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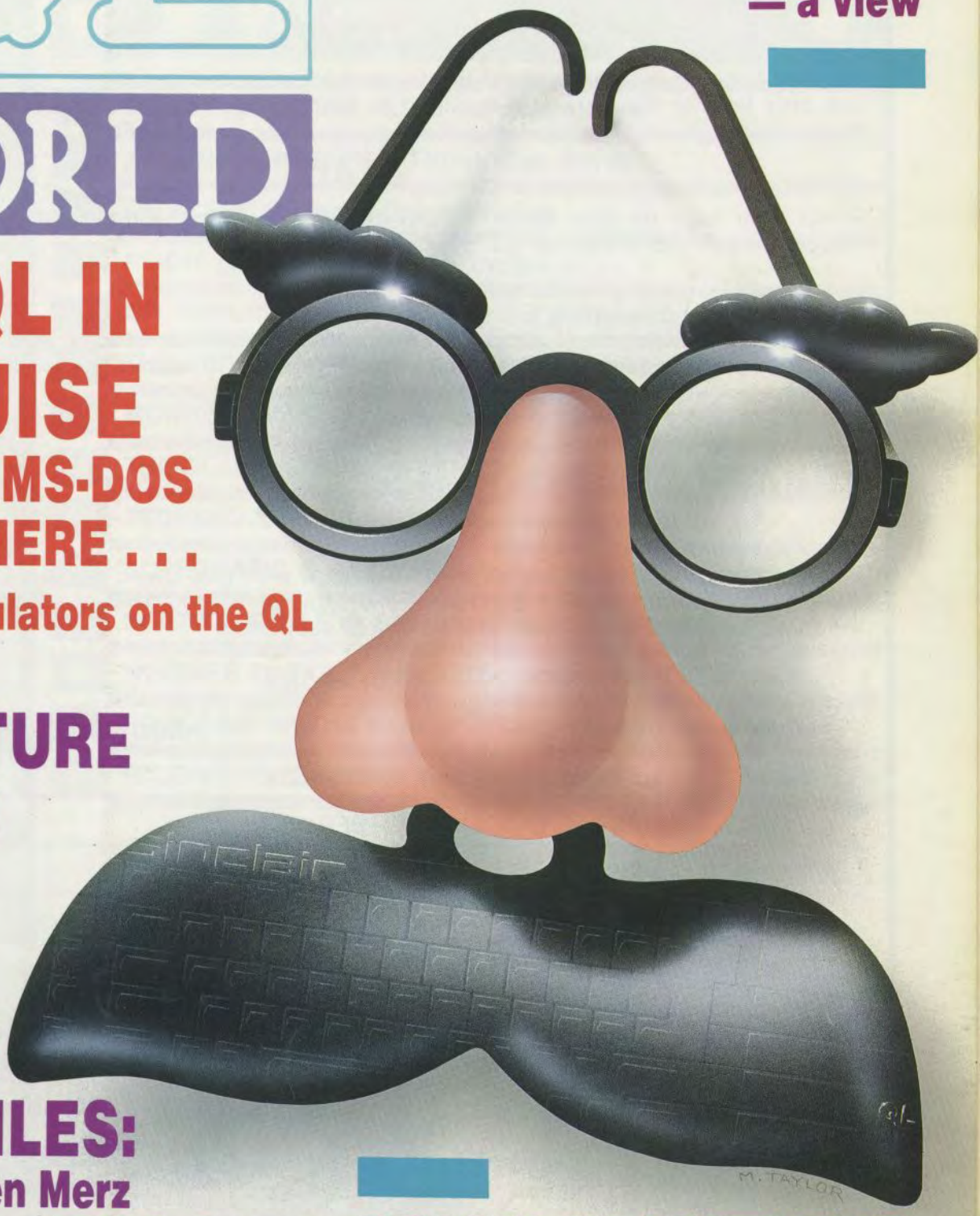

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FLASHBACK TO THE FUTURE

Bryan Davies looks at the latest version of an increasingly popular program.

SUPERBASIC

Concluding the calculator project.

THE SOLUTION — IBM PC EMULATOR

THE SOLUTION is Digital Precision's brand new PC Emulator System. By emulating an IBM PC as exactly as possible, **THE SOLUTION** enables its users to make their QL into a PC clone — no ifs, maybes or almosts. **THE SOLUTION** is available now!

A full technical specification of **THE SOLUTION** appeared in the February issue of QL WORLD. We now answwer your most common questions on the subject.

*Q. Do I have to know anything about QDOS, MSDOS, PCs or programming to use **THE SOLUTION**?*

A. No. Nothing at all.

*Q. Do I need any hardware to run **THE SOLUTION**?*

A. **THE SOLUTION** is purely software — there's no hardware to muck up your system. To run **THE SOLUTION** you must have at least one disk drive and at least 256K RAM expansion. If you have a 640K QL you have over 450K free for MSDOS and your programs — loads of room. And if you have a TRUMPCARD, you have more RAM available to MSDOS than on a big PC! If you don't have disks or expansion RAM, we can supply you with both at very competitive prices. And we don't stock anything but the best. Today's "bargain-price" hardware is all-too-often tomorrow's tragedy.

*Q. How compatible is **THE SOLUTION**?*

A. **THE SOLUTION** will run all properly written PC programs: that is, all programs that adhere to IBM's specifications. All the well-known and popular programs for the PC are properly written — if they weren't, their manufacturers would be swarmed with complaints from people who couldn't run the software on their particular brand of clone. It is a "chicken and egg" situation — it is because the sensible manufacturers don't break the rules and write software properly that they get to be famous in the first place!

Q. Can I have that again, in English this time?

A. Programs that break the rules, by making direct access to hardware and bypassing the BIOS, are the cause of problems. But these are programs that don't give just us headaches, they also won't work on many PC clones as well! It is impossible to guarantee compatibility with such naughty programs — but **THE SOLUTION** will have a good try to auto-guess what is expected of it, and will hence run the overwhelming majority of naughty programs too. Again, our emulator is no more fussy than many clones (including the unmentionable!) and less fussy than some of them.

Q. Naughty programs?

A. Software that breaks IBM specifications is invariably written either by people who didn't know better (this software is only found atthe bottom of the public domain league-table — our advice is to steer clear of the super-cheapos!) or by people who wanted to maximise speed (direct pokes into screen RAM, etc.) whatever the consequences — invariably these are games. Our test suite comprises 100+ programs, even including a smattering of games. **THE SOLUTION** works with all of them, perfectly. Of course we've tested it on BASICs, other high level languages, compilers, assemblers, monitors, databases like dBASE and Framework, spreadsheets like Lotus 1-2-3, Symphony and Supercalc, word processors like Wordstar, Superwriter, Word Perfect and loads of applications programs. For heaven's sake don't think this is a complete list. There isn't a single PC program we've encountered — and our betatesters have had access to hundreds — that has given a problem that we haven't traced either to a proven and demonstrated bug in "their" program (that causes a problem with a clone) or a bug — fixed by us in minutes — in our test version. There is no third category. The bottom line? Run garbage and you just might get hassles, but no more than you would get with a clone. In many ways, we are more PC compatible than the famous brand PCs. Run half-decent software and you won't. **THE SOLUTION** is super-compatible.

*Q. How fast is **THE SOLUTION**?*

A. How long is a piece of string? As we are emulating an 80x80 CPU, different 80x86 instructions translate into a different set of M68000 instructions. **THE SOLUTION** is hand-written in optimal machine-code, so it goes as fast as is possible.

Q. Don't avoid the question.

A. **THE SOLUTION** runs with most programs, at about 10%-20% of the speed of an XT. Usually it will more than double this, and if you have an ST QL Emulator or fast THOR, you can increase our speed figures to 250%-300% of their values. But on a QL we have found the speed very acceptable for the vast majority of applications, and adequate for everything (except zap-em-up games). And if your PC software involves a significant "human input" component, you may find no significant difference at all between the speed of **THE SOLUTION** and that of a fast PC. If you want even more speed, we strongly recommend you buy LIGHTNING together with **THE SOLUTION** — we haven't reinvented the wheel in **THE SOLUTION,** which consequently benefits from LIGHTNING technology. Remember the 10% discount when you buy LIGHTNING.

*Q. You mean I boot up **THE SOLUTION**, and then my QL is a PC. Can it really be that simple?*

A. It is that simple. You will get your DOS prompt, A> or whatever, and after than you can forget you are on the QL. Disks you read from and write to will be in MSDOS format from here on — so you can directly read that data you wrote at the office, and after you have finished and saved yourwork to disk you can take thedisk away and read it and manipulate it on you PC. As long as you are inside **THE SOLUTION**, the QL **IS** a PC.

Q. Isn't the keyboard different? What about F6 . . F10, PgDn, PgUp, DEL, INS etc,which are not QL keys?

A. Come on — it is Digital Precision you're talking to! We've remapped the keyboard — all IBM keystrokes are supported. You can reconfigure all the keys, too. So if you want (say) CTRL/DOWN to give PgDn, you can set it.

Q. What size drive?

A. Any. We can supply on 3.5" or 5.25", single or double sided, single or double density. Just tell us what you want. And if you have a QL with (say) 3.5" disks and want to use 5.25" IBM disks (IBM disks are available in both sizes, so this should not be a problem — but perhaps your office computer has only 5.25"), we can either sell you a 5.25" drive or a combined 3.5"/5.25" switchable drive, arranging a part-exchange with your existing hardware if you wish. Our prices are very competitive and we only supply NEC industrial quality goods. One thing — don't opt to format you IBM disks to quad-density (an option available on the latest PCs only) as QL drives can't read at that density).

Q. What peripherals can I use?

A. Obviously, you can't plug in IBM hardware cards! But printers, modems, other communications hardware like terminal emulators (yes, we do maintain the baud rates!), mice (that mimic the keyboard) etc. all work. As our devices are reconfigurable, all sorts of possibilities arise, including the use of ramdisks, spoolers and other QL devices. You have total freedom.

Q. Miracle have announced a hard disk. Comments?

A. We love Miracle too. **THE SOLUTION** will support it via a module that we will market within a few weeks of the delivery to us of the hard disk, which is expected sometime in April. At present we are planning to allow disk partitioning, so rather than either QDOS or MSDOS grabbing all of the hard disk, you can allocate a % of it to each of them. 10% off **THE SOLUTION** if you buy it and the Miracle hard disk from us.

Q. Do I get colour too?

A. Of course. Full CGA-standard emulation (loads of smart software that took us ages to do!) is provided, with no need for accessories! Monochrome and block graphics are obviously also supported. **SOLUTION** works perfectly with CAD, graphics and DTP systems as a consequence — truly amazing!

*Q. What versions of MSDOS will **THE SOLUTION** work with?*

A. Virtually any version! We have tried even ancient, 5-6 year old versions and they work with **THE SOLUTION**. But you may get problems running some programs (not our emulator), which take advantage of recent DOS amendments, with old MSDOS versions — again, no more than you would get on a clone.

*Q. Do I need to use Media Manager or Discover with **THE SOLUTION**?*

A. **No. THE SOLUTION** provides full function disk formatting and file copying of files from QDOS to MSDOS format and back, via a separate stand-alone QDOS utility that is very fast. **THE SOLUTION** even copes with anomalies that arise with 40 track disks in 80 track drives. The beauty of all this is that you can use our superb EDITOR program — either standard or Special Edition — to manipulate IBM files very easily. EDITOR format is perfectly compatible with Wordstar/Superwriter etc format, so work is transportable to and from Editor with perfect ease. We give a £10 discount on Editor when bought with **THE SOLUTION**.

Q. Does this mean Digital Precision prefers MSDOS?

A. You must be kidding. that is why we have made **THE SOLUTION** fully and natively multitasking. If you wish, you can run more than one PC program together, or PC and QL programs simultaneously. It is exactly as you would expect, the only difference being that to multitask from **THE SOLUTION** CRTL/C is not used (because it has a meaning under MSDOS) but instead SHIFT/CTRL/C.

Q. I've heard of another emulator. . .

A. So have we. We wasted a day looking at the latest shipped version, and could get it working — after some considerable effort — with only two of our 100+ test programs, and with neither of these completely correctly. The rest all crashed or hanged! There was no support for CGA! Monochrome support was ridiculous — no sub-screen scrolling, no multiple display pages, no reading of characters back off the screen — we have a suspicion that only teletype mode (no cursor repositioning traps honoured!) was supported, which is why the 2 programs we were able to load spattered output higgledy-piggledy all over the screen. It wouldn't work with TRUMPCARD. It won't multitask — when we forced it to, it hanged the QL. It crashed on CLS, and an any access to drive B:. The keyboard — contrary to claim — isn't configurable, and many key combinations are inaccessible. Using RJOB on it soon hangs the QL, indicating the extent to which it has corrupted the entire machine. No facility is provided for moving data or files to or from QDOS. DATE seems to return random characters. Error trapping resulted in a hang. Even DEBUG wouldn't work, MODE COM1:96 returns "com1 is a bad parameter". There is no method to allow you to reduce/control the amount of RAM scavanged by the "emulator". Benchmarking this very problematic — you don't measure time to completion, only time to crash — but on the few things that worked it appeared to be a third of the speed of **THE SOLUTION** (MASM assembler time 96 seconds with our one, 253 seconds with their one — judging by their seven minutes plus for a 360K disc formatting a 720K disk would take over 12(!!) minutes on their system if a bug that prevented the latter happening was fixed!

Our opinion is that it is a disgraceful program, one of the worst we have ever seen. Undoubtedly it will improve — it could hardly get worse, but it won't be usable. The ultimate insult is the manual (under 4 pages of Quill_doc file plus one twelve-line memo) from which we quote verbatim "It is not too difficult to crash the emulator!", it "still contains quite a few problems", "it is fine when using DOS and small packages," (untrue anyway, but revealing, as all PC packages are large!!). Not even could we get any BASIC (we tried five!) to work with their emulator — no input was possible, so you could not EDIT, LIST, RUN, etc. Even 10 FOR i=100 yielded a "type mismatch" error!! Not a single program we tried — even one line-ones failed to crash. Phil Borman, the Secretary of QUANTA, the Independent QL User Group, stated to us on 1/3/89, "I could get no PC programs to work under that emulator." One of QL World's technical reviewers admitted that he had spent a whole day with it and had failed to manage to get any PC program to function at all (let alone function properly!). We know that QUANTA and QL World have both received many angry complaints from customers who got "caught" — we've received quite a few (unsolicited) stories already all saying the alternative didn't work at all. Finally, one of the independent sources mentioned earlier stated that what we have said about the so-called alternative is mild compared to what should have been said . . . 'nuff said.

Q. We have heard what you have to say. What do others think?

A. We understand that reviewers for QL WORLD, QUANTA and other magazines were very impressed with **THE SOLUTION**.

Q. What is the difference between the two flavours of THE SOLUTION?

A. The emulator is identical. The sole difference is that with the **CHOCOLATE SOLUTION** you are supplied with a complete MSDOS V4.0 — including all system documentation, loads of wonderful Microsoft paper, etc. **THE VANILLA SOLUTION** costs **£79.95** — you've got to buy a DOS for yourself. The **CHOCOLATE SOLUTION** costs **£129.95**, just £50 more — that compares with a dealer price for over £90 for MSDOS alone! And 10% off everything if you buy LIGHTNING at the same time.

DIGITAL PRECISION

THE EDITOR SPECIAL EDITOR

Text handling par excellence

These are the ultimate file–handling programs for your favourite computer. A new concept in hyperspeed information manipulation, Editor serves as a word processor, printer driver, database and programming environment. You name it, Editor does it. Its logic and consistency of approach put Editor in a class of its own. Special Editor only works on expanded machines – it takes the QL to its very limits, and is ideal for handling documents, manuscripts, books etc.

TURBO

The supreme SuperBASIC compiler

Turbo is compatible with the entire syntax of SuperBASIC. Its friendliness, features, tolerance, flexibility and fast operation are legendary. TURBOcharged programs run upto 100x faster than BASIC ones . TURBO is supplied with a general–purpose, two–hundred command toolkit.

PRICES SLASHED!

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These programs provide wysiwyg document design, with a huge. number of RAM and device resident lo–res and hi–res fonts, continuously variable X & Y magnification, compatibility with Editor, Quill and Eye–Q, a preview function, comprehensive graphics facilities, flexible cut & paste, pixel justification etc. Both versions require expansion RAM, and Special Edition is disk only. The Special Edition is supplied with a free copy of grafiX, the well–known PDQL printer controller. Both versions work best with Eye–Q and Editor.

PRICE SLASHED!

DIGITAL C

A C compiler for beginners

Truly portable, but carefully tailored and optimised to produce fast, concise code on the QL. No cash crop conversion this!

SUCCESS

The supreme CP/M Code Emulation System

Converts the QL into a fully compatible CP/M operating environment. No ifs, buts or almosts. Run thousands of the world's favourite programs on your QL NOW! Emulates Z80 too!

For full program specifications refer to the July 1988 QL World

£10 off The Editor and/or ACT Special Edition if bought with anything else

IDIS

The first intelligent disassembler for the QL

The ideal disassembler for beginners – with IDIS you do not need to be an expert to crack other people's programs

3D PRECISION

A dream to use

Provides every facility for swiftly designing and manipulating three dimensional objects in real time. You have complete control over perspective, magnification and position, and you can create lines, surfaces, objects and worlds (groups of objects). Needs extra RAM..

MEDIA MANAGER SPECIAL EDITION

NEW

Media Manager is a very early DP release with oodles of functions. However, the design and user-friendliness of the system was not quite up to the standard of Digital Precision's other programs.
Consequently, we have spent a great deal of time rationalising and improving Media Manager, making it much easier to use, much faster, more powerful and more flexible. The result – Media Manager Special Edition. A classic release, a must for everyone who uses the QL to store things of value. Not that MMSE is just for when things go wrong – it is a manager too, with a host of medium control functions. And if you can program, we've supplied SuperBASIC extensions for every conceivable device control.
Additional features include the facility to read from, write to (and even format) IBM MSDOS/PCDOS disks and Atari TOS disks - two-way access both at sector-level and at file-level.

