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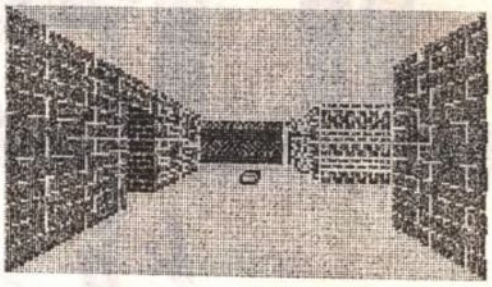

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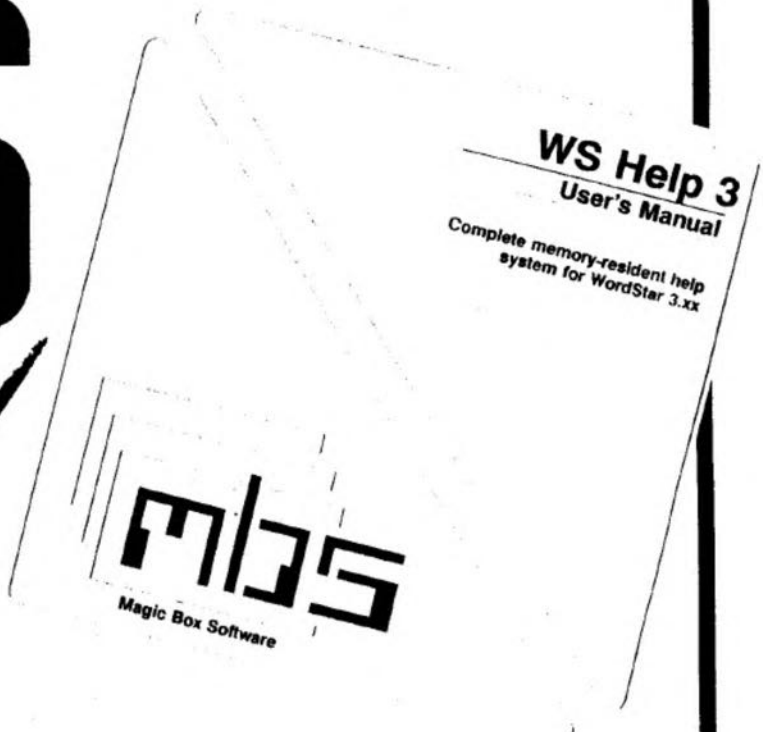

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DEADLINES:
7th of the preceding month.

In a Nutshell

As was said in last month's Nuthshell, we will be devoting each month's magazine to a particular flavour - last month's flavour of the month was "Utilities and Applications".

In this case, our flavours of the month are "Games and Adventures".

I hope you enjoy!

Hard Drive

On our way down to Melbourne, I picked up a hard drive from the Blaxland crew. Now, hard drives are a lot of fun, and can store a LOT of information. Also, it is faster and a lot more reliable than a floppy drive.

Just how much can this particular drive store? Well, a standard disk (35 tracks, single sided) has a capacity of about 630 sectors. The hard drive, on the other hand, can store 78,336 sectors, or 124 standard disks.

However, there is also a price tag attached to this form of media, which is just a little expensive ... about $1600. Then again, it's usually more cost-effective when you're going to use it running a small business (like us).

I've just completed putting all my personal data on the hard drive, and I've still got 69,000 sectors free!

In the near future, we're going to try a few new things in the office, now that we have the hard drive.

For example: True multi-user, multi-tasking. The entire database is going to be put on the hard drive (in my office) which Karen will access.

All this will take time, as like everything else. But in the end, we're going to have everything running smoothly.

Melbourne

Yes, we're back from Melbourne ... and yes, Melbourne is a very nice city. In fact, it's also a very unique city - it's the only place in the world that I know of where you can have all four seasons in the one day ... sunshine and 27 degrees in the morning, cloudy and 19 during the day, raining and 14 during the afternoon, and, with any luck, snow and -4 during the late afternoon/night.

Anyway, we were there for various reasons, including visiting a few user groups. They included the Moe/Morwell Users Group and the Ringwood User Group.

In both cases, the numbers of people who turned up for the meeting was great! The latest topics that were talked about were:

* Latest software
  - Springster
  - Vocal Freedom
  - Thexder
  - Lyra
  - and a few others
* Our latest software
  - New "Best of's" ...
* New Supertex software
  - with software downloads
* The future of the CoCo's
* "Sculptor" database software
  - database creation
* Hard drives
  - as said above
* And a few more items of interest.

If you live in the Moe/Morwell area, then the one to talk to is Joseph Hester, Tel. (051) 277817. This particular group also produces a newsletter.

On the other hand, if you live around the Melbourne area, then you would be inclined to ring Andrew Rawlings, on (03) 894 1443 (at home).

This message was scrawled on a piece of paper from Andrew, so I'll attempt to reproduce what it says:

"Our meetings are usually on the 3rd Wednesday of each month. The location is the Yarra Vally C. of E. School. (Melways ref. 36D12 or 50D1). Starting time is 8.00 pm sharp."

Supertex

Ron Wright has released a new software package called "Supertex", which is an updated version of "CoCoTex". It has a few more options than the older version had, including a totally new concept: the ability to download software.

Downloads

Yes, it's finally happening!

In about 2-3 months from now, you'll be able to download selected programs from the Softgold/CoCoOz monthly tapes, IF you have the Supertext package.

You may ask, "Why only selected programs? Why not the whole lot?"

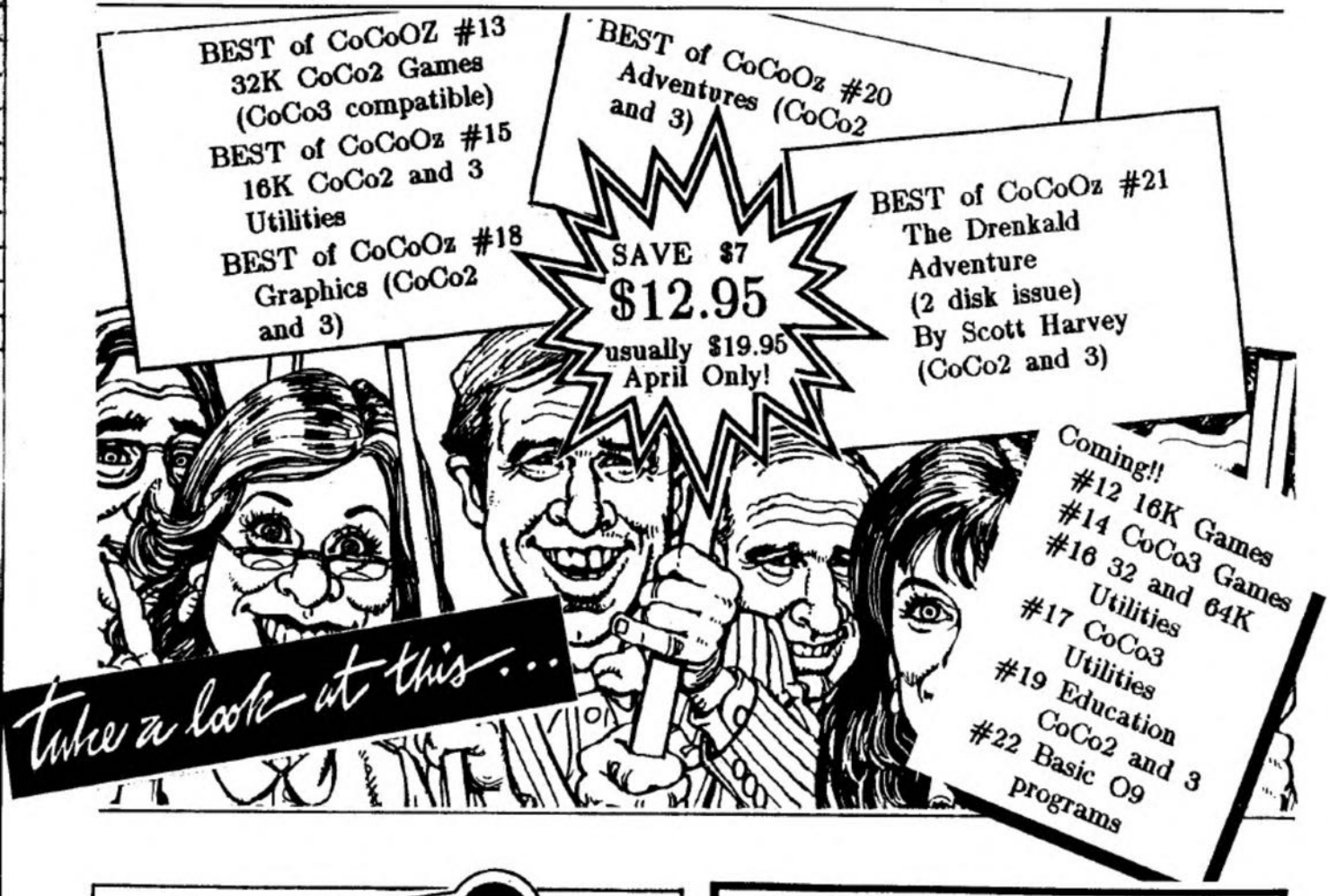
And there is a simple answer to all of that. Cost.

Try this on for size: we converted a program from a late CoCoOz monthly called "3Castle".

Altogether you could be looking at downloading in the order of 200 - 300 frames, and that takes time.

So that's it from me for this month.

Alex



COCO NEWS

WITH GRAHAM MORPHETT

Melbourne.

A big thank you goes to all the people who made our trip to Melbourne so enjoyable and successful.

We (meaning Alex & myself) had a great time with you all.

Special thanks to Andrew Rawlings, who went to inordinate lengths for us, and to his team at the Mooroondah club (ie, the one we've been calling Ringwood for the last four years - sorry about that guys, but we didn't know the difference until this year!).

Also thanks goes to Joe Hester, who organised against great odds, a meeting at Morwell for us - which in many ways was the highlight of the trip.

I think the thing that came out strongest is that unless we as CoCo users start to utilise the power of this amazing computer, and really get our teeth into the OS 9 operating system, then the machine is going to fall on its head.

For heaven's sake, we've been using the same BASIC since 1978 - it's good, but it's not that good! People keep whinging that it only addresses 22K effectively of RAM - well if you are ready to use more memory, then you need to change systems!

It's time to stop living in the past and using just a small proportion of your CoCo's power - it's time to move.

OS 9 admittedly is a bit more complex - but then a Mercedes is more complex than a Mini Moke! And that's the comparison - because when you start to use OS 9, you begin to realise the power of the CoCo - 2 or 3!

IBM's still can't multitask, but we've been able to do it since 1982!

IBM's can't communicate without expensive add on cards - but we can do it using our printer port!

IBM's can't even emulate the Viatel screens without expensive EGA cards.

Our CoCo's can do all this and more.

If you are one of the many who has purchased a CoCo 3, how about trying OS 9 - it will even let you use your old CoCo 2 as a terminal!

Take the plunge and purchase a hard disk - yes I know it's expensive, but if you decided to buy a compatible, you'd pay more.

Use the hard disk as a file server to your two computers - the kids can play games whilst you program or use the word processor - all on the same computer, using the same disk drive! Add a modem and you can log into your computer from work to obtain files or to check on the status of perhaps, your burgular alarm.

The message from this trip is plain - many are bored with their CoCo's - and they have a right to be if they are still doing the things they were doing five years ago. Get off your backside and take the plunge. It's time to learn something new - not for it's own sake any more, but because it opens a whole new world, and a gateway to future systems.

Changes

Oh no, I hear you groan - not more changes!!!

Computer users must be amongst THE conservative people of Australia - something that surprised me when I first became involved with the magazine! I know you all get upset when we change formats, but this next one is one we've actually been asked to do by many of you!

We're about to move all the CoCo material into this magazine.

Sounds easy right? Not really - apart from anything else, it will seriously effect the financial status of Goldsoft until Softgold Magazine becomes a strong magazine for the IBM's in it's own right. Hence the proliferation of special deals we'll be offering in the next few months.

If you want help, we need your help. We're not asking for charity - just purchase something from us that you've been planning to purchase over the next month or so, and that will help immensely.

Now, what's happening?

Well firstly, a lot of extra info is coming your way.

This magazine is going to become a magazine which meets the needs of all CoCo Users.

There's going to be an entirely new service incorporated which lists progressively ALL software, then hardware, available for the CoCo.

This list will be printed every month and updated every month - much in the same way as we update the Users Contacts list (yes, I know - I'll talk about them in a minute!!!).

We'll have the very popular TCKK kid's section in this magazine, and we'll have eight pages of easy programs - provided you send them - every month.

We're also going to continue to supply some printouts of BASIC programs, but the place to get most of these will be CoCoOz - and there will be GOOD descriptions of these programs in the magazine. I'm told that most of you don't type in the listings anyway - is that true?

Finally, we're expanding - with the help of our authors - the articles, OS 9, Forth, Basic 09, C and hardware mods section, to provide ideas and help. We want to challenge you to get going with new ideas and projects.

CoCoOz will therefore be much bigger!

We expect that Softgold on Tape/Disk will cease with the either the May or June '88 issue and that all subscriptions to this product will then be swung over to CoCoOz.

Subscribers already receiving CoCoOz, who also subscribe to Softgold on Tape/Disk, will have their CoCoOz sub extended by an appropriate amount. Advice of the extension will be mailed to you.

CoCoOz now becomes a much larger product.

On tape, expect up to 30 programs a month PLUS our

exciting new Program Resource Database - an extension of the new file we'll list every month in Australian CoCo Magazine.

Disk Users will get all of this, PLUS OS 9 material!!

Basically, this means that now the tapes will be longer and disk users could, on occasion, receive up to 3 disks per month!

In short, CoCoOz, which has always been excellent value for money, now becomes the best value for money resource product available for your CoCo - whether you are a new, middle or long term user, because despite the extra work and product involved, we'will be holding the price at the current level for subscribers. Unfortunately, the cost of individual units, including retail prices, will rise to $19.95.

Now for the first special!

For the LAST time, during the month of April, you can purchase 12 months of CoCoOz for $99! That's a saving of about $24, and it's one we won't be able to repeat with the new format.

User's Group Contacts

For the last month or two, the User's Group list has not been as up to date as we'd like. In fact it may well be that this month's list is not finally up to date either.

This has been caused by staff movements. We apologise for any inconvenience caused, we're confident the list will once more be correct next month.

Users' Groups.

There is only one way to quickly assimilate the quantity of information you need to know when you purchase a new computer, and that is to join a teaching Users' Group - as opposed to a software swapping club.

This magazine has always supported the groups and the learning system, and we reiterate our support of them again - if you are not a member of a group, likely as not you are going to have to rediscover things they could have told you.

You get out of computing what you put in. If you make the effort to get along to a group, you will reap high reward.

In an effort to further encourage Users' Group membership, and to assist our magazine in this time of change, we're offering a special price of $29.95 for 12 months of Australian CoCo Magazine to accredited Users' Group members ONLY.

This price is available to you only during April and May and is by way of recognising the effort and support that the groups provide both the community at large and this magazine. $29.95 is Greg Wilson's old 1983 price - so it's quite a special, and again I don't expect to be repeating the offer.

To be eligible, you must PROVE you are a member of a particular group. A photocopy of a letter from your group contact confirming your membership in 1988 would be a good way to provide proof.

More Best of CoCoOz!!

A whole new series of the "Best of" tapes and disks are being released.

Currently, and as previously announced,

#13 32K Games,
#15 16K Utilities,
#18 Graphics - CoCo 2 & 3,
#20 Adventures - CoCo 2 & 3,
& #21 The Drenkald Adventure by Scott Harvey

are available, and our third special for this month is to release these at $12.95 for the month. Again the price of these in the future will be $19.95, so this is a good opportunity to catch up with some of the top programs of previous magazines at a very reasonable price.

The missing links (!) - #12, #14, #16, #17, and #19 will be released during the next month or so.

The Program Resource Database

As stated earlier, we're about to introduce a new listing in this magazine of products available for the CoCo's 1, 2 and 3.

We're anxious to hear of "one off" producers of product for the CoCo - you know the sort of thing - disk drives, video amps, A-D Converters etc. If you do produce such product, or you know of someone who does, then let us know about it so we can include the details.

Graphics Contest.

As Johanna Vagg reminded me when we visited her on the way home from Melbourne, we did not give the results of the Graphics Contests in the last month's magazine.

Easy to understand really - the last magazine went to the printer's before the contest closed -, well, just after actually - but there wasn't enough time to finally decide.

And the decision has been a very difficult one because we have had entries from a range of people with varied experiences - so putting up one program against another in this case has been tough.

Anyway, enough of our problems.

In the IBM category, we had no graphics programs so there will not be a prize awarded.

In CoCo 2, the quality of programs was very high, and we mention the work of both Nick Kostarellis (Nomadix) and David Thurbon (Crystle) who both turned in very fine work.

However, on this occasion we are awarding the prize of ten boxes of disks to Harlend Kersten, who is 12 and who produced a picture called "Farm".

The award is made having regard for Harlend's age and quantity of years in computing versus the age and quantity of years in computing of Nick and David.

In the CoCo 3 section, we had a quantity of animated scenes. (Remember? We asked for animated scenes.)

David Dyson, winner of the Christmas Graphics competition, turned in a very significant piece of work. We mention his work along with that of Joy Wallace, our favourite CoCo Granny who created two pictures "Snow" and "Mill", both of which would have been very strong contenders if Charles Bartlet with "Animate" had not entered.

Congrats Charles for some very exciting work well done!

Charles not only took the "animation" theme seriously, he also developed our understanding of the CoCo 3 screen and how it operates under BASIC.

Like Harlend, Charles gets ten boxes of disks for his effort!

That's the Graphics competition for now. There'll be another after Conf '88, but in the meantime, there's a heap more to enter - especially, don't forget the Games competition!

The Bi-Centenial competition we previously advertised as completeing in February, will run through to Conf '88.

IBM users are most welcome to enter all categories, and you will be judged against other entries in the IBM world.

We thank all who entered the competition.

We are sorry there could only be two winners, however that is the nature of competitions!

We congratulate you all because we really feel that the standard

this year was as high as anything produced overseas.

The competitions are run to encourage you in your programming activities. We are unable to pay for programs received, although we do provide an incentive scheme for authors in addition to the competitions. The competition system therefore seems to be the best way to get some nice things flowing back to you.

Conf '88

Conf '88 is on in October and October's not that far away - believe it or not!

Next month we'll have reservation forms in the magazine and we would encourage you to get these back to us as quicky as possible as we may have to limit numbers.

Judging from the reaction in Melbourne it looks like this could be our biggest conference, because people are also using the opportunity to visit not only the Gold Coast, but also World Expo '88.

Needless to say, there'll be a lot of the usual, and some unusual too at conference this year - it's live in, so you don't have to worry about accommodation, and you can confidently bring the family, because we'll have non computer activities for them too.

If you want to use the site for accommodation for a few days after Conf '88, you really need to talk to me NOW, as that sort of accommodation has basically dried up in Queensland. I think I can get a few days extension for you if you want to holiday on after conference - but as I say, I need to know NOW!!!

Viatel

At last Supertex is released and the first software downloads off Viatel have been occuring.

As we get into the stride of this system, expect a range of CoCo software on Viatel from us.

The plan currently calls for about 50 programs to be there at any one time, and programs will be moved through the system pretty quickly - probably on a weekly basis, so there'll be quite a bit eventually to go online for!

As for other Viatel news, frankly there isn't much.

The system has been oriented to big business for the last twelve months and unless you are a CoCo or IBM owner, or perhaps a stayer (!), then frankly the system's been quite dull from the home user's point of view.

Of course despite this, Clubroom, our major Bulletin Board, has been very busy, and it must be considered the exception to the above statement - even given my personal bias!!!

Club News

I've not heard from the OS 9 group for a while and I further understand that the phone number has changed, so if anyone could enlighten us all with regard to this, it would be most appreciated.

The Latrobe Valley groups have been considering the problems associated with spending large amounts of time behind a keyboard.

Their latest newsletter discusses in some depth the ergonomic considerations associated with computers. This newsletter is well worth obtaining from Group Contact Joe Hester.

Whilst speaking about Joe, I must apologise to the many who thought they might appear in the magazine - especially to a lovely lady by the name of Jan, who became a target at one of the Viatel bashes - rest easy Jan! The photos didn't come out! But we'd still like a photo of you!!

In fact I lost virtually a whole roll somehow - and I don't feel as bad as I usually would because I hear that the official photographer at a recent Tandy function, who shall remain nameless, lost all his in a similar experiment!!

The Groups in Melbourne all appear to be strong despite the pundits who said that this would be CoCo's last year!

I'm especially impressed by the Mooroondah club because of the work they do with young people, but I heard from other groups whilst there and it may be that next time we might do something at their meetings too - Melbourne's such a BIG place!!

We also received the latest magazine from the Port Noarlunga club in Adelaide and this shows the club as strong as ever. Port Noarlinga is one of the first CoCo User's clubs and for it to be still in existence after all these years with the same man at the top, says a lot for his staying power, patience, and perception!

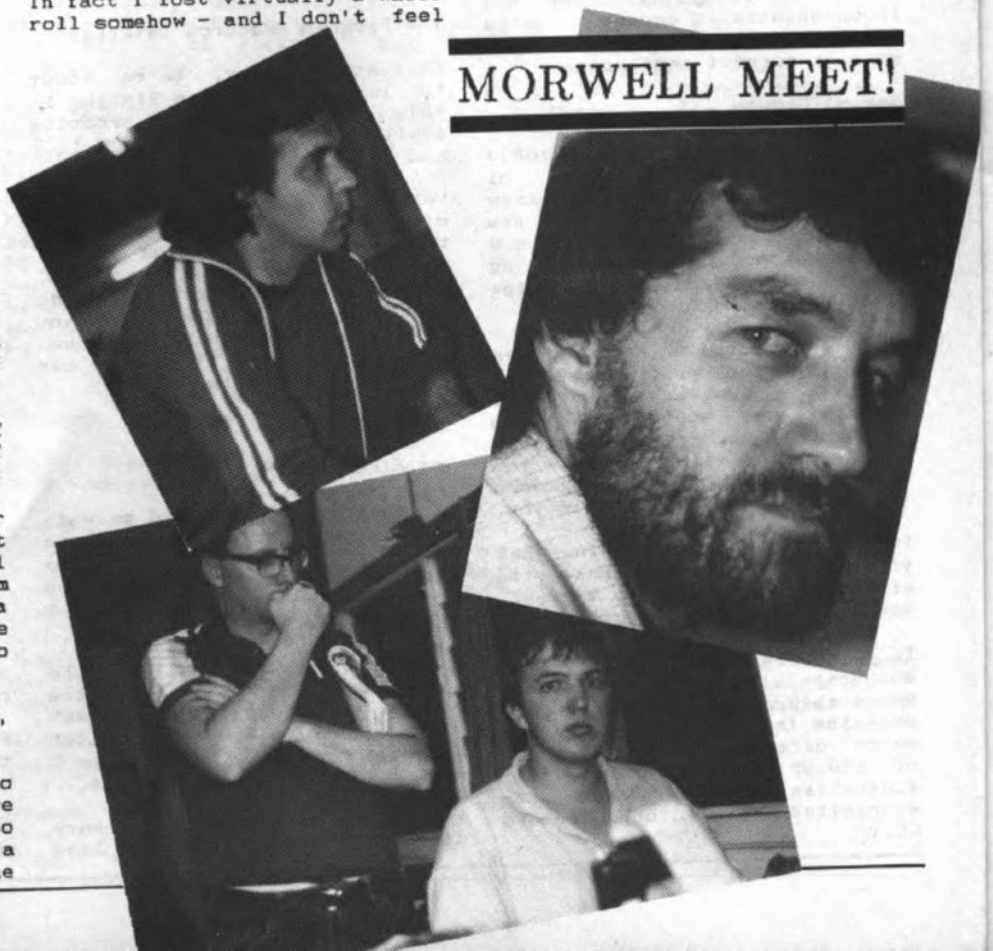
Well done Port Noarlunga, keep up the good work!

I must say, it's nice to be back in an exclusively CoCo Magazine! Softgold is a challenge, and I'm enjoying the work, but this one feels like home!

See you next month!

Graham

MORWELL MEET!



Pile up

SCIENCE PILE UP is a program I wrote for the science talent search in 1985. All instructions are in the program but some of the pictures are a little hard to unscramble.

by Mark Snell
32k ECB CoCo

GAME

The Listing:

```
1 GOTO 10
2 'SCIENCE PILE UP
3 'BY MARK SNELL
4 'APRIL '85
5 'TOUCHED UP OCTOBER '87
6 SAVE"131:3":END'1
7 END
10 D=0
20 B=0
30 CLS
40 DIM B(39,19)
50 CLS
60 PRINT"SCIENCE PILE UP"
70 PRINT
80 PRINT"YOU'RE RACING CAR'S BRA
KES ARE "
90 PRINT"ACTIVATED BY TYPING IN
THE NAME"
100 PRINT"OF THE PIECE OF SCIENT
IFIC      EQUIPMENT ON THE RIGHT
 HAND SIDEOF THE SCREEN"
110 PRINT
120 PRINT"YOU HAVE 2 GUESSES"
130 PRINT"IF YOU DONT STOP IN TI
ME YOU    WILL CRASH INTO THE WA
LL"
140 PRINT:PRINT
150 INPUT"PRESS <ENTER> TO CONTI
NUE";QW$
160 PMODE 3,1:PCLS:SCREEN 1,1
170 LINE(60,0)-(180,50),PSET,B
180 IF D=2 THEN LINE(100,70)-(14
5,163),PRESET,BF
190 IF D=2 THEN CIRCLE(120,50),2
0,8,1,.50,0
200 PAINT(90,20),6,8
210 IF D=2 THEN FOR S=1 TO 1000:
NEXT:CLS 3:GOTO 470
220 DRAW"S4;BM 100,192;U35;R7;D1
5;R5;U25;R5;U30;L5;D10;L6;U25;R6
;D10;R20;U10;R6;D25;L6;U10;L5;D3
0;R5;D25;R5;U15;R7;D35;L7;U15;L1
0;D5;L10;U5;L10;D15;L7"
230 PAINT(118,170),7,8
240 GET(90,99)-(145,200),B,G
250 IF D=1 THEN FOR NN=0 TO 20 S
TEP 2:PUT(90,99-NN)-(145,200-NN)
,B,PSET:NEXT
260 GOSUB 480
270 FOR WQ=1 TO 1500:NEXT
280 CLS
290 INPUT"WHAT IS IT";A$
300 IF A$="BEAKER"THEN C=1
310 IF A$="MEASURING CYLINDER" T
HEN C=2
320 IF A$="CONICAL FLASK" THEN C
=3
330 IF A$="TEST TUBE"THEN C=4
340 IF A$="GRAPH"THEN C=5
350 IF A$="THERMOMETER" THEN C=6
360 IF A$="TEST TUBE RACK"THEN C
=7
370 IF A$="RETORT STAND"THEN C=8
380 IF A$="WATCH GLASS"THEN C=9
390 IF A$="MATCHES"THEN C=10
400 IF A$="BUNSEN BURNER"THEN C=
11
410 IF A$="TRI POD"THEN C=12
420 IF C=A THEN 460
430 CLS2:PRINT"BAD LUCK, THE ANS
WER WAS";:PRINT@32,G$;:PRINT@64,
"PRESS ANY KEY";:EXEC 41393
440 D=D+1:GOTO 160
450 END
460 CLS 4:PRINT"RIGHT,VERY GOOD"
;
470 PRINT@ 32,"WOULD YOU LIKE AN
OTHER GAME";:PRINT @ 64,"";:INPU
T"(Y/N)";W$:IF W$="Y" THEN RUN E
LSE END
480 A=RND(12)
490 PMODE 4,1
500 IF A=1 THEN 620
510 IF A=2 THEN 680
520 IF A=3 THEN 710
530 IF A=4 THEN 740
540 IF A=5 THEN 780
550 IF A=6 THEN 810
560 IF A=7 THEN 850
570 IF A=8 THEN 960
580 IF A=9 THEN 990
590 IF A=10 THEN 1020
600 IF A=11 THEN 1070
610 IF A=12 THEN 1110
620 G$="BEAKER"
630 CIRCLE(190,100),5,7,1,.50,1
640 DRAW"BM195,100;D20"
650 CIRCLE(205,120),10,7,1,0,.50
660 DRAW"BM215,120;U25"
670 RETURN
680 G$="MEASURING CYLINDER"
690 DRAW"BM190,100;F5;D15;L5;D5;
R15;U5;L5;U15;E5"
700 RETURN
710 G$="CONICAL FLASK"
720 DRAW"S6;BM195,100;D5;G10;R25
;H10;U5"
730 RETURN
740 G$="TEST TUBE"
750 DRAW"BM200,95;D22;B;R10;U22"
760 CIRCLE(205,115),5,7,1,0,.50
770 RETURN
780 G$="GRAPH"
790 DRAW"BM195,100;D20;M;L10;R5;
M;U20;R5;M;U15;R5;M;U12;R5;M;U7"
800 RETURN
810 G$="THERMOMERTER"
820 DRAW"BM195,100;F25;E1;F5;G6;
H5;E1;H25;E5"
830 DRAW"BM104,200;C8;F20"
840 RETURN
850 G$="TEST TUBE RACK"
860 LINE(190,100)-(275,125),PSET
,B
870 DRAW"S1;BM200,95;D72;B;R10;U
72"
880 CIRCLE (202,114),1.2,7,1,0,.
50
890 DRAW"S1;BM215,95;D72;B;R10;U
72"
900 CIRCLE(216,114),1.2,7,1,0,.5
0
910 DRAW"S1;BM230,95;D72;B;R10;U
72"
920 CIRCLE(232,114),1.2,7,1,0,.5
0
930 DRAW"S1;BM245,95;D72;B;R10;U
72"
940 CIRCLE(246,114),1.2,7,1,0,.5
0
950 RETURN
960 G$="RETORT STAND"
970 DRAW"BM195,100;M;U5;D5;M;L5;
M;R10;D14;R15;D1;L15;D1;R15"
980 RETURN
990 G$="WATCH GLASS"
1000 CIRCLE(205,110),15,7,.65,0,
.50
1010 RETURN
1020 G$="MATCHES"
1030 LINE(190,100)-(220,150),PSE
T,BF
1040 LINE(230,105)-(230,145),PSE
T
1050 LINE(228,105)-(234,110),PSE
T,BF
1060 RETURN
1070 G$="BUNSEN BURNER"
1080 DRAW"BM190,145;U5;R15;U30;R
10;D20;R15;B;D3;L15;D7;R15;D5;L4
0"
1090 CIRCLE(209.99,130),3,7
1100 RETURN
1110 G$="TRI POD"
1120 DRAW"BM190,100;R10;M;R10;M;
D35"';M;F15;M;G15"
1130 LINE(200,100)-(185,135),PSE
T
1140 LINE(200,100)-(215,135),PSE
T
1150 RETURN
```

Basic Techniques

by Christopher Dent

TUTORIAL

THIS IS THE second part of a series of articles to show you how to get the most out of your programs. In the first part of the series I showed one of the most simple of all sorting routines - The Bubble Sort. In this months article I am going to show you another simple sorting routine - The Selection Sort.

The Selection Sort is in fact a shorter routine than the Bubble Sort and also works faster. The Selection Sort is also different from all other sorting routines as it only swaps one element of an array each pass.

The theory behind the Selection Sort is once again very simple.

On the first pass the entire array of 'n' elements is scanned for the smallest element. Once the smallest element is found, it is swapped with the first element of the array. So now the smallest value is in the first element in the array.

Next, the entire array except the first element (because the first element is already the smallest value in the array) is scanned again to locate the lowest remaining element.

Once it is found it is swapped with the second element of the array.

Now the first two elements of the array are sorted. The array is scanned again, with exception for the first two elements, and once again the lowest element is found and exchanged, this time with the third element of the array.

This task of finding the lowest remaining element and swapping it is done n-1 times (where 'n' is the size of the array).

If you do not understand the above explanation, the following listing (with full comments) of the Selection Sort and a sample run (With a step by step description of each process) should help.

```
10 REM Selection Sort Routine
20 REM Load array AR with 10
   Random Numbers
30 REM Lines 40 to 90 are not
   actually part of the
   Selection Sort routine, But
   are used to load the array
   be to sorted
40 DIM AR(10)
50 PRINT "Unsorted Array"
60 FOR AR=1 TO 10
70 AR(AR)=RND(10)
80 PRINT AR(AR);
90 NEXT AR
100 PRINT
110 REM Selection Sort routine
    starts here
120 FOR PA=1 TO 9
130 REM PA - Number of passes
    needed (One less than the
    number of elements in the
    array)
140 VA=100
150 REM VA - Value of the
    smallest remaining element
    (Must be set to a number
    larger than the largest
    element in the array before
    each new pass)
160 FOR EL=PA TO 10
170 REM EL - Total number of
    elements to scan (Scans
    from PA to end of array
    because all elements before
    element PA are already in
    order)
180 IF AR(EL)<VA THEN VA=AR(EL)
    :PO=EL
190 REM PO - The position of
    the smallest remaining
    element
200 NEXT EL
210 REM Swap element PA with
    the smallest remaining
    element
220 AR(PO)=AR(PA)
230 AR(PA)=VA
240 REM Display Pass Number and
    the Current Status of the
    array
250 PRINT "Pass";PA
260 FOR EL=1 TO 10
270 PRINT AR(EL);
280 NEXT EL
290 PRINT
300 NEXT PA
310 REM The entire array is now
    sorted
320 END
```

An execution of the above program produces something similar to the following ...

```
                Unsorted Array
7 5 1 9 9 1 7 4 4 5
                Pass 1
1 5 7 9 9 1 7 4 4 5
                Pass 2
1 1 7 9 9 5 7 4 4 5
                Pass 3
1 1 4 9 9 5 7 7 4 5
                Pass 4
1 1 4 4 9 5 7 7 9 5
                Pass 5
1 1 4 4 5 9 7 7 9 5
                Pass 6
1 1 4 4 5 5 7 7 9 9
                Pass 7
1 1 4 4 5 5 7 7 9 9
                Pass 8
1 1 4 4 5 5 7 7 9 9
                Pass 9
1 1 4 4 5 5 7 7 9 9
```

In the first pass it scans the entire array and locates the lowest value in the array; in this case the third element which has a value of one.

It then swaps the first and third element (the one and seven).

In the second pass it scans elements 2 through 10 and locates the lowest remaining value, in this case the sixth element, which has the value of one. It is then swapped with the second element of the array, which has a value of five.

In the third pass it scans elements 3 through 10 and locates the lowest remaining value, in this case the eighth element, which has the value of four.

It is then swapped with the third element of the array, which has a value of seven.

The process of locating the lowest value and swapping it continues until it has completed nine passes. After the ninth pass the array is fully sorted.

By studying the sample run you will notice that the array is fully sorted after 6 passes, however unlike the bubble sort we can not set any flags to stop

the sorting prematurely (at least to my knowledge we can't).

So the last three passes must be completed.

Now all I want to do is show how much faster this routine is compared to the Bubble Sort.

To do this, the following changes must be made to the program.

Remove all the REMs (each rem takes time to process).

```
DEL 10-30
DEL 110
DEL 130
DEL 150
DEL 170
DEL 190
DEL 210
DEL 240
DEL 310
```

Delete the lines to display the status of the array after each pass.

```
DEL 250-290
```

Insert a routine to time the sort.

```
110 TIMER=0
310 PRINT TIMER
```

Display the sorted array.

```
311 PRINT "Sorted Array"
312 FOR AR=1 TO 10
313 PRINT AR(AR);
314 NEXT AR
```

And finally, renumber it with RENUM just to make the line numbers increment by 10.

The final product should look like this ...

```
 10 DIM AR(10)
 20 PRINT "Unsorted Array"
 30 FOR AR=1 TO 10
 40 AR(AR)=RND(10)
 50 PRINT AR(AR);
 60 NEXT AR
 70 PRINT
 80 TIMER=0
 90 FOR PA=1 TO 9
100 VA=100
110 FOR EL=PA TO 10
120 IF AR(EL)<VA THEN
    VA=AR(EL):PO=EL
130 NEXT EL
140 AR(PO)=AR(PA)
150 AR(PA)=VA
160 NEXT PA
170 PRINT TIMER
180 PRINT "Sorted Array"
190 FOR AR=1 TO 10
200 PRINT AR(AR);
210 NEXT AR
220 END
```

After running the Bubble Sort and Selection Sort on several different size arrays, the following table was produced...

Array Size	Bubble Sort Time	Selection Sort Time
10	.96	.74
20	3.92	2.36
40	15.50	8.02
80	62.66	29.06
160	250.82	110.28
320	984.30	425.06
640	See Note	1674.32

All the above times are in seconds (I used the timer function) and are the average of ten readings (except for times greater than 900 seconds (quater of an hour) when only five readings were used).

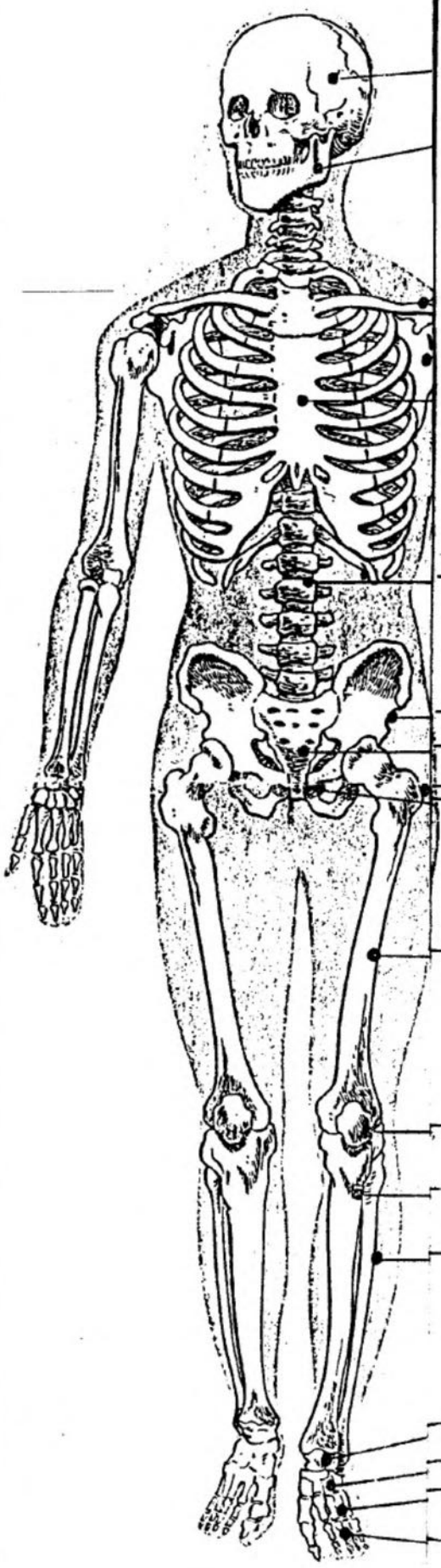
* NOTE *

An array of 640 elements was not Bubble sorted because it would have taken over one hour (3937 seconds or 1 hour, five minutes and 37 seconds, according to my calculations).

Increase In Array Size	Bubble Sort Time Increase Factor	Selection Sort Time Increase Factor
10 - 20	4.08	3.18
20 - 40	3.95	3.40
40 - 80	4.04	3.62
80 - 160	4.00	3.79
160 - 320	3.92	3.85
320 - 640	Unknown	3.93

By studying the above table, you will notice for the Bubble Sort, that if you increase the size of the array by a factor of 2, the time increases by a factor of 4 (+/- .08).

Continued on p14



Which bone?

by Mark Snell
16K ECB CoCo

GAME

"WHICH BONE is that?" was also written for the science talent search in 1985. Again, the instructions are in the program.

Refer to the skeleton of "Fred" to use the program effectively.

The Listing:

```
1 GOTO 10
2 'WHICH BONE IS THAT
3 'BY MARK SNELL
4 'APRIL'85
5 'TOUCHED UP OCTOBER '87
6 SAVE"131A:3":END'1
7 END
10 DIM A(12)
20 CLS
30 GOSUB 590
40 PRINT"WHICH BONE IS THAT"
50 PRINT"I WILL PRINT THE NAME O
F A BONE OR GROUP OF BONES ON TH
E SCREEN.YOU HAVE TO FIND IT ON
THE CHARTTHEN TYPE IN THE CORESP
ONDING   NUMBER"
60 FOR Q=1 TO 11
70 IF Q=11 THEN PRINT"YOU GOT ";
R;"OUT OF TEN":INPUT"ANOTHER GAM
E (Y/N)";AS$:IF AS$<>"N" THEN RU
N ELSE END
80 B=RND(21)
90 FOR Z=1 TO 10
100 IF A(Z)=B THEN 80
110 NEXT Z
120 A(Q)=B
130 ON B GOSUB 170,190,210,230,2
50,270,290,310,330,350,370,390,4
10,430,450,470,490,510,530,550,5
70
140 INPUT"WHAT NUMBER";G
150 IF G=B THEN R=R+1:PRINT:PRIN
T"RIGHT":PRINT
160 PRINT"THE NUMBER WAS";B:NEXT
 Q
170 PRINT"SKULL"
180 RETURN
190 PRINT"MANDIBLE"
200 RETURN
210 PRINT"CLAVICLE"
220 RETURN
230 PRINT"SCAPULA"
240 RETURN
250 PRINT"STERNUM"
260 RETURN
270 PRINT"HUMERUS"
280 RETURN
290 PRINT"SPINE"
300 RETURN
310 PRINT"RADIUS"
320 RETURN
330 PRINT"ULNA"
340 RETURN
350 PRINT"PELVIS"
360 RETURN
370 PRINT"SUCRUM"
380 RETURN
390 PRINT"GREAT TROCHANTER"
400 RETURN
410 PRINT"PUBIS"
420 RETURN
430 PRINT"FEMUR"
440 RETURN
450 PRINT"PATELLA"
460 RETURN
470 PRINT"TIBIA"
480 RETURN
490 PRINT"FIBULA"
500 RETURN
510 PRINT"TALUS"
520 RETURN
530 PRINT"TARSAL BONES"
540 RETURN
550 PRINT"METATARSAL BONES"
560 RETURN
570 PRINT"PHALANGES"
580 RETURN
590 PMODE 3,1:COLOR 4,3:PCLS:SCR
EEN 1,0
600 CIRCLE(60,60),10,,2,.07,.93
610 CIRCLE(160,60),10,,2,.57,.43
620 DRAW"BM70,53;R80;B;D14;L80"
630 PAINT(60,60),4,4
640 FOR WE= 1 TO 1000:NEXTWE
650 RETURN
```

CONF '88 = Koonjewarra, Gold Coast, Qld = October 1 and 2, 1988 = School Holidays = Same time as Expo 88 = Family Fun plus computing = Live on site = CoCo Help = IBM Compatible Help = Programming tuts = Games contest = Bush walking = Something for everyone = From family members to new users to experienced fanatics = The place to be if you want to learn about computers and have fun during the October school holidays = Application forms in this mag next month = BE THERE!

Hextomprise

by Bob Delbourgo
32k ECB CoCo

GAME

THE TWO-PLAYER, topological game of HEX was invented forty years ago in Denmark by Piet Hein. The rules of play are extremely easy, but the strategy is surprisingly intricate.

Moves are made on a rhomboidal board consisting of hexagonal cells; two opposite sides of the board are designated 'black', the other two are 'white' and the corner cells may belong to either side.

The idea is for each player to construct a CONNECTED 'daisy chain' of pieces from his/her side of the board to the other side. The first to succeed wins.

Play alternates, starting with 'black'; each player in turn inserts a piece of his-her colour on any unoccupied cell.

However, at the very beginning, black is barred from inserting his/her first piece on the vertical diagonal of the rhombus, in order to minimise black's starting advantage.

The colours of the sides are indicated by the coloured triangle bordering them.

For CoCo I substituted cyan for black and magenta for white. To my chagrin I have been obliged to write the program as a two-person game, ie CoCo does not play, since it is very hard to devise a perfect game for the computer, wehich takes account of all topological circumstances.

For the same reason, CoCo cannot identify a winning situation - the players must do so themselves. If you want some hints on developing your strategy, I advise you to read Martin Gardner's account of HEX in his book of "Mathematical Puzzles and Diversions".

In the meantime, I guarentee you will not be bored by the subtle variations you are likely to encounter in an actual game.

