

QLUB

News for the QL user



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ISSUE No. 3

JANUARY 1985

QL in the New Year

1985 promises to be a big year for the QL. Not only will a growing number of software options, extra storage devices, printers, monitors and other goodies become available for the machine, but they will bring with them an even greater number of applications for the QL.

AVAILABLE in the New Year QL CASH TRADER offers a powerful sales and general accounting facility for the smaller general, specialist or professional business. The program is uniquely simple to learn and operate. The small businessman using QL CASH TRADER can, for the first time, input through a single screen a wide range of unrelated transactions ranging from credit sales and purchases to business expenses and cash movements. The fully integrated system operates in real time

and continuously displays, in a window above the input area, Profit & Loss and Balance Sheet figures resulting from each transaction. Eighteen other reports can be displayed in this Report Window.

QL CASH TRADER recognises that business users of micros are not concerned with understanding computer or specialised accounting practices but need instantly available, accurate management and financial information about their business.

QL CASH TRADER requires the user to go through a simple sequence of learning and training exercises to understand the program's capabilities before allowing him access to the main program. This initial learning period and subsequent operation is supported by a comprehensive 200 page manual written in layman's language. The training exercise and manual have been designed to minimise the chances of mistakes or user disappointment.

QL CASH TRADER, by Accounting Software of Torquay, is the first of a new range of accounting software to be launched by Sinclair and will shortly be followed by a wide range of supporting products.

QL CASH TRADER is priced at £69.95 - **Qlub price** £54.95 .



HARDWARE UPDATE

PROBABLY the biggest hardware news in the past few months is the development by Quest International of disk drives for the QL.

Quest International Computer Technology announced the development of eight new additions for the QL in early November, including a range of 5.25 inch floppy disk drive units, ranging in price from £249 for a single 200K drive to £599 for an 800K dual drive version.

The disk drive prices include a disk controller, external power supply for the drives and all the necessary cables. Quest doesn't see the drives as replacements for the QL's own built-in Microdrives, but rather as complementary storage devices. The hard disk runs under Quest's CP/M 68K Operating System.

QUEST technical director Paul Bygrave said in a recent interview that the disk interface was developed simply because 'some people will find they need the extra space and speed that conventional disks can afford'.

For people who need even more disk-type storage, Quest also plans the release of a 10 Megabyte (7.5 megs formatted) Winchester hard disk system at £990.

In addition to the disk drives, the company has also announced RAM extensions, including 64K for £99, 128K for £159, 256K for £299 and 512K for £499. More information on all the equipment can be obtained from Quest International Computers Ltd., School Lane, Chandler's Ford, Hants. SO5 3YU or by telephoning 04215 66488.

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sinclair

THE EDITOR'S SCREEN

Happy Christmas and best wishes for a new year

THOSE wishes include even greater enjoyment of your QL and hopes that it can serve you even better in the new year than it has this year. As we've said on the front page, 1985 will be a very exciting year for your machine with loads more software, great storage alternatives and a chance to communicate.

ALL these developments will present great openings for you to add to the already large number of tasks your QL can already handle. The communications I mentioned, for example, are only as far away as your intention to buy a modem. This issue of QLUB News includes both details on a new communications service for QL owners known as QNET, as well as information on how to use it with the forthcoming QCOM hardware/software package.

And in addition to using QNET, you can always use the modem to dial up one of the many bulletin board systems throughout the country. It's worth remembering that your QL was designed from

Day One to be ready for communications — with the inclusion of TWO serial communications ports and our own networking system. This network means that you can exchange information and programs between one QL and another.

And then there's all the new software to contemplate — software which does everything from providing aid to small business to replaying some of the world's greatest chess games. The software you've seen so far is only a trickle compared with the flood of software planned for the machine.

Whatever you want your QL to do for you, there is likely to be a package to help you do it.

And if there isn't, it's now even easier to write one yourself. Using the new QL Toolkit or the QL Assembler, you can much more easily design your own programs in either SuperBasic or machine code. And with the recent release of Psion's Xchange software for the IBM, you can even design Archive programs which will work on the IBM version within Xchange (you might say the IBM is now 'QL-compatible' in this respect).

And probably the best news is that membership of QLUB is growing, with more people joining our exalted ranks all the time. This means more response to our challenges, a better selection of stories in the 'Quantum Leaps: The QL Case Study' section of QLUB News and more chances for you to exchange ideas with other QL Users.

So as you sit singing about acquaintances which should never be forgotten and speculate about what the new year has to offer, be secure in the knowledge that your QL will not be forgotten and will always be brought to mind.

See you next year ...

Q LETTERS

I am using the QL with a Brother CE-60 typewriter/printer. The printer has an RS-232C interface and a parallel interface. Which interface should I use to get printed text from Quill on the QL and how should I go about getting that interface to work with my machine?

Thanks for answering this inquiry and thanks for the new format newsletter.

A. C. M. Ball
Fulham, London SW6

The RS-232C interface problem (as described in the last issue) is that serial printer output standards are not yet quite standard. We know what we think the prevailing standard will be and have designed the QL's serial port to meet that standard.

If you want to get your printer working via the RS-232 port, try linking pins 5 and 20 on the RS-232 lead — as many Brother printers seem to require this extra signal on Pin 20. The alternative is to buy a 'Smart Cable' which will figure out all the RS-232 signals for you — and cost about £75 — or to buy a parallel printer interface for the QL (Transform of Kent do one for £49.95). If that doesn't work, contact Psion for more information on Quill's printer driver.

I'M having a problem in saving the printer driver on my QUILL master microdrive. I go through the whole business of using the 'install' program on the master, change the baud rate and a few other settings — but then when I go to use the program, I find that the settings are still at what they have always been!

How can I get the Install program to work? Is my printer up the spout? Help!
G. Brookfield
Surrey

The problem isn't with your printer. You have tried to save the new printer driver settings on your MASTER Quill Microdrive — something which is inadvisable at the best of times. The CLONE program is provided on the Quill master to enable you to copy the program and then use that copied version on which to make your changes to the printer driver. Your master is protected against having changes made to it, so just copy it and then lock it away. The copied version will then quite happily accommodate any changes you might wish to make to the printer drivers or anything else. And if you've already used up the blank Microdrive cartridges which came with your machine, you can always buy new ones at any Sinclair stockist.

This is your page

White space is not a pretty sight, particularly in the eyes of an editor. Only you can prevent this dreaded disease from striking the letters' column of Sinclair QLUB News.

If we say or do something you disagree with, are surprised by or just want to sound off about, put pen to paper (or hands to keyboard) and let us know. Like it says at the top of this column, this is your page and it's up to you to make the most of it.

It isn't the only place in this magazine for your comments — there's the Programmer's Forum for your programming tips and queries, the QL Case Study to air your applications hints and the QL Quarks column to hear QL quips — but the letters page is the first place most people look for letters.

Write to:
The Editor, QLUB News
Sinclair Research
25 Willis Road
Cambridge CB1 2AQ

SOFTWARE UPDATE



THE question is no longer soft-where, but soft-which? The latest QL software releases further widen the range of jobs which your machine can accomplish and include everything from entertainment to entry-level machine code. . . . First among the new crop of NOW AVAILABLE products is **QL Touch 'n' Go**. Are you frustrated by the 'keyboard barrier'? Does it take you hours to type in the simplest program or document? **QL Touch 'n' Go** will change all that.

With a little effort, this program can give you mastery over the standard QWERTY keyboard in just 24 hours. With it you should be able to achieve speeds of 40 words per minute and an alphabetic accuracy of 95%.

