

# ORIC

## USER

### MONTHLY

with Alternative Micros

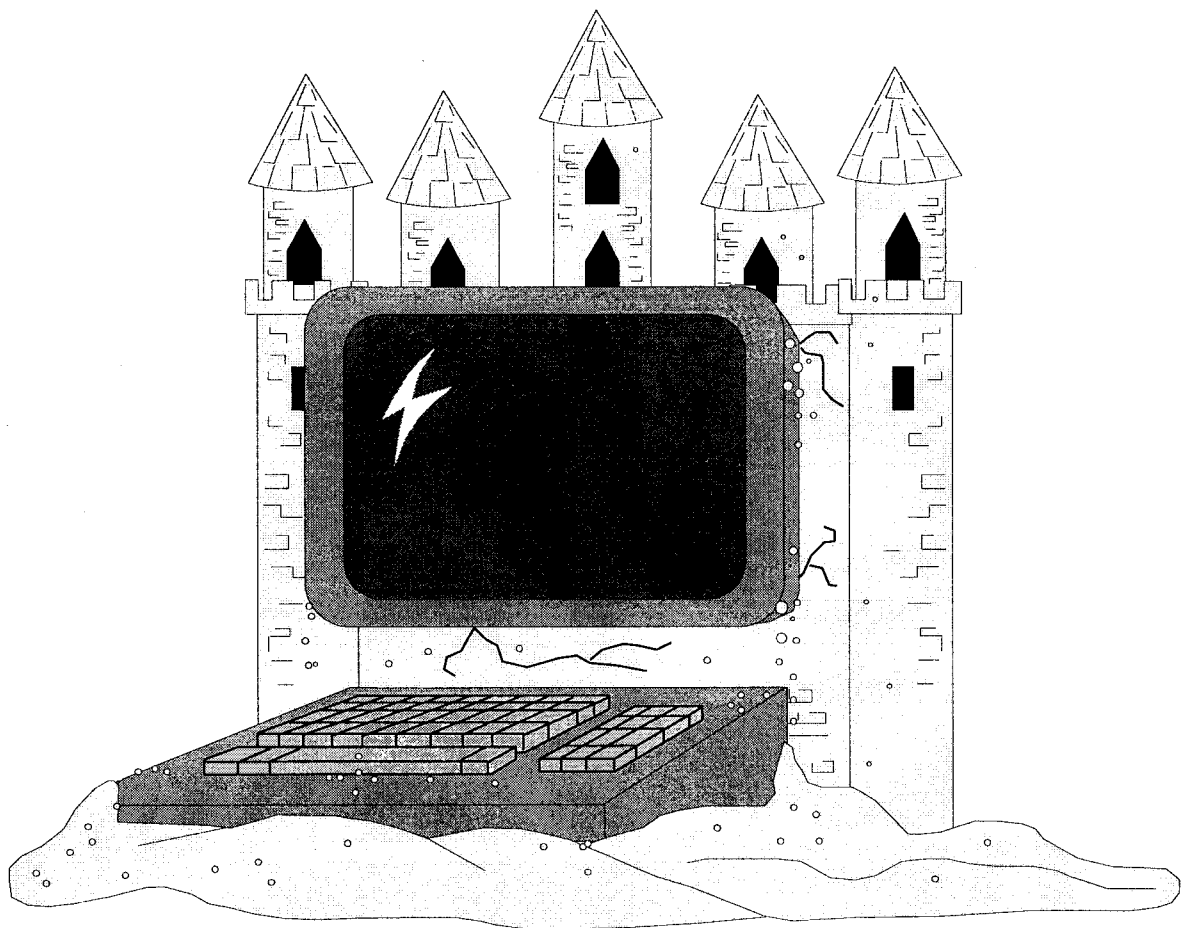
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*Keeping the  
Oric alive*

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## THE EDITORIAL

HELLO AND WELCOME,

to the September issue. Just as soon as we get into the Summer, and it seems to be all over, as thoughts turn to Autumn.

At least it will be cooler to sit down at the old keyboard.

OUMDISC #5 did not go out with the last issue as promised. The update to COLUMNS arrived, and I thought it would be wise to include it on the disc for those that had purchased Nick's classic. However, I again ran out of time, due in part to trying for a couple of days to get my car back on the road. Two days a week is about all I can now spare on the Oric, as I am regularly doing 2 Discos a week, and of course I have a 'real' job.

The amount of Oric related items appearing through the letter box has been tremendous recently, so please be patient.

I will be away in Spain for the latter half of September to soak up the sun and re-charge my batteries after an extremely hectic year. Therefore there will be no October issue, but a double November issue. Articles for inclusion in this should reach me by October 20th at the latest.

And so to this issue, AND WHAT AN ISSUE! -

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## COMPETITION

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THE FRONT COVER SHOWS A CASTLE AND AN ORIC. WHAT IS THE RELEVANCE. NAME THE TITLE OF THE SOFTWARE THAT IT ALLUDES TO AND THE SOFTWARE COMPANY TO WIN A PRIZE. ANSWERS TO THE EDITOR BY OCTOBER 1st.

ORIC USER MONTHLY - THE ONLY THING THAT HAS BEEN NUMBER ONE LONGER THAN 'LOVE IS ALL AROUND' BY WET,WET,WET

## MONTANA PATIENCE

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FROM NICK HAWORTH COMES 'MONTANA PATIENCE'. THIS COULD BE THE GAME TO BE 'HOOKED' ON FOR A FEW MONTHS. IT IS AVAILABLE NOW ON OUMDISC #5

NEWS . . NEWS . . NEWS

CHANGE OF ADDRESS

Adrian Matthews has moved again. He was in Bournemouth, but now resides in the land of Steve Marshall & Alistair Way. Adrian is now at: 7 WATSON CRESCENT (1F2), EDINBURGH EH11 1HD.

MIND MADNEZ

Arnt is kindly donating all profits from his MIND MADNEZ to OUM funds. Prices are now as follows: 3" disc - 3.50, 3.5"/5.25" - 2.50  
Cassette version not available.

COLUMNS

The updated version of COLUMNS has both known bugs fixed i.e - the illegal quantity error and the one regarding the timing of the hi-score on the Flash game.

SLOWLY RECOVERING

The intrepid Jon Haworth is recovering gradually. He can now walk 200 metres, and is able to sit for half an hour. As his nearest pub is about 150 metres away, he is just able to sit down for 4 or 5 pints in his allotted 30 minutes. YES - things are basically back to normal!

CONGRATULATIONS

WELL DONE TO NICK HAWORTH FOR GETTING 5 PASSES AT GRADE 'A' AND 4 AT GRADE 'B' IN HIS G.C.S.E EXAMS.

WHAT'S UP DOC!

WHAT IS DR.RAY UP TO THESE DAYS?