The Listing:

```
0 GOTO5
1 '***** HEX
2 '***** BOB DELBOURGO
3 SAVE"15A:3":END'1
5 CLS0
6 FORI=1TO13:READD:PRINT@D-1,CHR
$(223);:SOUNDI*10,2:NEXTI
7 FORI=1TO13:READD:SOUNDI*10+10,
2:PRINT@D-1,CHR$(239);:NEXTI
8 FORI=1TO13:READD:SOUNDI*10+20,
2:PRINT@D-1,CHR$(255);:NEXTI
9 PRINT@392,"BY  BOB DELBOURGO";
10 PRINT@0," USE ARROW KEYS AND
'<', '>' TO  MOVE CURSOR. 'ENTER
' TO INSERT.";
15 PRINT" THE FIRST MOVE CANNOT
BE ON THE CENTRAL VERTICAL DIAGO
NAL ..."
20 PRINT@448,"ENTER BOARD SIZE (
>8 & <14)";:INPUTS
21 S=INT(S):IFS<7 OR S>13THENPLA
Y"O5T200GFEDCBAGFEDCBA":GOTO20
30 GOSUB100
31 LINE(128,3)-(128-10*S+4,3),PR
ESET:LINE-(128-10*S+4,5*S+1),PRE
SET:LINE-(128,3),PRESET:PAINT(12
0,6),2,4
32 LINE(128,3)-(128+10*S-4,3),PR
ESET:LINE-(128+10*S-4,5*S+1),PRE
SET:LINE-(128,3),PRESET:PAINT(13
6,6),3,4
33 LINE(128,10*S+7)-(128-10*S+5,
10*S+7),PRESET:LINE-(128-10*S+5,
5*S+10),PRESET:LINE-(128,10*S+7)
,PRESET:PAINT(120,10*S+5),3,4
34 LINE(128,10*S+7)-(128+10*S-4,
10*S+7),PRESET:LINE-(128+10*S-4,
5*S+8),PRESET:LINE-(128,10*S+7),
PRESET:PAINT(136,10*S+5),2,4
40 I=6:J=6:P=0:N=0
45 COLORP+2:LINE(120,180)-(136,1
90),PSET,BF
50 X=128+10*(I-J):Y=5*(I+J+2):GO
SUB1005:PLAY"V5T8L9O1C":GOSUB100
0
55 K$=INKEY$:IFK$=""THEN50
59 IFK$=CHR$(13)THENGOSUB200
60 IFK$="^"THENI=I-1:J=J-1
61 IFK$=CHR$(10)THENI=I+1:J=J+1
62 IFK$=CHR$(8)THENJ=J+1
63 IFK$=CHR$(9)THENI=I+1
64 IFK$="<"ORK$=","THENI=I-1
65 IFK$=">"ORK$="."THENJ=J-1
66 IFJ>S-1 THENJ=S-1:SOUND50,2
67 IFI>S-1 THENI=S-1:SOUND50,2
68 IFJ<0 THENJ=0:SOUND50,2
69 IFI<0 THENI=0:SOUND50,2
70 IFK$="E"THENCLS:END
80 GOTO45
100 PMODE3,1:SCREEN1,1:PCLS1:COL
OR1,4:FORI=0TOS-1:FORJ=0TOS-1:X=
128+10*(I-J):Y=5*(I+J+2):GOSUB10
00:NEXTJ,I:RETURN
200 IFP(I,J)=1OR(N=0ANDJ=I)THENS
OUND200,2:RETURN
205 IFP=0THENPLAY"V30L100T100O1C
EGO2CEGO3CEGO4CEGO5CEG"
206 IFP=1THENPLAY"V30L100T100O5G
ECO4GECO3GECO2GECO1GEC"
210 PAINT(X,Y),P+2,4
220 P(I,J)=1:N=N+1:P=P+1:IFP=2TH
ENP=0
230 RETURN
1000 LINE(X-3,Y-5)-(X+3,Y-5),PRE
SET:LINE-(X+6,Y),PRESET:LINE-(X+
3,Y+5),PRESET:LINE-(X-3,Y+5),PRE
SET:LINE-(X-6,Y),PRESET:LINE-(X-
3,Y-5),PRESET:RETURN
1005 COLOR5:LINE(X-3,Y-5)-(X+3,Y
-5),PSET:LINE-(X+6,Y),PSET:LINE-
(X+3,Y+5),PSET:LINE-(X-3,Y+5),PS
ET:LINE-(X-6,Y),PSET:LINE-(X-3,Y
-5),PSET:RETURN
10000 DATA 170,201,233,265,298,1
72,205,237,269,300,234,235,236
10001 DATA 211,178,177,176,207,2
39,271,304,305,306,275,240,241
10002 DATA 181,213,214,247,280,2
81,313,185,217,216,278,277,309
```

Continued from p12

However, doubling the array size in a Selection Sort does not increase the time taken by a factor of 4 (or even a constant for that matter).

By further analysing the Selection Sort time increase factor you will notice that it is getting closer towards 4.

However the rate at which it is increasing gets smaller and therefore it will get very close to 4 but will never reach it (ie, 4 is its asymptote (I think)).

Maybe someone with a more powerful computer or a M/L expert can find out if the time increase factor will ever reach or exceed 4.

Monster Attack

by David and Adam Dyson
CoCo3

GAME

MONSTER ATTACK IS a game / adventure. You must kill monsters in the prehistoric days. You will have a long piece of rope, a gun, a sword, and a club.

If you get 100 points, you win the game. If you get killed eight times, the game is over.

The Listing:

```
0 GOTO4
1 'MONSTER ATTACK
2 '    BY DAVID D   31/12/87
3 SAVE"115C:3":END'1
4 ON BRK GOTO45
5 POKE65497,0
6 SC=0:KI=0
10 PALETTE9,0:PALETTE10,36:PALET
TE11,25:PALETTE12,38
11 HSCREEN2:HCLS1:HCOLOR8
12 A$="U10R10D10U5L10R10D5BR5"
13 T$="U10NL5R5BD10BR5"
14 C$="BU10NR10D10R10BR5"
15 K$="U10D5M+10,-5M-10,+5M+10,+
5BR5"
16 M$="U10R5ND5R5D10BR5"
17 O$="U10R10D10NL10BR5"
18 N$="U10R5D5R5NU5D5BR5"
19 S$="R10U5L10U5R10BD10BR5"
20 E$="NR10U5NR5U5R5BD10BR5"
21 R$="U10R10D5L5F5BR5"
22 HDRAW"S7BM20,20;"+M$+"BR10"+O
$+"BR10"+N$+"BR10"+S$
23 HDRAW "BR10"+T$+"BR10"+E$+"BR
10"+R$
24 HDRAW"BM30,50;"+A$+"BR10"+T$+
"BR10"+T$+"BR10"+A$+"BR10"
25 HDRAW C$+"BR10"+K$
27 HPRINT(5,7),"BY DAVID DYSON
&  ADAM DYSON"
28 HCOLOR12:HDRAW"BM0,80M+50,-4M
+50,+4M+50,-4M+50,+4M+50,-4M+50,
-4M+20,+4":HPAINT(172,140),12,12
29 HDRAW"BM148,192S17C4;U5LU5LU5
LU5LU3LDLDL2DL3UL2URRURURURURURU
RUR5DRDRDRDRD5RD5RD5RD5RD5"
30 HPAINT(150,192),4,4:HCIRCLE(1
30,82),4,8:HPAINT(130,82),8,8
35 PLAY"V31":FORD=1TO31:PLAY"T25
5O1L255GGFFEEDDCCAABBGV-":NEXT
40 I$=INKEY$:IFI$="" THEN 40
42 GOTO50
45 RGB:CLS:PRINT"BYE SEE YOU LAT
ER":WIDTH32:END
50 WIDTH40:CLS2:LOCATE7,5:ATTR4,
3,B,U:PRINT"***MONTER  ATTACK***
";:ATTR3,1:LOCATE3,6:PRINT"WRITT
EN BY DAVID DYSON & ADAM DYSON";
:LOCATE1,11:PRINT"ADVENTURE GAME
 THAT YOU":LOCATE25,11:ATTR0,7,B
,U:PRINT"KILL MONSTERS";:LOCATE5
,20:ATTR1,4,B
51 PRINT"PRESS ANY KEY FOR INSTR
UCTIONS";
55 IF INKEY$="" THEN 55
60 CLS1:PRINTSTRING$(19,">")
70 LOCATE19,0:PRINTSTRING$(19,"<
")
80 ATTR 2,5,B,U:LOCATE7,2:PRINT"
 MONSTER ATTACK";:ATTR 2,5:LOCAT
E 9,3:PRINT"INSTRUCTIONS";
90 LOCATE2,5:PRINT"In MONSTER AT
TACK you must fight off";
100 LOCATE2,6:PRINT"monsters. Th
e way to do that is you";
110 LOCATE2,7:PRINT"will be sele
cted a monster, there will";
120 LOCATE2,8:PRINT"be four mons
ters. they will be";
130 LOCATE2,9:PRINT"selected ran
domly. You will get a long";
140 LOCATE2,10:PRINT"piece of ro
pe a sword,gun, and a club";
150 LOCATE 2,11:PRINT"you must p
ick one of the following";
160 LOCATE 2,12:PRINT"you have e
ight goes for trying to kill";
170 LOCATE 2,13:PRINT"the monste
r.";
180 LOCATE 2,14:PRINT"Every time
 you kill a monster you will";
190 LOCATE 2,15:PRINT"get 10 poi
nts.";
200 LOCATE 2,16:PRINT"when you g
et 500 points you win";
205 LOCATE2,17:PRINT"If you get
hit twice you DIE";
210 LOCATE 2,19:PRINT"PRESS ANY
KEY TO START YOUR FIGHT";
220 IF INKEY$="" THEN 220
230 HSCREEN2:HCLS12:HCOLOR8:IF S
C=100 THEN GOTO920
231 ' BACK GROUND
232 HDRAW"S4"
240 HDRAW"BM0,46M+12,-4R8M+8,+2M
+8,+4R20M+40,-20R32M+28,+8R32M+4
8,-8R8M+40,+21M+24,-1M+4,+1M+12,
+4
250 HPAINT(0,0),11,8
260 HCOLOR10:HLINE(0,160)-(320,1
92),PSET,BF
270 D$="NU10M+5,-10M-5,+10M-5,-1
0"
280 FOR D=10TO310STEP10:HDRAW"BM
"+STR$(D)+",160C1S4"+D$:NEXT
290 GOTO390
300 'THE BRONTOSAURUS
305 HDRAW"BM244,164C9"
310 RESTORE:FOR D=1TO48
320 READ A,B
330 HLINE-(A,B),PSET
340 NEXT
350 DATA 260,152,276,140,280,128
,276,116,260,108,240,102,216,104
,216,132,192,132,192,128,196,124
,196,104,176,110,120,110,112,108
,112,132,84,132,88,132,88,100,72
,92,64,75,56,64,40,56,24,32,16,3
6,12,52,12,76,16,84,12,96,4,98,0
,88,0,40,8,24,20,16,32,20
360 DATA 60,44,80,66,92,68,124,5
2,156,52,192,76,212,84,260,96,28
8,108,292,116,292,128,280,144,24
4,164
370 HDRAW"BM88,100M+4,-12E8M+12,
-6BM112,108M+8,-4E8BM196,104M-6,
-8U8BM8,96U8EU2":HPAINT(144,80),
0,9:HSET(4,88,8):HPRINT(2,22),"I
T'S A BRONTOSAURUS":RETURN
390 S$="H4U4E4R4F4D4G4L4D4L4D4L4
D4L4D4BR8U4R4U4R2NU8R2D4R4D4BR8U
4L4U4L4U4L4U4"
400 SW$="E4H24E4H4G4H4G4F4G4F4E4
F24":GOTO600
406 'THE TRICERATOPS
410 HDRAW"BM319,104C9M-56,-16M-3
6,-28M-36,-24M-20,-4L56M-16,+4M-
12,+8M-16,-8M-4,-2M-4,+2D12M-4,+
8G4M-12,-2M-36,-6M+32,+12D4G8L8H
4M-4,-8M+4,+16F8M+14,+2U4E2M+12,
-4M+16,-8E6"
420 HDRAW"BM40,88M+2,+6M+16,+1M+
12,-3M+16,-9M+6,-12M-2,-8M-8,-12
M-19,-6U8BM88,44M+4,+12M-2,+7
430 HDRAW"BM80,86M+20,+8BR28M+44
,-6BR38BU2M+52,20M+16,+2M319,104
BM50,68E4F4M-4,+2M-4,-2"
440 HCIRCLE(106,100),9,9,2,.25,.
75:HCIRCLE(136,100),9,9,2,.25,.7
5
450 HDRAW"BM104,116M-4,+12M+20,-
12M-2,+8M+10,-8M-2,+12M+10,-12
460 HCIRCLE(178,100),9,9,2,.25,.
75:HCIRCLE(212,100),9,9,2,.25,.7
5
470 HDRAW"BM176,116G8M+20,-8M-4,
+8M+20,-8G8M+16,-8"
480 HPAINT(136,76),9,9:HPAINT(76
,48),1,9:HPAINT(56,80),12,9
490 HPRINT(2,22),"IT'S A TRICERA
TOPS":RETURN
500 ' THE ANKYLOSAURUS
510 HDRAW"C8BM108,56M+8,+4E4U4F4
R8U2R2DM+24,+1E2F2DB4F2D4M+4,-1R
2DG2M+3,-1R2D2G2M+2,+6E2M+6,+10R
4E2M-2,-16M+8,+12E12M-4,+12F2D4G
3M-12,+2D2G2M-1,+2M+1,+2D18H2G2H
2G2H2G2U4M+4,-8U4M-4,-12M+2,-8"
520 HDRAW"BM108,56M+2,+10M-4,-2D
```

```
4M+1,+2M+7,-2M+8,+2M+8,+4M+2,+4D
4G8L12G4H6U10M+4,-8BM102,88M+2,+
12G4E2F2E2F2E2F2E2U6E4R4NH2M+8,+
4R2D4E2F2E2F2E2F2E2E4U4M-18,+6M+
18,-6R8F4M-4,+8F4E2F2E4R2E2H2M+8
,-12G2H8M-16,-4"
530 E$="U2R2D2L2"
540 HDRAW"BM102,80C8"+E$:HDRAW"B
M116,80"+E$+"BM106,80M+2,+4M+2,-
4L4BM144,68M+8,-4D6M-8,-2BM152,6
0F4E4U4G6"
550 HPAINT(112,88),1,8:HPRINT(2,
22),"IT'S A ANKYLOSAURUS"
560 RETURN
570 'THE TYRANNOSAURUS
586 HDRAW"C9BM264,144M204,124M17
6,108M160,84H12M-12,-8M-16,-8M-1
2,-8M-8,-12H8M-20,-8M-12,-2M-8,+
2L4M-8,+4L7GD5M+20,+6M-16,+8F2R4
U2R8M+4,-1F10D8M+1,+4G4D4F4R4U2N
L2U2L6M+4,-6R3M+4,+6M+1,+12D24M+
4,+12M+10,+12F8D8LD4M-7,+4D2R4E2
F2R2E2F2R2E2F2R2E2U12M-4,-12"
587 HDRAW"BM110,133M-8,-16M+8,+6
R8M+12,-8M+3,+12M-12,-6M+12,+6D2
4G4L4M-4,+1D2R4D2M+4,-2R8D2M+4,-
2R4E4U20M-4,-16M+4,-12BD22BL2N+4
0,+16M+16,+4M264,144"
588 HDRAW"BM60,48E2R2F2R4DR4F12M
+4,+8R8F8D4M+1,+4F16M-4,-12M+10,
+26BM60,24R4BM76,96M+26,+20"
589 HDRAW"BM36,42U4F4U4M+4,+1U3M
+4,+3U4R4BM32,30M+2,+8M+2,-6F4E4
D4E3":HPAINT(116,60),0,9:HPAINT(
92,92),9,9:HPAINT(100,116),0,9
590 HPRINT(2,22),"IT'S A TYRANNP
SAURUS":RETURN
600 R=RND(4):PLAY"V31"
610 IF R=1 THEN GOSUB305:GOTO650
620 IF R=2 THEN GOSUB410:GOTO650
630 IF R=3 THEN GOSUB500:GOTO650
640 IF R=4 THEN GOSUB570:GOTO650
645 IF KI=8 THEN HCOLOR10:HLINE(
0,160)-(320,192),PSET,BF:HCOLOR8
:HPRINT(2,22),"SORRY!!!!!, YOUR
DEAD...GAME OVER.":HPRINT(2,23),
"YOUR SCORE WAS ":HPRINT(17,23),
SC:FORY=1TO10000:NEXT:RGB:END
650 FORD=1TO2000:NEXT:HCOLOR10:H
LINE(0,168)-(320,192),PSET,BF:HC
OLOR8:HPRINT(2,22),"YOU HAVE....
.1>..ROPE 2>... CLUB":HPRINT(2,2
3),"3>...GUN  4>...SWORD PICK WH
ICH ONE"
660 I$=INKEY$:IFI$="" THEN660 EL
SE IF I$="1" THEN 680  ELSE IF I
$="2" THEN 740  ELSE IF I$="3" T
HEN 790 ELSE IF I$="4" THEN 840
670 GOTO660
680 D=RND(4)
685 IF D=1 THEN 690
686 IF D=2 THEN 700
687 IF D=3 THEN 720
688 IF D=4 THEN 730
690 HCOLOR10:HLINE(0,160)-(320,1
92),PSET,BF:HCOLOR8:HPRINT(2,22)
,"YOU TIE THE MONSTERS LEGS":HPR
INT(2,23),"AND THE MONSTER LIES
TO IT'S DEATH":FORD=1TO10000:NEX
T:HCOLOR10:HLINE(0,160)-(320,192
),PSET,BF:SC=SC+10:GOTO230
700 HCOLOR10:HLINE(0,160)-(320,1
92),PSET,BF:HCOLOR8:HPRINT(2,22)
,"YOU TRY TO GET THE ROPE AROUND
":HPRINT(2,23),"THE MONSTERS LEG
S HE BIT YOUR HEAD OFF":PLAY"T25
5L25504V31GGGFFEEDDCCBBAA":KI=KI
+1
710 FOR D=1TO31:PLAY"T5004L255GG
FFEEDDCCBBAA":NEXT:HCOLOR10:HLIN
E(0,160)-(320,192),PSET,BF:GOTO6
45
720 HCOLOR10:HLINE(0,160)-(320,1
92),PSET,BF:HCOLOR8:HPRINT(2,22)
,"THE MONSTER WHIP'S YOU WITH HI
S":HPRINT(2,23),"TAIL":KI=KI+1:F
ORD=1TO31:PLAY"T5004L255GGFFEEDD
CCBBAA":NEXT:HCOLOR10:HLINE(0,16
0)-(320,192),PSET,BF:GOTO645
730 HCOLOR10:HLINE(0,160)-(320,1
92),PSET,BF:HCOLOR8:HPRINT(2,22)
,"THE MONSTER BITE'S SOME OF":HP
RINT(2,23),"YOUR GUT'S AND YOU D
IE!!!!":FORS=1TO30:PLAY"T5004L4G
GFFEEDDCCBBAA":NEXT:HCOLOR10:HLI
NE(0,160)-(320,192),PSET,BF:KI=K
I+1:GOTO645
740 S=RND(4)
741 IF S=1 THEN 750
742 IF S=2 THEN 760
743 IF S=3 THEN 770
744 IF S=4 THEN 780
750 HCOLOR10:HLINE(0,160)-(320,1
92),PSET,BF:HCOLOR8:HPRINT(2,22)
,"YOU HIT THE MONSTER OVER THE "
:HPRINT(2,23),"HEAD, THE MONSTER
 DIE'S!!":PLAY"T50G":FORD=1TO500
0:NEXT:HCOLOR10:HLINE(0,160)-(32
0,192),PSET,BF:SC=SC+10:GOTO230
760 HCOLOR10:HLINE(0,160)-(320,1
92),PSET,BF:HCOLOR8:HPRINT(2,22)
,"YOU TRY TO HIT THE MONSTERS HE
AD":HPRINT(2,23),"YOU MISS AND T
HE MONSTER KILLS YOU":PLAY"T50L4
04GGFFEEDDCCBBAA":FORD=1TO1000:N
EXT:KI=KI+1:GOTO645
770 HCOLOR10:HLINE(0,160)-(320,1
92),PSET,BF:HCOLOR8:HPRINT(2,22)
,"YOU HIT IT IN THE EYE AND THE
":HPRINT(2,23),"MONSTER GOES CRA
ZY AND KNOCK YOU DEAD":PLAY"T50L
404GGFFEEDDCCBBAA":FORD=1TO5000:
NEXT:KI=KI+1:HCOLOR10:HLINE(0,16
0)-(320,192),PSET,BF:GOTO645
780 HCOLOR10:HLINE(0,160)-(320,1
92),PSET,BF:HCOLOR8:HPRINT(2,22)
,"YOU TRY TO HIT IT YOU GET TO "
:HPRINT(2,23),"CLOSE AND HE STEP
S ON YOU":PLAY"T50L4O4GGFFEEDDCC
BBAA":FORD=1TO5000:NEXT:KI=KI+1:
HCOLOR10:HLINE(0,160)-(320,192),
PSET,BF:GOTO645
790 R=RND(4)
800 IF R=1 THEN 810
802 IF R=2 THEN 820
803 IF R=3 THEN 830
804 IF R=4 THEN 810
810 HCOLOR10:HLINE(0,160)-(320,1
92),PSET,BF:PLAY"T25504L4GG":HDR
AW"BM132,72C10"+S$:HPAINT(134,70
),10,10:HCOLOR8:HPRINT(0,22),"YO
U SHOT THE MONSTER AND THE MONST
ER DIE":FORD=1TO5000:NEXT:HCOLOR
10:HLINE(0,160)-(320,192),PSET,B
F:HPRINT(0,22),"SUDDENLY"
811 SC=SC+10:HCOLOR10:HLINE(0,16
0)-(320,192),PSET,BF:GOTO230
820 HCOLOR10:HLINE(0,160)-(320,1
92),PSET,BF:HCOLOR8:HPRINT(2,22)
,"YOU AIM AT THE MONSTER'S HEAD
BUT":HPRINT(2,23),"THEN MONSTER
WHIP'S YOU ,YOU DIE":PLAY"T50L50
5GGFFEEDDCCBBAA":FORD=1TO5000:NE
XT:HCOLOR10:HLINE(0,160)-(320,19
2),PSET,BF:KI=KI+1:GOTO645
830 HCOLOR10:HLINE(0,160)-(320,1
92),PSET,BF:HCOLOR8:HPRINT(2,22)
,"YOU WALK AROUND THE MONSTER TR
Y ":HPRINT(2,23),"TO AIM AT HIS
HEAD":FORD=1TO10000:NEXT:HCOLOR1
0:HLINE(0,160)-(320,192),PSET,BF
831 HCOLOR8:HPRINT(2,22),"YOU TR
IP OVER THE MONSTERS":HPRINT(2,2
3),"TAIL AND HE STEPS ON YOU":PL
AY"T5004L4GGFFEEDDCCBBAA":FORD=1
TO5000:NEXT:KI=KI+1:HCOLOR10:HLI
NE(0,160)-(320,192),PSET:GOTO645
840 R=RND(4)
850 IF R=1 THEN 890
860 IF R=2 THEN 900
870 IF R=3 THEN 910
880 IF R=4 THEN 890
890 HCOLOR10:HLINE(0,160)-(320,1
92),PSET,BF:PLAY"T255GG":HDRAW"C
4BM124,68"+SW$:HCOLOR8:HPRINT(0,
22),"YOU STICK THE SWORD IN THE
":HPRINT(0,23),"MONSTER'S GUT'S
AND HE LIES DEAD":FORD=1TO10000:
NEXT:HCOLOR10:HLINE(0,160)-(320,
192),PSET,BF:SC=SC+10
891 GOTO230
900 HCOLOR10:HLINE(0,160)-(320,1
92),PSET,BF:HCOLOR8:HPRINT(0,22)
,"YOU PULL THE SWORD ABOVE":HPRI
NT(0,23),"YOUR HEAD.THE THING WH
IP'S YOU":PLAY"T50GGFFEEDDCCBBAA
":FORD=1TO5000:NEXT:HCOLOR10:HLI
NE(0,160)-(320,192),PSET,BF:KI=K
I+1:GOTO645
910 HCOLOR10:HLINE(0,160)-(320,1
92),PSET,BF:HCOLOR8:HPRINT(0,22)
,"THE MONSTER KNOCK THE SWORD OU
T OF":HPRINT(0,23),"YOUR HAND ,T
HEN HE STEP'S ON YOU":HCOLOR10:P
LAY"GGFFEEDDCCBBAA":FORD=1TO5000
:NEXT:HLINE(0,160)-(320,192),PSE
T,BF:KI=KI+1:GOTO230
920 HSCREEN2:HCLS7
930 HDRAW"BM32,12R12F10E10R12G20
D28L6U28H20BM80,12R32D44L32U44BF
12R8D20L8U20BM116,12R12D28R8U28R
12D44L32U44BM184,12R12D24M+6,-8M
+6,+8U24R12D44L36U44BM224,12R32D
44L32U44BD16BR12R8D16L8U16BM264,
12R12F12U12R12D44L12H12D12L12U44
"
940 HPRINT(5,10),"WITH A SCORE O
F 100":HPRINT(5,11),KI:HPRINT(8,
11),"KILLES"
950 HPRINT(2,22),"PRESS ANY KEY
TO END"
960 I$=INKEY$:IFI$="" THEN960
970 WIDTH32:POKE65496,0:RGB:END
```

Structured Programming Pt.1

by John Redmond CoCo

ANNOUNCEMENT.

Recent articles in the Australian CoCo have explored some of the special ways in which Forth can be used to develop and manipulate all sorts of data structures to make programs smaller, faster and easier to write. The articles have not appealed to some readers, however, for a number of reasons:

1. Forth is another language, and who wants to be bothered with learning another language?
2. Forth is harder to learn than Basic: any other language will be harder to master than Basic. But Basic was devised as a beginner's language, wasn't it?
3. Forth programs look funny and the arithmetic is back-to-front: if you like lots of brackets, commas and colons Forth is definitely not the language for you - and, if you insist on staying with infix arithmetic and logic, you had better steer well clear of the Artificial Intelligence languages like Lisp, Prolog and Hope.
4. Forth is unfriendly: what rubbish! Forth has the benefits of a compiler together with the interactive nature of an interpreter.
5. Forth costs: E*FORTH has been available for a modest $60 - and well worth it - but few CoCo users, and NO dealers, have been prepared to give it a go. So, in future, the package will be available in the Public Domain.

I have decided to release E*FORTH from copyright for all non-commercial uses in order to help raise the standard of programming on the CoCo. All I ask is that, as a courtesy, E*FORTH be mentioned in any articles which arise from its use. Even though the CoCo 3 has been around for eighteen months now, there is not much new that can be done with the Color Computer - as long as the programming is done in Basic.

Readers should understand what Public Domain means. It means that you can copy from a friend (without being sneaky or feeling guilty). The primary means of distribution for E*FORTH, however, will be through Goldsoft, and the cost will be quite nominal. I want to do it in this way, as an acknowledgement of the contribution of Graham Morphett and the gang to computer education in Australia.

But Public Domain means something else, too. It means that you get something for almost (or absolutely) nothing, and that you are not entitled to ask for more.

And what is this something? E*FORTH is a terrific something. It has total compliance with the Forth-83 standard (and therefore with the majority of the recent textbooks), and has a large number of extensions, including a structured 6809 assembler. It uses the full 64k of RAM and the hires screen for character display, and has a terrific full-screen editor. It is a quality product, which has failed to sell in volume because of the reticence of Australian CoCo users.

In making this give-away decision, I have tried to consider the small band of loyal E*FORTH users. They have the manual, and they will continue to get applications support and library updates at cost.

Freeloaders can join the band by sending $40 to me at 23 Mirool St, West Ryde, NSW 2114.

I hope that this approach will look after the interests of all parties - and promote better programming. At least one impediment has been removed from coming to terms with a real programming language.

LIES, D....D LIES AND BENCHMARKS.

The CoCo is by now a mature product (euphemism for 'old') and I have detected in ranks the feeling that it is time to move on to something better - an Amiga or an AT with EGA card, because they are faster and have better graphics. Now, the latter belief is simply wrong, and has been debunked before in this magazine. I want now to talk about the other fallacy: speed.

A number of benchmarks have been used to compare hardware and software for micros, but the one that has persisted is the notorious Sieve of Eratosthenes, which finds the 1899 prime numbers in the first 8190 odd numbers. The Sieve originated in the pages of Byte magazine, and it tests just two things:

1. the speed of decision making and ...
2. the speed of looping.

It does not even begin to address the efficiency of parameter passing to and from functions and the speed of entry to and exit from the functions. But these are the real run-time overhead of properly modularized programs!

As a result, Forth appears to be about three times slower than code from a C or Pascal compiler. And this is wrong. Because it has no parameter passing overhead and takes very little time entering and leaving modules, a Forth program is at least as fast as one Forth in another language. What is more, it is very easy to integrate assembly code into Forth to get full machine language speed. Rhetoric? Let me prove the point by comparing the performance of structured assembly code (E*FORTH on the CoCo 3 at 1.7 MHz) with three C implementations on the IBM AT (which is over five times faster than the PC!).

Turbo C	: 5.77 sec
Microsoft C	: 9.51 sec
Lattice C	: 13.79 sec
E*FORTH	: 11.2 sec

(source: Borland Advertisement, 'Computer Language' June 1987.

```
SCREEN: 93
00: \ SIEVE BENCHMARK.                                          JWR  31DEC87
01: : SIEVE ;
02: 1 CONSTANT TRUE  0 CONSTANT FALSE
03: 8190 CONSTANT SIZE  CREATE FLAGS SIZE ALLOT
04: : DO-PRIME FLAGS SIZE TRUE FILL
05:    0 ( zero count)  SIZE 0 ( loop indices)
06:    DO  FLAGS I + ( add index to array address) C@ ( TRUE?)
07:       IF I DUP + 3 + DUP I + ( 2i+3 with 3i+3 on top)
08:          BEGIN DUP SIZE < ( wipe out multiples of I)
09:          WHILE FALSE OVER FLAGS + C! OVER + ( inc index) REPEAT
10:       DROP DROP 1+ ( increase count) THEN
11:    LOOP CR  . ." PRIMES" ;
12: : TIMES ( n) 0 DO DO-PRIME LOOP ;
13:
14: \ 10 TIMES timed at 99 sec. on version 4.01 ( 0.9 MHz).
15:
```

```
SCREEN: 96
00: \ Sieve benchmark (assembly).                               JWR  31DEC87
01: : SIEVE ;
02: 40000 CONSTANT FLAGS  FLAGS 8190 + CONSTANT TOP
03: CODE  (PRIMES) Y PSHS FLAGS # LDX  1 # LDB
04:  BEGIN ,X R+ STB TOP # CMPX U< NOT UNTIL
05:   FLAGS # LDX  0 # LDY
06:    BEGIN ,X R+ TST  0= NOT
07:     IF  1 ,Y LEAY  X PSHU  -1 ,X LEAX  X PSHU  D PULU
08:      FLAGS # SUBD  ASLB ROLA  3 # ADDD
09:      BEGIN D ,X LEAX  # TOP CMPX  U> NOT WHILE 0 ,X CLR  REPEAT
10:      X PULU  THEN
11:   TOP # CMPX  U< NOT UNTIL  Y PSHU Y PULS
12: END-CODE
13: : DO-PRIMES  (PRIMES) . ." primes  " ;
14: : TIMES ( n) 0 DO PRIMES LOOP ;
15: \ 25 TIMES takes 22.5 sec at 0.9 MHz.
```

```
SCREEN: 97
00: \ Sieve benchmark in C.                                     JWR  31DEC87
01: main ()
02: {{ int i, prime, k, count, iter;
03: for (iter = 1; iter <= 10; iter++)
04:    {{ count = 0;
05:    for ( i = 0; i <= size; i++) flags[i] = true;
06:    for ( i = 0; i <= size; i++)
07:       {{ if (flags[i])
08:          {{ prime = i + i + 3;
09:             for ( k = i + prime; k <= size; k += prime)
10:               flags[k] = false;
11:          count++;
12:          }}
13:       }}
14:    }}
15:
```

Times are for 25 iterations o the Sieve.)

This (shocking) comparison really illustrates that the quality of code from expensive top-shelf compilers is poor. It is unlikely that very much highly optimized code will be written any more. Now that companies like Microsoft have made the policy decision to write future software in C, all code will be much slower and bulkier than it need be.

STRUCTURED ASSEMBLY CODE

Beginners usually have trouble with assembly for two reasons (apart from its inherently primitive nature): the notation is prefix (not infix!), where the operator comes first (see point 3. above) and nonsense labels are needed to mark points to which loopin and branching occur.

The Forth assembler which we will be using in the coming months differs in two important ways:

1. The notation is postfix (like all Forth code).
2. There are no stupid labels.

Instead, structure control, using IF, ELSE, WHILE and UNTIL, is available (again, like all Forth code).

A simple example of a Forth definition is the word LSHIFTS, which expects on the stack two parameters: a number (to be left-shifted) and the number of left shifts required.

<see table 1>

Without the comments:

<see table two>

The more conventional assembly code would be something like:

```
        LDX   ,U++
        PULU  D
        BEQ   LS9
LS1     ASLB
        ROLA
        LEAX  -1,X
        BNE   LS1
LS9     PSHU  D
        JMP   NEXT
```

For comparison, the functionally equivalent high-level Forth code is:

<table 3>

A better way, using DO .. LOOP, is:

```
: LSHIFTS  ?DUP
   IF  0 DO 2* LOOP  THEN ;
```

I labour this simple example to make the point that, although they differ in speed, ALL definitions do the same thing. Each is a softawre black box which knows its role in life and knows nothing about the outside world other than what is passed to it on the stack. This is Referential Transparency and Functional Programming in all their purity. Whatever language you use, you should strive to construct such black boxes.

THE SIEVE BENCHMARK.

Screens 93, 96 and 97 show the Sieve coded in three different ways. Let's try to understand what the algorithm is about. There are three loops:

1. A simple loop to fill an array (called FLAGS) with ones (scr. 93, line 4 and scr. 96, line 4).
2. A test loop to check which array elements have one in them (scr. 93, line 6 and scr. 96, line 6).
3. A reset loop which, given a loop index (I), starts at index 3I+3, sets this array element to zero, increments the index by 2I+3 and repeats up to the end.

Note the index of an array element is NOT the same as its address. Hence the subtraction of the array base address (FLAGS) to get the index (scr. 96, line 8). The prime count is incremented (scr. 93, line 10 and scr. 96, line 7).

For comparison, the main body of the equivalent C code is in

Continued on p27

<table 1>

```
CODE LSHIFTS  ( unsigned no, #shifts)
 ,U R++ LDX  (get #shifts and set flags)
 D PULU  (get number)
 0= NOT  IF   (if #shifts <> 0)
  BEGIN  ASLB ROLA  (shift left)
    -1 ,X LEAX  (decrement #shifts)
  0= UNTIL  (until counter = 0)
 THEN  (end of conditional code)
 D PSHU  (put result on the stack)
END-CODE
```

<table 2>

```
CODE LSHIFTS  ,U R++ LDX D PULU  0= NOT
 IF  BEGIN  ASLB ROLA
      -1 ,X LEAX  0= UNTIL  THEN
 D PSHU  END-CODE
```

<table 3>

```
: LSHIFTS  ?DUP ( extra copy if <> 0)
  IF  BEGIN SWAP 2* SWAP 1-
  DUP 0= UNTIL  DROP ( counter) THEN ;
```

<tqble 4>

```
: LSHIFTS  ?DUP
  IF  0 DO 2* LOOP  THEN ;
```

The Yurndor Legend

by Scott Harvey
CoCo3 (Disk only)

ADVENTURE

THE TIME IS many centuries ago, in a time when all was possible and the battle between good and evil was not a legend but reality. The earth was preparing for a turning point in its history; a choice must be made between the ways of science and sorcery, which a great many have interests in and who are willing to stop at nothing to see come to pass.

A race hidden from the eyes of man is preparing for the time that was fortold so long ago by the great prophet of their land. The land of Yurndor, a land where the people are not mere mortals but warriors that are the earth's only true hope of salvation.

It was written by the great Yurdonian prophet Rurgez that:

" ... the time will draw near when the imbalance of good and evil shall intrude into reality. Then the earth shall gape wide and into the land of men shall spawn the evil that spills forth from the cracks. That is what we, the warriors of Yurndor, have been preparing for.

Yet only one from among us shall be allowed to walk among the mortals and set right the atrocities that could tear apart the realms of reality forever and allow the powers of evil to take hold.

That one must be the most powerful warrior that has risen among us. For to them will fall a task beyond the means of even the great sorcerer Zergarn himself. Choose wisely who will be the chosen one - it all depends upon it."

So ends the prophecy of Rurgez.

It has fallen to you, the most powerful warrior from amongst all the men, women and children of Yurndor, to be the saviour.

Good luck in your quest, for failure would mean the death of us all.

EXPLANATION

The above legend is the basis for an entire series of graphic adventures set in many varied lands and involving a great number of tasks. Each one may be played seperately as each is an entire adventure in itself, but together they make up the "YURNDOR WARRIOR LEGENDS".

The first in the series is 'The Seal of Yordone' and a background story follows.

THE SEAL OF YORDONE

... the story behind the legend.

Ah, welcome to our humble land, traveller, let us relieve you of your weary disposition by inviting you to be our guest in the local tavern. Are you not the Mighty Warrior of Yurndor that we have heard so much about?

Come, let us share a tale over a drink, and unfortunately it is quite a sad tale I must burden you with.

You see, our troubles began recently, traveller, when one of the men in our village had begun a Cult several months ago. The Cult was devoted to an Evil Sage who was killed many years ago by one of the great Warriors when he had taken control of the Land of Drenkald.

Perhaps you know of it. Anyway, not more than a few weeks ago, our worst fears were realised: Drakkor has been returned to life and is now threatening the very existence of all the known lands. Our village is not as simple as it seems, you might say. You see, the village is built upon the sight of the Point of Joinings. Believed by many to be just a legend, this Point has been found by Drakkor and his new mentor Herax, the leader of the cult, and he has removed the Seal of Yordone that holds together all the Lands at the Point of Joinings.

If, by the next moon in 7 days, the Seal is not replaced then the Join will be broken and all the lands will be overturned and the minions of hell will rise up through the cracks and walk the earth to do as they will.

The Seal itself is hardly more than a silver disc, but what makes it special is that by the light of the 13th Moon, a spell was cast upon it by the Mightiest Sorcerer in our history, Zarkoz. This spell allowed it to hold together the world as we know it. Without it, the world is doomed to be turned into Hell itself and Drakkor will reign supreme.

You see our troubles, traveller ... can you help us in our fight against Drakkor? If you are truely the Mighty Warrior of Yurndor, then you are perhaps the world's last hope.

This is your first task Saviour ... do you accept its challenge?

If so, may the luck of us all go with you!

ABOUT THE PROGRAM

The Seal of Yordone is a graphic adventure that requires a CoCo 3 disk system. Due to the length of the program and memory required it will be necessary for disk users to do a PCLEAR 0 before attempting to type in or run the program each time. This is done by typing the following:-

```
POKE25,14
POKE26,1
POKE3584,0
NEW
```

This will clear all available memory for use in the game. The actual program itself is broken up into 3 main sections, once again for memory reasons.

The first of which is the program that contains the title screen and will start the game when "RUN".

The second of which contains all the data required for the game. This is all put into a

```
,27,0,0
1350 DATA IN THE DEADLANDS,0,31,
0,0,0,0
1360 DATA IN THE CAVERNS,30,0,34
,0,0,0
1370 DATA IN THE CAVERNS,0,0,0,3
3,0,0
1380 DATA AT A STONE DOORWAY,36,
0,0,34,0,0
1390 DATA IN THE CHAMBER OF JOIN
INGS,0,0,0,0,0,0
1400 R= 36:FORI=1TOR:READR$(I):W
RITE#1,R$(I):FORA=1TO6:READD(I,A
):WRITE#1,D(I,A):NEXT:NEXT
1410 REM FORMAT FOR OBJECT DATA=
DESCRIPTION,KEYWORD,ROOM #LOCATI
ON,POINT #VALUE,RESPONSE WHEN EX
AMINED
1420 DATA SWORD,SWOR,0,0,IT IS A
 DRAGON BLADE.
1430 DATA BOARD,BOAR,11,-3,IT IS
 A FLOOR BOARD AND IS LOOSE.
1440 DATA VIAL,VIAL,0,0,IT IS FI
LLED WITH ACID DUST.
1450 DATA POUCH,POUC,1,0,IT IS C
LOSED.
1460 DATA COINS,COIN,0,3,THEY AR
E GOLD AND THERE ARE 2 OF THEM.
1470 DATA MIRROR,MIRR,9,0,IT REF
LECTS BEAUTIFULLY.
1480 DATA SHIELD,SHIE,11,0,IT HA
S BEEN SHINED VERY WELL.
1490 DATA KNIFE,KNIF,0,0,THE SIL
VER BLADE SHINES.
1500 DATA SLOT,SLOT,19,-3,IT IS
GOES A SHORT DEPTH INTO THE GROU
ND.
1510 DATA HOOK,HOOK,0,-3,IT IS C
ONNECTED SOLIDLY TO THE WALL.
1520 DATA WALL,WALL,0,-3,IT IS Y
OUR AVERAGE WALL.
1530 DATA SPELLBOOK,SPEL,25,0,IT
 SEEMS TO BE FILLED WITH SPELLS.
1540 DATA PLATE,PLAT,0,0,IT IS S
ILVER AND ODDLY SHAPED.
1550 DATA CUPBOARD,CUPB,14,-3,IT
 IS CLOSED.
1560 DATA RUG,RUG,21,-3,IT IS AN
 ODD LOOKING RUG.
1570 DATA CRYSTAL,CRYS,19,-3,IT
IS GLOWING AND PRODUCING A BEAM.
1580 DATA CLOAK,CLOA,0,0,IT IS A
 CLOAK OF INVISIBILITY.
1590 DATA SEAL,SEAL,0,0,IT IS TH
E SEAL OF YORDONE.
1600 DATA HOLE,HOLE,36,-3,IT IS
THE POINT OF JOININGS.
1610 DATA SANDWICH,SAND,13,0,IT
LOOKS VERY TEMPTING!
1620 DATA PAPER,PAPE,0,0,THERE I
S SOMETHING WRITTEN ON IT.
1630 DATA BEAM,BEAM,19,-3,THE LI
GHT BEAM SHOOTS INTO THE FLOOR.
1640 DATA DRAGON,DRAG,16,-4,BIG;
 NASTY AND VERY MAD.
1650 DATA DREKENBEAST,DREK,26,-4
,A LARGE BLACK MUTANT DRAGON.
1660 DATA VIPER,VIPE,32,-4,THE S
AND VIPER BLOCKS YOUR WAY EAST.
1670 DATA DARK-CREEPER,DARK,34,-
4,A LARGE BEAST THAT HIDES WITHI
N DARKNESS.
1680 DATA DRAKKOR,DRAK,24,-4,IT
IS THE EMMENSELY POWERFUL SAGE H
IMSELF.
1690 DATA HERAX,HERA,23,-4,DRAKK
OR'S SERVANT IS BLOCKING THE NOR
THERN DOOR.
1700 DATA CARILL,CARI,7,-4,THE M
YSTERIOUS SORCERER IS WAITING.
1710 DATA BARMEN,BARM,6,-4,A LAR
GE BALDING SHADY LOOKING MAN.
1720 DATA DEADSKEL,DEAD,31,-4,A
HALF DEAD EVIL SERVANT OF DARKNE
SS.
1730 DATA GUARD,GUAR,20,-4,HE IS
 AN ORC AND SEEMS INTENT ON STOP
PING YOU.
1740 DATA BRENZORT,BREN,30,-4,AN
 INVISIBLE VAMPIRE BAT.
1750 DATA JERDAN,JERD,0,0,
1760 DATA CHAMBER,CHAM,0,0,
1770 DATA ZARKERN,ZARK,0,0,
1780 DATA MOVENDEL,MOVE,0,0,
1790 O=37:FORI=1TOO:READO$(I,1):
READO$(I,2):READLO(I):READSC(I):
READO$(I,3):WRITE#1,O$(I,1),O$(I
,2),LO(I),SC(I),O$(I,3):NEXT:T=R
ND(-TIMER):FORI=1TOO:IFLO(I)=-2T
HENLO(I)=RND(O):NEXT:ELSENEXT
1800 DATA EXAMINE,INVENTORY,QUIT
,SEARCH,GET,DROP,PUT,THROW,READ,
LIFT,REFLECT,OPEN,PAY,STAB,BRIBE
,SAY,CAST,SCREAM,EAT,RUB
1810 NV= 20:FORI=1TONV
1820 READ V$(I):WRITE #1,V$(I)
1830 IFLEN(V$(I))<4 THEN V$(I)=V
$(I)+CHR$(32):GOTO 1830
1840 V1$=V1$+LEFT$(V$(I),4):NEXT
1850 PRINT #1,V1$
1860 FORI=1TO O
1870 IFLEN(O$(I,2))<4 THENO$(I,2
)=O$(I,2)+CHR$(32):GOTO 1870
1880 N1$=N1$+LEFT$(O$(I,2),4):NE
XT
1890 PRINT#1,N1$
1900 CLOSE#1
2000 CLS0:LOCATE 17,10:PRINT"DON
E.":PALETTE RGB:END
```

⊕

Listing THREE:

```
0 PALETTE0,0:PALETTE14,37:PALETT
E11,64
10 POKE65496,0
20 CLEAR2500
30 DIMR$(36),RM(36),D(36,6),V$(2
0),O$(37,3),LO(37),SC(37),C$(6)
40 OPEN"I",#1,"DATA"
50 R=36:FORI=1TOR:INPUT#1,R$(I):
FORA=1TO6:INPUT#1,D(I,A):NEXT:NE
XT
60 O=37:FORI=1TOO:INPUT#1,O$(I,1
),O$(I,2),LO(I),SC(I),O$(I,3):NE
XT
70 NV=20:FORI=1TONV:INPUT#1,V$(I
):NEXT:INPUT#1,V1$:INPUT#1,N1$
80 CLOSE#1
90 POKE65497,0
100 DATAN,S,E,W,U,D:FORDD=1TO6:R
EADC$(DD):NEXTDD
110 L=1:L5=1:T=0:LN=0:RFL=0:SOP=
0
120 HSCREEN2
130 HCLS11:HCOLOR0:CP=20
140 HLINE(0,0)-(320,90),PSET,B
150 GOSUB3320
160 HPRINT(0,13),"You are ":HPRI
NT(8,13),R$(L)
170 CP=8
180 PC=15
190 HPRINT(0,15),"You see:"
200 Z=0:FORA=1TOO
210 IFLO(A)=LANDPOS(0)+LEN(O$(A,
1))>40THENPC=PC+1:CP=8
220 IFLO(A)=LTHENHPRINT(CP,PC),O
$(A,1)+CHR$(44):Z=1
230 IFLO(A)=LTHENCP=CP+LEN(O$(A,
1))+1
240 NEXT
250 IFZ=0THENHPRINT(6,15),CHR$(8
)+":NOTHING OF INTEREST."
260 HPRINT(0,17),"Obvious exits
lead: "
270 CP=20
280 FORG=1TO6:IFD(L,G)<>0THENHPR
INT(CP,17),C$(G)+CHR$(32)
290 IFD(L,G)<>0THENCP=CP+2
300 NEXT
310 ONBRKGOTO1420
320 X=88:POKE&HE6E2,&H7D:POKE&HE
6E3,&H00:POKE&HE6E7,&H88:POKE&HE
6E8,&HB8:HCLS11:POKE&HE6E2,&H20:
POKE&HE6E3,&H00:POKE&HE6E7,&H9F:
POKE&HE6E8,&HFF:AN$="":I$="":CP=
10:HPRINT(0,19),"WHAT NOW? "
330 HCOLOR14:AN$=INKEY$
340 IFAN$<>""THENHPRINT(CP,19),A
N$:ELSE330
350 IFAN$=CHR$(13)THEN390
360 IFAN$=CHR$(8)ANDX>=96THENX=X
-8:CP=CP-1:HCOLOR11:HLINE(X,160)
-(X-7,151),PSET,BF:HCOLOR14:LNG=
LEN(I$):I$=LEFT$(I$,LNG-1):GOTO3
30
370 I$=I$+AN$:CP=CP+1:X=X+8
380 GOTO330
390 HCOLOR0:POKE&HE6E2,&H88:POKE
&HE6E3,&HB8:HCLS11:POKE&HE6E2,&H
20:POKE&HE6E3,&H00
400 IFI$=""THENHPRINT(0,21),"WHA
T?":GOTO320
410 IFI$="LOOK"THEN130
420 IFLEN(I$)>1THEN460
430 L5=L
440 G=INSTR("NSEWUD",I$):IFG=0TH
ENHPRINT(0,21),"I DON'T UNDERSTA
ND.":GOTO320
450 IFD(L,G)>0THENL5=D(L,G):L=L5
:GOTO130:ELSEHPRINT(0,21),"YOU C
AN'T GO THAT WAY.":GOTO320
460 I$=I$+" ":SP=INSTR(I$,CHR$(3
2))
```

data file on the disk which is loaded each time the main program is run.