The **Harcourt Keyboard Mastery Method**. After years of teaching typing by the traditional methods based on 'hieroglyphic' drills, Stan Harcourt, driven by the idea that there must be a better way, developed this completely new approach. Based around the early introduction of the most frequently used letters and the 1,000 most common words, the course is unique in both its approach and its simplicity.

Specially designed for your micro. Stan Harcourt's son, Bob, a recognised computer programming expert, teamed up with his father to produce this concentrated keyboard skills package for computer users. Originally they developed it for disc-based systems, and have now produced an exciting new version of the program specially for the QL. **QL Touch 'n' Go** sells for £24.95 — and is, of course, discounted to QLUB members at £19.95.

GST Computer Systems Ltd of

Cambridge (authors of the QL Assembler and Linker) are to provide QLUB Members with the advanced 68K/OS Operating System at an attractive discount. Features of the GST Computer Systems 68K/OS are as follows:— plug-in card with switch to select 68K/OS or Qdos, instant access to QL multitasking, enhanced screen windowing facilities, unix-like real-time kernel including pipes, extensive library of application software including full screen editor, and detailed user and programming manuals.

"Despite the complexity of 68K/OS I soon found it easy to use and certainly more friendly than CP/M or MSDOS," said Ralph Bancroft of *Personal Computer News*, 3rd November 1984. To order, contact GST Computer Systems Ltd, 8 Green Street, Willingham, Cambridge CB4 5JA or telephone (0954) 81991 and ask for Sally Pateman, quoting your QLUB membership number.

68K/OS Operating System — RR Price — £99.95. QLUB Price — £89.95. 68K/ASM Assembler — RR Price — £39.95. QLUB Price — £31.95. 68K/OS Systems Programmers Reference Manual (Binder not supplied) — RR Price — £4.95. QLUB Price — £3.95.

In addition to the traditional software suppliers, backed by big colour ads in computer mags and lots of money, there are smaller entrepreneurs getting into the QL software supply business. Here's just a sampling of some of the wares advertised by these small companies — who often fill a need that others don't have the time to deal with. But remember, let the buyer beware, check these products out fully

before you buy and make sure there's someone to whom you can go if the software doesn't work. Small software houses may often have good ideas, but they sometimes don't include professional marketing and shipping. If possible, send a SAE first to get more information before you buy.

Anyway, here are the ads. . . . **QLutilities**, 4 programs on Microdrive for Sinclair QL to prevent DIRectory overflowing the screen, provide single-key loading and deletion of files, repeat formatting of cartridges and backup copying of whole or part of any cartridges . . . £10 from WD Software, Hill Top, St Mary, Jersey C.I. **Systems Software — File Manager** simplifies and extends microdrive file handling. A sorted directory of either or both Microdrives is kept. The usual file commands are available, but compressed and generalised by 'wild cards' and defaults . . . £10 all inclusive, SAE for details from Saltgrade Software, 31 Royal Terrace, Edinburgh EH7 5AH.

Sinclair has developed a standard format for floppy disks to allow the interchange of floppy disk formats between different manufacturers' systems of the same physical type. This format has been adopted by a number of third-party disk manufacturers and would be the basis for any Sinclair disk product. The description of this format is available on application to Sinclair Research Software Department, 25 Willis Rd, Cambridge CB1 2AQ. . . . To help software houses producing software in SuperBASIC for the QL the SuperBASIC production kit is being made available. It takes the form of a set of machine code routines extending the facilities of SuperBASIC to include fast image-loading of Basic programs, fixed decimal point conversion, error trapped I/O, random file access and code protection. The package of routines is loaded from cartridge at the start of the day and remains accessible to Basic programs until the machine is reset. Enquiries should be made through Sinclair Research Software Department.

SINCLAIR SOFTWARE OFFERS

A 20 per cent discount on Sinclair Research QL Software sold through QLUB. This includes:

QL Chess - Qlub price £14.95

QL Assembler - Qlub price £31.95

QL Toolkit - Qlub price £14.95

QL Cash Trader - Qlub price £54.95

Send your order to Sinclair Research, Stanhope Rd, Camberley or telephone 0276 685311 quoting your membership number.

INTERFACE INQUEST



QCOM Qomes to the res-Q!

THE object of the Interfacing Inquest is to answer questions about getting the QL to talk to other machines — be they printers, screens, modems or other computers.

In this column, we are fortunate enough to be able to announce the development of a new communications package for the QL which will make it much easier to link to Prestel and other professional computer databases. This announcement pre-empts the planned terminal program, which we had hoped to present in this space.

But with the developments you'll read about below, you may well want to get a rather different communications package than the planned terminal program would have given you — so we're enhancing the terminal program to work with the new equipment and will present it soon.

A new communications package for the QL, called QCOM, will allow the machine to link to a DEC minicomputer, and to phone-in databases such as Prestel.

QCOM will comprise three separately available units. The first of these is a controller and terminal emulator called

QCON; a second module, the QMOD modem, can be stacked on top of it, and an auto-dial and auto-answer unit called QCALL can be fitted on top of the modem.

QCON is stacked with sophisticated software to run the comms package. If used alone, its partly microdrive-based software allows the QL to be linked to large DEC minicomputers, or — via a built-in RS-232 port — to run any other standard modem.

This base module enhances the QL's serial ports, enabling them to transmit and receive at independently-set rates of 75, 300, 600, 1200, 2400, 4800 or 9600 baud. Any unprotected Microdrive file can be sent using the QCON software, and there's even a facility, via the menu-driven command structure, for the encryption of private data.

Next on your shopping list might be the QMOD/OE modem, likewise kitted out in deepest QL black and featuring QL-style fluting and ribs.

The device gives both 1200/1200 and Prestel-style 1200/75 baud transmission

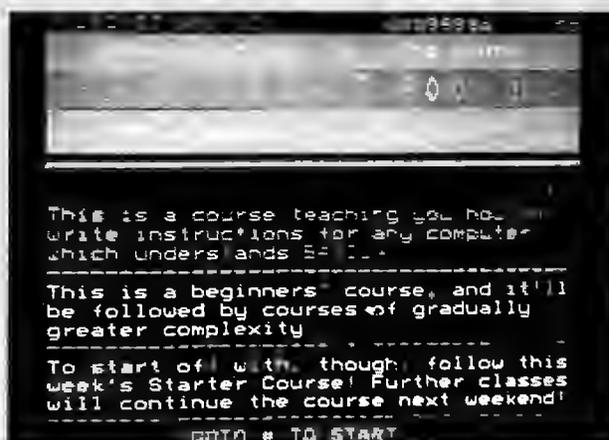
rates, and incorporates a telephone extension socket for manual dialling. OE says the decision not to include 300/300 capability was based on the assumption that the Prestel rate is rapidly becoming the industry standard for phone-up databases; anybody disagreeing can always buy a different modem.

Finally, the really dedicated hacker will want the QCALL unit.

Apart from the manicure-preserving wonders of auto-dial, QCALL offers an auto-answer facility which will permit incoming calls to be accepted automatically and to trigger pre-programmed activity from the QL; the owner of a complete QCOM package could run his own bulletin board, could exchange data with other modem owners, could — in his absence — receive data, store it on microdrive, and then pass it on to a third QCOM unit using QCALL's auto-dial facility. It will cost £49.95.

Details of how to order will be given in the next issue.

COMMUNICATIONS CORNER



Here's just a sampling of the information you get with Micronet.

QNET, Micronet, Prestel and much more...

THE QL is now on-line. A special QL database area called QNET has been opened up on the Prestel Microcomputing service and a special QL modem has been developed for getting onto the service (for details on the modem see page opposite).

