142,4
4,160,34,175,27,180,26,183,26,18
4,27,183,29
1250 DATA 6,2,146,41,135,20,144,
11,155,5,160,4,167,5,177,26,4,1,
0,140,15,152,38,1,0,147,9,159,34
,1,0,153,6,165,31,1,0,160,4,172,
28
1260 COLOR1:LINE(148,40)-(149,35
),PSET:PAINT(145,45),4,2:PAINT(1
80,27),4,2:PAINT(105,50),4,2:PAI
NT(150,20),1,2:GOSUB1910
1270 A$="T3L8O2B-B-O>CDO<B-O>DCO
<FB-B-O>CDL4O<B-L8AP8"
1280 B$="B-B-O>CDE-DCO<B-AFGAL4B
-L8B-P8"
1290 C$="L8.GL16AL8GFGAB-P8L8.FL
16GL8FE-L4DL8FP8"
1300 D$="L8.GL16AL8GFGAB-GFB-AO>
CL4O<B-L8B-"
1310 PLAY"XA$;XB$;XC$;XD$;"
1320 RETURN
1330 'funeral march of a marione
tte - gounod
1340 DATA 31,2,168,30,160,21,159
,18,158,16,158,13,156,10,155,11,
154,15,154,23,150,20,146,14,145,
15,144,17,144,20,146,23,141,22,1
39,22,138,23,138,25,139,27,141,3
0,137,29,134,30,132,32,132,34,13
5,37,138,39,141,38,150,35,155,33
,159,31,162,30
1350 DATA 5,2,179,30,176,26,174,
25,172,24,166,24,164,25
1360 GOSUB1880:GOSUB1910
1370 DATA 5,1,2,131,71,114,55,4,
2,168,56,165,54,161,50,158,45,15
5,39,5,2,170,55,166,52,163,48,16
0,44,159,42,157,38,14,2,148,42,1
55,39,160,36,162,30,165,29,170,2
8,180,26,180,19,175,20,170,21,16
7,25,162,30,159,31,155,32,149,35
1380 DATA 10,2,148,40,141,25,140
,20,140,11,142,7,145,3,150,1,158
,2,163,5,167,10,170,21
1390 CIRCLE(112,53),3,2:PAINT(11
2,53),3,2:PAINT(160,46),0,2:PAIN
T(170,25),4,2:PAINT(155,20),4,2:
PAINT(155,37),4,2
1400 A$="T5L12O1AP12DP6O2L6DDC#O
1PO2C#P6DEP6"
1410 B$="L12O1AP12DP6O2L6DDC#O1B
O2C#P6DEP6"
1420 C$="O1L12AP12O2DP6FP12L3AL6
GFP6L12AP12O3L3CL6O2B-AP6O3L12C#
P12L3EL6DC#O2B-AGFE"
1430 D$="O1L12DP6O2L6DDC#O1BO2L1
2C#P6L6DEP6"
1440 E$="O1L12AP12DF6O2L6DDC#O1B
O2L12C#P6L6DEP6"
1450 F$="O1L12AP12O2FP6AP12O3L3C
O2L6B-AGFE-GB-DC#DEP6FL3.EL6D"
1460 PLAY"XA$;XB$;XC$;XD$;XE$;XF
$;"
1470 RETURN
1480 'stars and stripes forever
- sousa
1490 GOSUB1910:FORU=1TO5:READX,Y
:PAINT(X,Y),4,4:NEXT
1500 DATA 5,8,4,117,60,122,57,12
7,69,124,55,128,49,123,52,120,47
,120,55,117,60,8,4,122,29,126,22
,127,17,129,18,133,16,131,21,134
,25,129,23,122,29,10,4,175,20,17
9,18,180,13,181,18,186,22,183,22
,185,25,181,23,178,26,178,22,175
,20
1510 DATA 8,4,208,42,205,33,208,
38,211,33,212,38,217,39,212,42,2
08,48,208,42,8,4,199,65,203,61,2
03,64,206,67,203,68,199,71,198,6
8,195,65,199,65,123,55,129,21,18
0,20,210,39,200,67
1520 A$="T4O3L4DDL8CO2BL4BL8A#BL
2.BL8A#BL4BL8A#BO3L4DL8O2BO3DL2C
O2L4.A"
1530 B$="L8AL4AL8G#AL4AL8G#AL2.O
3CL8O2BAL8BL4.O3DL4.EL8EL2.O2A"
