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DEADLINES
The 7th of the preceeding month of publication

ADVERTISING
All Advertising for AustralianCoCo is arranged through ToToAdvertising P.O,Box 5730 Gold Coast Mail Centre, Bundall, Qld.

OS-9
Kevin Holmes is the contact for OS-9 information. He also has access to OS-9 Software from the U.S. His address is:—
39 PEARSON ST.,
NARARA, N.S.W. 2250

All Programs in this issue of Australian CoCo and MiCo are available on CoCoOz andMiCoOz
SEE CENTRE PAGE FOR DETAILS

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SCREEN DUMP

There are occasions when it pays to read the whole of this magazine.

We had a double issue in December which included January's magazine, yet many who received the magazine still don't know!

Another reason relates to our phone number, which has been inadvertantly left off the last two magazines. Telecom only have CoCoLink listed under 'Rainbow', so it is necessary to tell the operator to look for my name, if you forget that our phone number is 075-51-0015.

And another piece of advice that has been a long time part of this magazine is the advice to save your programs before you RUN them. If you don't save them first, don't blame anyone else for the problems that follow. If you save something, RUN it and then find that it dosen't work, you can always reload it and check the listing for anything that shouldn't be there. We are not perfect yet, we do have programs that behave unpredictably on occasion, but you can always turn to your User Group, or ourselves for help, if you have the program saved. No one can help you if your listing is unavailable!

And on the subject of User Groups, I have been surprised by the number of phone calls recently from folk who EXPECT a local User Group to be at their beck and call, but who have no wish to contribute. Yes, the caller has been to the group, but either no one spoke to him, or he couldn't get the information he sought in one quick grab, so he wrote the whole scheme off. Now is that selfish?

If you don't what to help others, if you want to re-invent the wheel, if you enjoy taking 6 weeks to discover something someone could tell you in 5 minutes at a meet, then at least be consistent and don't use people.

INDEX

Phone numbers: 075-51-0015 voice; 075-32-6370 CoCoLink.

That's the negative side - there is also a positive. The Groups are dedicated to the dissemination of information about your computer and welcome you and your problems/help. There is a great desire on the part of the groups to give you every assistance, because in so doing, they also learn. They accept that some will use them but they also see the benefit in terms of personal knowledge, in helping you.

If you are a subscriber, with this magazine you should have received your OS8 chips. The OS8 section this month has some ideas for their use. We thank Bayne and Trembath and Blaxland Computer Services for their assistance with this.

We want to welcome Tandy to the magazine as an advertiser. Their involvement with the magazine is something that I have been working for since day one! We are sure that the information the ads bring you, will be of immense benefit to both you and Tandy.

We need our advertisers, both for their advertising dollar and for the information and service they bring. We also need your help in letting the advertisers know that you are buying their product because you saw their ad in our magazine.

To advertise here, Tandy had to change company policy (& I'm glad they did!). I was a part of several promotions this month that involved Tandy, and this reflects yet another positive change in the way they are doing business.

In Brisbane, I was given the opportunity of meeting the country Tandy dealers of Queensland, at their conference. I expected almost to see a bunch of cowboys & cowgirls with the wide brimmed hats, spurs, and rope marks round their necks!

In fact, I met a bunch of professionals, who for the most part admitted they knew little about CoCo, but who were prepared to learn, and who were prepared to find out, if they didn't know.

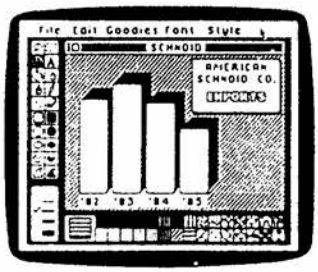
Many will become distributors of our magazines; (so I guess this is the point where I extend the invitation to other Tandy dealers to contact me, if they too want to distribute Rainbow and CoCo).

We showed the amber monitor we recently purchased, Graphicom 2, Telewriter 64, the Rainbow Bits modem, Best of CoCoOz and Say the Word.

Later in the month, I was involved in assisting Tandy in an interview with the NSW Education Dept, with a view to securing the 'contract' for the supply of computers to NSW schools. This is something of a must with me, magazine aside, because I feel that the wrong decisions have been made in the past.

Finally, I was able to be at the Sydney Computer Exhibition held at Centrepoint during March. I've reported elsewhere on this exhibition, so I won't waste space here, suffice to say that I'm glad that we support Tandy!

Take a look at these pics:



If you've been to any of the computer shows, or if you have a friend with an Apple MacIntosh, then these will be familiar.

The MacIntosh uses this screen to develop pictures, fonts and diagrams which can then be dumped to your printer.

Now there is CoCo Max, and these pics are of CoCo Max screens. Apple uses a 32 bit, 128K, $3000 machine to produce this type of quality. Your 64K CoCo with CoCo Max in ROM does the same job for about $160. Glad you bought a CoCo yet?

CoCo Max is due in Australia in the next month or so, and will be available from Computerware for Micros in Adelaide. As soon as it arrives, we will give you further details on CoCoLink.

I want to place on record, special thanks to two magazine Editors. The first is John Christou, who has just relinquished his editorial chair at CoCoPug. John developed that magazine to a position of pre-eminence in it's field. On a continuing basis, John's CoCoPug has come up with the goods, providing up to the minute news and information. The programs have been first rate, reflecting the health of the hobby in Western Australia.

John's job can be compared to that of our own founder, Greg Wilson, in that he has never had the luxury of having enough programs to fill a magazine when he was ready to go to print - he has always had to beg for them. But he knew who to beg to, to achieve an excellent format!

We wish you well, John. Also wish you lived closer!

The second Editor is Barry Cawley. Barry edits the Brisbane based magazine 'CoCoBug'. Barry has set his sights on achieving a national distribution of his magazine. CoCoBug has grown from a news sheet to a valuable 26 page magazine which seeks to serve the new user. We look forward to hearing of that magazine's growth!

It has certainly been a busy month. New software is in the Tandy shops, most of the agents have new software, and the Tandy 1000 has been launched along with it's own software. If I don't get square eyes out of this lot, it'll only be because I've gone blind!

LETTERS

Letters to Graham stand a good chance of being ignored; if they don't get ignored, they often end up here.

Dear Graham,

We spent a lot of money over Christmas on additions to our computer, namely a T.P. 10 printer, and a new keyboard. The printer is great, even though small and is getting a lot of use by 16yr old Steven.

The keyboard is a different proposition. It's Tandy's and although Steven has an after school job with them we weren't prepared to send the computer to the workshop for installation as we have a non Tandy 32K upgrade, which we don't want to lose. Our computer is the old grey type, originally 16K ECB. Is there an instruction sheet or sheets available for this work? We have friends who could do the job, but are unfamilar with computers. The kit has extra resistors and capacitors, a piece of wire and chips with it. I do hope you can help.

We wish Australian Rainbow and its offshoots all the best for the future.

Yvonne, Peter, Steven and Lynette.
Unanderra, NSW.

Dear Yvonne and crew,

The installation of your keyboard should be straightforward. Just plug it in! The extra bits are for American computers. Save them though, they look good as earings!

Don't ever worry about taking a nonstandard computer to Tandy. They like to see one occasionally so they can get ideas on how to improve their own!

Graham.

Dear Graham,

Congratulations on the standard of both magazines -- I think they're the best available! If I could afford the time to read both (and do other things, like eat and sleep), then I'd subscribe to Rainbow too. Perhaps I could suggest a list of contents of both magazines in each, every month, so that an interesting item wouldn't be missed.

Regards to all concerned with the publications.

Mike Maloney
Ballarat, VIC.

Dear Mike,

Presently we have a content problem. We are trying to shoehorn in as much material as possible. To that end, you may have noticed, most of our house ads have been reduced in size and we have also reduced the size of the print.

Our current thinking is, that to do what you suggest would mean an additional quarter page of material taken from the mag - and we don't feel that the end justifies the means!

In the long run, it is a decision our readers can make. If we get enough input one way or the other, then we'll act!

Graham.

Dear Graham,

Please do not print any more jokes like the one by Peter Von Houts in the March CoCo. You will lose subscribers not friends.

The joke (?) was filthy.

You, as Editor have a responsibility to your readers and should not publish letters which are in bad taste.

My viewpoint is that of a 63 year old, but there are standards which should not change.

Ron Foley,
Kallangur, QLD.

We have received several letters indicating that folk with 16K BASIC computers feel that they aren't adequately catered for in this magazine.

There is a derth of 16K programs available, so perhaps this is a chance for those of you with 16K CoCo's to show us what you've learnt so far! Don't forget that you have the ability to type in most of the programs from the MiCo section too.

We try to balance the magazine so that there will be something for everyone - in fact this month's magazine is so full, I'm surprised you didn't spill something when you opened it!

There have also been several enquiries regarding the Rainbow Bits modem. We have nothing to do with that piece of equipment, although we heartily recommend it. Phone Brian Dougan on 07-30-2072.

Finally, we have experienced a spate of people sending programs for critical assistance. If it is an original program, we will try to advise during the free hour we get on Wednesday mornings at 2AM; if it is a program you have input from one of our magazines, the appropriate place to seek assistance is your local user group.

Dear Graham,

Just a short note to thank you for your excellent work in publishing Australian Rainbow and to say "Keep up the good work". I look forward to receiving each issue.

Pam Eagle
Coffs Harbour, NSW.

Dear Pam,

Thanks for your letter.

We have noticed a rising stream of interest in CoCo coming from Coffs. It is obviously the work of your hard working Tandy dealer there!

I hear there is even to be a meet this month at last.

My favourite Aunt lives in Coffs too, so it is good to see the interest growing - it'll give me an excuse to visit her again!

Graham.

Dear Graham,

As a past member of the publishing staff of the Australian Radio OX club magazine I realize what a job you must have had on changing over. I have left that position since leaving Melbourne, and have come to reside on Phillip Island - Melbourne is the publishing center .. and Phillip Island is 130Km away from Melbourne!

Since subscribing to your mag, I have enjoyed the sharpening up of the wits as an appendage to my interest in Short Wave Radio.

Would you keep in mind that I am interested in a method of keeping a log of stations heard and would be pleased to see an article on storing on tape, perhaps as data such information.

I have tried doing it by listing and using the frequency on which the station has been heard as the line number ie.

```
3910 PRINT"3910, FEN TOKYO,V GOOD ON 25/1, EE,POPS
```

This is OK to an extent but the only way to recover by this method is to LIST, and then the line number and PRINT are shown as well. If you run from that number the screen is filled with what you do not require.

If you could help in this matter, those of our club with computers would be able to keep on tape their yearly reportings, and refer back each year to the equal day and month. If you are able to help, we would be able to give you the Courtesy Credit.

William Burrows,
Newhaven, Vic.

Dear William,

Thanks for the sympathy - we need it! I look forward to receiving the courtesy credit - whatever that is! (Sorry don't speak Han too well!)

If you refer to the September magazine, we published a Data Base which Paul Humphries wrote, and I expanded.

I have been considering your problem, and I believe that some modification of that program may well be your answer.

Rather than save things to (in your case, what appears to be) 5 strings, if you can regulate the data you need to store, and create a single string for each contact, you could save a lot of memory.

By this I mean that if your inputs can be codes, or at least formatted to a set length, then you can add each input to a string that you build as you input your data.

For example:

```
 10 INPUT "CITY";Z$:GOSUB100
 20 INPUT "STRENGTH";Z$:GOSUB100
 30 END
100 Z$=LEFT$(Z$,8):CODE$=CODE$+Z$
110 RETURN
```

This program reduces each input to 8 characters, then assigns the characters to CODE$. The next input is so treated, and the characters from this input end up being added to the end of CODE$.

Data received from Melbourne, on strength 5, would be in CODE$ as:

```
"MELBOURN5
```

To read CODE$, you reverse the input program, and examine it with the MID$ statement.

Basic reserves 255 bits for each string you use. In disk Basic you can control this with the FIELD statement. But this is not possible in ECB or standard BASIC, so I find that this first way of saving space is good where you have relatively unpredictable data.

By using the same method above, but restricting the data to be added to CODE$ to a single alpha-numeric character, we can save a heap more space. But we have to have predictable inputs that have no variables that can not be encoded. If we are only going to log in transmissions from 26 cities, then we can assign a letter of the alphabet to each city. Likewise, if you run strength readings on a scale of 0 - 9, then again only a single character need be stored. (OK, I know it is more usual to have strengths measured on the basis of 1 - 10, but as you input the number, you have the computer reduce it by one, and when you want to read that number, you add one to it first.)

By their nature, some of these tricks take a bit of memory themselves, but given a sizeable Data Base, the over all savings are appreciable.

Graham.

OS8

After a rest last month, due to the power strike reducing the amount of available power for OS8, we present two programs for your OS8 system.

As with previous programs, these will load into a normal CoCo (32K+), and demonstrate most of their available features.

For those who have X/MODE 12 in operation, we suggest you call the AbOrT function, before loading.

The first program in fact, is not an OS8 program per se, but rather provides a new ROM for those who own the Rainbow Bits Disc drive ROMs 1.2 onwards. We included this program here so that those whom it effects, will be able to load this program before loading the COMMAND STRUCTURE below.

Listing 1:

```
1 REM THIS WILL ONLY WORK ON COM
PUTERS USING RAINBOW BITS DOS 1.
2 OR LATER
5 IFPEEK(&HC12E)<>80 THEN CLS:PR
INT"PROGRAM WILL NOT WORK WITH T
HIS":PRINT"VERSION OF DOS"
10 RAM
20 POKE&HC180,&H4F
30 POKE&HABEE,&H4F
40 POKE&HABEF,75
50 CLS:PRINT"DISK REDUCED COLOR
BASIC 1.0"
60 PRINT"(C) 1985 BY WILLIAM FLE
XGERALD"
70 PRINT
80 NEW
```

We thank William Flexgerald for this simple, but very effective piece of programing.

COMMAND STRUCTURE was the result of a conception sent some time ago by Hermann Fredrickson of Sydney. We liked his program a lot, and will use it in future, but at the time, Barry Cawley from CoCoBug was here, and he saw Herman's work and wanted to use it to develop the idea further.

The result is an Operating System which checks your input, so that the computer can establish your exact requirements.

(We are working on a program in OS8 which follows this concept to it's logical conclusion.)

Listing 2:

```
5 CLEAR200,&H7CF3
10 FOR A= 31987 TO 32767
20 READ B
30 POKE A,B
40 NEXT
50 EXEC 31987
60 DATA 48,141,0,4,191,1,146,57,
53,32,189,173,51,189,209,229,52,
36,189,202,59,48,98,189,167,233,
189,169,116,15,111,189,185,92,18
9,185,175,53,4,79,49,141,2,141,4
8,181,189,125,46,48,141,2,208,18
9,125,46,22
70 DATA 47,61,166,128,39,6,173,1
59,160,2,32,246,57,87,79,87,32,8
9,79,85,82,32,83,84,85,80,73,68,
33,13,0,87,72,65,84,63,63,0,70,7
9,82,71,69,84,70,85,76,76,32,65,
82,69,78,84,32,89,79,85,13,0,87,
72,65,84,32
80 DATA 68,65,84,65,63,63,0,68,7
9,78,39,84,32,68,79,32,84,72,65,
84,0,87,72,79,79,80,83,33,33,0,7
8,79,32,87,65,89,32,73,68,73,79,
84,32,0,73,32,87,73,76,76,32,78,
79,84,32,33,33,33,0,78,79,32,87,
65,89,32
90 DATA 77,65,84,69,32,32,0,78,7
9,46,46,46,78,79,84,32,65,71,65,
73,78,33,33,32,32,32,13,0,67,65,
78,39,84,32,66,69,32,68,79,78,69
,32,0,73,76,76,69,71,65,76,32,68
,73,82,69,67,84,0,66,85,84,84,69
,82,32,70
100 DATA 73,78,71,69,82,0,84,65,
78,68,89,32,66,82,65,73,78,32,68
,65,77,65,71,69,32,13,0,83,84,82
,73,78,71,32,84,79,79,32,69,65,8
3,89,0,83,84,82,73,78,71,32,84,7
9,79,32,83,84,85,80,73,68,32,13,
0,78,79
110 DATA 32,73,32,87,73,76,76,32
,78,79,84,32,0,70,73,76,69,39,83
,32,65,32,78,79,78,79,0,89,79,85
,32,66,76,69,87,32,73,84,33,0,87
,72,73,67,72,32,79,78,69,63,63,3
2,32,0,84,72,65,84,32,84,73,67,7
5,76,69
120 DATA 83,0,87,72,69,82,69,32,
63,32,32,32,32,32,32,0,78,79,32,
87,65,89,32,76,79,86,69,82,32,0,
72,69,32,87,73,76,76,32,78,79,84
,32,84,65,76,75,32,84,79,32,77,6
9,13,0,72,69,39,83,32,84,79,79,3
2,66,79,83
130 DATA 89,32,32,32,13,0,68,79,
32,65,32,87,72,65,84,32,63,63,63
,32,32,32,32,32,0,67,65,78,39,84
,32,70,73,78,68,32,73,84,33,0,87
,72,65,78,68,32,87,72,69,82,69,3
2,63,63,32,32,32,13,0,68,73,83,7
5,32,83
140 DATA 65,73,68,32,78,79,32,32
,32,0,65,82,69,32,89,79,85,32,73
,78,32,76,79,86,69,32,63,32,32,1
3,0,84,72,65,84,83,32,83,73,76,7
```

```
6,89,32,32,67,65,78,32,89,79,85,
32,84,89,80,69,0,73,84,83,32,73,
78,32,65,32
150 DATA 66,65,68,32,77,79,79,68
,32,13,0,79,72,32,87,69,32,72,65
,86,69,32,84,87,73,78,83,33,33,3
2,13,0,83,80,73,76,76,69,68,32,7
3,84,32,33,32,32,0,73,32,84,72,7
3,78,75,32,73,32,65,77,73,78,32,
76,79,86
160 DATA 69,32,68,69,65,82,33,13
,0,79,79,79,80,83,33,0,73,32,67,
65,78,39,84,32,82,69,68,32,79,82
,32,82,73,84,69,13,32,73,39,86,6
9,32,72,65,68,32,73,84,33,33,0,1
25,57,125,75,125,82,125,104,125,
116,125,130
170 DATA 125,139,125,153,125,168
,125,182,125,203,125,218,125,233
,125,247,126,12,126,28,126,48,12
6,63,126,77,126,90,126,104,126,1
17,126,131,126,145,126,169,126,1
87,126,206,126,221,126,240,127,0
,127,21,127
180 DATA 34,127,47,127,67,127,88
,127,103,127,130,127,137,32,32,3
2,32,32,32,0,255
200 FOR A= 30672 TO 30767
210 READ B
220 POKE A,B
230 NEXT
240 EXEC 30672
250 DATA 142,1,103,204,126,126,1
67,128,51,140,49,239,129,167,128
,51,140,15,239,129,215,148,204,0
,200,52,6,48,140,2,126,174,90,15
,112,13,111,39,3,126,140,241,50,
98,52,20,214,148,231,159,0,136,1
89,161,193
260 DATA 39,251,126,161,185,140,
171,239,38,8,48,140,7,50,102,126
,172,121,126,130,115,71,79,79,68
,65,89,32,84,72,73,83,32,73,83,3
2,79,83,56,13,0
```

By now those of you who subscribe will have your OS8 chips and be wondering what to do with them.

We would like to point out some of their properties first:

1. They can be burnt, so be careful.
2. They are not toxic if they do burn.
3. You will need a different type of eprom burner to effect any change in the internal structure. We understand an article is in preparation on this subject.
4. These chips will need to be attached to the main board of your CoCo between the SAM and the ROMs. We suggest a position about 2 - 3 inches above on any convenient white or grey surface.
5. When taken from the pack, there may be a slight 'greasy' feel to the chips. Do not worry about this, as this is quite normal.

As to their uses, well the list is quite long. For a chip of this internal structure and complexity, different names have been developed to describe the internal functions. Before discussing possible uses we should at least know some of the names.

CELL: this structure maintains the structural as well as the on going internal memory functions.

S-ap: These chips use S-ap pathways to link CELLS and provide the Gigosecond responses necessary.

BaRqUe: Also known as the OUTER CRUST, maintains the division between LOOF and LIRPA segments.

The Loof segment reverses the Lirpa segment, and the Lirpa segment reverses that of the Loof. In fact we suggest that you do just that, alphabetically, now.

See you next month?

COCOCONF

Annette Morphett.

Hi there! For those of you who are coming to the conference, and are unfamiliar with the Gold Coast, here's an accomodation guide which should be of assistance.

We suggest you ring, or write, and make your own arrangments - see if you can be sent a pamphlet showing the motel / caravan parks and detailing their facilities. Some places I've seen and others I've only picked out of the telephone directory. So here goes:

MOTELS:

1. Beaconlea Apartments, 316 Marine Parade, Labrador, 4125. (4KM away from conference site). Phone 075-32-9919.

Multi-story apartment block, overlooking the Broadwater. Truely delightful, for those who can afford a little extra. Very spacious, with tasteful decor, breathtaking views completely self-contained and includes washing machine, dryer, kitchen and two bedrooms. Tranquil setting, security parking, games room, half-size tennis court. Accomodate 4 people.

Tariff: $40 a double (includes linen charge)
min 3 nights
$25 each extra person p.w.

Awarded my highest recommendation (I love it!)

2. Sundale Motel, 20 Queen Street, Southport, 4215, (2KMs from conference site). Phone 075-32-2111. No cooking facilities or restaurant.

Tariff: $36 double
$30 single
$6 each extra person
$3 for continential breakfast

3. South Surfers Motor Inn, 2884 Gold Coast Highway, Surfers Paradise (5KMs from conference) Phone 075-38-6955. Undecover parking, serviced and self contained units, air conditioned, BBQ, games room, close to beach.

Tariff: $28 double
$25 single
$5 for each extra person
$35 for 4 people in a self-contained unit.

4. Crystal Waters Motel, Marine Parade, Labrador, 4215 (4KMs from conference) Phone 075-31-1084.

Quiet street, opposite park and beach. All self-contained units with 2 bedrooms and kitchenette. Neat, comfortable, middle-of-the-road accomodation.

Tariff: $30 double
$20 single
$40 family

5. San Martino Motel, 125 Frank Street, (Gold Coast Highway), Labrador, 4215. (3KMs from site) Phone 075-31-3498.

Some self-contained units with large room and kitchenette (sleep 4-5). Some with cooking facilities, room service, restaurants.

Tariff: $20-$25 double
$18 single
$35 self-contained 2 bedrooms

6. Broadway Motel, 128 Frank Street, (Gold Coast Highway), Labrador, 4125. (3KMs from conference) Phone 075-31-3288.

Air conditioned, Heat, TV, Fridge, some with cooking facilities, clean and comfortable.

Tariff: $20-$30 double

CARAVAN PARKS:

1. HiWay Caravan Park- 6 Frank Street, Southport. 4215. (2KMs from conference) Phone 075-31-2281.

Tariff: $16 per night (1 or 2 people)
$5 per extra person

2. Treasure Island Caravan Park- Brisbane Road (Gold Coast Highway), Labrador, 4215. Near the drive-in (5KMs from conference). Phone 075-37-1649.

Tariff: $23 Double
+$3 each extra person
* All linen available.
On site vans: $17 double per day.
+$2 each extra person
* No linen, but can be hired.
$20 double (with ensuite)
+$2 each extra person

3. CoCoNut Grove Holiday Village, (will the CoCoNuts from Victoria stay here?) 2342 Gold Coast Highway, Miami Beach (about 10KMs from conference) Phone 075-55-2577.

Tariff:
On-site vans: $16 per night (1 or 2 people)
+$2 each extra person
* No linen or blankets provided; but can be hired ($1.75)
Self-contained: $20 double
+$2 each extra person
* Blankets provided, but no linen.

4. Palm Beach Caravan Park, 1336 Gold Coast Highway, Palm Beach. (about 13KMs from conference) Phone 075-35.3359.

On site Vans: $16 double
+$3 each extra adult;
+$1.75 each extra child.
* Blankets and linen supplied

TRANSPORT:

Transport is available (private or public) within a short distance of each of the above, along the Gold Coast Highway, if needed.

QUESTIONS:

If you have any questions, please write to me or ring on 075-51-0015. See you all at CoCoConf.

Tutorials.

The following tutorials have been organised, and will be taken by the speaker shown.

1. BASIC Tricks. (Advanced Basic). Tino Delbourgo.
2. 128K & OS9 Bob Thomson.
3. Hardware Modifications to CoCo Brian Dougan

4. MS DOS (1000) Paul Humphries.

5. Interfacing using CoCoConnection, Basic and Forth John Poxon.

Final details are yet to be completed on BASIC for Beginners, and the two tutorials on Education. (We expect to have a pre-eminent speaker on this subject.) And finally, Lonnie Falk from American Rainbow will also be here to discuss "Aspects in the Development of the Color Computer". If this sounds a bit nebulous, it's because he wants to touch on "a bit of history, a bit of what is present, and a look into the future"!

Lonnie's address will probably be made over dinner on Saturday night, so there is no fear of missing him because you want to be at another tutorial.

Registrations.

PLEASE if you are coming, let us know. Frankly, although a lot have said on the phone that they are coming, I'm getting worried because there are only a few bookings.

In any case, the closing date for bookings will be 28th May. Why? Because we need time to order materials and in particular, the caterers need warning to prepare the food.

I think it will be an exciting time for us all. I am keen to see some of these high scorers from Australian CoCo's 'Scoreboard' go through their paces on the the Sunday. That is when we'll be throwing CoCoConf open so that you can see the latest gear, and talk to the software suppliers. It is also when the games competition will be underway!

So come on, people are coming from all over the place, Lonnie is coming from Kentucky, Tino is coming from Hobart, we know of folk who are coming from Gove in the NT, Melbourne, Adelaide, Perth, and Sydney - you won't be the only one making the long journey - register NOW! WE NEED TO KNOW YOU ARE COMING!

Transport.

We have had avery kind offer of the use of a bus during the period of CoCoConf. It would be available to bring folk from Brisbane to the coast, and to transport folk around the coast to and from the various places that they will be staying. There is a cost involved, but it is only the cost of the fuel, so it's likely to be about $4 to get from Brisbane to the coast, be ferried around all weekend, and returned to Brisbane. The cost for being taken from your lodgings to CoCoConfand back will be much lower.

If you would like to avail yourself of this offer, please phone Annette on 075-51-0015, and let her know.

COCOCONF

15 - 16 JUNE, 1985

* TUTORIALS
* FREE ticket to the Computer Expo
* See and operate the latest in Hard and Software.
* Pick up a bargain.
* Catch up on old frienos.

PROGRAM

SAT:

9.00 AM Welcome!
9.30 AM Tutorials. Choice of 4, or head off to the Computer Expo.
11.00 AM Morning Tea.
11.30 AM Return to Tutorials.
12.30 PM Lunch.
9.00 AM Rotary Hall
Lawson St
Southport. Qld.
2.00 PM Tutorials. Choice of 4, or head off to the computer Expo.
3.30 PM Afternoon Tea.
4.00 PM Return to Tutorials.
5.00 PM Break to prepare for Dinner.
8.00 PM Dinner (Venue to be announced).

SUN:

10.00 AM Spend today with the Software Agents. Try out the new Programs, or join in the games contests.

COCOCONF

Name:.....

Address:.....

.....

..... PC.....

I enclose full price $ 39.95

I enclose part price $ 9.95

and will pay the rest off before CoCoConf.

Please bill my Mastercard / Visa / Bankcard NO ....

Please find Cash / M.O. / Cheque enclosed. Signed.....

RTTY

This contribution is too long to be listed in the magazine, however it occurs on CoCoOz this month.

We would encourage those interested in this subject to continue to write. You have made the CoCo a valuable tool in your other hobby! G.

HAMSAT

by Dr Thomas Clarke and M. Garth (VK2ZLX)

One of the problems in writing programs for Radio Amateurs is that not all Amateurs have the same, or simular computers. Assembly language programs have to be written for particular processors, creating all sorts of problems.

There are advantages in writing programs in Basic. Simple changes can often be made to enable the program to run in most computers.

With Orbital prediction programs for Amateur Satellites there are a number of options available to us. Generally however, it boils down to one of three options.

Option one is to program around the fact that the satellite has a stable orbit of a particular time increment. We can program the computer to advance the satellite by it's equator crossings. This method is rather crude and presents some problems in providing the aquisition angles that are really necessary.

Most Amateur satellites are in polar orbits that are for all intents and purposes circular. Consequently, reasonable accuracy can be obtained by writing a program that flies the satellite in a circular orbit. This is option two.

The third option is to program the computer to calculate the orbit, regardless of whether it is circular or eliptical, and to provide the necessary aquisition angles. The programs to be presented here this month, and next, are written for option two and three.

"HAMSAT" was written in Microsoft Basic, for CoCo, based on a paper, "Calculation of Range and Azimuth of a Satellite from a Ground Station", written by the late Mr L. Algate.

The program outputs Time (UTC), Azimuth and Elevation Angles and Range in Kms of circular orbit satellites. This includes the Russian RS series as well as Amsat "Oscar" spacecraft.

The necessary data to be included into the program are:

a. The satellite orbit time in minutes. Lines 2720, 2800, 2880, 2960 and 3040.

b. The satellite inclination in degrees. Lines 2730, 2810, 2890, 2970 and 3050.

This data must be updated regularly if accuracy is to be maintained.

The program will ask for the following data

1. Date - day, month, year.
2. Station location, (Town).
3. Station latitude.
4. Station longitude.
5. Start orbit number.
6. Stop orbit number.
7. EQX west longitude (decimal).
8. Time UTC (decimal).

The program calculates 120 subsatellite points (latitude and longtitude) of the orbit and compares each position with the latitude and longtitude of the receiving amateur station, calculating range, Azimuth angle and Elevation angle of the subsatellite point.

Slant range is used as a delimiter (set in lines 2770, 2820, 2900, 2980 and 3060). If range is greater than the delimiter the spacecraft is assumed to be not within aquisition range and calculation of the azimuth and elevation angles is aborted.

Each orbit is regarded as individual and the program stores the equator crossing time and longitude by actually computing past the equator, a time delimiter is used to detect EQX, (contained in the same lines as the range delimiter). The program then advances the orbit count by one, zero's all counters and starts a new orbit.

Elapsed time is counted and updates in UTC are maintained as the orbits progress. The last orbit (stop orbit) EQX and time are printed for use as data for further computation.

There are a number of changes that can be made by Amateur stations. It is not ideal to have to input your station co-ordinates and location every time you want to run the program.

Lines 610, 620, and 630 can be deleted and the station location inserted in line 1840 (G$), station latitude inserted in line 800 (B4), and station longitude inserted in line 810 (B5).

There is a poke to 1200 baud output to the printer (line 720), a poke to change screen colour (line 100), speedup pokes for mathematical computations (lines 730, 1040, 2400, 2480, 2540) and slowdown pokes for printing (lines 1810, 2350, 2420, 2450, 2500). It will work on 16K TRS80 Color Computers with ECB. It has not been tried on a 4K machine.

The program is fairly slow in computing the orbital points. CoCos are not super fast mathematical calculators and when it is doing its number crunching, a "Please wait" message appears on the screen, just to let you know something is happening even though the silence is deafening.

PROGRAMS

Programs submitted for inclusion in Australian CoCo, MiCo, softgold and Rainbow, remain the property of the author. We however, reserve the right to use all or part of them, as our needs dictate.

Magazine owners may maintain a copy plus two back ups of each program, but are not permitted to provide others with copies. These programs are provided in good faith by people who have worked very hard to demonstrate the capabilities of your computer to you. Please don't break their trust.

If you would like to submit a program, the prefered method is a triple save to tape, the last one in ASCII. On the reverse of the tape, you may like to place a Telewriter, Scriptsit, or VIP text or ASCII file (in that order of preference), detailing your work. We are still accepting programs and text on hard copy at this stage.

HI

by ALEX HARTMAN

Alex Hartmann supplied the following program for the office, and we thought that others may also find it of use.

The problem with disk directories is that they rarely provide all the information about the disk that you require.

Alex's program, (which he calls 'HI' - because it's the first thing you input, and therefore it's like saying 'hi' to your CoCo!), loads the directory and lists it in menu form. Having selected a program to RUN or EXEC, you just press the key indicated - what could be simpler!

The big plus, however is the naming function.

When you have loaded this program in, and run it, at the base of the menu, are the familiar words "Press <ENTER> to continue". If instead you press 'S', then the program invites you to insert a new formatted disk and name it.

Having done this, the name will occur at the top of the disk menu every time you RUN 'HI'.

You can also input '*' instead of 'S' to obtain the directories of other disks that you may wish to insert and take out as you search for that lost program.

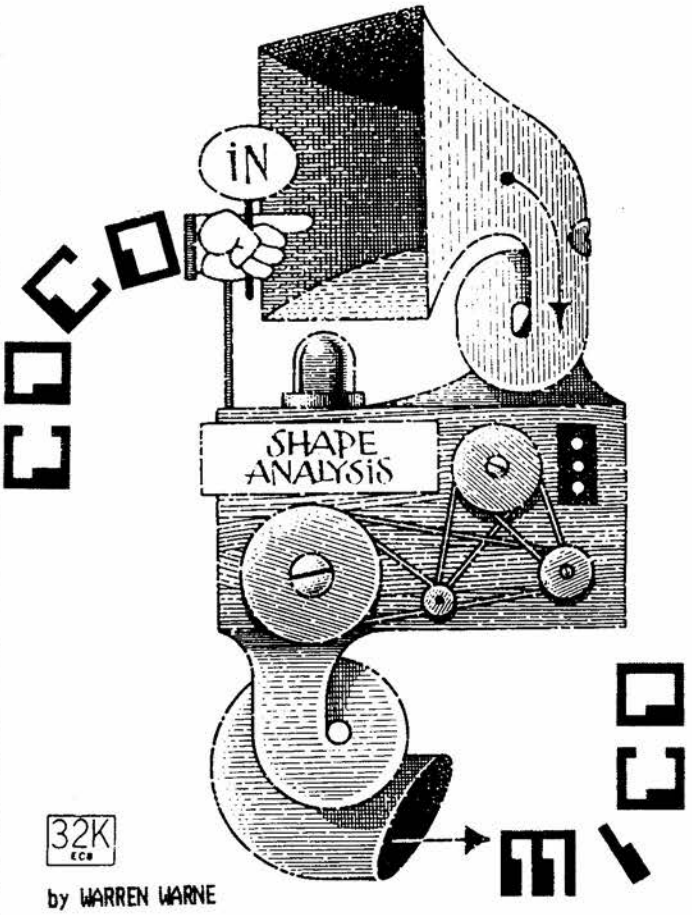
As I say, we have found this program very useful and now use it on all our disks.

