

WHAT MICRO? TEST

Sinclair QL: £399

Here at last!

Sinclair's new micro, the much hyped, much criticised and much delayed QL, became a legend long before anyone had owned one. Way back in January, Sir Clive's outfit announced a 32-bit 'plug-in-and-go' business micro for £400. It had 128K Ram, two microdrives, four professional business programs, a proper keyboard and a built-in operating system that allowed it to do more than one task at once. In short, it sounded like a machine that was more advanced than machines in the £2000 price bracket from manufacturers such as IBM and Apple.

It took a lot less than the promised 28 day delivery for the truth to emerge. The QL was far from ready and ever since Sinclair Research has been struggling to get a presentable version of the computer to market. The company still placed ads and took money from eager customers and in a long, torturous saga, gradually released better versions of the machine.

As customers received their QLs, often with incomplete manuals and unforgivable software bugs, it also be-

Max Phillips takes a quantum leap into the world of Sinclair, and waited nearly a year.

came obvious that the machine had a fair share of curious limitations and omissions. The final versions of the built-in software needed more memory than the 32K originally allowed in the design, and many customers received QLs with an extra circuit board, affectionately known as 'the kludge', stuck in the cartridge port.

In short, rather than make its vaunted 'Quantum Leap' into the business world, Sinclair Research ended up with egg on its face and many of its trusting customers felt let down. And it had totally destroyed the credibility of the QL. At *What Micro?*, apart from keeping you up to date with the saga, we've avoided looking in detail at the QL itself. There's no point in reporting on an unfinished product.

The situation has changed now. The QL we look at here is the latest version of the machine and is likely to be so for a while and Sinclair has announced that it will be available at selected shops fairly soon. The built-in software is version AH (some customers have the distinctly less reliable version FB). The infamous kludge has disappeared. The extra Eprom (erasable programmable Rom) it contained is now within the case, soldered with typical Sinclair dexterity onto the top of one of the other two Eprom chips.

So, how does the machine stand-up? Considering its painful launch and the ridiculous rush to get it out, the QL is still a very impressive piece of work. The machine seems to be aimed at a market that micros have yet to take real advantage of. It's a complete desk-top tool aimed at those who've never used anything more than a calculator and it's sold at a price where an office can buy one instead of a new typewriter. But Sinclair has not ruled out the usual games hobbyist uses and has provided copious sound and graphics as well as a



Images: IBM, WhatMicro

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Basic programming language.

The QL is a delightful shape - it's basically just a keyboard with a little bit tacked on the end that houses the two built-in microdrives. Three push-in plastic feet tip the unit to a sensible typing angle although they do have a nasty habit of falling off! QL expansions plug in at the left end of the machine. On a machine with the promised hard disk, the QL will probably be just like a detached keyboard attached to a larger box - a nice enough system to use.

The package is spoilt however by a separate power supply and the lack of an on/off switch. Incidentally, it's the first Sinclair machine to be graced with a Reset button but since this destroys the contents of memory and totally restarts the computer, it is about as useful as pulling the plug. Sinclair might as well have left it off.

The QL connects to an ordinary TV or an RGB colour monitor (a black and white composite monitor can be attached if you wire up a special cable). The display quality seems to be very variable depending greatly on particular QLs and TV combinations. However, Sinclair seems to have pushed the specification beyond sensible limits.

The QL is capable of an eighty five character line (512 by 256 pixels) and so often both the right and left hand edges of the picture aren't visible. This happens on TVs and monitors. You'll also find that of the 256 'stipple' colours, many simply don't work on a TV. To avoid this problem, the first thing the machine does when it is switched on is ask you whether you are using a monitor or TV. If you press F2 for a TV, the QL selects a less demanding display mode. Even so, Sinclair really needs to do more work to ensure that the display fits onto both TVs and monitors.

Window system

The display itself is extremely versatile. It can be set to a low resolution (40 or 64 columns) or high resolution mode. In low res, there are eight colours available on a grid of 256 by 256 dots. The eight colours can be automatically mixed using 256 'stipples' producing a vast range of patterns, some of which show up as different colours, such as orange and light blue. In high res mode, there are only four colours (red, green, white and black) but the resolution doubles to 512 by 256.

The screen is mostly controlled by the built-in software. This makes it rather slow but it does allow some beautiful features. Characters can be written in eight different sizes, blocks of the screen can be smoothly scrolled in all four directions, colours can be instantly swapped around and so on.