1540 C$="L4O3DDL8CO2BL4BL8A#BL2.
BL8A#BL4BL8A#BO3CO2BL8.AL16F#L2A
L4.GL8GL4GL8F#GL4B-L8AGO3L2.GO2L
8G"
1550 D$="ABO3DO2GABO3DO2DL8.EL16
.BL2AL2G"
1560 PLAY"XA$;XB$;XC$;XD$;"
1570 RETURN
1580 'mexican hat dance - tradit
ional
1590 DATA 31,2,168,30,160,21,159
,18,158,16,158,13,156,10,155,11,
154,15,154,23,150,20,146,14,145,
15,144,17,144,20,146,23,141,22,1
39,22,138,23,138,25,139,27,141,3
0,137,29,134,30,132,32,132,34,13
5,37,138,39,141,38,150,35,155,33
,159,31,162,30
1600 DATA 5,2,179,30,176,26,174,
25,172,24,166,24,164,25
1610 GOSUB1880
1620 GOSUB1910:PAINT(155,10),4,2
:PAINT(140,26),4,2:PSET(149,36,2
):PAINT(160,27),4,2
1630 DATA 4,21,2,148,41,145,42,1
40,42,135,41,133,41,130,40,127,3
8,126,36,129,32,133,28,139,24,14
6,20,149,20,149,13,150,8,152,4,1
55,2,157,2,159,4,163,10,164,13,1
65,16
1640 DATA 10,2,164,13,170,12,175
,11,185,10,190,10,191,11,192,13,
190,17,183,25,180,28,174,30,4,2,
191,11,176,18,147,30,131,35,128,
36,1,2,150,35,160,33
1650 A$="T5O3L6CFP6CFP6CL3.FL3P6
L6CFGFEP6FL3.GP6"
1660 B$="O3L6CEP6CEP6CL3.EP6L6CE
FEDP6EL3.FP6"
1670 C$="L6O4CO3BO4CO3AA-AFEFCP6
O2AB-O3CDEFGAB-GP6"
1680 D$="B-AB-GG-GEE-ECP6O4CO3BO
4CDCO3B-AGF"
1690 PLAY"XA$;XB$;XC$;XD$;"
1700 RETURN
1710 'scales
1720 COLOR3:LINE(205,10)-(250,10
0),PSET,BF:FORI=1TO6:READY1,Y2:L
INE(220,Y1)-(250,Y2),PRESET,BF:N
EXTI:Y1=0:Y2=0:FORJ=1TO8:Y1=Y1+1
0:Y2=Y2+10:LINE(205,Y1+10)-(250,
Y2+10),PRESET:NEXTJ:LINE(205,10)
-(250,100),PSET,B
1730 DATA 17,23,27,33,47,53,57,6
3,67,73,87,93
1740 A$="T4L8O1BO2CC#DD#EFF#GG#A
A#BO3CC#DD#EFF#GG#AA#BO4CL2C#"
1750 B$="L8C#CO3BB-AA-GG-FEE-DD-
CO2BB-AA-GG-FEE-DD-CO1L2B-"
1760 PLAYA$+B$
1770 RETURN
1780 'sakura - japanese folk mel
ody
1790 DATA 31,2,168,30,160,21,159
,18,158,16,158,13,156,10,155,11,
154,15,154,23,150,20,146,14,145,
15,144,17,144,20,146,23,141,22,1
39,22,138,23,138,25,139,27,141,3
0,137,29,134,30,132,32,132,34,13
5,37,138,39,141,38,150,35,155,33
,159,31,162,30
1800 DATA 5,2,179,30,176,26,174,
25,172,24,166,24,164,25
1810 GOSUB1880:GOSUB1910:PAINT(1
55,15),4,2
1820 DATA 2,8,2,151,9,125,40,135
,39,140,38,147,36,150,35,156,33,