MORE SUPER SPECIAL DEALS

we want to encourage more and more users to experience for themselves the stunning acceleration imparted to the operation of all Digital Precision programs (and everyone else's programs) by LIGHTNING.
Programs that particularly benefit are editing/word processing programs, databases, graphics/CAD programs, desktop publishers, compilers, games and programs with a high computational overhead (like astrological systems).
We will give a 10% discount, additional and supplementary to all other discounts, for any purchase of two or more programs, if one of them is LIGHTNING. This discount applies to the total price – it is not just 10% off LIGHTNING but 10% off the lot!

DIGITAL C SPECIAL EDITION

NEW

Digital C Special Edition has all the features of the much-acclaimed Digital C System, plus:
★ **Direct access** to all QL traps and vectored utilities is provided.
★ **Machine code** has now been used for writing all the standard library functions – this maximises execution speed and minimizes code size.
★ **Huge programs** can be compiled – no 64K or other code size limit.
★ **Many new fast** library functions including SCANF are supplied.
★ **User selectable size** optimisation gives the choice of efficient 16 bit and flexible 32 bit addressing.
★ **Long integers** are now supported.
★ **Long pointers** are now supported.
★ **Long constants** in octal, decimal and hex are now available.
★ **User friendliness** is improved.

PROFESSIONAL PUBLISHER

NEW

Digital Precision is proud to announce an all-new, top-of-the-range desktop publishing system.

Professional Publisher has all the features and controls you require to produce output of the very highest quality.

Professional Publisher has ALL the features of Desktop Publisher Special Edition, plus the following:

★ **Linked windows...** Any number of windows can be 'invisibly' connected in a sequence determined by you so that text flows from one automatically into the next. Windows can be of any shape.

★ **Wraparound graphics...** Any graphic can be placed on a page and text can be made to automatically flow around the graphic. Pixel-proportional spacing and the integrity of columns will be maintained – the graphic can be of any shape and can wholly or partly overlap any number of windows. The user may define any polygon (up to 64 sides) to demarcate the desired border of the graphic, which need not coincide with its actual outline.

★ **Full mouse compatibility...** Smiling mouse owners can start smiling! The incredibly silky smooth feel of this system, when either used from keyboard or mouse, has to be experienced to be be believed. It comes from our special scrolling and cursor-handling routines, handwritten in machine code. We suggest you use the system from the keyboard first, and then go in for a mouse if you feel the need to.

★ **Style and layout designer** allows you to create any number of layout templates, which contain details of columns, margins, gutters, breaks, guides etc. This permits the easy creation of multiple pages.

★ **No more fiddling** around with cursor keys for exact positioning – text can be snapped into guides.

★ **Full compatibility** (and now absolutely hassle free!) with ASCII files (say from Editor Special Edition), Quill_doc files and Quill_lis files – now with complete preservation of paragraphing, indentation, tabulation, superscripting, subscripting, italicising etc. Any size files can be handled – Pro Publisher has an on-screen skip/preview/chunk routine!

★ **Huge range of fonts supplied** (hundreds) – memory resident and disk resident – with sizes ranging from 8x8 to a gigantic 48x48! User-adjustable (pixel accuracy) descender position, character spacing, X and Y axis widths etc. In addition there are 26 graphic fonts!

★ **Page dimensions specifiable** either in pixels or millimetres – up to an enormous 960x1600 pixels and down to a tiny 48x48 pixels. Inch and mm rules provided.

★ **The whole of the ASCII set** is now supported – this is very useful if you want lots of special symbols or if you want to support non-English characters.

★ **Fingerprinting** is supported.

★ **A virtually infinite** selection of fill textures, with font patterns, graphics, or whatever you choose.

★ **There are 256 paint brushes**, with a unique programmable overlap (1/3/9 pixels) function.

★ **Automatic shading** and grey scale conversion of colour screens.

★ **Automatic interpolation** of graphics and fonts.

★ **Automatic bending/stretching/resizing** of graphics.

★ **All Boolean functions** supplied for brushes, fonts, graphics and freehand drawing – AND/OR/XOR

★ **Cut & paste** is supported both TO AND FROM the page itself, saved screens and compressed screens – this incredible support of all permutations gives unheard of flexibility!

★ **Full support for kerning** and pixel justification, including user-definable % line usage, user-definable maximum and minimum inter-character spacing and inter-word spacing (preventing the ugly spread of characters or words on a line when the first word on the next line is a very long one), preselectable/defeatable auto-hyphenation, auto-indent control, dropcaps, left/right/centre/off justification etc. etc.

★ **Walkdown menus** (selections either by a single keypress or by a moveable bar, you decide), context-sensitive help, very greatly enhanced user-friendliness.

★ **8/9/24 pin printers**, laser printer support, output any part of the page, individually vary X and Y axis magnification, user-selectable print density and number of passes.

★ **Professional Publisher** is supplied on disk for expanded QLs.

Digital Precision want to particularly acknowledge the skills of the ace programmer Andrew Astrand and his dedicated team.

REMINDER: Taken out a QL WORLD subscription yet? Yes, our non-UK friends, we mean you as well. Do it NOW!

IDIS SPECIAL EDITION

All the features of the much-acclaimed IDIS intelligent disassembler – but even more intelligence!
This remarkable Special Edition, Only available to users of expanded QLs, has the amazing ability to recall earlier decisions while in a 'trial' disassembly mode. This greatly reduces the amount of help the system requires from you – usually to zero! Also, no longer will you need to answer the same (or similar) question more than once. Also added are facilities for dumping in hex/ASCII, default responses to startup interrogation, automatic resequencing of absolute addresses, non-destructive windowing etc.

NEW

UPGRADES

To upgrade from one version of a program to a later version of the same program, send us the cartridge/disk and £10. Except in the case of Special Edition Editor owners upgrading to the latest Special Edition Editor, do not return your manual to us.
To upgrade from a program to the Special Edition of the program (say from the standard Editor to Special Editor), send us the cartridge/disk, manual and the difference in current advertised price between the two programs, plus £10. For this purpose we will consider Professional Publisher to be an upgrade from the Desktop Publishers and Professional Astrologer to be an upgrade from Super Astrologer.

For example:
* To upgrade DIGITAL C to SPECIAL EDITION C send us £40 (£49.95-£29.95+£10)
* To upgrade an early SPRITE GENERATOR to the current version send us £10

PRODUCT AVAILABILITY ROSTER >>>>
Everything available NOW except:
Media Manager SE: 25th Jan 1989
THE SOLUTION: 25th Jan 1989

DIGITAL PRECISION

MEDIA MANAGER

PRICE SLASHED!

Manages and controls disks and cartridges, transfers from/to alien formats, recovers corrupt/lost data.

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The Adventure Creation Tool enables the user – who need not know how to program – to create the most amazing adventures, with text, pictures and animation. A disk drive is needed.

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Moves stuff from cartridge to disk, performs any translate.

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An expert system to help you improve your BASIC programming.

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Quite simply, one of the fastest FORTH–83 compilers ever written.

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Moves things about, smoothly, quickly, flexibly, 256 planes.

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Outputs screens (from Eye–Q etc.) to printers (Epson or Oki) beautifully, with lots of options.

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A generously specified contract bridge tutor and player. Of phenomenal educational and entertainment value!

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With all the features you would expect. Its superb, silky, precision feel is what makes this program so special.

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OPEN CHANNEL

Open Channel is where you have the opportunity to voice your opinions in *Sinclair QL World*. Whether you want to ask for elp with a technical problem, provide somebody with the answer, or just sound off about something which bothers you, write to: Open Channel, Sinclair QL World, Greencoat House, Francis Street, London SW1 1DG.

Go public

Could you include a plea in Open Channel for the author of the free Medic games to make them public domain so that many more people can enjoy them? I could supply copies of three of the games to the Quanta, QL S.V.B. and QLAF public domain libraries, if I had permission to do so.

Rich Mellor,
Walsall,
West Midlands.

CGH Services is doing its best to promote cheap computing on the QL. It would benefit users to have access to as wide a range of software as possible. On the other hand, we do not want to see people ripped off.

Could I ask for your co-operation in our attempt to set up a definitive register of public domain and shareware programs? All we need is for you to publicise this and ask anyone who can provide proof of permission for software to enter the public domain — or shareware, for which an up-to-date register of authors' addresses is essential — to contact us so that we and other suppliers such as QL S.V.B. can deal with public domain material with a clear conscience.

We would appreciate it if publishers would give public domain status to material on which they own the copyright if they cease trading — or authors, if they still retain copyright. Several interesting cases come to mind — the "free" games issued by Medic, *Sign Designer* by Eric Penman now that DS has vanished, and so on.

I would appreciate any comments readers have to make on this matter. Why is public domain and QL software such a confused picture?

Richard Alexander,
CGH Services,
Cwm Gwen Hall,
Pencader,
Dyfed,
Cymru SA39 9HA.

Editor's comment: Public domain often appears confused because a "folk history" of routines and, for some machines, extensive software libraries appear to become common property, with nobody claiming ownership rights. In reality, although routines often circulate freely without an author's name attached, they tend to be straightforward building blocks which could have been originated by any good programmer, with no commercial potential by themselves.

Longer programs or packages in the public domain appear there because an author has "contributed" them to the world at large by waiving copyright.

The only way for a program to enter the public domain is for the copyright holder to waive copyright. The main reason defunct businesses do not assign their copyright to the public domain is either that they hope to be able to realise the value of the software in some other way in the future, or that the copyright ownership is still somewhat uncertain between publisher and author — often formal contracts are not signed — so no-one will take the final decision.

That not infrequently leads to good software becoming "frozen" in a situation where nobody can re-issue it because all the interested parties cannot be traced. Shareware is a very satisfactory way of sharing software without relinquishing ownership.

Slow link

I have read several times about a new command for the JS ROM, TRA, but I have never seen its syntax. As it translates characters to the printer it could be the solution for the 10 translatable characters allowed by Quill.

I am using Metacomco Lattic C, but I found the linker — GST Linker R101V030 — too slow. Does anyone know a faster one? Where can I get the Sinclair Relocatable Object File standard? I could write a new, faster linker. Does anybody have any clues?

Joao Cardoso,
Pr. Sousa Caldas 102-42
400 VN GAIA,
Portugal.

No manual

Does anybody have the installation program for the Seikosha GP-250X printer? I purchased this printer without a manual and will be glad of any information which will help me toget the best use of it.

Les Allerton,
5 Hyfrydle,
Llanddewi-brefi,
Tregaron,
Dyfed SY25, 6UT.

Editor's comment: Here is another user who needs direct assistance from somebody with the relevant printer.

Editor's notebook

A number of readers in the last six months have had problems with *Front Page Extra 2* by GAP Software. Purchasers were in many cases promised *Front Page Extra 3* to replace faulty copies of FPX2 but have not received updates. *QL World* would like to hear from users who have either received a working upgrade of Front Page Extra 2 or have in some other way overcome problems with the program.

I received two letters from Europe asking why we do not publish "more of the news". There have been a few events in the last year which have been surrounded by clouds of rumour and conjecture but *QL World* abides by the rule of "all the news that's fit to print" and prints it, as soon as it is verified sufficiently to go to press.

There is gossip on the grapevine; disputes spring up and lie down and new versions of historical tales are swapped. Unfortunately, much of this rich folklore is not "fit to print" for one reason or another. When we have news from a proper source, which bears directly on our readers or suppliers, we print it in the next available issue.

TROUBLE SHOOTER

A PROBLEMS SOLVED

Bryan Davies looks at disc drives and the new Solution emulator, among other things.

Jusfiq Hadiar seeks an article on fitting disc drives to the QL. Specifically he wishes to know how one can use a drive which comes from, or is designed for, another computer, such as a PC. It is easy enough to write about connecting a drive which comes from or is designed for, another computer, such as a PC. It is easy enough to write about connecting a drive with which one is familiar but the problem is in knowing enough about several different drives to write about them without having tested them.

In principle, drives made to the Shugart interface specification should work with various types of computer and interface; the difficulty may be more with power supplies and jumper connections than with the basic interface. Adding a second "bare" drive to an existing single one can overload the power supply fo the latter and this may not be obvious at first. Recently I bought a Brother 3.5in. drive from a shop in Tottenham Court Road and it worked when attached to an existing 3.5in. drive on a friend's QL but it did some strange things when he attempted to do a wild copy from one drive to the other.

Power lack

The problem was lack of capacity in the single power supply. The drive was not sold as being specifically for any computer but was said to be capable for formatting to 720KB or 1.44MB on a PC. The only difficulty getting it to work was deciding which jumper connections were needed to make it Drive 2. Likewise, a Cumana 5.25in. drive taken from a QL worked when plugged into my AT, with nothing other than jumper position changes.

There is a fair variety of locations and designations for jumpers and also some variation in signal and power connectors. If readers can provide specific, detailed information on connecting non-standard drives to standard QL interfaces, either Dennis Briggs or myself will be better able to deal with specific enquiries. At the moment I do not think what I could say would be of help to sufficient people to justify a separate article. It is certainly likely that the arrival of an MS-DOS emulator will arouse interest in additional drives.

The hard drive set announced by Miracle is by no means the only one to be connected to a QL but all the others seem to be non-commercial. CST offered an SCSI interface for years and some readers have connected hard drives to that but the capacity limit is 20MB. Several members of the Quanta user group have rigged drives for their own use and it is hoped about six of them will have been seen running at the AGM/Workshop in March. Perhaps 1989 is the year for us to be put on a par with the other main home computers in this regard.

Shipped

The Digital Precision MS-DOS emulator is now being shipped to customers; the demand seems to have been high, which is no surprise, as readers often mention having PCs as well as QLs. My initial impressions of running the program with MS-DOS 3.30 is that it is very stable and should be able to handle the well-known PC programs.

Setting up the program involves little effort. Preparing versions of PC programs to run on the QL can take some time if your PC has a different configuration; remember to change the screen mode and default drives if necessary. Quill 1.1, *MultiMate Advantage* 3.60 and *XTree Professional* 1.0 run with no hitch, so far as I can see; *WordPerfect* 4.2 also runs but two command keyings may have to be modified.

It is very pleasing to find the DOS user area is larger than on a PC. Surprising also is the size of The Solution — very small for what must be a big job. What complaints there have been from early users centre on drive problems; the reasons for this appear to be drives which are not working properly and, possibly, failure to set the configuration correctly for the program. The instructions are comprehensive and clear but you may have to ponder for a time about drive settings.

The Sector Software FlashBack Special Edition should be available to customers in April; the final beta test versions were being checked by the usual guinea pigs during March. There have been several logical developments from the initial version and existing users will probably want to upgrade.

Auto-castle

The enquiry from **L. G. L. Unstead-Joss** about how castling is done in the Psion Chess program has produced as many letters from other readers as any other subject in the last year or so. The answer is to move the King to the castled position; this is an "illegal" move, in that the King moves two squares instead of one, but the program understands this to mean you want to castle and it moves the Castle automatically to the corresponding position. Following chess rules you cannot castle if the King has been moved previously, or is in check. Naturally, you have to clear the back row of other pieces to enable castling to take place.

There have been some complaints that the **Super User Bureau** has not been answering the telephone. The latest number I have is 0388 450610; if you have difficulty obtaining anyone on that number, please let us know. There have been more reports of difficulties with the **ANT Computing** MS-DOS emulator; no reply has been received to an enquiry to this supplier. **Schoen PCP** has not answered various queries regarding its hardware products.

Book demand

Athene is sending a copy of Turbo Quill Plus to **Reg Gilbert** in Nova Scotia; the other was "lost in the wash" originally or the goods were lost in the post. Gilbert is another reader to ask about the chances of Jan Jones' book, *QL SuperBasic — The Definitive Handbook*, being reprinted; if sufficient readers write to request it perhaps something can be done but the print run required is such that no supplier will want to deal with it unless interest is very firm.

D. N. Mendes da Costa wrote from Portugal asking whether or not there is a way of speeding re-calculation in Abacus. His spreadsheets occupy 50-60KB and take up a grid of about A1-AC250; this is much larger than most people use, I suspect, and re-calculation takes typically 50-70 seconds, even with the *Lightning* program loaded. Does anyone have any general suggestions?

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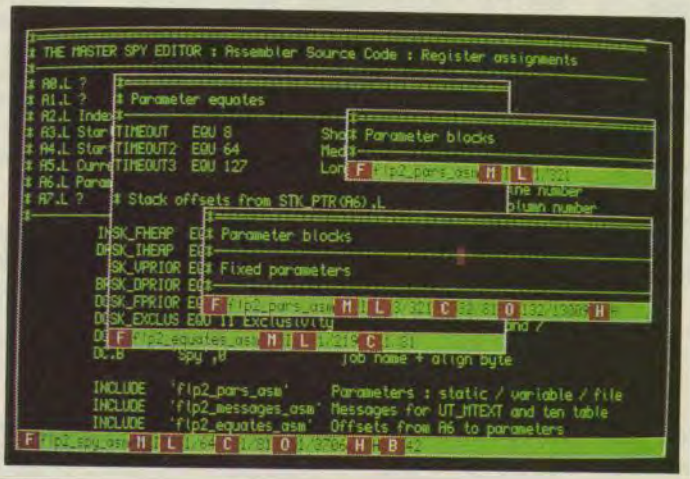
QL SCENE

Ark file editor is looking at you

Master Spy from Art Software is a file editor which is exceptional in its ability to show different "views" of a file in the process of editing. *Master Spy* uses a real-windows environment with windows which can be quickly re-sized and relocated, with quick <CTRL><UP> <CTRL><DOWN> switching between windows.

Each view has full editing capabilities and the program is fully multi-tasking. A window refresh method which takes account of the memory available allows the program to run on expanded or unexpanded QLs.

Features include multiple file handling and multiple views of each file, lazy screen with optional screen switching, local and global block handling, cut or paste, left/right scroll, fast string exchange and search, highly user-configurable, one 35K file with no extensions, loads in less than 10 seconds from disc, compatible with *Lightning* and *Speedscreen*. Master spy costs £29.95 (U.K.), £31.95 (Europe) or £33.95 (world) from Ark Distribution, Corve Farmhouse, Chale Green, Ventnor PO38 2LA. A review of Master Spy appears on page 18.



