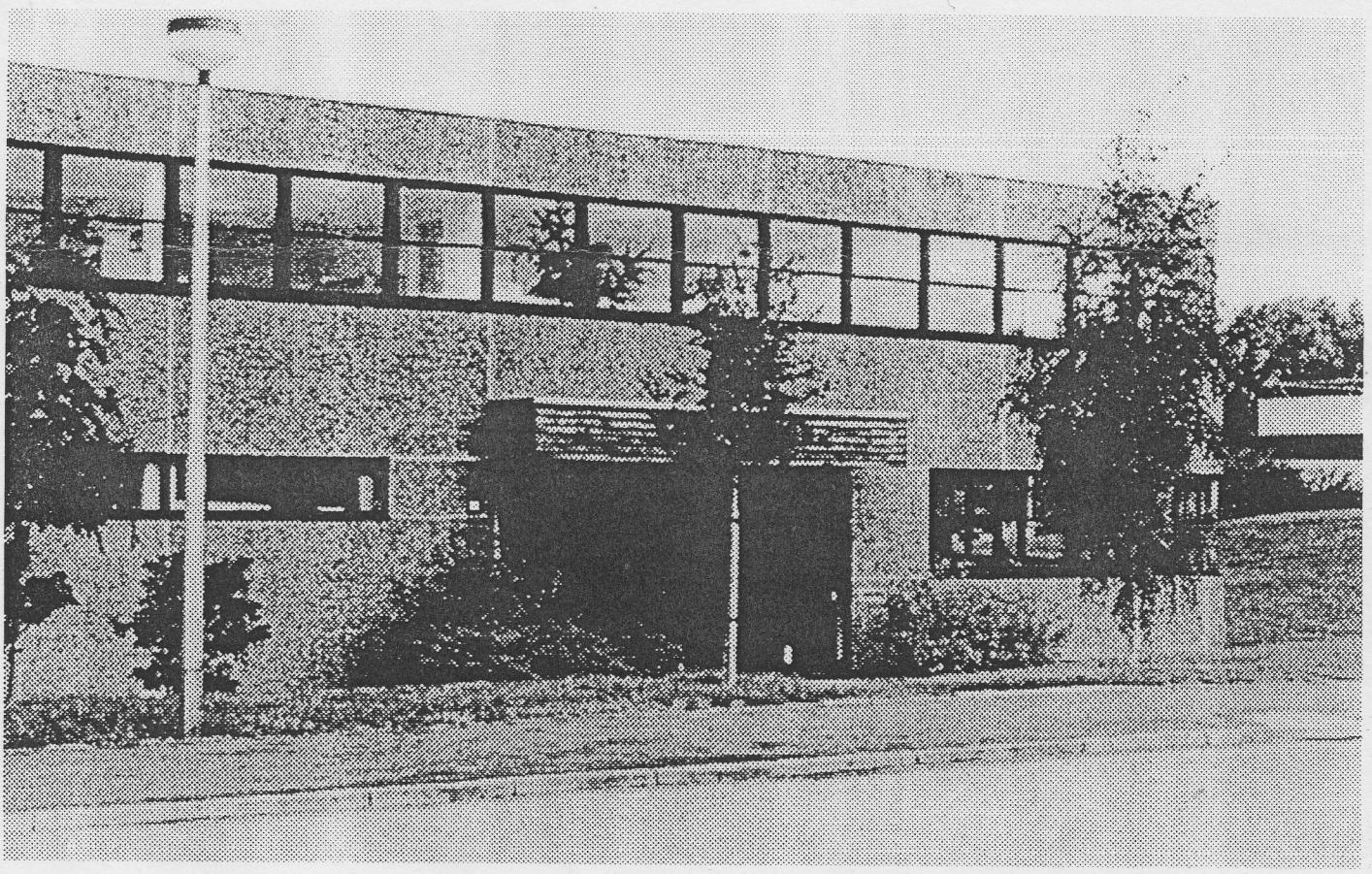
ØRIC USER MONTHLY

and Alternative Micros

Helping to keep the Oric alive

Number 75

November 1993



Oric's first Cambridge Science Park premises

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THE EDITORIAL

HELLO ONCE AGAIN,

AND WELCOME TO A MUSICAL ISSUE OF ORIC USER MONTHLY. NEW FEATURES INCLUDE ALL THINGS MUSICAL FROM BOTH JON HAWORTH AND STEVE MARSHALL.

WITH 'SONIX' RELEASE PROBLEMS FINALLY RESOLVED AND TREVOR SHAW DELVING INTO J.H's MIDI-INTERFACE; IT IS CERTAINLY ALL SYSTEMS GO FOR THE MUSICALLY MINDED.

The next issue will be less serious with lots of hints and tips for Gamesters,as well as the updated Hi-Score list.

And so to the contents of this issue:

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DECEMBER and JANUARY O.U.M

Articles etc. for inclusion in the December issue should reach me Nov.24th at the latest.

As usual the January issue will go out late and we will give Peter Bragg a rest (play Snooker do you Peter!). Articles for the Jan. issue by December 19th. please.

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SONIX

Aplogies to those who have waited oh so long for SONIX. Basically it's all down to JB. I suppose I shouldn't of believed him when he said the text files storing the manual were straight forward. Anyway - I have been promised the updated manual by November 3rd. This should arrive along with yet more uodates to the program itself,and therefore hopefully worth the wait.

In the latest league tables on bugged software, JB leads Nick Haworth by 99 own goals to 8 - that should keep the French happy. The next issue of the mag. will list all known bugs in French software. This 258 page issue will probably be the last that we can afford!

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MESSAGE FROM THE EDITOR TO DAVID DEMPSTER

Don't you read the Messages section!.

MESSAGE FROM THE EDITOR TO TIM PHOENIX

Don't you respond to letters!

MESSAGE FROM THE EDITOR TO JEAN BOILEAU

I will get down to CAPRI MARKETING to get your software order as soon as time permits. I have not forgotten you.

==========

HARDWARE - I can no longer afford (physically and financially) to put together Disc systems. I have done what i set out to do and convert as many as possible. I will offer advice, but am getting a bit pi..ed off with answering the same old questions. Before writing with a query on drives and printers etc., PLEASE refer to back issues of the magazine. Alternately you can buy - "THAT'S WHAT I CALL THE SAME OLD BLOODY 20 ORIC RELATED QUESTIONS - Pt.1 ",which was released on K-TEL!

N E W S .... N E W S .... N E W S

SOFTWARE CHARTS

Sales covered are from Jan.1st.1993 to Oct.31st,when a total of 189 units were sold covering 100 different titles. The Arcade/Strategy chart is shown on page 10.

OVERALL CHART

1st - DON'T PANIC (10 sold), 2nd - ZEBULON (9 sold), 3rd - COMPILER from Dr.Ray (7 sold), Joint 4th - WORDWORTH and SONIX (6 sold), Joint 6th - TETRIX and 3D OXO/BACKGAMMON (5 sold), Joint 8th - IJK CHESS,TRICKSHOT,IJK INVADERS,MANIC MINER and ORIC MUNCH (4 sold).

NOTE - as you can see -it's tight at the top! Will one of our newer releases come and pinch the top spot from Jonathan Bristow. Your Xmas orders will decide. Let's have a competition - name the top 3 in the overall chart as at Dec.31st. First correct forecast out of the hat wins 10 pound of ORIC software. Closing date is Dec.23rd.

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SIMULATION

1st - 3DOXO/BACKGAMMON, 2nd - IJK CHESS, 3rd - FRIGATE COMMANDER.

UTILITIES

1st - COMPILER, Joint 2nd - WORDWORTH and SONIX, Joint 4th - ORIC MON and ORIC CAD.

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OUM DISC No.4

I am very near to completing the 4th. OUM DISC. If it is not despatched with this issue,then it will go out separately within a week. Included on it are: some fixes from Dr.Ray for Sedoric and Atmos bugs, some utilities from John Hughes, demo programs to show how the COMPILER will speed up programs, TETRIS6B from Jonathan Bristow, some arcade games,some music and what ever else I can fit on.

I am still getting orders for back issues of the OUM DISCS. Latest sales figures for these are as follows:
OUMDISC no.1 - 41 sold, OUMDISC no.2 - 41 sold, OUMDISC no.3 - 42 sold.
I thank you for your support.