Sinclair has even set up a very crude windowing system. You can divide the screen into separate areas, each showing perhaps a different part of an application - a data entry window, a help



Keyboards have never been Sinclair's strong point but the QL's is an improvement



You also get four professional cartridge software packages written by Psion

COMPARABLE MICROS

Model	Price	Memory	Free Memory for Basic	Drive Capacity	Price with Two Drives
Advance 86B	£1500	128k	62K	2x320K	£1600
BBC	£400	32K	9.26K	2x200K	£850
Einstein	£500	80K	42K	2x250K	£650
QL	£400	128K	92K	2x100K	£400
Spectrum 48K	£130	48K	39K	2x100K	£200
Wren	*£1150	64K	45K	2x200K	£1150

*Includes 7" mono monitor

window and so on. These aren't proper windows like those produced by Apple, Microsoft and Digital Research on expensive business machines because they are just reserved areas of the screen. Open a window on top of another and you destroy what is underneath. You can't close a window and open it again with its contents intact. So it's only a crude screen handling facility

but it does allow some really nice effects to be produced easily.

The display, despite its technical shortcomings, is one of the QL's best features. No doubt we shall see lots and lots of fancy screen handling software for the machine in months to come.

Keyboards have never been a Sinclair strong point but the QL's is a definite improvement. It's got sixty-four hard

full-travel moving keys in a reasonably normal layout. However, the mechanism is, like the Spectrum and Advance, a single shaped rubber mat underneath the keytops. All the key rows are also level and many have claimed that the keyboard is unworkable. Certainly, you do have to hit the keys more accurately than with most keyboards. But the end result is far from unpleasant and fairly fast typing speeds can be achieved.

However, the keyboard doesn't cope well with more than one key depressed at once (something fast typists do all the time) and quite often the keys 'bounce' producing several characters where you meant one. Despite a copious range of keys including five function keys, cursor keys, Control, Escape, Alt and all the punctuation you could dream of, Sinclair has omitted a sensible backspace key. This frequently used key is relegated to the bottom left of the keyboard where you must press Control and Left Arrow. You get used to this but it really does get in the way.

Storage is provided by two microdrives built into the right end of the QL. These use the same tapes as the Spectrum drives but run faster and have a capacity of at least 100K rather than at 85K or more. Microdrives are much criticised because of their slow speed and unreliability but they are a distinct improvement over cassette and transform the QL compared to ordinary home micros.

However, there's no cassette interface at all on the machine. So software will have to be sold on Microdrive cartridges which currently cost £4.95 each and are difficult to duplicate. As a result, software for the QL will be more expensive than for other machines.

The guts of a QL are 128K Ram and a 68008 microprocessor. There's been a lot of waffle about whether this chip is 8-bit, 16-bit or 32-bit. It's a cut down version of the 68000 processor and although it does most of its 'thinking' in 32-bit words, it communicates with the rest of the system in the usual 8-bytes. The 68008 has a beautiful instruction set which will delight machine code programmers everywhere but its real advantage is that it can handle up to 1Mb of memory at once. As yet, the QL fails to exploit this.

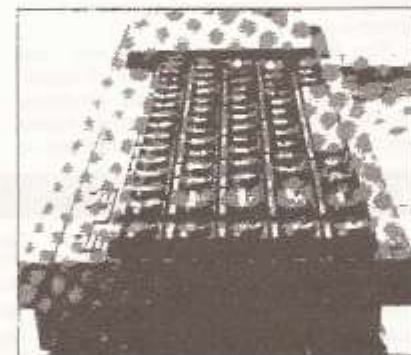
Its 128K Ram is also a bit of an overstatement. 32K of it is always used for the screen display, leaving a 96K machine for the user. 68008 programs are also notoriously bulky (as Sinclair itself has found out the hard way) so the 96K may not go as far as you'd expect. As a result, the QL doesn't offer any significant performance or speed advantage over everyday 6502 and Z80 micros although it harbours a definite potential.

On the interfacing side, the QL is nothing short of curious. There's no Centronics port - maddening as nearly all low cost printers need one and it is the only interface standard that isn't



Four business microdrive cartridges

likely to need an expert to make it work. Instead, the QL has two serial ports. There's a really smart-ass piece of thinking gone into these. The two ports are wired the opposite way round to each other. If your serial device and cable doesn't work in one of the ports, the chances are it will work in the other! But this triumph of lateral thinking doesn't excuse the fact that they are weak interfaces.



Both serial ports must transmit and receive data at the same speed. This rules out a direct link to Prestel and Micronet as this requires 75 baud transmit and 1200 baud receive. What's more, both ports must be set to the same speed. So you may have problems using a modem and a printer on one system.

What's more, the ports use new-style

phone jacks as their plugs. These may be compact and secure but they are well nigh impossible to wire up yourself.