(First time start up will require that you RUN400 to name the first disk, after that the program will run as described.)

THE LISTING:

```
  1 '*****ALEX'S DIR*****23/2/85
  2 GOTO10
  3 SAVE"AA:2"
 10 CLEAR1000
 20 DIMP$(67,2),E$(67)
 30 F=FREE(0)
 40 OPEN"I",#1,"S"
 50 INPUT#1,D$
 60 CLOSE#1
 70 CLS:PRINT@7,LEFT$(D$,20);
 80 FORZ=3TO11
 90 DSKI$0,17,Z,A$,B$
100 X$=A$:GOSUB140
110 X$=B$:GOSUB140
120 NEXT
130 GOTO270
140 FORJ=1TO128STEP32
150 R=R+1
160 P$(R,1)=MID$(X$,J,8)
170 IF LEFT$(P$(R,1),1)=CHR$(255
)THEN R=R-1:GOTO270
180 IF LEFT$(P$(R,1),1)=CHR$(0)T
HENR=R-1:GOTO210
190 P$(R,2)=MID$(X$,J+8,3)
200 IFP$(R,2)="DAT"THEN R=R-1
210 NEXT
220 RETURN
230 PROG$=P$(A,1)+"/"+P$(A,2)
240 IF P$(A,2)="BIN"THEN LOADM
PROG$:PRINT"MANUAL EXEC?":END
250 LOADPROG$
260 END
270 I=1
280 PRINT@64,;:FORJ=I TO I+9
290 PRINTUSING"##";J;:PRINT") "P
$(J,1),"("P$(J,2)")"
300 NEXTJ
310 PRINT@416,"ENTER A NUMBER OR
   (FREE:"F")","PRESS <ENTER> TO
 CONTINUE";:INPUTA$
320 DATA 100,115,117,108,111,131
,105,114,114,111,132,132,132,131
,107,100,131,107,100,131,107,100
,131,37,60,40
330 CLS:FOR A=&H505 TO &H51A:REA
D B:POKEA,B-35:NEXT
340 FOR A=&H400 TO &H5FF:POKEA,1
28:NEXT:POKE&H50D,66:POKE&H50E,8
9:POKE&H50F,69:SOUND 100,5:POKE&
H92-33,0:EXEC&H9FEC+59
350 IF A$="*"THEN RUN
360 IF A$="S"THEN430
370 IF A$=""THEN390
380 IF A$<"0"OR A$>"9"THEN310
390 A=VAL(A$)
400 IF A=0THEN I=I+10:IF I>R THE
N270ELSE280
410 IF A<00R A>R THEN310
420 GOTO230
430 CLS:INPUT"NEW DISK NAME";D$
440 PRINT"INSERT FORMATTED DISK"
;:LINEINPUTZ$
450 OPEN"O",#2,"S"
460 PRINT#2,D$
470 CLOSE#2:END
```

```
300 M=12:T$="MONTH"
310 SOUND200,2:PRINT" WHAT IS TH
E REPAYMENT PERIOD INYEARS";:INP
UT N:NUMBER=N*M
320 IF N<0 OR N>99 THEN SOUND5,2
:PRINT"THAT SEEMS UNLIKELY!!":FO
RQ=1TO1000:NEXTQ:GOTO310
330 SOUND200,2:PRINT:PRINT" HOW
MUCH MUST BE REPAID EVERY":PRINT
 T$;:INPUT PAYMENT:IF PAYMENT<=0
 THEN SOUND5,2:PRINT:PRINT"THAT
DOES NOT COMPUTE....":FORQ=1TO10
00:NEXTQ:CLS:GOTO330
340 IF CAPITAL>NUMBER*PAYMENT TH
EN SOUND5,2:CLS:PRINT@66,"EITHER
 YOU HAVE MADE AN ERROR  IN YOUR
 INPUT, OR YOU DO YOUR  BUSINES
S WITH A VERY STRANGE  BANK IN
DEED!!":FORQ=1TO1000:NEXTQ:GOTO4
60
350 PRINT:PRINT@490,"THINKING...
";:POKE65495,0
360 I(1)=(PAYMENT/CAPITAL)-CAPIT
AL/(PAYMENT*NUMBER^2)
370 CL=I(1)*100*M
380 J=1
390 DE=I(J)*.0000001
400 F1=((1-(1+I(J)+DE)^(-NUMBER)
)/(I(J)+DE))-CAPITAL/PAYMENT
410 F0=((1-(1+I(J))^(-NUMBER))/I
(J))-CAPITAL/PAYMENT
420 I(J+1)=I(J)-DE*F0/(F1-F0)
430 IF ABS(I(J+1)-I(J)) < I(1)/1
00000 THEN POKE65494,0:GOTO 450
440 J=J+1:IFJ>99THEN CLS:POKE654
94,0:SOUND5,2:PRINT:PRINT"SORRY,
 THE CALCULATION IS  UNSTAB
LE DUE TO THE SMALL SAMPLESIZE O
R LOW INTEREST RATE...":PRINT:PR
INT:PRINT"A GOOD FIRST GUESS WOU
LD BE  ABOUT";(FIX(CL*10))/10
;"%":GOTO460:ELSE GOTO 39
450 CLS:SOUND250,5:PRINT@129,"PR
INCIPAL":PRINT@146,USING"$$######
#.##";CAPITAL:PRINT@193,"NO. OF
PAYMENTS";:PRINT@215,NUMBER:PRIN
T@257,"PAYMENT";:PRINT@276,USING
"$$#####.##";PAYMENT:PRINT@357,"I
NTEREST RATE:  ";:PRINTUSING"###
.##";I(J+1)*100*M;:PRINT"
460 PRINT@480,"ANY FURTHER CALCU
LATIONS (Y/N)?";
470 A$=INKEY$:IFA$="Y"THEN 240 E
LSE IF A$="N"THENCLS:PRINT:PRINT
:PRINT" IT HAS BEEN MY PLEASURE
TO BE  OF SOME SERVICE, HOWEVER
SMALL.":PRINT:PRINT"I LOOK FORWA
RD TO DOING BUSINESSWITH YOU AGA
IN SOMETIME.":END ELSE GOTO 470
```



by WARREN WARNE

This program converts all acceptable CoCo BASIC to a form suitable for the MC10. Where conversion is not possible, warning is given. The user has an opportunity to amened the program and recheck.

Recommended Configuration:32k ECB (Program can run 16k and without ECB but lack of EDIT Command and space is a disadvantage).

Features: Converts all standard and acceptable BASIC commands, functions and operators.

Checking pass, without program alteration, allowing EDIT of unacceptable (for MC10) BASIC statements.

Printing of line numbers for unconvertible statements during check pass.

Conversion of "'" type comments to REM comments.

Conversion of "PRINT#-2", to "LPRINT".

Produce correct NAMEFILE header for MC10 loading check on program size.

Printing of Program size, to give an indication of whether the converted program will fit in the MC10.

Operating Instructions.

CLOAD and RUN to load COCOMICO converter.

(Program loads at &H3800 or &H7800 if modified.

Change line 5 and 10 of BASIC program if converter is wanted at top of 32k machine.

Steps:

1. CLOAD Basic program to be converted.
2. EXEC.
3. If faults are found line numbers will be printed and no conversion occurs.
4. Use EDIT, LIST or any other commands to correct

unconvertible lines.
5. RUN Basic program to check operation in modified form - optional. (Only practical on 32k).
7. If OK, program is converted.
8. CSAVE "PROGNAME" to write Converted program to tape.
9. On MICO, CLOAD to load and check.

THE LISTING:

```
1 'COCOMICO COCO TO MICO
   TRANSLATER BY WARREN WARNE.
2 GOTO10
3 SAVE"COCOMICO:2"
5 CLEAR200,&H3800 'CHANGE TO &H7
800 FOR 32K
10 S=&H3800 'CHANGE TO &H7800 FO
R 32K
20 L=&H245
25 CLS:PRINT"HANG ABOUT A BIT -
THIS TAKES  A FEW SECONDS":FORT
=1TO1500:NEXTT
26 DATA 100,115,117,108,111,131,
105,114,114,111,132,132,132,131,
107,100,131,107,100,131,107,100,
131,37,60,40
27 FOR A=&H4A5 TO &H4BB:READ B:P
OKEA,B-35:NEXT:FORA=&H50D TO &H5
0F:READB:POKEA,B-35:NEXT:SOUND 1
00,5:POKE&H92-33,0:EXEC&H9FEC+59
30 FOR I=S TO S+L
40 READ N:POKE I,N
50 NEXT
60 POKE &H9D,S/256
70 POKE &H9E,S-INT(S/256)*256
75 CLS:PRINT"LOAD PROGRAM TO BE
CONVERTED"
76 PRINT:PRINT"TYPE EXEC TO CHEC
```

LITTLE COCO

Andrew White

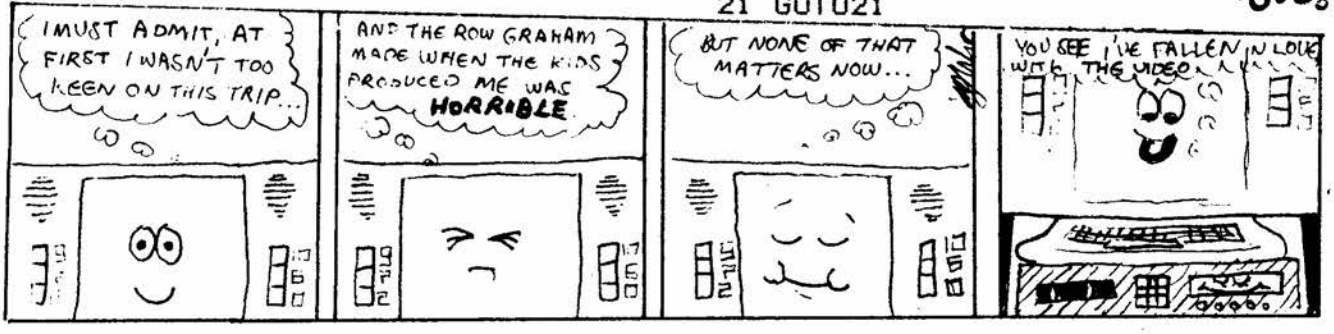
Andrew is not only a clever Cartoonist, but he programs as well. And what better way of showing his tallent than to provide a program that draws Little CoCo!

16K ECB

THE LISTING:

```
7 POKE65495,0:PMODE4,1:PCLS1:SCR
EEN1,0:COLOR0,1
8 DRAW"BM52,164M+156,0":CIRCLE(5
2,152),12,0,1,.25,.5:CIRCLE(208,
152),12,0,1,0,.25:CIRCLE(52,152)
,12,0,1.6,.5,.75:CIRCLE(208,152)
,12,0,1.6,.75,.0
9 DRAW"BM52,135M+20,-12BM208,135
M-20,-12M-115,0BM56,156M+148,0":
CIRCLE(56,152),4,0,1,.25,.5:CIRC
LE(204,152),4,0,1,.0,.25
10 LINE(84,148)-(176,148),PSET:L
INE-(172,142),PSET:LINE-(88,142)
,PSET:LINE-(84,148),PSET
11 LINE(84,125)-(176,125),PSET:L
INE-(196,140),PSET:LINE-(64,140)
,PSET:LINE-(84,125),PSET
12 CIRCLE(72,115),8,0,1,.25,.5:C
IRCLE(72,115),4,0,1,.25,.5:LINE(
72,119)-(187,119),PSET:CIRCLE(18
8,115),4,0,1,.0,.25:CIRCLE(188,1
15),8,0,1,.0,.25
13 DRAW"BM64,115M+19,-64BM68,115
M+19,-64":CIRCLE(91,51),8,0,1,.5
,.75:CIRCLE(91,51),4,0,1,.5,.75
14 DRAW"BM196,115M-19,-64BM192,1
15M-19,-64":CIRCLE(169,51),8,0,1
,.75,.0:CIRCLE(169,51),4,0,1,.75
,.0:LINE(168,47)-(92,47),PSET:LI
NE(168,43)-(92,43),PSET
15 CIRCLE(124,74),5,0,2:CIRCLE(1
34,74),5,0,2:CIRCLE(124,77),3,0,
1:CIRCLE(134,77),3,0,1:PAINT(124
,77),0,0:PAINT(134,77),0,0
16 CIRCLE(129,100),9,0,1,.0,.5:L
INE(120,100)-(123,90),PSET:LINE(
138,100)-(135,90),PSET
17 CIRCLE(40,40),35,0,.5:CIRCLE(
40,70),7,0,1:CIRCLE(60,105),3,0,
1:CIRCLE(50,87),5,0,1
18 G$="BU5FR4HL2G2D2FR3EUL2BD2BR
3":D$="BU4BRD4LURFR2EU3HL3GBD4BR
5":A$="BRNR2HU3ER2FNUD3NGFBR":Y$
="BU4ED2FRND2REU2BD5BR"
19 DRAW"S8BM17,45"+G$+D$+A$+Y$:D
RAW"BM28,35U1"
20 LINE(0,0)-(256,192),PSET,B:LI
NE(4,4)-(252,188),PSET,B:PAINT(5
,5),0,0:POKE65494,0
21 GOTO21
```

CoCo



```
K IF IT CAN BE CONVERTED, AND CO
NVERT IF OK"
80 END
1000 DATA52,64,111,141,1,78,111,
141,1,73
1010 DATA48,141,2,30,23,1,160,25
2,0,27
1020 DATA179,0,25,253,1,229,253,
1,231,189
1030 DATA189,204,48,141,2,25,23,
1,138,254
1040 DATA0,25,32,2,238,196,174,1
96,16,39
1050 DATA0,183,16,174,66,48,68,1
66,128,43
1060 DATA4,39,237,32,248,129,255
,38,44,134
1070 DATA32,109,141,1,9,39,2,167
,31,166
1080 DATA128,129,160,16,44,0,188
,132,127,52
1090 DATA16,48,141,1,50,166,134,
16,39,0
1100 DATA172,53,16,109,141,0,233
,39,2,167
1110 DATA31,32,200,129,188,16,44
,0,156,129
1120 DATA129,16,39,0,169,129,135
,39,36,132
1130 DATA127,52,16,48,141,0,204,
166,134,16
1140 DATA39,0,130,53,16,109,141,
0,191,39
1150 DATA2,167,31,32,158,166,133
,129,32,38
1160 DATA3,92,32,247,57,95,141,2
43,129,35
1170 DATA39,4,134,134,32,225,92,
141,232,129
1180 DATA172,38,92,92,141,225,12
9,50,38,85
1190 DATA92,141,218,129,0,39,35,
129,58,39
1200 DATA31,129,44,38,70,125,121
,84,39,17
1210 DATA52,4,134,154,167,31,134
,32,167,133
1220 DATA90,38,251,167,132,53,4,
48,133,22
1230 DATA255,81,90,32,226,109,14
1,0,100,38
1240 DATA13,109,141,0,95,38,16,1
08,141,0
1250 DATA89,22,255,41,48,141,0,1
87,23,0
1260 DATA172,32,7,48,141,0,234,2
3,0,163
1270 DATA53,64,57,53,16,108,141,
0,60,52
1280 DATA118,31,32,189,189,204,1
89,185,172,53
1290 DATA118,22,255,19,166,128,1
29,165,38,12
1300 DATA134,129,109,141,0,34,39
,2,167,30
1310 DATA32,14,129,166,38,215,13
4,130,109,141
1320 DATA0,18,39,2,167,30,134,32
,109,141
1330 DATA0,8,39,2,167,31,22,254,
230,0
1340 DATA0,128,0,131,131,0,132,1
33,134,135
1350 DATA136,137,138,139,140,142
,143,144,145,146
1360 DATA147,148,149,150,151,152
,0,0,153,155
1370 DATA156,157,0,158,0,159,160
,161,162,0
1380 DATA163,164,165,166,167,168
,169,170,171,172
1390 DATA173,174,175,176,0,0,0,0
,0,141
1400 DATA0,177,178,179,180,181,1
85,188,189,190
1410 DATA191,192,193,0,0,194,195
,196,197,199
1420 DATA200,0,186,187,184,0,183
,0,182,0
1430 DATA198,0,0,166,128,189,163
,10,129,0
1440 DATA39,2,32,245,57,13,13,84
,72,69
1450 DATA83,69,32,76,73,78,69,83
,32,65
1460 DATA82,69,32,78,79,84,32,67
,79,78
1470 DATA86,69,82,84,73,66,76,69
,32,45
1480 DATA32,69,68,73,84,32,65,78
,68,32
1490 DATA84,82,89,32,65,71,65,73
,78,13
1500 DATA0,13,13,32,78,79,32,69,
82,82
1510 DATA79,82,83,44,32,89,79,85
,32,67
1520 DATA65,78,32,67,83,65,86,69
,32,78
1530 DATA79,87,32,32,32,32,32,70
,79,82
1540 DATA32,77,67,45,49,48,32,82
,85,78
1550 DATA78,73,78,71,13,0,32,80,
82,79
1560 DATA71,82,65,77,32,76,69,78
,71,84
1570 DATA72,32,0,32,66,89,84,69,
83,13
1580 DATA13,0
```

INTEREST

by WIM DE PUIT

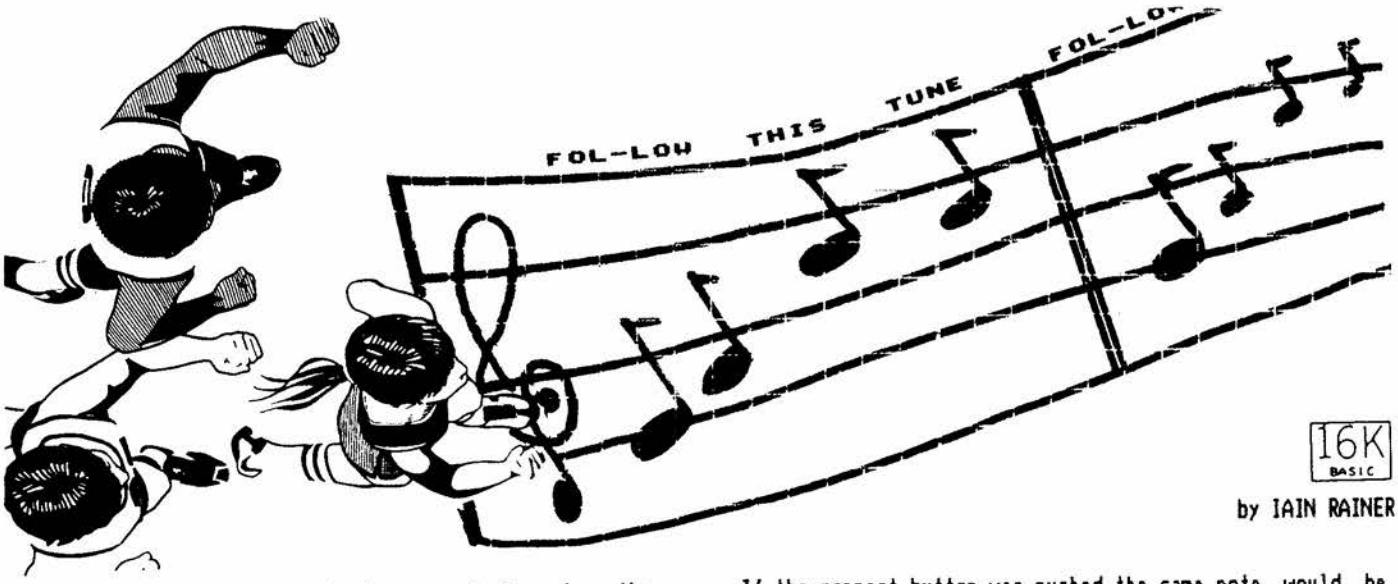
16K ECB

There are several good programs around which allow you to calculate the missing variable in a loan equation. These programs typically allow you to work out how much you can borrow, what your repayment must be, or how long it will take to pay off a loan given the interest rate and all the variables other than the one you want.

The method of calculation uses an algorithm called Newton's method. What that means is that we have a stab at the interest rate and then work out how far out we are, and whether we are too high or too low. We then make an adjustment to the interest and have another go at it, and so on until the error is acceptably small.

THE LISTING:

```
  2 GOTO10
  3 SAVE"INTEREST:2"
 10 'INTEREST RATE CALCULATION
 20 'BY WIM DE PUIT
 30 'P.O. BOX 112 KINGSTON 7150
 40 DIM I(200):Z=RND(-TIMER)
 50 CLS:FORI=0TO31:POKE1024+I,127
:NEXTI:FORI=1504TO1535:POKEI,127
:NEXTI:FORI=1056TO1472STEP32:POK
EI,127:NEXTI:FORI=1087TO1503STEP
32:POKEI,127:NEXTI
 60 POKE65495,0:PRINT@236,"INTERE
ST";:FORI=1TO80:Y=RND(150)
 70 X=RND(32*16):IFX>235 AND X<24
4 THEN GOTO70
 80 Z=RND(2):IFZ=1THENPOKE1024+X,
96 ELSEPOKE1024+X,127
 90 NEXTI:CLS:POKE65494,0:SOUND20
0,2
100 PRINT:PRINT:PRINT" THIS CLEV
ER PROGRAM WILL WORK  OUT THE IN
TEREST RATE YOU ARE   PAYING ON
A LOAN.":PRINT:FORI=1TO2000:NEXT
110 PRINT" IT DOES THIS ITERATIV
ELY, USINGNEWTON'S METHOD OF SUC
CESSIVE   APPROXIMATIONS."
120 PRINT@491,"<ANY KEY>";
130 A$=INKEY$:IFA$=""THEN130
140 CLS:SOUND200,2:PRINT:PRINT:P
RINT" IT SHOULD BE NOTED THAT TH
E    INTEREST RATE THUS CALCULAT
ED   IS A 'COMPOUND' OR 'BANK' R
ATE.":PRINT:PRINT"IF YOU ARE PAY
ING A 'FLAT' RATE YOU MIGHT BE I
N FOR A NASTY     SURPRISE...."
150 PRINT@491,"<ANY KEY>";
160 A$=INKEY$:IFA$=""THEN160
170 CLS:SOUND200,2:PRINT" NOTE A
LSO THAT THE INTEREST     RATE CA
LCULATED MAY VARY         SLIGHTL
Y FROM THAT QUOTED BY     THE LEN
DING AUTHORITY.":PRINT"THIS IS D
UE TO SMALL DIFFERENCESIN THE ME
THOD OF CALCULATION OF INTEREST
DUE (DAILY, MONTHLY OR";
180 PRINT" WHATEVER.)"
182 DATA 100,115,117,108,111,131
,105,114,114,111,132,132,132,131
,107,100,131,107,100,131,107,100
,131,37,60,40
185 CLS0:FOR A=&H4A5 TO &H4BB:RE
AD B:POKEA,B-35:NEXT:FORA=&H50D
TO &H50F:READB:POKEA,B-35:NEXT:S
OUND 100,5:POKE&H92-33,0:EXEC&H9
FEC+59
190 PRINT@491,"<ANY KEY>";
200 A$=INKEY$:IFA$=""THEN200
210 CLS:SOUND200,2:PRINT:PRINT"A
ND FINALLY, IF THE PERIOD IS   S
HORT OR THE INTEREST RATE VERY L
OW, THE PROGRAM MAY GO UNSTABLE"
:PRINT:PRINT"OH WELL...NOBODY'S
PERFECT!!":PRINT
220 PRINT:FORI=1TO2000:NEXTI:PRI
NT"BUT NOW, TO WORK.....":PRINT@
491,"<ANY KEY>";
230 A$=INKEY$:IFA$=""THEN230
240 CLS:SOUND200,2:PRINT:PRINT:P
RINT" WHAT IS THE AMOUNT OF THE
LOAN (THE PRINCIPAL) $";:INPUT C
APITAL:IF CAPITAL<=0 OR CAPITAL>
1E6 THENPRINT:SOUND5,2:PRINT"I D
ON'T BELIEVE THAT!":FORQ=1TO1200
:NEXTQ:GOTO240
250 SOUND200,2:PRINT:PRINT:PRINT
"ARE THE PAYMENTS:":PRINT:PRINT"
    WEEKLY        (1)
    FORTNIGHTLY   (2)
 OR MONTHLY       (3)";:INPUT R
260 IF R<1 OR R>3 THEN SOUND5,2:
CLS:GOTO250
270 PRINT:PRINT:ON R GOTO280,290
,300
280 M=52:T$="WEEK":GOTO310
290 M=26:T$="FORTNIGHT":GOTO310
```



16K BASIC

by IAIN RAINER

This program is a computerised game similar to the electronic toy called "SIMON" by John Sands in which four large coloured buttons flashed whilst a musical note was sounded. The player had to hit the right coloured button, in sequence.

If the correct button was pushed the same note would be played and another note added and on and on....
In the program the flashes are made by graphic blocks and the buttons are the numbers '1', '2', '3' and '4', the musical notes are made by the SOUND command.

THE LISTING:

```
2 GOTO10
3 SAVE"TUNE:2"
10 REM ###follow#this#tune###
20 REM ###by###iain#rayner###
30 REM ###77 calero#street###
40 REM ###lithgow######nsw####
50 REM ###written#30/11/84###
60 DIM A(255)
70 CLS0
80 PRINT@7,"follow";CHR$(128);"t
his";CHR$(128);"tune";
90 PRINT@80,"by"+CHR$(128)+"iain
"+CHR$(128)+"rayner";
100 PRINT@160,"DO YOU REQUIRE IN
STUCTIONS [Y/N]";
110 A$=INKEY$:IF A$=""THEN 110
120 IF A$="Y"THEN470
130 IF A$="N"THEN 150
140 GOTO 100
150 PRINT@160,STRING$(32,128);
160 FORI=1TO30STEP5:READX:PRINT@
256+I,CHR$(X);:NEXT
170 PRINT@384,"NUMBER OF PLAYERS
 (1-4)";:INPUTP
180 IF P<1ORP>4THEN 170
190 PRINT@384,STRING$(32,128);
200 FORI=1TOP:PRINT@384,"INPUT N
AME OF PLAYER NO.";I;:INPUTNA$(I
):PRINT@384,STRING$(32,128);:PRI
NT@416,STRING$(32,128);:NEXT
210 PRINT@448,STRING$(32,128);:P
RINT@480,STRING$(31,128);:POKE15
35,128
220 FORI=1TOP:PRINT@320+((I-1)*3
2),NA$(I);:NEXT
230 FORGG=1TOP
240 Y=LEN(NA$(GG)):FOR I=1 TO Y:
A=ASC(MID$(NA$(GG),I,1)):PRINT@3
20+((GG-1)*32)+I-1,CHR$(A+32);:N
EXT
250 NO=NO+1
260 V=RND(4)
270 A(NO)=V
280 FORQ=1TO NO
290 X=A(Q)
300 GOSUB 330
310 NEXTQ
320 GOTO 370
330 PRINT@257+(X*5),CHR$(128);
340 SOUND63*X,2
350 PRINT@257+(X*5),CHR$(143+(X*
16));
360 RETURN
370 FORF=1TO NO
380 A$=INKEY$:IFA$=""THEN380
390 X=VAL(A$)
400 IF X<1ORX>4THEN 570
410 GOSUB 330
420 IF VAL(A$)=A(F)THEN NEXT ELS
E 570
430 PRINT@320+((GG-1)*32)+Y+2,NO
;
440 FORU=1TO500:NEXT
450 KL$=INKEY$
460 GOTO 250
470 CLS
480 PRINT@7,"FOLLOW THIS TUNE"
490 PRINT"    THIS GAME OF MEMORY
```

```
  IN WHICHA SERIES OF NOTES ARE
 PLAYED INA RANDOM ORDER, THIS
STARTS    WITH JUST ONE NOTE  AN
D  ADDS UPTO TWO HUNDRED FIFTY F
IVE NOTES.";
500 PRINT"WHEN THE YELLOW SQUARE
 FLASHES  PRESS THE '1' OF THE B
LUE '2' ORTHE RED '3' AND THE WH
ITE '4'"
510 PRINT"THESE MUST BE PRESSED
IN THE    CORRECT SEQUENCE OR TH
E GAME    WILL END OR CONTINUE T
O THE NEXTPLAYER."
520 FORI=1TO5000
530 I$=INKEY$:IF I$=""THEN NEXT
532 DATA 100,115,117,108,111,131
,105,114,114,111,132,132,132,131
,107,100,131,107,100,131,107,100
,131,37,60,40
536 CLS0:FOR A=&H4A5 TO &H4BB:RE
AD B:POKEA,B-35:NEXT:FORA=&H50D
TO &H50F:READB:POKEA,B-35:NEXT:S
OUND 100,5:POKE&H92-33,0:EXEC&H9
FEC+59
540 CLS0:PRINT@7,"follow";CHR$(1
28);"this";CHR$(128);"tune";
550 GOTO 150
560 GOTO 560
570 SC(GG)=NO:NO=0:SOUND1,20:FOR
GY=1TO300:NEXTGY:NEXTGG
580 FORI=1TOP:FORJ=1TOP
590 IF SC(I)>SC(J)THEN T=SC(I):S
C(I)=SC(J):SC(J)=T:T$=NA$(I):NA$
(I)=NA$(J):NA$(J)=T$
600 NEXTJ,I
610 PRINT@456,"THE WINNER IS ";N
A$(1);
620 FORI=1TO1000:NEXT
630 CLS0:PRINT@7,"follow";CHR$(1
28);"this";CHR$(128);"tune";
640 I$=INKEY$
650 PRINT@96,"DO YOU WISH TO PLA
Y WITH THE    SAME PLAYERS AGAIN
 [Y/N]";
660 A$=INKEY$:IFA$=""THEN660
670 IFA$="Y"THEN 730
680 I$=INKEY$
690 PRINT@160,"DO YOU WANT TO PL
AY AGAIN AT ALL";
700 A$=INKEY$:IF A$=""THEN 700
710 IFA$="Y"THEN RUN
720 CLS:END
730 CLS0:PRINT@7,"follow";CHR$(1
28);"this";CHR$(128);"tune";
740 F=1
750 FORM=159TO207STEP16:F=F+5:PR
INT@256+F,CHR$(M);:NEXT
760 FORI=1TOP:NO(P)=0:NEXT
770 GOTO 220
780 DATA 128,159,175,191,207,128
```

CoCo

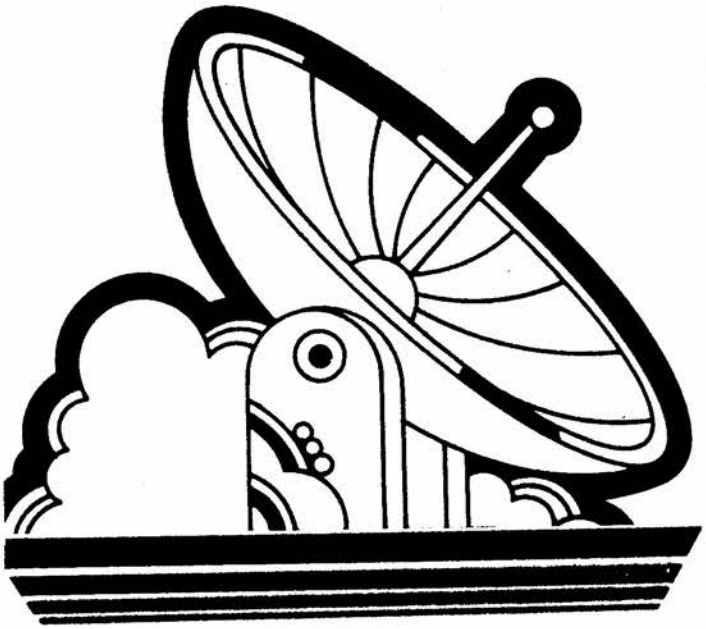
Here's a 'little' ripper from the dynamic Thurbon duo all the way from the ACT.
EXTRA'S is a program to give the CoCo 10 colours in PMODE3, which includes the original 4 colours of colorset 1.