BULL ELECTRICAL

I have just recieved the Autumn Newsletter from Bull Electrical of Hove (Tel: 0273 203500). Plenty of bargains (V.A.T and postage to be added) : -
MSDOS 3.3 on 5.25" + manual - 5 pounds, Amstrad PPC Modems - 5 pounds, TANDON 14" Colour Monitors - 120 pounds, IBM CGA 14" Colour Monitors (ex-equipment) - 69 pounds, Amstrad DMP4000 Printer mechanisms - 5 pounds, Amstrad LQ3500 printer mechanisms - 5 pound, Commodore C64 computer - 42.99, Commodore C64GS Games console - 7.99 (4 game cartridge - Fiendish Freddy,Int.Soccer,Flimbos Quest and Klax for 3 pounds), CPC 464 computer + Green Screen Monitor ,built-in datacorder and pack of 5 games - 29 pounds (an incredible price), CTM 644 RGB Colour Monitor - 59 pounds, and finally nad you had better believe it: Dorothy Perkins Body Suits at just 4.99 each! What will they sell next????
Watch this space!

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THE BACKLOG

I have made a concerted effort to clear the backlog here at OUM. A selection of replies to letters appear in this issue and scores of other letters have been sent out. All but the latest software orders have been despatched and even these should be completed within a week of this issue going out.
As I am starting to get extremely busy with other matters,I'm afraid the ORIC will suffer until after Xmas. Therefore I have had to hold back on the remainder of the Contact List and the Listings section is only a small one.
I thank you for your patience.
Meanwhile I would ask that if you wish to order software for Xmas,that you place your orders by Nov. 20th at the latest.
I have not found time to produce a new mail order catalogue. The Oct.'92 list still stands as do any new products/offers as published in OUM. Please read your back issues or send an S.A.E if you have lost your price list.

==========

R E A D E R S L E T T E R S

Dear Dave,
thank you for your recent ORIC mailshot. I am interested in knowing more and purchasing another ATMOS.....
- Jonathan Haines (Torquay)

Dear Jonathan,
..... as for a new Oric Atmos, Steve Hopps can supply these. The new price is 37 pounds incl. post.
- Dave

==========

Dear Dave,
I would like a little information on the OUM disc to which I have seen reference,but am not totally sure what it contains.
- Paul Schofield (Bradford)

Dear Paul,
the easiest way to explain what each of the 4 OUM DISCS contain is to send you a copy of the instruction sheets that go out with them.
If any other reader would like copies then just send me an S.A.E
- Dave

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Dear Dave,
I have just got hold of an OPUS 3" drive..... it is from a BBC. Will it work with an Oric and will I need a disc interface?
- Simon Ullyatt (Boston)

Dear Simon,
thanks for the S.A.E.
A complete letter is now with you,but a few points for other readers who may wish to invest in a disc based system.
As long as the OPUS is Shugart type then it should work with the Oric. I have come across some 3" drives however that would Boot Oricdos perfectly,but not Sedoric. Of course 3.5" now seems to be the way forward for new users.
As well as requiring a power supply for the drive you will need an interface (50 pound from Steve Hopps).
The interface powers the Atmos.
Until stocks dried up, Steve was selling OPELCO disc systems,which included the drive power supply. If Steve still has cases for these units then he may be prepared to fit your 3" drive into it. Perhaps Steve could let us know!
- Dave

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Dear Dave,
thank you for your recent mailshot. I still have my Oric,but had more or less given up on it - however I couldn't bear to part with a machine I thought could do more than I ever knew about.....
- Matthew Hisbent (Fife)

Dear Matthew,
I think it surprises a lot of people what the Oric can really do...
To regular readers I hope you haven't still got a mailshot letter that youv'e forgotten to send out. Our club would be in a sorry state if it were not for the input of some of our newer readers e.g. Steve Marshall's excellent article in this issue and the hints recently from John Hughes. We need new blood to contribute along with our regular columnists.
- Dave

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Dear Dave,
Alistair here.
After a great two months touring Eastern Europe (great weather!),drinking cheap beer and visiting fascinating places; I have come down to earth with the freezing cold and constant rain of Edinburgh.
Yes, I am now in full-time employment.....
- Alistair Way (Edinburgh)

Dear Alistair,
nice to hear that you are back safely.
As far as Oric matters are concerned,you have landed in the right city; in fact the right road. You will be pleased to know that you live just a few doors away from Steve Marshall.

- Dave

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M O R E L E T T E R S O V E R L E A F

Dear Dave,

you may remember all the problems I seemed to be getting with not being able to run Sedoric with my Opelco system (3" drive). Well,at the moment I have managed to get Sedoric up and running,and this letter is using WORD-SPEED for the first time.

As a last resort to try and get Sedoric booted,I took the drive out of the box and into work to see if anyone there could assist. They recommended that I took a chance and removed the top printed circuit board to expose the Disc reading head and the stepping motor tracks. Not too difficult,but fiddly. There are only two screws holding this board down,and then the board will carefully wriggle away and to one side.

Once the Read Head and the trackways are exposed,it is no problem to clean all the moveable parts with a suitable cleaner using cotton buds. I used FREON 113,which dries very clean and quick.

Now lo and behold,and at the moment I can load Sedoric discs that I couldn't before.

If this could work for me,it may work for someone else out there.

Bye the way, is there a Dos Manual for Sedoric users,as I have no printed matter to help me with the basic commands of this system,and I feel that I should have at least the first steps before going straight into WORD-SPEED.

- John Hurley (Yeovil)

Dear John,

glad to hear that your problem is finally resolved and I hope it helps anyone else out there who may be having problems with their 3" drives.

One item missing from WORD-SPEED is the ability to format a disc from it (EASYTEXT allows this). Therefore unless you delete text files at some stage,then you will run out of room to store more files. You can obtain SEDORIC DOS,complete with it's extra commands,utilities and extensive manual by sending 8 pounds and a 3" disc to Allan Whitaker at Oric Enthusiasts. You must supply the 3" disc,whereas 3.5" or 5.25" disc users can just add 80 pence to their payment. I would thoroughly recommend that you obtained SEDORIC as: a) as a registered user you will be informed of updates, and b) there are some utilities on the 'B' side of your WORD-SPEED disc,which will need an understanding of how Sedoric works. You may also be intererested to know that an update to WORD-SPEED is now available (see OUM from a couple of months back).

- Dave

==========

Dear Dave,

I use my ORIC so little nowadays that there isn't much point in renewing my subscription to O.U.M.

The ORIC used to get most use when the grandchildren came,but now they have their own P.C's and think the Oric to be very "old hat". Also, I find that things are so orientated to Sedoric now,that anything new coming along is no use to me,as I run on he old Cumana V1.0,and can therefore not boot the discs.

I would like to thank you very much for all your help in the past.

- R.H Townsend (Rustington).

Dear Mr. T,

as always, I am saddened by the loss of a reader. I do thank you ,however, for taking the time to write with your reasons. Many who just stop subscribing, never bother to tell me the reason. I don't know if they grow fed up with the mag., sell up or just can't afford it.

As I explained to you previously,there is a way of upgrading your system. It's just a matter of changing an Eprom. You decided not to take that path and that is your decision.

As 75% of readers are now disc based,then I tend to find that letters and articles that I recieve are bias toward disc systems. As Sedoric has become the main work tool of the disc users, so Sedoric has become the main focus of attention. As well as upsetting non-Sedoric users,it may also dismay users who are still cassette based. The only way I can print cassette items is if I am sent them. Basically - you send it and I'll print it!

- Dave

==========

Dear Dave,

regarding your query in the article about 'THE MEET'. Steve Hopps could not of been in my luggage,as it was scanned and X-rayed at the airport;the bag opened and all the material X-rayed once again. Fortunately they had no screwdriver,so the interfaces stayed in one piece! I saw in the eyes of the policewoman that she was wondering what a man of my age could do with videogames and joysticks.

I had no news of Jon Haworth,who kindly drove us to the airport. On our way to the plane,we passed a bar and at the time to say goodbye, Jon had vanished (in the air!). Therefore I had no time to ask him what was so funny in the advertisment for plumbing accessories that I had given him in Paris. Of course the plumbing company is called "MISTER ATMOS".

