

SINCLAIR QL

Jack Schofield reports on the new Sinclair micro, which once again combines low price with an astonishingly ambitious spec.

EACH OF Sinclair's new machines has been more amazing than the one before, but this time he has really excelled himself. The QL fully deserves the initials, which stand for Quantum Leap, it is so far ahead of everything else at the same price.

The Sinclair QL is a 32-bit multi-tasking micro with windowing, 128K of RAM, two built-in Microdrives, a good-quality keyboard, a good selection of I/O ports and four software packages, all for £399.

The CPU is the Motorola 68008, the newest and most junior member of the powerful 68000 family. It has a 32-bit internal architecture and an eight-bit data bus. The 68000 itself is a 32-bit chip used in more expensive machines such as Apple's Lisa at £7,500, the Fortune 32:16, the Sage II, Wicat 150, Hewlett-Packard Model 16 and similar models at £3,500 upwards.

Perhaps the micro which is closest in terms of functionality would be a £2,000 IBM PC running the window manager Desq which costs \$399 extra, not including the applications software. That, at least, was my impression at the launch of the QL, where all the demonstrations were run using real machines, said to be "pilot production models".

Obviously there will be teething problems — all new micros suffer from them. However, the QL is being made by Thorn-EMI at its Feltham plant which used to build the Newbrain, an earlier Sinclair design. On past performance, the QL should be well made but there will probably be supply problems due to demand.

There will also be bugs, and some features of the QL will turn out to have unforeseen and possibly

unwanted consequences. But even so, the Sinclair QL is too powerful a machine for anyone to ignore — and that includes professional and educational as well as home micro users.

The QL comes complete with 128K of RAM, of which 32K is dedicated to the screen display. That leaves 96K of user RAM, some 2½ times the amount free to Basic in a 64K Commodore or Atari. Sinclair says a half-megabyte RAM pack will be available later to fit the expansion bus. Let's hope it doesn't wobble.

Mbyte addressing

The QL has 32K of ROM, which contains both Sinclair SuperBasic and the QDOS multi-tasking operating system. A further 32K of ROM can be added via the cartridge slot in the back. This slot and its cartridges appear to be physically the same as the Spectrum ones, but are not compatible. Altogether this accounts for 704K, while the total linear addressing capability of the 68008 is 1Mbyte, from 00000 to FFFFF.

The QL has no cassette-tape port and no disc interface. Mass storage is provided by two built-in Sinclair QL Microdrives. Each contains a 200in. loop of video tape moving at 30in. per second, making a circuit every 7.5 seconds. This justifies Sinclair's claim of average access time around 3.5 seconds.

Each Microdrive has a capacity of up to 255 sectors of 512 bytes. The capacity is quoted conservatively at 100K each — about 16K more than the Spectrum Microdrives. The two versions are not compatible, though both can use the same cartridges if they are appropriately formatted. Up to six extra QL Microdrives can be added, to provide 800K on-line storage, and a hard-disc interface has been promised for the future.

The Microdrives remain as yet unproven for serious use, so obviously many people will want to add conventional floppy-disc drives. This may be possible via the expansion bus, or the two RS-232C ports provided. The ports transmit at 75 baud to 19,200 baud, or provide full duplex transmit/receive at up to 9,600 baud.

The ROM-resident QDOS operating system was not demonstrated at the launch, but appears to be Unix-like. It seems most commands can be used from SuperBasic. The Exec command will load a sequence of programs and run them in parallel.

Sinclair SuperBasic is an enhanced



Mass storage is provided on 100K Microdrive floppy-tape cartridges.

version of Spectrum Basic — with some massive improvements. The wretched multiple-shift "single keyword" entry has, thankfully, gone. Other enhancements make the language much more BBC-like. For example, SuperBasic has procedures, and variables can be defined as Local. Structured commands include If-Then-Else, If-Endif, and Repeat-End Repeat.

Special commands to handle the windowing capability include Window, which is used to create one, and Pan to allow sideways scrolling. Pan 50 means Pan left by 50 pixels. To the Spectrum concepts of Paper and Ink you can now add Under, Over and Strip. Windows look like fun. There is also Date\$ for the battery-backed real-time clock, a nice feature sadly lacking from the Acorn BBC machine and the IBM PC.

The QL can drive a colour TV or RGB monitor directly. The screen display is bit mapped with co-ordinate 0,0 in the top left. Screen RAM is organised as 16-bit words starting at 20000 hex and progressing with the raster scan.

There are two display modes. The four colours black, red, white and green can be used with 512-by-256 pixel definition. In the 256-by-256 pixel mode, eight colours are available: black, blue, red, magenta, green, cyan, yellow and white.

The SuperBasic command CSize is used to set character size. Characters can be 6, 8, 12 or 16 pixels wide, and 10 or 20 pixels high, opening up a wide range of effects. The character set can be redefined. On a monitor the QL will normally display 85 columns of text by 25 lines. On a TV set, the width may be from 40 to 60 columns.

There must be reservations until production samples become available, but the QL's 65-key keyboard seems excellent. With the legs supplied to lift the back it has a good angle, and the full-travel keys seem fine for touch-typing. They are also pleasantly quiet.