ACCORDING TO ARTHUR CRAWFORD, THE FOLLOWING: "I had a discussion with Ray about speeding up data storage in Sedoric. He proposed a method from the top of his head that unfortunately I found to have severe limitations in my applications. However, we have had further discussions and Ray is working on the problem. A further discussion I had with ray at the Meet was about use of the COMPILER and circumventing the limitation that it does not support Sedoric OPEN statements. It seems that the way forward is to use WORDSPEED to change the memory address of compiled program sections, and use them with uncompiled sections (this problem may be solved anyway by the data storage methods that Ray is currently working on and in the long term Ray said that he is intending to update BASIC Sedoric data storage).

## LOOKING AT CLASSIC GAMES

with Arnt Erik Isaksen

Part 1.2

This month we start to look at a real favourite for many home computers back in 1984. Did you guess? Manic Miner.

**MANIC MINER.** Software Projects 1984.

Collect the keys on 32 different screens and move Miner Willy to the exit door. Beware of hitting moving creatures or poisonous plants, or of falling to high. The music is very good in this game - especially in the intro where you can see the Oric plays on a piano. By the way, the music played during the game is composed by a Norwegian, Edward Grieg, and is called "Dovregubbens hall".

This game was especially popular for the Commodore 64 and the ZX Spectrum. Manic Miner was also a popular game for the Oric - number 11 in Your Oric's last charts...

O:\*\*\* S:\*\*\*\*\* G:\*\*\*\* A:\*\*\*\*\*

**HARRIER ATTACK.** Durell Software 1984.

This game brings you into a war - where you are sent on a mission. Start at your harrier, fly to the island, shoot the enemy's jets and bomb its tanks before you return. Fast action! Far from as good as the Commodore 64 version - but is still an OK game.

O:\*\*\* S:\*\*\* G:\*\*\* A:\*\*\*\*

**SCUBA DIVE.** Durell Software 1984.

Dive into the sea and bring pearls and/or corals back to your boat. Look out for sharks and other baddies and don't run out of air. Popular game for the ZX Spectrum - the Oric version is however not as good. An original piece of software.

O:\*\*\*\*\* S:\*\*\* G:\*\*\*\* A:\*\*\*\*

**SKRAMBLE.** Microdeal 1983. Rita Jay.

This is one of the very few commercial Oric games ever to be written by a girl/woman. That is however no reason to get Skramble as the graphics and sounds are far from good. Similar to Harrier Attack as you must shoot or bomb everything that moves or stands still. This is certainly not my favourite - and it should not be your favourite either. Microdeal released this game for the Dragon too, but I don't know if the Dragon version is better.

O:\*\* S:\*\* G:\*\* A:\*\*

**LIGHT CYCLE.** P.S.S. 1983. A.J. Clarke.

Have you ever seen the film called "TRON". This game enables you to control a light-cycle. You must make your opponent crash - either a human or your faithful Oric. Different speeds. Similar to Snake Venom (FGC Software), but not as good or fast, even though the two players option is an advantage.

O:\*\* S:\*\*\* G:\*\* A:\*\*\*\*

**MUSHROOM MANIA.** Arcadia 1983.

Shoot the centipede that is moving down the screen. Your weapon is a machine-gun, which can be turned on/off. The sounds are very noisy. Poor game.

Centipede (P.S.S.), which is written by John Marshall will be reviewed in another part of this series.

O:\*\* S:\* G:\*\* A:\*\*

**ELEKTRO STORM.** P.S.S. 1983. Tony Stoddard.

Alarm..... Protect your city, which is viciously attacked by missiles. You have three bases and control an aim. Find your target and send a rocket from one of your bases. Similar to "City under Attack", which was a type-in in Home Computing in 1984. Not a fantastic game.

O:\*\*\* S:\*\*\* G:\*\* A:\*\*\*

**RABBIT.** Norsoft 1985.

Flip some moving objects and pick them up before they start to move again. A 2nd flip makes the object move again. The two players option is fun as you can choose to cooperate or to be nasty against each-other....

"Is this a classic game?" you ask yourself when you read the title of this game. "Rabbit" is in fact clearly based on the original "Mario Bros" game. "Rabbit" is far from as good as "Mario Bros" for Commodore 64 - but it is OK if you play together with a friend.

O:\*\*\* S:\*\*\* G:\*\*\*\* A:\*\*\*\*

It is time to move on..... in time. In the late 1980's a game appeared on the computer scene - available for almost all computers, including PC, Macintosh, Nintendo, Sega, Amiga, C-64, Amstrad and..... ORIC!!! A Russian had the idea for one of the world's most well-known games - TETRIS.

**TETRIS.** CEO Soft 1990. Daniel Duffau.

**TETRIX.** Mirage Software 1990. Andre Widhani.

The object of the game is simple. Shapes that are made up by four pieces are falling down the screen. When complete rows are made they will disappear and make more space. You can move the shapes to left or right and rotate all the objects, excluding the square. The game is over when it is no more space available for more shapes to fall. You got to think fast if you want to smash the OUM hi-scores for Tetris or Tetrix!!

Tetris was the first version of Tetris to come on the Oric scene. You can choose to start a game with a more difficult level or a number of blocks already placed in the playing area. This version is as good as or better than many versions on PC's. The graphics are good enough and the sound is acceptable.

Tetrix is in my opinion not as good as Tetris. Some shapes are almost invisible on a b/w screen. The advantage of Tetrix is that you can play with alternative shapes.

**Tetris.** O:\*\*\*\* S:\*\*\* G:\*\*\*\* A:\*\*\*\*\*

**Tetrix.** O:\*\*\*\* S:\*\*\* G:\*\*\* A:\*\*\*\*+

AMENDED RATING : HUNCHBACK.

O:XXXX G:XXXX S:\*\*\*\* A:XXXX

```

100 ' ** HI-SCORES-TO-DISK PATCH **
110 '
120 ' ** FOR INSECT INSANITY **
130 '
140 ' ** BY DENIS BONFIELD **
150 '
160 CLS:RESTORE
170 POKE#26A,PEEK(#26A)AND#E
180 PRINT @5,10;"INSERT 'INSECT' DISK INTO DRIVE A"
190 PRINT @13,14;" 'SPACE' TO BEGIN"
200 IF KEY$<>" " THEN GOTO 200
210 LOAD"INSECT",N
220 FOR F=#5360 TO #53C4
230 READ A:POKE F,A
240 NEXT F
250 DOKE#3F7D,#5360:DOKE#2F1A,#537C
260 PRINT @6,18;"SAVE OVER ORIGINAL ??? - (Y/N)"
270 K$=KEY$
280 IF K$<>"Y" AND K$<>"N" THEN 270
290 IF K$="Y" THEN A$="INSECT" ELSE A$="RENAMEME"
300 SAVED A$,A#501,E#5400,T#501
310 PRINT @6,22;"MODIFIED AND SAVED AS ";A$;" ":WAIT 500:RESET
320 '
330 ' ** PATCH CODE **
340 '
350 DATA #20,#F2,#04,#20,#4C,#DA,#AC,#0E,#C2,#D0,#06,#20,#3C,#2D,#4C,#79
360 DATA #53,#AD,#0D,#C2,#A2,#BB,#20,#65,#DA,#4C,#F2,#04,#08,#78,#20,#AA
370 DATA #F9,#20,#F2,#04,#A9,#60,#8D,#7A,#DA,#20,#4C,#DA,#AC,#0E,#C2,#F0
380 DATA #0B,#AD,#0D,#C2,#A2,#BB,#20,#96,#DA,#4C,#B6,#53,#AD,#02,#C2,#0D
390 DATA #03,#C2,#F0,#12,#20,#7D,#DC,#8A,#8D,#0D,#C2,#8C,#0E,#C2,#A2,#BB
400 DATA #20,#96,#DA,#20,#8A,#DA,#A9,#A2,#8D,#7A,#DA,#20,#F2,#04,#20,#B7
410 DATA #0D,#28,#4C,#1F,#2F

```



The above program modifies 'Insect Insanity', allowing all high-scores to be saved to Sedoric discs.

