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For your TANDY Computer

AUSTRALIAN

CoCo

incorporating softgold

ToTo

incorporating
softgold

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7th of the preceeding month

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OS-9
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All programs in this issue of Australian CoCo/MiCo/softgold are available on CoCoOZ and MiCoOz.
SEE SUBSCRIPTION PAGE FOR DETAILS

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Founder GREG WILSON

SCREEN DUMP

Australian CoCo is one year old.

The dream of our founder Greg Wilson, Aussie CoCo has grown to be as popular as our other magazine for the Colour Computer, "Australian Rainbow".

The key to Aussie CoCo's success is the wealth of talent and the variety of programs sent by our contributors.

It represents in microcosm, the reason why today so many people choose Tandy computers in preference to others.

In excess of 110 Users' Groups support the Colour Computer in Australia; there are five major third party software suppliers for CoCo; 350 Tandy shops now sell not only the CoCo, but information in the form of our magazines, and software.

Surrounding the above factors, is an envelope of concern by all involved, that you obtain the best product and information, and that you succeed in your endeavour to get to know your CoCo beastie (that's a Douganism!).

We have a number of new readers this month, so I want to reiterate some advice we give from time to time - it is fun to explore CoCo's abilities. But the learning process can be speeded up by joining a User Group.

Other people have been where you are - they know a lot of the information you seek, and they are willing to share.

INDEX

UPPER CASE .... PROGRAM
Lower Case .... Article

Programs required again this month!

Finally, in case you were wondering, here are a few of the things your CoCo can do. Sometimes a modification to CoCo's hardware is necessary. Your CoCo can:

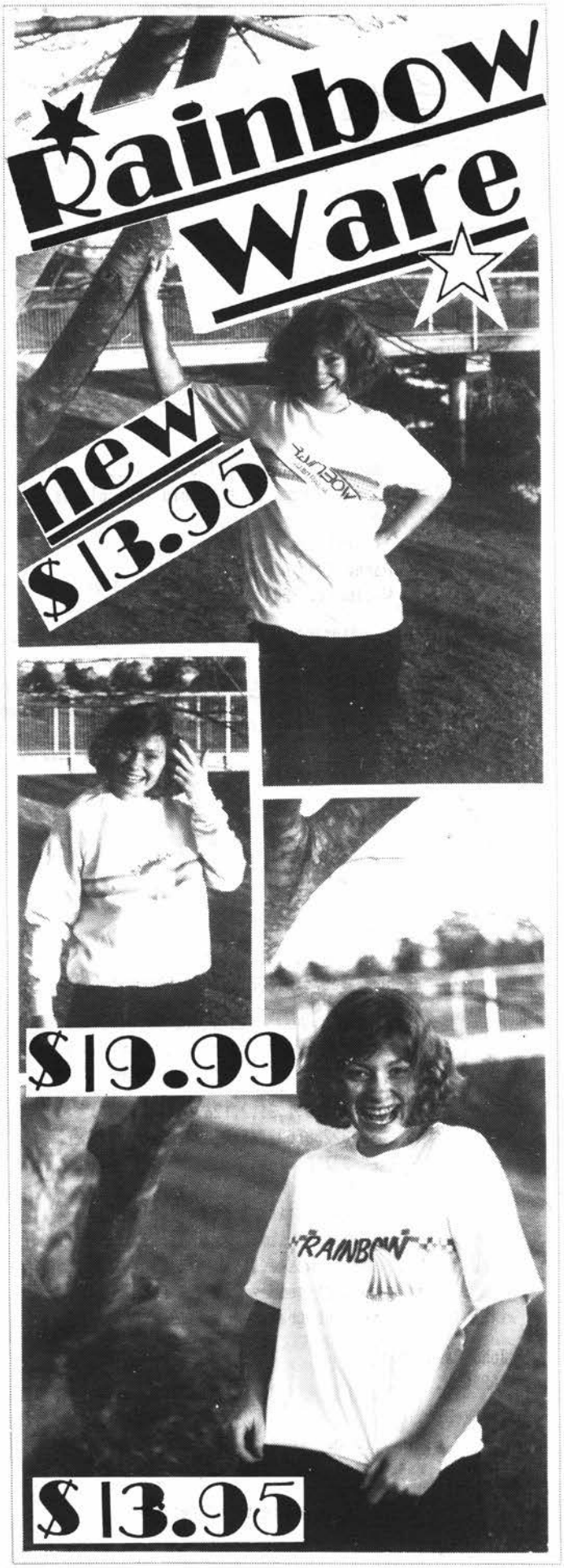
* Use either a TV or a monitor for screen display;
* Use up to four disk drives with up to eighty tracks each;
* Have up to 1 mb (megabyte) of memory;
* Display a 80 X 24 character screen, (monitor required);
* Display 40, 51 & 64 column screens for programs & program input, using just the TV;
* Use a number of Disk Operating Systems including CPM, RS DOS & derivatives, OS 9, Flex and XEX;
* Use a number of practical languages which include BASIC, LOGO, FORTH, PASCAL, C, MACHINE, and soon, FORTRAN & COBOL.
* Choose between a number of good alternative
  - Word Processors (choice of 4 good ones)
  - Music Processors (choice of 2 good ones)
  - Graphics Processors (choice of 4 good ones)
  - Speech Processors (choice of 3 good ones);
* Recognise and react to your voice;
* Control virtually anything external to the computer - eg Burglar Alarms,
  - Robots,
  - Science Experiments;
* (Believe it or not), Play an excellent game of Donkey King or Sailorman;
* Use most printers available today, (some are more compatible than others);
* Communicate with other computers - either on 300 / 300 Baud protocol or with Viatel on the 1200 / 75 Baud protocol;
* Display up to 64 colours, using the Delbourgo Expanded Colour Basic;
* Calculate tables & graphs of Bessel functions, (Poly)gamma functions and Orthogonal polynomals;
* also teach a kid the A.B.C. and how to count to 10.

It is hard to believe a white (or grey) plastic box little more than the size of a cornflakes packet can do all this, but it can, and this is why CoCos are so very popular.

This month I will be in Melbourne for the week beginning 16/9. I will be at Jeff Sheen's User Group meeting on the Wednesday night, and possibly one or two others. You can phone Jeff or myself for further details. I am looking forward to meeting with you folk in Melbourne.

Finally, just a note about the new Rainbow Ware shown on this page. These new garments are hand dyed and in mixed pastel colours which run vertically. Its unfortunate that we can't show these in colour, because they really do look the part!

All the previous patterns are still available for another month as well.



LETTERS

Letters to the Editor, should be addressed to:
Australian CoCo Magazine
P.O. Box 1742,
Southport. Qld. 4215.

Questions of a technical nature can be addressed to Dr CoCo at the same address.

Hi There,
Has someone out there got a spare copy of JUNE 82 issue of Rainbow, If so would they please contact me at:

17 Oatlands Rd.,
Narne Warren Nth,
Victoria. 3804.

J. WYLIE

*

Dear Graham,
After puzzling for some time, I have finally come up with a way to get PCLEAR0.

The assembler for the routine is

```
LDD #$601
TFR D,Y
JMP $96A5   Part of ROM for PCLEAR
```

For the 16K, use the following:

```
5 CLEAR 200,16374
10 DATA 204,6,1,31,2,126,150,165
20 FORN=16374TO16381:READA:POKEN,A:NEXT
30 EXEC16374
```

FOR THE 64K:

```
5 CLEAR200,32758
10 DATA 204,6,1,31,2,126,150,165
20 FORN=32758TO32765:READA:POKEN,A:NEXT
30 EXEC 32758
```

These three lines at the beginning of a program will act in the same way as a PCLEAR0 command would (if it was available). That is, you get the same amount of memory as a POKE25,6:NEW without losing your program.

John Carmichael
TAREE N.S.W.

*

Dear Kevin,
In the May edition of CoCo the program "COMMONS" was listed. Can this program be run on an MC-10 20K computer?
Your advice would be appreciated

W.BURTON

Bill,
The program will not run as is, but the logic sections and much of the screen formatting is OK. Obviously lines such as line 50 are irrelevant in the MC-10, and the DRAW lines which follow wont work either, but as you live in Brisbane and near several User Groups, why not attend one and get them to show you how this program works. The conversion shouldn't be too complex and it will certainly be a worthwhile exercise.
Kevin

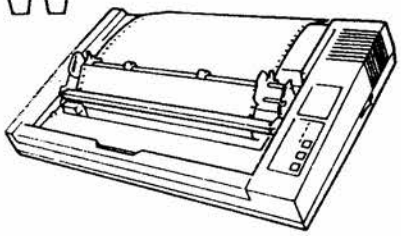
*

Dear Graham,
Could you please supply me with the address of Mr John Brothers. Rainbow mentioned that he has developed a digital camera to go with CoCoMax and I am very interested in high quality graphics.
Finally, is it possible to obtain copies of the magazine on microfische?
Mark Beadle
Kelmscott. WA.

Mark,
John Brothers address is:
PO Box 2101
Adelaide. SA. 5001.
We do not supply nor at this stage condone the conversion of this magazine to microfische.
Graham.

REVIEW

CPB — 136



PRINTER

Source:	Energy Control Systems; North Qld Colour Software.
Price:	$542.97
Character Set:	Full 96 ASCII character set with descenders, additional ASCII numbers are European characters; PLUS Graphics characters, Greek characters, Maths and additional symbols.
Print Speed:	130 C.P.S.
Columns / line:	Normal - 136 columns Condensed - 233 columns Enlarged - 68 columns Elite - 163 columns
Print Direction:	Bidirectional.
Number of copies:	Original plus two copies.
Interfaces:	CPB-136 (P) - Centronics parallel interface. CPB-136 (S) - RS232C / Current Loop with 11 data transfer rates between 75 & 4800 Baud including 600 & 1200.
Buffer:	2K

Longer term readers will note that it is all but one year since we last reviewed a printer in this magazine.

We have had offers of items for review, but as you may know, we tend to be biased towards the C. Itoh range of printers.

It would be unwise however, to ignore the CPB-136 printer.

In the value for money stakes, it has to win hands down! This is not your normal 8" printer - this is a 13.6" printer priced well below most of the competition.

The other nice thing about this printer is the instruction book - it is almost as good as a Tandy book - it even has tryout programs!

There are two character sets which you switch in and out with escape codes (explained later); and there are the usual four print modes - Condensed, Elite, Pica and Proportional.

In fact there are a lot of control codes which even our beloved C. Itoh printers don't have - buzzer codes, super / subscript, set skip over perforation and so on.

Those who have not yet savored the delights of being able to print everything your computer could possibly want to say (and often more), will be unfamiliar with the term 'escape code'.

Unfortunately, few instruc[redacted]nuals give clear advice regarding this vital piece o[redacted]via.

The 'escape code' is merely the message you send your printer to warn it that the next piece of information you send to it is an instruction.

We use the ASCII code 27, that is, in a Basic program, we type

CHR$(27) followed by the code for whatever it is that we want to do.

Here again the book can often be unclear on how to go about this.

The book for the CPB-136, for example, tells us that to set the printer to ELITE mode, we send ESC M. What the book really means in Basic, is that we should write a line that looks like this:

```
10 PRINT#-2,CHR$(27)"M";
```

The line could also have read:

```
10 PRINT#-2,CHR$(27);CHR$(109);
```

where CHR$(109) is the ASCII number for "M".

Notice that we can use all the screen PRINT devices for positioning text on the page too. In this case, the use of the semi colon (;), will ensure that a line feed will not take place until more instructions have been received.

Longer term readers will also be aware of my dictums re the advantages of dot matrix printers verses others.

I prefer the dot matrix printer. This one especially, is capable of producing a perfectly adequate print quality, as the samples show.

I especially like the ease of use of this model.

Most printers have a series of DIP switches hidden somewhere which allow you to configure your printer to suit your computer.

The CPB-136 has these placed on the top panel, where you don't even have to hurt your fingers to get at them!

A minor complication for purchasers of non-Tandy printers is that you will have to re-configure the wiring on the Tandy cable which they love to sell you for other printers!

It is not hard, and is an ideal job to be done at your user group, where you can get lots of advice, often most of it at the same time. This dosen't get you anywhere, but you go home nicely confused, rather than just confused.

The trick with the wire is to read the manual which came with the computer. I know it is a novel idea, but as you are likely to be looking at the manual for the printer,

PRINTER TEST

♥♦♣♠!"#$%&' ()*+,-./0123456789:;<=>?

ª º ¿ ⌐ ¬ ½ ¼ ¡ « »

!"#$%&' ()*+,-./012

efghijklmnopqrstu

!"#$%&' ()*+,-./0123456789:;<=>

!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\

you might as well break new ground and take a peek at the CoCo manual, "TRS 80 Colour Computer 2 Operation Manual". Page 26 shows the RS 232 pin location, and the function of each wire.

The white wire goes to pin 3 on the elongated RS 232 connector; the red wire goes to pin 7; the black to pin 8; and the green to pin 20.

From here on you need to work your way through the tables on page 57 of the printer manual setting Baud rates etc to suit yourself.

Energy Control and North Queensland don't seem to be able to get enough of these printers which must mean that someone else likes them beside me! It also means that you may have to wait a week or so for delivery, but especially for the price, I doubt that you'll be sorry you did.

Graham.

UHF CB RADIOS

We have a number of readers who are into Ham radio, some who have the hobby of short wave radio listening, and still many others who use a CB radio in their day to day lives.

I have had both VHF and UHF CB radios for some time in the car, and UHF in the office and at home. Why both? Well the UHF bands are nice and quiet - not too many people have UHF yet - and that is great, except when you need a road report! That's when VHF channel 8 comes into its own every time!

VHF gives a range of about five miles on AM and about 25 OR 400 miles (this latter is not reliable) on SSB (single side band). The radio freaks will be squirming as I say that, but simplified, it's close enough for the purpose of this article!

It follows that VHF CB is good for casual conversation, but if you want to use the radio for business, or rely on it to give you coverage over larger areas on a regular basis, it just wont do.

Enter UHF. UHF simplex (ie radio to radio communication) will work about the same distance as VHF SSB, except that it works in straight lines and is either 'present' or not - there is no fade out. This means you can take advantage of hills to selectively increase your range.

But UHF CB will work duplex also - ie your set can broadcast to another set remotely situated, usually on a hill, and that set will then rebroadcast your signal.

The effect is to extend your transmission distance by a factor of up to 5 or 6!

In practical terms therefore, we use our UHF radios to cover the distance from Ballina in the south, to Buderim in the north, to Toowoomba in the west. (There are patches in between that are in 'shaddow', so we don't necessarily have total access to all that area, and we use several different repeater stations to accomplish this.)

You can understand then why I was pleased to see Tandy take into stock their new UHF CB radio. The local guy here in Southport, spurred by the stories of the effectiveness of these radios which we told him, went to a considerable amount of trouble setting up a special aerial on the roof of the shopping complex where he is. (And you may know just how much shopping centre managements love that!)

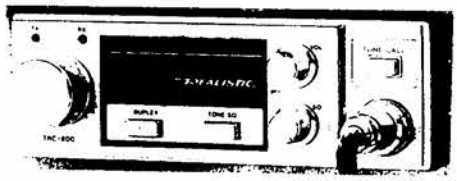
There were a few teething difficulties, but soon the radio was working, and Bernie took the bit in his teeth and ordered ten radios.

Needless to say, when people heard of the service he was prepared to give, how he had gone out to a customer's house to help with the antenna, and how good this Tandy radio is, Bernie sold his ten radios in less than a week! I think he will sell that many per week for some time to come - if Tandy's old problem of running out of stock doesn't rear its ugly head!

I know it is unusual to talk about non computer products in this magazine, but we needn't be too one eyed, and I thought it appropriate to tell you about these radios because they could well do a job for you.

Budget about $450-$500 per radio (an aerial is an additional cost over the cost of the set). The decision to purchase UHF CB has been one of the best decisions I have made in my business.

Graham.



BASIC TUTORIAL by Graham Morphett

A Very Trival Pursuit,
or Attack of the Bleeper Bees,
or How to Make Other Computers Look Like They're Stupid!

The problem with a new computer is that although you may be prepared to type in programs - the only way to learn - very little of what you type in, in the early days, makes sense.

That's OK - you'll have to live with that problem for a few years yet, but it would be nice to occasionally have something to type in that you can understand.

Hence "Very Trivial" or "Extremely Very Trivial" or "VT" as Alex Hartman calls it!

VT could be the basis of a number of games, and can be transfered to the higher resolution screens with some excellent results.

In the raw form in which we present it, it is designed to work in 16K Basic CoCos, but even if you have a smarter computer, type this quickie in.

Because VT is designed as a tutorial program, you will not find it on CoCoOz.

OK, let's go! Type in these lines:

```
1 '******VERY TRIVIAL PURSUIT***
   ********BY GRAHAM MORPHETT***
2 GOTO10
3 CSAVE"VERYTRIV"
10 FORT=1TO510:PRINT"@";:NEXTT
15 GOTO15
```

The first three lines are standard lines which we urge you to incorporate in your programming. It has always been a good idea to name your programs as you work with them. In this way, you can come back to them and remember where or what you were up to when you last worked on the program.

For this reason you'll often also see a date in our listings. This is the date of our last update of the program.

When you type "RUN3" and ENTER, assuming your cassette recorder is set up correctly, the program is CSAVEd efficiently, and you don't have to remember exact names. This is an especially helpful habit to have if you own a disk drive. (Disk drive owners of course change CSAVE in line 3 to SAVE.)

Normally, a program should have a CLS command near the start. The CLS command clears all the junk off the screen, and ensures a minimum of confusion as the program begins.

In this case however, the aim of line 10 is to place a screen of "@" characters on the screen. If we left out the semi colon (;) in this line, the computer would print each "@" down the screen. If you haven't seen that happen, then type the line without the ";" and watch what happens when you RUN the program.

Another interesting variat[redacted]s when you replace the semi colon with a comma (,).

Line 15 is temporary, and is designed just to hold the screen where it is till we've seen what's happening.

RUN the program now and notice we have a spare space at the bottom right. If we place a "@" there, the screen will line feed (add an extra line of spaces the the bottom), thereby rolling the top line of @'s off the screen - and we don't want this to happen, so for now the space stays.

For those who have not hitherto indulged in the delights of the FOR - NEXT loop, line 10 should also provide some clues as to the function of this, one of BASIC's most powerful tools.

FOR - NEXT loops allow the computer to do things repeatedly - after all this is the main reason many folk buy a computer! If you have a job which is repetitive, boring and relatively predictable, chances are the computer can do it very efficiently indeed, and if the program being written to complete that task is written in BASIC, it will probably include a FOR - NEXT loop.

In this case, the FOR - NEXT loop prints "@" 510 times, side by side on the screen.

After you've seen this happen, type 15 and press ENTER to erase line 15, and type:

```
20 I$=INKEY$
25 PRINT@P,"@";
26 PRINT@C,"@";
30 IFI$=CHR$(10)THENP=P+32
35 IFI$=CHR$(9)THENP=P+1
40 IFI$=CHR$(94)THENP=P-32
45 IFI$=CHR$(8)THENP=P-1
70 IFP<0THENP=0
75 IFP>510THENP=510
80 PRINT@P,CHR$(207);
85 'GOSUB100
90 GOTO20
```

Make sure you have the REM - ie the ' in place in line 85. At this stage we have the beginings of some computerised fun!

The INKEY$ command allows for input from the keyboard. Normally when we use the INPUT command, we have to press ENTER to tell the computer that INPUT is complete. But especially in cases where predictable key entry is all that is required, INKEY$ can be used to preclude the need to use the ENTER key.

Forgetting lines 25 & 26 for now, the computer assigns "", or nothing, to the string space I$. Pressing any key will assign that key's value to I$ until the program reaches line 20 again.

Lines 30 - 45 test the arrow keys to see if they have been pressed. If an arrow key has been pressed, the variable "P", which we are using to remember our current screen position, is incremented by an amount.

The variable "P" is then used in the PRINT@ statement in line 80.

CHR$(207) is a block graphics character - in this case, a white block. This character is "us" - ie, it indicates

where we are on the screen.

So it will "filcker" and to simplify rubbing it out should we move it, line 25 PRINTs a 2 in its place soon after the white block gets PRINTed.

RUNning the program at this stage allows you to use the arrow keys to move the white marker around the screen.

Lines 70 & 75 are "error traps" - they stop the computer from being required to do something it can't do. In this case, the variable "P" could be incremented well past the 510 screen locations we decided at the start to use. The trouble is, the PRINT@ statement wont accept many more - so we limit "P" to 510, and the same goes at the other end. When "P" gets to zero, we stop it from going lower.

The program is starting to show some promise. We now have the ability to move our marker around the screen. From here on its up to you. There is an infinite variety of things to do - limit the areas the white marker can move to; have the computer chase the white marker; get the computer to place its own marker on the screen, and you chase the computer; have secret, randomly selected danger spots - quicksand, if you like - and so on - the selection of additional possibliities is endless.

As an example, take the REM out of line 85 and type:

```
100 C=PL(1):GOSUB200:FORY=1TO5
110 PL(Y)=PL(Y+1)
120 NEXT
130 PL(5)=P
135 PRINT@C,CHR$(175);
136 IFC=P THENSOUND200,2:SOUND15
0,1:SOUND200,2:SOUND150,1
140 RETURN
200 R=RND(5):IFR=5THENC=RND(510)
210 RETURN
```

This routine will give the computer a blue marker (CHR$(175) - line 135), and allow it to chase you.

The problem for programmers is that the computer "knows" where you are, or can find out pretty quickly if we show it how. In games of this nature, the idea is to use a routine which gives us a chance, but which will also approximate the type of response we are seeking from the computer.

The FOR - NEXT loop in lines 100 - 120 achieve this. In line 100, the computer is told our location five moves ago (C=PL(1)). C is to be the computer's screen location (line 135). Forget the GOSUB200 for a moment.

Line 110, in conjunction with the FOR - NEXT loop, filters a "stack" of saved variables down one position, to make space for the latest piece of information on our current location (Line 130)

Line 136 tests to see if the computer has "got" you, if so then the computer makes an appropriate sound.

The GOSUB 200 was created to provide a sense of unpredictability about the computer's movements - just to keep you from feeling too secure!

So, you can see that a relatively simple routine makes for a very nice game. We'll be looking forward to seeing what variations you can come up with!

VAGG 7

VAGG'S POKE COLLECTION

by Johanna Vagg

Vagg 1, Vagg 2 etc., makes me think of the comment I sometimes make about my kids - ie that they only have numbers instead of names ... it's easier! Now I'll begin to name my articles, but, like my kids, they won't have unusual names.

The experts can go on to the next page, but ordinary people like me might like to read on. First a recap of earlier pokes:

POKE 25,6:NEW	for maximum memory without graphics
POKE 65495,0	the high speed poke
POKE 113,0:EXEC40999	for a cold start
POKE 113,0 and RESET	for cold start
POKE 359,60	for slow screen printing and listing
POKE 359,13:SCREEN 0,1	for the orange screen--you can write programs and edit while in this screen.

That last one is interesting. I thought that when you ran a graphics program while in the orange screen, pressing BREAK somehow caused the program to hangup ... try it ... put in the orange screen (or just the POKE 359,13) before typing in a little graphics program. RUN it. Press BREAK. Did it hang up?? As long as you haven't pressed any other keys, you can type in CONT - yes, even though you can't see what you're typing! -- and the program will continue. Press BREAK again. This time type in POKE 359,126. The POKE 359,13 just didn't allow a return to the normal screen. There's another one of those. My kids have fun with it:

```
      POKE 359,128
Here again you can type
      POKE 359,126
to return to normal.
```

First however, I suggest you play around with it a bit. It's quite a test of your confidence BUT you can type in a program. It will work if you haven't made any mistakes!!

What about converting Mico Peeks and Pokes to CoCo?

Graham keeps telling the 16K'ers that they can key in the MiCo programs ... but he doesn't tell you what changes may be necessary. You don't have to have a 16K machine for this - it's great for kids (and older folk) to be able to type in a shorter program. My ten year old keyed in a great little word game the other day. It was only half a page. That was listing 1 of the Delbourgos' "Take Our Word". It was specially written to suit Mico or CoCo. The same applies to "Space Bar Bandit" in December Mico.

"Monarchs" in October Mico is actually the CoCo listing! It has the CoCo pokes in lines 10-220. Except for lines 20 and 30, these lines can be left out if the program looks a bit long (they contain the title page). POKES to 1024-1535 produce a display on the screen. The MiCo screen is at 16384-16895. So in other programs if you see any POKES in that range, substitute.

eg for
FOR X=16384 TO 16895 type
FOR X=1024 TO 1535

"Typing Attack" in June MiCo has a couple of other POKES as well, eg, POKE 49151,67. I think this is the orange screen. We know how to get that on the CoCo. Then there are Pokes to 17026, which Mike Turk says in October Mico, "changes the cursor". I don't know just what it does, but, "if in doubt, leave it out!" I left it out. The program is fine without it. Don't forget to change 16384 to 1024 in line 105. The same Pokes appear in "Micomania" in the same magazine.

If you come across 16925 or 16926, substitute 283 or 284. Just for fun type POKE 283,200 then try typing something. Then turn to page 73 December MiCo and read about key debounce. While you're there, type in listing 3, changing line 8 to:

FOR X=338 TO 345

The keyboard rollover table in MiCo is at 16945 to 16952 and in CoCo it's at 338 to 345. While you have your December magazine, why not key in a little musical program (page 79)? It never ceases to amaze me how much can be done in only half a page!

I must add that I don't claim to have discovered any of these POKES. I've found them RAINBOW and CoCo and collected them.

One more thing, for those who aren't averse to typing in long programs ... when Graham says 64K he often means 32K. "Tangle" in June CoCo fits nicely in a 32K machine (and it's fun too) and all the programs in July CoCo fit in the 32K. "Move about" is less than 6K ... so it's a 16K ECB program.

If you don't like t[illegible]nd you have a 32K CoCo, then it's nice to know t[illegible]uly CoCo will get you 10 games not just 6!!

true lower case

If you have one of the very latest CoCos with the colours on the badge as slashes rather than as dots, then the following hardware modification will give you true lower case.

1. Lift Pin 30 of IC 3 from the board.
2. Fit single pole change over switch.
3. Connect centre pin of switch to IC 3 pin 30.
4. Connect one outside pin of switch to IC 4 pin 14
5. Connect other side of switch to IC 3 pin 17.

The switch allows you to switch back to block lower case, because under some circu[illegible]nces apparently, colour is not available with true lower case switched in.

This information is very recent and we have not had time to get and test it.

Next month we hope to have photos showing how to do the work, and a further report on the colour situation.

So if you are unsure of how to do this job, have someone at your User Group look over your shoulder as you do it, or wait till we can get the more detailed explaination into the magazine.

Our thanks to Tandy for providing this piece of good news!

" ADVICE JUST IN "

Yes, I'm another one of those CoCo buff freaks offering "helpful" advice for the "beginner".

Upon writing a program you cannot just sit in front of your CoCo and type away. Most good programs are a result of careful preparation and planning beforehand.

Firstly you must work out what you want the program to do, and how this is to be done.

Will there be input from the keyboard, data comments or joysticks? Will there be printout to the screen or printer? These are the main tasks.

The next step is to break these down into smaller or sub-tasks. These may, in many cases, include the use of many variables which sometimes can get out of hand. I suggest you choose your variables wisely, for example. c=color, s=score, and hs=high score. These will make your work much easier.

You should be checking the program logic as you go along and are writing it. Utilize the REM comment as often as possible. These not only help to trap errors, but make the program more readable and understandable.

For those gifted ones with Extended Color Basic the Tron and Troff commands may be used to trace other nasty errors. But most importantly, always save your programs at least twice and SKIPF test it before you run it.

These hints can help turn your brilliant programming ideas into brilliant programs.

- Justin Lipton.

PS. if ever you are in trouble and need some advice, give Graham a rest (he deserves it!) and call me on (03) 857-5149 or your friendly meet contact.

64K ECB

Richard Cubitt

Hi! I would like to submit this program, based on the movie "Ghostbusters".

It is my first high resolution arcade game and it took me about 5 to 6 months to complete. I never seem to be able to find enough time to program!

Part of the first screen is ex Australian Rainbow a few months ago.

The instructions are in the program, but to move the Ghostbuster, you may have to press the arrow keys a couple of times!

THE LISTING:

```
0 '*********GHOSTBUSTERS********
1 REM PROGRAM WRITTEN BY RICHARD
 CUBITT APRIL 1985.
2 GOTO10
3 SAVE"GBUSTERS:2":DIR2:STOP
10 CLS(0)
11 FOR H=1 TO 8
12 SOUNDRND(255),RND(4):SOUNDRND
(255),1:SOUNDRND(255),RND(5)
13 A=RND(8):B=RND(8):C=RND(8):D=
RND(8)
14 FOR E=4 TO 9
15 SET(E,4,A)
16 SET(E,9,A)
17 NEXT E
18 FOR E=5 TO 8
19 SET (4,E,A)
20 SET(5,E,A)
21 NEXTE
22 SET(9,7,A)
23 SET(9,8,A)
24 SET(8,7,A)
25 FOR E=4 TO 9
26 SET(12,E,B):SET(13,E,B):SET(1
6,E,B):SET(17,E,B)
27 NEXT E
28 FOR E=14 TO 15
29 SET(E,6,B):SET(E,7,B)
30 NEXT E
31 FOR E=20 TO 25
32 SET(E,4,C):SET(E,5,C):SET(E,8
,C):SET(E,9,C)
33 NEXTE
34 FOR E= 6 TO 7
35 SET(20,E,C):SET(21,E,C):SET(2
4,E,C):SET(25,E,C)
36 NEXT E
37 FOR E=28 TO 33
38 SET(E,4,D):SET(E,6,D):SET(E,8
,D):SET(E,9,D)
39 NEXT E
40 SET(28,5,D):SET(29,5,D):SET(3
2,7,D):SET(33,7,D)
41 FOR E= 36 TO 41
42 SET (E,4,A):SET(E,5,A)
43 NEXT E
44 FOR E= 6 TO 9
45 SET(38,E,A):SET(39,E,A)
46 NEXT E
47 FOR E=4 TO 9
48 SET(E,18,B):SET(E,20,B):SET(E
,22,B):SET(E,23,B)
49 NEXT E
50 SET(4,19,B):SET(5,19,B):SET(8
,19,B):SET(9,19,B):SET(4,21,B):S
ET(5,21,B):SET(8,21,B):SET(9,21,
B)
51 FOR E=18 TO 23
52 SET(12,E,C):SET(13,E,C):SET(1
6,E,C):SET(17,E,C)
53 NEXT E
54 SET(14,22,C):SET(14,23,C):SET
(15,22,C):SET(15,23,C)
55 FOR E=20 TO 25
56 SET(E,18,D):SET(E,20,D):SET(E
,22,D):SET(E,23,D)
57 NEXT E
58 SET(20,19,D):SET(21,19,D):SET
(24,21,D):SET(25,21,D)
59 FOR E=28 TO 33
60 SET(E,18,A):SET(E,19,A)
61 NEXT E
62 FOR E= 20 TO 23
63 SET(30,E,A):SET(31,E,A)
64 NEXT E
65 FOR E= 36 TO 41
66 SET(E,18,B):SET(E,20,B):SET(E
,22,B):SET(E,23,B)
67 NEXT E
68 FOR E=36 TO 38
69 SET(E,19,B):SET(E,21,B)
70 NEXTE
71 FOR E=44 TO 49
72 SET(E,18,C):SET(E,20,C)
73 NEXTE
74 FOR E=18 TO 23
75 SET(44,E,C):SET(45,E,C)
76 NEXT E
77 SET (48,19,C):SET (49,19,C)
78 SET(46,21,C):SET(47,21,C):SET
(47,22,C):SET(48,22,C):SET(48,23
,C):SET(49,23,C)
79 FOR E=52 TO 57
80 SET(E,18,D):SET(E,20,D):SET(E
,22,D):SET(E,23,D)
81 NEXT E
82 SET(52,19,D):SET(53,19,D):SET
(56,21,D):SET(57,21,D)
83 NEXT H
84 FOR SD=255 TO 1 STEP-2
85 SOUNDSD,1
86 NEXT SD
87 SOUND 8,8
88 PMODE3,1
89 PCLS
90 SCREEN1,0
91 CIRCLE (126,98),78,8
92 CIRCLE(126,98),56,8
93 LINE (99,49)-(175,129),PSET
94 LINE (79,69)-(153,145),PSET
95 DRAW "BM 131,55;H6U2H2U6E2U4E
4U2E4U6;N;R2;N;L2H2L6H2E2R8E2R6F
4R6F4D6F2D4F2D4F4D12G2"
96 DRAW "BM 163,57;R6F2R2F2R4F2R
2F2R2F2R2F6R2F2E2R2E2R4;BM 207,7
3;D4R4L4D4R2L4G2L4G2L32D22G2D2G2
"

97 DRAW"BM135,129;D4L2G2L2G2L2G2
L8G2L12G2L4;BM 72,153;L10G2L10R8
U2R2E6;BM 81,127;E4U2E2U4E2U4E2U
10E2U4E2U2E2;BM 109,61;E4R2E4R8"
98 DRAW"BM89,81;D6L8H2L14G2L2U2E
4H2L12U2L2E2R14U2H4U2R4F2R4F2R6"
99 DRAW"BM145,41;D6R2U4;BM147,49
;L4;BM147,35;L4;BM149,27;D4;BM14
1,27;D4;BM139,25;E4;BM151,25;H4"
100 DRAW"BM177,81;C2;U6H2U2H4U2L
2U2H4"
101 PRESET(178,81):PRESET (178,8
2):PRESET(178,83):PRESET(178,80)
:PRESET(178,84)
102 DRAW"BM135,22;R6D1R4D1R5D1R2
D1"
103 PRESET(142,46)
104 PRESET(138,45)
105 DRAW"BM159,53;L2U2L2L2U2L4U2
L8U3L14"
106 DRAW"BM75,81;C2;U2R2U4R2U4"
107 DRAW"BM139,25;C8;E4;BM151,25
;H4"
108 DRAW"BM201,80;C2;U6"
[illegible]
```

```
112 LINE(172,64)-(177,80),PSET
113 DRAW"BM161,58;C2;R6D2L8D2R8D
2L8"
114 DRAW"BM82,84;L12U1R10U1L10"
115 PAINT(204,75),2,8
116 PAINT (196,100),8,8
117 PAINT (126,100),8,8
118 PAINT(81,50),8,8
119 PAINT(172,46),8,8
120 PAINT(144,80),2,8
121 PAINT(104,120),2,8
122 PAINT(144,20),2,8
123 PAINT(69,77),2,8
124 PAINT (64,150),2,8
125 MOTOR ON:AUDIO ON
126 FOR TT=1 TO 10
127 FOR K=1 TO 3500:NEXT K
128 SCREEN 0,1
129 FOR G=1 TO 500
130 NEXT G
131 SCREEN 1,0
132 NEXT TT
133 MOTOR OFF:AUDIO OFF
134 DIMB(23,43)
135 DIM M(15,47)
136 PCLS:CLS(3)
137 PRINT@224,"INSTRUCTIONS Y/N"
:A$=INKEY$:IF A$="Y" THEN GOSUB
375
138 IF A$=""THEN 137
139 G=1:J=0:EST=150:MN=150:GN=0:
T=125:T2=151:S=152:S2=168
140 MP=4:Y=12:Z=12:A=12:D=4:G=56
:H=12:I=48
141 PMODE3,1
142 CLS:SCREEN0,0:SOUND100,5:PRI
NT"ONE MOMENT PLEASE..."
143 COLOR3
144 LINE(0,0)-(256,192),PSET,B
145 LINE(0,168)-(256,168),PSET
146 LINE(0,144)-(256,144),PSET
147 PAINT(4,156),2,3:COLOR3:LINE
(28,144)-(20,168),PSET
148 LINE(80,144)-(72,168),PSET
149 LINE(132,144)-(124,168),PSET
150 LINE(180,144)-(172,168),PSET
151 LINE(232,144)-(224,168),PSET
152 LINE(20,0)-(20,144),PSET
153 LINE(236,0)-(236,144),PSET
154 DRAW"BM0,56;R8D88"
155 LINE(8,56)-(20,60),PSET
156 DRAW"BM236,56;R20"
157 LINE(44,8)-(192,144),PSET,B
158 LINE(44,8)-(72,56),PSET,B
159 LINE(44,56)-(192,56),PSET,B
160 DRAW"BM84,8;D48;BM112,8;D48;
BM124,8;D48;BM152,8;D48;BM144,8;
D48"
161 LINE(44,58)-(192,5
162 LINE(44,62)-(192,62
163 LINE(44,64)-(192,64),PSET
164 LINE(56,88)-(180,88),PSET
165 LINE(44,92)-(192,92),PSET
166 LINE(44,92)-(56,88),PSET
167 LINE(192,92)-(180,88),PSET
168 DRAW"BM56,92;D52;BM118,92;D5
2;BM180,92;D52;BM56,88U16;BM92,8
8;U16;BM96,88;U16;BM140,88;U16;B
M144,88;U16;BM180,88;U16"
169 LINE(74,64)-(56,72),PSET
170 LINE(74,64)-(92,72),PSET
171 LINE(118,64)-(96,72),PSET
172 LINE(118,64)-(140,72),PSET
173 LINE(162,64)-(144,72),PSET
174 LINE(162,64)-(180,72),PSET
175 PAINT(22,1),4,3
176 COLOR3
177 PAINT(76,20),4,3
178 PAINT(116,20),4,3
179 PAINT(156,20),4,3
180 COLOR3
181 LINE(20,4)-(236,4),PSET
182 LINE(20,8)-(236,8),PSET
183 FOR X=1 TO 33
184 LINE(20,Y)-(44,Z),PSET
185 LINE(192,Y)-(236,Z),PSET:Y=Y
+4:Z=Z+4
186 NEXT X
187 FOR X=1 TO 11
188 LINE(72,A)-(84,A),PSET
189 LINE(112,A)-(124,A),PSET
190 LINE(152,A)-(164,A),PSET
191 A=A+4
192 NEXT X
193 C=0
194 FOR X=1 TO 18
195 LINE(24,C)-(24,C+4),PSET
196 C=C+8
197 NEXT X
198 FOR X=1 TO 18
199 LINE(32,D)-(32,D+4),PSET
200 D=D+8
201 NEXT X
202 E=0
203 FOR X= 1 TO 18
204 LINE(40,E)-(40,E+4),PSET
205 E=E+8
206 NEXT X
207 FOR X=1 TO 18
208 LINE(200,F)-(200,F+4),PSET
209 LINE(208,F+4)-(208,F+8),PSET
210 LINE(216,F)-(216,F+4),PSET
211 LINE(224,F+4)-(224,F+8),PSET
212 LINE(232,F)-(232,F+4),PSET
213 F=F+8
214 NEXT X
215 PAINT(5,5),3,3:PAINT(244,1),
3
FOR X=1 TO 10
217 LINE(G,0)-(G,4),PSET
218 LINE(G-8,4)-(G-8,8),PSET
219 G=G+16:NEXT X
220 FOR X=1 TO 6
221 LINE(80,H)-(80,H+4),PSET
222 LINE(120,H-4)-(120,H),PSET
223 LINE(160,H)-(160,H+4),PSET
224 H=H+8:NEXT X
225 FOR X=1 TO 36
226 LINE(I,60)-(I,62),PSET
227 I=I+4:NEXT X
228 PAINT(46,60),2,3
229 PAINT(46,57),2,3
230 PAINT(46,63),2,3
231 COLOR3
INT(76,80),2,3:PAINT(120,8
:PAINT(164,80),2,3:CIRCLE(
74,88),10,3,1,.5,1
233 CIRCLE(118,88),10,3,1,.5,1
234 CIRCLE (162,88),10,3,1,.5,1
235 DRAW"BM74,64;D16;BM118,64;D1
6;BM162,64;D16"
236 LINE(56,72)-(68,80),PSET
237 LINE(92,72)-(80,80),PSET
238 LINE(96,72)-(112,80),PSET
239 LINE (140,72)-(124,80),PSET
240 LINE(144,72)-(156,80),PSET
241 LINE(180,72)-(168,80),PSET
242 LINE(56,84)-(66,84),PSET
243 LINE (82,84)-(92,84),PSET
244 LINE(96,84)-(110,84),PSET
245 LINE(126,84)-(140,84),PSET
246 LINE(144,84)-(154,84),PSET
247 LINE(170,84)-(180,84),PSET
248 LINE(44,12)-(192,12),PSET
249 PAINT(56,10),2,3:PAINT(96,10
),2,3:PAINT(136,10),2,3:PAINT(17
6,10),2,3
250 COLOR3:LINE(44,10)-(72,10),P
SET
251 DRAW"BM84,10;R28;BM124,10;R2
8;BM164,10;R28"
252 PAINT(80,90),4,3
253 PAINT(48,100),3,3:PAINT(188,
100),3,3:PAINT(52,80),3,3:PAINT(
188,80),3,3:PAINT(96,68),3,3:PAI
NT(144,68),3,3
254 FORX=56TO144STEP2
255 LINE(236,X)-(256,X),PSET
256 NEXTX
257 FORX=56TO140STEP2
258 LINE(8,X)-(20,X+4),PSET
259 NEXTX
260 DRAW"BM255,152;L20G12L20D15R
24E8R8F8R4"
261 CIRCLE(239,178),10,3,1,0,.5
262 LINE(256,1
(205,168),PRES
ET
263 DRAW"BM255,154;L16G12R27"
264 PAINT(224,172),4,3
265 PAINT(250,153),3,3
```

```
266 PAINT(245,178),3,3
267 COLOR2:CIRCLE(239,178),3
268 LINE(204,170)-(256,170),PSET
269 COLOR3:LINE(250,154)-(250,16
6),PSET
270 DRAW"BM156,144;U4R4U12L2U8R2
U2L2U4R4D4L2D2R2D2L2D8R4U8L4D4R2
D6L2D12"
271 PAINT(158,142),3,3
272 COLOR4
273 DRAW"BM158,124;L3U6;BM158,12
4;L4U8;BM158,125;L4U12"
274 DRAW "BM151,43C3;L2H1L3U1L16
2E2R1E2U3H1U2H1U1H1U1H1U3L1U1L1R
1E2U2D1L261H1L261D1G1L2D1
1G1D1G1D1G1F1D264E4F1R1F1R
275 DRAW"BM133,27;E1;BM135,28D2;
BM138,28;D2;BM137,32;L1;BM137,34
D1R1D3L1D1U1L1U3;BM137,42L2"
276 PAINT(140,50),2,3
277 CLS:PRINT"GET READY!!!":SOUN
D100,5:SOUND50,3:SCREEN0,1
278 FOR GM=1 TO 2000:NEXT GM:SOU
ND100,2
279 SCREEN 1,0
280 READ GM
281 IF GM=1 THEN 295
282 IF GM=2 THEN 301
283 IF GM=3 THEN 307
284 IF GM=4 THEN 313
285 FOR X=1 TO EST:NEXTX
286 GOSUB319
287 FOR X=1 TO EST:NEXT X
288 GOSUB 319
289 FOR X=1 TO EST:NEXT X
290 GOSUB319
291 FOR X=1 TO EST:NEXT X:GOSUB
319
292 GET(125,13)-(151,55),B,G
293 PUT(165,13)-(191,55),B,PSET
294 COLOR1:LINE(126,13)-(151,55)
,PSET,BF
295 GP=1:GET(T,13)-(T2,55),B,G
296 PUT(45,13)-(71,55),B,PSET
297 COLOR1:LINE(T,13)-(T2,55),PS
ET,BF
298 T=45:T2=71
299 GOSUB319:FOR X=1 TO EST:NEXT
 X:GOSUB 319
300 GP=1:GOSUB319:GOTO 280
301 GP=2:GET(T,13)-(T2,55),B,G
302 PUT(85,13)-(111,55),B,PSET
303 COLOR1:LINE(T,13)-(T2,55),PS
ET,BF
304 T=85:T2=111
305 GOSUB319:FOR X=1 TO EST:NEXT
 X:GOSUB 319
306 GP=2:GOSUB319:GOTO 280
307 GP=3:GET(T,13)-(T2,55),B,G
308 PUT(125,13)-(151,55),B,PSET
309 COLOR1:LINE(T,13)-(T2,55),PS
ET,BF
310 T=125:T2=151
311 GOSUB319:FOR X=1 TO EST:NEXT
 X:GOSUB 319
312 GP=3:GOSUB319:GOTO 280
313 GP=4:GET(T,13)-(T2,55),B,G
314 PUT(165,13)-(191,55),B,PSET
315 COLOR1:LINE(T,13)-(T2,55),PS
ET,BF
316 T=165:T2=191
317 GOSUB319:FOR X=1 TO EST:NEXT
 X:GOSUB 319
318 GP=4:GOSUB319:GOTO 280
319 A$=INKEY$
320 IF A$=CHR$(32)THEN  346
321 IF A$=CHR$(8)THEN 326
322 IF A$=CHR$(9)THEN 336
323 IF A$=CHR$(32)THEN   346
324 GN=GN+1:IF GN=MN THEN 365
325 RETURN
326 GET(S,96)-(S2,143),M,G
327 COLOR1:LINE(S,96)-(S2,143),P
SET,BF
328 S=S-32:S2=S2-32
329 MP=MP-1:IF MP=<1 THEN MP=1
330 IF S=<56 THEN S=56
331 IF S2=<72 THEN S2=72
332 PUT(S,96)-(S2,143),M,PSET
333 A$=INKEY$
334 IF A$=CHR$(32)THEN GOSUB 346
335 RETURN
336 GET(S,96)-(S2,143),M,G
337 COLOR1:LINE(S,96)-(S2,143),P
SET,BF
338 MP=MP+1:IF MP=>4 THEN MP=4
339 S=S+32:S2=S2+32
340 IF S=>152 THEN S=152
341 IF S2=>168 THEN S2=168
342 PUT(S,96)-(S2,143),M,PSET
343 A$=INKEY$
344 IF A$=CHR$(32)THEN GOSUB 346
345 RETURN
346 IF MP=GP THEN 352
347 PLAY"T160CDC"
348 COLOR4:LINE(S,112)-(S,93),PS
ET
349 FOR X=1 TO 30:NEXT X
350 LINE(S,112)-(S,93),PRESET
351 GOTO 319
352 PLAY"T160CDCDCDAAAA"
353 COLOR4
354 LINE(S,112)-(S,93),PSET
355 FOR X=1 TO 30:NEXT X
356 SC=SC+100:IF SC=3000 THEN GO
SUB 360
357 SCREEN1,0:FOR X=1 TO 30:NEXT
 X:SCREEN1,J
358 LINE(S,112)-(S,93),PRESE
359 RETURN
360 SCREEN1,1:MN=30:GN=0::EST=99
361 Q=0:J=1:SC=1500
362 TA=TA+1:IF TA=2 THEN 370
363 PLAY"ABCDEFGGFEDCBA"
364 RETURN
365 PLAY"T150AAABBBCCDDDEEEFFEDA
FBCFEEEEAAAFFFCCCDDBBDEADAEADEAD
ECBCBCADEFFDEADBCADEBCEDAEADCC":
CLS(2):SCREEN0,1:PRINT"YOU HAVE
RUN OUT OF TIME AND THEGHOSTS HA
VE TAKEN OVER THE TOWN.YOU SCORE
 WAS ";SC
366 PRINT:PRINT"ANOTHER GAME Y/N
"
367 A$=INKEY$:IF A$="Y"THEN RUN
134
368 IF A$=""THEN 367:END
369 END
370 PLAY"T150AABBBCCDDEEFFFDDEAA
CCBBDDFFFFEEDDAADCBFEDFDEFDEFFBB
BAAADDEEEEFFCDCDCDCDEEEDEEDDEEAA
AAAAAAAAA":CLS(4):SCREEN0,0:PRI
NT"YOU HAVE KILLED ALL THE GHOST
S  AND BEEN ELECTED THE NEW TOWN
   HERO YOUR SCORE WAS ";SC:GOTO
 366
371 STOP
372 DATA 1,2,3,4,1,2,3,4,2,3,4,3
,2,1,2,3,4,3,2,1,2,1,2
373 DATA 1,3,2,4,1,4,2,3,4,2,1,3
,4,1
374 DATA 4,3,1,2,4,1,2,3,4,3,2,4
,1,2,3,4,3,1,2,3,2,3,2,4,1,2,3,4
,3,2,1,2,1,2,1,3,2,4,3,4,3,4,1,2
,3,4,3,2,1,2,3,2,3,1,4,3,2,1,2,3
,2,3,1,4,3,2,4,3,1,2,3,1,2,4,2,3
,2,1,2,4,2,3
375 CLS(5):PRINT"YOU HAVE BEEN A
SSIGNED TO RID   GOTHAM CITY OF
IT'S GHOSTS.     TO MOVE YOUR GH
OSTBUSTER USE THEARROW KEYS, TO
FIRE PRESS THE   SPACE BAR. GOOD
 LUCK!!!!!!!!!!!!"
376 FOR XC=1 TO 3000:NEXT XC
377 RETURN
```