Since February 1st the French Bulletin Board is no longer located at Laurent's (142 62 6640), but in my home (033 1 48484656). I suspect that this has little interest to English speakers/writers.

As a follow on to Tony Clark's article on Amstrad monitors; I have recently made an adaptor for our "secretaire's" son,who was confined to bed. He has got the new model of Amstard monitor (described as "cream coloured", in France cream is more yellow and we call that "blanc casse" or broken white). If anyone is interested in the connections then I can send a copy.

I hope you will not have to type all this to fill the magazine!

Best regards to all Oric users.

- Jean Boileau (Bondy,France)

A N D S O M E M O R E

Dear Jean,

it is always nice to get a letter from you,even if the recession in France means that you can only afford to use pencil nowadays.

Did I detect a note of Gallic sarcasm at the end of your letter. I hope you are not implying that I use readers letters as page fillers! I'm sure your letter is of interest to others and gives our magazine a bit of variety.

- Dave

==========

Dear Dave,

the following is a copy of a letter that I sent to Brian Kidd regarding puzzles. It is intended for print as it raises some points which should be considered by all readers...!

Having recieved a recent issue of O.U.M, I was sad to read that there were no other entries than me for the competition. I myself enjoy a good puzzle and, I would have thought,so would other computer users. After all,programming involves lots of problem solving and the use of logic. Personally I found the first couple of puzzles a bit difficult,not having the sufficient maths knowledge,but the later word puzzles were easy enough for everyone to have a go at - or so I thought!

Games such as 'FUNPARK' contain several puzzles and I believe that this got a favourable response,so presumably there must be several members who enjoy puzzles (?). I'm sure there must have been more people that had a go,but didn't bother to enter their attempt.

I would like to see some sort of puzzle/quiz to remain as part of O.U.M. It lengthens the amount of enjoyment I get out of the magazine,and it's nice to see puzzles related to the Oric,rather than struggling through the daily crossword.

Perhaps the prizes are not of interest to some,but I feel that members should support the work of the 'Oric Mainstays' (those at the top of the contact list). If people didn't bother to contribute,then our little club would die off,which would mean that those who don't contribute would have to do without the numerous benefits gained through the O.U.M. So it is in the interests of us all to support those doing the hard work - if we want to see our ORIC's perform as they were intended.

After coming across your address by chance, (it came with an ATMOS I bought after a final attempt at getting ORIC software,via placing adverts), my system has been upgraded to a disc based ATMOS and now has a reasonable amount of software which is,on the whole,of a much better quality than my old tapes. I have also bought a number of second-hand tapes to boost my collection,and also got a printed connected up to my ATMOS. All this was done with the help of O.U.M,and my computer now is the respectable machine I always knew it was capable of being. Without O.U.M I would still have the slow ORIC-1 with a handful of tapes,and would probably be using the Speccy instead. (Haven't used it since joining O.U.M !!!).

Steve Marshall (Edinburgh).

Dear Steve,

whilst response to Brian's competitions has been pretty pathetic, I must admit that I did forewarn him as it was what I had come to expect from competitions that I had run previously in O.U.M.

I am not going to preach to readers that they must submit entries - it is entirely their decision. What does annoy me is the fact that the readers who complained when I dropped the competitions previously, are not in fact now entering!

I would love to see sack loads of entries,but if it is not to be then so be it.

Nobody has written to ask me to stop printing puzzles nad therefore I can only assume that readers do perhaps attempt them,if only for personal satisfaction rather that personal gain.

Recently we have printed some posers from John Hughes. Perhaps if we get a good mix of puzzles,posers,and competitions,then that is the way to go.

==========

THE LETTERS PAGES WERE PUT TOGETHER USING 'WORD-SPEED' (available from Allan Whitaker at ORIC ENTHUSIASTS).

By the way Ray - you are slowly weaning me onto WORD-SPEED. One benefit I have found is the speed of input of characters compared to EASYTEXT, and therefore I am making less typing mistakes. Of course with VORTEX you can alter the typing speed to suit - but that's another story.

==========

IF YOU WISH A QUICK REPLY TO A LETTER THEN PLEASE INCLUDE A STAMPED ADDRESSED ENVELOPE,ELSE THE REPLY WILL BE PUBLISHED IN AN ISSUE OF O.U.M OR SEND TO YOU WITH YOUR MAGAZINE.

IF ANY PART OF YOUR LETTER IS NOT FOR PUBLICATION ,THEN PLEASE SPECIFY.

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S E D O R I C M A P

In a previous issue of O.U.M we looked briefly at the use of the FUNCTION key. We now take a further look at the pre-defined keywords.

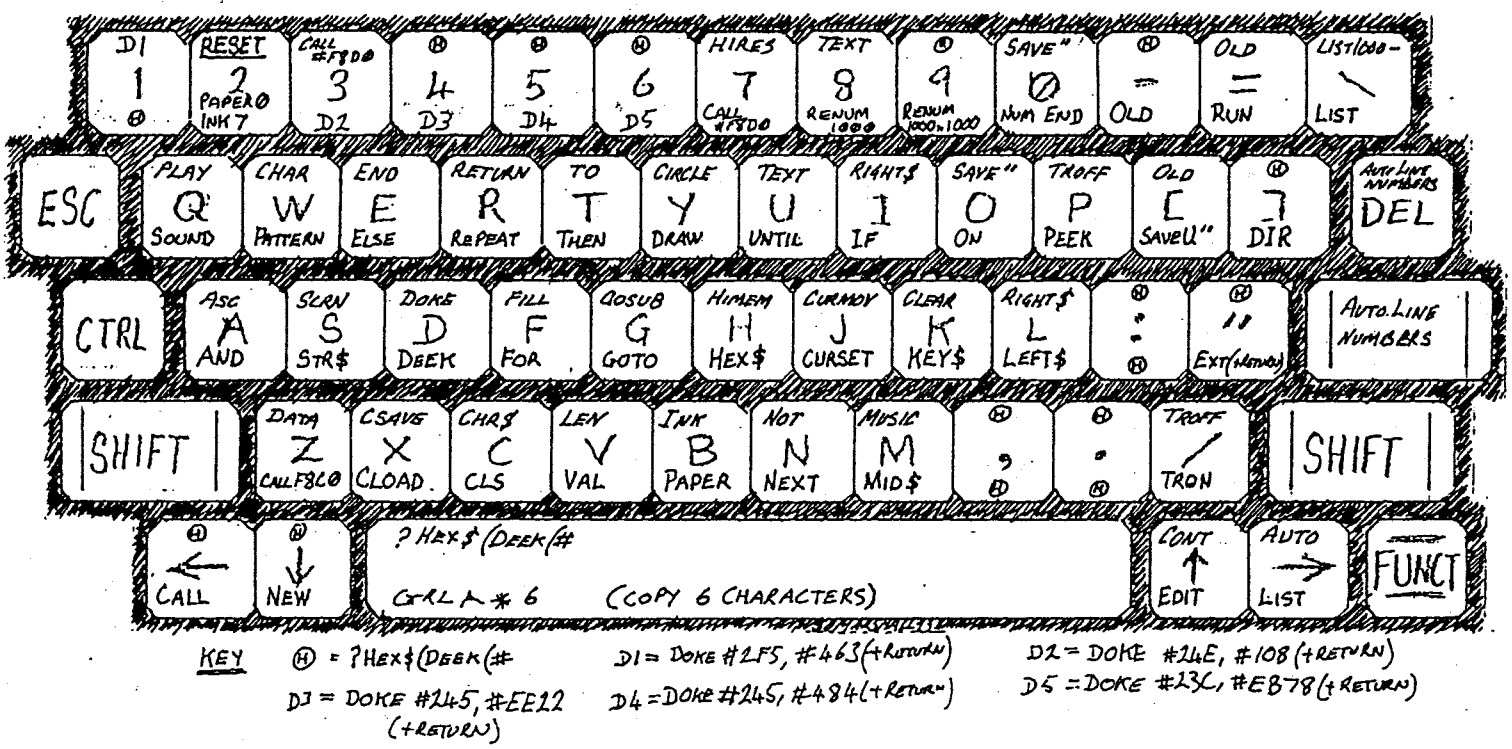
Steve Marshall has drawn up a diagram to show just exactly what is pre-defined,and we print his sketch on this page.