The main program is basically all the working section of the game. It includes all the graphics, interpretation, etc, needed to make the game operate.

PREPARING AND LOADING THE GAME

After each program section has been typed in, run the program 'DATCREAT/BAS' this will create the data file used in the game and save it on the disk.

IMPORTANT: This only has to be done once and can then be used idefinately every time you play the game.

Now the game is ready to be played it can be started by typing ...

```
POKE 25,14
POKE 26,1
POKE3584,0
NEW
RUN "BOOT"
```

... which will start the game.

The game plays like most adventure games using two word commands ie, GET POUCH.

Not much more knowledge is required other than, "please save all programs before running", as not doing so may create quite bitter feelings towards the computer through loss, and we wouldn't want that now would we?

Anyway I hope you enjoy playing the game and it is but the first of the series. Watch for the second Legend in the Yurndor Warrior series, "THE THREE KEYS OF SARELTO".

Good Luck and above all have fun!

Anyone wishing to contact me about this program or with any queries may do so by writing to:-

Scott Harvey
12 Dutton Crescent,
Coffs Harbour, NSW 2450.

Listing ONE:

```
0 POKE65497,0:PALETTE10,62:PALET
TE0,0:PALETTE11,64:PALETTE1,8:PA
LETTE2,36:PALETTE3,54:PALETTE4,5
6:PALETTE5,58
1 WIDTH40
2 HSCREEN2:HCLS11
3 HCOLOR0
4 HLINE(10,10)-(300,181),PSET,B
5 HPAINT(0,0),1,0
10 HPRINT(7,2),"THE YURNDOR WARR
IOR LEGENDS":HPRINT(15,4),"LEGEN
D 1"
20 HCOLOR1:HPRINT(10,6),"THE SEA
L OF YORDONE":HCOLOR0
25 HCOLOR2:HPRINT(12,9),"BY SCOT
T HARVEY":HCOLOR0
30 HDRAW"BM120,90;D60;M+30,+15M+
30,-15U60M-20,+5M-10,-5M-10,+4M-
20,-5;BM150,90D75U40R30L60"
40 HDRAW"BM125,95;D2M+13,+20G3R2
E2M+3,+4E2M-3,-4E2U2G3M-13,-20L2
"
50 HCIRCLE(165,110),12:HCIRCLE(1
65,110),10:HDRAW"BM163,110E2F2G2
H2"
60 HDRAW"BM130,140D10M+5,+1M+5,-
1U10H5G5E5U5H2M+2,+7M+2,-7G2;BM1
32,142;R6D2L6U2"
70 HDRAW"BM155,140R8D12R4U12R8U4
L8U6L4D6L8D4"
80 HPAINT(130,110),2,0:HPAINT(15
5,95),3,0:HPAINT(125,130),3,0:HP
AINT(155,130),2,0
90 A$=",95;M+5,+15E10M-15,-5M+15
,+5R20M+15,-5M-5,+15H10F10D30M-1
0,-5G10H10M-10,+5U30R1C11R9C0G5R
10H5R1C11R19C0G5R10H5L1C11L9D15C
0H5R10G5D1C11D4C0R10F5H5G10H10G5
E5R10"
100 HDRAW"BM30"+A$:HDRAW"BM220"+
A$
110 HPAINT(35,100),5,0:HPAINT(75
,100),5,0:HPAINT(225,100),5,0:HP
AINT(265,100),5,0:HPAINT(55,105)
,4,0:HPAINT(240,105),4,0
120 HPRINT(13,21),"PRESS ANY KEY
"
200 IFINKEY$=""THEN200
250 POKE 65496,0
300 LOAD "LEGEND1",R
```

Listing TWO:

```
5 WIDTH 40
10 PALETTE 0,59:PALETTE8,0:PALET
TE9,36
20 ATTR 0,0
30 LOCATE6,1:PRINT"THE YURNDOR W
ARRIOR LEGENDS":LOCATE15,3:PRINT
"LEGEND 1":LOCATE10,5:PRINT"THE
SEAL OF YORDONE":LOCATE13,10:ATT
R1,0,B:PRINT"CREATING DATA";:LOC
ATE17,11:PRINT"FILE";:ATTR0,0:LO
CATE 6,19:PRINT"VERSION 1.00 COP
YRIGHT 1987."
40 LOCATE 12,16:PRINT"BY SCOTT H
ARVEY"
1000 CLEAR2000
1010 OPEN "O",#1,"DATA"
1020 DIMR$(36),RM(36),D(36,6),V$
(20),O$(37,3),LO(37),SC(37),C$(6
)
1030 REM FORMAT FOR ROOM DATA=DE
SCRITION,DESTINATIONS(N,S,E,W,U,
D),HELP RESPONSE
1040 DATA IN A BEDROOM,2,0,0,0,0
,0
1050 DATA IN A CORRIDOR,6,1,0,0,
0,0
1060 DATA AT A MENACING GATEWAY,
0,0,0,32,0,0
1070 DATA IN A CORRIDOR,5,0,0,3,
0,0
1080 DATA IN A LARGE CHAMBER,0,4
,0,0,0,0
1090 DATA IN A BAR,12,2,0,0,0,0
1100 DATA IN A BACKROOM,0,0,0,6,
0,0
1110 DATA IN A SECRET CORRIDOR,0
,0,9,5,0,0
1120 DATA IN A SECRET CORRIDOR,0
,0,10,8,0,0
1130 DATA IN THE DUNGEON,15,0,0,
9,0,0
1140 DATA IN A WEAPONS STORE,0,1
6,12,0,0,0
1150 DATA IN A STREET,17,6,0,11,
0,0
1160 DATA IN THE PANTRY,0,0,14,0
,0,0
1170 DATA IN THE KITCHENS,0,0,15
,13,0,0
1180 DATA IN A CORRIDOR,20,10,0,
14,0,0
1190 DATA IN A DRAGON'S LAIR,0,0
,0,0,0,0
1200 DATA IN A STREET,22,12,0,0,
0,0
1210 DATA IN A SECRET PASSAGE,23
,0,0,0,0,0
1220 DATA IN A PLAIN BRICKED ROO
M,0,0,20,0,0,0
1230 DATA IN THE GUARD ROOM,0,15
,0,0,0,0
1240 DATA IN A SORCERY STORE,26,
0,22,0,0,0
1250 DATA IN A STREET,27,17,0,21
,0,0
1260 DATA AT A DOORWAY,0,0,0,0,0
,0
1270 DATA IN THE INNER SANCTUM,0
,0,0,0,0,0
1280 DATA IN THE SECRET BOOK ROO
M,0,0,0,0,0,0
1290 DATA IN THE DREKEN CHAMBER,
0,0,0,0,0,0
1300 DATA AT THE CITY GATES,0,22
,31,0,0,0
1310 DATA AT A CAVE ENTRANCE,0,0
,29,0,0,0
1320 DATA IN THE CAVERNS,0,0,30,
28,0,0
1330 DATA IN THE CAVERNS,0,0,0,2
9,0,0
1340 DATA IN THE DEADLANDS,0,0,0
```

```
470 V2$=LEFT$(I$,SP-1):N2$=MID$(
I$,SP+1):V$=LEFT$(V2$,4):N$=LEFT
$(N2$,4):V=INSTR(V1$,V$):N=INSTR
(N1$,N$)
480 IFV=0THENHPRINT(0,21),"I DON
'T UNDERSTAND.":GOTO320:ELSEV=(V
-1)/4+1
490 IFN=0THENHPRINT(0,21),"I DON
'T UNDERSTAND.":GOTO320:ELSEN=(N
-1)/4+1
500 ON V GOTO510,550,610,630,660
,720,750,800,860,890,920,960,101
0,1030,1050,1070,1090,1150,1170,
1200
510 IFLO(N)<>-1ANDLO(N)<>LTHENHP
RINT(0,21),"YOU DON'T HAVE THAT
AND I DON'T SEE IT":GOTO320
520 IFO$(N,3)=""THENHPRINT(0,21)
,"NOTHING SPECIAL.":GOTO320
530 HPRINT(0,21),O$(N,3):GOTO320
540 HPRINT(0,21),"You can't exam
ine that!":GOTO320
550 HCLS11:HPRINT(0,0),"YOUR INV
ENTORY:":NH=0
560 CP=2:FORI=1TOO:IFLO(I)=-1THE
NH=1:HPRINT(0,CP),O$(I,1):CP=CP+
1
570 NEXT:IFNH=0THENHPRINT(0,CP+1
),"NOTHING."
580 HPRINT(13,19),"PRESS ANY KEY
":IF INKEY$="" THEN 580 ELSE 590
590 GOTO 130
600 HPRINT(0,21),"I DON'T UNDERS
TAND.":GOTO320
610 END
620 HPRINT(0,21),"I DON'T UNDERS
TAND":GOTO320
630 IFL=31ANDO$(31,3)="IT IS DEA
D"ANDN=31THENHPRINT(0,21),"You h
ave found your knife.":LO(8)=31:
GOTO1220
640 IFL=5ANDN=35THENHPRINT(0,21)
,"You have found a secret corrid
or":D(5,3)=8:GOTO1220
650 HPRINT(0,21),"You find nothi
ng.":GOTO320
660 IFLO(N)=-1THENHPRINT(0,21),"
YOU ALREADY HAVE IT.":GOTO320
670 IFLO(N)<>LTHENHPRINT(0,21),"
I DON'T SEE ONE OF THOSE!":GOTO3
20
680 IFSC(N)=-4THENHPRINT(0,21),"
I'M NOT ATTEMPTING THAT!":GOTO12
20
690 IFSC(N)=-3THENHPRINT(0,21),"
YOU CAN'T GET THAT!":GOTO320
700 LO(N)=-1:CA=CA+1:HPRINT(0,21
),"OKAY. YOU HAVE IT.":GOTO1220
710 HPRINT(0,21),"I DON'T UNDERS
TAND.":GOTO320
720 IFLO(N)<>-1THENHPRINT(0,21),
"YOU DON'T EVEN HAVE IT!":GOTO32
0
730 LO(N)=L:CA=CA-1:HPRINT(0,21)
,"OKAY YOU DROPPED IT.":GOTO1220
740 HPRINT(0,21),"I DON'T UNDERS
TAND.":GOTO320
750 IP$="":IFL=19ANDLO(6)=-1ANDN
=6THENHPRINT(0,21),"WHERE?":GOSU
B1310:IFIP$="SLOT"THENHPRINT(0,2
2),"OKAY!":LO(6)=0:RFL=1:GOTO122
0:ELSEHPRINT(0,22),"THAT WON'T W
ORK!":GOTO320
760 IP$="":IFL=19ANDLO(7)=-1ANDL
O(10)=19ANDN=7ANDRFL=1THENHPRINT
(0,21),"WHERE?":GOSUB1310:IFIP$=
"HOOK"THENHPRINT(0,22),"OKAY!":L
O(7)=0:RFL=2:GOTO1220:ELSEHPRINT
(0,22),"THAT WON'T WORK":GOTO320
770 IP$="":IFL=19ANDLO(8)=-1ANDN
=8ANDLO(11)=19ANDRFL=2THENHPRINT
(0,21),"WHERE?":GOSUB1310:IFIP$=
"WALL"THENHPRINT(0,22),"OKAY":LO
(8)=0:RFL=3:GOTO1220ELSEHPRINT(0
,22),"THAT WON'T WORK":GOTO320
780 IP$="":IFL=36ANDLO(18)=-1AND
N=18THENHPRINT(0,21),"WHERE?":GO
SUB1310:IFIP$="HOLE"THENGOTO1370
ELSEHPRINT(0,21),"What would be
the point of that!":GOTO320
790 HPRINT(0,21),"WHERE?":GOSUB1
310:HPRINT(0,22),"NOPE!":GOTO320
```

After each listing has been typed in, RUN the program "DATCREAT/BAS' this will create the data file used. Then SAVE it to disk.

```
800 IFL=26ANDLO(24)=26ANDN=17AND
LO(17)=-1THENHPRINT(0,21),"The c
loak covers the Drakenbeast,":HP
RINT(0,22),"screaming it explode
s into dust":HPRINT(0,23),"your
cloak also disappears.":LO(24)=0
:LO(17)=0:D(26,1)=21:LO(3)=26:GO
TO1220
810 IFL=31ANDLO(31)=31ANDLO(8)=-
1ANDN=8THENHPRINT(0,21),"The Dea
dskel slumps to the ground":HPRI
NT(0,22),"killed by the silver k
nife.":O$(31,3)="IT IS DEAD":LO(
8)=0:D(31,1)=32:GOTO1220
820 IFL=32ANDLO(25)=32ANDLO(3)=-
1ANDO$(3,3)="IT IS OPEN AND FILL
ED WITH ACID DUST"ANDN=3THENHPRI
NT(0,21),"The vial has hit the v
iper filling it":HPRINT(0,22),"w
ith acid dust and dissolving it.
":LO(25)=0:O$(3,3)="IT IS EMPTY"
:D(32,3)=3:LO(3)=32:GOTO1220
830 IFL=24ANDLO(16)=-1ANDLO(27)=
24ANDSOP=2THENHPRINT(0,21),"Drak
kor has died under the power of"
:HPRINT(0,22),"the crystal combi
ned with the spells":D(24,3)=25:
LO(27)=0:LO(16)=24:GOTO1220
840 IFL=30ANDLO(33)=30ANDLO(16)=
-1ANDN=16THENHPRINT(0,21),"The B
renzort catches the crystal and"
:HPRINT(0,22),"flies away with i
t.":LO(33)=0:LO(16)=0:D(30,2)=33
:GOTO1220
850 IF LO(N)=-1 THEN HPRINT(0,21
),"OKAY.":LO(N)=L:GOTO1220ELSEHP
RINT(0,21),"YOU DON'T HAVE ONE!"
:GOTO 320
860 IFLO(21)=-1ANDN=21THENHPRINT
(0,21),"It says quite simply : Z
ARKERN":GOTO320
870 IFLO(12)=-1ANDN=12THENHPRINT
(0,21),"It says : MOVENDEL":GOTO
320
880 HPRINT(0,21),"YOU CAN'T READ
 THAT!":GOTO 320
890 IFL=11ANDN=2THENHPRINT(0,21)
,"HEY YOU FOUND SOMETHING!":LO(1
)=11:GOTO1220
900 IFL=21ANDLO(15)=21ANDN=15THE
NHPRINT(0,21),"IT IS NOT A RUG A
T ALL!":LO(15)=0:LO(17)=21:GOTO1
220
910 HPRINT(0,21),"You can't read
 that!":GOTO320
920 IFL=19ANDRFL=1ANDN=22THENHPR
INT(0,21),"The beam hits the mir
ror and is":HPRINT(0,22),"reflec
ted onto a hook.":LO(10)=19:GOTO
320
930 IFL=19ANDRFL=2ANDN=22ANDLO(1
0)=19THENHPRINT(0,21),"The beam
hits the mirror and reflects":HP
RINT(0,22),"onto the shield and
then into the wall.":LO(11)=19:G
OTO320
940 IFL=19ANDRFL=3ANDLO(11)=19AN
DN=22THENHPRINT(0,21),"The beam
hits the mirror reflects off":HP
RINT(0,22),"the shield, hits the
 knife blade, and":HPRINT(0,23),
"veers into a gap opening a secr
et door.":D(19,4)=18:SC(16)=0:GO
TO320
950 HPRINT(0,21),"You can't refl
ect that!":GOTO320
960 IFLO(4)=-1ANDN=4THENHPRINT(0
,21),"YOU FIND TWO GOLD COINS!":
LO(5)=-1:O$(4,3)="IT IS OPEN":GO
TO320
970 IFLO(3)=-1ANDO$(3,3)<>"IT IS
 OPEN AND FILLED WITH ACID DUST"
ANDN=3THENHPRINT(0,21),"Okay it
is now open":O$(3,3)="IT IS OPEN
 AND FILLED WITH ACID DUST":GOTO
320
980 IFL=14ANDLO(14)=14ANDO$(14,3
)<>"IT IS OPEN."ANDN=14THENHPRIN
T(0,21),"The cupboard is not bar
e!":LO(13)=14:O$(14,3)="IT IS OP
EN.":GOTO1220
990 IFLO(20)=-1ANDLO(21)=0ANDN=2
0THENHPRINT(0,21),"A paper sandw
ich?!?!":LO(21)=-1:GOTO320
1000 HPRINT(0,21),"You can't ope
n that!":GOTO320
1010 IFL=6ANDLO(5)=-1ANDN=30THEN
HPRINT(0,21),"THANKS MATE! GO TH
ROUGH TO THE":HPRINT(0,22),"BACK
ROOM.":D(6,3)=7:GOTO1220
1020 HPRINT(0,21),"Won't accept
it!":GOTO320
1030 IFL=16ANDLO(23)=16ANDLO(1)=
-1ANDN=23THENHPRINT(0,21),"YOU H
AVE SLAIN THE DRAGON":O$(23,3)="
```

```
IT IS DEAD.":D(16,1)=11:LO(8)=16
:GOTO1220
1040 HPRINT(0,21),"You can't sta
b that.":GOTO320
1050 IFL=20ANDLO(32)=20ANDLO(5)=
-1ANDN=32THENHPRINT(0,21),"The O
rc says: I will not let you pas.
.":HPRINT(0,22),"Oh if you put i
t that way off you go!":HPRINT(0
,23),"and wanders off.":LO(32)=0
:D(20,4)=19:GOTO1220
1060 HPRINT(0,21),"Won't accept
it.":GOTO320
1070 IFL=7ANDN=29THENGOTO1240
1080 HPRINT(0,21),"Nothing speci
al happens.":GOTO320
1090 IFL=3ANDN=34THENL=4:GOTO130
1100 IFL=23ANDN=36ANDLO(28)=23TH
ENHPRINT(0,21),"Grenden screams
and disappears in a":HPRINT(0,22
),"burst of green flames":LO(28)
=0:D(23,3)=24:GOTO1220
1110 IFL=24ANDN=34ANDLO(27)=24TH
ENHPRINT(0,21),"- ZAP / ZIP -":S
OP=1:GOTO320
1120 IFL=24ANDN=36ANDLO(27)=24AN
DSOP=1THENHPRINT(0,21),"- ZIP /
ZAP -":SOP=2:GOTO320
1130 IF L=25 AND N=37 THEN HPRIN
T (0,21),"WOW!!":L=28:HCLS11:GOT
O 1220
1140 HPRINT(0,21),"Nothing speci
al happens.":GOTO320
1150 IFL=34ANDLO(26)=34ANDN=36TH
ENHPRINT(0,21),"The Dark-Creeper
 is terrified at your":HPRINT(0,
22),"screaming and runs away in
a panic!":LO(26)=0:D(34,3)=35:GO
TO1220
1160 HPRINT(0,21),"No reaction!"
:GOTO320
1170 IFLO(20)=-1ANDLO(21)=0ANDN=
20THENHPRINT(0,21),"Yeeeechhh ta
sted like a bit of old":HPRINT(0
,22),"paper!":LO(20)=0:GOTO320
1180 IFLO(20)=-1ANDLO(21)<>0ANDN
=20THENHPRINT(0,21),"Probably wo
uld have tastes better with":HPR
INT(0,22),"the paper in it!":LO(
20)=0:GOTO320
1190 HPRINT(0,21),"I don't think
 that would be wise!":GOTO320
1200 IFLO(13)=-1ANDN=13THENHPRIN
T(0,21),"It is not a plate at al
l!":LO(13)=0:LO(18)=-1:GOTO320
1210 HPRINT(0,21),"Nothing happe
ns.":GOTO320
1220 POKE&HE6E2,&H60:POKE&HE6E3,
&H7C:POKE&HE6E7,&H88:POKE&HE6E8,
&HB8:HCLS11:POKE&HE6E7,&H9F:POKE
&HE6E8,&HFF:POKE&HE6E2,&H20:POKE
&HE6E3,&H00:GOTO140
1230 GOTO320
1240 HCLS11:HPRINT(0,0),"You mus
t be the traveller I have been":
HPRINT(0,1),"told to meet.Welcom
e! The task ahead of":HPRINT(0,2
),"you is not an easy one and I
admire":HPRINT(0,3),"your courag
e for undertaking it."
1250 HPRINT(0,4),"I have some in
formation that is vital":HPRINT(
0,5),"to your quest.":HPRINT(0,6
),"to gain entry to Drakkor's fo
rtress":HPRINT(0,7),"you must ca
st this spell :- JERDEN.":HPRINT
(0,8),"After doing this you shou
ld be in the"
1260 HPRINT(0,9),"fortress. That
 is all I have to tell":HPRINT(0
,10),"you I am afraid. Oh and if
 you visit":HPRINT(0,11),"my sor
cery shop I may have something":
HPRINT(0,12),"that you can use o
n your journey."
1270 HPRINT(0,13),"Other than th
at":HPRINT(0,14),"Good luck and
beware! Drakkor's minions":HPRIN
T(0,15),"are everywhere! Quick l
eave here and":HPRINT(0,16),"beg
in your quest"
1280 HPRINT(5,20),"PRESS ANY KEY
 TO CONTINUE"
1290 IFINKEY$=""THEN1290
1300 GOTO130
1310 CP=7:AN$=""
1320 AN$=INKEY$
1330 HCOLOR14
1340 IFAN$<>""THENHPRINT(CP,21),
AN$ELSE1320
1350 IFAN$=CHR$(13)THENHCOLOR0:R
ETURN
1360 IP$=IP$+AN$:CP=CP+1:GOTO132
0
1370 HCLS11:HPRINT(0,0),"Congrat
ulationsd! You have sealed the":
HPRINT(0,1),"Point of Joinings a
nd Drakkor has been":HPRINT(0,2)
,"defeated and destroyed. You ha
ve solved":HPRINT(0,3),"The Seal
 of Yordone! However....."
1380 HPRINT(0,18),"There are sti
ll more Legends to be":HPRINT(0,
19),"told in your travels.":HPRI
NT(7,22),"PRESS ANY KEY TO CONTI
NUE"1390 IFINKEY$=""THEN1390
1400 HPRINT(18,11),"SO":HPRINT(1
6,12),"GOODBYE!":FORI=1TO4000:NE
XTI:HPRINT(13,13),"UNTIL NEXT TI
ME"
1410 GOTO 1410
1420 PALETTERGB:POKE65496,0:END
1430 HLINE(0,0)-(70,10),PSET:HLI
NE-(70,50),PSET:HLINE-(0,90),PSE
T:HLINE(70,50)-(130,50),PSET:HLI
NE(70,10)-(250,10),PSET:HLINE-(3
20,0),PSET:HLINE(250,10)-(250,50
),PSET:HLINE-(320,90),PSET
1440 HLINE(80,15)-(120,35),PSET,
B:HLINE(83,17)-(117,33),PSET,B:H
LINE(200,15)-(240,35),PSET,B:HLI
NE(203,17)-(237,33),PSET,B:HLINE
(125,65)-(195,75),PSET,B:HLINE(1
20,60)-(125,80),PSET,B:HLINE(195
,60)-(200,80),PSET,B
1450 HLINE(190,50)-(250,50),PSET
:HDRAW"BM125,65;M+5,-15U10D10R5;
BM195,65M-5,-15U10D10L5;BM160,40
;L2H3F3R4F3"
1460 HCIRCLE(160,40),30,0,.3,.50
,.0
1470 HCIRCLE(145,50),9,0,.4:HCIR
CLE(175,50),9,0,.4:HLINE(155,50)
-(165,50),PSET
1480 HDRAW"BM83,30;R2E10M+5;+10M
-2,-3M+7,-7M+7,+10;BM110,25;E5M+
2,+5;BM88,20L1G1D1F1R1E1U1H1"
1490 HDRAW"BM203,30;R34;BM25,20;
M+5,+10M+5,-10F5M-10,+5;BM295,20
;M-5,+10M-5,-10M-5,+5M+10,+5"
1500 PALETTE1,34:PALETTE2,60:PAL
ETTE3,62:PALETTE4,16:PALETTE5,54
:PALETTE6,8:PALETTE7,4:PALETTE8,
61:PALETTE9,56:PALETTE10,36
1510 HPAINT(160,20),3,0:HPAINT(4
0,40),3,0:HPAINT(160,5),3,0:HPAI
NT(260,40),3,0:HPAINT(160,60),8,
0:HPAINT(145,50),2,0:HPAINT(170,
50),2,0
1520 HPAINT(160,35),1,0:HPAINT(1
60,70),1,0:HPAINT(123,70),1,0:HP
AINT(197,70),1,0:HPAINT(95,30),4
,0:HPAINT(100,20),6,0:HPAINT(220
,20),6,0:HPAINT(220,32),5,0
1530 HPAINT(35,25),7,0:HPAINT(28
5,25),7,0:HPAINT(160,80),9,0
1540 HCIRCLE(40,20),5,10:HCIRCLE
(280,20),5,10:HPAINT(40,20),10,1
0:HPAINT(280,20),10,10
1550 RETURN
1560 HLINE(0,0)-(130,20),PSET:HL
INE-(130,60),PSET:HLINE-(0,90),P
SET:HLINE(130,20)-(190,60),PSET,
B:HLINE-(320,90),PSET:HLINE(190,
20)-(320,0),PSET
1570 HDRAW"BM150,60;U25E5R10F5D2
5BM55,30M+5,+10M+15,-10D5M-15,+5
;BM265,30;M-5,+10M-15,-10D5M+15,
+5"
1580 HDRAW"BM75,30;M+4,-5M-1,+5M
+3,-3M-1,+3M+4,+2M-5,+1M+3,+2M-7
,+1"
1590 HDRAW"BM245,30M-4,-5M+1,+5M
-3,-3M+1,+3M-4,+2M+5,+1M-3,+2M+7
,+1"
1600 PALETTE1,60:PALETTE2,34:PAL
ETTE4,56:PALETTE5,36:IF L=2 THEN
 PALETTE3,62 ELSE PALETTE3,30
1610 HPAINT(160,70),4,0:HPAINT(1
60,40),1,0:HDRAW"BM150,60;C1R20C
0":HPAINT(10,10),3,0:HPAINT(160,
10),3,0:HPAINT(280,40),3,0:HPAIN
T(70,35),2,0:HPAINT(250,35),2,0
1620 HPAINT(160,25),3,0:HPAINT(7
7,33),5,0:HPAINT(243,33),5,0
1630 RETURN
1640 HLINE(0,20)-(100,60),PSET,B
:HLINE(220,20)-(320,60),PSET,B:H
LINE(0,60)-(320,60),PSET
1650 FORX=10TO90STEP10:HDRAW"BM"
+STR$(X)+",20;U5H2E2F2G2":NEXTX:
FORX=230TO310STEP10:HDRAW"BM"+ST
R$(X)+",20;U5H2E2F2G2":NEXTX
1660 HDRAW"BM100,60;U50F10U10M+1
0,+5;BM110,20D25M+15,+10E5F5M+15
,-10U35M-10,+5M+10,-5D10E10D50U5
0F10U10M+10,+5;BM170,20;D25M+15,
+10E5F5M+15,-10U35M-10,+5M+10,-5
D10E10D50"
1670 HCIRCLE(130,15),9,0,.4,.50,
.0:HCIRCLE(190,15),9,0,.4,.50,.0
1680 HDRAW"BM115,25;D5R5H5;BM140
,30R5U5G5;BM130,30G5R10H5;BM130,
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15G5F5E5H5;BM120,45;E5R10F5L20;B
M175,25;D5R5H5;BM190,15G5F5E5H5;
BM205,25D5L5E5;BM190,30G5R10H5;B
M180,45;E5R10F5L20"
1690 PALETTE1,60:PALETTE2,59:PAL
ETTE3,36:PALETTE4,51:PALETTE5,62
:PALETTE6,25:PALETTE7,9:PALETTE8
,37:PALETTE9,20
1700 HPAINT(10,5),6,0:HPAINT(40,
40),1,0:HPAINT(260,40),1,0:HPAIN
T(160,70),5,0:HPAINT(115,20),2,0
:HPAINT(175,20),2,0
1710 HPAINT(105,30),7,0:HPAINT(1
65,30),7,0:HPAINT(116,27),3,0:HP
AINT(144,27),3,0:HPAINT(176,27),
3,0:HPAINT(204,27),3,0:HPAINT(13
0,20),4,0:HPAINT(190,20),4,0
1720 HPAINT(130,42),8,0:HPAINT(1
90,42),8,0:HPAINT(130,33),9,0:HP
AINT(190,33),9,0
1730 RETURN
1740 HLINE(0,0)-(95,10),PSET:HLI
NE-(95,60),PSET:HLINE-(0,90),PSE
T:HLINE(320,0)-(225,10),PSET:HLI
NE-(225,60),PSET:HLINE-(320,90),
PSET:HLINE(95,10)-(225,10),PSET
1750 HLINE(135,15)-(185,40),PSET
,B:HLINE(137,17)-(183,38),PSET,B
1760 IF L=5 THEN HDRAW"BM155,23;
D10M+5,+2M+5,-2;U10M-5,-1M-5,+1;
BM158,25;G1D1F1E1U1H1;BM162,25;G
1D1F1E1U1H1;BM160,30M-3,+2R6M-3,
-2
1770 IF L=5 THENHDRAW"BM155,26H2
D6E2;BM165,26E2D6H2;BM137,30;R15
;BM167,30;R15"
1780 HDRAW"BM30,25F10M+15,-10D5M
-15,+5BM55,25E5M-1,+5M+7,+2M-7,+
2M+2,+5M-5,-4"
1790 HDRAW"BM290,25G10M-15,-10D5
M+15,+5;BM265,25H5M+1,+5M-7,+2M+
7,+2M-2,+5M+5,-4"
1800 A$="U2R12D2L12U2R2U18R8D18U
18R2U2L12D2R2":HDRAW"BM109,65"+A
$:HDRAW"BM199,65;"+A$
1810 HDRAW"BM95,60;R16;BM119,60R
82;BM209,60R16"
1820 PALETTE1,60:PALETTE2,36:PAL
ETTE3,62:PALETTE4,56:PALETTE5,34
:PALETTE6,10:PALETTE7,59
1830 IF L=5 THEN PALETTE1,60 ELS
E PALETTE1,59
1840 HPAINT(160,70),4,0:HPAINT(1
60,5),1,0:HPAINT(50,20),1,0:HPAI
NT(270,15),1,0:HPAINT(160,50),1,
0:HPAINT(115,55),3,0:HPAINT(205,
55),3,0:HPAINT(57,27),2,0:HPAINT
(263,27),2,0
1850 HPAINT(50,30),5,0:HPAINT(27
0,30),5,0:HPAINT(160,20),6,0:HPA
INT(175,35),7,0:IF L=5 OR  L=24
AND LO(27)=0 THEN RETURN
1860 HDRAW"C8BM135,90;R50L50M+5,
-45M+10,-5E5F5E5F5M+10,+5M+5,+45
;BM150,40;F10E10G10M+2,+40L4M+2,
-40;BM160,40G2D3R1U3E1F1D3R1U3H2
;BM155,35U15H5M+10,+5M+10,-5G5D1
5BM150,40;M-5,-10M+10,+5;BM170,4
0M+5,-10M-10,+5"
1870 HDRAW"BM157,25U2F2L2;BM163,
25U2G2R2;BM160,27G1R2H1;BM160,31
;G3R6H3C0":PALETTE8,0:PALETTE9,6
2:PALETTE10,36:HPAINT(150,60),8,
8:HPAINT(160,22),9,8:HPAINT(160,
80),10,8:HPAINT(155,40),9,8:HPAI
NT(170,60),8,8
1880 HPAINT (150,35),8,8:HPAINT(
170,35),8,8
1890 RETURN
1900 HLINE(80,42)-(240,55),PSET,
B:HLINE(105,15)-(135,20),PSET,B:
HLINE(78,40)-(242,42),PSET,B
1910 HLINE(0,0)-(90,10),PSET:HLI
NE-(90,35),PSET:HLINE(80,55)-(0,
90),PSET:HLINE(90,10)-(230,10),P
SET:HLINE-(320,0),PSET:HLINE(230
,10)-(230,35),PSET:HLINE(240,55)
-(320,90),PSET
1920 HDRAW"BM78,40;M+12,-5R55;BM
150,35;R10;BM165,35;R65M+12,+5BM
105,20;D15R30U15;BM150,20;R30"
1930 HLINE(20,15)-(70,18),PSET:H
LINE-(70,35),PSET:HLINE-(20,45),
PSET:HLINE-(20,15),PSET:HLINE(22
,17)-(68,20),PSET:HLINE-(68,33),
PSET:HLINE-(22,43),PSET:HLINE-(2
2,17),PSET
1940 HDRAW"BM145,31D2R5U2L5D1M+1
,+4R3M+1,-4":HDRAW"BM160,31D2R5U
2L5D1M+1,+4R3M+1,-4":HDRAW"BM227
,35U7H2E2F2G2D7;BM221,35U7H2E2F2
G2D7"
1950 HDRAW"BM22,35;M+46,-5"
1960 FORX=150TO175STEP5:HDRAW"BM
"+STR$(X)+",20U4E1U3R1D3F1D4":NE
XTX:FORX=110TO130STEP5:HDRAW"BM"
+STR$(X)+",20;F1G1F1G1F1G1F1G1F1
G1F1G1F1":NEXTX
1970 HDRAW"BM185,35U3M+1,-2U1M+1
,-2E2M+2,-1M+3,-1E2F1R4E1F2M+3,+
1M+2,+1F2M+1,+2D1M+1,+2D3L6U1M-1
,-2M+6,-5M-7,+5M+1,+2D1L14U1M+1,
-2M-7,-5R2C11R8U6C0H1U7E1R6F1D7G
1U1C11U4L1C0U2D2L1C11L3C0U2D2R1C
11D1L2D1C0F1R4E1
1980 PALETTE1,54:PALETTE2,8:PALE
TTE3,34:PALETTE4,62:PALETTE5,60:
PALETTE6,32:PALETTE7,56:PALETTE8
,21:PALETTE9,59
1990 HPAINT(10,10),9,0:HPAINT(17
0,5),9,0:HPAINT(270,40),9,0:HPAI
NT(160,70),7,0:HPAINT(120,17),3,
0:HPAINT(160,50),3,0:HPAINT(180,
37),4,0:HPAINT(200,30),8,0:HPAIN
T(200,21),3,0:HPAINT(200,18),5,0
:HPAINT(140,20),9,0
2000 HPAINT(187,33),5,0:HPAINT(2
10,33),5,0:HPAINT(117,30),6,0:HP
AINT(40,25),2,0:HPAINT(40,35),1,
0
2010 HPAINT(160,41),4,0
2020 RETURN
2030 HLINE(0,0)-(80,10),PSET:HLI
NE-(80,60),PSET:HLINE-(0,90),PSE
T:HLINE(320,0)-(240,10),PSET:HLI
NE-(80,10),PSET:HLINE(240,10)-(2
40,60),PSET:HLINE-(320,90),PSET
2040 HLINE(195,60)-(240,60),PSET
:HLINE(140,20)-(180,40),PSET,B
2050 HDRAW"BM125,75R5U15R60D15R5
U20H5L60G5R70L70D20BM130,67R2U7B
M190,67L2U7;BM30,20M+5,+10M+10,-
10D5M-10,+5;BM290,20M-5,+10M-10,
-10D5M+10,+5"
2060 HLINE(140,20)-(180,40),PSET
:HLINE(180,20)-(140,40),PSET
2070 HDRAW"BM85,72;R25M-5,-20U10
G5E8U7H2M-2,-1L3U2M+2,-1M+1,-2U5
M-1,-2M-2,-3M-3,-2M-3,+2M-2,+3M-
1,+2D5M+1,+2M+2,+1D2L3M-2,+1G2D7
F8M+3,-6M-5,-3U3D3M+5,+3L1M+2,+6
M-2,-6M+4,-3U3
2080 HDRAW"BM85,72M+5,-20U10D10M
-5,+20R5M-3,+2D1R6E1R1D1R1U3R2D3
R1U1R1F1R6U1M-3,-2L4M-3,-20M-3,+
20
2090 HLINE(80,60)-(87,60),PSET:H
LINE(125,60)-(108,60),PSET:HLINE
(96,17)-(100,25),PSET,BF
2100 PALETTE1,54:PALETTE2,36:PAL
ETTE3,34:PALETTE4,56:PALETTE5,59
:PALETTE6,61:PALETTE7,62
2110 HPAINT(10,20),5,0:HPAINT(16
0,5),5,0:HPAINT(210,30),5,0:HPAI
NT(250,40),5,0:HPAINT(160,70),4,
0:HPAINT(160,52),7,0:HPAINT(160,
57),3,0:HPAINT(145,30),1,0:HPAIN
T(170,30),1,0:HPAINT(160,25),2,0
:HPAINT(160,35),2,0
2120 HPAINT(100,60),6,0:HPAINT(1
00,40),6,0:HPAINT(97,65),0,0:HPA
INT(43,25),3,0:HPAINT(277,25),3,
0
2130 RETURN
2140 HLINE(0,0)-(130,20),PSET:HL
INE-(130,70),PSET:HLINE-(0,90),P
SET:HLINE(130,20)-(190,70),PSET,
B:HLINE(320,0)-(190,20),PSET:HLI
NE-(190,70),PSET:HLINE-(320,90),
PSET
2150 HLINE(145,35)-(174,70),PSET
,BF
2160 HDRAW"BM40,30;F10M+15,-10D5
M-15,+5;BM280,30;G10M-15,-10D5M+
15,+5;BM65,30;E5M-2,+5M+5,-2;M-5
,+5M+4,+2L4M+3,+3M-6,-4"
2170 HDRAW"BM255,30;H5M+2,+5M-5,
-2M+5,+5M-4,+2R4M-3,+3M+6,-4"
2180 HPAINT(5,40),2,0:HPAINT(315
,40),2,0:HPAINT(160,5),2,0:HPAIN
T(160,75),1,0:HPAINT(160,30),2,0
2190 PALETTE1,56:PALETTE3,36:IF
L=18 THEN PALETTE 2,6 ELSE PALET
TE 2,1
2200 IF L=18 THEN PALETTE2,6
2210 RETURN
2220 HLINE(0,0)-(100,10),PSET:HL
INE-(100,60),PSET:HLINE-(0,90),P
SET:HLINE(320,0)-(220,10),PSET:H
LINE(220,60)-(320,90),PSET:HLINE
(100,10)-(220,60),PSET,B:HLINE(1
45,25)-(175,60),PSET,BF
2230 HDRAW"BM30,81;U51M+30,-5D47
;BM40,40;D10M+10,-2U10;M-10,+2;B
M43,39;D10;BM46,39;D10;BM290,81;
U51M-30,-5D47;BM280,40;D10M-10,-
2U10;M+10,+2;BM277,39;D10;BM274,
39;D10"
2240 PALETTE1,4:PALETTE2,56:PALE
TTE3,34
2250 HPAINT(160,5),2,0:HPAINT(16
0,20),2,0:HPAINT(80,30),2,0:HPAI
NT(240,40),2,0:HPAINT(160,80),3,
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0:HPAINT(45,60),1,0:HPAINT(275,6
0),1,0
2260 RETURN
2270 HLINE(0,0)-(90,10),PSET:HLI
NE-(90,50),PSET:HLINE-(0,90),PSE
T:HLINE(90,10)-(230,10),PSET:HLI
NE-(230,50),PSET:HLINE-(320,90),
PSET:HLINE(230,10)-(320,0),PSET
2280 HLINE(135,40)-(220,60),PSET
,B:HDRAW"BM90,50;R10U25E5R15F5D2
0L25R25D5R10U10E5R75F5D10R10"
2290 IF L= 11 THENHDRAW"BM35,40M
+15,-5D20M-15,+5U20;BM20,30U2M+4
0,-7E2M+5,+2M-5,+2H1;M-40,+7"
2300 IF L=11 THENFORY=50TO15STEP
-10:HDRAW"BM250,"+STR$(Y)+";U2M+
45,+16;D2M-45,-16":NEXTY
2310 IF L=11 THEN HLINE(153,22)-
(177,24),PSET,B:HDRAW"BM155,20;M
+10,+5;BM165,20;M-10,+5":HCIRCLE
(160,20),5,0,1,.50,.0:HCIRCLE(16
0,25),5,0,1,.0,.50
2320 PALETTE1,56:PALETTE2,60:PAL
ETTE3,34:PALETTE4,61:PALETTE5,62
:PALETTE6,24
2330 HPAINT(160,5),2,0:HPAINT(19
0,20),2,0:HPAINT(10,10),2,0:HPAI
NT(310,10),2,0:HPAINT(160,70),1,
0:HPAINT(110,30),4,0:HPAINT(215,
55),3,0:HPAINT(180,37),5,0:IF L=
11 THEN HPAINT(40,45),6,0
2340 IF L=11 THENHPRINT(19,6),"W
EAPONS"ELSE HPRINT(18,6),"SORCER
Y"
2350 RETURN
2360 HLINE(140,0)-(140,40),PSET:
HLINE-(0,80),PSET:HLINE(80,0)-(8
0,56),PSET:HLINE(180,0)-(180,40)
,PSET:HLINE-(320,80),PSET:HLINE(
140,30)-(180,30),PSET:HLINE(260,
0)-(260,62),PSET
2370 HDRAW"BM30,72;U32M+20,-5D31
BM10,15;D20M+10,-3U20M-10,+3;BM5
5,20;M+10,-3U20;BM55,20U18;M+10,
-1
2380 HDRAW"BM105,51U23M+15,-3D21
2390 HCIRCLE(160,30),8,0,.6,.50,
.0
2400 HDRAW"BM210,49;U24M+15,+3;D
25
2410 PALETTE1,4:PALETTE2,34:PALE
TTE3,54:PALETTE4,38:PALETTE5,8:P
ALETTE6,60:PALETTE7,62
2420 HPAINT(160,10),5,0:HPAINT(3
0,10),1,0:HPAINT(40,50),0,0:HPAI
NT(15,20),3,0:HPAINT(60,10),3,0:
HPAINT(100,10),2,0:HPAINT(110,40
),0,0:HPAINT(200,10),6,0:HPAINT(
220,40),0,0:HPAINT(300,10),1,0:H
PAINT(160,28),4,0:HPAINT(160,60)
,7,0
2430 RETURN
2440 HLINE(0,70)-(90,70),PSET:HL
INE(230,70)-(320,70),PSET:HLINE(
120,15)-(200,70),PSET,B
2450 HDRAW"BM120,70;M-30,+10U75M
+30,+10;BM95,15D57;M+20,-7U45;M-
20,-5;BM200,15;M+30,-10D75M-30,-
10;BM205,20;M+20,-5D57M-20,-7U45
"
2460 FORY=60TO30STEP-10:HDRAW"BM
130,"+STR$(Y)+";R60":NEXTY
2470 PALETTE1,4:PALETTE2,34:PALE
TTE4,60:PALETTE5,56
2480 HPAINT(10,10),4,0:HPAINT(10
,80),5,0:HPAINT(95,10),1,0:HPAIN
T(100,30),2,0:HPAINT(160,25),2,0
:HPAINT(215,40),2,0:HPAINT(215,1
5),1,0
2490 HPRINT(17,1),"PANTRY"
2500 RETURN
2510 HLINE(60,0)-(260,60),PSET,B
:HLINE-(320,90),PSET:HLINE(60,60
)-(50,65),PSET
2520 HDRAW"BM50,70U15L15M-40,+10
M+10,+5M+40,-15D15M-20,+10U17D17
M-20,+10U20D20M-10,-4"
2530 HDRAW"BM80,70;R5U5R40D5R5U1
0H5L40G5D10;BM87,65D2L2;BM123,65
D2R2BM160,60U40E10R40F10D40"
2540 HPAINT(165,30),7,0
2550 HDRAW"BM190,10NG10ND10NF10;
BM200,20;R5E5M-5,+10F5D5G5L30H5U
5E5M-5,-10F5R30;BM175,35E2M+3,+1
G1M-3,+1
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Watch for the second legend in the YURNDOR WARRIOR series...
'THE THREE KEYS OF SARELTO'

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2560 HLINE(80,15)-(110,17),PSET,
B:HLINE(80,25)-(110,27),PSET,B
2570 HDRAW"BM170,60;M-5,-15M+10,
+5U10M+5,+10E10D10E5F5M+5,-10M+5
,+10E5M-5,+15"
2580 PALETTE1,60:PALETTE2,56:PAL
ETTE3,34:PALETTE4,4:PALETTE5,36:
PALETTE6,62:PALETTE7,57
2590 HPAINT(10,10),1,0:HPAINT(13
0,10),1,0:HPAINT(310,10),1,0:HPA
INT(20,75),3,0:HPAINT(40,65),3,0
:HPAINT(190,55),3,0:HPAINT(100,6
3),4,0:HPAINT(190,55),5,0
2600 HPAINT(5,80),4,0:HPAINT(190
,30),0,0:HPAINT(20,63),6,0:HPAIN
T(105,57),6,0:HPAINT(160,80),2,0
:HPAINT(1,88),2,0
2610 RETURN
2620 '
2630 HLINE(0,10)-(320,10),PSET:H
LINE(0,30)-(80,15),PSET:HLINE-(1
30,55),PSET:HLINE(195,55)-(245,1
5),PSET:HLINE-(320,30),PSET:HLIN
E(0,90)-(90,80),PSET:HLINE-(150,
78),PSET:HLINE-(170,78),PSET:HLI
NE-(230,80),PSET:HLINE-(320,90),
PSET
2640 HDRAW"BM85,80;U5;M+3,-14M+2
,-6H5U9E1R3F1D4U4E1R3F1D4U4E1R3F
1D4U4E1R3F1D9G5M+2,+5M+8,+10D9M+
10,-9R85M+10,+9U9M+8,-10M+2,-5H5
U9E1R3F1D4U4E1R3F1D4U4E1R3F1D4U4
E1R3F1D9G5M+2,+6M+5,+20
2650 HDRAW"BM135,15M+10,+5E5F5R1
5E5F5M+10,-5M-5,+10M-3,+15M-2,+5
M-5,+6G5L15H5M-5,-5M-2,-5M-3,-15
M-5,-10;BM153,54M-3,+10BM172,54M
+3,+10
2660 HDRAW"BM150,60M-10,-5L20M-1
7,+5;BM175,60M+10,-5R20M+17,+5;B
M150,25D5R10M-10,-5;BM165,30R10U
5M-10,+5;BM150,45E5R15F5L25R2F2E
2R17G2H2;BM152,49;R21G2L17H2R4E1
F1R9E1F1
2670 HDRAW"BM85,45;R20;BM220,45R
20":FORX=85TO100STEP5:HDRAW"BM"+
STR$(X)+",45M+2,+5M+3,-5":NEXTX:
FORX=220TO235STEP5:HDRAW"BM"+STR
$(X)+",45M+2,+5M+3,-5":NEXTX
2680 PALETTE1,16:PALETTE2,22:PAL
ETTE3,36:PALETTE4,8:PALETTE5,56:
PALETTE6,60:PALETTE7,54
2690 IF L=26 THEN PALETTE 1,0:PA
LETTE2,6
2700 HPAINT(160,5),6,0:HPAINT(11
0,20),4,0:HPAINT(160,35),1,0:HPA
INT(160,65),1,0:HPAINT(160,74),2
,0:HPAINT(95,70),1,0:HPAINT(230,
70),1,0
2710 HPAINT(152,27),3,0:HPAINT(1
73,28),3,0:HPAINT(160,42),2,0:HP
AINT(160,50),2,0
2720 FORX=83TO103STEP5:HPAINT(X,
46),7,0:HPAINT(X+135,46),7,0:HPA
INT(X,43),2,0:HPAINT(X+135,43),2
,0:NEXTX
2730 HPAINT(160,85),5,0
2740 RETURN
2750 PALETTE1,9:PALETTE2,36:PALE
TTE3,62:PALETTE 4,53:PALETTE5,54
:PALETTE 6,0
2760 HLINE(0,30)-(320,30),PSET:H
CIRCLE(295,10),5
2770 HPAINT(10,40),3,0
2780 HPAINT(10,10),1,0:HPAINT(29
5,10),2,0
2790 FOR X=0 TO 325 STEP 27:HCIR
CLE(X,35),15,4,.9,.50,.0:NEXT X
2800 HCOLOR4:HLINE(0,38)-(320,38
),PSET:HCOLOR0
2810 HPAINT(1,33),4,4
2820 FOR X=10 TO 310 STEP 27:HCI
RCLE(X,42),15,5,.9,.50,.0:NEXTX
2830 HCOLOR5:HLINE(0,47)-(320,47
),PSET:HCOLOR0
2840 HPAINT(1,43),5,5
2850 PALETTE 6,62
2860 IF L=32  THEN HDRAW"BM160,6
5;F5R8M+4,-2R7F2D1R3U3L2M-3,-2L7
M-4,+2L8M-5,-3"
2870 IF L=31 THEN HDRAW"BM160,75
;E5U8L2M-3,-2U2D2H2F2L2R2M+2,+3M
+3,+1U2E2M-2,-5M+5,-3M+5,+3M-2,+
5F2R2M+3,-2U2D2R2L2E2G2M-3,+3M-2
,+1U2D2D6F5M-5,-2L10M-5,+2BM169,
56R1BM172,56L1;BM169,60U1R2D1;BM
168,70R4U5H2G2D5"
2880 RETURN
2890 PALETTE 1,62:PALETTE2,1:PAL
ETTE3,55:PALETTE4,11
2900 HLINE(0,50)-(320,50),PSET
2910 FOR X=0 TO 320 STEP 8:A=RND
(17):HLINE(X,47)-(X+4,47-A),PSET
```

```
:HLINE-(X+8,47),PSET:A=RND(13):H
LINE(X,3)-(X+4,3+A),PSET:HLINE-(
X+8,3),PSET:NEXTX
2920 HPAINT(20,48),1,0:HPAINT(1,
2),1,0
2930 HPAINT(20,25),2,0
2940 HPAINT(120,65),3,0
2950 IF L=35 THEN PALETTE5,56:HC
OLOR5:HLINE(135,15)-(185,50),PSE
T,BF:HCOLOR0:HLINE(140,20)-(180,
50),PSET,BF
2960 IF L=36 THEN HCIRCLE(160,70
),20,,.34:HPAINT(160,70),3,0:HCI
RCLE(160,70),15,,.34:HPAINT(160,
70),0,0
2970 RETURN
2980 HLINE(0,0)-(100,10),PSET:HL
INE(100,60)-(0,90),PSET:HLINE(22
0,10)-(320,0),PSET:HLINE(220,60)
-(320,90),PSET:HLINE(100,10)-(22
0,60),PSET,B
2990 PALETTE 1,62:PALETTE2,60:HP
AINT(160,5),1,0:HPAINT(10,10),1,
0:HPAINT(310,10),1,0:HPAINT(160,
40),1,0:HPAINT(160,70),2,0
3000 IF L=19 THEN RETURN ELSE 30
10
3010 PALETTE 3,0
3020 HDRAW"C3;BM120,70;R5U10R30D
10R5U15L40R40H5L30G5D15"
3030 IF LO(32)=20 THENHDRAW"C3BM
170,70R8U5M+2,-8M+2,+8D5R8U1M-4,
-1U3M+2,-8U8M-8,+1M-8,-1D1M+8,+1
M+8,-1M-8,+1M-8,-1D8M+2,+7D3M-4,
+1D1"
3040 IF LO(32)=20 THENHDRAW"BM17
2,49M-2,-14M+5,-2R10M+5,+2M-2,+1
4BM177,33U2R6D2U2M+2,-4U3L10M+5,
-4M+5,+4L10D3M+2,+4;BM176,25R2D1
L2U1;BM182,25R2D1L2U1;BM178,28R1
;BM181,28R1;BM178,30R4;BM170,35M
-7,+8D3M+7,+4R2;BM171,42G3F4"
3050 IF LO(32)=20THEN HDRAW"BM19
0,35M+7,+8D3M-7,+4R2;C3BM189,42F
3G4F4C0
3060 PALETTE 4,18:PALETTE5,37:PA
LETTE6,34:PALETTE7,60:IF LO(32)=
20THENHPAINT(180,45),4,3:HPAINT(
185,55),5,3:HPAINT(180,26),7,3:H
PAINT(168,41),7,3:HPAINT(192,41)
,7,3:HPAINT(140,57),6,3:RETURN
3070 HPAINT(140,57),6,3:RETURN
3080 HLINE(40,0)-(40,60),PSET:HL
INE-(0,90),PSET:HLINE(40,60)-(70
,60),PSET:HLINE(80,60)-(280,60),
PSET:HLINE-(320,90),PSET:HLINE(2
80,0)-(280,60),PSET
3090 HLINE(40,60)-(280,60),PSET
3100 HDRAW"BM120,60;U40M+30,-10R
10D50U50R10M+30,+10D40;BM155,35G
5;BM165,35F5"
3110 IF LO(28)=0 THEN PALETTE 1,
16:PALETTE2,19
3120 HPAINT(170,20),3,0:HPAINT(1
50,20),3,0:HPAINT(10,10),4,0:HPA
INT(110,10),4,0:HPAINT(310,10),4
,0:HPAINT(160,80),5,0
3130 HDRAW"BM120,60;U40M+30,-10R
10D50U50R10M+30,+10D40;BM155,35G
5;BM165,35F5"
3140 IFLO(28)=23THENHDRAW"C6BM90
,70M-10,-5G5H5M-10,+5E10U10H5U10
M-15,-15M+10,+5M+10,-5U10F2M+3,-
2M+3,+2E2D10M+10,+5M+10,-5M-15,+
15D10G5D10F10;BM70,60H10M-10,-30
U3L2R2D3L2R2D3L2R2;BM80,60E10M+1
0,-30R2L2D3R2L2U6R2L2;BM72,14F2;
BM78,14G2;BM72,20E2R2F2C0"
3150 PALETTE1,1:PALETTE2,59:PALE
TTE5,46:PALETTE4,55:PALETTE6,0:I
F LO(28)=23 THEN HPAINT(75,30),2
,6:HPAINT(60,35),1,6:HPAINT(90,3
5),1,6:PALETTE3,56 ELSE PALETTE
3,0
3160 IF LO(28)=0 THENPALETTE 6,4
6:PALETTE2,46
3170 RETURN
3180 HLINE(0,0)-(70,10),PSET:HLI
NE(70,60)-(0,90),PSET:HLINE(250,
10)-(320,0),PSET:HLINE(250,60)-(
320,90),PSET:HLINE(70,10)-(250,6
0),PSET,B
3190 FOR Y=60 TO 10 STEP -10:HLI
NE(70,Y)-(250,Y),PSET:NEXT Y
3200 FOR X=70 TO 245 STEP 5:HLIN
E(X,10)-(X,60),PSET:NEXT X
3210 PALETTE 13,6:PALETTE12,56:H
PAINT(10,10),13,0:HPAINT(160,5),
13,0:HPAINT(310,10),13,0:HPAINT(
160,80),12,0:RETURN
3220 HLINE(0,0)-(90,70),PSET,B:H
LINE(230,0)-(320,70),PSET,B:HLIN
E(110,40)-(210,40),PSET:HCIRCLE(
160,40),10,0,1,.50,.0
3230 HDRAW"BM30,15;D30M+15,+10M+
15,-10U30L30R15D40U20M-15,-5;BM4
5,35M+15,-5BM260,15;D30M+15,+10M
+15,-10U30L30R15D40U20M-15,-5;BM
275,35M+15,-5"
3240 HDRAW"BM90,70;D5M+20,-5U70;
BM230,70D5M-20,-5U70"
3250 PALETTE 1,38:PALETTE2,62:PA
LETTE3,8:PALETTE4,11:PALETTE5,60
:PALETTE6,34:HPAINT(10,10),5,0:H
PAINT(310,10),5,0:HPAINT(160,10)
,3,0:HPAINT(160,38),1,0:HPAINT(1
60,80),2,0:HPAINT(35,25),4,0:HPA
INT(50,45),4,0:HPAINT(265,25),4,
0:HPAINT(285,45),4,0
3260 HPAINT(100,20),6,0:HPAINT(2
20,20),6,0
3270 RETURN
3280 HLINE(0,60)-(320,60),PSET:H
DRAW"BM130,60;M-5,-20M+10,-5M-5,
-15M+10,+5U5R5M+5,-10F10E5F5E10D
20E10M+5,+10M-5,+10M+5,+10M-5,+1
0"
3290 PALETTE 1,56:PALETTE 2,62:H
PAINT(160,40),0,0:HPAINT(40,30),
1,0:HPAINT(10,80),2,0
3300 RETURN
3310 GOTO 3310
3320 ON L GOSUB1430,1560,1640,15
60,1740,1900,2030,2140,2140,2220
,2270,2360,2440,2510,1560,2620,2
360,2140,2980,2980,2270,2360,308
0,1740,3180,2620,3220,3280,2890,
2890,2750,2750,2890,2890,2890,28
90
3330 RETURN
```