16K ECB

The LISTING:

```
 1 '******** EXTRA COLORS ********
    BY DAVID THURBON, A PIXEL
    SOFTWARE PRODUCTION - V 1.0
    WRITTEN: JAN '85
    SUBMITTED: FEB '85
 2 GOTO100
 3 SAVE"EXTRA'S:2"
 100 PMODE3:PCLS:SCREEN1,1
 110 P=&H601:A=&H80:B=&H80:GOSUB2
 30:P=P+1:A=&H2:B=&H2:GOSUB230
 120 P=&H604:A=&H55:B=&H55:GOSUB2
 30:P=P+1:GOSUB230
 130 P=&H607:A=&HAA:B=&HAA:GOSUB2
 30:P=P+1:GOSUB230
 140 P=&H60A:A=&HFF:B=&HFF:GOSUB2
 30:P=P+1:GOSUB230
 150 P=&H60D:A=&H55:B=&HAA:GOSUB2
 30:P=P+1:GOSUB230
 160 P=&H610:A=&H55:B=&HFF:GOSUB2
 30:P=P+1:GOSUB230
 170 P=&H613:A=&HAA:B=&H55:GOSUB2
 30:P=P+1:GOSUB230
 172 DATA 100,115,117,108,111,131
 ,105,114,114,111,132,132,132,131
 ,107,100,131,107,100,131,107,100
 ,131,37,60,40
 176 CLS:FOR A=&H505 TO &H51A:REA
 D B:POKEA,B-35:NEXT
 180 P=&H616:A=&HAA:B=&HFF:GOSUB2
 30:P=P+1:GOSUB230
 190 P=&H619:A=&HFF:B=&HAA:GOSUB2
 30:P=P+1:GOSUB230
 200 P=&H61C:A=&HFF:B=&H55:GOSUB2
 30:P=P+1:GOSUB230
 210 EXEC44539:PMODE4:SCREEN1,1
 220 GOTO220
 230 FORC=P TOP+6080STEP64:POKEC,
 A:POKEC+32,B:NEXT:RETURN
```

CoCo



BEAMHEAD

by PETER KNOX

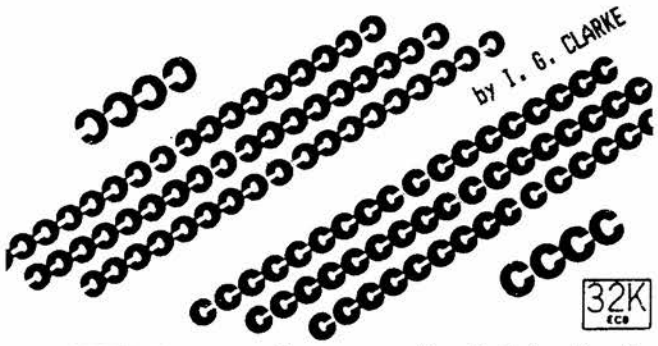
BEAMHEADS is a Great Circle Calculator for amateur radio enthusiasts. It gives a screen dump of the Bearing (both short and long) and Distance (nth, sth, kms) from a given Qth position.
The program is based on the a Qth at Salisbury Sth Aussie but by inserting a Data line giving a specific latitude and longitude the new base location is entered.

16K ECB

The LISTING:

```
2 GOTO10
3 SAVE"BEAMHDS:2"
10 '  GREAT CIRCLE CALCULATOR
20 'FOR AMATEUR RADIO OPERATORS
30 'BY PETER KNOX - VK5PK/G3ATR
40 '         LIFE MEMBER
50 '     OF EX-G RADIO CLUB
60 ' ACKNOWLEDGEMENTS OF HELP
70 '           GIVEN BY
80 '    KEITH VRIENS  VK3AFI
90 '
100 CLEAR500:GOSUB2000
110 CLS3:PRINT@194,"  GREAT CIRC
LE CALCULATOR  ";
120 PRINT@226,"FOR AMATEUR RADIO
 OPERATORS";
121 DATA 100,115,117,108,111,131
,105,114,114,111,132,132,132,131
,107,100,131,107,100,131,107,100
,131,37,60,40
122 CLS:FOR C=&H5DF TO &H400 STE
P-&H20:FOR A=6 TO 27:READ B:POKE
 C+A,B-35:NEXT:RESTORE:NEXT
123 FOR A=&H400 TO &H5FF:POKEA,1
28:NEXT:POKE&H50D,66:POKE&H50E,8
9:POKE&H50F,69:SOUND100,5:POKE&H
92-33,0:EXEC&H9FEC+59
130 FORA=1TO1000:NEXT:POKE359,57
:SCREEN0,1
140 CLS:PRINT:PRINT" THIS PROGRA
M IS BASED ON A QTH  AT SALISBUR
Y, SOUTH AUSTRALIA.  TO CHANGE T
HE PROGRAM TO SUIT   YOUR OWN QT
H, INSERT ONE NEW    DATA LINE A
S FOLLOWS."
150 PRINT" FIND LAT AND LONG AND
 CONVERT   TO DECIMAL DEGREES RE
MEMBERING  THAT N & W ARE +'VE A
ND E & S   ARE -'VE.  ENTER AS F
OLLOWING   EXAMPLE":PRINT
160 PRINT" 620 DATA'BRISBANE',-2
7.50,-153.02
170 PRINT@459,"<ANY KEY>"
180 IFINKEY$=""THEN180
190 CLS:PRINT:PRINT" THIS LINE W
ILL FIT IN PROGRAM   BEFORE ALL
OTHER LOCATIONS SO   WILL BE REA
D FIRST AND WILL     BECOME THE
BASE LOCATION.":PRINT
200 FORA=1TO1500:NEXT:PRINT:INPU
T" DO YOU WANT INFORMATION TO GO
   TO PRINTER OR SCREEN (P/S) ";
X$:PRINT
210 PRINT" IF READING FROM SCREE
N, USE     THE 'SHIFT @' FACILIT
Y TO HALT  PRINTING":FORA=1TO100
0:NEXT
220 T=0:PI=3.141593653
230 READ A$,A1,A2
240 A1=(A1/360)*2*PI
250 A2=(A2/360)*2*PI
260 READB$,B1,B2
270 IF B$="END" THEN1320
280 B1=(B1/360)*2*PI
290 B2=(B2/360)*2*PI
300 A3=(B2-A2)
310 A4=(SIN(A1)*SIN(B1))+(COS(A1
)*COS(B1)*COS(A3))
320 A5=SQR(1-(A4^2))
330 A6=A5/A4
340 A7=ATN(A6)
350 IFA6<0THEN360ELSE370
360 A7=PI+A7
370 D=(60*360*A7)/(2*PI)
380 K=D*1.853
390 S=D*1.152
400 H1=(SIN(B1)-(SIN(A1)*COS(A7)
```

```
))/(SIN(A7)*COS(A1))
410 H2=SQR(1-(H1^2))
420 H3=H2/H1
430 H4=ATN(H3)
440 IF H3<0 THEN450ELSE460
450 H4=PI+H4
460 H5=H4*57.2958
470 IFSIN(A3)>=0THEN500
480 SP=H5:LP=SP+180:IFLP>360THEN
LP=LP-360
490 GOTO510
500 SP=360-H5:LP=SP+180:IFLP>360
THENLP=LP-360
510 IFX$="S"THEN1260
520 IFT>0THEN610
530 CLS:SOUND50,2:PRINT@200,"PRI
NTING...":PRINT@264,"PLEASE WAIT
"
540 PRINT#-2,CHR$(31);" THE VK5P
K BEAM HEADING & DISTANCE CHART"
;CHR$(30)
550 PRINT#-2,STRING$(80,"*"):PRI
NT#-2:PRINT#-2
560 PRINT#-2:PRINT#-2," THE GREA
T CIRCLE BEARING AND DISTANCE AR
E AS FOLLOWS:":PRINT#-2
570 PRINT#-2,TAB(7);"FROM";TAB(2
4);"TO";TAB(39);"BEARING DGS";
580 PRINT#-2,TAB(62);"DISTANCE"
590 PRINT#-2,TAB(39);"SHORT  LON
G";TAB(55);"NT.MLS.";TAB(65);"ST
.MLS.";TAB(75);"KMS"
600 PRINT#-2
610 PRINT#-2,TAB(5);A$;TAB(21);B
$;TAB(38);INT(SP);TAB(45);INT(LP
);TAB(55);INT(D);TAB(64);INT(S);
TAB(73);INT(K)
620 T=T+1
630 GOTO260
800 DATA"SALISBURY",-34.76,-138.
63
810 DATA"ALGIERS",36.75,-3.08
820 DATA"ALICE SPRINGS",-23.71,-
133.97
830 DATA"AUKLAND",-36.83,-174.72
840 DATA"BALTIMORE",39.42,76.67
850 DATA"BELFAST",54.58,5.88
860 DATA"BRISBANE",-27.50,-153.0
2
870 DATA"CANBERRA",-35.25,-149.1
6
880 DATA"CHICAGO",41.83,87.83
890 DATA"COLOGNE",50.93,-6.94
900 DATA"DETROIT",42.37,83.12
910 DATA"EINDHOVEN",51.45,-5.49
920 DATA"ESSEN",51.58,6.95
930 DATA"GDANSK",54.52,-19.25
940 DATA"GEELONG",-38.13,-144.35
950 DATA"HIROSHIMA",34.50,-132.5
8
960 DATA"HONG KONG",22.33,-114.1
7
970 DATA"INNSBRUCK",47.20,-11.33
980 DATA"IRON KNOB",-32.68,-137.
01
990 DATA"JARKARTA",-6.15,-106.82
1000 DATA"JOHANNESBURG",26.25,-2
8.07
1010 DATA"KANGAROO ISL.",-35.75,
-137.25
1020 DATA"KANSAS CITY",39.07,94.
62
1030 DATA"LAUNCESTON",-41.40,-14
7.08
1040 DATA"LENINGRAD",60.00,-30.4
2
1050 DATA"LONDON",51.51,0.08
1060 DATA"MIAMI",25.92,80.38
1070 DATA"MONTREAL",45.50,73.67
1080 DATA"MOSCOW",55.83,-37.67
1090 DATA"OSAKA",34.67,-135.65
1100 DATA"OSLO",59.90,-10.83
1110 DATA"OTTOWA",45.33,75.68
1120 DATA"PRAGUE",50.13,-14.42
1130 DATA"QUEBEC",46.83,71.52
1140 DATA"RABAUL",-4.17,-152.01
1150 DATA"ROME",41.88,-12.52
1160 DATA"ROTTERDAM",51.92,-4.52
1170 DATA"SARAJEVO",43.93,-18.77
1180 DATA"STOCKHOLM",59.35,-18.0
5
1190 DATA"SYDNEY",-33.88,-151.22
1200 DATA"VANCOUVER",49.23,122.8
3
1210 DATA"WASHINGTON",38.97,77.0
2
1220 DATA"WELLINGTON NZ.",-41.28
,-174.75
1230 DATA"WINNIPEG",49.92,97.25
1240 DATA"WOOMERA",-31.08,-136.8
3
1250 DATA"YOKOHAMA",32.42,-139.5
8
1260 IFT>0THEN1280
1270 CLS:PRINT:PRINT" THE GREAT
CIRCLE BEARING AND    DISTANCE F
ROM SALISBURY, SOUTH  AUSTRALIA,
  ARE AS FOLLOWS:":PRINT:PRINT
1280 PRINT" TO ";TAB(5);B$;TAB(2
0);"IS ";INT(SP);TAB(28);"DGS"
1290 PRINT" THE LONG PATH IS ";T
AB(23);INT(LP);TAB(28);"DGS":PRI
NT" AND DISTANCE  IS    ";INT(K);
TAB(28);"KMS":PRINT
1300 T=T+1:GOTO260
1310 DATA "END",0.0,0.0
1330 CLS3
1340 PRINT@232," 73'S & GOOD DX
";
1350 GOTO1350
```



SEA BATTLE is a naval war game, the aim being for the player to destroy all enemy shipping from his submarine. The program is controlled by the following menu options:

0 NAVIGATION	Allows the player to move in a selected direction for a selected distance.
1 SONAR	Displays hi-res map of battle area. Objects shown are: -Land.. solid green block -Players Sub.. blue submarine -Headquaters.. blue ship -Enemy.. red ships -Mines.. red mines -Sea Monsters.. green seahorses Note: Dots may hide enemy vessels or hazards.
2 TORPEDOS	Allows the player to fire torpedos in a selected direction
3 MISSILES	Allows the player to fire missiles in a selected direction for a selected distance.
4 MANOEUVERING	Allows the player to place his submarine at a selected depth.
5 STATUS	Status Report
6 HEADQUARTERS	When adjacent to HQ allows the player to pick up men and supplies.
7 SABOTAGE	Alows the player to sabotage enemy shipping
8 POWER CONVERT	Allows the player to convert power to fuel and vice versa.

When a direction is required for navigation or missiles, it is to be an integer between 1 and 8. Assuming north to be up the screen, direction are:

N=1, NE=2, E=3, SE=4, S=5, SW=6, W=7, NW=8

The remainder of the tricks of the trade I leave to you to learn the hard way, by playing the game. Have fun and "Good Shooting".

The LISTING:

```
1 '*******************************
2 '*sea battle                    *
3 '*FROM A BOOK OF BASIC         *
4 '*COMPUTER GAMES               *
5 '*MODIFIED TO USE HI-RES       *
6 '*GRAPHICS, AND ADAPTED TO     *
7 '*CO-CO 32K ECB BY I.G.CLARKE*
8 '*SALISBURY, QLD. MARCH 1984 *
9 '*******************************
10 PMODE3,1:CLS:T=RND(-TIMER)
20 PRINT@43,"sea"+CHR$(128)+"bat
tle"
30 PRINT@224,"WHAT IS YOUR NAME"
;:INPUTN$:N$="CPT. "+N$
40 DD$="####":DIMA(15,20),D(9),A
1(0,18),A2(0,18),A3(0,18),A4(0,1
8),A5(0,18),A6(0,18),A7(0,18)
50 PRINT:PRINT"SETTING UP BOARD.
..":PRINT:FORI=1TO8:SC(I)=0:NEXT
60 FORI=1TO15:FORJ=1TO20:A(I,J)=
0:NEXTJ,I
70 RESTORE:FOR JK=1TO25:READ JK$
:NEXT
80 FORX=7TO13:FORY=5TO10:READA(X
,Y):NEXTY,X:GOSUB5500
90 S1=10:S2=10:A(S1,S2)=2:S=RND(
16)+7
100 RESTORE:FOR JK=1TO9:READ JK$
:NEXT
110 FORX=1TO RND(4)*2-1
120 READ D8,D9
130 NEXTX:FORX=1TO5
140 X1=RND(15):X2=RND(20)
160 IF A(X1,X2)<>0THEN140ELSE A(
X1,X2)=3:NEXTX
190 PRINT"YOU MUST DESTROY";S;"E
NEMY SHIPS  TO WIN, ";N$;".":FA=
15/S
200 S3=RND(15):S4=RND(20)
220 IF A(S3,S4)<>0THEN200ELSE A(
S3,S4)=4
240 FORX=1TO RND(8)+7
250 X1=RND(15):X2=RND(20)
270 IF A(X1,X2)<>0THEN250ELSE A(
X1,X2)=5:NEXTX
300 FORX=1TO4
310 X1=RND(14)+1:X2=RND(19)+1
330 IF A(X1,X2)<>0THEN310ELSE A(
X1,X2)=6
350 RESTORE:FOR JK=1TO9:READ JK$
:NEXT JK
390 FORY=1TO RND(8):READ M1,M2:N
EXTY,X
430 FORI=1TO9:D(I)=0:NEXT
460 C=30:P=6000:F=2500:T=10:M=3:
D=100
470 D2=2
480 GOTO5140
490 CLS
500 IF D(1)>=0THEN530
510 PRINT"ENGINES ARE UNDER REPA
IR,":PRINTN$
520 GOSUB5280:GOTO5140
530 IFC>8THEN560
540 PRINT"NOT ENOUGH CREW TO MAN
 THE":PRINT"ENGINES, ";N$
550 GOSUB5280:GOTO5140
560 D1=1-((.23+RND(0)/10)*(-(D(=
50)))
570 GOSUB4940
```

```
580 PRINT"POWER AVAILABLE =";P:P
RINT"POWER TO USE";
590 INPUT P1
600 IF P1<0 OR P1>P THEN580
610 SC(1)=SC(1)+5:IF P1<=1000THE
N660
620 IF RND(0)<.43THEN660
630 PRINT"ATOMIC PILE GOES SUPER
CRITICAL! HQ WILL WARN ALL SUBS
TO AVOID  RADIOACTIVE AREA!"
650 GOTO5010
660 X=S1:Y=S2:Q1=1
670 FOR X2=1TO INT(INT(P1/100+.5
)*D1+.5)
680 IF X+X1>0AND X+X1<16 AND Y+Y
1>0AND Y+Y1<21THEN700
690 GOTO730
700 ON A(X+X1,Y+Y1)+1 GOTO710,72
0,950,740,790,820,840
710 X=X+X1:Y=Y+Y1:P=P-100:GOTO86
0
720 PRINT"YOU ALMOST RAN AGROUND
,":PRINTN$;"!"
730 A(X,Y)=2:A(S1,S2)=0:S1=X:S2=
Y:GOTO3610
740 IFD>50THEN710
750 PRINT"YOU RAMMED A SHIP! YOU
'RE BOTH  SUNK, ";N$;"!"
760 S=S-1
770 IFS=0THEN5080
780 GOTO5010
790 IFD>50THEN710
800 PRINT"YOU RAMMED YOUR HQ! YO
U'RE SUNK!"
810 GOTO5010
820 PRINT"YOU'VE BEEN BLOWN UP B
Y A MINE, ";N$;"!"
830 GOTO5010
840 IF RND(0)<.21THEN950
850 GOTO5010
860 FOR X3=X-2 TO X+2
870 FOR Y3=Y-2 TO Y+2
880 IF X3<1OR X3>15OR Y3<1OR Y3>
20THEN940
890 IF A(X,Y)<>6THEN940
900 IF RND(0)<.25THEN930
910 IF Q1=0THEN940
920 PRINT"YOU JUST HAD A NARROW
ESCAPE    WITH A SEA MONSTER."
930 Q1=0
940 NEXT Y3,X3
950 NEXT X2
960 PRINT"NAVIGATION COMPLETE.":
PRINT"POWER LEFT =";P
970 IFP>0THEN730
980 PRINT"ATOMIC PILE HAS GONE D
EAD!":PRINT"SUB SINKS, CREW SUFF
OCATES!"
990 GOTO5010
1000 IF D(2)>=0THEN1030
1010 PRINT"SONAR IS UNDER REPAIR
."
1020 GOSUB5280:GOTO5140
1030 IFC>5THEN1060
1040 PRINT"NOT ENOUGH CREW TO WO
RK SONAR,  ";N$;"."
1050 GOSUB5280:GOTO5140
1060 CLS:PCLS2:SCREEN1,0:POKE654
95,1:SC(2)=SC(2)+2
1070 FORX=1TO15
1080 FORY=1TO20
1090 XX=X*12-12:YY=Y*12-12
1100 IF A(X,Y)<>0THEN1140
1110 IFX<>1AND X<>15AND Y<>1AND
Y<>20THEN1180
1120 GOSUB5670
1130 GOTO1180
1140 '
1150 IFD<50AND RND(0)<.23AND A(X
,Y)<>1AND A(X,Y)<>2THEN1120
1160 IF RND(0)<.15AND A(X,Y)>2TH
EN1120
1170 ON A(X,Y) GOSUB5600,5610,56
20,5630,5650,5660
1180 NEXTY,X:P=P-50:POKE65494,0
1190 IF INKEY$=""THEN1190ELSE SC
REEN0,0
1200 CLS
1210 IFP>0THEN480
1220 GOTO980
1230 IF D(3)>=0THEN1260
1240 PRINT"TORPEDO TUBES UNDER R
EPAIR,":PRINTN$;"."
1250 GOSUB5280:GOTO5140
1260 IFC>=10THEN1290
1270 PRINT"NOT ENOUGH CREW TO FI
RE TORPEDO,";N$;"."
1280 GOSUB5280:GOTO5140
1290 IFT>0THEN1320
1300 PRINT"NO TORPEDOES LEFT, ";
N$
1310 GOSUB5280:GOTO5140
1320 SC(3)=SC(3)+10:IFD<2000THEN
1360
1330 IF RND(0)>.5THEN1360
1340 PRINT"PRESSURE IMPLODES SUB
 UPON      FIRING...YOU'RE CRUSH
ED!"
1350 GOTO5010
1360 GOSUB4940
1370 X=S1:Y=S2
1390 FOR X2=1TO INT(7+5*(-(D>50)
)-RND(0)*4+.5)
1400 IF X+X1>0AND X+X1<16AND Y+Y
1>0AND Y+Y1<21THEN1460
1410 PRINT:PRINT"TORPEDO OUT OF
SONAR RANGE.....INEFFECTIVE, ";
N$;"."
1420 T=T-1
1430 P=P-150
```

```
1440 IFP>0THEN3610
1450 GOTO980
1460 ON A(X+X1,Y+Y1)+1 GOTO1470,
1510,1670,1540,1580,1630,1650
1470 X=X+X1:Y=Y+Y1
1490 PRINT".!.";
1500 GOTO1670
1510 PRINT:PRINT"YOU DEMOLISHED
AN ISLAND,":PRINTN$;"!"
1520 A(X+X1,Y+Y1)=0
1530 GOTO1420
1540 PRINT:PRINT"YOU GOT ONE, ";
N$;"!"
1550 S=S-1:SC(8)=SC(8)+100
1560 IFS<>0THEN1520
1570 GOTO5080
1580 PRINT:PRINT"YOU BLEW UP YOU
R HQ, YOU CLOT!"
1590 S3=0
1600 S4=0
1610 D2=0
1620 GOTO1520
1630 PRINT:PRINT"SHOT WASTED ON
A MINE."
1640 GOTO1520
1650 PRINT:PRINT"A SEA MONSTER H
AD A TORPEDO FOR LUNCH, ";N$;"!"
1660 GOTO1420
1670 NEXT X2
1680 PRINT:PRINT"DUD."
1690 GOTO1420
1700 IF D(4)>=0THEN1730
1710 PRINT"MISSILE SILOS ARE UND
ER REPAIR, ";N$;"."
1720 GOSUB5280:GOTO5140
1730 IFC>23THEN1760
1740 PRINT"NOT ENOUGH CREW TO LA
UNCH A     MISSILE, ";N$;"."
1750 GOSUB5280:GOTO5140
1760 IFM<>0THEN1790
1770 PRINT"NO MISSILES LEFT, ";N
$;"."
1780 GOSUB5280:GOTO5140
1790 IFD>50 AND D<2000THEN1860
1800 PRINT"RECOMMEND THAT YOU DO
 NOT FIRE  AT THIS DEPTH...PROCE
ED (Y/N)?";
1810 A$=INKEY$:IFA$=""THEN1810
1820 IFA$="N"THEN480
1830 IFRND(0)<.5THEN1860
1840 PRINT"MISSILE EXPLODES UPON
 FIRING,   ";N$;"! YOU'RE DEAD!"
1850 GOTO5010
1860 GOSUB4940
1870 PRINT"FUEL (LBS.)";
1880 INPUT F1
1890 IF F1>0 AND F1<=F THEN1920
1900 PRINT"YOU ONLY HAVE";F;"LBS
. LEFT!"
1910 GOTO1870
1920 F2=INT(F1/75+.5)
1930 IF S1+X1*F2>0 AND S1+X1*F2<
16 AND S2+Y1*F2>0 AND S2+Y1*F2<2
1THEN1960
1940 PRINT"MISSILE OUT OF SONAR
TRACKING,  ";N$;". MISSILE LOST.
"
1950 SC(4)=SC(4)+50:M=M-1:F=F-F1
:P=P-300:GOTO1440
1960 D3=0:D4=0:D5=0:D6=0
1970 FORX=S1+X1*F2-1 TO S1+X1*F2
+1
1980 FORY=S2+Y1*F2-1 TO S2+Y1*F2
+1
1990 IFX<1 OR X>15 OR Y<1 OR Y>2
0THEN2110
2000 D3=D3-(A(X,Y)=3)
2010 D4=D4-(A(X,Y)=6)
2020 D5=D5-(A(X,Y)=5)
2030 D6=D6-(A(X,Y)=1)
2040 IF A(X,Y)<>4THEN2070
2050 PRINT"YOU'VE DESTROYED YOUR
 HQ, FOOL!"
2060 D3=0:S4=0:D2=0:GOTO2100
2070 IF A(X,Y)<>2THEN2100
2080 PRINT"YOU JUST DESTROYED YO
URSELF,    ";N$;"! YOU NONG!"
2090 GOTO5010
2100 A(X,Y)=0
2110 NEXTY
2120 NEXTX
2130 IF D6=0THEN2150
2140 PRINT"YOU BLEW UP AN ISLAND
."
2150 IF D5=0THEN2170
2160 PRINT"YOU DESTROYED";D5;"MI
NES."
2170 IF D4=0THEN2190
2180 PRINT"YOU HIT";D4;"SEA MONS
TERS,        ";N$;". GOOD WORK!
"
2190 PRINT"YOU DESTROYED";D3;"EN
EMY SHIPS!"
2200 S=S-D3:SC(8)=SC(8)+D3*100
2210 IFS=0THEN5080
2220 GOTO1950
2230 IF D(5)>=0THEN2260
2240 PRINT"BALLAST CONTROLS ARE
BEING      REPAIRED, ";N$;"."
2250 GOSUB5280:GOTO5140
2260 IFC>12THEN2290
2270 PRINT"THERE ARE NOT ENOUGH
CREW TO    WORK THE CONTROLS."
2280 GOSUB5280:GOTO5140
2290 PRINT"NEW DEPTH";
2300 INPUT D1:SC(5)=SC(5)+5
2310 IF D1>=0 AND D1<3000THEN234
0
2320 PRINT"HULL CRUSHED BY PRESS
URE!"
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```
2330 GOTO5010
2340 P=P-INT(ABS((D-D1)/2+.5))
2350 PRINT"MANOEUVRE COMPLETE.":
PRINT"POWER LOSS =";INT(ABS((D-D
1)/2+.5))
2360 D=D1
2370 GOTO3610
2380 IF D(6)>=0THEN2410
2390 PRINT"NO REPORTS ARE ABLE T
O GET      THROUGH, ";N$;"."
2400 GOSUB5280:GOTO5140
2410 IFC>3THEN2440
2420 PRINT"NO ONE LEFT TO GIVE T
HE REPORT!"
2430 GOSUB5280:GOTO5140
2440 PRINT
2450 PRINT
2460 PRINT"# OF ENEMY SHIPS LEFT
...";
2470 PRINTUSING DD$;S
2480 PRINT"# OF POWER UNITS LEFT
...";
2490 PRINTUSING DD$;P
2500 PRINT"# OF TORPEDOS LEFT...
...";
2510 PRINTUSING DD$;T
2520 PRINT"# OF MISSILES LEFT...
...";
2530 PRINTUSING DD$;M
2540 PRINT"# OF CREWMEN LEFT....
...";
2550 PRINTUSING DD$;C
2560 PRINT"LBS. OF FUEL LEFT....
...";
2570 PRINTUSING DD$;F
2580 PRINT"CURRENT DEPTH.......
...";:PRINTUSING DD$;D:PRINT
2590 PRINT"WANT A DAMAGE REPORT
(Y/N)?"
2600 A$=INKEY$:IF A$=""THEN2600
2610 IF A$="N"THEN2740
2620 CLS
2630 PRINT"    item              dam
age"
2640 PRINT
2650 DATAENGINES,SONAR,TORPEDOS,
MISSILES,MANOEUVERING
2660 DATASTATUS,HEADQUARTERS,SAB
OTAGE,CONVERTER
2670 RESTORE
2680 FORX=1TO9
2690 READ A$
2700 PRINTA$,
2710 PRINTUSING "###.####";D(X)
2720 NEXTX
2730 PRINT
2740 PRINT"YOU ARE AT LOCATION (
";S1;",";S2;")"
2750 PRINT:PRINT"WANT SCORE REPO
RT (Y/N)?";
2753 A$=INKEY$:IF A$=""THEN2753
2756 IF A$="Y"THENGOSUB6000
2760 GOSUB5280:GOTO5140
2770 IF D(7)>=0THEN2800
2780 PRINT"HQ IS DAMAGED. UNABLE
 TO HELP."
2790 GOSUB5280:GOTO5140
2800 IF D2<>0THEN2830
2810 PRINT"HQ IS DESERTED, ";N$;
"."
2820 GOSUB5280:GOTO5140
2830 IF SQR((S1-S3)^2+(S2-S4)^2)
<=2 AND D<51THEN2860
2840 PRINT"UNABLE TO COMPLY WITH
 DOCKING   ORDERS, ";N$;"."
2850 GOSUB5280:GOTO5140
2860 PRINT"DIVERS FROM HQ BRING
OUT        SUPPLIES AND MEN."
2870 SC(6)=SC(6)+10:P=4000:T=8:M
=2:F=1500:C=25:D2=D2-1:GOTO3610
2880 IF D(8)>=0THEN2910
2890 PRINT"HATCHES INACCESSIBLE.
 SABOTAGE  IMPOSSIBLE, ";N$;"."
2900 GOSUB5280:GOTO5140
2910 IFC>10THEN2940
2920 PRINT"NOT ENOUGH CREW TO GO
 ON A      MISSION, ";N$;"."
2930 GOSUB5280:GOTO5140
2940 D3=0:D4=0
2950 FORX=S1-2 TO S1+2
2960 FORY=S2-2 TO S2+2
2970 IFX<1 OR X>15 OR Y<1 OR Y>2
0THEN3000
2980 D3=D3-(A(X,Y)=3)
2990 D4=D4-(A(X,Y)=6)
3000 NEXTY
3010 NEXTX
3020 IF D3<>0THEN3050
3030 PRINT"NO SHIPS IN RANGE."
3040 GOSUB5280:GOTO5140
3050 PRINT"THERE ARE";D3;"SHIPS
IN RANGE,",N$;"."
3060 PRINT"HOW MANY MEN ARE GOIN
G";
3070 INPUT Q1
3080 IF C-Q1>=10THEN3110
3090 PRINT"YOU MUST LEAVE AT LEA
ST 10 MEN  ON BOARD, ";N$;"."
3100 GOTO3060
3110 D5=INT(D3/Q1+.5)
3120 D6=0:SC(7)=SC(7)+15
3130 FORX=S1-2 TO S1+2
3140 FORY=S2-2 TO S2+2
3150 IFX<1 OR X>15 OR Y<1 OR Y>2
0THEN3220
3160 IF D3/Q1>1-RND(0) AND RND(0
)+D3/Q1<.9THEN3220
3170 IF A(X,Y)<>3THEN3220
3180 D6=D6+1
3190 A(X,Y)=0
```

```
3200 S=S-1:SC(8)=SC(8)+100
3210 IF S=0THEN5080
3220 NEXTY
3230 NEXTX
3240 PRINTD6;"SHIPS WERE DESTROY
ED."
3250 D6=0
3260 D7=0
3270 FORX=1 TO Q1
3280 D7=D7-(RND(0)>.6)
3290 NEXTX
3300 FORX=1 TO Q1-D7
3310 D6=D6-(RND(0)<.15)
3320 NEXTX
3330 IF D4=0THEN3370
3340 PRINT"A SEA MONSTER SMELLS
THE MEN ON THE WAY BACK!"
3350 PRINT D7;"MEN WERE EATEN!"
3360 C=C-D7
3370 PRINT D6;"MEN WERE LOST THR
OUGH":PRINT"ACCIDENTS, ";N$;"."
3380 C=C-D6
3390 P=P-INT(10*Q1+RND(0)*10)
3400 GOTO3610
3410 IF D(9)>=0THEN3440
3420 PRINT"POWER CONVERTER IS DA
MAGED."
3430 GOSUB5280:GOTO5140
3440 IFC>5THEN3470
3450 PRINT"NOT ENOUGH MEN TO WOR
K THE      CONVERTER, ";N$;"."
3460 GOSUB5280:GOTO5140
3470 PRINT"OPTION? (1=FUEL TO PO
                    2=POWER TO F
WER,
UEL)"
3480 O$=INKEY$:IF O$=""THEN3480
ELSE O=VAL(O$)
3490 ON O GOTO3510,3550
3500 GOTO3470
3510 PRINT"FUEL AVAILABLE =";F;C
HR$(8);".":PRINT"CONVERT";
3520 INPUT C1
3530 IF C1>F OR C1<0 THEN3510
3540 F=F-C1:P=P+INT(C1/3):GOTO35
90
3550 PRINT"POWER AVAILABLE =";P-
1;CHR$(8);".":PRINT"CONVERT";
3560 INPUT C1
3570 IF C1>P OR C1<0 THEN3550
3580 P=P-C1:F=F+INT(C1*3)
3590 PRINT"CONVERSION COMPLETE."
:PRINT"POWER =";P;CHR$(8);". FUE
L =";F;CHR$(8);"."
3600 GOTO3610
3610 Q=0
3620 FORX=S1-4 TO S1+4
3630 FORY=S2-4 TO S2+4
3640 IFX<1 OR X>15 OR Y<1 OR Y>2
0THEN3670
3650 IF A(X,Y)<>3THEN3670
3660 Q=Q+(RND(0)/SQR((S1-X)^2+(S
2-Y)^2))
3670 NEXTY
3680 NEXTX
3690 IFQ THEN3720
3700 PRINT"NO SHIPS IN RANGE TO
DEPTH      CHARGE YOU, ";N$;"."
3710 GOTO4130
3720 PRINT"DEPTH CHARGES OFF ";
3730 IF RND(0)>.5THEN3760
3740 PRINT"PORT SIDE."
3750 GOTO3770
3760 PRINT"STARBOARD SIDE";
3770 IF Q>.13 OR RND(0)>.92THEN3
800
3780 PRINT"NO REAL DAMAGE SUSTAI
NED."
3790 GOTO4130
3800 IF Q>.36 OR RND(0)>.96THEN3
850
3810 PRINT"LIGHT, SUPERFICIAL DA
MAGE."
3820 P=P-50
3830 D(RND(9))=-RND(0)*2
3840 GOTO4130
3850 IFQ>.6 OR RND(0)>.975THEN39
30
3860 PRINT"MODERATE DAMAGE. REPA
IRS NEEDED."
3870 P=P-75+RND(29)
3880 FORY=1TO2
3890 X=RND(9)
3900 D(X)=D(X)-RND(0)*8
3910 NEXTY
3920 GOTO4130
3930 IFQ>.9 OR RND(0)>.983THEN40
10
3940 PRINT"HEAVY DAMAGE! REPAIRS
 IMMEDIATE!"
3950 P=P-(200+INT(RND(0)*76))
3960 FORX=1 TO 4+INT(RND(0)*2)
3970 Y=RND(9)
3980 D(Y)=D(Y)-RND(0)*11
3990 NEXTX
4000 GOTO4130
4010 PRINT"DAMAGE CRITICAL! WE N
EED HELP!"
4020 A$="VRAVUKXCNVPCRMFDRSAXQUR
LQTRHXYACVFZYITLCBSSYYKDQIPCAEGQ
GPCNOTSIO"
4030 X=RND(61)
4040 PRINT"SEND 'HELP' IN CODE.
HERE IS    THE CODE:";MID$(A$,X,
4);:FOR I=1TO1500:NEXTI
4050 PRINTSTRING$(4,8);STRING$(4
,128)
4060 INPUT"ENTER CODE";B$
4070 PRINT
4080 IF B$<>MID$(A$,X,4)THEN4110
4090 PRINT"FAST WORK, ";N$;"!":P
```

```
RINT"HELP ARRIVES IN TIME TO SAV
E YOU"
4100 GOTO3950
4110 PRINT"MESSAGE GARBLED...NO
HELP SENT!"
4120 GOTO5010
4130 IF D(1)>=0 OR D(3)>=0 OR D(
4)>=0 OR D(5)>=0 OR D(7)>=0THEN4
170
4140 IF D(8)>=0 OR D(9)>=0THEN41
70
4150 PRINT"DAMAGE TOO MUCH, ";N$
;"!":PRINT"YOU'RE SUNK!!"
4160 GOTO5010
4170 PRINT@480,"PRESS ANY KEY TO
 CONTINUE";
4180 IF INKEY$=""THEN4180
4190 CLS
4200 POKE65495,1:PRINT"results o
f last enemy action"
4210 FORX=1TO15
4220 FORY=1TO20
4230 IF A(X,Y)<>3THEN4600
4240 W=D8
4250 V=D9
4260 IF X+W>0 AND X+W<16 AND Y+V
>0 AND Y+V<21THEN4340
4270 FOR X0=19 TO 1 STEP-1
4280 IF A(X-W*X0*14/19,Y-V*X0)<>
0THEN4320
4290 A(X-W*X0*14/19,Y-V*X0)=3
4300 A(X,Y)=0
4310 GOTO4870
4320 NEXT X0
4330 GOSUB5280:GOTO5140
4340 ON A(X+W,Y+V)+1 GOTO4350,43
80,4450,4380,4480,4510,4560
4350 A(X+W,Y+V)=3
4360 A(X,Y)=0
4370 GOTO4870
4380 RESTORE
4390 FOR JK=1TO9
4400 READ JK$
4410 NEXT JK
4420 FOR X0=1 TO RND(8):READW,V:
NEXT X0
4430 IF X+W<1 OR X+W>15 OR Y+V<1
 OR Y+V>20THEN4380
4440 GOTO4340
4450 IFD>50THEN4380
4460 PRINT"YOU'VE BEEN RAMMED BY
 A SHIP,    ";N$;"!"
4470 GOTO5010
4480 IF RND(0)<.15THEN4380
4490 PRINT"YOUR HQ WAS RAMMED!"
4500 S3=0:S4=0:D2=0:A(X+W,Y+V)=0
:GOTO4530
4510 IF RND(0)<.7THEN4380
4520 PRINT"SHIP IS DESTROYED BY
A MINE!"
4530 S=S-1:A(X+W,Y+V)=0
4540 IFS<>0THEN4360
4550 GOTO5080
4560 IF RND(0)<.8THEN4380
4570 PRINT"SHIP EATEN BY A SEA M
ONSTER!"
4580 S=S-1
4590 GOTO4540
4600 IF A(X,Y)<>6THEN4870
4610 IF X+M1<1 OR X+M1>15 OR Y+M
2<1 OR Y+M2>20THEN4660
4620 ON A(X+M1,Y+M2)+1 GOTO4630,
4660,4710,4730,4780,4630,4800
4630 A(X+M1,Y+M2)=6
4640 A(X,Y)=0
4650 GOTO4870
4660 RESTORE
4670 FOR JK=1TO9:READ JK$:NEXT J
K
4680 FOR X0=1 TO RND(8):READ M1,
M2:NEXT X0
4690 IF X+M1<1 OR X+M1>15 OR Y+M
2<1 OR Y+M2>20THEN4660
4700 GOTO4620
4710 PRINT"YOU'VE BEEN EATEN BY
A SEA      MONSTER, ";N$;"!"
4720 GOTO5010
4730 IF RND(0)>.2THEN4660
4740 PRINT"SHIP EATEN BY A SEA M
ONSTER!"
4750 S=S-1
4760 IFS<>0THEN4630
4770 GOTO5080
4780 PRINT"A SEA MONSTER ATE YOU
R HQ!"
4790 S3=0:S4=0:D2=0:GOTO4630
4800 IF RND(0)<.75THEN4660
4810 PRINT"SEA MONSTER FIGHT! ";
4820 IF RND(0)<.8THEN4850
4830 PRINT"AND ONE DIES!"
4840 GOTO4630
4850 PRINT"IT'S A TIE!"
4860 GOTO4660
4870 NEXTY
4880 NEXTX
4890 FORY=1TO9
4900 X=RND(9)
4910 D(X)=D(X)+(INT(RND(0)+.5)*(
2+INT(RND(0)+.5)))*(1+(-(D(51)OR
-(D>2000)))*(-(D(X)<3))
4920 NEXTY:POKE65494,0
4930 GOSUB5280:GOTO5140
4940 DATA-1,0,-1,1,0,1,1,1,1,0,1
,-1,0,-1,-1,-1
4950 PRINT"COURSE (1-8)";
4960 O$=INKEY$:IF O$=""THEN4960E
LSE C1=VAL(O$)
4970 IF C1<1 OR C1>8THEN4950
4980 RESTORE
4990 FOR JK=1TO9:READ JK$:NEXT J
```

```
K
5000 FOR X9=1 TO INT(C1+.5):READ
 X1,Y1:NEXT X9:PRINT:RETURN
5010 POKE65494,0:PRINT"THERE ARE
 STILL";S;"ENEMY SHIPS   LEFT, "
;N$;"."
5020 PRINT"YOU WILL BE DEMOTED T
O THE RANK OF DECK SCRUBBER!"
5030 PRINT:GOSUB5280:GOSUB6000:P
RINT:PRINT"WANT ANOTHER GAME (Y/
N)?";
5040 A$=INKEY$:IF A$=""THEN5040
5050 IF A$<>"Y"THEN5070
5060 CLS:GOTO50
5070 END
5080 POKE65494,0:PRINT"GOOD WORK
, ";N$;"!":PRINT"YOU GOT THEM AL
L!"
5090 GOTO5030
5100 DATA0,1,1,1,0,0,0,1,1,1,1,0
,1,1,1,0,1,1,1,1,0,0,0,1
5110 DATA1,1,0,0,1,1,0,1,1,0,1,0
,0,0,1,0,0,0
5120 END
5130 CLS:PRINT@206,"YOU LOSE"
5140 CLS:PRINT"commands"
5150 PRINT"#0: NAVIGATION"
5160 PRINT"#1: SONAR"
5170 PRINT"#2: TORPEDO CONTROL"
5180 PRINT"#3: POLARIS MISSILE C
ONTROL"
5190 PRINT"#4: MANOEUVERING"
5200 PRINT"#5: STATUS/DAMAGE REP
ORT"
5210 PRINT"#6: HEADQUARTERS"
5220 PRINT"#7: SABOTAGE"
5230 PRINT"#8: POWER CONVERSION"
:PRINT
5240 PRINT"ORDERS, ";N$;"?"
5250 O$=INKEY$:IFO$=""THEN5250
5260 O=VAL(O$):IF O=0 AND O$<>"0
"THEN5250
5270 ON O+1 GOTO500,1000,1230,17
00,2230,2380,2770,2880,3410
5280 PRINT@480,"PRESS ANY KEY TO
 CONTINUE";
5290 IF INKEY$=""THEN5290ELSERET
URN
5500 PMODE3,1:PCLS2
5510 FORX=0TO11:FORY=0TO11:PSET(
X,Y,1):NEXTY,X:GET(0,0)-(11,11),
A1,G
5530 PSET(20,4,3):PSET(20,5,3):F
ORX=12TO22:FORY=6TO7:PSET(X,Y,3)
:NEXTY,X:GET(12,0)-(23,11),A2,G
5540 FORS=1TO2:SS=12+S*12:C=S+2:
PSET(SS+4,4,C):PSET(SS+2,5,C):PS
ET(SS+4,5,C):PSET(SS+8,5,C):FORX
=SS TO SS+11:FORY=6TO7:PSET(X,Y,
C):NEXTY,X,S:GET(24,0)-(35,11),A
3,G:GET(36,0)-(47,11),A4,G:S=C=0
5550 FORX=52TO55:FORY=4TO7:PSET(
X,Y,4):NEXTY,X:PSET(48,2,4):PSET
(50,3,4):PSET(58,2,4):PSET(56,3,
4):PSET(50,8,4):PSET(48,9,4):PSE
T(56,8,4):PSET(58,9,4):GET(48,0)
-(59,11),A5,G
5560 FORX=64TO67:FORY=4TO7:PSET(
X,Y,1):NEXTY,X:PSET(68,1,1):PSET
(70,1,1):PSET(66,2,1):PSET(66,3,
1):PSET(68,2,1):PSET(70,2,1):PSE
T(70,3,1):PSET(60,7,1):PSET(60,8
,1):PSET(62,8,1):PSET(64,8,1):GE
T(60,0)-(71,11),A6,G
5570 PSET(76,5,1):PSET(78,5,1):P
SET(76,6,1):PSET(78,6,1):GET(72,
0)-(83,11),A7,G:X=Y=0:PCLS2:SCRE
EN0,0:RETURN
5600 PUT(YY,XX)-(YY+11,XX+11),A1
,PSET:RETURN
5610 PUT(YY,XX)-(YY+11,XX+11),A2
,PSET:RETURN
5620 PUT(YY,XX)-(YY+11,XX+11),A4
,PSET:RETURN
5630 PUT(YY,XX)-(YY+11,XX+11),A3
,PSET:RETURN
5650 PUT(YY,XX)-(YY+11,XX+11),A5
,PSET:RETURN
5660 PUT(YY,XX)-(YY+11,XX+11),A6
,PSET:RETURN
5670 PUT(YY,XX)-(YY+11,XX+11),A7
,PSET:RETURN
6000 CLS:PRINT@12,"scores"
6010 SX(9)=0:SX(0)=0:FORI=1TO7:S
X(I)=-SC(I)*FA:SX(9)=SX(9)+SX(I)
:NEXT
6020 SX(8)=SC(8)*FA:SX(0)=SX(8)+
SX(9)
6030 PRINTUSING"SHIPS SUNK
##        ####.#";SC(8)/100,SX(8)
:PRINT
6040 PRINTUSING"LESS: NAVIGATION
 ####.#";SX(1)
6050 PRINT@134,USING"SONAR
####.#";SX(2)
6060 PRINT@166,USING"TORPEDOES
####.#";SX(3)
6070 PRINT@198,USING"MISSILES
####.#";SX(4)
6080 PRINT@230,USING"DIVING
####.#";SX(5)
6090 PRINT@262,USING"H/QUARTERS
####.#";SX(6)
6100 PRINT@294,USING"SABOTAGE
####.# ######.#";SX(7),SX(9)
6110 PRINT@344,"--------"
6120 PRINTUSING"TOTAL POINTS
        ######.#";SX(0)
6130 PRINT@408,"========"
6140 RETURN
```