The keywords on the bottom of the keys are arrived at by means of FUNCT + that key,whereas the ones at the top of the key utilise FUNCT + SHIFT + key.

For example: FUNCT + M = MID$,whereas FUNCT + SHIFT + M = MUSIC.

If you decide to alter any of the keywords then just Tipex out the appropriate word(s) and photocopy the map.

Steve suggests colouring in similar terms with the same colour. e.g: all string keywords in red, graphics keywords in green, music ones in green etc.



A L T E R N A T E M I C R O S

FANZINE

Oric owner and O.U.M reader Simon Ullyatt has been busy working on a FANZINE dealing with various 8-bit machines,such as the C64,Speccy etc. He has had quite a lot of interest shown in it. Three of the C64 PD libraries are now advertising it and he has even had a mention on Channel 4's DIGITISER pages. The mag. costs 75p or 1.50 with a covertape plus a stamp. Simon intends to deal with more neglected machines in the future such as the VIC,MSX,BBc,C16/+4,ZX81 and DRAGON etc, but needs support from users with contributions. We hope to have more news on this for you later in this or the next issue of OUM.

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MACINTOSH

I was recently asked if I was going to deal with PC's etc. on the ALTERNATE MICRO page. Well - I don't see why not. After all,if queries are raised or if something maybe of interest to others,then I'll pass it on.

Recently Arnt Erik Isaksen from Norway has bought a Macintosh Performa 400 at the cost of about 1200 pounds. It consists of 4Mb Ram,40Mb Harddisk,colour display,keyboard,microphone (excellent sampling),mouse and Stylewriter II (printer). Software includes 'Claris Works', 'At Ease' and some demos.

Arnt would like to hear from any other Macintosh users out there.

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ATARI JAGUAR

This is a new one to me! Simon Ullyatt is currently considering investing in an ATARI JAGUAR. It's a console - 64 bit, 5 RISC custom chips,can shift 850 million bits of data a second,has real time texture mapping,scaling etc.abilities, and costs around 150 pounds.

Well, I hope they get the marketing right this time or it could go the way of the ATARI LYNX - then we will all be picking them up at half price within a year!

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ATARI LYNX

Steve 'Muso' Marshall writes to tell me that after seeing the info. on the Atari Lynx in O.U.M, that he has gone out and bought one. Well Steve; at that price you can't really go wrong for a newer type of technology

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ARCHIMEDES Vs AMIGA

Peter Bragg tells me that if he hadn't of bought his Archimedes,then an Amiga would of been his second choice,as it is a very good machine. It's nice to see that Peter's computing time is split 50-50 between the Archimedes and the faithful Oric.

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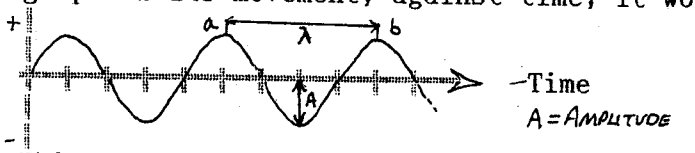
DRAGON 'MEETS' ORIC

Every year the Dragon User Group holds a show at Ossett. After their last get-together there was talk of sharing the venue with another 8-bit group. Peter Thornburn is (have you remembered Peter?) to write to them with a view to the Oric sharing centre stage. This would not take the place of our own Aylesbury meets,but as it is held in the North,then would allow some of you the comfort of a short journey. We will keep you posted - won't we Peter!

==========

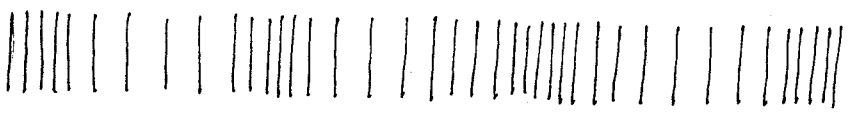
MARSHALL'S MUSIC

Just about everyone out there will have used sound on their computer in some form. Whether you've just used ZAP, or programmed in a tune or two, this article is written to give more background information about sound, and how it is produced.
SOURCES OF MUSICAL SOUND. All musical instruments are sounded via the production of vibration. A faster vibration gives a high note - a slow vibration low one. Imagine a record player being slowed down. The singer's voice will become deeper - speed up the record and you get 'Pinky and Perky'. This is the basic principle behind pitch (or frequency).
WAVELENGTH/FREQUENCY/PITCH. If you twang a ruler on the end of a table and draw a graph of its movement, against time, it would look like this:-



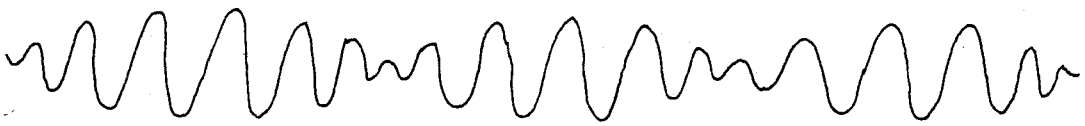
This 'waveform', (a transverse one), shows that a wave results from an oscillation (vibration) and has several parts to consider.
WAVELENGTH, (a-b) is one complete cycle and can be measured from any two similar points on the graph. It is usually most convenient to measure from the highest point on the graph, to the next highest point i.e. 'peak to peak'. The length of one complete cycle is known as the wavelength - measured in metres.
FREQUENCY, is measured in Hertz (Hz), which you should be familiar with, from your radio dial. Previously 'cycles per second', or c.p.s. was used. This is a much better term, as frequncy = the number of cycles per second. The above diagram shows that the ruler is vibrating at one cycle per second, which is 1Hz.
AMPLITUDE, is the distance from the axis of the graph,(No discplacement), to the highest (or lowest) point on the graph - as indicated. The larger this is, the louder the sound is. Some of you may be familiar with a visual representation of this on their graphic equalizer. More on volume later.
From a graph like this we can establish the formula $V=f\lambda$, where v=velocity, f=frequency and λ(lambda)=wavelength.

Sound actually travels to the ear by what are called longitudinal waves. This is a series of compressions which looks like this:-



This can be felt by putting your hand infront of a hi-fi speaker. The movement of the speaker pushes the air, compressing it. Because sound needs a medium to travel in, sound cannot travel in a vacuum. (In space no-one can here you scream !!!)

Two waveforms can be mathmatically added together. If they are exactly the same then this will result in a doubling of the amplitude, and therefore an increase in volume.
If we add together two slightly different freqencies, say 250 & 260 Hz, then the resultant waveform would look something like this:-



If you say 'wawawawawawa' then you will here what this sound likes - The pich is constant but the volume goes up and down. The frequency of the 'wawas' is 250-260 = 10Hz which doesn't sound too nice. When pianos go slightly out of tune they produce these 'beats' which give the piano that 'Honky Tonk' sound. It is also by listening to this beat that pianos are tuned. As the two notes become closer together the beat slows down. When the beat stops the two notes are at the same pitch and therefore in tune.
THE VIBRATING STRING. When a string vibrates, the sound produced is the combined effect of many 'harmonics' vibrating at the same time.
We shall have a look at harmonics next time.

Steve 'Muso' Marshall

COLUMNS

From the pen of Nick Haworth, COLUMNS is now available direct from O.U.M. We previewed this game in our last issue. It is now complete with some intro music and 3 other tunes,all of which were input to the Oric via a utility for entering and playing music under interrupts - part of Jon Haworth's new series. Tune 'A' is a bit of a puzzler and we have decided to make it into a competition. The first person to write with it's title will have their outlay for the game refunded. Now with a few more additional features,mainly cosmetic,this is certainly one for your collection. In fact two copies have already been sold,including one to the irrepressible Marke's - watch out for some big hi-scores!

Prices are as follows:

3" Disc - 4.50
3.5" Disc - 4.00
5.25" Disc - 4.00
Cassette - 3.50

Yes folks - a cassette version just for those not fortunate enough to be on disc. The game is currently Atmos only,but if we recieve requests then I am told that an Oric-1 version could be arranged.

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WANTED

Steve Marshall would like to get hold of CHICKENS and DEMON from Durell software for the Oric. I'm not sure if they were ever released. I await comments.