As the game code occupies the memory area where Basic programs normally reside - from #501 upwards - some pokes are necessary before entering the patch program. These are :-

```

POKE #5500,0
DOKE #9A,#5501 ;new start address for Basic
DOKE #9C,#5503

```

The patch program may now be entered. Note that if the entered program is to be saved to disc and run at a later date these three pokes must be entered again beforehand. Typing 'RUN' will execute the program so just follow the on-screen instructions.

Note: Patch not recommended for use with Sedoric 2.xx

Denis Bonfield.



Greetings, good Oric Folk! There's more than one muso in our house, and this month, since I'm on holiday, I'm giving Steve a hand. I probably should say the next bit in hushed tones - *I'm actually a PC person, not an Oricker!* But I'm not prejudiced - some of my best friends use Orics, (well, one best friend, anyway), and arranging music for computer is much the same, whichever machine you use.

Steve has explained in great detail how to enter in a piece of music complete with piano part. But what happens if all you have is the melody line, and a string of guitar chords? You can type in the melody line, but what next?

Let's have a look at part of a typical tune.

G G7 C D7 G C G  
 "Waltz- ing Ma - til - da, Waltz- ing Ma - til - da, You'll come a - waltz - ing Ma - til - da with  
 D7 G B7 Em C G  
 me," And he sang as he sat and wait - ed while his bil - ly boiled "You'll come a -  
 D D7 G  
 waltz - ing Ma - til - da with me."

The guitar chords, above the music, contain all the information you'll need to provide an accompaniment. If I was playing this song on the guitar, I'd be singing the tune, and accompanying it by using the chords. I could simply strum the chords, two strums to a bar (because it's in 2/4 time), or I could play a more elaborate accompaniment by using a fingerpicking style, also called arpeggios.

First you have to understand how a chord is made up. Steve explained this in the March '94 OUM, but see right for a quick recap.

Probably the easiest way to deal with your accompaniment is simply to write the note names and octave numbers under the melody line

(in pencil! - in case of mistakes). Of course since the Oric has only 3 sound channels you can't play the melody line as well as all three notes of your chord. Which one to miss out? Usually the 3rd: generally the 1st and 5th are the most important in a chord. The diagram shows what this might look like. I've put the 3rds in brackets for future reference. Each chord is played twice for each bar of 2/4 time, as shown above.

(You may find that some tunes sound too low if you use the octave numbers suggested in the manual. This tune certainly did. Try entering in the first couple of bars and listen to them before you do any more. If it sounds too low, make each octave one higher. All the octave numbers given in these examples are one higher than the book recommends.)

You can try working out the rest of the chords and typing them into your Oric. You'll find it's okay, but a rather boring accompaniment. How can we improve this?

### CHORDS

A BASIC 3-NOTE CHORD IS MADE UP OF THE 1ST, 3RD AND 5TH NOTES OF THE SCALE IN QUESTION.

IF THE CHORD'S NAME IS, FOR EXAMPLE, G-(SOMETHING), THE 3 NOTES WOULD BE G, B, D.

### MINOR CHORDS

THE SIMPLE WAY TO CREATE A MINOR CHORD IS TO LOWER THE 3RD NOTE BY ONE SEMITONE. FOR EXAMPLE, EM CONTAINS E, G (NOT G#) AND B.

	G		G7		C		D7	
	"Waltz- ing Ma - til - da, Waltz- ing Ma - til - da,							
melody	D5	D5 D5	D5	B4	G5	G5 G5	F#5	E5
5th	D3	D3	D3	D3	G3	G3	A3	A3
3rd	(B3)	(B3)	(B3)	(B3)	(E3)	(E3)	(F#3)	(F#3)
1st	G2	G2	G2	G2	C3	C3	D3	D3

ARPEGGIOS

A much more interesting accompaniment can be created using arpeggios. An arpeggio is simply a broken chord - instead of playing all the notes at once, you play them one after another. So a chord of C major, in 2/4 time, would be played C3, E3, G3, C4, each note lasting for one quaver. (That's doh, me, soh, doh.) All the chords with simply one letter for a name can be constructed this way. Remember to flatten the 3rd in the Em.

7th chords have a distinctive sound about them, because instead of using high doh for the last note, you play a *flattened 7th*. This is the second-last note of the scale, lowered by one semitone. For example, G7 consists of G2, B2, D3, F3. 7th chords often occur just before the end of a phrase, or the end of the tune: they lead your ear on to the final chord on the key note. *Waltzing Matilda* could be played using only the chords of G, C and D7, but to make it more interesting other related chords have been included, like Em and B7. Explaining why these particular chords are used would take another article in itself: if anyone really wants this I'll write it.

Let's take a look at part of *Waltzing Matilda* with an arpeggiated accompaniment.

G4	A4	B4	G4	E4	F#4	G4	D4	G4	B4	D5	C5	B4	A4	A4	A4	G4	melody					
E3	G3	B3	E4	C3	E3	G3	C4	G2	B2	D3	G3	D3	F#3	A3	D4	D3	F#3	A3	C4	D3	arpeggio	
E2				C2				G2														bass

Treating the whole tune this way will produce quite a satisfactory accompaniment. There are, however, as many ways of harmonizing a tune, as there are tunes, and the best way to approach it is to use your own musical ear. Try something: if it sounds good, use it. If it doesn't, scrap it and try something else.

A useful rule when writing a harmony is only to use notes that are included in the guitar chord. To harmonise a D for example, with a G chord above it, you could use D, G or B, but not C, as C doesn't occur in a G chord. If the D note has a D chord above it, you could use any of D, F# or A to harmonize satisfactorily: since G doesn't occur in a D chord, don't use a G in the harmony.

For the bass line it's simplest to use the chord's 1st note in its lowest position, but try other variations and find out what sounds good to you.

COMING SOON  
 HOW TO HARMONIZE IN DIFFERENT KEY SIGNATURES: 3/4, 6/8 AND SO ON.  
 WHAT IS COMPOUND TIME?  
 HOW TO HARMONIZE WHEN THERE ARE NO GUITAR CHORDS.