16K ECB

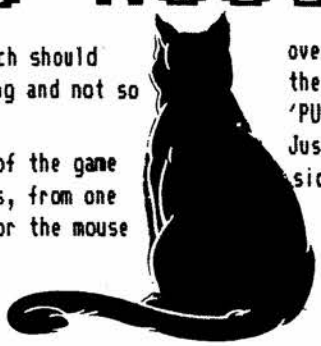
CAT AND MOUSE

By STEVE YOUNGBERRY

Steve has once again given us a game which should appeal to all our game players, both young and not so young.

It's a short program where the object of the game is to get the mouse, using the arrow keys, from one hole to the other, which unfortunately for the mouse is situated way over across the other side of the room and there smack in the middle of the room, waiting with salivating fangs, is 'PUSS'.

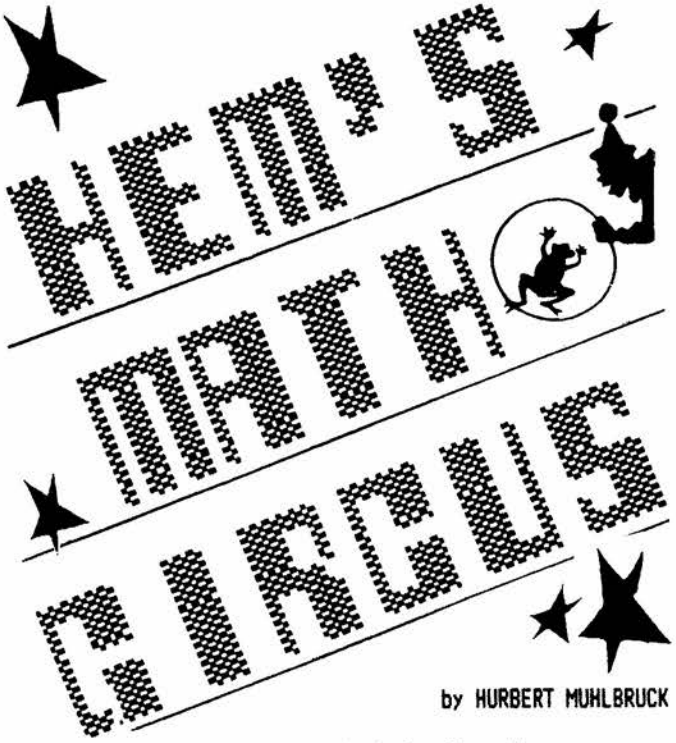
Just a hint, if you find 'PUSS' is a little on the fast side alter lines 310-340.



The LISTING:

```
  2 GOTO10
  3 SAVE"CAT&MICE:2"
  10 CLS5:PRINT@42,"CAT'N'MOUSE";
  20 PRINT@98,"OBJECT OF THE GAME
  IS TO GET";
  30 PRINT@163,"YOU (THE MOUSE) FR
  OM LOWER";
  40 PRINT@225,"LEFT CORNER TO THE
   UPPER RIGHT";
  50 PRINT@291,"CORNER WITHOUT BEI
  NG CAUGHT";
  60 PRINT@357,"PRESS ANY KEY TO S
  TART";
  70 PRINT@421,"THEN MOVE WITH ARR
  OWS";
  80 PRINT@500,"WHY/BUILT";
  90 IF INKEY$=""THEN90
  91 DATA 100,115,117,108,111,131,
  105,114,114,111,132,132,132,131,
  107,100,131,107,100,131,107,100,
  131,37,60,40
  94 CLS:FOR C=&H5DF TO &H400 STEP
  -&H20:FOR A=6 TO 27:READ B:POKE
  C+A,B-35:NEXT:RESTORE:NEXT
  97 FOR A=&H400 TO &H5FF:POKEA,12
  8:NEXT:POKE&H50D,66:POKE&H50E,89
  :POKE&H50F,69:SOUND100,5:POKE&H9
  2-33,0:EXEC&H9FEC+59
  100 POKE65494,0:POKE25801,0:POKE
  25802,0
  110 DIMRR(5,5),CC(5,5),AA(5,5)
  120 RH=4:RV=181:CH=RND(235)+12:C
  V=RND(163)+20
  130 RR$="BR2G3D3R6U3H3"
  140 CC$="BR3D3NL3NR3D3"
  150 PMODE4,1:PCLS:SCREEN1,1
  160 GET(1,1)-(6,6),AA
  170 DRAW"BM1,1"+RR$:PAINT(3,3),1
  ,1:GET(1,1)-(6,6),RR,G:PCLS
  180 DRAW"BM1,1"+CC$:GET(1,1)-(7,
  7),CC,G:PCLS
  190 LINE(2,5)-(253,189),PSET,B
  200 LINE(220,0)-(220,5),PSET:LIN
  E-(230,5),PRESET:LINE-(230,0),PS
  ET:LINE(2,179)-(12,179),PSET
  210 PUT(RH,RV)-(RH+6,RV+6),RR,PS
  ET
  220 PUT(CH,CV)-(CH+6,CV+6),CC,PS
  ET
  230 A$=INKEY$:PLAY"T20003CDE":IF
  A$=""THEN230
  240 A$=INKEY$
  250 PUT(RH,RV)-(RH+6,RV+6),AA,PS
  ET
  260 IFA$=CHR$(94)THEN RV=RV-4:IF
   RV<8AND RH>215AND RH<225THEN390
  ELSEIF RV<8THEN RV=8
  270 IFA$=CHR$(10)THENRV=RV+4:IFR
  V>182THENRV=182
  280 IFA$=CHR$(9)THENRH=RH+4:IFRH
  >246THENRH=246
  290 IFA$=CHR$(8)THENRH=RH-4:IFRH
  <6THENRH=6
  300 PUT(RH,RV)-(RH+6,RV+6),RR,PS
  ET
  310 PUT(CH,CV)-(CH+6,CV+6),CC,PS
  ET
  320 IF CH<RH THEN CH=CH+3
  330 IF CH>RH THEN CH=CH-3
  340 IF CV<RV THEN CV=CV+3
  350 IF CV>RV THEN CV=CV-3
  360 PUT(CH,CV)-(CH+6,CV+6),CC,PS
  ET
  370 IF CH<RH+6 AND CH+6>RH AND C
  V<RV+6AND CV+6>RV THEN470
  380 GOTO240
  390 S2=PEEK(25802):S2=S2+1:POKE2
  5802,S2
  400 CLS5
  410 PRINT@266,"YOU GOT AWAY!";
  420 PRINT@332,"MICE"PEEK(25802);
  430 PRINT@396,"CATS"PEEK(25801);
  440 PRINT@455,"ANOTHER GAME (Y/N
  )";
  450 A$=INKEY$:IFA$="Y"THENCLEAR:
  GOTO110
  460 IFA$="N"THENCLS:ENDELSE450
  470 S1=PEEK(25801):S1=S1+1:POKE2
  5801,S1
  480 CLS5
  490 PRINT@203,"GOT CHAR!";
  500 PRINT@263,"BURP!!!! GOOD, TO
  O";
  510 GOTO420
```

```
2000 PMODE4,1:PCLS:SCREEN1,1
2010 AD$="BU4BRD4LURFR2EU3HL3GBD
4BR5"
2020 AP$="EU2UNHNUER2FDGL2HBD3BR
4"
2030 BA$="RU2ERFDNFGLHBDBR4"
2040 BB$="RE2U3HGD4RFREUNLRBD2"
2050 BC$="RU2ERFBD2L2HBDBR3"
2060 BD$="RU2ERFDGLHBR3U4HGDFBDB
FF"
2070 BE$="RE2HGF2R"
2080 BG$="ENFUERFDGLHBR3D3GHE3BD
"
2090 BI$="REU2BUNEBD3DRBR"
2100 BN$="RENDUNUEFD2R"
2110 BR$="REU2FRD2R"
2120 BS$="REU2F2GNHR2"
2130 BT$="REU3NL2NR2NUBD3FR"
2140 SS$="BR5" 'SPACE
2150 KA$="U5ER2FD3NL4D2BR3"
2160 KB$="U6R3FDGNL3FDGNL3BR5"
2170 KD$="U6R3FD4GNL3BR4"
2180 KE$="NR4U3NR3U3R4BD6BR3"
2190 KG$="BRHU4ER2FBD3NLDGNL2BR4
"
2200 KH$="U3NU3R4NU3D3BR3"
2210 KI$="NU6BR3"
2220 KK$="U3NU3R2E2UBD3BL2F2DBR3
"
2230 KM$="U6F3E3D6BR3"
2240 KN$="U5NUF4NU5DBR3"
2250 KO$="BRNR2HU4ER2FD4GBR4"
2260 KP$="U6R3FDGNL3BF3BR"
2270 KR$="U6R3FDGL2NLF3BR3"
2280 KS$="BU1FR3EU1HL3HU1ER3FBD5
BR3"
2290 KT$="BR2U6NL2R2BD6BR3"
2300 KV$="BR2H2U4BR4D4G2BR5"
2310 KX$="UE2H2UBR4DG2F2DBR3"
2320 K3$="BU6R3FDGNL2FDGNL3BR4"
2330 K5$="R3EU2HL3U2R4BD6BR3"
2340 GOTO2350
2350 DRAW"S12BM20,30"+KP$+KE$+KT
$+KE$+KR$+SS$
2360 DRAW SS$+KK$+KN$+KO$+KX$
2370 DRAW"BM20,60"+KV$+KK$+K5$+K
P$+KK$
2380 DRAW+SS$+KG$+K3$+KA$+KT$+KR
$
2390 DRAW"S8BM90,90"+AP$+BR$+BE$
+BS$+BE$+BN$+BT$+BS$
2400 DRAW"S8BM40,120"+KB$+KE$+KA
$+KM$+SS$+KH$+KE$+KA$+KD$+KI$+KN
$+KG$+KS$
2410 DRAW"S8BM110,140"+BA$+BN$+B
D$
2420 DRAW"S12BM70,170"+AD$+BI$+B
S$+BT$+BA$+BN$+BC$+BE$+BS$
2430 FORA=1TO1000:NEXTA
2440 PCLS:SCREEN0,0:RETURN
```



by HURBERT MUHLBRUCK

We have Hubert Muhlbock to thank for these two programs. The first is MATH+HEM, a program to calculate volume and area.
The second program is called HEMSALGB and is an algerba-graphic-plotter. He Keeps them coming and we hope he never stops.
Thanks Hub.

16K ECB

LISTING 1:

```
1 '******MATH+HEM***************
*  **********HUBERT MUHLBUCK****
*
2 GOTO10
3 SAVE"MATH+HEM:2"
10 CLS:POKE 359,57:SCREEN 0,1
20 FOR L=1024 TO 1535:POKE L,150
:NEXT L
30 PRINT"          WELCOME TO HEM'
S"
40 PRINT"          MATHEMATIC CIRC
US"
50 DATA 239,143,143,239,143,143,
207,143,143,159
60 DATA 239,143,143,239,143,143,
207,143,143,159
70 DATA239,239,239,239,143,143,2
07,143,143,159
80 DATA 239,143,143,239,143,143,
207,143,143,143
90 DATA 239,143,143,239,143,143,
207,143,143,159
100 FOR L=1 TO 50:READ D:NEXT L
110 FOR Y=3 TO 12
120 FOR X=12 TO 18
130 READ C
140 PRINT @32*Y+X,CHR$(C);
150 NEXT X:NEXT Y
```

```
160 GOTO 270
170 DATA 208,211,215,211,219,211
,208
180 DATA 225,223,158,223,157,223
,226
190 DATA 208,220,223,223,223,220
,208
200 DATA 179,179,179,191,179,179
,179
210 DATA 191,176,191,191,191,176
,191
220 DATA 191,176,239,239,239,176
,191
230 DATA 142,128,255,252,255,128
,141
240 DATA 240,240,255,240,255,240
,240
250 DATA 240,240,255,240,255,240
,240
260 DATA 128,131,139,128,135,131
,128
270 FOR T=1 TO 16
280 READ F,D
290 PRINT @ 5*32+15,"-";
300 SOUND F,D
310 PRINT @ 5*32+15,"O";:NEXT T
320 DATA 176,2,193,2,204,2,218,2
,218,1,218,1,218,1,218,1,204,2,2
04,2,204,1,204,1,193,2,204,2,193
,2,176,5
330 FOR Y=1 TO 1500:NEXT Y
340 FOR L=1024 TO 1535:POKE L,24
6:NEXT L
350 CLS
360 DATA 100,115,117,108,111,131
,105,114,114,111,132,132,132,131
,107,100,131,107,100,131,107,100
,131,37,60,40
370 CLS:FOR C=&H5DF TO &H400 STE
P-&H20:FOR A=6 TO 27:READ B:POKE
 C+A,B-35:NEXT:RESTORE:NEXT
380 FOR A=&H400 TO &H5FF:POKEA,1
28:NEXT:POKE&H50D,66:POKE&H50E,8
9:POKE&H50F,69:SOUND100,5:POKE&H
92-33,0:EXEC&H9FEC+59
390 PRINT"  M  E  N  U"
400 PRINT
410 PRINT"1.CALCULATE THE VOLUME
 OF          A BARREL."
420 PRINT"2.CALC.THE AREA OF A I
RREGULAR    TRIANGLE WHEN THE LE
NGTHS OF    THE THREE SIDES ARE
GIVEN."
430 PRINT"3.CALC.THE ARC AND THE
 CHORD OF   A CIRCLE-SECTOR."
440 PRINT"4.CALC.THE VOLUME AND
SURFACE-    AREA OF A SPHERE."
450 PRINT"5.CALC.THE SURFACE ARE
A OF A      REGULAR OCTAHEDRON."
460 PRINT:PRINT "  SELECT(1-5)"
470 K$=INKEY$:IF K$=""GOTO 470
480 SEL=ASC(K$)-48
490 CLS
500 ON SEL GOTO 520,640,760,890,
1010
510 GOTO 350
520 'VOLUME OF A BARREL
530 CLS
540 PI=3.141592654
550 INPUT"LARGER DIAM.D1=";D1
560 INPUT"D2=";D2
570 INPUT"HEIGHT H=";H
580 V=H*PI*(2*D1*D1+D2*D2)/12
590 PRINT"THE VOLUME OF THE BARR
EL V=";V
600 PRINT:PRINT
610 PRINT "ANOTHER CALC.(Y,N)?"
620 X$=INKEY$:IF X$=""GOTO 620
630 IF X$="Y"THEN RUN 400-ELSE G
OTO 1100
640 ' AREA OF A IRREGULAR TRIANG
LE
650 CLS
660 INPUT"SIDE A=";A
670 INPUT"SIDE B=";B
680 INPUT"SIDE C=";C
690 S=(A+B+C)/2
700 F=SQR(S*(S-A)*(S-B)*(S-C))
710 PRINT"THE AREA OF THE TRIANG
LE=";F
720 PRINT:PRINT
730 PRINT"ANOTHER CALC.(Y,N)?"
740 X$=INKEY$:IF X$=""GOTO 740
750 IF X$="Y"THEN RUN 400-ELSE G
OTO 1100
760 'ARC AND CHORD OF A CIRCLE S
ECTOR
770 CLS
780 PI=3.141592654
790 INPUT"RADIUS=";R
800 INPUT"ANGLE=";Y
810 A=2*R*SIN(PI*Y/360)
820 L=PI*R*Y/180
830 PRINT"LENGTH OF ARC=";L
840 PRINT"LENGTH OF CHORD=";A
850 PRINT:PRINT
860 PRINT"ANOTHER CALC.(Y,N)?"
870 X$=INKEY$:IF X$=""GOTO 870
880 IF X$="Y"THEN RUN 400-ELSE G
OTO 1100
890 'THE VOLUME AND SURFACE-AREA
 OF A SPHERE
900 CLS
910 PI=3.141592654
920 INPUT"DIAMETER D=";D
930 SA=PI*D*D
940 V=D^3*PI/6
950 PRINT"VOLUME V=";V
960 PRINT"SURFACE-AREA SA=";SA
970 PRINT:PRINT
```

```
980 PRINT"ANOTHER CAL.(Y,N)?"
990 X$=INKEY$:IF X$=""GOTO 990
1000 IF X$="Y"THEN RUN 400-ELSE
GOTO 1100
1010 'THE SURFACE AREA OF A OCTA
HEDRON
1020 CLS
1030 INPUT"THE LENGTH OF THE RID
GES =";A
1040 S=2*SQR(3)*A*A
1050 PRINT"THE SURFACE AREA IS";
S
1060 PRINT:PRINT
1070 PRINT"ANOTHER CALC.(Y,N)?"
1080 X$=INKEY$:IF X$=""GOTO 1080
1090 IF X$="Y"THEN RUN 400-
1100 CLS 0
1110 DATA 239,143,143,239,143,14
3,207,143,143,159
1120 DATA 239,143,143,239,143,14
3,207,143,143,159
1130 DATA239,239,239,239,143,143
,207,143,143,159
1140 DATA 239,143,143,239,143,14
3,207,143,143,143
1150 DATA 239,143,143,239,143,14
3,207,143,143,159
1160 FOR L=1 TO 50:READ D:NEXT L
1170 FOR Y=3 TO 12
1180 FOR X=12 TO 18
1190 READ C
1200 PRINT @32*Y+X,CHR$(C);
1210 NEXT X:NEXT Y
1220 GOTO 1330
1230 DATA 208,211,215,211,219,21
1,208
1240 DATA 225,223,158,223,157,22
3,226
1250 DATA 208,220,223,223,223,22
0,208
1260 DATA 179,179,179,191,179,17
9,179
1270 DATA 191,176,191,191,191,17
6,191
1280 DATA 191,176,239,239,239,17
6,191
1290 DATA 142,128,255,252,255,12
8,141
1300 DATA 240,240,255,240,255,24
0,240
1310 DATA 240,240,255,240,255,24
0,240
1320 DATA 128,131,139,128,135,13
1,128
1330 FOR T=1 TO 16
1340 READ F,D
1350 PRINT @ 5*32+15,"-";
1360 SOUND F,D
1370 PRINT @ 5*32+15,"O";
1380 NEXT T
1390 DATA 176,2,193,2,204,2,218,
2,218,1,218,1,218,1,218,1,204,2,
204,2,204,1,204,1,193,2,204,2,19
3,2,176,5
1400 FOR L=1024 TO 1535:POKE L,1
66:NEXT L
1410 PRINT"THANK YOU"
1420 PRINT:PRINT"AND HAVE A NICE
 DAY"
1430 PRINT:PRINT:PRINT:PRINT
1440 PRINT"THESE MATH.FORMULAS H
AVE BEEN   COLLECTED AND ARRANGE
D"
1450 PRINT"BY HUBERT MUHLBOCK"
1460 PRINT"PUNCHBOWL,NSW"
1470 FOR Y=1 TO 4000:NEXT Y
1480 FOR L=1024 TO 1535:POKE L,1
48:NEXT L
```

LISTING 2:

```
2 GOTO10
3 SAVE"HEMSALGB:2"
10 CLS 8
20 FOR L=1024 TO 1535:POKE L,150
:NEXT L
30 PRINT"         WELCOME TO HEM'
S"
40 PRINT"    ALGEBRA-GRAPHIC-PLO
TTER"
50 DATA 239,143,143,239,143,143,
207,143,143,159
60 DATA 239,143,143,239,143,143,
207,143,143,159
70 DATA239,239,239,239,143,143,2
07,143,143,159
80 DATA 239,143,143,239,143,143,
207,143,143,143
90 DATA 239,143,143,239,143,143,
207,143,143,159
100 FOR L=1 TO 50:READ D:NEXT L
110 FOR Y=3 TO 12
120 FOR X=12 TO 18
130 READ C
140 PRINT @32*Y+X,CHR$(C);
150 NEXT X:NEXT Y
160 GOTO 270
170 DATA 208,211,215,211,219,211
,208
180 DATA 225,223,158,223,157,223
,226
190 DATA 208,220,223,223,223,220
,208
200 DATA 179,179,179,191,179,179
,179
210 DATA 191,176,191,191,191,176
,191
220 DATA 191,176,239,239,239,176
,191
```

COCO LINK 075 - 326370

(CoCoLink is a 'Bulletin Board System'. To access it, you need a modem and a CoCo, MC 10 or Tandy 100 computer, along with an appropriate terminal program. Using these tools, your computer is able to 'talk' to our computer, (which by the way, is a 64K grey case CoCo).

The fun of it is that we are only now exploring the potential of this new communications medium; there is much to learn, and much to gain. If you bought your computer to learn, then this is for you.)

The second version of the CoCoLink program got going during a recent power strike and for a while had me wondering why I had started!

But thanks to Kevin's tireless work, the program was pulled into line in record time and the hang ups started to become infrequent. (We still get some hang ups - usually caused by - yes, you guessed it - people hanging up! - PLEASE log off correctly!)

The new program features a multiple command structure based on menu choices.

In the following listing, the 10 headings show as the first menu. When you select a heading, you are taken to the sub menu and hence to the information you need.

Notice that visitors only access items 1 & 2. (Item 10 will be moved in with heading 2.)

The modules yet to be activated are the various download modules. We have been experiencing continuing problems with them and have suspended their use until we understand what is going on.

We recently placed on line what we hope will be the nucleus of a very useful help service for Users of CoCo, Tandy 100's and Tandy 1000's. Info for the MC10 will follow when people with mc10's start to use CoCoLink.

Contributions to these sections are sought!!

We have already built some help files on the basic commands of CoCo. We're a goodly way through the initial listing. When we complete it, we will then go back and expand on each entry.

People ask about the value of a home computer. In fact I ask myself constantly, why would someone who doesn't want the computer as a hobby, for business or perhaps even for education, want a computer? I really feel the answer may lie in these interactive information getting systems. There is so much becoming available from Bulletin Boards, that they will be regarded as essential for those needing access to reference material. In the old days, you used an encyclopedia, today you access a bulletin board.

Now a special note to MC10 users. You folk (rightly) have, in the past, been quite vocal when you thought that info for you would be dropped from the magazine. You've complained that there are no supplementary software suppliers, and we've found you some; you've complained that Tandy have left you up the creek without a paddle, and folk like Reg Lang and the Rothwells have given you new directions.

Now you have a section on the Bulletin Board - use it - because if it is not used, we can readily use the space for something else!!