The QNET service started on October 14 and is operated by the same people who do the popular Micronet general microcomputer information service. Sid Smith, who runs the editorial section of QNET and provided the story overleaf says it all came about because a number of Micronet journalists who attended the QL

launch back in January were so impressed with the machine that they ordered — and paid for — their own personal QLs. This developed a strong basis of self-interest for Micronet journalists, who subsequently became involved in both the setting up of QL User magazine and QNET.

QNET will cost the same to join as Micronet (£13 per quarter), although there will be an initial £8 discount for members of QLUB.

Membership of QNET will not only entitle you to the free software, QL news and features that will be on the system,

but also to the whole range of regular Prestel services, including Micronet and Viewfax 258.

QNET will also be the only electronic information service to use the software downloading protocols offered by the OE modem. This means that if you want to download programs over the phone, QNET will be THE place to do it.

You can join QNET by writing to QNET, c/o Micronet subscription department, Third Floor, Durrant House, Herbal Hill, London EC1 or by phoning 01-278 3143.

Quantum Leaps: The QL Case Study

THE QL will be used for many different things by many different people. They will either tailor existing software or write their own programs to accomplish specific tasks with the machine. Each of these adaptations is, in its own way, a quantum leap. This column is devoted to highlighting such uses of the QL so that these advances can be shared by all users.

A SINCLAIR QL is about to set off for a year's stay in the Antarctic.

The machine is travelling courtesy of a team of five Britons who plan to spend a lengthy period in scientific study on the southern ice-cap, and finally to send two of their number on a 900 mile walk to the South Pole.

During their stay, the QL (the only computer they're taking) will be used to write a book about the expedition, and to process scientific data about the weather and its effects on expedition members.

The project is called "In the Footsteps of Scott," and commemorates the tragic attempt in 1912 of a party under Captain Robert Scott to be first to the South Pole. The modern expedition isn't keen to emulate its forebears too closely, of course, since Scott and his party perished on the march back to safety.

"The QL is just part of the top-class range of equipment we're taking to make sure that things don't go wrong this time," says the expedition's doctor, Mike Stroud.

"We chose this machine because of the unrivalled range of facilities it offers, because of its software, and because we like Sir Clive."

As expedition doctor, Mike will be using the QL for observations of his companions.

"As the year progresses," he explains, "the day-length will change from twenty-four hours of light to none at all. I want to chart the effects of this change, and of the levels of cold, on the human metabolism.

"I'm also likely to be the one doing most of the work on the book, so I'm looking forward to learning all about word processing."

In fact, Mike confesses to knowing nothing at all about computers, but counts on the QL being easy to pick up quickly.

The machine will spend all its time in the expedition's base hut, thereby avoiding the worst extremes of temperature. But the same won't be true of the two hardy souls who'll be setting off to walk almost 1,000 miles from that base camp to the South Pole.

Unlike Scott, in whose footsteps they are certainly following, the two men will



not be assisted by tractors and animals; instead, wearing special harnesses, they intend to drag all their supplies behind them on man-sledges. By employing the lightest and strongest of modern materials, each sledge will be able to carry enough supplies for both men — thus ensuring that the loss of a sledge will not endanger life.

Similar forethought is evident in the expedition's store of supplies.

"The expedition ship will drop us off at base camp during the Antarctic summer," says Dr Stroud, "and then spend the next few months doing charter work around Australia and New Zealand.

"We hope the ship will be able to come and collect us the following year, but there's always the possibility that the pack ice won't break up enough to let it through. We're having to take a two year supply of stores to cater for that possibility."

Their ship was not built as an Antarctic supply vessel, and extensive conversion work has been undertaken to equip it for its new role.

"Apart from upgrading the radar and acquiring satellite navigation equipment, we've had to weld additional ribs into the hull, to enable it to withstand the pressure of the ice. We've bought longer cables so that we can anchor hundreds of yards off shore, and special fins have been placed at the stern of the ship to deflect pack ice away from the propeller."

Like the rest of their equipment, the ship has been acquired through donations from industry — though Dr Stroud is particularly touched by the extent to which private citizens, such as school children, have also helped.

"We've had donations of amounts as small as 50p from some people," he recalls. "We've invested our own money, of course, but lots of schools have helped. We've also had contributions from well-known people like Prince Charles. It's because of aid from a large variety of sources that we've been able to raise something like £750,000 for this expedition."

The fruits of that fund-raising, in the form of huge quantities of equipment, are now sitting in a warehouse in London's West India Dock. Along with the QL, there are heaps of low-temperature clothing, tents, sledges and navigation gear, and such unexpected items as a mountain bicycle, a whole cheese, and a remarkable quantity of toilet paper.

Dr Stroud, meanwhile, is looking forward to a serious session with the QL. "Learning about computing will be a nice way of spending the winter," he says, "though we'd like to take lots of games as well."

If you have any unique application idea for your QL which you'd like to share on these pages, write to:

**Quantum Leaps:
The QL Case Study
The Editor QLUB NEWS
Sinclair Research, 25 Willis
Road, Cambridge CB1 2AQ**

The QL Xmas Wish List

by Santa QLaws

'Twas the night before Christmas and all through the house not a creature was stirring, not even a QL'

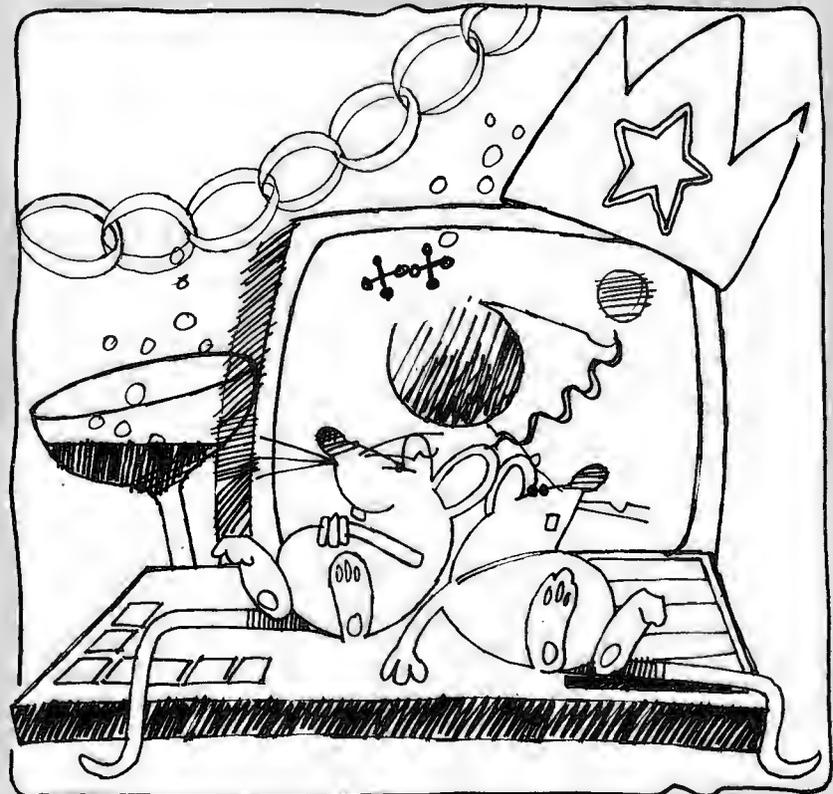
HISTORY will record that my QL planned to be soundly asleep on the eve of Yuletide '84, and that after using Archive to sort through the list of gifts and using Quill to print warning letters to children who had been naughty — as opposed to nice — it had planned to take a well-deserved break.