160,32,162,31,6,2,174,28,181,26,
185,25,190,23,195,20,195,18,151,
9
1830 A$="T3O2L4AAL4.BP8L4AAL4.BP
```

```
8"
1840 B$="ABO3CO2BAL8BAL4.FP8L4EC
EFL8EP8L8ECL4.O<BP8"
1850 C$="O2L4AAL4.BP8L4AAL4.BP8C
EFAL8BAL4FL4.E"
1860 PLAY"XA$;XB$;XC$;"
1870 RETURN
1880 'REMOVE CREST AND TOP OF HE
AD
1890 PAINT(168,28),1,2:PAINT(150
,30),1,2
1900 FORQ=1TO2:READJ,C,X1,Y1:COL
OR1:LINE(X1,Y1)-(X1,Y1),PSET:FOR
I=1TOJ:READX2,Y2:LINE-(X2,Y2),PS
ET:NEXTI,Q:RETURN
1910 POKE65495,0:READT:FORQ=1TOT
:READJ,C,X1,Y1:COLORC:LINE(X1,Y1
)-(X1,Y1),PSET:FORI=1TOJ:READX2,
Y2:LINE-(X2,Y2),PSET:NEXTI,Q:POK
E65494,0:RETURN
```

The Listing:

```
0 GOTO10
3 SAVE"93E:3":END'6
10 '*****************************
20 '*                           *
30 '*    MUSIC VERSION 1.1      *
40 '*  (C) COPYRIGHT IBM 1981   *
50 '* MODIFIED NICK KOSTARELAS *
60 '*          04/07/85         *
70 '*                           *
80 '*****************************
90 CLS:PMODE0,1:PCLEAR4
100 CLEAR500
110 PLAY"V30L4T90"
120 DIMA(20):PMODE4,1:COLOR0,5:P
CLS:DRAW"BM3,7LGDFREU8F2":GET(0,
0)-(7,11),A
130 PRINT@105,"color computer"
140 PRINT:PRINTTAB(7)"MUSIC VERS
ION 1.1"
150 PRINT:PRINTTAB(10)"MODIFIED
BY:":PRINTTAB(6)"NICK KOSTARELAS
 1985"
160 PRINT@482,"(C) COPYRIGHT IBM
 CORP. 1981";
170 GOSUB1850:FORI=1TO1500:NEXT
180 CLS
190 PRINT"   ------- selections
-------":PRINT
200 PRINT"   A-MARCH  E-HUMOR  I
-SAKURA"
210 PRINT"   B-STARS  F-BUG    J
-BLUE  "
220 PRINT"   C-FORTY  G-POP    K
-SCALES"
230 PRINT"   D-HAT    H-DANDY  ^
-EXIT  "
240 DIMM(88),O(70)
250 FORI=30TO39:M(I)=I+73:NEXT:F
ORI=40TO51:M(I)=161+I:NEXT:FORI=
52TO63:M(I)=249+I:NEXT:M(I)=401:
M(65)=402:M(66)=403
260 FORI=0TO6:M(I)=32767:NEXT
270 O(0)=0
280 O(30)=10:O(31)=15:O(32)=21:O
(33)=32
290 O(34)=37:O(35)=43:O(36)=48:O
(37)=54:O(38)=59
300 O(39)=65:O(40)=76:O(41)=81:O
(42)=87
310 O(43)=92:O(44)=98:O(45)=109:
O(46)=114
320 O(47)=120:O(48)=125:O(49)=13
1:O(50)=136
330 O(51)=142:O(52)=153:O(53)=15
8:O(54)=164
340 O(55)=169:O(56)=175:O(57)=18
6:O(58)=191
350 O(59)=197:O(60)=202:O(61)=20
8:O(62)=213
360 O(63)=219:O(64)=230:O(65)=23