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SPECTRUM CLUB

New Atmos owner Dave Tonks runs a Spectrum club - more details when I recieve them. Dave is at: 37 Parker Street,Bloxwich,Walsall. WS3 2LE (Tel: 0922 406239)

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ARCADE/STRATEGY CHARTS

Other charts appear elsewhere in this issue. This chart covers sales on disc/casssette for the first 10 months of 1993. The top 3 are the same as last time. Units sold are shown.

1. - DON'T PANIC (Mirage/JCB) - Jonathan Bristow - 10 sold
2. - ZEBULON (Mirage/JCB) - Jonathan Bristow - 9 sold
3. - TETRIX (Mirage) - Andre Widhani - 5 sold

Joint 4 - TRICKSHOT, IJK INVADERS, MANIC MINER and ORIC MUNCH - all 4 sold

Joint 8. - DPTLQ, PROBE 3, XENON III, GHOSTMAN and CHUCKFORD - all 3 sold

Ones to watch (2 sold of each already) are : COLUMNS and MIND MADNEZ.

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STOCKMARKET

David Goodrum is currently hooked on STOCKMARKET for the Oric, and wonders if anyone knows of any other multi-player games in the same sort of league?

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B I T S ' n ' B O B S

MESSAGE TO JIM OSWIN FROM THE EDITOR

Nice to hear that you have upgraded from an Oric-1 to an Atmos,via a car boot sale. If you need a Manual, Atmos Welcome tape or any info. then please get in touch.

MESSAGE to GARY EGERTON from THE EDITOR

Your subscription to OUM expires after the Feb'94 issue. The label on the OUM envelope shows a date e.g. 2/94 - this is the expiry date.

WANTED

Steve Marshall is still on the look -out for issues 9 and 10 of the ORIC OWNER magazines.

WANTED

A Disc Controller (working or not) is wanted by Gary Egerton for his Oric Microdisc - preferably a French Version.
Perhaps Laurent would be so kind as to run this advert in the French issue of the CEOMAG!

SPECCY SERIAL INTERFACE

Steve MArshall asks if Speccy Serial Interfaces can be used for the ORICALL Bulletin Board. He says - "There must be some use for a Speccy?"

Over to Mr. Haworth!
If the answer is no,then it can always be used as a Door Stop!

A NOTE FROM PETER

" I see that Jon H and co. have been producing some very interesting HIRES printouts and I am sure that the same could be done on the Archimedes. I hace a camcorder and digitizer board. The files it produces are 179K,just a wee bit too big for the Oric, but maybe I can do something about that. First of all,I need to set up some desktop routines. Using the Archimedes desktop should make it easier to modify the files and cut them down to size. Should be interesting if I can make the time to do it"

- PETER BRAGG

SPREADSHEET

Two letters in a week asking for the same thing - a Disc based Spreadsheet.
Well gentlemen - you are in look. Adapted for disc some time ago by Peter Weisner and currently being used by the likes of Steven Friend and Gavin Williams; it was originally part of Allan Whitaker's Shareware scheme. Allan has since passed distribution of Pete's package to me and I have permission to pass it on from SOFTBACKS - I have to send them money.
Softback's ACCOUNT BOOK is linked to Tansoft's ORIC CALC and is available on Sedoric disc.
Price structure is as follows:

A) Both programs with both manuals (the Account Book one has been amended) on disc - 7 pounds.
B) As above ,but less the ORIC CALC manual - 6.50
C) - ORIC CALC only c/w manual - 4.50
D) - If you have Oric Calc on cassette and just wish to update it to disc then send proof of purchase (inlay), a disc and 50 pence.

A cassette version of ORIC CALC is available.

Machine Code for the Oric Atmos (Part 30)

Peter N. Bragg

The Story so far

We have looked at the basic requirements for machine code programming. A small selection of useful 6502 Instructions appeared in Part 22 of the series. Also illustrated were a few programming techniques that I have found useful. Last time, we started to look at binary and how it is used in computers. Data memory "bits" were compared with the common household electric light switch. Switch OFF = "0" and switch ON = "1". This meant that as well as storing data, individual memory bits could also be used as indicators (Flags), or as a real electrical ON/OFF switch for the computer hardware items. If in doubt, take a look at Part 29 of the series.

So what use is it ?

Binary is useful for those of us who have made hardware additions to our Orics in the form of modems or expansion boards etc. Setting up such hardware, usually requires a little binary to deal with the necessary flags and circuit switches.

Binary is also used for the display. This is not so obvious because a fair number of text and graphics commands allow us to do a lot using Basic only. However, there are always those who want to go that much further. Observe our friends from CEO, who are transferring graphics from other machines to the Oric. Knowledge of the binary makeup of the HIRES display is a must for writing this sort of software.

Conversion Table

The first thing that we need is an easy method of converting hex code into binary and the table on the right is all you need for that. In fact, you don't even need the decimal part, as decimal is not very practical for the purpose. The Atmos Manual lists 00 to FF, but if you look at it's hex/binary conversion you will find that it is sixteen repeats of this table. Conversions are simple. For example -

To convert 93 hex to binary, just look up the binary for 9 and then look up the binary for 3 and put them together like so -

9 hex is 1001 in binary and 3 hex is 0011 in binary, so 93 hex is 1001 0011 in binary.

decimal	hex	binary
0	0	0000
1	1	0001
2	2	0010
3	3	0011
4	4	0100
5	5	0101
6	6	0110
7	7	0111
8	8	1000
9	9	1001
10	A	1010
11	B	1011
12	C	1100
13	D	1101
14	E	1110
15	F	1111

The table converts either way, hex to binary or binary to hex. The largest value you are likely to use on the Oric is a single byte, which is two hex digits or eight binary digits. Hex code and binary are used by most computer systems, so it is worth mentioning a small point. If you ever have to deal with large binary values, you will find it much easier if you split the value up into groups of four digits, starting from the right hand side of the value. For example - 1010101110111010 in binary, looks a bit horrendous ! However, it can also be written as 1010 1011 1011 1010 which makes it easier to handle and convert into hex. This particular value converts into a well-known ancient Scandinavian four byte group !! However, I should stress that you are only likely to need single bytes on the Oric.

For an example of the effect of binary code operation, you don't have to look any further than the screen colours to see binary code at work.

A Splash of Colour
---------- The Oric uses eight colours numbered in a sequence, from "Ø" for black, to "7" for white and you will find the same sequence in use, whether you are using Basic or machine code. All the colours on the screen are produced by just three colour guns in the TV (or monitor) tube. There is a "gun" each, for Red, Green and Blue. If you take the eight colour numbers "Ø" to "7" as hex digits and convert them to binary, using the table above and also list their respective colours, you will see how Oric controls the colour guns. Bit Ø controls the RED gun, Bit 1 controls GREEN and Bit 2 controls BLUE. So for example, take colour number 5. That is Ø1Ø1 in binary. Ignore the left hand digit (that is used for something else). The remaining 1Ø1 is Blue ON, Green OFF and Red ON and that should produce Magenta, which in fact is what we get for colour number 5 (ie. INK5, PAPER5 etc).

Hopefully, all this has given you some idea of how binary code operates. The table above is a useful item to put with your instruction set, preferably on a "crib card", so that it is handy when you come across a binary instruction.

Binary Bashing
---------- Essentially, there are two types of instruction that can handle binary data. They are Logical Instructions and the Shift Instructions.

Logical instructions have the effect of combining a data byte with an instruction operand byte to produce a single byte result. This type of instruction makes it easy to change any selected bits in a byte without affecting other bits in that particular byte, quite useful if you want to deal with specific pixels on the display screen, or set up a joystick, etc.

Shift instructions on the other hand, affect the whole of the data byte. They treat a data byte as if it were in a tube. In effect they push a new bit into one end of the data byte which shunts all the other bits along one space, causing the bit at the other end to "fall out" of the data byte. So for example, if you shift a data byte one bit to the left, all the bits will shift, bit Ø will go into bit 1 position, bit 1 will go into bit 2 position and so on, up to bit 7, which will fall off the end. A shift to the right goes the other way and it is bit Ø that falls off the end, this time. The bits that "fall off the end" are not necessarily lost, they can be saved and pushed back into the data byte at the other end, during the Shift operation. This allows all the bits in a data byte to be "rotated", if you want that.