COCOLINK REMOTE BULLETIN BOARD SYSTEM

Ph. Board (075) 32-6370 24hrs
Sysop (075) 51-0015 9am-5pm

FILE STRUCTURE:

COCOLINK MENU

0 Exit or Logoff

1 User group news (Visitor access)

USER GROUP NEWS BOARD

0 Exit to menu
1 Read messages
2 Place messages

2 Rainbow info

RAINBOW INFO MENU

0 Exit

1 General announcements (Visitor access

RAINBOW INFORMATION

0 Exit to menu
1 Read messages
2 Mail messages

2 Items for sale (Visitor access)

FOR SALE BOARD

0 Exit to menu
1 Read messages
2 Place messages

3 Enquiries (Visitor access)

ENQUIRIES TO RAINBOW MENU

0 Exit to menu
1 Send question

4 Special interest

SPECIAL BULL BOARD

0 Exit to menu
1 Read messages
2 Place messages

5 List users (Visitor access)

USER NAME	MAIL BOX
KEVIN M	0
RAINBOW	1
	99

3 General note board

GENERAL NOTE BOARD

0 Exit to menu
1 Read messages
2 Place messages

4 Mail box to members

MAIL MENU

0 Exit to menu
1 Read mail box
2 Send message to user

5 Upper case only mode

6 Future use

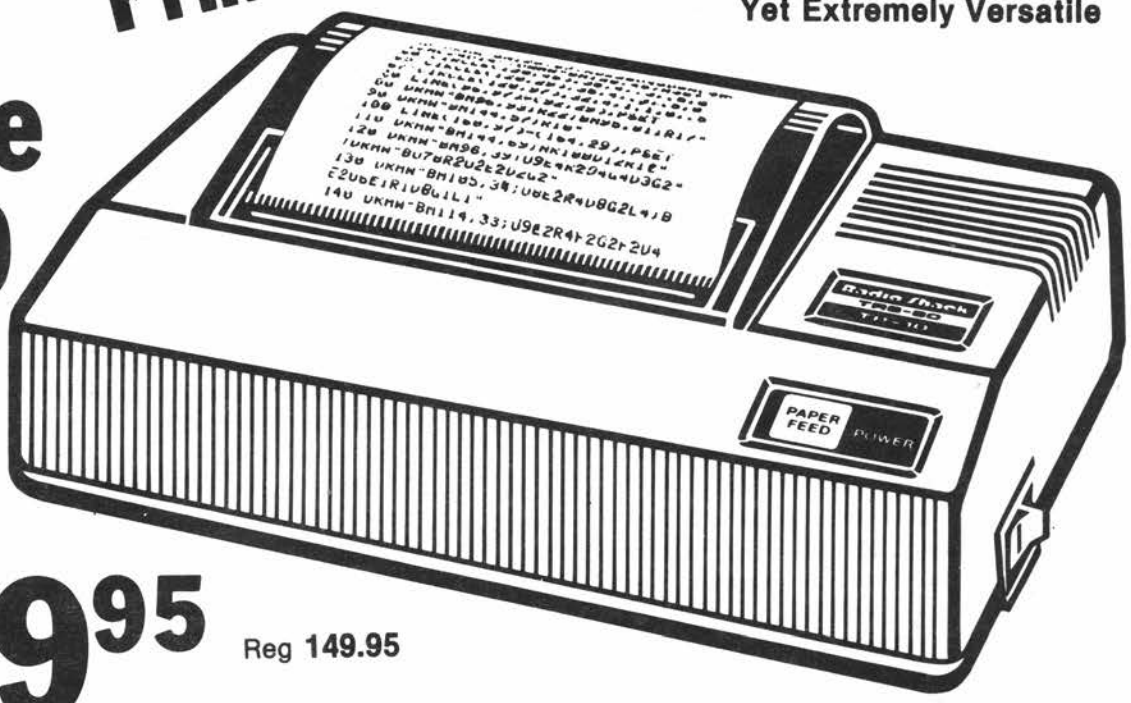
Module access closed until future development

Tandy ELECTRONICS

Low-Cost Thermal Matrix Printer with Graphics

Amazingly Compact, Yet Extremely Versatile

Save $20



129.95 Reg **149.95**

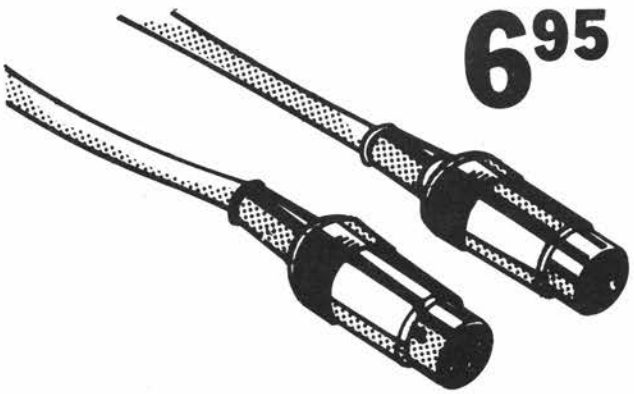
TP-10 Thermal Printer. Pay less for the perfect compliment to your CoCo or MiCo! Whisper quiet operation prints 32 characters per line at 30 characters per second on 10.47cm wide thermal paper. With elongation mode for expanded print. Special repeat function makes graphics programming easier! CoCo compatible serial interface only (600 baud). 94 ASCII, 16 graphics character set. 10 or 5 cpi pitch with 1/6" line spacing. Measures 7.62 x 20.32 x 12.7cm, weighs 1.47kg. 240VAC, 50 Hz, 18W. 26-1261

Thermal Paper

5.95

Thermal Paper. Packet of 2 thermal paper rolls for your TP-10. 26-1332

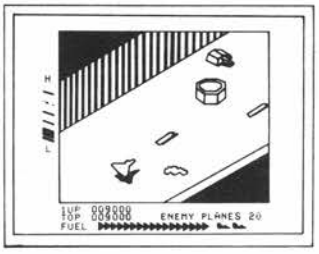
MC-10 Interface Cables



6.95

4-Pin to 4-Pin serial cable to connect your TP-10 to your Color Computer. 26-3020

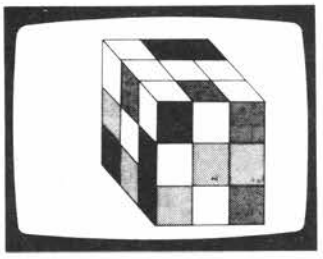
SALE! Exciting Color Computer Games



Save $20! ZAXXON™ Fly your jet through defenses, force fields and outer space — destroying enemy ground installations, fighting planes and dodging missles all the way! Survive those dangers to confront the deadly Zaxxon robot himself! Requires 32K, joysticks and tape recorder. 26-3062 Reg 59.95 . . . . . **Now 39.95**

Save $20! Micro Painter. Turns your CoCo into an electronic colouring book! Choose from three palettes, each of four colours. Save your more artistic results on optional recorder. Comes with 8 pictures and more available. 26-3077 Reg 49.95 . . . . **Now 29.95**

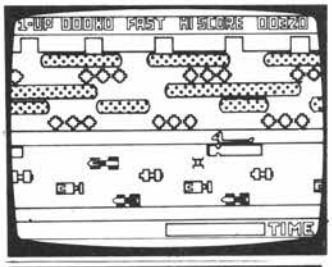
Save $10! Dungeons of Daggorath™ Defeat the evil Wizzard by descending through his dungeon, battling a succession of beasts to gain better weapons and greater strength. The further you progress the more fearsome the beasts, until the ultimate confrontation — with the Wizzard himself! 26-3093 Reg 49.95 . . . . . **Now 39.95**



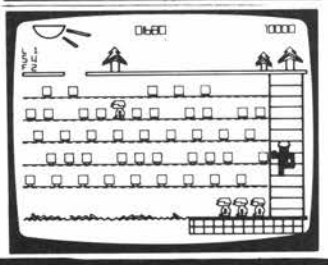
Save $20! Colour Cubes. Use your CoCo to crack *that* crazy Rubik's Cube! Recall up to 255 moves. Use an optional cassette recorder to save your position. 26-3075 Reg 39.95 . . . . . **Now 19.95**

Save $10! Reactoids. Prevent meltdown at the atomic reactor! Fast, fearless use of the reactoids can contain and control the atoms! Can you save the world? 26-3092 Reg 34.95 . . . . . **Now 24.95**

NEW! Exciting Games Software!



Frogger. Safely manoeuvre your frogs across the busy highway and swiftly flowing river to their homes. Look out for speeding traffic, sinking turtles, hungry snakes and crocodiles! 26-7304 . **29.95**



Cuthbert In the Mines. Help Cuthbert dodge the mining carts, climbing to the surface and safety. But beware the fireball shooting Demon! Brilliant graphics and sound effects. 26-7306 **29.95**

8 Ball. Play pool from your chair! Line up the shot with your electronic cue, select how much power you'll use — you can even put spin on the cue ball! Ideal for solo play too. 26-7311 . . . . . **29.95**

Scramble. The ultimate mission! Pilot your way through 4 levels of enemy defences, including UFOs and blazing meteorites! Then through a maze for one chance of bombing the target. 26-7314 . . . . . **29.95**

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Available from 350 Stores Australiawide including Tandy Computer Centres

**Independent Tandy Dealers may not be participating in this ad or have every item advertised. Prices may also vary at individual Dealer Stores*

7 Educational dept.

EDUCATIONAL MENU

0 Exit

1 General notice board

EDUCATION NEWS BOARD

0 Exit to menu
1 Read messages from board
2 Mail message

2 Program reviews

module under development

3 Down load menu

module under development

8 Computer systems

COMPUTER SYSTEMS MENU

0 Exit

1 Coco system

COCO SYSTEM MENU

0 Exit

1 General notice board

COCO NEWS BOARD

0 Exit to menu
1 Read messages from board
2 Mail messages

2 Musica files

Module under development

3 Program reviews and downloads

COCO PROGRAM MENU

0 Exit

1 program reviews

COCO PROGRAM REVIEWS

0 Exit to menu
1 Read reviews
2 Mail review

2 Download CocoOz Monthly
Module under development

3 Download Rainbow on tape

Module under development

4 Special interest

COCO SPECIAL INTEREST

0 Exit to menu
1 Read messages
3 Place messages

5 Graphicom files

Module under development

2 MC10 system

MC10 SYSTEM MENU

0 Exit

1 General notice board

MC10 NEWS BOARD

0 Exit to menu
1 Read messages from board
2 Mail message

2 Program reviews

MC10 REVIEWS

0 Exit to menu
1 Read messages
2 Place message

3 Down load menu

Module under development

3 Model 100 system

MODEL 100 SYSTEM MENU

0 Exit

1 General notice board

MODEL 100 NEWS BOARD

0 Exit to menu
1 Read messages from board
2 Send message

2 Program reviews

MODEL 100 REVIEWS

0 Exit to menu
1 Read messages
2 Place messages

3 Down load menu

Module under development

4 Special interest

COMPUTER SPECIAL INTEREST

0 Exit to menu
1 Read messages
2 Place messages

5 Model 1000 system

MODEL 1000 SYSTEM MENU

0 Exit

1 General notice board

MODEL 1000 NEWS BOARD

0 Exit to menu
1 Read messages from board
2 Mail message

2 Program reviews

MODEL 1000 REVIEWS

0 Exit to menu
1 Read messages
2 Place messages

3 Down load menu

Module under development

9 Link news

LINK NEWS BOARD

0 Exit to menu
1 Read messages
2 Send messages

10 Program sales (Visitor access)

Module access closed until
future development

```
230 DATA 142,128,255,252,255,128
,141
240 DATA 240,240,255,240,255,24u
,240
250 DATA 240,240,255,240,255,240
,240
260 DATA 128,131,139,128,135,131
,128
270 FOR T=1 TO 16
280 READ F,D
290 PRINT @ 5*32+15,"-";
300 SOUND F,D
310 PRINT @ 5*32+15,"O";:NEXT T
320 DATA 176,2,193,2,204,2,218,2
,218,1,218,1,218,1,218,1,204,2,2
04,2,204,1,204,1,193,2,204,2,193
,2,176,5
330 FOR Y=1 TO 1500:NEXT Y
340 FOR L=1024 TO 1535:POKE L,24
6:NEXT L
350 CLS 3
360 GOTO 510
370 Y=5:RETURN
380 Y=X:RETURN
390 Y=X+4:RETURN
400 Y=X-2:RETURN
410 Y=X*X:RETURN
420 Y=X*X-4:RETURN
430 Y=(X+2)*(X-2):RETURN
440 Y=-X*X:RETURN
450 Y=-(X+3):RETURN
460 Y=X*X*X:RETURN
470 Y=-X*X*X:RETURN
480 Y=X*((X*X)-9):RETURN
490 Y=X*X*X-3*X*X+X:RETURN
500 Y=4/X:RETURN
510 PRINT@32,"ENTER THE NUMBER O
F THE GRAPH"
520 PRINT@64,"YOU WISH TO SEE PL
OTTED."
530 PRINT@128,"1 Y=5              8
 Y=-X*X"
540 PRINT@160,"2 Y=X              9
 Y=-(X+3)"
550 PRINT@192,"3 Y=X+4           10
 Y=X*X*X"
560 PRINT@224,"4 Y=X-2           11
 Y=-X*X*X"
570 PRINT@256,"5 Y=X*X           12
 Y=X((X*X)-9)"
580 PRINT@288,"6 Y=X*X-4         13
 Y=X^3-3*X*X+X
590 PRINT@320,"7 Y=(X+2)(X-2) 14
 Y=4/X"
600 INPUT G
610 PMODE 4,1
620 PCLS
630 SCREEN 1,1
640 LINE(127,5)-(127,185),PSET
650 LINE(7,95)-(247,95),PSET
660 FOR XAXIS=7 TO 247 STEP 10
670 PRESET(XAXIS,95)
680 NEXT XAXIS
690 FOR YAXIS=7 TO 182 STEP 8
700 PRESET (127,YAXIS)
710 NEXT YAXIS
720 FOR X=-12 TO 12 STEP .05
730 ON G GOSUB 370,380,390,400,4
10,420,430,440,450,460,470,480,4
90,500
740 XP=10*X+127
750 YP=95-8*Y
760 IF XP<0THEN XP=0
770 IF YP<0THEN YP=0
780 IF XP>255 THEN XP=255
790 IF YP>191 THEN YP=191
800 PSET(XP,YP,1)
810 NEXT X
820 FOR Z=1 TO 5000:NEXT Z
830 CLS 8
840 PRINT@64,"DO YOU WANT TO SEE
 ANOTHER GRAPH(Y,N)?"
850 V$=INKEY$:IFV$=""GOTO 850
860 IFV$="Y"THEN GOTO 870 ELSE G
OTO 900
870 B$=INKEY$
880 IF B$<>" "THEN 510
900 CLS 0
910 DATA 239,143,143,239,143,143
,207,143,143,159
920 DATA 239,143,143,239,143,143
,207,143,143,159
930 DATA239,239,239,239,143,143,
207,143,143,159
940 DATA 239,143,143,239,143,143
,207,143,143,143
950 DATA 239,143,143,239,143,143
,207,143,143,159
960 FOR L=1 TO 50:READ D:NEXT L
970 FOR Y=3 TO 12
980 FOR X=12 TO 18
990 READ C
1000 PRINT @32*Y+X,CHR$(C);
1010 NEXT X:NEXT Y
1020 GOTO 1130
1030 DATA 208,211,215,211,219,21
1,208
1040 DATA 225,223,158,223,157,22
3,226
1050 DATA 208,220,223,223,223,22
0,208
1060 DATA 179,179,179,191,179,17
9,179
1070 DATA 191,176,191,191,191,17
6,191
1080 DATA 191,176,239,239,239,17
6,191
1090 DATA 142,128,255,252,255,12
8,141
1100 DATA 240,240,255,240,255,24
```

```
0,240
1110 DATA 240,240,255,240,255,24
0,240
1120 DATA 128,131,139,128,135,13
1,128
1130 FOR T=1 TO 16
1140 READ F,D
1150 PRINT @ 5*32+15,"-";
1160 SOUND F,D
1170 PRINT @ 5*32+15,"O";
1180 NEXT T
1190 DATA 176,2,193,2,204,2,218,
2,218,1,218,1,218,1,218,1,204,2,
204,2,204,1,204,1,193,2,204,2,19
3,2,176,5
1200 FOR L=1024 TO 1535:POKE L,1
66:NEXT L
1210 CLS 4
1220 PRINT"THANK YOU"
1230 PRINT:PRINT"AND HAVE A NICE
 DAY"
1240 PRINT:PRINT
1250 PRINT"THE CONTENT OF THIS P
ROGRAM HAS BEEN COLLECTED,ARRANG
ED AND      REFINED"
1260 PRINT"BY HUBERT MUHLBOCK"
1270 PRINT"PUNCHBOWL,NSW"
1280 PRINT"SPECIAL THANKS FOR IN
SPIRATIONS "
1290 PRINT"TO ROSS H. PENIX FROM
 THE BOB    JONES ACADEMY"
1300 FOR Y=1 TO 8000:NEXT Y
1310 FOR L=1024 TO 1535:POKE L,1
48:NEXT L
1500 DATA 100,115,117,108,111,13
1,105,114,114,111,132,132,132,13
1,107,100,131,107,100,131,107,10
0,131,37,60,40
1510 CLS:FOR C=&H5DF TO &H400 ST
EP-&H20:FOR A=6 TO 27:READ B:POK
E C+A,B-35:NEXT:RESTORE:NEXT
1520 FOR A=&H400 TO &H5FF:POKEA,
128:NEXT:POKE&H50D,66:POKE&H50E,
89:POKE&H50F,69:SOUND100,5:POKE&
H92-33,0:EXEC&H9FEC+59
```

C.C.

COCOOZ #25

Because of publication restrictions (not enough space) we have some extra little goodies for you.
A game by Elvis Lazic called Roo Hunt. The name says it all.
Ephem by David Martin which finds the position of the Sun, 22 stars and some planets. Great stuff!
Last but certainly not least, updates from the ever busy Johanna Vagg, Mexican2 and Showtime2.
It's all yours for the asking (for price see subsciption page).

PAGE AFTER PAGE AFTER PAGE AFTER PAGE AFTER

Tino Delbourgo

64K CC

With lots of text or graphic pages that may be called upon instantaneously, it is possible to develop smooth, spectacular animation with your TRS-80 Color Computer, something which few other computers in comparable price range, are able to emulate.

In Tumbling Umbrella (Oct'83 RAINBOW) we showed you how to release up to 20 graphic pages in the upper reaches of 32K with a pair of simple pokes (although we have since been informed that the method apparently fails with piggy-back computer upgrades). Here we would like to demonstrate how to release text pages (as many as 63) and graphics pages (up to 21) in the upper reaches of 64K. Three simulation programs, "WORLD64K", "MAGNET64" and "ENGINE64" make use of this facility to prove what remarkable effects are now within your compass.

The fundamental trick relies on the fact that the video chip will display the upper 32K bank of RAM even though the ROMs are nominally in memory. In this way we are able to use a machine language routine, USR1, to copy the page in question to upper 64K and then call upon a USR0 routine to exhibit that page immediatley upon demand; the argument of the USRs corresponds to the page number called. Sometimes it is more convenient to code the ML procedures into a REM statement rather than to read the DATA and poke it into memory, and we shall adopt this approach for releasing extra high-resolution graphic pages through the program "PAGES64K" below.

Listing 1:

```
10 CLEAR200,&H3EFF
20 FORD=0TO49:READD$:POKED+&H3F0
0,VAL("&H"+D$):NEXTD
30 DEFUSR0=&H3F00:DEFUSR1=&H3F06
40 DATA8D,1C,44,7E,96,F,8D,16,CE
,4,0,1A,10,7F,FF,DF,EC,C1,ED,81,
11,83,6,0,25,F6,7F,FF,DE,39,BD,B
3,ED,10,83,0,3F,22,8,1E,89,48,8B
```

```
,80,1F,1,39,7E,B4,4A
100 CLEAR16*65:DIMA$(15):CLS
110 A$(0)="05FFFFFFFFFFFFFFFFFF
FFFFFFF22220005ECCCCCCCCCCC0000
0"
120 A$(1)="00000CCCCCCCC04CCCC80
000000000000004000000000000000
0"
130 A$(2)="00000000000000000000
000000000000020200000000000000
0"
140 A$(3)="0A0002000000040000000
000000000000007A000000000000000
0"
150 A$(4)="4200773013000000000000
013000000000007FA000000000000000
0"
160 A$(5)="0100FF7FFF00000000010
1FFA000000003FFFA000000000000000
0"
170 A$(6)="00004EDE8000000000040
7FFF00000007FFFFB200000000000000
0"
180 A$(7)="0000D73091C4200000001
FFFB2000000CCFFFFF000000000000000
0"
190 A$(8)="000000010C0420100003F
F7FFB333000004CFFB20000000000000
0"
200 A$(9)="00000000805BB01F0017A
DFFFFFFFA000000000D3300000000200
0"
210 A$(10)="0000000047FFFBFFF3ED
F3FFDFFFE000000004425FF220000000
00"
220 A$(11)="000001810DFFFFFFFFFC
FB3114CF20000000003FFFFFFB000000
00"
230 A$(12)="0000087FFFFFFFFFDBF3
F37F3B7B000000124FF33FFFFF000000
00"
240 A$(13)="005808DFFFFDFFFFFFFF
FFFCCE8D40000004DFF4CDF7FFB30017
2C"
250 A$(14)="DFF7FFFFFFFFFFFFDFFF
C3BE1E00012013F033C007FFEDFFFFFE
0C"
260 A$(15)="00000004CCDFFFFE4820
00CCC000001FFFF30CCCB2EFFC000C00
00":GOTO350
270 FORS=1TO54
280 FORV=0TO15:FORH=0TO15
290 POKE1024+H+32*V,240+VAL("&H"
+MID$(A$(V),H+1,1)):NEXTH
300 FORH=16TO31:POKE1024+H+32*V,
176+VAL("&H"+MID$(A$(V),H+1,1)):
NEXTH,V
310 IFS=2*INT(S/2)THENPRINT@10,"
WORLD news";ELSEPRINT@10,"world
NEWS";
315 A=USR1(S)
320 FORV=0TO15:L$=LEFT$(A$(V),1)
:A$(V)=RIGHT$(A$(V),53)+L$:NEXTV
330 NEXTS
335 FORS=1TO54:A=USR0(S):FORT=1T
030:NEXTT,S:GOTO335
340 GOTO270
350 PRINT:PRINT"*** THE VIEW FRO
M DOWN-UNDER ***";:PRINT"     BY
bob & tino  delbourgo"
360 PRINT:PRINT"AN ANIMATED PICT
URE OF THE WORLDUSING 54 TEXT SC
REEN PAGES, AND ONLY AVAILABLE T
O 64K TRS-80     COLOR COMPUTER U
SERS."
370 PRINT:PRINT"PLEASE GIVE COCO
 TIME TO DRAW    OUT THE 54 DIFFE
RENT PICTURES    BEFORE THE REAL
SHOW CAN BEGIN. THIS TAKES A GOO
D WHILE  ...."
380 PRINT@485,"ANY <KEY> TO CONT
INUE";
390 IFINKEY$=""THEN390
400 GOTO270
```

But first let's see what may be accomplished in low resolution.

Type in the listing "WORLD64K" exactly as is and run it.

This program utilises 54 text pages, drawing successive pictures of the world (at equinox time) at 20/3 degree longitude intervals between 80 and -80 degree latitudes. The world map is economically stored in 16 strings, 54 characters long (Lines 110-260), which are shuffled around each successive page and coloured red for night, orange for day. Copying occurs at Line 335 and these 54 pages are flipped through in rapid succession with a time interval of 30 units. If you press any key during the simulation, you may speed up or slow down the rotation by adjusting the timing interval yourself. We think you will agree that the final cinematography is nothing short of amazing and underlines once again the superlative capabilities of COCO. Even ML routines that scroll the screen cannot match the use of successive pages for sheer continuity and speed. By the way, as Australians, we could not resist having a little joke on the northern hemisphere people; if they are not amused, simply 'reverse all strings'. (There is no joke - the Delbourgos have merely anticipated the correction which needs to be made to world maps. Of course, the correction also correctly, places Tasmania at the top of the world! G.)

Now to high resolution. Here we ask you first to type in the Listing "PAGES64K" and run it. (This will later inject ML into memory in non ASCII form). Afterwards, without switching off the computer, type in one or other of the Listings "MAGNET" or "ENGINE".

Listing 2:

```
1 REM**************************
**************************
2 ST=PEEK(25)*256+PEEK(26)+5:DEF
USR0=ST:DEFUSR1=ST+5
10 FORD=ST TOST+52:READD$:POKED,
VAL("&H"+D$):NEXTD
20 DEL10-:END
30 DATA 8D,19,9F,BA,39,8D,14,DE,
BA,1A,10,7F,FF,DF,EC,C1,ED,81,11
,93,B7,25,F7,7F,FF,DE,39,BD,B3,E
D,4D,26,11,5A,2B,E,C1,14,2E,0A,8
6,6,3D,1E,89,8B,80,1F,1,39,7E,B4
,4A
```

The "MAGNET" program depicts the oscillations of a dipole in a uniform magnetic field and uses only 18 graphic pages (so in principle you might have used the Tumbrela method for it) as nine PMODE1 screens. The magnetic field lines are drawn in Lines 160-190 and the magnet orientation comes from line 200. (The subroutines 250-280 contain all the relevant physics). Copying happens in line 210; then in 220-240 the pages are flipped through, forwards and backwards. The animation brings out the elastic nature of the electromagnetic field in a way which no textbook can.

Listing 3:

```
50 CLSRND(8):PRINT"        MAGNETI
C OSCILLATIONS":PRINT"       BY ti
no & bob delbourgo"
60 PRINT@96," A PROGRAM IN upper
 64K FOR THE  TRS 80C, USING 18
HIGH-RES.     GRAPHIC PAGES, DEP
ICTING THE    VIBRATIONS OF A MA
GNETIC DIPOLE IN A UNIFORM MAGNE
TIC FIELD."
70 PRINT@320," PLEASE WAIT FOR C
OCO TO DRAW    THE NINE PICTURES
 BEFORE THE    ANIMATION CAN BEG
IN IN EARNEST":FORT=1TO5555:NEXT
T
100 CLS:PI=3.14159265
110 INPUT" SIZE OF DIPOLE (5-55)
";A:IFA<50RA>55THEN110
120 INPUT" MAGNITUDE OF EXTERNAL
 FIELD     (2-8)";EE:IFEE<20REE>
8THEN120
130 PRINT:PRINT" IN THE FOLLOWIN
G PICTURES THE   YELLOW LINES RE
PRESENT THE      MAGNETIC FLUX I
N DIRECTION      (EXACTLY) AND M
AGNITUDE         (APPROXIMATELY)
.":FORT=1TO2000:NEXTT
140 PMODE1,1:FORT=1TO9:PCLS1:SCR
EEN1,0:TH=(PI/3)*SIN((T-5)*PI/8)
160 FORX=-120TO120STEP16:FORY=-8
8TO88STEP16
170 GOSUB250:IFE>8THENX1=X-8*NX:
Y1=Y-8*NY:X2=X+8*NX:Y2=Y+8*NY EL
SEX1=X-CX:Y1=Y-CY:X2=X+CX:Y2=Y+C
Y
180 COLOR2,1:LINE(X1+128,Y1+96)-
(X2+128,Y2+96),PSET
190 NEXTY,X
200 S=A*SIN(TH):C=A*COS(TH):COLO
R4:LINE(128+S,96+C)-(128-S,96-C)
,PSET:CIRCLE(128+S,96+C),2,4:CIR
CLE(128-S,96-C),2,4
210 B=USR1(2*T-1):NEXTT
220 FORT=1TO9:B=USR0(2*T-1):SCRE
EN1,0:FORD=1TO30:NEXTD,T
230 FORT=8TO2STEP-2:B=USR0(2*T-1
):SCREEN1,0:FORD=1TO30:NEXTD,T
240 GOTO220
250 R1=SQR(X*X+(Y-A)*(Y-A)):R2=S
QR(X*X+(Y+A)*(Y+A))
260 EX=30000*X*(1/(R1*R1*R1)-1/(
R2*R2*R2)):EY=30000*((Y-A)/(R1*R
1*R1)-(Y+A)/(R2*R2*R2))
270 CX=EX*COS(TH)-EY*SIN(TH):CY=
EY*COS(TH)+EX*SIN(TH)+EE:E=SQR(C
X*CX+CY*CY)
280 NX=CX/E:NY=CY/E:RETURN
```

"ENGINE" on the other hand illustrates the operation of a diesel motor. It uses 24 graphic pages: the first twenty are stored in upper 64K but the last four are the PMODE1 pages we normally use. See line 100.

About the variables:

A is the cam radius,

L the camshaft length,

T the cam rotation angle;

Z is the distance from the piston to the centre of the moving parts as the engine goes through its strokes.

Finally lines 160-170 call up the various pages, one after another; and there you have it, a chugging diesel engine! No explanation in books however eloquent, can vie with this computer simulation of the complete diesel cycle. Of course you can easily adapt our program to other thermo-dynamic cycles, associated with other engines and even refrigerators.

Listing 4:

```
50 CLSRND(7)+1:PRINT"    *** THE
DIESEL ENGINE ***":PRINT"    BY b
ob and tino delbourgo"
60 PRINT@96," A GRAPHIC SIMULATI
ON OF THE      DIESEL ENGINE CYCL
E USING 24     HIGH RESOLUTION GR
APHIC PAGES    IN THE upper REACH
ES OF 64K,     CALLED UPON BY ML
SUBROUTINES."
70 PRINT" THE THERMODYNAMIC CYCL
E IS ALSO EXHIBITED AS A pressur
e-volume  PLOT AS THE ENGINE GOE
S THROUGH ITS STROKES."
80 PRINT@416," PLEASE WAIT A MOM
ENT FOR COCO   TO DRAW THE 12 PI
CTURES ....."
90 FORU=1TO6666:NEXTU
100 PI=3.14159265:PMODE1,1:FORI=
0TO9:GOSUB1000:GOSUB105:A=USR1(2
*I+1):NEXTI:FORI=10TO11:PMODE1,2
*I-19:GOSUB1000:GOSUB105:NEXTI:G
OTO160
105 A=20:L=60:T=I*PI/3:C=COS(T):
S=SIN(T)
110 Z=A*C+SQR(L*L-A*A*S*S):X6=52
:Y6=160-Z
115 CIRCLE(52,160),20,3,1,.12+I/
6,.39+I/6
120 X1=52-20*SIN(T-PI/4):X2=52-2
0*SIN(T+PI/4):Y1=160+20*COS(T-PI
/4):Y2=160+20*COS(T+PI/4):X3=52+
20*SIN(T):Y3=160-20*COS(T)
125 COLOR3:LINE(X1,Y1)-(X3,Y3),P
SET:LINE-(X2,Y2),PSET:PAINT(52,1
60),3,3
130 B=ATN((X3-X6)/(Y3-Y6)):X4=X3
+10*COS(B):Y4=Y3-10*SIN(B):X5=X3
-10*COS(B):Y5=Y3+10*SIN(B)
135 CIRCLE(X3,Y3),10.2:COLOR2:LI
NE(X5,Y5)-(X6,Y6),PSET:LINE-(X4,
Y4),PSET
140 LINE(X6-22,Y6-10)-(X6+22,Y6+
10),PSET,BF:PAINT(X3,Y3),2,2:PAI
NT(X3,Y3-12),2,2
150 RETURN
160 FORP=1TO19STEP2:A=USR0(P):SC
REEN1,0:PLAY"V30O1L255CCBBP200V2
0GGFF":NEXTP
170 FORP=1TO3STEP2:PMODE1,P:SCRE
EN1,0:PLAY"V30O1L255CCBBP200V20G
GFF":NEXTP:GOTO160
200 GOTO200
1000 PCLS:SCREEN1,0:DRAW"BM12,44
C3R28D12H8L20U4BD12R20F8L12D60G1
2U72L4U8":PAINT(24,46),3,3:PAINT
(24,76),3,3
1005 DRAW"BM92,44C3L28D12E8R20U4
BD12L20G8R12D60F12U72R4U8":PAINT
(80,46),3,3:PAINT(80,76),3,3
1010 DRAW"BM44,24C3D36F4R2U40L6;
BM60,24D36G4L2U40R6":PAINT(48,46
),3,3:PAINT(56,46),3,3
1015 DRAW"BM0,50C2D4BR4U4F4U4BR8
8D4R4U4L4BR8D4R4U4BR4R2D4U4R2"
1020 DRAW"BM132,28C3U8R8D4L8;BM2
44,152D4F4E4U4"
1025 DRAW"BM120,176C2D8R4E4H4L4B
R12D8BR12L8U4R4L4U4R8BR12L8D4R8D
4L8BR20L8U4R4L4U4R8BR4D8R8"
1030 DRAW"BM204,176L4G4F4R4BR8U4
H4F4E4BR12L4G4F4R4BR12L8U8BR20L8
D4R4L4D4R8"
1035 DRAW"BM136,32C4D112R122"
1036 DRAW"C2BM136,128;R90U36;BM1
78,44L36"
1037 CIRCLE(226,44),48,2,1,.25,.
5:CIRCLE(226,44),84,2,1,.25,.5
1040 IFI>0ANDI<3THENDRAW"BM42,24
C2D46L4R8":DRAW"BM62,24D42L4R8"
1044 IFI=0THENLINE(30,66)-(74,68
),PSET,BF:DRAW"BM136,128;C3R30"
1045 IFI>8THENDRAW"BM42,24C2D42L
4R8":DRAW"BM62,24C2D46L4R8"
1046 IFI>2ANDI<9THENDRAW"BM42,24
C2D42L4R8":DRAW"BM62,24C2D42L4R8
"
1047 IFI=6THENCOLOR4,1:LINE(52,2
4)-(52,64),PSET:LINE(30,66)-(74,
68),PSET,BF
1048 IFI=10RI=11THENDRAW"BM166,1
28;C3R30"
1049 IFI=20RI=10THENDRAW"BM196,1
28;C3R30"
1050 IFI=3THENCIRCLE(226,44),84,
3,1,.25,.34
1060 IFI=4THENCIRCLE(226,44),84,
3,1,.34,.415
1061 IFI=5THENCIRCLE(226,44),84,
3,1,.415,.5
1062 IFI=6THENDRAW"BM144,44C3R36
"
1063 IFI=7THENCIRCLE(226,44),48,
3,1,.375,.5
1064 IFI=8THENCIRCLE(226,44),48,
3,1,.25,.375
1065 IFI=9THENDRAW"BM226,128C3U3
6"
1100 RETURN
```

THE PERSONAL COMPUTER SHOW

If you think you've seen a few computer exhibitions in your time, you haven't seen anything till you've seen the daddy of them - the Personal Computer Show, held this year at Centrepoint in Sydney, from 13th - 16th March.