5:O(66)=241
370 GOTO510
380 READJ,K
390 CM$=INKEY$
400 IFCM$="^"THENRETURN
410 IFJ=-1THENFORI=1TO500:NEXT:R
ETURN
420 Q=O(J)
430 IFQ=0THEN460
440 IFPPOINT(Q,100)=5ANDPPOINT(Q
-2,100)=0THENPP=5:PY=104:PUT(Q,P
Y)-(Q+7,PY+11),A,PSET:GOTO460
450 PP=0:PY=79:PUT(Q,PY)-(Q+7,PY
+11),A,PRESET
460 READJ1,K1
470 O=INT(M(J)/100):N=M(J)-O*100
:PL$="O"+STR$(O)+"T"+STR$(INT(60
/K+.5))+";"+STR$(N):IFJ1=0THENPL
$=PL$+"T"+STR$(INT(60/K+.5))+"P5
":READJ1,K1
480 PLAYPL$:J=J1:K=K1
490 COLORPP:LINE(Q,PY)-(Q+7,PY+1
1),PSET,BF
500 GOTO390
510 PRINT@384,STRING$(32,32);:PR
INT@246,"                "
520 PRINT@226,"ENTER SELECTION =
=>";
530 IFINKEY$<>""THEN530
540 CM$=INKEY$:IFCM$=""THEN540
550 IFCM$="^"THEN790
560 RESTORE
570 IFCM$="A"THENS$="MARCH ":D=1
040:GOTO690
580 IFCM$="B"THENS$="STARS ":D=1
230:GOTO690
590 IFCM$="C"THENS$="FORTY ":D=7
38:GOTO690
600 IFCM$="D"THENS$="HAT   ":D=1
398:GOTO690
610 IFCM$="E"THENS$="HUMOR ":D=4
54:GOTO690
620 IFCM$="F"THENS$="BUG   ":D=0
:GOTO690
630 IFCM$="G"THENS$="POP   ":D=5
74:GOTO690
640 IFCM$="H"THENS$="DANDY ":D=9
18:GOTO690
650 IFCM$="I"THENS$="SAKURA":D=1
708:GOTO690
660 IFCM$="J"THENS$="BLUE  ":D=1
50:GOTO690
670 IFCM$="K"THENS$="SCALES":D=1
554:GOTO690
680 GOTO520
690 PRINT" ";CM$;"-";S$
700 PRINT:PRINT"    LOOKING FOR
SELECTION..."
710 IFD=0THEN730
720 POKE65495,0:FORI=1TOD:READS$
:NEXT:POKE65494,0
730 PRINT@288,STRING$(32,32);:FO
RI=1TO3:PRINT@328,"FOUND SELECTI
ON":FORJ=1TO300:NEXT:PRINT@328,"
found selection":FORJ=1TO300:NEX
TJ,I740 PRINT@328,STRING$(16,32)
750 READD
760 READS$:PRINT:PRINTTAB(16.5-(
LEN(S$)/2))S$:FORI=1TO1500:NEXT
770 SCREEN1,1:GOSUB380
780 GOTO510
790 CLS:END
800 DATA -2,"la cucaracha - mexi
can folk song"
810 DATA 42,1,0,1,42,1,0,1,42,1,
0,1,47,1,0,5,51,1,0,3,42,1,0,1,4
2,1,0,1
820 DATA 42,1,0,1,47,1,0,5,51,1,
0,5,30,1,0,1,30,1,0,1,35,1,0,3,4
7,1,0,1
830 DATA 47,1,0,1,46,1,0,1,46,1,
0,1,44,1,0,1,44,1,0,1,42,8,0,2,4
2,1,0,1
840 DATA 42,1,0,1,42,1,0,1,46,1,
0,5,49,1,0,3,42,1,0,1,42,1,0,1,4
2,1,0,1
850 DATA 46,1,0,5,49,1,0,5,37,1,
0,1,37,1,0,1,30,1,0,3,54,2,56,2,
54,2,52,2
860 DATA 51,2,49,2,47,8