Logical Mr Spock ?
---------- Let's have a look at Logical instructions first. We have a choice of three. They are AND, ORA and EOR. All three are used in the same way, so once you know how to use one of them, you will be able to use all three. The only difference is the final effect. To keep it simple, I will concentrate on the effect of the instructions rather than go into the details of logical operations. Remember we are operating on single data bytes, which consist of eight bits. For each bit, we have three options. (a) We can make it "Ø" or (b) we can make it "1" or (c) we can simply change it from its current state to the other state, in other words, from "1" to "Ø" or from "Ø" to "1". The AND instruction will provide option (a), ORA provides option (b) and EOR provides option (c).

This appears to be a long explanation for the benefit of a mere handful of binary instructions, that are not used that often anyway. However, most of what has been said in these last two articles applies to all computers, not just the Oric, so it is useful to know, even if it is a long way from being a complete description of binary operation. Next time...some instructions !

RAMBLING IN THE ROM - 54

Ramblings...

Not in the ROM this month (sighs of relief!) - I felt it was time for a change to match the start of the new season's computing. It's been a hectic time over the last few weeks, starting with my now infamous day trip to Belgium to acquire ten years' collected goodies from Rudi Staumont. I'm still sorting through everything, but already it has proved a fascinating exercise.

The first result has been the discovery of a series of articles in a French magazine called 'Soft & Micro' in late 1984 and the first half of 1985. They deal with music and the Oric Atmos, and in my humble view are a mine of information, good enough to merit translation and publishing for the first time in Britain.

The series starts with a simple introduction to what music is, how it is written, and the terminology of musicians. It develops into a guide to writing music in Basic, with particular reference to compacting the usually endless lines of data. It then points out the limitations of programmming music in Basic, and concludes with quite the best little machine code routine I've seen - a music 'driver' that runs under interrupts. What that means is that the music you enter plays while your program is running, or even while you edit it! So, keeping the French title, 'Software Sounds' starts this month, and will continue as and when Dave sees fit over the months to come. The ROM disassembly will return next month.

Just as I offered these articles to Dave, Steve Marshall produced the first of his series to be found elsewhere in this issue. Happily, I think the two series will be complementary - Steve is a wizz on the ins and outs of music, and his articles will add a lot of depth to our knowledge of what is happening when we play music; the series I have translated is very much tied to programming your Oric. Together, they will hopefully awaken more interest in the musical capabilities of the machine. They might even tempt you to buy 'Sonix'!

MICROWAVES

Oric gains colours

After you have experienced the colours on the Oric, you might like to add some more to your collection.

The program shown below produces every possible colour using the Oric colours. The colours are produced by POKEing two alternate colours onto the HIRES screen so that they merg together, and give the impression of another colour.

Using this method, colours such as pink and orange can be produced.

```
10      HIRES
20      FOR A=17 TO 23
30      FOR B=17 TO 23
40      FOR C=40960 TO 49000
        STEP 80
50      POKE C,B
60      NEXT C
70      FOR D=41000 TO
        48960 STEP 80
80      POKE D,A
90      NEXT D
100     WAIT 200
110     NEXT B
120     NEXT A
```

Graham Bailey,
Camberley, Surrey (PCN 1984)

Another new feature this month is the start of a series of reprints of those famous 'Microwaves', readers' hints and tips that appeared in Personal Computer News (now defunct) from 1983 to 1985 (so far as the Oric is concerned). I hope you find them entertaining and even informative.

So now, on with the first part of 'Software Sounds'...

Jon Haworth

SOFTWARE SOUNDS

The first of a series of articles originally appearing in the French magazine 'SOFT & MICRO' between October 1984 and June 1985
written by Jean-Marie Cour
translated by Jon Haworth

"FRERE JACQUES, FRERE JACQUES..."

Music, it seems, is the art of assembling sounds which are pleasant to the ear. Armed with your ATMOS computer and its powerful electronic 'music box', let's see how to make it play the famous children's song... and to ring bells!

There are those of us who have, since childhood, practised the scales, done our aural exams and performed all the other hated exercises so indispensable to the young musician. For them, the score of "Frère Jacques" is simple, clear and childlike.

As for those of us who know little of notes, of the keys of C and G, and who inevitably have no musical ear, now it's your turn to perform! The computer will allow us to enter straight into faultless musical composition, though not without some twists and turns...

The Score

Since the Renaissance, we have represented pieces of music on a sort of ladder, drawn with 5 horizontal lines. The music is read from left to right as with a book, along this musical **stave**.

In the western tradition, the **notes** are coded according to conventions which have their origins in Greek antiquity, an era when philosophy, art and mathematics were only a kind of Magic.

The Octave

In general, our ear hears as 'the same sound, but higher pitched' vibrations of the air which are in the relationship two to one. In the language of physics, it is a doubling of frequency; for the musician it is an **interval** of one **octave**.

The ATMOS has a sound generator which, as we shall see later in this series, is a very complicated integrated circuit, but which can be represented as three 'sound boxes', each individually furnished with:

- an **octave** selector
- a **note** selector
- a **volume** command

all of which are commanded by a Basic instruction: MUSIC.

In the following program, we are going to play only one of the three voices, a single **channel** in computer terms:

```
10      MUSIC 1,3,1,8
15      WAIT 50
20      MUSIC 1,4,1,8
25      WAIT 50
30      GOTO 10
```

The MUSIC command in line 10 is interpreted as follows:

- the 1 indicates channel 1; they are numbered 1, 2 and 3
- the 3 indicates the third octave, as will be explained
- the 1 indicates the note C
- the 8 indicates a medium volume on a scale from 1 to 15

The command in line 20 is identical, save that 4 indicates the fourth octave. As for the waits of a half-second (50/100ths) in lines 15 and 25, they simply prolong the two sounds, which repeat over and over again via the loop (GOTO 10 in line 30).

Harmony

This short program gives a 'two-tone' signal which sounds remarkably like a fire-engine siren. Even an untutored ear will correctly hear the 'perfect' harmony of the two sounds; for the musician, it is by definition **the same note**, at an interval of one octave.

With a loop where the octave is varied from 0 to 7, you get a C across 8 successive octaves; and you understand when you hear it why there is no room for any more!

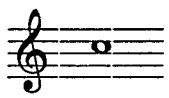
```
10      FOR OCTAVE=0 TO 7
15      WAIT 50
20      MUSIC 1,OCTAVE,1,8
25      WAIT 50
30      WAIT 50
40      NEXT
50      GOTO 10
```

In effect the C of octave 0 vibrates about 16 times a second, bordering on the infrasonic. We feel it as much with our body as with our ears. A C of the ninth octave is virtually an ultrasound which, while it might interest our dog or our dolphin, can hardly be heard by us because it is so high pitched (about 4,200 vibrations per second).

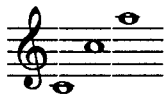
As with temperatures, which start in centigrade arbitrarily at 0, the moment when ice forms, the western scale commences arbitrarily with 'C'.

On the stave

When the stave starts with a G clef, the curling symbol that we all associate with Music, the 'C' of octave 4 is placed thus:



In the musical stave, one moves up or down in steps defined by the lines and the spaces between the lines. We can now look at 'C' one octave higher (5) and one lower (3, middle C):



As is usuallly done, we have added the 'missing lines': one below to place middle C3, and two above to arrive at C5.

In Basic, this simple score will be translated as:

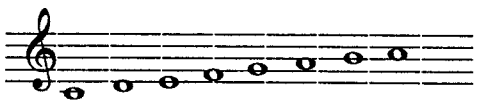
```
MUSIC 1, 3, 1, 8
MUSIC 1, 4, 1, 8
MUSIC 1, 5, 1, 8
```

Do Re Me Fah So La Ti Do

Even without any special musical knowledge, we know how to hum the scale of our subheading. It's correct name is a **diatonic** scale; it corresponds to our simplest instruments, from the reed-pipe to the spinet of the Vosges.

This scale of sounds includes 8 notes, including a second DO to reach the following group of 8 (hence the term OCTAVE).