WE'RE CELEBRATING

For our first birthday issue we thought we'd try something a little different in the way of program listings.

Over the last 12 months, indeed even longer, the CoCo community has become indebted to the Delbourgo family from Tasmania. So much so that our inaugural Greg Wilson award was presented to them at this years CoCoConf.

Reams have been written of their unique contribution to our community that we won't embarass them any further, except to say thank you, once more and to dedicate this first birthday issue to their outstanding programming skills.

The following programs in this first birthday issue are from the Delbourgo family treasure chest ... it's our birthday gift to you.

We take this opportunity to thank and congratulate all contributors to Australian CoCo this last thrilling, if not exhausting year. Keep those great programs coming in.

I would also like to take this opportunity to say a personally thank you to our editor Graham Morphett.

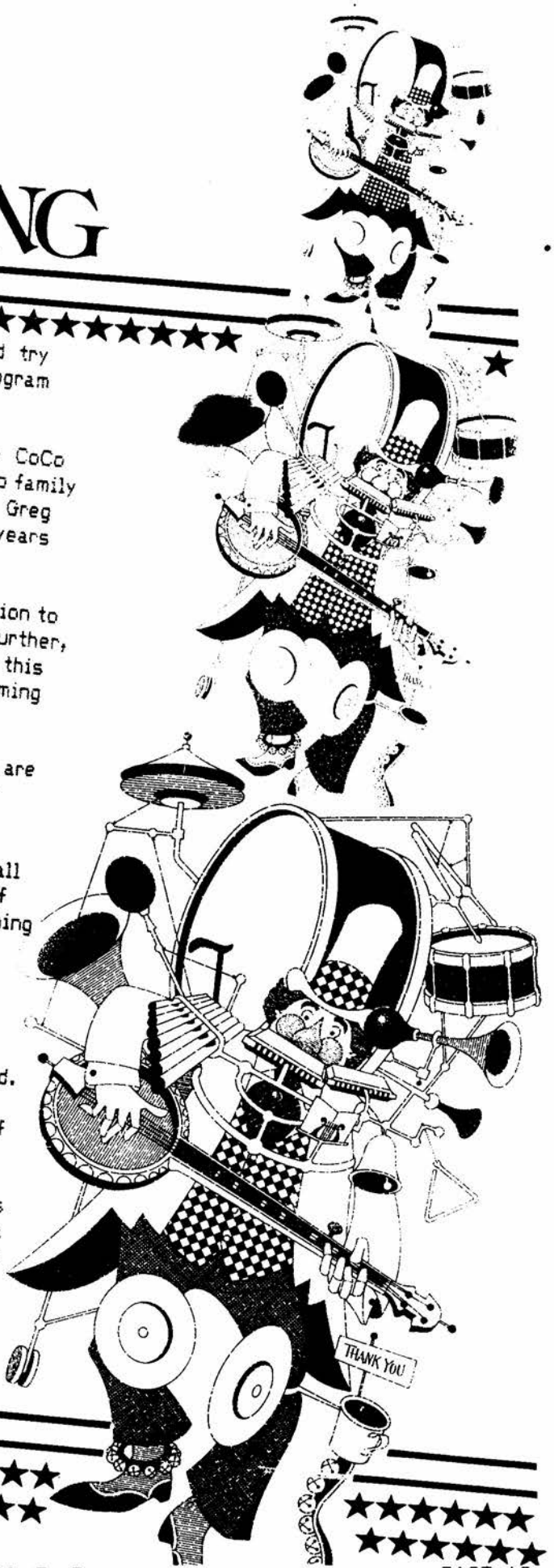
His friendship and encouragement are most appreciated.

But we must do something about his foolish sense of humour.

Seriously, without someone as 'foolish' as Graham was after Greg Wilson's demise we would indeed not have a continuing Color Computer family of which we can be so justly proud.

So strike up the band, I think we're ready for another 12 months.

Darcy O'Toole.



16K WORD GAME

A GIFT WITH WORDS?

by Bob Delbourgo

(So called 'IQ' testing is intended as a guide to show other people the probable abilities of the person being tested. Most psychologists use the IQ test only as a starting point for further investigation, because many factors effect a person's abi[illegible]

Things like personal experiences, personal motivation and one's current health will change a psychologist's reaction to IQ test results.

An IQ test score of 100 is considered "average", but a score of 10 either side of 100 is a very similar result.

In fact IQ scores really have to vary by 15 - 30 points either side of 100 for the psychologist to be able to make any solid deductions regarding comparative intelligences.

This game tests one specific aspect of intelligence - your verbal reasoning ability. It is a lot of fun, and if taken in that spirit will be used time and time again.

Please don't take the test result seriously, as scores are meant to be only a very general guideline of a small and specific aspect of your general abilities.

Parents please note: we have no idea as to the validity of the sampling and scoring proceedures used to determine results of this test. We therefore urge you not to accept the final outcome as the true and exact verbal reasoning ability of the player. G.)

How good are your verbal reasoning abilities? Hans Eysenck proposed to help you answer that question in his book on IQ. I have adapted his verbal reasoning ability quiz to run on CoCo (ECB is not needed) or on the MC-10 (subject to certain minor modifications). There is very little to explain about the program except to point out that:

(i) if you are running it on CoCo, type it exactly as is,

& (ii) if you are using the MC-10 you will need 20K memory and will have to delete lines 105, 120, 160, 1002, 1003 and 1004 for lack of TIMER. Further you must time yourself and end the proceedings after 45 minutes.

Be very careful to type in the DATA statements totally accurately as they encode the answers. (The encryption was deliberate in case the typist also wished to indulge in the quiz).

Also do not be too worried if you do not arrive at the 'standard' solution. I found three answers which were just as acceptable as Eysenck's -- and there may be more.

Have fun and please don't take the quiz with the implied IQ assessment too seriously!

THE LISTING:

```
1 '***VERBAL IQ*****************
* *********BOB DELBOURGO*******
*
2 GOTO100
3 SAVE"VERBALIQ:2":STOP
100 CLEAR500:CLS:DIMD(50),A$(50)
,B$(50)
101 PRINT" AN IQ TEST ON VERBAL
ABILITY"
102 PRINT" ADAPTED FROM H. EYSEN
CK'S BOOK"
103 PRINT:PRINT" b y  b o b  d
e l b o u r g o"
104 PRINT:PRINT:PRINT" YOU HAVE
45 MINUTES IN WHICH  TO SOLVE
50 WORD PROBLEMS."
105 PRINT" EVERY TIME A NEW QUES
TION IS  ATTEMPTED, THE RUNNIN
G TIME  WILL BE DISPLAYED."
106 PRINT:PRINT@486,"DECODING AN
SWERS";:FORD=1TO50:READD$
107 A$(D)="":FORL=1TOLEN(D$):A$(
D)=A$(D)+CHR$(ASC(MID$(D$,L,1))-
INT(D/2)-L+20):NEXTL
108 NEXTD
117 PRINT@494,"TO START...";
118 PRINT@486,"<ENTER> ";:FORT=1
TO100:NEXTT:PRINT@486,"<enter> "
;:FORT=1TO100:NEXTT
119 IFINKEY$<>CHR$(13)THEN118
120 TIMER=0
150 CLS:PRINT@9,"question menu"
151 FORJ=0TO9:FORI=1TO5:K=7*I+57
+32*J
152 K$=MID$(STR$(I+5*J),2):PRINT
@K,K$")";
153 IFD(I+5*J)=0THENPRINT@K+3,CH
R$(239);
154 IFD(I+5*J)=1THENPRINT@K+3,CH
R$(255);
155 NEXTI,J:PRINT@480,CHR$(239)"
=ATTEMPTED , "+CHR$(255)+"= NOT
ATTEMPTED.";:PRINT@448,"enter 51
 to end the quiz."
156 PRINT@416,"WHICH QUESTION";
157 INPUTQ:Q=INT(Q):IFQ>51ORQ<1T
HENSOUND100,1:GOTO156
158 IFQ=51THEN750
159 GOSUB1000:GOSUB2000:IFN=50TH
EN750
160 IFTM=4ANDTIMER>15000THEN750
161 GOTO150
170 IFD(Q)=0THENGOSUB910:PRINT@2
11,"":PRINT@211,"";:INPUTB$:IFB$
=""THENA=1:RETURN
171 IFD(Q)=0THENB$(Q)=B$:D(Q)=1:
A=1:N=N+1:RETURN
172 IFD(Q)=1ORA=0THENPRINT@211,"
a:";:PRINTB$(Q):GOSUB950
173 RETURN
210 PRINT@194,"NEW(*****)TALE";:
GOSUB900:GOSUB170:IFA=0THEN210
211 RETURN
220 PRINT@195,"BAL(***)DER";:GOS
UB920:GOSUB170:IFA=0THEN220
221 RETURN
230 PRINT@131,"SCHAMOT";:PRINT@1
95,"LABLOTOF";:PRINT@259,"CEKTIF
C";:PRINT@323,"SNINET";
231 GOSUB930:GOSUB170:IFA=0THEN2
30
232 RETURN
240 L$=" SSLPRTR LBR":FORL=1TO6:
PRINT@98+32*L,MID$(L$,2*L-1,2);:
NEXTL
241 PRINT@197,"(***)";:GOSUB940:
GOSUB170:IFA=0THEN240
242 RETURN
250 PRINT@192,"PUSH(*****)PAPERS
";:GOSUB900:GOSUB170:IFA=0THEN25
0
251 RETURN
260 PRINT@194,"TR(***)IVE";:GOSU
B920:GOSUB170:IFA=0THEN260
261 RETURN
270 PRINT@131,"TIRANAS";:PRINT@1
95,"TINLOM";:PRINT@259,"RYBOCS";
:PRINT@323,"RYLESEP";
271 GOSUB930:GOSUB170:IFA=0THEN2
70
272 RETURN
280 PRINT@195,"(*****)-BALL";:PR
INT@138,"/BIRD";:PRINT@266,"\LEG
 ";:GOSUB960:GOSUB170:IFA=0THEN2
80
281 RETURN
290 PRINT@193,"FRIEND(****)JOIN"
;:GOSUB900:GOSUB170:IFA=0THEN290
291 RETURN
300 PRINT@194,"EX(****)ACLE";:GO
S[illegible]UB170:IFA=0THEN300
[illegible]N
3[illegible]T@132,"STOP  ";:PRINT@19
```

```
6,"DRIOA ";:PRINT@260,"PENOH ";:
PRINT@324,"DREAGN";
311 GOSUB930:GOSUB170:IFA=0THEN3
10
312 RETURN
320 PRINT@195,"(****)-HORN";:PRI
NT@137,"/TREE";:PRINT@265,"\LACE
";
321 GOSUB960:GOSUB170:IFA=0THEN3
20
322 RETURN
330 PRINT@197,"SP(**)CH";:GOSUB9
20:GOSUB170:IFA=0THEN330
331 RETURN
340 PRINT@193,"CUT(****)OPENING"
;:GOSUB900:GOSUB170:IFA=0THEN340
341 RETURN
350 PRINT@130,"TRACROS";:PRINT@1
94,"TEADS";:PRINT@258,"LEPAPS";:
PRINT@322,"RESHICER";:PRINT@386,
"BABECAGS";
351 GOSUB930:GOSUB170:IFA=0THEN3
50
352 RETURN
360 L$="SRHLDFGBNPTW":FORL=1TO12
:PRINT@36+32*L,MID$(L$,L,1)::NEX
TL:PRINT@163,"C";:PRINT@198,"(**
*)";
361 GOSUB940:GOSUB170:IFA=0THEN3
60
362 RETURN
370 PRINT@195,"ST(***)PLE";:GOSU
B920:GOSUB170:IFA=0THEN370
371 RETURN
380 PRINT@130,"HARCI";:PRINT@194
,"NOPEY";:PRINT@258,"PYPOP";:PRI
NT@322,"CUTREBPUT";:PRINT@386,"L
IPUT";
381 GOSUB930:GOSUB170:IFA=0THEN3
80
382 RETURN
390 L$="SRTBFHMNPTW":FORL=1TO10:
PRINT@34+32*L,MID$(L$,L,1);:NEXT
L:PRINT@197,"(***)";
391 GOSUB940:GOSUB170:IFA=0THEN3
90
392 RETURN
400 PRINT@193,"PUNISH(****)NICE"
;:GOSUB900:GOSUB170:IFA=0THEN400
401 RETURN
410 PRINT@194,"APR(**)ION";:GOSU
B920:GOSUB170:IFA=0THEN410
411 RETURN
420 PRINT@130,"REETIRR";:PRINT@1
94,"STALANIA";:PRINT@258,"XEBOR"
;:PRINT@322,"LUNTAW";
421 GOSUB930:GOSUB170:IFA=0THEN4
20
422 RETURN
430 PRINT@193,"FLAME(***[illegible]T"
;:GOSUB900:GOSUB170:IFA=0THEN430
431 RETURN
440 L$="SL PBLCR D K S W":FORL=1
TO8:PRINT@66+32*L,MID$(L$,2*L-1,
2);:NEXTL
441 PRINT@197,"(***)";:GOSUB940:
GOSUB170:IFA=0THEN440
442 RETURN
450 PRINT@195,"ST(****)ER";:GOSU
B920:GOSUB170:IFA=0THEN450
451 RETURN
460 PRINT@130,"RUYERS";:PRINT@19
4,"SEEXS";:PRINT@258,"NOLLWARC";
:PRINT@322,"AROLFID";
461 GOSUB940:GOSUB170:IFA=0THEN4
60
462 RETURN
470 PRINT@192,"CROWD(*****)PAPER
S";:GOSUB900:GOSUB170:IFA=0THEN4
70
471 RETURN
480 PRINT@195,"A(****)Y";:GOSUB9
20:GOSUB170:IFA=0THEN480
481 RETURN
490 PRINT@130,"OCIRA";:PRINT@194
,"OKOTI";:PRINT@258,"OOTRONT";:P
RINT@322,"REBLAGED";
491 GOSUB930:GOSUB170:IFA=0THEN4
90
492 RETURN
500 L$="RTBCDGKLSV":FORL=1TOLEN(
L$):PRINT@66+32*L,MID$(L$,L,1);:
NEXTL
501 PRINT@197,"(***)";:GOSUB940:
GOSUB170:IFA=0THEN500
502 RETURN
510 L$="FLTH R K P S WST":FORL=1
TO8:PRINT@66+32*L,MID$(L$,2*L-1,
2);:NEXTL
511 PRINT@197,"(***)";:GOSUB940:
GOSUB170:IFA=0THEN510
512 RETURN
520 PRINT@193,"SHAPE(****)CLASS"
;:GOSUB900:GOSUB170:IFA=0THEN520
521 RETURN
530 PRINT@194,"HAM(******)ENT";:
GOSUB920:GOSUB170:IFA=0THEN530
531 RETURN
540 PRINT@130,"LEEGA";:PRINT@194
,"WARPSOR";:PRINT@258,"RALK";:PR
INT@322,"LAHEW";
541 GOSUB930:GOSUB170:IFA=0THEN5
40
542 RETURN
550 L$="THSL P HCL B D J L R S":
FORL=1TO11:PRINT@34+32*L,MID$(L$
,2*L-1,2);:NEXTL
551 PRINT@197,"(***)";:GOSUB940:
GOSUB170:IFA=0THEN550
552 RETURN
560 PRINT@196,"S(***)GET";:GOSUB
920:GOSUB170:IFA=0THEN560
561 RETURN
570 PRINT@130,"KINSECD";:PRINT@1
94,"SLEWL";:PRINT@258,"NIENIEST"
;:PRINT@322,"FEDEO";:PRINT@386,"
TISWF";
571 GOSUB930:GOSUB170:IFA=0THEN5
70
572 RETURN
580 PRINT@192,"ACCOUNT(****)BEAK
";:GOSUB900:GOSUB170:IFA=0THEN58
0
581 RETURN
5[illegible]="DHLMPT":FORL=1TO6:PRINT@
[illegible]32*L,MID$(L$,L,1);:NEXTL:PRIN
T@196,"(***)";: RETURN
600 PRINT@193,"NOTCH(****OSUB170
:IFA=0THEN600
601 RETURN
610 PRINT@194,"DEC(****)AGE";:GO
SUB920:GOSUB170:IFA=0THEN610
611 RETURN
620 PRINT@130,"LIONSTEVIE";:PRIN
T@194,"OIQSMTOU";:PRINT@258,"TAN
G";:PRINT@322,"EMITTER";
621 GOSUB930:GOSUB170:IFA=0THEN6
20
622 RETURN
630 PRINT@192,"NEW(*****)IMPUDEN
T";:GOSUB900:GOSUB170:IFA=0THEN6
30
631 RETURN
640 PRINT@194,"DE(****)ER";:GOSU
B920:GOSUB170:IFA=0THEN640
641 RETURN
650 L$="RMCSDHL":FORL=1TO7:PRINT
@66+32*L,MID$(L$,L,1);:NEXTL:PRI
NT@197,"(***)";:GOSUB940:GOSUB17
0:IFA=0THEN650
651 RETURN
660 PRINT@130,"SHROPAMEE";:PRINT
@194,"TOGA";:PRINT@258,"RHOSE";:
PRINT@322,"VABERE";
661 GOSUB930:GOSUB170:IFA=0THEN6
60
662 RETURN
670 L$=" H D S LGRSKDR":FORL=1TO
7:PRINT@65+32*L,MID$(L$,2*L-1,2)
;:NEXTL
671 PRINT@197,"(***)";:GOSUB940:
GOSUB170:IFA=0THEN670
672 RETURN
680 PRINT@194,"ENC(****)LES";:GO
SUB920:GOSUB170:IFA=0THEN680
681 RETURN
690 L$="HLTBDNP":FORL=1TO7:PRINT
@66+32*L,MID$(L$,L,1);:NEXTL:PRI
NT@161,"S";
691 PRINT@197,"(***)";:GOSUB940:
```

```
GOSUB170:IFA=0THEN690
692 RETURN
700 PRINT@130,"TORREBH";:PRINT@1
94,"STERIS";:PRINT@258,"LINOVI";
:PRINT@322,"NUTA";:PRINT@386,"HO
TMER";
701 GOSUB930:GOSUB170:IFA=0THEN7
00
702 RETURN
750 CLS:PRINT@11,"assessment":PR
INT:IFN<50THENPRINT"TIME'S UP!!"
751 IFN=50THENPRINT"YOU'VE COMPL
ETED THE TEST IN    GOOD TIME!"E
752 IFQ=51THENPRINT"TIRING, WASN
'T IT?"
753 D=0:S=0:FORI=1TO50:IFA$(I)=B
$(I)THENS=S+1
754 IFD(I)=1THEND=D+1
755 NEXTI
760 PRINT:PRINT"YOU GOT"S"QUESTI
ONS CORRECT OUTOF 50, HAVING ACT
UALLY ATTEMPTED"D"OF THEM."
761 PRINT"THIS GIVES YOU AN IQ O
F"INT(2.6*S)+90
762 FORI=1TO50:D(I)=1:NEXTI
763 PRINT:PRINT"DO YOU WISH TO S
EE THE ANSWERS?";
764 K$=INKEY$:IFK$="N"THENEND
765 IFK$="Y"THEN770
766 GOTO764
770 CLS0:PRINT"WHICH QUESTION";:
INPUTQ
771 IFQ<1ORQ>50THENSOUND100,1:GO
TO770
772 CLSRND(7)+1:PRINT@0,"questio
n #"Q
773 FORI=18TO498STEP32:PRINT@I,C
HR$(128);:NEXTI
774 PRINT@275,"s:"A$(Q):GOSUB200
0:GOTO770
900 PRINT@115,"synonym of":PRINT
@147,"words outside";:PRINT@179,
"the brackets":RETURN
910 PRINT@481,"enter AT ONCE TO
SKIP QUESTION";:RETURN
920 PRINT@83,"which word":PRINT@
115,"ends the 1st":PRINT@147,"on
e & starts":PRINT@179,"second on
e":RETURN
930 PRINT@115,"which is the":PRI
NT@147,"odd anagram":PRINT@179,"
(unscrambled)";:RETURN
940 PRINT@115,"which ending":PRI
NT@147,"can complete":PRINT@179,
"all prefixes":RETURN
950 PRINT@481,"ANOTHER (A)TTEMPT
 OR (M)ENU?";
951 K$=INKEY$:IFK$="A"THENA=0:B$
(Q)="":N=N-1:D(Q)=0:RETURN
952 IFK$="M"THENA=1:RETURN
953 GOTO951
960 PRINT@115,"which word":PRINT
@147,"can precede":PRINT@179,"th
e final set";:RETURN
1000 CLSRND(7)+1:PRINT@19,"quest
ion#"Q;
1001 FORI=18TO498STEP32:PRINT@I,
CHR$(128);:NEXTI
1002 IFTIMER>30000THENTM=TM+1:TI
MER=TIMER-30000
1003 MI=10*TM+INT(TIMER/3000):SE
=INT(TIMER/50):SE=SE-60*INT(SE/6
0)
1004 PRINT@0,"RUN TIME: ";:PRINT
@14,SE;:PRINT@17,CHR$(34);:PRINT
@10,MI;:PRINT@13,"'";
1005 RETURN
2000 IFQ<26THENONQ GOSUB210,220,
230,240,250,260,270,280,290,300,
310,320,330,340,350,360,370,380,
390,400,410,420,430,440,450
2005 IFQ>25THENON(Q-25) GOSUB460
,470,480,490,500,510,520,530,540
,550,560,570,580,590,600,610,620
,630,640,650,660,670,680,690,700
2010 RETURN
5000 DATA ";=E5=",":04","AC?>36(
","83(","?B6EF","5?6","=:>GCC","
3>47@",")3G9","F8BI"
5001 DATA "94F9;E","F<D;","<B","
GA?K","7=;IJB?N",":?I","G?G","9?
9BL","?3D","=AG?"
5002 DATA "FF","O:FIQQ",">BL@","
>?K","KCIC","@GKOGCA","JMAPQ",">
KOL","=AIEQAEG","AKR"
5003 DATA "EKE","CMQM","PRQIOI",
"UGAMG","SLP","SAS","DIOUWINT","
BJNO","IOV","OKFO"
5004 DATA "MKQI","VHPJ\P[RYY","H
UIXN","IISJ","RGP","WJSHXQYJQ","
MUY","W[Z\","FXR","\PWUSY"
```

16K ECB

MOSAICS

by D & R Delbourgo

Those of you in the flooring industry will appreciate this program.

In fact it is not at all well known, that when the major flooring manufacturers of the world need new patterns for their product, they contact Bob and family who run off this program, send a screen dump, and pocket thousands of dollars for their effort.

Bob and family have always been able to entertain and instruct. This program is a prime example of that ability.

THE LISTING:

```
1 '***********MOSAICS***********
   *********D&R DELBOURGO*******
2 GOTO10
3 SAVE"MOSAICS:2":DIR2:STOP
10 CLS0:POKE65495,0:S$="L4003C02
BAGFEDC":PRINT@448,"RANDOM MOSAI
CS BY D&R DELBOURGO";:PRINT@480,
"hobart, tasmania, australia700
";:FORV=1TO5:GOSUB93
11 Z=R:FORY=0TO384STEP128:FORX=1
TO25STEP6:GOSUB15:NEXTX,Y
12 Z=S:FORY=0TO256STEP128:FORX=3
3TO57STEP6:GOSUB16:NEXTX,Y
13 Z=T:FORY=0TO256STEP128:FORX=6
9TO93STEP6:GOSUB17:NEXTX,Y
14 PLAY"P1":NEXTV:PLAYS$:GOTO18
15 O=1024+Y+X:FORW=0TO3:POKEO+W,
Z:POKEO+34+W,Z:NEXTW:PLAY"L25502
C":RETURN
16 O=1024+Y+X:FORW=0TO1:POKEO+W,
Z:POKEO+32+W,Z:POKEO+34+W,Z:POKE
O+64+W,Z:NEXTW:PLAY"L25502E":RET
URN
17 O=1024+Y+X:FORW=0TO1:POKEO+W,
Z:POKEO+30+W,Z:POKEO+32+W,Z:POKE
O+64+W,Z:NEXTW:PLAY"L25502G":RET
URN
18 A=RND(9):ONA GOTO19,27,34,43,
51,58,66,76,86
19 CLS0:FORV=1TO5:GOSUB93
20 Z=R:FORY=65TO449STEP128:FORX=
0TO24STEP8:GOSUB25:NEXTX,Y
21 Z=S:FORY=37TO421STEP128:FORX=
0TO16STEP8:GOSUB26:NEXTX,Y
22 Z=T:FORY=129TO385STEP128:FORX
=0TO24STEP8:GOSUB25:NEXTX,Y
23 Z=U:FORY=101TO357STEP128:FORX
=0TO16STEP8:GOSUB26:NEXTX,Y
24 PLAY"P1":NEXTV:PLAYS$:GOTO18
25 O=1024+Y+X:POKEO,Z:POKEO+1,Z:
POKEO+3,Z:POKEO+4,Z:POKEO-31,Z:P
OKEO-30,Z:POKEO-29,Z:POKEO-62,Z:
PLAY"O2L255C":RETURN
26 O=1024+Y+X:POKEO,Z:POKEO+1,Z:
POKEO+3,Z:POKEO+4,Z:POKEO+33,Z:P
OKEO+34,Z:POKEO+35,Z:POKEO+66,Z:
PLAY"O2L255G":RETURN
27 CLS0:FORV=1TO5:GOSUB93
28 Z=R:FORY=0TO194STEP194:FORX=3
3TO57STEP6:GOSUB33:NEXTX,Y
29 Z=S:FORY=0TO188STEP188:FORX=3
[redacted]EP6:GOSUB33:NEXTX,Y
[redacted]FORY=0TO194STEP194:FORX=1
3[redacted]STEP6:GOSUB33:NEXTX,Y
```

```
31 Z=U:FORY=0TO188STEP188:FORX=1
33TO157STEP6:GOSUB33:NEXTX,Y
32 PLAY"P1":NEXTV:PLAYS$:GOTO18
33 O=1024+Y+X:POKEO,Z:POKEO+32,Z
:POKEO+64,Z:POKEO+65,Z:POKEO+66,
Z:POKEO+96,Z:POKEO+98,Z:POKEO+12
8,Z:POKEO+130,Z:PLAY"L25502C":RE
TURN34 CLS0:FORV=1TO5:GOSUB93
35 Z=R:FORX=33TO47STEP14:GOSUB39
:NEXTX:FORX=136TO150STEP14:GOSUE
40:NEXTX:FORX=225TO239STEP14:GOS
UB39:NEXTX:FORX=328TO342STEP14:G
OSUB40:NEXTX:FORX=417TO431STEP14
:GOSUB39:NEXTX
36 Z=S:FORX=40TO54STEP14:GOSUB39
:NEXTX:FORX=129TO143STEP14:GOSUE
40:NEXTX:FORX=232TO246STEP14:GOS
UB39:NEXTX:FORX=321TO335STEP14:G
OSUB40:NEXTX:FORX=424TO438STEP14
:GOSUB39:NEXTX
37 Z=T:FORX=69TO90STEP7:GOSUB42:
NEXTX:FORX=162TO183STEP7:GOSUB41
:NEXTX:FORX=261TO282STEP7:GOSUB4
2:NEXTX:FORX=354TO375STEP7:GOSUB
41:NEXTX
38 PLAY"P1":NEXTV:PLAYS$:GOTO18
39 O=1024+X:POKEO,Z:POKEO+1,Z:PO
KEO+3,Z:POKEO+4,Z:POKEO+5,Z:POKE
O+6,Z:POKEO+32,Z:POKEO+35,Z:POKE
O+38,Z:POKEO+64,Z:POKEO+65,Z:POK
EO+66,Z:POKEO+67,Z:POKEO+69,Z:PO
KEO+70,Z:PLAY"O2L255C":RETURN
40 O=1024+X:POKEO,Z:POKEO+1,Z:PO
KEO+2,Z:POKEO+3,Z:POKEO+5,Z:POKE
O+6,Z:POKEO+32,Z:POKEO+35,Z:POKE
O+38,Z:POKEO+64,Z:POKEO+65,Z:POK
EO+67,Z:POKEO+68,Z:POKEO+69,Z:PO
KEO+70,Z:PLAY"O2L255E":RETURN
41 O=1024+X:POKEO,Z:POKEO+1,Z:PO
KEO+33,Z:POKEO+65,Z:POKEO+96,Z:P
OKEO+97,Z:PLAY"O2L255G":RETURN
42 O=1024+X:POKEO,Z:POKEO+1,Z:PO
KEO+32,Z:POKEO+64,Z:POKEO+96,Z:P
OKEO+97,Z:PLAY"O3L255C":RETURN
43 CLS0:FORV=1TO5:GOSUB93
44 Z=R:FORY=0TO256STEP256:FORX=1
TO21STEP10:GOSUB49:NEXTX,Y:FORY=
128TO384STEP256:FORX=6TO26STEP10
:GOSUB49:NEXTX,Y
45 Z=S:FORY=0TO256STEP256:FORX=6
TO26STEP10:GOSUB49:NEXTX,Y:FORY=
128TO384STEP256:FORX=1TO21STEP10
:GOSUB49:NEXTX,Y
46 Z=T:FORY=0TO256STEP256:FORX=3
TO28STEP5:GOSUB50:NEXTX,Y
47 Z=U:FORY=128TO384STEP256:FORX
=3TO28STEP5:GOSUB50:NEXTX,Y
48 PLAY"P1":NEXTV:PLAYS$:GOTO18
49 O=1024+Y+X:POKEO,Z:POKEO+3,Z:
POKEO+4,Z:POKEO+32,Z:POKEO+36,Z:
POKEO+64,Z:POKEO+68,Z:POKEO+96,Z
:POKEO+97,Z:POKEO+99,Z:POKEO+100
,Z:PLAY"L25502C":RETURN
50 O=1024+Y+X:POKEO,Z:POKEO+31,Z
:POKEO+33,Z:POKEO+63,Z:POKEO+65,
Z:POKEO+96,Z:POKEO+32,Z-3:POKEO+
64,Z-12:PLAY"L25502G":RETURN
51 CLS0:FORV=1TO5:GOSUB93
52 Z=R:FORY=0TO384STEP192:FORX=2
TO16STEP14:GOSUB56:NEXTX,Y:FORY=
96TO288STEP192:FORX=9TO23STEP14:
GOSUB56:NEXTX,Y
53 Z=S:FORY=0TO384STEP192:FORX=9
TO23STEP14:GOSUB56:NEXTX,Y:FORY=
96TO288STEP192:FORX=2TO23STEP14:
GOSUB56:NEXTX,Y
54 Z=T:FORY=0TO384STEP96:FORX=35
TO56STEP7:GOSUB57:NEXTX,Y
55 PLAY"P1":NEXTV:PLAYS$:GOTO18
56 O=1024+X+Y:POKEO,Z:POKEO+1,Z:
POKEO+2,Z:POKEO+4,Z:POKEO+5,Z:PO
KEO+6,Z:POKEO+32,Z:POKEO+34,Z:PO
KEO+35,Z:POKEO+36,Z:POKEO+38,Z:P
OKEO+64,Z:POKEO+70,Z:PLAY"L25502
C":RETURN
57 O=1024+X+Y:POKEO,Z:POKEO+4,Z:
POKEO+32,Z:POKEO+33,Z:POKEO+34,Z
:POKEO+35,Z:POKEO+36,Z:POKEO+66,
Z:PLAY"L25502G":RETURN
58 CLS0:FORV=1TO5:GOSUB93
59 Z=R:FORY=0TO384STEP128:FORX=0
TO24STEP8:GOSUB63:NEXTX,Y
60 Z=S:FORY=0TO384STEP128:FORX=3
3TO61STEP4:POKE1024+X+Y,Z:NEXTX,
Y:FORY=0TO256STEP128:FORX=71TO87
STEP8:GOSUB64:NEXTX,Y
61 Z=T:FORY=0TO384STEP128:FORX=3
9TO55STEP8:POKE1024+Y+X,Z:NEXTX,
Y:FORY=0TO256STEP128:FORX=67TO91
STEP8:GOSUB65:NEXTX,Y
62 PLAY"P1":NEXTV:PLAYS$:GOTO18
63 O=1024+X+Y:POKEO,Z:POKEO+1,Z:
POKEO+2,Z:POKEO+4,Z:POKEO+5,Z:PO
KEO+6,Z:POKEO+32,Z:POKEO+34,Z:PO
KEO+35,Z:POKEO+36,Z:POKEO+38,Z:P
OKEO+64,Z:POKEO+65,Z:POKEO+66,Z:
POKEO+68,Z:POKEO+69,Z:POKEO+70,Z
:PLAY"O2L255C":RETURN
64 O=1024+Y+X:POKEO,Z:POKEO+31,Z
:POKEO+32,Z:POKEO+33,Z:POKEO+64,
Z:PLAY"L25502E":RETURN
65 O=1024+Y+X:POKEO,Z:POKEO+30,Z
:POKEO+31,Z:POKEO+32,Z:POKEO+33,
Z:POKEO+34,Z:POKEO+64,Z:PLAY"L25
502G":RETURN
66 CLS0:FORV=1TO5:GOSUB93
67 Z=R:FORX=33TO57STEP6:FORY=0TO
224STEP224:GOSUB72:PLAY"L25503C"
:NEXTY,X
68 Z=S:FORX=130TO154STEP6:FORY=0
TO224STEP224:GOSUB73:PLAY"L25503
E":NEXTY,X
69 Z=T:FORX=102TO126STEP6:FORY=0
TO224STEP224:GOSUB74:PLAY"L25503
G":NEXTY,X
70 Z=U:FORX=167TO191STEP6:FORY=0
TO224STEP224:GOSUB75:PLAY"L25504
C":NEXTY,X
71 PLAY"P1":NEXTV:PLAYS$:GOTO18
72 O=1024+X+Y:FORP=0TO4:POKEO+P,
Z:NEXTP:POKEO-32,Z:POKEO+32,Z:PO
KEO-30,Z:POKEO+34,Z:POKEO-28,Z:P
OKEO+36,Z:RETURN
73 O=1024+X+Y:FORP=0TO4:POKEO+P,
Z:POKEO+P+64,Z:POKEO-32+32*P,Z:N
EXTP:POKEO-64,Z:POKEO+98,Z:RETUR
N
74 O=1024+X+Y:FORP=0TO3:POKEO-P,
Z:POKEO-32*P,Z:NEXTP:POKEO-34,Z:
RETURN
75 O=1024+X+Y:FORP=0TO3:POKEO-P,
Z:POKEO+32-32*P,Z:NEXTP:POKEO-4,
Z:RETURN
76 CLS0:FORV=1TO5:GOSUB93
77 Z=R:FORX=100TO124STEP8:FORY=0
TO192STEP192:GOSUB82:PLAY"L25503
C":NEXTY,X:FORX=417TO441STEP8:FO
RP=0TO3:POKE1024+X+P,Z:NEXTP:POK
E1024+X+35,Z:NEXTX
78 Z=S:FORX=200TO216STEP8:FORY=0
TO192STEP192:GOSUB82:PLAY"L25503
E":NEXTY,X:FORX=64TO88STEP8:FORP
=0TO3:POKE1024+X+P,Z:NEXTP:POKE1
024+X-32,Z:NEXTX:O=1216:GOSUB85:
O=1408:GOSUB85:FORP=0TO2:FORQ=0T
O192STEP192
79 POKE1183-P+Q,Z:POKE1247-P+Q,Z
:POKE1245+32*P+Q,Z:NEXTQ,P:Z=T:F
ORX=96TO120STEP8:FORY=0TO192STEP
192:GOSUB83:PLAY"L25503G":NEXTY,
X
80 FORX=38TO62STEP8:FORY=0TO384S
TEP192:GOSUB84:PLAY"L25504C":NEX
TY,X:FORX=130TO154STEP8:FORY=0TO
192STEP192:GOSUB84:PLAY"L25504C"
:NEXTY,X
81 PLAY"P1":NEXTV:PLAYS$:GOTO18
82 O=1024+X+Y:FORP=-3TO3:POKEO+P
,Z:NEXTP:FORP=-64TO64STEP32:POKE
O+P,Z:NEXTP:FORP=0TO3:POKEO+64+P
,Z:POKEO-64-P,Z:NEXTP:FORP=0TO2:
POKEO+3-32*P,Z:POKEO-3+32*P,Z:NE
XTP:RETURN
83 O=1024+X+Y:POKEO,Z:POKEO+100,
Z:RETURN
84 O=1024+X+Y:POKEO,Z:POKEO+32,Z
```

```
:RETURN
85 FORP=0TO2:POKE0-32*P,Z:POKE0+
32*P,Z:POKE0+1+P,Z:POKE0+65+P,Z:
POKE0+3-32*P,Z::NEXTP:RETURN
86 CLS0:FORV=1TO5:GOSUB93
87 Z=R:FORX=3TO27STEP8:GOSUB91:N
EXTX:FORX=167TO183STEP8:GOSUB91:
NEXTX:FORX=323TO347STEP8:GOSUB91
:NEXTX:0=1215:GOSUB92:FORP=192TO
194:POKE1024+P,Z:POKE1088+P,Z:NE
XTP
88 Z=S:FORX=7TO23STEP8:GOSUB91:N
EXTX:FORX=163TO187STEP8:GOSUB91:
NEXTX:FORX=327TO343STEP8:GOSUB91
:NEXTX
89 0=1055:GOSUB92:0=1375:GOSUB92
:FORP=32TO34:POKE1024+P,Z:POKE10
88+P,Z:POKE1344+P,Z:POKE1408+P,Z
:NEXTP
90 PLAY"P1":NEXTV:PLAY$:GOTO18
91 0=1024+X:FORP=0TO3:POKE0-P,Z:
POKE0+32+P,Z:POKE0+64-P,Z:POKE0+
96+P,Z:POKE0+128-P,Z:NEXTP:PLAY"
L25503C":RETURN
92 FORP=0TO3:POKE0-P,Z:POKE0+64-
P,Z:POKE0+128-P,Z:NEXTP:POKE0+32
,Z:POKE0+96,Z:PLAY"L25503C":RETU
RN
93 R=RND(8):S=RND(8):IFR=S THEN9
3
94 T=RND(8):IFT=R THEN94
95 IFT=S THEN94
96 U=RND(8):IFU=R THEN96
97 IFU=S THEN96
98 IFU=T THEN96
99 R=16*R+127:S=16*S+127:T=16*T+
127:U=16*U+127:RETURN
```

32K ECB

CLASSIC PLANE CURVES

by Bob Delbourgo

Those of you studying Trigonometry will appreciate the work Bob has put into the following program.