The Budget

QL Supersoft has released a new home finance package, *Home Budgeting*, in three sections — entry, analysis and config. Entry accepts entries from bank and credit card statements and can produce a statement, including cheque numbers and the user-defined budget codes which are the basis of the program. Analysis can load 12 monthly files and extract average spending and deviation from each budget. The data can be searched, and hard copy can be produced.

Ten bank accounts and 56 budget accounts can be supported. Unexpanded QLs can handle 200 transactions a month, with performance gains from greater memory. One microcassette, Supersoft says, typically can hold three years' data.

Home Budgeting costs £14.95 for two Microdrives containing the package which can be loaded to disc, or send an SAE and one mdv for a free demonstration version. QL Supersoft, 3 Hammond Road, Basingstoke, Hampshire. Tel: 07356 6935.

Palantir to Rob Roy

All communications for Palatair Products concerning Inkwell or IDT should now be sent to Rob Roy Software, 94 Teignmough Road, Clevedon, Avon BS21 6DR.

Cricket out of rough

If it is the sunniest day of the year so far, thoughts turn to sport and what better than cricket? Nigel Holder, publisher of *International Cricket*, has been in touch to say that V1.3 of the game, now available, "has all the graphics rough edges smoothed out such as the sprite flicker and sprite over-write problems", and that the program is available for 128K and 256K QLs.

Nigel Holder, 24 Beightons Walk, Healey Gardens, Rochdale, Lancashire OL12 6EA.

Flight

EkoTek Datasystems has contacted *QL World* with additional information on *Flight Simulator*, reviewed in QL World February. The original cartridge contained only two worlds, with a monochrome and colour version of each. A cartridge with five additional worlds will be available from April, costing £10.

Flight Simulator costs £15 from EkoTek Datasystems, PO Box 140, 7570 AC Oldenzaal, The Netherlands.

Blag

A game publicised previously by GAP Software, *Blag*, is now available in an updated version, re-titled Blag2 in Microdrive, from its author.

Blag2 is a detective adventure for expanded QLs. The hero, detective constable Adrian Blunder, has access to a police computer, a police vehicle, police files and a police dog in his quest to solve Woolendon's first major crime. The player can write notes to Blunder's notebook as the game proceeds, doubtless in a westerly direction, towards it conclusion.

Blag2 costs £7 from A. W. Woolcock, 30 Lyndhurst Road, Ashurst, Southampton SO4 2DUL or can be obtained from QL S.V.B.

Qlub

The QL Qlub of Norway would like U.K. user groups and suppliers to send news reports and press releases for its monthly magazine to Qlub of Norway, PO Box 193, N-7080 Heimdal, Norway. This is also the address for subscribers and enquiries.

Ron Massey consults Archive in the search for a solution to the all-too-common problem of lost database files.

•PSIO

Besides the dreaded QL "BAD OR CHANGED MEDIUM", the most feared QL error message is the Archive "WRONG FILE TYPE". Judging from the number of despairing letters I receive concerning this problem, Archive would seem to have built-in gremlins waiting to make their presence known only after painstakingly accumulating a considerable number of records for a significant time. When lightning strikes the disaster is usually monumental.

"WRONG FILE TYPE" can be an indication of trying to load the incorrect type of file, such as a Quill document, into Archive. This type of error arises because the data structure of the file is not consistent with Archive requirements.

Another reason is that the file has been corrupted because of any of a variety of causes from classes of problem. The first occurs when a cartridge or disc becomes unreadable.

Hardware errors of this nature can arise from a number of causes, the most common being removing media while the drive is running, using poor specification or damaged media, power spikes or, less commonly, a drive fault.

Media recovery

Media corruption is a relatively rare event and, if it occurs, victims may have some success in restoring files with one of several media recovery programs such as the Talent *Cartridge Doctor*, the PDQL *Lazarus*, Digital Precision *Super Media Manager* or the Adder *QDoctor*.

Much more commonly, "WRONG FILE TYPE" is the message you will get if you have failed to observe Archive operating procedures. Because of the way the program updates its records but not its file structure information while you are using it, it is true to say that an Archive database is corrupted whenever it is opened and remains so until it is closed.

Files will usually become corrupted permanently if you OPEN a file, add, update, amend or delete records and then re-set the QL without issuing a CLOSE command. Failing to "CLOSE" a file will leave the file in its altered state.

To appreciate the problem with file as opposed to media corruption, it is worth having at least a nodding acquaintance with the way Archive manages files. An Archive database is composed of five elements — a control record, a file data table, a file index table, free space table and a file structure table.

Neither Quill nor Archive normally save files in a straight text format. Information regarding the respective structures for the file data generated by both programs is preserved in a 20-byte file header. The Quill file header looks typically like the following, where the separated number indicated are CHR$ characters:

0 20 vrm1qdf0 0 0 11 131 1 214 0 38 0 88

A typical Archive header, this one from the Psion GAZET_dbf demo instruction file, consists of:

0 20 vrm1dbf0 0 0 40 231 3 206 0 38 0 208

where the first two bytes — characters — are the record control word (RCW), followed by an eight-byte file type identifier and then 10 bytes representing four control fields defining the relative positions and lengths of the subsequent sections of the file. As with the foregoing Quill file header the discrete numbers are character code numbers.

If you OPEN an Archive file you can browse or even order your records with little likelihood of anything going wrong. From the moment you modify any of your files in any way your database is at risk. Using any of the record editing commands causes Archive to modify the eight-byte file type identifier, so that it becomes:

CHR$(0)rm1dbf0

With the QL version of Archive, including the Thor *XChange*, none of the control fields is updated until the CLOSE command is issued and Archive will thereafter refuse to recognise the file as its own.

This means that when you try to open or look at file Archive will return an error message. Attempting to recover your file with the use of an editor will not usually repair this problem, nor will any of the media recovery systems mentioned.

If you try to edit the file in the format in which it is stored you may find that you can change the file identifier null character back to "v", write the file to your storage media and try to re-load it.

What can happen is that all will appear to be going well. If you then issue the DISPLAY command, Archive may even display your field names but the file will not appear and Archive will probably have crashed.

Once you have concluded that it is the structure of your file which is corrupted you have several courses open to you. Any attempt to recover your database requires that you have an intimate working knowledge of the structure of the database you are trying to recover. It is of considerable help if you also have a clear idea what you were doing when the file became corrupted.

Attempting to recover Archive files can be placed into one of two distinct categories. At the bottom of the recovery effort scale, if you have been entering numerical data or if you have not altered the length of any of the string fields, recovery may possibly be fairly simple — a few minutes' work.

At the top of the effort scale, however, if you have been using any Archive editing commands and have been modifying one or more string fields in one or more records, you could have several hours' work to attempt to recover your data.

Trying the easiest approach first — it should be emphasised that this method may work only if you have not altered the length of your string fields — from SuperBasic, make a working copy of your file by typing:

COPY *drive_oldname_dbt* TO *drive_newname_dbt*

Again from SuperBasic, type the following — either as separate lines or individual commands separated by a colon:

```
OPEN#4, drive_newname_dbf
PRINT#4, chr$(0);chr$(20);"vrm1dbf0";
CLOSE#4
```

It should be noted that the semi-colons are vital. What this process will do is to over-write the first 10 bytes of the altered file header and put it into a form Archive will recognise. After doing this, load Archive and OPEN the *newname* file. On the Archive command line, type:

```
DISPLAY : WHILE NOT (EOF) : NEXT :
SPRINT : END WHILE
```

If you have recovered access to your file successfully, Archive will display each record in majestic procession from beginning to end. If, on the other hand, Archive displays any random rubbish and/or crashes you have probably altered the length of one or more of the string fields and you now have a job ahead of you.

At that point you have one of three main options — forget the whole idea; or, if you need your database and it is not too much of a monumental task, you can re-build the entire thing from its humble beginnings. Alternatively, you have another option which has had a phenominally high

success rate in recovering busted Archive file, the PDQL Archive utility *Recover*.

The basic philosophy of this utility is to create a database file, in export format, based on data extracted selectively from a corrupted file, in usual Archive format, in which data and/or one or more of the control components may be corrupt.

Once you have recovered as much of your file as is possible — which, for a variety of reasons, may or may not include every single record — you can edit the export file further by loading it into the Digital Precision *The Editor*, after which it may then be loaded into Archive with the IMPORT command.

Observing the convention used in many PDQL utilities, the Recover operating procedure occurs as program and user dialogue. When the program is started, you can specify various options — input and output drives and filenames, whether or not you want file output displayed, confirmation of first fields, maximum string length and final confirmation of choices.

Recover scans and decodes the record data section of the corrupt file. As each new record is started, the program displays optionally the contents of the decoded field and asks for confirmation that the decoded field is acceptable.

Given confirmation, the program proceeds with the rest of the record which is displayed optionally as it is written to the output file. The process is repeated to the end of the file or until a quit option has been selected.

While examining a record tests are made to check for "reasonableness" of the data. If it encounters very long strings, their length may be an indication that the string controller is corrupt. If these tests fail, the program displays the decoded value and reports the error. You then have the option of accepting the field or invoking any of several corrective actions.

Some of the data collected by Recover may contain spurious characters which could cause problems for Archive. Such characters are converted to percent signs which can be edited out of the file later.

Numeric fields are decoded in the floating point format used in an Archive database, tending to work to 16 significant places. Because of this numeric output is a little slow and may include more significant places than Archive supports. The IMPORT function, however, will perform any necessary truncation and/or rounding off.

It should be emphasised that, in almost all cases, Recover is extremely simple to use. Although Recover will do most of the work for you, you will be prompted for information regarding what it has found in the jumble of your file and occasionally you will be asked what you would like to do with such data.

Database file corruption can usually be prevented by observing three basic precautions — use full-specification media, use a power filter or, preferably, an uninteruptable power supply and always close a file before proceeding to other things. Unless you are planning to enter or amend data, it is best to use look in preference to the OPEN command.

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DIY TOOLKIT

Each month Simon Goodwin adds new commands to the QL repertoire. This month's software simulates four highly-accurate stopwatches.

The QL has real-time clock. It can tell you the real time so long as the computer has not crashed and you bothered to set the current time when you started to use the machine. This month's DIY Toolkit implements four independent stopwatches, potentially 50 or 60 times more accurate than the system clock. You control the watches with five new commands and read the time with a SuperBasic function.

The inspiration behind the routines was from two *QL World* readers, Daniel Aronovitch of Belgium and Peter Lund of West Germany.

Aronovitch pointed out that the standard QL clock has a one-second resolution, which he finds insufficiently precise. You can measure things accurately with that clock but you may have to run them over and over again in a loop so that the total time adds to a substantial number of seconds.

Our new routines give accurate results faster because they are linked into the QL 'polled list' of small routines to be run regularly. The watches have a resolution of 1/50 second on a British-made QL.

The command T_ON enables all the stop watches. You start an individual watch with the command T_START. By default, this starts the first watch, number 1 — but you can control others independently by adding a watch number, like this:

T_START 3

At any point you can read the time so far with the T_COUNT function. PRINT T_COUNT, T_COUNT(3) gives the times for watch 1 and watch 3. All the watches can start, stop or re-start independently.

The results are positive numbers between 0 and two billion-odd. You get the unlikely value 2,147,483,647 if you try to read T_COUNT before using T_START. T_STOP stops a watch counting and T_RESTART allows it to continue, without re-setting it to zero as T_START would.

The commands work satisfactorily in multi-tasking compiled code. The clocks are global rather than local to each task. This arrangement allows communication between tasks. One task can start or stop a timer being read by another.

The time returned by T_COUNT is measured in 'frames', because the QL calls routines in the polled list every time a new display frame is sent to your TV or monitor. This gives an accuracy of 0.02 second in the U.K., where a PAL TV receives 50 frames per second.

QLs made for overseas markets may send 60 frames per second, to suit an American NTSC television. Listing three uses the new commands to measure the number of frames between one click of the DATE clock and the next; it should give 50 or 60, depending on the system frame rate.

In practice, you might get a result of 51 or 61 if you run the program under the

```
QL World DIY Toolkit May 1989 - LISTING 1, PAGE 1 of 2.

* QL WORLD DIY TOOLKIT - timing routines
* Ver. 0.5, Copyright 1989 Simon N Goodwin.
*
initialise lea.l    define,a1
           move.w   $110,a2          BP.INIT vector
           jmp      (a2)
*
turnon     lea.l    serve_flag,a0
           tst.w    (a0)             Already on?
           bne.s    job_done         If so, do nothing
           moveq    #28,d0           MT.LPOLL
           move.w   d0,(a0)+         Set flag
           lea.l    server,a2        Address of interrupt code
           move.l   a2,4(a0)         Put address in SERVE_PTR
           trap     #1               Link server to QDOS
           bra.s    job_done
*
turnoff    lea.l    serve_flag,a0
           tst.w    (a0)             Already off?
           beq.s    job_done
           clr.w    (a0)+            Clear flag
           moveq    #29,d0           MT.RPOLL - remove server
           trap     #1
           bra.s    job_done
*
start      bsr.s    check_par
           clr.l    (a4)             Count from zero
           bra.s    job_done
*
stop       bsr.s    check_par
           bset     #7,(a4)          Set sign bit of count
           bra.s    job_done
*
restart    bsr.s    check_par
           bclr     #7,(a4)          Clear sign of count
job_done   moveq    #0,d0
           rts
*
count      bsr.s    check_par
           move.l   (a4),d1
           bclr     #31,d1           Strip sign bit
*
* Convert D1.L into a floating point value (see December QLW)
*
return_fp  move.w   d1,d4            D4 will be exponent
           move.l   d1,d5            D5 will be mantissa
           beq.s    normalised       Zero is a trivial case
           move.w   #2079,d4         First guess at exponent
```

TIMER (TASK)

```
                add.l   d1,d1           Already normalised?
                bvs.s   normalised
                subq.w  #1,d4           No, halve exponent weight
                move.l  d1,d5           Double mantissa to match
                moveq   #16,d0          Try a 16 bit shift
*
normalise       move.l  d5,d1           Take copy of mantissa
                asl.l   d0,d1           Shift mantissa D0 places
                bvs.s   too_far         Overflow; must shift less
                sub.w   d0,d4           Correct exponent for shift
                move.l  d1,d5           New mantissa is more normal
too_far         asr.w   #1,d0           Halve shift distance
                bne.s   normalise       Try shift of 8, 4, 2 and 1
*
* Check there's enough space for the result: 6 bytes
*
normalised      moveq   #6,d1           No. of bytes needed
                move.w  $11A,a0         BV.CHRIX vector
                jsr     (a0)
                move.l  $58(a6),a1      Get safe A1 value
                subq.l  #6,a1
                move.l  a1,$58(a6)      Grab 6 more bytes safely
*
                move.l  d5,2(a1,a6.l)   Stack mantissa
                move.w  d4,0(a1,a6.l)   Stack exponent
                moveq   #2,d4           Floating point result
                bra.s   job_done
*
check_par       lea.l   clocks,a4       A4 -> first timer
                cmp.l   a3,a5
                beq.s   return          No parameters, A4 is set
                move.w  $112,a2         CA.GTINT vector
                jsr     (a2)
                bne.s   bad_return
                subq.w  #1,d3           Only one parameter wanted
                bne.s   bad_param
                move.w  0(a1,a6.l),d0   Fetch parameter
                addq.l  #2,$58(a6)      Tidy maths stack
                subq.w  #1,d0           Clock offsets start at 0
                bmi.s   bad_param       Reject anything negative
                cmp.w   #3,d0           Valid range is 1 to 4
                bhi.s   bad_param       Reject anything too big
                asl.w   #2,d0           *4 to index among clocks
                add.w   d0,a4           Implicit EXT.L
return          rts
*
bad_param       moveq   #-15,d0         Error code ERR.BP
bad_return      addq.l  #4,a7           Return to old caller
                rts
*
server          lea.l   clocks,a0       Scan all clocks
                moveq   #4-1,d0         DBRA clock count
loop            move.l  (a0)+,d1        Get current time
                bmi.s   next            Is clock running?
                addq.l  #1,d1           If so, tick
                move.l  d1,-4(a0)       Store new time
next            dbra    d0,loop         Do the next one
                rts
*
serve_flag      dc.w    0               Set if server is on
serve_link      dc.l    0               Points to server list
serve_ptr       dc.l    0               Points to server code
*
clocks          dc.l    -1,-1,-1,-1
*
define          dc.w    5               Five procedures
                dc.w    start-*
                dc.b    7,'T_START'
                dc.w    stop-*
                dc.b    6,'T_STOP'
                dc.w    restart-*
                dc.b    9,'T_RESTART'
                dc.w    turnon-*
                dc.b    4,'T_ON'
                dc.w    turnoff-*
                dc.b    5,'T_OFF'
                dc.w    0,1             One function
                dc.w    count-*
                dc.b    7,'T_COUNT'
                dc.w    0
*
                end
```

SuperBasic interpreter, as the QL may count one extra frame time while it is getting out of the loop and interpreting the T_STOP command.

The DATE clock has an advantage over the polled timers; it has its own counting hardware, so it never misses a count whatever the QL is doing. Polled routines use the processor and sometimes the QL is in such a time-critical routine that it cannot afford to execute the polled list.

The QL turns off interrupts temporarily when running the Microdrives and when reading or writing data on floppy disc. In both cases the processor must pick up every bit or byte in a given sector on the disc or cartridge. If it was interrupted partway through a sector it would have to wait a long time for the sector to come round again.

The Microdrive handler disables interrupts as soon as it starts looking at the tape and re-starts them once the required data has been read or written. It takes only microseconds to execute the polling code but sectors come round only every seven seconds, so it is vital not to miss one.

Discs turn at 300 rpm, so the maximum delay is only 200 milliseconds if a sector is interrupted and the device driver has to wait for it to come round again. This might be tolerable but unfortunately if the frame interrupt comes every 20 mS the disc is likely to be in the same place 10 interrupts later. If the disc is running at exactly the correct speed the QL might seek a sector forever, being interrupted at the same points on each turn of the disc.