C D E F G A B C



Here is the Atmos interpretation:

```
10  REM Diatonic scale
20  MUSIC 1,3,1,8: WAIT 50
30  MUSIC 1,3,3,8: WAIT 50
40  MUSIC 1,3,5,8: WAIT 50
50  MUSIC 1,3,6,8: WAIT 50
60  MUSIC 1,3,8,8: WAIT 50
70  MUSIC 1,3,10,8: WAIT 50
80  MUSIC 1,3,12,8: WAIT 50
90  MUSIC 1,4,1,8: WAIT 50
100 GOTO 10
```

In the eight Basic lines from 20 to 90 only the third parameter of MUSIC (the note) is altered, except for the last of these lines, where we must change the octave (from 3 to 4) to give the final C.

The numbering seems strange to non-musicians:

```
1 = C       8 = G
3 = D      10= A
5 = E      12= B
6 = F
```

Don't worry, there is a good reason for the gaps!

The well-tempered scale

Popularised (?) by Johann Sebastian Bach, our complete musical scale, also called **chromatic** and **tempered** contains not seven notes (C to B) but **twelve.**

In effect the western tradition chose to divide the octave into twelve intervals 'equal' to the ear; this is not only a subjective notion, but also can be interpreted mathematically and physically.

If one wished to express the fact that the 'same' C returns each time the number of vibrations per second (frequency) is multiplied by two, you would get this progression:

C0 = one times C0
C1 = twice C0
C2 = four times C0
C3 = eight times C0 etc.

in short, a geometric progression.

A little mathematics shows that a twelfth of an octave is achieved by increasing the frequency as follows:

$$12\sqrt{2}$$

The calculation is done once for all occasions in the computer memory, which will translate the scale of notes from 1 to 12 (in an octave) into effectively equal intervals. Now a short Basic loop so we can listen to them:

```
10 REM Chromatic scale
20 FOR N=1 TO 12
30 MUSIC 1,3,N,8: WAIT 50
40 NEXT
60 GOTO 10
```

Sharps and flats

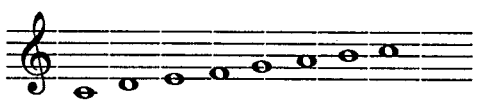
This last loop gives rise to a sense of frustration unless we complete it with a thirteenth note, C4 in a line 50:

```
50 MUSIC 1,4,1,8: WAIT 50
```

This dissatisfaction with what one hears if we stop on certain notes, as with the B (=12) in our loop, corresponds to the musical notion of a 'leading note'.

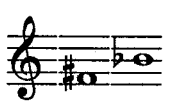
Looking again at the stave, it is obvious that there is no vacant space for these intermediate notes, those the computer numbers 2, 4, 7, 9 and 11. There are two possibilities: either invent a new stave with twelve positions or, following tradition, proceed as follows...

The **diatonic** scale includes unequal divisions and unequal intervals. Of the twelve **semi-tones** which make up an octave, only two are used contiguously: those which separate E from F and B from C. The other pairs of notes are separated by a full tone (2 semi-tones).

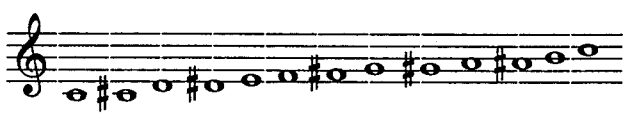


1 1 ½ 1 1 1 ½

You therefore have to invent symbols to express 'C augmented by a semi-tone', the sharp ♯, and 'B diminished by a semi-tone', the flat ♭.



These two signs are used **before** the note they affect. Using sharps, the chromatic scale looks as follows:



1 2 3 4 5 6 7 8 9 10 11 12 1

Plus one, Minus one

With the numerical notation of the computer, to rise a semi-tone is very simple: you add 1 to the note (unless you reach the next octave, when you must add 1 to the octave and return the note to C=1):

OCTAVE = 3	C = 1	
OCTAVE = 3	C♯ = 2	+ ½ tone
OCTAVE = 3	D = 3	+ ½ tone
...	...	
OCTAVE = 3	A♯ = 11	+ ½ tone
OCTAVE = 3	B = 12	+ ½ tone
OCTAVE = 4	C = 1	+ ½ tone, change octave

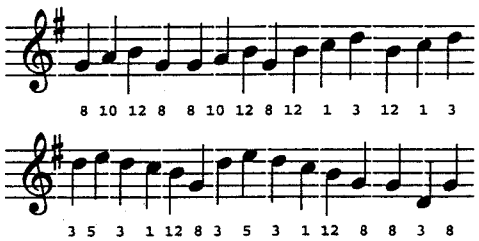
As for flats, it works in the same way, but with substraction by 1:

OCTAVE = 4	B = 12	
OCTAVE = 4	B♭ = 11	- ½ tone
OCTAVE = 4	A = 10	- ½ tone
...	...	
OCTAVE = 4	D = 3	- ½ tone
OCTAVE = 4	D♭ = 2	- ½ tone
OCTAVE = 4	C = 1	- ½ tone
OCTAVE = 3	B = 12	- ½ tone, change octave

It is clear that the 'intermediate' notes can be obtained equally by sharpening the note below or by flattening the note above! Thus we can compile a table of all the notes (top right), with their number for the computer .

Numbering 'Frère Jacques'

Forgetting for the moment that the notes of the real score have more or less irregular tails, that there are bar lines on the stave, etc., let's just recall all the notes but three:



ATMOS	NOTE
1	C
2	C♯ or D♭
3	D
4	D♯ or E♭
5	E
6	F
7	F♯ or G♭
8	G
9	G♯ or A♭
10	A
11	A♯ or B♭
12	B

What does the sharp perched all alone by the clef mean? It is there because of a musical convention that saves writing, and means that all notes in that position on the stave must be systematically altered. So one finds, according to the **key**, one or more 'clef alterations' which affect the whole piece of music.

If you look at the one in 'Frère Jacques', it is on the 'F' line. so, all F notes must be read as F♯. In fact there aren't any, which simplifies our task.

The computer numbering consists of calculating two numbers per note. The first is the octave; as the piece is not very long, the number will be 4 for notes above C4 and 3 below. The second number is the note itself. The last two notes of the piece (see the full score next time) count as one because of the **tie** (notes joined by a curved line).

Execution... is questionable

But there's no more space for this time; all will be revealed in part two.....

THE BACK PAGE

THE FOLLOWING LISTING WAS ADAPTED FOR THE 'ORIC' BY TONY CLARK. IT WAS THE FIRST TIME HE HAD USED AN ORIC, BUT OBVIOUSLY HIS WORK WITH OTHER 8-BIT MACHINES HAS HELD HIM IN GOOD STEAD.