Most of the curves you will study can be found here and you should be able to use this program with a screen dump to complete assignments in this subject, (and get the answers right the first time!). G.

THE LISTING:

```
 1 '**CLASSIC PLANE CURVES*******
   *******BOB DELBOURGO*********
 2 GOTO10
 3 SAVE"CLASSIC:2":DIR2:STOP
 10 R=RND(-TIMER):GOTO153
 11 CLS:PI=3.14159265:PRINT@6,"cl
 assic plane curves":PRINT@43,"R.
 DELBOURGO"
 12 PRINT@67,"THE CURVES ARE REPR
 ESENTED INONE OF TWO CONVENIENT
 FORMS:"
 13 PRINT"parametrically-  X=F(Q)
  , Y=G(Q)   WHERE F AND G ARE SP
 ECIFIED     FUNCTIONS AND THE PA
 RAMETER Q   LIES WITHIN SOME RAN
 GE."14 PRINT"in polar form -  R=
 H(P)            WHERE THE MAP H
 IS DEFINED,     R=RADIUS & P=POL
 AR ANGLE."
 15 PRINT"THE CURVES ARE DETERMIN
 ED BY ONEOR TWO VARIABLES: A SCA
 LE AND   PERHAPS ANOTHER CONSTAN
 T."
 16 PRINT@448,"(1) OR (2) PARAMET
 ERS";:INPUTN
 17 N=INT(N):IFN(1ORN)2THEN16
 18 ONN GOTO19,60
 19 R=RND(7)+1:CLSR:PRINT@2,"one-
 parameter classic curves";
 20 PRINT@65,"1. LEMNISCATE   2.
 EIGHT-CURVE";:PRINT@97,"3. FOLIU
 M       4. FREETH     ";
 21 PRINT@129,"5. BICORN       6.
  VERSIERA   ";:PRINT@161,"7. CIS
 SOID      8. CARDIOID   ";
 22 PRINT@193,"9. DELTOID      10
 .ASTROID    ";:PRINT@225,"11.NEP
 HROID     12.COCHLEOID  ";
 23 PRINT@257,"13.STROPHOID    14
 .GUTSCHOVEN ";:PRINT@289,"15.TRI
 SECTRIX   16.QUADRATRIX ";
 24 PRINT@353,"THE SIZE IS THE ON
 LY PARAMETER";:PRINT@385,"WHICH
 IS VARIED FOR EACH CURVE";
 25 GOSUB106:GOSUB104
 26 C1=C:C2=0:GOSUB107:ONC1 GOTO2
 8,30,32,34,36,38,40,42,44,46,48,
 50,52,54,56,58
 27 RUN
 28 PRINT@6,"bernoulli lemniscate
 ";:PRINT@128,"      R = A*SQR(C*
 C-S*S)"
 29 GOSUB109:A1=20:A2=200:A3=20:P
 1=-.25:P2=.25:P3=.02:X1=30:Y1=95
 :GOTO114
 30 PRINT@2,"8-curve OR gerono le
 mniscate";:PRINT@128,"     R = A
 *(SQR(c*c-s*s))/c*c  AND c=COS
 (Q), s=SIN(Q)"
 31 GOSUB110:A1=20:A2=120:A3=20:Q
 1=-1:Q2=1:Q3=.1:X1=125:Y1=95:GOT
 O117
 32 PRINT@8,"descartes folium";:P
 RINT@128,"   X = A*Q/(1 + Q*Q*Q)
              Y = A*Q*Q/(1 + Q*Q*
 Q)"
 33 GOSUB110:A1=40:A2=160:A3=20:Q
 1=-10:Q2=10:Q3=.26:X1=125:Y1=95:
 GOTO117
 34 PRINT@9,"freeth nephroid";:PR
 INT@128,"   R = A*(1 + 2*SIN(P/2
 ))"
 35 GOSUB109:A1=5:A2=35:A3=5:P1=0
 :P2=2:P3=.1:X1=155:Y1=95:GOTO114
 36 PRINT@8,"sylvester bicorn";:P
 RINT@128,"X = A*s, Y = A*c*c*(2+
 c)/(3+s*s)s = SIN(Q) , c = COS(Q
 )"
 37 GOSUB110:A1=20:A2=120:A3=20:Q
 1=-1:Q2=1:Q3=.05:X1=130:Y1=25:GO
 TO117
 38 PRINT@4,"versiera OR agnesi w
 itch";:PRINT@128,"X=2*A*TAN(Q),Y
 =2*A*COS(Q)*COS(Q)";
 39 GOSUB110:A1=10:A2=70:A3=10:Q1
 =-.5:Q2=.5:Q3=.05:X1=128:Y1=25:G
 OTO117
 40 PRINT@8,"diocles cissoid";:PR
 INT@128,"   R = A*S*S/C"
 41 GOSUB109:A1=20:A2=180:A3=20:P
 1=-.98:P2=0:P3=.04:X1=80:Y1=95:G
 OTO114
 42 PRINT@8,"Koersma cardioid";:P
 RINT@128,"   R = 2*A*(1 + C)"
 43 GOSUB109:A1=10:A2=70:A3=10:P1
 =-1:P2=1:P3=.05:X1=80:Y1=95:GOTO
 114
 44 PRINT@9,"euler deltoid";:PRIN
 T@128," X=A*(2*c*(1+c)-1), Y=2*A
 *(1-c), c = COS(Q), s = SIN(Q)"
 45 GOSUB110:A1=8:A2=40:A3=8:Q1=-
 1:Q2=1:Q3=.05:X1=120:Y1=95:GOTO1
 17
 46 PRINT@7,"bernoulli astroid";:
 PRINT@128," X = A*c*c*c  ,  Y= A
 =s*s*s  ,  c = COS(Q)  ,  s =
 SIN(Q)"
 47 GOSUB110:A1=10:A2=90:A3=20:Q1
 =-1:Q2=1:Q3=.05:X1=125:Y1=95:GOT
 O117
 48 PRINT@8,"huygens nephroid";:P
 RINT@128," X = A*(3*COS(Q) - COS
 (3*Q))     Y = A*(3*SIN(Q) - SIN
 (3*Q))"
 49 GOSUB110:A1=3:A2=22:A3=4:Q1=-
 1:Q2=1:Q3=.05:X1=125:Y1=95:GOTO1
 17
 50[illegible]T@6,"bernoulli cochleoid"
 ;:PR[illegible]T@128,"      R = A*SIN(P)/
```

```
P"
51 GOSUB109:A1=20:A2=80:A3=20:P1
=-3:P2=3:P3=.1:X1=125:Y1=95:GOTO
114
52 PRINT@8,"barrow strophoid";:P
RINT@128,"  R = A*(SEC(P) - 2*CO
S(P))"
53 GOSUB109:A1=20:A2=90:A3=10:P1
=-.99:P2=0:P3=.03:X1=125:Y1=95:G
OTO114
54 PRINT@8,"gutschoven kappa";:P
RINT@128,"   R = A/TAN(P)"
55 GOSUB109:A1=20:A2=80:A3=20:P1
=.01:P2=2.01:P3=.02:X1=125:Y1=95
:GOTO114
56 PRINT@6,"maclaurin trisectrix
";:PRINT@128,"   R = A*(SEC(P) -
 4*COS(P))"
57 GOSUB109:A1=10:A2=60:A3=10:P1
=-.49:P2=.49:P3=.02:X1=185:Y1=95
:GOTO114
58 PRINT@7,"hippias quadratrix";
:PRINT@128,"      R = A*P/(SIN(P
))"
59 GOSUB109:A1=3:A2=12:A3=3:P1=-
2.02:P2=2.02:P3=.04:X1=125:Y1=95
:GOTO114
60 R=RND(7)+1:CLSR:PRINT@2,"two-
parameter classic curves";
61 PRINT@65,"1. LIMACON      2.
CONCHOID   ";:PRINT@97,"3. PARAP
EDAL    4. HIPPOPEDE  ";
62 PRINT@129,"5. PIRIFORM     6.
 LAME        ";:PRINT@161,"7. TRI
FOLIUM    8. RHODONEUM  ";
63 PRINT@193,"9. CYCLOID      10
.EPICYCLOID ";:PRINT@225,"11.HYP
OCYCLOID  12.BOWDITCH   ";
64 PRINT@257,"13.LOG.SPIRAL   14
.ARCH.SPIRAL";:PRINT@289,"15.SIN
.SPIRAL   16.EPISPIRAL  ";
65 PRINT@353,"APART FROM A SCALE
, THERE IS A";:PRINT@385,"SECOND
 PARAMETER WHICH YOU MAY";:PRINT
@417,"CHOOSE FOR YOURSELVES.
    ";
66 GOSUB106:GOSUB104
67 C2=C:C1=0:GOSUB107:ONC2 GOTO6
9,71,73,75,78,80,82,84,86,88,90,
92,94,96,99,101
68 RUN
69 PRINT@8,"pascal limacon";:PRI
NT@128,"   R = A*(2*COS(P) + M)"
70 M1=0:M2=10:GOSUB108:A1=12:A2=
72:A3=12:P1=-1:P2=1:P3=.05:X1=90
:Y1=95:GOTO114
71 PRINT@7,"nicomedes conchoid";
:PRINT@128,"   R = A*(1 + M*COS(
P))"
72 M1=.2:M2=5:GOSUB108:A1=90:A2=
70:A3=20:P1=-.99:P2=1.01:P3=.02:
X1=125:Y1=95:GOTO114
73 PRINT@6,"pedal of a parabola"
;:PRINT@128," R = A*(SEC(P) - (M
+1)*COS(P))"
74 M1=-5:M2=5:GOSUB108:A1=5:A2=2
5:A3=5:P1=-.49:P2=.49:P3=.02:X1=
125:Y1=95:GOTO114
75 PRINT@7,"proclus hippopede";:
PRINT@128,"X=A*c*SQR(1-M*s*s),
c=COS(Q),  Y=A*s*SQR(1-M*s*s),
s=SIN(Q)"
76 M1=.5:M2=2:GOSUB108:A1=20:A2=
120:A3=20:X1=125:Y1=95:IFM>1THEN
K=ATN(SQR(1/(M-1)))/PI ELSEK=1
77 Q1=-K:Q2=K:Q3=.05:GOTO117
78 PRINT@6,"de longchamps pirifo
rm";:PRINT@128," X=A*(1+s), Y =
M*A*c*(1+s),     c=COS(Q), s=SIN
(Q)"
79 M1=.5:M2=1.5:GOSUB108:A1=10:A
2=50:A3=10:X1=60:Y1=95:Q1=-.5:Q2
=1.5:Q3=.05:GOTO117
80 PRINT@11,"lame curve";:PRINT@
128,"R = A/((C^M)+(S^M))^(1/M)
     WITH M INTEGER."
81 M1=1:M2=10:GOSUB108:M=INT(M):
A1=10:A2=90:A3=10:X1=125:Y1=95:P
1=-.25:P2=.75:P3=.05:GOTO114
82 PRINT@8,"kepler trifolium";:P
RINT@128,"R = A*COS(P)*(SIN(P)*S
IN(P) - M)";
83 M1=.1:M2=.6:GOSUB108:A1=10:A2
=80:A3=10:X1=179:Y1=95:P1=0:P2=1
:P3=.02:GOTO114
84 PRINT@8,"grandi rhodoneum";:P
RINT@128,"  R = A*COS(M*P), M= I
NTEGER"
85 M1=2:M2=10:GOSUB108:M=INT(M):
A1=20:A2=80:A3=20:X1=125:Y1=95:P
1=0:P2=2:P3=.02:GOTO114
86 PRINT@8,"mersenne cycloid";:P
RINT@128,"X = A*(Q - M*s), Y = A
*(1- M*c),c=COS(Q) , s=SIN(Q)"
87 M1=.2:M2=2:GOSUB108:A1=10:A2=
40:A3=10:X1=2:Y1=55:Q1=0:Q2=8:Q3
=PRINT@128," X = A*(M*COS(Q) - C
OIN(Q) - SIN(M*Q))"
89 M1=3:M2=10:GOSUB108:M=INT(M):
A1=10:A2=70:A3=10:X1=125:Y1=95:Q
1=0:Q2=2:Q3=.05:GOTO117
90 PRINT@8,"romer hypocycloid";:
PRINT@128," X = A*(M*COS(Q) + CO
S(M*Q),     Y = A*(M*SIN(Q) - SI
N(M*Q))"
91 M1=3:M2=10:GOSUB108:M=INT(M):
A1=10:A2=70:A3=10:X1=125:Y1=95:Q
1=0:Q2=2:Q3=.05:GOTO117
92 PRINT@2,"bowditch OR lissajou
s figure";:PRINT@128,"X=A*(SIN(M
*Q)+D), Y=A*SIN(Q)    WITH M rat
ional"
93 D=RND(5)*PI/20:M1=.1:M2=10:GO
SUB108:A1=30:A2=90:A3=30:X1=130:
Y1=95:Q1=-5:Q2=5:Q3=.05:GOTO117
94 PRINT@2,"descartes logarithmi
c spiral";:PRINT@128,"     R = A
*EXP(M*P)"
95 M1=.04:M2=.08:GOSUB108:A1=20:
A2=20:A3=20:X1=125:Y1=95:P1=-8:P
2=10:P3=.1:GOTO114
96 PRINT@7,"archimedes spiral";:
PRINT@128,"  R = A*(P^(1/M)), M
INTEGER<>0"
97 M1=-3:M2=3:GOSUB108:M=INT(M):
IFM=0THENM=1
98 A1=32:A2=32:A3=1:X1=125:Y1=95
:P1=0.1:P2=8:P3=.1:GOTO114
99 PRINT@2,"maclaurin sinusoidal
 spiral";:PRINT@128," R = A*(COS
(P/M)^M), M=INTEGER"
100 M1=1:M2=5:GOSUB108:M=INT(M):
A1=10:A2=90:A3=20:X1=125:Y1=95:P
1=-.5*M:P2=.5*M:P3=.05:GOTO114
101 PRINT@8,"poinsot episprial";
:PRINT@128,"   R = A/(COS(M*P)),
 M INTEGER"
102 M1=1:M2=6:GOSUB108:M=INT(M):
A1=10:A2=50:A3=20:X1=128:Y1=95:P
1=.015:P2=2.015:P3=.007:GOTO114
103 IFX>0ANDX<256ANDY>0ANDY<192A
NDX0>0ANDX0<256ANDY0>0ANDY0<192T
HENLINE(X,Y)-(X0,Y0),PRESET:RETU
RN ELSERETURN
104 PRINT@449,"INPUT CHOICE #";:
INPUTC:C=INT(C):IFC<00RC>16THENS
OUND100,1:FORI=1488TO1503:POKEI,
16*R+127:NEXTI:GOTO104
105 RETURN
106 PRINT@481,"ENTER 0 TO RESTAR
T THE PROGRAM";:RETURN
107 CLSRND(7)+1:PRINT@64,"IS DEF
INED THROUGH:":RETURN
108 PRINT@448,"INPUT M BETWEEN"M
1"&"M2;:INPUTM:IFM<M1 ORM>M2 THE
N108
109 PRINT@224,"WHERE C=COS(P),S=
SIN(P) ";:PRINT@256,"  AND X=R*C
   ,Y=R*S    ";
110 PRINT@320,"THE SCALE A IS VA
RIED IN";:PRINT@352,"THE FOLLOWI
NG DIAGRAMS..";:PRINT@416,"AFTER
 DRAWING PRESS <R> FOR MENU";
111 FORI=1TO14:RESET(48+I,15):NE
XTI:FORI=1TO9:RESET(49,14+I):RES
ET(48+I,14+I):NEXTI:PRINT@286,"X
";:PRINT@377,"Y";:PRINT@282,"p";
:PRINT@348,"R";
112 PRINT@491,"ANY  INKEY";:PLAY
"P33":PRINT@491,"any  inkey";:PL
```

```
AY"P33":IFINKEY$=""THEN112
113 PMODE2,1:PCLS1:SCREEN1,0:RET
URN
114 FORA=A1 TO A2 STEPA3:P=P1:T=
P*PI:GOSUB120:X0=R*COS(T)+X1:Y0=
R*SIN(T)+Y1:FORP=P1+P3 TO P2+.00
01 STEPP3:T=P*PI:GOSUB120:X=R*CO
S(T)+X1:Y=R*SIN(T)+Y1:GOSUB103
115 X0=X:Y0=Y:NEXTP,A:SOUND100,5
:SCREEN1,1
116 IFINKEY$()"R"THEN116ELSEIFC2
=0THEN19ELSE60
117 FORA=A1 TOA2 STEPA3:Q=Q1:T=Q
*PI:GOSUB120:X0=X:Y0=Y:FORQ=Q1+Q
3 TO Q2+.00001 STEPQ3:T=Q*PI:GOS
UB120:GOSUB103
118 X0=X:Y0=Y:NEXTQ,A:SOUND200,5
:SCREEN1,1
119 IFINKEY$()"R"THEN119ELSEIFC2
=0THEN19ELSE60
120 IFC2=0THENONC1 GOSUB121,122,
123,124,125,126,127,128,129,130,
131,132,133,134,135,136:RETURN E
LSE ONC2 GOSUB137,138,139,140,14
1,142,143,144,145,146,147,148,14
9,150,151,152:RETURN
121 R=A*SQR(COS(2*T)):RETURN
122 X=A*COS(T)+X1:Y=A*COS(T)*SIN
(T)+Y1:RETURN
123 X=A*Q/(1+Q*Q*Q)+X1:Y=A*Q*Q/(
1+Q*Q*Q)+Y1:RETURN
124 R=A*(1+2*SIN(T/2)):RETURN
125 C=COS(T):S=SIN(T):X=A*S+X1:Y
=A*C*C*(2+C)/(3+S*S)+Y1:RETURN
126 X=A*TAN(T)+X1:Y=2*A*COS(T)*C
OS(T)+Y1:RETURN
127 R=A*SIN(T)*SIN(T)/COS(T):RET
URN
128 R=A*(1+COS(T)):RETURN
129 C=COS(T):S=SIN(T):X=A*(2*C*(
1+C)-1)+X1:Y=2*A*S*(1-C)+Y1:RETU
RN
130 C=COS(T):S=SIN(T):X=X1+C*C*C
*A:Y=Y1+S*S*S*A:RETURN
131 X=X1+A*(3*COS(T)-COS(3*T)):Y
=Y1+A*(3*SIN(T)-SIN(3*T)):RETURN
132 R=A*SIN(T)/T:RETURN
133 C=COS(T):R=A*((1/C)-2*C):RET
URN
134 R=A/TAN(T):RETURN
135 C=COS(T):R=A*((1/C)-4*C):RET
URN
136 R=A*T/(SIN(T)):RETURN
137 R=A*(2*COS(T)+M)/(M+1):RETUR
N
138 R=A*(1+M/COS(T)):RETURN
139 C=COS(T):S=SIN(T):R=A*(S*S-M
*C*C)/C:RETURN
140 C=COS(T):S=SIN(T):X=A*C*SQR(
1.00001-M*S*S)+X1:Y=A*S*SQR(1.00
001-M*S*S)+Y1:RETURN
141 S=SIN(T):C=COS(T):X=A*(1+S)+
X1:Y=A*M*C*(1+S)+Y1:RETURN
142 C=COS(T):C=C^M:S=SIN(T):S=S^
M:R=A/((C+S)^(1/M)):RETURN
143 C=COS(T):R=4*A*C*(1-C*C-M):R
ETURN
144 R=A*COS(M*T):RETURN
145 X=A*(T-M*SIN(T))+X1:Y=A*(1-M
*COS(T))+Y1:RETURN
146 X=A*(COS(T)-(COS(M*T))/M)+X1
:Y=A*(SIN(T)-(SIN(T*M))/M)+Y1:RE
TURN
147 X=A*(COS(T)+(COS(M*T))/M)+X1
:Y=A*(SIN(T)-(SIN(M*T))/M)+Y1:RE
TURN
148 X=A*SIN(M*T+D)+X1:Y=A*SIN(T)
+Y1:RETURN
149 R=A*EXP(M*T):RETURN
150 R=A*(T^(1/M)):RETURN
151 R=A*(COS(T/M)^M):RETURN
152 R=A/(COS(M*T)):RETURN
153 PCLEAR2:GOTO11
```

16K ECB

ARCHIMEDIAN TESSELATIONS

by Bob Delbourgo

You may well ask, "What is a Tesselation?".

A tesselation is a mosaic pattern, and these were first described by that great man of the bath tub, Archimedies.

Archimedies discovered that when a few of his mates got in the same bath tub with him that the water rose. (They used to wear clothes in the bath tub in those days.)

He discovered these tesselations some time later when he let the water out of the bath, for the first time in several years, and cleaned the bath.

Even today that bath is still to be found high on a hill overlooking Athens.

Tourists go there each day, because even now, it is the only place to get a wash in Greece.

G.

THE LISTING:

```
1 '**********TESSEL**********
  ********BOB DELBOURGO********
2 GOTO10
3 SAVE"TESSEL:2":DIR2:STOP
10 PI=3.141592653:PMODE4,1:PCLS1
:SCREEN1,1:DIMM$(8)
11 M$(1)="R7L14BR2BU6DF2DF4DF2DE
L8UE2UE4UE2U"
12 M$(2)="BU7F7G7H7E7"
13 M$(3)="BU4R6DG2DG2DG2DLUH2UH2
UH2UR6"
14 M$(4)="H7F14H7E7G14R3BR8R3U3E
U8U3L3BL8L3D3BD8D3"
15 M$(5)="BUU4R7L7D4F2RFDG2DG2BL
8G2LGUH2UH2U"
16 M$(6)="BU3E3D3R3G3F3L3D3H3G3L
3L3E3H3R3U3F3"
17 M$(7)="ERERERH2F3BD8BL6L4R2UE
HLHLHLE2G3"
18 M$(8)="BH3U3G3R3BR6U3F3L3BD6F
3G3U3BL6L3F3U3"
20 A=14:H=A*SQR(7)/2:H1=H+A/2:V1
=H-A/2
30 DIMX(12),Y(12)
40 FORI=0TO4:FORJ=0TO3:XX=2+I*(2
*H+A):YY=26+J*(2*H+A):GOSUB400:N
EXTJ,I
50 FORI=0TO3:FORJ=0TO2:XX=2+(I+.
5)*(2*H+A):YY=26+(J+.5)*(2*H+A):
GOSUB400:NEXTJ,I
60 DRAW"BM35,100C0U8L4R8BD15BR18
L8U4R4L4U4R8BR8R8U4L8U4R8BR16L8D
4R8D4L8BR26L8D4R4L4D4R8BE8BR2U8D
8R8"
70 DRAW"BM134,99U4E4F4L8R8D4BR13
BD8U8L4R8BR16L8R4U8L4R8BR18L8D8R
8U8BD16BR8U8F8U8BR9R8U4L8U4R8"
80 DRAW"BM32,150U8R8D4L8R4F4BF12
BU3RBR30BU10U8R4F4G4L4BR24BD8L8U
4R4L4U4R8BE9BD1D8R8BR10U8R5F4L9R
9G4L5BR24L8D8R8U8BR9U8D8R8U8BF8B
R2U8R8D4L8R4F4BR17L8D8R8U4L4BE13
BD9U8R8D8L8"
90 DRAW"BM82,48U8R8D4L8R4F4BR18L
8D4R4L4D4R8BE12R4D4L8U8R8BD16D8R
8U8BE8BR2L8U8BF16BR2U4E4F4L8R8D4
BE8U8R8D4L8R4F4":FORT=1TO4000:NE
XT
100 CLS:PRINTSTRING$(64,CHR$(153
));:PRINT@4,"ARCHIMEDEAN TESSELA
TIONS";:PRINT@192,STRING$(32,CHR
$(153));
110 PRINT@364,"ARE OBTAINED BY FU
LL TILING WITHREGULAR POLYGONS A
ND ARE DEFINEDBY THE NUMBER OF P
OLYGONAL SIDESCYCLICALLY SURROUN
DING A VERTEX.";
120 PRINT@224,"THERE ARE JUST 11
```

```
 SUCH TILINGS:-three regular tes
selations:":PRINT"A. [3,6]    B.
 [4,4]   C. [6,3] eight semiregu
lar tesselations:"
130 PRINT"1. (3,12,12)    2. (4,
6,12)     3. (4,8,8)      4. (3,
4,6,4)    5. (3,6,3,6)    6. (3,
3,3,3,6)  7. (3,3,4,3,4)  8. (3,
3,4,3,4)  INPUT HEXADECIMAL CHOI
CE";
140 FORI=1529TO1535:POKEI,153:NE
XTI
150 POKE1529,128:PLAY"P20":POKE1
529,153
160 I$=INKEY$:C=VAL("&H"+I$):IFC
<10RC>12ORC=9THEN150
170 ONC GOTO240,260,280,300,320,
340,360,380,290,180,200,220
180 CLS:PRINT"  THE REGULAR TESS
ELATION [3,6]   CONSISTS OF TRIA
NGULAR CELLS":GOSUB530
190 GOSUB560:GOSUB580:GOSUB570:G
OTO100
200 CLS:PRINT"  THE REGULAR TESS
ELATION [4,4]   CONSISTS OF SQUA
RE CELLS":GOSUB530
210 GOSUB560:GOSUB640:GOSUB570:G
OTO100
220 CLS:PRINT"  THE REGULAR TESS
EATION [6,3]    CONSISTS OF HEXA
GONAL CELLS":GOSUB530
230 GOSUB560:GOSUB580:GOSUB570:G
OTO100
240 GOSUB520:PRINT@43,"(3,12,12)
":GOSUB530:GOSUB500
250 GOSUB560:GOSUB580:GOSUB570:G
OTO100
260 GOSUB520:PRINT@43,"(4,6,12)"
:GOSUB530:GOSUB500
270 GOSUB560:GOSUB580:GOSUB570:G
OTO100
280 GOSUB520:PRINT@43,"(4,8,8)":
GOSUB530:GOSUB500
290 GOSUB560:GOSUB640:GOSUB570:G
OTO100
300 GOSUB520:PRINT@42,"(3,4,6,4)
":GOSUB530:GOSUB500
310 GOSUB560:GOSUB580:GOSUB570:G
OTO100
320 GOSUB520:PRINT@42,"(3,6,3,6)
":GOSUB530:GOSUB500
330 GOSUB560:GOSUB580:GOSUB570:G
OTO100
340 GOSUB520:PRINT@41,"(3,3,3,3,
6)":GOSUB530:GOSUB500
350 GOSUB560:GOSUB580:GOSUB570:G
OTO100
360 GOSUB520:PRINT@41,"(3,3,4,3,
4)":GOSUB530:GOSUB500
370 GOSUB560:GOSUB640:GOSUB570:G
OTO100
380 GOSUB520:PRINT@41,"(3,3,3,4,
4)":GOSUB530
390 GOSUB560:GOSUB790:GOSUB570:G
OTO100
400 X(1)=XX:Y(1)=YY:X(2)=XX+H1/2
:Y(2)=Y(1)+V1/2:X(3)=XX+H1:Y(3)=
Y(1)+V1
410 X(4)=XX+3*H1/2:Y(4)=Y(2):X(5
)=XX+2*H1:Y(5)=Y(1):X(6)=X(5):Y(
6)=Y(1)-A
420 X(7)=X(4):Y(7)=Y(6)-V1/2:X(8
)=X(3):Y(8)=Y(6)-V1:X(9)=X(2):Y(
9)=Y(7)
430 X(10)=X(1):Y(10)=Y(6):X(11)=
X(1)+H:Y(11)=Y(1)-A/2:X(12)=X(11
)+A:Y(12)=Y(11)
440 LINE(X(1),Y(1))-(X(3),Y(3)),
PRESET:LINE-(X(5),Y(5)),PRESET:L
INE-(X(6),Y(6)),PRESET:LINE-(X(8
),Y(8)),PRESET:LINE-(X(10),Y(10)
),PRESET:LINE-(X(1),Y(1)),PRESET
450 LINE(X(2),Y(2))-(X(11),Y(11)
),PRESET:LINE-(X(12),Y(12)),PRES
ET:LINE-(X(7),Y(7)),PRESET:LINE(
X(4),Y(4))-(X(12),Y(12)),PRESET:
LINE(X(11),Y(11))-(X(9),Y(9)),PR
ESET:RETURN
460 ONC GOSUB690,700,720,730,750
,760,770,660,660,660,670,680:RET
URN
470 X0=A*COS(D)+XX:Y0=A*SIN(D)+Y
Y
480 FORK=1TON:X=A*COS(D+2*K*PI/N
)+XX:Y=A*SIN(D+2*K*PI/N)+YY
490 LINE(X0,Y0)-(X,Y),PRESET:X0=
X:Y0=Y:NEXTK:RETURN
500 INPUT"ENTER (1) TO PAINT, EL
SE (0)";P:IFP()1THENP=0
510 RETURN
520 CLS:PRINT@4,"SEMIREGULAR TES
SELATIONS":RETURN
530 PRINT@224,"ENTER (B) IF NO M
OTIF":PRINT@128,"";:INPUT"ENTER
MOTIF STRING OR # ((9)";M$:M=VAL
(M$):IFM)8THEN530
540 IFM()0THENM$=M$(M)
550 RETURN
560 PRINT@448,"ANY INKEY FOR DRA
WING TO PROCEED    AFTER DRAWING
, ANY INKEY";
570 IFINKEY$=""THEN570ELSEPMODE4
,1:PCLS1:SCREEN1,0:RETURN
580 B=8*SQR(3):FORJ=0TO3:FORI=0T
O3+J:X1=92+B*(2*I-J):Y1=24*(J+1)
590 GOSUB460:IFP=1THENPAINT(X1,Y
1),0,0
600 GOSUB630:NEXTI,J:FORJ=0TO2:F
ORI=0TO3+J:X1=92+B*(2*I-J):Y1=16
8-24*J
610 GOSUB460:IFP=1THENPAINT(X1,Y
1),0,0
620 GOSUB630:NEXTI,J:PAINT(2,2),
0,0:SCREEN1,1:RETURN
630 DRAW"BM"+STR$(INT(X1))+","+S
TR$(INT(Y1))+"C"+STR$(P)+"XM$;":
RETURN
640 FORJ=0TO6:FORI=0TO6:X1=56+24
*I:Y1=24*(J+1):GOSUB460:IFP=1THE
NPAINT(X1,Y1),0,0
650 GOSUB630:NEXTI,J:PAINT(2,2),
0,0:SCREEN1,1:RETURN
660 FORK=0TO2:LINE(X1-B*COS(K*PI
/3),Y1-B*SIN(K*PI/3))-(X1+B*COS(
K*PI/3),Y1+B*SIN(K*PI/3)),PRESET
:NEXTK:RETURN
670 LINE(X1-12,Y1)-(X1+12,Y1),PR
ESET:LINE(X1,Y1-12)-(X1,Y1+12),P
RESET:RETURN
680 A=9*SQR(3):FORK=0TO2:LINE(X1
+A*COS((4*K+1)*PI/6),Y1+A*SIN((4
*K+1)*PI/6))-(X1,Y1),PRESET:NEXT
K:RETURN
690 N=12:D=PI/12:A=8*SQR(3)/COS(
D):XX=X1:YY=Y1:GOSUB470:RETURN
700 N=12:D=PI/12:A=8*SQR(3)/(SIN
(D)+COS(D)):XX=X1:YY=Y1:GOSUB470
710 N=4:FORL=0TO5:XX=X1+8*SQR(3)
*COS(L*PI/3):YY=Y1+8*SQR(3)*SIN(
L*PI/3):A=8*SQR(6)*SIN(PI/12)/(C
OS(PI/12)+SIN(PI/12)):D=L*PI/3+P
I/4:GOSUB470:NEXTL:RETURN
720 D=PI/8:N=8:A=11.9/COS(D):XX=
X1:YY=Y1:GOSUB470:RETURN
730 D=PI/6:A=8*(3-SQR(3)):N=6:XX
=X1:YY=Y1:GOSUB470
740 N=4:A=A*(SQR(3)+1)/4:FORL=0T
O5:XX=X1+2*A*COS(L*PI/3):YY=Y1+2
*A*SIN(L*PI/3):D=L*PI/3+PI/4:GOS
UB470:NEXTL:RETURN
750 N=6:D=0:A=8*SQR(3):XX=X1:YY=
Y1:GOSUB470:RETURN
760 XX=X1:YY=Y1:D=.05+PI/2-ATN(S
QR(3)/4):A=7*SQR(19/3):N=3:GOSUB
470:D=D+PI/3:GOSUB470:RETURN
770 D=PI/12:A=6*SQR(2)/COS(D):N=
4:XX=X1:YY=Y1:D=PI/3:GOSUB470
780 R=(6+SQR(12))/COS(PI/12):FOR
L=0TO3:XX=X1+R*COS(L*PI/2+PI/12)
:YY=Y1+R*SIN(L*PI/2+PI/12):N=3:D
=PI/12+L*PI/2:A=4*SQR(3)/COS(PI/
12):GOSUB470:NEXTL:RETURN
790 FORI=0TO6:FORJ=0TO1:XX=60+20
*I:YY=25+74.64*J:LINE(XX,YY)-(XX
+20,YY),PRESET:LINE-(XX+20,YY+20
),PRESET:LINE-(XX,YY+20),PRESET:
LINE-(XX,YY),PRESET
800 DRAW"BM"+STR$(XX+10)+","+STR
$(INT(YY+10))+"C0;XM$;":NEXTJ,I
810 FORI=0TO7:FORJ=0TO1:XX=50+20
```

```
*I:YY=62.32+74.64*J:LINE(XX,YY)-
(XX+20,YY),PRESET:LINE-(XX+20,YY
+20),PRESET:LINE-(XX,YY+20),PRES
ET:LINE-(XX,YY),PRESET
820 DRAW"BM"+STR$(XX+10)+","+STR
$(INT(YY+10))+"C0;XM$;":NEXTJ,I
830 FORI=0TO7:FORJ=0TO2:XX=60+20
*I:YY=8.68+74.64*J:LINE(XX-10,YY
)-(XX,YY+17.32),PRESET:LINE-(XX+
10,YY),PRESET:LINE-(XX-10,YY),PR
ESET:NEXTJ,I
840 FORI=0TO7:FORJ=0TO1:XX=60+20
*I:YY=45+74.64*J:LINE(XX,YY)-(XX
+10,YY+17.32),PRESET:LINE-(XX-10
,YY+17.32),PRESET:LINE-(XX,YY),P
RESET:NEXTJ,I
850 PAINT(2,2),0,0:SCREEN1,1:RET
URN
```

32K ECB

GO

by Bob Delbourgo

Like so many of the games Bob and Family provide us with, Go is a game of skill and logic for two players.

Unfortunately we do not have a full set of instructions for Go. If one of our readers can assist with these, we will print them in the future.

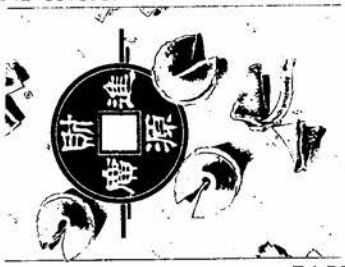
However, for those who know how to play Go, and for those who like to experiment, here is yet another classic game from the Delbourgo team.

G.