Continued from p19

screen 97. These screens will repay some study as they illustrate some differences in language emphasis and style. C, for instance, usually does not require explicit calculation of adresses (as in scr. 93, line 6), while Forth does not need the explicit declaration of the local variables (it uses the stack instead).

I look forward to writing further articles in this series. Now that I've freed myself from producing further B*FORTH revisions (all written in assembly!), I have the time to explore things which I enjoy more: writing portable applications programs and utilities. I will therefore be writing about manipulation the RS-DOS directory and files created under it, using buffered I/O, syntax parsing, writing an IEEE floating point package, writing a Prolog interpreter, etc, etc. I feel good about doing this, because I know that I am using principles and algorithms which are valid in all languages - and I am using a standard language which is available on every computer. Guess the first high-level language for OS/2? You got it!

(Forth? - Ed.)

Eno

by Tom Hitchins
32k ECB CoCo

GAME

THIS GAME IS ACTUALLY created by someone else, and given to me when I bought something from Computer Hut Software (a long time ago).

Anyway, "Eno" is quite a good combination game/adventure, and the storyline goes something like this:

"Your eccentric Aunt has just died and left you her estate - she had millions. If you find 'it', it's yours!"

At the startup of the game, you are given one clue, and the game commences from there.

The Listing:

```
0 GOTO10
1 '***** ENO
3 SAVE"44A:3":END'1
10 CLEAR1000
20 CLS:PRINT@12,"<<ENO>>":PRINT@
107,"CREATORS:":PRINT@138,"PAUL
AUSTIN":PRINT@174,"AND":PRINT@20
1,"LEROY C. SMITH"
30 PRINT@320,"COPYRIGHT 1982 BY
PAL CREATIONS";
40 DIMA$(16),B$(29),A(29),B(16,6
),C$(6),C(10):A=5:B=0
50 FORC=1TO6:READC$(C):NEXTC
60 C=0
70 C=C+1:READA$(C):IFA$(C)="END"
 THEN 90
80 FORD=1TO6:READB(C,D):NEXTD:GO
TO70
90 C=0
100 C=C+1:READB$(C):IFB$(C)="END
"THENE=C-1:GOTO110:ELSEREADB$,A(
C):H$=H$+B$:GOTO100
110 C=0
120 C=C+1:READB$:IFB$="END"THEN1
30ELSEC$=C$+LEFT$(B$,3):GOTO120
130 CLS:PRINT"YOUR ECCENTRIC AUN
T HAS JUST     DIED AND LEFT YOU
HER ESTATE.    SHE HAD MILLIONS."
:PRINT"IF YOU FIND IT, IT'S YOUR
S!!!   YOUR ONLY CLUE: LIVING RO
OM!?!?!"
140 PRINT@169,"GOOD HUNTING.":PR
INT:PRINT@456,"[PRESS ANY KEY]"
150 IF INKEY$=""THEN150
160 CLS:PRINT@8,"YOUR VOCABULARY
:":PRINTTAB(11)"PUSH=MOVE":PRINT
TAB(11)"TAKE=GET":PRINTTAB(11)"L
OOK=EXAMINE":PRINTTAB(11)"DROP=L
EAVE":PRINTTAB(11)"TEAR=BREAK":P
RINTTAB(11)"TURN=CHANGE":PRINTTA
B(11)"QUIT=END":PRINTTAB(14)"REA
D":PRINTTAB(14)"OPEN"
170 PRINTTAB(14)"HELP":PRINTTAB(
11)"INVENTORY":PRINT@452,"[PRESS
 ANY KEY TO START]"
180 IF INKEY$=""THEN180
190 CLS
200 F=1
210 PRINT"YOU ARE ";
220 PRINTA$(F)
230 PRINT"YOU CAN SEE: ":I=0
240 FORJ=1TOE
250 IF INT(A(J))<>INT(F)THEN270
260 PRINT "  "B$(J):I=1
270 NEXT:IFI=0THENPRINT"  NOTHIN
G IMPORTANT"
280 PRINT"YOU CAN GO: "
290 FORJ=1TO 6
300 IFB(F,J)<>0THENPRINT" *"C$(J
);
310 NEXT
320 PRINT
330 PRINTSTRING$(32,61);
340 SOUND150,1
350 INPUT"WHAT NOW";B$
360 IFB$=""THEN350ELSEIFB$="LOOK
"THENCLS:GOTO210
370 IFB$="QUIT"ORB$="END"THENEND
380 IFLEFT$(B$,2)="GO"THENPRINT"
USE SINGLE LETTERS TO INDICATE
DIRECTION (EXAMPLE, N=NORTH)":GO
TO330
390 IFLEFT$(B$,3)<>"INV"THEN450
400 PRINT"YOU ARE CARRYING:":I=0
410 FORJ=1TOE
420 IFA(J)=-1THENPRINTB$(J):I=1
430 NEXT:IFI=0THENPRINT"NOTHING"
440 GOTO330
450 IFLEN(B$)=1THEN640
460 IFB$="HELP"THEN710
470 K=INSTR(B$,CHR$(32)):IFK=0TH
ENPRINT"TRY USING TWO WORD COMMA
NDS.":GOTO330
480 E$=LEFT$(B$,K-1):G$=MID$(B$,
K+1)
490 D$=LEFT$(E$,3):F$=LEFT$(G$,3
)
500 IFD$="TAK"THEND$="GET"
510 IFD$="LEA"THEND$="DRO"
520 IFD$="LOO"THEND$="EXA"
530 IFD$="MOV"THEND$="PUS"
540 IFD$="TEA"THEND$="BRE"
550 IFD$="TUR"THEND$="CHA"
560 L=(INSTR(C$,D$)+2)/3:IFL<1TH
ENCLS:PRINT"SORRY, I JUST DON'T
KNOW HOW TO":PRINTE$" ANYTHING."
:GOTO210
570 M=(INSTR(H$,F$)+2)/3:IFM<1TH
ENCLS:PRINT"SORRY, YOU JUST DON'
T SEE ANY ":PRINTG$" HERE.":GOTO
210
580 IFM=18ANDF=15THENM=25
590 IFM=18ANDF=13THENM=23
600 IFM=14ANDF=11THENM=19
610 IFM=14ANDF=15THENM=26
620 IFM=20ANDF=15THENM=27
630 IFLEN(B$)>1THEN760
640 L=0:CLS:IFB$="N"ANDB(F,1)<>0
THENF=B(F,1):GOTO210
650 IFB$="S"ANDB(F,2)<>0THENF=B(
F,2):GOTO210
660 IFB$="E"ANDB(F,3)<>0THENF=B(
F,3):GOTO210
670 IFB$="W"ANDB(F,4)<>0THENF=B(
F,4):GOTO210
680 IFB$="U"ANDB(F,5)<>0THENF=B(
F,5):GOTO210
690 IFB$="D"ANDB(F,6)<>0THENF=B(
F,6):GOTO210
700 GOTO760
710 O=O+1
720 IFO=>6 THEN PRINT"THAT'S ENO
UGH HELP FOR YOU.      YOU CAN'T
CALL FOR HELP EVERY   TIME YOU A
RE PUZZLED.":GOTO330
730 IFO=1THENPRINT"CURIOSITY KIL
LED THE CAT.":GOTO330
740 IFF=5THENPRINT"TOO MUCH TV I
S NOT GOOD FOR YOU.":GOTO330
750 PRINT"I'M SO CONFUSED!!!":GO
TO330
760 I=0:IFA(M)=F THENI=1ELSEIFA(
M)=-1THENI=2
770 ONL GOTO800,910,940,1070,114
0,1450,1490,1540,1570,1630
780 IFLEN(B$)=1THEN PRINT"YOU CA
N'T GO THAT WAY!":GOTO210
790 PRINT"I DON'T UNDERSTAND WHA
T YOU ARE TELLING ME.":GOTO330
800 '
810 IFI=2THENPRINT"YOU ALREADY H
AVE IT!":GOTO330
820 IFI=0THENPRINT"YOU DON'T SEE
 IT HERE.":GOTO330
830 IFB=>A THENPRINT"YOU CAN'T C
ARRY ANYTHING ELSE!":GOTO330
840 IFM=7THENCLS:PRINT"C O N G R
 A T U L A T I O N S ! YOU ARE N
OW A MILLIONAIRE!!!!!!!DON'T SPE
ND IT ALL IN ONE PLACE!":GOTO219
0
850 IFM=4ORM=6ORM=10ORM=11ORM=14
ORM=16ORM=17ORM=18ORM=19ORM=20OR
M=22ORM=23ORM=25ORM=26ORM=27THEN
PRINT"YOU CAN'T TAKE IT.":GOTO33
0
860 IFM=5THENA(6)=2
```

```
870 IFM=8ORM=9THENGOTO2130
880 IFM=1THENA(2)=1
890 IFM=2THENA(3)=1
900 A(M)=-1:PRINT"OK, YOU HAVE I
T":B=B+1:GOTO330
910 '
920 IFI=2THENPRINT"OK, YOU DROPP
ED IT.":B=B-1:A(M)=F:ELSE PRINT"
YOU DON'T HAVE IT!"
930 GOTO330
940 '
950 IFI=0THENPRINT"YOU DON'T SEE
 IT HERE.":GOTO330
960 IFM=8ORM=9THEN2130
970 IFM=6THEN2150
980 IFM=10THEN2140
990 IFM=16THENA(17)=F:IFC(3)<>1T
HENC(3)=1:PRINT"OK, THEY'RE OPEN
":GOTO330:ELSEIFM=16THENPRINT"TH
EY ARE ALREADY OPEN":GOTO330
1000 IFM=20THENA(21)=F:IFM=20AND
C(2)=1THENPRINT"THEY ARE ALREADY
 OPEN":GOTO330
1010 IFM=20ANDC(2)=0THENPRINT"OK
, THEY'RE OPEN":C(2)=1:GOTO330
1020 IFM=24ANDC(1)=0THENC(1)=1:G
OTO1060
1030 IFM=24ANDC(1)<>0THENPRINT"I
T'S ALREADY OPEN":GOTO330
1040 IFM=27THEN2160
1050 PRINT"SORRY, IT DOES NOT OP
EN.":GOTO330
1060 PRINT"OK, IT'S OPEN":GOTO33
0
1070 '
1080 IFI=0THENPRINT"YOU CAN'T CL
OSE ANYTHING THAT   YOU CAN'T SE
E OR DON'T HAVE.":GOTO330
1090 IFM=20ANDC(2)=1THENPRINT"OK
, THEY'RE CLOSED.":GOTO330:ELSEI
FM=20THENPRINT"THEY'RE ALREADY C
LOSED":GOTO330
1100 IFM=24ANDC(1)=1THENPRINT"OK
, IT'S CLOSED.":GOTO330:ELSEIFM=
24THENPRINT"IT'S ALREADY CLOSED"
:GOTO330
1110 IFM=16ANDC(3)=0THENPRINT"TH
EY'RE ALREADY CLOSED":GOTO330
1120 IFM=16ANDC(3)=1THENPRINT"OK
, THEY'RE CLOSED.":C(3)=0:A(17)=
0:GOTO330
1130 PRINT"YOU TRIED, BUT IT DOE
SN'T CLOSE.":GOTO330
1140 '
1150 IFI=0THENPRINT"YOU DON'T SE
E ANYTHING LIKE THATAROUND HERE.
":GOTO330
1160 IFM=1THENPRINT"IT IS A PERS
IAN RUG.":GOTO330
1170 IFM=2THENPRINT"LOOSE":GOTO3
30
1180 IFM=3THENPRINT"IT STINKS. T
HERE IS THE REMAINS OF A GOLD-FI
SH IN THE CATS MOUTH";:A(28)=F:G
OTO330
1190 IFM=4THENPRINT"PINK":GOTO33
0
1200 IFM=5THENPRINT"PICTURE OF A
 BLACK CAT.":GOTO330
1210 IFM=6THENPRINT"IT'S LOCKED.
":GOTO330
1220 IFM=7THENPRINT"GREEN":GOTO3
30
1230 IFM=8THENPRINT"THERE ARE 29
 GOLDFISH IN HERE.":A(9)=4:GOTO3
30
1240 IFM=9THENPRINT"SWIMMING":GO
TO330
1250 IFM=10THENPRINT"THE TV IS O
N. IT'S TUNED TO      CHANNEL 11
WHICH IS PLAYING      'ALIEN'.":G
OTO330
1260 IFM=11THENPRINT"IT CLASHES
WITH THE CURTAINS.":A(12)=7:GOTO
330
1270 IFM=12THENPRINT"THERE IS A
MAGAZINE UNDER IT.":A(13)=7:GOTO
330
1280 IFM=13THENPRINT"IT'S A SCIE
NCE FICTION MAGAZINE.":GOTO330
1290 IFM=14THENPRINT"IT HAS A BU
RNED OUT BULB.":A(15)=8:GOTO330
1300 IFM=15THENPRINT"*MADE IN PO
LAND*":GOTO330
1310 IFM=16THENPRINT"GOLD, PURPL
E, ORANGE, AND PINK":GOTO330
1320 IFM=17THENPRINT"THERE GOES
THE MAILMAN":GOTO330
1330 IFM=18THENPRINT"IT HAS 2 DO
ORS.":A(20)=11:GOTO330
1340 IFM=19THENPRINT"ELECTRIC":G
OTO330
1350 IFM=20ANDC(2)=0THENPRINT"TH
EY'RE CLOSED.":GOTO330
1360 IFM=21THEN PRINT"P.U.!!!!
 THEY STINK!!":GOTO330
1370 IFM=22THENPRINT"CLASHES WIT
H THE RUG.":GOTO330
1380 IFM=23THENPRINT"BROWN":A(24
)=13:GOTO330
1390 IFM=24THENPRINT"'THE CAT WI
TH 9 LIVES'":GOTO330
1400 IFM=25THENPRINT"IT HAS 2 DO
ORS.":A(27)=15:GOTO330
1410 IFM=26THENPRINT"ELECTRIC":G
OTO330
1420 IFM=27THENPRINT"THEY'RE CLO
SED.":GOTO330
1430 IFM=28THENPRINT"IT STINKS.
NOT MUCH REMAINS OF 1":GOTO330
1440 PRINT"NOTHING SPECIAL ABOUT
 IT.":GOTO330
1450 '
1460 IFM=8THEN2130
1470 IFM=10THEN2140
1480 PRINT"NOTHING HAPPENED.":GO
TO330
1490 '
1500 IFI=0THENPRINT"NOTHING LIKE
 THAT AROUND HERE   THAT YOU CAN
 BREAK.":GOTO330
1510 IFM=8THEN2130
1520 IFM=10THEN2140
1530 PRINT"YOU TRIED, BUT COULDN
'T BREAK IT":GOTO330
1540 '
1550 IFI=0THENPRINT"YOU DON'T SE
E ANYTHING LIKE THATAROUND HERE.
":GOTO330
1560 PRINT"YOU TRIED TO ENTER, B
U COULDN'T.":GOTO330
1570 '
1580 IFI=0THENPRINT"YOU DON'T SE
E IT HERE.":GOTO330
1590 IFM=13THENPRINT"TITLE:'THE
CAT EATING FISH FROM OUTER SPACE
'":GOTO330
1600 IFM=24ANDC(1)=1THEN PRINT"T
O MY BELOVED CAT 'ENO' ON HIS  N
INTH LIFE.":GOTO330
1610 IFM=24ANDC(1)=0THENPRINT"OP
EN BEFORE READING":GOTO330
1620 PRINT"NOTHING IMPORTANT.":G
OTO330
1630 IFM=10THEN2140ELSEPRINT"YOU
 CAN'T TURN IT":GOTO330
1640 DATANORTH,SOUTH,EAST,WEST,U
P,DOWN
1650 DATAIN THE LIVING ROOM,2,9,
6,13,0,0
1660 DATABY A LOVE SEAT,0,1,3,14
,0,0
1670 DATAIN THE LIVING ROOM,0,6,
4,2,0,0
1680 DATA BY A LARGE FISH TANK,0
,5,0,3,0,0
1690 DATABY A TV,4,7,0,6,0,0
1700 DATAIN THE LIVING ROOM,3,8,
5,1,0,0
1710 DATABY A STUFFED CHAIR,5,0,
0,8,0,0
1720 DATABY A FLOOR LAMP,6,0,7,9
,0,0
1730 DATABY THE CURTAINS,1,0,8,1
0,0,0
1740 DATAIN THE LIVING ROOM,13,0
,9,11,0,0
1750 DATABY AN END TABLE,12,0,10
,0,0,0
1760 DATABY A SOFA,15,11,13,0,0,
0
1770 DATABY A COFFEE TABLE,14,10
,1,12,0,0
1780 DATAIN THE LIVING ROOM,0,13
,2,15,0,0
1790 DATABY AN END TABLE,0,12,14
,0,0,0
1800 DATAEND
1810 DATAAN OVAL RUG,RUG,1
1820 DATAA LOOSE BOARD,BOA,0
1830 DATAA DEAD CAT,CAT,0
1840 DATAA LOVE SEAT,SEA,2
1850 DATAA PICTURE,PIC,2
1860 DATAA SAFE,SAF,0
1870 DATA1 MILLION BUCKS,BUC,0
1880 DATAA LARGE FISH TANK,TAN,4
1890 DATA29 FISH,FIS,0
1900 DATAA CONSOLE TV SET,TV ,5
1910 DATAA STUFFED CHAIR,CHA,7
1920 DATAA CHAIR CUSHON,CUS,0
1930 DATAA MAGAZINE,MAG,0
1940 DATAA FLOOR LAMP,LAM,8
1950 DATAA BURNED OUT BULB,BUL,0
1960 DATACURTAINS,CUR,9
1970 DATAA PICTURE WINDOW,WIN,0
1980 DATAAN END TABLE,TAB,11
1990 DATAA TABLE LAMP,LAM,11
2000 DATAEND TABLE DOORS,DOO,0
2010 DATAA PAIR OF NURSE SHOES,S
HO,0
```

Continued on p36

Motherlode

by Tom Hitchins
32k ECB CoCo

ADVENTURE

MOTHERLODE IS another combination game/adventure that I got from Computer Hut Software when I bought software from them, quite a while ago.

I rang them up to see if it was alright to submit this and another program ("Eno") to the magazine, and they said it was alright.

Anyway, the basic storyline goes something like this:

Your great grandfather has recently died, and has left you a goldmine. The only condition of acceptance, of course, is to find the Motherlode.

Have fun!

The Listing:

```
1 CLS3:PRINT@42,"MOTHER LODE";:P
RINT@226,"COPYRIGHT 1983 PAL CRE
ATIONS";:PRINT@363,"CREATORS:";:
PRINT@394,"PAUL AUSTIN";:PRINT@4
30,"AND";:PRINT@457,"LEROY C. SM
ITH";:PLAY"V21O3T4L4CCEGO4CL1O3A
L4AFGAL1GP5O3L4CCEGFL1DL4DEFEDL1
C"
2 CLS:PRINT@234,"**TELEGRAM**":P
LAY"V31O4T6B":H=H+1
3 CLS:PLAY"V20O4T7A"
4 IFH=5THEN6
5 GOTO2
6 CLS:PRINT@42,"**TELEGRAM**":PR
INTSTRING$(32,"-"):PRINT"GREAT G
RANDFATHER DEAD/STOP      LEFT YO
U GOLDMINE/STOP           CONDITI
ONS EXIST/STOP            MUST FI
ND MOTHER LODE/STOP       CONDOLE
NCES & GOOD LUCK/STOP     BLANCHE
 LIVINGSTON (EXECUTOR)"
7 PRINT@352,STRING$(32,"-"):PRIN
T"DO YOU EXCEPT CHALLENGE?":
8 INPUTA$:IFA$=""THEN8
9 IFA$="YES"THEN13
10 IFA$="NO"THENCLS:PRINT"TOO BA
D. RUMOR HAS IT THAT YOUR GRANDF
ATHER SPENT A LIFETIME    DIGGIN
G AND LOOKING FOR GOLD.   SOME S
AY HE SPENT MONEY LIKE IT GREW O
N TREES BUT NEVER WORKED ADAY IN
 HIS LIFE FOR WAGES. GUESSYOU'LL
 NEVER KNOW!":END
11 GOTO8
12 A$=INKEY$:IFA$=""THEN12ELSERE
TURN
13 CLS:PRINT"YOU ARE IN THE ROCK
Y MOUNTAINS  AT THE PROPERTY LIN
E OF YOUR    MINE. THERE IS A SI
GN THAT SAYS:##HUMANS KEEP OUT##
...THERE IS ADUSTY PATH THAT LEA
DS UP A STEEPHILL AND A ROAD THA
T LEADS EAST.";:
14 PRINT"YOU CAN:":PRINT"A)  FOL
LOW PATH":PRINT"B)  TAKE ROAD"
15 GOSUB12
16 IFA$="A"THEN84
17 IFA$="B"THEN90
18 GOTO15
19 CLS:PRINT"THERE ARE A LOT OF
TREES AND    THEY ALL LOOK THE S
AME. YOU ARE LOST. WHICH DIRECTI
ON WILL YOU  GO?":PRINT"A)  NORT
H":PRINT"B)  SOUTH":PRINT"C)  EA
ST":PRINT"D)  WEST"
20 GOSUB12
21 IFA$="A"THEN31
22 IFA$="B"THEN26
23 IFA$="C"THEN43
24 IFA$="D"THEN38
25 GOTO20
26 CLS:PRINT"THESE MOUNTAINS ARE
 REALLY HARD ON THE OLD HEART. W
HICH WAY WILLYOU GO NOW?":PRINT"
A)  NORTH":PRINT"B)  SOUTH"
27 GOSUB12
28 IFA$="A"THEN19
29 IFA$="B"THEN142
30 GOTO27
31 CLS:PRINT"YOU ARE LOST. NO 2
ROCKS LOOK   THE SAME AND AT THE
 SAME TIME   NONE LOOK DIFFERENT
.":PRINT"YOU CAN:":PRINT"A)  GO
NORTH":PRINT"B)  HEAD SOUTH":PRI
NT"C)  MEANDER EAST":PRINT"D)  W
ANDER WEST"
32 GOSUB12
33 IFA$="A"THEN48
34 IFA$="B"THEN26
35 IFA$="C"THEN43
36 IFA$="D"THEN48
37 GOTO32
38 CLS:PRINT"LOST AGAIN HUH?":PR
INT"YOU CAN:":PRINT"A)  GO SOUTH
":PRINT"B)  HEAD NORTH"
39 GOSUB12
40 IFA$="A"THEN55
41 IFA$="B"THEN48
42 GOTO39
43 CLS:PRINT"STILL LOST?":PRINT"
YOU CAN:":PRINT"A)  GO WEST":PRI
NT"B)  GO EAST"
44 GOSUB12
45 IFA$="A"THEN26
46 IFA$="B"THEN48
47 GOTO44
48 CLS:PRINT"IF YOU ARE LOST, YO
U CAN ONLY   PICK A DIRECTION AN
D HOPE.      YOU CAN:":PRINT"A)
 HEAD NORTH":PRINT"B)  HEAD SOUT
H":PRINT"C)  BEAR TO THE WEST":P
RINT"D)  GIVE UP AND TRY AGAIN"
49 GOSUB12
50 IFA$="A"THEN19
51 IFA$="B"THEN31
52 IFA$="C"THEN26
53 IFA$="D"THEN450
54 GOTO49
55 CLS:PRINT"YOU ARE IN A ROCKY
AREA. THERE  IS A HOLE UNDER A L
ARGE ROCK. ITLOOKS BIG ENOUGH TO
 ENTER.      YOU CAN:":PRINT"A)
 GO WEST":PRINT"B)  GO NORTH":PR
INT"C)  CLIMB DOWN THE HOLE"
56 GOSUB12
57 IFA$="A"THEN61
58 IFA$="B"THEN26
59 IFA$="C"THEN126
60 GOTO56
61 CLS:PRINT"YOU ARE OUTSIDE A S
HED. THERE ISA PATH LEADING EAST
.":PRINT"YOU CAN:":PRINT"A)  FOL
LOW PATH":PRINT"B)  ENTER SHED".
62 GOSUB12
63 IFA$="A"THEN55
64 IFA$="B"THEN66
65 GOTO62
66 CLS:PRINT"YOU ARE IN AN OLD S
HED. THE DUSTCOVERS THE FLOOR AN
D THERE ARE  CRACKS IN THE WALLS
.":PRINT"YOU CAN:":PRINT"A)  LEA
VE SHED":PRINT"B)  DO SOMETHING
SPECIAL"
67 GOSUB12
68 IFA$="A"THEN61
69 IFA$="B"THEN71
70 GOTO67
71 CLS:PRINT"WHAT DO YOU WANT TO
 DO?":INPUTA$:IFA$="KICK FLOOR"T
HEN72ELSE66
72 CLS:PRINT"IS THERE ANYTHING E
LSE YOU WANT TO DO?":INPUTA$:IFA
$="HIT WALL"THENCLS:PLAY"V31O1T5
5ABCDEFGADFBEGEDACB":PRINT"A TRA
P DOOR IN THE FLOOR OPENED AND T
HERE ARE 1000 GOLD INGOTS  THERE
. CONGRATULATIONS, YOU DID IT. Y
OU'RE RICH."ELSE66
73 END
74 CLS:PRINT"YOU ARE OBVIOUSLY I
N YOUR GREAT GRANDFATHERS CABIN.
 THERE ISN'T ANYTHING HERE WORTH
 LOOKING AT. YOU CAN:":PRINT"A)
 LEAVE CABIN":PRINT"B)  REST A W
HILE"
75 GOSUB12
76 IFA$="B"THEN79
77 IFA$="A"THEN97
```

```
78 GOTO75
79 CLS:PRINT"OK, YOU RESTED!":PR
INT"WHY DON'T YOU:":PRINT"A)  LE
AVE THE CABIN"
80 GOSUB12
81 IFA$="A"THEN97
82 GOTO80
83 CLS:PRINT"THAT REALLY WASN'T
TOO SMART.    THE STREAM WASHED Y
OU UNDER IN  THE RAPIDS AND YOU
DROWNED.      IT LOOKS LIKE YOU A
RE ALL WASHEDUP!":FORX=1TO6000:N
EXT:GOTO450
84 CLS:PRINT"YOU ARE AT AN OPENI
NG TO A MINE.IT'S SHORING LOOKS
QUITE UNSAFE.A PATH LEADS WEST A
ND SOUTH.     YOU CAN:":PRINT"A)
 FOLLOW WEST PATH":PRINT"B)  ENT
ER MINE":PRINT"C)  GO SOUTH"
85 GOSUB12
86 IFA$="A"THEN97
87 IFA$="B"THEN103
88 IFA$="C"THEN13
89 GOTO85
90 CLS:PRINT"YOU ARE ON A DIRT R
OAD AT A FOURWAY CROSSING. THERE
 ARE TREES SOBIG THEY MUST BE 30
0 YEARS OLD. YOU CAN:":PRINT"A)
 GO NORTH":PRINT"B)  GO SOUTH":P
RINT"C)  GO EAST":PRINT"D)  GO W
EST"
91 GOSUB12
92 IFA$="A"THEN108
93 IFA$="B"THEN137
94 IFA$="C"THEN142
95 IFA$="D"THEN13
96 GOTO91
97 CLS:PRINT"YOU ARE OUTSIDE A R
UNDOWN POOR  EXCUSE OF A CABIN.
THE DOOR IS  MISSING AND THE ROO
F SAGS. A    PATH LEADS EAST."
98 PRINT"YOU CAN:":PRINT"A)  ENT
ER CABIN":PRINT"B)  FOLLOW PATH"
99 GOSUB12
100 IFA$="A"THEN74
101 IFA$="B"THEN84
102 GOTO99
103 CLS:PRINT"YOU ARE IN THE MIN
E ENTRANCE. ITIS VERY DARK AND T
HERE ARE RATS AND BATS.":PRINT"Y
OU CAN:":PRINT"A)  FEEL YOUR WAY
 INTO THE MINE":PRINT"B)  GO BAC
K OUT"
104 GOSUB12
105 IFA$="A"THEN114
106 IFA$="B"THEN84
107 GOTO104
108 CLS:PRINT"YOU ARE IN A FIELD
 WITH MANY OLDSTUMPS SCATTERED A
BOUT. IT LOOKSAS THOUGH IT WAS C
LEARED OVER A HUNDRED YEARS AGO.
 THERE'S AN   OLD DIRT ROAD LEAD
ING SOUTH."
109 PRINT"YOU CAN:":PRINT"A)  TA
KE ROAD":PRINT"B)  CROSS THE STU
MP FIELD"
110 GOSUB12
111 IFA$="A"THEN90
112 IFA$="B"THEN147
113 GOTO110
114 CLS:PRINT"IT IS REALLY DARK
IN HERE. YOU  KEEP TRIPPING OVER
 WHAT FEELS   LIKE ROCKS AND HAV
E WORKED YOUR WAY AROUND SEVERAL
 TURNS. YOU   CAN NO LONGER SEE
THE LIGHT FROMTHE ENTRANCE. YOU
HEAR THE SOUNDOF WINGS FLAPPING
OVERHEAD."
115 PRINT"YOU CAN:":PRINT"A)  HE
AD NORTH":PRINT"B)  HEAD SOUTH"
116 GOSUB12
117 IFA$="A"THEN120
118 IFA$="B"THEN103
119 GOTO116
120 CLS:PRINT"YOU ARE IN A DARK
TUNNEL AND YOUFEEL A CRUDE LADDE
R LEADING TO  AN UPPER SHAFT.":P
RINT"YOU CAN:":PRINT"A)  CLIMB L
ADDER":PRINT"B)  FEEL YOUR WAY N
ORTHEAST":PRINT"C)  GO SOUTH"
121 GOSUB12
122 IFA$="A"THEN126
123 IFA$="B"THEN159
124 IFA$="C"THEN114
125 GOTO121
126 CLS:PRINT"YOU ARE IN A LARGE
 ROOM WITH    LIGHT SHINING DOWN
 FROM ABOVE.  THERE IS A PICK AN
D A BOX OF    DYNAMITE AGAINST T
HE NORTH WALL.THIS MUST BE AN AI
R SHAFT."
127 PRINT"YOU CAN:":PRINT"A)  GE
T THE DYNAMITE":PRINT"B)  GO BAC
K DOWN THE LADDER"
128 GOSUB12
129 IFA$="A"THEN132
130 IFA$="B"THEN120
131 GOTO128
132 CLSRND(8):PLAY"V31O1T255ACDF
GEBDAAFGBEDA"
133 R=R+1
134 IFR=15THEN136
135 GOTO132
136 CLS:PRINT"WHEN YOU GOT THE D
YNAMITE, IT   EXPLODED. YOU SHOU
LD GET SOME   TRAINING ON HANDLI
NG EXPLOSIVES.DID YOU GET A BIG
BANG OUT OF   THAT?":FORX=1TO700
0:NEXT:GOTO450
137 CLS:PRINT"YOU ARE ON THE EDG
E OF A SMALL  BUT SWIFT MOUNTAIN
 STREAM.      YOU CAN:":PRINT"A)
  GO BACK THE DIRECTION YOU
  CAME FROM":PRINT"B)  SWIM ACRO
SS THE STREAM"
138 GOSUB12
139 IFA$="A"THEN90
140 IFA$="B"THEN83
141 GOTO138
142 CLS:PRINT"YOU ARE IN A RUGGE
D MOUNTAIN ANDTHERE ARE PINE TRE
BS ALL OVER.  YOU CAN:":PRINT"A)
  WORK YOUR WAY NORTH":PRINT"B)
 GO WEST"
143 GOSUB12
144 IFA$="A"THEN19
145 IFA$="B"THEN90
146 GOTO143
147 CLS:PRINT"YOU ARE AT AN ENTR
ANCE TO A MINELEADING INTO THE S
IDE OF A STEEPCLIFF. THERE IS AN
 OLD COAL CARTHERE. A FIELD WITH
 STUMPS IS TO THE WEST."
148 PRINT"YOU CAN:":PRINT"A)  EN
TER MINE":PRINT"B)  HEAD FOR THE
 STUMPS"
149 GOSUB12
150 IFA$="A"THEN153
151 IFA$="B"THEN108
152 GOTO149
153 CLS:PRINT"YOU ARE IN A MINE
WITH A HIGH   CEILING. IT IS PIT
CH DARK TO THENORTH, AND LIGHT S
HINES IN FROM THE ENTRANCE. THER
E IS A VERY   STRONG SULFUR SMEL
L. IT IS VERY DAMP AND COLD."
154 PRINT"YOU CAN:":PRINT"A)  HE
AD FOR THE ENTRANCE":PRINT"B)  F
EEL YOUR WAY NORTH"
155 GOSUB12
156 IFA$="A"THEN147
157 IFA$="B"THEN159
158 GOTO155
159 CLS:PRINT"THE WALLS HERE ARE
 WET AND IT   IS OBVIOUS THAT TH
ERE ARE LARGE PUDDLES OF STAGNAT
E WATER. YOUR FEET ARE WET AND T
HE MINE SPLITSINTO 4 TUNNELS."
160 PRINT"YOU CAN:":PRINT"A)  GO
 NORTH":PRINT"B)  GO SOUTH":PRIN
T"C)  GO EAST":PRINT"D)  GO WEST
"
161 GOSUB12
162 IFA$="A"THEN174
163 IFA$="B"THEN153
164 IFA$="C"THEN167
165 IFA$="D"THEN120
166 GOTO161
167 CLS:PRINT"THE MINE HERE HAS
A VERY LOW    CEILING. YOUR HEAD
 IS SORE FROM BUMPING INTO IT. Y
OU FEEL AN    OPENING LOW TO THE
 GROUND THAT  IS JUST BIG ENOUGH
 FOR YOU TO   SQUEEZE THROUGH. P
ASSAGES LEAD  TO THE NORTH AND W
EST."
168 PRINT"YOU CAN:":PRINT"A)  FE
EL YOUR WAY NORTH":PRINT"B)  FEE
L YOUR WAY WEST":PRINT"C)  SQUEE
ZE YOURSELF INTO THE      HOLE"
169 GOSUB12
170 IFA$="A"THEN174
171 IFA$="B"THEN159
172 IFA$="C"THEN278
173 GOTO169
174 CLS:PRINT"YOU ARE SO LOST IT
 SEEMS YOU'LL NEVER FIND YOUR WA
Y OUT OF HERE.THERE ARE PASSAGES
 ALL OVER IN  EVERY DIRECTION. T
OO BAD YOU    DON'T HAVE ANY LIG
HT."
175 PRINT"YOU CAN FEEL YOUR WAY:
":PRINT"A)  NORTH":PRINT"B)  SOU
TH":PRINT"C)  EAST":PRINT"D)  WE
ST"
176 GOSUB12
177 IFA$="A"ORA$="C"THEN174
178 IFA$="B"THEN167
179 IFA$="D"THEN187
180 GOTO176
181 CLS:PRINT"THERE IS A FAINT G
LOW COMING    FROM PHOSPHEROUS I
N THE CEILING.THE WALLS ARE WET
```