Some old computers avoided this problem by deliberately tweaking the speed of the drive to keep the display and the disc out of sync but that messy solution creates problems if you use discs from other systems. The QL disables interrupts while it is reading or writing a sector. This is faster and more reliable but it means that one or two interrupts are missed for every 512 bytes accessed.

If exact timings are crucial, keep your data on RAM disc and save the results only when all the watches have stopped. The stopwatch routines are not much use for timing programs which depend on external hardware but such programs are unlikely to give consistent results in any case, as they will work at different speeds depending on physical factors like friction and the exact starting position of the disc or tape.

If you have something time-critical to do, you can turn off interrupts in your programs with these instructions:

```
Trap #0
ORI #$700,SR
```

The TRAP gets you into supervisor mode, as you are not allowed to disable interrupts in user mode, the default. The ORI sets the processor status register so that all but level 7 interrupts are ignored. Level 7 is top, used by CTRL-ALT-7, and cannot be disabled. The QL frame inter-

rupt uses level 2. Once the critical code has finished you should re-enable interrupts as soon as possible with: ANDI #$D8FF,SR.

The QL has two lists of interrupt-controlled routines, the 'polled list' and the 'scheduler list'. Both are executed if an interrupt occurs during 'user' code, like tasks and resident procedures. Routines in the scheduler list are not executed if the QL is processing 'supervisor' code, like device drivers. The routines in the scheduler list have a lower priority and run just before the QL considers swapping to another task.

You can put code into either list with TRAP #1 calls MT.LPOLL and MT.LSCHD. The command T_ON links the DIY Toolkit stopwatch code. The more you poll, the less time the QL has remaining to run real programs. It is important to remove code, with MT.RPOLL or MT.RSCHLD, if it is not needed. The command T_OFF disconnects the stopwatch, freezing any clocks running at the time until you re-start counting with T_ON.

Even if all four watches are running, in slow RAM the counting routine 'steals' less than six milliseconds of processing time in each second.

Other routines which use interrupts can be less friendly. QRAM and some disc interfaces add interrupt code, which slows programs measurably, but there is no command to turn off those routines once they are linked to Qdos.

You should use the scheduler list for complicated routines and keep the polled list for things you need to run regularly.

The system reads the keyboard with a polled list routine as it is important to get every keypress, even if the machine is busy — perhaps printing a long string of characters. By contrast, Qdos puts the routine to make the cursor blink in the scheduler list; it does not matter so much if the cursor misses a blink now and again while devices are busy.

The code of the new commands is presented in two forms. Listing two is a hex-loader, written originally by Marcus Jeffrey who compiled DIY Toolkit until the end of 1987. The first part is the same every month, and reads the latest machine code from DATA at the end of the listing.

When you RUN listing two it checks the data and prints a message if it spots a typing mistake. If all is well it asks you to specify the file and device where you want the code to be stored. You may re-load this file later and link it into Basic, so that you can use T_START, T_STOP, T_RESTART, T_ON, T_OFF and T_COUNT in your programs.

Use these commands to load and link the code file:

```
base=RESPR(316)
LBYTES "file name", base
CALL base
```

You may need to type NEW before using the commands if you have an AH or JM version of the QL.

```
QL World DIY TOOLKIT May 1989 - LISTING 2.

100 REMark Sinclair QL World HEX LOADER
110 REMark by Marcus Jeffery & Simon N Goodwin
120 :
150 CLS: RESTORE : READ space: start=RESPR(space)
160 PRINT "Loading Hex..." : HEX_LOAD start
170 INPUT "Save to file...";f$
180 SBYTES f$,start,byte : STOP
190 :
200 DEFine FuNction DECIMAL(x)
210 RETurn CODE(h$(x))-48-7*(h$(x)>"9")
220 END DEFine DECIMAL
230 :
240 DEFine PROCedure HEX_LOAD(start)
290 byte = 0 : checksum = 0
300 REPeat load_hex_digits
310    READ h$
320    IF h$="*" : EXIT load_hex_digits
330    IF LEN(h$) MOD 2
340       PRINT"Odd number of hex digits in: ";h$
350       STOP
360    END IF
370    FOR b = 1 TO LEN(h$) STEP 2
380       hb = DECIMAL(b) : lb = DECIMAL(b+1)
390       IF hb<0 OR hb>15 OR lb<0 OR lb>15
400          PRINT"Illegal hex digit
             in: ";h$ : STOP
420       END IF
430       POKE start+byte,16*hb+lb
440       checksum = checksum + 16*hb + lb
450       byte = byte + 1
460    END FOR b
470 END REPeat load_hex_digits
480 READ check
490 IF check <> checksum
500    PRINT"Checksum incorrect.
       Recheck data.":STOP
520 END IF
530 PRINT"Checksum correct, data
    entered at: ";start
560 END DEFine HEX_LOAD
570 :
580 REMark Space requirements for
    the machine code
590 DATA 316
600 :
610 REMark Machine code data
620 DATA "43FA00F834790000","01104ED241FA00D2"
630 DATA "4A506634701C30C0","45FA00B0214A0004"
640 DATA "4E41602441FA00BA","4A50671C4258701D"
650 DATA "4E41601461604294","600E615A08D40007"
660 DATA "6006615208940007","70004E7561482214"
670 DATA "0881001F38012A01","671C383C081FD281"
680 DATA "691453442A017010","2205E1A169049840"
690 DATA "2A01E24066F27206","30790000011A4E90"
700 DATA "226E00585D892D49","00582385E8023384"
710 DATA "E800780260B249FA","0052BBCB67243479"
720 DATA "000001124E92661E","5343661830 31E800"
730 DATA "54AE005853406B0C","B07C00036206E540"
740 DATA "D8C04E7570F1588F","4E7541FA001E7003"
750 DATA "22186B0652812141","FFFC51C8FFF44E75"
760 DATA "0000000000000000","0000FFFFFFFFFFFF"
770 DATA "FFFFFFFFFFFFFFFF","FFFF0005FF380754"
780 DATA "5F5354415254FF34","06545F53544F5000"
790 DATA "FF3209545F524553","54415254FEF00454"
800 DATA "5F4F4E00FF000554","5F4F464600000001"
810 DATA "FF1C07545F434F55","4E540000","*",27966
```

Listing one is the source text, assembled with HiSoft DevPac. The listing allows you to examine the code in detail and adapt it with your own assembler if you feel the urge. The code should be easy to read if you follow the comments. The calls to link and unlink the polling routine are straightforward, so long as you are careful not to link or unlink the code more than once.

T_START, T_STOP and T_RESTART share much the same code. They call CHECK_PAR to process the parameter, if any, and return with A4 pointing to the long word count used by a particular watch. The value has the top bit set, making it negative if the clock is stopped.

T_COUNT fetches the value, ignores the top bit and converts it into floating point form. The conversion routine RETURN_FP is almost identical to the one in the May and December, 1988 issues.

The server is only eight lines long. It loops through the watches, adding one to the count of each which is not pausing. All the watches pause eventually when the count exceeds 31 bits, so long as you leave your QL on for 70 weeks or so.

Interrupt code can use all registers except A6, which must point at the system variables. Beware of using system calls which might cause Qdos to enter the scheduler or the QL will probably get knotted.

As listed, the code allows for up to four independent stop watches. It is easy to increase the number. At CLOCKS, add one extra long word −1 for each new timer and change the maximum value in the CHECK_PAR and SERVER routines.

The new value should be one fewer than the number of watches. The watches are numbered from one when you issue commands, so that the default number is 1, but it is convenient for the computer to count from zero internally.

The names of commands and functions have been moved to the end this month to make it easier for you to patch them if they clash with variable names in your programs. All the address offsets are earlier in the file and you can extend the file freely, so long as you adjust the RESPR before loading.

Each watch uses a 32-bit accuracy, including one bit to indicate whether or not a watch is paused. It would be difficult to use any larger range as the QL can read or write only a maximum of 32 bits in one go. If we split the value there is a risk that an interrupt might change the count just after T_COUNT had read one part and before it read the next.

Under rare circumstances this could cause bizarre results — 31 bits is sufficient to time things which take well over a year to run. There cannot be that many QLs which run without crashing for a year at a time.

There should be more outpourings from my assembler in next month's *QL World*. As ever, I am interested to hear your suggestions, apart from EVAL, which would require a re-write of the SuperBasic interpreter. Please send details if you can think of a useful new SuperBasic command which is not already available commercially.

```
QL World DIY Toolkit May 1989 - LISTING 3.

100 REMark QL Timer routines - frame counter
110 REMark for QL World DIY Toolkit May 1989
120 T_ON : t=DATE
130 REPeat poll : IF DATE>t : EXIT poll
140 T_START : t=t+1
150 REPeat poll : IF DATE>t : EXIT poll
160 T_STOP
170 PRINT T_COUNT;" frames per second."
```


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THE EDITORS

Two new editors meet Ron Massey, a researcher with an impeccable reputation.

According to a survey covering common computer usage, word processing accounts for more than 55 percent of all home computer use. A subset of this survey included file editors, programs which support the entire range of character codes. Character editors are a genré of program which ranges from simple dedicated word processors to programs which provide facilities for loading and modifying any kind of file.

There are very few programs of any type which satisfy every requirement completely. Choosing which type of editor is best will depend on what you want to do with it. Word processors generally, and Quill in particular, are unsuitable for editing binary files. The Quill printable character range is limited to CHR$(32) to CHR$(191).

With limited success, Quill can be used to produce source code files for use with machine code compilers. If you edit source code or binary files on a regular basis you will need to have an ASCII editor capable of handling the entire QL character set.

The Metacomco *Ed* was one of the first editors available for the QL and was bundled with each of its language programs and, like most other editors, its use can be extended to other applications. Development of Ed ceased with version 1.17 and it still has two principal faults — it includes a number of bugs and is sluggish to use.

Designed orginally to overcome the inherent shortcoming of the Metacomco editor, the concept of the DP *The Editor* has expanded steadily to provide more features to its conceptually powerful system. At the top of the features list, The Editor is probably the most powerful editor devised for any computer. It is fast, programmable, most of its operating parameters can be configured for special applications and it has three main loading modes. A normal Read command will load most files but will truncate very long file lines automatically. The Read Unformatted command will read in any file, straight text or binary, and switch the editor into overstrike mode, ready for editor binary — such as machine code — files.

By typing-in the Read Document command or inputting the command MD, The Editor is put into word processing mode, complete with automatic position-definable page breaks. A separate utility is used to print document files into which you have added your own printer control codes.

The Editor has one principal disadvantage. Whether you have the standard version for unexpanded machines or the Special Edition, it is a very large program and both versions of the program require *Turbo* toolkit. Users with 128K machines are restricted to a maximum of around 40K files.

The other disadvantage of the size of The Editor is that, if you are programming and continually compiling, testing, crashing and re-loading a developing program with its attendant support application programs, re-setting and re-loading the QL is a regular occurence.

It was because of the various restrictions of other editors that the ARK *The Spy* was born. One of the principal features of The Spy is that is compactness made it ideal in a programming environment where you may be assembling, testing, crashing, re-loading, *ad infinitum*, during program development.

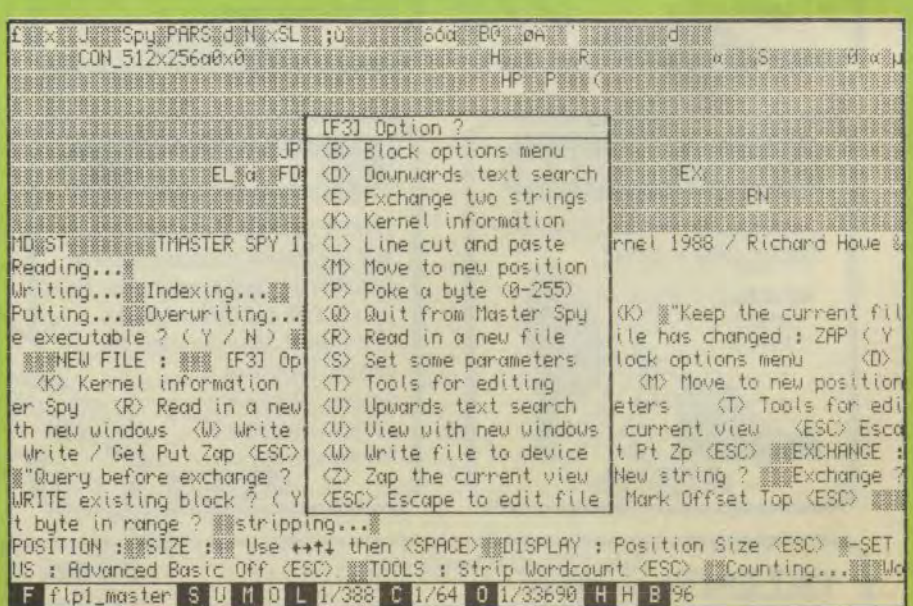
Information
Program: Master Spy
Supplier: Ark Distribution
Price: £29.95
Program: QD
Supplier: Jochen Merz Software
Price: £26.45

Compactness

The new ARK editor, *Master Spy*, like its predecessor, has four principal and exceptional advantages over all other QL editors — it is compact, very fast and it is a multi-file editor; it is not limited to loading one file per editor.

In all other editors, if you wish to have more than one document for editing you must exec two or more copies of the program. Not so with Master Spy. A powerful program feature, you can read and stack as many files as you have memory for.

The fourth advantage is that, as a stand-alone program, it requires no toolkit extensions or utilities. With a program



The Master Spy main command menu, accessed from F3.

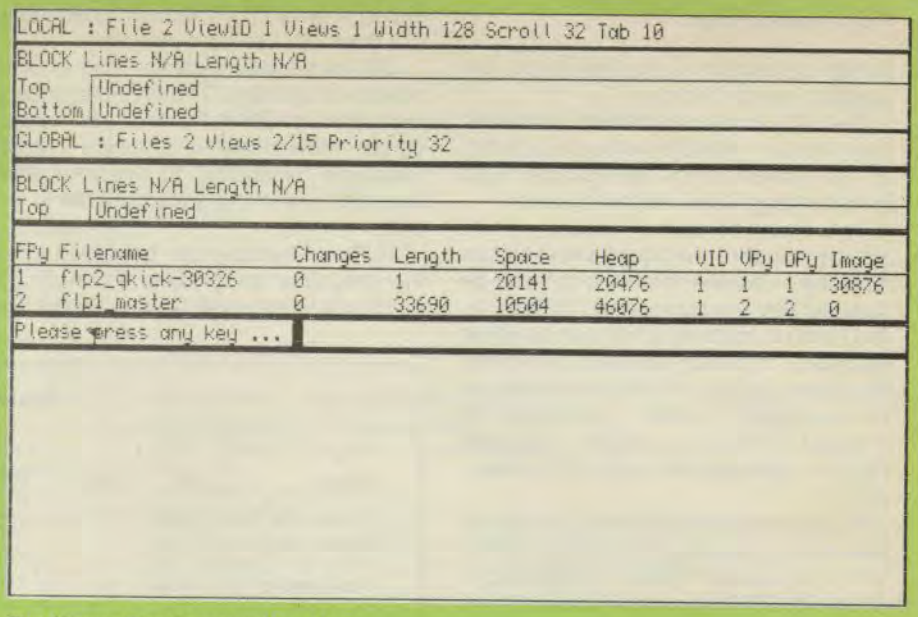
size around 32K, Master Spy can be multi-tasked alongside other programs such as assemblers or monitors, even in an unexpanded QL.

Improvements made to Master Spy now provide users with an extended range of commands and several other enhancements. Navigation can now be made by word, as well as character and line. Characters can be replaced as well as used in search parameters.

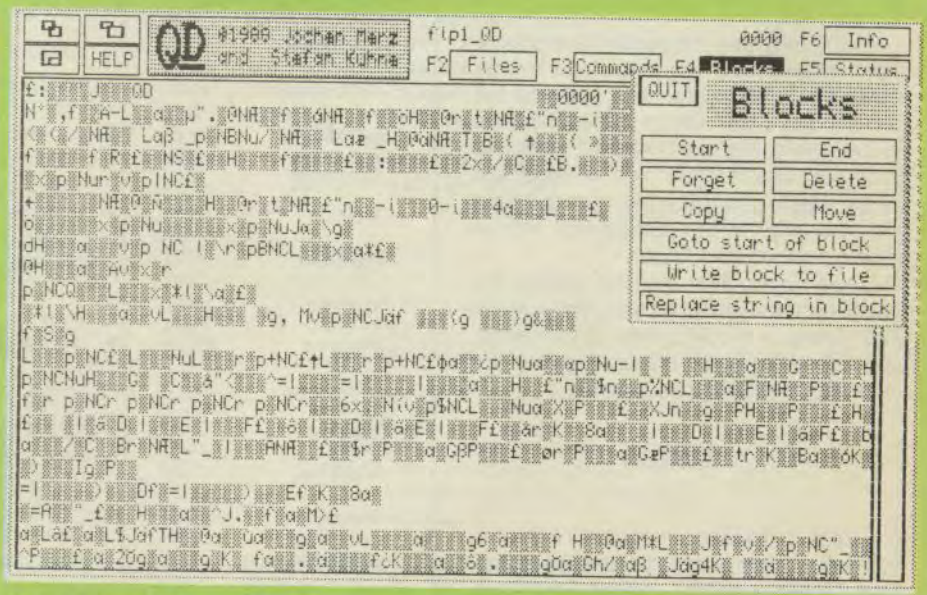
Sixty-nine program parameters, ranging from display parameters such as screen sizes and colours to keys used for command inputs, may be re-defined. Maximum line lengths may be defined in the range of 128 to 32,767 characters/bytes.

A separate parameter table is provided with the program manual listing the locations in the program file which need to be altered for each parameter. To configure Master Spy for your system and applications, read a working copy of the program file into itself and modify any parameters such as default drives you wish and write it back again.