THE LISTING:

```
1 '***********GO***************
  ********BOB DELBOURGO********
2 GOTO10
3 SAVE"GO?:2":DIR2:STOP
10 GOSUB40:GOSUB69:GOSUB53
11 CLS0:PRINT"WHEN THE GAME IS O
VER PRESS (E) TO END. for correc
t counting    it is vital to rem
ove all the   prisoners, demarca
te all the    boundaries with st
ones of the   same colour and to
 place a stoneat the bottom righ
t corner.":GOSUB64
12 SCREEN1,1:GOSUB68:SCREEN0,0
13 CLS0:DIMP(19,19):U=0:XB=8:YB=
-4:XW=248:YW=-4:SW=0:SB=0:GOSUB7
3:CLS0:INPUT"BLACK'S HANDICAP ()
=1)";BH:IF BH<1THEN13ELSEBH=INT(
BH):PRINT"BLACK, INSERT YOUR STO
NES NOW":FORT=1TO1000:NEXTT
14 PMODE4,1:PCLS1:SCREEN1,1:GOSU
B35
15 FORI=1TOBH
16 J0=JOYSTK(0):J1=JOYSTK(1):X=I
NT((18-2*H)*J0/63+1+H):Y=INT((18
-2*H)*J1/63+1+H)
17 IFPEEK(65280)=127ORPEEK(65280
)=255THENGOSUB78ELSE19
18 PLAY"V31L255T25501C":GOTO16
19 IFPEEK(65280)=126ORPEEK(65280
)=254THENGOSUB36
20 NEXTI
21 SCREEN0,0:PRINT:PRINT"YOU NOW
 PLAY ALTERNATELY":PRINT"WHITE,
YOU GO FIRST...":FORT=1TO1000:NE
XTT
22 SCREEN1,1
23 J0=JOYSTK(0):J1=JOYSTK(1):J2=
JOYSTK(2):J3=JOYSTK(3):X=INT((18
-2*H)*J0/63+1+H):Y=INT((18-2*H)*
J1/63+H+1):A=INT((18-2*H)*J2/63+
H+1):B=INT((18-2*H)*J3/63+H+1)
24 I$=INKEY$:IFI$="I"THEN86
25 IFI$="E"THEN123
26 IFU=1THEN31
27 IFPEEK(65280)=127ORPEEK(65280
)=255THENGOSUB80ELSE29
28 PLAY"V31L255T25505C":GOTO23
29 IFPEEK(65280)=125ORPEEK(65280
)=253THENU=1:GOSUB38
30 GOTO23
31 IFPEEK(65280)=127ORPEEK(65280
)=255THENGOSUB78ELSE33
32 PLAY"V31L255T25501C":GOTO23
33 IFPEEK(65280)=126ORPEEK(65280
)=254THENU=0:GOSUB36
34 GOTO23
35 FORY=6+10*H TO186-10*H STEP10
:LINE(33+10*H,Y)-(223-10*H,Y),PR
ESET:NEXTY:FORX=38+10*H TO218-10
*H STEP10:LINE(X,1+10*H)-(X,191-
10*H),PRESET:NEXTX:RETURN
36 IFP(X,Y)=1THENSCREEN1,0:PLAY"
L15T201CCCDL8C":FORT=1TO50:NEXTT
:SCREEN1,1:I=I-1:U=1:RETURN
37 FORR=1TO5:CIRCLE(10*X+28,10*Y
-4),R,0:NEXTR:P(X,Y)=1:RETURN
38 IFP(A,B)=1THENSCREEN1,0:PLAY"
L15T203CCCDL8C":FORT=1TO50:NEXTT
:SCREEN1,1:U=0:RETURN
39 FORR=1TO4:CIRCLE(10*A+28,10*B
-4),R,1:NEXTR:CIRCLE(10*A+28,10*
B-4),5,0:P(A,B)=1:RETURN
40 POKE65495,0:CLS0:R=16*RND(8)+
127:IFR=143THEN40
41 FORI=1097TO1108:POKEI,R:NEXT:
FORI=1255TO1271:POKEI,R:NEXT:FOR
I=1068TO1228STEP32:POKEI,R:NEXT:
FORI=1073TO1233STEP32:POKEI,R:NE
XT:FORI=1387TO1395:POKEI,R:NEXT
42 DATA1291,1298,1323,1331,1364,
1420,1482
43 FORJ=1TO7:READD:POKED,R:NEXTJ
44 FORI=0TO2:FORJ=0TO3:POKE1133+
J+32*I,R-12:NEXTJ,I:FORI=1421TO1
428:POKEI,R-12:NEXTI
45 DATA1036,1041,1384,1398,1413,
1414,1432,1433
46 FORJ=1TO8:READD:POKED,R-12:NE
XTJ
47 POKE1354,R-8:POKE1451,R-8
48 POKE1355,R-7:POKE1452,R-7
49 DATA1385,1397,1415,1431,1486,
1487,1488,1489,1490,1491,1513
50 FORJ=1TO11:READD:POKED,R-3:NE
XTJ
51 POKE1453,R-10:POKE1485,R-10:P
OKE1460,R-5:PRINT@303,"GO";:PRIN
T@492,"R.DELBOURGO";:PRINT@430,"
C.1982";
52 FORI=1TO2:PLAY"T30L3CL5GL5C0
1L8CP50CP50CP10":NEXTI:FORI=1TO2
:PLAY"L5T402CCCDL2CP4":NEXTI:PLA
Y"L5CCCL4DL5CCCL4DL5CDCDL3C":RET
URN
53 PMODE4,1:PCLS1
54 GOSUB35
55 FORI=1TO33:READY,X
56 DATA2,6,2,7,2,8,2,12,2,13,2,1
4,3,5,3,9,3,11,3,15,4,5,4,11,4,1
5,5,5,5,7,5,8,5,9,5,11,5,15,6,5,
6,9,6,11,6,15,7,5,7,9,7,11,7,15,
8,6,8,7,8,8,8,12,8,13,8,14
57 FORR=1TO5:CIRCLE(10*X+28,10*Y
-4),R,0:NEXTR
58 NEXTI
59 FORI=1TO41:READY,X
60 DATA14,1,14,2,14,3,14,6,14,9,
14,10,14,11,14,14,14,17,14,19,15
,3,15,5,15,7,15,9,15,11,15,13,15
,15,15,17,15,18,15,19
61 DATA16,1,16,3,16,5,16,6,16,7,
16,9,16,10,16,11,16,13,16,14,16,
15,16,17,16,19,17,2,17,5,17,7,17
,9,17,13,17,15,17,17,17,19
62 FORR=1TO5:CIRCLE(10*X+28,10*Y
-4),R,0:NEXTR
63 NEXTI:RETURN
64 FORI=1TO34:READY,X
65 DATA10,1,10,2,10,3,10,5,10,7,
10,9,10,10,10,11,10,13,10,14,10,
15,10,17,10,18,10,19,11,1,11,3,1
1,5,11,7,11,10,11,13,11,15,11,17
,11,18,12,1,12,2,12,3,12,5,12,6,
12,7,12,10,12,13,12,14,12,15,12,
17
66 FORR=1TO4:CIRCLE(10*X+28,10*Y
```

```
-4),R,1:NEXTR:CIRCLE(10*X+28,10*
Y-4),5,0
67 NEXTI:RESTORE:X=0:Y=0:RETURN
68 PLAY"O2T4L5FFFDCCC01A02CCCFDD
DP5CCCFDDDO1A#02CDC01AL3GL5P10AA
#02L3CL5C01A02CDC01AL3G":FORT=1T
0300:NEXTT:RETURN
69 CLS0:PRINT"instructions: WE A
SSUME THAT YOU";:PRINT@32,"ALREA
DY KNOW THE RULES OF go."
70 PRINT@97,"BLACK USES THE RIGH
T JOYSTICK,";:PRINT@129,"WHITE U
SES THE LEFT. PRESS THE";:PRINT@
161,"FIRE BUTTON TO INSERT A STO
NE.";
71 PRINT@225,"TO INTERRUPT THE G
AME IN ORDER";:PRINT@257,"TO REM
OVE PRISONERS OR REPLACE";:PRINT
@289,"STONES, PRESS <I>. USE ARR
OW  ";:PRINT@321,"KEYS TO MOVE C
URSOR AROUND.   ";
72 PRINT@353,"press <P> to take
a prisoner, ";:PRINT@385,"<B> to
 insert a black stone,  ";:PRINT
@417,"<W> to insert a white ston
e.  ";:PRINT@449,"press <R> to r
eturn to game.  ";:RETURN
73 PRINT@258,"  (1) MICRO BOARD
   (7X7)   ";:PRINT@290,"  (2) MI
NI  BOARD  (11X11)  ";:PRINT@322
,"  (3) SMALL BOARD  (15X15)  ";
:PRINT@354,"  (4) NORMAL BOARD (
19X19)  ";:PRINT@386,"ENTER YOUR
 CHOICE NO.";:INPUTS:IFS=1THENH=
6:RETURN
74 IFS=2THENH=4:RETURN
75 IFS=3THENH=2:RETURN
76 IFS=4THENH=0:RETURN
77 IFS<1ORS>4ORIN(S)<>S THEN73
78 PRESET(10*X+23,10*Y-9):PRESET
(10*X+33,10*Y+1):PRESET(10*X+33,
10*Y-9):PRESET(10*X+23,10*Y+1):P
RESET(10*X+24,10*Y-8):PRESET(10*
X+32,10*Y):PRESET(10*X+32,10*Y-8
):PRESET(10*X+24,10*Y)
79 PSET(10*X+23,10*Y-9):PSET(10*
X+33,10*Y+1):PSET(10*X+33,10*Y-9
):PSET(10*X+23,10*Y+1):PSET(10*X
+24,10*Y-8):PSET(10*X+32,10*Y):P
SET(10*X+32,10*Y-8):PSET(10*X+24
,10*Y):RETURN
80 PRESET(10*A+23,10*B-9):PRESET
(10*A+33,10*B+1):PRESET(10*A+33,
10*B-9):PRESET(10*A+23,10*B+1):P
RESET(10*A+24,10*B-8):PRESET(10*
A+32,10*B):PRESET(10*A+32,10*B-8
):PRESET(10*A+24,10*B)
81 PSET(10*A+23,10*B-9):PSET(10*
A+33,10*B+1):PSET(10*A+33,10*B-9
):PSET(10*A+23,10*B+1):PSET(10*A
+24,10*B-8):PSET(10*A+32,10*B):P
SET(10*A+32,10*B-8):PSET(10*A+24
,10*B):RETURN
82 PRESET(10*P+23,10*Q-9):PRESET
(10*P+33,10*Q+1):PRESET(10*P+33,
10*Q-9):PRESET(10*P+23,10*Q+1):P
LAY"V31L255T25503C"
83 PSET(10*P+23,10*Q-9):PSET(10*
P+33,10*Q+1):PSET(10*P+33,10*Q-9
):PSET(10*P+23,10*Q+1):GOT088
84 IFP(A,B)=1 THEN SCREEN1,0:PLA
Y"L1503CCCDL8C":FORT=1TO50:NEXTT
:SCREEN1,1:RETURN
85 FORR=1TO4:CIRCLE(10*A+28,10*B
-4),R:NEXTR:CIRCLE(10*A+28,10*B-
4),5,0:P(A,B)=1:RETURN
86 P=10:Q=10
87 V=2:GOT082
88 PLAY"V31T255L25503C":I$=INKEY
$
89 IFI$=CHR$(94)THENQ=Q-1:IFQ<1+
H THENQ=1+H
90 IFI$=CHR$(10)THENQ=Q+1:IFQ>19
-H THENQ=19-H
91 IFI$=CHR$(9)THENP=P+1:IFP>19-
H THENP=19-H
92 IFI$=CHR$(8)THENP=P-1:IFP<1+H
 THENP=1+H
93 IFI$="R"THEN23
94 IFI$="P"THEN99
95 IFI$="B"THEN118
96 IFI$="W"THEN113
97 IFI$="E"THEN123
98 GOT087
99 IFPPOINT(10*P+28,10*Q-4)=5THE
NV=1
100 IFPPOINT(10*P+27,10*Q-3)=0TH
ENV=0
101 FORR=1TO5:CIRCLE(10*P+28,10*
Q-4),R:NEXTR:P(P,Q)=0
102 LINE(10*P+23,10*Q-4)-(10*P+3
3,10*Q-4),PRESET:LINE(10*P+28,10
*Q-9)-(10*P+28,10*Q+1),PRESET
103 IFV=0THENYB=YB+10ELSE107
104 IFYB=196THENYB=6:XB=XB+10
105 FORR=1TO5:CIRCLE(XB,YB),R,0:
NEXTR:SW=SW+1
106 GOT087
107 IFV=1THENYW=YW+10
108 IFYW=196THENYW=6:XW=XW-10
109 CIRCLE(XW,YW),5,0:SB=SB+1
110 GOT087
111 IFV=2THENSCREEN1,0:FORT=1TO5
0:PLAY"L15T203CCCDL8C":NEXTT:SCR
EEN1,1
112 GOT087
113 IFP(P,Q)=1THENSCREEN1,0:PLAY
"L15T203CCCDL8C":FORT=1TO50:NEXT
T:SCREEN1,1:GOT087
114 FORR=1TO4:CIRCLE(10*P+28,10*
Q-4),R:NEXTR:CIRCLE(10*P+28,10*Q
-4),5,0:P(P,Q)=1:SB=SB-1
115 CIRCLE(XW,YW),5:YW=YW-10
116 IFYW=-4THENYW=186:XW=XW+10:I
FXW>186THENXW=186
117 GOT087
118 IFP(P,Q)=1THENSCREEN1,0:PLAY
"L15T203CCCDL8C":FORT=1TO50:NEXT
T:SCREEN1,1:GOT087
119 FORR=1TO5:CIRCLE(10*P+28,10*
Q-4),R,0:NEXTR:P(P,Q)=1:SW=SW-1
120 FORR=1TO5:CIRCLE(XB,YB),R:NE
XTR:YB=YB-10
121 IFYB=-4THENYB=186:XB=XB-10:I
FXB<8THENXB=8
122 GOT087
123 CLS0:PRINT"THE COMPUTER WILL
 NOW EVALUATE  THE AREA OCCUPIED
 BY EACH       PLAYER, ADJUST FO
R PRISONERS,  AND DECIDE WHO HA
S WON..."
124 FORJ=H+1TO19-H
125 FORI=H+1TO19-H:IFP(I,J)=1THE
N133
126 FORK=I TO19-H:IFP(K,J)=1THEN
132
127 NEXTK
128 FORL=J+1 TO19-H:IFP(19-H,L)=
1THEN130
129 NEXTL
130 IFPPOINT(218-10*H,10*L-4)=5T
HEN SW=SW+1 ELSE SB=SB+1
131 GOT0133
132 IFPPOINT(10*K+28,10*J-4)=5TH
ENSW=SW+1 ELSE SB=SB+1
133 NEXTI
134 NEXTJ
135 PRINT@323,"BLACK'S SCORE IS
  "SB;
136 PRINT@355,"WHITE'S SCORE IS
  "SW;:PLAY"T2L1203DGED02BGBAF#D
F#L6G"
137 IFSB>SW THEN PRINT@392,"BLAC
K HAS WON"; ELSE IFSW>SB THEN PR
INT@392,"WHITE HAS WON"; ELSE PR
INT@392,"NO go - A DRAW";
138 PRINT@486,"ANOTHER go? (Y/N)
";
139 Y$=INKEY$:IFY$=""THEN139
140 IFY$="Y"THENRUN4
141 IFY$="N"THEN END
142 GOT0139
```



16K ECB

SHIFT

by Bob Delbourgo

Shift is a card game of skill and stratergy, here transfered to the computer by Bob.

The instructions are embedded in the program, and once more, Bob uses techniques which reflect his complete understanding of CoCo.

Let's see how you go!

G.

THE LISTING:

```
1 '***********SHIFT*************
  ********BOB DELBOURGO********
2 GOTO10
3 SAVE"SHIFT:2":DIR2:STOP
10 CLS0
11 DATA 42,41,40,39,70,103,104,1
05,138,169,168,167,166
12 DATA 44,76,108,140,172,109,11
0,142,174
13 DATA 176,144,112,48
14 DATA 52,51,83,115,147,179,114
,116
15 DATA 55,87,119,151,183,184,86
,88
16 FORI=1TO42:READD:POKE1024+D,2
55:SOUND1*3,1:NEXTI
17 PRINT@225,"A NOVEL GAME OF CH
ANCE & SKILL";:PRINT@393,"bob de
lbourgo";:PRINT@449,"15 WILLOWDE
NE AVENUE, HOBART,";:PRINT@481,"
 TASMANIA , AUSTRALIA 7005.";
18 PRINT@294,"INSTRUCTIONS (Y/N)
?";
19 I$=INKEY$:IFI$="Y"THEN23
20 IFI$="N"THEN31
21 PRINT@294,STRING$(20,32);
22 GOTO18
23 CLSRND(8):PRINT@13,"shift";
24 PRINT@64,"CARDS 0-9 IN A NUMB
ER, N, OF    COLORS OF YOUR CHOI
CE ARE DEALT IN N ROWS, N AT A T
IME. A HIGHERNUMBERED CARD OF ON
E COLOR CAN  ELIMINATE A LOWER N
UMBERED CARD OF THE SAME COLOR I
N ANOTHER ROWIF BOTH ARE rightmo
st CARDS OF "
25 PRINT"THEIR RESPECTIVE ROWS.
AFTER ALLPOSSIBLE ELIMINATIONS,
N MORE   CARDS ARE DEALT."
26 GOSUB91
27 CLSRND(8):PRINT@13,"shift";:P
RINT@64,"IF ALL CARDS IN ONE ROW
 ARE     ELIMINATED ONE CAN THEN
 shift   ONE CARD AT A TIME FROM
 ANOTHER ROW INTO THE BLANK ROW.
 IN THIS WAY ONE MAY SUCCEED IN
REMOVING MORE CARDS."
28 PRINT"WITH A LITTLE LUCK ONE
MAY END  WITH A 9 OF EACH COLOR
IN EACH  ROW! SOME STRATEGY IS N
EEDED TO ACHIEVE THIS AIM..."
29 PRINT"YOUR SCORE GOES DOWN BY
 9-N FOR EACH CARD SUCCESSFULLY
REMOVED."
30 GOSUB91
31 CLEAR500:CLSRND(8):PRINT@13,"
shift";
32 PRINT@64,"";:INPUT"HOW MANY P
LAYERS (8 MAX.)";PL:PL=INT(PL):I
FPL<1ORPL>8THEN32
33 DIMN$(PL),SC(PL):FORI=1TOPL
34 PRINT@32*(I+3),"PLAYER #"I",
YOUR NAME";:INPUTN$(I):IFLEN(N$(
I))>12 THEN34
35 NEXTI
36 RD=RD+1
37 CLSRND(8):PRINT@13,"shift";:F
ORP=1TOPL
38 CLSRND(8):PRINT@13,"shift";:P
RINT@64,N$(P)" , HOW MANY ROWS,
PLEASE":PRINT" (8 MAXIMUM,  4 MI
NIMUM)";:INPUTRO:RO=INT(RO):IFRO
<40RRO>8THEN38
39 MU=9-RO
40 SC(P)=SC(P)+9*MU*RO
41 R=RND(-TIMER)
42 POKE359,57:CLS0:GOSUB88
43 SCREEN0,1
44 PRINT@448,"shuffling the char
acters....
45 FORI=1TORO:D$(I)="":C$(I)="":
FORJ=0TO9:C$(I)=C$(I)+MID$(STR$(
J),2)+CHR$(127+I*16)+CHR$(128):N
EXTJ,I
46 FORS=1TORO*RND(20)+RND(50)
47 I=RND(RO):J=RND(RO):IFJ=I THE
N47
48 K=RND(10):L=RND(10)
49 A$=MID$(C$(I),3*K-2,3):MID$(C
$(I),3*K-2,3)=MID$(C$(J),3*L-2,3
):MID$(C$(J),3*L-2,3)=A$
50 NEXTS
51 FORJ=1TO10:FORI=1TORO:D$(I)=D
$(I)+LEFT$(C$(I),3)
52 PRINT@32*I+36,D$(I);:C$(I)=RI
GHT$(C$(I),LEN(C$(I))-3):NEXTI
53 PRINT@448,N$(P)"'S RUNNING SC
ORE ="SC(P)
54 PRINT@352,"ELIMINATIONS (Y/N)
?";:PRINT@384,STRING$(32,128);
55 I$=INKEY$:IFI$="Y"THEN58
56 IFI$="N"THEN67
57 GOTO55
58 PRINT@384,"row1, row2 FOR ELI
MINATION ";:LINEINPUTQ$:IFLEN(Q$
)<3ORMID$(Q$,2,1)<>","THENSOUND
100,1:GOTO54ELSER=VAL(LEFT$(Q$,1
)):S=VAL(RIGHT$(Q$,1))
59 IFR=S THENGOSUB90:GOTO54
60 IFR<1ORR>RO ORS<1ORS>RO THENG
OSUB90:GOTO54
61 IFRIGHT$(D$(R),2)<>RIGHT$(D$(
S),2)THENGOSUB90:GOTO54
62 GOSUB93
63 FORI=1TORO:PRINT@32*I+36,D$(I
)+CHR$(128)+CHR$(128)+CHR$(128);
:NEXTI
64 PRINT@448,N$(P)"'S RUNNING SC
ORE ="SC(P)
65 FORT=5TO1STEP-1:SOUND20*T,1:N
EXTT
66 GOTO54
67 PRINT@352,"CARD SHIFTS (Y/N)
?";:PRINT@384,STRING$(32,128);
68 I$=INKEY$:IFI$="Y"THEN71
69 IFI$="N"THEN80
70 GOTO68
71 PRINT@384,"ENTER card row,emp
ty row ";:LINEINPUTQ$:IFLEN(Q$)<
3ORMID$(Q$,2,1)<>","THENSOUND10
0,1:GOTO67ELSER=VAL(LEFT$(Q$,1))
:S=VAL(RIGHT$(Q$,1))
72 IFR=S THENGOSUB90:GOTO67
73 IFR<1ORR>RO ORS<1ORS>RO THENG
OSUB90:GOTO67
74 IFD$(S)<>""THENGOSUB90:GOTO67
75 IFD$(R)=""THENGOSUB90:GOTO67
76 GOSUB96
77 FORK=1TORO:PRINT@32*K+36,D$(K
)+CHR$(128)+CHR$(128)+CHR$(128);
:NEXTK
78 PRINT@448,N$(P)"'S RUNNING SC
ORE ="SC(P)
79 FORT=1TO5:SOUND20*T,1:NEXTT:G
OTO54
80 NEXTJ:FORH=1TO10:SOUND10*H,1:
SOUND10*(20-H),1:NEXTH:NEXTP
81 CLSRND(8):PRINT"ROUND"RD
82 PRINT@64,"PLAYER":PRINT@90,"S
CORE";
83 FORP=1TOPL:PRINT@64+32*P,N$(P
):PRINT@90+32*P,SC(P):NEXTP
84 PRINT@448,"SHIFT SOME MORE (Y
/N)?"
85 I$=INKEY$:IFI$="Y"THEN36
86 IFI$="N"THENEND
87 PRINT@448,STRING$(21,32);:GOT
O84
88 PRINT@0,"ROW";:FORR=1TORO:PRI
```

```
NT@32*R+32,R":";:NEXTR
89 PRINT@15,"ROUND"RD;
90 SOUND100,1:PRINT@352,STRING$(
64,128);:RETURN
91 PRINT@487,"ANY KEY TO CONTINU
E";:IFINKEY$=""THEN91ELSERETURN
92 RETURN
93 U=VAL(MID$(D$(R),LEN(D$(R))-2
,1)):V=VAL(MID$(D$(S),LEN(D$(S))
-2,1))
94 IFU<V THEND$(R)=LEFT$(D$(R),L
EN(D$(R))-3)ELSED$(S)=LEFT$(D$(S
),LEN(D$(S))-3)
95 SC(P)=SC(P)-MU:RETURN
96 D$(S)=RIGHT$(D$(R),3):D$(R)=L
EFT$(D$(R),LEN(D$(R))-3):RETURN
```

16K ECB

NUMERIC SCRABBLE

by Bob Delbourgo

You've seen Scrabble, the Pyramids, the Leaning Tower of Pisa and the Blue Palace; now we give you "Equality", a Scrabble for people with numeric minds. The instructions are included in the game, so type in the listing and let's see how you go!

G.

THE LISTING:

```
1 '**********NUMERIC SCRABBLE***
   ********BOB DELBOURGO********
2 GOTO10
3 SAVE"NUMSCRAB:2":DIR2:STOP
10 'initialise variables and str
ings
11 CLEAR500:GOTO147
12 DIMC(5),A(13),PT(15),PE(15):R
=RND(-TIMER):C$=CHR$(8)+CHR$(9)+
CHR$(10)+CHR$(94)+"0123456789=+-
*/RCP"
13 C(1)=61:C(2)=43:C(3)=45:C(4)=
42:C(5)=47:T1$="L9T25V103C":T2$=
"L10T10V901G02G03G04G05G04G03G02
G01G"
14 FORI=1TO7:N$=N$+CHR$(159)+CHR
$(239):NEXTI:N1$=CHR$(239)+N$:N2
$=N$+CHR$(159)
15 FORI=1024TO1534STEP2:N=RND(5)
:R=RND(10):POKEI,47+R:POKEI+1,C(
N):NEXTI
16 PRINT@140,"EQUALITY";:PRINT@2
36,"SCRABBLE";:PRINT@110,"N";:PR
INT@174,"M";:PRINT@206,"E";:PRIN
T@270,"I";:PRINT@302,"C";:PRINT@
334,"A";:PRINT@272,"Y";:PRINT@36
2,"R.DELBOURGO";
17 PLAY"L8CCL4FFL8FL4AL12GP12FGF
12AL4F"
18 PRINT@481,STRING$(5,"=")"INST
RUCTIONS (Y/N) ?"STRING$(5,"=");
19 I$=INKEY$:IFI$="N"THEN32ELSEI
FI$="Y"THEN21ELSE19
20 'instructions
21 CLS:GOSUB145:GOSUB146
22 PRINT"THIS BOARD GAME (FOR UP
 TO FOUR PLAYERS) IS A NUMERIC V
ERSION OFSCRABBLE. EVERY PLAYER
IS DEALT 6 INTEGERS (0-9) AND 5
OPERATORS(=,+,-,*,/) AT RANDOM W
HICH ARE USED TO BUILD VALID SUM
S ALONG  A HORIZONTAL or VERTICA
L LINE."
23 GOSUB146:PRINT"THE BOARD IS 1
5X15 AND INTEGERS MUST BE LAID O
N "CHR$(239)",OPERATORS ON "CHR$
(159);
24 PRINT"ALL SUMS MUST BE SEPARA
TED BY "CHR$(239)" AND/OR "CHR$(
159)", CAN ONLY CONTAIN one =BUT
 ANY # OF INTEGERS/OPERATORS.";
25 GOSUB143
26 CLS:GOSUB145:GOSUB146
27 PRINT"THE ORDER OF OPERATIONS
 IS FIXEDTO BE: DIVISION, MULTIP
LICATION,SUBTRACTION AND THEN AD
DITION."
28 GOSUB146:PRINT"FOR EACH PIECE
 PLAYED SCORING IS #:VALUE OF DI
GIT                =:1    +:3
 -:5    *:7    /:9";
29 GOSUB146:PRINT"YOU INSERT YOU
R PIECES BY TYPINGTHE APPROPRIAT
E CHARACTER.  WHENFINISHED (P) P
ASSES PLAY TO NEXTPLAYER. (R) TO
 RETRACT INCORRECTENTRY, (C) TO
CHANGE all PIECES.";
30 GOSUB143
31 'determine # players and init
ialise remaining quantities
32 CLSRND(7)+1:GOSUB145
33 PRINT@64,"HOW MANY PLAYERS (4
 MAX.)";:INPUTNP:NP=INT(NP):IFNP
<1ORNP>4THENSOUND200,2:GOTO33
34 DIMP$(NP),SC(NP),NN$(NP),OO$(
NP):RM=24/NP
35 FORI=1TONP:PRINT@64*(I+1),"PL
AYER #"I"YOUR NAME";:INPUTP$(I):
IFLEN(P$(I))>8THENP$(I)=LEFT$(P$
(I),8)
36 NEXTI
37 CLS:FORI=0TO15:POKE1504+I,175
:POKE1039+32*I,175:POKE1072+I,17
5:POKE1232+I,175:POKE1296+I,175:
NEXTI:POKE1048,175
38 FORI=0TO96STEP32:POKE1112+I,1
75:NEXTI:FORI=1TONP:SC(I)=0:NN$(
I)="":OO$(I)="":NEXTI:RD=0:X=7:Y
=7
39 FORI=0TO448STEP64:PRINT@I,N1$
;:NEXTI:FORI=32TO416STEP64:PRINT
@I,N2$;:NEXTI
40 PRINT@17,"PLAYER";:PRINT@26,"
SCORE";:FORI=1TONP:PRINT@48+32*I
,P$(I);:NEXTI
41 PRINT@304,"move cursor with";
:PRINT@336,"the arrow keys.";:PR
INT@368,"type character";:PRINT@
400,"to insert piece,";:PRINT@43
2,"(R) to retract";:PRINT@464,"(
C) to change,";:PRINT@496,"(P) t
o pass.";
42 'deal pieces to each player,
6 numbers, 3 operators and 2 =
43 FORI=1TONP:FORJ=1TO6:NN$(I)=N
N$(I)+CHR$(47+RND(10)):NEXTJ:FOR
J=1TO3:OO$(I)=OO$(I)+CHR$(C(RND(
4)+1)):NEXTJ:OO$(I)=OO$(I)+"==":
NEXTI
44 'start game
45 P=0:RD=RD+1:IFRD=RM THEN52
46 'show hand and wait for keypr
ess
47 Q=1:T$="":S$="":P=P+1:IFP=NP+
1THEN45
48 PRINT@240,CHR$(229)+NN$(P)+CH
R$(234)+CHR$(149)+OO$(P)+CHR$(15
4)+CHR$(175);
49 I$=INKEY$:GOSUB102:IFI$=""THE
N49
50 ONINSTR(1,C$,I$) GOTO54,56,58
,60,63,63,63,63,63,63,63,63,63,6
3,66,66,66,66,66,69,75,79
51 GOSUB102:GOTO49
52 PRINT@483,"GAME OVER!";:PLAYT
2$:PRINT@17,"(S) TO RESTART"
53 IFINKEY$()"S"THENPRINT@17,"(s
) to restart";:GOTO52ELSE37
54 X=X-1:IFX<0THENX=0 'left
55 GOTO49
56 X=X+1:IFX>14THENX=14 'right
57 GOTO49
58 Y=Y+1:IFY>14THENY=14 'down
59 GOTO49
60 Y=Y-1:IFY<0THENY=0 'up
61 GOTO49
62 'number insertion
63 I=INSTR(1,NN$(P),I$):IFI=0ORP
EEK(1024+X+32*Y)<>239THENSOUND10
0,1:GOTO49
```

```
64 GOSUB104:GOTO48
65 'operator insertion
66 I=INSTR(1,OO$(P),I$):IFI=OORP
EEK(1024+X+32*Y)<>159THENSOUND10
0,1:GOTO49
67 GOSUB108:GOTO48
68 'retraction routine
69 IFQ=1THENSOUND100,1:GOTO49
70 FORI=1TOQ-1:POKEPT(I),PE(I):N
EXTI 'restore board
71 NN$(P)=NN$(P)+S$:S$="" 'readj
ust strings
72 OO$(P)=OO$(P)+T$:T$=""
73 Q=1:GOTO48
74 'change routine
75 IFQ>1THENSOUND100,1:GOTO48 EL
SENN$(P)="":OO$(P)=""
76 FORJ=1TO6:NN$(P)=NN$(P)+CHR$(
47+RND(10)):NEXTJ
77 FORJ=1TO4:OO$(P)=OO$(P)+CHR$(
C(RND(4)+1)):NEXTJ:OO$(P)=OO$(P)
+"="
78 PRINT@58+32*P,USING"####";SC(
P):PLAYT2$+T2$+T2$+T2$:GOTO47
79 SC=0:IFQ=2THEN101
80 'pass routine
81 PRINT@484,"CHECKING";:D=PT(2)
-PT(1):IFABS(D)>15THEND=32ELSED=
1
82 FORII=2TOQ-1:IFD=1ANDABS(PT(I
I)-PT(1))>15THEN101 'check if ho
rizontal
83 IFD=32ANDPT(II)-PT(1)<>32*INT
((PT(II)-PT(1))/32)THEN101 'chec
k if vertical
84 NEXTII
85 'determine string along line
of play
86 L$="":IFD=1THENP1=32*INT(PT(1
)/32):FORI=P1 TOP1+14:L$=L$+CHR$
(PEEK(I)-64):NEXTI 'along horizo
ntal
87 IFD=32THENP1=1024+PT(1)-32*IN
T(PT(1)/32):FORI=P1 TOP1+448STEP
32:L$=L$+CHR$(PEEK(I)-64):NEXTI
'along vertical
88 L=LEN(L$)
89 'break up into substrings for
 analysis
90 FORK=1TOL:IFMID$(L$,K,1)=CHR$
(95)ORMID$(L$,K,1)=CHR$(175)THEN
NEXTK
91 L$=RIGHT$(L$,L-K+1):L=L-K+1
92 FORJJ=1TOL:IFMID$(L$,JJ,1)=CH
R$(95)ORMID$(L$,JJ,1)=CHR$(175)T
HEN94ELSENEXTJJ
93 'get substring
94 SS$=LEFT$(L$,JJ-1):SS=LEN(SS$
):IFSS>1THENGOSUB111:IFKK=1THEN1
01
95 IFL<JJ THEN96ELSEL$=RIGHT$(L$
,L-JJ+1):L=L-JJ+1:GOTO90
96 FORTT=1TOLEN(S$+T$):TT$=MID$(
S$+T$,TT,1):SC=SC+INSTR(1,"12345
6789",TT$)+INSTR(1,"= + - * /",T
T$):NEXTTT
97 SC(P)=SC(P)+SC:PRINT@58+32*P,
USING"####";SC(P):PRINT@484,STRI
NG$(8,175);
98 PLAYT2$+T2$+T2$+T2$:IFLEN(S$)
>0THENFORJ=1TOLEN(S$):NN$(P)=NN$
(P)+CHR$(47+RND(10)):NEXTJ
99 IFLEN(T$)>0THENFORJ=1TOLEN(T$
):OO$(P)=OO$(P)+CHR$(C(RND(4)+1)
):NEXTJ
100 GOTO47
101 PRINT@484,"INVALID!";:SOUND1
0,20:PRINT@484,STRING$(8,175);:G
OTO70
102 PT=1024+X+32*Y:PP=1080+32*P:
PE=PEEK(PT):POKEPT,PE:POKEPT,191
:POKEPP,175:POKEPP,207:PLAYT1$:P
OKEPP,175:PT(Q)=PT:PE(Q)=PE:POKE
PT,PE:RETURN
103 'readjust number string
104 NN=LEN(NN$(P)):NN$(P)=LEFT$(
NN$(P),I-1)+RIGHT$(NN$(P),NN-I)
105 S$=S$+I$:PRINT@X+32*Y,I$;:Q=
Q+1
106 PLAYT2$:RETURN
107 'readjust operator string
108 OO=LEN(OO$(P)):OO$(P)=LEFT$(
OO$(P),I-1)+RIGHT$(OO$(P),OO-I)
109 T$=T$+I$:PRINT@X+32*Y,I$;:Q=
Q+1
110 PLAYT2$:RETURN
111 KK=0:FORI=1TO13:A(I)=0:NEXTI
:IFSS=2*INT(SS/2)THENKK=1:RETURN
 'valid string must be odd
112 FORI=1TOSS STEP2:N$=MID$(SS$
,I,1):IFN$<"0"ORN$>"9"THENKK=1:R
ETURN 'test number sequence
113 FORI=2TOSS STEP2:O$=MID$(SS$
,I,1):IFO$="/"ORO$="*"ORO$="-"OR
O$="+"ORO$="="THENNEXTI ELSEKK=1
:RETURN 'test operator sequence
114 E=0:FORI=2TOSS STEP2:IFMID$(
SS$,I,1)="="THENE=E+1 'test # eq
ual signs in substring
115 NEXTI:IFE=OORE>1THENKK=1:RET
URN
116 FORI=2TOSS STEP2:IFMID$(SS$,
I,1)<>"="THENNEXTI ELSEE=I
117 LL$=LEFT$(SS$,E-1):RR$=RIGHT
$(SS$,SS-E) 'split substrings on
 either side of = sign
118 A$=LL$:GOSUB122:LL=A:A$=RR$:
GOSUB122:RR=A
119 IFABS(LL-RR)<.000001THENKK=1
120 RETURN
121 'carry out the sums on the s
trings
122 N=(LEN(A$)+1)/2:O=N-1
123 FORI=1TON:A(I)=VAL(MID$(A$,2
*I-1,1)):NEXTI
124 O$="":FORI=1TOO:O$=O$+MID$(A
$,2*I,1):NEXTI
125 'division first
126 DI=INSTR(1,O$,"/"):IFDI=0THE
N130
127 A(DI)=A(DI)/A(DI+1):FORI=DI+
1TON:A(I)=A(I+1):NEXTI
128 O$=LEFT$(O$,DI-1)+RIGHT$(O$,
O-DI):N=N-1:O=O-1:GOTO126
129 'then multiplication
130 MU=INSTR(1,O$,"*"):IFMU=0THE
N134
131 A(MU)=A(MU)*A(MU+1):FORI=MU+
1TON:A(I)=A(I+1):NEXTI
132 O$=LEFT$(O$,MU-1)+RIGHT$(O$,
O-MU):N=N-1:O=O-1:GOTO126
133 'then subtraction
134 SU=INSTR(1,O$,"-"):IFSU=0THE
N138
135 A(SU)=A(SU)-A(SU+1):FORI=SU+
1TON:A(I)=A(I+1):NEXTI
136 O$=LEFT$(O$,SU-1)+RIGHT$(O$,
O-SU):N=N-1:O=O-1:GOTO134
137 'then addition
138 AD=INSTR(1,O$,"+"):IFAD=0THE
N142
139 A(AD)=A(AD)+A(AD+1):FORI=AD+
1TON:A(I)=A(I+1):NEXTI
140 O$=LEFT$(O$,AD-1)+RIGHT$(O$,
O-AD):N=N-1:O=O-1:GOTO138
141 'the final result of the sum
142 A=A(1):RETURN
143 PRINT@481,STRING$(9,"=");"ty
pe any key"STRING$(9,"=");
144 IFINKEY$=""THEN144ELSERETURN
145 PRINTSTRING$(12,"=")"equalit
y"STRING$(12,"=");:RETURN
146 PRINTSTRING$(32,"=");:RETURN
147 PCLEAR2:GOTO12
```

32K ECB

HERALDRY

by Bob Delbourgo

The great contribution Bob and family have made is in the teaching of programming techniques to CoCo, MC-10 and T100 users.

This next program is a prime example of a program which uses a number of techniques we haven't seen before.

The program allows you to build your family crest on screen, and save it to tape, for use in other programs.

Even if you are unaware of your family crest, you can still have fun building one! G.