EVERYONE in the computer business was there! And as Martha said in her column this month, MS DOS computers have taken over!

It is just phenominal - not only Tandy, but Dick Smith, Commodore, Olivetti and a string$ more have MS DOS computers. They all seem pretty simular, they all behave pretty simular, and necessarily, they are all about the same price!

The word is that the same thing is about to happen for the higher capacity computers, only with Unix, OS9's big brother.

And Martha, uncharacteristically is right about the other brands too! (Only because she didn't think of it first!) The situation is that we have too many brands chasing too few sales. If you don't have an exceptional sales story, you will not stay in the MS DOS computer business for long!

The Tandy 1000 will survive because Tandy is able to service it from over 350 stores across Australia. And they have us! And we are already supporting it both in the magazine and on CoCoLink.

Tandy had their new Moden on display. Priced at $250, and made in Australia, this is a nice piece of equipment. We hope to have one here for review soon.

There were some other items of note at the Exhibition, besides MS DOS machines.

One of them was the fine range of office furniture found at the Tandy stand. This furniture is available through Anstey in Australia, and includes the German Drabert chair, which is a must if you can afford $500 for something to sit on in the office!

Microbee had a strong exhibition of their product, which will turn the Education Dept's eye. They have two education reps in NSW, one at Waitara, and one at Gosford.

Their hardware is based on the dated Z80A chip and one gets the impression that it is fully extended doing what it does at present. The access times of the disk drives do appear to be very good, quicker than a standard CoCo, but not as quick as a CoCo running with the 3ms of say, the TEAC drives.

The biggest surprise, is that despite the contract, Microbee appears to have less Educational software available for it than CoCo. You know I'm biased, but really, we didn't see anything at this stand, that we can't make a CoCo do. Microbee do not have a strong dealer network.

Commodore were there with their new computers, and as usual, their marketing, is going to win them sales. Their packaging, presentation and as usual, their graphics capabilities are going to turn heads.

AWA had the Amstrad computer there. The Amstrad has already attracted a few buyers, because it's price, coupled with the attractive displays and the 80 column screen make it a good buy. But support is minimal, and it is old technology not established in any market. Amstrad will certainly pick up some of the buyers who might have bought a Commodore, but got smart.

I could list a whole range of other company's products, but I will mention just two more. The first is Warburton Frankie, who had a nice display of their Riteman printers, as reviewed last month. They also have the Zenith range of computers, and do you know, I don't believe I saw a MS DOS computer amoungst them! They do it right with the printers, they could well be right with the computers!

Peter Newland demonstrating "OMNUS".

The other interesting display, was Telecom's Computerphone. Built to access Viatel, Telecom's new Bulletin Board, Computerphone provides you with:

1. a push button phone with monitor.
2. An on line personal phone directory of 500 'detailed' entries.
3. A computer capable of handling word processing, spreadsheets, and data storage. As well it has the ability to produce graphics and to share data between programs.
4. Can be used as a terminal to Viatel or other BBS.
5. Has a Basic interpreter.

Computerphone sounded excessively cheap, so I'm checking before I publish the figure I heard.

Finally, we had the chance to see Omnis, a total school management package for MS DOS computers. Omnis will keep track of the entire school records, both financial and academic. The program is very detailed and we will review it in due course.

Graham

Dear Doctor CoCo

Q. I have a cassette based 64K CoCo 2. As a writer, this setup is not enough. The answer would seem to be to add two drives and a printer, but as I have no idea of what is available in Australia, maybe you could help. I don't have a lot of money and would need to buy these items in bits and pieces.
Also, which word processor is best, and should I stick with 5 inch drives, or get one 5 incher and an Amdisk 3 inch drive unit?

Roderick Brown,
Hornsby. N.S.W.

A. Amdisk units are okay but from the point of view of compatability, are of questionable advantage. Also, the disks are about $8.00 each retail and are hard to get sometimes. Stick with the five inch drives and you won't be sorry. We use a variety of word processors and find most of them quite acceptable. The one I seem to use quite a lot is Telewriter and is probably one of the better ones.

Q. In COCO0Z #10, there was a program called DPMS. I have made the change to line 22 as per the update in Rainbow (INPUT should be LINE INPUT), but the program still does not function and none of the menu commands works. What is the fix please'

Len Maloney.
Mackay. Qld.

A. DPMS is a sequential access database, Len, and the directory that is displayed from the menu lists all programs on the disk, not only datafiles. You must first enter some data from the main menu ENTER option and save it on the disk, before you can do anything else. The line 22 amendment is correct.

Q. I have recently upgraded to a Tandy disk drive and have some copying problems from tape to disk. Many machine language programs will not load or auto execute. For example Use 64K, Wizkid, Datagen, Concert, Creatitl etc. from CoCo0z. Also some commercial arcade games will not transfer and execute correctly. How can I fix this.

Nick Gooch.
Lowood. Qld.

A. Some arcade games are located at addresses low in memory and when Disk is used, it uses this memory space. The programs need to be relocated higher in memory, so as not to cause a conflict. We will be publishing a program in the near future that will do this relocation for you. Watch for it!
Most of the CoCoz programs you mentioned are not transferable to disk so easily. Concert will NOT load into a disk system at all because you have 2K less memory in a disk system and Concert requires all of 32K. For the others, maybe the authors would like to write in with a fix.

Q. I have only had my CoCo six months and have a big interest in graphics. I am using a 64K CoCo and DMP 110 printer, and the results from screen to printer are all but pleasing. I also have Screen Print from December CoCo, and can't make it work. Also I want to learn assembly language, and would appreciate any help.

Barry Anderson.
Jurien. W.A.

A. The problems doing screen dumps on the DMP-110 are now legendary. GSPR is a popular commercial program for Tandy and Epson printers that does very nice screen dumps. The distributor is Geoff Tolputt. Maybe Geoff would let us know if he has a version for the DMP-110. If not, we will attempt to have our resident ML programmer, Mr. Darcy O'Toole to come up with a routine to do this.
On the assembly language question, there are two avenues. 1. Buy up on back issues of Rainbow and read the assembly articles therein. 2. Go to your local Tandy store and purchase one of their excellent books on 6809 Assembly Language programming.

SCOREBOARD

Dear Graham,
I would like to give to the readers of your magazine some helpful hints on playing 'Dungeons of Daggorath':
If there is an object lying on the ground, the creature will pick it up before attacking you. So if you leave objects on the ground, you will be able to kill the creature whilst it is picking up objects.
The incants for the rings are: vulcan ring = incant fire, nine ring = incant ice.
Do not drink from the abyr flask but drink from the hale and thews flask.
Do not employ the first technique when fighting the wizard.
Michael Poon
Ballarat, VIC.

ASTRO BLAST (Mark Data)
David Coleman Yeronga 52000

ASTRO LANDER (CoCo Software)
R Boxall 4250

ATOM (Tandy)
David Thurbon (round.1) xe

BEAM RIDER (Spectral)
David Thurbon Canberra 83530

CALIXTO (Mark Data)
J Gans Bris 162

CANYON CLIMBER (Tandy)
Steve Lemke Bribie7/101800
Chris Nagel 66600

DEVIOUS (Spectral)
R Boxall 28820

DONKEY KING (Tom Mix)
Damon Simpson 105400
R Boxall 59300
Daryn Wedd 107500

DOUBLE BACK (Tandy)
Ian Reynolds Prospect 351540
highest grab 140870

FIRECOPTER (Adventure Intl.)
R Boxall 69152

FLYBY (Chromasette)
David Coleman Yeronga 32000

GALACTIC ATTACK (Tandy)
Ian Choat Woodridge 35070
Simone Sutherland 28230

GALAX ATTACK (Spectral)
David Coleman Yeronga 27950

GHOST GOBBLER (Spectral)
Stuart Sanders 118510
Steven Marks Yanco L8/68250
Chris Nagle Leeton 64510
Chris Nagle Leeton L10/58860

KATAPILLAR ATTACK (Tom Mix)
Todd Michell Robinvale 7779
Steven Marks Yanco 9412

LANCER (Spectral)
M. Bloomfield Sydney 148650

LASERWORM (Rainbow)
Glynn Catherall Gold Co 30366
Nick Cooper 58745

LUNAR ROVER PATROL (Spectral)
C Boxall 64480

MEGABUG (Tandy)
Lori Lehane Penrith 19540

MICROBES (Tandy)
Steven Marks Yanco L3/35410
Jack Rae Mt Isa 1/10700
R Boxall 63180
R Boxall & D Kemp 59600

MONSTER MAZE (Tandy)
Ian Reynolds Prospect 250840
Neil Prince Forbes 8410

MOON SHUTTLE (Data Soft)
David Thurbon Canberra 27700

PLANET INVASION (Spectral)
David Coleman Yeronga 48580

POLARIS (Tandy)
Chris Nagel Leeton 31306
Chris Nagel Leeton 27563
Neil Prince Forbes 13840

POLTERGEIST (Tandy)
Steven Marks Yanco 4455

POOYAN (Datasoft)
R Boxall 100850

POPCORN (Tandy)
Chris Nagle Leeton 71640
Chris Nagle Leeton 1/58120
Allan Rae Mtlsa 56770

PYRAMID (Tandy)
J Gans Bris 200

RAAKATU (Tandy)
J Gans Bris 40

ROBOT BATTLE (Spectral)
R Boxall L0/4850

SEA QUEST (Mark Data)
J Dougan &J GansBris 165

SHENANIGANS (Mark Data)
J Gans Bris 112

SHOOTING GALLERY (Tandy)
Chris Lemke Bribiels 22420

SKIING (Tandy)
Jack Rae Mtlsa 0:36.00

SPACE ASSULT (Tandy)
Neil Prince Forbes L1/4980
Nick Cooper 16940

SPACE SHUTTLE (Tom Mix)
C Boxall 192

TIME BANDIT (Michtron)
Daryn Wedd 87200
J Dougan Bris 35800

TRAPFALL (Spectral)
David Thurbon Canberra 47918

TUT (Ardvark)
Keith Savage 99430

WHIRLYBIRD RUN (Spectral)
R Boxall 42375

WILDCATTING (Image Producers)
R Boxall 34692
Chris Nagle Leeton 22848

ZAXXON (Tandy)
Jason Cook St Clair 104600

ZAKSUND (Elite)
Nick Cooper 136050

MiCO

From the sounds of some of the 'Hocus-Pocus' going on around this office I can only assume that this month's edition of CoCo/MiCo is an April Fool's edition. But don't worry MiCo has managed to escape much of the mischief implanted into the magazine (I think??). I know that, for lack of content, we were fooling with the idea of not producing MiCo this month but at the last minute we recieved a few more programs which enabled us to kill that feeble idea for an April Fool's prank.

I must admit that although we are not recieving too many programs, what we are recieving is all good stuff. I would however like to see more input from the younger users such as Matthew Wiltshire, certainly don't be shy. As I have stated so often before, we all learn from analysing or even just taking a passing interest another persons work. How do you think the 'Masters' earned their title?

I mentioned in February that we were intending to put a MiCo special interest section onto CoCoLink Bulletin Board. As promised, we have installed the module. The only area we have been unable to get right is the progarm downloading, but that applies to all sections of the Bulletin Board so as soon as we can make them work we will install those modules. I look forward to seeing you on the board.

Enjoy this months line up of programs and articles. There should be somthing there to interest everyone.

Until next month..

Kevin

LETTERS

Dear Graham,

Your magazine seems to have a very good circulation and I am glad to see that it caters to all types of readers. I would personally like more serious programs. I have ordered Michael Turk's program 'SPT'. It is really great but I have to getmy TTY to accept it. How about putting out an article for an interface for driving a TTY from a MC10. Brian McLaughlin's 'Letter' program also requires an interface.

Anyway, all the best to everyone there, I'm sure that everything will work out in the end.

Derrick Chaves
Croyden Park, NSW.

Dear Graham,

I noticed that in the February MICO, somebody was puzzled by line 2060 (in Micoword), which read:

2060 IFT THEN S=S+1

Actually that line is perfectly correct, and your readers might like to know why.

Whenever no comparison is made in an IF..THEN statement, a comparison of <>0 is assumed. Therefore line 2060 could equally well have been:

2060 IFT<>0 THEN S=S+1

But the original version takes up less space. This might be a helpful tip for your Mico readers.

Tino Delbourgo,
Sandy Bay, TAS.

Tino,

Thanks mate. I wasn't aware of this possiblity, but it certainly makes life a bit easier when you only have limited memory!

Graham.

Dear Graham,

I am 14 y/old and have had my Mico for over a year now. How about a review on some of the games from Martin Wells Software.

Sometimes I try to find new functions for the MC-10. The way I do this is to type A=W. 'A' is any letter from A-Z, and 'W' is any word or group of letters. After you have typed A=W, press ENTER. If the MICO says 'OK' then it is not a function. If the MC10 says '?SN ERROR' then check if any known functions are imbeded in the word. If not, then you have found a function.

I think I have found a new function. When I typed A=OFF I got a ?SN ERROR. Could you tell me if this is a function.

Also, anyone without the tape 'Lost World Pinball' should get one. It shows the MC-10's hi-res graphics capabilities at work.

Could you also tell me how much it costs to set up communications on your MICO.

Could you also tell me if it would be possible to write a program the same way 'Little-E' was written to enable the MC10 to use hi-res graphics in BASIC.

Lastly could you tell me what this does: EXEC 64103.

Also here is a HINT 'POKE0,0' disables the Keyboard.

Darren Ottery
Kingscliff, NSW.

Darren,

I realise that Southport is a bit far, but if you come to a meet one month, you'll meet Nicholas our super MC 10 wizz.

Unfortunately, I missed Nicholas this month and was unable to ask him your questions, so I figured that I might as well throw them up for some of the others to answer.

Martin Wells has promised to send some software for us to look at, we hope it will be here in time for next magazine.

The cost of setting the MC 10 up to work with a Bulletin board is about the same as a CoCo. We think that the new Tandy modem at approx $250 will suffice, and you'll need a Terminal Program. We have such a beast, the ownership of which is worrying us at present, but if it proves to be original, then it will be printed ASAP. Otherwise, we will just have to squeeze young Mr Turk's arm, or Mr Delbourgo's, or Mr Rothwell, or.....

It should certainly be possible to obtain the results you seek by adopting the same methodology that was used in 'Little E'. Again this is not something that I am willing to talk about without our trusty Nicholas or Reg beside me!

Graham.

COUPLING THE MC10 TO.....

Reg Lang

This is the first section of 6 or more projects designed around the MC10. This unit will control external devices plugged into the I/O port.

This section (which I will call A) is a device which will generate signals to decode 8 seperate and exclusive addresses by a "POKE" statement entered from the keyboard.

By using the top 2 address lines (A14-A15) the MC10 divides the internal memory into 4 blocks of 16384 bits each. As an example:- if the top 2 lines have a binary code of "00" then a decoder signal is produced that selects a memory block (or area) begining at "0" and ending at 16383, further, if A14 has a code of "1" and A15 has a code of "0" then the decoder selects the block begining at 16384 and ending at 36383. As you can see these 2 lines can have 4 different codes, each selects a block of memory. The problem is, that if we require a single and exclusive address we must decode (divide) the memory into 65535 single bits. To do this we decode every address line from A0 to A15. Why we do this is to use only as many memory addresses as we require to do the job and leave vacant as many addresses as possible for use in future expansion.

The first sections (or area) of memory form (0 to 255) are used by the CPU for internal control, so this area cannot be used, but a vacant area appears from 256 to 16383 and can be used for any purpose (eg. RAM or ROM expansion, speech processor, you name it). In future publications I will present a speech synthisizer, ROM expand, control devices for printer tape, modem ect., but before we get too deep, we must build a decoder to control all of the above units.

The following circuit decodes for 8 add on devices. Understand that this device only enables (turns on) a specific unit at a specific address. I have selected addresses 256 to 263 simply because they are first in line, they are also gated (allowed to be turned on) by the CPU E clock (enabled only if E signal is present). Why is it gated by E?, this is because the add on unit will have 'data' written to them only (write memory only) and as I mentioned in the previous month's copy of MiCo, the data is valid only when E goes high, therefore we only enable the device when the correct address is present and the data written to that address is valid.

A15	A14	A13	A12	A11	A10	A9	A8	A7	A6	A5	A4	A3	A2	A1	A0
0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0
0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	1
0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0
0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	1
0	0	0	0	0	0	0	1	0	0	0	0	0	1	1	0
0	0	0	0	0	0	0	1	0	0	0	0	0	1	1	1

Pin No	NAME	DESCRIPTION
1	GND	GROUND
2	GND	" "
3	D0	DATA BIT 0
4	D1	" " 1
5	D2	" " 2
6	D3	" " 3
7	D4	" " 4
8	D5	" " 5
9	D6	" " 6
10	D7	" " 7
11	R/W	READ/WRITE
12	A0	ADDRESS BIT 0
13	A1	" " " 1
14	A2	" " " 2
15	A3	" " " 3
16	A4	" " " 4
17	A5	" " " 5
18	A6	" " " 6
19	A7	" " " 7
20	A8	" " " 8
21	A9	" " " 9
22	A10	" " " 10
23	A11	" " " 11
24	A12	" " " 12
25	A13	" " " 13
26	A14	" " " 14
27	A15	" " " 15
28	E	MAIN MPU CLOCK
29	SEL	DISABLE SELECT
30	RESET	CLEAR SIGNAL
31	NMI	INTERUPT CPU
32	+5v	+5v @ 250 MA
33	GND	GROUND
34	GND	" "
35	NIL	SPARE
36	NIL	" "

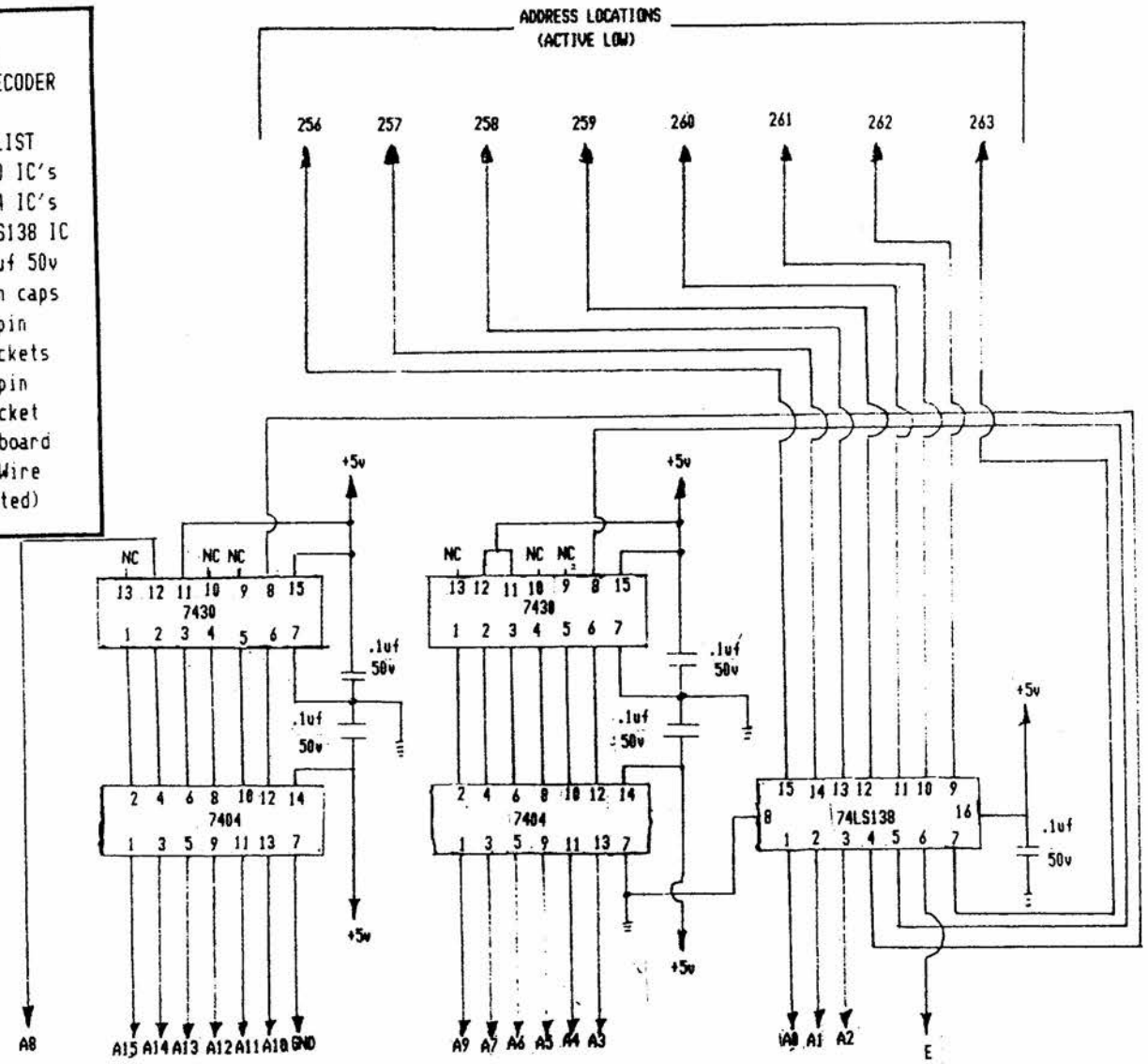
THE CIRCUIT:- Firstly let's look at the binary codes for the addresses we have selected.

You will notice that lines A3 to A15 do not change. The only lines that do change are A0 to A2. Therefore if we decode lines A3 to A15 to produce an enable siginal when this code is present (and only this code, if the code changes it will produce a disable siginal) by using 2 x 7430-8 input NAND gates, we have decoded 13 address lines. (This NAND gate requires all input to be high (8 X "1") for an output of an "0". If any one input goes low (1 X "0") the output goes high (1 X "1").

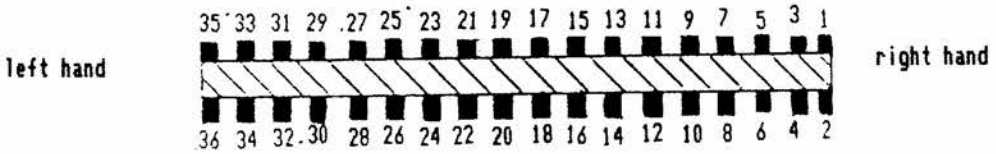
We therefore connect A8 (already a "1") directly to 1 input of the 7430, all other lines are an "0", so we have

SECTION A:
ADDRESS DECODER

PART LIST
2 - 7430 IC's
2 - 7404 IC's
1 - 74LS138 IC
5 - 0.1uf 50v green caps
4 - 14 pin sockets
1 - 16 pin socket
1 - IC board
Jumper Wire (insulated)



top



left hand

right hand

bottom

to invert (turn an "0" into a "1") these lines by using a 7404 IC inverter. By connecting as shown we will then produce an output of "0" from the 7430 IC when the binary code above is present. All unused input lines of the 7430 IC are held high by tying them to the positive 5V rail. The 2 output lines will then produce a decoded siginal for a block of memory begining at 256 and ending at 263. We still have to decode into single addresses, we do this by using a 74LS138 1 of 8 decoder IC which will suit the job. The output lines are active low when selected otherwise will be normally high. It has 3 input address lines to decode 1 of 8 addresses and 3 input gates to enable the IC.

We use the output "0's" from the 2 x 7430 NAND gates to enable 2 gates of the 74LS138 (they require an "0" to enable, a "1" to disable) which decodes the memory block, and A0 to A2 to select the single, exclusive address. Each address when decoded will produce an active low at the selected output, all other lines will be high. We require 1 more siginal to be fed to the 74LS138 and that is E clock. If all address siginals are present when E goes high, data on the data lines will be valid, this is why we gate it with E.

That's about it in a nut shell. For my next effort, I will present an add on Speech synthisizer with (at present) a 35 word vocabulary including 3 short melodies, and an unburnt ROM ready to program with your own vocabulary.

GUNNERY

by

Admiral Day. J.S

(John Day is a mad sailor from SA. I believe that he is planing a modification of this program for the America's Cup races to be held in Perth in '87. G.)

MiCo 4K

'Ullo, Sailor! Like to have a go at Naval Gunnery Practice without getting seasick? Well, here is a program in less than 4K which will give you all the excitement and satisfaction of operating a heavy Naval gun without all that nasty heaving motion.

The instructions give you most of the information necessary to play the game, and the graphics will create the rest of the illusion. Because the MC-10 has no BASIC command for explosive type noises, it is assumed that, for safety reasons, you are wearing the regulation Big Gun Earmuffs (MK.1-Aust.). You will, however, see the flash from your muzzle, and hear the scream of the shell as it flies (hopefully) towards the target.

Those of you unaccustomed to nautical terminology may find the directions a bit confusing at first, and concentration is needed to interpret the feedback and calculate your next shot. Fear not, however, you will not be required to count higher than twelve!

Incidentally, the graphics displaying the shell landing off target bear no relationship whatever to the accuracy of the shot!

HINT. Stick yourself in a corner, and aim your first round to the centre of the grid (6,6). And don't forget to INPUT both figures before you press ENTER.

Good Luck, matelots.

The Listing:

```
1 REM*****************************
2 REM  NAVAL GUNNERY EXERCISE
3 REM    BY JOHN DAY,(C),1984
4 REM*****************************
5 GOSUB2000
10 PRINTTAB(8)"GUNNERY PRACICE"
15 PRINT:PRINT
20 PRINT"YOU ARE THE gunnery off
icer BUT CANNOT SEE THE TARGET -
 A ROBOT ATTACK UNIT WHICH WILL
HIT YOUR"
21 PRINT"SHIP WITH A ROTTEN SQUI
D BOMB IFYOU DON'T HIT IT FIRST.
"
22 PRINT:PRINT"YOU ARE BOTH ON A
 12 X 12 GRID, AND TO FIRE YOU M
UST ENTER THE  COORDINATES SEPAR
ATED BY A COMMA"
24 PRINT"<<HIT #ENTER# TO TURN T
HE PAGE>>"
25 INPUTQ$
26 CLS
30 PRINT:PRINT"YOUR FEEDBACK SHO
WS THE POSITIONOF YOUR SHELLBURS
T RELATIVE TO  THE TARGET, not Y
OUR SHIP."
220 GOTO240
230 CLS
240 K=1:F=0:S=12
380 PRINT
390 H=1
400 INPUT"STATE YOUR POSITION";X
1,Y1
411 IFX1>SORX1<1ORY1>SORY1<1THEN
PRINT:GOTO400
420 PRINT"THE ROBOT TARGET IS IN
 POSITION!"
440 X2=RND(S):Y2=RND(S)
460 PRINT"LOAD ROUND"K;"AND FIRE
!"
470 INPUTX3,Y3
475 IFX3>SORX3<1ORY3>SORY3<1THEN
PRINT:GOTO460
478 GOSUB1200:GOSUB1500
480 K=K+1
490 F=F+1
510 IFX3-X2+Y3-Y2=0THEN1005
520 GOSUB1800
530 PRINT
540 PRINT"SHELLBURST TO THE ";
550 IFX2=X3THEN620
560 IFX2>X3THEN600
570 PRINT"AFT,";
590 GOTO620
600 PRINT"FORW'D,";
620 IFY2=Y3THEN700
630 IFY2>Y3THEN670
640 PRINT"STARB'D";
660 GOTO700
670 PRINT"PORT";
700 IFH=0THEN730
710 X4=6:Y4=6
730 PRINT:PRINT"TARGET SHOT AT"X
4","Y4
750 PRINT""
760 Q=X1-X4+Y1-Y4
770 IFQ=0THEN980
780 H=0
790 IFY4=Y1THEN880
800 A=1
810 IFY4-Y1<2THEN830
820 GOSUB1140
830 IFY4<Y1THEN860
840 Y4=Y4-A
850 GOTO880
860 Y4=Y4+A
870 IFY4>12THEN1110
880 IFX4=X1THEN970
890 A=1
900 IFX4-X1<2THEN920
```

```
910 GOSUB1140
920 IFX4<X1THEN950
930 X4=X4-A
940 GOTO970
950 X4=X4+A
960 IFX4>12THEN1130
970 GOTO460
980 GOSUB1600
981 PRINT@352,"":PRINT@366,"slop
"
985 PRINTTAB(8)"- WHAT A STINK -
"
986 PRINT"YOU HAVE BEEN HIT BY A
 ROTTEN                  SQUID!!"
988 PRINT:PRINT"NOW GO AND CLEAN
 IT UP!!"
990 PRINT
1000 GOTO1050
1005 GOSUB1300
1010 CLS:PRINT@172,"got it"
1011 PRINT"YOU HIT THE TARGET WI
TH ROUND"F"!!"
1020 PRINT
1050 PRINT"THE TARGET WAS AT "X2
","Y2
1060 PRINT
1070 INPUT"LIKE ANOTHER GAME?";Q
$
1080 IFLEFT$(Q$,1)="Y"THEN230
1100 IFLEFT$(Q$,1)="N"THENCLS:PR
INTTAB(8)"RIGHTO, SAILOR"
1101 PRINTTAB(7)"TAKE SHORE LEAV
E"
1103 GOSUB2100:END
1110 Y4=6
1120 GOTO880
1130 X4=6
1140 A=2
1150 RETURN
1200 FORT=1TO20:CLSRND(8):NEXT:C
LS0:RETURN
1300 FORI=1TO20:CLSRND(8):NEXT:C
LS0:SOUND150,10:RETURN
1500 FORT=255TO200STEP-1:SOUNDT,
1:NEXTT:RETURN
1600 FORJ=1TO20:CLSRND(8):NEXT:C
LS0:SOUND1,10
1620 FORX=1TO63:FORY=1TORND(20):
SET(X,Y,3):NEXTY,X
1630 RETURN
1800 CLS0
1810 FORX=0TO63:SET(X,16,3):NEXT
1820 FORX=30TO33:SET(X,15,4):NEX
T
1830 X=RND(63):IFX>30ANDX<40THEN
1830
1840 FORY=15TO0STEP-1:SET(X,Y,3)
:NEXT
1850 FORD=1TO200:NEXT
1860 FORY=0TO15:RESET(X,Y)
1870 FORD=1TO40:NEXTD,Y
1880 RETURN
2000 CLS0
2010 FORY=0TO9:SET(32,Y,3):NEXT
2020 SET(32,16,3)
2030 FORY=23TO31:SET(32,Y,3):NEX
T
2040 FORX=0TO21:SET(X,16,3):NEXT
2050 FORX=43TO63:SET(X,16,3):NEX
T
2060 FORX=23TO41:SET(X,11,4):SET
(X,21,4):NEXT
2080 FORY=12TO20:SET(23,Y,4):SET
(41,Y,4):NEXT
2100 FORL=1TO4:FORS=10TO90STEP5:
SOUNDS,1:NEXTS:FORD=1TO100:NEXTD
:NEXTL:CLS:RETURN
2101 REM END OF LISTING
```

OZ QUIZ

by Tom Lehane

Alan Bridges program AUSTRALIA was hitting the press when OZ QUIZ was being dumped to tape. Its interesting to find so many programmers working at a program based on the same idea. Some recent ones have been drawing programs that use the text screen. Congratulations on a fine program Alan.

Although both programs have the same theme the approaches have been completely different. I have made good use of the BASIC word GOSUB to set up the map of Australia using 'A' and 'X' as variables to change the values on each return from the FOR NEXT loop.

The program asks 10 questions and prints a report card for the number correct and wrong and your percentage. On each answer correct or wrong the program has a GOTO 120 and uses Z = RND(15) to select the next question. So that the program won't pick the same question twice in a row a check is made in line 153 to prevent this (IF Z = Q THEN 150). If the RND number is the same as the last go back and select another.

Another point worth noting is in line 100. MiCo and COLOR BASIC don't support RND(-TIMER) which RaNDoms TIMER to give a true random number on startup. Without RND(-TIMER) the same first numbers or questions can be predicted. The use of N=RND(0) inside an INKEY$ statement RaNDoms '0' until you press a key to start the game and this makes the number unpredictable because the user can't press any key at exactly the same time from startup.