Key layout

The key layout is excellent, with a full space bar, two Shift keys and an over-sized L-shaped Return key in exactly the right place. There are four cursor-control keys: left and right arrows are to the left of the space bar, up and down to the right. There are also five function keys, plus Control and Alt.

Most of the key assignments seem correct, though there are some oddities. For example, there is no Delete key: you use Ctrl-Left Arrow instead, but at least they are close together. As on the Spectrum, both £ and \$ are present. Sinclair's brochure, attached to U.K. copies of this magazine, reproduces the keyboard full size.

The QL is well supplied with ports, most of which have already been mentioned. The two ports labelled CTL1 and CTL2 are for one or two joysticks. Regrettably they will not accept the standard nine-pin D Atari-type connector used on the Spectrum

interface. The same ports will undoubtedly run other accessories too. The QL has no parallel port, but a Centronics printer port is promised as an add-on extra.

The network ports are for QLAN, the QL's built-in local area network. It allows up to 64 QLs and Spectrums to be connected with a data-transmission rate of 100K baud. Has no one at Sinclair noticed that there already is an entirely different system called QLAN? It is produced by Quorum for the Canon AS-100 micro — see our November 1983 issue, page 113.

Four software packages are supplied with the QL: a word processor, a spreadsheet, a database and a business graphics package. Data can be passed between them using the Import and Export commands. All four programs have been written by Psion, which will fully support and upgrade the software for people who

join QLUB at a cost of £35 per year.

Extravagant claims have been made for these packages: "They outperform the software for all existing micros". On demonstration they looked fast, attractive and user-friendly — but then, it would be a poor demonstration if they did not. Judgement must be reserved until after we have had the chance to test them.

Competition

If the claims are true, the software alone must be worth somewhere between £400 and £1,500. But even if they are not the QL on its own looks worth rather more than the asking price so it's hard to see how you can lose on the deal.

At the moment, only one company has a comparable machine at under £5,000, including software. That is Apple, whose new Macintosh is also previewed in this issue.

Several other companies are rumoured to be working on 16/32-bit small micros. Commodore is said to be using the Z-8000, Atari and Apple the 68000, and IBM has an 8088 in the PCjr. Acorn is readying the ABM, a business micro using the National Semiconductor 16032 chip. But the Sinclair QL is almost here, and the rival machines are not. Sinclair will be selling the machine in the U.S. at \$499.

It will be most interesting to see Acorn's response. The QL makes the Electron look feeble, and it offers so much for the money the BBC Model B itself could be threatened. A redesigned, cheaper main board looks overdue, as does a price cut.

Conclusions

● The Sinclair QL has an excellent specification, a good keyboard, a good range of ports and looks unbeatable value for money.

● Although it will be initially short of software, especially until everyone learns 68000 assembler, the packages included promise to make it a usable machine from the start.

● SuperBasic, the real keyboard and LAN make the QL a very attractive machine for schools, colleges and, especially, students of computing.

● When the hard-disc interface arrives, or someone hooks up a couple of standard twin floppies at, say, £400 the Sinclair QL has the potential to beat every business micro on the market at under £2,000 — and most that are under £5,000. If I ran ICL, I would launch just such a version, at £999, at the earliest possible moment.

● If the QL is reliable, delivered in quantity and lives up to its promise, it should do very well indeed, providing competition even for IBM.

● The Sinclair QL is designed by Sinclair Research of Cambridge. Enquiries can be sent to Sinclair at Freepost, Camberley, Surrey GU15 3BR. Telephone: (0276) 686100.

Specification

CPU: Motorola 68008 running at 7.5Mhz; 32-bit internal bus, eight-bit data bus; 1 Mbyte linear addressing capability

Other ICs: Intel 8049 controller plus four semi-custom ULAs

Memory: 128K RAM, including 32K video RAM; 32K ROM; RAM expandable to 640K; ROM expandable to 64K via 32K cartridge slot

Keyboard: 65-key moving-key QWERTY layout with four cursor keys and five function keys

Storage: two built-in 100K Microdrive floppy tapes, average access time 3.5 seconds

Display: via additional TV or monitor; monitor display up to 85 characters by 25 lines; TV from 40 to 60 characters by 25 lines; user-defined character sets

Graphics modes: 512 by 256 pixels in four colours or 256 by 256 pixels in eight colours; colour coding is non-compatible between modes

Built-in software: Sinclair SuperBasic structured Basic with procedures, extendability and full-screen editor; QDOS multi-tasking operating system with time-slice job scheduler, multiple windowing and device independent I/O

Software in price: Quill word processor; Abacus spreadsheet; Archive database and Easel business-graphics package; all written by Psion

Interfaces: TV and RGB monitor ports, Microdrive expansion, two RS-232 serial ports, two joystick ports, two local area network ports, main-board expansion bus, internal expansion socket

Power supply: 9V DC at 1.8A; 15.5V AC at 0.2A

Dimensions: 138mm by 46mm by 472mm

Weight: 1,388g (3 lb.)

Price: £399 including VAT, plus £7.95 post and packing

Availability: mail-order only, in limited quantities from the end of February