THE LISTING:

```
1 '**********HERALDRY**********
  ********BOB DELBOURGO********
2 GOTO10
3 SAVE"HERALDRY:2":DIR2:STOP
10 CLS5:C1=191:C2=159:C3=175:C4=
191:GOSUB131
11 PRINT@0,"heraldry -- daniel&b
ob delbourgo";:FORI=454TO486STEP
32:PRINT@I,STRING$(20,249);:NEXT
I:PRINT@487,"DIEU ET  MON DROIT"
;
12 DATA 160,161,162,163,164,187,
188,189,190,191,192,219,223,224,
225,226,227,251,252,253,254,255,
256,283,286,288,289,290,291,292,
315,319
13 FORI=1TO32:READD:PRINT@D,CHR$
(246);:NEXTI
14 C1=255:FORH=105TO201STEP96:GO
SUB196:NEXTH:FORH=272TO368STEP96
:GOSUB196:NEXTH:FORH=169TO336STE
P167:GOSUB197:NEXTH
15 PRINT@81,CHR$(254);:PRINT@87,
CHR$(253);:PRINT@209,CHR$(251);:
PRINT@215,CHR$(247);:C=191:H=113
:GOSUB198
16 H=1258:GOSUB199
17 PLAY"O2L2GL8AB03L4CL2EP4O2L2G
L8AB03CEL2GP4O3L4AGL8EFGP8L4FEL8
CDEP8L4DCL8O2AB03CEL2G"
18 PRINT@0,STRING$(32,32);:PRINT
@0,"";:INPUT"YOUR SURNAME";NN$
19 PRINT@0,"ON COMPLETION OF COA
T OF ARMS,  TYPE (S)-SAVE TO TAP
E,(C)-RESUME";:FORT=1TO2222:NEXT
T
20 CLS1:GOSUB201:PRINT@65,"BANDS
";
21 FORI=18TO27:RESET(I,4):NEXTI:
FORJ=1TO8:RESET(38,J):RESET(39,J
):NEXTJ:FORK=0TO6:RESET(52+K,7-K
):RESET(3+K,11+K):NEXTK
22 FORK=0TO3:RESET(22-K,13+K):RE
SET(23+K,13+K):RESET(34+K,14):RE
SET(40+K,14):RESET(38,11+K):RESE
T(39,11+K):RESET(50+K,14):RESET(
8+K,24):RESET(18+K,24):RESET(24+
K,24):RESET(22,25+K):RESET(23,25
+K):RESET(34+K,24):RESET(40+K,24
):NEXTK
23 RESET(22,24):RESET(23,24):FOR
K=0TO7:RESET(54,11+K):RESET(55,1
1+K):RESET(6,21+K):RESET(7,21+K)
:RESET(38,21+K):RESET(39,21+K):R
ESET(51+K,21+K):RESET(58-K,21+K)
:NEXTK
24 GOSUB152:PRINT@480,"shield pa
rtitions - TYPE HEX#";:GOSUB142
25 ON V GOTO26,37,41,45,49,53,57,
61,65,69,73,77
26 CLS1:GOSUB201
27 FORK=0TO7:FORL=0TO2:RESET(3+K
,2+L):NEXTL,K:FORK=0TO5:FORL=0TO
1:RESET(4+K,5+L):NEXTL,K:POKE112
3,128
28 FORK=0TO9:RESET(18+K,3):RESET
(18+K,4):RESET(50+K,3):RESET(50+
K,4):RESET(50+K,24):NEXTK:FORK=0
TO7:RESET(22,1+K):RESET(23,1+K):
RESET(22,11+K):RESET(23,11+K):RE
SET(54,21+K):RESET(55,21+K):NEXT
K
29 POKE1164,140:FORK=0TO3:RESET(
34+K,1+K):RESET(35+K,1+K):RESET(
42-K,1+K):RESET(43-K,1+K):RESET(
34+K,7-K):RESET(35+K,7-K):RESET(
43-K,7-K):RESET(42-K,7-K):RESET(
2+K,17-K):RESET(3+K,17-K):RESET(
11-K,17-K):RESET(10-K,17-K)
30 RESET(50+K,21+K):RESET(51+K,2
1+K):RESET(59-K,21+K):RESET(58-K
,21+K):RESET(50+K,27-K):RESET(51
+K,27-K):RESET(59-K,27-K):RESET(
58-K,27-K):NEXTK
31 FORK=0TO6:RESET(43-K,11+K):RE
SET(42-K,11+K):RESET(50+K,11+K):
RESET(51+K,11+K):NEXTK
32 FORK=0TO2:POKE1410+K,128:POKE
1379+32*K,128:NEXTK:POKE1378,142
:POKE1380,141:POKE1442,139:POKE1
444,135
33 FORK=0TO3:RESET(18+K,21+K):RE
SET(19+K,21+K):RESET(27-K,21+K):
RESET(26-K,21+K):RESET(22,25+K):
RESET(23,25+K):NEXTK
34 FORK=0TO8STEP2:FORL=0TO6STEP2
:RESET(35+K,21+L):NEXTL:FORL=0TO
4STEP2:RESET(34+K,22+L):NEXTL,K:
RESET(38,28):RESET(40,28)
35 GOSUB152:PRINT@480,"banded sh
ields - TYPE HEX #";:GOSUB142
36 ON V GOTO81,84,88,94,98,103,11
1,107,115,119,123,127
37 CLS6:C1=128:C2=128:C3=143:C4=
143:GOSUB131:PRINT@12,"per fess"
;
38 PRINT@141,"COLOR1";:PRINT@269
,"COLOR2";:GOSUB146:GOSUB147
39 CLS6:C3=C2:C4=C2:C2=C1:GOSUB1
31
40 H1(1)=1161:H2(1)=1169:H1(2)=1
325:H2(2)=H1(2):N=2:GOSUB144:GOT
O156
41 CLS6:C1=128:C3=128:C2=143:C4=
143:GOSUB131:PRINT@12,"per pale"
;
42 PRINT@201,"COLOR1";:PRINT@210
,"COLOR2";:GOSUB146:GOSUB147
43 CLS6:C3=C1:C4=C2:GOSUB131
44 H1(1)=1129:H2(1)=1289:H1(2)=1
137:H2(2)=1297:N=2:GOSUB144:GOTO
156
45 CLS6:C1=128:C2=C1:C3=143:C4=1
43:GOSUB131:GOSUB187:PRINT@9,"pe
r bend dexter";
46 PRINT@137,"COLOR1";:PRINT@272
,"COLOR2";:GOSUB146:GOSUB147
47 CLS6:C3=C2:C4=C2:C2=C1:GOSUB1
31:GOSUB187
48 H1(1)=1129:H2(1)=H1(1):H1(2)=
1295:H2(2)=H1(2):N=2:GOSUB144:GO
TO156
49 CLS6:C1=128:C2=C1:C3=143:C4=C
3:GOSUB131:GOSUB190:PRINT@8,"per
 bend sinister";
50 PRINT@266,"COLOR1";:PRINT@145
,"COLOR2";:GOSUB146:GOSUB147
51 CLS6:C3=C2:C2=C1:C4=C3:GOSUB1
31:GOSUB190
52 H1(1)=1169:H2(1)=H1(1):H1(2)=
1291:H2(2)=H1(2):N=2:GOSUB144:GO
TO156
53 CLS6:C1=128:C2=C1:C3=143:C4=C
3:GOSUB131:GOSUB193:PRINT@11,"pe
r chevron";
54 PRINT@141,"COLOR1";:PRINT@333
,"COLOR2";:GOSUB146:GOSUB147
55 CLS6:C3=C2:C4=C2:C2=C1:GOSUB1
31:GOSUB193
56 H1(1)=1128:H2(1)=1138:H1(2)=1
357:H2(2)=H1(2):N=2:GOSUB144:GOT
O156
57 CLS6:C1=128:C2=143:C3=223:C4=
C3:GOSUB131:PRINT@8,"per quarter
 fess";
58 PRINT@137,"COLOR1";:PRINT@145
```

```
,"COLOR2";:PRINT@301,"COLOR3";:G
OSUB146:GOSUB147:GOSUB148
59 CLS6:C4=C3:GOSUB131
60 H1(1)=1129:H2(1)=H1(1):H1(2)=
1138:H2(2)=H1(2):H1(3)=1325:H2(3
)=H1(3):N=3:GOSUB144:GOTO156
61 CLS6:C1=143:C2=128:C3=223:C4=
C2:GOSUB131:PRINT@3,"per quarter
 pale sinister";
62 PRINT@137,"COLOR1";:PRINT@265
,"COLOR2";:PRINT@209,"COLOR3";:G
OSUB146:GOSUB147:GOSUB148
63 CLS6:C4=C2:GOSUB131
64 H1(1)=1129:H2(1)=H1(1):H1(2)=
1289:H2(2)=H1(2):H1(3)=1137:H2(3
)=1297:N=3:GOSUB144:GOTO156
65 CLS6:C1=128:C3=C1:C2=143:C4=2
23:GOSUB131:PRINT@9,"per bend de
xter";
66 PRINT@201,"COLOR1";:PRINT@145
,"COLOR2";:PRINT@273,"COLOR3";:G
OSUB146:GOSUB147:GOSUB148
67 CLS6:C4=C3:C3=C1:GOSUB131
68 H1(1)=1129:H2(1)=1289:H1(2)=1
137:H2(2)=H1(2):H1(3)=1297:H2(3)
=H1(3):N=3:GOSUB144:GOTO156
69 CLS6:C1=128:C2=C1:C3=143:C4=2
23:GOSUB131:PRINT@12,"per pall";
70 PRINT@141,"COLOR1";:PRINT@265
,"COLOR2";:PRINT@273,"COLOR3";:G
OSUB146:GOSUB147:GOSUB148
71 CLS6:C4=C3:C3=C2:C2=C1:GOSUB1
31
72 H1(1)=1129:H2(1)=1137:H1(2)=1
289:H2(2)=H1(2):H1(3)=1297:H2(3)
=H1(3):N=3:GOSUB144:GOTO156
73 CLS6:C1=128:C2=143:C3=C2:C4=C
1:GOSUB131:PRINT@12,"per cross";
74 PRINT@137,"COLOR1";:PRINT@145
,"COLOR2";:PRINT@265,"COLOR3";:P
RINT@273,"COLOR4";:GOSUB146:GOSU
B147:GOSUB148:GOSUB149
75 CLS6:GOSUB131
76 H1(1)=1129:H2(1)=H1(1):H1(2)=
1137:H2(2)=H1(2):H1(3)=1289:H2(3
)=H1(3):H1(4)=1297:H2(4)=H1(4):N
=4:GOSUB144:GOTO156
77 CLS6:C1=128:C2=C1:C3=143:C4=C
3:GOSUB131:GOSUB193:GOSUB195:PRI
NT@11,"per saltire";
78 PRINT@200,"COLOR1";:PRINT@109
,"COLOR5";:GOSUB146:GOSUB150
79 CLS6:C2=C1:C3=C:C4=C:GOSUB131
:GOSUB193:GOSUB195
80 H1(1)=1133:H2(1)=1325:H1(2)=1
224:H2(2)=1234:N=2:GOSUB144:GOTO
156
81 GOSUB140:PRINT@9,"in escutche
on";
82 C=128:GOSUB153:PRINT@77,"COLO
R1";:PRINT@237,"COLOR5";:GOSUB14
6:GOSUB150
83 CLS6:C2=C1:C3=C1:C4=C1:GOSUB1
31:GOSUB153:H1=1197:H2=H1:GOSUB1
45:GOTO156
84 GOSUB140:PRINT@13,"a cross";
85 C=128:GOSUB171:PRINT@137,"COL
OR1";:PRINT@145,"COLOR2";:PRINT@
265,"COLOR3";:PRINT@273,"COLOR4"
;:PRINT@205,"COLOR5";:GOSUB146:G
OSUB147:GOSUB148:GOSUB149:GOSUB1
50
86 CLS6:GOSUB131:GOSUB171
87 N=5:H1(1)=1128:H2(1)=H1(1):H1
(2)=1138:H2(2)=H1(2):H1(3)=1289:
H2(3)=1289:H1(4)=1297:H2(4)=H1(4
):H1(5)=1229:H2(5)=H1(5):GOSUB14
4:GOTO156
88 GOSUB140:PRINT@12,"a saltire"
;
89 C=128:GOSUB162:PRINT@141,"COL
OR1";:PRINT@237,"COLOR5";:GOSUB1
46:GOSUB150
90 GOSUB146
91 GOSUB150
92 CLS6:C2=C1:C3=C1:C4=C1:GOSUB1
31:GOSUB162
93 H1=1229:H2=H1:GOSUB145:GOTO15
6
94 GOSUB140:PRINT@13,"a fess";
95 C=128:GOSUB167:PRINT@141,"COL
OR1";:PRINT@205,"COLOR5";:PRINT@
301,"COLOR3";:GOSUB146:GOSUB150:
GOSUB148
96 CLS6:C2=C1:C4=C3:GOSUB131:GOS
UB167
97 H1(1)=1128:H2(1)=1138:H1(2)=1
289:H2(2)=1297:H1(3)=1229:H2(3)=
H1(3):N=3:GOSUB144:GOTO156
98 GOSUB140:PRINT@12,"a chevron"
;
99 C=128:GOSUB168:PRINT@109,"COL
OR1";:PRINT@205,"COLOR5";:PRINT@
301,"COLOR3";:GOSUB146:GOSUB150:
GOSUB148
100 GOSUB148
101 CLS6:C2=C1:C4=C3:GOSUB131:GO
SUB168
102 H1(1)=1128:H2(1)=1138:H1(2)=
1357:H2(2)=H1(2):H1(3)=1197:H2(3
)=H1(3):N=3:GOSUB144:GOTO156
103 GOSUB140:PRINT@14,"a pale";
104 C=128:GOSUB173:PRINT@168,"CO
LOR1";:PRINT@175,"5";:PRINT@178,
"COLOR2";:GOSUB146:GOSUB147:GOSU
B150
105 CLS6:C3=C1:C4=C2:GOSUB131:GO
SUB173
106 H1(1)=1128:H2(1)=1256:H1(2)=
1138:H2(2)=1266:N=2:GOSUB144:GOT
0156
107 GOSUB140:PRINT@9,"a bend dex
ter";
108 C=128:GOSUB175:PRINT@112,"CO
LOR1";:PRINT@205,"COLOR5";:GOSUB
146:GOSUB150
109 CLS6:C2=C1:C3=C1:C4=C1:GOSUB
131:GOSUB175
110 H1(1)=1138:H2(1)=H1(1):H1(2)
=1322:H2(2)=H1(2):N=2:GOSUB144:G
OTO156
111 GOSUB140:PRINT@8,"a bend sin
ister";
112 C=128:GOSUB177:PRINT@107,"CO
LOR1";:PRINT@205,"COLOR5";:GOSUB
146:GOSUB150
113 CLS6:C2=C1:C3=C1:C4=C1:GOSUB
131:GOSUB177
114 H1(1)=1128:H2(1)=H1(1):H1(2)
=1328:H2(2)=H1(2):N=2:GOSUB144:G
OTO156
115 GOSUB140:PRINT@12,"a lozenge
";
116 C=128:GOSUB179:PRINT@104,"CO
LOR1";:PRINT@205,"COLOR5";:GOSUB
146:GOSUB150
117 CLS6:C2=C1:C3=C1:C4=C1:GOSUB
131:GOSUB179
118 H1=1229:H2=H1:GOSUB145:GOTO1
56
119 GOSUB140:PRINT@13,"a pall";
120 C=128:GOSUB180:PRINT@109,"CO
LOR1";:PRINT@205,"COLOR5";:GOSUB
146:GOSUB150
121 CLS6:C2=C1:C3=C1:C4=C1:GOSUB
131:GOSUB180
122 H1=1229:H2=H1:GOSUB145:GOTO1
56
123 GOSUB140:PRINT@12,"a checky"
;
124 C=128:GOSUB182:PRINT@175,"1"
;:PRINT@239,"5";:GOSUB146:GOSUB1
50
125 CLS6:C2=C1:C3=C1:C4=C1:GOSUB
131:GOSUB182
126 GOTO156
127 GOSUB140:PRINT@8,"saltire a
cross";
128 C=128:GOSUB171:GOSUB162:PRIN
T@237,"COLOR5";:PRINT@76,"1";:GO
SUB146:GOSUB150
129 CLS6:C2=C1:C3=C1:C4=C1:GOSUB
131:GOSUB171:GOSUB162
130 H1=1229:H2=H1:GOSUB145:GOTO1
56
131 FORI=7TO15:FORJ=64TO192STEP3
2:POKE1024+I+J,C1:POKE1033+I+J,C
2:NEXTJ,I
132 FORI=8TO15:FORJ=224TO256STEP
32:POKE1024+I+J,C3:POKE1032+I+J,
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C4:NEXTJ,I
133 FORI=9TO15:FORJ=288TO320STEP
32:POKE1024+I+J,C3:POKE1031+I+J,
C4:NEXTJ,I
134 FORI=12TO15:FORJ=352TO384STE
P32:POKE1024+I+J,C3:POKE1028+I+J
,C4:NEXTJ,I
135 POKE1386,C3:POKE1387,C3:POKE
1455,C3:POKE1396,C4:POKE1397,C4:
POKE1456,C4
136 FORI=13TO50:RESET(I,3):NEXTI
:FORJ=4TO11:RESET(13,J):RESET(50
,J):NEXTJ
137 FORJ=11TO14:RESET(14,J):RESE
T(49,J):NEXTJ:FORJ=14TO16:RESET(
15,J):RESET(16,J+2):RESET(48,J):
RESET(47,J+2):RESET(18,J+5):RESE
T(45,J+5):RESET(20,J+7):RESET(43
,J+7):NEXTJ
138 FORJ=18TO19:RESET(17,J):RESE
T(46,J):RESET(21,J+5):RESET(42,J
+5):RESET(23,J+6):RESET(40,J+6):
RESET(25,J+7):RESET(38,J+7):RESE
T(29,J+8):RESET(34,J+8):NEXTJ:RE
SET(19,21):RESET(44,21):RESET(22
,24):RESET(41,24):RESET(24,25):R
ESET(39,25)
139 FORI=26TO29:RESET(I,26):RESE
T(I+8,26):RESET(I+4,27):NEXTI:RE
TURN
140 CLS6:C1=143:C2=143:C3=143:C4
=143::GOSUB131:RETURN
141 PRINT@448,STRING$(32,223);:R
ETURN
142 POKE1534,128:Q$=INKEY$:POKE1
534,143:IFQ$=""THEN142
143 V=VAL("&H"+Q$):IFV<10RV>12TH
EN142ELSERETURN
144 FORI=1TON:PRINT@448,"ENTER B
LAZON (0-20) #";I;:INPUTM$(I):M(
I)=VAL(M$(I)):IFM(I)>20THEN144EL
SEGOSUB155:NEXTI:GOSUB141:RETURN
145 PRINT@448,"ENTER CENTRAL BLA
ZON (0-20)";:INPUTM$:M=VAL(M$):I
FM>20THEN145ELSEGOSUB154:GOSUB14
1:RETURN
146 PRINT@448,"ENTER COLOR 1 (1-
8)";:INPUTC1$:C1=VAL(C1$):C1=127
+16*C1:IFC1>255ORC1<143THEN146EL
SERETURN
147 PRINT@448,"ENTER COLOR 2 (1-
8)";:INPUTC2$:C2=VAL(C2$):C2=127
+16*C2:IFC2>255ORC2<143THEN147EL
SERETURN
148 PRINT@448,"ENTER COLOR 3 (1-
8)";:INPUTC3$:C3=VAL(C3$):C3=127
+16*C3:IFC3>255ORC3<143THEN148EL
SERETURN
149 PRINT@448,"ENTER COLOR 4 (1-
8)";:INPUTC4$:C4=VAL(C4$):C4=127
+16*C4:IFC4>255ORC4<143THEN149EL
SERETURN
150 PRINT@448,"ENTER COLOR 5 (0-
8)";:INPUTC$:C=VAL(C$):IFC>8THEN
150
151 IFC=0THENC=128:RETURN ELSEC=
127+16*C:RETURN
152 FORI=0TO3:PRINT@134+8*I,RIGH
T$(STR$(I+1),1);:PRINT@294+8*I,R
IGHT$(STR$(I+5),1);:NEXTI:PRINT@
454,"9";:PRINT@462,"A";:PRINT@47
0,"B";:PRINT@478,"C";:RETURN
153 FORL=0TO64STEP32:PRINT@105+L
,STRING$(14,C);:NEXTL:FORL=0TO1:
PRINT@202+32*L,STRING$(12,C);:PR
INT@267+32*L,STRING$(10,C);:NEXT
L:PRINT@332,STRING$(8,C);:PRINT@
366,STRING$(4,C);:RETURN
154 S=16*RND(8)+127:FORH=H1 TOH2
 STEP(H2-H1):ONM GOSUB205,206,20
7,208,209,210,211,212,213,214,21
5,216,217,218,219,220,221,222,22
3,224:NEXTH:RETURN
155 S=16*RND(8)+127:FORH=H1(I) T
O H2(I) STEP(H2(I)-H1(I)):ONM(I)
GOSUB205,206,207,208,209,210,211
,212,213,214,215,216,217,218,219
,220,221,222,223,224:NEXTH:RETUR
N
156 PRINT@416,"ENTER MOTTO";:PRI
NT@448,"";:INPUTMO$:IFLEN(MO$)>3
0THEN156
157 PRINT@416,STRING$(11,223);:P
RINT@448,STRING$(40,223);:GOSUB1
70
158 PRINT@0,"    THE "NM$" COAT
OF ARMS":PLAY"P12":PRINT@0,"
the "NM$" coat of arms":PLAY"P16
":L$=LEFT$(NM$,8)
159 I$=INKEY$:IFI$="S"THEN:CSAVE
ML$,1024,1535,1024
160 IFI$="C"THEN18
161 GOTO158
162 FORK=0TO5:PRINT@71+K*33,STRI
NG$(4,C);:PRINT@85+K*31,STRING$(
4,C);:NEXTK:PRINT@207,STRING$(2,
C);:PRINT@267,STRING$(10,C);:PRI
NT@298,STRING$(4,C);:PRINT@306,S
TRING$(4,C);
163 POKE1355,C:POKE1356,C:POKE13
63,C:POKE1364,C:POKE1387,C:POKE1
396,C
164 IFC=128THENPOKE1353,C:POKE13
54,C:POKE1386,C:POKE1365,C:POKE1
366,C:POKE1397,C
165 IFC<>128THENPOKE1353,C-11:PO
KE1354,C-2:POKE1386,C-11:POKE136
5,C-1:POKE1366,C-7:POKE1397,C-7
166 RETURN
167 FORK=0TO32STEP32:PRINT@200+K
,STRING$(16,C);:NEXTK:IFC=128THE
NPOKE1223,C:POKE1240,C:RETURN EL
SEPOKE1223,C-10:POKE1240,C-5:RET
URN
168 FORK=0TO2:PRINT@172+30*K,STR
ING$(6,C);:PRINT@174+34*K,STRING
$(6,C);:NEXTK:PRINT@142,STRING$(
4,C);:PRINT@265,STRING$(3,C);:PR
INT@276,STRING$(3,C);
169 IFC=128THENPOKE1288,C:POKE13
21,C:POKE1303,C:POKE1334,C:RETUR
NELSEPOKE1288,C-10:POKE1321,C-2:
POKE1303,C-5:POKE1334,C-1:RETURN
170 R=RND(8):R=16*R+118:L=INT(LE
N(MO$)/2):PRINT@496-L,MO$;:PRINT
@463-L,STRING$(LEN(MO$)+2,R);:PO
KE1519-L,R:POKE1520+LEN(MO$)-L,R
:RETURN
171 FORK=0TO32STEP32:PRINT@200+K
,STRING$(16,C);:NEXTK:FORK=64TO3
84STEP32:PRINT@15+K,STRING$(2,C)
;:NEXTK
172 IFC=128THENPOKE1223,C:POKE12
40,C:POKE1455,C:POKE1456,C:RETUR
NELSEPOKE1223,C-10:POKE1240,C-5:
POKE1455,C-3:POKE1456,C-3:RETURN
173 FORK=78TO398STEP32:PRINT@K,S
TRING$(4,C);:NEXTK
174 IFC=128THENPOKE1455,C:POKE14
56,C:RETURNELSEPOKE1455,C-3:POKE
1456,C-3:RETURN
175 FORK=103TO273STEP34:PRINT@K,
STRING$(6,C);:NEXTK:PRINT@71,STR
ING$(4,C);:PRINT@307,STRING$(3,C
);
176 IFC=128THENPOKE1334,C:POKE13
65,C:POKE1366,C:RETURNELSEPOKE13
34,C-1:POKE1365,C-1:POKE1366,C-7
:RETURN
177 FORK=115TO265STEP30:PRINT@K,
STRING$(6,C);:NEXTK:PRINT@85,STR
ING$(4,C);:PRINT@298,STRING$(3,C
);
178 IFC=128THENPOKE1321,C:POKE13
53,C:POKE1354,C:RETURNELSEPOKE13
21,C-2:POKE1353,C-11:POKE1354,C-
2:RETURN
179 FORK=0TO3:PRINT@111+31*K,STR
ING$(2*K+2,C);:PRINT@335-33*K,ST
RING$(2*K+2,C);:NEXTK:RETURN
180 FORK=0TO3:PRINT@135+34*K,STR
ING$(6,C);:PRINT@147+30*K,STRING
$(6,C);:NEXTK:FORK=271TO399STEP3
2:PRINT@K,STRING$(2,C);:NEXTK:PR
INT@71,STRING$(2,C);:PRINT@87,ST
RING$(2,C);:PRINT@103,STRING$(4,
C);:PRINT@117,STRING$(4,C);
181 IFC=128THENPOKE1455,C:POKE14
56,C:RETURNELSEPOKE1455,C-3:POKE
1456,C-3:RETURN
```

```
182 FORX=75TO83STEP4:FORY=0TO256
STEP128:GOSUB186:NEXTY,X
183 Y=0:X=71:GOSUB186:X=87:GOSUB
186:X=269:GOSUB186:X=273:GOSUB18
6:FORX=137TO149STEP4:GOSUB186:NE
XTX:POKE1421,C:POKE1422,C:POKE14
25,C:POKE1426,C:POKE1224,C:POKE1
256,C:POKE1239,C:POKE1271,C
184 IFC=128THENX=265:GOSUB186:X=
277:GOSUB186:POKE1223,C:POKE1240
,C:RETURN
185 POKE1223,C-10:POKE1240,C-5:P
OKE1289,C:POKE1290,C:POKE1301,C:
POKE1302,C:POKE1321,C-2:POKE1322
,C:POKE1333,C:POKE1334,C-1:RETUR
N
186 PRINT@X+Y,STRING$(2,C);:PRIN
T@X+Y+32,STRING$(2,C);:RETURN
187 FORK=0TO3:PRINT@119+30*K,STR
ING$(2*(K+1),C3);:NEXTK:POKE1208
,C3-1:POKE1240,C3-5
188 FORK=0TO2:PRINT@297-32*K,STR
ING$(2*(K+1),C1);:NEXTK:POKE1256
,C1
189 IFC1<>128THENPOKE1288,C1-10:
POKE1321,C1-2:RETURNELSEPOKE1288
,C1:POKE1321,C1:RETURN
190 FORK=0TO3:PRINT@103+32*K,STR
ING$(2*(K+1),C4);:NEXTK:POKE1191
,C4-2:POKE1223,C4-10
191 FORK=0TO2:PRINT@309-34*K,STR
ING$(2*(K+1),C1);:NEXTK:POKE1271
,C1
192 IFC1<>128THENPOKE1334,C1-1:P
OKE1303,C1-5:RETURNELSEPOKE1334,
C1:POKE1303,C1:RETURN
193 FORK=0TO2:PRINT@297-32*K,STR
ING$(2*(K+1),C1);:PRINT@309-34*K
,STRING$(2*(K+1),C1);:NEXTK:POKE
1256,C1:POKE1271,C1
194 IFC1<>128THENPOKE1288,C1-10:
POKE1321,C1-2:POKE1303,C1-5:POKE
1334,C1-1:RETURNELSEPOKE1288,C1:
POKE1321,C1:POKE1303,C1:POKE1334
,C1:RETURN
195 FORK=0TO4:PRINT@207-34*K,STR
ING$(2+4*K,C3);:NEXTK:RETURN
196 POKE1024+H,C1-4:POKE1024+H+1
,C1-12:POKE1024+H+2,C1-3:POKE102
4+H+3,C1-2:POKE1024+H+4,C1:POKE1
024+H-31,C1-12:RETURN
197 C1=255:POKE1024+H,C1-3:POKE1
024+H+1,C1:POKE1024+H+3,C1-11:PO
KE1024+H+4,C1-3:POKE1024+H-32,C1
-13:POKE1024+H-31,C1-3:FORI=0TO2
:POKE1024+H-30+I,C1-12:NEXTI:RET
URN
198 I=H+1024:POKEI+1,C-6:POKEI+2
,C-10:POKEI+3,C-5:POKEI+5,C-5:PO
KEI+4,C-15:POKEI+33,C-3:POKEI+34
,C:POKEI+35,C-2:POKEI+36,C-9:POK
EI+37,C-15:POKEI+65,C-9:POKEI+66
,C-7:POKEI+67,C-15:POKEI+68,C-6:
POKEI+69,C-15:RETURN
199 FORI=0TO4:POKEH+I,147:NEXTI:
POKEH+32,154:POKEH+131,147:FORJ=
36TO132STEP32:POKEH+J,159:NEXTJ:
POKEH+64,148:POKEH+65,146:POKEH+
97,148:POKEH+98,146:POKEH+130,14
8

200 POKEH+33,221:POKEH+34,219:PO
KEH+66,221:POKEH+67,219:POKEH+99
,221:RETURN
201 FORH=0TO48STEP16:FORV=0TO20S
TEP10
202 FORI=1TO12:RESET(H+I,V):NEXT
I:FORJ=1TO6:RESET(H+1,V+J):RESET
(H+12,V+J):NEXTJ
203 FORJ=6TO8:RESET(H+2,V+J):RES
ET(H+11,V+J):NEXTJ:FORI=3TO4:RES
ET(H+I,V+8):RESET(H+I+6,V+8):NEX
TI
204 FORI=4TO9:RESET(H+I,V+9):NEX
TI,V,H:RETURN
205 POKEH,S-14:POKEH+1,S-14:POKE
H+2,S-14:POKEH+3,S-13:POKEH+4,S-
13:POKEH+5,S-13:POKEH+32,128:POK
EH+33,S-4:POKEH+34,S-4:POKEH+35,
S-8:POKEH+36,S-8:POKEH+37,128:RE
TURN
206 POKEH+1,128:POKEH+2,S-8:POKE
H+3,S-4:POKEH+4,128:POKEH+33,S-3
:POKEH+34,S-8:POKEH+35,S-4:POKEH
+36,S-3:RETURN
207 POKEH,S-14:POKEH+1,S-14:POKE
H+2,128:POKEH+3,128:POKEH+4,S-13
:POKEH+5,S-13:POKEH+32,S-14:POKE
H+33,S-6:POKEH+34,S-6:POKEH+35,S
-9:POKEH+36,S-9:POKEH+37,S-13:RE
TURN
208 POKEH,128:POKEH+1,128:POKEH+
2,S-10:POKEH+3,S:POKEH+4,S:POKEH
+5,128:POKEH+32,S-11:POKEH+33,S:
POKEH+34,S-12:POKEH+35,S-8:POKEH
+36,S-12:POKEH+37,S-13:RETURN
209 POKEH+1,S-12:POKEH+2,128:POK
EH+3,128:POKEH+4,S-12:POKEH+33,S
-11:POKEH+34,S:POKEH+35,S:POKEH+
36,S-7:RETURN
210 POKEH+1,S-12:POKEH+2,S-12:PO
KEH+3,S-12:POKEH+4,S-8:POKEH+33,
S-11:POKEH+34,S-3:POKEH+35,S-3:P
OKEH+36,S-11:RETURN
211 POKEH+1,S-14:POKEH+2,S-2:POK
EH+3,S-1:POKEH+4,S-13:POKEH+33,S
-11:POKEH+34,S-2:POKEH+35,S-1:PO
KEH+36,S-7:RETURN
212 POKEH,S-3:POKEH+1,S-8:POKEH+
2,S-4:POKEH+3,S-12:POKEH+4,S-12:
POKEH+5,S-5:POKEH+32,S-12:POKEH+
33,S-3:POKEH+34,S-14:POKEH+35,S-
9:POKEH+36,S-2:POKEH+37,128:RETU
RN
213 POKEH+1,S-12:POKEH+2,S-8:POK
EH+3,S-4:POKEH+4,S-12:POKEH+33,1
28:POKEH+34,S-1:POKEH+35,S-2:POK
EH+36,128:RETURN
214 POKEH+1,S-14:POKEH+2,S-8:POK
EH+3,S-4:POKEH+4,S-13:POKEH+33,S
-11:POKEH+34,S-4:POKEH+35,S-8:PO
KEH+36,S-7:RETURN
215 POKEH,S-12:POKEH+1,S-4:POKEH
+2,S-12:POKEH+3,S-12:POKEH+4,S-1
2:POKEH+5,S-13:POKEH+32,S-3:POKE
H+33,S-1:POKEH+34,S-3:POKEH+35,1
28:POKEH+36,128:POKEH+37,128:RET
URN
216 POKEH+1,S-12:POKEH+2,S-8:POK
EH+3,S-4:POKEH+4,S-12:POKEH+33,S
-3:POKEH+34,S-2:POKEH+35,S-1:POK
EH+36,S-3:RETURN
217 POKEH+1,S-11:POKEH+2,S:POKEH
+3,128:POKEH+4,128:POKEH+33,128:
POKEH+34,S-2:POKEH+35,S:POKEH+36
,S-1:RETURN
218 POKEH+1,S-2:POKEH+2,S-4:POKE
H+3,S-12:POKEH+4,S-12:POKEH+33,S
-10:POKEH+34,S-2:POKEH+35,S-1:PO
KEH+36,S:RETURN

219 POKEH,S-10:POKEH+1,S:POKEH+2
,S-8:POKEH+3,S-4:POKEH+4,S:POKEH
+5,S-5:POKEH+32,128:POKEH+33,S-3
:POKEH+34,S-2:POKEH+35,S-1:POKEH
+36,S-3:POKEH+37,128:RETURN
220 POKEH+1,S-8:POKEH+2,S-8:POKE
H+3,S-4:POKEH+4,S-4:POKEH+33,S-1
1:POKEH+34,S-2:POKEH+35,S-1:POKE
H+36,S-7:RETURN
221 POKEH+1,S:POKEH+2,S-3:POKEH+
3,S-1:POKEH+4,S:POKEH+33,128:POK
EH+34,S-3:POKEH+35,S-12:POKEH+36
,S:RETURN

222 POKEH,S-1:POKEH+1,S-2:POKEH+
2,S-12:POKEH+3,S-12:POKEH+4,S-12
:POKEH+5,S-13:POKEH+32,S-4:POKEH
+33,S-8:POKEH+34,128:POKEH+35,S-
14:POKEH+36,S-1:POKEH+37,S-5:RET
URN
223 POKEH+1,S-3:POKEH+2,S-12:POK
EH+3,S:POKEH+4,S-14:POKEH+33,S-1
2:POKEH+34,S-9:POKEH+35,S-3:POKE
H+36,S:RETURN

224 POKEH+1,S:POKEH+2,S-5:POKEH+
3,S-10:POKEH+4,S:POKEH+33,S:POKE
H+34,S-5:POKEH+35,S-10:POKEH+36,
S:RETURN
```

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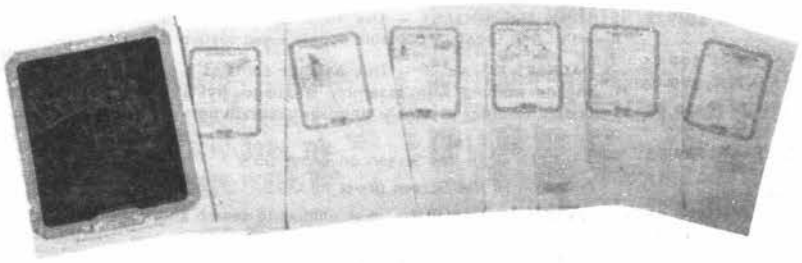

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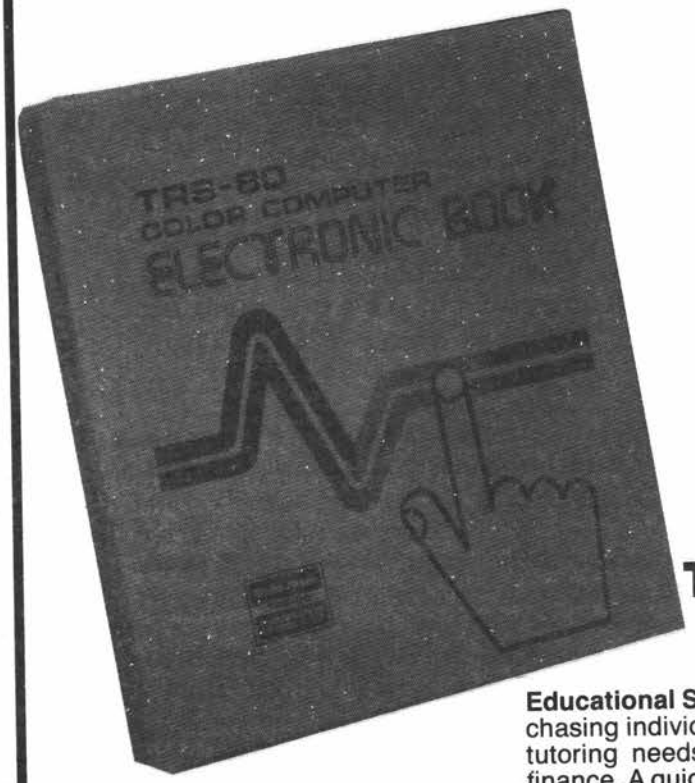

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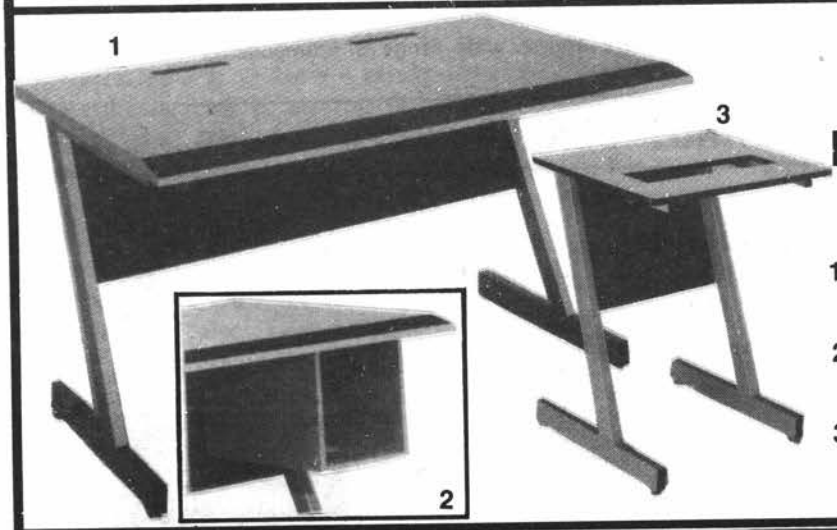

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BASIC TUTORIAL

HOW TO EXTEND COLOR BASIC PART 4

DRAW

by A. Hartmann

Due to some peoples' overwhelming questions about graphics and so forth, I have decided to add one more part to 'How to Extend Color Basic', thus making it Part 4. Welcome old friends and hello new ones!

Have you wanted to do a totally text program and wanted to do some text graphics but were then confronted by the thought that you had to 'SET' all the little squares? If you've had that problem, well here is the answer.

I get Extended Color Basics' 'DRAW' command, convert it to BASIC, and there you have it. To those people who have Color Basic, 'DRAW' needs some explaining. If you do know how 'DRAW' works, go down the page until you see a '#'.

'DRAW' lets you draw a line (or lines) starting anywhere with any color and any direction you wish.

You can...

* Start anywhere on the screen (0-63 on the x - axis and 0-31 on the y - axis);
* Give any color code at any time (from 0-8);
* Move up, down, left, right, up-left, up-right, down-left, and down-right. All this can be enclosed in one string and any of the above can be repeated any number of times. This is the command summary:

BMx,y : Starts at 'x,y'; if you don't use 'BM', x and y are 0.

Cx : Defines color. x can be anything from 0-8; green is used as default.

Dx : Goes down x squares.

Ux : Goes up x squares.

Rx : Goes right x squares.

Lx : Goes left x squares.

Ex : Goes diagonally up and right 'x' times.

Fx : Goes diagonally down and right 'x' times.

Gx : Goes diagonally down and left 'x' times.

Hx : Goes diagonally up and left 'x' times. For example, a typical 'DRAW' string would look like this:

A$="BM20,10;C4;U5;R30;D5;L30;" The 'BM' tells the computer to start 20 across and 10 down. The ";" is important! You must put it in to separate one command from another! The 'C4' tells the computer to pick the color red. Then it will go up 5 squares ('U5'), right 30 squares ('R30'), down 5 squares ('D5'), and eventually left 30 squares ('L30'). Viola! A red rectangle!

Of course the combination can be endless. Its up to you what you want to make of it.

<= People who know what 'DRAW' does, continue reading here.

The program is fairly short, and although it took about 2 days to figure out, I had lost it about 4-5 times (due to I/O errors) and one case where the program took up about 4K, so I reduced it to circa 1K.

If you have any ideas you would like to present, but do not have the time to develop (or something like that), please write to me. My address is:

3 Sundowner Court,
Mermaid Waters,
Qld, 4218.
(No telephone number)

Next Month: Describing that section in the back of the Color Basic manual, "Section IV - Don't Byte Off More Than You Can Chew". It seems some people are getting indigestion! (ha-ha-ha)

Until next time.

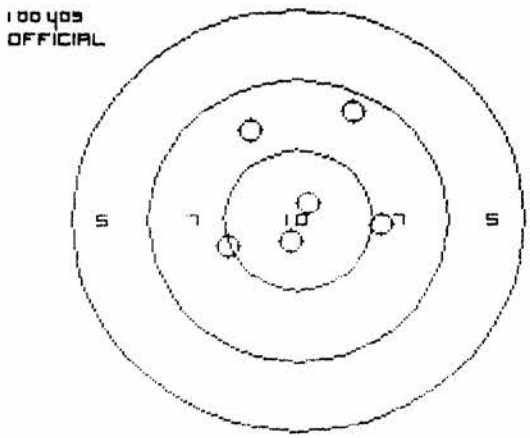
- Alex.