I was all in favour of this. The elves' union (Elves, Artisans and Tradesman's Local 1) had initial misgivings about the little black box from Cambridge, but those soon disappeared after a few days of working with the QL. Still, the machine had had a rough ride and deserved some time off.

So when it transpired that a few days before Christmas, the machine dozed off, with a faint snoring sound emitting from the Microdrive slot, I wasn't worried. I was more than a little intrigued, however, when strange things started appearing on the screen the next day. Under the heading, TEN THINGS I WANT FOR CHRISTMAS, my dreaming QL wrote:

(1) Some wafer-thin memory chips — My owner keeps threatening to stick "a great fat 512K memory expansion" in my side, but I'm afraid it will spoil my sleek figure. If it were wafer-scale integrated technology RAM, however, I'm sure it would be much more slimming.

(2) Some new shoes — His lordship keeps losing the little plastic 'shoes' which fit



underneath me to give me height. I like the rakish angle they provide (it makes my profile look even better), but perhaps owning some Gucci feet would make my owner less likely to constantly drop them and lose them.

(3) A baby brother — Life can get pretty lonely here at the North Pole, even with S. Qlaus and the membership of EAT (the Elves, Artisans and Tradesman's union). If only I had another QL to talk to over my network, we would swap information, talk about the good old days at Camberley and share out the work.

(4) Racing stripes for my Microdrive — They run a lot faster than people think, and maybe if I had a few racing stripes on the outside, people would stand up and take notice.

(5) A dust cover — it gets pretty cold in here at night and that would keep me warm....



It was at this point that I tripped over the power plug and my QL stopped its on-screen dreaming and went into an even deeper sleep — from which I didn't bother to wake it until after Christmas. (And I won't tell which of the gifts I ended up getting, but suffice to say that my machine no longer feels lonely.)

Abacus Tips

Text names, ra

	January	February	March	April	December	TOTAL
Sales	134.88	148.78	147.74	155.12	229.19	2132.98
Direct Costs	87.18	91.46	96.83	100.83	148.97	1386.38
Gross Margin	46.98	49.25	51.71	54.29	80.21	
Rent	3.67	3.67	3.67	3.67	3.67	44.84
Rates	2.58	2.58	2.58	2.58	2.58	30.88
Electricity			9.43		9.43	37.72
Telephones		3.28				12.88

command>

sum(B11:M11)

THE ability to use text cells as labels for rows, columns and cells, is an excellent feature of Abacus, in that it allows you to refer to various parts of the spreadsheet in a more natural way. However like any powerful tool it can be misused and abused.

Careful planning of your spreadsheet, and in particular, how you label columns and rows, will lead to your being able to take maximum advantage of the automatic naming facility.

One of the most frequent problems encountered is in the case where duplicate labels are required. As you will no doubt have discovered, when there are two labels the same, Abacus will always find the first occurrence of the label and nothing you can do will persuade it to recognize the second label. COSTS is just such an example in the spreadsheet opposite shown in Figure A.

COSTS.JAN will always reference cell B3 and never cell B6. The only way around this problem is to choose a different name for the cell at A6 so that it is

differentiated from the cell at A3. The argument against this is that it will spoil the printout of the final document.

There is fortunately a way around this problem by using the if function. Choose a cell in the top row to the right of the very last cell you are currently using. In the example above something like cell M1 would be fine. The idea is to use the cell as a temporary flag and so it must be outside the range of anything you are intending to print. Put a 1 in M1 and then put the formula if (m1, 'B_COSTS', 'COSTS') in CELL A6. As the flag is on cell A6 will now have the label B_COSTS and you can refer to cell B6 as B_COSTS.FEB. Now for the clever part. Just before you print the spreadsheet go to cell M1 and type in 0, which will turn the flag off and the contents of cell A6 will change to COSTS which is what is required for the report.

When you have a lot of cells like this the advantage is enormous as just by changing the value of M1 you can have all the labels changed from your working label to the labels you require when printing.

Some of you may have been puzzled to find that if you entered in cell A8, for example:

'Sales

and then in B8 the formula

sales=1000

that you would receive the error message

Name is not a row or column

This is because, as of yet, Abacus has no way of knowing whether you want to act upon the row or the column in which the label 'Sales' appears. The way in which Abacus deduces this is by looking for the nearest cell containing a value either along the row or the column of the cell containing 'Sales'. If the nearest is along the row, then 'Sales' will be treated as a row reference, and likewise for columns. (Note that if the nearest cells in both directions are the same distance away there is still an ambiguity and Abacus will give the error AMBIGUOUS NAME). If this fails, Abacus can still resolve the problem if the row or column concerned is to be the result of a formula. In such a case it will make the reference

and Hints

anges and more...

	A	B	C	D	E
1		Jan	Feb	Mar	Apr
2	Shoes				
3	COSTS	150	200	400	325
4					
5	Bags				
6	COSTS	210	180	215	230
7					

Figure A

the same as any row or column references in the formula, if there are none, then there is still an ambiguity. For example, if costs is already a row then sales=costs/2+450 will make costs a row as well. (Please note that you cannot mix row and column references in a formula.)

RANGES

There is more than one way to refer to a range of cells. Ranges which are allowed are as follows:

i) sum(a1:b5), which is the basic range.

ii) sum(sales), which can be used to select any labelled column or row.

iii) sum(col) or sum(row), which can only be used to select the column or row that the cursor is in.

Each of the last two methods will prompt you for the start and end cells.

There are two methods which you might believe are allowed, but which are definitely not.

i) You cannot use absolute cell references in a range, so the example sum(\$A1:B5) is illegal.

ii) Text cannot be used to identify either end of a range, so the example sum(sales.feb:prof.mar) is also illegal.

USE OF INDEX

There is a fairly mild limitation in Abacus that when you use the absolute cell reference by specifying \$a1 for example, you are restricted to having both the column and row references absolute at all times.

Quite often it is necessary to refer to the same row but a different column and vice versa, i.e. an absolute row reference and a relative column reference. To this end the function index has been supplied along with the functions COL() and ROW().

As a small example consider the multiplication table shown in Figure B.

Here index(1,row()) is getting the values out of column A while index(col(),1) is getting the values out of row 1.

	A	B	C	D	E	F
1	1000.00	1330.00	1768.90	2352.64	3129.01	9580.54
2	1000	1330	1768.9	2352.637	3129.0072	9580.5442

Figure C

ROUNDING

A lot of problems that people have are concerned with what appears to be an irregularity with the sum and other allied range functions. Consider the example shown in Figure C.

This example was generated by typing 1000 into A1 and then row=a1*1.33 from B to E into B1. Then enter SUM(a1:e1) into cell F1. Then use copy to copy a1:f1 to a2. Finally use units, cells, decimal, 2,a1:f1 to set the units for row 1.

On first inspection you will notice that according to what is displayed in a1:e1 the

	A	B	C	D	E
1		1		2	3
2	1	1		2	3
3	2	2		4	6
4	3	3		6	9

[b1] row=col()-1 from b to e
 [a2] col=row()-1 from 2 to 4
 [b2] index(1,row())*index(col(),1)
 F3 E b2 b2:e4

Figure B

answer in cell F1 should be 9580.55 and that Abacus has apparently made a mistake in summing the row. However a close look at row 2 will show the answer to the problem.

Abacus always uses the full precision stored with each cell no matter what display format you ask Abacus to display the data.

If you require data rounded to two decimal places then you must do so explicitly by rounding the values as you calculate them. There are two ways of doing this in Abacus.

1). If the number to be rounded is known to be less than 2^28-1 then the formula in b1 should read int(a1*133+.5)/100.