870 DATA -1,-1
880 DATA -2,"blue dabube waltz b
y j.s.strauss"
890 DATA 42,4,46,4,49,4,49,4,0,4
,61,2,0,2,61,2,0,6,58,2,0,2,58,2
,0,6,42,4,42,4
900 DATA 46,4,49,4
910 DATA 49,4,0,4,61,2,0,2,61,2,
0,6,59,2,0,2,59,2,0,6,41,4,41,4,
44,4,51,4,51,4
920 DATA 0,4,63,2,0,2,63,2,0,6,5
9,2,0,2
930 DATA 59,2,0,6,41,4,41,4,44,4
,51,4,51,4,0,4,63,2,0,2,63,2,0,6
,58,2,0,2,58,2
940 DATA 0,6,42,4
950 DATA 42,4,46,4,49,4,54,4,0,4
,66,2,0,2,66,2,0,6,61,2,0,2,61,2
,0,6,42,4
960 DATA 42,4,46,4,49,4,54,4,0,4
,66,2,0,2
970 DATA 66,2,0,6,63,2,0,2,63,2,
0,6,44,4,44,4,47,4,51,2,0,2,51,1
4,0,2,48,4
980 DATA 49,4,58,16
990 DATA 54,4,46,4,46,8,44,4,51,
8,49,4,42,4,0,2,42,2,42,4,0,8,49
,2,0,2,47,2
1000 DATA 0,6,49,2,0,2
1010 DATA 47,2,0,6,49,4,58,16,56
,4,49,2,0,2,46,2,0,6,49,2,0,2,46
```

```
,2,0,6,49,4
1020 DATA 56,16,54,4,49,2,0,2,47
,2,0,6,49,2,0,2,47,2,0,6,49,4,58
,16
1030 DATA 56,4,49,4,54,4,56,4,58
,4,61,8,59,4,58,2,58,2,58,4,56,2
,0,2,54,4,0,8
1040 DATA -1,-1
1050 DATA -2,"humoresque by dvor
ak"
1060 DATA 47,3,0,2,49,1,47,3,0,2
,49,1,51,3,0,2,54,1,56,3,0,2,54,
1
1070 DATA 59,3,0,2,58,1,61,3,0,2
,59,1,58,3,0,2,61,1,59,3,0,2,56,
1
1080 DATA 49,24,47,3,0,2,49,1,47
,3,0,2,49,1,51,3,0,2,54,1,56,3,0
,2,54,1
1090 DATA 56,3,0,2,58,1,61,3,0,2
,59,1,58,3,0,2,61,1,59,3,0,2,56,
1
1100 DATA 54,3,0,2,54,1,59,3,0,2
,47,1,49,6,54,6,47,18
1110 DATA -1,-1
1120 DATA -2,"pop! goes the weas
el - anonymous"
1130 DATA 47,2,0,2,47,2,49,2,0,2
,49,2,51,2,54,2,51,2,47,2,0,2,42
,2
1140 DATA 47,2,0,2,47,2,49,2,0,2
,49,2,51,6,47,2,0,2,42,2,47,2,0,
2,47,2,49,2
1150 DATA 0,2,49,2,51,2,54,2,51,
2,47,2,0,4,56,2,0,4,49,2,0,2,52,
2,51,6,47,2
1160 DATA 0,4,59,2,0,2,59,2,56,2
,0,2,59,2,58,2,61,2,58,2,54,2,0,
4,59,2,0,2
1170 DATA 59,2,56,2,0,2,59,2,58,
6,54,2,0,2,51,2,52,2,0,2,51,2,52
,2,0,2,54,2
1180 DATA 56,2,0,2,58,2,59,2,0,4
,56,2,0,4,49,2,0,2,52,2,51,6,47,
2
1190 DATA -1,-1
1200 DATA -2,"symphony #40 by mo
zart"
1210 DATA 55,2,54,2,54,4,55,2,54
,2,54,4,55,2,54,2,54,4,62,4,0,4
1220 DATA 62,2,61,2,59,4,59,2,57
,2,55,4,55,2,54,2
1230 DATA 52,4,52,4,0,4,54,2,52,
2,52,4,54,2,52,2,52,4,54,2,52,2