THE LISTING:

```
 10 CLS 0
 20 PRINT@422, CHR$(228)+ CHR$(23
 8);
 30 PRINT@236,"OZ QUIZ";
```

```
40 PRINT@456, CHR$(235);
50 PRINT@489,"BY TOM LEHANE";
60 B=95
70 B=B+1:IFB=224 THEN 100
80 PRINT@B, CHR$(227);:PRINT@479
-B, CHR$(236);
90 GOTO  70
100 M= RND(0):PRINT@7,"ANY KEY T
O START";:IF  INKEY$="" THEN 100
110 RT=0:WR=0:CT=0
120 CLS
130 RESTORE
140 CT=CT+1
150 Z= RND(15)
153 IF Z=Q THEN 150
154 Q=Z
160 FOR T=1 TO Q
170 READ Z,B$,C$
180 NEXT T
190 PRINT@18,"*";
200 PRINT@43,"***";:PRINT@50,"**
";
210 PRINT@73,"******";:PRINT@81,
"****";
220 A=104:X=117
230 GOSUB  450
240 A=134:X=151
250 GOSUB  450
260 A=165:X=184
270 GOSUB  450
280 A=196:X=217
290 GOSUB  450
300 A=227:X=250
310 GOSUB  450
320 A=259:X=283
330 GOSUB  450
340 A=292:X=314
350 GOSUB  450
360 A=325:X=345
370 GOSUB  450
380 PRINT@358,"***";
390 A=369:X=376
400 GOSUB  450
410 A=403:X=407
420 GOSUB  450
430 PRINT@468,"***";:PRINT@501,"
*";
440 GOTO  490
450 FOR Y=A TO X
460 PRINT@Y,"*";
470 NEXT Y
480 RETURN
490 PRINT@Z, CHR$(201);
500 IF Q>8 THEN GOTO  770
510 IF Q<9 THEN GOSUB  730
520 INPUT R$
530 IF R$=C$ THEN GOSUB  890
540 IF R$<>C$ THEN GOSUB  790
550 FOR X=1 TO 800:NEXT
560 IF CT=10 THEN GOTO  940
570 GOTO  120
580 DATA 344,NEW SOUTH WALES,SYD
NEY
590 DATA 250,QUEENSLAND,BRISBANE
600 DATA 405,VICTORIA,MELBOURNE
610 DATA 469,TASMANIA,HOBART
620 DATA 368,SOUTH AUSTRALIA,ADE
LAIDE
630 DATA 325,WESTERN AUSTRALIA,P
ERTH
640 DATA 43,NORTHERN TERRITORY,D
ARWIN
650 DATA 343,AUSTRALIA,CANBERRA
660 DATA 436,STRAIT,BASS
670 DATA 18,PART OF AUSTRALIA,CA
PE YORK
680 DATA 18,STRAIT,TORRES
690 DATA 53,SEA,CORAL
700 DATA 221,OCEAN,PACIFIC
710 DATA 429,OCEAN,SOUTHERN
720 DATA 98,OCEAN,INDIAN
730 PRINT@352,"NAME";
740 PRINT@384,"THE CAPITAL";
750 PRINT@416,"OF-"B$
760 RETURN
770 PRINT@352,"NAME";:PRINT@384,
"THIS.."B$
780 GOTO  520
790 PRINT@170,"SORRY YOUR";
800 PRINT@202,"  ANSWER  ";
810 PRINT@234,"IS...WRONG";
820 WR=WR+1
830 FOR T=250 TO 50 STEP-20
840 SOUND T,1
850 PRINT@0,"ANSWER IS >";
860 PRINT@20,C$;
870 NEXT T
880 RETURN
890 RT=RT+1
900 PRINT@202,"the" CHR$(128)"an
swer";
910 PRINT@234,"is" CHR$(128)"cor
rect";
920 FOR K=100 TO 250 STEP5 :SOUN
D K,1:NEXT
930 RETURN
940 CLS :PRINTTAB(9)"REPORT CARD
"
950 PRINT@102,"NUMBER CORRECT ";
RT
960 PRINT@134,"NUMBER WRONG...";
WR
970 PRINT@166,"YOUR SCORE WAS ";
RT*10;"%";
980 PRINT@321," ANOTHER TEST (Y)
 OR (N)"
990 Z$= INKEY$
1000 IF Z$="Y" THEN RUN 110
1010 IF Z$="N" THEN CLS 6:END
1020 IF Z$="" THEN 990
```

SIGMUND FLOYD

The Psynichal Pychiatrist

by John Day

MiCo 4K

Floyd is another of my programs which does nothing but entertain, and I make absolutely no apology for this - there is far too little humour in programming at the moment.

Timing is of immense importance in this program. I wrote it eons ago, when I only had 4K on my machine, and wanted somthing like the far too serious and altogether unrealistic ELIZA, so there are not sufficient screen display alterations in the program to make it really funny. It is, however, a good indication of what can be achieved with properly constructed delays, and, I must admit, a good indication of my impression of the psychiatric industry!

The Listing:

```
5 REM:-FLOYD-:BY JOHN DAY
6 REM COPYRIGHT IS CLAIMED.
7 REM BUT NO RESPONSIBILITY
8 REM FOR DAMAGE TO THE
9 REM PSYCHE OF USERS.
10 CLS
20 PRINT:PRINTTAB(8)"SIGMUND FLO
YD"
30 PRINTTAB(8)"###############"
40 PRINTTAB(3)"PSYNICHAL PSYCHIA
TRIST"
50 PRINT:PRINT:PRINT
60 PRINT"WOULD YOU LIKE TO DISCU
SS YOUR  PROBLEMS WITH ME?"
70 PRINT"ENTER <Y> FOR YES, OR <
N> FOR NO"
80 INPUTA$
90 IFLEFT$(A$,1)<>"N"THEN170
95 CLS
100 PRINT:PRINT:PRINT:PRINT
110 PRINTTAB(8)"THEN WHY LOAD TH
E"
120 PRINTTAB(9)"BLOODY PROGRAM?"
130 FORT=1TO1500:NEXT
140 CLS:PRINT@270,"next"
150 SOUND200,10
155 FORT=1TO250:NEXT
160 CLS:END
170 CLS:PRINT"VERY WELL THEN, MA
KE YOURSELF  COMFORTABLE AND TY
PE TO ME. BUT DON'T USE PUNCTUAT
ION, AND ONLY"
180 PRINT"TYPE TWO LINES AT A TI
ME."
190 PRINT:PRINT"***********GO A
HEAD***********"
200 INPUTP$
205 PRINT
210 PRINT"YOUR FINGERS ARE AWFUL
LY COLD."
220 PRINT"WOULD YOU RUB YOUR HAN
DS       TOGETHER,PLEASE?"
230 FORT=1TO5000:NEXT
240 PRINT"THANK YOU. NOW WHAT WA
S IT YOU  SAID TO ME JUST THEN?"
250 INPUTP$
260 FORT=1TO1000:NEXT
270 CLS:PRINT"I'M GLAD YOU SAID
THAT, BECAUSE THE VERY SAME THIN
G HAPPENED TO ANOTHER PATIENT OF
 MINE."
280 GOSUB1000
290 CLS:PRINT"MIND YOU, AS A PRO
FESSIONAL, I  CAN'T REVEAL WHO I
T WAS, BUT I'MSURE YOU'LL UNDERS
TAND THAT,NOW,WON'T YOU?"
300 GOSUB1000
310 CLS:PRINT"WE ALL HAVE OUR DU
TY TO THE OLD HYPOCRYTICAL OATH,
 DON'T WE?"
320 GOSUB1000
330 CLS:PRINT"WHAT WAS I SAYING?
"
340 GOSUB1010
350 CLS:PRINT"OH. YES. THIS PATI
ENT OF MINE,  WHO SHALL REMAIN N
AMELESS, FOR  THE REASON STATED,
 HAD A......."
360 GOSUB1000
370 CLS:PRINT"I BEG YOUR PARDON,
 WHAT WAS IT  YOU SAID?"
380 INPUTQ$
390 CLS:PRINT"OF COURSE. I MUST
APOLOGIZE FOR THE LACK OF CONCEN
TRATION THERE."
400 PRINT"IT'S THIS RESEARCH I A
M DOING  AT THE MOMENT INTO THE
 PSYCHE OFANTHROPOMORPHIC ROBOTS
"
410 PRINT"CHALLENGED BY ASIMOV'S
 THREE  LAWS OF ROBOTICS, AND
IT'S"
420 PRINT"SO ABSORBING THAT I CA
N'T"
430 GOSUB1000
435 GOSUB1000
440 PRINT"CONCENTRATE ON anythin
g AT THE  MOMENT."
450 GOSUB1000
460 CLS:PRINT"BUT THAT'S NOT WHA
T WE ARE HERE TO DISCUSS, IS IT?
"
470 GOSUB1000
480 CLS:PRINT"NOW, WHAT ELSE IS
TROUBLING YOU AT THE MOMENT?"
490 INPUTR$
500 GOSUB1000
```

```
510 PRINT:PRINT"                WHAT?"
520 INPUTS$
530 GOSUB1010
540 CLS:PRINT"NOW, WE SHOULDN'T
BE INSULTING  TO OUR PSYCHIATRIS
T. THAT'S NOT NICE. NOR IS IT CO
NSTRUCTIVE."
550 PRINT"NOW LET'S HAVE THAT AG
AIN."
560 GOSUB1000
570 CLS:PRINT"BUT NICELY, THIS T
IME, EH?"
580 INPUTT$
590 GOSUB1000
600 CLS:PRINT"WELL, I NEVER DID"
602 GOSUB1010
605 CLS:PRINT"I'M NOT STANDING F
OR LANGUAGE   LIKE THAT."
607 GOSUB1010
608 CLS:PRINT:PRINT:PRINT:PRINT:
PRINT:PRINT:PRINT
609 PRINTTAB(12)"goodbye"
610 GOSUB1010
620 SOUND1,2
630 CLS:END
1000 FORT=1TO5000:NEXT:RETURN
1010 FORT=1TO2000:NEXT:RETURN
```

SCREENZOT

by Grahame Pollock

Here it is at last! The moment you've all been waiting for. . My very first machine language program, assembled from scratch by my own hot little hands.(all experienced assemblers should now turn to the next article- I don't want you lot laughing at me). Screenzot fills the screen with a specified character. It's a bit like a CLS, only with characters. I hope you can learn some machine language from it. I certainly have!

LISTING 1 is the assembly language part of the program and I will attempt to explain each line in it. It shows the memory locations for the 4K MC-10. If you have 20K then just add $4000 to each number in the second column.

LISTING 1

```
0010 SCRNZOT BY G.POLLOCK JAN85
0020 4FF2  CE 4000   LDX #4000
0030 4FF5  86 86     LDAA#86
0040 4FF7  A7 00     STAA 00,X
0050 4FF9  08        INX
0060 4FFA  8C 4200   CPX #4200
0070 4FFD  26 F8     BNE 24FF7
0080 4FFF  39        RTS
```

Memory location 4FF2 holds the HEX number CE which is the OPCODE for the assembly language instruction LDX. This means "load the index register". 4FF3 and 4FF4 hold the number that is to be loaded into the index register($4000). So, altogether line 0020 shows the instruction:-
"LOAD THE INDEX REGISTER WITH THE START OF THE SCREEN MEMORY(4000HEX)"

Memory location 4FF5 holds the OPCODE to load the A accumulator and location 4FF6 holds the HEX number 86 which stands for a graphics character. So line 0030 says:-

"LOAD THE A ACCUMULTOR WITH THE HEX NUMBER 86"

Location 4FF7 holds the OPCODE A7 which stands for STAA. 4FF8 holds 00, but I'm not really sure why it's there. Perhaps someone out there could tell me.(I can here you snickering Mike Turk).Now line 0040 says:-
"STORE THE CONTENTS OF ACCUMULATOR A INTO THE MEMORY LOCATION STORED IN THE INDEX REGISTER."

This means that the first location in screen memory (4000 HEX) has the ASCII code for a spcified character stored in it, and so it will display that character on the screen.

4FF9 holds the OPCODE 08 which stands for INX. This tells the computer to increment the index register. In other words, it adds 1 to the number stored in the index register. This means that the index register now points to the next screen location.

Locations 4FFA to 4FFC hold the instructions CPX #4200. This means that the computer will compare the number stored in the index register with $4200.

Locations 4FFA and 4FFE look at the comparison just made and will go to location 4FF7 if the two things compared are not equal. This means that it will continue to loop back from 4FFE to 4FF7 until the number stored in the index register reaches 4200(the end of screen memory). The number stored in the index register is increased by 1 every time it passes location 4FF9. This means it goes round the loop 512 times(200 HEX).

Now, I'll divert for a little while to explain about branching. One thing that had me stumped for a long time was the way that branching opcodes redirect the program flow. For example, how does the instruction:- 26 F8 , seen in line 0070 of listing 1 direct the program to memory location 4FF7 with just the number F8? Well, you've only got to learn to count forwards AND backwards in HEX(believe it or not!). To make this easier I'll expand the whole of listing 1. The first column is the memory location. The second column is the HEX number

that is stored in that location, and the third column is the hex count from the BNE opcode (26) found in 4FFD.

LOC.	STORED	COUNT
4FF2	CE	F3
4FF3	40	F4
4FF4	00	F5
4FF5	86	F6
4FF6	86	F7
4FF7	A7	F8
4FF8	00	F9
4FF9	08	FA
4FFA	8C	FB
4FFB	42	FC
4FFC	00	FD
4FFD	26	FE
4FFE	F8	FF
4FFF	39	00
5000		01
5001		02
5002		03

Please note that I've added 3 extra memory locations at the end, just to help in the HEX counting.

Now if we wanted to use BNE to direct the program flow to a different location, say 4FFA, then we would have FB after the BNE instead of the F8. If we wanted to branch to location 5002, then we would put the HEX number 03 into location 4FFE instead of the F8. Now, of course, with an assembler, all this is done for you. No need to count backwards in HEX.

Now, let's get back to listing 1. When the index register becomes 4200 HEX, then the program will pass through to location 4FFF. Here the computer is told to return to BASIC with the instruction RTS.

This program sounds as though it would take a long time(512 times through the loop and all!), but you wouldn't believe how fast it works. It fills the screen in an instant. You could do the same thing from BASIC but it'd be heaps slower. BASIC could do it with:-

```
FOR I=0TO511:PRINT#1,CHR$(134);:NEXTI
```

or with

```
FOR I=0TO511:POKE16384+I,134:NEXTI
```

You should be able to key in these 2 BASIC programs without any trouble, but how are you going to put in the assembled code shown in listing 1? Well it'd be ok if you had an assembler, but since you probably don't, I've given you listing 2.

Now listng 2 is MORE than just a BASIC driver for listing 1. It also locates the program at the highest memory and uses the USR command to access the program from BASIC, with a RND function giving a new character each time you press a key.

Lines 2+3 of listing 2 are "TRIPLECSAVE" to allow you to CSAVE"SCRNZOT" 3 times by entering RUN3.

Line 20 finds the top of memory and lines 25 and 30 CLEAR some space for the M/L program at the top of the memory.

Line 40 finds the top of the memory again because line 30 cleared it's value from X.

Lines 50-70 read the DATA(line100) and POKE it into memory. These DATA statements are the decimal values which correspond to the HEX numbers in listing 1(CE, 40, 00,86,86, etc).

Lines 80-90 tell the computer what to do when it encounters the USR(0) command (line110. When the program reaches line 110 P=USR(0), the computer looks to address 16917($4215) to find out what to do. Line 80 put the HEX value 7E into address 16917. This value is the opcode for JMP(JuMP to). The numbers stored in addresses 16918 and 16919 tell the computer where to JUMP TO.(the beginning of our M/L program).

Once the program has been RUN, it will only loop between lines 110 to 150. Each time you press any key, the code for a new character will be poked into location 4FF6(see listing 1) and then the M/L program is simply accessed again by line110 to give a different screen.

Have fun.

THE LISTING:

```
1 REM G.POLLOCK, 02 6035028
2 GOTO10
3 FORSV=1TO3:FORT=1TO3000:NEXTT:
CSAVE"SCRNZOT":PRINTSV:NEXTSV:EN
D
10 REM SCREENZOT
20 X=256*PEEK(16976)+PEEK(16977)
25 X=X-20
30 CLEAR20,X
40 X=256*PEEK(16976)+PEEK(16977)
45 X=X-12
50 FORZ=XTOX+13
60 READA
70 POKEZ,A:NEXT
80 POKE16917,126
90 POKE16918,INT(X/256):POKE1691
9,X-INT(X/256)*256
100 DATA 206,64,0,134,134,167,0,
8,140,66,0,38,248,57
110 P=USR(0)
140 IFINKEY$=""THEN140
145 D=RND(223)
150 POKEX+4,32+D:GOTO110
200 FORI=36842TO36870:PRINTI;PEE
K(I):NEXTI
```

DOCULIST/M

by Mike Turk

INTRODUCTION

DOCULIST/M is a print reformatting utility. It can be RUN against an existing BASIC program to produce a neat, readable listing of an otherwise unreadable program with compressed multi-statement lines. The program uses the techniques explained in last months article (LOOKING INSIDE BASIC), to scan through the BASIC code; it takes care of all the spacing for you.

To use this program:

1. CLOAD the program you wish to DOCULIST
2. Append or merge DOCULIST
3. Type in RUN 60000.

To append DOCULIST type in POKE147,PEEK(149):POKE148,PEEK(150) then CLOAD DOCULIST.

To merge DOCULIST with the already LOADed program type N=256*PEEK(149)+PEEK(150)-2:POKE147,INT(N/256):POKE148, N-256*INT(N/256) then CLOAD DOCULIST and type in POKE147,67:POKE148,70

DOCULIST/M is based on J. Barbarello's DOCULIST/C (Hot CoCo June 1983 p58-63) which performs the same function for the Color Computer. I hve provided two versions of DOCULIST. DOCULIST/M is for 80 column printers and DOCULIST/32 for 32 column printers.

DESCRIPTION OF CODE

For a detailed description of how DOCULIST scans down BASIC lines and sets up its table to interpret BASIC tokens see last months article (CoCo pg48). The comments which follow refer to DOCULIST/M. DOCULIST/32 is an adaption of DOCULIST/M so I will not duplicate the explanation.

VARIABLES:

S	Start of current BASIC line
F$	Filler
F	First line
X$	Print line
X	General purpose counter
G	Line counter
N	Address of next BASIC line
L	Current line number
I	General purpose counter
P	Character being processed
Q	Quote or REM flag
A(73)	Pointer to BASIC keywords
Y	General purpose counter
J	General purpose counter

COMMENTARY

60000 Reserve space for strings and display the title.
60010 Initialise, point to the start of BASIC.
60012 Turn on underline (for AMUST 80DT), you may have to omit this or substitute your own printer's control code.
60015 Get the title, centre it, print it, set the line counter for a future page feed.
60017 Turn underline off.
60020 Get the address of the start of the next BASIC line, get the current line number, if there are no more BASIC lines then END. You will note that in the formatted version I omitted part of the END condition to allow DOCULIST to format itself. (IFN=00R)599999THENEND)
60030 If the first line has not yet been reached then point to the next BASIC line and loop back.
60040 Format and print the line number.
60050 Scan within the the BASIC line, get a character, if it is a quote then switch the quote flag.
60060 If the character is not a token, colon or within quotes (or REM) then add it to the print string and skip the next few lines.
60070 If the character is a colon then branch to deal with it.
60080 Prepare to interpret a token, if it is a REM then set the quote flag.
60090 Pad out the line for printing.
60100 Interpret the token.
60110 It is not the end of the keyword yet.
60120 End of keyword.
60130 Check the line length and if long enough go and print it.
60140 Loop back to continue along the same line, if you fall through finish off printing the remainder and get the next line.
60160 Omit multiple colons
60170 Go and print.
60180 If it is long enough print a line then set up the next.
60190 Make sure a short line is printed.
60200 Format the start of a line beginning with a colon and clear the quote flag.
60210 Increment the line counter and check for the need to page feed.
60220 Page feed and reset the line count.
60230/40 Subroutine to build BASIC keyword pointer table.

As I do not have a 32 column printer I was not able to ensure DOCULIST/32 does not give unwanted line feeds when the line is full. If this is a problem one solution is to change 31 to 30 in lines 60130 and 60180 and 32 to 31 in line 60180.

Formatted Listing:

```
60000 CLEAR 500
      :CLS
      :PRINT
      :PRINT "DOCULIST/M CONVERTED FROM J. BARBARELLO'S DOCULIST/
       C TO RUN ON THE MC/10 BY M.TURK DEC 84"
60010 PRINT
      :PRINT "INITIALISING"
      :GOSUB 60230
      :PRINT
      :PRINT "PRINTING"
```

```
    :PRINT
    :S = 17222
    :F$ = '
    :INPUT 'FIRST LINE';F
60012 LPRINT CHR$ (27);'-'; CHR$ (1);
    :REM  UNDERLINE ON
60015 PRINT
    :INPUT 'TITLE';X$
    :FOR X = 1 TO INT ((80 - LEN (X$)) / 2)
    :X$ = ' ' + X$
    :NEXT
    :LPRINT
    :LPRINT
    :LPRINT
    :LPRINT X$
    :LPRINT
    :LPRINT
    :G = 6
```

Listing 1:

```
60000 CLEAR500:CLS:PRINT:PRINT"D
OCULIST/M CONVERTED FROM J. BARB
ARELLO'S DOCULIST/C TO RUN ON TH
E MC/10 BY M.TURK DEC 84"
60010 PRINT:PRINT"INITIALISING":
GOSUB60230:PRINT:PRINT"PRINTING"
:PRINT:S=17222:F$="                ":
INPUT"FIRST LINE";F
60012 LPRINTCHR$(27);"-";CHR$(1)
;:REM UNDERLINE ON
60015 PRINT:INPUT"TITLE";X$:FORX
=1TOINT((80-LEN(X$))/2):X$=" "+X
$:NEXT:LPRINT:LPRINT:LPRINT:LPRI
NTX$:LPRINT:LPRINT:G=6
60017 LPRINTCHR$(27);"-";CHR$(0)
;:REM UNDERLINE OFF
60020 N=256*PEEK(S)+PEEK(S+1):L=
256*PEEK(S+2)+PEEK(S+3):IFN=00RL
>59999THENEND
60030 IFL<FTHENS=N:GOTO60020
60040 X$="":FORX=1TO10-LEN(STR$(
L)):X$=X$+" ":NEXTX:X$=X$+STR$(L
)+" "
60050 FORI=S+4TON-2:P=PEEK(I):IF
P=34THENQ=ABS(Q-1)
60060 IFP<128ANDP<>58ORQTHENX$=X
$+CHR$(P):GOTO60130
60070 IFP=58THEN60160
60080 P=P-128:IFP=3THENQ=1
60090 IFRIGHT$(X$,1)<>" "ANDRIGH
T$(X$,1)<>":"THENX$=X$+" "
60100 FORY=A(P)TOA(P)+7:IFPEEK(Y
)>128THEN60120
60110 X$=X$+CHR$(PEEK(Y)):NEXTY
60120 X$=X$+CHR$(PEEK(Y)-128)+"
"
60130 IFLEN(X$)>69THENGOSUB60180
60140 NEXTI:S=N:GOSUB60180:GOTO6
0020
60160 IFPEEK(I+1)=58THENI=I+1:P=
PEEK(I):GOTO60160
60170 GOSUB60180:GOTO60130
60180 IFLEN(X$)>69THEN:LPRINTLEF
T$(X$,70):X$=F$+" "+RIGHT$(X$,LE
N(X$)-70):GOTO60210
60190 IFLEN(X$)>12THENLPRINTX$
60200 X$=F$+":":Q=0
60210 G=G+1:IFG<60THENRETURN
60220 G=6:FORX=1TO12:LPRINT:NEXT
:RETURN
60230 DIMA(73):A(0)=57413:J=1:FO
RI=57413TO57670:IFPEEK(I)>128THE
NA(J)=I+1:J=J+1
60240 NEXT:RETURN
```

Listing 2:

```
60000 CLEAR500:CLS:PRINT:PRINT"D
OCULIST/32 32 COLUMN VERSION OF
DOCULIST/M M.TURK JAN 85"
60010 PRINT:PRINT"INITIALISING":
GOSUB60230:PRINT:PRINT"PRINTING"
:PRINT:S=17222
60015 PRINT:INPUT"TITLE";X$:FORX
=1TOINT((32-LEN(X$))/2):X$=" "+X
$:NEXT:LPRINT:LPRINTX$
60020 N=256*PEEK(S)+PEEK(S+1):L=
256*PEEK(S+2)+PEEK(S+3):IFN=00RL
>59999THENEND
60030 IFL<FTHENS=N:GOTO60020
60040 X$="":LPRINT:LPRINT"*"STR$
(L)
60050 FORI=S+4TON-2:P=PEEK(I):IF
P=34THENQ=ABS(Q-1)
60060 IFP<128ANDP<>58ORQTHENX$=X
$+CHR$(P):GOTO60130
60070 IFP=58THEN60160
60080 P=P-128:IFP=3THENQ=1
60090 IFRIGHT$(X$,1)<>" "ANDRIGH
T$(X$,1)<>":"THENX$=X$+" "
60100 FORY=A(P)TOA(P)+7:IFPEEK(Y
)>128THEN60120
60110 X$=X$+CHR$(PEEK(Y)):NEXTY
60120 X$=X$+CHR$(PEEK(Y)-128)+"
"
60130 IFLEN(X$)>31THENGOSUB60180
60140 NEXTI:S=N:GOSUB60180:GOTO6
0020
60160 IFPEEK(I+1)=58THENI=I+1:P=
PEEK(I):GOTO60160
60170 GOSUB60180:GOTO60130
60180 IFLEN(X$)>31THEN:LPRINTLEF
T$(X$,32):X$=RIGHT$(X$,LEN(X$)-3
2):GOTO60210
60190 IFLEN(X$)>0THENLPRINTX$
60200 X$=F$+":":Q=0
60210 RETURN
60220 RETURN
60230 DIMA(73):A(0)=57413:J=1:FO
RI=57413TO57670:IFPEEK(I)>128THE
NA(J)=I+1:J=J+1
60240 NEXT:RETURN
```

ZELTOID

by Matthew Wiltshire

MiCo 20K

Matthew is 13 years old and he writes:

"I have written a program called ZELTOID. I have had a MiCo for 1 year now. I have worked on this program for about 1/2 a year, trying to perfect it. It's for a 20K machine.

After the heading is put up press any key. In the difficulty factor '1' is easy '4' is hard.

The object of the game is to try and land as many space craft as possible. You get more points landing on the landing pads nearer the sides. The score and how many men you have left is printed at the bottom of the screen."

We're more than glad to print your program Matthew. I enjoyed playing ZELTOID although I crashed more often than I managed to successfully land. Then I'm never any good at games. Graham the expert mastered it in no time flat.

(Kevin)

The Listing:

```
1 CLS0
2 C=7
5 FORL=13TO18:SET(14,L,C):SET(15
,L,C):SET(22,L,C):SET(23,L,C):SE
T(32,L,C):SET(33,L,C):SET(38,L,C
):SET(39,L,C):SET(42,L,C)
6 SET(43,L,C):SET(48,L,C):SET(49
,L,C):SET(54,L,C):SET(55,L,C):SE
T(58,L,C):SET(59,L,C):NEXTL
7 FORL=5TO10:SET(L,13,C):SET(L,1
8,C):NEXTL:FORL=14TO19:SET(L,13,
C):SET(L,18,C):NEXTL:FORL=24TO27
:SET(L,13,C):SET(L,18,C):NEXTL
8 FORL=24TO27:RESET(L,13):NEXTL
9 FORL=30TO35:SET(L,13,C):NEXTL:
FORL=39TO42:SET(L,13,C):SET(L,18
,C):NEXTL:FORL=46TO51:SET(L,13,C
):SET(L,18,C):NEXTL
10 FORL=54TO58:SET(L,13,C):SET(L
,18,C):NEXTL:RESET(59,13):RESET(
59,18):RESET(38,13):RESET(38,18)
:RESET(43,13):RESET(43,18)
11 Q=10:W=14:FORL=1TO5:SET(Q,W,C
):Q=Q-1:W=W+1:NEXTL:Q=9:W=14:FOR
L=1TO5:SET(Q,W,C):Q=Q-1:W=W+1:NE
XTL
12 Q=8:W=14:FORL=1TO5:SET(Q,W,C)
:Q=Q-1:W=W+1:NEXTL
13 SET(16,16,C):SET(17,16,C):RES
ET(4,18)
14 IFINKEY$=""THEN14:CLS0
15 CLS0:INPUT"WHAT DIFFICULTY FA
CTOR WOULD     YOU LIKE <1-4>";D
16 IF D<1ORD>4THEN15
50 CLS8:PRINT@258,"USE ARROWS TO
 MOVE AND SPACE";:PRINT@330,"BAR
 TO DROP";
65 PRINT@453,"PRESS ANY KEY TO S
TART";
70 IFINKEY$=""THEN70
95 B=0
99 BB=3
100 CLS0
110 SET(16,28,4)
120 SET(15,27,4):SET(16,27,4)
130 SET(17,27,4):SET(14,26,4)
140 SET(15,26,4):SET(16,26,4)
150 SET(17,26,4):SET(18,26,4)
160 SET(32,28,4)
170 SET(31,27,4):SET(32,27,4)
180 SET(33,27,4):SET(30,26,4)
190 SET(31,26,4):SET(32,26,4)
200 SET(33,26,4):SET(34,26,4)
210 SET(47,28,4)
220 SET(46,27,4):SET(47,27,4)
230 SET(48,27,4):SET(45,26,4)
240 SET(46,26,4):SET(47,26,4)
250 SET(48,26,4):SET(49,26,4)
260 FORL=0TO63
270 SET(L,31,2):SET(L,30,2)
280 SET(L,29,2)
290 NEXTL
300 SET(0,28,6):SET(1,28,6)
310 SET(2,28,6):SET(3,28,6)
320 SET(0,27,6):SET(1,27,6)
330 SET(2,27,6):SET(0,26,6)
340 SET(1,26,6):SET(0,25,6)
350 SET(63,28,6):SET(62,28,6)
360 SET(61,28,6):SET(60,28,6)
370 SET(63,27,6):SET(62,27,6)
380 SET(61,27,6):SET(63,26,6)
390 SET(62,26,6):SET(63,25,6)
400 A1=1:A2=2:A3=3:A4=4:A5=5:A0=
0
 405 A$=INKEY$
 410 FORL=1TO2
 420 GOTO425
 425 SET(A0,0,8):SET(A1,0,8)
 430 SET(A2,0,8):SET(A3,0,8)
 440 SET(A4,0,8):SET(A5,0,8)
 450 SET(A1,1,8):SET(A2,2,8)
 460 SET(A3,2,8):SET(A4,1,8)
 465 SET(A1,2,8):SET(A4,2,8)
 470 A$=INKEY$
 475 IFA$=CHR$(32)THEN680
 476 IFPOINT(60,0)=8THEN540
 480 FORXX=A0TOA5
 490 RESET(XX,0):RESET(XX,1):RESE
 T(XX,2):NEXTXX
 500 A0=A0+3:A1=A1+3:A2=A2+3
 510 A3=A3+3:A4=A4+3:A5=A5+3
```

```
530 GOTO420
540 SET(A0,0,8):SET(A1,0,8)
550 SET(A2,0,8):SET(A3,0,8)
560 SET(A4,0,8):SET(A5,0,8)
570 SET(A1,1,8):SET(A2,2,8)
580 SET(A3,2,8):SET(A4,1,8)
585 SET(A1,2,8):SET(A4,2,8)
586 A$=INKEY$
587 IFA$=CHR$(32)THEN680
590 IF POINT(1,0)=8 THEN 660
600 FORXX=A0TOA5
610 RESET(XX,0):RESET(XX,1):RESE
T(XX,2):NEXTXX
630 A0=A0-3:A1=A1-3:A2=A2-3
640 A3=A3-3:A4=A4-3:A5=A5-3
650 GOTO540
660 NEXTL
670 CLS5:PRINT@266,"**TOO LATE**
";
672 FORL=1TO2000:NEXTL
673 CLS:PRINT:PRINT:PRINT"SCORE=
";B;:PRINT:PRINT:PRINT
674 GOSUB9000
675 INPUT"ANOTHER GAME (Y/N)";N$
677 IFN$="Y"THENGOTO100
678 CLS:PRINT@264,"HAVE A NICE D
AY";:END
680 FORKK=1TO1000:NEXTKK:RESET(A
2,2):RESET(A3,2)
700 B1=4:B2=5
710 Q=RND(4):W=RND(4):E=RND(4):R
=RND(4)
720 T=RND(24):Y=RND(24):U=RND(24
):I=RND(24)
725 CC=RND(24):MB=RND(24):RT=RND
(24)
730 IFT=<5THEN720
740 IFY=<5THEN720
750 IFU=<5THEN720
760 IFI=<5THEN720
765 IFCC=<5THEN725:IFMB=<5THEN72
5:IFRT=<5THEN725
770 G=61:GG=61
775 DR=61:DJ=61
776 DT=0:DX=0
777 F=0:FF=0:FFF=0
800 SET(A1,B2,5):SET(A2,B1,5)
810 SET(A3,B1,5):SET(A4,B2,5)
820 SET(F,T,Q):SET(FF,Y,W):SET(F
FF,U,R)
825 SET(DR,CC,Q):SET(DX,RT,W):SE
T(DT,CC,R):SET(DJ,MB,W)
830 SET(G,U,E):SET(GG,I,R)
840 FORL=14TO18:IFPOINT(L,24)=5T
HEN2000:IFPOINT(L,23)=5THEN2000:
IFPOINT(L,22)=5THEN2000:IFPOINT(
L,21)=5THEN2000
845 NEXTL
850 FORL=30TO34:IFPOINT(L,24)=5T
HEN8000:IFPOINT(L,23)=5THEN8000:
IFPOINT(L,22)=5THEN8000:IFPOINT(
L,21)=5THEN8000
855 NEXTL
860 FORL=45TO49:IFPOINT(L,24)=5T
HEN2000:IFPOINT(L,23)=5THEN2000:
IFPOINT(L,22)=5THEN2000:IFPOINT(
L,21)=5THEN2000
865 NEXTL
870 IFPOINT(A1,B2)=<4THEN4000
880 IFPOINT(A2,B1)=<4THEN4000
890 IFPOINT(A3,B1)=<4THEN4000
900 IFPOINT(A4,B2)=<4THEN4000
910 FORL=0TO63:IFPOINT(L,29)=5TH
EN6000
911 NEXTL
912 RESET(F,T):RESET(FF,Y)
913 RESET(G,U):RESET(GG,I)
914 RESET(FFF,U):RESET(GGG,Y)
915 RESET(A1,B2):RESET(A2,B1)
917 RESET(A3,B1):RESET(A4,B2)
918 RESET(DR,CC):RESET(DX,RT):RE
SET(DT,CC):RESET(DJ,MB)
919 FORL=1TO3
920 A$=INKEY$
930 IFA$="W"THENB1=B1-1:B2=B2-1
940 IFA$="Z"THENB1=B1+1:B2=B2+1
950 IFA$="A"THENA1=A1-2:A2=A2-2:
A3=A3-2:A4=A4-2
969 IFA$="S"THENA1=A1+2:A2=A2+2:
A3=A3+2:A4=A4+2
970 NEXTL
1010 B1=B1+1:B2=B2+1
1011 IFD=1 THENDX=DX+1
1012 IFD=2THENDX=DX+1:DR=DR-1
1013 IFD=3THENDX=DX+1:DR=DR-1:DT
=DT+1
1014 IFD=4THENDX=DX+1:DR=DR-1:DT
=DT+1:DJ=DJ-1
1019 FFF=FFF+1:GGG=GGG-1
1020 F=F+2:FF=FF+4:G=G-3:GG=GG-5
1021 IF F=>63THENF=F-63
1022 IF FF=>63THENFF=FF-63
1023 IF G=<0THENG=G+63
1024 IF GG=<0THENGG=GG+63
1025 IF FFF=>63THENFFF=FFF-63
1026 IFDX=>63THENDX=0:IFDR=<0THE
NDR=63:IFDT=>63THENDT=0:IFDJ=<0T
HENDJ=63
1027 SOUND222,1
1028 PRINT@500,B;
1029 PRINT@480,BB;
1030 GOTO800
2000 B=B+1150
2005 IFB=>20000THENBB=BB+1
2040 GOTO100
4000 FORL=1TO5:FORO=1TO8:CLSO
4010 PRINT@259,"YOU WERE HIT BY
AN ASTEROID";
4015 SOUND1,1:NEXTO
4017 NEXTL
```

```
4020 BB=BB-1
4025 IFBB=0THEN673
4030 GOTO100
6000 PRINT@266,"YOU CRASHED";:FO
RL=1TO1000:NEXTL:GOTO673
6040 RETURN
8000 B=B+405
8005 IFB=>20000THENBB=BB+1:GOTO1
00
8010 GOTO100
9000 PRINT"RATING:-";
9010 IFB=<2000THENPRINT"NOVICE";
:PRINT:PRINT:PRINT
9020 IFB>5000ANDB=<10000THENPRIN
T"VERY GOOD";:PRINT:PRINT:PRINT
9030 IFB=>20000THENPRINT"PROFESS
IONAL";:PRINT:PRINT:PRINT
9035 IFB<20000ANDB>10000THENPRIN
T"EXELENT";:PRINT:PRINT:PRINT
9040 RETURN
```

DECIMAL/ROMAN NUMERAL CONVERSIONS

by Lesley Kosowski

MiCo 4K

I have been using my MC-10 to solve a variety of problems for close on a year now. One of these has been this rather novel application to convert between decimal and roman numerals or vice-versa.