2). For any number val(str(a1*1.33,0,2)).

Try both these examples and see that they work correctly. By the way note that

the formulae given above are suitable for rounding to two decimal places and you will have to modify them appropriately for any other rounding you require.

ORDERING CELLS

Finally, you may have wondered why the manual advises against ordering cells holding formulae. It is in fact perfectly legal to order formulae, the problem is, this may not have the effect you desire! The problem stems from formulae which refer to other cells in the spreadsheet. Consider the case of a formula making a reference to a cell directly above it. After the order this formula will still be referring to the cell directly above it, the only problem is this will almost certainly be a different cell, indeed it is quite possible that it will be trying to access a cell not on the grid at all. (If you try this out don't forget to type F3 X to recalculate the grid.) As you may guess the results can be disastrous, and this is why you are advised against ordering formulae.

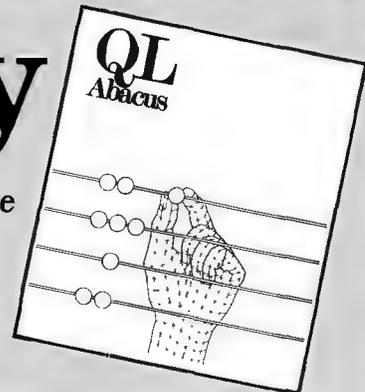
Yet it is possible to order formulae and do so without suffering any damage, so what are the ground rules? Firstly, a relative reference to a cell in the same row will be unaffected, as the relative positions within any row are not changed by an order. Any other relative reference though, is likely to be totally meaningless after an order. Secondly, an absolute reference to a cell within the order range will almost certainly give the wrong result. Although the formula will be still accessing the same location in the grid, the contents of this cell are likely to have changed. The formula could in fact end up referring to itself! Any absolute references to outside the order range are unaffected.

To sum up then, 99% of the time you should have no need to order formulae. If you find that you do, check very carefully that you can. If you think you can, then save the spreadsheet beforehand just in case. If you can't, but would still like to see the results anyway, (maybe just to print them out), again save the spreadsheet before doing the order. The results will be meaningful for as long as the grid isn't recalculated.



QLibrary

WELCOME back to the QLibrary, where we feature new books on your favourite micro and give you a chance to see more than just the dust-jacket before you buy.



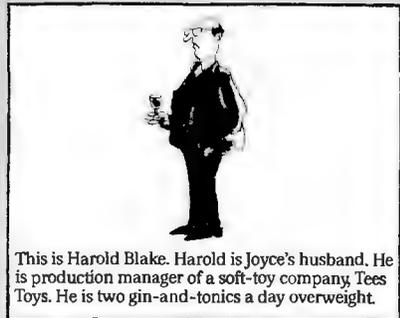
THIS issue we're featuring a series from Blueprint — a subsidiary of Century Communications.

There are five books in the series — selling for between £6.95 and £7.95 — one covering each of the four software packages that come with the QL (Abacus, Easel, Quill and Archive) and one discussing how to exchange information between them.

Each of the books in the series has a plain white cover, featuring the title and a blue, digitised hand holding a symbol representing the application covered in the book.

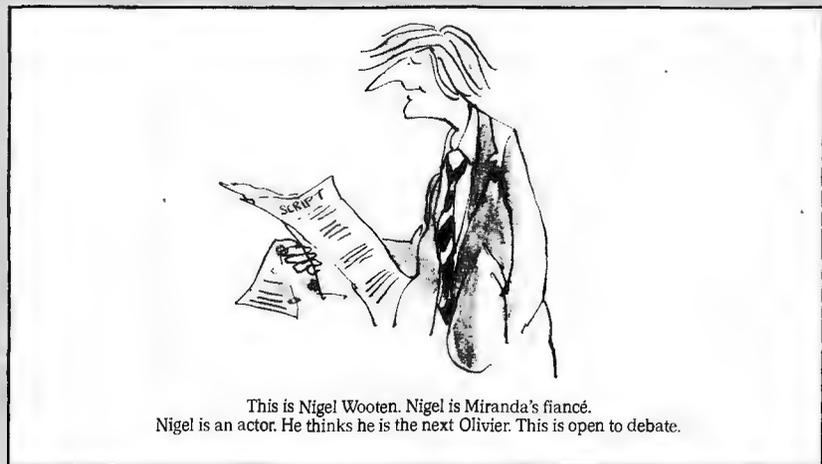
Within these elegant covers, the text is simple and well-written — illustrating the software in something of a 'storybook' fashion.

The Quill book, for example, concerns the loves and lives of Nigel Wooten and Miranda Blake, as they try to come to grips with the business of getting married.



This is Harold Blake. Harold is Joyce's husband. He is production manager of a soft-toy company, Tees Toys. He is two gin-and-tonics a day overweight.

So the first exercise in using the word-processor isn't a dull series of explanatory steps, but rather Nigel Wooten composing a letter to Miranda's parents in the hope that he'll obtain their blessing for the union.



This is Nigel Wooten. Nigel is Miranda's fiancé. Nigel is an actor. He thinks he is the next Olivier. This is open to debate.

And the chapter on using different typefaces is peppered with the thoughts of Joyce Blake, who is writing to tell her best friend all about her daughter's engagement. All this isn't to say that the books are frivolous — they aren't — but they entertain as they educate.

All the books share the same set of characters — which are illustrated by Sunday times cartoonist Derek Adler and described vividly by the authors. Here's how they are described:

"This is Joyce Blake. Joyce is Harold's wife. She is also setting up her own business, Jada Jewellery. Joyce is thrilled. Harold isn't sure.

"This is Harold Blake. Harold is Joyce's husband. He is production manager of a soft-toy company. He is two gin-and-tonics a day overweight.

"This is Miranda Blake. She is Joyce and Harold's daughter. She is a solicitor. She is also Nigel Wooten's fiancée, for reasons which escape everyone.

"This is Nigel Wooten. Nigel is Miranda's fiancée. Nigel is an actor. He thinks he is the next Olivier. This is open to debate.

"This is Chris Blake and this is Paula Blake. They are Harold and Joyce's twins. Chris likes Toyah. Paula prefers Boy George. Otherwise, there is not much difference between them."

So you've got all the makings of a good read in these books, easy-to-understand material, believable (well, almost) characters and an entertaining writing style that should lift discussions of typefaces, word-counts, spreadsheets, fieldnames and pie-

charts to new literary heights.

All the books are between the 125-150 page mark, so they won't be too heavy to lug about with your highly portable QL and after you've come to grips with the software — you can refer back to them for a good laugh once in a while.

It's worth pointing out that although well-written and produced, the Blueprint series seems very much designed for the novice. If you are an experienced user with a good working knowledge of the QL and its software, then these books may not teach you anything new.

But if the built-in software is something you've been meaning to get to grips with for some time, but just haven't had the chance to, then this series could be the one for you. The books can be ordered through Century Communications Ltd., Portland House, 12-13 Greek Street, London W1V 5LE.