The Listing:

```
1 '**********DRAW DEMO**********
   *********ALEX HARTMAN********
2 GOTO10
3 SAVE"DRAW:2":DIR2:STOP
10 GOTO13
11 CLS:PRINT"dISK OR tAPE";:INPU
TA$:IF A$="D"THENPRINT"PREPARE D
ISK!":PRINT"PRESS ENTER";:EXEC41
875:SAVE"DRAW":END
12 INPUT"HOW MANY TIMES";A:FORI=
1TO A:CSAVE"DRAW":MOTORON::FORJ=
1TO480:NEXTJ,I:MOTOROFF:END
13 CLS0:A$="C3;BM0,5;R5;L5;D7;R5
;U4;L3;C1;BM8,0;D7;U4;R5;L4;F4;H
4;R4;U3;L5;C7;BM16,0;D7;U4;R5;D4
;U7;L5;C2;BM24,0;D7;U4;R5;U3;L5;
C1;BM32,0;D7;U7;D2;R5;U2;D7;C2;B
M40,0;D7;U7;C8;BM42,0;R5;L5;D7;R
5;C4;BM56,0;L5;D2;R5;D4;L5;":GOS
UB19
14 A$="C7;BM28,10;D7;U4;R5;L4;F4
;H4;R4;U2;L5;":GOSUB19
15 A$="BM20,25;C6;E3;G3;R2;L2;F4
;BM25,25;C0;R3;BM32,26;C3;E4;L4;
R4;G7;R5;
16 GOSUB19
17 PRINT@440,"- ALEX";
18 IFINKEY$=""THEN18ELSEEND
19 IF A$=""THENRETURN
20 FORI=1TO LEN(A$):IF MID$(A$,I
,1)<>";"THEN S$=S$+MID$(A$,I,1)E
LSE S$=""
21 C$=MID$(S$,1,1):D$=S$
22 IF C$="C"THEN C=VAL(RIGHT$(D$
```

```
,LEN(D$)-1))
23 IF C$="U"THEN FORA=1TO VAL(RI
GHT$(D$,LEN(D$)-1)):Y=Y-1:GOSUB3
3:NEXT:GOTO32
24 IF C$="D"THEN FORA=1TOVAL(RIG
HT$(D$,LEN(D$)-1)):Y=Y+1:GOSUB33
:NEXT:GOTO32
25 IF C$="L"THEN FORA=1TOVAL(RIG
HT$(D$,LEN(D$)-1)):X=X-1:GOSUB33
:NEXT:GOTO32
26 IF C$="R"THEN FORA=1TOVAL(RIG
HT$(D$,LEN(D$)-1)):X=X+1:GOSUB33
:NEXT:GOTO32
27 IF C$="E"THEN FORA=1TO VAL(RI
GHT$(D$,LEN(D$)-1)):X=X+1:Y=Y-1:
GOSUB33:NEXT:GOTO32
28 IF C$="F"THEN FORA=1TOVAL(RIG
HT$(D$,LEN(D$)-1)):X=X+1:Y=Y+1:G
OSUB33:NEXT:GOTO32
29 IF C$="G"THEN FORA=1TOVAL(RIG
HT$(D$,LEN(D$)-1)):X=X-1:Y=Y+1:G
OSUB33:NEXT:GOTO32
30 IF C$="H"THEN FORA=1TOVAL(RIG
HT$(D$,LEN(D$)-1)):X=X-1:Y=Y-1:G
OSUB33:NEXT:GOTO32
31 IF LEFT$(D$,2)="BM"THEN X=VAL
(MID$(D$,3,2)):Y=VAL(MID$(D$,6,8
)):GOTO32
32 NEXT:RETURN
33 IF X>63THEN X=63
34 IF X<0THEN X=0
35 IF Y<0THEN Y=0
36 IF Y>31THEN Y=31
37 SET(X,Y,C):RETURN
```

SHOOT



by Jeff Wetzig

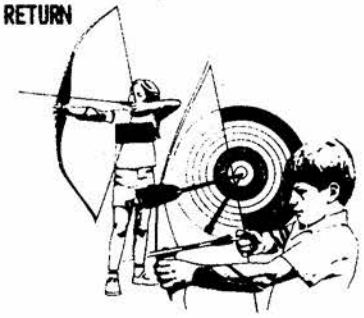
With the winter months upon us I have created, albeit rough, a little program to keep the hunters amoungst us in top form while not leaving the comfort of our heated computer rooms.

The program draws three rings of on 'Offical 100 yard Target'. At the press of the fire button (squeeze of the trigger) six shots are let fire at the unsuspecting target. After recording the score, press the fire button to reset a fresh target.

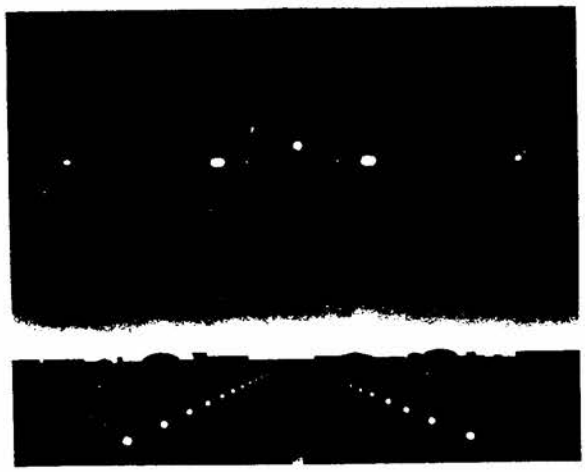
I admit the sound effects are not the best, I would prefer the THUNDERING of the muzzel blast, The crack of the sonic boom and the thud of the stroking Projectile. But its not to be, so if anyone can think of an improvement I'd be glad to hear of it.

The Listing:

```
1 '****OFFICIAL 100YRD TARGET***
  **********JEFF WETZIG**********
2 GOTO10
3 SAVE"SHOOT:2":DIR2
10 PRINT"USE RIGHT FIRE BUTTON"
11 PRINT"TO FIRE SIX SHOTS"
12 PRINT"USE BOTTON TO RESET"
13 TIMER = 0
14 T = TIMER
15 IF T = 200 GOTO 17
16 GOTO 14
17 PMODE 4,1
18 PCLS
19 SCREEN 1,1
20 CIRCLE (125,95),30
21 CIRCLE (125,95),60
22 CIRCLE (125,95),90
23 GOSUB 42
24 GOSUB 37
25 FOR A = 1 TO 6 STEP 1
26 X=RND(255):IF X<40 THEN X=X+1
00
27 IF X>210 THENX=X-100
28 Y=RND(191):IFY<30 THENY=Y+30
29 IF Y>180 THEN Y=Y-30
30 SOUND 1,1
31 CIRCLE (X,Y),5
32 NEXT A
33 P = PEEK(65280)
34 IF P = 126 THEN 18
35 IF P = 254 THEN 18
36 GOTO 33
37 P = PEEK(65280)
38 IF P = 126 THEN 25
39 IF P = 254 THEN 25
40 GOTO 37
41 RETURN
42 DRAW"BM120,95;U2D4"
43 DRAW"BM124,95;U2R4D4L4U2"
44 DRAW"BM 85,95;D2U4L4"
45 DRAW"BM 45,95;U2R4L4D2R4D2L4"
46 DRAW"BM167,95;D2U4L4"
47 DRAW"BM200,95;U2R4L4D2R4D2L4"
48 DRAW"BM 10,10;U4"
49 DRAW"BM 14,10;U4R3D4L3"
50 DRAW"BM 19,10;U4R3D4L3"
51 DRAW"BM 26,10;U4D4R3U4D8"
52 DRAW"BM 31,10;U4R3D4L3"
53 DRAW"BM 36,10;R3U2L3U2R3"
54 DRAW"BM 10,20;U4R4D4L4"
55 DRAW"BM 16,20;U2R2L2U2R4"
56 DRAW"BM 22,20;U2R2L2U2R4"
57 DRAW"BM 28,20;U4"
58 DRAW"BM 30,20;U4R4D4L4"
59 DRAW"BM 36,20;U4"
60 DRAW"BM 38,20;U4R4D4U2L4"
61 DRAW"BM 44,20;U4D4R4"
62 RETURN
```



CLOSE ENCOUNTERS



by Laurie O'Shea

I have a dream. A dream of a world, where the marvels of microprocessor technology can assist us to enable those who are handicapped, disadvantaged, elderly, illiterate, chronically unemployed attain new freedoms, hope, achievement, communication, dignity and a sense of personal worth.

There are so many ways we can help these people. The deaf to overcome their loneliness, the blind to be able to unlock new worlds and challanges, the elderly and housebound to reach out to other people, the adult illiterate to find the key to unlock the wonderful world of words, the chronically unemployed to learn new vocational skills.

My dreams can only be achieved with the dedication and purposeful preseverence of hard-working individuals. But that way we can unlock the prisons and chains of hearing disorders, speech handicaps, autism, dyslexia, retardation, poverty, illiteracy and aging ... so that people can achieve and retain a sense of purpose and feel that they are needed.

I had despaired of seeing my dream achieve anything other than meagre success, after several attempts and then I discovered "Australian Rainbow", "Australian CoCo", and it's wonderful team of staff and readers. Graham Morphett sent me some back issues and I saw the answer was there before me. The readers of the most "user-friendly" magazines I have ever seen.

Have you ever wondered what it is like to have a disability or be otherwise "different"?

Try switching off the television, the radio, put on earplugs and try to communicate. Try to talk on a telephone when you can't hear the other person at the other end. Put on a blindfold and read a book! Hard isn't it? Try one night. Terrible. Try it the rest of your life ... numbing horror!

What is part of the answer? The 4C's. A Circle of Caring CoCo's. People with skills in computing reaching out to find ways of using their knowledge to help others improve their quality of life.

I'll put a few ideas forward in this article and then encourage feed-back either directly or via the pages of these magazines. I'm a Tandy-phile from way back. It is a computer make with a future and most of that future is that the readers of these magazines are a nucleus of dedicated people who are serious enthusiasts and not 90 day Pacman players.

People who are deaf often become very shy and withdrawn because they have great difficulty in communicating. Language has been the greatest step in human communication that took us from the caveman to homosapiens. I won't go into great detail but it is evident that the most cruel affliction that can afflict us is loss of ability to understand speech.

Think about one of the most wonderful socializing devices we have in most of our homes these days - the telephone. With it you can reach across a suburb, across a city, across a country, across the world ... if you can hear. Yes I know about those special telephones for the deaf. They are very expensive and both parties need one each.

But what about a growing product that can assist the deaf to "talk" to the hearing each other, and the world? A Tandy CoCo (or another home computer) and a modem with suitable software.

An "electronic friend" that can help those with speech or hearing problems communicate. What is stopping this? Cost is a factor but not in insuperable as service clubs could help. No, the difficulty that keeps most people away from acquiring the enriching experience of owning a computer is fear. People are afraid of computers.

I know, I've talked to dozens, no hundreds of people, who would like to own a computer but were afraid that it would be beyond their ability to understand such machines. Imagine how much more dificult it would be for the disabled.

What is the answer? The User Groups. These are a contact with the community, and where people can learn to understand how a computer can enrich their lives. But there are some special steps necesary and I've had experience in how important these are to a sucessful community communication concept.

In 1983, at the end of October I mooted the idea of a computer club in Mount Gambier, where I had recently shifted. The local Tandy dealer offered his support, as well as the Apple dealer, while the remaining dealers refused. There had been several failures in getting a computer club going.

At the first meeting in the middle of November we had a group of enthusiastic children, some extremely dedicated young people and one Tandy CoCo, much loved and worked to death. We were dreamers. We planned an open night on educational Technology in 16 days time because the Tandy dealer arranged for an empty shop.

We had to rush desperatly but we met the deadline. A few community service announcements on the radio, a small advertisment in the local paper, lots of letters and word of mouth, plus photocopied posters (I learnt to use an electronic typewriter as a typesetter) resulted in over

100 people attending. We borrowed 5 Tandy machines, one Apple-compatable, a Tasman Turtle and a BBC. The night was an outstanding success as we turned a city of 23000 on the first steps to "computer-literacy".

As a direct and indirect result of that night the local Tandy dealer sold about 16 machines over the next 6 months, but something more important happened that night for a little deaf boy named Darren.

I'd written to the Speech Hearing Center and the Principle persuaded Darren's parents to bring him along.

The little boy's dad asked if we could let his child use a CoCo. When it was obvious from the gleam in his eyes and his beaming face that something special was happening to the boy, the father asked us if we would put the child's name on the waiting list to join when he was 8 years of age ... our lower limit.

We reduced the minimum age to six years on the spot, joined Darren and other children with disabilities and learning problems that night. Darren and his brother became regular participants and from his first meeting it was obvious we had found an activity this very shy, very sensitive, very loveable little boy could really enjoy on an equal basis with other children his own age.

Darren quickly acquired the skills necessary to use the Sinclair ZX-81's we were allowed to use in the computing room of the High School which allowed us to use it free of charge. He was able to key in his own programs from listings ... no simple feat on a ZX-81 I can assure you. We also had CoCo's, Mico's & Commodes, with the odd Atari or Microbee.

We helped Darren with the "Buddy" system. Another boy or girl who had had more experience sat with children who were first experiencing a computer. We matched children who were suitable and patient, with children and even adults who were "tender foots" (or is that "tenderbytes" ... sorry Lord Baden-Powell of the Boy Scout Movement!).

Over a few months we acquired about 100 regular participants of whom about 60 joined the group (which had become the South-East Computer Enthusiasts Group Incorporated). Up to 50 attended each meeting.

About 20 children had handicaps or special learning problems, but it was impossible to tell among that bunch of happy children and adults that anyone had a problem, let alone a handicap. So successful were we that a committee member asked one night when we were going to start our stated aim involving disabled people in our activites.

The young secretary and I took him around to see Darren and about ten other children with a disability or a problem happily computing away busily in groups of two, three, or four. We had children with dyslexia, excessive shyness, learning difficulties, poor sight, co-ordination difficulties, speech handicaps and no one could pick them out from the others.

Parents commented how children who'd been rejected so many times because they stuttered badly, had a "gammy" leg, were clumsily or unable to understand the complex rules of many sports all said ... "Can we go again, Mummy please?"

We organised a Computer Camp, which was made successful because Tandy Australia loaned us half a dozen computers, and the local Tandy Dealer also helped. Several children with disabilities were included in the group of enthusiastic participants, including a retarded boy.

So successful was this camp, where children who'd never wnated to go back to another group or activity, had a weekend of companionship and understanding, that we were unable to give out all the donated "goodies" ... CoCa Cola, Sweets, cakes, etc. The children preferred to learn computing from each other, so we had to give them all a special pack to take home. We also gave individual help to children at home, after the camp.

Quite a few of the children got to own their own computers and from the children came the idea of "electronic friendship". They wanted to communicate with other children or adults who coudn't come to meetings over the telephone by a computer. Many of their ideas never came to fruition because I left Mount Gambier after a few months to return to Adelaide to see my children, from whom I'd been seperated by a sad divorce.

I got a letter to say that the group couldn't find adults to act as a committee members. I returned to Mount Gambier to help the group keep going, but it was too late. But the project was a success because it showed that a lot can be achieved by a group of caring people and computers.

Each CoCo User Group could act as a catalyst for such a project in its own area. Open nights on a regular basis will attract people who want to learn about computers. Letters to social agencies, Special Schools, social work departments of churches and hospitals will find people who will benefit. Individual follow-up in the home will help disabled people benefit.

(Many groups need a purpose and I really feel this could be the one we've been looking for.

The advent of the CoCoConnection and the EARS program makes work with the disabled especially interesting.

We at Rainbow will help if we can, if your group decides to get more involved in your community. G.)

STRIP JACK

by Gordon Wilson

Gordon Wilson (age 10) has caused some comment both here in the office and at our recent User Group meeting by sending us a Strip Jack program.

Obviously he created the program as an exercise in programming only, but we are made to wonder just what it is that people get up to in Adelaide, and can we join in?

As subjects of this nature have caused furores in the past, we have determined that for the sake of decency, we will not include this program in the magazine.

However if you are such a deviate that you want to try it out (to understand the programming techniques only of course!), then it can be found on this month's CoCoOz!

USER FRIENDLYer

by Darcy O'Toole

G'day!

So you've got yourself a Tandy computer.

To those who showed extreme valour in the face of the enemy, ie those endless brands that are hurled at us incessently through the media, I say well done!

Of course if you've really done your homework you would have purchased a Color (oops) Colour Computer or CoCo as we affectionately call the little dear.

This column, indeed this magazine, is addressed to you the brand new user.

Others who have chosen an MC10 or 2000 or whatever be gone! you have your own piece of the action elsewhere in the magazine.

If you have the 'standard' home computer set-up namely 16K ECB CoCo, tape recorder and TV, you have in your possession either your biggest headache or an inexpensive way of dabbling into the future minus a crystal ball.

We have, through User Friendlyer, attempted over the last couple of editions to point out a few problem areas that may greet you in the coming weeks/months/years.

We will attempt to recount some of this information.

Our greatest asset as user is undoubtly the user groups, a network of people with the same aims as yourself but at various stages of involvement and areas of speciality.

Groups are supervised and generally organised by the Group Contact. Contacts are a strange, masochistic bunch who are there to motivate, assist and generally make your CoCo experience exciting, educational and just plain fantastic, but they can't do it alone. They need your help and your ability to help yourself.

Remember, if everything else fails (manual, friend and prayers) help is just a phone call away. The location and phone number of the User Group Contact is on the back of this magazine. Don't hesitate, phone NOW!

As stated above, 16K memory seems to be the norm but lately 'everyone' is craving more, more, more memory. Why? I don't know, 16K is limited when it comes to those big brassy and very effective advanced programs but in fact, 16K ECB will keep you busy for quite some time to come. For example, a lot of the listings in CoCo and Rainbow are earmarked 64K but with a little knowledge and an enquiring mind can be made to fit into 16K, remembering that these programs are basically ideas that you as a learning, thinking human person can adapt. Try it, you might learn something.

Don't forget MICO, at the rear of this magazine these listings can also be typed in and used on the 16K CoCo.

There are quite a few back issues of this mag with programs too.

If you have a data cassette you already know the great piece of equipment you have in your hands.

Don't use anything else. If you haven't one - get one, as soon as possible.

Cassette based home computing is both efficient and user friendly. If you have the cash and need the sophistication of the disk system please shop around, talk to the people from the user group who have disks, make sure that it's what you want then make the decision best suited to your needs.

TV versus Monitor.

TV is fine for home computing but can be subject to many interferences. These can be bought down to an acceptable level in most cases but still a monitor's definition is superior and is less prone to said interferences, the cost of monitors is usually the cruncher though.

FACT - Computers run on software.

FACT - There are dozens and dozens of programs for games, utilities and education etc on the market.

FACT - There is software and there is software.

It has been stated before but is worth repeating already, the program listings in our two magazines while indeed maybe 'finished' programs contributed by other users for all of us to enjoy and learn. More importantly, to improve on and in doing so expand our own individual understanding of the BASIC language, the method by which the programs are written.

This also applies to just about everything else in the magaziness, the bottom line is that unless we, as new users grow, expand and involve ourselves in the magazine, the people who have contributed in the past and the users who follow us will stagnate, become complacent and we'll lose this great organisation we have going for us.

Finally Tandy - our second best friend and our second worst enemy.

Let me say first that Tandy salespeople are human, they really are. They have been known to make the occassional booboo but forgive them, they should be handled with TLC and above all taken quite seriously, regardless of what you really think way down, deep inside, who knows, they might even fool you one day and help you out when you least expect it.

THE ADVENTURES OF CoCo

by A. White

16K ECB

babysitter

by Johanna Vagg

Babysit2 is a present for Katie Morphett. It plays ten nursery rhymes and displays a picture with each song.

I used Bob Horne's lettering routine from his "Area & Perimeter" (Feb 85 Australian CoCo) program.

By the way, when I wrote "Kidstuff" (on Feb CoCoOz & Best Of CoCoOz #1, I knew very little about CLEAR and DIM statements. I still don't know much, but I've realised that by changing line 20 to CLEAR 200 and line 1015 to DIM V(10,15), the program will fit into a 16K ECB CoCo.

Back to Babysit2!

The Listing:

```
1 '*******BABYSITTER #2*********
   *****JOHANNA VAGG************
2 GOTO10
3 SAVE"BABYSIT2:2":DIR2:STOP
10 CLEAR500
20 DIMCH$(51):FORZ=1TO51:READCH$
(Z):NEXTZ
30 P$="T4L4GEGP4GE6P4"
40 T$="AGFEDEF"
50 PMODE1,1:PCLS2:SCREEN1,0
60 DRAW"BM10,50;S24":M$="NURSERY
":GOSUB1440
70 DRAW"BM25,130":M$="RHYMES":GO
SUB1440
80 PLAYP$
90 FORX=1 TO 800:NEXT:PCLS2
100 PMODE3,1:SCREEN1,0:PCLS2:DRA
W"BM20,40;S8":M$="DEDICATED TO":
GOSUB1440:DRAW"BM80,60":M$="KATI
E MORPHETT":GOSUB1440:DRAW"BM99,
90":M$="AND":GOSUB1440
110 DRAW"BM85,110":M$="KATY LEE
VAGG":GOSUB1440:PLAYT$:PCLS2
120 PMODE1,1:SCREEN1,0:PCLS2
130 COLOR0,1
140 PLAY"T404L4GF#GL2EL4E"
150 DRAW"BM10,20;S8":M$="LITTLE
MISS MORPHETT":GOSUB1440
160 DRAW"BM130,40":M$="(RAN AWAY
)":GOSUB1440
170 DRAW"BM50,120;S16":M$="*":GO
SUB1440:DRAW"BM50,127":M$="*":GO
SUB1440
180 CIRCLE(160,180),30,3,.5
190 PAINT(160,180),3,3
200 CIRCLE(220,175),10,4,1,.1,.6
210 LINE (210,170)-(228,180),PSE
T
220 LINE(220,183)-(228,165),PSET
230 K$="T4L404GF#GL2EL4EF#EF#L2D
L4DGF#GL2EL4EL1AL4F#GF#GEF#GF#EF
#DEF#EGF#EDC#L1D"
240 PLAYK$
250 FORX=1 TO 1000:NEXT
260 PCLS2
270 DRAW"BM100,160;S62":M$="O":G
OSUB1440:DRAW"BM85,161":M$=")":G
OSUB1440
280 LINE(100,90)-(60,70),PSET
290 LINE(100,100)-(60,80),PSET
300 LINE(60,70)-(60,80),PSET
310 DRAW"BM56,30;S8":M$="KATY PU
T THE":GOSUB1440:DRAW"BM20,170":
M$="KETTLE":GOSUB1440:DRAW"BM200
,170":M$="ON":GOSUB1440
320 DRAW"BM128,69;S4":M$="+":GOS
UB1440
330 O$="T403L4ABAGF#DL2DL4EF#EDC
#02AL2A03L4ABAGF#DDF#02L2B03C#L1
DL4F#DGEF#DL2DL4G02B03EDC#02AL2A
03L4F#DGEF#DDF#L202BL403C#C#L1D"
340 PLAYO$
350 FORX=1 TO 1000:NEXT
360 PCLS1
370 COLOR2,1
380 CIRCLE(128,100),50,,.9,0,.8
390 LINE(128,100)-(142,60),PSET
400 LINE(128,100)-(177,100),PSET
410 PAINT(125,100)
420 DRAW"BM50,20;S8":M$="SIMPLE
SIMON":GOSUB1440
430 DRAW"BM110,120":M$=". .":GOS
UB1440:DRAW"BM90,100":M$=".":GOS
UB1440:DRAW"BM110,80":M$=".":GOS
UB1440
440 DRAW"BM40,175":M$="MET A P
IEMAN":GOSUB1440
450 S$="T303L4FFGAFFDCFFGAL2FL4E
CFFGAB-AGFECDEL1FP2"
460 PLAYS$
470 PLAYS$
480 FORT=1 TO 1000:NEXT
490 PCLS1
500 PLAY"T304L4GL2GL4E"
510 DRAW"BM49,50":M$="ITS RAININ
6":GOSUB1440
520 FORT=1 TO 20
530 X=RND(255):Y=RND(191):C=RND(
3)+1
540 CIRCLE(X,Y),1,C
550 NEXT
560 PLAY"AL2GL4E"
570 DRAW"BM120,110":M$="ITS POUR
ING":GOSUB1440
580 FORT=1TO50:X=RND(255):Y=RND(
191):CIRCLE(X,Y),1:NEXT
590 R$="EL2GL4EAL2GL4EEGGEAGGEAL
8GGL4GEL8EAL2GEP4L4AL2GL4AAL2GL4
AAGEL2.GL4GL1C"
600 PLAYR$
610 FORT=1 TO 1000:NEXT
620 PCLS2
630 COLOR4,2
640 PLAY"T403L2EL4EL2E"
650 LINE(30,191)-(99,0),PSET:LIN
E(200,191)-(130,0),PSET
660 PAINT(0,0),1,4:PAINT(255,0),
1,4
670 PLAY"L4EL2AL4AL2A"
680 LINE(128,100)-(124,85),PSET:
LINE(138,100)-(142,85),PSET
690 LINE(124,85)-(142,85),PSET:L
INE(128,100)-(138,100),PSET
700 CIRCLE(134,82),10,4,.6,.5,1
710 PAINT(130,95),4,4
720 PLAY"L4AL2BL4BL2BL4BL2.04C#0
3A"
730 PLAY"L2EL4EL2EP4L60CDEFEDCCD
EFEDCDEFEDCP4L4EL2F#L4F#L2F#L4F#
L2EL4DL2C#02L4BL2.AA"
740 PLAY"T6002BAGFEDCBAGFEDCBAGF
EDCBAGFEDC"
750 FORT=1 TO 1000:NEXT
760 PMODE0,1:SCREEN1,1:COLOR0,1:
PCLS1
770 CIRCLE(128,120),50,,.55
780 PAINT(128,120)
790 CIRCLE(80,90),22,,.75
800 PAINT(80,90)
```

```
810 LINE (110,140)-(105,165),PSE
T:LINE(110,140)-(115,165),PSET:L
INE(146,140)-(151,165),PSET:LINE
(146,140)-(141,165),PSET
820 B$="T403L2CCGGL4AB04C03AL1GL
2FFEEDDL1CL2GL4GGL2FL4FFL2EL4EEL
2.DL4DL2GL4GGFGAFL2EL4DDL1C"
830 PLAYB$
840 FORP=1 TO 1000:NEXT
845 PMODE3,1:SCREEN1,1:PCLS6
850 COLOR5,6
860 CIRCLE(128,120),50,5,.55
870 PAINT(128,120)
880 CIRCLE(80,90),22,5,.8
890 PAINT(80,90)
900 LINE(110,140)-(105,165),PSET
:LINE(110,140)-(115,165),PSET:LI
NE(146,140)-(151,165),PSET:LINE(
146,140)-(141,165),PSET
910 M$="T303L4EDCDEEL2EL4DDL2DL4
EGL2GL4EDCDEEEEDDEDL1C"
920 PLAY M$
925 PLAYM$
930 FORT=1 TO 1000:NEXT
940 PMODE1,1:SCREEN1,0:PCLS2
950 DRAW"BM100,190;S62":M$="0":G
OSUB1440
960 PAINT(128,170)
970 LINE(100,120)-(50,70),PSET
980 LINE(110,109)-(60,57),PSET
990 CIRCLE(55,60),13,,.9
1000 DRAW"BM98,172;S62":M$="?":G
OSUB1440
1010 DRAW"BM99,172;S62":M$="?":G
OSUB1440
1020 DRAW"BM80,60;S12":M$="*":GO
SUB1440:DRAW"BM80,67":M$="*":GOS
UB1440
1030 DRAW"BM81,60":M$="*":GOSUB1
440:DRAW"BM81,67":M$="*":GOSUB14
40
1040 DRAW"BM70,20;S8":M$="INKY P
INKY":GOSUB1440
1050 I$="T203L8CDCEL4GGL8AA04C03
AL2GL4FL8FGL4EL8EDDDDL2CL4CL8CEL
4GL8GGAA04C03AL4GL8GFFFGL4EEL8DD
DDL2C"
1060 PLAYI$
1070 FORT=1 TO 1000:NEXT
1080 PCLS2
1090 DRAW"BM110,110;S32":M$="O":
GOSUB1440
1100 CIRCLE(127,94),10,,.4,.1,.4
5
1110 DRAW"BM119,68;S16":M$="M":G
OSUB1440
1120 DRAW"BM102,180;S48":M$="Q":
GOSUB1440
1130 DRAW"BM118,80;S4":M$=". .":
GOSUB1440
1140 DRAW"BM30,20;S8":M$="HEY DI
DDLE DIDDLE":GOSUB1440:DRAW"BM50
,110":M$="THE":GOSUB1440:DRAW"BM
170,110":M$="CAT":GOSUB1440
1150 C$="T403L4EFEDCDEFEDCDL2EL4
GGFEL1DL4EFFEL2FL4EL2FL4GL4AL4BO
4CC03GFEFDL1C"
1160 PLAYC$
1170 FORP=1 TO 2000:NEXT
1180 PCLS2
1190 DRAW"BM55,50;S16":M$="1,  2
":GOSUB1440
1200 FORX=1 TO 500:NEXT
1210 DRAW"BM40,90;S8":M$="BUCKLE
 MY SHOE":GOSUB1440
1220 FORX=1 TO 500:NEXT
1230 DRAW"BM50,130;S16":M$="3,
4":GOSUB1440
1240 FORX=1 TO 500:NEXT
1250 DRAW"BM28,170;S8":M$="KNOCK
 ON THE DOOR":GOSUB1440
1255 PLAY"T1202L4CDCDCDCDCDCDCDC
DCDCD"
1260 FORX=1TO 1000:NEXT
1270 PCLS2
1280 DRAW"BM55,50;S16":M$="5,  6
":GOSUB1440
1290 FOR P=1 TO 6:LINE(RND(255),
RND(191))-(RND(255),RND(191)),PS
ET:NEXT
1300 DRAW"BM50,130;S8":M$="PICK
UP STICKS":GOSUB1440
1310 FORX=1 TO 1000:NEXT
1320 PCLS2
1330 DRAW"BM55,50;S16":M$="7,  8
":GOSUB1440
1340 DRAW"BM28,90;S8":M$="LAY TH
EM STRAIGHT":GOSUB1440
1350 X=50:Y=100:Y1=180
1360 FORP=1 TO 6
1370 LINE(X,Y)-(X,Y1),PSET
1380 X=X+30
1382 FORL=1 TO 100:NEXTL
1385 NEXTP
1390 FORP=1 TO 1000:NEXT:PCLS2
1400 DRAW"BM55,50;S16":M$="9, 10
":GOSUB1440
1410 FORP=1 TO 100:NEXT
1420 DRAW"BM28,110;S8":M$="A BIG
 FAT":GOSUB1440:DRAW"BM80,170;S3
2":M$="HEN":GOSUB1440
1425 FORP=1 TO 1000:NEXT
1427 PCLS2
1430 GOTO150
1440 L=LEN(M$):FORZ=1TOL:C1=RND(
2)+2:M=ASC(MID$(M$,Z,1))-39:IFM=
-7THENDRAW"BR4"ELSEDRAW"C"+STR$(
C1)+CH$(M)
1450 DRAW"BR2":NEXT:RETURN
1460 REM***DATA FOR DRAW STRINGS
***
1470 DATABR2H2U2E2BD6BR4
1480 DATABR4E2U2H2BD6BR4
1490 DATABR4U6BD3NE3NF3NG3NH3BD3
BR4
1500 DATABR2BUU4D2L2R4BD3BR4
1510 DATABR2RDG1BU2BR4,BR2BU3R38
D3BR2,BR3UBDBR3,BR6BU6DG4DBR7
1520 DATABRHU4ERFD4GNLBR2
1530 DATAR2U6NGD6R2
1540 DATABU5ER2FDGL2GD2R4
1550 DATABU5ER2FDGNLFDGL2NHBR3
1560 DATABR3U6G3R4BD3
1570 DATABUFR2EU2HL3U2R4BD6
1580 DATABU3R3FDGL2HU4ER2BD6BR
1590 DATABU6R4DG3D2BR3
1600 DATABRHUER2EUHL2GDFR2FDGNL2
BR
1610 DATABRR2EU4HL2GDFR3BD3
1620 DATABR4,BR4,BR4,BR3BU2R3BU2
L3BD4BR6,BR4,BR4UBUUEU1HL1GBD6BR
6,BR4
1630 DATAU5ER2FD2NL4D3
1640 DATARU6NLR2FDGNL2FDGNL3BR
1650 DATABR4BU5HL2GD4FR2EBD
1660 DATARU6NLR2FD4GNL2BR
1670 DATAU6NR4D3NR3D3R4
1680 DATAU3NR3U3R4BD6
1690 DATABUU4ER3BD4NLD2L3NHR3
1700 DATAU3NU3R4NU3D3
1710 DATAR2U6NL2NR2D6R2
1720 DATABUNUFR2ENU5BD
1730 DATAU3NU3RNE3F3
1740 DATANU6R4
1750 DATAU6F2DUE2D6
1760 DATAU6F4NU4D2
1770 DATABRHU4ER2FD4GNL2BR
1780 DATAU6R3FDGL3D3BR4
1790 DATABRHU4ER2FD4GNL2BUHF2
1800 DATAU6R3FDGL3RF3
1810 DATABUFR2EUHL2HUER2FBD5
1820 DATABU6R4L2D6BR2
1830 DATABUNU5FR2ENU5BD
1840 DATABU6D4F2E2U4BD6
1850 DATANU6E2UDF2NU6
1860 DATAUE4NUG2H2NUF4D
1870 DATABU6DF2E2NUG2D3BR2
1880 DATABU6R4DG4DR4
```

SCOREBOARD

by Michael Horn

Tandy have a new game out on tape called "King Cuthbert". It is similar to the arcade game Donkey Kong.

A Gorilla has kidnapped (in this case) Cuthbert's girlfriend and it's up to him to rescue her. You start out with three Cuthberts per game and if one is hit with a fireball or a barrel he dies. There are two screens - the ramp (barrel) screen, in which Cuthbert must climb ladders and walk along girders while avoiding a rolling barrel thrown at him by the Gorilla, by jumping over them or smacking them with a hammer.

On the second screen (the fireball screen), Cuthbert must knock out the rivets in each end of the 4 floors so that the platform, on which the Gorilla is standing, will crumble, at the same time he must avoid the fireball on each floor by jumping over it or smacking it. You must complete each screen in an allocated period of time.

King Cuthbert can take one or two players and has three difficulty levels, although I think it is not very hard. The joysticks give you good control over the game. The major problem with King Cuthbert is that it takes forever and a day to load in from tape.

Over all I think it is a good game, but it does not beat "Donkey King" by Tom Mix which is more or less the same game only much harder.

Cuthbert would suit kids under age 9.

Michael.

BUZZARD BAIT

Technical Dept.
Cost: $29.95
RAM requirements: 32K
Supplier: Tom Mix via Tandy
Other Bits: 1 (or 2) joysticks, tape deck.

What to do dept.

Buzzard Bait is fast and has plenty of sounds to go with it. One can have one or two players playing AT THE SAME TIME! Yes, that's right! One of the good bits of this game.

Your aim is to survive each attack of mounted riders by dismounting them. They will then turn into an egg and the bird (which somewhat resembles an emu) which flys away. You must then collect the egg before it hatches and a new rider emerges. And so the whole thing continues, until you rid the screen of all the riders.

BUT its not that easy. If you take too much time, then some big pterodactyl will come and annoy you. You can destroy it, but it's not advisable (it takes run-ups towards you).

Along with hatching riders and flying emus and killer pterodactyls, there are also a few other things I have to warn you about, like the boiling lava and the lava hand who drags you down, and disintegrating platforms, and other nifty items like that.

Problem Dept.

There are a few minor bugs with the program. It takes forever to load, and if you don't like the screen you choose, you have to reload it again. If you have a disk drive plugged in, it will not work (ie it will crash).

General Comments Dept.

This is a very good game, and I would advise anyone who likes a fast game with good noises to get it. My rating out of 10 (with 5 being the pass mark):

Sound : 7
Speed: 7
Ease of Use (How hard): 6
Documentation: 5
Difficulty: 5 and up as levels increase.

Reviewed by
Alex Hartmann.

DANGER RANGER

Technical Dept.
Cost: $29.95
RAM: 16K
Supplier: Microdeal
Other bits: 1 joystick, tape deck

What to do dept.

The object of the game is VERY simple. Collect the ten keys from one chamber, avoid all the floating urns, roving eyes, and radioactive bats to eventually end up in an acid chamber guarded by "demon heads" to collect treasure chests. Then it starts all over again, adding one more creature to the first set.

Problem Dept.

* You get three screens to choose from: black, buff, and green. If you don't like one, you have to reload the game and choose another.
* There is only one copy on each side, whereas the leaflet says there are 3 copies on each side.
* Instructions too lengthy. Fairly simple instructions would have been enough in such a simple game.
* There are only two playing screens in the whole game, and so making the game very boring after a while.

General Comment Dept.

Overall the game barely passed the 'So-So' mark and the whole thing more or less flogged a dying horse. My rating out of 10 (with 5 my average):

Speed: 5
Sound: 6

Documentation: 8
Difficulty (Number of levels available): 5
Ease of use (How hard): 3
Reviewed by Alex. H.

TUTS TOMB

Technical Dept.
Cost: $31.95
Ram: 32K
Supplier: Mark Data (Software Spectrum)
Other bits: 1 joystick, tape deck

What to do dept.
After the appropriate title music (the sub-title at the top gives it away) you press the fire button to find yourself in one of the pharoghs' tombs. Not to forget, you are also a famous explorer and archaeologist (hence the name Indiana Jones) in search of the pharoghs ancient treasures.

On the way through the pyramid, you find snakes, bats, 'stars' (funny-looking flying things), and other great stuff to keep you occupied (along with the odd precious gem or vase). Oh yes, you are also armed with a laser and a flash bomb (which kills everything visible on the screen).

There are 16 chambers in all, divided up into 4 chambers all of which have to be passed and a certain key found) to reach the biggie of the treasures. Each one of these four chambers has a certain time limit and if you don't hurry, you will go splat all over the chamber.

Problem Dept.
A change for the better! There are only two small problems I encountered in playing "TUTS TOMB":
* The joystick reading seems to jam up a little only because the software accepts only directions at 90, 180, 270, and 360 degree angles. Apart from that, it's hassle-free.
* The creatures kill you without even coming into contact with them, and so making the game fairly "open-spaced".

General Comment, Dept.
It's a challenging game, like trying to figure out how to get past the next obstacle. It's fun, and I would recommend it to anyone who likes a game with excellent graphics and sounds. (My brother loves it!). My rating on this would be (with 5 being my average):
Speed: 7
Sound: 8
Documentation: Not available, but easy to figure out.
Difficulty (Number of levels available): 16
Ease of use (how hard): 6, 7, & 8 depending upon which chamber you're in.
Reviewed by Alex. H.
with help from Michael H.