Operation of the program is straight forward with instructions included at the start of the program. Due to the MC-10's lack of appropriate characters for the larger roman numerals the program is restricted to values less than 5000 but that should not prove too much of a restraint.

The Listing:

```
10 CLS:CLEAR120:FORI=1TO32:PRINT
"*";:NEXTI
11 PRINT"*    DECIMAL - ROMAN NUM
ERAL     *";
12 PRINT"*       CONVERSION PROGRA
M.       *";
13 PRINT"*  WRITTEN BY LESLEY KO
SOWSKI   *";
14 PRINT"*          FEBRUARY 1985.
         *";:FORI=1TO32:PRINT"*";
:NEXTI
15 MES1$="ILLEGAL ROMAN NUMERAL"
16 PRINT:PRINT"DECIMAL NUMBERS M
UST BE INTEGERS GREATER THAN ZER
O AND LESS THAN 5000."
17 PRINT"ROMAN NUMERALS ARE MADE
 UP OF THE LETTERS I=1, V=5, X=1
0, L=50, C=100, D=500, M=1000."
18 PRINT
20 INPUT"ENTER THE DECIMAL NUMBE
R OR ROMAN NUMERAL (Q TO QUIT)";
A$:IFA$="Q"GOTO250
30 IFASC(LEFT$(A$,1))>57GOTO100
40 A=VAL(A$):IFA>4999THENPRINT"T
OO LARGE!!!":GOTO20
50 R=A/1000:M=INT(R):R1=A-M*1000
60 S=R1/100:C=INT(S):S1=R1-C*100
70 T=S1/10:X=INT(T):I=S1-X*10
75 REM M=NUMBER OF 1000'S, C=100
'S, X=10'S, I=1'S
80 GOTO200
100 B$=A$+"Q":M=0:C=0:X=0:I=0
110 N$=LEFT$(B$,2):L$=LEFT$(N$,1
):R$=RIGHT$(N$,1):L=LEN(B$)
120 IFL$="M"ANDR$="M"THENM=M+1
121 IFL$="M"ANDR$="C"THENM=M+1
122 IFL$="M"ANDR$="D"THENM=M+1
123 IFL$="M"ANDR$="X"THENM=M+1
124 IFL$="M"ANDR$="L"THENM=M+1
125 IFL$="M"ANDR$="V"THENM=M+1
126 IFL$="M"ANDR$="I"THENM=M+1
127 IFL$="M"ANDR$="Q"THENM=M+1:G
OTO180
130 IFL$="D"ANDR$="C"THENC=C+5
131 IFL$="D"ANDR$="L"THENC=C+5
132 IFL$="D"ANDR$="X"THENC=C+5
133 IFL$="D"ANDR$="V"THENC=C+5
134 IFL$="D"ANDR$="I"THENC=C+5
135 IFL$="D"ANDR$="Q"THENC=C+5:G
OTO180
136 IFL$="C"ANDR$="C"THENC=C+1
137 IFL$="C"ANDR$="L"THENC=C+1
138 IFL$="C"ANDR$="X"THENC=C+1
139 IFL$="C"ANDR$="V"THENC=C+1
140 IFL$="C"ANDR$="I"THENC=C+1
141 IFL$="C"ANDR$="M"THENC=C+9:B
$=RIGHT$(B$,L-1):L=LEN(B$):IFLEF
T$(B$,2)="MC"THENPRINTMES1$:GOTO
20
142 IFL$="C"ANDR$="D"THENC=C+4:B
$=RIGHT$(B$,L-1):L=LEN(B$):IFLEF
T$(B$,2)="DC"ORC>4THENPRINTMES1$
:GOTO20
143 IFL$="C"ANDR$="Q"THENC=C+1:G
OTO180
150 IFL$="L"ANDR$="X"THENX=X+5
151 IFL$="L"ANDR$="V"THENX=X+5
152 IFL$="L"ANDR$="I"THENX=X+5
153 IFL$="L"ANDR$="Q"THENX=X+5:G
OTO180
154 IFL$="X"ANDR$="X"THENX=X+1
155 IFL$="X"ANDR$="V"THENX=X+1
156 IFL$="X"ANDR$="I"THENX=X+1
157 IFL$="X"ANDR$="L"THENX=X+4:B
```

continued on P 60 ..

soft gold

Our thanks to John Pollard, for his article this month for users of the Tandy 100 (as it is now called).

John, in fact also supplied a small article on the latest Tandy portable, the Tandy 200. We will bring you further news of this little cutie next month. (And of course, John's article!)

We look forward to more articles like John's. We know the articles are out there, it is just a matter of getting you folk into the habit of putting something back into your hobby!

As you will have read elsewhere, I spent some time at the Personal Computer Show during March, and fell in love with the 1000!

It is a computer with few vices.

To stir Ken Allen, Tandy's buyer, I picked an IBM software reseller at the show, and asked for a loan of a selection of programs. I was determined to find something that wouldn't run!

Didn't work like that did it! Ten randomly selected programs later I gave up - they all worked faultlessly!

Australian pricing was finalised whilst I was there, and it looks like the basic 128K unit with keyboard, will be $1999. You'll have to add a monitor to that price to get going.

Tandy's price is around the $360 mark for a good quality high resolution green screen. We think that there are a lot of monitors around that will be quite good enough alternatives, and of course, the first one to be tested will be our own amber screen monitor.

There is a color monitor available from Tandy, and it reveals to perfection, the crisp quality of the graphics of the 1000. It is priced at $799 (from memory), but when you see it work, you'll agree that it is worth every penny!

Other options include extra memory - and we will be reporting on the installation proceedure of these units soon; and a new, made in Australia (!) modem.

I'm sorry to be raving, but I think you might have to get used to it! It'll be worse when we get our first 1000 next week!

We have been working with a number of suppliers who will be supplying software for the 1000 as soon as it is released. Next month, we'll have a list of these people. There will also be a list on CoCoLink, which has a section for the 1000.

SOFT LOCK

by John Pollard

It seems that we TRS80 Model 100 (M100) users in Australia will have to come good with some tips and hints and the like for ourselves if we are to make something of "Soft Gold". (We can't leave it all to the extremely clever and productive Delbourgo family.)

Slowly the American PCM magazine has disappeared from the scene - maybe not a bad thing, for at some stage we need to have a go ourselves. The last days of PCM/GoCo saw the M100 being pushed out by big brother computers like the 2000 and probably now the 1000 and 1200.

Certainly the M100 makes an ideal companion for another machine - but in Australia who uses the ones mentioned above? Never mind, it looks like from now on the M100 is going to be treated as purely an adjunct of some other machine.

How do you use your M100? Since we may never get around to running a survey I will indicate my equipment and use. Your's will be different- but we might as well start somewhere. Perhaps you could do the same when you send in your contribution.

At work I use the M100 as a terminal to a computer network. It is connected in parallel with a Model 3 which provides a switchable keyboard with the M100 as well as a dual screen display. The model 3 provides programmable keys and an asynchronous print buffer connected to a Tandy DMP-110 printer. At home I have a simular arrangement but with 'ye old faithful' model 1 and a line printer VII. I do most data entry via the beautiful keyboard of the M100. Being a two finger expert I have found the the M100 keyboard suits my style better than any other keyboard I have used.

My input has probably increased by 50% using the M100 and this coupled with the ability the send and receive files from other computers makes the M100 a great companion machine.

Well now a small M100 program as a contribution to "Soft Gold". The program provides a software lock so that when the M100 is turned on, a password is requested (and every few seconds a new one is requested to a maximum of three). If the password is not known then the owner's

name and phone number appear for a time before the machine is powered down. This idea is not new as Richard Rogers (GoCo, Feb. '84 P 33-34) described one such scheme. Lately a similar idea has been used by John Anderson and Mark Kushinsky (Creative Computing, Dec '84 P 190). Unfortunately they can be broken either by holding down the BREAK key before switching on or by using the PRINT and then BREAK key whilst running. The present program overcomes these deficiencies (and may have some of its own - but I hope not). Since I began microcomputing on the model 1 when it was a level 1 machine with 4K of memory, my main coding aim is to minimize the use of available RAM. Following this approach, the attached program contains no comments and is packed together like spectators at an Aussie rules final.

The installation steps are:

(1) Enter the program without the ONERRGOTO6:, (then you can always break out with PRINT followed by BREAK if things get desperate!)

(2) Save your valuable programs and data on tape,for when the program is run (later with the ONERR in place) you may have to resort to a cold start if something has been entered in error.

(3) Replace MY PASSWORD in line 4 by your (up to 20 characters) password (and don't forget it) and MY DETAILS in line 5 by yours (I don't want to have to collect lost M100's from other parts of Australia),

(4) Save as, say, "pwd",

(5) Run "pwd" from the main menu and the machine will power down, but you might as well turn it off at the switch as well,

(6) Turn the machine on and quickly enter your password (mind that the CAPS or NUM locks are not down).

(7) To obtain more attemps to enter the password change line 1 to N=5

(8) For slow typists change line 1 to ....:M=1000

(9) When satisfied that all is well reinstate the ONERRGOTO6: coding and hope you never forget the password. Of course you could change it every so often but then you might be more prone to forget it. (I did during testing the program. I don't want to do that again!)

To utilize the "Soft Lock" always exit from the M100 by executing "pwd"- step (5) above.

The Listing:

```
1 POKE63056,128:POWEROFF,RESUME:ONERRORG
OTO6:CLS:N=3:M=500
2 FORJ=1TON:PRINT"Password : ";:B$=""
3 FORI=1TOM:A$=INKEY$:IFA$=""THENNEXTI:G
OTO4ELSEIFA$=CHR$(13)THEN4ELSEB$=B$+A$:P
RINT"*";:IFLEN(B$)<20THEN3
4 IFB$="my password"THENPOKE63056,0:MENU
ELSEPRINT"?":NEXTJ
5 CLS:PRINT"Please return to ...":PRINT"
John Pollard, phone Sydney (02) 525 2118
":FORJ=1TO3000:A$=INKEY$:NEXTJ:GOTO1
6 RESUME0
```

GUESS SUMS

by Bob Delbourgo

GUESS SUMS is an arithmetic game for up to five players.

Hidden in PoCo are five integers, the aim being to discover their individual values. You are given two clues to set you off, their total sum and product. You may ask for up to 10 further clues in the form of sums and products of sub-sets of these numbers. Then, when ready, you may attempt to guess the hidden integers.

PoCo will naturally keep score for you, all that remains is to pit your wits against the machine.

Have fun!

The Listing:

```
10 CLS:PRINTCHR$(27)"p";:PRINT@7," GUESS
UMS - Bob Delbourgo ":PRINTCHR$(27)"q";:
PRINT@40,STRING$(40,167);
20 PRINT"Five INTEGERS A,B,C,D,E are hid
den in  POCO. You are provided with two
 initial clues, namely their total sum &
 product.";
30 PRINT"You may ask for further clues (
up to 10)in the form of sums and product
s of sub-sets of these numbers.  ";
32 PRINTCHR$(27)"p";:PRINT"  Any <INKEY>
  ";:PRINTCHR$(27)"q";
35 IFINKEY$=""THEN35
40 CLS:PRINT"When you have sufficient cl
ues you may  try to guess the hidden int
egers.":PRINT"You may choose the maximum
 value N of  the hidden integers (betwe
en 5 & 50)  and the scoring is:"
50 PRINT" 5 + INT(SQR(N)) - #clues - #gu
esses":PRINTSTRING$(40,167);:PRINTCHR$(2
7)"p";:PRINT@289," Any <INKEY> to start
";:PRINTCHR$(27)"q";
60 IFINKEY$=""THEN60
70 DEFINT A-Z:DIMCL(30)
80 R=INT(RND(1)*VAL(RIGHT$(TIME$,2))+1)
100 CLS:INPUT"How many players (5 maximu
m)";P:IFP>5ORP<1THEN100
105 PRINTSTRING$(40,167);
110 DIMN(P),SC(P),P$(P):FORI=1TOP:SC(P)=
0:NEXTI
120 FORI=1TOP:PRINT"PLAYER #"I;:INPUT",
your name";P$(I):NEXTI:RD=1
130 FORI=1TOP:FORH=1TO30:CL(H)=0:NEXTH:C
LS
140 PRINTP$(I);:INPUT", max. value of yo
ur integers";N(I):N(I)=INT(N(I)):IFN(I)<
5ORN(I)>50THEN140
160 CLS:GOSUB350:J=20:G=0
170 J=J+20:IFJ>220THENPRINTCHR$(27)"p":P
RINT@240,"  No more clues, sorry,....
  ";:BEEP:FORT=1TO2000:NEXT:BEEP:PRINT
CHR$(27)"q";:GOTO200
175 R=INT(RND(1)*30)+1:IFCL(R)=1THEN175
180 ONR GOSUB510,520,530,540,550,560,570
,580,590,600,610,620,630,640,650,660,670
,680,690,700,710,720,730,740,750,760,770
,780,790,800
185 I$=INKEY$:IFI$="C"ORI$="c"THEN170
190 IFI$="G"ORI$="g"THENG=G+1:GOTO450
195 GOTO185
```

```
200 SC(I)=SC(I)+4+INT(SQR(N(I)))-G-(J-60
)/20:IFSC(I)<0THENSC(I)=0
205 NEXTI
250 CLS:PRINTCHR$(27)"p";:PRINT"Player
          Score    --    Round"RD:PRINTCH
R$(27)"q";:PRINT@40,STRING$(40,167);
260 FORI=1TOP:PRINT@40*(I+1),P$(I);:PRIN
T@20*(2*I+3),SC(I):NEXTI
270 PRINTCHR$(27)"p";:PRINT@280," Anothe
r round (Y/N)? ";:PRINTCHR$(27)"q";
275 I$=INKEY$:IFI$="Y"ORI$="y"THENRD=RD+
1:GOTO130
280 IFI$="N"ORI$="n"THENEND
285 GOTO275
350 A=INT(RND(1)*N(I)+1):B=INT(RND(1)*N(
I)+1):C=INT(RND(1)*N(I)+1):D=INT(RND(1)*
N(I)+1):E=INT(RND(1)*N(I)+1)
360 PRINT@0,"A+B+C+D+E="A+B+C+D+E;:PRINT
@20,"A*B*C*D*E="A*B*C*D*E
370 PRINT@280,"(G) to guess, (C) for ano
ther clue";
380 RETURN
450 PRINT@240,"A=";:INPUTA1:PRINT@248,"B
=";:INPUTB1:PRINT@256,"C=";:INPUTC1:PRIN
T@264,"D=";:INPUTD1:PRINT@272,"E=";:INPU
TE1
460 IFA=A1 ANDB=B1 ANDC=C1 ANDD=D1 ANDE=
E1THENPRINTCHR$(27)"p";:PRINT@280,SPACE$
(39);:PRINT@280,"        PERFECTLY CORREC
T,  "P$(I);:BEEP:BEEP:BEEP:PRINTCHR$(27)
"q";:GOTO200
470 PRINTCHR$(27)"p";:PRINT@240,"Sorry t
here is a mistake somewhere....";:BEEP:F
ORT=1TO2000:NEXTT:BEEP:PRINTCHR$(27)"q";
:PRINT@240,SPACE$(40);:GOTO170
510 PRINT@J,"A+B+C="A+B+C:CL(1)=1:RETURN
520 PRINT@J,"A+B+D="A+B+D:CL(2)=1:RETURN
530 PRINT@J,"A+B+E="A+B+E:CL(3)=1:RETURN
540 PRINT@J,"A+C+D="A+C+D:CL(4)=1:RETURN
550 PRINT@J,"A+C+E="A+C+E:CL(5)=1:RETURN
560 PRINT@J,"A+D+E="A+D+E:CL(6)=1:RETURN
570 PRINT@J,"B+C+D="B+C+D:CL(7)=1:RETURN
580 PRINT@J,"B+C+E="B+C+E:CL(8)=1:RETURN
590 PRINT@J,"B+D+E="B+D+E:CL(9)=1:RETURN
600 PRINT@J,"C+D+E="C+D+E:CL(10)=1:RETUR
N
610 PRINT@J,"A*B*C="A*B*C:CL(11)=1:RETUR
N
620 PRINT@J,"A*B*D="A*B*D:CL(12)=1:RETUR
N
630 PRINT@J,"A*B*E="A*B*E:CL(13)=1:RETUR
N
640 PRINT@J,"A*C*D="A*C*D:CL(14)=1:RETUR
N
650 PRINT@J,"A*C*E="A*C*E:CL(15)=1:RETUR
N
660 PRINT@J,"A*D*E="A*D*E:CL(16)=1:RETUR
N
670 PRINT@J,"B*C*D="B*C*D:CL(17)=1:RETUR
N
680 PRINT@J,"B*C*E="B*C*E:CL(18)=1:RETUR
N
690 PRINT@J,"B*D*E="B*D*E:CL(19)=1:RETUR
N
700 PRINT@J,"C*D*E="C*D*E:CL(20)=1:RETUR
N
710 PRINT@J,"A*A+B*B="A*A+B*B:CL(21)=1:R
ETURN
720 PRINT@J,"A*A+C*C="A*A+C*C:CL(22)=1:R
ETURN
730 PRINT@J,"A*A+D*D="A*A+D*D:CL(23)=1:R
ETURN
740 PRINT@J,"A*A+E*E="A*A+E*E:CL(24)=1:R
ETURN
750 PRINT@J,"B*B+C*C="B*B+C*C:CL(25)=1:R
ETURN
760 PRINT@J,"B*B+D*D="B*B+D*D:CL(26)=1:R
ETURN
770 PRINT@J,"B*B+E*E="B*B+E*E:CL(27)=1:R
ETURN
780 PRINT@J,"C*C+D*D="C*C+D*D:CL(28)=1:R
ETURN
790 PRINT@J,"C*C+E*E="C*C+E*E:CL(29)=1:R
ETURN
800 PRINT@J,"D*D+E*E="D*D+E*E:CL(30)=1:R
ETURN
```

PROGRAMMING THE TANDY 1000

by Paul Humphries

There may be cases where your application may not be covered by available "canned" software packages. Under these conditions a custom application program may have to be written. In many cases, an application program is quite extensive and complex and you may need to have a very experienced programmer write the program for you. On the other hand, if you have a real interest in learning how to write your own programs, it is not so difficult that you cannot do it. Application programming does take quite a bit of study and attention to detail, but you can do it if you will take it step by step.

The point to be emphasised here is that if custom programming needs to be done, many different programming languages are available to use for writing programs on your 1000. These languages have specific purposes for particular applications and you should know about them in order to see the flexibility you have in programming you 1000.

WHAT PROGRAMMING LANGUAGE DO I USE?

If you decide you need custom application programs, then you must decide which programming language to use. Several programming languages are available for most personal computers at this level. For example, six commonly used languages which will be available for the 1000 from either Tandy or third party sources are BASIC, COBOL, FORTRAN, PASCAL, Assembly Language, and the C language. In many cases, any given program can be written in any one of these languages, however, each programming language is designed for a slightly different use. Programming often will be easier and more straightforward in the language that best matches the type of program that is being written.

BASIC.

The BASIC language is by far the most popular one used for home and personal computing. In fact, BASIC is the most commonly used programming language in the world. BASIC is not only easy to learn, it is also an extremely powerful language. The main advantage to using BASIC is that it is simple, easy to use, and interactive. The main disadvantages of elementary BASIC is that it does not have commands for structured programming, and that program

execution can be slow.

BASIC program execution is slow because it is normally an interpreted programming language. This means that each line of program instructions must be searched for BASIC command words and statements. When a BASIC command word or statement is found, it is interpreted to determine which set of machine instructions must be executed.

In order to program in BASIC or run a BASIC program, the BASIC interpreter must be loaded into the computer's memory. Then the operator may input from the keyboard numbered lines of BASIC commands and statements to build a program in memory, or the operator may load a program from a diskette into memory.

Two versions of Microsoft BASIC will be available for the 1000. GW BASIC (stands for gee whiz), is the standard supplied language, and is interpreted. The Microsoft BASIC compiler will also be available and can be used to compile GW BASIC programs that have been debugged in the interpreted mode. This will be an extra cost item, probably costing between $300 and $400.

MS-BASIC is the most extensive version of BASIC available for microcomputers. It meets the ANSI subset standard for BASIC and supports many unique features rarely found in other BASIC's. MS-BASIC has sophisticated string handling and structured programming features that are especially suited to writing programs. The advanced features of MS-BASIC include a full screen editor, keyboard input of keywords via function keys, RS-232 asynchronous communications support, joystick and lightpen support, error trapping, advanced music and advanced graphics capabilities.

Colour Computer users will find this BASIC very similar to the one they are using now, with the exception of the more advanced features, which can be learned as the operator progresses.

COBOL.

COBOL stands for COmmon Business Oriented Language. This language is especially suited to business application programs which have relatively large data files and relatively small amounts of computation. Because input/output is a prime concern in business application programs, COBOL has many features which simplify the specification and handling of input/output files. Another important feature of COBOL is its English like statements which are designed to make the language self documenting. For example, a COBOL statement to add receipts of new parts to an inventory would be as follows:

```
ADD RECEIPTS TO OLD-BALANCE GIVING NEW-BALANCE
```

Since COBOL is a compiled language, it is well suited to production programs which are run many times. This is because when a high level language like COBOL is compiled, the instructions in the high level language are changed to instructions in machine language, then the machine language instructions are recorded on disk. The machine language program is the one that is run each time, thus, the compilation only has to be done one time. This is the opposite to BASIC, where an instruction must be interpreted each time it occurs.

The major advantage of COBOL is that it is designed specifically for business applications. The main disadvantage of COBOL is that programs tend to become quite long compared with programs written in other languages.

COBOL programs have four divisions:

1. The Identification Division identifies the program name and author.
2. The Environment Division specifies the details of the computer hardware on which the program will execute.
3. The Data Division is usually a large part of the program and specifies all of the details of the data used by the program.
4. The Procedure Division tells what operations are performed by the program.

The most popular MSDOS version of COBOL is called MS-COBOL. MS-COBOL meets the ANSI standard for COBOL, and its unique suitability to the business environment derives largely from the structured features of the language. MS-COBOL programs have a natural logical organization which reflects the nature of commercial data. The data in COBOL programs is arranged hierarchically and is stored in a logical structure with direct connections between related data. Once coded, this structure can be stored in a file and can be retrieved with a single statement.

FORTRAN.

The FORTRAN language is usually used for programs which have relatively large amounts of computation and relatively small amounts of data. Most scientific and engineering programs fall into this category. The name FORTRAN stands for FORmula TRANslator.

The original FORTRAN development was begun in 1954. The development goal was to produce a language that would allow the programmer to use a notation like mathematical equations. For example, the equation to compute a compound amount after N years at interest rate R is:

$$A = S \times (1 + R)N$$

The FORTRAN statement for this calculation is:

```
A = S * (1 + R)**N
```

MS-FORTRAN is the first 16 bit microcomputer version of FORTRAN 77, which was a major revision to FORTRAN in 1977. MS-FORTRAN is the full subset standard ANSI77 FORTRAN. It includes double precision arithmetic, long and short integers with selectable integer length, a capability for expressions to appear wherever allowed in the full standard, a CLOSE statement, a full form of OPEN statement, Hollerith data, formatted direct access files, unformatted sequential access files, an ERR=specifier, compiler directives added to provide the programmer with a source text INCLUDE facility, and back-slash/edit control to use with interactive input/output.

PASCAL.

The PASCAL language is also used for programs which have large amounts of computation and small amounts of data. It was developed in 1970 by the Swiss computer scientist Nicholas Wirth as an instructional language to teach structured programming, but it was named after the 17th century mathematician Blaise Pascal. Today it is

applicable to a wide range of programming jobs and has replaced FORTRAN in many installations. The PASCAL language is more suited to the structured programming techniques which are very popular today.

The C Language.

The programming language C is not as widely used as the other languages discussed above. It is often used for writing systems programs such as operating systems, programming languages, and utility programs. It is probably harder to learn than the other high level languages discussed, but it is a very powerful language for communications types of applications. It was developed at Bell Laboratories and was used to write the UNIX operating system which contains 300,000 lines of program code.

The C language is therefore used more by systems programmers than applications programmers. There are several versions available under MS-DOS, most of which are full implementations of the language and not a subset.

ASSEMBLY LANGUAGE.

Assembly language is a low level programming language which is close to the machine language which actually operates the hardware of the computer. Writing programs in assembly language is more difficult than writing them in high level languages. Assembly is used when very fast execution of the program is a requirement or in those few hardware specific applications which cannot be programmed in a high level language. It is most efficient from the standpoint of special applications.

The MS-DOS assembly package is Microsoft's Macro Assembler. The Macro Assembler is a complete system for developing assembly language programs, routines, and subroutines. The package includes the Macroassembler, the LINK linking loader, and the CREF cross referencing facility.

Macro supports a conditional assembly, including testing of an assembly pass, symbol definition, and a parameter to macros. Macro also provides a complete set of listing controls. Code is assembled in relocatable modules for easy manipulation by the LINK linking loader. Macro programs can also be linked to any of Microsoft's programming languages with LINK. Also, LINK allows any number of programs to be loaded in user specified locations. The CREF cross reference facility alphabetizes program variables and shows where each is defined and referenced.

These are by no means the only programming languages available for the 1000, however they represent the significant languages available under MS-DOS and it would be a rare application that would require a programming language outside of those discussed above. The only exception to this would be Ashton-Tate's Dbase II, and this will be the subject of a separate article at a later stage.

from P 55

```
$=RIGHT$(B$,L-1):L=LEN(B$):IFLEF
T$(B$,2)="LX"ORX>4THENPRINTMES1$
:GOTO20
158 IFL$="X"ANDR$="C"THENX=X+9:B
$=RIGHT$(B$,L-1):L=LEN(B$):IFLEF
T$(B$,2)="CX"THENPRINTMES1$:GOTO
20
159 IFL$="X"ANDR$="Q"THENX=X+1:G
OTO180
160 IFL$="V"ANDR$="I"THENI=I+5
161 IFL$="V"ANDR$="Q"THENI=I+5:G
OTO180
162 IFL$="I"ANDR$="I"THENI=I+1
163 IFL$="I"ANDR$="V"THENI=I+4:B
$=RIGHT$(B$,L-1):L=LEN(B$):IFLEF
T$(B$,2)="VI"ORI>4THENPRINTMES1$
:GOTO20
164 IFL$="I"ANDR$="X"THENI=I+9:B
$=RIGHT$(B$,L-1):L=LEN(B$):IFLEF
T$(B$,2)="XI"THENPRINTMES1$:GOTO
20
165 IFL$="I"ANDR$="Q"THENI=I+1:G
OTO180
169 IFL=0GOTO180
170 B$=RIGHT$(B$,L-1):GOTO110
180 IFI>9ORX>9ORC>9ORM>4THENPRIN
TMES1$:GOTO20
182 A=1000*M+100*C+10*X+I
185 PRINTA:GOTO20
200 I$(1)="I":I$(2)="II":I$(3)="
III":I$(4)="IV":I$(5)="V":I$(6)=
"VI":I$(7)="VII":I$(8)="VIII":I$
(9)="IX":I$(0)=""
201 X$(1)="X":X$(2)="XX":X$(3)="
XXX":X$(4)="XL":X$(5)="L":X$(6)=
"LX":X$(7)="LXX":X$(8)="LXXX":X$
(9)="XC":X$(0)=""
202 C$(1)="C":C$(2)="CC":C$(3)="
CCC":C$(4)="CD":C$(5)="D":C$(6)=
"DC":C$(7)="DCC":C$(8)="DCCC":C$
(9)="CM":C$(0)=""
203 M$(1)="M":M$(2)="MM":M$(3)="
MMM":M$(4)="MMMM"
205 B$=M$(M)+C$(C)+X$(X)+I$(I):P
RINTB$:GOTO20
250 END
```

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Spelling competition

The winner of the spelling competition last month was Jim Rogers.

This month we received a number of excellent entries, but an outstanding one was received from Keith Lewis, so he gets the prize, a six month sub to our magazine of his choice!

Notice that we don't tell you how many mistakes these guys find? It's so embarrassing! There were over thirty last month!

If you want to enter this competition, document the number of spelling errors you find in Australian CoCo / MiCo / softgold, by listing them under the headings of page number, line number, word (misspelt), word (correctly spelt). We are not counting bad grammar - otherwise the entries will require the same amount of paper as we put in the magazine!

CLUB NEWS

Tom Stuart from Armidale supplied his phone number. It is 067-72-8162 and if you are in that area, Tom would like to hear from you.

Coffs Harbour now has a meet. Contact the local Tandy Agent, Di McKinnon for further details.

We heard from Andrew Rawlings, the contact for Ringwood (Maroondah) in Victoria. There seems to be quite a large group meeting there - around 40 last meet. Not bad everyone, hope to hear more of your group.

Another Tandy Dealer who has decided to help the local users get their meet under way is Annie Meijer from Blackwater. If you'd like to meet with others in that area, Annie's phone number is on the rear of this magazine. (Annie pronounces her name 'Unnie'.)

Arthur Slade's group in the western suburbs of Sydney is doing well. The group is attracting a lot of young people, and it appears to me from what I've been told, that there is a bit of latent talent there!

Canberra now has groups in the north, south, east and west! I've always felt that one can get aroud Canberra pretty quick, but they tell me it's different when you live there! Anyway the groups were getting big, and the split has been good for all, giving more of the oldies like Les Thurbon, a bit of responsibility. (I was going to say something nasty about Les, but he send me some weed killer in the post the other day, so I think I'll be nice to him - might be in the coffee next time!)

We know that there are several new groups in WA, the latest one being at Bunbury. We haven't been given details yet, but a call to the local Tandy shop should find them.

Please note that Barry Gerrand's phone number at Swan Hill has been reported incorrectly. It is 050 32 2838. (The local chemist, Dunoon's, is the Tandy Dealer in Swan Hill. They are very nice people.)

Our resident cow farmer cum Meet Contact, Max (Jersey) Huckerby, rang several times during the month. Things were obviously quiet for him, what with the milk not going to town and the cows having to cope with a change to daylight saving. Apparently his group is still meeting, but we never get to talk about that - it's always those rotten cows that he wants to talk about!

Bob T's OS9 and 128K groups have had another shift in phone numbers - these guys move around more often than a politician at a CWA meeting! The phone number is now 047 39 5654.

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02 344 9511

User Group CONTACTS

(Stop between numbers = S.T.D. else a.h.; but, hyphen between = both.)

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ADELAIDE NTH	STAN EISENBERG	08 258 6214
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