1240 DATA 52,4,61,4,0,4,61,2,59,
2,58,4,58,2,55,2,54,4,54,2,52,2
1250 DATA 50,4,50,4,0,4,62,2,61,
2,61,4,64,4,58,4,61,4
1260 DATA 59,4,54,4,0,4,62,2,61,
2,61,4,64,4,58,4,61,4
1270 DATA 59,4,62,4,61,2,59,2,57
,2,55,2,54,4,46,4,47,4,49,4
1280 DATA 50,4,52,2,50,2,49,4,47
,4,54,4,0,4,65,8
1290 DATA 66,2,0,6,65,8,66,2,0,6
,65,8
1300 DATA 66,4,65,4,66,4,65,4,66
,4
1310 DATA -1,-1
1320 DATA -2,"yankee doodle - an
onymous"
1330 DATA 50,3,50,3,52,3,54,3,50
,3,54,3,52,3,45,3,50,3,50,3,52,3
,54,3,50,6
1340 DATA 49,3,0,3
1350 DATA 50,3,50,3,52,3,54,3,55
,3,54,3,52,3,50,3,49,3,45,3,47,3
,49,3,50,6
1360 DATA 50,3,0,3
1370 DATA 47,5,49,1,47,3,45,3,47
,3,49,3,50,3,0,3.45,5,47,1,45,3,
43,3,42,6
1380 DATA 45,3,0,3
1390 DATA 47,5,49,1,47,3,45,3,47
,3,49,3,50,3,47,3,45,3,50,3,49,3
,52,3,50,6
1400 DATA 50,6,-1,-1
1410 DATA -2,"funeral of a mario
nette - gonoud"
1420 DATA 37,1,0,2,30,1,0,5,42,3
,42,3,41,3,39,3,41,3,0,3,42,3,44
,3,0,3,37,1,0,2
1430 DATA 30,1,0,5,42,3,42,3,41,
3,39,3,41,3,0,3,42,3,44,3,0,3,37
,3,42,3,0,3,45,3
1440 DATA 49,6,47,3,45,3,0,3,49,
3,52,6,50,3,49,3,0,3,53,3,56,6,5
4,3,53,3,50,3
1450 DATA 49,3,47,3,45,3,44,3,30
,1,0,5,42,3,42,3,41,3,39,3,41,3,
0,3,42,3,44,3
1460 DATA 0,3,37,1,0,2,30,1,0,5,
42,3,42,3,41,3,39,3,41,3,0,3,42,
3,44,3,0,3
1470 DATA 37,3,45,3,0,3,49,3,52,
6,50,3,49,3,47,3,45,3,43,3,47,3,
50,3,42,3
1480 DATA 41,3,42,3,44,3,0,3,45,
1,0,2,44,9,42,1
1490 DATA -1,-1
1500 DATA -2,"stars & stripes fo
rever - sousa"
1510 DATA 54,6,54,6,52,3,51,3,51
,6,50,3,51,3,51,16,0,2,50,3
1520 DATA 51,3,51,6,50,3,51,3
1530 DATA 54,6,51,3,54,3,52,12,4
9,6,0,3,49,3,49,6,48,3,49,3
1540 DATA 49,6,48,3,49,3
1550 DATA 52,16,0,2,51,3,49,3,51
,3,54,9,56,9,56,3,49,16,0,2,54,6
1560 DATA 54,6,52,3,51,3,51,6,50
,3,51,3,51,16,0,2,50,3,51,3,51,6
,50,3,51,3
1570 DATA 52,3,51,3,49,5,46,1,49
,12,47,6,0,3,47,3,47,6,46,3,47,3
,50,6,49,3,47,3
1580 DATA 59,15,0,3,47,3,49,3,51
,3,54,1,0,2,47,3,49,3,51,3,54,1,
0,2,42,3,44,5
1590 DATA 51,1,49,12,47,1
1600 DATA -1,-1
1610 DATA -2,"mexican hat dance
- traditional"
1620 DATA 52,2,57,2,0,2,52,2,57,
2,0,2,52,2,57,6,0,4,52,2,57,2,59