FOR THE SAKE OF FORM

Reporting in Archive

```

HELP          FIND the first record which contains
press F1      the text entered in any field.
PROMPTS      ENTER TEXT
press F2      (CONTINUE finds further records)
COMMANDS     press F3
              ESCAPE
              press ESC

COUNTRIES OF THE WORLD

Country: INDONESIA          Continent: S.E.ASIA
Capital: JAKARTA           Currency: RUPIAH
Languages: BAHAGIA INDONESIA

----- DATA -----
Population ..... 135.4 millions
Land Area ..... 1919 thousands of square kilometres
Gross Domestic Product ..... 153 U.S. dollars per capita

>find
"indonesia"
>find
"china"

```

REPORTING is about getting information out of a database. The 'report' could be anything from a single figure to a printout of the whole database — it depends upon the information required. In this article, I will explain some of the techniques you can use to produce reports by working through two examples. The examples use the gazeteer file which is supplied on the same microdrive cartridge as the Archive program. To follow the examples, you should copy 'gazet — dbf' (it is quickest to do this in BASIC using COPY) from the program cartridge to one of your own data cartridges which should be inserted into mdv2.

Since we are not going to modify gazet, it should be opened with:

```
>look 'gazet'
```

If this is the first time that you have looked at gazet, you should enter

```
>display
```

to get an idea of the information within gazet.

Suppose that we wish to list the six richest countries in Europe in order of wealth (really by gross domestic product).

Since we are not interested in anything other than European countries, we can immediately exclude all other continents with:

```
>select continent$='EUROPE'
```

It is often the case that a report deals with a well-defined section of the whole and the select command is the most natural way of narrowing down the records to be dealt with. As a matter of interest,

```
>print count()
```

shows that there are 28 European countries in Gazet (out of a total of 152).

At this stage, the records have no particular order and the command
>order gdp;d
will place the records in descending order of gdp (Gross Domestic Product).

To print the information, it is best to write a short procedure. Use the edit command and insert the following:

```

proc d;limit
cls: first
while recnum() < limit and not eof()
print recnum()+1; tab 5;
country$; tab 25;gdp
next: endwhile
endproc

```

We have created a procedure 'd' with parameter 'limit' which can be used to list any number of the richest countries in the required order. You can get the first six by entering

```
>d;6
```

Are you surprised that the United Kingdom is not in the list? Try listing a greater number until you get Britain. The figures in Gazet are quite old; if you are interested you can always update the figures using a more recent source.

We will now explain the procedure. The first line declares the procedure name and the argument 'limit'. Although we were asked for the top six it is no harder (and more useful) to make this a variable parameter. The next line does a couple of initialisations: clearing the screen and making the first record the current record.

The rest of the procedure consists of a while loop to print the required number of records. Line 3 declares the beginning of the loop and defines how many times the loop should be traversed — while the record count is less than the limit

(remember that recnum() returns zero for the first record) and the end of file has not been reached. The following line is the print statement (replace with lprint for output to a printer) which prints the record number, country and the gdp. Notice how the 'tab' print item is used to make the output line up in a table. Just before the endwhile, the 'next' command advances the current record at the end of the loop.

Say we wanted to export the 14 richest countries to Easel for display. We can further select, discarding all but the top 14 using:

```

>select recnum() < 14
and export the country and gdp to the file
'gdp14_exp' with
>export 'gdp14';country$,gdp

```

To import this into Easel you have to quit Archive, start up Easel, press F3 for commands, select F for Files, I for Import and finally type the file name — gdp14.

As a second example, suppose we would like to know the area of the populated land as a percentage of the area of the world's surface.

If you have quit Archive 'look' at gazet again or, if you are still in Archive with gazet open, use

```
>reset
```

to undo previous selects.

To get the total populated land area, we can sum the area field (measured in thousands of square kilometres) with:

```

>let sum=0
all:let sum = sum + area : endall
and display the result with
>print sum

```

The radius of the Earth is about 6000 kilometres and so the required percentage is given by:

```

>print 100*sum*1000/(4*pi)*6000^2)

```

which should come out at about 29%. The first 100 is for %; the 1000 is to convert from thousands of square kilometres to square kilometres; the expression in brackets is the formula for the surface area of a sphere.

Although this example is a shade esoteric, it illustrates the technique of summing a numeric field. To get the average, just divide by the number of records. For example, the average land area is produced by:

```
>print sum/count()
```

In the above two examples, we used two different looping constructs. The while . . . next . . . endwhile loop construct is usually used to produce reports in tabular form because it obeys the prevailing order and is more versatile than the simpler all . . . endall construct. The all . . . endall loop is used for complete scans of the file where the order of the scan is unimportant — it has the advantages of being faster and simpler.

An eye for more than a pie

EASEL is an Educational Tool

THE coupling in EASEL of powerful formula evaluation and high-res graphics adds up to a superb tool for teaching or learning about mathematics. In this article I will suggest how to make effective use of EASEL's capabilities for visualising mathematical functions.

FOR those of you who have grown a little rusty on your maths, a function can be thought of as a special machine which transforms some value, known as the argument of the function, into another, known as the result. To illustrate this idea, enter the formula $x=cell$ into EASEL. As you can see, 'cell' is a useful set of figures in EASEL which has the value of the number of the cell, so that the first has value 1 and the last 12. Now type $fx=x*x$

The curve which results is called a parabola, each point on curve fx is the square of the corresponding point on curve x . The curve fx is a picture of the function which converts x to the square of x (see figure 1).

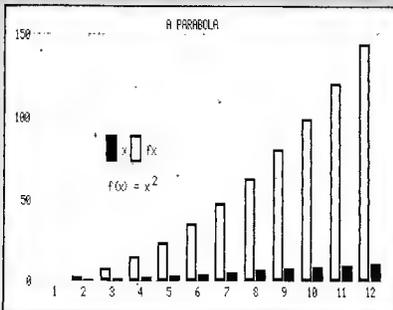


Figure 1

In EASEL many common mathematical functions are available. Let's look at the sine function; it oscillates first positive and then negative as the argument increases in value, with a period of $2*\pi$. To make it easy to calculate sine curves of various frequencies we can make a set of figures which linearly increases from 0 to $2*\pi$ over the width of the graph. Hold your finger down on the TABULATE key for some time, the cursor will move to the right and then increase the number of cells on the screen. Allow this process to happen a few times. Now there are many cells on the screen and our curves can be drawn with high resolution. Type in $x=(cell - 1)*2*\pi/(cellmax - 1)$ 'cellmax' is another special EASEL set of figures which has the value of the total number of cells at each point, so as cell increases from 1 to cellmax in this expres-

sion, the value of the expression increases from 0 to $2*\pi$.

Now type $fx=\sin(x)$

What results is a beautiful sine curve which executes one oscillation posi-

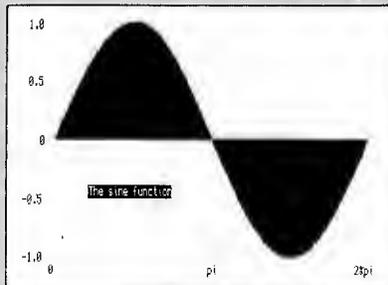


Figure 2

tive and negative across the screen (see figure 2). Try typing in $fx=\sin(2*x)$ and notice that there are now twice as many oscillations, we have doubled the frequency of our sine wave.

You can probably now see that the way is open to drawing many interesting functions. To draw an example of an amplitude modulated sine wave for example type in $amp=(1 - 0.5*\sin(2*x))*\sin(10*x)$ and change to a line curve for better effect (see figure 3). What you can see is a sine

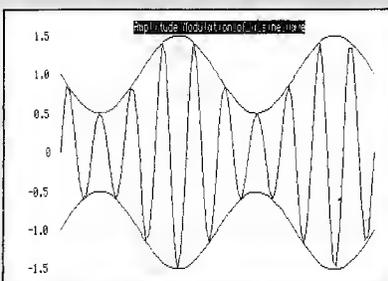


Figure 3

wave of frequency 10 whose amplitude is being modulated at frequency 2 to a depth of 0.5. This demonstrates this principle on which A.M. radio is transmitted. If you are interested you may like to try and draw a frequency modulated wave.