Master Spy uses three console windows. Size, position, border, ink and paper colours for the main, error and Status screens may be re-set independently. Default cursor control parameters, such as tab intervals, may also be re-set. Several versions of the program may be configured for use in a multi-tasking environment and for different applications.



The Master Spy kernal information.



The QD block command range.

Offset

Initially, the Master Spy screen displays only the Status Command Line at the bottom of the screen and has three switchable modes of operation — off, include only basic information or provide advanced editing information. The basic Status line displays drive_filename, insert/overwrite mode, current line number/total file lines and current column number/total file columns.

Switching to Advance Status, you are provided additionally with information regarding Offset: current/total; byte value in the range of 0 to 255 (the chr$ code) and hard/soft hyphen. Both basic and advance Status windows display a capslock indicator.

Commands are invoked from the keyboard, immediate commands by either single or combination keypresses and secondary commands, after pressing <F3>.

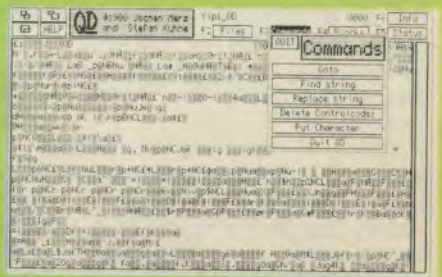
A powerful editing feature allows you to transfer blocks of lines globally between and locally within files. As supplied, the system is configured for 15 VIEWS but can be altered to any number required.

In common with most file editors, Master Spy does not include provision for printer output. If you require hard copy you can either write the entire file or a defined block to your printer port via ser or par. Any printer control codes will need to be added to the document file. Inserting printer control codes, such as font sizes, underline or bold, may be done manually or you can use either the Psientific Software *Keydefine* utility or the *Toolkit II* ALTKEY function for the purpose.

ARK will eventually be introducing a word processor version variant of its Spy editors. It is reported that it will be a type-now-format-later kind of WP and will also include multiple file processing.

New QL programs are gravitating towards either of two schools of thought-control systems which are conventionally menu-drive or programs which are keyboard/cursor/mouse-driven using the QJump Qptr pointer environment.

The editors discussed so far fall into the first category. A new editor from Germany, *QD*, is the first of what is likely to become one of a large range of products of the latter type. In common with the



The QD command menu.

Ultrasoft *Disk Manager*, QD is a full-feature program which can be operated from the keyboard, cursor keys and/or using the QJump Qimi mouse interface.

In common with many of the new QL products being developed in Germany, QD uses a screen format similar to the QJump *QRAM* system. To run QD, either QRAM or Qptr, both QJump utilities, must be loaded. For that reason, a sizeable

Continued on next page

From previous page

portion of memory is required to get the program up and running.

The QD screen is divided into three main areas — selector buttons at the top of the screen; scroll bar on the right screen margin; and the main screen.

Two types of control buttons, which may be mouse- or keyboard-selected, are provided — screen control, which can be selected with the cursor and <SPACE>, and function controls, which can be either keyboard- or cursor-selected. By moving the cursor to one of the screen buttons you can select CLOSE — equivalent to pressing CTRL C — MOVE, SIZE and HELP — also selected with <F1> selection.

Six program control buttons can also be selected by pressing <F2> to <SHIFT> <F1> to access FILES, COMMANDS, BLOCKS, STATUS and INFO respectively. Each button accesses its own menu, options from which have their own submenus.

FILES provides the usual file management options such as load, load a font, insert a text file, save, print and zap the current file. The range of commands include goto the start, end or specified document line number, find or replace a string, delete control codes, cursor-select any character at the current text screen cursor position and Quit.

Block commands include setting the usual start and end of a block, copy, move and delete a block, unset block marks, GOTO start of block, replace a string and write the marked block to a file.

Status

Status information includes TAB interval, left margin, default filename extension, insert/overwrite modes, confirmation requester on/off, back-up of file on/off switch and cursor flash frequency. Pressing ‹F6› or clicking on the button provides cursor information for line and column position and free memory. Configuring QD is done with the QJump *Config* routine.

Which of the many QL editors you choose will obviously depend on the type of job you want to do, the amount of money you wish to spend on a program and, for those using 128K machines, the amount of workspace you need to have available.

Each QL editor has its individual features to commend it. Both programs use separate user-editable help screens, accessed with <F1>. Lazy screens are sometimes used by programs to increase screen-handling speed by moving the area round the cursor position rather than the entire screen.

Master Spy uses two-way lazy screens; QD scrolls and pans in a conventional manner. Considerably slower than the ARK editor in both its screen handling and speed at which it will accept typed input, QD does not use lazy screens.

QD uses menu selection and is Qimi mouse-compatible. The only disconcerting feature of QD is that the main screen cursor moves like a graphics cursor, eventually "snapping" to character positions but everything sorts itself out in the end.

ALTkey functions can be added to all the programs using either the ALTKEY function available with QJump Toolkit II or the Psientific Keydefine. Toolkit II, supplied with most disc interfaces, is also available separately as either an add-on EPROM or solely as software. The software version is available as either a complete toolkit or as a configurable system from which you can select individual commands for your requirements.

The features table lists features native to each program, without the use of additional utilities of which there are many to choose.

			Metacomco	DP's std.	DP's spec		ARK's	ARK's
Feature	Quill	Text87	Ed	The Editor	The Editor	QD	The Spy	Master Spy
Program function								
Multi-tasking		x	x	x	x	x	x	x
System config				x	x	x	x	x
Drive management	x	x	x			x		
Program control								
‹F3› commands	x	x	x	x	x	x	x	x
Command input	Key	Key	Key	Cmd line	Cmd line	Key/Menu	Cmd line	Cmd line
Command file				x	x			
ALTKEY							x	x
Mouse (Qimi)						x		
File editing								
Primary app	WP	WP	Any	Any	Any	Any	Any	Any
Document files	x	x	x	x	x	x	x	x
Binary files			x	x	x	x	x	x
Multiple files							x	x
Find/replace	x	x	x	x	x	x		x
Global replace				x	x	x		
Undo			x	x	x	x		
Formatted output	x	x		x	x	x		
Screen display								
MODEs	4/8	4	4/8	4/8	4/8	4	4	4
Help	x		x	x	x	x	x	x
Special fonts	x	x		x	x			
Lazy screen				x	x	x	x	x
Windows								
Configurable			x	x	x	x	x	x
Movable			x	x	x	x	x	x
Multiple								x
Vital statistics								
Price	Free	£45	Free(1)	£29.95	£49.95	£26.45	£14.95	£29.95
Speed	Slow	Moderate	Slow	Fast	Fast	Mod fast	Very fast	Very fast
Approx size	51K	?	22K	61K	90K	24K(2)	23K	32K

(1) Supplied free with each Metacomco compilers.
(2) Uses QJump pointer environment; requires QRAM or QPTR.

MONITOR SAVE
by Klamer Schutte

This routine will prevent your monitor burning-in. When loaded, it will de-activate the monitor a specified time after the last keypress. Pressing any key will activate the screen again. In addition, pressing the combination CTRL ALT F5 will freeze the screen. Unlike the combination CTRL 5, this is not a toggle but a switch; pressing it again will not unfreeze the screen.

Before the routine can be used it should either be loaded with the supplied hex loader or the assembly should be typed-in and assembled. The use of the routine is very simple. Load the routine with address-respr(290) and lbytes <filename>, address, call it with the call address, and it will be working. The default time after which the screen will go black after the last keypress is 3,000 units, equal to 60 seconds.

Significant

You can change that time by using the routine Timeout. After the specified timeout, the screen will go black. When the next key is pressed the screen will again be activated and the routine starts counting again. When the time between successive keypresses is shorter than the timeout, the screen will stay active.

While the screen is de-activated, the next keypress will still be treated as significant by the system, i.e., it will not only re-activate the screen but will have any effect it would normally have. If the screen is de-activated and you are not sure what the next keypress will accomplish, use the combination CTRL ALT F5 to freeze the screen.

The Timeout command can be used in two ways — either without parameters, in which case it will de-activate the screen and link in the routine, or with one parameter. When this parameter is positive it will set the time after which the screen goes black to the parameter units and link in the routine. When the parameter is negative the screen will be activated and the routine will be linked out to save processor time.

Polled list

When first called the procedure is added to SuperBasic. Then the routine which does the work is added to the polled list. In this list it must be the last entry because otherwise when pressing CTRL ALT F5 the screen will freeze one-fiftieth of a second too late. This is the typical time for one line of printing or scrolling and it will destroy the screen layout with a command such as VIEW in TK2.

The normal system trap will link in the routine as the first entry, so that it cannot be used. In TK2 the same is done for its ALT KEY function. For this reason, a special kind of linking is used when the last link is in RAM, because TK2 does not allow another program to change the address of its link.

When the Basic procedure is called it will enter at the label. The things done by this routine are straightforward. The routine in the polled list starts as polled. When no key is pressed, the routine is fast — only 10 68000 machine instructions are executed. Detecting whether a key is pressed is done by testing the system variable SV.ARCNT at 163984. When this value changes a key is pressed. The thing is not done by the normal rules of good programming — the data part procs—Basic is partly used double to save memory.

àhal. ASOon/off

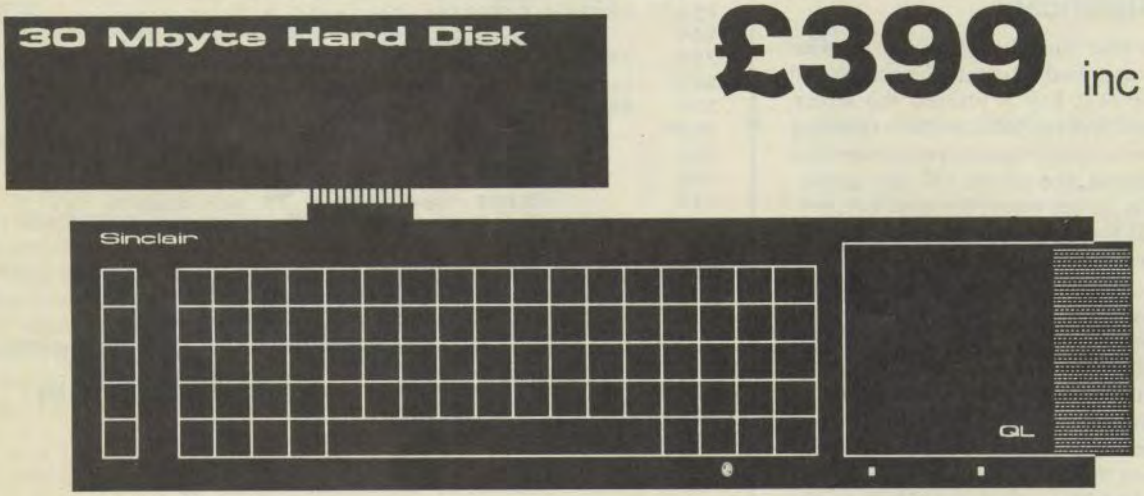
```
mdv1_TIMEOUT_BOOT 1988 Mar 20 15:34:10  Sun

100 REMark : Boot routine for 'TIMEOUT'
110 address=RESPR(290)
120 LBYTES mdv1_timeout_ext,address
130 CALL address
140 NEW
```

```
MDV1_TIMEOUT_BAS 1988 Mar 20 15:35:19  Sun

100 REMark Klamer Schutte
110 REMark ** Hex Loader **
120 REMark Copied from Sinclair QL World
130 CLS
140 RESTORE 590
150 READ Space
160 Start = RESPR( Space )
170 PRINT "Loading Hex...":Hex_Load Start
180 INPUT "Save to file ?",F$
190 SBYTES F$, Start, byte
200 STOP
230 DEFine PROCedure Hex_Load(Start)
250   DEFine FuNction Decimal( X )
260     RETurn CODE(H$(X))-48-7*(H$(X)>'9')
270   END DEFine Decimal
290   byte=0:Checksum=0
300   REPeat Load_Hex_Digits
310     READ H$
320     IF H$="*" THEN EXIT Load_Hex_Digits
330     IF LEN(H$)&&1 THEN
340       PRINT "Odd number of hex digits in: ";
H$
350       STOP
360     END IF
370     FOR b=1 TO LEN(H$) STEP 2
380       Hb=Decimal(b):lb=Decimal(b+1)
390       IF Hb<0 OR Hb>15 OR lb<0 OR lb>15 THEN

400         PRINT "illegal hex digit in: ";H$
410         STOP
420       END IF
430       POKE Start+byte,16*Hb+lb
440       Checksum=Checksum+16*Hb+lb
450       byte=byte+1
460     END FOR b
470   END REPeat Load_Hex_Digits
480   PRINT "Checksum is: ";Checksum
490   READ Check
500   IF Check<>Checksum THEN
510     PRINT "Checksum incorrect. Recheck data."
520     STOP
530   END IF
540   PRINT "Checksum is correct"\"Data entered at
: ",Start
560 END DEFine Hex_Load
590 DATA 290
610 DATA "3078011043FA0046","4E9043FA00C845FA"
620 DATA "00AE2549000C41F9","0002803C4E402010"
630 DATA "67062248204060F6","B1FC000200006E14"
640 DATA "256800040004228A","41EA000843FA000E"
650 DATA "228A606445EA0008","C54860F000010010"
660 DATA "0754494D454F5554","0000000000003078"
670 DATA "01184E904A806628","0C4300016E2041FA"
680 DATA "0062661E21769800","FFFC6C084A106706"
690 DATA "4210602E611258AE","00587000606A70F1"
700 DATA "4E75610460000082","4A10661450D041FA"
710 DATA "0026247AFFA84E40","209224880A7C2000"
720 DATA "4E75247AFF9841FA","000E249060C80000"
730 DATA "0000000000000000","0000000000000000"
740 DATA "0BB8FF0041FAFF84","303900028090B068"
750 DATA "FFFE660E20105280","2080B0A800746728"
760 DATA "4E753140FFFE4290","13F9000280340001"
770 DATA "80630C79F9FF0002","808A67024E7513FC"
780 DATA "00FF00028033 4E75","13FC00FF00018063"
790 DATA "4E75","*",23056
```

MIRACLE SYSTEMS

ACCESS VISA

QL HARD DISK



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- ☆ 3 metre cable
- ☆ All cabling included

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- ☆ 1200/75 e.g Prestel, T Gold
- ☆ Autodial
- ☆ 3 metre cable
- ☆ Plugs into SER2
- ☆ Viewdata software
- ☆ 80 column software
- ☆ Not BT approved!

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expires ☐☐/☐☐

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Address _____

_____

Ferret

Ferret is a new utility that hides in the background until needed. When you can't remember the filename of the doc or program that you were working on. You simply call up ferret and send it looking for the file by giving it a clue about the content.

If you wrote to Quanta then simply type 'Quanta' and tell Ferret where to look. It will fly through your disk or Mdv and read all the files, looking for a match. Any file that contains the search text is named and the the file contents around the match are shown to you if required.

The program searches only specified files, e.g. _doc or _bas and will either search the whole file for a match or will just the first 1-5K of it. This can be used by leaving notes in the header of a Basic program which can subsequently be searched for.

Ferret is designed to be quick and easy to use and will work on all QL's and memory sizes. It comes on 3.5" disk or Microdrive and is a must for anyone with an extensive disk or Mdv collection. During searching the filename is displayed together with the file size - you can see the program working. The next time you can't find a file don't waste time looking for it, just send your ferret after it.

Sector price £12

Printers

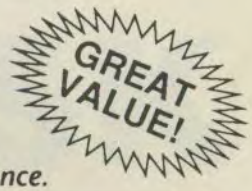
Star LC10 Colour

The new Star LC10 colour printer is an 8 column printer that works superbly with the QL.

The 8 colour ribbon only costs £6 to replace - less than the cost of black ribbons for some printers. The colour commands are easily implemented - simply type "((C))" followed by the colour number required. The LC10 colour has 6 NLQ fonts all of which give excellent output.

Sector price £274

Star LC2410



This 24 pin version of the LC10 gives excellent NLQ output for professional looking correspondence.

- 80 column carriage
- 170 cps draft
- IBM and Epson compatible
- 57 cps NLQ
- Centronics interface
- Tractor and friction

Sector price only £374

Sector Software

The best programs and peripherals for the QL

Phillips CM8833 Stereo Monitor

A dark screen monitor with composite video, RGB linear and RGB TTL inputs.

Plainly speaking it is a very good monitor that is well suited to the QL or any other computer. The monitor has a green screen button to convert from colour to green screen and back again at the press of a button. It can handle all 4096 colours available on the Amiga and has full stereo sound output through its two built in speakers. Not much use on the QL, but if you change computers this monitor will work just as well with your new one. The Phillips CM8833 is the same price as the Discontinued Microvitec QL monitor, but is much, much better.

~~RRP £300~~

Sector price £260

Star LC10

This is a mono version of the LC10 colour.

- 80 column
- Centronics interface
- tractor and friction feed
- Paper parking facility
- IBM and Epson compatible
- set fonts from front panel

Sector price £239

Brother M1109

A 9 pin print head, 80 column, 120 cps draft, 25 cps NLQ printer with many features for a very low price.

Has both Centronics and serial interfaces. It is an ideal budget priced printer, but with features found on much higher priced machines. This special price cannot be guaranteed beyond the end of March as a price rise is imminent.

- 80 column
- IBM & Epson FX80 mode
- Tractor and friction feed
- 25 cps NLQ
- 120 cps draft
- Roll paper option

Sector price £180

FlashBack Special Edition

NEW!

– for the expanded QL and CST Thor

After months of blood, sweat and tears, a massive effort by ace machine code programmer Peter Jefferies, technical system support by Dilwyn Jones and Chas Dillon, we are delighted to announce an entirely new version of Flash-Back, FlashBack Special Edition.

FlashBack Core System

By Peter Jefferies

Peter has re-written FlashBack introducing a host of improvements and extra features, only a few of which can be listed here due to constraints of space.

Now written entirely in re-entrant hand coded assembler. This means that you can now use multiple copies of Flashback SE at any one time and transfer details between files.