Many of you will have had a go, at some time or another, at writing some sort of program in BASIC. There is, however, quite a difference between a short program that performs a specific function, and a games program. How is it done?

GETTING STARTED. First of all you must have a definite idea of what you want to do. The Program may, and probably will change into something somewhat different from your original idea, but you have to start somewhere.

First of all, jot your idea down on paper. The flow-chart is a good way of doing this. Before you start groaning I should say that there is no need to stick to the rules of the box types used in flow-charts. Just use two or three boxes. One for a decision, (IF/THEN statements etc), and one for any non-decision action. You can also use one for things like screen outputs. Just use whatever you're happiest with - it is for your own benefit, no-one else's!

Once this is sorted, have a think about what screens you may need to define and sketch them out. Once these are sorted out you can draw them on squared paper which can prove to be useful for checking coordinates later on.

If you want to redefine the character set then do this using a suitable program if you have one. Remember that if you want to use text within the game to retain the upper-case characters. Lowercase can then be redefined.

BACK TO BASIC. Once you have sorted out how the program should work you can start typing! This is where things can go wrong.

Get that flow-chart out and follow it through. Try and write chunks of program that do a specific thing. You can make sure one chunk is working OK before progressing to the next. Probably at the beginning you'll have character definitions and will be defining the variables used. Leave out the introductions until later. Remember the program might not end up as you had first imagined it.

Then the first screen can be displayed. After this it can sometimes get a little tricky. Let's take a look at a Space Invader type game. You have the invaders moving across the screen, the base needs to move and the base must be able to shoot at the invaders and there should be a check for a hit. Now that's a lot of information to be juggling around, and it's times like this that the flow-chart can really help out. It's easy to get one of the above things working, but when you want several things to occur at the same time many get stuck and, in the end, give up - and the Oric loses out again. Pre-planning can be vital to the success of a program and if you want to try a bit of programming you should really make sure the program is going to work before you start typing, or you could be wasting your time.

Now what we need when there is a lot of things that need doing at once is a list of priorities. The things that should be happening all at once need to be programmed to happen one after the other. Once the program runs the operations can seem to occur at the same time. Think of the movie film. This is made up of several separate pictures which combine to give the impression of a moving image.

With the Invaders you will need to move the invaders. There can then be a check for the press of a key. If the fire button is pressed then the program will need to jump to a routine to handle this. There will then be a check to see if a key is pressed to move the base, and if so to jump to the appropriate routine.

The program will then loop back to the Invader movement.

Once all that has been programmed in you can add the routines to check for a hit, and the routine to remove the hit invader.

You see how the program is handled in stages? You can continue adding little bits of program like this, providing you get the most important ones done first.

Programming can seem so daunting before you start - there's just so much to do.

But if you do the bit of paperwork before hand and then program in stages, as described, (saving the program regularly as well - just in case), the whole process becomes a lot easier.

Once you've got your program working you can add all the frills - the introduction to programs are becoming more interesting and complicated nowadays.

This is partly due to disc drives and the increasing number of Public Domain items released, and utility programs like Jon Bristow's range of editors. There are so many things to help you now, there shouldn't be much to stop you writing a decent piece of software.



If you haven't done so by this stage, you can add the instructions. This can be done in various ways. There are many games that require a printed instruction sheet/manual but it is always good practice to include some form of instruction in with the program. Ten years ago every type-in seemed to have a large chunk of text at the end which was displayed before you could play a game. It is better to give the gameplayer the option of viewing the instructions so that he/she/it doesn't have to wade through it each time they load in the game. There are several games that are improved merely by a bit of thought going into the presentation of the program. Compare 'Psychiatric' to 'Panic', 'Maze Rally' to 'Driver'.

BASIC is a slow programming language, and the Oric is not a very fast machine. (Anyone remember the benchtests from the old computer mags?) You can, however get really good results, and with Dr. Rays Compiler (and others to come from J. B) there should be no excuses for having a bash at programming. How many of you have started a program, but never finished it? Come on you lot. Help is at hand. There's nothing to stop you completing that program now. The Oric will only survive as long as people are writing material for it.

GO ON GIVE IT A TRY !!!

## BOMBER

```

5 REM -----
10 REM --- WRITTEN BY : -----
15 REM --- LARS LUNDBREN -84 ---
17 REM -----
20 PAPER0:INK3
30 POKE&18,10:CLS:PRINT
40 GOSUB 4000
50 GOSUB 1000
60 GOSUB 1100
70 GOSUB 2000
80 IF WIN THEN 50
85 GOSUB 3000
100 GOTO 50
1000 RESTORE:FOR Y=1 TO 4:READ W
1010 FOR Z=0 TO 7
1020 READ X:POKE W+Z,X:NEXT Z:NEXT Y
1070 DATA 47072,92,92,72,92,126,126,92,72,46376,64,64,64,92,126,67,126,64
1080 DATA 46384,64,64,112,120,95,94,79,64,46592,119,127,93,85,95,93,117,127
1099 RETURN
1100 REM ---
1110 CLS:PRINT:WIN=FALSE
1120 BL=40:B=0
1140 PLOT 0,25,20:PLOT1,25,"-----"
1150 FOR Z=24 TO 15-SP STEP-1
1160 FOR Y=1 TO 38
1170 X=INT(RND(1)*(5+SP))+1
1180 IF SCRN(Y,Z+1)<>32 AND X>1 THEN PLOT Y,Z,"@"
1190 NEXT Y:NEXT Z
1200 PLOT 0,1,1:PRINTSPC(22)"BOMBS LEFT: "BL
1210 PLOT 9,1,2:PLOT 35,1,2:PLOT 12,1,1
1999 RETURN
2000 REM ---
2010 A=48160
2020 POKE A+2,37:POKE A+1,38:POKE A,5
2030 IF B=1 THEN 2070
2040 IF KEY$="" THEN 2100
2050 B=1:BL=BL-1:IF BL<0 THEN 2100
2055 BL$=STR$(BL):PLOT 36,1," ":PLOT 36,1,BL$
2060 C=A+82
2070 POKE C-40,3:POKE C,124
2080 C=C+40:IFC>49040 THEN B=0
2090 IF B=0 THEN POKE C-40,3
2100 A=A+1:IF PEEK(A+2)=64 THEN 2130
2110 IF A<>49020 THEN 2020
2120 SC=SC+1:WIN=TRUE
2130 RETURN
3000 REM ---
3010 EXPLODE:SC=0:POKE A+1,38:POKE A,3:POKE A+2,32
3030 A=A+41
3040 REPEAT
3050 POKE A,38:POKE A-40,3
3060 A=A+40
3070 UNTIL A>49040
3080 PLOT 2,10,12:PLOT 3,10,1:PLOT 4,10,"PRESS ANY KEY FOR ANOTHER GAME"
3090 K$=KEY$:GET K$
3999 RETURN
4000 REM --- INSTR.
4010 PLOT 14,1,19:PLOT 14,2,19:PLOT 24,1,16:PLOT 24,2,16
4020 PLOT 13,1,4:PLOT 13,2,4:PLOT 12,1,10:PLOT 12,2,10
4030 PLOT 16,1,"BOMBER":PLOT 16,2,"BOMBER"
4040 PLOT 13,5,"INSTRUCTIONS":PLOT 12,5,1
4050 PRINT:PRINT:PRINT:PRINT:PRINT:PRINT
4060 PRINT" Your mission is to bomb the city"
4070 PRINT:PRINT" to provide yourself with a suitable"
4080 PRINT:PRINT" landing site. Should you achieve"
4090 PRINT:PRINT" this, a more difficult screen will "
4100 PRINT:PRINT" will be presented. You have limited"
4110 PRINT:PRINT" number of bombs so don't be wasteful"
4120 PRINT:PRINT" Press any key to drop bombs."
4130 PLOT 5,24,1:PLOT 6,24,"PRESS ANY KEY TO CONTINUE"
4140 K$=KEY$:GET K$:RETURN