On from the serial ports are two joystick ports which also use phone jacks rather than any normal joystick input such as the now widespread Atari standard. Don't expect to get joysticks for a while either. There's also the Rom cartridge port but as this has been occupied on early QLs by the 'kludge', it is likely that cartridge software will be delayed for a while.

The QL also has a ZX net connection which is thankfully compatible with the ZX net provided for the Spectrum by ZX Interface 1. It is possible to link up to 63 QLs/Spectrums on the same network.

Buried in the right hand edge of the machine is a connector for further microdrives but more importantly in the left hand end is a full expansion connector. Virtually anything, including floppy disks, more memory or hard disk, can be added here and it's almost certain that Sinclair will go for an add-on expansion box which lets you plug in several add-ons at once.

So much for the QL's hardware. The machine also comes with more software than any micro in its price range. Built into the machine is SuperBasic, a completely new dialect of the Basic language and QDOS, an operating system which controls all the major operations of the machine. This claims to offer facilities akin to those available under MS-DOS and Concurrent CP/M on

BASIC

Model	Range of Commands	Ease of Use	Line Re-Number	Line Auto-Number	Trace	Error Trap	Basic Maths Speed	Basic Sort Speed	Basic Text Speed	Basic Graphic Speed
Advance 866	8	8	✓	✓	✓	✓	22	13	151	31
BBC	8	7	✓	✓	✓	✓	55	11	29	25
Einstein	7	7	✓	✓	✓	✓	44	19	107	87
QL	8	7	✓	✓	✓	✓	16	26	167	80
Spectrum	5	8	✓	✓	✓	✓	176	36	151	57
Wren	7	7	✓	✓	✓	✓	9	25	-	-



Hopefully the machine you buy will be like this one, without the 'klunge' jammed in the back

machines such as the IBM PC.

On top of that, on four microdrive cartridges you get four professional business programs written by Sinclair's favourite software house Psion. These cover the major application areas that people use personal micros for. QL Quill is a wordprocessor, QL Archive is a database and QL Abacus is a spreadsheet. Business graphics is rapidly becoming the fourth name on this list and QL Easel is one of the most approachable business graphics packages yet.

The arrogantly named SuperBasic is a big, juicy version of the language. For the programmers among you, it's got lots of extremely nice features - multiline procedures and functions, local variables, formatted listings, REPEAT loops, a set of fast graphics commands and so on. Many of these are distinctly welcome. It's easy to add new commands to the Basic simply by declaring them in procedures. Others are a waste of space. The QL can handle numbers ridiculously big compared to most machines. Impressive, but how many people need it?

SuperBasic tends to be a very powerful and entertaining version of the language but it's a lot more suited to the experienced hacker than the sort of newcomers who are going to buy a QL. A compact, really friendly and very fast Basic would have been a better idea.

On a more pleasing note, SuperBasic runs with around a jolly 85K free for Basic programs and data. The only thing that comes close in the price range is the Advance 86a with around 62K. 85K is the biggest free memory of any interpreted Basic on any popular micro and that alone should encourage the dedicated Basic hacks to the QL to create some monster-sized programs.

Behind the scenes on the QL is an operating system called QDOS. Sinclair claims QDOS is a serious 68000 operating system with capabilities to match much more expensive machines. However, many of these facilities, such as the ability to run more than one program at once, can't be seen yet because no information is available from Sinclair as to how it's done. It's certainly not straightforward to run a couple of Basic programs at the same time.

Much of the operating system is very 'grown-up'. All the different devices in the QL - the ports, the network, the screen windows and so on - have

names and all data can be freely moved between them. It's possible to send data for the printer to a microdrive file so that it can be printed later. You can copy a microdrive file to the screen to see what's in it. And so on. What's more, new devices, such as a plug-in disk or Centronics port, simply become part of the system. All very professional indeed.

However, there are some obvious restrictions. There's no proper file typing system and no way of referring to a group of files with a single command. This may be fine on a twin microdrive micro with maybe ten files on each drive but it is totally impractical if the QL has a hard disk attached with hundreds of files on it. So QDOS is a bit of a mystery at the moment and you can't really say anything more until more of its facilities are aired in public.

The four Psion programs are, real business programs. In terms of specification they easily outclass anything available on cassette for other home micros. However, if we compare them to

and super-scripted as appropriate. Archive is both a simple card index style file handler and a fully programmable database giving it a breadth that spans the entire gamut of database packages for bigger micros.

Abacus is a delightful spreadsheet for accounting and forecasting. It's made really simple to use because it automatically names the various sections of the 'worksheet' using the column headings and row names you give it. Many small spreadsheets force you to use co-ordinates such as A1, B2, C3 and so on. Abacus is also very good at handling text, making it easy to produce very presentable worksheets.