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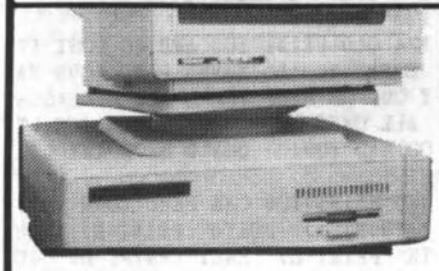

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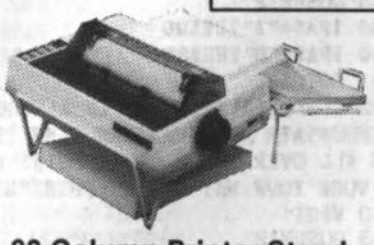

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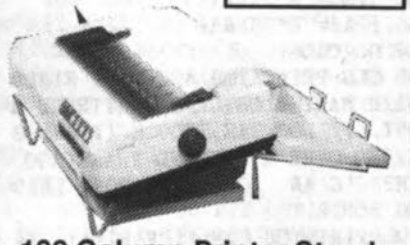

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```
AND THERE ARE PUDDLES OF WATER O
N THE FLOOR.  YOU CAN:":PRINT"A)
 FEEL YOUR WAY SOUTH":PRINT"B)
 HEAD EAST":PRINT"C)  HEAD WEST"
182 GOSUB12
183 IFA$="A"THEN288
184 IFA$="B"THEN307
185 IFA$="C"THEN174
186 GOTO182
187 CLS:PRINT"THE MINE PASSAGE S
PLITS OFF IN  MANY DIRECTIONS.":
PRINT"YOU CAN:":PRINT"A)  HEAD N
ORTH":PRINT"B)  HEAD SOUTH":PRIN
T"C)  HEAD EAST":PRINT"D)  HEAD
WEST"
188 GOSUB12
189 IFA$="A"ORA$="C"ORA$="D"THEN
192
190 IFA$="B"THEN174
191 GOTO188
192 CLS:PRINT"YOU CAN FEEL A SMA
LL OPENING AT YOUR FEET. A COLD
BREEZE ESCAPESFROM IT AND CHILLS
 YOUR LEGS.  THE PASSAGES LEAD
IN SEVERAL  DIRECTIONS."
193 PRINT"YOU CAN:":PRINT"A)  FO
LLOW YOUR NOSE":PRINT"B)  HEAD W
EST":PRINT"C)  WANDER AIMLESSLY"
:PRINT"D)  SQUEEZE INTO THE OPEN
ING"194 GOSUB12
195 IFA$="A"ORA$="C"THEN187
196 IFA$="B"THEN167
197 IFA$="D"THEN181
198 GOTO194
199 CLS:PRINT"GUESS WHAT THAT NO
ISE WAS THAT  SOUNDED LIKE A RAT
?":FORX=1TO4000:NEXT:CLS:PRINT"I
T WAS A WOLVERINE THAT MADE THEM
ISTAKE OF ENTERING THE MINE ANDI
T GOT LOST. IT WAS IN HERE FOR W
EEKS AND WAS STARVING."
200 PRINT"LOOKS LIKE YOU MADE TH
E SAME  MISTAKE TOO, EXCEPT YO
U WEREN'T AS HUNGRY AS IT WAS.":
FORX=1TO10000:NEXT:GOTO450
201 CLS:PRINT"YOU ARE IN A VERY
TIGHT TUNNEL. IT SPLITS OFF IN 4
 DIRECTIONS.  YOU CAN:":PRINT"A)
  CRAWL NORTH":PRINT"B)  CRAWL S
OUTH":PRINT"C)  CRAWL EAST":PRIN
T"D)  CRAWL WEST"
202 GOSUB12
203 IFA$="A"ORA$="D"THEN201
204 IFA$="B"THEN214
205 IFA$="C"THEN207
206 GOTO202
207 CLS:PRINT"YOU ARE IN A VERY
TIGHT TUNNEL. IT SPLITS OFF IN 4
 DIRECTIONS.  YOU CAN:":PRINT"A)
  CRAWL NORTH":PRINT"B)  CRAWL S
OUTH":PRINT"C)  CRAWL EAST":PRIN
T"D)  CRAWL WEST"
208 GOSUB12
209 IFA$="A"THEN307
210 IFA$="B"THEN214
211 IFA$="C"THEN222
212 IFA$="D"THEN201
213 GOTO206
214 CLS:PRINT"YOU ARE IN A VERY
TIGHT TUNNEL. THERE IS A STRONG
AMMONIA SMELL FROM BAT DROPPINGS
. SOMETHING  IS MOVING JUST AHE
AD OF YOU. IT MUST BE A RAT."
215 PRINT"YOU CAN:":PRINT"A)  CR
AWL SOUTH":PRINT"B)  CRAWL WEST"
:PRINT"C)  CRAWL EAST":PRINT"D)
 CRAWL TOWARDS THE SUSPECTED
 RAT"
216 GOSUB12
217 IFA$="A"THEN222
218 IFA$="B"THEN201
219 IFA$="C"THEN229
220 IFA$="D"THEN199
221 GOTO216
222 CLS:PRINT"THIS MINE SPLITS
OFF IN MANY  DIRECTIONS.":PRINT
"YOU CAN:":PRINT"A)  HEAD NORTH"
:PRINT"B)  HEAD SOUTH":PRINT"C)
 HEAD EAST":PRINT"D)  HEAD UPWAR
D AND WEST"
223 GOSUB12
224 IFA$="A"THEN235
225 IFA$="C"THEN207
226 IFA$="D"THEN167
227 IFA$="B"THEN229
228 GOTO223
229 CLS:PRINT"ALTHOUGH YOU CAN'T
 SEE ANYTHING,YOUR SENSES TELL Y
OU THAT THERE IS A DEEP PIT NEAR
BY.":PRINT"YOU CAN:":PRINT"A)  G
O NORTH":PRINT"B)  FOLLOW YOUR S
ENSES":PRINT"C)  CRAWL WESTWARD"
230 GOSUB12
231 IFA$="A"THEN214
232 IFA$="B"THEN289
233 IFA$="C"THEN235
234 GOTO230
235 CLS:PRINT"YOU ARE IN THE MIN
E AND IT IS  DARK. TWISTING PAS
SAGES LEAD IN SEVERAL DIRECTIONS
.":PRINT"YOU CAN:":PRINT"A)  FEE
L YOUR WAY NORTH":PRINT"B)  FOLL
OW WEST OPENING":PRINT"C)  HEAD
EAST"
236 GOSUB12
237 IFA$="A"THEN229
238 IFA$="B"ORA$="C"THEN240
239 GOTO236
240 CLS:PRINT"YOU CAN FEEL YOUR
WAY:":PRINT"A)  WEST":PRINT"B)
SOUTH"
241 GOSUB12
242 IFA$="A"ORA$="B"THEN235
243 GOTO241
244 CLS:PRINT"YOU ARE IN THE ENT
RANCE TO THE  MINE. YOU CAN SEE
LIGHT TO THE  WEST AND IT IS DAR
K HEADING INTOTHE MINE.":PRINT"Y
OU CAN:":PRINT"A)  GO TOWARD THE
 LIGHT":PRINT"B)  GO TOWARD THE
DARKNESS"
245 GOSUB12
246 IFA$="A"THEN294
247 IFA$="B"THEN240
248 GOTO245
249 CLS:PRINT"YOU ARE AT THE BAN
K OF A ROCK  BOTTOM RIVER. THE
WATER IS CLEARAND SWIFT. THERE I
S A ROWBOAT  HERE AND A PATH LE
ADING EAST."
250 PRINT"YOU CAN:":PRINT"A)  TA
KE PATH":PRINT"B)  GET IN THE BO
AT"
251 GOSUB12
252 IFA$="A"THEN294
253 IFA$="B"THEN299
254 GOTO251
255 CLS:PRINT"YOU ARE AT THE BOT
TOM OF A SMALLWATERFALLS. THE RI
VER GOES UNDERIT. RAINBOW TROUT
LAY ON THE  RIVER BOTTOM BASKI
NG IN THE SUN.YOU CAN:":PRINT"A)
  ROW UNDER THE FALLS":PRINT"B)
 ROW DOWN STREAM"
256 GOSUB12
257 IFA$="A"THEN260
258 IFA$="B"THEN299
259 GOTO256
260 CLS:PRINT"THIS IS AN UNDERGR
OUND CAVE WITHTHE RIVER FLOWING
FROM THE NORTHIT IS COLD AND EER
IE.":PRINT"YOU CAN:":PRINT"A)  R
OW NORTH":PRINT"B)  ROW SOUTH"
261 GOSUB12
262 IFA$="A"THEN265
263 IFA$="B"THEN255
264 GOTO261
265 CLS:PRINT"THERE IS A FORK IN
 THE RIVER.  YOU CAN SEE BECAUS
E THERE ARE  CAVE FISH WHICH GL
OW. YOU CAN  SEE LIGHTS MOVING
ALL AROUND IN THE WATER."
266 PRINT"YOU CAN:":PRINT"A)  GO
 SOUTH":PRINT"B)  TAKE RIGHT FOR
K":PRINT"C)  TAKE LEFT FORK"
267 GOSUB12
268 IFA$="A"THEN260
269 IFA$="B"THEN272
270 IFA$="C"THEN335
271 GOTO267
272 CLS:PRINT"THIS RIVER SPLITS
OFF IN TWO  DIRECTIONS. WATER
DROPLETS KEEP HITTING YOU ON THE
 HEAD. YOU  HEAR WATER RUSHING
 TO THE RIGHT.YOU CAN:":PRINT"A)
  ROW TO YOUR RIGHT":PRINT"B)  R
OW TO YOUR LEFT":PRINT"C)  ROW S
OUTH"
273 GOSUB12
274 IFA$="A"THEN313
275 IFA$="B"THEN318
276 IFA$="C"THEN265
277 GOTO273
278 CLS:PRINT"IT IS AWFULL TIGHT
 IN THIS HOLE.YOU CAN:":PRINT"A)
  BACK OUT":PRINT"B)  SQUEEZE ON
 AHEAD"
279 GOSUB12
280 IFA$="A"THEN167
281 IFA$="B"THEN283
282 GOTO279
283 CLS:PRINT"IT IS TOO TIGHT FO
R YOU TO GO ONANY FURTHER.":PRIN
T"YOU MUST:":PRINT"A)  BACK OUT"
284 GOSUB12
285 IFA$="A"THEN287
286 GOTO284
287 CLS:PRINT"YOU CAN'T BACK OUT
. THE TUNNEL  IS TOO SMALL AND I
T SEEMS YOU  GOT YOURSELF STUCK
 IN IT. IT'S  'CURTAINS' FOR YOU
 PAL.":FORX=1TO4000:NEXT:GOTO450
288 CLS:PRINT"BECAUSE OF THE DAR
```

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K, YOU HAD TO RELEY ON YOUR SENS
ES. HOWEVER   THEY WEREN'T ENOUG
H TO STOP YOU FROM FALLING DOWN
A DEEP SHAFT. WHEN YOU LANDED AT
 THE BOTTOM,  YOU BROKE YOUR NEC
K. THAT'S THE 'BREAKS' BUB!":FOR
X=1TO9000:NEXT:GOTO450
289 CLS:PRINT"YOU FELL INTO A PI
T THAT WASN'T AS DEEP AS YOU SEN
SED. ACTUALLY IT WAS ONLY 3 FEET
 DEEP. IT ONLYGOES ONE DIRECTION
.":PRINT"YOU CAN:":PRINT"A)  CLI
MB BACK OUT AND HEAD          NOR
TH":PRINT"B)  FOLLOW PIT"
290 GOSUB12
291 IFA$="A"THEN229
292 IFA$="B"THEN244
293 GOTO290
294 CLS:PRINT"YOU'RE IN A HIGH M
OUNTAIN AREA  WITH HUGE GRANITE
BOULDERS      STREWN ALL ABOUT.
THERE IS A    MINE ENTRANCE NEAR
BY AND A PATH LEADING BETWEEN TH
E BOULDERS.   YOU CAN:":PRINT"A)
  ENTER THE MINE":PRINT"B)  TAKE
 PATH"
295 GOSUB12
296 IFA$="A"THEN244
297 IFA$="B"THEN249
298 GOTO295
299 CLS:PRINT"YOU ARE IN A WEATH
ER BEATEN     ROWBOAT. THERE ARE
 2 OARS IN IT.THE RIVER FLOWS EA
ST.":PRINT"YOU CAN:":PRINT"A)  R
OW UPSTREAM":PRINT"B)  ROW DOWNS
TREAM":PRINT"C)  GO ON THE SHORE
"
300 GOSUB12
301 IFA$="A"THEN255
302 IFA$="B"THEN306
303 IFA$="C"THEN249
304 GOTO300
305 GOTO301
306 CLS:PRINT"THE FLOW OF THE RI
VER TURNED    INTO VERY SWIFT RA
PIDS. BEFORE  YOU KNEW WHAT HAPP
ENED, IT TOOK CONTROL OF YOUR BO
AT AND SWEPT  YOU OVER A LARGE W
ATERFALLS,    SMASHING YOUR BOAT
 TO PIECES ANDOF COURSE YOU TOO.
":FORX=1TO9000:NEXT:GOTO450
307 CLS:PRINT"THIS IS A LOW ROOM
 WITH EXITS IN3 DIRECTIONS.":PRI
NT"YOU CAN:":PRINT"A)  CRAWL NOR
TH":PRINT"B)  CRAWL EAST":PRINT"
C)  GO WEST"
308 GOSUB12
309 IFA$="A"THEN174
310 IFA$="B"THEN207
311 IFA$="C"THEN181
312 GOTO308
313 CLS:PRINT"THE RIVER HERE CON
TINUES ON TO  THE NORTH. THERE I
S NO LONGER   ANY GLOWING FISH T
HIS FAR INTO  THE CAVE. IT IS PI
TCH DARK.     YOU CAN:":PRINT"A)
  ROW TO THE NORTH":PRINT"B)  HE
AD SOUTH"
314 GOSUB12
315 IFA$="A"THEN323
316 IFA$="B"THEN272
317 GOTO314
318 CLS:PRINT"THIS UNDERGROUND R
IVER IS SPOOKYAND DARK. THE CURR
ENT RUNS SOUTHAND IS GETTING STR
ONGER.":PRINT"YOU CAN:":PRINT"A)
  ROW NORTH":PRINT"B)  LET THE C
URRENT TAKE YOU       SOUTH"
319 GOSUB12
320 IFA$="A"THEN334
321 IFA$="B"THEN272
322 GOTO319
323 CLS:PRINT"THE RIVER FORKS OF
F TO THE NORTHAND THE NORTHWEST.
":PRINT"YOU CAN:":PRINT"A)  ROW
NORTHWEST":PRINT"B)  ROW NORTH"
324 GOSUB12
325 IFA$="B"THEN329
326 IFA$="A"THEN328
327 GOTO324
328 CLS:PRINT"THIS IS AS FAR AS
YOU CAN GO TO THE NORTH. THE CUR
RENT SEEMS TO BE COMING FROM THE
 NORTHEAST ANDIS TOO SWIFT TO RO
W AGAINST. YOUARE SWEPT SOUTHWAR
DS.":FORX=1TO5000:NEXT:GOTO335
329 CLS:PRINT"THERE IS A SMALL L
EDGE HERE WITHA SMALL OPENING AB
OUT 4 FEET    OVER HEAD WITH LIG
HT SHINING    THROUGH.":PRINT"YO
U CAN:":PRINT"A)  GET OUT OF YOU
R BOAT AND GET    ONTO THE LEDGE
":PRINT"B)  ROW SOUTH"
330 GOSUB12
331 IFA$="A"THEN340
332 IFA$="B"THEN323
333 GOTO330
334 CLS:PRINT"THIS IS AS FAR AS
YOU CAN GO.   THE CURRENT TOOK C
ONTROL OF YOURBOAT AND SWEPT YOU
 SOUTHWEST.":FORX=1TO4000:NEXT:G
OTO328
335 CLS:PRINT"YOU ARE UNDER GROU
ND IN A NARROWCAVE WITH A VERY C
OLD RIVER     FLOWING SOUTHWARDS
.":PRINT"YOU CAN:":PRINT"A)  ROW
 NORTH":PRINT"B)  LET THE CURREN
T TAKE YOU        SOUTH"
336 GOSUB12
337 IFA$="A"THEN328
338 IFA$="B"THEN265
339 GOTO337
340 CLS:PRINT"YOU ARE ON A LEDGE
. THERE IS AN OPENING AND A BOAT
 HERE.":PRINT"YOU CAN:":PRINT"A)
  CLIMB THROUGH THE OPENING":PRI
NT"B)  GET INTO THE BOAT"
341 GOSUB12
342 IFA$="A"THEN345
343 IFA$="B"THEN329
344 GOTO341
345 CLS:PRINT"YOU ARE IN THE MOU
NTAINS AGAIN. THE FRESH AIR FEEL
S GOOD AND THESUN WARMS YOUR CHI
LLED BONES.   THERE IS A SMALL H
OLE BESIDE A  ROCK AND A PATH LE
ADING WEST ANDNORTH."
346 PRINT"YOU CAN:":PRINT"A)  SQ
UEEZE DOWN INTO THE HOLE":PRINT"
B)  TAKE NORTH PATH":PRINT"C)  T
AKE WEST PATH"
347 GOSUB12
348 IFA$="A"THEN340
349 IFA$="B"THEN352
350 IFA$="C"THEN358
351 GOTO347
352 CLS:PRINT"THERE IS A SPLIT I
N THE PATH.   YOU CAN:":PRINT"A)
  GO EAST":PRINT"B)  GO WEST":PR
INT"C)  GO SOUTH"
353 GOSUB12
354 IFA$="A"THEN363
355 IFA$="B"THEN369
356 IFA$="C"THEN345
357 GOTO353
358 CLS:PRINT"THERE IS A DEEP RA
VINE WITH A   ROPE BRIDGE CROSSI
NG IT. THE    ROPES LOOK ROTTEN.
":PRINT"YOU CAN:":PRINT"A)  CROS
S BRIDGE":PRINT"B)  FOLLOW PATH
EAST"
359 GOSUB12
360 IFA$="A"THEN368
361 IFA$="B"THEN345
362 GOTO359
363 CLS:PRINT"THERE IS A DEEP RA
VINE HERE THATIS TOO WIDE TO CRO
SS. HOWEVER   THERE IS A ROPE BR
IDGE HERE THATLOOKS ROTTEN.":PRI
NT"YOU CAN:":PRINT"A)  FOLLOW PA
TH":PRINT"B)  CROSS ROPE BRIDGE"
364 GOSUB12
365 IFA$="A"THEN352
366 IFA$="B"THEN374
367 GOTO364
368 CLS:PRINT"WHY DIDN'T YOU HEE
D OUR WARNING?WE TOLD YOU IT WAS
 ROTTEN. THE  ROPE BROKE WHEN YO
U WERE HALFWAYACROSS AND YOU FEL
L TO AN AWFUL DEATH.":FORX=1TO80
00:NEXT:GOTO450
369 CLS:PRINT"THERE IS A ROPE BR
IDGE CROSSING A DEEP RAVINE. THE
 ROPE LOOKS   ROTTEN. A PATH LEA
DS EAST.      YOU CAN:":PRINT"A)
  CROSS BRIDGE":PRINT"B)  TAKE P
ATH"
370 GOSUB12
371 IFA$="A"THEN391
372 IFA$="B"THEN352
373 GOTO370
374 CLS:PRINT"YOU ARE IN THE MOU
NTAINS. THERE IS A ROPE BRIDGE A
ND A PATH.    YOU CAN:":PRINT"A)
  CROSS ROPE BRIDGE":PRINT"B)  F
OLLOW PATH"
375 GOSUB12
376 IFA$="A"THEN363
377 IFA$="B"THEN379
378 GOTO375
379 CLS:PRINT"THERE IS A TATTERE
D SHED HERE   AND THE DOOR IS OP
EN.":PRINT"YOU CAN:":PRINT"A)  F
OLLOW PATH NORTH":PRINT"B)  ENTE
R SHED"
380 GOSUB12
381 IFA$="A"THEN374
382 IFA$="B"THEN384
383 GOTO380
384 CLS:PRINT"COBWEBS COVER EVER
YTHING IN THISSHED. THERE IS A D
UST COVERED   BOOK ON A SMALL TA
BLE.":PRINT"YOU CAN:":PRINT"A)
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EXIT SHED":PRINT"B)  READ BOOK"
385 GOSUB12
386 IFA$="A"THEN379
387 IFA$="B"THEN389
388 GOTO385
389 CLS:PRINT"I FOUND THE MOTHER
 LODE ON APRIL28, 1889. IT MUST
HAVE BEEN THE BIGGEST EVER FOUND
 IN THIS AREA.I WOULDN'T DARE TE
LL ANYONE FOR FEAR OF CLAIM JUMP
ERS. IT HAS   ALL BEEN SMELTED I
NTO INGOTS,   AND I HID IT UNDER
 THE FLOOR.";
390 PRINT"   ALL YOU HAVE TO DO
IS FIRST---  KICK FLOOR AND...."
:FORX=1TO10000:NEXT:GOTO384
391 CLS:PRINT"THERE IS A ROPE BR
IDGE HERE AND A PATH LEADING SOU
TH.":PRINT"YOU CAN:":PRINT"A)  C
ROSS BRIDGE":PRINT"B)  FOLLOW PA
TH"
392 GOSUB12
393 IFA$="A"THEN369
394 IFA$="B"THEN407
395 GOTO392
396 CLS:PRINT"YOU ARE OUTSIDE A
DESERTED SHED.THERE IS A PATH LE
ADING SOUTH.  YOU CAN:":PRINT"A)
  ENTER SHED":PRINT"B)  FOLLOW P
ATH"397 GOSUB12
398 IFA$="A"THEN401
399 IFA$="B"THEN432
400 GOTO397
401 CLS:PRINT"YOU ARE IN A WEATH
ERED SHED WITHHOLES IN THE ROOF.
 THERE IS A   BOX OF DYNAMITE ON
 A SHELF.     YOU CAN:":PRINT"A)
  EXIT SHED":PRINT"B)  GET DYNAM
ITE"
402 GOSUB12
403 IFA$="A"THEN396
404 IFA$="B"THEN445
405 GOTO402
406 CLS:PRINT".....SECOND---HIT
WALL":FORX=1TO3000:NEXT:GOTO401
407 CLS:PRINT"YOU ARE AT THE BAS
E OF A GIANT, SOLID GRANITE WALL
 LEADING UP   THE SIDE OF A MOUN
TAIN.":PRINT"YOU CAN:":PRINT"A)
 SCALE THE GRANITE WALL":PRINT"B
)  GO SOUTH":PRINT"C)  GO NORTH"
408 GOSUB12
409 IFA$="A"THEN418
410 IFA$="B"THEN413
411 IFA$="C"THEN391
412 GOTO408
413 CLS:PRINT"THERE IS A BIRCH T
REE HERE WITH WRITING CARVED IN
THE TRUNK. THEWRITING SAYS DON'T
 CLIMB THIS   TREE.":PRINT"YOU C
AN:":PRINT"A)  GO NORTH":PRINT"B
)  CLIMB TREE"
414 GOSUB12
415 IFA$="A"THEN407
416 IFA$="B"THEN425
417 GOTO414
418 CLS:PRINT"THESE MOUNTAINS AR
E BEAUTIFUL,  BUT THEY CAN BE FR
IGHTENING IF  YOU DON'T KNOW WHA
T YOU ARE     DOING. THERE IS A
PATH LEADING  NORTH, SOUTH, AND
A CLIFF TO THEEAST"
419 PRINT"YOU CAN:":PRINT"A)  TA
KE NORTH PATH":PRINT"B)  FOLLOW
SOUTH PATH":PRINT"C)  CLIMB DOWN
 CLIFF"
420 GOSUB12
421 IFA$="A"THEN413
422 IFA$="B"THEN426
423 IFA$="C"THEN407
424 GOTO420
425 CLS:PRINT"DIDN'T YOU READ TH
E WRITING     CARVED ON THIS TRE
E? YOU SHOULD HAVE, BECAUSE A RA
TTLESNAKE IS  UP HERE AND IT JUS
T BIT YOUR    NECK. IT LOOKS LIK
E YOU WON'T   EVER LEARN.":FORX=
1TO9000:NEXT:GOTO450
426 CLS:PRINT"YOU ARE AT THE EDG
E OF A LARGE  BLACKBERRY PATCH.
THE BARBS ARE SHARP AND THE BERR
IES ARE BIG.  YOU CAN:":PRINT"A)
  GO NORTH":PRINT"B)  TRY TO GO
THROUGH THE BERRY     BUSHES":PR
INT"C)  HEAD SOUTH"
427 GOSUB12
428 IFA$="A"THEN418
429 IFA$="B"THEN432
430 IFA$="C"THEN438
431 GOTO427
432 CLS:PRINT"YOU ARE IN THE MID
DLE OF A LARGEBLACKBERRY PATCH."
:PRINT"YOU CAN:":PRINT"A)  GO NO
RTH":PRINT"B)  GO EAST":PRINT"C)
  GO SOUTH"
433 GOSUB12
434 IFA$="A"THEN396
435 IFA$="B"THEN426
436 IFA$="C"THEN438
437 GOTO433
438 CLS:PRINT"YOU ARE IN A BLACK
BERRY PATCH.  A BUSH IS MOVING T
O THE SOUTH.  YOU CAN:":PRINT"A)
  HEAD NORTHWEST":PRINT"B)  GO N
ORTH":PRINT"C)  GO SOUTH"
439 GOSUB12
440 IFA$="A"THEN432
441 IFA$="B"THEN426
442 IFA$="C"THEN444
443 GOTO439
444 CLS:PRINT"IF IT WASN'T FOR B
AD LUCK, YOU  WOULDN'T HAVE ANY
LUCK AT ALL.  WHEN YOU WENT SOUT
H, YOU FOUND  WHAT WAS MOVING TH
E BUSH. IT WASAN 8 FOOT GRIZZLY
BEAR AND YOU  HAVE JUST BEEN TOR
N TO SHREADS.":FORX=1TO10000:NEX
T:GOTO450
445 CLS:PRINT"THERE IS A LEDGER
UNDER THE BOX.YOU CAN:":PRINT"A)
  DROP BOX":PRINT"B)  READ LEDGE
R"
446 GOSUB12
447 IFA$="A"THEN401
448 IFA$="B"THEN406
449 GOTO446
450 CLS0:PRINT@174,"TYPE:";:PRIN
T@203,"(AW SHUCKS)";:PRINT@264,"
TO TRY AGAIN!";:
451 H=0:R=0:INPUTB$:IFB$="AW SHU
CKS"THEN1ELSE451
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Continued from p29

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2020 DATAA SOFA,SOF,12
2030 DATAA COFFEE TABLE,TAB,13
2040 DATAA BOOK,BOO,0
2050 DATAAN END TABLE,TAB,15
2060 DATAA TABLE LAMP,LAM,15
2070 DATAEND TABLE DOORS,DOO,0
2080 DATAREMAINS OF A GOLD-FISH,
REM,0
2090 DATAEND
2100 DATAGET,DROP,OPEN,CLOSE,EXA
MINE,PUSH,BREAK,ENTER,READ,CHANG
E
2110 DATAEND
2120 GOTO330
2130 CLS:PRINT"YOU HAVE JUST BRO
KEN THE TANK.":PRINT"IT FLOODED
THE LIVING ROOM AND  YOU HAVE DR
OWNED. WE TOLD YOU ITWAS A <<LAR
GE>> FISH TANK!!!!!!!":PRINT"NEX
T TIME LISTEN TO WHAT WE SAY!":G
OTO2190
2140 CLS:PRINT"THE TV SET JUST S
HORT-CIRCUITED AND ELECTROCUTED
YOU. YOUR     SPOUSE WILL GET T
HE MONEY NOW!!!";:GOTO2190
2150 CLS:INPUT"FIRST NUMBER OF T
HE COMBINATION:";C:IFC<>1THEN222
0ELSECLS:INPUT"2ND NUMBER OF COM
BINATION:";C:IFC<>30THEN2220ELSE
CLS:INPUT"3RD NUMBER OF COMBINAT
ION:";C:IFC<>11THEN2220ELSEA(7)=
2:GOTO1060
2160 CLS:PRINT"A LARGE RAT JUST
JUMPED OUT.   IT SCARED YOU SO
BAD YOU ARE   HAVING A CARDIAC
ARREST. YOU   FEEL A SEVERE PAI
N IN YOUR CHESTAND YOU COLLAPSE
TO THE FLOOR."
2170 INPUT"CALL FOR HELP";A$:IFA
$="HELP"THENCLS:PRINT"YOU SHOULD
 HAVE WATCHED YOUR   CHOLESTERO
L INTAKE. YOU ARE DEAD":GOTO2190
2180 GOTO2170
2190 PRINT"PRESS <Y> TO TRY AGAI
N"
2200 A$=INKEY$:IFA$=""THEN2200EL
SEIFA$="Y"THEN10ELSECLS:PRINT"OK
, SEE YOU LATER."
2210 END
2220 CLS:PRINT"WRONG NUMBER!!!
                YOU SET OFF THE A
LARM AND HAVE  BEEN MISTAKEN FOR
 A BURGLAR. YOUHAVE BEEN ARRESTE
D AND SENT TO  JAIL. AFTER YOU S
ERVE YOUR TIME TRY AGAIN.":GOTO2
190
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Buffer Business/1

by George McLintock
32k CoCo/CoCo3

UTILITY

I HAVE SUBMITTED a machine language utility, called COMSBUF, which performs a range of functions that share some common features

The two main functions performed are:

1. communications between computers, with or without a modem.
2. a serial type buffer which can extend to include the extra 32K of RAM of a 64K CoCo, with a similar amount of extra RAM with a CoCo 3.

These functions tend to go together because one of the options with communications is to receive a long string of characters and put them in a buffer for processing later on.

Various other options for serial type buffer processing are also provided, and these routines could be of interest, even if the communication routines are not.

It should be noted that the communication routines are not suitable for bulletin board type use. They are intended mainly for direct computer to computer communications, although they will work through a modem.

With the introduction of the CoCo 3, there may be some other people who also have two CoCo's and who might find these routines interesting.

For people who have a CoCo and another computer, these routines provide the basic functions required for the CoCo side of direct connection communications

Functions Provided

* Send a Basic string through the serial port
* Receive a Basic string through the serial port
* Receive a stream of characters through the serial port, and put them in the buffer. The stream of characters received could be generated from another CoCo which is printing them as if to a printer
* Send a stream of characters from the buffer to the serial port
* Add a Basic string from the program to the buffer
* Get a Basic string from the buffer and return it to the program, with various options as to the nature of the string returned. This provides a range of options for manipulating text strings, ie reformatting before printing etc.

Using the Routines with a Basic Program

The ML routines provide some standard type functions for data manipulation, and the Basic program which calls them has to perform the other operations required to achieve the results desired.

This submission includes an outline of the functions performed by the ML routines, and the calling sequence required to use them. It also includes a description of how to set up and install the ML routines for use by a Basic program.

As a further example of their actual use, I've included another submission, called XCOM, which is a Basic program which allows the ML routine functions to be performed from a menu arrangement.

I've also developed a version of a two computer game, which should be submitted shortly.

The setting up of the computer to computer link is common to any communications function, and this is also described in this submission.

COMMUNICATION ROUTINES

BAUD RATE

The timing loops used to determine the baud rate for communications in these routines is effectively the same as the one used in the old CoCo ROM for the printer, and the baud rate is set by the same pokes as used for the printer.

Hence both the send and receive routines in COMSBUF will operate at the same baud rate that is set for the printer, ie it is determined by the values pokes into locations 149 and 150 (decimal). It is normally 600 baud when the computer is turned on.

Both the send and receive data routine operates correctly at 9600 baud.

STOP BITS

The transmit data routine provides the equivalent of two stop bits after each character is transmitted.

The receive data routine will operate correctly with one stop bit, however the fill buffer routine requires two stop bits when operating at 9600 baud. This is because of the extra time required to 'display' the characters received. The 'get basic string routine' will work okay with one stop bit at 9600 baud.

If using the routines with two CoCo's, then two stop bits are always sent.

BITS PER CHARACTER

These routines are set up to send and receive 8 bits per character. This can be altered to a less number of bits per character by poking a replacement value into M+28 for sending and M+53 for the get character routine.

If getting characters with less than 8 bits, then the low order unused bits for each byte will be zero and the bytes have to be adjusted after getting them, eg if you receive characters of 7 bits, then you have to divide each byte by 2 to get the correct pattern.

Normally this should not be necessary, but it can be done if required. Other devices which use 7 bits per character normally provide an option of parity bit always zero or always one, and this can be selected to suit what is sent/received by the CoCo as 8 bit characters.

COMMUNICATION OPERATIONS

As noted, these communication routines are designed mainly for direct computer to computer connections and contain very limited automatic functions.

If you set it up to receive a string of characters from the serial port and put them in the buffer, then the only way to return control to the program which called it is to press the '@' key on the keyboard, ie you have to be there and press a key to complete the operation.

I have written other similar routines to recognise a control character sequence as the end of text, but have found them less convenient to use. Mainly because of the inconvenience of having to add the control codes to the characters being sent, and the restrictions it imposes on the characters being transmitted.

These routines can be used to collect any characters printed by another CoCo, including any screen dump for any printer. They can also be used to transmit and receive any data in any format or structure, without any restrictions.

They are designed to handle bit patterns only. The nature of the data and how you handle it at either end is controlled by other programs, and is completely independent of the data transmission itself.

BUFFER OPERATIONS

The operations with the buffer that are performed by the ML routines are also quite limited, with most of the logic required for the total operation being performed by the Basic program which calls them.

All the ML routines do is to add characters to the buffer and bring them back again. The overall functions that can be achieved by the use of the buffer is obtained from the Basic program, rather than the ML routines.

ENTRY POINTS

The entry points for the routines are as follows. Entry points are shown as a displacement from M, where M is the start of the routine:

M+0 - sends a Basic string through the serial port

M+&H77 - gets a Basic string from the serial port

M+&HA5 - gets characters from the serial port and adds them to the buffer and exits when @ key pressed

M+&HC6 - resets temporary buffer pointer to start

M+&HCD - resets permanent buffer end to start

M+&HDB - adds data from a Basic string to the buffer

M+&H123 & M+&H129 - gets characters from the buffer and returns them in a Basic string, with various options to control the length of the string returned. The two entry points provide alternative ways of returning the string data

M+&H1B0 - removes page skips produced by a word processor

M+&H18E - removes Carriage returns at the end of lines that are produced by a word processor.

SEND AND GET A BASIC STRING

These two routines complement each other, and are intended mainly for two computer games and other forms of interactive use of two computers operating together.

They send and receive a single Basic string, eg to tell the other computer the results of a move, set A$ equal to the result and send it to the other with a call like:

```
A$=USR(A$)
```

The receiving computer can pick up this result with a call like:

```
B$=USR1(B$)
```

At the end of this sequence, B$ in the receiving computer will be the same as A$ in the sending computer, and hence the programs in both computers will know the same result.

If the result is expressed as a number, it can be converted to a string with the command A$=STR$(A), with a series of numbers built up in the same way.

The only restriction with these routines is that the receiving computer must be waiting for the string, ie it must have executed its B$=USR1(B$)) before the sending computer actually sends it.

This is not difficult to achieve, and a method for doing so is described with the section on establishing a link between two computers.

For most games you will probably find that the normal operations of the program will ensure that the receiving computer is always waiting anyway.

For example, if the sequence is player 1 moves and sends the results to player 2's computer, and then waits for the results of player 2's move. With this sequence, player 1's computer will always be ready to receive the results of player 2's move, even if player 2 has already made his move and is waiting to send it immediately.

The time required for computer 2 to return the results to Basic and then enter its send routine will normally exceed the time required for computer 1 to exit the send and enter its own receive routine. If any overlap does occur, a simple FOR T=1 TO 10:NEXT between the receive and send calls will fix the problem.

These routines operate by sending the number of characters in the message as the first character sent, ie the sending routine sends the length of the string as the first character sent. It then sends that many characters.

When the receiving routine gets the first character, it puts it in the VARPTR of the receiving string as its string length, and then loops until it gets that many characters. When it has got them all, it returns to the calling program.

You can in fact use the receive string routine to get characters which are printed, if you print the string length first, eg

```
PRINT#-2,CHR$(LEN(A$));A$
```

... will be received correctly by the get Basic string routine.

The data for the string received by this routine is returned to Basic in the cassette buffer, and the VARPTR of the string set to point to it there. This simplifies the calling sequence required and reduces the requirement for garbage collection in the Basic program.

If you want to keep this data in normal string space, it can be moved there with code like:

```
A$=A$+""
```

For more information about this procedure, see the section on returning strings from the buffer.

GET CHARACTERS FROM THE SERIAL PORT AND ADD TO THE BUFFER

This routine does a perpetual loop on the serial port, each character received is added to the buffer. It is entered by an EXEC 'address' command.

The only way to return control to the calling program is to press the '@' key on the keyboard of the receiving computer.

The other way the routine ends is if the buffer fills up.

The routine which checks for the start of a new character from the serial port also checks the keyboard for the @ key. When the @ key is pressed, it sets the pointer for the end of buffer and returns to the calling program.

As each character is added to the buffer, the routine checks for buffer full. If so, control returns to the calling program and the error switch is turned on.

The routine to check for the @ key does so by checking the PIA directly. This allows data input to continue while the CoCo is in 'all RAM' mode while filling the buffer.

Each character received by this routine is 'displayed' on the 32 column text screen by the equivalent of pokes to screen memory.

This is mainly so that you can see that characters are being received. Characters display as per their screen code, and only upper case letters show as normal ASCII.

SEND CHARACTERS FROM BUFFER TO THE SERIAL PORT

This is the reverse operation to getting characters from the serial port and is performed by the Basic program itself, and not by the ML routines directly.

The sequence required is to get a string of characters from the buffer and print them from Basic using the PRINT#-2,A$ command.

For this operation to work, the other computer must set it's data output line to suit the ROM routine ie to simulate a printer ready signal.

For two CoCo's, this is done with a POKE &HFF20,0 in the receiving machine.

It is possible to send characters without a printer ready signal, and this is described later.

ADD A BASIC STRING TO THE BUFFER

This routine allows data to be put into the buffer from the Basic program. It is entered with a call like:

```
A$=USR(A$)
```

... which will add the data from the string A$ to the end of the buffer.

If the buffer becomes full then the error switch is set non-zero; Normally it is set to equal zero.

The data is added to the buffer starting from the location contained in the permanent end of buffer pointer, and this pointer is then increased to show the new end of buffer.

The temporary end of buffer pointer is not altered by this operation.

GET A BASIC STRING FROM THE BUFFER

This routine is entered by a call like A$=USR(A$). Following this call, A$ will contain the next string from the buffer.

There are two entry points provided which perform the same function, but use different procedures to return the string data.

M+&H129: Returns the string data to the program in the cassette buffer area, ie the VARPTR of A$ (the parameter for the call) is altered to point to the cassette buffer area as holding the string data.

This is the most convenient way of returning string data to Basic and reduces the need for garbage collection by Basic.

If you want to retain the value of this string after getting the next one, then you have to move it to normal string space with code like A$=A$+"", otherwise it will be replaced by the next string, eg to move 10 values back to an array you have to use code like:

```
FOR X=1 TO 10
A$(X)=USR(A$(X))
A$(X)=A$(X)+""
NEXT X
```

If you perform this operation without the second last line, then only A$(10) will have a valid value, and this will be included in all the other elements.

If each string is used after its return, and not retained, then Basic will not require any garbage collection at all.

Even if all strings are retained, then the need for garbage collection with this approach will be considerably less than what would be required for the alternative entry point.

M+&H123: This entry point performs the same function as the one above, except that the string data is returned to an area reserved for it by the Basic program in normal string space.

Before calling this entry point, the program must reserve a string of sufficient length to hold the longest string returned, eg the calling sequence would be like:

```
A$=STRING$(255,0)
A$=USR1(A$)
```

It is the requirement to reserve space for the longest string which causes more frequent garbage collection to occur. The ML routine will set the correct length of the string returned, and this leaves a lot of unused space in normal string space.

This second entry is provided mainly for use with cassette files, but it may have other uses as well. Whenever a cassette file is open you can't use the cassette buffer for any other purpose, and hence this alternative entry point may be required for those circumstances.

Another alternative is to use a different area of memory to return the string data. This can be achieved by poking a different starting value to use into location M+&H12C in the ML routine.

For example, if you don't mind garbage on the screen while outputting data to a cassette file you can POKE M+&H12C,4: POKE M+&H12D,0, and use the first entry point instead. This will return the data to the text

screen area instead of the cassette buffer.

If using a CoCo 3 with WIDTH 40 and cassette files, then the pokes above can be used for all operations with the buffer.

SELECTING THE LENGTH OF EACH STRING RETURNED FROM THE BUFFER

The routine to return a string from the buffer can be set to perform a number of functions which are useful for reformatting text, and the actual use of these are described in more detail with the Basic program.

This section provides an outline of the logic used to determine the end of each string returned, so that you can work out how to achieve certain functions.

The routine provides an option to return strings in a way which avoids splitting a word at the end of a line. It can also be set to return lines of a fixed length, irrespective of the contents of each byte.

As submitted, the routine is set to return strings with a maximum length of 80 characters, and to not split words at the end of each line.

It will return shorter strings if either of the following occurs:

- it reaches a carriage return character (CHR$(13)) in the buffer, in which case the string will contain the characters up to and including the CR.
- it reaches the end of the buffer, in which case the error switch will be turned on (as an end of buffer marker), and the remaining characters from the buffer will be returned in the string.

If the last character in the buffer is a CR, then the last string will be returned normally, and the next call to the buffer will return a null string and set the end of buffer marker.

The various parameters used when returning characters from the buffer are as follows CC1 (at M+&H143) - first control character to force the end of a string returned CC2 (at M+&H147) - a second control character that can also force the end of a string.

As submitted, both CC1 and CC2 are set equal to 13 (CR) EC1 (at M+&H9D) - main control character to mark an 'acceptable' end of line character EC2 (at M+&H15F) - a secondary control character that can also be acceptable at the end of a line.

As submitted, EC1 is set equal to blank (32) and EC2 to a hyphen (45).

The difference between EC1 and EC2, is that if the 80th character (with MLEN=80) is not equal to EC1 but the 81st character is equal to EC1, then the temporary buffer pointer is increased to point to the next character which is not equal to EC1.

BUFFER POINTERS

The working storage area for these routines contain four pointers which control the operations effecting the buffer.

These are:

STBUF (at M+&H93): start of buffer
ENDBUF (at M+&H95): end of buffer

These are normally set once and remain fixed for the program. They can vary to occupy the top of memory which is not being used by the Basic program.

As submitted, the routine is set up for XCOM where the buffer starts at 25000 and ends at Hex FE00.

The end address is set to suit the CoCo 3. If the routine is to be used in a 64K CoCo only, the end of buffer can extend to Hex FF00. For a 32K CoCo the end of buffer should be changed to Hex 8000, while for a 16K machine it should be Hex 4000.

The end of buffer is altered by a poke to M+&H95 (which is a 2 byte integer). The start of buffer can be set to any suitable value. If it is in the lower 32K of memory, then the area below Hex 8000 should be protected from Basic with a CLEAR statement.

If you want to restrict the buffer to the upper 32K of memory only then poke Hex 80 into M+&H95 and 0 into M+&H96.

The routine has other buffer pointers to control the movement of data to and from the buffer.

There is a permanent end of buffer pointer (at M+&H99) which shows the end of data in the buffer. This is adjusted each time data is added to the buffer.

There is also a temporary pointer (at M+&H97) which is used to control the sequential extraction of data from the buffer. As data is returned from the buffer, this pointer points to the address of the next character to be extracted.

The amount of free space in the buffer can be determined by:

```
PEEK(M+&H95)*256+PEEK(M+&H96)
- PEEK(M+&H99)*256-PEEK(M+&H9A)
```

... ie end of buffer minus permanent end of data.

ERROR SWITCH

The routines contain a switch, at M+&H9B, which is normally zero, but it is set non-zero if the buffer fills up.

This switch is also set non-zero when all data has been extracted from the buffer, ie when the temporary pointer equals the the end of data pointer.

ENTRY POINTS TO CHANGE BUFFER POINTERS

The entry at M+&HC6 will reset the temporary pointer to the start of the buffer:
- used to start extracting data from the begining of the buffer

The entry at M+&HCD will reset the permanent end of buffer pointer (and the temporary one as well) to the start of the buffer.

This effectively sets the buffer to empty again.

SET UP AND USE OF THE ROUTINE

This routine is relocatable and can be executed from any part of memory. For normal use, I consider the most appropriate place to put it is at the end of the Basic program which calls it.

The routine is submitted as a Basic program which contains data statements to be poked into memory. This Basic program is set up to install the ML routine at the end of another program and then to delete itself from that program.

To install it, merge COMSBUF with the program which is to use the ML routines and RUN 55000.

The start address for the ML routine can be found by the

Basic program by the following code:

```
M=PEEK(27)*256+PEEK(28)-481
```

To install the routine in a fixed area of memory, delete lines 55110-55150 and replace with CLEAR 200,32000: A=32000. The various entry points and position of parameters etc, within the ML code are then calculated as an offset from the value of M, eg the entry to get a string from the serial port is at M+&H77.

The routines to send and receive a Basic string are contained in the first 146 bytes of the ML routine. If you only want to use this routine for two computer games, then these first 146 bytes are all that is required.

USING THE ROUTINE WITH A COCO 3

As submitted, COMSBUF is set up for an old CoCo, although it contains the code required to use it with a CoCo 3.

The extra 32K RAM for the buffer in a CoCo 3 can be used by poking &H20 into locations M+&HF2 and M+&HFC. This converts a branch never instruction to a branch always one to set the memory map as required for a CoCo 3.

The communication routines themselves work the same with any CoCo, the only difference comes from the code required for the large buffer in the upper 32K of RAM.

The Listing:

```
1 '**  COMSBUF
       BY GEORGE MCLINTOCK
  (COMMUNICATIONS & TEXT FORMAT)
2 GOTO 55000
3 SAVE"146A:3":END'7
4 'ML ROUTINE FOR COMMUNICATIONS
  BETWEEN COMPUTERS
5 'AND TEXT FORMATTING FROM THE
  BUFFER
6 'BUFFER CAN EXTEND TO THE EXTR
A 32K RAM IN 64K COCO AND COCO 3
8 'TO PUT IN FIXED AREA OF MEMOR
Y - DELETE LINES 55110-55150  -
REPACE WITH CLEAR 200,32000:A=32
000
9 '
55000 LN=56000:FOR X=0 TO 478 ST
EP 25:IF X<474 THEN N=25 ELSE N=
3
55010 GOSUB 55030:NEXT X
55020 RESTORE:GOTO 55110
55030 PRINT LN;:A=0:FOR Y=0 TO N
-1
55040 READ C$:B=VAL("&H"+C$):A=A
+B
55050 NEXT Y:READ C$:IF A<> VAL(
"&H"+C$) THEN PRINT "ERROR IN LI
NE NO";LN:STOP
55060 LN=LN+10:RETURN
55070 '
55080 FOR Y= 0 TO N-1:READ C$:PO
KE A,VAL("&H"+C$)
55090 A=A+1:NEXT Y:READ C$:RETUR
N
55100 '
55110 M$="9E1B308901DE6F806F806F
809F1B39":Y=&H01DA
55120 B=0:FOR X=1 TO 30 STEP 2:N
=VAL("&H"+MID$(M$,X,2)):B=B+N:PO
KE Y,N:Y=Y+1:NEXT X
55130 IF B <> &H611 THEN PRINT·"
ERROR IN LINE NO 55110":STOP
55140 EXEC &H1DA:CLEAR
55150 A=PEEK(27)*256+PEEK(28)-48
1:LN=56000
55160 FOR X=0 TO 478 STEP 25:IF
X<474 THEN N=25 ELSE N=3
55170 GOSUB 55080:NEXT X
55180 '
55190 PRINT:PRINT "COMSBUF NOW A
DDED TO END OF     BASIC PROGRAM
":PRINT "AND EXTRA BASIC CODE DE
LETED"
55200
55210 DEL 55000-56190
56000 DATA A6,84,8D,E,E6,84,27,9
,EE,2,A6,C0,8D,4,5A,26,F9,39,34,
17,1A,50,8D,16,5F,9AF
56010 DATA 8D,15,C6,8,34,4,5F,44
,59,58,8D,B,35,4,5A,26,F3,8D,2,3
5,97,C6,2,F7,FF,959
56020 DATA 20,8D,0,9E,95,8C,9E,9
7,8C,9E,97,30,1F,26,FC,39,8D,F1,
C6,8,34,4,8D,E9,12,B18
56030 DATA 12,F6,FF,22,54,46,35,
4,5A,26,F0,8D,DB,35,95,4F,34,15,
1A,50,F6,FF,22,54,24,A2F
56040 DATA DD,86,FE,B7,FF,2,B6,F
F,0,81,FE,26,EE,35,1,C6,FF,35,94
,CE,1,DA,EF,2,8D,E4C
56050 DATA DC,26,10,1F,89,A7,84,
27,A,8D,D2,26,8,A7,C0,5A,26,F7,3
9,6F,84,39,61,A8,FE,AED
56060 DATA 0,61,A8,61,A8,0,50,20
,0,0,0,0,0,0,0,8D,53,AE,36,CE,4,
20,8D,AC,26,697
56070 DATA 12,A7,80,A7,C0,AC,32,
24,8,11,83,5,FF,25,EE,20,E9,6C,3
8,AF,36,20,2C,8D,39,9F9
56080 DATA EC,30,ED,34,39,8D,F7,
ED,36,39,8D,2D,EC,34,C3,0,0,20,E
F,8D,1D,EE,2,E6,84,C06
56090 DATA 27,EE,AE,36,A6,C0,A7,
80,AC,32,24,D3,5A,26,F5,AF,36,21
,21,7F,FF,DE,1C,AF,39,C57
56100 DATA 1A,50,21,9,7F,FF,DF,3
1,8C,9F,6F,38,39,CC,30,31,FD,FF,
A4,CC,32,33,FD,FF,A6,CCD
56110 DATA 20,EC,CC,3C,3D,FD,FF,
A4,CC,3E,3F,FD,FF,A6,20,D4,8D,D5
,EE,2,20,7,8D,CF,CE,E73
56120 DATA 1,DA,EF,2,AF,3C,AE,34
,5F,AC,36,24,36,A6,80,A7,C0,5C,6
D,3B,26,8,81,D,27,9A8
56130 DATA 2B,81,D,27,27,C1,50,2
5,E7,C1,FF,27,1F,A1,3A,26,24,AF,
3E,E7,20,A1,3A,27,13,958
56140 DATA 81,2D,27,F,A6,1E,30,1
F,5A,26,F1,AE,3E,E6,20,20,2,6C,3
8,EE,3C,E7,C4,AF,34,9D8
56150 DATA 16,FF,78,A6,84,A1,3A,
27,4,A6,1F,20,D2,A6,84,A1,3A,26,
E7,30,1,20,F6,17,FF,AE3
56160 DATA 69,AE,30,A6,80,AC,36,
24,14,81,D,26,F6,A6,84,81,20,27,
F0,81,D,27,EC,86,20,A5A
56170 DATA A7,1F,20,E6,16,FF,42,
17,FF,47,AE,30,A6,80,AC,36,24,F2
,81,D,26,F6,5F,A6,85,BB0
56180 DATA 81,D,26,EF,5C,C1,4,26
,F5,AF,3C,33,4,A6,C0,A7,80,11,A3
,36,25,F7,AF,36,AE,B27
56190 DATA 3C,20,D7,133
```

The Listing:

```
                    00100 *CALLED  COMSBUF  FOR COMMUNICATIONS AND BUFFERETC
                    00110 *
7D00                00120         ORG     32000
          FF22      00130 RIN     EQU     $FF22     RS232 INPUT
          FF20      00140 ROUT    EQU     $FF20     RS232 OUTPUT
          0050      00150 MSK     EQU     $50       MASK INTERRUPTS
          00AF      00160 UNMSK   EQU     $AF
```

```
                        00170 *
                        00180 *SEND A STRING OF CHARACTERS
                        00190 *CALLED BY  A$=USR(A$)
                        00200 *
7D00 A6   84            00210 US      LDA     ,X        STR LEN
7D02 8D   0E            00220         BSR     SEND      SEND IT
7D04 E6   84            00230         LDB     ,X        FOR COUNTER
7D06 27   09            00240         BEQ     USFIN
7D08 EE   02            00250         LDU     2,X       STR  DATA AREA
7D0A A6   C0            00260 US1     LDA     ,U+       NEXT CHAR
7D0C 8D   04            00270         BSR     SEND      SEND IT
7D0E 5A                 00280         DECB              COUNTER
7D0F 26   F9            00290         BNE     US1
7D11 39                 00300 USFIN   RTS
                        00310 *
                        00320 *SEND CHARACTER IN  A
                        00330 *
7D12 34   17            00340 SEND    PSHS    CC,A,B,X
7D14 1A   50            00350         ORCC    #MSK      MASK INTERRUPTS
7D16 8D   16            00360         BSR     SETH      SEND SECOND STOP BIT
7D18 5F                 00370         CLRB              START BIT
7D19 8D   15            00380         BSR     TIME      SEND IT
7D1B C6   08            00390         LDB     #8        COUNTER
7D1D 34   04            00400 SL1     PSHS    B         SAVE COUNTER
7D1F 5F                 00410         CLRB
7D20 44                 00420         LSRA              MOVE NEXT BIT
7D21 59                 00430         ROLB              TO SEND
7D22 58                 00440         ASLB              POSITION
7D23 8D   0B            00450         BSR     TIME      SEND IT
7D25 35   04            00460         PULS    B         GET COUNTER
7D27 5A                 00470         DECB
7D28 26   F3            00480         BNE     SL1
7D2A 8D   02            00490         BSR     SETH      FIRST STOP BIT
7D2C 35   97            00500         PULS    CC,A,B,X,PC   RETURN
                        00510 *
                        00520 *TIMING LOOP FOR SEND AND GET ROUTINES
                        00530 *IS SAME TIMING AS USED FOR ROM PRINT ROUTINE
                        00540 *
7D2E C6   02            00550 SETH    LDB     #2        SET BIT ON
7D30 F7   FF20          00560 TIME    STB     ROUT      SET AS REQ
7D33 8D   00            00570 TIME1   BSR     F4SAME    TIMING
7D35 9E   95            00580 F4SAME  LDX     <$95
7D37 8C   9E97          00590         CMPX    #$9E97    FOR SAME DELAY
7D3A 8C   9E97          00600         CMPX    #$9E97    AS ROM ROUTINE
7D3D 30   1F            00610 LP1     LEAX    -1,X
7D3F 26   FC            00620         BNE     LP1
7D41 39                 00630         RTS
                        00640 *
                        00650 *THIS ROUTINE GETS 8 BITS FROM RS232
                        00660 *IS ENTERED AFTER START BIT FOUND
7D42 8D   F1            00670 STARTF  BSR     F4SAME    HALF WAIT
7D44 C6   08            00680         LDB     #8        COUNTER
7D46 34   04            00690 GL1     PSHS    B
7D48 8D   E9            00700         BSR     TIME1
7D4A 12                 00710         NOP               EQUAL TIME
7D4B 12                 00720         NOP
7D4C F6   FF22          00730         LDB     RIN       GET BIT
7D4F 54                 00740         LSRB
```

```
7D50 46          00750          RORA
7D51 35   04     00760          PULS    B
7D53 5A          00770          DECB
7D54 26   F0     00780          BNE     GL1
7D56 8D   DB     00790          BSR     TIME1   WAIT ONE MORE
7D58 35   95     00800          PULS    CC,B,X,PC RETURN
                 00810 *
                 00820 *GET A CHARACTER FROM RS232 PORT
                 00830 *AND RETURN IN  A  REG
                 00840 *
7D5A 4F          00850 GET      CLRA            SET CC OFF
7D5B 34   15     00860          PSHS    CC,B,X
7D5D 1A   50     00870          ORCC    #MSK
7D5F F6   FF22   00880 STRTWT   LDB     RIN
7D62 54          00890          LSRB
7D63 24   DD     00900          BCC     STARTF  START FOUND
                 00910 *
                 00920 *TEST @ KEY
                 00930 *IF PRESSED RETURN WITH CC SET
                 00940 *
7D65 86   FE     00950          LDA     #254
7D67 B7   FF02   00960          STA     $FF02
7D6A B6   FF00   00970          LDA     $FF00
7D6D 81   FE     00980          CMPA    #254
7D6F 26   EE     00990          BNE     STRTWT
7D71 35   01     01000          PULS    CC
7D73 C6   FF     01010          LDB     #-1     SET CC
7D75 35   94     01020          PULS    B,X,PC  RETURN
                 01030 *
                 01040 *GET CHARACTER STRING FROM RS232 PORT
                 01050 *RETURN DATA IN CASSETTE BUFFER
                 01060 *AND ADJUST VARPTR OF STRING TO POINT TO IT
                 01070 *CALLED BY A$=USR(A$)
                 01080 *
7D77 CE   01DA   01090 UG       LDU     #$01DA  CASSETTE BUFFER
7D7A EF   02     01100          STU     2,X     SET VARPTR TO IT
7D7C 8D   DC     01110          BSR     GET     GET LENGTH
7D7E 26   10     01120          BNE     ERRB    NOT VALID
7D80 1F   89     01130          TFR     A,B     FOR COUNTER
7D82 A7   84     01140          STA     ,X      TO VARPTR
7D84 27   0A     01150          BEQ     ERRB    ZERO LEN
7D86 8D   D2     01160 UG1      BSR     GET     GET CHAR
7D88 26   08     01170          BNE     ERRB1   ERROR
7D8A A7   C0     01180          STA     ,U+     PUT IN STRING
7D8C 5A          01190          DECB
7D8D 26   F7     01200          BNE     UG1
7D8F 39          01210          RTS
                 01220 *
                 01230 *ONLY ERROR IS @ KEY PRESSED
                 01240 *RETURN NULL STRING IF SO
                 01250 *
7D90 6F   84     01260 ERRB     CLR     ,X
7D92 39          01270 ERRB1    RTS
                 01280 *
                 01290 *BUFFER ROUTINES
                 01300 *
         FFDF    01310 RAM      EQU     $FFDF
         FFDE    01320 ROM      EQU     $FFDE
```

```
                FFF0    01330 STBUF   EQU     -16
                FFF2    01340 ENDBUF  EQU     -14
                FFF4    01350 THISBF  EQU     -12
                FFF6    01360 PERMBF  EQU     -10
                FFF8    01370 ERX     EQU     -8
                FFF9    01380 MLEN    EQU     -7
                FFFA    01390 EC1     EQU     -6
                FFFB    01400 SW1     EQU     -5
                FFFC    01410 T1      EQU     -4
                FFFE    01420 T2      EQU     -2
                0000    01430 T3      EQU     0
                        01440 *
7D93            61A8    01450         FDB     25000   START BUFFER
7D95            FE00    01460         FDB     $FE00   END     BUFFER
7D97            61A8    01470         FDB     25000   TEMP END DATA
7D99            61A8    01480         FDB     25000   PERM    END DATA
7D9B            0050    01490         FDB     80      ERX & MLEN
7D9D            2000    01500         FDB     $2000   EC1 & SW1
7D9F            0000    01510         FDB     0       TEMP
7DA1            0000    01520         FDB     0       TEMP
7DA3            0000    01530 TABLE   FDB     0       TEMP
                        01540 *
                        01550 *FILL BUFFER FROM RS-232 PORT
                        01560 *EXIT WHEN  @  KEY PRESSED
                        01570 *
7DA5 8D         53      01580 ZZFIL   BSR     SETRAM
7DA7 AE         36      01590         LDX     PERMBF,Y  START FROM
7DA9 CE         0420    01600 FIL1    LDU     #$420   TEXT SCREEN
7DAC 8D         AC      01610 FIL2    BSR     GET     GET CHAR
7DAE 26         12      01620         BNE     ENDFIL  END
7DB0 A7         80      01630         STA     ,X+     IN BUFFER
7DB2 A7         C0      01640         STA     ,U+     TO SCREEN
7DB4 AC         32      01650         CMPX    ENDBUF,Y
7DB6 24         08      01660         BHS     BUFULL
7DB8 1183       05FF    01670         CMPU    #$5FF   END SCREEN
7DBC 25         EE      01680         BLO     FIL2
7DBE 20         E9      01690         BRA     FIL1
7DC0 6C         38      01700 BUFULL  INC     ERX,Y   SHOW FUL
7DC2 AF         36      01710 ENDFIL  STX     PERMBF,Y  NEW END
7DC4 20         2C      01720         BRA     RBASIC
                        01730 *
                        01740 *RESET TEMP BUFFER POINTER TO START
                        01750 *
7DC6 8D         39      01760 ZZTSET  BSR     SETY
7DC8 EC         30      01770         LDD     STBUF,Y
7DCA ED         34      01780 TSET1   STD     THISBF,Y
7DCC 39                 01790         RTS
                        01800 *
                        01810 *RESET BOTH TEMP AND PERM POINTERS TO START
                        01820 *
7DCD 8D         F7      01830 ZZPSET  BSR     ZZTSET
7DCF ED         36      01840         STD     PERMBF,Y
7DD1 39                 01850 ENDST   RTS
                        01860 *
                        01870 *ADJUST TEMP POINTER
                        01880 *
7DD2 8D         2D      01890 ZADJ    BSR     SETY
7DD4 EC         34      01900         LDD     THISBF,Y
```

```
7DD6 C3   0000      01910          ADDD    #0
7DD9 20   EF        01920          BRA     TSET1
                    01930 *
                    01940 *MOVE DATA FROM STRING AND ADD IT TO BUFFER
                    01950 *
7DDB 8D   1D        01960 ZZSTIN   BSR     SETRAM
7DDD EE   02        01970          LDU     2,X     START ADDRESS
7DDF E6   84        01980          LDB     ,X      STR LEN
7DE1 27   EE        01990          BEQ     ENDST   ZERO LEN
7DE3 AE   36        02000          LDX     PERMBF,Y  CURRENT END
7DE5 A6   C0        02010 LPSTIN   LDA     ,U+
7DE7 A7   80        02020          STA     ,X+
7DE9 AC   32        02030          CMPX    ENDBUF,Y
7DEB 24   D3        02040          BHS     BUFULL
7DED 5A             02050          DECB
7DEE 26   F5        02060          BNE     LPSTIN
7DF0 AF   36        02070          STX     PERMBF,Y  NEW END
                    02080 *
                    02090 *FALL THROUGH TO
                    02100 *CHANGE MEMORY MAP AS REQUIRED
                    02110 *
7DF2 21   21        02120 RBASIC   BRN     COCO3X
7DF4 7F   FFDE      02130          CLR     ROM
7DF7 1C   AF        02140 RBAS1    ANDCC   #UNMSK
7DF9 39             02150          RTS
                    02160 *
7DFA 1A   50        02170 SETRAM   ORCC    #MSK
7DFC 21   09        02180          BRN     COCO3
7DFE 7F   FFDF      02190          CLR     RAM
7E01 31   8C 9F     02200 SETY     LEAY    TABLE,PCR
7E04 6F   38        02210          CLR     ERX,Y   ERROR SWITCH
7E06 39             02220          RTS
                    02230 *
7E07 CC   3031      02240 COCO3    LDD     #$3031
7E0A FD   FFA4      02250          STD     $FFA4
7E0D CC   3233      02260          LDD     #$3233
7E10 FD   FFA6      02270          STD     $FFA6
7E13 20   EC        02280          BRA     SETY
                    02290 *
7E15 CC   3C3D      02300 COCO3X   LDD     #$3C3D
7E18 FD   FFA4      02310          STD     $FFA4
7E1B CC   3E3F      02320          LDD     #$3E3F
7E1E FD   FFA6      02330          STD     $FFA6
7E21 20   D4        02340          BRA     RBAS1
                    02350 *
                    02360 *RETURN CHARACTERS FROM BUFFER IN STRING
                    02370 *EACH STRING ENDS DEPENDING ON PARAMETERS SET
                    02380 *
7E23 8D   D5        02390 SE       BSR     SETRAM  RET IN STRING
7E25 EE   02        02400          LDU     2,X
7E27 20   07        02410          BRA     SEC
7E29 8D   CF        02420 ZZGET    BSR     SETRAM  RET CASSETTE BUFFER
7E2B CE   01DA      02430          LDU     #$01DA
7E2E EF   02        02440          STU     2,X
7E30 AF   3C        02450 SEC      STX     T1,Y    SAVE IT
7E32 AE   34        02460          LDX     THISBF,Y  START FROM
7E34 5F             02470          CLRB            COUNTER
7E35 AC   36        02480 LPGET    CMPX    PERMBF,Y
```

```
7E37 24  36      02490          BHS     ENDX1
7E39 A6  80      02500          LDA     ,X+
7E3B A7  C0      02510          STA     ,U+
7E3D 5C          02520          INCB
7E3E 6D  3B      02530          TST     SW1,Y
7E40 26  08      02540          BNE     LPGET0  BYPASS
7E42 81  0D      02550          CMPA    #13
7E44 27  2B      02560          BEQ     ENDCR
7E46 81  0D      02570          CMPA    #13     IS CC2
7E48 27  27      02580          BEQ     ENDCR
7E4A C1  50      02590 LPGET0   CMPB    #80
7E4C 25  E7      02600          BLO     LPGET   CONTINUE
7E4E C1  FF      02610          CMPB    #255    IS MAXL
7E50 27  1F      02620          BEQ     ENDCR   DONT ADJUST END
7E52 A1  3A      02630          CMPA    EC1,Y
7E54 26  24      02640          BNE     SF
7E56 AF  3E      02650 SF2      STX     T2,Y    IF REQUIRED
7E58 E7  20      02660          STB     T3,Y
                 02670 *
7E5A A1  3A      02680 LPGET1   CMPA    EC1,Y
7E5C 27  13      02690          BEQ     ENDCR
7E5E 81  2D      02700          CMPA    #45     IS EC2
7E60 27  0F      02710          BEQ     ENDCR
7E62 A6  1E      02720          LDA     -2,X
7E64 30  1F      02730          LEAX    -1,X
7E66 5A          02740          DECB
7E67 26  F1      02750          BNE     LPGET1
7E69 AE  3E      02760          LDX     T2,Y    NONE FOUND
7E6B E6  20      02770          LDB     T3,Y    RESTORE
7E6D 20  02      02780          BRA     ENDCR
7E6F 6C  38      02790 ENDX1    INC     ERX,Y
7E71 EE  3C      02800 ENDCR    LDU     T1,Y    PUT LEN
7E73 E7  C4      02810          STB     ,U      IN STRING
7E75 AF  34      02820          STX     THISBF,Y  NEW TEMP
7E77 16  FF78    02830          LBRA    RBASIC
                 02840 *
                 02850 *CHECK NEXT FOR EC1
                 02860 *IF SO ADVANCE TO NEXT NOT ONE
7E7A A6  84      02870 SF       LDA     ,X
7E7C A1  3A      02880          CMPA    EC1,Y
7E7E 27  04      02890          BEQ     SF1
7E80 A6  1F      02900          LDA     -1,X
7E82 20  D2      02910          BRA     SF2
7E84 A6  84      02920 SF1      LDA     ,X
7E86 A1  3A      02930          CMPA    EC1,Y
7E88 26  E7      02940          BNE     ENDCR
7E8A 30  01      02950          LEAX    1,X
7E8C 20  F6      02960          BRA     SF1
                 02970 *
                 02980 *REMOVE CR'S AT END OF LINE
                 02990 *
7E8E 17  FF69    03000 ZEOL     LBSR    SETRAM
7E91 AE  30      03010          LDX     STBUF,Y
7E93 A6  80      03020 EOL1     LDA     ,X+
7E95 AC  36      03030          CMPX    PERMBF,Y
7E97 24  14      03040          BHS     FINEOL
7E99 81  0D      03050          CMPA    #13
7E9B 26  F6      03060          BNE     EOL1
```

```
7E9D A6   84     03070          LDA    ,X      PAST CR
7E9F 81   20     03080          CMPA   #32
7EA1 27   F0     03090          BEQ    EOL1
7EA3 81   0D     03100          CMPA   #13
7EA5 27   EC     03110          BEQ    EOL1
                 03120 *REPLACE CR WITH BLANK
7EA7 86   20     03130          LDA    #32
7EA9 A7   1F     03140          STA    -1,X
7EAB 20   E6     03150          BRA    EOL1
7EAD 16   FF42   03160 FINEOL   LBRA   RBASIC
                 03170 *
                 03180 *REMOVE PAGE BREAKS
                 03190 *
7EB0 17   FF47   03200 ZPBR     LBSR   SETRAM
7EB3 AE   30     03210          LDX    STBUF,Y
7EB5 A6   80     03220 PBK1     LDA    ,X+
7EB7 AC   36     03230          CMPX   PERMBF,Y
7EB9 24   F2     03240          BHS    FINEOL
7EBB 81   0D     03250          CMPA   #13
7EBD 26   F6     03260          BNE    PBK1
7EBF 5F          03270          CLRB
7EC0 A6   85     03280 PBK2     LDA    B,X
7EC2 81   0D     03290          CMPA   #13
7EC4 26   EF     03300          BNE    PBK1
7EC6 5C          03310          INCB
7EC7 C1   04     03320          CMPB   #4
7EC9 26   F5     03330          BNE    PBK2
                 03340 *REMOVE EXTRA BYTES
7ECB AF   3C     03350          STX    T1,Y
7ECD 33   04     03360          LEAU   4,X
7ECF A6   C0     03370 PBK3     LDA    ,U+
7ED1 A7   80     03380          STA    ,X+
7ED3 11A3 36     03390          CMPU   PERMBF,Y
7ED6 25   F7     03400          BLO    PBK3
7ED8 AF   36     03410          STX    PERMBF,Y
7EDA AE   3C     03420          LDX    T1,Y
7EDC 20   D7     03430          BRA    PBK1
                 03440 *
          7EDE   03450 ZZEND     EQU    *
          7D77   03460          END    UG
00000 TOTAL ERRORS
```

CONNECTING TWO COMPUTERS FOR COMMUNICATIONS

For two computers to be able to communicate with each other they must be connected together with a cable. It is quite easy to connect two CoCo's together because you can use a simple modification to an existing printer cable for the purpose.

The printer connection on the CoCo is a four pin RS-232, of which only three pins are required for a printer or for direct computer to computer communications.

The three pins used on the CoCo end of the cable are transmit data (2), receive data (3), and signal ground (7). The pin numbers above in brackets are the pin numbers for a standard RS-232 connector.

The actual positions of these pins in the CoCo port are shown in the manual which comes with the computer.

The CoCo printer cable has a straight through connection for the four wires in it. If you use an unmodified cable to connect two CoCo's then the transmit pin in one will be connected to the transmit pin in the other, and no communications are possible.

To allow communications you have to connect the transmit data pin in each machine to the receive data pin in the other, and this requires two wires in the cable to be swapped over.

There are various ways of doing this, but I consider the easiest way of achieving the desired results is to use normal telephone plugs (one male and one female) in the cable.

Telephone plugs can be obtained from a range of stores and can be attached to a cable without solder. They use either a screw down connector or a pin on post mechanism to connect the wires to the pins in the plug.

If you cut a normal printer cable and connect the wires together again through telephone plugs then you can still use it as a normal printer cable.

To convert it to a cable suitable for communications you have to swap over the wires from pins 2 and 3 in one of the plugs, so that pin 2 in each computer connects to pin 3 in the other one.

The easy way to identify the two wires that have to be changed is to determine which wire connects to each pin in the printer cable connections.

If you don't know how to do this, or don't have the bits to do it, then you can do it by trial and error without any risk of damanging your computer.

There are only 4 wires in the cable and 6 different ways of swapping two of them in a plug.

Simply try each possible combination, using the test below, until you get the right result. A wrong combination will not damage anything.

Once you have found the wire colors to change for your printer cable, record it somewhere for future reference.

On the plug itself is the best place.

The correct cable connection should allow the following:

In machine A, POKE &HFF20,2
In machine B, PEEK(&HFF22)
Should be an odd number, normally 5.

In machine A, POKE &HFF20,0
In machine B, PEEK(&HFF22)
Should be an even number, normally 4.

Buffer Business/2

by George McLintock
32k ECB CoCo

UTILITY

I HAVE SUBMITTED a ML routine, called COMSBUF, which provides a number of facilities for communications between computers and serial buffer processing. This submission, called XCOM, is a Basic program which allows a number of the functions of COMSBUF to be performed through a menu setup, and provides examples of the calling sequence etc required for the use of COMSBUF.

Functions provided include:
- fill buffer from RS-232 port
- display buffer contents to screen
- save buffer to disk or tape
- load file from disk or tape to buffer
- send contents of buffer through RS-232 port
- print the contents of the buffer to a printer, with various options for reformatting text from the buffer
- modify various parameters and perform other functions like load a subscript file to the buffer, send a file through the serial port without a printer ready signal, and send and receive messages entered from the keyboard.

Most aspects which relate specifically to the operation of the ML routine are described with COMSBUF, this description is concerned mainly with the text formatting options.

The various file operations performed follow a standard type procedure, and the use of fixed length strings is covered with COMSBUF.

TEXT FORMATTING

There are a number of word processors around for the old CoCo and they each have their own strengths and weaknesses.

My own preference, for ease and convenience of use, is Scripsit and this is the package I normally use on the CoCo

The aspects which I don't like about Scripsit relate mainly to it's limited text formatting capabilities and the funny way it handles line counting during printing.

XCOM provides the extra text formatting features that I particularly want from a word processor, and bypasses the bits that I don't like.

It is also a convenient framework for adding extra features that I might want for a specific requirement.

The particular features provided are:
- automatic indenting of paragraphs
- not allowing a sub-heading to be the last line printed on a page
- variable size top and bottom margins
- a normal line count procedure for printing.

It does not provide automatic page headings or numbering, but the program logic allows these to be easily added. (In the GOSUB routine at line 250). I don't use these functions very often, and prefer to add specific code for the purpose when I do.

I've also included the logic for a GOSUB routine to print a return address and letterhead at the top of the first page for text where this might be appropriate. In the program submitted, this routine, at line 1070, is empty because it must be specific to the person using it.

AUTOMATIC INDENTING

This is a feature I use regularly and it is set up to be easy to use while entering the initial manuscript text. It is based on a standard text layout to start it.

XCOM contains a string, K$, set in line 2820, which identifies characters that will cause automatic indenting of a paragraph when they are the first non-blank characters following a carriage return, eg a common layout which I use for sub-paragraphs is to indent it 3 or 4 spaces and preceed the paragraph with a dash.

To obtain this effect, simply enter the spaces after the carriage return, type the dash and enter the rest of the text normally.

XCOM will then automatically print this in the way required, for any line length etc. The number of spaces that the paragraph will be indented is the same as the number of spaces between the CR and the text.

K$ can contain any number of characters to be used for this purpose, but there are additional special features associated with the first two characters, ie as set up, K$ starts with '*>-' etc.

The first character, (*), is used as a special control code and it's use can be extended by adding extra code to the program. eg as a form of ESC character, where following codes can be used for extra functions.

I've included it in this way because I had thought of using it for some extra printer control codes and layout options, but I haven't had a need for them yet. For XCOM it is used to control the next function described only.

The second character will cause automatic indenting in the same way as the rest of the characters in the string. The only difference is that this character is not actually printed in the text.

It is replaced with a blank before printing and provides an ability to indent a para without printing a symbol as well, eg '>' will indent the para but not print, while '-' will do the same thing but the '-' is printed as well.

The other characters in the string operate the same as '-' and their function is to show different levels of sub-paragraph's when printed.

The actual size of the indenting is the number of

characters between the CR and the start of the actual text, eg for 'bb-bSub-para'

The next line of text printed will start under the 'S'.

SUB HEADINGS AT END OF PAGE

This is another feature which relates to a personal preference for layouts. I tend to use sub-headings freely in the form of space after previous para, sub-heading, space and then more text.

With this layout, it can happen that the sub-heading is the last line printed on a page, and the following text starts on the next page.

The first character in K$, (*), is used to prevent this. It indicates that if there is less than a specified number of lines to be printed on this page, then XCOM skips to the top of the next page before printing the line.

When entering the initial text, a sub-heading is preceeded by an *, and XCOM is set so that if a line starting with an '*' is within 4 lines of the end of the page, it will skip to the next page before printing it.

This ensures that a sub-heading will be followed by at least 2 lines of text on the same page. The '*' is not printed, it is deleted from the string before printing. ie it is not replaced with a blank.

LINES PER PAGE

Subscript provides a fixed length page break of 4 characters and has a funny way of counting lines per page, such that the first page has more lines printed than the rest.

XCOM provides a parameter to specify the number of lines printed per page, and the number of spaces for each page break. It is set for a total of 70 lines per page (A4 size).

With this approach, you simply set the paper where you want it to start printing, and all subsequent pages will have the same sized top margin, which can be any number of lines.

USING XCOM FOR FORMATTING TEXT

The basic procedure required to format printed text with XCOM is to load the text into the buffer and then print it out from there.

The procedure used to get the text file into the buffer depends on where it is comming from and what is the most convenient way of getting it into the buffer.

WITH 2 COMPUTERS

One of the uses I have for XCOM is to format and print text which is entered initially into an Olivetti MC-10 portable computer (a Tandy 100 compatible).

For this one, I use the direct computer to computer connection function with XCOM to transfer the text from the Olivetti to the CoCo buffer and then print it from the buffer.

I also save the file from the buffer to disk in the CoCo to keep a copy of it. The file on disk can also be loaded back into Scripsit on the CoCo if required.

As a matter of interest, data can also be sent from the CoCo to the Olivetti with XCOM, but it requires an extra time delay in the CoCo transmission to avoid losing characters at the Olivetti end.

A similar procedure can be used for two CoCo's if it happens to be convenient. eg if you enter it into a CoCo using the ROM pack, and want to transfer the file to another CoCo.

For this one, connect the CoCo's with a coms cable (described with COMSBUF), and use Scripsit to print it from one machine to the other. If doing this, remember to set the left margin to zero before printing, otherwise the ML routine which removes the CR's at the end of each line will not work correctly, because a left margin will cause a blank to follow every CR.

When the file is in the buffer you can then do any of the other functions of XCOM with it.

If using the disk version of Scripsit to print to another CoCo then you have to allow for the different timing of it's baud rate, eg while 600 bauds from disk Scripsit will be accepted OK by the Tandy DMP-105, it is not acceptable to a lot of other machines, and will not be received correctly by another CoCo with the normal poke 150,87.

To receive it correctly in another CoCo you have to use a lower value for the baud rate eg POKE 150,82 will receive characters correctly from Disk Scripsit with baud rate 33.

WITH A SINGLE COMPUTER

You don't have to have two computers to use the text formatting functions of XCOM with Scripsit (or other word processor), it can be used with any file produced by the package.

Disk Scripsit can produce two different types of files and both can be loaded into the buffer for XCOM.

These filese are the TXT file, which is the normal package file, and has a non-standard file structure, and the SPL file which is a standard file produced by printing the file to disk. For the ROM Scripsit, any file to be loaded into the buffer must be printed to tape.

XCOM will load both of these types of files from disk, and which one you use depends mainly on whether you want to use part of the Scripsit text formatting capabilities or not.

Scripsit provides two common text formatting functions which are not included in XCOM. These are:

- Center text in the page and
- imbedded printer control codes in the text.

If you want to use either of these functions then you have to use the printed file (SPL) for loading the buffer. With this file these formatting functions will be as provided by Scripsit.

If using the SPL file, then it must be produced using a left margin of zero, and after loading it to the buffer, you must execute the ML routines to remove page breaks and to remove the CR's generated at the end of each line.

The remove page breaks routine should be executed first to ensure the correct removal of all CR's at the end of each line. If done in the wrong sequence, a CR preceeding a page break may not be removed

The TXT file produced by Scripsit does not have a normal structure and cannot be inputted from disk using the LINE INPUT or INPUT commands. While you will get most of the file with these commands, you will lose the end of long lines.

A procedure which will load

the full TXT file is to open it as a direct access file with a length of one, and read it in byte by byte and put it in the buffer that way.

This procedure is used for the option to load a Scripsit file. The SPL file is loaded as a normal file.

The internal codes used by Scripsit are less than CHR$(10) and these are excluded from the buffer during the load, so that you finish up with a normal text file in the buffer which requires no further processing before printing from the buffer.

SPECIAL BASIC FORMAT

XCOM also contains two routines to produce a formatted print of a Basic program.

The first routine indents the second and subsequent lines of print for a single Basic line past the line number, and ends each line with a blank or ':'.

The second routine prints each separate statement on a new line, and indents multiple statements to appear under the start of the one above it.

It also provides a further indentation of IF .. THAN .. ELSE statements.

The basic operation for this second function is based on using the ':' character in CC2 as a secondary control character which will also force the end of a string in COMSBUF.

The Basic program to be printed by this routine can be put in the buffer by any suitable procedure in much the same way as for text files, eg printed from another computer or from a disk or tape file. If loaded from a disk or tape file, then the program has to be saved in ASCII format.

This also provides a procedure for transfering a Basic program from some other computer to the CoCo, ie get the program into the buffer by sending it from the other computer and then save it to disk or tape. The format of the file produced by XCOM can be loaded by Basic in the CoCo as a normal program.

USING XCOM

XCOM requires the ML routine, called COMSBUF, to be in memory at the same time as the Basic program. The best way of using them both together is to incorporate COMSBUF at the end of the Basic program, and this is the way XCOM is set up to operate.

If you want COMSBUF to be in some other area of memory then you must change the value of M, in line 2650 to equal the start of the ML routine, and alter the CLEAR statement etc to suit.

XCOM can be used with any CoCo, and the code in line 2850 sets it up for a CoCo 3 or old CoCo.

If used with an old CoCo with less than 64K of RAM, then the buffer pointers have to be altered as described with COMSBUF.

CONNECTING THE COCO TO ANOTHER COMPUTER

The communication functions of XCOM require a cable connection between the CoCo and other computer. Methods for doing this are described with COMSBUF.

The Listing:

```
1 '**  XCOM
       BY GEORGE MCLINTOCK
2 GOTO 10
3 SAVE"146/BAS:3":END'7
4 'A BASIC PROGRAM TO USE THE
   FACILITIES PROVIDED BY THE
   ML ROUTINE COMSBUF
5 'COMMUNICATIONS BETWEEN COMPUT
ERS AND TEXT FORMATTING FROM THE
 BUFFER
10 CLEAR 2000,25000:PCLEAR 1
20 GOTO 2650 'set parameters
30 '
40 PRINT:INPUT "PRESS ENTER TO C
ONTINUE";Z
50 CLS: PRINT "COMSBUF IN COCO":
 PRINT "OPTIONS ARE"
60 PRINT "1 TO BUFFER FROM RS-23
2"
70 PRINT "2 BUFFER TO SCREEN"
80 PRINT "3 BUFFER TO DISK"
90 PRINT "4 DISK TO BUFFER"
100 PRINT "5 TAPE OPERATIONS"
110 PRINT "6 PRINT BUFFER"
120 PRINT "7 RESET BUFFER"
130 PRINT "8 OTHER OPTIONS"
140 PRINT "9 EXIT"
150 PRINT: INPUT"ENTER CHOICE";Z
160 IF Z < 1 OR Z > 9 THEN PRINT
 "INVALID":GOTO 40
170 ON Z GOSUB 430,510,700,810,9
50,1020,1630,1680,200
180 GOTO 40
190 '
200 STOP
210 '
220 IF RIGHT$(A$,1)=CHR$(13) THE
N A=0:A$=LEFT$(A$,LEN(A$)-1) ELS
E A=1
230 RETURN
240 'print a line formatted
250 PRINT#-2,TAB(LM+EM);A$
260 LC=LC+1:IF LC=<LP THEN RETUR
N
270 LC=1:IF TM=0 THEN RETURN
280 FOR X=1 TO TM:PRINT#-2:NEXT
X
290 RETURN
300 'get string, print it & retu
rn
310 A$=USR1(A$):LN=LN+1:PRINT A$
:RETURN
320 'reset temp pointer to start
330 LN=1:EXEC M+&HC6: PRINT "TEM
P POINTER RESET":RETURN
340 'show end of buffer
350 PRINT:PRINT "END OF BUFFER -
";LN;" STRINGS"
360 A=PEEK(M+&H99)*256+PEEK(M+&H
9A)
370 PRINT "BUFFER CONTAINS";A-SB
380 PRINT "SPACE REMAINING";EB-A
390 RETURN
400 'get file name
410 PRINT:INPUT "ENTER FILE NAME
 ";N$:RETURN
420 'fill buffer from serial por
t
430 CLS:PRINT "PRESS @ WHEN FINI
SHED":
440 PRINT "WAITING TO FILL BUFFE
R
450 POKE &HFF20,0 'for other coc
o
460 EXEC M+&HA5
470 IF PEEK(EC)=0 THEN PRINT "NO
RMAL END" ELSE PRINT "BUFFER FUL
L"
480 POKE &HFF20,2 'RESET
490 GOSUB 360:RETURN
500 'buffer to screen
510 CLS:PRINT "BUFFER TO SCREEN"
520 GOSUB 330
530 GOSUB 310: IF PEEK(EC)<>0 TH
EN 350
540 PRINT:INPUT  "E/Q/F/B";Z$:IF
 Z$="" THEN 530
550 IF Z$="Q" THEN RETURN
560 IF Z$="B" THEN INPUT "NUMBER
 OF BYTES BACKWARDS";Z:Z=0-Z:GOT
O 640
570 IF Z$<>"F" THEN 530
580 PRINT:PRINT "MOVE FORWARD BY
":PRINT "1 STRINGS":PRINT "2 BYT
ES":INPUT Z$
590 INPUT "ENTER NUMBER TO MOVE"
;Z
600 IF Z$<>"1" THEN 640
610 FOR X=1 TO Z:GOSUB 310
620 IF PEEK(EC) <>0 THEN 350
630 NEXT X:GOTO 530
640 Z=Z+PEEK(E)*256+PEEK(E+1)
650 IF Z<SB THEN GOSUB 330:GOTO
530
660 IF Z>EB THEN 350
670 POKE E,INT(Z/256):POKE E+1,Z
-INT(Z/256)*256
680 GOTO 530
690 'buffer to disk
700 CLS:PRINT"BUFFER TO DISK":GO
```