```

The Story so far

----- We have looked at essentials for machine code programming and a small selection of useful 6502 Instructions appeared in Part 22 of the series. Last time, we started to have a closer look at programming technique.

Write On !!

----- One can write programs with very simple tools, essentially a pencil, notepad and rubber eraser. There are many people who try to write programs in ink or biro in a note book with fixed pages. Inevitably, you will make some errors and when that happens, you will find that it is much easier to modify or correct program listings written in pencil.

I use a small notepad with detachable pages and most important, write on one side only. The ability to shuffle the listing around on single-sided sheets of paper is a tremendous help, if you need to sort out a programming problem. The listing can be spread out and looked at in plan form. Errors can then be corrected and modifications can be made with the minimum of effort.

Of course, the wordprocessor provides even better facilities for alteration and correction than the pencil and rubber eraser combination and is a lot quicker to use. However, it does have limitations in display and printout. This is really a matter of personal choice. I find that a combination of handwritten and wordprocessed listings works best for me.

So why bother ?

----- I feel that good clear listings are essential for three reasons. First, they make it easier to sort out any errors and get the software working, secondly, they are invaluable, when you decide to update and improve the software and finally, listings from successful software can save a lot of time and effort when writing new stuff.

It is worth making a small effort to produce some additional notes. The traditional "REM" statement, is bit too limited to be useful in this respect and I prefer a listing of the type used in this series of articles, which is not much different from those found in Oric's "Advanced User Guide".

Assembler ?

----- A lot of people use Assemblers. They may be useful for entering the machine code/assembly language, but they are no use for the actual programming. The hardest part of programming, is to break your ideas down into separate operations and then select the right instructions for each one and an assembler is no good for that. They also tend to be a bit slow to use and have more scope for errors, which is why I haven't used one for years.

On the other hand, Assembly Language is a very useful tool. It provides a connecting link between the drab code numbers required by the Oric and the much more interesting program operation described in your listing.

If you look at the listings published in this series of articles, you will notice that they are divided into three main columns. The centre column is the Assembly Language column. To the right of that is the description of what each Assembly Language instruction is doing and why. On the other side, to the left of the Assembly Language column are the instruction hex codes and data and their addresses. These are usually written in last of all after the Assembly and program description, because at that stage, hex codes can be easily entered using an instruction code table (on a small crib card).

My listings usually have one instruction per line, with a blank line separating each operation. The aim is to make the listing easy to read. Look at the listings in this series and you will see instructions grouped together as specific operations. The operation below is a typical example.

This sample uses three instructions. It fetches an input, tests it and uses the result to decide on which one of two actions, it will put into operation. This is the way I would write it, to make the listing readable.....

---Continue or Finish ?---

```
1033:AD 01 10 : LDA 1001      : Fetch a copy of Key input for test.
1036:C9 1B    : CMP"ESC"      : Test - Was "ESC" key pressed ?
1038:F0 03    : BEQ"103D"    : Yes - so skip to finish the routine now.
                                   No - so continue with next operation.
```

Other operations are listed in a similar fashion, to that shown above. A blank line above and below each operation and possibly a brief "title", help to separate out each operation and make the whole listing that much easier to follow.

Waste Paper Production !

----- My listings are written or printed on single-sided sheets for reasons given above and use a small paper size, for easy storage. I can write and read fairly small print and so I can get quite a lot of information on the listing sheets, which are seven and a half inches by five inches in size (say 190mm by 125mm in metric). A spiral backed "reporter" note pad is ideal for handwritten listings. I also make the wordprocessor listing printouts the same size.

If eyesight is a problem, it would be better to use a larger size, but keep to a single size and only use one side of the paper and you will find that it makes life a lot easier.

And there's more

----- Inevitably, some routines run to several listing sheets each and you may wonder how it is possible to keep track of a listing that could consist of many routines and a very large number of loose sheets.

The answer is simple. For a start the instruction addresses provide an obvious sequence, which places every sheet in the right order. You may recall from the last article that every routine is started by calling it's very first instruction. Every listing sheet is headed by a Calling address (usually a "JSR") and therefore there is no problem finding the start of any particular routine. The last instruction in any routine is always clearly labelled as the finish (ie. "RTS" and "Exit").

In addition to the Calling address, each listing is headed by the software title, the routine label and the date that particular software item was written. Those few simple items ensure that there is no possibility of a mix-up or missing listing sheet going un-noticed.

Machine code/Assembly programming is considered to be extremely difficult, by most programmers and most seem to do things the hard way, irrespective of computer language used. However, the simple techniques outlined above, have made it a lot easier for me. Look at the listings that I have used in this series and you will find that they are largely written as a "description" in plain English. So essentially, you could say that the programming language I use, is the language that I speak and you can't get simpler than that !!

F E E D B A C K

NOW FOR SOME FEEDBACK FOR QUERIES RAISED IN PREVIOUS ISSUES OF O.U.M

LIST DIRECTORY TO PRINTER

In the August issue John Hurley was having trouble listing an ORICDOS disc directory to the printer.

In the same day I had two answers.

Stan Holden came up with - POKE#2F1,128: !DIR

John himself figured out that the !PRINTER ON command works perfectly on an ORICDOS master as supplied by Steve Hopps etc., but will not work on a disc formatted to ORICDOS standards, even if it contains the SYSTEM DOS. I can only assume that the original masters contained a message in the BOOTUP sequence.

=====

ORIC-1 APPEAL

-----

Regarding the appeal for an ORIC-1 for Jack Brooks (issue 83 - page 13). Sincere thanks to Frank Bolton for getting dear old Jack out of a fix.

=====

COLOUR MONITOR

-----

Jonathan Bristow no longer requires a colour monitor (as requested issue 83 - page 2)

=====

ATARI 2600 GAMES

-----

Arnt Erik Isaksen found a couple of ATARI 2600 games, whilst in London. I have purchased a few on his behalf and sent him a list. If anyone else is interested then please contact me.