- Much slicker screen handling, faster scrolling etc.
- Separate Group and Order (Index) commands provided
- Successive record selection (Grouping) now supported
- Six options of file indexing now available: these include number handling (leading zeros optional)
- New powerful string match update from View screen
- Saving of selected subset of current file to disc/Mdv
- Two types of search and replace supported. One lightning fast, the other allowing on screen step-by-step consent
- New 'quit program' facility provided
- Edit line (Search, Group, Read etc.) greatly improved
- Ad-hoc record selection/rejection on subsequent Groupings
- Many quick-key presses for next, back, repeat search etc.
- Entirely compatible with existing Falshback files
- Compatible with Qram

New extended config program

By Peter Jefferies

Greater choice of turn on key and variations of record separator to printer.

- New extended import program
- extensively modified by Chas Dillon.
- More flexible when reading in Archive files, allows sub record definition at import and mistakes, restart option etc.

Report Generator

Planned by Chas Dillon Written by Dilwyn Jones

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THE QL IN DISQUISE

The QL has two new sets of clothes. Mike Lloyd rolls up his sleeves and checks them.

Computer programs rarely communicate directly with the computers on which they run. They are more usually designed to work in an environment provided by an operating system. Operating systems are programs which perform the mundane but essential chores such as screen handling, communication with devices such as disc drives, the performance of simple arithmetic, the allocation of memory, the provision and supervision of the screen cursor and so on.

By accessing the computer power indirectly through an operating system, software designers can be reasonably sure that future developments in the computer will not entail a complete re-write of their programs. Additionally, a program written under a particular operating system should run on any make of computer which supports that operating system, although this is often more true in theory than in practice.

The Sinclair QL has a very powerful and highly-respected operating system called Qdos which is technically superior to MS-DOS in most areas, with the possible exception of its lack of a true hierarchical file structure, a consequence of the decision to shun discs in favour of Microdrives. Perhaps the greatest strength of Qdos is its support of multi-tasking, the ability to run more than one program independently and simultaneously.

The Qdos operating system is provided in ROM which makes it available as soon as the QL is switched on. The IBM PC and its clones have very few ROM-based facilities — just sufficient to control low-level communications and to be able to load a full operating system from a disc. After the system disc contents have been installed in RAM other programs can be loaded and run. The PC operating system was purchased from Microsoft, hence MS-DOS.

There is something of the Russian doll to all of this. It would seem to be possible to have an Atari 520 ST, which normally uses the proprietary Atari TOS operating system, running a QL emulator which includes Qdos and SuperBasic under which runs a PC emulator to provide the BIOS and MS-DOS facilities to support a Pascal compiler running an actual program.

It is one thing to write a program which emulates Qdos on an Atari, for the two computers have central processing units from the same family of chips, the Motorola M68000 series. What makes the provision of a PC emulator on either of those computers so special is that MS-DOS is written in machine code understood by a different family of chips, the Intel 8086 series.

No comparison

CPU instructions can be represented as numbers. It is as electronic representations of binary numbers that the CPU receives them. Humans tend to call them by convenient mnemonics, such as NOP for "no operation." For the Motorola M68000 the value 20081 means "no operation": for the Intel 8086, however, the equivalent number is 144. This is an example of a straightforward transfer of one instruction value for another which unfortunately happens very rarely.

Many important 8086 instructions have no direct comparison in M68000 code and so their actions must be broken into a number of steps, each of which can be represented by a single M68000 command. This is exactly equivalent to a fluent translation from one human language to another; there is rarely a simple word-for-word substitution which makes sense.

As the need for a translator slows a human conversation, it is only to be expected that the computing equivalent has an adverse effect on the speed of the programs being run in the alien environment. Whether this is acceptable or not depends on the programs being run and the needs of the user. Arcade games suffer appreciably from any loss of momentum but business applications, graphics packages and the more leisurely games such as chess and adventures can all be acceptable in their slowed-down state.

It is important to remember that both emulators reviewed emulate 8086 code and not MS-DOS. To use them, a copy of MS-DOS must be obtained from the suppliers, from Microsoft or by using a copy which you already own. Borrowing a system disc to copy it is theft.

DIGITAL PRECISION THE SOLUTION

Steve Sutton, chief architect of the enormously successful *Lightning* utility, has not been idle since the release of his masterpiece. He has now completed work on an emulation program which mimics the operating environment of the IBM PC closely.

The *Solution*, the rather grandly-named Intel 8088 emulation program, is provided in two flavours — without MS-DOS it is described as Vanilla but it becomes Chocolate when sold in company with the latest MS-DOS release, Version 4.01. Whatever the flavour, the Solution remains the same. It requires a recommended minimum of 512K RAM expansion and at least a single disc to function on a QL.

The QL-format disc on which it is provided contains a 75K highly-linearised machine code program, a keyboard mapping file and a configuration utility. Needless to say, the Solution is accompanied by comprehensive documentation in the usual Digital Precision house style.

Purchasers of the chocolate Solution will also receive Microsoft documentation for MS-DOS and its master discs. Digital Precision has provided an additional copy of MS-DOS pre-configured for the QL so that users without deep knowledge of the operating system can have PC programs running within minutes of receiving the package. The company offers its usual post-sales support to Solution purchasers.

The first thing I noted about the Solution was how effortless it was. Re-set the computer, insert the Solution disc, wait a few seconds while it loads, follow its instructions to insert the system disc and after little more than a minute the QL screen is over-written by a neatly-bordered PC-compatible window.

The text was displayed using an authentic IBM font and the cursor was the PC flashing underline rather than the QL red block. To receive keyboard input the QL cursor must remain active and so it is parked unobtrusively at the top left of the screen.

All the system level MS-DOS commands worked normally but at very slow speed, around 10 percent of the rate of an IBM XT. Great pains have been taken to make the program as rapid as possible but the notorious bottlenecks of the M68008 restricted Sutton's room for manoeuvre.

On the faster Thor 16, which uses the more powerful M68000 chip, the Solution will be much faster. Comparisons with the similar PC-ditto emulator for the Atari 520 ST, which incidentally occupies a generous 220K of RAM space, suggests that the Thor 16/Solution combination is at least the equal of the Atari ST with PC-ditto.

The Solution provides a PC screen emulator running as a separate task in addition to the BIOS screen handler. That ensures programs which bypass BIOS to update the screen will still work. As a consequence, text printing was spasmodic, with the screen being updated up to half a second behind keyboard input. Very fast touch-typists will find this annoying but the average typist who needs to look at the keyboard will perhaps never notice this quirk.

No hesitation

The Solution ran industry-standard programs such as *Lotus 1-2-3, dBase III, SuperCalc* and *Symphony* without hesitation. Given the acid test of running *Flight Simulator* the Solution was again successful but the slow execution of the code made the program unrewarding to play. Other graphics-based games were the same.

Having become used to a much slower pace under the control of Solution, I was surprised by the relative turn of speed demonstrated by programs compiled with Borland Turbo Pascal. Other compiled languages from the same stable will, I imagine, show similar pace. It is a fine compliment to the thoroughness of Sutton's programming that the low-level code produced by compilers works as reliably with Solution as it would on native PCs.

There are programs which run imperfectly with the Solution. This is only to be expected when there are MS-DOS programs which will not run on dedicated PC clones. Some software writers increase execution speed by making direct hardware calls rather than going through the operating system and on the QL their programs naturally are disappointed by the absence of the expected hardware.

Some software must run with interrupts enabled, while others are executed faster with interrupts disabled. Programs which use high-density screen graphics cannot possibly work on a QL because the basic limitations of 512x256 pixels and a maximum of eight colours are hardware-related and remain even under MS-DOS.

A useful help window is available constantly while the Solution is running, accessed by pressing CTRL, SHIFT and ALT simultaneously. MS-DOS programs can be suspended and resumed, interrupts can be enabled and disabled, disc track specifications can be specified, and so on. For obvious reasons the amount of memory allocated to the Solution cannot be changed while MS-DOS is running but the option is given to alter the program memory requirement before booting the system disc.

The Solution is fully multi-tasking and exists as an independent job. QRAM existed peaceably alongside the emulation program and it was possible to return temporarily or permanently to SuperBasic and use the QL as if the Solution was not there, provided that it was left via the help window.

MS-DOS always claims at least one floppy disc for itself, thus rendering it unavailable to Qdos. Users will find themselves developing two software libraries, one for Qdos and one for MS-DOS format discs.

The Solution is a remarkably competent utility but its slow execution rate limits its effectiveness. In that respect it is no different from PC-ditto, as both have the same problems to solve. Users hoping to tap into the wide range of MS-DOS games will be equally disappointed by PC-ditto and the Solution and business users intending to use the QL as their only MS-DOS machine are being unrealistic.

The people who will find the Solution most useful are those who perhaps use MS-DOS in an office and wish to work on files at home using familiar packages. Others who would find the Solution worthwhile are newcomers to MS-DOS who wish to learn more about the operating system before using PCs at work; people who do not have the time at the office to play adventure games; and programmers who want to continue developing Pascal or C programs at home. Businesses with Thor 16s will find that the Solution will run faster on their machines.

ANT COMPUTING EMULATOR

There are many routes by which software and hardware packages arrive for review by *Sinclair QL World*. The most obvious one is that manufacturers, anxious for publicity and proud of their products, forward a copy for review. More timid sources might advertise their products first and then contact the magazine. Occasionally, readers will write requesting that a particular program is given space on the review page. Occasionally, but distressingly, readers contact us because they wish to warn others about a faulty product before they, too, are persuaded to part with hard-earned money.

Sadly, the ANT Emulator falls into this last and most unwelcome category. Previously unknown ANT Computing began advertising its Emulator, which seeks to reproduce the computing environment of IBM PCs on the QL, in the December issue of *Sinclair QL World*. A reader who responded to that advertisement states that he had his cheque cashed promptly but waited several weeks for the product to arrive. Disappointment turned to disbelief when it became obvious that the program was in a clearly unfinished state and was not capable of running any of the popular MS-DOS programs mentioned.

The meagre documentation, described as a beginners' guide to MS-DOS, comprised a five-page Quill file, one page of which was devoted to the message "It is not too difficult to crash the Emulator," an observation with which I must agree.

Attempts to contact ANT Computing and request Version 2 of the program, which was advertised in the February issue, met with no success. ANT Computing is not listed in the common business directories, does not supply a telephone

number, does not seem to be registered for VAT and does not allow credit card purchases.

The Emulator was tested with the help of MS-DOS expert Tony Abbey. A QL fitted with Trump Card would not run the Emulator until a RAM disc had been created to reduce the free memory to below 640K. Once that had been done, the Emulator loaded quickly and asked intelligent questions about the discs attached to the QL before requesting a system disc.

This is an IBM format disc which contains either the MS-DOS or PC-DOS operating system essential for any program to run. Version 3.3 of MS-DOS loaded in less than two minutes and the familiar A> drive prompt was displayed, followed by what MS-DOS users would consider to be the rather unfamiliar flashing block cursor used by Qdos.

Many system-level commands appeared to work, including disc formatting and directory listing. The acid test, however, is the ability to convince MS-DOS programs they are running on a PC rather than a QL. Attempts to load programs running under CGA — the IBM low-resolution colour graphics mode — proved fruitless and it is assumed that CGA is not yet supported by the Emulator. The majority of programs configured for the text-only monochrome MDA mode loaded but all, without exception, exhibited such unusual behaviour that they were impossible to use.

Programs such a *Lotus 1-2-3, Symphony, WordPerfect, SuperCalc* and Turbo Pascal crashed very quickly. GWBasic loaded with a corrupted display and failed to acknowledge anything typed on the screen. Its inverse video menu was printed in normal text colours, followed by the QL chequerboard character which presumably represented the control codes.

As the keyboards of the PC and the QL are so different, these programs need a comprehensive re-mapping of the keyboard for their menus to work but the Emulator documentation gives no clue how this has been done, if at all. We could find neither the "home" key, which returns the cursor to the top left corner of the screen, nor the "print screen" key which dumps the current screen contents to the printer.

Turning from the sophisticated end of the PC software market, a public domain word processor called "pco" was loaded. Its garbled title screen was displayed and re-displayed in an endless loop until the QL was re-set. The only program which we could run with any confidence was an IBM assembler.

Trying to take a screen dump using QRAM, it was discovered that the task-switching combination on CTRL-C was disabled by the Emulator. The Emulator cannot multi-task and wreaks havoc with the Qdos system tables so that SuperBasic inevitably crashes if it is used immediately after an Emulator session, even if the Emulator has been removed from RAM using the RJOB toolkit command.

My impression of the Emulator is that it is an ambitious attempt to reach a very difficult goal which eludes it. It is rushed, unfinished, bug-ridden, incomplete and poorly-documented. Its development has probably fallen foul of the 80-20 rules—80 percent of development time is taken by the final 20 percent of the program. That is no excuse for marketing and distributing the program in its present condition.

The version of the Emulator we have examined is unusable in any meaningful way and does not begin to match the specification printed in the ANT Computing advertisements, which more properly describe the programmer's intensions rather than his achievements.

Perhaps Version 2 will be better and we will report on it when it is released and give due praise if it works.

● *QL World current information is that V.1 of the ANT Emulator has been withdrawn from the market.*

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TECHNICAL HELPLINE

Paul Walton looks through windows, explores dumps, checks his traps and powers down the easy way.

Windows

I cannot discover how to have INPUT purely window-orientated. e.g.: INPUT #5;"Key in data ";data$ is rejected when run, writes B J Hammett of Swansea.

Your example is rejected because of the use of the SuperBasic word DATA. Input on the QL is window-orientated so long as you have opened the channels to which your windows relate. These lines show the effect of windows on input:

```
10 OPEN #5 , con_50x50a100x100_32
20 AT #5 , 10 , 10
30 INPUT #5 ; "Input #5 is always here :" ; ip5$
40 INPUT #0 ; "Input #0 is now here :" ; ip0$
50 GOTO 20 : REMark etc.
```

TRAPped

From West Germany, C Lensing asks: When calling trap #1 with 2 in D0, the base address of the job is returned in A0. At what offset is the name and length of the job returned?

The job name will be at 10(A0) after the TRAP #1 call. The length of the job can be found by calling TRAP #1 again. This will return information of the net job, including its base address in A0. Subtracting if from the previous value in A0 will give the length of the first job.

Everything

A collection of questions from a new QL user, P Tang of Manchester. What are TurboQuill, JS ROM, JM ROM, toolkits, the connector next to the RESET button and how can I obtain signal timing diagrams?

TurboQuill reconfigures Quill to improve the cursor and screen-handling speeds significantly.

The versions of SuperBasic are, from oldest to latest, FB, PM, AH, JM, JS and MG. All contain bugs but are steady improvements.

Toolkits are software routines which can be loaded into memory and are then available as extra SuperBasic commands. Typically they give you more powerful file-handling routines, multi-tasking facilities and printer driver features.

The connector next to the RESET button is for connecting extra Microdrives.

Signal timing and all technical information for the QL can be found in the QL Service manual advertised by a variety of suppliers in *QL World* for about £20.

Citizen

D M Peberdy of Droitwich wants to dump screens to a Citizen 120D printer. He asks: Is there anywhere I can get a listing of a suitable machine code screen dump routine without having to buy a graphics/drawing program?

A machine code routine for screen dumping will be no faster than one written in SuperBasic because the printer is the slowest element in the whole process. Figure one is a SuperBasic procedure to dump areas of the QL screen to a Citizen 120D or any Epson-compatible printer. The procedure is called with a program line such as:

1000 dump 10, 0, 100, 250

which will dump the screen from row 10, column 0 to row 100, column 250 where a full screen is 0, 0, 255, 511.

Figure 1

```
100 DEFine PROCedure dump(fr,fc,lastr,lastc)
110 LOCal base,addr,pc,n1,n2,i,j
120  OPEN #5,ser1
130  PRINT#5,CHR$(27);"A";CHR$(8);
140  base=131072+fr*128+(fc DIV 4)
150  pc=lastr-fr+1
160  n1=(2*pc) MOD 256
170  n2=(2*pc) DIV 256
180  FOR i=(fc DIV 4) TO (lastc DIV 4) STEP 2
190    addr=base+i+128*pc
200    PRINT #5,CHR$(27);"*";
210    PRINT #5,CHR$(5);CHR$(n1);CHR$(n2);
220    FOR j=pc TO 1 STEP -1
230      addr=addr-128
240      PRINT#5,CHR$(255-PEEK(addr));
250      PRINT#5,CHR$(255-PEEK(addr+1));
260    END FOR j
270    PRINT #5
280  END FOR i
290  CLOSE #5
300 END DEFine dump
```

Power

P A Jones in Kuwait is "fed up with scrambling under my desk to reach the plug socket to switch off the QL." Is it possible to insert a switch between the power pack and the QL?

You can fit a switch but as a simpler alternative why not pull out the power connector from the back of the QL? Remember to remove Microdrive cartridges and/or discs beforehand.

TECHNICAL HELPLINE

Brother

A M Maher in Somerset is having difficulty with his Brother HR5 printer. The left-hand margin starts to slip during printing text while the graphics output from Easel is totally unsuitable.

When a printer fails to maintain a straight left-hand margin it is unlikely to be a fault in the setting-up. Also if the horizontal width of, or gaps between, letters is inconsistent, this further suggest that the mechanism which drives the printhead is faulty. The easiest way to check this is to put the printer on self-test. To do this with the Brother HR5 the sequence is:

1. Turn on power.
2. Load paper.
3. Turn off power.
4. While holding down the (ON LINE) key, turn on the power again.

The printer will then print its character set until it runs out of paper. If the margin is still uneven the printer is confirmed as being faulty.

The problem with the graphics output from Easel is probably due to using an incorrect printer driver routine. The Brother uses standard Epson graphics commands, so use that driver in Easel.

Annoying

D Simon from the Isle of Wight writes describing an apparent bug in Quill. When I am holding a def_tmp on mdv2_ and trying to reformat on mdv1_, Quill forgets the current document name. Is anything to be done?