ASTRO BLAST (Mark Data)
David Coleman Yeronga 52000
ASTRO LANDER (CoCo Software)
R Boxall 4250
ATOM (Tandy)
David Thurbon (round.1) xe
BEAM RIDER (Spectral)
Tony Evans Bowen 483060
David Thurbon Canberra 83530
BUST OUT (Tandy)
Richard Pankhurst Roseville
20 Balls 2490
Alex Hartmann Gold Coast
20 Balls 1869
BLOCHEAD (Computerware)
Michael Horn Gold Cst 29825
Colleen James Gold Cst 4425
CALIXTO (Mark Data)
J Gans Bris 162
CANYON CLIMBER (Tandy)
Steve Lemke Bribie 7/101800
Chris Nagle Leeton 101000
CASHMAN (Comp Shack)
Richard Pankhurst Rsvll 6640
CAVERN COPTER (Rainbow)
Richard Pankhurst Rsvll 1509
CHOPPERSTRIKE (Comp Shack)
Ken Uzzell Roseville 25300
CLOWNS (Tandy)
Darren Reed Watsonia 20950
Brendan Gay Gold Cst 16570
Alex Hartmann Gold Cst 13000
DEFENSE (Spectral)
Michael Horn Gold Cst 33600
Richard Pankhurst Rsvll 31730
Alex Hartmann Gold Cst 28960
DEMON ASSULT (Aardvack)
Richard Pankhurst Rsvll 31250
DEMON SEED (Comp Shack)
Ken Uzzell Roseville 11350
DEVIOUS (Spectral)
R Boxall 28820
DONKEY KING (Tom Mix)
Daryn Wedd 107500
Damion Simpson 105400
Chris Nagle Leeton 82900
Tim Harper Gove 68000
DOUBLE BACK (Tandy)
Ian Reynolds Prospect 351540
highest grab 140870
Michael Horn Gold Coast 44310
DRACONIAN (Tom Mix)
Richard Pankhurst Rsvll 19140
EZSKI (Chomasette)
Alan Manfield Quoiba 16188
FIRECOPTER (Adventure Intl.)
R Boxall 69152
FEMBOTS REVENGE
Tony Evans Bowen 4750
Richard Pankhurst Rsvll 1050
FLYBY (Chromasette)
David Coleman Yeronga 32000
FROGGER (Tandy)
Andrew Law Sunbury 12500
FROG TREK
Darren Reed Watsonia 9770
Richard Pankhurst Rsvll 8550
GALACTIC ATTACK (Tandy)
Greg & Ian Choat OConnll 129680
Ian Choat O'Connell 42160
Darren Reed Watsonia 35800
GALAX ATTACK (Spectral)
Alan Mansfield Quoiba 39600
David Coleman Yeronga 27950
GHOST GOBBLER (Spectral)
Stuart Sanders 118510
Ian Choat O'Connell L10/94640
Steven Marks Yanco L8/68250
David Ogden BullCreek L7/43810
ICEBLOCK
Richard Pankhurst Rsvll 58610
JUNIOR'S REVENGE(ComputerWare)
Andrew Law Sunbury 325100
KATAPILLAR ATTACK (Tom Mix)
Steven Marks Yanco 9412
Todd Michell Robinvale 7779
Chris Nagle Leeton 6985
KOMET KAZE (Color Quest)
Ken Uzzell Roseville 14000
LANCER (Spectral)
M. Bloomfield Sydney 148650
LASERWORM (Rainbow)
Nick Cooper 58745
Glynn Catherall Gld Cst 30366
LUNAR ROVER PATROL (Spectral)
L Vanjour & Q Hill NSW 75300
C Boxall 64400
Michael Horn Gold Coast 14900
MEGABUG (Tandy)
Lori Lehane Penrith 19540
Chris Nagle Leeton 15398
Johanna Vagg Forbes 8672
MICROBES (Tandy)
Andrew Wyllie Somerset 185550
R Boxall 63100
Steven Marks Yanco L3/35410
MONSTER MAZE (Tandy)
Ian Reynolds Prospect 250840
Neil Prince Forbes 8410
MONTE ZOOMERS (Computer Hut)
Mike Driscall Bowen 27650
MOON SHUTTLE (Data Soft)
David Thurbon Canberra 27700
MR DIG
Leigh Eanes Emerald 1132250
MS GOBBLER (Spectral)
Alan Mansfield Quoiba 8760
Ken Uzzell Roseville 8490
Michael Horn Gold Coast 6250
OUTHOUSE (Comp Shack)
Richard Pankhurst Rsvll. 8126
PINBALL (Tandy)
Ian Choat O'Connell 174950
PLANET INVASION (Spectral)
Lachlan Mead Bonaderry 90450
David Coleman Yeronga 48500
POLARIS (Tandy)
Chris Nagle Leeton 31306
Neil Prince Forbes 13040
POLTERGEIST (Tandy)
Chris Nagle Leeton 4865
Steven Marks Yanco 4455
Alex Hartmann Gold Cst 2205
POOYAN (Datasoft)
Ian Reynolds Prospect 1286850
C Hinton & Q Hill NSW 301150
Mike Fitzpatrick S.A. 105150
POPCORN (Tandy)
Chris Nagle Leeton 184180
Allan Rae Mt Isa 56770
PROJECT NEBULA (Tandy)
Paul Simpson 540
Michael Horn Gold Coast 410
Ken Uzzell Roseville 255
PROTECTOR (Tom Mix)
Andrew Law Sunbury 165322
Steven Bullock Roseville 1589
PYRAMID (Tandy)
Simon Cox Dubbo 220
Darren Reed Watsonia 220
J Gans Bris 200
QUASER
Richard Pankhurst Rsvll 87

RAAKATU (Tandy)
Simon Cox Dubbo 50
Richard Pankhurst Rsvll 50
Darren Reed Watsonia 50

RETURN OF THE JET-I
Andrew White L14/33177

ROBOT BATTLE (Spectral)
Michael Horn Gold Cst 9300
Alex Hartmann Gold Cst 4900
R Boxall L0/4850

ROMAN CHECKERS
Richard Pankhurst Rsvll 60

SCEPTER
Ian Choat O'Connell
Won in 7 min. 47 sec.
Ken Uzzell Roseville
Won in 21min. 51 sec.

SEA QUEST (Mark Data)
J Dougan &J Gans Bris 165
J Holt Glen Iris 150
Darren Reed Watsonia 100

SHARK (Computerware)
Alan Mansfield Quoiba 90000

SHENANIGANS (Mark Data)
J Gans Bris 112
Carla Miller Burwood V 148

SHOOTING GALLERY (Tandy)
C Hinton & Q Hill NSW 54310
Sharon Avery Woy Woy 52700
Chris Lemke Bribiels 22420

SKIING (Tandy)
Jack Rae MtIsa 0:36.00

SKRAMBLE (Tom Mix)
Ian Choat O'Connell 90040

SPACE ASSULT (Tandy)
Nick Cooper 16949
Darren Reed Watsonia 10430
Michael Horn Gold Cst L1/7370

SPACE RACE (Spectral)
Michael Horn Gold Cst 29100
Brendan Gay Gold Cst 23800

SPACE SHUTTLE (Tom Mix)
Lachlan Mead Bomaderry 515
Tony Evans Bowen 491
Richard Pankhurst Rsvill 344

SR-71-281 (Tom Mix)
Simon Cox Dubbo
1 mile from Target

STARFIRE (Intellectronics)
Andrew Law Sunbury 65000

SUB HUNT
Warren Macintosh Rsvll 5135

SANDS OF EGYPT (Tandy)
Richard Pankhurst Roseville
127 Turns

TIME BANDIT (Michtron)
Lachlan Mead Bomaderry 104670
Daryn Wedd 87200
Grant Menner Perth 62610

TOUCHSTONE
Mike Driscall Bowen 59480

TRAPFALL (Spectral)
David Thurbon Canberra 47918
Andrew Law Sunbury 37000

TUT (Aardvark)
Keith Savage 99430

TUT'S TOMB (Mark Data)
Tony Evans Bowen 53280
Barry Tomkinson Tregear 29840
Alex Hartmann Gold Cst 24680

VIKING
Ken Uzzell Roseville
King in 16 years

WHIRLYBIRD RUN (Spectral)
Lachian Mead Bomaderry 94200
Eddie Driscall Bowen 81300
R Boxall 42375

WILDCATTING (Image Producers)
Colleen James Gold Cst 39169
R Boxall 34692
Michael Horn Gold Cst 34151

ZAKSUND (Elite)
Nick Cooper 136050
Jeff Wetzig 97100
Michael Hom Gold Cst 31400

ZAXXON (Tandy)
Mike Fitzpartrick S.A. 118700
K Holzapfel Brisbane 115800
Jason Cook St Clair 104600

16K ECB

LISSAJOUS THEME

by Bob Delbourgo

This program senses your brain waves and provides a graphic representation of the Alpha and Beta waves as they are emitted from your head.

Because it was written in OS8, the sensing routine is embedded, all you need do is input several numbers, which will occur to you, in response to the prompts, and you are away!

If the graph shown is not concentric, then don't tell anyone. G.

THE LISTING:

```
1 '******A LISSAJOUS THEME*****
  **********BOB DELBOURGO*****
2 GOTO10
3 SAVE"LISSAJOS:2":DIR2:STOP
10 CLS(RND(7)+1):POKE65495,0
20 A$="VARIATIONS ON A":K=0:GOSU
B420:POKE1504,96
30 A$="LISSAJOUS THEME":K=2:GOSU
B420:POKE1506,96
40 A$="BY BOB DELBOURG":K=29:GOS
UB420:POKE1533,79
50 A$="HOBART AUSTRALI":K=31:GOS
UB420:POKE1535,65
60 T=T+.6:X=INT(31+24*SIN(T/25))
:Y=INT(16-15*COS(T/10))
70 RESET(X,Y):IFT>320THEN90
80 GOTO60
90 FORI=1TO2:PLAY"V"+STR$(I*15)+
"O2L8DP8L16DDFEDL8AP8O1L16AAO2C+
O1BAL8O2DP8L16DDFEDL4AO1A":NEXTI
100 CLS:PRINT"VARIATIONS ON A LI
SSAJOUS THEME":PRINT@32,STRING$(
32,61);
110 INPUT"ENTER THE X:Y FREQUENC
Y RATIO F";F
120 INPUT"ENTER THE X:Y RELATIVE
 PHASE PH";PH
130 INPUT"ENTER THE X DAMPING FA
CTOR  DX ";DX:DX=DX/1000:IFDX<0T
HEN130
140 INPUT"ENTER THE Y DAMPING FA
CTOR  DY ";DY:DY=DY/1000:IFDY<0T
HEN140
150 INPUT"ENTER THE X DRIFT VELO
CITY VX  ";VX
160 INPUT"ENTER THE Y DRIFT VELO
CITY VY  ";VY
170 PRINT@480,"<C> TO CONTINUE,
<R> TO RESTART";
180 I$=INKEY$:IFI$="C"THEN200
190 IFI$="R"THEN100ELSE180
200 PMODE4,1:PCLS:SCREEN1,0:T=0
210 T=T+1
220 SX=EXP(-T*DX):SY=EXP(-T*DY)
230 X=127+90*SX*SIN(F*T/32+PH)+V
X*T/128:Y=95-90*SY*COS(T/32)+VY*
T/95
240 IFX<0THENX=0
250 IFY<0THENY=0
260 IFX>255THENX=255
270 IFY>191THENY=191
280 PSET(X,Y,1):IFINKEY$="R"THEN
300
290 GOTO210
300 SCREEN1,1:SOUND50,1:IFINKEY$
=""THEN300
310 CLS(RND(7)+1):PRINT"VARIATIO
NS ON A LISSAJOUS THEME":PRINT@4
80," PRESS <R> FOR A NEW VARIATI
ON ";:POKE1535,143
320 PRINT@64,"YOUR PARAMETER VAL
UES WERE:-"
330 PRINT@128,"X:Y FREQUENCY RAT
IO F = ";F
340 PRINT@160,"X:Y RELATIVE PHAS
E PH = ";PH
350 PRINT@192,"X DAMPING FACTOR
  DX = ";DX*1000
360 PRINT@224,"Y DAMPING FACTOR
  DY = ";DY*1000
370 PRINT@256,"X DRIFT VELOCITY
  VX = ";VX
380 PRINT@288,"Y DRIFT VELOCITY
  VY = ";VY
390 FORI=1TO2:PLAY"V"+STR$(I*10)
+"O2L6AL8GL12EFGL4CP8L8DO1AL12BO
2CO1L4GP4":NEXTI
400 IFINKEY$<>"R"THEN400
410 GOTO100
420 FORI=0TO14:PRINT@32*I+K,MID$
(A$,I+1,1);:NEXTI:RETURN
```

Dear Doctor CoCo

Dear Dr. CoCo,

I noticed in the Rainbow (June - CoCo Link) the article on Viatel and it's 1200/75 Baud Rate protocol, it was mentioned that it would not be worth getting a new modem for this service.

I hope to overcome this problem with a new product I will soon be handling in the very near future, it's called a baud rate converter and all that is needed is your normal modem and software.

I haven't got much info on it as yet but as soon as I get my hands on one I will send it for you to review.

I'm not sure what software is to be used with Viatel, I did see 'Prestel' mentioned (I've never heard of it!!) you might be able to suggest something there?

Peter Miller
Carnegie, VIC.

Peter,

Very interested to hear about your "Baud Rate Converter". It is hard to see how this could be achieved but one should never say it can't be done!

VIATEL will require more than a different BAUD rate for your modem, it is configured around a 40 column screen for text and block graphics which will be another problem for CoCo with its 32 column screen format.

For software, look to your Tandy store, because I understand they will have something to do the job in a month or two.

****

Dear Dr. CoCo,

I was reading page 5 of December, 1984 Australian CoCo and saw a story about T.V.s losing their colour. Especially Rank Arena.

Guess who has a 22" and a portable and they both loose their color?

It mentioned the problem was easy to fix but it didn't mention how to fix it. Would you have any idea on how to do this.

David
Gympie. QLD.

David,

I believe some early models of the short white CoCo had a minor problem with the colour output causing problems on some T.V. sets. TANDY will remedy this free of charge if you return the computer to them.

****

Dear Dr. CoCo,

I have enclosed a copy of a page from Electronics Australia, November 1984. The page gives details of a disk drive unit to suit among many, the Tandy Colour Computer.

What I would like to know is, is this DISK DRIVE able to accept Tandy Software, is there any additional cost to run my COCO and are they reliable?

I look forward to many hours of good reading of your great magazine.

Robert Seaburn
Tarraleah TAS.

Robert,

One big advantage of Tandy's CoCo is that unlike Apple or Commode it uses industry standard DISK DRIVES so the ones you mention should be suitable.

However these are what is known as BARE DRIVES, to make a working system you will need a case, power supply, cable and most importantly a Tandy compatible DISK CONTROLLER with gold plated edge connectors for reliability.

A further word of caution - you will generally get what you pay for in this world, so the cheapest drive you can buy may not be the best long term investment. So stick to the better brands like TANDY, TEAC, TANDON or CHINNON.

****

Dear Dr. CoCo,

I own a 16K ECB with one of the white, older-styled keyboards and I am interested in extending to 64K. Could you please recommend a place which sells the kits at a reasonable price, and that mails them as well. Could you tell me what equipment is required to do it myself?

Paul Reidy
Kyogle. N.S.W.

Paul,

Upgrading your CoCo to 64K is not overly difficult if you are reasonably handy with mechanical / electrical work. Normally I would refer you to your local user group but as I am not aware of a group in Kyogle and it's beyond the scope of this column I will write individually with detailed instructions.

****

Dear Dr. CoCo,

I have a grey TRS80C which I have upgraded to 64K and a Gemini 10X printer that I use mainly for word processing and filing.

My children also have a fair selection of games that they play on the computer. I also occasionally dabble in a bit of simple programming.

My problem started when I wrote a small program to pick random Lotto numbers.

To my horror I found that by using the RND command I came up with an identical set of numbers after each cold start. I have since found that the Color Computer RND command is not entirely random.

I have been told that the use of the TIMER command will get a set of true Random numbers. Could you please run an article in CoCo to explain the ins and outs and method of incorporating this routine into programs were a true Random selection is required.

As a last note, keep up the good work in RAINBOW and CoCo, I have found both these publications of great benefit in helping me understand and get maximum benefit out of my system.

Max Clews

Max,

The problem with the RND command you refer to is common to all computers. To define a truly Random number is more difficult than most people imagine and for a computer to generate one is also very difficult. Most computers have what is called a pseudo random number generator and the result is the problem you found, it always starts from the same base and generates a similar string of numbers.

The easy, but not absolute answer is to change the base from which it starts. This can be done by inserting this line as one of the first lines in your program:

H=RND(-TIMER)

By setting the base to the timer count which varies depending on how long after switch on you run your program, you change the base for this RND function.

****

CLASSIFIEDS

Platinum Worksaver. SPECIAL this month only. Tape or Disk $25.00 (normally $50.00); Disk Package $30.00 (normally $75.00). From Geoff Fiala, PO Box 170, St Lucia, Qld. 4067. 07-44-6084.

16K TRS 80 CoCo plus cassette recorder, one pair joysticks and Rainbow Magazines Jan 83 to Oct 84. Lance Baker, C coy 2/4 RPR Lavarack Baracks, Vic.

MC-10 + 16K expansion pack, 16 games and books. $199.00 ONO. Darren Ottery. 066-74-1944.

OS-9, Basic 09 and OPAK. Hardly used. $250 ONO. Chris Nagle. 069-53-2969.

MiCO

I suffered the pleasure of spending most of last month discovering that there also exists a life without computers, at least for the duration of my vacation.

I guess we need a complete break every now and then to keep things in perspective. I reckon too that I have bombarded you long and often enough, encouraging you I hope, in the virtues of the MC10. So today I won't rehash this old theme any further. The MC10 is simply a superb little machine.

But I will continue with my plea for programs. You will find that this month we only have two authors among our entire content. The modification to KEY-BEEP was submitted by Chris Frend. Again, this months issue almost totally exhausts my supply of programs. And I thought winter meant everyone stayed indoors.

I guess I should put forward a few ideas, and hopefully stimulate some interest.

One area I have always felt our computers could do well is in the area of horse racing, although I must admit I have not been able to effectively put my ideas into practice mainly because my betting remains confined to Melbourne Cup day. Last year more through good luck than good managment I made my only ever profit.

So with Cup Day around the corner lets have a bit of a think. Newsagents sell every Friday a magazine called Computer Form which apears to essentially be a database analysis of horses running in the main races. From that it should not be too difficult to produce a program that somehow rates the horses and then from the betting odds prior to the race determines what percentage of your cash should be placed on each of the bettter horses in order to make a small profit if any one of those horses were to win.

Far be it for me to encourage gambling but this system could easily be tested by examining successive weeks results through reading the sunday papers. That is one sugestion for a different winter project, now that winter is almost over. Maybe you have some ideas of your own for different programs. Why not see if you can make them work.

May messing around with computers always be fun. See you next month.

Kevin

20K MC10

KEY — BEEP

by Brian McLaughlin

Along with all his other work Chris Frend has made an alteration to Brian McLaughlin's KEY-BEEP program to enable it to be loaded just below LITTLE-E in the expanded MC10. He had found that when loading the original version the availiable memory was restricted to that of the 4K MC10.

The Listing:

```
1 REM **KEY-BEEP**
2 REM BY BRIAN MCLAUGHLIN
3 REM COOMA  NSW  2630
4 REM JUNE 1984
5 REM
6 REM ALTERED BY CHRIS FREND
        GUNNEDAH  NSW  2380
7 REM SO "KEY-BEEP" IS LOADED
      JUST BELOW "LITTLE E" IN
      THE MC-10 FITTED WITH THE
      16K RAM EXPANSION.
8 REM
10 CLEAR29,36569
20 CLS
30 FOR I=36570 TO 36598
40 READ A:PRINT I;:PRINTTAB(10)A
50 POKE I,A
60 CS=CS+A
70 NEXT I
80 IF CS<>3607 THEN PRINT"DATA E
RROR":END
90 EXEC 36570
100 CLS:PRINT"KEY-BEEP EXECUTED"
:NEW
110 DATA 134,233,183,66,135,134,
142,183,66
120 DATA 134,134,126,183,66,133,
60,54,55,134
130 DATA 224,198,1,189,255,171,5
1,50,56,57
```

20K MC10

NOUGHTS and CROSSES

by Chris Frend

O&X is my version of the original Noughts and Crosses game. It is a rather long program but certainly well worth the effort of typing.

You are given the option of two levels of play: Advanced, in which I defy any player to beat the computer, and Beginner, in which the computer moves at random except to block or make a winning move. The numbering of the playing sections should create some interest. The program technique can be revealed using "DUMP". (Another of Chris's programs elsewhere in this issue. Kevin)

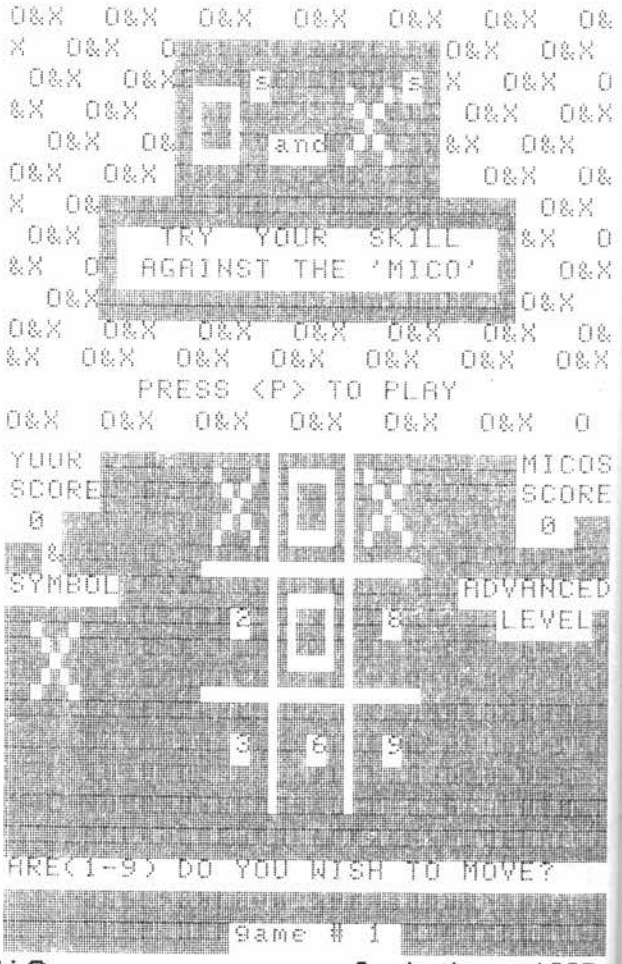
The Listing:

```
1 REM ****************
      *  O'S & X'S   *
      ****************
2 REM BY CHRISTOPHER FREND
3 REM GUNNEDAH  NSW  2380
5 CLEAR 1000
10 REM**INTRO GRAPHICS**
12 CLS8:OX$="O&X":FORX=0TO511STE
P2+RND(4):IFX>509THENPRINT@X,LEF
T$(OX$,511-X);:GOTO 14
13 PRINT@X,OX$;
14 NEXTX
16 FORX=32TO160STEP32:FORY=9TO22
:PRINT@X+Y,CHR$(128);:NEXTY,X
17 FORX=5TO26:PRINT@192+X,CHR$(1
28);:PRINT@288+X,CHR$(128);:NEXT
18 FORX=224TO256STEP32:FORY=5TO2
6STEP21:PRINT@X+Y,CHR$(128);:NEX
TY,X
20 X=20:Y=5:GOSUB 2500
30 PRINT@77,"s";:PRINT@142,"and"
;:PRINT@85,"s";
40 X=36:GOSUB 2300
50 PRINT@230,"      A GAME FOR
  ";
60 PRINT@262," 1  PLAYER-V-'MICO
' ";
70 FORD=1TO2000:NEXT
80 PRINT@230,"           BY
  ";:PRINT@262,"
    ";
90 NM$="CHRISTOPHER J FREND":FOR
X=1TOLEN(NM$):PRINT@261+X,MID$(N
M$,X,1);:SOUND(100+(5*X)),1:NEXT
X
93 FORD=1TO2500:NEXT
95 PRINT@230,"  TRY  YOUR  SKILL
  ";
97 PRINT@262," AGAINST THE 'MICO
' ";
100 PP=448:HP$="
                PRESS <P> TO PLA
Y":GOSUB 3500:A$=D$
102 IFA$<>"P"THENGOTO 100
105 SOUND150,2:SOUND170,2:SOUND1
90,2:SOUND210,4
110 DIM C(3,3)
120 DATA 0,0,0,0,0,0,0,0,0
130 DIM X(3,3)
140 DATA 22,22,22,30,30,30.38,38
,38
150 DIM Y(3,3)
160 DATA 1,9,17,1,9,17,1,9,17
170 FORA=1TO3:FORB=1TO3:READC(A,
B):NEXTB,A
180 FORA=1TO3:FORB=1TO3:READX(A,
B):NEXTB,A
190 FORA=1TO3:FORB=1TO3:READY(A,
B):NEXTB,A
195 CLS0:GOSUB 2600
200 PP=416
210 HP$="                    HOW MAN
Y GAMES DO YOU WISH TO PLAY (1-9
) ?":GOSUB 3500:G=VAL(D$)
215 IF G<1 OR G>9 THEN 200
220 HP$="                        WHAT
SKILL LEVEL?  PRESS <B> FOR BEGI
NNER, <A> FOR ADVANCED.":GOSUB 3
500:SK$=D$
240 IFD$="A" OR D$="B" THEN BA$=
D$:GOTO 247
245 GOTO220
247 GOSUB 2698
250 HP$="                    WHAT SY
MBOL DO YOU WANT?  PRESS <O> OR
<X>.":GOSUB 3500:A$=D$
260 IF A$="O" OR A$="X" THEN 270
265 GOTO 250
270 IF G=0 THENGOTO 3000
275 GOSUB 2693
280 HP$="                          WI
LL YOU MOVE FIRST?  PRESS <N> OR
 IF YES - YOUR MOVE SQUARE (1-9)
.":GOSUB 3500:M$=D$
285 IFM$>="1"ANDM$<="9"THEN M$="
Y":Z1=VAL(D$):GOTO 335
290 IFM$="N"THENGOTO 1300
300 IFM$="Y"THENGOTO 320
310 GOTO 280
320 HP$="                    TO WHI
CH SQUARE(1-9) DO YOU WISH TO MO
VE?":GOSUB 3500:Z1=VAL(D$)
330 IF Z1<1 OR Z1>9 THEN320
335 GOSUB 2100
340 PRINT@416,""
350 IF C(X1,Y1)<>0THEN GOTO 400
360 C(X1,Y1)=1:X=X(X1,Y1):Y=Y(X1
,Y1)
370 IFA$="X"THENGOSUB2300
380 IF A$="O" THENGOSUB 2500
```

```
390 GOTO 440
400 SOUND 80,4
410 PRINT@416,"       ***ILLEGAL
 MOVE!***"
420 FOR D=1TO2000:NEXT
430 GOTO320
440 REM**WINNING MOVE CHECK**
450 TT=3
460 Y1=1
470 WC=0
480 FORX1=1TO3:WC=WC+C(X1,Y1):NE
XT
490 IFWC=TT THEN GOTO 710
500 Y1=Y1+1:IFY1=4 THENGOTO520
510 GOTO 470
520 X1=1
530 WC=0
540 FOR Y1=1TO3:WC=WC+C(X1,Y1):N
EXT
550 IF WC=TT THEN GOTO 710
560 X1=X1+1:IFX1=4 THEN GOTO580
570 GOTO530
580 X1=1:Y1=1:WC=0
590 WC=WC+C(X1,Y1)
600 X1=X1+1:Y1=Y1+1
610 IFY1=4 THENGOTO630
620 GOTO 590
630 IF WC=TT THEN GOTO 710
640 X1=3:Y1=1:WC=0
650 WC=WC+C(X1,Y1)
660 X1=X1-1:Y1=Y1+1
670 IFY1=4THEN GOTO690
680 GOTO 650
690 IFWC=TT THENGOTO710
700 GOTO730
710 IF TT=15 THENGOTO810
720 IF TT=3THENGOTO830
730 REM**FULL BOARD CHECK**
740 FORX1=1TO3:FOR Y1=1TO3
750 IF C(X1,Y1)=0 AND TT=15 THEN
GOTO 320
760 IFC(X1,Y1)=0 THEN GOTO880
770 NEXTY1,X1
780 REM**GAME RESULT**
790 PRINT@416,"          **WE'RE
EVEN!**"
800 S1=S1+.5:S2=S2+.5:GOTO850
810 PRINT@416,"       **I WIN THI
S GAME!**"
820 S2=S2+1:GOTO 850
830 PRINT@416,"      **YOU WIN TH
IS TIME!**"
840 S1=S1+1
850 G=G-1:GM=S1+S2+1:SOUND200,3
860 FOR X1=1TO3:FORY1=1TO3:C(X1,
Y1)=0:NEXTY1,X1
865 FORD=1TO3000:NEXT
867 IFG=0 THENGOTO 3000
870 CLS0:GOSUB 2600
875 GOTO270
880 REM**CHECK FOR&MOVE TO WIN/B
LOCK**
890 TT=10
900 Y1=1
910 WC=0
920 FORX1=1TO3:WC=WC+C(X1,Y1):NE
XT
930 IF WC=TT THENGOTO 1090
940 Y1=Y1+1:IFY1<=3 THEN 910
950 X1=1
960 WC=0
970 FORY1=1TO3:WC=WC+C(X1,Y1):NE
XT
980 IF WC=TT THENGOTO 1110
990 X1=X1+1:IF X1<=3THEN 960
1000 X1=1:Y1=1:WC=0
1010 WC=WC+C(X1,Y1):X1=X1+1:Y1=Y
1+1
1020 IFY1<=3THEN 1010
1030 IF WC=TT THENGOTO 1130
1040 X1=3:Y1=1:WC=0
1050 WC=WC+C(X1,Y1):X1=X1-1:Y1=Y
1+1
1060 IFY1<=3 THEN 1050
1070 IFWC=TT THENGOTO1160
1080 GOTO 1230
1090 FORX1=1TO3:IFC(X1,Y1)=0 THE
NGOTO 1190
1100 NEXT
1110 FORY1=1TO3:IF C(X1,Y1)=0THE
N GOTO1190
1120 NEXT
1130 X1=1:Y1=1
1140 IFC(X1,Y1)=0THENGOTO1190
1150 X1=X1+1:Y1=Y1+1:IFY1<=3THEN
1140
1160 X1=3:Y1=1
1170 IFC(X1,Y1)=0THENGOTO1190
1180 X1=X1-1:Y1=Y1+1:IFY1<=3THEN
1170
1190 X=X(X1,Y1):Y=Y(X1,Y1):C(X1,
Y1)=5
1195 GOSUB 2110
1200 IFA$="O"THENGOSUB2300
1210 IFA$="X"THENGOSUB2500
1220 TT=15:GOTO460
1230 IFTT=10THEN1250
1240 IFTT=2THENGOTO1300
1250 TT=2:GOTO900
1300 REM**EARLY MOVES-BEGINNER**
1310 IFSK$="A"THENGOTO1350
1320 X1=RND(3):Y1=RND(3)
1330 IF C(X1,Y1)<>0 THENGOTO1320
1340 GOTO1190
1350 REM**EARLY MOVES ADVANCED**
1360 T=0:FORX1=1TO3:FORY1=1TO3:T
=T+C(X1,Y1):NEXTY1,X1
1370 IFT=0THENGOTO1430
1380 IFT=1THENGOTO1470
1390 IFT=6THENGOTO1500
```

```
1400 IFT=7THENGOTO1780
1410 IFT=12THENGOTO1980
1420 GOTO2010
1430 X1=RND(3):Y1=RND(3)
1440 IF(X1=2)AND(Y1=2)THENGOTO11
90
1450 IF(X1=2)OR(Y1=2)THEN1430
1460 GOTO1190
1470 IFC(2,2)=0THEN1490
1480 X1=1:Y1=1:GOTO1190
1490 X1=2:Y1=2:GOTO1190
1500 IFC(2,2)=1THENGOTO1640
1510 FORX1=1TO3STEP2:FORY1=1TO3S
TEP2
1520 IF(C(X1,Y1)=1)AND(C(2,2)=5)
THENGOTO1720
1530 IFC(X1,Y1)=1THENGOTO1730
1540 NEXTY1,X1
1560 X1=2:FORY1=1TO3STEP2
1570 IF C(X1,Y1)=1 AND C(2,2)=0
THENGOTO 1760
1580 IFC(X1,Y1)=1THENGOTO1770
1590 NEXT
1600 Y1=2:FORX1=1TO3STEP2
1610 IF C(X1,Y1)=1 AND C(2,2)=0
THENGOTO 1760
1620 IFC(X1,Y1)=1 THENGOTO 1770
1630 NEXT
1640 FORX1=1TO3STEP2:FORY1=1TO3S
TEP2:IFC(X1,Y1)=5 THEN 1660
1650 NEXTY1,X1
1660 IFX1=1 THEN 1680
1670 X1=1:IFY1=1 THEN 1700
1675 GOTO1690
1680 X1=3:IFY1=1 THEN 1700
1690 Y1=1:IF Z=6 THEN1740
1695 GOTO1190
1700 Y1=3:IFZ=6 THEN 1740
1710 GOTO1190
1720 GOTO 1660
1730 Z=6:GOTO1640
1740 IFC(X1,Y1)=1 THEN1760
1750 GOTO 1190
1760 X1=2:Y1=2:GOTO 1190
1770 X1=1:Y1=1:GOTO 1190
1780 T=0:FORX1=1TO3STEP2:FORY1=1
TO3STEP2
1790 T=T+C(X1,Y1):NEXTY1,X1
1800 IFT=0 THENGOTO 1960
1810 IFT=1 THEN 1840
1820 IFT=6 THENGOTO 1970
1830 X1=2:Y1=1:GOTO 1190
1840 X1=2:FORY1=1TO3STEP2:IFC(X1
,Y1)=1 THENGOTO1880
1850 NEXT
1860 Y1=2:FORX1=1TO3STEP2:IFC(X1
,Y1)=1 THENGOTO 1920
1870 NEXT
1880 Y2=Y1:FORY1=1TO3STEP2:FORX1
=1TO3STEP2
1890 IFC(X1,Y1)=1THEN 1910
1900 NEXTX1,Y1
1910 Y1=0:Y1=Y2:GOTO 1190
1920 X2=X1:FORX1=1TO3STEP2:FORY1
=1TO3STEP2
1930 IFC(X1,Y1)=1 THEN 1950
1940 NEXTY1,X1
1950 X1=0:X1=X2:GOTO 1190
1960 X1=3:Y1=3:GOTO1190
1970 X1=1:Y1=3:GOTO 1190
1980 FORX1=1TO3STEP2:FORY1=1TO3S
TEP2
1990 IFC(X1,Y1)=0 THENGOTO 1190
2000 NEXTY1,X1
2010 FORX1=1TO3:FORY1=1TO3:IFC(X
1,Y1)=0 THENGOTO1190
2020 NEXTY1,X1
2030 END
2100 ON Z1 GOTO 2120,2140,2160,2
180,2200,2220,2240,2260,2280
2110 IFX1=1 AND Y1=1 THEN2125
2115 GOTO 2130
2120 X1=1:Y1=1:IF C(X1,Y1)<>0 TH
ENGOTO 400
2125 PRINT@44,CHR$(128);:RETURN
2130 IFX1=1 AND Y1=2 THEN2145
2135 GOTO 2150
2140 X1=1:Y1=2:IF C(X1,Y1)<>0 TH
ENGOTO 400
2145 PRINT@172,CHR$(128);:RETURN
2150 IFX1=1 AND Y1=3 THEN2165
2155 GOTO 2170
2160 X1=1:Y1=3:IF C(X1,Y1)<>0 TH
ENGOTO 400
2165 PRINT@300,CHR$(128);:RETURN
2170 IFX1=2 AND Y1=1 THEN2185
2175 GOTO 2190
2180 X1=2:Y1=1:IF C(X1,Y1)<>0 TH
ENGOTO 400
2185 PRINT@48,CHR$(128);:RETURN
2190 IFX1=2 AND Y1=2 THEN2205
2195 GOTO 2210
2200 X1=2:Y1=2:IF C(X1,Y1)<>0 TH
ENGOTO 400
2205 PRINT@176,CHR$(128);:RETURN
2210 IFX1=2 AND Y1=3 THEN2225
2215 GOTO 2230
2220 X1=2:Y1=3:IF C(X1,Y1)<>0 TH
ENGOTO 400
2225 PRINT@304,CHR$(128);:RETURN
2230 IFX1=3 AND Y1=1 THEN2245
2235 GOTO 2250
2240 X1=3:Y1=1:IF C(X1,Y1)<>0 TH
ENGOTO 400
2245 PRINT@52,CHR$(128);:RETURN
2250 IFX1=3 AND Y1=2 THEN2265
2255 GOTO 2270
2260 X1=3:Y1=2:IF C(X1,Y1)<>0 TH
ENGOTO 400
2265 PRINT@180,CHR$(128);:RETURN
```

```
2270 IFX1=3 AND Y1=3 THEN2285
2280 X1=3:Y1=3:IF C(X1,Y1)<>0 TH
ENGOTO 400
2285 PRINT@308,CHR$(128);:RETURN
2300 REM**FOR X**
2310 XH =X
2320 FOR XV=Y TO (Y+4)
2330 SET(XH,XV,3)
2340 XH=XH+1
2350 NEXT
2360 XH=X+4
2370 FOR XV=YTO (Y+4)
2380 SET(XH,XV,3)
2390 XH=XH-1
2400 NEXT
2410 RETURN
2500 REM**FOR O**
2510 FOR H=XTO (X+4):FOR V =YTO(
Y+4)
2520 SET(H,Y,3):SET(H,(Y+4),3):S
ET(X,V,3):SET((X+4),V,3)
2530 NEXTV,H
2540 RETURN
2600 REM**GRAPHICS**
2610 FOR X=21TO43
2620 SET(X,7,4):SET(X,15,4)
2630 NEXT
2640 FOR Y =0 TO 22
2650 SET(28,Y,4):SET(36,Y,4)
2660 NEXT
2670 POKE16428,49:POKE16556,50:P
OKE16684,51
2675 POKE16432,52:POKE16560,53
2680 POKE16688,54:POKE16436,55:P
OKE16564,56:POKE16692,57
2690 GM=S1+S2+1:PRINT@492,"game
#";GM;
2693 PRINT@98,"&";:PRINT@128,"SY
MBOL";:X=3:Y=11
2695 IF A$="X"THENGOSUB2300
2697 IF A$="O"THENGOSUB2500
2698 IFBA$="A"THENPRINT@152,"ADV
ANCED";:PRINT@186,"LEVEL";
2699 IFBA$="B"THENPRINT@152,"BEG
INNER";:PRINT@186,"LEVEL";
2700 PRINT@0,"YOUR ";:PRINT@32,"
SCORE";:PRINT@64,;S1;:PRINT@27,"
MICOS";:PRINT@59,"SCORE";:PRINT@
91,;S2;
2710 RETURN
3000 REM**GAME END**
3010 CLS8:PRINT@197," ";GM-1;" G
AME/S  FINISHED ";:PRINT@480,;
3020 GOSUB2700
3025 IF S1>S2 THEN 3030
3027 GOTO3035
3030 FORWD=1TO6:SOUND220,1:PRINT
@73,"**WELL DONE!**";:FORD=1TO80
:NEXTD
3031 PRINT@73,"                ";:
FORD=1TO80:NEXTD,WD
3032 PRINT@73,"**WELL DONE!**";
3035 FORD=1TO3:SOUND150,2:NEXT:F
ORD=1TO2000:NEXT:SOUND 100,3
3040 PRINT@480,"  PLAY AGAIN <y>
/<N>?  ";:E$=INKEY$:FORD=1TO100:
IFE$<>""THENGOTO 3060
3042 NEXTD:PRINT@494,"Y>/<n";:E$
=INKEY$:FORD=1TO100:IFE$<>""THEN
GOTO 3060
3044 NEXTD:GOTO 3040
3060 IFE$<>"Y"THENCLEAR:GOTO 12
3070 CLS0:S1=0:S2=0:GM=0:A$=""
3075 BA$=""
3080 FORX1=1TO3:FOR Y1=1TO3:C(X1
,Y1)=0:NEXTY1,X1
3090 GOTO195
3500 REM**HORIZONTAL DISPLAY**
3505 SOUND150,2
3510 PRINT@PP,LEFT$(HP$,32);
3520 FORD=1TO70:NEXT
3530 HP$=MID$(HP$,2)+LEFT$(HP$,1
)
3540 D$=INKEY$:IFD$=""THENGOTO 3
580
3550 PRINT@PP,"
                ";
3560 FORD=1TO300:NEXT
3570 RETURN
3580 GOTO 3510
```



TAPE INDEX

by Graham Pollock

Tape Index is a program that will allow you to scan through a tape and find out about the programs on it. To do this it will SKIPF through the tape and look at some storage addresses in RAM after each program has gone past.

The program filename is stored between addresses 16991 ($425F) and 16998 ($4266). The program type is stored at address 16999 ($4267). The 3 types of programs are identified by their own file type number:-

0 means BASIC
2 means MACHINE LANGUAGE
4 means NUMERICAL ARRAY

The addresses 17004($426c) and 17005 ($426d) hold the program length for BASIC and array types, and the start address for M.L. programs.

IF you have a printer you may choose to have ahard copy of your tape index.

There is only one problem. It won't give you the length of BASIC programs on MICOOZ (but it will for TOM LEHANES tapes CSAVED with the MC-10 emulator, COCO-MICO).

One more thing while I am up here on my soap-box. I'd like to commend Darren Ottery on his graet contributions to the mag. I was particularly impressed by TYPING ATTACK (July MiCo). Great work Darren!

Bye for now!

```
1 PRINT"TAPE INDEX BY G.POLLOCK"
2 GOTO10
3 FORSV=1TO3:FORT=1TO3000:NEXTT:
CSAVE"TPINDEX":PRINTSV:NEXTSV:EN
D
10 INPUT"SCREEN(0) OR PRINTER(1)
";PR
20 PRINT"PRESS PLAY"
30 PRINT"TURN PRINTER OFF AND RE
SET TO   END"
32 IFPR=1THENINPUT"TAPE NAME":TN
$:LPRINTTN$
35 SKIPF
40 N=N+1:PRINTSTR$(N);".";:IFPR=
1THENLPRINTSTR$(N);".";
50 FORI=16991TO16998
60 PRINTCHR$(PEEK(I));:IFPR=1THE
NLPRINTCHR$(PEEK(I));
70 NEXTI
80 PRINT":";:IFPR=1THENLPRINT":"
;
90 TP=PEEK(I)
100 IFTP=0THENTP$="BAS.":L$="LEN
GTH="
110 IFTP=2THENTP$="M.L.":L$="STA
RTS AT"
120 IFTP=4THENTP$="NUM.":L$="LEN
GTH="
125 I=I+5
130 L=256*PEEK(I)+PEEK(I+1)
140 PRINTTP$;L$;L:IFPR=1THENLPRI
NTTP$;L$;L
145 SOUND50,2
150 GOTO35
```

4K MC10, PRINTER

SLIP

by Chris Frend

SLIP is a handy little utility program I use to simplify my home accounting. When paying accounts by cheque I use SLIP to produce a payment advice slip which is mailed with the cheque. I can then retain the account itself for my own records. What could be simpler.