=====

RPM & H SOCIETY

-----

In the last issue I mentioned that the RPM & H SOCIETY had passed my name onto Paul Hill. Paul tells me that it stands for "RAILWAY PRINTING MUSEUM & HISTORICAL SOCIETY. EINSTEIN UK USER GROUP. STEAM COMPUTER SOCIETY"

Now I see the connection, as I mentioned the STEAM COMPUTER SOCIETY/EINSTEIN GROUP in the last issue and continue about them this time around. Thanks to Paul for clarification and welcome to him as our latest subscriber.

=====

PROBLEMS STILL OUTSTANDING

-----

I have done my bit and now it is time to do yours.

Over the past year there have been, as far as I know, many problems not yet resolved. Please take time out to check back issues and look for problems raised. If they have not been resolved through the pages of OUM, and you have an answer, then please pass it on.

READERS LETTERS

DEAR DAVE,

regarding the message on the back page from Peter Bragg (July OUM) - apologies for taking so long to respond. I still haven't got formatting software for the BBC B and in truth, am not too concerned as I find it hard to get enthusiastic about the machine. Thanks for responding though.

MESSAGE TO EVERYONE - has anyone got an original technical manual for the ENTERPRISE for sale?

I finally got some RTTY software for the ATARI STE to use in conjunction with my newly acquired SSB radio, and I must say I'm disappointed with the results. Although the software itself wasn't up to much, it at least showed me just how little plain text RTTY is being broadcast today. Only one station from China broadcast anything of interest and this was only for one or two hours in the evening. I could get nothing at all from Europe even with a long-wire antenna attached. Depressing. I had great expectations.

Having had a chance to play around with J.B's SONIX, I must say I think it's an impressive piece of software. Well worth the asking price. Ditto for Dr.Ray's COMPILER.

- DENIS BONFIELD (London).

DEAR DENIS,

thank you for, as always, an interesting letter.

We have many radio buffs out there and I'm sure your comments will be of interest. I'm also sure that J.B and Dr.Ray will appreciate your comments.

- DAVE

=====

DEAR DAVE,

I'm writing this after a couple of days hard work on the ORIC, and a couple of hours hacking up a tree for a friend with my chainsaw (66cc of pure power - Arr, Arr, Arr!!).

I've finally managed to get a 2nd drive working on my ATMOS. Part of the trouble I was having was because I was connecting the 2nd drive to the expansion port of the CUMANA interface. Is this only for 3rd and 4th drives? - or something else?

For the record; our house is packed with the following: 4 x ORIC's (including switchable Rom Atmos + 16k Oric-1 (2 x 3.5" drives) and Modem.

NOTE FROM THE EDITOR: have I really got to list all these other inferior machines, especially as I'm feeling rather hazy from this dry white wine from the local supermarket, and to cap it all, young Matthew is shouting - "Dad, it's Colin Jackson's race now".

Hello, I'm back. Colin won his hurdle race, and so back to Steve's inferior machines.

We continue with: Amstrad CPC464 and CPC664 (disc version of 464) - Frank Bolton once questioned the spelling of the word DISC. I have an Amstrad DISK that you load via the file "DISC"!!

Dragon 32, BBC 'B', Toshiba MSX - can anyone tell me the connections for the cassette port?

Speccy+ 128 (eek!), Einstein c/w 3" drive and monitor ( a nice machine!), Atari STE, and a boring old 286 PC (Ally's).

- STEVE "Who's bloody bald" MARSHALL (Edinburgh).

DEAR STEVE,

If we read of an Edinburgh Chain saw massacre then we will know who to blame.

Regarding the expansion port of the Cumana interface - it is non-existent. Though it is marked as such, there is nothing there. I assume it was an idea never used, but the cases were manufactured as though it would be.

Ta for the info. on your computer collection.

Also thanks for sending me the latest version of your game - CYBOJUDGE. It is certainly coming along. I'm going to find some time to look at it further and come up with some ideas for you to use.

- DAVE

=====

ALTERNATE MICROS

LUKEUG/STEAM COMPUTER SOCIETY/RPM & H

It transpires that all the above are one and the same. We printed some info. on Page 12 of the June issue and followed up with more last month. The group appears to use more than one name and more than one type of introductory letter.

If you are an EINSTEIN owner and want to be kept informed, or want to buy some disc software, then check out the address previously given.

=====

EMULATORS

-----

Recently advertised in MICRO MART were Emulators for the PC.

Machine type & price as follows:

Commodore 64 - 3 pound, Spectrum - 2 pound, Amstrad CPC - 2 pound, Dragon - 3 pound and Macintosh - 5 pound.

From the same source are games packs: 500 Speccy programs - 20 pound, 400 Commodore 64 programs - 20 pound.

The contact is: Daniel Thomas of: TIGANA, FERNBANK ROAD, ROSS-ON-WYE. HR9 5RU

Many thanks to Arnt for the information - it's nice to see he put his time to good use, whilst staying in London.

=====

ARNT'S LATEST GIRLFRIEND

-----

I THOUGHT LONG AND HARD BEFORE DECIDING TO PRINT THIS PICTURE. I HAD PREVIOUSLY PRINTED A PICTURE OF A PARROT THAT ARNT HAD SENT, AND SO WHY NOT ANOTHER BIRD. IT IS FROM THE MACINTOSH - DIRTY RAINCOAT BRIGADE! I'VE HAD TO TURN THE PICTURE SIDEWAYS TO FIT IT IN - A BIT ON THE SIDE!



## 6502 EMULATOR - MIKE BROWN

## INTRODUCTION

HI- I'm Mike (son of OUM subscriber - Don). In the last issue of OUM, Dave mentioned my EMULATOR - here are the details.

## THE EMULATOR

Over Christmas I wrote a 6502 EMULATOR in 80x86 assembly code. The main reason was for potential use as part of a third year Computer Science project. The entire 6502 instruction set is modelled, with the exception of decimal maths (binary maths is there), and interrupt handling. With the thoughts of an Emulator in mind, there is also the ability to trap certain instructions with special meanings, e.g Load and Store operations on the VIA chip, Screen memory etc. I never got round to optimising or extending its abilities though.

The Emulator quite happily runs a 6502 monitor/debugger program I wrote a little while earlier for use on a single board 6502 machine I designed. On my machine (7.8 MIPS) it clocks up about 0.014 Mips, but I can speed that up at the expense of code size and readability. The structure was designed purely for ease of following it. Now I understand it, I can start speeding it up. The code should work on an 8086/8088, but a 286 through 486 will be better. For later versions, a 286 will probably be essential, 486 handy.

It took a while to get the monitor and Emulator both working, so I will make it available as inexpensive Shareware, as follows:-

For a demonstration of it working, either send a 3.5" DD/HD disk and SAE, or 1.50 cash/P.O./cheque, and I will send you on PC formatted disk:-

- \* The compiled (non optimised and interrupt-less) Emulator program.
- \* Memory dump of the monitor program.
- \* ASCII documentation on disk with info on use, and more details on the emulator.