,2,57,2,56,4
1630 DATA 57,2,59,2,0,8,52,2,56,
2,0,2,52,2,56,2,0,2,52,2,56,6,0,
4,52,2
1640 DATA 56,2,57,2,56,2,54,4,56
,2,57,2,0,6,64,2,63,2,64,2,61,2,
60,2,61,2
1650 DATA 57,2,56,2,57,2,52,2,0,
4,49,2,50,2,52,2,54,2,56,2,57,2,
59,2,61,2
1660 DATA 62,2,59,2,0,4,62,2,61,
2,62,2,59,2,58,2,59,2,56,2,55,2,
56,2,52,2
1670 DATA 0,4,64,2,63,2,64,2,66,
2,64,2,62,2,61,2,59,2,57,2
1680 DATA -1,-1
1690 DATA -2,"scales"
1700 DATA 30,1,31,1,32,1,33,1,34
,1,35,1,36,1,37,1
1710 DATA 38,1,39,1,40,1,41,1,42
,1,43,1,44,1,45,1,46,1,47,1
1720 DATA 48,1,49,1,50,1,51,1,52
,1,53,1,54,1,55,1,56,1
1730 DATA 57,1,58,1,59,1,60,1,61
,1,62,1,63,1,64,1,65,1,66,8,0,4,
66,8
1740 DATA 65,1,64,1,63,1,62,1,61
,1,60,1,59,1,58,1,57,1
1750 DATA 56,1,55,1,54,1,53,1,52
,1,51,1,50,1,49,1,48,1
1760 DATA 47,1,46,1,45,1,44,1,43
,1,42,1,41,1,40,1,39,1,38,1
1770 DATA 37,1,36,1,35,1,34,1,33
,1,32,1,31,1,30,8
1780 DATA -1,-1
1790 DATA -2,"sakura - japanese
folk melody"
1800 DATA 49,8,49,8,51,12,0,4,49
,8,49,8,51,12,0,4,49,8,51,8,52,8
,51,8
1810 DATA 49,8,51,4,49,4,45,16,4
4,8,40,8,44,8,45,8
1820 DATA 44,8,44,4,40,4,39,16,4
9,8,49,8,51,12,0,4,49,8,49,8,51,
12,0,4
1830 DATA 40,8,44,8,45,8,49,8,51
,4,49,4,45,8,44,16
1840 DATA -1,-1
1850 PCLS
1860 LINE(8,72)-(250,122),PSET,B
1870 FORI=19TO239STEP11:LINE(I,7
2)-(I,122),PSET:NEXT
1880 B=2:A=2:FORI=15TO235STEP11
1890 LINE(I,72)-(I+7,99),PSET,BF
1900 B=B+1:IFB>=A THENI=I+11:B=0
:IFA=2THENA=3ELSEA=2
1910 NEXT:RETURN
```

'This program (Listing 2) has better music quality, as it does not have to redraw every note, like in the first program'

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THOMSON AMBER/GREEN COMPOSITE MONITORS WITH SOUND	ALL - $350.00
TANDY 1000 SX - 384K, 2 DRIVE	T1000 - $1999.00
TANDY 1000 EX	T1000 - $1299.00
HI-RES INTERFACE	CC3 - $23.00
TANDY COLOUR COMPUTER 3 - 128K	CC3 - $370.00
TANDY 102 PORTABLE	T102 - $999.00
TANDY 200 PORTABLE	T200 - $1399.00
MULTIPAK INTERFACE - SWITCHABLE COCO 2/3, LED ON/OFF	CC2/3 - $199.95
VIDEO DRIVER WITH SOUND	CC2 - $38.00
VIDEO DRIVER WITHOUT SOUND (if your monitor has sound)	CC2 - $32.00