A 4" (32 column) printer is best for this application although there is absolutely no reason why you should not use any other printer.

The Listing:

```
1 REM ************************
      * PAYMENT ADVICE SLIP *
      ************************
2 REM BY CHRISTOPHER J FREND
3 REM GUNNEDAH  NSW  2380
5 CLEAR 1000
10 CLS:PRINT@6,"PAYMENT ADVICE S
LIP"
20 PRINT@64,"WHO OR WHAT COMPANY
 ARE THESE   SLIPS TO BE NAMED F
OR":INPUT C$
22 IFLEN(C$)>26THEN PRINT@128,"T
OO LONG.  PLEASE SHORTEN!!":FORD
=1TO2000:NEXT:PRINT@128:GOTO 20
25 PRINT:PRINT"ADDRESS OF ";C$:I
NPUT"STREET";ST$
26 INPUT"SUBURB/TOWN";SU$
27 INPUT"STATE";SA$:POKE17025,PE
EK(17025)-(23-LEN(SA$)):INPUT"PO
STCODE";PO$
29 SA$=SA$+"   "+PO$
30 PRINT:PRINT"HOW MANY SLIPS DO
 YOU REQUIRE",:INPUT C
40 PRINT:PRINT"PRESS <R> WHEN RE
ADY TO PRINT";
50 A$=INKEY$:IFA$<>"R"THEN50
55 CLS:PRINT@160,"PRINTING PAYME
```

```
NT ADVICE SLIPS    FOR "C$"."
60 FORP=1TOC
62 IFC=0 THENGOTO 230
65 IF C=PTHENPRINT@256,"THERE IS
 1 SLIP TO PRINT.     ":SOUND150,
3:GOTO 70
66 PRINT@256,"THERE ARE"(C-P+1)"
SLIPS TO PRINT. "
70 LPRINTCHR$(27)CHR$(14)CHR$(10
)CHR$(10)
80 LPRINTTAB(1)"PAYMENT ADVICE"
CHR$(27)CHR$(15)
90 LPRINT:LPRINTTAB(18)"DATE:...
......"
100 LPRINT"FROM:"
105 IFLEN(SU$+SA$)<=25THEN SU$=S
U$+"   "+SA$:SA$=""
110 LPRINTTAB(5)C$;CHR$(13)TAB(5
)ST$;CHR$(13)TAB(5)SU$:IFSA$=""T
HEN120
115 LPRINTTAB(5)SA$
120 LPRINT:LPRINT:LPRINT"ACCOUNT
 DATE:....."
130 LPRINT:LPRINT"ACCOUNT NO.:..
....."
140 LPRINT:LPRINT"CHEQUE NO.:...
....."
150 LPRINT:LPRINT"AMOUNT:   $"
160 LPRINT:LPRINT"QUERIES/COMMEN
TS:............."CHR$(10)
170 L$="....................
....."
180 LPRINT L$ CHR$(10)
190 LPRINT L$ CHR$(10)
200 LPRINT L$ CHR$(10)
210 LPRINT"--------------------
----------"
220 NEXT
230 PRINT@256,"PRINTING COMPLETE
.          "
240 FORS=1TO3:SOUND200,2:SOUND10
0,3:NEXT:END
```

ROM MUSIC

by Graham Pollock

ROM-MUSIC is aprogram that will allow you to listen to your ROM. Why would anyone want to listen to their ROM you say? Well don't knock it until you try it.

This short program is written in machine language and simply goes through the ROM, picking out the numbers stored there and using them as the tone in the SOUND command. You can try doing a similar thing in BASIC with:-

```
10 FOR X=57344TO65535
20 SOUND PPEK(X),1
30 NEXTX
```

But it stops after a while. The M.L. doesn't.

I've not made the rpogram self-locating because it is anly a demonstration program and not a useful utility like LITTLE-E or SLOWLIST (available from: S Pollock, 24 KENT ST, MINTO, 2566).

Lets look at the machine language:-

```
4FEC CE E000    LDX  #$E000
  load X register with start of ROM
4FEF C6 01      LDAB #$01
  load B accumulator with the sound length

4FF1 A6 00      LDAA 00,X
  load A with # stored at address X

4FF3 3C         PSHX
  put X register onto stack

4FF4 BD FFAB    JSR  $FFAB
  goto sound routine

4FF7 38         PULX
  pull X register off stack
4FF8 08         INX
  add 1 to X register

4FF9 8C FFFF    CPX  #$FFFF
  compare X register with the end of ROM

4FFC 26 F1      BNE  $4FEF
  branch to 4FEF if not end of ROM
4FFE 39         RTS
  return to sender
```

```
1 CLS:PRINT"ROM-MUSIC BY G.POLLO
CK"
2 GOTO10
3 FORSV=1TO3:FORT=1TO3000:NEXTT:
CSAVE"ROM-MUSIC":PRINTSV:NEXTSV:
END
10 FORX=20460TO20478
20 READY
30 POKEX,Y
40 NEXTX
50 CLS:PRINT"NOW YOU'RE LISTENIN
G TO YOUR ROM"
60 EXEC20460
65 INPUT"PLAY AGAIN(Y/N)";PL$
66 IFPL$="N"THENEND
67 GOTO60
70 DATA 206,224,0,198
75 DATA 1
77 DATA 166,0
80 DATA 60,189,255,171,56,8,140
90 DATA 255,255
100 DATA 38,241,57
110 REM LINE 75 IS TONE LENGTH
120 REM LINE 90 IS END ADDRESS
```

4K MC10, PRINTER

DUMP

by Chris Frend

The main part of DUMP, when added to any other program and accessed by an INKEY$ or similar, will produce a screen dump to the printer. In my case a TP-10.

The graphics printout is reversed, ie. all screen colours are white and black appears as black. Some printers may require that you alter or delete the graphics ASCII codes if all you get when printing graphics is garbage. (Case in point: Our printers persist in printing Katakana characters instead of block graphics as many of you may have observed in our listings. Kevin)

Also notice that when running DUMP the video RAM is poked from 1 to 255 with suprising results- reverse video numbers.

The Listing:

```
1 REM*****************************
2 REM* SCREEN DUMP TO PRINTER *
3 REM*****************************
4 REM  BY CHRISTOPHER J FREND
5 REM      GUNNEDAH  NSW  2380
6 REM
7 REM USE ROUTINE 100-140 AFTER
      INKEY$ OR INPUT STATEMENT
      AND ALL THAT IS DISPLAYED
      ON THE SCREEN IS PRINTED.
8 REM ROUTINE 160-190 TRANSPOSES
      GRAPHICS CHARACTERS FOR
      THE PRINTER.  THE PRINTER
      I USE IS A TP-10.
9 REM FOR A SURPRISE NOTE THE
      SCREEN CHARACTERS WHEN THE
      PROGRAM IS RUN!!
10 CLS
20 Y=0:FORX=16384TO16639
30 POKEX,Y:Y=Y+1
40 NEXT
50 PRINT@384," FOR DUMP TO PRINT
ER PRESS <P>"
60 A$=INKEY$:IFA$<>"P"THEN 60
100 FORX=16384TO16895:Y=PEEK(X)
105 IFY>127THENGOTO 160
110 IFY<31THEN Y=Y+96:GOTO 130
120 IFY>95ANDY<128THEN Y=Y-64:GO
TO 130
125 IFY=31THEN Y=32
130 LPRINTCHR$(Y);
140 NEXT:FORX=1TO4:LPRINT:NEXT
150 END
160 IFY>143THEN Y=Y-16:GOTO 160
170 IFY<136THEN Z=135-Y:Y=136+Z:
GOTO 190
180 Z=143-Y:Y=128+Z
190 GOTO 130
```

HIRESDEM

by Graham Pollock

SYSTEM REQUIREMENTS:20K MC-10
+ROM1.1

At last you can use high resolution graphics on your MC-10.

After a phone call from Mike Turk, I set about moving ROM into RAM and altering the appropriate addresses.

It really didn't take as long as I expected. As you all know, the basic scratchpad on the MC-10 is right in the middle of the hi-res screens.

In order to free up the hi-res screens for use by MC-10 owners, I had to carry out the following steps:-

1.move ROM from $E000-$FFFF TO $7000-$8FFF.
2.alter all JSR,JMP and LDX addresses that point to within ROM by using a short BASIC program.
3.use MICO EXPOSED to move the BASIC scratchpad from $4200-$4346 to $5000-$5146.
4.alter the SIGNON MESSAGE.
5.alter part of the COLD START routine $8755-$8763.
6.set the new ROM's EXECution address to $874A.
7.altered FDB tables.
8.altered the SOUND routine.

The only catch is that you've got to get ROM1.1 on tape. If you send me a blank tape with reverse postage, I'll post it to you.(24 KENT ST, MINTO,N.S.W.,2566,AUSTRALIA)

There are 16 different screens that can be used. To show you these screens, I've included a short demonstration program. If you don't have ROM1.1 you can still see the screens by deleting lines50-110.

When you have the tape, this is what you do:-

1.CLEAR25,28672:CLOADM"ROM1.1":EXEC(ENTER)

2.CLOAD"HIRESDEM"(ENTER)

3.RUN(ENTER)

You can choose from screens 0-7 and A-H. Once the demonstration pattern is complete, you can flick from one screen to another. There are 4 resolutions to choose from and 4 different color sets for each. The screens may display 1, 2,3 or 6K of memory(the 6K mode displays 4K and then repeats the first 2K)

The screen display depends on the number POKEd into address 49151. The numbers 32,36,40,44,48,52,56,60,96,

100,104,108,112,116,120,124 are for the 16 sreens.

A sound is heard when you flick from one screen to another. In order for the sound not to affect the screen, an address in the new sound routine must be POKED(36782). In line 230 there are 2 POKES. The first is for the screen, and the second is for the sound. In fact, if a sound is being used as soon as the screen is entered, you don't need to POKE into 49151. The modified SOUND routine will change the screen according to the number in 36782. Line 210 shows the 2 POKES needed to return to normal.

If you press RESET you will need to reenter ROM1.1 by using

EXEC34634(ENTER)

To check to see if you are in ROM1.1 or ROM1.0, you will need to POKE49151, 44 and look for movement. If you see action on the screen, then you will have to :-

POKE49151,0:EXEC34634
to reenter ROM1.1.

HAVE FUN!!!!!

```
1 PRINT"HIRES DEM BY G.POLLOCK"
2 GOTO10
3 FORSV=1TO3:FORT=1TO3000:NEXTT:
CSAVE"HIRESDEM":PRINTSV:NEXTSV:E
ND
10 PRINT"THIS DEMO PROGRAM MUST
BE USED  WITH ROM1.1"
20 PRINT"CHOOSE FROM SCREENS"
22 PRINT"0,1,2,3,4,5,6,7"
24 PRINT"A,B,C,D,E,F,G,H"
25 PRINT"FLICK FROM ONE TO ANOTH
ER"
30 PRINT"PRESS 'R' TO RETURN"
40 GOSUB200
50 FORX=16384TO17222
54 POKEX,0:NEXTX
55 E=0
60 FORX=16384TO20448STEP32
80 POKEX+E,RND(255)
90 POKEX-E,RND(255)
100 E=E+1:IFE=32THENE=0
110 NEXTX
115 GOSUB200:GOTO115
200 I$=INKEY$:IFI$=""THEN200
210 IFI$="R"THENPOKE49151,0:POKE
36782,0:GOTO10
215 F=48
220 IFASC(I$)>63THENF=49
225 P=((ASC(I$)-F)*4)+32
230 POKE49151,P:POKE36782,P
240 SOUND200,4
250 RETURN
```

SUPER CLOAD

by Graham Pollock

Look!
Up in the sky!
It's a bird!
It's a plane!
No! It's SUPERCLOAD!
Faster than a speeding I/O ERROR
More powerful than an OM ERROR
Able to Cload tall programs in a single key
stroke.

SUPERCLOAD allows your MiCo to recover after a CLOADing error and CLOAD again, all by itself. All you have to do is put in the initial CLOAD and press PLAY. The first decent program will CLOAD in. You can start CLOADing half way through a program and the followong program will CLOAD in.

The macine language looks like this:-

```
429A 7E 4FF2  JMP   $4FF2
------------

4FF2 36       PSHA
  put the A accumulator on the stack

4FF3 86 97    LDAA  #$97
  load the A accumulator with $97

4FF5 B1 42B2  CMPA  $42B2
  compare A with the value at $42B2

4FF8 27 02    BEQ   $4FFC
  branch to $4FFC if equal

4FFA 32       PULA
  pull the A acc. off the stack

4FFB 39       PTS
  return

4FFC 7E FD63  JMP   $FD63
  jump to CLOAD
```

The BASIC loader is self-locating and you have a choice of two possible places:-

1. Below the top of RAM
2. Below last M.L. program

The second option actually loads the M.L. in below the DEFAULT EXECution address. It will only load in below previous M.L. if that M.L. has been EXECuted at it's start address.

In other words, SUPERCLOAD option2 will NOT interfere with either LITTLE-E or TRILIST (a triple SLOWLIST program availiable from S. POLLOCK, 24 KENT ST, MINTO, 2566)

The MC10 has two error return extension vectors. LITTLE-E uses the first at 17047-17049 ($4297-$4299) and SUPERCLOAD uses the second at 17050-17052 ($429A-$429C).

The Listing:

```
1 CLS:PRINT"SUPERCLOAD BY G.POLL
OCK"
2 GOTO10
3 FORSV=1TO3:FORT=1TO3000:NEXTT:
CSAVE"SUPCLOAD":PRINTSV:NEXTSV:E
ND
10 PRINT:PRINT"DO YOU WANT ME"
30 PRINT:PRINT"1. BELOW TOP RAM"
40 PRINT:PRINT"2. BELOW LAST M.L
. PROGRAM"
50 INPUTPN
60 IFPN=1THENPK=16976:GOTO80
70 PK=16927:GOTO95
80 GOSUB100:CLEAR25,X
85 PK=16976:GOSUB100
90 GOTO110
95 GOSUB100:CLEAR25,X:PK=16927:G
OSUB100:GOTO110
100 X=256*PEEK(PK)+PEEK(PK+1):X=
X-14:RETURN
110 FORZ=XTOX+12
120 READA
130 POKEZ,A:NEXTZ
140 POKE17050,126
150 POKE17051,INT(X/256):POKE170
52,X-INT(X/256)*256
155 EXECX
160 DATA 54,134,151,177,66,178,3
9,2
170 DATA 50,57,126,253,99
```

soft gold

The fellows at Scarborough Fair Tandy lent me a T 200 to play with for the last month or so and I have to say that we have been impressed.

Despite its compact size - it literally fits into a brief case with room to spare, the T 200's features are very "large computer".

The keyboard especially is most comfortable to use and I would love to see it adapted for CoCo. The exception is the so-called numeric key pad, which you'd have to get used to!

Upon start up, the six programs in ROM plus any files you have in memory are shown by name on the screen, along with the time and date.

Using the arrow keys you select the item you want and press the enter key to go to it.

There is a nice text processor, a modem function (for the US), an address book, a scheduler, a spreadsheet, and Basic.

We wanted to try the spreadsheet, and found it to be quite useful. It is very similar to Spectaculator. The only problem with it is the T 200's 20 column screen - too short really.

But it was in Basic were we got to understand just how useful this little computer could be.

Standard, the T 200 comes with 24K, & this is expandable to 72K. The Basic is very much Color Computer Basic without the color commands. Spaces are not required between command words, and implementation is fast, as long as long outputs to the screen are not required - a quartz screen is not as fast as a CRT!

The RND function is the only command we could find which differed to that of the Colour Computer. The T 200 RND calls a number less than one (1) - that is, RND(1) the only acceptable command, might return .67845932. If you need the equivalent of CoCo's RND(6), the command would be

```
10 R=INT(10*RND(1)):IFR)6THEN 10
```

This small annoyance aside, the computer is a pleasure to work with. It has an RS 232 output, a parallel printer port, a phone jack (for the US), and a cassette I/O, as well as a system bus for disk drives etc, and a reset button placed across the back.

With these features, it is not hard to imagine someone using the computer on business trips, writing reports, and evaluating figures obtained in the field, eg sales & mapping. I've even heard of a policeman who keeps a list of wanted vehicles in his T100. As he travels along, he just punches in numbers of suspicious cars to see if they come up - if they do, his T100 even tells him why he wants the suspect! With a T200, he could keep records of many more suspects!

Technically, the T200 has a 80C85 CPU operating at 2.4 MHz (8 bits), operating in temperatures from five degrees C to 40 degrees C.

Price at present is $1399.95

*

A copy of Computer + Software News dated July 22, 1985 floated across my desk the other day. Amoungst other things, it held the news that Tandy captured 20% of US sales of pc style computers in June '85. This is in contrast to IBM with 30%, Apple with 19% and Kaypro - next closest with 9%.

Best selling disk drive brand was Tandy with 21% of the US market in June, then Apple with 19%, IBM with 7%, Commodore had 3%, and then there were a range of other small suppliers.

Modems in June - well Hayes sold a whopping 43%, Tandy 20% Apple 13% and next was US Robotics with 3%.

The best selling printer brands according to Computer + Software News were Epson - 18%, Tandy - 18%, Apple - 15%, Okidata - 11%, C. Itoh - 7%.

Finally, the best selling monitors were Tandy's, with 18%, Apple was next with 14%, IBM also had 14% and Andek had 8%.

*

MAILSHOT.

By Paul Humphreys.

One of the more useful business applications for a computer is personalizing form letters in conjunction with a customer database. Wordstar has Mailmerge, Dbase has its own facility for this technique, and there are others. All of these have a high price tag, and while this is justified for a person using this type of program every day, the cost becomes prohibitive for the occasional user, so here is one that will only cost you a bit of typing in time.

Mailshot is written using IBM Advanced Basic, so will therefore work without change on the Tandy 1000's GW Basic. For the Color Computer users out there, I have

not used any IBM Basic specific commands that are not available on your CoCo, with two exceptions.

If you are typing in the program for a Tandy 1000, change nothing. If you wish to use it on a Color Computer, change all incidences of 'LPRINT' to 'PRINT #-2,'. Also change the 'FILES "*.doc"' in line 5015 to a 'DIR'. Nothing else should need changing.

Mailshot is menu driven. It uses two type of data files, one for database information, and one for the actual body of your form letter. The second type should be created with a text editor in ASCII and formatted with a line width of 65 characters. The left margin should have no indentation as this will be done automatically when Mailshot prints your form letters. You may create as many different form letters as you wish and you will be prompted for the name of the one to print at the proper time. These form letters must be saved with the extension of ".doc". The database files use sequential access to allow you to have more than one list saved under different names. No extension is necessary for these files as they default to ".dat".

The first thing to select from the menu is '3. Enter Names' as you will need some information before save and load will do anything. '4. Sort File' will do a sort on the surname. '5. Print Form Letters' will do the actual mail merge. To use this option, load your datafile into memory first, and when prompted from option 5, enter the name of a form letter that you have created on the default drive. These letters should not include dates, salutations, or the 'Yours faithfully, ' etc. There should be no blanks at the top or bottom of the body of the letter, as these are inserted in the correct proportion by Mailshot.

'6. Print Labels' does sticky mailing labels for you. If you are using a different size label to the one I do, you may have to add or remove LPRINT's in lines 6070 to 6100 to ensure correct spacing between labels.

'7. List to Screen.' print the labels to the screen as a way of checking what you have in your database. There is no feature for editing or deleting datafiles in Mailshot, as I find it more convenient to edit the datafile directly using a text editor. You may put in a feature for doing this if you feel the need, but it is not really a necessary feature. Option 8 ends the program. It is error trapped, but if you do exit accidentally without saving your file, you can recover by typing 'GOTO 130' before you do anything else.

The printer control codes are set up for an Epson printer and will work with most printers you will be using with a 1000. If you are using a CoCo with an Amust or CPA-80 or similar, they will work for you. If you are using a Radio Shack printer, you will have to change these codes to suit. Insert your name in line 9130 and go....

```
10 'mailshot: Procedure
11 '(C) by P.R. Humphreys 6/7/85 for Soft Gold. All Rights Reserved
100 CLEAR 15000:DIM A$(5,300)
130 CLS
140 PRINT "MAIL SHOT"
150 PRINT:PRINT "1. LOAD FILE"
160 PRINT "2. SAVE FILE"
170 PRINT "3. ENTER NAMES"
180 PRINT "4. SORT FILE"
190 PRINT "5. PRINT FORM LETTERS"
200 PRINT "6. PRINT LABELS"
210 PRINT "7. LIST TO SCREEN"
212 PRINT "8. END PROGRAM"
214 PRINT:PRINT "ENTER A SELECTION ";
215 AZ$=INKEY$:IF AZ$="" THEN 215
220     IF AZ$="1" THEN GOTO 1000
```

```
230     IF AZ$="2" THEN GOTO 2000
240     IF AZ$="3" THEN GOTO 3000
250     IF AZ$="4" THEN GOTO 4000
260     IF AZ$="5" THEN GOTO 5000
270     IF AZ$="6" THEN GOTO 6000
280     IF AZ$="7" THEN GOTO 7000
282     IF AZ$="8" THEN GOTO 8000
285 GOTO 130
290 'End of procedure mailshot
300 END  :REM End of main program
310 '
320 '
1000 REM LOAD FILE
1010 '
1020 '
1030 CLS:B=1
1040 PRINT "FILE NAME TO LOAD ";:INPUT X$:IF X$="Q" THEN 130 ELSE
X$=X$+".DAT":OPEN "I",#1,X$
1050 INPUT #1,T
1060 IF EOF(1) THEN CLOSE#1:GOTO 130
1070 FOR I=1 TO 5:LINE INPUT #1,A$(I,B):NEXT I
1080 B=B+1
1090 GOTO 1060
1100 CLOSE #1:GOTO 130
2000 REM SAVE FILE
2010 '
2020 '
2030 CLS:PRINT "ENTER FILE NAME TO SAVE ";:INPUT M$:IF M$="Q" THEN 130
2035 M$=M$+".DAT"
2040 PRINT :PRINT "NOW SAVING FILE"
2050 OPEN "O",#1,M$
2060 PRINT #1,T
2070 FOR I=1 TO T:FOR J=1 TO 5:PRINT #1,A$(J,I):NEXT J:NEXT I
2080 CLOSE #1:GOTO 130
3000 REM ENTER NAMES
3010 FOR I=T+1 TO 300:CLS:PRINT "ENTER NAMES.....":PRINT :PRINT "Enter christian
and surnames separately - ":PRINT :PRINT :PRINT "CHRISTIAN NAME: ";:LINE INPUT
X$:A$(1,I)=X$
3020 PRINT :PRINT "SURNAME: ";:LINE INPUT X$:A$(2,I)=X$:PRINT :PRINT "ADDRESS
1: ";:LINE INPUT X$:A$(3,I)=X$
3030 PRINT :PRINT "ADDRESS 2: ";:LINE INPUT X$:A$(4,I)=X$:PRINT :PRINT
"ADDRESS 3: ";:LINE INPUT X$:A$(5,I)=X$
3040 T=T+1:PRINT :PRINT "ADD MORE NAMES (Y/N)";:SOUND 200,10
3050 GZ$=INKEY$:IF GZ$="" THEN 3050
3060 IF GZ$="N" OR GZ$="n" THEN 130 ELSE NEXT I
4000 REM SORT FILE
4010 CLS:IF T=0 THEN 130 ELSE PRINT "SORT MODE":PRINT:PRINT "NOW SORTING"
4020 Z=0
4030 FOR I=1 TO T-1:IF A$(2,I)<=A$(2,I+1) THEN 4050
4040 FOR J=1 TO 5:S$=A$(J,I):A$(J,I)=A$(J,I+1):A$(J,I+1)=S$:Z=1:NEXT J
4050 NEXT I
4060 IF Z=1 THEN 4020 ELSE GOTO 130
5000 REM PRINT FORM LETTERS
5010 CLS:LINE INPUT "ENTER TODAY'S DATE: ";DAT$
5015 PRINT :FILES "*.doc":INPUT "Enter name of form letter to be printed
";NF$:NF$=NF$+".DOC"
5020 PRINT :PRINT "PRESS ENTER TO BEGIN PRINTING FORM LETTERS"
5025 FOR I=1 TO T
5030 PRINT :PRINT "PROGRAM WILL WAIT FOR AN ENTER AFTER EACH LETTER
IS PRINTED -":PRINT "TYPE 'QUIT' TO RETURN TO MAIN MENU: ";: LINE INPUT
WAT$:REM THESE LINES MAY BE REMOVED FOR CONTINUOUS PRINTING
5033 REM SET EMPHASIZED PRINT
5034 LPRINT CHR$(27);"E"; ESC $ (14)
5035 IF WAT$="QUIT" OR WAT$="quit" THEN 130
5040 LPRINT:LPRINT:LPRINT:LPRINT
5050 LPRINT "                                                    ";DAT$
```

```
5060 LPRINT
5070 LPRINT "            Mr. ";A$(1,I);" ";A$(2,I)
5080 LPRINT "            ";A$(3,I)
5090 LPRINT "            ";A$(4,I)
5100 IF A$(5,I)="" THEN 5120
5110 LPRINT "            ";A$(5,I)
5120 LPRINT
5130 LPRINT "            Dear Mr. ";A$(2,I)
5135 LPRINT "    "
5150 GOSUB 9000
5400 NEXT I
5500 GOTO 130
6000 REM PRINT LABELS
6010 CLS:PRINT "MAILING LABELS WILL BE PRINTED WHEN YOU PRESS ENTER"
6020 PRINT :PRINT "TURN PRINTER ON AND INSERT LABELS FIRST";:INPUT LA$
6023 REM SET EMPHIZED PRINT
6024 LPRINT CHR$(27);"E";
6025 FOR I=1 TO T
6030 LPRINT "            Mr. ";A$(1,I);" ";A$(2,I)
6040 LPRINT "            ";A$(3,I)
6050 LPRINT "            ";A$(4,I)
6060 LPRINT "            ";A$(5,I)
6070 LPRINT
6080 LPRINT
6090 LPRINT
6100 LPRINT
6110 NEXT I
6120 GOTO 130
7000 REM PRINT LABELS TO SCREEN
7010 CLS:PRINT "MAILING LABELS WILL BE PRINTED TO SCREEN WHEN YOU
PRESS ENTER ";:LINE INPUT SCR$:CLS
7025 FOR I=1 TO T
7030 PRINT "            Mr. ";A$(1,I);" ";A$(2,I)
7040 PRINT "            ";A$(3,I)
7050 PRINT "            ";A$(4,I)
7060 PRINT "            ";A$(5,I)
7070 PRINT
7080 PRINT
7090 PRINT
7100 PRINT
7105 IF INT(I/2)=I/2 THEN PRINT:PRINT "Press ENTER to continue";:INPUT EN$:CLS
7110 NEXT I
7120 PRINT :LINE INPUT "Press ENTER to return to menu";RM$
7130 GOTO 130
8000 REM END PROGRAM - PUT ANY ERROR TRAPS YOU LIKE HERE
8010 CLS:PRINT "ARE YOU SURE? (Y/N)";:LINE INPUT SU$
8020 IF SU$<>"y" THEN 130 ELSE END
9000 REM FORM LETTER INPUT MODULE
9010 OPEN "I",#1,NF$
9020 LINE INPUT #1,DOC$
9030 LPRINT "        ";DOC$
9040 IF EOF(1) THEN CLOSE #1:GOTO 9125
9050 GOTO 9020
9125 REM SET CONTROL CODES FOR UNDERLINE AND EMPHASIZED (SET FOR
EPSON)
9126 LPRINT "    ":LPRINT "            Yours faithfully":LPRINT " ":LPRINT " ":LPRINT
" ":LPRINT " ":LPRINT " "
9127 LPRINT CHR$(27);"G";
9130 LPRINT TAB(12);CHR$(27);CHR$(45);CHR$(1);"Your Name here";:LPRINT
CHR$(27);CHR$(45);CHR$(0);
9140 LPRINT CHR$(27);"
9150 LPRINT CHR$(12);
9160 CLS:RETURN
9170 'END OF SUBROUTINE BODY
```

CLUB NEWS

Johanna Vagg tells me that the Lachlan Computer Users' Group meets on the third Monday evening of the month in (I presume) Forbes. Anyone interested should contact Johanna.

The Scarborough Club in Queensland meets on the first and third Saturdays of the month at 7.30 PM. Peter May is the contact on 07-203-6723.

Bruce King has left Wagga Wagga for the smog and pace of Sydney. He will be sorely missed. Bruce was a lecturer at the C.A.E. there. Now he is in Sydney, he has to work on IBMs. Needless to say, I hear he is not amused!

Ces Jenkinson is the secretary of the Wagga Wagga club, and he can be contacted on 069-25-2263.

David Tulk, Tandy's man in Albury, is renovating the first floor of his building so that he can use it as a classroom. He is also going to invite the Albury Users' Group to use the facility.

There are several other groups using Tandy facilities, I know the Bankstown group uses the classroom in the local Tandy Computer Centre, and I think there is another also in Sydney. There are advantages to meeting in a Tandy store, if it is convenient. So if your group has space problems, you might find the local Tandy man helpful.

The Bankstown Group by the way, meets on the last Thursday night of the month from 7.00 PM. They have a lot of new users, so if you're feeling shy - don't worry. Jonathan Lee Micheals will look after you. If he dosen't, Hubert Muhlbock will! (Little go at Hub).

The Bankstown Group now also have an OS-9 special interest group, and Carl Stern is the contact on 02-646-3619.

Speaking of special interest groups, the Port Lincoln group, which seems to get into everything, has taken up the challenge and is hooking into FORTH. We look forward to seeing their first program.

Andrew Wyllie has decided to become a contact in the Burnie - Wynyard area of Tasmania. His phone number is 002 (I think) 35-1839. Might do to check the STD, because in that area of Australia things change pretty quickly - I understand it's the Tasmanian Tigers - they attack the phone lines so Telecom has to keep changing peoples' phone numbers so the tigers can't find 'em!

We now have a contact in Kyogle, NSW. Paul Reidy (066-32-1028) is the contact there, so all those folk who were concerned about getting a local club together in Kyogle, call Paul.

We have a surprisingly high number of readers in some of these towns which some might consider "out of the way".

Kyogle is a small, but very pretty place south west of Murwillumbah, and not that far from us. It was a railway town in the great age of steam - not as big as Junee in its hey day, but I've always enjoyed Kyogle's people - they possess that "salt of the earth" quality we seem to be loosing elsewhere.

Armidale contact Tom Stuart, has made a very sensible suggestion - we agree with him that a comparative table of printer codes would be very useful. He has sent some info on Epson RX80 and the BMC 80, we know most about the C.Itoh, and most of you have Tandy and Gemini printers - so if we pool our info, we should come up with something quite useful!

I have been sorry to see the CoCoPug magazine of the Perth group have to reduce size because of lack of content. The folk in Perth have done a mighty job over the last few years on this magazine, and I just hope that this dosen't mean the end is near.

I love that little magazine, and always look forward to my copy.

The Cooma Group have their own newsletter. This group is made up mainly of school age people, and Fred Bisseling tells me he is able to leave the entire Newsletter to Phillip Majcherski and his mates. Considering the quality of the final product, this is a considerable achievement.

The Cooma group, by the way, meets on the third Thursday of the month, presumably in Cooma (!).

I think we have also received a newsletter from the La Trobe group, but as usual it came and it went - I'll have to get them to send a second copy in future!

Now we have magazines going to the US, I know a lot of those folk are very interested in Australiana - stories on things like OS8, Tasmanian Tigers and the Kangaroos that feed in the main street of Surfers Paradise are always of interest to them.

If your group can help with an OS8 program, or another piece of Australiana, now would be a good time to send it in!

SURVEY

Last year we stated in our survey "We know you hate surveys, so we thought we'd do it early in the peace before you find all our other faults".
Now you've had time to figure out what you hate about us, what you love about us, and what you want to see changed anyway, we thought we'd drop another on you!
Upon completion, please pop this page in an envelope and return to:
FREEPOST 5
SOUTHPORT. QLD. 4215. by the 7th October, 1985.

The purpose of the survey is the same - to find out what you like, what you don't like, and to find out where you are up to and who is winning in your relationship with your computer.

There is another contest at the end of the survey - you don't have to enter it if you don't want to. The prize is EITHER a CCR 82 cassette recorder, OR three boxes of disks. If you enter the contest, make sure you let us know which prize you would prefer!

1. Name .....

2. Address .....

3. From where did you obtain this magazine?
. Subscriber? - If so, Number 820
. Newsagent . Meet Group
. Tandy . Other - please specify .....

4. Age Range: . 0 - 10 . 11 - 20
. 21 - 40 . 41 - 65
. 66 - 200 ✓+

5. What type of computer do you own?

. CoCo 16K CB . Tick here if your CoCo is a model 2 (white case).
. CoCo 16K ECB
. CoCo 32K ECB
. CoCo 64K ECB ✓
. MC 10 4K . MC 10 20K
. Tandy 100 . Tandy 200
. Tandy 1000 ✓ please specify size ..... 256 K TWIN DISK (access only?).
. Tandy 2000 please specify size .....
. Other, please specify .....

6. What other items of hardware do you own?

. Cassette Deck. Type CCR81
. Disk Drive. No .... Type .....
. Printer ✓ Type CGP115 + DMP105

. Modem X Type .....

. Monitor ✓ Type DSI MON 3 .....

. Other, please specify .....

7. What items of hardware do you plan on purchasing this coming 12 months?

DISK ROM COCO 3 .....

8. How do you use your computer? Please give % use.

10 % . Games	% . Communication
40 % . Business	% . Scientific Appn
% . Software Production (Commercial)	% . Robotics
% . Other Control	% . Education (GRANDCHILD).
50 % . To further own computer knowledge. ✓	

9. Would you say you have a 50% or greater proficiency in:

. Basic YES.	. Assembly Language
. Basic 09	. PASCAL
. Forth	. Cobol

. Other, Please specify .....

10. With which of the above languages are you also familiar, as opposed to having a working knowledge of?

ASSEMBLY. .....

11. Magazine buying habits:

I subscribe	Magazine	I purchase separately
.	American Rainbow	.
✓	HOT COCO	.
.	Others*	. 80 MICRO.

* excluding our magazines, please specify: .....

12. What did you like about the last two of our magazines you've received?

.....

13. What did you dislike about the last two of our magazines you've received?

.....

14. Could we include something we are not doing now?

AN ARTICLE OR TWO ON USING MSDOS WITH THE COCO! .....

15. Tandy: Which shop do you frequent? .....MT. ISA.....(OUTBACK ELECTRONICS)

16. What is the store manager's name? .....GARRY HANDY.....

17. Is the shop tidy and well laid out? .....YES.....

18. Does this store usually have what you want? .....YES.....

19. Are the people there able to help you with your computing problems?

.....I Normally do it the hard way.....

20. Have you been able to strike up a friendship with any of them?

.....Yes.....

21. To what other shops do you go to obtain the type of gear you also buy from Tandy? .....There are none in the Area.

22. CoCoConf '86 might be held in Sydney. Would you plan to come? .....

23. If it were to be on the Gold Coast again, would you come? .....

24. Would you prefer to be charged for CoCoConf '86 on a Daily Basis? .....

25. Meet Groups: Do you regularly attend a Meet Group? ..NO

26. Are there changes needed to the back of the magazine for your group?

.....

27. This is your opportunity to speak, go:

28. Competition. Complete the following FIVE line program:

```
10 A$="Martha Gritwhistle"
20 B$="
30
40
50 PRINT
```

All entries are the property of this magazine, the worse the entry, the greater likelihood of success (just look at last year's winner!).

NOW! is the time to subscribe to Australian CoCo/MiCo/softgold

Copies of back issues can be obtained, subject to the availability of stocks, by using this order form and marking clearly which issues you require to be sent to you.
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Please note that RAINBOW on TAPE is issued irregularly
or Annually $144 ☐ or Debit my Credit Card Monthly ☐

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Medium $9.95 ☐

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PO BOX 1742,
SOUTHPORT. QLD. 4215.

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(Stop between numbers = b.h. else a.h.; but, hyphen between = both.)

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MacQUARIEFIELDS	KIETH ROACH	02 618 2858
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MAITLAND	LYN DAWSON	049 49 8144
MARYBOROUGH	NORM WINN	071 21 6638
MELBOURNE	JEFF SHEEN	03 528 3724
MELTON	MARIO GERADA	03 743 1323
MILDURA	SCOTT HOWISON	050 23 6016
MORPHETTVALE	KEN RICHARDS	08 384 4503
MOREE	ALF BATE	067 52 2465
MORWELL	GEORGE FRANCIS	051 34 5175
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MUDGEE	BRIAN STONE	063-72-1958
MURGON	PETER ANGEL	071 68 1628
NAMBUCCA HDS	WENDY PETERSON	065 68 6723
NEWCASTLE	LYN DAWSON	049 49 8144
NOWRA	ROY LOPEZ	044 48 7031
ORANGE	STEVE LOVETT	063.62.4025
' or	JIM JAMES	063 62 8625
PARKES	DAVID SMALL	068 62 2682
PENRITH	ALEX SCHOFIELD	047 31 5303
PERTH	IAN MACLEOD	09 448 2136
PORT LINCOLN	JOHN BOARDMAN	086 82 2385
PORT MacQUARIE	RON LALOR	065 83 8223
PORT NOARLUNGA	ROB DALZELL	08 386 1647
PORT PIRIE	KEVIN GOWAN	086 32 1368
RINGWOOD	ANDREW RAWLINGS	03 726 6521
ROCKHAMPTON	KEIRAN SIMPSON	079 28 6162
ROSEVILLE	KEN UZZELL	02 467 1619
SALE	BRYAN McHUGH	051 44 4792
SANDGATE	MARK MIGHELL	07 269 5090
SCARBOROUGH	PETER MAY	07 203 6723
SEACOMBE HTS	GLENN DAVIS	08 296 7477
SMYTHESDALE	TONY PATTERSON	053 42 8815
SPRINGWOOD	DAVID SEAMONS	047 51 2107
STURT	MARY DAVIS	08 296 7477
SUNBURY	JACK SMIT	03.744.1355
SUTHERLAND	IAN ANNABEL	02 528 3391
SWAN HILL	BARRIE GERRAND	050.32.2838
SYDNEY TEENS	ROD HOSKINSON	02 48 5948
SYDNEY EAST	JACKY COCKINOS	02 344 9111
TAMWORTH	ROBERT WEBB	067 65 7256
TAHMOOR	GARY SYLVESTER	046 81 9318
TONGALLA	TONY HILLIS	058 59 2251
TOOWOOMBA	GRAHAM BURGESS	076 30 4259
TOWNSVILLE	JOHN O'CALLAGHAN	077 73 2064
TRARALGON	MORRIS GRADY	051 66 1331
UPPER HUNTER	TERRY GRAVOLIN	065 45 1698
WAGGA WAGGA	CES JENKINSON	069 25 2263
WHYALLA	NORRIE CHRIS HUNTER	086 45 3395
WONTHAGGI	PAT KERMODE	056 74 4583
WYNYARD	ANDREW WYLLIE	002 35 1839
YARRAWONGA	KEN SPONG	057 44 1488

SPECIAL INTEREST GROUPS

BUSINESS

BRIZBIZ	BRIAN BERE-STREETER	07 349 4696

TDP - TELEWRITER, DYNACALC PROCOLOR

BRISBANE	GEOFF TOLPUTT	07 44 6084

OS9 GROUPS

BANKSTOWN	CARL STERN	02 646 3619
BRISBANE	JACK FRICKER	07 262 8869
KALGOORLIE	TERRY BURNETT	090.21.5212
MONARO	FRED BISSELING	0648 23263
PENRITH	BOB THOMSON	047 30 2468
SYDNEY EAST	JACKY COCKINOS	02.344.9111
SYDNEY NTH	MARK ROTHWELL	02 817 4627
BLAXLAND 128K	BOB THOMSON	047 30 2468

MiCo GROUPS

CARLISLE	STUART HALL	08 361 1922
LITHGOW	DAVID BERGER	063 52 2282
PORT LINCOLN	JOHN	086 82 2385
ROCKHAMPTON	TIM SHANK	079 28 1846
SYDNEY	RAJA VIJAY	02 519 4106

TANDY 1000 / MS DOS

BRISBANE	BRIAN DOUGAN	07 30 2072
SYDNEY	ROGER RUTHEN	047.39.3903
	FORTH	
PORT LINCOLN	JOHN BOARDMAN	086 82 2385

AUSTRALIAN RAINBOW

With the exception of our double issue at Christmas last year, this month's Australian Rainbow is the largest we've printed. I'm very pleased with it - it's an EDUCATION issue, but there is something for everyone, including:

POSTAGE PAID AUSTRALIA