```
SUB 330
710 D=1:GOSUB 740
720 GOTO 350
730 'write out file
740 GOSUB 410
750 OPEN "O",#D,N$
760 IF D>0 THEN GOSUB 310 ELSE A
$=USR1(A$)
770 PRINT #D,A$;
780 IF PEEK(EC)=0 THEN 760
790 CLOSE:RETURN
800 'disk to buffer
810 CLS:PRINT"DISK TO BUFFER"
820 D=1:GOSUB 850
830 GOTO 350
840 'get from file
850 PRINT:PRINT"PRESS ENTER TO S
ET BUFFER EMPTY OR A TO ADD TO E
ND EXISTING":INPUT Z$
860 IF Z$<>"A" THEN EXEC M+&HCD
870 GOSUB 410:LN=1
880 OPEN "I",#D,N$
890 IF EOF(D) THEN CLOSE:RETURN
900 LINE INPUT #D,A$
910 IF LEN(A$)<255 AND RIGHT$(A$
,1)<>CHR$(13) THEN A$=A$+CHR$(13
)
920 A$=USR2(A$):LN=LN+1:PRINT A$
;
930 GOTO 890
940 'tape operations
950 CLS:PRINT "TAPE OPERATIONS":
GOSUB 330
960 PRINT "1 TO SAVE":PRINT "2 T
O LOAD":INPUT Z:D=-1
970 POKE M+&H12C,4:POKE M+&H12D,
0 'CHANGE WS
980 IF Z=1 THEN GOSUB 740 ELSE G
OSUB 850
990 POKE M+&H12C,1:POKE M+&H12D,
&HDA
1000 GOTO 350
1010 'print buffer
1020 CLS:PRINT"PRINT BUFFER":GOS
UB 330
1030 PRINT"1 TO SEND TO SERIAL P
ORT":PRINT "2 FOR FIRST SPECIAL
BASIC PRINT 3 FOR SECOND BASIC F
ORMAT":PRINT "4 TO START WITH LE
TTERHEAD":PRINT"OR PRESS ENTER F
OR FORMATTED    PRINT IE PAGE BR
EAKS ETC":INPUT Z$
1040 IF Z$="" OR Z$="4" THEN 111
0 ELSE IF Z$="2" OR Z$="3" THEN
1330
1050 GOSUB 310:IF PEEK(EC)=0 THE
N PRINT#-2,A$;:GOTO 1050
1060 RETURN
1070 'PRINT LETTER HEAD, RETURN
ADDRESS ETC
1080 'AND SET LC EQUAL TO CORREC
T LINE COUNT
1090 RETURN
1100 'NORMAL FORMATTED PRINT
1110 LC=1:EM=0:SW=0:POKE E1,LW
1120 IF Z$="4" THEN GOSUB 1070
1130 GOSUB 310:IF PEEK(EC)<>0 TH
EN 350
1140 GOSUB 220
1150 IF SW=0 THEN 1310
1160 IF A$="" THEN 1310
1170 FOR Y=1 TO LEN(A$) 'follows
 a cr
1180 IF MID$(A$,Y,1) <> " " THEN
 1200
1190 NEXT Y:GOTO 1310
1200 Z$=MID$(A$,Y,1)
1210 Z=INSTR(K$,Z$):IF Z=0 THEN
1310
1220 IF Z=1 THEN A$=MID$(A$,Y+1)
:IF LP-LC<EM THEN FOR LC=LC TO L
P:PRINT#-2:NEXT LC:GOSUB 270:GOT
O 1310 ELSE 1310
1230 IF Z=2 THEN MID$(A$,Y)=" "
'replace with blank
1240 FOR Z=Y+1 TO LEN(A$)
1250 IF MID$(A$,Z,1)<>" " THEN 1
270
1260 NEXT Z
1270 GOSUB 250
1280 EM=Z-1:POKE E1,LW-EM
1290 IF A=0 THEN SW=1:EM=0:POKE
E1,LW ELSE SW=0
1300 GOTO 1130
1310 GOSUB 250:GOTO 1290
1320 'special basic print
1330 IF Z$="2" THEN D=0:Z=E2 ELS
E D=1:Z=M+&H15F
1340 LC=1:EM=0:SW=1:Y=PEEK(Z):PO
KE Z,ASC(":")
1350 GOSUB 330
1360 GOSUB 310:IF PEEK(EC)<>0 TH
EN POKE Z,Y:GOTO 350
1370 GOSUB 220
1380 IF LEFT$(A$,1)=" " THEN A$=
MID$(A$,2):GOTO 1380
1390 IF D=0 THEN GOSUB 250 ELSE
IF INSTR(A$,K2$)=0 AND INSTR(A$,
K3$)=0 THEN GOSUB 250 ELSE GOSUB
 1450
1400 IF SW=0 THEN 1420
1410 EM=INSTR(A$," "):POKE E1,LW
-EM:X=X+1
1420 IF A=0 THEN SW=1:EM=0:POKE
E1,LW ELSE SW=0
1430 GOTO 1360
1440 'indent if then else
1450 K2=INSTR(A$,K2$):K3=INSTR(A
$,K3$)
1460 IF K3=0 OR (K2>0 AND K2<K3)
 THEN K4=K2:K1=0 ELSE K4=K3:K1=1
1470 IF EM=0 THEN X=INSTR(A$," "
) ELSE X=0
1480 GOSUB 1590:EM=EM+X
1490 IF K1=0 THEN EM=EM+5 ELSE E
M=EM-5:IF EM<0 THEN EM=0
1500 K2=INSTR(5,A$,K2$):K3=INSTR
(5,A$,K3$)
1510 IF K2=0 AND K3=0 THEN 1560
1520 IF K3=0 OR (K2>0 AND K2<K3)
 THEN K4=K2:X=0 ELSE K4=K3:X=1
1530 GOSUB 1590
1540 IF X=0 THEN EM=EM+5 ELSE IF
 K1=1 THEN EM=EM-5:IF EM<0 THEN
EM=0
1550 K1=X:GOTO 1500
1560 GOSUB 250
1570 EM=EM+5:POKE E1,LW-EM:SW=0
1580 RETURN
1590 Z$=MID$(A$,K4):A$=LEFT$(A$,
K4-1):GOSUB 250
1600 A$=Z$:IF MID$(A$,5,1) <> "
" THEN A$=LEFT$(A$,4)+" ";MID$(A
$,5)
1610 RETURN
1620 'reset buffer
1630 CLS:PRINT "RESET BUFFER"
1640 PRINT"T FOR TEMPORY POINTER
 ONLY":PRINT"OR ENTER FOR BOTH":
INPUT Z$
1650 IF Z$="T" THEN 330 ELSE EXE
C M+&HCD
1660 RETURN
1670 'other options
1680 CLS:PRINT"OTHER OPTIONS"
1690 PRINT"0 RETURN TO MAIN MENU
"
1700 PRINT"1 CHANGE EXTRACT PARA
METERS"
1710 PRINT"2 CHANGE PRINT PARAME
TERS"
1720 PRINT"3 PRINT/SAVE FROM TEM
P POINTER"
1730 PRINT"4 ADJUST POINTERS"
1740 PRINT"5 REMOVE END OF LINE
CR'S"
1750 PRINT"6 REMOVE PAGE BREAKS"
1760 PRINT"7 SHOW FREE MEMORY"
1770 PRINT"8 PRINT BUFFER WITHOU
T ROM"
1780 PRINT"9 SEND/GET STRINGS"
1790 PRINT"10 SCRIPSIP FILE FROM
 DISK"
1800 PRINT:INPUT"ENTER CHOICE";Z
1810 IF Z<1 THEN RETURN ELSE IF
Z>10 THEN PRINT "INVALID":GOTO 1
690
1820 ON Z GOSUB 1870,1990,2110,2
200,2320,2330,1840,2350,2410,255
0
1830 GOTO 1680
1840 GOSUB 360:INPUT "PRESS ENTE
R TO CONTINUE";Z:RETURN
1850 PRINT"ENTER  NUMBER , NEW V
ALUE":PRINT" OR  , ENTER TO FINI
SH":RETURN
1860 'change extract params
1870 CLS:PRINT"EXTRACT PARAMETER
S ARE":GOSUB 1850
1880 PRINT:PRINT"1 MLEN =";PEEK(
E1)
1890 PRINT"2 MAXL =";PEEK(M+&H14
F)
1900 PRINT"3 SW =";PEEK(M+&H9E)
1910 PRINT"4 CC1 =";PEEK(M+&H143
)
1920 PRINT"5 CC2 =";PEEK(E2)
1930 PRINT"6 EC1 =";PEEK(M+&H9D)
1940 PRINT"7 EC2 =";PEEK(M+&H15F
)
1950 INPUT Z,X:IF Z<1 THEN RETUR
N ELSE IF Z>7 THEN PRINT "INVALI
D":GOTO 1880
1960 IF Z=1 THEN POKE E1,X ELSE
IF Z=2 THEN POKE M+&H14F,X ELSE
IF Z=3 THEN POKE M+&H9E,X ELSE I
F Z=4 THEN POKE M+&H143,X ELSE I
F Z=5 THEN POKE E2,X ELSE IF Z=6
 THEN POKE M+&H9D,X ELSE POKE M+
&H15F,X
1970 GOTO 1870
1980 'change print parameters
1990 CLS:PRINT"PRINT PARAMETERS
```

```
ARE":GOSUB 1850
2000 PRINT:PRINT"1 LEFT MARGIN =
";LM
2010 PRINT"2 CHARS PRINTED PER L
INE =";LW
2020 PRINT"3 TOP MARGIN =";TM
2030 PRINT"4 LINES PRINTED PER P
AGE =";LP
2040 PRINT"5 MIN LINES AFTER ";L
EFT$(K$,1);" =";BM
2050 INPUT Z,X
2060 IF Z<1 THEN RETURN ELSE IF
Z>5 THEN PRINT "INVALID":GOTO 20
00
2070 IF Z=1 THEN LM=X ELSE IF Z=
2 THEN LW=X ELSE IF Z=3 THEN TM=
X ELSE IF Z=4 THEN LP=X ELSE BM=
X
2080 POKE E1,LW 'SET MAXLIN
2090 GOTO 1990
2100 'save from temp pointer
2110 CLS:PRINT"PRINT/SAVE FROM T
EMP POINTER"
2120 PRINT:PRINT"ENTER OPERATION
 TO BE PERFORMED FROM TEMP POINT
ER TO END OF BUF"
2130 PRINT"1 SAVE TO TAPE"
2140 PRINT"2 SAVE TO DISK"
2150 PRINT"3 PRINT TO SERIAL POR
T"
2160 PRINT"4 PRINT FORMATTED"
2170 INPUT Z:IF Z<1 OR Z>4 THEN
PRINT "INVALID":GOTO 2120
2180 ON Z GOTO 980,710,1050,1110
2190 'adjust pointers
2200 CLS:PRINT"ADJUST POINTERS":
GOSUB 1850
2210 PRINT"- START BUFFER =";SB
2220 PRINT"- END BUFFER =";EB
2230 K1=PEEK(M+&H99)*256+PEEK(M+
&H9A):PRINT "1 PERM END DATA =";
K1
2240 PRINT"2 TEMP END OF DATA ="
;PEEK(E)*256+PEEK(E+1)
2250 K3=PEEK(&H3FE)*256+PEEK(&H3
FF):PRINT "3 LAST PERM END =";K3
2260 PRINT:PRINT"4,1 SET LAST PE
RM END TO THIS   4,2 SET THIS PE
RM END TO LAST"
2270 INPUT Z,X:IF Z<1 THEN RETUR
N ELSE IF Z>4 THEN PRINT "INVALI
D":GOTO 2210
2280 IF Z=4 THEN IF X=2 THEN Z=1
:X=K3 ELSE Z=3:X=K1
2290 IF Z=1 THEN POKE M+&H99,INT
(X/256):POKE M+&H9A,X-INT(X/256)
*256 ELSE IF Z=2 THEN POKE E,INT
(X/256):POKE E+1,X-INT(X/256)*25
6 ELSE POKE &H3FE,INT(X/256):POK
E &H3FF,X-INT(X/256)*256
2300 GOTO 2200
2310 'remove crs
2320 EXEC M+&H18E:RETURN
2330 EXEC M+&H1B0:RETURN
2340 'print buffer without rom
2350 CLS:PRINT"PRINT BUFFER WITH
OUT ROM"
2360 POKE M+2,18:POKE M+3,18
2370 GOSUB 330
2380 GOSUB 310:IF PEEK(EC) <> 0
THEN POKE M+2,&H8D:POKE M+3,&HE:
GOTO 350
2390 A$=USR4(A$):FOR X=1 TO 500:
NEXT X:GOTO 2380
2400 'send/get string
2410 CLS:PRINT"SEND AND GET STRI
NGS"
2420 PRINT:PRINT"ENTER 1 TO SEND
 FIRST"
2430 PRINT"OR PRESS ENTER TO GET
 FIRST
2440 INPUT Z:IF Z=1 THEN 2490
2450 PRINT:PRINT"WAITING FOR MES
SAGE"
2460 A$=USR3(A$)
2470 PRINT:PRINT"MESSAGE IS"
2480 PRINT A$
2490 PRINT:PRINT"ENTER MESSAGE"
2500 INPUT A$
2510 A$=USR4(A$)
2520 PRINT:PRINT"MESSAGE SENT"
2530 GOTO 2450
2540 'load subscrip file from di
sk
2550 CLS:PRINT"LOAD SCRIPSIT FIL
E FROM DISK"
2560 GOSUB 410:GOSUB 330
2570 OPEN "D",#1,N$,1
2580 FIELD #1,1 AS G$
2590 FOR X=1 TO LOF(1)
2600 GET #1,X:IF G$<CHR$(10) THE
N 2620
2610 A$=USR2(G$): PRINT G$;
2620 NEXT X
2630 CLOSE:GOTO 360
2640 'initialise variables
2650 M=PEEK(27)*256+PEEK(28)-481
2660 DEFUSR1 = M+&H129 'get stri
ng from buffer
2670 DEFUSR2 = M+&HDB 'add strin
g to buffer
2680 DEFUSR3 = M+&H77 'get strin
g from rs232
2690 DEFUSR4 = M 'send string to
 rs232
2700 EC = M+&H9B 'error switch
2710 E=M+&H97 'temp end buffer
2720 E1=M+&H14B 'mlen
2730 E2=M+&H147 'cc2
2740 SB=PEEK(M+&H93)*256+PEEK(M+
&H94) 'start buffer
2750 EB=PEEK(M+&H95)*256+PEEK(M+
&H96) 'end buffer
2760 LM=6 'left margin
2770 LW=72 'chars printed per li
ne
2780 TM=6 'top margin
2790 LP=64 'lines printed per pa
ge
2800 BM=4 'min line nos
2810 POKE E1,LW 'SET ML FOR LW
2820 K$="*).-:=+" 'control codes
 for formatting
2830 EXEC M+&HCD 'reset pointers
 at start
2840 K1$="IF":K2$="THEN":K3$="EL
SE"
2850 IF PEEK(&HE301)=87 THEN POK
E M+&HFC,32:POKE M+&HF2,32 ELSE
POKE M+&HFC,33:POKE M+&HF2,33 'C
OCO 3 OR OLD ONE
2860 GOTO 40
```

Hscreen 3 and 4

by Joy Wallace
CoCo3
GRAPHICS

THIS IS A small program to show the different colour effects that can be created in HSCREEN 4 and HSCREEN 3.

The 4 colours in HSCREEN 4 and the 2 colours in HSCREEN 3 can still show some interesting combinations.

Run the program to see the pattern in the HSREEN 4 mode, then press the <break> key to see it in HSCREEN 2.

The Listing:

```
0 GOTO10
3 SAVE"114A:3":END'5
10 '*****************************
***         *** DEMO FOR HSCREEN
3 AND 4 ***
11 '********BY JOY WALLACE******
***
15 WIDTH40:HSCREEN4
20 FORP=0TO3:C=RND(63):PALETTEP,
C:NEXTP
35 POKE 65497,0
40 CLS1:HCLS0
45 HCOLOR1
102 FORX=1TO640STEP5:HLINE(X,0)-
(320,98),PSET:HLINE(X,190)-(320,
96),PSET:NEXTX
104 HCOLOR3:FORY=1TO190STEP3:HLI
NE(640,Y)-(320,98),PSET:NEXTY
106 HCOLOR2:FORY=1TO190 STEP3:HL
INE(0,Y)-(320,98),PSET:NEXTY
108 'FORR=200TO350STEP2:C=RND(15
):HCIRCLE(320,96),R,C,.55:NEXTR
110 FORW=1TO50:NEXTW
112 FORP=0TO3:C=RND(63):PALETTEP
,C:NEXTP
113 ON BRK GOTO 115
114 GOTO 110
115 WIDTH40:HSCREEN3
120 CLS1:HCLS0
125 HCOLOR1
130 FORX=1TO640STEP5:HLINE(X,0)-
(320,98),PSET:HLINE(X,190)-(320,
96),PSET:NEXTX
135 HCOLOR1:FORY=1TO190STEP3:HLI
NE(640,Y)-(320,98),PSET:HLINE(0,
Y)-(320,98),PSET:NEXTY
140 FORW=1TO50:NEXTW
145 FORP=0TO1:C=RND(63):PALETTEP
,C:NEXTP
147 ON BRK GOTO 155
150 GOTO 140
155 PALETTE CMP:POKE65496,0:END
```

Tom the Cat

DO YOU KNOW Tom and Jerry? If you don't, then Tom is the cat, and Jerry is the mouse. And this drawing is about Tom the cat.

The drawing is Tom sliding across a Kitchen floor.

by David Dyson
CoCo3

GRAPHICS

The Listing:

```
1 GOTO155
2 'TOM
3 SAVE"115:3":END'5
155 HSCREEN2:HCLS4:HCOLOR8
156 HLINE(44,64)-(52,67),PSET
170 FOR D=1TO42
180 READ A,B
185 HLINE-(A,B),PSET
190 NEXT
200 DATA 60,72,63,76,64,78,72,80
,78,88,80,92,84,96,84,100,76,104
,74,108,68,110,70,105,74,109
220 DATA 74,110,76,108,78,111,68
,116,64,117,62,114,61,112,68,104
,69,101,64,98,60,97,64,98,69,101
,80,96,82,94
230 DATA 75,84,74,88,76,92,78,96
,76,98,76,96,74,92,68,88,66,87,6
4,88,63,90,64,92,64,96,68,100
240 HSET(72,96,8):HSET(79,93,8)
260 FOR S=1 TO9
270 READ A,B,C,E
280 HLINE(A,B)-(C,E),PSET
290 NEXT
300 DATA 96,88,80,98
310 DATA 100,94,81,99
320 DATA 50,108,52,106
330 DATA 52,106,56,104
340 DATA 56,104,60,102
350 DATA 60,102,70,101
360 DATA 56,120,60,108
370 DATA 60,108,68,104
380 DATA 68,104,72,103
390 HCIRCLE(78,100),1,8
405 HDRAW"BM44,64"
410 FORR =1 TO 22
420 READ A,B
430 HLINE-(A,B),PSET
440 NEXT
450 DATA 47,72,48,76,42,80,40,84
,24,88,16,92,14,94,20,100,28,107
,36,111,40,112,38,109,39,106,36,
108,36,104,35,104,36,100,35,97,3
2,96,36,94,36,89,14,94
460 HDRAW"BM48,76E3M50,78M54,74M
53,78M60,76M58,78M64,78"
465 HDRAW"BM41,112M40,114M44,112
M44,116R2"
480 HDRAW"BM46,116"
490 FORD=1TO35
500 READA,B
510 HLINE-(A,B),PSET
520 NEXT
530 DATA 40,128,34,140,33,148,36
,152,40,155,52,152,68,144,80,133
,84,134,88,132,88,131,78,124,80,
123,90,129,88,120,84,118,80,118,
76,120,80,118,84,118,88,120,88,1
16,88,113,80,114,72,116,70,120,6
8,128,64,132,56,136,53,138,53,13
6,56,132,56,132,60,124
540 DATA 56,132,56,138
550 HDRAW"BM66,130M68,120ERFBM76
,112F2"
565 HDRAW"BM60,148
570 FORD=1TO22
580 READ B,G
590 HLINE-(B,G),PSET
600 NEXT
610 DATA 68,160,84,176,92,180,98
,182,108,176,128,168,152,179,156
,180,168,176,172,168,174,164,172
,160,164,164,160,164,140,156,138
,152,132,156,130,158,128,156,124
,154,116,156,108,168
620 HDRAW"BM64,128D2FD3FD3FD3FD"
630 HDRAW"BM88,120R12M+12,-4M+4,
-12U2E2F2D2M122,108M122,104M+4,-
3M+4,+3M128,104M134,100R3M140,10
4M140,112M136,114M133,112M132,10
8M132,110M108,132M104,136M100,13
3M92,132M86,124"
640 HDRAW"BM122,109D4G2"
650 HDRAW"BM68,144M84,160M88,148
M100,137M108,136M118,138
660 HDRAW"BM118,138M120,124M124,
120M128,124M128,132G2BM124,120M1
28,118M132,118G2F2D4RLD8BM132,11
8M140,124M139,144M132,156BM124,1
56M118,138
665 HDRAW"BM152,160M148,176":HDR
AW"BM112,116M116,124"
670 PALETTE3,7
671 HDRAW"BM52,144C4R10"
680 HPAINT(40,96),3,8:HPAINT(100
,160),3,8:HPAINT(104,124),3,8:HP
AINT(52,70),3,8
690 HCOLOR8:HLINE(188,84)-(256,1
88),PSET,B
700 HLINE(184,80)-(260,192),PSET
,B
710 HLINE(260,80)-(319,192),PSET
,B
720 HLINE(264,84)-(315,188),PSET
,B
730 HDRAW"BM72,80M256,80M72,80BF
4R32D34BM112,80D36BM112,176D16L4
U16BM112,129DF4L4BU2U4BM116,84R6
4M180,188L64U16,80,192M256,192BM
116,84D16BM116,124D12"
740 HDRAW"BM0,80R44BG4L36M4,188R
44U36BM4,188M128,188BM52,152D40R
4U42"
750 D$="H4U4E4R4F4D4G4"
760 HDRAW"BM104,80"+D$+"BR36"+D$
770 HDRAW"BM116,80U12M124,56M132
,52M140,56M140,64L4U4H2G2M124,64
M122,80"
780 FOR D=1TO256STEP20:HPAINT(36
+D,184),7,8:NEXT:HPAINT(100,92),
7,8:HCOLOR8:HLINE(0,188)-(319,19
2),PSET,BF:HCOLOR1:HPAINT(0,0),1
,8:HLINE(0,188)-(319,192),PSET,B
F:HDRAW"C8BM4,188M315,188"::HPAI
NT(4,192),5,8
790 HPAINT(92,82),5,8:HPAINT(140
,82),5,8:HPAINT(216,82),5,8:HPAI
NT(280,82),5,8
800 HPAINT(114,132),5,8:HPAINT(1
10,132),5,8:HPAINT(54,156),5,8:H
PAINT(50,160),5,8:HPAINT(114,184
),5,8
810 HPAINT(106,74),0,8:HPAINT(14
8,76),0,8:HPAINT(124,60),0,8
815 FOR T=1TO500:NEXT
820 PALETTERND(8),RND(63):GOTO81
5
6900 GOTO6900
```

Punk 2

REMEMBER "PUNK", printed a few months before? Well, here is a much better punk with an ear ring, sunnies and a punk hair style.

by David Dyson
CoCo3

GRAPHICS

The Listing:

```
0 GOTO5
1 '***** PUNK
2 '***** BY DAVID DYSON
3 SAVE"115B:3":END'7
5 HSCREEN2:PALETTE9,60:PALETTE10,34:PALETTE11,32:PALETTE12,0:PALETTE13,35:HCLS12
6 HCOLOR11:HLINE(0,0)-(100,112),PSET,BF:HDRAW"C8BM174,172M+18,+6M-8,-10M+16,+8M-10,-20M+16,+4M-20,-24M+24,+8M-20,-20M+12,+8M-20,-32M+12,+8M-16,-28M+20,+8M-16,-20R8M+10,+1M-24,-13M+16,-8M-24,-2E12M+12,-8L4M-12,+4M-16,+8M+24,-24M-12,+8M-8,+6M-4,+6"
7 HDRAW"BM160,34M+8,-32M-20,+28M-4,-28M-6,+20M-12,-20D4M+8,+16M-16,-20D16M-20,-16M+12,+16M-14,-4M+10,+8M-12,-2M+16,+12M-16,-1M-12,+3M+12,+4R8M-32,+12M+24,-6M-24,+20M+20,-12M-6,+10M+20,-4M-10,+12R24M-16,+10M+28,+2M-10,+6M+30,+2"
8 HDRAW"BM151,90M-16,+8M+24,+8G12M+16,+4F4M-10,+16M+6,-4M-6,+20E8M-8,+16E8M-3,+20M+12,-6"
9 HDRAW"BM72,63M+2,+6G4M-2,+4D4M+1,+3M-20,+28D2F2M+6,+2R4M+16,-6BM72,113M+1,+4M-1,+4D4R12M+8,-2M-8,+4U2D2L4U2D2L4U2D2L4U2D2M+12,+19F4M+12,+2M+8,+2M+8,+4F4M+2,+4D8M-1,+8R46U32E4"
10 HDRAW"BM73,68M+10,+8R8M+16,8M-4,+1M-12,-5M-10,-2M-12,+6"
13 HDRAW"BM112,88G8M+4,+6BM112,84F4D4G4F4D4G4L4":HCIRCLE(112,108),3,8:HCIRCLE(112,112),3,8:HDRAW"BM113,114D2R2D2L2D2L2U2L2U2R2U2R2"
14 HDRAW"BM88,84F12NR4ND4H2NR4ND4H2NR4ND4H2NR4ND4H2NR4ND4H2NR4ND4H2NR4ND4H2NR4ND4"
15 HPAINT(120,44),10,8:HPAINT(124,148),9,8:HPAINT(72,76),8,8:HPAINT(88,68),9,8
16 HDRAW"BM8,8R8M+8,+4D4G4L4D8L8U20BF4R4D4L4U4BM28,8D20R16U20L4D16L8U16L4BM48,8D20R4U12F12R4U20L4D16NH16BM72,8R4D8E8R4G8F8D4L4U4H4L4D8L4U20"
17 HDRAW"BM12,32R8D12L8U12BM24,32NR8D6NR4D6"
18 D$="R4F4D4G4F4D4G4L4H4U4E4H4U4E4BD4R4D4L4NU4BD8R4D4L4U4BU16"
19 HDRAW"BM16,48"+D$+"BR12"+D$
20 HPRINT(2,10),"BY"
21 HDRAW"BM12,96D16E8H8F12NL8F4E8D8E4H4BU4D1BD3BR8D8E4H4"
22 HDRAW"BM100,48F8BM104,44M+16,+24BM108,36F12BM120,28F12BM136,27F8BM136,40M+24,+32BM124,48F12BM116,56M+20,+24BM136,64F12BM140,48M+8,+12BNM152,40F8BM160,56M+8,+16BM168,80F8BM160,88F12BM172,96M+20,+16BM172,132F8BM170,140F4BM172,148F8BM178,162F4"
23 HCOLOR1:HLINE(196,12)-(256,112),PSET,BF
24 B$="D4R8D4L8D4R24U4R8U4L20U4L12D4R20D4R4L16R4D4"
25 FORD=0TO319STEP32:HDRAW"BM"+STR$(D)+",179C4"+B$:NEXT
26 HCOLOR4:HLINE(0,192)-(320,192),PSET:HLINE(0,179)-(320,179),PSET
27 HLINE(8,136)-(44,140),PSET,BF:HLINE(212,136)-(248,140),PSET,BF:HCOLOR8:HLINE(190,112)-(320,112),PSET:HLINE(100,4)-(100,0),PSET:HLINE(196,12)-(256,112),PSET,B
28 HDRAW"BM197,0D2":HPAINT(200,4),13,8
29 HCOLOR10:FORD=1TO112STEP2:HLINE(257,0+D)-(320,0+D),PSET:NEXTD:FORD=1TO12STEP2:HLINE(196,0+D)-(256,0+D),PSET:NEXTD
1000 GOTO1000
```

Eagle

by David Dyson
CoCo3

GRAPHICS

EAGLE WAS WRITTEN for the CoCo 2, but when the CoCo 3 came out, it was changed to suit the CoCo 3.

Eagle was a drawing out of a sewing book. I photocopied it, took it home, and started to convert it to a program.

The Listing:

```
0 GOTO9
1 '***** EAGLE
2 '***** DAVID DYSON
3 SAVE"115A:3":END'5
9 RGB
10 HSCREEN2:HCLS4:PALETTE9,34:HCOLOR8
20 HDRAW"BM1,4S8R1D2R1D1R1D1R1D1R1D1R1D1R1U3L1U2L1U4R1U1R1U1R1D3R1D2R1D2R1U3R1U2D1D1R1U2R1D4R1U1R1U1R1U2R1D5R1D2R1D2R1U5R1U1R1U1R1D5R1D2R1D3R1D3R1D1R1D1R1D1R1D1R1D1R2D1R2D1R1D1R1D1R1D1R1D1R1D1R1D1R2D1R1D1R1D1R1D1R1D1R1D1R1D1R1D1R1D1"
30 HDRAW"R1D1R1D1R1D1R1D1R2D1R3U2R2U1R2U1R1U1R2U2R1U1R2U1R1U1R2U1R2U1R2U1R1U1R2U1R2U1R2U1R2U1R3U1R3U1R4U1R1U1R1U1R2U1R1U1R1U1R1U1R1U2R1U1R1U1R1U1R1D4R1U1R1U2R1U1R2U1R2U1R1U2R1U2R1U1R1D2L1D4L1D2R1U2R1U1R1U4R1U1R1U4R1D1R1D6R1D5L1D2L1D1L1D2R1U1R1D2"
40 HDRAW"L1D2L1D2L1D2R1U1R1D2L2D2L1D2L2D1L1D1L2D1R1D1L1D1L2D1L4D2L3D1L7D1R2D1L2D1L2D1L2D1L7D1L7D1R2D1R5D1R1D2R1D1R2D1R1D1R1D4L1D1L1D1L1U3L1U1L1U1L2D1R1D1R1D1R1D1L5U1L1U1L1U1L8D2R1D1R1D1R1D1R1D2R1D1R1D2R1D1R1D1R1D3R1D1R1D1R1D1R1D1R1D1R4D1R3D1R1D2R1D1
50 HDRAW"R1U1L2U1L2D4L4U1L1U1R1U1L1U2L2U1L3D1R1D2L2U1L1U1L1U3R1U1R3U1L1U1L2D1L1U2L1D1L1D1L2U3L1D1L1U4L1D2L1D1L2U3L1D1L1D1L1U2L1U2L1U1L3D3R3D3L1D1L3U1L1U2L1U1L1U1L1U2L1D2L1D1L2U2R1U1L2D1L1D1L1U2R1U2L2D1L3D1L2U1L2U1R2U1L6U1L2U1L2U1L2U1L2U1L1U1L1U1L1U1L1U
60 HDRAW"L1U1L1U1L2U2L2U1L1U1L1U1L1U2L1U2L1U2L1U1L1U3L2D1R1D1R1D1R2D1R1D1R4D1R3D1R3D1R5D1R8D1R2D1R4U1L3U1L2U1L3U1L1U1L7U1R3U1L2U1L1U1L2U1L2U1L1U1L2U1L1U1L2U1L1U1L1U1L1U1L1U1L1U1L1U1L1U1L1U2L1U1R1U1L1U1L1U2L1U1L1U1L1U1L1U2L1U3
70 HDRAW"U2"
130 HCIRCLE(160,106),3,8
140 HPAINT(128,96),9,8
150 HPAINT(160,156),7,8
160 HPAINT(4,128),5,8
30000 GOTO30000
```

Snow

by Joy Wallace
CoCo3

GRAPHICS

SNOW IS A CoCo 3 graphics program that depicts a small church with high-reaching mountains in the background.

The stars twinkle (have a close look)!

The Listing:

```
0 '*****************************
********   ************ SNOW SCE
NE **************
    BY                        *****
******* JOY WALLACE *************
   ***************JAN 1988*******
********
1 GOTO4
3 SAVE"114:3":END'5
4 CLEAR500
5 PALETTE0,0:PALETTE1,63:PALETTE
2,8:PALETTE3,63:PALETTE4,59:PALE
TTE5,34:PALETTE6,32:PALETTE7,4:P
ALETTE15,25:PALETTE14,63:PALETTE
13,10:PALETTE12,1:PALETTE11,10:P
ALETTE10,56:PALETTE9,7:PALETTE8,
2
10 WIDTH40:HSCREEN2:POKE65497,0
15 CLS6:HCLS2
20 HCIRCLE(230,16),2,14,2
25 FORV=1TO50:X=RND(320):Y=RND(5
0):HSET(X,Y,14):NEXTV
30 HDRAW"C15BM0,63M+4,+2M+30,8M+
16,12M+30,8M+12,+8M110,110M+30,-
20M+10,-6M+20,-5M+20,-15U3M+6,-4
M+20,-5M+20,-8R6M+30,-8R6M+20,+6
E2M+20,+8
35 HDRAW"BM25,70M+12,-2M+25,-10R
3M+10,+2R2M+7,-5R6M+20,-7E5M+20,
+12M+15,+2R10M+20,-3M+5,+4M+7,+3
40 HLINE(0,0)-(320,191),PSET,B
45 HPAINT(10,75),3,15
48 '****MOUNTAIN****
50 HDRAW"BM189,62L5H3L5D2M-20,-2
D2M+20,+2M+10,+4G2M-20,-2G2H3L2G
2L3D1M+6,+2F4D3L6M-6,+2M-14,-3M-
12,+15L2M+10,-17M+3,-1H2M-10,-2U
2M+5,-8M-7,-5G2M+5,+3G4M-5,+10L5
F3M+8,+3M-10,+3L9M+3,-5H3E3H3M-1
0,+12L3E3M-2,-3UE6H2M-20,+15L2H2
E2M+20,-15R3EUHL6G3LD2L
52 HDRAW"M-25,+10L6H2E2R4E2H2L4M
-20,+8
54 HDRAW"BM137,56L6M+14,+3M+9,+3
FDGM-26,-5BL8BD4H3L2H3L2M-4,+6GL
HM+4,-8UH2M-12,+4L2M-12,+4D2M-9,
+4HUE5
56 HPAINT(140,70),15,15:HPAINT(1
10,70),15,15:HPAINT(110,50),3,15
:HPAINT(70,60),15,15:HPAINT(120,
90),11,15
200 '****CHURCH****
205 HCOLOR5:HLINE(220,60)-(240,9
0),PSET,BF:HLINE(220,90)-(233,12
5),PSET,BF
210 HDRAW"C0BM220,60R20M-10,-30M
-10,+30
215 HPAINT(230,50),6,0
220 HLINE(220,63)-(240,65),PSET,
B:HLINE(220,83)-(240,85),PSET,B
225 HLINE(233,63)-(233,125),PSET
230 HDRAW"BM224,80R4U8H2G2D8BR12
R2U9HGD9R1U10FD9BM233,90M+20,+10
D25L55U25M+21,-10D35BR4BU2U20E3F
3D20L6
235 HDRAW"BM253,125M+20,-10U21M-
20,+6
240 HPAINT(225,120),0,0:HPAINT(2
26,76),0,0
250 HLINE(207,108)-(212,119),PSE
T,BF:HLINE(240,108)-(245,119),PS
ET,BF
255 HPAINT(205,100),5,0:HPAINT(2
38,100),5,0:HPAINT(257,117),5,0
260 '**ROOF SNOW**
265 HDRAW"C15BM233,90R7U3E2M+7,-
1R3M+22,+10D4M-20,+6M-20,-10U4BM
219,90M-23,+10D4M+23,-10U4
270 HCOLOR3:HLINE(222,59)-(238,5
9),PSET:HLINE(223,80)-(239,81),P
SET,B
275 HPAINT(245,90),3,15:HPAINT(2
17,92),3,15
280 '****BRIDGE****
285 HCIRCLE(60,170),15,4,.9,.58,
0:HCIRCLE(100,170),15,4,.9,.5,.9
5:FORR=60TO68STEP8:HCIRCLE(80,17
0),R,4,.4,.6,.95:NEXTR
290 HCOLOR4:HDRAW"BM30,157M+9,+6
M+8,+2BD5BR27R10BR30BU4M+20,-5
295 HPAINT(80,160),7,4
300 HDRAW"BM113,167M-6,+4M+4,+2M
-2,+2M+10,+4M+40,+6M+50,+4M+20,+
1L160H3U2E3U2M-20,-15L4M-10,-5
305 HDRAW"BM126,150M+8,-6UM-4,-2
UM+3,-2UL5UM+4,-3H6M-12,+8F3M-26
,+5
310 HPAINT(110,180),13,4:HPAINT(
123,145),13,4
315 FORR=60TO68STEP8:HCIRCLE(80,
170),R,15,.4,.6,.95:NEXTR
320 HDRAW"C12BM108,175HGHGHGHGHG
HGHGHGGHGHGHGHGHGHGHHEFEFEFEFE
FEFEEFEFEFEFEFEFEFEFEHHGHGHGHGHG
GHGHGHGHGHGHGHGHGHGHGHGHHBEFEFE
FEFEFEFEFEFEFEFEFEFEFEFEBL4BU1HG
HGHGHGHGH
325 HDRAW"BM128,185HGHGHGHGHGHGH
GHBL5HGHGHGBL5HGHGHGHGBU5EFEFEFE
FEFBR10EFEFEFEFBG10BL10EFEFEFEFE
FEFEFEBR20FEFEFEFEFEFEFEFEFEFEFE
FE
344 '***SNOW****
350 HDRAW"C4BM126,150M+8,-6M+20,
-3E3M+20,-8M+20,-6M+20,-5R3M+40,
+3R9M+20,-9M+20,-7M+20,-5R6BM126
,150M+18,+9M-20,+5M-12,+6D4F2M+3
0,+6M+30,+4M+50,+4R94U85
360 HPAINT(225,120),3,4
365 HCOLOR3:HDRAW"BM263,122 R7M+
53,-21
368 '***FENCE***
370 HCOLOR5:HLINE(220,168)-(222,
175),PSET,BF:HLINE(250,156)-(252
,174),PSET,BF:HLINE(280,150)-(28
2,168),PSET,BF
375 HDRAW"BM319,146M240,162D1M31
9,148U1M240,162BM319,155M282,162
D2M319,157U1M282,163BM286,164M23
5,173D1M286,165
380 HDRAW"C4BM127,127M+10,-6M+10
,-2M+25,-5BM127,127M-10,-5M-10,-
2M-20,-4M-20,-3M-10,-2BM127,127M
-5,-8M-15,-10RM+15,+10M+5,+8
382 HDRAW"C4BM134,160M+25,-2
385 HDRAW"C8BM50,140"+H$
390 H$="E2FG5BG2BD2E7FG9BR2E8FG1
5BG2BD2E17FG17BG2BD2E20FG2BG2G15
BR2E15FG15BG2BD2E16BFG18BG2BD2E2
1FG22BR2E20FG19BR2E18FG2BG4G10BR
2E9FG8BR2BEE6FG5BR2E3FG2BR2E
395 HDRAW"BM40,90"+H$
400 HDRAW"BM20,140"+H$
449 '***TREE****
450 HDRAW"S4C10BM40,191M+4,-8M+2
,-3M+1,-3U2M-18,-34M-1,-4U4H4M-2
,-8M-10,-12U2M-2,-8M-9,-6U10M+11
,+10R2M-2,-6M-2,-8U6U11M+2,-21U4
H11U3M+5,+3F4M+4,+1M+5,-1M+5,-6M
+7,-10FD2M-7,+10M-5,+6M-3,+6M-1,
+10M-1,+7D19M+5,+14M+6,+16M+5,+1
0M+6,+10F3M+30,+54
455 HDRAW"M+8,+3M+3,+4M+6,+2F3L5
0BR7U2E2RM+4,+3BR2U4R2M+7,+4BM10
,70R2M+1,+10M+5,+15M-1,+10M+4,+1
M+6,+10D2M+7,+9D2F4M+21,+40D6G5L
4M-9,+4BM2,87M+4,+4M+6,+2E2
456 HPAINT(42,189),10,10:HPAINT(
48,189),9,10:HPAINT(57,189),9,10
:HPAINT(50,178),9,10:HPAINT(4,87
),10,10
457 HDRAW"BM31,14R5M+8,+4M+12,+1
6BM31,20R4M+12,+14BM31,20R2M+6,+
12BM10,30M+8,-10E2R4F4M+4,+6BM16
,24R6M+4,+2BM16,75M+10,-4E4M+10,
-6M-10,+6G4M-10,+4DC9M+10,-4E4M+
```

Continued on p59

Elements

by Mark Snell
16k CB CoCo

GAME

AGAIN, ANOTHER entry into the 1985 Science Competition. In this game, I will give you the name of an element, and you have to guess its chemical symbol.

The Listing:

```
 1 GOTO 10
2 'ELEMENTS
3 'BY MARK SNELL
4 'MAY'86
5 'TOUCHED UP OCT'87
6 SAVE"131B:3":END'1
7 END
10 CLS
20 PRINT"*********SCIENCE SYMBOL
S********"
30 PRINT "              INSTRUCTION
S"
40 PRINT"I WILL PRINT THE NAME O
F AN     ELEMENT AND YOU MUST TY
PE IN ITSCHEMICAL SYMBOL.   YOU
WILL GET A MARK AND A RATING"
50 PRINT"GOOD LUCK!!!!!!!!"
60 PRINT"TYPE ANY KEY";
70 EXEC41393:PRINT
80 FOR Q=1 TO 10
90 E=RND(22)
100 IF E=A OR E=B OR E=C OR E=D
OR E=F OR E=G OR E=H OR E=I OR E
=J OR E=K THEN 90
110 IF Q=1 THEN A=E
120 IF Q=2 THEN B=E
130 IF Q=3 THEN C=E
140 IF Q=4 THEN D=E
150 IF Q=5 THEN F=E
160 IF Q=6 THEN G=E
170 IF Q=7 THEN H=E
180 IF Q=8 THEN I=E
190 IF Q=9 THEN J=E
200 IF Q=10 THEN K=E
210 ON E GOTO 300,310,320,330,34
0,350,360,370,380,390,400,410,42
0,430,440,450,460,470,480,490,50
0,510
220 INPUT"DO YOU KNOW WHAT IT IS
";A$:IF A$=P$ THEN 520 ELSE 530
230 PRINT"YOU GOT";R;"OUT OF 10"
240 IF R=10 THEN PRINT"EXCELLENT
250 IF R=9 THEN PRINT"VERY GOOD"
260 IF R=8 OR R=7 THEN PRINT"GOO
D"
270 IF R=6 THEN PRINT"SATISFACTO
RY"
280 IF R=5 OR R<5 THEN PRINT"POO
R"
290 INPUT"ANOTHER GAME (Y/N)";QW
$:IF QW$="Y" THEN RUN ELSE END
300 PRINT"GOLD":P$="AU":GOTO 220
310 PRINT"ALUMINIUM":P$="AL":GOT
O 220
320 PRINT"CALCIUM":P$="CA":GOTO
220
330 PRINT"COPPER":P$="CU":GOTO 2
20
340 PRINT"IRON":P$="FE":GOTO 220
350 PRINT"LEAD":P$="PB":GOTO 220
360 PRINT"MAGNESIUM":P$="MG":GOT
O 220
370 PRINT"MERCURY":P$="HG":GOTO
220
380 PRINT"POTASSIUM":P$="K":GOTO
 220
390 PRINT"SILVER":P$="AG":GOTO 2
20
400 PRINT"SODIUM":P$="NA":GOTO 2
20
410 PRINT"ZINC":P$="ZN":GOTO 220
420 PRINT"BROMINE":P$="BR":GOTO
220
430 PRINT"CARBON":P$="C":GOTO 22
0
440 PRINT"CHLORINE":P$="CL":GOTO
 220
450 PRINT"HYDROGEN":P$="H":GOTO
220
460 PRINT"IODINE":P$="I":GOTO 22
0
470 PRINT"NITROGEN":P$="N":GOTO
220
480 PRINT"OXYGEN":P$="O":GOTO 22
0
490 PRINT"PHOSPHORUS":P$="P":GOT
O 220
500 PRINT"SILICON":P$="SI":GOTO
220
510 PRINT"SULPHUR":P$="S":GOTO 2
20
520 PRINT"YOU ARE RIGHT,WELL DON
E":R=R+1:NEXT Q:GOTO 230
530 PRINT"BAD LUCK,THE ANSWER WA
S ";P$:NEXT Q:GOTO 230
```

Space Shuttle

by Adam Dyson
CoCo3
GRAPHICS

G'DAY ... THIS IS my entry into the graphics competition being held. My entry, "Space Shuttle", depicts the space shuttle on its launch pad, about to blast off into space. (Yes, animation even!)
Anyway, enjoy.

The Listing:

```
0 GOTO60
3 SAVE"145B:3":END'5
10 'SPACE SHUTTLE
20 '      BY
30 '    ADAM DYSON
40 '      (C)
50 '     28/1/88
60 HSCREEN2:HCLS5:PALETTE9,63:PA
LETTE10,63:PALETTE14,34:PALETTE1
3,0
70 HDRAW"C8BM188,188U8E2U6R6D8L8
D8R4BU8BR8NU8D8H4G4BR8R20E4R12F4
R28E4R12F4R4U24L84D4L4G4BM190,17
2R10"
80 HCIRCLE(196,188),2:HCIRCLE(22
6,188),2:HCIRCLE(232,188),2:HCIR
CLE(274,188),2:HCIRCLE(282,188),
2
81 HPAINT(264,180),9,8:HPAINT(19
8,182),9,8
82 HDRAW"C3BM216,176U8F8U8F8R8U4
L8U4R8ND8F8H4L4BL12L4"
83 HDRAW"C8BM108,192U4E4U8BU12U4
4M+8,-20M+8,+20U40M+16,-24M+16,+
24D40M+8,-20M+8,+20D44BD12D8F4D4
L72"
84 HDRAW"BM68,192U88R4U8R4NU28R8
D8NL12R4D8R4D4R4D4L8D12NR24ND60U
12NR24"
86 HDRAW"BM104,176U4E28U48M+12,-
24M+12,+24D48F28D4L28D16L24U16L2
8"
87 HPAINT(136,128),9,8:HPAINT(11
6,128),9,8:HPAINT(116,184),9,8:H
PAINT(160,184),9,8
88 HDRAW"C8BM132,100E8R8F8D4H8L8
G8":HPAINT(134,100),8,8
90 HDRAW"BM136,104D8R4U8BR2NR4D4
R4D4NL4BR2U8R4D8U4L4"
100 HDRAW"BM136,116R16D12L16U12B
M140,136E4F4G4H4"
101 HDRAW"BM144,148M+4,+24L8M+4,
-24":HPAINT(144,164),8,8
102 HDRAW"BM132,184C13R24D8L24U8
":HPAINT(136,188),13,13
103 HDRAW"C8BM68,104F20G20F20G20
F20G20F20G20BM88,104G20F20G20F20
G20F20G20F20G20F20"
```

Continued on p59

Border+

by Fred Howes
32k ECB + DMP 110

APPLICATION

MY DAUGHTERS, Nikki and Sally, were most fortunate last Christmas and received a CoCo 3 family pack from dear old Santa.

Of course Dad had to show them how to use it and, naturally, has been hooked. So much so that we now have a disk drive and a printer (DMP 105), with the most recent addition being Deskmate 3.

It is surprising how one thing leads to another (or is it?). The next thing on the list is a monitor as the portable TV that Santa struggled down the chimney that has no vertical hold control - meaning everytime we run Deskmate the OS9 boot sends it scrolling out of control.

This means that we have to commandeer the *big* TV - nuisance value only.

I must say at this stage that Peter Wiltshire of Tandy West Lakes has always been very helpful, right from day one. It has got that way that I don't have to look up the 'phone number any more, and my wife has banned me from going there.

We still have a lot to get, like a second drive, multi-pack interface, modem, and of course, software!! Peter has always been prepared to go out of his way to help and is currently replacing my Deskmate #2 disk which came minus the PAINT program.

So far, we have been concentrating on buying hardware items, adding bits and pieces as finances allow. For programs, we have been relying on Softgold and CoCo, particularly Johanna Vagg's articles which have been very helpful. Bob Horne's programs are a great teaching aid - Nikki's much improved results at school are testimony to that.

I have learned fom Bob as well as I think I have typed in nearly every program of his that you have published over the past twelve months, including Chatwin Manor. Most of the programs we use at the moment are based on the girls' education or utilities that will help them.

Which brings me to the reason I was prompted to write.

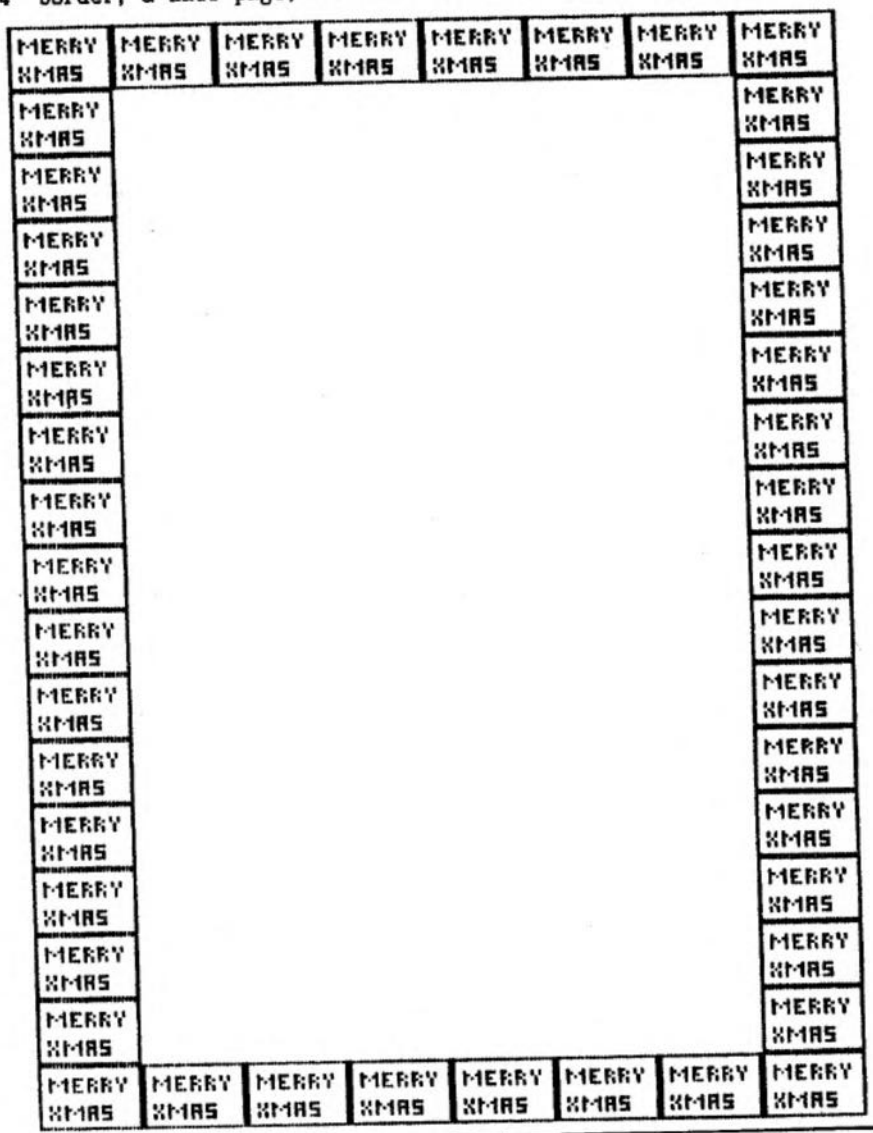
Nikki has been encouraged by her teacher to submit her assignments using the CoCo and I have been on the lookout for a program to print a border around her work. In August Softgold I thought I had found it - "Border", by Harry Hoffman. This is an excellent program which allows you to create graphic or written borders. However, on running it, I was a little disappointed to find that it only printed a line ACROSS the page.

For the next few nights, I sat down with my very limited Basic computer knowledge and modified it so that it now prints a full A4 border, a half page, a third page, and a quarter page border.

The latter was to be used by the girls when making cards, but of course these have to be done upside-down to make a card (I'll have to refer back to Johanna Vagg's GRAPHIX for this).

They still use it though, to border a small drawing on the left side of the page.

When I read the letter from Arthur Williams in last months Softgold, I was finally prompted to clean up the program a bit



and send it in. Of course all credit must go to Harry for this excellent idea. I did, however, take out his theme tune as it was taking up lots of time with all the continual 'RUN'-ning I had to do.

The line numbers are mostly the same for those that have already typed it up and the additions can clearly be seen at the end.

There are necessarily a few changes to the original lines.

At this stage I am not sure if this is the right way to go about things - I was just trying to alter something to fit my childrens' specifications and thought it may be of some use to others. As for SAVEing the border, I'll leave that to someone else as I'm not up with those techniques.

Ed's note: To answer your question, it is alright to do what you did - that's how we learn.

The only condition to altering programs is that you have to state where you got the program from in the first place, and who the author was. You've done both!

The Listing:

```
0 GOTO10
1 '***** BORDER ++
2 '***** BY FRED HOWES
3 SAVE"97:3":END'8
10 CLEAR5000
20 DIM P(28,21)
30 DIM F(3,28)
40 DIM H(28)
50 DIM V(21)
60 DIM E(28,21)
70 POKE150,87
80 CLS0
90 PRINT@98,"BORDER PRINTING PRO
GRAM ";
100 PRINT@164," FOR DMP 105 PRIN
TER ";
110 PRINT@228," UPGRADE, ORIGINA
L BY ";
120 PRINT@295," HARRY HOFFMAN ";
130 PRINT@361," CROWS NEST ";
135 FORT=1TO3000:NEXT
230 CLS2:POKE65496,0:POKE65494,0
:PRINT#-2,CHR$(30)
240 GOSUB1260
250 PRINT@109,CHR$(128)"menu"CHR
$(128);
260 PRINT@162," [S] START CREATI
NG BORDER ";
270 PRINT@226," [I] INSTRUCTIONS
          ";
280 PRINT@290," [P] PRINTOUT BOR
DER       ";
290 PRINT@354," [X] EXTEND PATTE
RN        ";
300 PRINT@418," [V] VIEW PICTURE
 ONLY     ";
310 PRINT@482," [Q] QUIT PROGRAM
          ";
320 I$=INKEY$:IF I$=""THEN320
330 IF I$="S"THEN460
340 IF I$="I"THEN1270
350 IF I$="P"THEN2000
360 IF I$="X"THEN540
370 IF I$="V"THEN1250
380 IF I$<>"Q"THEN320
390 CLS8:GOSUB1260
400 PRINT@235,CHR$(128)"finish"C
HR$(128);:PRINT@416,"";:END
460 PMODE4,1:PCLS1:SCREEN1,1
470 COLOR0
480 FORX=0TO225STEP8
490 LINE(X,0)-(X,169),PSET
500 NEXTX
510 FORX=0TO169STEP8
520 LINE(0,X)-(225,X),PSET
530 NEXTX
540 SCREEN1,1:X=2:Y=2:Z=4:H=1:V=
1
560 POKE65497,0
570 IF PEEK(341)=247 THEN Y=Y-8:
V=V-1
580 IF PEEK(342)=247 THEN Y=Y+8:
V=V+1
590 IF PEEK(343)=247 THEN X=X-8:
H=H-1
600 IF PEEK(344)=247 THEN X=X+8:
H=H+1
610 IFV<=1THEN V=1 ELSE IF V=>21
 THEN V=21
620 IF X<=2 THEN X=2 ELSE IF X>2
18THEN X=218
630 IF H<=1THEN H=1 ELSE IF H=>2
8 THEN H=28
640 IFY<=2 THEN Y=2 ELSE IF Y>16
2 THEN Y=162
650 LINE(X,Y)-(X+Z,Y+Z),PSET,B
660 FOR DL=1TO10:NEXTDL
670 COLOR1
680 IF PEEK(340)=251 THEN LINE(X
-1,Y-1)-(X+5,Y+5),PSET,BF
690 LINE(X,Y)-(X+Z,Y+Z),PSET,B
700 FOR DL=1TO10:NEXTDL
710 COLOR0
720 IF PEEK(339)=254 THEN LINE(X
-1,Y-1)-(X+5,Y+5),PSET,BF
730 IF PEEK(338)=254 THEN EXEC44
539
740 IF PPOINT(X+2,Y+2)=0THEN P(H
,V)=1 ELSE P(H,V)=0
750 IF PEEK(343)=253 THEN 770
760 GOTO570
770 FOR C=1 TO H
780 IF P(C,1)=1 THEN E(C,1)=1 EL
SE E(C,1)=0
790 IF P(C,2)=1 THEN E(C,2)=2 EL
SE E(C,2)=0
800 IF P(C,3)=1 THEN E(C,3)=4 EL
SE E(C,3)=0
810 IF P(C,4)=1 THEN E(C,4)=8 EL
SE E(C,4)=0
820 IF P(C,5)=1 THEN E(C,5)=16 E
LSE E(C,5)=0
830 IF P(C,6)=1 THEN E(C,6)=32 E
LSE E(C,6)=0
840 IF P(C,7)=1 THEN E(C,7)=64 E
LSE E(C,7)=0
850 IF P(C,8)=1 THEN E(C,8)=1 EL
SE E(C,8)=0
860 IF P(C,9)=1 THEN E(C,9)=2 EL
SE E(C,9)=0
870 IF P(C,10)=1 THEN E(C,10)=4
ELSE E(C,10)=0
880 IF P(C,11)=1 THEN E(C,11)=8
ELSE E(C,11)=0
890 IF P(C,12)=1 THEN E(C,12)=16
 ELSE E(C,12)=0
900 IF P(C,13)=1 THEN E(C,13)=32
 ELSE E(C,13)=0
910 IF P(C,14)=1 THEN E(C,14)=64
 ELSE E(C,14)=0
920 IF P(C,15)=1 THEN E(C,15)=1
ELSE E(C,15)=0
930 IF P(C,16)=1 THEN E(C,16)=2
ELSE E(C,16)=0
940 IF P(C,17)=1 THEN E(C,17)=4
ELSE E(C,17)=0
950 IF P(C,18)=1 THEN E(C,18)=8
ELSE E(C,18)=0
960 IF P(C,19)=1 THEN E(C,19)=16
 ELSE E(C,19)=0
970 IF P(C,20)=1 THEN E(C,20)=32
 ELSE E(C,20)=0
980 IF P(C,21)=1 THEN E(C,21)=64
 ELSE E(C,21)=0
990 F(1,C)=E(C,1)+E(C,2)+E(C,3)+
E(C,4)+E(C,5)+E(C,6)+E(C,7)+128
1000 F(2,C)=E(C,8)+E(C,9)+E(C,10
)+E(C,11)+E(C,12)+E(C,13)+E(C,14
)+128
1010 F(3,C)=E(C,15)+E(C,16)+E(C,
17)+E(C,18)+E(C,19)+E(C,20)+E(C,
21)+128
1020 NEXTC
1040 POKE65496,0:POKE65494,0
1050 GOTO230
1090 SCREEN1,1
1100 FOR R=1TO M
1110 FOR X=1TO H
1120 PRINT#-2,CHR$(F(1,X));
1130 NEXTX,R
1140 PRINT#-2,CHR$(13);
1150 FOR R=1TO M
1160 FOR X=1TO H
1170 PRINT#-2,CHR$(F(2,X));
1180 NEXTX,R
1190 PRINT#-2,CHR$(13);
1200 FOR R=1TO M
1210 FOR X=1TO H
1220 PRINT#-2,CHR$(F(3,X));
1230 NEXTX,R
1240 RETURN
1250 SCREEN1,1:IF INKEY$="" THEN
 PLAY"A":GOTO1250 ELSE GOTO230
1260 PRINT@34,"  BORDER+ BY FRED
 HOWES ";:RETURN
1270 CLS4:GOSUB1260
1280 PRINT@106,"instructions";
1290 PRINT@162,"THIS PROGRAM WAS
 DESIGNED  ";
1300 PRINT@194,"FOR A DMP 105 PR
INTER, USING";
1310 PRINT@226,"ORDINARY A4 TYPI
NG PAPER.  ";
1320 PRINT@258,"AFTER PRESSING T
```

```
HE S-KEY IN ";
1330 PRINT@290,"THE menu, USE TH
E 4 ARROWS  ";
1340 PRINT@322,"TO MOVE THE CURS
OR. TO SET A";
1350 PRINT@354,"POINT USE THE A-
KEY. TO     ";
1360 PRINT@386,"RESET A POINT, P
RESS<R) ..  ";
1370 PRINT@418,"TRY A AND ARROW-
KEY TOGETHER";
1380 PRINT@482,"PRESS ANY KEY TO
 CONTINUE   ";
1390 EXEC44539
1400 CLS5:GOSUB1260
1410 PRINT@98,"PRESS TWO ARROWS
TO MOVE     ";
1420 PRINT@130,"CURSOR TOWARDS A
NY CORNER   ";
1430 PRINT@162,"DON'T WORRY ABOU
T DIFFERENT ";
1440 PRINT@194,"LOOKING, BLACK S
QUARES.     ";
1450 PRINT@226,"THEY MEAN EXACTL
Y THE SAME. ";
1460 PRINT@258,"ONLY TOTALLY WHI
TE SQUARES  ";
1470 PRINT@290,"ARE not SET THE
REST IS SET ";
1480 PRINT@482,"PRESS ANY KEY TO
 CONTINUE   ";
1490 EXEC44539
1500 CLS6
1510 GOSUB1260
1520 PRINT@98,"WHEN FINISHED THE
 PICTURE    ";
1530 PRINT@130,"MOVE THE CURSOR
AS FAR TO   ";
1540 PRINT@162,"THE RIGHT AS YOU
 CAN OR WILL";
1550 PRINT@194,"THE HORIZONTAL P
OSITION OF  ";
1560 PRINT@226,"THE CURSOR DETER
MINES THE   ";
1570 PRINT@258,"WIDTH OF THE PRI
NTED PICTURE";
1580 PRINT@322,"TO LEAVE THE CRE
ATIVE MODE  ";
1590 PRINT@354,"PRESS <M> FOR ME
NU          ";
1600 PRINT@386,"PRESS <@> TO RES
T THE CURSOR";
1610 PRINT@482,"PRESS ANY KEY TO
 CONTINUE   ";
1620 EXEC44539:GOTO230
2000 CLS2:GOSUB1260
2010 PRINT@100,CHR$(128)"PRINTOU
T SELECTION"CHR$(128);
2020 PRINT@162,"(A) FULL PAGE
   ";
2030 PRINT@226,"(B) HALF PAGE
   ";
2040 PRINT@290,"(C) THIRD PAGE
   ";
2050 PRINT@354,"(D) QUARTER PAGE
   ";
2055 PRINT@418,"(E) SINGLE LINE
   ";
2060 IN$=INKEY$:IF IN$="" THEN20
60
2070 IF IN$="A" THEN3000
2080 IF IN$="B" THEN3010
2090 IF IN$="C" THEN3020
2100 IF IN$="D" THEN3030
2110 IF IN$="E" THEN M=17:PRINT#
-2,CHR$(18):GOSUB1090:GOTO230
2200 PRINT#-2,CHR$(18):GOSUB1090
2210 SCREEN1,1:PRINT#-2,CHR$(13)
;
2220 FORL=1TO N
2230 FORX=1TO H
2240 PRINT#-2,CHR$(F(1,X));
2245 NEXTX
2250 PRINT#-2,CHR$(27);CHR$(16);
CHR$(Q);CHR$(K);
2251 FORX=1TO H:PRINT#-2,CHR$(F(
1,X));
2260 NEXTX
2270 PRINT#-2,CHR$(13);
2280 FORX=1TO H
2290 PRINT#-2,CHR$(F(2,X));
2295 NEXTX
2300 PRINT#-2,CHR$(27);CHR$(16);
CHR$(Q);CHR$(K);
2301 FORX=1TO H:PRINT#-2,CHR$(F(
2,X));
2310 NEXTX
2320 PRINT#-2,CHR$(13);
2330 FORX=1TO H
2340 PRINT#-2,CHR$(F(3,X));
2345 NEXTX
2350 PRINT#-2,CHR$(27);CHR$(16);
CHR$(Q);CHR$(K);
2351 FORX=1TO H:PRINT#-2,CHR$(F(
3,X));
2360 NEXTX
2370 PRINT#-2,CHR$(13);
2380 NEXTL
2390 GOSUB1090
2400 PRINT#-2,CHR$(30):GOTO230
3000 M=17:N=33:K=193:Q=1:GOTO220
0
3010 M=17:N=16:Q=1:K=193:GOTO220
0
3020 M=17:N=9:Q=1:K=193:GOTO2200
3030 M=8:N=15:Q=0:K=196:GOTO2200
```

THE END THE END THE END THE END THE END THE END THE END THE END THE END THE END

Continued from p55

```
10,-6DM-10,+6G4M-10,+4
458 HDRAW"C10BM41,61EU8M+2,-4E3R
5FM+0,+8BM1,61M+3,-2U4H2M-4,-2L3
M-4,+2G2D6M+4,+12RC9M-4,-12BM30,
110ER5M+10,-4M+1,-4BM30,111ER5M+
10,-4M+1,-4C10BM30,109ER5M+10,-4
M+1,-4U2M+16,-7U1M-8,+4C9M-8,+3C
10D2M+4,+1F2R6E2M+5,-1C9DM-5,+1G
2L6H2M-4,-1
460 HPAINT(42,189),4,10:HPAINT(4
8,189),9,10:HPAINT(57,189),9,10:
HPAINT(50,178),9,10:HPAINT(4,87)
,4,10
462 HDRAW"BM75,190M-5,-2UHM-6,-3
M+5,+4R2M+6,+3BM12,36M1,25U1M12,
35D2M1,26BM17,36M+14,-18DM18,36B
M10,80U24RU12RU7RD7LD12LD24M+3,+
14
463 HDRAW"C3BM182,128M197,124
464 HDRAW"C1BM180,130R14M+8,-2M+
4,+2M200,116M+6,-1M198,98M204,10
0M195,84M185,100M191,98M180,116R
6M180,130
465 HLINE(272,110)-(274,115),PSE
T,BF:HPAINT(188,118),3,1
466 HDRAW"S4C8BM193,88"+H$
467 HDRAW"BM186,91G7BM180,99E7FG
6BG2BD2E8BGBD2G10BG8BR2E16BFBG1G
14BR2E7BD2G7BG6BR2E10BR2G12BR2E9
BR2G8BR2E6
490 HDRAW"S8BM292,66"+H$
495 HDRAW"BM292,68"+H$
500 HCOLOR5:HLINE(0,0)-(320,191)
,PSET,B:HLINE(1,1)-(319,190),PSE
T,B
510 FORD=1TO5:NEXTD
515 PALETTE14,56
520 FORD=1TO1000:NEXTD
525 PALETTE14,63
530 GOTO  510
600 ON BRK GOTO 610
610 WIDTH40:ATTR5,4:POKE65496,0
```

Continued from p56

```
104 HDRAW"BM88,132E12F12BM112,12
0G12H12
106 HLINE(0,56)-(320,56),PSET
107 HCOLOR8:FORD=0TO320STEP 20:R
=RND(20):HLINE(0+D,56)-(20+D,24+
R),PSET,B
108 NEXTD
109 HPAINT(0,0),2,8
110 HPAINT(0,100),14,8:HPAINT(96
,156),14,8:HPAINT(212,100),14,8
111 HCIRCLE(0,0),16,1:HPAINT(5,5
),1,1
114 PALETTE13,32:PALETTE13,48:GO
TO114
```

Sketch Pad

by Peter Niekamp
32k ECB CoCo

UTILITY

SKETCH PAD IS A very advanced sketching utility that allows your CoCo to be used as a sketch pad, on a high-resolution screen with the minimum of ease. The available commands are:

- Arrow keys: these move the cursor. Pressing <shift> will move the cursor to the edge of the screen.
- <shift><clear> will clear the screen, and you can then start again.
- <d> erases last line, circle, box or filled box. Similar to an 'oops' found on CoCo Max.
- <s> sets first position for line, circle, get, box and filled box.
- <a> shows the display screen.
- <:> saves the working screen to tape. If you are experienced enough, you can modify the program so that it saves the screen to disk instead.
- <-> loads a screen from tape. Like I said above, you can modify the program to load from disk instead.
- <@> toggles the cursor.
- <f> draws a line between the first position (defined with <s>) and cursor position.
- <c> draws a circle using <s> and the cursor as the circle ratio.
- <g> gets the area (like the GET command in basic) using <s> and the cursor position.
- <u> puts the GET-ed area at cursor position.
- <b> draws a box from <s> to cursor position.
- <l> Like <b>, only fills the box.
- <p> paints area at cursor position.
- <k> erases pixel at cursor position.
- <r> reverses drawing colour, similar to an inverse.
- <w> draws a grid. Enter first number for horizontal lines (2 - 99), and second number for verticle lines (2 - 99).
- <o> removes grid created by <w>.
- <spacebar> stops the cursor.

The program moves through a few more paces, and then you can create your masterpiece.

Have fun!

The Listing:

```
1 GOTO10
2 '*****************************
3 '*********SKETCH PAD**********
4 '*******BY PETER NIEKAMP******
5 '*****************************
6 SAVE"144:3":END'7
10 PCLEAR 8:DIM T(40,40):R=5:X2=
0:Y2=0:I=0
20 GOTO1020
30 CLS:PRINT"DO YOU WANT A 1) BL
ACK ON WHITE SCREEN OR     2) WH
ITE ON BLACK      (1/2)";:INPUT Q
W
40 IF QW<1 OR QW>2 THEN 30
50 IF QW=1 THEN D=0:Q=1 ELSE D=5
:Q=0
60 IF D=5 THEN O=0 ELSE O=5
70 PMODE4,5:PCLSQ:PMODE4,1:PCLSQ
:SCREEN1,1:X=128:Y=96
80 PMODE4,1:SCREEN1,1
90 IF X<0 THEN X=0ELSE IF X>256T
HEN X=256ELSEIFY<0THENY=0ELSE IF
 Y>191 THENY=191
100 P=PPOINT(X,Y)
110 PSET(X,Y):FOR Z=1TO 20
120 NEXT Z
130 PRESET(X,Y):FOR Z=1TO 20:NEX
T
140 PSET(X,Y,P)
150 A$=INKEY$:IF A$=CHR$(32) THE
N X2=0:Y2=0
160 IF A$="K" THEN 450
170 IF A$="D" THEN 950
180 IF A$="A" THEN 830
190 IF A$="W" THEN 740
200 IF A$=":" THEN 850
210 IF A$="-" THEN 900
220 IF A$="O" THEN 410
230 IF A$=CHR$(64) THEN 610
240 IF A$=CHR$(8) THEN510ELSE IF
 A$=CHR$(94)THEN 550
250 IF A$=CHR$(10) THEN 570 ELSE
 IF A$=CHR$(9) THEN 590
260 IF A$=CHR$(93) THEN X=256 EL
SE IF A$=CHR$(21) THEN X=0
270 IF A$=CHR$(91) THEN Y=191 EL
SE IF A$=CHR$(95) THEN Y=0
280 IF A$=CHR$(92) THEN 420
290 IF A$="S" THEN X1=X:Y1=Y:GOT
080
300 IF A$="F" THEN 470
310 IF A$="C" THEN 490
320 IF A$="U" THEN 690
330 IF I=1 THEN 350
340 X=X+X2:Y=Y+Y2
350 IF A$="B"THEN 640
360 IF A$="L" THEN 650
370 IF A$="G" THEN 660
380 IF A$ ="P"THEN 630
390 IF A$="R" THEN 1000
400 GOTO80
410 PCOPY8TO4:PCOPY7TO3:PCOPY6TO
2:PCOPY5TO1:GOTO80
420 IF QW=1 THEN PCLS 1:PMODE4,5
:PCLS 1:PMODE4,1:GOTO100
430 PMODE4,1:PCLS:PMODE4,5:PCLS:
PMODE4,1
440 GOTO100
450 PSET(X,Y,O):PMODE4,5:PSET(X,
Y,O)
460 GOTO80
470 COLOR D:LINE(X,Y)-(X1,Y1),PS
ET:PMODE4,5:COLOR D:LINE(X,Y)-(X
1,Y1),PSET:PMODE4,1:P1=X:P2=Y:L=
1
480 GOTO80
490 C2=SQR((X-X1)^2+(Y-Y1)^2)
500 CIRCLE(X1,Y1),C2,D:PMODE4,5:
CIRCLE(X1,Y1),C2,D:PMODE4,1:L=2:
GOTO80
510 IF I=0 THEN X2=-2:Y2=0:GOTO5
30
520 X=X-1:GOTO80
530 X=X+X2:Y=Y+Y2
540 GOTO80
550 IF I=0 THEN X2=0:Y2=-2:GOTO5
30
560 Y=Y-1:GOTO80
570 IF I=0 THEN X2=0:Y2=2:GOTO53
0
580 Y=Y+1:GOTO80
590 IF I=0 THEN X2=2:Y2=0:GOTO53
0
600 X=X+1:GOTO80
610 IF I=1THEN I=0 ELSE I=1:GOTO
90 ELSE GOTO80
620 GOTO80
630 PAINT(X,Y),D,D:PMODE4,5:PAIN
T(X,Y),D,D:PMODE4,1:GOTO80
640 COLOR D:LINE(X1,Y1)-(X,Y),PS
ET,B:PMODE4,5:COLOR D:LINE(X1,Y1
)-(X,Y),PSET,B:PMODE4,1:P1=X:P2=
Y:L=3:GOTO80
650 COLOR D:LINE(X1,Y1)-(X,Y),PS
ET,BF:PMODE4,5:COLOR D:LINE(X1,Y
1)-(X,Y),PSET,BF:PMODE4,1:P1=X:P
2=Y:L=4:GOTO80
660 PMODE4,5:A=X:B=Y:Z1=X1:Z2=Y1
:GET (X1,Y1)-(X,Y),T,G:PMODE4,1
670 COLOR O:LINE(X1,Y1)-(X,Y),PS
ET,BF:PMODE4,5:COLOR O:LINE(X1,Y
1)-(X,Y),PSET,BF:PMODE4,1
```

```
680 GOTO80
690 IFA>Z1 THEN XX=A-Z1 ELSE IF
A<Z1 THEN XX=Z1-A
700 IF B>Z2 THEN YY=B-Z2 ELSE IF
 B<Z2 THEN YY=Z2-B
710 IF X+XX>256 OR Y+YY>191 THEN
 CLS:PRINT" YOUR PICTURE WILL NO
T FIT IN     THIS AERA":EXEC44539
:GOTO 80
720 PMODE4,5:PUT(X,Y)-(X+XX,Y+YY
),T,PSET:PMODE4,1:PUT(X,Y)-(X+XX
,Y+YY),T,PSET
730 GOTO 80
740 PP=0:WW=0:LL=0:ZA=0
750 A$=INKEY$:IF WW=2 THEN 790
760 IF A$="" THEN 750 ELSE WW=WW
+1
770 IF WW=2THEN LL=LL*10
780 LL=LL+VAL(A$):GOTO 750
790 IF ZA=1 THEN 820
800 R=0:PP=256/LL:PMODE4,1:COLOR
 D:FOR E=1TO LL:R=R+PP:LINE(R,0)
-(R,191),PSET:NEXT E
810 PP=0:WW=0:LL=0:ZA=1:GOTO750
820 PP=191/LL:COLOR D:R=0:FOR E=
1TOLL:R=R+PP:LINE(0,R)-(256,R),P
SET:NEXT:GOTO80
830 PMODE4,1:PMODE4,5:SCREEN1,1:
EXEC44539
840 GOTO80
850 POKE65494,0:SCREEN0,0:CLS
860 PCOPY8TO4:PCOPY7TO3:PCOPY6TO
2:PCOPY5TO1
870 PRINT"SAVE FILE- ":INPUT"FIL
ENAME-";A$
880 CSAVEM A$,1536,7679,0
890 GOTO80
900 POKE65494,0:SCREEN0,0:CLS:PR
INT"LOAD FILE":INPUT"FILENAME-";
A$
910 SCREEN1,1
920 CLOADM A$
930 PCOPY1TO5:PCOPY2TO6:PCOPY 3T
O7:PCOPY 4TO8
940 GOTO80
950 IF L=1 THEN COLOR O:LINE(P1,
P2)-(X1,Y1),PSET:PMODE4,5:COLOR
O:LINE(P1,P2)-(X1,Y1),PSET:PMODE
4,1:GOTO 80
960 IF L=3 THEN COLOR O:LINE(P1,
P2)-(X1,Y1),PSET,B:PMODE4,5:COLO
R O:LINE(P1,P2)-(X1,Y1),PSET,B:P
MODE4,1:GOTO80
970 IF L=2 THEN CIRCLE(X1,Y1),C2
,O:PMODE4,5:CIRCLE(X1,Y1),C2,O:P
MODE4,1:GOTO80
980 IF L=4 THEN COLOR O:LINE(P1,
P2)-(X1,Y1),PSET,BF:PMODE4,5:COL
OR O:LINE(P1,P2)-(X1,Y1),PSET,BF
:PMODE4,1:GOTO80
990 GOTO80
1000 O=D:IF D=5 THEN D=0 ELSE D=
5
1010 GOTO80
1020 W=0:CLS0
1030 FOR Q=1TO 7
1040 W=W+16
1050 Z$=CHR$(143+W)
1060 X$=Z$+Z$+Z$+Z$
1070 C$=CHR$(128):V$=C$+C$+C$+C$
1080 PRINT@66,X$+C$+Z$+C$+C$+Z$+
C$+X$+C$+X$+C$+X$+C$+Z$+C$+C$+Z$
;
1090 PRINT@98,Z$+V$+Z$+C$+Z$+C$+
C$+Z$+V$+C$+Z$+Z$+C$+C$+Z$+V$+Z$
+C$+C$+Z$;
1100 PRINT@130,X$+C$+Z$+Z$+C$+C$
+C$+Z$+Z$+Z$+C$+C$+C$+Z$+Z$+C$+C
$+Z$+V$+X$;
1110 PRINT@162,C$+C$+C$+Z$+C$+Z$
+C$+Z$+C$+C$+Z$+V$+C$+Z$+Z$+C$+C
$+Z$+V$+Z$+C$+C$+Z$;
1120 PRINT@194,X$+C$+Z$+C$+C$+Z$
+C$+X$+C$+C$+Z$+Z$+C$+C$+X$+C$+Z
$+C$+C$+Z$;
1130 PRINT@266,X$+C$+X$+C$+Z$+Z$
+Z$;
1140 PRINT@298,Z$+C$+C$+Z$+C$+Z$
+C$+C$+Z$+C$+Z$+C$+C$+Z$;
1150 PRINT@330,X$+C$+X$+C$+Z$+C$
+C$+Z$;:PRINT@362,Z$+V$+Z$+C$+C$
+Z$+C$+Z$+C$+C$+Z$;
1160 PRINT@394,Z$+V$+Z$+C$+C$+Z$
+C$+Z$+Z$+Z$;
1170 FOR E=1TO 50:NEXT E
1180 NEXT Q
1190 PRINT@345,"by";:PRINT@377,"
peter";:PRINT@409,"niekamp";
1200 PRINT@451,"instructions"+C$
+CHR$(123)+"y"+CHR$(124)+"n"+CHR
$(125);:A$=INKEY$:IF A$="" THEN
1200
1210 IF A$="Y" THEN 1240
1220 IF A$="N" THEN 30
1230 GOTO1200
1240 CLS:PRINT" **********SKETCH
 PAD**********"
1250 PRINT" DO YOU WANT A HARD C
OPY";
1260 INPUT A$
1270 IF A$="Y" THEN D=-2 ELSE IF
 A$="N" THEN D=0:GOTO1290 ELSE G
OTO1240
1280 PRINT" PLEASE GET YOUR PRIN
TER READY                PRESS A
KEY":EXEC44539
1290 PRINT@32:PRINT#D," ARROW KE
YS MOVE CURSOR"
1300 PRINT#D," SHIFT ARROW MOVES
 CURSOR TO     EDGE OF SCREEN"
1310 PRINT#D," SHIFT CLEAR CLEAR
S SCREEN"
1320 PRINT#D," D ERASE LAST LINE
 CIRCLE,BOX OR FILLED BOX"
1330 PRINT#D," S SETS FIRST POSI
TION FOR LINE  ,CIRCLE,GET,BOX A
ND FILLED BOX"
1340 PRINT#D," A SHOWS DISPLAY S
CREEN"
1350 PRINT#D," : SAVE SCREEN TO
TAPE"
1360 PRINT#D," - LOADS SCREEN FR
OM TAPE"
1370 PRINT#D," @ TOGGLES CURSOR"
1380 PRINT#D," F DRAWS LINE BETW
EEN S AND      CURSOR POSITION"
1390 IF D=-2 THEN 1400ELSE EXEC4
4539
1400 CLS:PRINT@32:PRINT#D," C DR
AWS CIRCLE,S CIRCLE CENTRE   C C
IRCLE RATIO"
1410 PRINT#D," G GETS AREA FROM
S TO CURSOR    POSITION"
1420 PRINT#D," U PUTS AREA AT CU
RSOR POSITION"
1430 PRINT#D," B DRAWS BOX FROM
S TO CURSOR    POSITION"
1440 PRINT#D," L DRAWS BOX FROM
S TO CURSOR    POSITION AND FILL
S"
1450 PRINT#D," P PAINTS AREA AT
CURSOR    -    POSITION"
1460 PRINT#D," K ERASES PIXCEL A
T CURSOR       POSITION"
1470 PRINT#D," R REVERSES DRAWIN
G COLOUR"
1480 IF D=-2 THEN 1490 ELSE EXEC
44539
1490 CLS:PRINT@128:PRINT#D," W P
RINT GRID.ENTER FIRST NUMBER FOR
 HORIZONTAL LINES(02-99).     ENT
ER SECOND NUMBER FOR          VER
TICAL LINES(02-99)"
1500 PRINT#D," O REMOVES GRID"
1510 PRINT#D," SPACEBAR STOPS CU
RSOR"
1520 IF D=-2 THEN 30 ELSE EXEC44
539:GOTO 30
1530 END
```

DR COCO

THE DOCTOR IS IN

Dear Dr CoCo,

In the February 1988 issue of Australian CoCo Magazine on page 49, Lindsay Bradford wrote in regarding a correction to an original program by Rick Adams and Dale Lear.

Lindsay pointed out a data error in line 210 - the 70 should have been a 96 or a 97. However, upon checking the original assembly listing I found that Hex 31 does not equal 51 in line 250. It should equal 49.

Problem number 1: the program does not work. In a previous issue of Australian CoCo, November 1987, on page 11, Brian Bere-Streeter sent in a revised listing of corrections.

What I have done is use Brian's corrections plus the changes in the data statements. Now at least I get all the squares, but no colour!

No problem, I will keep trying.

Also, in the February issue, Neil Etheridge enquired about a game called "Moonbase Amphibia". He is correct in that there are some lost lines. I encountered the same problem. The original program was in the August issue and in the September 1985 issue, on page 129, there are a series of corrections to be made.

Problem number 2. Even with the additional lines, I get an OM error in line 1000.

Incidentally, I own a CoCo 3 with a multi-pack and a disk drive.

Hope I have been of some help.

Robert Fergusson,

Hobart, TAS.

Robert,

Ta very much for that information regarding "Moonbase Amphibia". I'm sure there's somebody who can benefit from that. Now, all we need is for that person to find out about that OM error in line 1000, and tell all of us how to go about 'fixing' it.

Regarding the Colour Chart program: I've just checked all references made to the program, and yes, there seems to be a few things that have gone wrong.

However, the one that does the job, and does it well, is the one that appeared in the February edition of Australian CoCo. Type it in as it appears, and I'll guarantee that it works.

For your convenience, here is that same listing:

```
 0 GOTO10
 1 '***** 3COLOUR
 2 '***** LINDSAY BRADFORD
 3 SAVE"71A:3":END'7
 10 'ORIGIONAL  PROGRAM BY RICK
    ADAMS & DALE LEAR CONVERTED
    TO AUSTRALIAN TELEVISIONS
    BY LINDSAY BRADFORD
 20 FORI=0TO15:PALETTEI,0:NEXTI
 30 PALETTE 1,63
 40 HSCREEN 2
 50 POKE65497,0
 60 HPRINT(4,1),"Color Computer
    3 - Color Chart"
 70 FOR X=0TO3
 80 HLINE(X*80+10,32)-(X*80+40,
    160),PSET,B
 90 FOR Y=0 TO15
 100 HPRINT (X*10+5,Y+4),X*16+Y
 110 HLINE(X*80+10,Y*8+40)-(X*80
     +40,Y*8+40),PSET
 120 HPAINT(X*80+20,Y*8+36),8+X,
     1
 130 NEXT Y,X
 140 FOR I=4096 TO 4160
 150 READ A
 160 POKE I,A
 170 NEXT I
 180 EXEC 4096
 190 DATA26,80,198,46,247,255,3
 200 DATA134,16,142,0,16,206,32
 210 DATA48,198,97,125,255,2,125
 220 DATA255,3,42,251,125,255,0
 230 DATA0,125,255,1,42,251,90
 240 DATA38,245,125,255,0,125
 250 DATA255,1,42,251,191,255
 260 DATA184,255,255,186,48,137
 270 DATA1,1,51,201,1,1,198,7,74
 280 DATA38,218,32,198
```

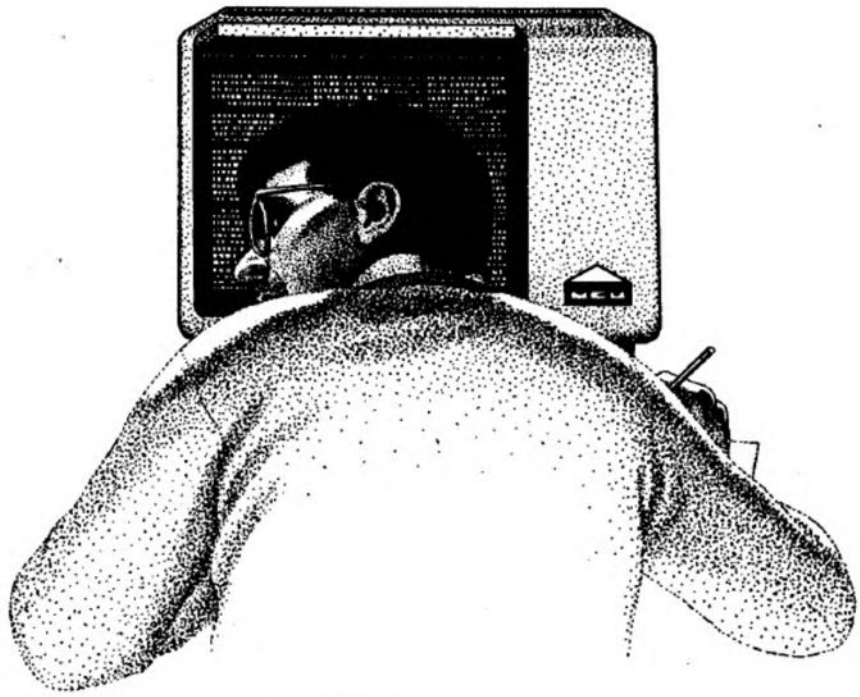
Hope I have been of some help to you.

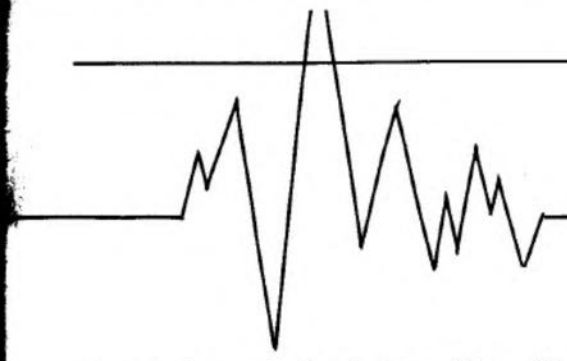
***

Dear Dr CoCo,

I run a CoCo 3 cassette based system with a CM-8 monitor. Can you explain how I can use TAB on the 40 and 80 column screens?

When I use TAB with the 32 character screen, everything is okay, but TAB-bing in the other





If you have a computer problem, let the doctor take a look at it!

screens does not start from the left side, but rather from the end of the last TAB.

This makes it impossible to have straight columns.

Ken Willings,
Blacktown, NSW

Ken,

That, in my opinion, is a small bug left over in the CoCo 3 ROM's. It is also very annoying, as I have found out.

But to combat the problem, I had a very simple solution: I would use the LOCATE command to 'TAB' across the screen. But that doesn't always work, so I resorted to the following:

Situation: I want to print out a score table, with peoples' names, their score, their average (sum of scores divided by the number of games), and their team name. There are 10 teams, with the name of each team captain for the team.

I want to tabulate the results over the screen in the 80-column mode.

Solution: I would go through the entire team and find out:

- what the largest name was,
- the largest number that is going to be printed,
- the largest team name,
- etc.

... so I could "manually" tab them across the screen.

Also, I would add two more after each field, to put a bit of space between one field and the other when I print them out.

The following program will do all this for me. Remember, what we are interested in is how the program works, not what it does.

The program:

```
0 GOTO10
1 '***** EXAMPLE PROGRAM
3 SAVE"DRCOCO:3",A:END' INHOUSE
10 WIDTH80:PALETTE0,0:PALETTE8
   ,64:CLS1
20 CLEAR1200
30 'Read in all fields.
40 FORI=0TO10
50 READ N$(I)  'Name
60 READ S$(I)  'Score
70 READ A$(I)  'Average
80 READ T$(I)  'Team name
90 NEXT
100 'Now to find out the
    largest string in each
    field.
110 FORI=0TO10
120 NL=LEN(N$(I)):IF NL>LN
    THEN LN=NL
130 SL=LEN(S$(I)):IF SL>LS
    THEN LS=SL
140 AL=LEN(A$(I)):IF AL>LA
    THEN LA=AL
150 TL=LEN(T$(I)):IF TL>LT
    THEN LT=TL
160 NEXT
170 'Now we give them all a
    'right' size.
180 FORI=0TO10
190 N$(I)=N$(I)+STRING$(LN-LEN(
    N$(I))+2,32)
200 S$(I)=S$(I)+STRING$(LS-LEN(
    S$(I))+2,32)
210 A$(I)=A$(I)+STRING$(LA-LEN(
    A$(I))+2,32)
220 T$(I)=T$(I)+STRING$(LT-LEN(
    T$(I))+2,32)
230 NEXT
240 'Now to display the data
250 FORI=0TO10
260 PRINTN$(I);S$(I);A$(I);T$(I
    )
270 NEXT
280 DATA Name,Sc,Av,Team Name
290 DATA Kevin Mischewski,25,54
    ,Fred Aetir
300 DATA Sonya Young,35,58,Hot
    Stuff
310 DATA Tracy Yapp,23,53,Gee
    Wizzers
320 DATA Paul Wynn,21,50,Drongo
    s
330 DATA Graham Morphett,24,57,
    Banana Benders
340 DATA Karen Court,26,54,Trai
    ners
350 DATA Deon George,28,60,Tand
    yman
360 DATA Dr CoCo,24,54,High
    tshifters
370 DATA Alex. Hartmann,27,53,K
    rauts
380 DATA Jim Rogers,25,50,MicoM
    en
```

I hope that will help you out.

***

Dear Dr CoCo,

I have been given your name from the Tandy store at Coffs Harbour. I bought a Colour Computer 3 from them at Christmas time and decided to type in a game out of CoCo Magazine that was given to me.

The first one I tried to type in was "Ninja Adventure", and found myself stuck on line 57. The cursor would stop 4 characters before the end of the line.

Anyway, I gave up on that and tried the "Terminator II". I typed all 416 lines and ended up with the title screen. If I touched any keys, I would end up with a SN error in 106.

I then tried to re-write line 106 in all sorts of different way, but still got the same error.

So do you have any copies of September, October, November December, January and Feburary that I could buy and see if they have written the corrections in another copy?

Bev Jolley,
Bellengin, NSW

Bev,

The error you get is due to a very simple answer. But before I go on, I will explain something.

When you type in a line of Basic code, the computer will only accept 'so many' characters, or to be precise, 249 characters, before the 'cursor stops and won't go on any further'.

What the author has done is cheat the computer. He uses another command called EDIT, which like it says, Edits a line of code. He then presses the 'X' key (which stands for 'eXtend the line') and types in the last few characters of code.

Now with that in mind, your answer is to simply EDIT the offending line (in the first case, type EDIT 57 and press <enter>), press 'X' and add the extra bit of code.

***

user contacts

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

ACT:

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LISMORE	BOB HILLARD	066 24 3089
SYDNEY	GRAHAM POLLOCK	02 603 5028

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TANDY ACCESS	02 625 8271
THE COCOCONNECTION	02 618 3591

VIDEOTEX SYSTEMS

VIATEL	01955
MOUSEIRI	059 42 5528
VTX 4000	03 741 3295

TANDY INFO ON VIATEL

GOLDLINK	VIATEL #542#
TOWER CODE	VIATEL #642#5#
TANDY	VIATEL #642#1#

SOME TANDY USERS ON VIATEL

ALLAN BEALE	720353300
FRED BISSELING	648230630
JACK FRICKER	730283690
JOHN GRIGGBY	945872030
STUART HALL	939765790
BOB KENNY	655122050
JEFF LARSEN	705471270
G LEVIS	954811900
IAIN MACLEOD	944621360
CHRIS NAGLE	689523360
RICHARD PANKHURST	280717870
ROSS PRATT	648230650
RICCAY SCHWAHL	298151500
ARTHUR SLADE	262289400
DARCY O'TOOLE	755100150
RON WRIGHT	352924510