MODIFIED ARCHER JOYSTICKS - SUIT COCO 2/3	CC2/3 - $27.00
MODIFIED QUICKSHOT JOYSTICKS - " "	CC2/3 - $35.00
CITIZEN 120D DOT MATRIX PRINTER - EXTRA TYPEFONTS	ALL - $599.00
DMP-106 DOT MATRIX PRINTER	ALL - $399.00
DMP-130 DOT MATRIX PRINTER	ALL - $499.00
AVTEK MINI MODEM - 300 & 1200/75 baud, economy plus	ALL - $250.00
TANDY INTERNAL MODEM - 300 & 1200/75 + VTEX2 software	T1000 - $699.00
NICE MODEM II - auto ans/dial, Hayes compatible	ALL - $749.00
WYSE 30 TERMINALS	CC3 - $999.00

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PRINTER PAPER 9-1/16" x 11" PLAIN per 1000 sheets	$17.00
PRINTER PAPER " x " PLAIN per box 4000 sheets	$60.00
PRINTER PAPER 9-1/2" x 11" PLAIN per 1000 sheets clean edge	$25.00
PRINTER PAPER 9-1/2" x 11-2/3" PLAIN A4 per 1000 sheets	$29.00
PRINTER PAPER 11" x 15" PLAIN per 1000	$30.00
PRINTER PAPER 11" x 15" BLUE RULE per 1000 (also SCREEN)	$27.00
NCR 2 PART 9-1/2" x 11" (no carbon required) per 1000	$74.00
RAINBOW PACK 500 each blue,green,pink,yellow 9-1/2" x 11"	$55.00
MAILING LABELS 11mm x 50mm (4 up) per 1000	$6.00
MAILING LABELS 23mm x 89mm (1 up) per 1000	$16.00
MAILING LABELS 36mm x 102mm (1 up) per 1000	$18.00
CASSETTE LABELS (orange) per100 (10 per sheet)$5.00 (white)	$4.00
BLANK CASSETTES C-10's (10 min.) $1.10 each. C-30's	$1.30
STORAGE CASE, HINGED, LOCKABLE 5-1/4" holds 100 $25; holds 60	$22.00
STORAGE CASE, HINGED 3-1/2" holds 60	$15.00
3-1/2" DSDD DISKETTES box 10	$55.00
5-1/4" DSDD DISKETTES box 10	$25.00
DISK HEAD CLEANING KIT 3-1/2"	$11.95
DISK HEAD CLEANING KIT 5-1/4"	$11.95
LARGE RANGE PRINTER RIBBON/CARTRIDGES (Tandy/non Tandy)	P.O.A.
LARGE RANGE PRE-PRINTED INVOICE/STATEMENT FORMS AVAILABLE	P.O.A.
DISKETTE NOTCHER	$9.95
PERFECT 5-1/4" DSDD DISKETTES BOX 10	$25.00
DATA PERFECT 5-1/4" DSDD DISKETTES BOX 10	$19.00

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AGC CREDIT LINE

BLAXLAND COMPUTER SERVICES PTY. LTD.

134 GREAT WESTERN HIGHWAY,
BLAXLAND 2774 N.S.W.
P.O. BOX 125
PHONE: (047) 39 3903

PRICES SUBJECT TO CHANGE WITHOUT NOTICE.

POSTAGE AND PACKAGING EXTRA