This letter is typical of many which relate to quirks in software where the problem is more annoying than catastrophic. The def_tmp file referred to occurs when the size of a document forces Quill to hold only part of it in memory. Quill cannot over-write the original version until the edit session ends and so it must keep the current state of the complete edited version on Microdrive or disc. If you save the new version, it replaces the original and the def_tmp file is deleted automatically, so you may never notice it.

If, in the middle of an editing session, you ask Quill to format a cartridge, then Quill closes any def_tmp file and loses the name of the current document. This happens whether or not a def_tmp file is in use and illustrates two important points about the use of word processors.

First, when a bug becomes old and respected it is called a feature. Second, people who use word processors in earnest respect the foibles, back-up their work at regular intervals and do not tempt fate by reformatting a cartridge in the middle of a session.

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SUPER BASIC

In the second part of the Superbasic Calculator project Mike Lloyd presents a long module with speed as its purpose.

The second stage in *QL-Calculator* development permits input to be placed on the screen area created by the listings published last month. The complexity of the logic governing the input of the relatively small set of characters used by a calculator is surprising and explains why this month's listings are dominated by the largest-ever SuperBasic module definition to be published.

Good programming style centres on dividing programs into small, easily-understood portions, what the educationalist Seymour Papert calls "mind-sized pieces." This programming strategy has been emphasised repeatedly throughout the SuperBasic articles. Why, then, does listing 2.1 extend to almost 50 lines? First, despite its length, it does not flout Papert's rule. It is a coherent module with a single purpose which can readily be encompassed by the average mind; it verifies data input. Second, programs are divided not only by user definitions but also by lesser structures. Listing 2.1 is subdivided by the SELect structure into smaller pieces which were designed, written and tested independently.

Simpler than logic

There are also practical matters to consider. The verification of input, character by character, must be very rapid if data is to be entered at anything like an acceptable speed. If *Main_Loop* had called a series of subordinate procedures each call would have resulted in an appreciable delay which would have made the program unwieldly. Finally, if it is any consolation, the code is much simpler than the logic which underlies it, as figure one demonstrates.

The design of listing 2.1 reflects strongly the underlying assumptions about arithmetic which arose from the original analysis for the calculator program. It is essential to have a precise working definition of what is meant by a "number". Everybody knows what a number is, except a computer, which needs to be taught. It is a salutory reminder of the enormous gulf between human and machine intelligence to consider the differences between explaining the concept of a number to a child and to a QL.

To a child a number is a way of describing quantity using numerals. To a computer, unable to understand the abstract concept of quantity, a number is a set of symbols which conform to certain rules. The computer wants to know where a number starts and stops and what may appear within it. The rules expressed or implied in listing 2.1 are that a number must include at least one valid digit; a number is assumed to be positive unless it is preceded by a unary minus to show negation; a real number may include a single decimal point; an integer may not include a decimal point; numbers are bounded by operators or equals signs.

The listing comprises a REPeat loop which is negotiated once for each key-press. At the beginning of each loop the *Overflow* flag is set to zero and the input line of the display is updated by over-printing. What happens after a keypress depends on which category the SELect structure places it in. Most of the actions will be clear from figure one. The important variables are the *Num$* string, which holds the number currently being entered: *Key*, which represents the latest character to be entered; and *Op*, representing the last operator to be entered. In this context the operators include the equals sign. Both *Key* and *Op* represent characters according to their position in the Valid$ string.

```
Listing 2.1

2100 DEFine PROCedure Main_Loop
2102 LOCal Loop, Key, Overflow, Quit
2104 REPeat Loop
2106   Overflow = 0: Show_Line
2108   Key = Fetchkey (Valid$)
2110   SELect ON Key
2112   = 0 TO 15                    :REMark       Numerals
2114     IF Num$(3) INSTR ' -' AND op <> 26
2116       Num$ = Num$(2 TO) & Valid$(Key +1)
2118     ELSE
2120       Warning
2122     END IF
2124   = 16                         :REMark Decimal point
2126     IF "." INSTR Num$ OR IntOnly OR op = 26
2128       Warning
2130     ELSE
2132       Num$ = Num$(2 TO) & "."
2134     END IF
2136   = 19                         :REMark     Minus sign
2138     IF Num$ = B$
2140       Num$(10) = '-'
2142     ELSE
2144       IF Num$(10) = '-'
2146         Num$ = B$: op = 20
2148       ELSE
2150         Summate
2152       END IF
2154     END IF
2156   = 20 TO 24                   :REMark      Operators
2158     IF Num$(10) INSTR " -"
2160       Num$ = B$: op = Key + 1
2162     ELSE
2164       Summate
2166     END IF
2168   = 26                         :REMark         Equals
2170     IF Num$ = B$
2172       IF op = 18: PrtOut B$
2174     ELSE
2176       Summate
2178     END IF
2180   = 27                         :REMark         Delete
2182     Num$ = " " & Num$(1 TO 9)
2184   = 28 TO 33                   :REMark Esc, F1 to F5
2186     Menu_Manager (Key -28)
2188     IF Quit: EXIT Loop
2190   END SELect
2192 END REPeat Loop
2194 END DEFine Main_Loop
```

```
Listing 2.2

2200 DEFine FuNction  Fetchkey      (Text$)
2205 LOCal Key, Loop, Posn
2210 REPeat Loop
2215   Key = CODE (INKEY$ (-1))
2220   SELect ON Key
2225     = 97 TO 102: Key = Key -32
2230     = 63, 88:    Key = Key +32
2235   END SELect
2240   FOR Posn = 1 TO LEN (Text$)
2245     IF Key = CODE (Text$ (Posn)):
                EXIT Loop
2250   END FOR Posn
2255   Warning
2260 END REPeat Loop
2265 SELect ON Posn = 22, 24, 26: RETurn Posn
2270 RETurn Posn -1
2275 END DEFine Fetchkey
Listing 2.3

2300 DEFine PROCedure Change_Keys
2305 SELect ON In_Val
2310 REMark Decimal Digits
2315 = 1: Valid$(3 TO 16) = "2345678??????"
2320 REMark Hex Digits
2325 = 2: Valid$(3 TO 16) = "23456789ABCDEF"
2330 REMark Binary Digits
2335 = 3: Valid$(3 TO 16) = FILL$("?", 14)
2340 REMark Octal Digits
2345 = 4: Valid$(3 TO 16) ="234567" &
         FILL$("?",8)
2350 END SELect
2355 END DEFine Change_Keys
```

```
Listing 2.4

2400 DEFine PROCedure Menu_Manager (Choice)
2405 LOCal x, Fkey$(6)
2410 Fkey$ = "": Quit = 0
2415 FOR x = 27, 232 TO 248 STEP 4
2420   Fkey$ = Fkey$ & CHR$(x)
2425 END FOR x
2430 SELect ON Choice
2435   = 0: Quit = Quit_Menu
2440   = 1: IF Num$ <> B$: Store_Menu
2445   = 2: IF Num$ =  B$: Fetch_Menu
2450   = 3: IF Num$ =  B$: Constant_Menu
2455   = 4: IF Num$ =  B$: Set_Menu:
            Change_Keys
2460   = 5: IF op   <> 26: Num$ = B$
2465 END SELect
2470 Main_Menu
2475 END DEFine Menu_Manager


Listing 2.5

2500 DEFine PROCedure Show_Line
2505 Hue 7: AT 8, 0: PRINT Num$(1 TO 10);
2510 Hue 4: PRINT BaseTag$(In_Val)
            ! Valid$(op)
2515 END DEFine Show_Line


Listing 2.6

2600 DEFine PROCedure Warning
2605 BEEP 4000, 50, 80, 500, 80
2610 END DEFine Warning
```

The most complicated code concerns the treatment of the equals sign and the operators, a task shared between *Main-_Loop* and a procedure called *Summate*. Summate updates the running total and controls output; it will be published next month. If an operator is entered accidentally it can be over-written by any of the other operators.

Complications set in with the minus sign because it has two roles, subtraction and negation. The program needs to make intelligent decisions about what the minus means based on the circumstances. Most hand-held calculators refuse to acknowledge unary minus and therefore think that five times minus three is two.

Complication

The QL-Calculator copes by following these rules. If there is a number on the input line the minus must mean subtraction; if the input line is empty the minus is assumed initially to mean negation and is placed in the input area; if the user meant the minus to be an operator, pressing the minus key again removes the unary minus and inserts the subtraction operator; if the user wants to subtract a negative number, pressing the minus key again produces a unary minus on the input line — in this way it is possible to subtract negative numbers; if the unary minus is a mistake, another press on the minus key removes it.

The only other complication involves the equals key, which can have one of four effects. Its most obvious purpose is to signal that a total is required. At this stage

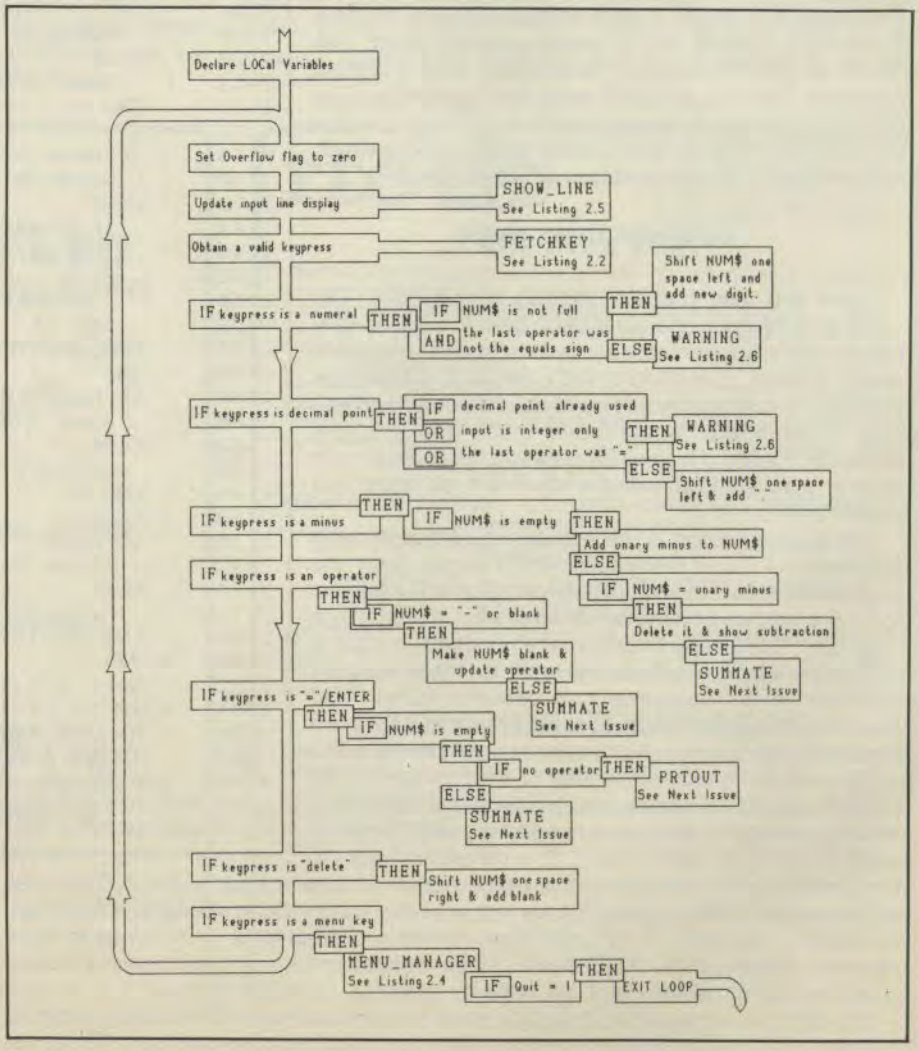

Figure 1.

the output is regarded as a subtotal and calculations may continue. A second press of the equals key converts the subtotal into the final total, underlines it and re-sets the relevant variables ready for the next sum.

The third use of the equals key arises from the ability of QL-Calculator to convert between different bases. It may be that the user wishes to use this facility without involving any calculations. In this instance it is necessary to enter only, say, a hex number and press the equals key to see its decimal equivalent. The final use of the equals key is to scroll the display between calculations. This is specially useful when the printer is echoing the output.

Fetchkey

Listing 2.1 assumes that all input is valid. The job of ensuring that this is so is undertaken by the Fetchkey function — listing 2.2 — in conjunction with the Valid$ string passed to it as a parameter called Text$ in the function definition. The essence of the definition is that it detects all keypresses, compares them to the list of valid characters in Text$ and, if a match is found, returns the character position in the string.

To permit lower- and upper-case input all lower-case characters are converted to upper-case prior to comparison. One exception is capital X, which is converted to lower case for use as a multiplication sign. The other exception is the question-mark which is never valid but which can occur in a Text$ string as a null character. If the question mark is pressed accidentally it has 32 added to it so that a match will not be found.

Three symbols have alternatives for input, although the output is always the same. The asterisk or the letter X indicate multiplication; division can be represented by a solidus or by the conventional division symbol and the RETURN key can be substituted for the equals key. Fetchkey always returns the second of these options.

The first character position in Valid$ is occupied by a zero and the other numerals are similarly offset. The true value of the numeral is returned by subtracting one from the actual character position.

The Valid$ string is kept updated to include only the digits of the current input base by the Change_Keys procedure — listing 2.3 — which updates the first 16 places of Valid$ according to the current value of the In_Val variable. The question mark occupies surplus character positions for all bases except hexidecimal.

The Main_Loop definition is simplified by calling the Menu_Manager slave procedure whenever one of the function keys or the escape key is pressed. The first duty of this procedure is to create a string of valid characters, this time called Fkey$. This string is sent to Fetchkey instead of Valid$, ensuring that normal input is inhibited until the chosen menu has been left. The procedure then calls the appropriate definition according to which key has been pressed. These definitions will be explained in the final instalment of the project.

The smallest of the listings accompanying this article carry-out housekeeping functions. Show_Line — listing 2.5 — is responsible for printing the current input line, highlighting the input number in white and also showing the current base and operator. Warning — listing 2.6 — is used to express the computer's disapproval to anything with which it cannot cope.

Having added this month's definitions to those already entered, further testing can be carried-out. You should be able to enter any valid number and be able to prove that anything invalid is excluded. Try two decimal points, or strange letters. Changes to the In_Val variable in the Init_Vars procedure published last month will allow you to experiment with different input bases.

● *In next month's issue, the crucial summation procedure and its attendant functions will be explained.*

SOFTWARE FILE

Information:
Program: From The Tower of Valagon
Supplier: CGH Services, Cwm Gwen Hall, Pencader, Dyfed, Cymru SA39 9HA.
Tel: Pencader 574
Price: £8: Disc mdv: includes manual
Price: £6.50: If media has postage included: includes manual. Overseas add 10 percent for postage.

From the Tower of Valagon is a recent text adventure release from CGH Services, publishers of QL Adventurers Forum magazine and other adventures. Bill Johns of Club QL International enters the forest clearing to investigate.

From The Tower of Valagon, a text adventure by Alan Pemberton, is one of two adventure programs published by CGH Services from this author. It is complete with a very readable manual and explains to the first-time adventure games player, in easy-to-understand language, some of the various commands which can be used.

Being a novice adventure games player, I decided that the first thing I should do is read the manual. It consists of only four pages, so it does not take long to read but it contains a wealth of information, such as The Tale of Valagon, how to make a back-up, loading, about the display, commands, objects, characters, special commands, multiple commands and help.

Built-in clone

As the game is on Microdrive or disc you are able to choose which format suits you best and, as usual, the first thing to do is make a back-up. That is easy, as the program has a built-in clone. Format a Microdrive/disc, put the Master Microdrive/disc in drive one and type "Lrun mdv1 or f1p1_clone_bas" followed by ENTER. The clone program will then load.

You are then asked to enter the name of the drive from which the working copy will boot. Microdrive users press enter. Disc users enter f1p1_ or fdk1_, depending on their interface type. The next prompt asks for the name of the drive the program will use to SAVE/LOAD game positions, ENTER for the default, mdv2_, or enter your choice.

The clone program then requires to be told to where you intend to place the blank Microdrive/disc to be copied, mdv2_ or f1p2_. Once that is done, place formatted Microdrive/disc in specified drive, press any key and the clone program will make the back-up you require. Loading

the game, you set up the QL as normal, place the working copy in drive one, press F2. The game will then load automatically.

Once loaded, a description of the first location appears in the main window, with a brief reminder in a smaller window above. When the small prompt (cursor) appears, you can enter your commands via the keyboard in the normal QL manner, then press ENTER.

A general outline of the story is that the City of Hirin would become most prosperous and would then lapse into self-satisfied complacency. The King no longer needs the court mystic, Valagon. Spurned, Valagon goes to his high tower on Mount Perethil to hatch an evil plot. Invoking evil spirits, he conjures a vast army of Orcs to take the city by force and extract cruel revenge on the King.

Verb-noun

Wiser Oracles foresee the arrival of a handsome prince, from lands afar, to take on Valagon and restore peace and tranquility. He was scared and ran away, which leaves you in a fix. You find yourself in a forest clearing near your home village of Elak. Can you fight against the odds and free the land from Valagon's clammy grasp?

The types of command used most often fall into the so-called 'VERB-NOUN' category, e.g., GET SWORD, KILL OGRE, CLIMB ROPE and so on. Some of the most commonly-used words/abbreviations in brackets:
NORTH (N); NE; UP (U); DROP; IN; EXAMINE; CLIMB; SOUTH (S); NW; DOWN (D); PUT; ENTER; LOOK (L); OPEN; EAST (E); SE; GET; THROW; OUT; INVENTORY (I); CLOSE; WEST (W); SW; TAKE; ATTACK; LEAVE.

You will encounter a variety of objects as you progress, most of which must be used in some way to complete the adventure. The foregoing list gives some suggestions. You can obtain a list of the objects you are carrying by typing INVENTORY or I.

Some objects may also be containers; if you EXAMINE a container you will be told what it holds — anything. Objects may be PUT INTO or TAKE'n FROM containers, e.g., PUT EGG INTO BASKET — you must use INTO, not IN; EXAMINE EGG; TAKE EGG FROM BASKET — just TAKE EGG also works.

If you type LOOK — or just L — after the location description, a list of the objects present, if any, is printed.