Great potential

Easel is a definite step forward for business graphics packages in that it is very interactive. You can just type in a set of numbers and see them graphed instantly. Easel does everything by default - it scales and labels the axes, colours the bars and so on. You change

DISPLAY

Model	Max No. of Colours	Max Graphics Resolution	Max. Text Format	Range of Control	Ease of Use	Overall
Advance 86B	16	640x200	80x25	7	7	8
BBC	8	640x256	80x32	8	6	9
Einstein	16	256x192	40x24	8	7	8
QL	8	512x206	85x25	8	7	9
Spectrum	8	256x176	40x24	4	6	4
Wren	8	640x256	80x25	5	5	6

the performance of real disk-based programs, from the Perfect suite upwards, they don't do so well.

The problem seems to be that the packages are over-ambitious. It doesn't take a great deal of thought to realise that the microdrives are too slow to be used to overlay sections of a large program as it is running. Yet both QL Easel and QL Quill do this all the time, making them unbearably slow. It's curious ... A word processor such as Wordwise on the BBC or Apple Writer on the Apple sits with its text entirely in the memory of the computer and still finds thousands of satisfied users everyday. Yet Psion's program is too big to fit in the QL!

The programs do have remarkable specs for such a small machine. Quill provides on-screen formatting with text appearing underlined or in bold or sub-

only the things you want to. There's a full range of different graphs - bar charts, pie charts and so on. The program also has a limited set of calculation facilities built in. Easel encourages you to experiment and fiddle about with your data until you get the best possible results.

Although only one of the programs may be loaded at once, you can pass data between them. You write the data to an 'Export' file on the microdrive from one program, load the second program and then read the file back in again. This is terribly slow but does allow you, for example, to graph the data on spreadsheet or read database information into a letter you're writing. The Psion programs form a complete suite that will do almost all the jobs you can think of.

They are also fairly straightforward to use as every step is laboriously promp-

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ted along the way. This does mean that anyone can pick up the programs but it makes people who've used them for more than about ten minutes start to find themselves frustrated that the packages can't go any faster. What's more, there are some, often unnecessarily, complex and long-winded key sequences to use the programs. Using them at speed requires a considerable amount of keyboard dexterity. Coupled with the odd, but not unobvious, and often harmful bug here and there it is certain that the Psion programs could do with some polishing.

If Psion can improve the speed of the programs and make them a little more comfortable to use, then the QL starts to look as if it will do the jobs it was intended for. Psion has launched similar programs for bigger machines such as the IBM and Sirius and it will be interesting to see how these perform. On the QL, at least they are not as effective as they should be - something that hopefully will be sorted out soon.

The QL manual is, not surprisingly, in a similar state to the machine. With the micro and its software changing so rapidly, the writers could obviously do little more than list the commands available and say what they do. There is no sensibly ordered step-by-step guide and beginners are in for something of a

shock.

Given the state of the diagrams in the manual, the number of errors (both factual and merely typographical) and the somewhat 'in at the deep end' approach, it isn't difficult to assume that Sinclair will be furiously working on a new version as soon as possible.

Premature launch

After so much criticism, our judgement of the QL is probably a forgone conclusion. However, most of the problems stem from the premature launch. However it is tremendous value for money and it is a challenging and useful micro. It really does have the potential to be a top-selling system.

However, if you are looking for a serious business personal computer, it may still be best to double your money and go for a small business machine such as the Osborne 1 (£800) or Sanyo MBC550 (£700). Sinclair may indeed have a machine which can do serious

work for total newcomers for just £499. But it's not ready yet.

On the other hand, if we take the QL as a home hobbyist machine, how does it fare? It does a lot better. It has the potential to be a great games machine and a delight for enthusiasts plus a few real business programs thrown into it as a bargain.

Anyone looking to learn about computers in general would learn a lot from a QL. It's just a matter of waiting to see how software support and Sinclair's own support turn out.

As to a recommendation, it is probably sensible to steer clear of the QL until it sorts itself out. To put it in perspective, the QL's remaining bugs are probably no worse than those of BBC or Oric 1 at launch.

If you are an experienced hobbyist looking for the challenge of the lead-edge home micro, the Sinclair QL could be just what you want, however probably wise to wait a little.

VERDICT

The rush to launch the QL has rather needlessly spoilt a machine with a lot of potential. However now that Sinclair are putting it into shops it should regain some of the credibility it lost and should prove very popular. It may even repeat the successes of the ZX81 and Spectrum. In the meantime, beginners and serious users should look elsewhere and even the dedicated among us should think carefully.