If you like what you see, then send me 5 pounds and get:

- \* The original emulator source code (good to learn from).
- \* The current emulator source code (commented, partly optimized and harder to follow, but more useable).
- \* The monitor program source code (useful - I have versions for Oric and Apple, as I can reassemble it to run at any address easily to squeeze into tight memory requirements of other programs).
- \* The assembled emulator, and a memory dump of the monitor program ready to load.
- \* A 6502 benchmark program, which you can use to compare the speed on your machine to a real 6502.
- \* ASCII/Postscript documentation for the above on disk/paper, as required.
- \* One major revision of the emulator at a later date for free. (This will probably be speed increases through use of 286/486 specific instructions and tighter code, plus extensions.)
- \* Permission to use the emulator/monitor source within your own code.

As soon as I get time I will look further at extending the 6502 emulator and getting the all important "traps" worked out so that an Oric can be modelled. Details of these will follow at a later date.

Recent testing gave the following figures (non optimized version):

Running monitor program, with screen output - 0.057 MIPS  
 " " " NO screen output - 0.157 MIPS

As you see, the figures vary depending on what you're doing. I/O is time-expensive when using BIOS calls!

All correspondence to:

MIKE BROWN, 2 Glentworth Avenue, Whitmore Park, Coventry. CV6 2HW

MORE READERS LETTERS

DEAR DAVE,

I am sorry I won't be renewing my Oric subscription in the near future. Due to family health problems, I haven't used the Oric for months, and my interest is nil at the moment. I have enjoyed reading the OUM in the past, and I hope for all your other members that the magazine can continue to be a success.

- W. OAKES (Erdington).

DEAR Mr. Oakes,

I am truly sorry to hear about the health problems. I sincerely hope that a speedy recovery is the order of the day.

Should you ever get back to ORIC-ing ways, then you know that you will always be welcome back to the fold. Readers come and go, but luckily we have a nucleus of people to continue OUM for the foreseeable future.

- DAVE

=====

DEAR DAVE,

in issue 84 of OUM was a query from John Hurley regarding ORICDOS and printing directories.

The ORIC OWNER magazine was right, however the !PRINTER ON command is a toggle and is reset by the code that prints READY.

In order to get it to work, either use the command within a program or use a multi-line statement i.e -

!PRINTER ON: !DIR

The command will need to be re-issued every time it is required, as Basic keeps on resetting it.

It took me a while to catch on to what the article was saying, as I couldn't get it to work at first, and it was only after I came back to it after several months that I read it correctly.

Hoping this helps a fellow user (even if it is a bit long winded).

- JOHN FOGGIN (Ashington)

DEAR JOHN,

well - that's 3 answers to one problem (see page 12). It is so nice to see more than one reply to a query.

- DAVE

=====

DEAR DAVE,

regarding Frank Bolton's program - see print out below. I had to use a HIRES screen to get it as TEXT screen prints the correct keys.

```

I HAVE JUST LOADED A DISC & BY PRESSING
SHIFTED KEY'S 2 , BOTH CURLY BRACKETS,
AND THE LAST KEY IN THE TOP ROW, BOTH
SHIFTED AND UN-SHIFTED
THE FOLLOWING IS WHAT IS PRINTED

à û ç é è

I CAN'T SEE ANYTHING ON THE DISC THAT
WOULD CHANGE JUST THESE KEY'S
BUT I CAN PRINT ON SCREEN IN LOWER CASE
THE FRENCH WORDS

café, paté, château, ça, congénère,
AND MANY MORE

```

- RON EVANS (London)

DEAR RON,

I passed your letter to Frank, and set out on the back page is his reply.

- DAVE



-----

After taking over control of the Ultimate Hi-score Chart some months ago, I thought it time to say something about it.

The chart is a list of the highest scores recorded on Oric games where a score has been reported. Currently there are almost 140 pieces of software on the chart. That's quite a lot, but there are still many games yet to make it to the chart.

I am gradually buying more software. A few years ago, before discovering OUM I had only a handful of Oric-1 cassettes. I'm now building up my collection, buying all those titles I had missed and wasn't aware of.

Now when I get a game and try it out, I'll play it a few times and then jot down my best score. If there isn't a hi-score on the chart for this game then I'll stick it in. This has meant that my name has appeared a great deal on the chart. These scores are included just to 'set the ball rolling'. They are there to be beaten and I expect someone to do so. There are some scores on the chart that are my best efforts - and I'll break your legs if you better them. (Joke)

Before joining OUM I didn't really like hi-score charts, but I found that as I bought new software I would get a score near to a score on the chart, so I'd play the game again trying to beat the hi-score. This meant that I was playing games much more than I otherwise would, and getting more enjoyment out of a game than I thought I would do. 'Light Cycles' is an example of this. So many times I would come so close to beating Peter Thornburns score - I had to keep trying. If you use the hi-score chart like this, you could find yourself enjoying the Oric a lot more too !

Recently there seems to be a drop in the number of scores reported - only Liz Coates and Brian Kidd have sent scores direct to me. There must come a point where the chart becomes a list of unbeatable scores, but that is well into the future at the moment. However, what I have been considering is a chart for the best scores of the year. This could be printed every 2 or 3 months and the Ultimate Hi-score Chart printed at the end of the year. This would give everyone a chance to get onto the charts and could breathe a bit of life into gameplaying. What I need is some response to this idea. I'm not going to do this if no-one is interested. If you like the idea, WRITE IN.

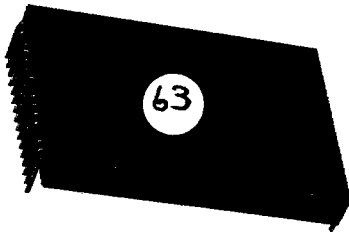
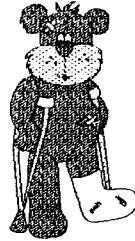
For now, the chart continues to expand and I will keep bunging my scores in. If you want to get onto the chart then give my scores a bashing, or look for one of the many titles that aren't on the chart. You would be suprised how many games still have to make it onto the chart !

Send your comments on the above to me or Dave. Keep on tapping !!!

Steve Marshall

# HOBBLING

## IN THE ROM



# MICROWAVES

Go to the top  
of your Oric

This subroutine allows 48K Oric proramers to print on the top line of the screen which is normally used for Oric's messages. Just set M\$="Text to print" and GOSUB 110. You can make the text flash by adding the line 120 M\$=CHR\$(#C)+M\$.

In the unlikely event that you've got a 16k Oric, you should subtract 8000 hex from all the addresses used.

Colin Failes,  
Glasgow.

```

100 REM :PRINT M$ ON TOP
    LINE OF SCREEN
110 FOR I=#BB83 TO
    #BB83+36:POKE I, 32:
    NEXT I
130 FOR I=1 TO LEN(M$): POKE
    #BB83+1,ASC(MID$(M$,I,1)):
    NEXT I
140 RETURN
  
```

PCN 12

3/6/83

Such was the tearing of hair and gnashing of teeth at the absence of any Rambling in last month's issue that I have been dragged to the keyboard - and now proudly present OUM's new feature - Hobbling in the ROM, hopefully preserving the witty repartee of the original, but at a more leisurely pace.