The exponential function is another interesting one. Businessmen would like their profits figures to follow this curve.

Type in $profits=\exp(2*cell/cellmax)$ and you will understand what I mean. To increase your profits even further just change the number 2 into a larger one! If you multiply an exponential by a sine wave you get a pretty good picture of what happens when you turn an amplifier up too loud and the microphone feeds back (see figure 4).

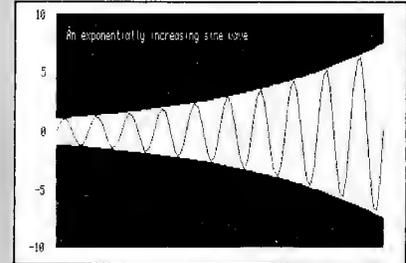


Figure 4

I hope you find these few examples interesting. Have a look in the manual and you will find many other functions to draw.

Hot tips on using EASEL

1. Every time you want to enter a new set of figures into EASEL you use the Newdata command. This clears the screen and sets the cursor to the far left ready for new numbers to be entered. Many people will not have realised that it is possible to enter data into EASEL while all the other data is still displayed. To demonstrate this start up EASEL and type in some numbers. Now use the Newdata command to start up a new set of figures, and then use the View command, taking the 'all Figures' default. Now press ESC to return to the top input level and type in some more numbers. You are entering data into your new set of figures while the first is also displayed. This can be extremely useful for comparison.

2. You may have found out that pressing F4 will delete all the values in the cell marked by the cursor wire, and so is useful for rubbing out mistakenly entered values. What is not so obvious is how to delete the cell altogether. Suppose you want to have a graph of profits for only the first six months of the year, for example. What you must do is delete all the labels you don't want as well. To do this get into commands and select Edit Labels. Now use the TABULATE key (or SHIFT TABULATE) to move the cursor to a label you want to delete and press F4. The label will disappear and the cursor will move to the next cell, so you can delete a whole line of labels by holding the key down continuously. Press ENTER and use the View command to see all figures. What you will find is that cells which had neither a label nor any numbers in them will have disappeared.

Finally, here is a little surprise for you. Load in EASEL and carefully enter the following keystrokes, a comma means press ENTER: 0, 2, 1, 3, 2, 5, 4, 8, 5, 9, F3 CF 4, CL 15, ESC a = - figures, F3 CL 15, NB, TAB 0, 0, F3 C L, left_arrow, , , down_arrow down_arrow down_arrow, 100, V, , E K F4

QCLOSE-UP

Charles Davies and Colly Myers: sorting out the Software

LAST issue, you were introduced to David Karlin — the man who designed the QL. Following that theme, QLUB News tracked down the men who put together the software which made up the Quill, Abacus, Archive and Easel programs.

The software was developed at Psion, under the watchful eye of Psion chairman David Potter, by technical director Charles Davies and software director Colly Myers. Colly and Charles have worked closely together for some time, although the QL software was probably the most ambitious micro project they had taken on together.

According to Charles, the work started about 18 months before the QL was eventually launched in January 1984. It started when Psion identified the desirability of developing affordable integrated business software in August 1982. At the time, Psion was 'cash-rich' from the runaway success of its ZX-81 and Spectrum software and wanted a long-term project to plough the money back into and a project that would spread the risk from the home games to the business market.

It wasn't until Feb 1983 when the software was under development on the Psion VAX minicomputer that discussions began about putting it on the QL. The software was produced in such a way that it could be 'ported' onto various machines and processors quite easily (which it did — becoming the Xchange software Psion offers on the IBM PC, Graduate, ICL One Per Desk, Apricot and Sirius computers).

On April 4th, 1983 Psion began work on 'coding' the software using the VAX. Ironically, the easiest package to use — Easel — was initially the hardest to get going on the VAX (because the VAX doesn't have any inherent high-res graphics capabilities). A BBC Micro was used for the early development of the graphics facilities in Easel — it acted as a sort of graphics terminal for the VAX development software. It could, of course, only be used in monochrome as the BBC can't generate the same quality of high-resolution graphics in colour as the QL — but it was a starting point.

By late summer 1983, some of the packages were working with the 'rack-based' early version of the QL. In October,

there was a slight panic when it looked like the software was all going to be too big to fit into the machine and work began to 'crunch' it down by using Psion's now-famous 'table-language'.

After a long Christmas, in which Charles remembers spending many long Yuletide hours at work, the software was ready for the January 12 launch.

The rest, as they say, is history.



The Psion team with its new Xchange software; (from left to right) Charles Davies, David Potter and Colly Myers.

Your chance to win one of 25 free QL Chess programs



IN the second of our QLUB competitions (the entries for the first one are still flooding in, so we've extended the deadline for that contest to December 15 and winners will be notified before Christmas), we're offering you a chance to win a free copy of one of the micro world's best chess programs — QL Chess — which would normally cost you £14.95 with your QLUB member's discount.

THERE'S no questionnaire to fill in this time, just answer the three skill-testing questions and you're in with a chance. The first 25 correct entries drawn will win QL Chess — and we hope (as long as people get their entries in on time) to have the winners drawn in time for the next issue.

Here are the questions:

(1) What is the last name of the current Soviet Chess champion?

(2) In the last issue of QLUB News we featured the man who designed the QL. What was his name?

(3) Name the managing director of Sinclair Research.

Those questions should not have been too taxing, and neither should the next task. Fill out the completed competition entry and send it with your membership no. to:

QLUB Competition
The Editor
QLUB News
Sinclair Research Ltd.
25 Willis Road
Cambridge CB1 2AQ

Membership no.

Machine Code and More

In every pursuit there are people who seek out information at a level not generally pursued by others—specialists who work hard to be as enthusiastic and well-informed as possible. This page, Machine-code and more, is for just those people. While other sections of QLUB News will deal with SuperBASIC programming and questions of more general interest, this page will be reserved for those with a keen eye for—and an interest in—machine code programming. The QL will indeed be a challenge for you, but by sharing information we can help you meet that challenge.

Qdos unlocked

LAST issue we presented a short program to maintain a digital clock/calendar using the multitasking facilities of the Sinclair QL. The clock used its own window, which appeared in the top right of the default command window (#0) and could be altered by a change to the program.

The program consisted entirely of calls to Qdos. In this issue we explain those calls along with some asides on general points of interest in the operating system. These are really designed to show the flavour of Qdos rather than be rigorous descriptions of the parameters and environment used by each call.

The Qdos routines used by the program. These are:—

MT.PRIOR set job priority

This is a manager TRAP (#1), which requires a Job ID in D1, and the priority to set that Job to in D2. SuperBASIC's EXEC command sets Jobs up with a priority of 32, which is really too high for something as unimportant as this clock, so it sets its own priority to 1, which is the lowest possible value without inactivating it completely. Note that -1 for a Job ID means the calling Job — if you know the ID of any other Jobs, then you can set their priorities to suit yourself: SuperBASIC's Job ID is zero.

MT.RCLCK read system clock

This is another manager TRAP, which reads the hardware clock into D1 as a long word: the number produced is the same as what would be printed by the SuperBASIC statement PRINT DATE. Since the clock is in hardware, it is unaffected by resetting the QL, although you will have to reEXECute this program to continue displaying the time after resetting. Of course, if you haven't set the clock by using SDATE at some time after switching the QL on, the time shown will be incorrect.