THE GAME IS 'KINGDOM' - AN OLD STRATEGY GAME THAT HAS YOU MANAGING THE LAND AND THE CORN PLANTED AND THUS THE LIFESPAN OF THE VILLAGERS.

```
10 CLS:PAPER6:INK4
40 PRINT:PRINT:PRINT:
70 PRINT CHR$(4);
80 PRINT CHR$(27);"J";
90 PRINT TAB(16)"KINGDOMS"
100 PRINT CHR$(4)
110 PRINT:PRINT
130 PRINT TAB(8)"DO YOU WANT INSTRUCTIONS?"
140 PRINT:PRINT
160 PRINT TAB(13)"1 YES  2 NO ";
170 GET X$
180 X=VAL(X$)
190 IF X=1 OR X=2 THEN GOTO 240
200 CLS
210 PRINT
220 PRINT TAB(12)"MUST BE 1 OR 2"
230 GOTO 110
240 IF X=1 THEN GOSUB 9000
250 CLS
260 LETY=0:LETC=5000:LETS=1000:LETL=200
300 CLS
305 LETY=Y+1:LETK=0
320 PRINT
330 PRINT TAB(12)"IT IS YEAR";Y
340 PRINT
350 PRINT TAB(6)"YOUR STORE NOW CONTAINS"
360 PRINT TAB(5);C;"SACKS OF CORN"
370 PRINT
380 PRINT TAB(6)"YOU HAVE";S;"SUBJECTS"
390 PRINT
400 PRINT TAB(6)"YOU HAVE";L;"ACRES OF LAND"
410 PRINT TAB(5)"--------------------------"
420 IF Y=21 THEN GOTO 4000
430 PRINT
440 PRINT TAB(6)"HOW MANY SACKS OF CORN DO"
450 PRINT TAB(6)"YOU WANT PLANTED";
460 INPUT P
470 PRINT
480 IF NOT P>C THEN GOTO 530
490 PRINT TAB(6)"YOU HAVENT GOT THAT MUCH"
500 LET K=K+1
510 IF K=4 THEN GOTO 300
520 GOTO 460
530 IF NOT P>2*S THEN GOTO 580
540 PRINT TAB(6)"NOT ENOUGH PEOPLE TO SOW IT"
550 LET K=K+1
560 IF K=4 THEN GOTO 300
570 GOTO 460
580 IF NOT P>8*L THEN GOTO630
590 PRINT TAB(6)"NOT ENOUGH LAND"
600 LET K=K+1
610 IF K=4 THEN GOTO 300
620 GOTO 460
630 PRINT
640 LET C=C-P
650 PRINT TAB(6)"--------------------------"
660 PRINT TAB(6)"HOW MANY SACKS OF CORN DO"
670 PRINT TAB(6)"YOU WANT GIVEN OUT AS FOOD"
680 PRINT TAB(6)"YOU HAVE";C
690 PRINT
700 INPUTF:IF NOT F>C THEN GOTO 770
720 PRINT TAB(6)"YOU HAVENT GOT THAT MUCH"
730 LET K=K+1
740 IF K=5 THEN LET C=C+P
750 IF K=5 THEN GOTO 300
760 GOTO 700
770 LET C=C-F
780 CLS
790 PRINT
800 LETZ=1:LETA=P/8:LETX=L*3/4
830 IF A<X THEN LET Z=-1
840 LET G= Z*L/4:LETL=L+G:LETZP=1
870 LET M=1:LETE=F/4
890 IF E<S THEN LET ZP=-1
900 LET SP=(E-S)*ZP
910 LET X=S*3/4
920 IF E<X THEN LET M=-1
930 LET S=E
940 LET XX=RND(1)*3+1
950 LET X=INT(XX)
960 IF Z<0 THEN GOTO 1000
970 PRINT TAB(6)"YOU HAVE INCREASED YOUR LAND"
980 PRINT TAB(6)"BY";G;"ACRES"
990 GOTO 1010
1000 PRINT TAB(6)"YOU HAVE LOST";G*Z;"ACRES"
1010 PRINT
1020 IF L>12 THEN GOTO 1110
1030 PRINT TAB(5)"--------------------------"
1040 PRINT
1050 PRINT TAB(6)"YOU HAVE LOST THE GAME"
1060 PRINT TAB(6)"DUE TO A LACK OF LAND"
1070 PRINT
1080 PRINT TAB(6)"PRESS A KEY TO TRY AGAIN"
1090 GET A$
1100 GOTO 260
1110 IF SP=0 THEN GOTO 1450
1120 IF ZP<0 THEN GOTO 1150
1130 PRINT TAB(6)"YOU HAVE GAINED";SP;"SUBJECTS"
1140 GOTO 1160
1150 PRINT TAB(6);SP"PEOPLE HAVE STARVED"
1160 PRINT
1170 IF S>24 THEN GOTO 1260
1180 PRINT TAB(6)"--------------------------"
1190 PRINT
1200 PRINT TAB(6)"YOU HAVE LOST THE GAME"
1210 PRINT TAB(6)"DUE TO A LACK OF SUBJECTS"
1220 PRINT
1230 PRINT TAB(6)"PRESS A KEY TO START AGAIN"
1240 GET A$
1250 GOTO 260
1260 IF M>0 THEN GOTO 1440
1270 PRINT
1280 PRINT TAB(6)"TOO MANY PEOPLE ARE STARVING"
```

TAP!

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1290 PRINT TAB(6)"THERE IS AN ASSINATION ATTEMPT"
1300 PRINT
1310 PRINT TAB(6)"PRESS A KEY TO SEE IF YOU"
1320 PRINT TAB(6)"SURVIVE"
1330 PRINT
1340 GET A$
1350 FOR D = 1 TO 300:NEXT D
1370 IF X>1 THEN GOTO 1420
1380 PRINT TAB(5)"YOU DIED"
1390 PRINT TAB(6)"PRESS A KEY TO PLAY AGAIN"
1400 GET A$
1410 GOTO 260
1420 PRINT TAB(5)"--------------------------"
1430 PRINT TAB(6)"OK START BREATHING"
1440 PRINT
1450 PRINT TAB(6)"PRESS A KEY TO CONTINUE"
1460 GET A$
1470 CLS
1480 IF P<1 THEN GOTO 300
1490 LET W=1:LET B=1
1510 IF P<20 THEN GOTO 1680
1520 LET QQ=RND(1)*6+1
1530 LET Q=INT(QQ)
1540 LET H=(P/10)*2
1550 IF Q>2 THEN LET H=(P/10)*4
1560 IF Q=6 THEN LET H=(P/10)*8
1570 IF NOT H>(S/10)*16 THEN GOTO 1630
1580 LET B=-1
1590 LET N=H-(S/10)*16
1600 IF N>3200 THEN LET N=3200
1610 LET N=N*10
1620 LET H=(S/10)*16
1630 IF C/10+H>3200 THEN GOTO 1660
1640 LET C=C+H*10
1650 GOTO 1700
1660 LET W=-1
1670 GOTO 1700
1680 LET Q=3
1690 LET C=P*2+C
1700 FOR D=1TO 150
1710 NEXT D
1720 PRINT
1730 IF Q<3 THEN PRINT TAB(6)"THE HARVEST HAS BEEN POOR"
1740 IF Q>3AND Q<6THEN PRINT TAB(6)"THE HARVEST HAS BEEN AVERAGE"
1750 IF Q=6 THEN PRINT TAB(6)"THE HARVEST HAS BEEN GOOD"
1760 PRINT
1770 PRINT TAB(5)"--------------------------"
1780 PRINT
1790 IF B>0 THEN GOTO 1820
1800 PRINT TAB(6)N;"SACKS LOST DUE TO LACK"
1810 PRINT TAB(6)"OF MANPOWER"
1820 PRINT
1830 IF W>0 THEN GOTO 3000
1840 PRINT TAB(6)"=========================="
1850 PRINT
1860 PRINT TAB(6)"YOU HAVE OVER 32000 SACKS"
1870 PRINT TAB(6)"SO YOU WIN"
1880 PRINT
1890 PRINT TAB(6)"PRESS A KEY TO START AGAIN"
1900 GET A$
1910 GOTO 260
3000 PRINT TAB(6)"PRESS A KEY TO CONTINUE"
3010 GET A$
3020 CLS
3030 GOTO 300
4000 CLS
4010 PRINT
4020 PRINT TAB(6)"YOU HAVE SURVIVED TWENTY"
4030 PRINT TAB(6)"YEARS SO YOU WIN"
4040 PRINT
4050 PRINT TAB(6)"PRESS ANY KEY TO PLAY AGAIN"
4060 GET A$
4070 CLS
4080 GOTO 260
9000 CLS
9010 PRINT
9020 PRINT TAB(6)"YOU ARE THE RULER OF A SMALL"
9030 PRINT TAB(6)"MEDIEVAL KINGDOM. YOU HAVE TO"
9040 PRINT TAB(6)"DECIDE HOW MUCH CORN TO PLANT"
9050 PRINT TAB(6)"AND HOW MUCH TO USE TO FEED"
9060 PRINT TAB(6)"YOUR SUBJECTS."
9070 PRINT
9080 PRINT TAB(6)"IT TAKES FOUR SACKS OF CORN"
9090 PRINT TAB(6)"TO FEED ONE PERSON FOR ONE"
9100 PRINT TAB(6)"YEAR. IT TAKES EIGHT SACKS TO"
9110 PRINT TAB(6)"PLANT ONE ACRE. ONE PERSON"
9120 PRINT TAB(6)"CAN PLANT TWO SACKS IN A YEAR."
9130 PRINT
9140 PRINT TAB(6)"YOU HAVE TO SURVIVE FOR TWENTY"
9150 PRINT TAB(6)"YEARS OR ACCUMULATE 32,000"
9160 PRINT TAB(6)"SACKS OF CORN TO WIN."
9170 PRINT
9180 PRINT
9190 PRINT TAB(6)"PRESS ANY KEY TO CONTINUE.";
9200 GET A$
9210 CLS
9220 RETURN
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TA-TA FOR NOW!