Many thanks to all who have enquired after my progress - I hope to be returning to something like normal by the end of this month. And so:

### Hobbling on...

D60A TXA	D6C5 TXA	
D60B BMI D5DD	D6C6 BMI D698	and if integer array variable
D60D INY	D6C8 INY	index the dimension
D60E LDA (91), Y	D6C9 LDA (91), Y	take the dimension
D610 LDY #00	D6CB LDY #00	and calculate the position of the header
D612 ASL A	D6CD ASL A	x2 (2 bytes for each component)
D613 ADC #05	D6CE ADC #05	+5 (constant: 2 name, 2 length, 1 dimension)
D615 ADC 91	D6D0 ADC 91	and adjust
D617 STA 91	D6D2 STA 91	the work pointer
D619 BCC D61D	D6D4 BCC D6D8	to the effective start of arrays
D61B INC 92	D6D6 INC 92	not forgetting the high byte
D61D LDX 92	D6D8 LDX 92	test if at end of arrays
D61F CPX C8	D6DA CPX C8	
D621 BNE D627	D6DC BNE D6E2	no, continue
D623 CMP C7	D6DE CMP C7	
D625 BEQ D5E1	D6E0 BEQ D69C	yes, pass to next array
D627 JSR \$D636	D6E2 JSR \$D6F1	no, treat the element
D62A BEQ D61F	D6E5 BEQ D6DA	and pass to the next one

Treat a variable

D62C LDA (91), Y	D6E7 LDA (91), Y	first character of name
D62E BMI D665	D6E9 BMI D720	it's an integer, pass to next
D630 INY	D6EB INY	
D631 LDA (91), Y	D6EC LDA (91), Y	the second
D633 BPL D665	D6EE BPL D720	it's real, also pass to next
D635 INY	D6F0 INY	adjust Y on the pointer

Treat the element pointed to by #91-#92, indexed by Y

D636 LDA (91), Y	D6F1 LDA (91), Y	take the length
D638 BEQ D665	D6F3 BEQ D720	empty string, pass to the next one
D63A INY	D6F5 INY	
D63B LDA (91), Y	D6F6 LDA (91), Y	address low byte
D63D TAX	D6F8 TAX	in X
D63E INY	D6F9 INY	
D63F LDA (91), Y	D6FA LDA (91), Y	address high byte
D641 CMP A3	D6FC CMP A3	verify below temporary top of memory
D643 BCC D64B	D6FE BCC D706	yes, continue
D645 BNE D665	D700 BNE D720	no, next
D647 CPX A2	D702 CPX A2	not so sure, test the high byte
D649 BCS D665	D704 BCS D720	too high, next
D64B CMP CF	D706 CMP CF	compared to the top itself?
D64D BCC D665	D708 BCC D720	below, exit
D64F BNE D655	D70A BNE D710	above, the top retains its position
D651 CPX CE	D70C CPX CE	still unsure, look at the low byte
D653 BCC D665	D70E BCC D720	too low, next
D655 STX CE	D710 STX CE	it is the highest variable
D657 STA CF	D712 STA CF	below top of memory
D659 LDA 91	D714 LDA 91	recover the address
D65B LDX 92	D716 LDX 92	of the pointer
D65D STA BD	D718 STA BD	
D65F STX BE	D71A STX BE	and save it
D661 LDA C2	D71C LDA C2	and the length of the element
D663 STA C4	D71E STA C4	

Next element

D665 LDA C2	D720 LDA C2	take length of element
D667 CLC	D722 CLC	
D668 ADC 91	D723 ADC 91	added to the current address
D66A STA 91	D725 STA 91	
D66C BCC D670	D727 BCC D72B	high byte as well
D66E INC 92	D729 INC 92	so getting the new address
D670 LDX 92	D72B LDX 92	that is also in AX
D672 LDY #00	D72D LDY #00	index to 0 for the next one
D674 RTS	D72F RTS	

Continue the reorganisation

D675 LDA BE	D730 LDA BE	is there a string to move?
D677 ORA BD	D732 ORA BD	
D679 BEQ D670	D734 BEQ D72B	no, that's finally the end of it all!
D67B LDA C4	D736 LDA C4	yes, take the length of the element
D67D AND #04	D738 AND #04	variable: 4 array: 0
D67F LSR A	D73A LSR A	variable: 2 array: 0
D680 TAY	D73B TAY	calculate the pointer index
D681 STA C4	D73C STA C4	and save it

(to be continued)

THE BACK PAGE

A REPLY TO RON FROM FRANK (RE-PAGE 14)

DEAR RON,

Dave passed to me, for comment, your letter complaining that my screen character designer won't work on your printer. This is hardly surprising, - after all you wouldn't expect a screw-driver to drive a car. If you read the notes on page 20 of QUM issue 83, they make it clear that it is for screens. I quote: "use for your screens" and later - "programmed to print on the screen."

The Contact List states that you have an MCP and a Citoth printer. If the Citoth is a second printer it presumably has a manual that will tell you how to re-define characters. The technique bears little relationship to screen re-definition. My Citizen 120D re-defines vertically as distinct from the horizontal re-definition of the Atmos for screen. So I'm sorry if you're disappointed, but the programme is for people who need re-defined characters ON SCREEN.

- FRANK BOLTON (Leicester)

ROMANIA

Frank and Luis have recently been playing host to John from Romania. They have been teaching him the Gospel according to Saint Oric, as John will be in control of the systems being sent to his country.

'Saint Francis & Pope Pedro' inform me that transport has now been arranged for the consignment of all the Oric goodies.

Meanwhile Frank and Luis are taking a well deserved break in Brighton - checking out the local talent and ale, no doubt!

THE RAIN IN SPAIN

Well, the rain in Spain had better keep to the plain, and not to the beach. We fly out on the 11th of September, and therefore no telephone calls until October 1st. Letters and cheques can still be sent.

LATEST FROM THE DOC

As we go to press, I have received a 4 page letter/article from Dr. Ray. I will re-produce it in full for our double issue, but meanwhile - some snippets.

ARRAYS

A program from Ray for swift Save and Load of Arrays under Sedoric.  
FREE STANDING CODE

Concerning the compilation of 'free-standing' code, which can be CALL'ed from a Basic program - a method to do this via WORDSPEED.

BLOCKS OF MEMORY

Two ".ASM" files in WORDSPEED format to allow one to save blocks of memory from within a machine code program and those of a Basic program.

COMPILER UPGRADE

The upgrade to Ray's COMPILER is about complete - as I receive it then all registered users will receive the update.

HARDWARE & SOFTWARE

The project is taking shape, and ALL Oric users will be asked for their views.

Well, that should whet your appetite.