MT.FRJOB force remove a Job

This TRAP forcibly terminates execution of a Job. Usually only inactive Jobs may be removed from the system, but since a Job must be active to execute the code to remove itself, this TRAP is required to allow a Job to kill itself off. It is also of use to remove a Job which is no longer required but is still running. For instance, it is possible, with the appropriate software, to search through the Job table, find the clock program, and kill it off. As well as a Job ID in D1, it also requires an error code

in D3, which is returned to the calling Job if it was waiting for the removed Job to complete. So if you alter the program to deliberately cause an error (e.g. make the window too big), and run it with EXECW, you will get two error messages, one from the Job itself, and one from SuperBASIC, which was waiting for the Job to return. If you run it using EXEC, then SuperBASIC does not wait for the Job to complete, so you only get one error message — the other, passed back by MT.FRJOB, is ignored.

SD.POS set cursor position (absolute)

This is one of the many I/O TRAPS (#3) available on the QL. This is one of the screen driver traps, which are special in that only SCR or CON type channels will process them — they are ignored by such things as the serial ports etc. The cursor in the channel identified by the value passed in A0 is set to the absolute position given in D1 (row) and D2 (column). A timeout must also be passed in D3 — if the operation is not completed in this number of TV frames (one every 20ms) then the I/O system will not do the operation, but return the error code for 'not complete' (-1). As with all Qdos errors, this is returned in D0. When SuperBASIC gets such an error return, it converts it to one of the (presumably familiar!) error messages, and prints it out to the command channel.

UT.SCR set up a screen channel

This is one of the utility vectors available in Qdos. In addition to the 68008 TRAP instructions, there is a table of addresses in the low end of the ROM pointing to a number of useful routines. These also differ from the TRAP routines in that the requirements they make on the calling routine vary considerably, as do the registers smashed by them. In general the TRAP routines may need any of D0-D3 and A0-A3 passed as parameters, and may or may not preserve these registers or return them as results. All other registers are guaranteed to be preserved. The utility vectors may smash more or fewer registers, and may need to be called in supervisor mode, or with all addresses relative to A6.

This utility is one of the simplified TRAP routines — it not only opens the screen channel, but sets up the ink, paper and border, all of which would require calls to four TRAPS — quite a saving of programming effort! It is passed A1 point-

ing to a parameter block in the format shown by the comments in the assembler listing, and returns the channel ID in A0.

CN.DATE convert date to string

This is one of the conversion routines, much used by SuperBASIC to convert from one type to another (e.g. string to floating point). Since these are mostly used by SuperBASIC, the addresses must be relative to A6. This routine takes the date in numeric form in D1, and converts it to a string, the end of which is pointed to by A1 (A6 relative, remember). When it returns, the beginning of the string is pointed to by A1. This apparently odd arrangement makes it easier to put the string on the evaluation stack. Note also that this conversion is recursive, and therefore uses large quantities of stack — allow plenty of space when you SEXEC the program.

UT.ERRO print error message to channel 0

This is a very easy routine to use — just pass it a number from -1 to -21 in D0, and it prints the appropriate error message to #0.

UT.MTEXT print message to a given channel

This routine takes a channel ID (in A0) and the absolute address of a string (in A1), and prints the string to that channel. The string must be in the standard format, i.e. a word giving the length of the string, followed by the actual characters of the string; if a newline is required at the end of the text (or anywhere else in it!) it must be specifically included in the string — there is no implicit newline at the end.

The SuperBASIC program POKES the program into a piece of memory reserved using the RESPR function, and then saves the result onto microdrive 1. The command EXEC mdv1_clock will then start the clock going. The data statements include a simple checksum at the end of each which I hope will trap most typing errors — if an error is detected the program will stop, and tell you which line caused the problem. The window definition block is in lines 1120 (the last four items excluding the checksum) and 1130. If you alter any of these parameters, the checksum will probably be wrong, so I would advise you to put it in as it stands and get it working, then delete the checksums and their associated code (just line 180 would be sufficient code to delete).

QL Quarks

THE first laugh in this issue's QL Quarks is on us. You may have noticed in the last issue that although our headline said QL Quarks, the copy at the bottom of the column said Quirks.

Well, this all came about because the QLUB News sub-editor had never heard of a Quark. For his benefit (don't worry, this isn't the first time he's heard this), I'll explain again what a Quark is. According to a friend who specialises in knowing things that nobody knows they need to know until the need arises (did you follow that?), a quark was an unidentified sub-atomic particle in particle physics — which has since become identified.

Why, you may well be asking, should a column of supposed funnies and guffaws in QLUB News be christened with this obscure name? Well, quarks are just like humour — an unidentifiable quantity which you enjoy more as you understand. The word quark also satisfies this editor's penchant for alliteration.

WHAT THE PAPERS SAY: Just what is a 'VIC 20 16K RAM joystick tape recorder'? I'm not quite sure either, but one was selling for £85 a few weeks ago in Popular Computing Weekly. Also on offer was Acord Elite (a new software offering from Honda?), an XZ81, a CSM Vic 20 and 'QL



software on . . . Microdriver cartridge'. Are you a Microdriver?

IN an effort to raise the tone and general humour in this column, QL Quarks is offering yet another challenge (last issue's winners will be printed in the next issue).

But we know your pearls of wisdom don't come cheap and in an effort to tickle your funny-bone via your pocketbook, we'll give a free copy of QL Toolkit for the

best completed answer to the following limerick:

A QL computer from Cambridge . . .

The most amusing completion to this poetic parable gets the program (and remember, we like alliteration).

Special Offer Office

HERE we are again at the special offer office, with yet more news of deals and discounts for QLUB members

Joining the exalted ranks of companies to offer discounts to QLUB members is Personal Computer News, the country's leading weekly computer magazine. PCN is offering a staggering £5 off the £20 price of a year's subscription to PCN — but only, of course, if you're a member of QLUB.

To get in on this deal, write to the PCN subscriptions department at the address below, enclosing your £15 cheque or money order and a note detailing your QLUB membership number, along with your name and address. PCN's address is: QLUB Special Offer, Subscriptions Department, PCN Magazine, VNU Business Publications, 53-55 Frith Street, London W1A 2HG.

As detailed on page 3 GST Computer Systems are offering the advanced 68K/OS Operating System at an attractive discount. Full details are given in 'Software Update' on page 3. To order, contact GST

Computer Systems Ltd, 8 Green St., Willingham, Cambridge CB4 5JA or telephone (0954) 81991 and ask for Jane Pateman, quoting your QLUB membership number.

In addition to this new offer, there are several standing offers for discounts to QLUB members which we outlined in the last issue. In case you missed them, they include:

* A 20 per cent discount on Sinclair Research QL software sold through QLUB. This includes:

QL Chess - Qlub price £14.95

QL Assembler - Qlub price £31.95

QL Toolkit - Qlub price £19.95

QL Cash Trader - Qlub price £54.95

Send your order to Sinclair Research, Stanhope Road, Camberley, or telephone 0276 685311 quoting your membership number.

* A discount of 15p per issue off the cover price of EMAP's QL User magazine. You would normally have to pay 85p for the magazine alone, never mind the postage

involved in a subscription — but if you subscribe through QLUB the magazine will be delivered for an all-in (postage-included) price of 70p per copy or £4.20 for the next six issues. (Send a cheque or money order for £4.20 to PRQL Subscription Department, QL User, Priory Court, 30/32 Farringdon Lane, London EC1.)

* A substantial discount on membership in the QNET electronic information service. (For more details see page 5 of this issue, to join write to QNET at the same address as QL User).

Next Issue

- Books galore - We feature the new QL series from Longmans.
- TV or not TV? - Choosing a monitor for the QL.
- Sounds great - getting music from your machine.