Reply

Some really unsavoury characters can be met on your travels; others may be friendly. Some will be intent on your downfall, others may be able to help or give useful information. You can GIVE things to characters and TAKE things from them. Some characters may converse with you; e.g., SAY TO SAILOR HELLO or just . . ; SAILOR HELLO (but not HELLO SAILOR); ASK BISHOP ABOUT ACTRESS; ASK JOE TO GIVE MONEY TO CHARATIY; TELL CHARATIY TO GIVE MONEY TO ME; TELL FIDO TO ATTACK BURGLAR; ASK FIDO TO FOLLOW; TELL FIDO TO STAY.

SAVE will save current game position to Microdrive/disc. You will be asked to supply a filename and the extender "_sav" will be added, so you can readily identify save files from a directory.

Later you can use LOAD to load the position back into memory. You will be asked to supply the appropriate filename. Note, you should not type in the extender "_sav" yourself at the end of the filename when saving or loading. RAM SAVE and RAM LOAD SAVE/LOADs the current position in memory, so there is no messing with Microdrive/disc. Of course, the information is lost if you switch off for any reason.

SCORE gives your current progress as a percentage.

Using the words "THEN", "AND" and "IT" you can string together a number of commands, e.g., GET THE BAT AND BALL AND GO NORTH THEN DROP THE BAT AND EXAMINE IT.

Certain words, such as "THE" and "GO", can be omitted. Any word of more then four letters can be abbreviated to the first four letters. The above sentence could read GET BAT AND BALL AND THEN DROP BAT AND EXAMINE IT.

EXAMINE everything and persevere. If you dislike being killed and having to start again from scratch, use RAM SAVE; that can save you plenty of wasted time and one can take a few more risky actions. Help and advice is available from the QL Adventure Forum. You can also contact the author if all else fails. The names and addresses of QLAF and the author are on the back cover of the manual.

If you are an adventure addict and a member of QLAF the price of £6 plus manual is very good. If you are not sure about adventure games and a non-member of QLAF, £8 is still as fair price for the game plus manual. I found that after about an hour of learning the ropes and being killed twice, I was starting to get into it. Certainly use RAM SAVE and RAM LOAD.

One of the things I would have liked to have seen included in the From the Tower of Valagon is more graphics. I know that some people think graphics tend to distract one from the game but presentation is a big selling factor and graphics would certainly have made it more interesting for me.

I liked the different-coloured text used on the screen for the Questions/Instructions/Replies — questions/instructions being in yellow, the typed-in Replies being in blue. The sound, in the form of a key-beep as one types-in, could really do with being a little louder. Again, along with the graphics, I would have liked to have seen included some different sound effects.

"Once you have loaded and started the game the more you play it the more you become involved, as you are never sure what will happen next. . . "

Characters

Once you have loaded and started the game the more you play it the more you tend to be involved, as you are never sure what will happen next and it certainly helps to have a notebook available to keep track of what you have typed-in; otherwise you find you are entering the same reply to the same questions time after time.

The only problem I had was switching off the computer and leaving the game. If I were working on a points system of one to 10, I would give From the Tower of Valagon eight points. I did not get a very high percentage score for progress through the game but I shall continue as time permits.

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WHITHER TI

It may be typical of minority groups in the personal computer world that they tend to fear and expect the imminent demise of their pet computers. The QL certainly generates its share of gloomy comment. Should we feel pessimistic about the prospects for us in 1989? Consider some of the known ingredients in the pot.

The QL is accepted as being a machine which can stand comparison with any of the others in the personal computer world. The hardware is reliable, with the exception of Microdrives, and maintenance is not difficult for the DIY user; there are several companies able to supply spare parts and to do repairs. It has a good operating system, said to be better in at least some respects than those on the PC, Atari and Amiga, and the same is true of SuperBasic.

The QL is capable of running several jobs simultaneously — multi-tasking; the Macintosh and the PC are alive and well, without even having that capability, except in models available only recently. The list of hardware add-ons is not so long as that for the BBC but it is sufficient for most users; the only major missing item has been a hard disc and one of them is in the final stages of test at the time of writing. The software library is excellent and expanding all the time. Above all, the cost of developing and maintaining a QL system is relatively low.

QL at heart

While on the subject of the hardware and availability of spares and repairs, remember that there are other machines which are essentially QLs at heart — the ICL OPD and the Merlin Tonto. Both of those machines were sold in significant quantity; they have some similarities to the QL from a servicing point of view, although few parts used in them are suitable for the QL, with modification, the Microdrives are usable.

All is not positive, naturally. It would be good to have an upgrade path, rather in the manner a PC user can plan to move to a 80286 AT, then an 80386, for faster operation. The Thor and the Futura were our way to better things but the latter never materialised and the future of the Thor has been uncertain. The original Thor was basically a QL; while being an improvement in several respects, it did not offer significantly greater speed or more memory.

The current Thor XVI is much faster and permits a healthy increase in the maximum memory. It is, in various ways, the proper kind of next step from the QL but — to be of real significance to the QL world, it must be sold in quantity — thousands rather than hundreds — and that will depend to a larger extent, in the U.K. anyway, on the price range and method of distribution.

There has been doubt about the future of the Thor operation and many people would like to hear the present status of CST. Briefly, CST and Dansoft, the Danish software and systems house, have combined efforts to enable the Thor XVI to be produced in Denmark and the first production batch from the new manufacturing facility was due for completion

> *"The QL is capable of multi-tasking — the only major missing item has been a hard disc, and one is in the final stages of test . . ."*

before the end of March. Prototype batches have already been produced in Denmark.

The computer is essentially the same as it was when introduced in the U.K. but there have been numerous detail improvements in the software and the hardware has been re-engineered for production by the new company. The bad news is that all units which are on the production line at present are spoken for, so there will be a waiting list for a time. The Thor XVI is what many QL users have long dreamed of, a machine similar in behaviour to the QL which will run much of its existing software but operates much faster, has a hard disc option, and can be fitted with a much larger memory — present maximum 2MB, to be increased later.

The people who produce and contribute to *QL World* are not unaware of the part the magazine plays in keeping the QL scene healthy. It is the only publicly-available magazine devoted to the QL, the place where users can learn about new software and hardware and get some of their questions answered. As a buyer of the magazine it is for you to indicate what you like or dislike about its contents. There are various possible changes which can be considered but it is difficult to be certain what would appeal to buyers, unless they provide feedback.

User groups

There are active QL user groups in various countries. The one in the U.K. is Quanta, open to users anywhere in the world. Subscription is £14 (U.K.) and £17 (other countries) per year and a monthly magazine of about 30-40 pages is mailed to all members. Many technical queries are dealt with through the letters in the magazine and there are frequent mini-reviews of products.

There is a large library of programs written by members and programs are available on cartridge or disc at low charges. Membership is around 1,650 and growing all the time. The group has been in existence for several years and, despite the inevitable occasional trauma, is solidly-based and active. If user groups in other countries wish their details to be published they can send them to me for inclusion in the Trouble Shooter column.

Anyone who has followed the pages of *QL World*, or *QL User* before that, will remember a few names which were well-known but are now gone. There are, however, a few names which were there in the beginning and are still with us. Looking through the October/November, 1984 issue of *QL User*, there is Microvitec, still making good colour monitors and now producing PCs as well. Then Psion, not actively producing anything for the QL now but doing very well with The Organiser.

What about wafer-thin integration? Sir Clive Sinclair is still developing this and an announcement of a commercial form of wafer memory appears imminent. Sagesoft no longer shows interest in the QL but is active in the PC world. Miracle Systems has been producing the serial-parallel converter which most of us use with our printers for more than four years and the company is very much an active supporter of the QL now.

The Expanderam memory expansion has been around for several years and the Trump Card which followed it has been a

HE QL?

Bryan Davies traces the development of the QL support groups and suppliers since its inception, looks at the machine in its current context and reports on the most recent developments by CST in Denmark.

real boon for many users. The latest development is the hard disc and interface.

Incidentally, when you think about prices, the fairly recent increase from £19.95 to £29.95 for the printer interface leaves it £10 cheaper than it was in late 1984. Miracle has now addressed the music market which has been neglected on the QL. IQLUG was the original name of Quanta and it was in the same issue. Strong Computer Systems was in that issue, too, although taking a smaller advertisement than it does now; it is, sensibly, supplying equipment to PC and Atari users now but still offering a range of QL products.

Transform is another supplier which has hedged its bets by selling other products but it and Transform International still offer a range of QL products; International sells the products of Eidersoft and Pyramide, two suppliers which fell by the QL wayside.

In issue 2 of *QL World*, September, 1985, you would have found Talent Computer Systems, whose software is currently handled by TK Computerware. CST was in that issue, as was Tandata; the latter does not advertise QL products now but supports them.

Care Electronics offers a much wider range now than it did then; the current products include those of QJump. The latter is the outlet for Tony Tebby's creative enthusiasm for the QL and nobody has a longer association with the QL than he has.

Still around

Other suppliers around in those days are Compware, whose products are currently available from Eidersoft-QL, and Digital Precision. DP is devoted to the QL market, without being blind to the uses of other computers — witness the recent release of the PC MS-DOS emulator. A big strength of DP is the ability to call on the services of people with excellent programming and systems knowledge. The people who developed major software such as The Editor and Turbo could not make a good living by devoting their time to the QL alone but they are content to work on such projects because they think the computer is a good one. The MS-DOS emulator can extend the usefulness of the QL a long way and the availability of DOS emulation on the Thor XVI must be important to business users.

What of the other major suppliers of today? Sector Software has been a pillar of the establishment in recent years and shows no sign of backing out now. The enthusiasm is still there and new software is being introduced. An interest in the Z-88 is compatible with the QL, since there are users with both machines. PDQL was formed to deal with QL products; while that supplier is now selling the Amiga and Z-88 as well, it only indicates good business sense.

The Amiga and Atari have similarities with the QL; additional income from such machines helps to make continued participation in QL activities possible. PDQL is wide and orientated to the business user and the programmer; useful additional programs are being introduced fairly regularly. There are several support companies whose advertisements can be found regularly at the back of the magazine. Aladdink has been offering a ribbon re-inking service for years and Suredata and P M Engineering have been doing repairs for a similar time. Tony Firshman started using a QL, then introduced a suppression plug, and now offers repairs, spares and modems.

> *"Production of the Thor is being handled by a well-known instrument manufacturer in Denmark . . . and re-engineered for volume production . . ."*

Although not to be seen in the advertisements, Dennis Briggs Adman Services supplies spares and advice round the world; Briggs is also very active in Quanta and is providing a technical answer service in *QL World*. Having just one product is not a guarantee of commercial success but when that one is as significant as *text*[87] you have to believe that the supplier's interest in the QL is very serious; Software[87] has shown faith through a long gestation period, until its wordprocessing program has become one which should be considered by all users who do a good deal of WP work.

TK Computerware is not a supplier which tries to grab the headlines but it has many satisfied customers and perhaps the widest range of QL products. For overseas buyers, sending money with orders to the U.K. can be a chancy business but TK has a reputation second to none on the QL scene for its dealings with customers.

Microfairs

An encouraging sign in the last year or so has been the getting-together of various suppliers and individuals to promote QL events. Apart from the familiar Microfairs in London there are now alternatives for users who find it inconvenient to travel to the south-east. There may be insufficient support to have frequent QL-only events, so combining with other machines makes sense; together we can survive and prosper.

As always, the enthusiasm of the individual companies is of great importance to the QL user. When you attend QL events you will find those people there too, ready to assist and provide advice freely. The suppliers who are "only here for the beer" do not last too long. It may not appear so but thousands of individual telephone and letter queries are dealt with each year. My impression of users' concerns now is that there are fewer problems with suppliers taking money and not supplying the goods than was the case a year or so ago. This is particularly important for overseas users, who are not in a good position to chase bad suppliers.

New QLs are still available from several suppliers. The prices are now much lower than they were when the machine was introduced but they are by no means rock bottom; this is really a good sign, because it shows that suppliers have not decided to unload their stocks and get out of the QL market. The Microdrives on later machines, usually with JM or JS ROM chips, are more reliable than on early machines but it is nevertheless desirable to fit disc drives for serious use.

One of the main operational problems with the computer has been locking up; this subject has been dealt with often, so suffice it to say that much of the trouble can be eliminated by buying a better power supply and/or suppressing interference sources in the house or office. It is

possible to have a QL switched on all day — mine usually is — without it giving trouble.

The basic 128K memory now seems limited but there are still a variety of ways to increase this to 640K. The most obvious expansion these days is to go straight to 896K. Some users would like to have more but it is doubtful if the lack of 1MB or more is a serious handicap for many users and there is at least one overseas supplier offering that amount of memory for those who need it.

The following is a summary of information supplied to *QL World* by David Oliver of CST. The CST operation has now settled in Denmark and is co-operating closely with Danish software and systems house Dansoft, led by Hellmuth Stuven, to produce and market the Thor XVI. CST is now the design part of the operation, with Thor International being the marketing arm; Dansoft will continue its separate activities as before, including distributing the Thor in Denmark. Production of the computer is being handled by a well-known instrument manufacturing company in Denmark and that company has re-engineered the Thor for volume production.

Discussions are taking place to appoint a U.K. distributor. Thor service in the U.K. is being handled by PM Engineering. Until U.K. distribution is arranged, orders should be placed directly with Thor International. A batch of prototypes of the revised computer has been produced and the first proper production batch was due for completion about mid-March. Orders have already been taken for the immediate production run, so there will be some delay before new orders can be filled but the manufacturing rate should be higher than in the past. There have been many improvements to the software. New products are inthe pipeline but nothing concrete can be said about them as yet.

The Thor XVI can run existing QL programs which can be classified as well-written, for example, *Lightning, Speed-Screen* and programs compiled with Turbo. Programs which require master Microdrive cartridges cannot be used, nor can those designed to run in a maximum of 128KB of memory. As before, the Psion XChange suite is supplied with the computer. The Argos operating system is now version 6.40. The hard disc — either 20 or 45MB — can be partitioned, making it possible that Argos can be put into one area of the drive and MS-DOS emulation into another; CST has not yet verified this but is informed that the Digital Precision MS-DOS emulator — The Solution — will run on the Thor.

Much of the previous Thor activity has centred on various Danish customers and networking has been a very important part of the requirements. At present, several Thor XVIs are being used in a network by a news distribution company.

Language support has always been a strong feature of Thors. It is possible to run several copies of Quill, each in a different language but sharing one set of program code.

The basic Thor XVI has 512KB of RAM, the Argos operating system, a mouse interface — the mouse is not supplied — one 720KB 3.5in. disc drive and the Psion XChange suite. Extra hardware includes another disc drive, a 20 or 45MB SCSI hard disc drive and RAM in increments of 512KB up to a total of 2MB fitted — to be increased when RAM prices fall.

Prices FOB Copenhagen are £1,080 for the single floppy version, £1,550 with single floppy and 20MB hard disc, £1,865 with dual floppies and 45MB hard disc. Each additional 512KB of RAM costs £155. Since the prices are FOB, potential buyers have to allow for shipping and tax in addition until a U.K. distributor is appointed. The present contact address and numbers for sales enquiries are:

INFORMATION

Thor International
Raadhusstraede 4B, 4
1466 Kobenhavn K, Denmark.
Tel. (010451) 930305
Fax (010451) 938292
(substitute the appropriate code to Denmark when calling from countries other than the U.K.)

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If you have a program that is worthy of consideration, send it to 'The Progs', Sinclair QL World, Greencoat House, Francis Street, London SW1P 1DG. We pay for everything published at the usual page rates — £80 per thousand words.

Program of the month

This month we present two 'ambient' programs, a pattern generator *Carpet*, and *Background Music*, which plays in the background while another program is running.

CARPET by Caspar Vidal Reynes

Carpet is a program which explores the world of one-dimensional cellular automats. One-dimensional cellular auto-mata are linear versions of the two-dimensional automata whose classic example is John H. Conway's *Game of Life*.

This type of automaton consists of a linear row or "field" of cells; each cell can take on one of four different states — 0, 1, 2 or 3. The transition rule for the next state on the cell depends on the sum of the states of three cells, the cell itself and its two neighbours. This sum can take values from 0 to 9 and the 10-digit rule assigns a new value for each sum.

Carpet calculates this for a field of 1,024 cells along 200 successive states. Only 512 cells are displayed. The X-axis represents space, the Y-axis, time. Once the program has started there are 12 options:

RAND generates a random initial state
POINT puts a number of cells at the same colour and distance
BAR puts coloured bars and spaces
COLOUR re-colours the screen
CONT continues calculating more states
OLD recovers last initial state
SWOP swops actual and last screens
ZOOM zooms a 200 × 100 window by two
SEQ generates a symmetrical sequence
RSEQ repeats a sequence along the 1,024 cells
LAST recovers last screen
RULE changes the transformation rule

All options are selected with cursor keys and then activated by the keys ENTER. CONT, SWOP and ZOOM are also activated by typing C, S or Z. In the RULE option, you can use the space bar to move in and change only the desired values. On SEQ and RSEQ options, do not enter more than 10 parameters or so, to avoid window scroll. There are two empty options for future use.

The program has its own leader for the machine code routine, but you can delete those lines and the data lines and write an LBYTES MDV1_carpet_bin, BASE after the RESPR line.

```
100 WINDOW 512,256,0,0:CLS
110 AT 5,32:PRINT'The Game of
the Life :'
120 AT 10,20:PRINT'1   One-dim
ensional'
130 AT 12,20:PRINT'2   Two-dim
ensional'
140 a$=INKEY$(-1)
150 IF a$='1':LRUN mdv1_CARPET
160 IF a$='2':LRUN mdv1_LIFE
170 GO TO 140

100 REMark ** MATHEMATICAL CAR
PET **
110 :
120 REMark        GASPAR VIDAL
130 REMark        MAJORICA IS.
140 REMark           SPAIN
150 :
160 REMark  === LOADER ===
170 :
180 BASE=RESPR(30000)
190 CLS:PRINT'Loading DATA'\\
200 NL=3990:fe=0
210 RESTORE 4000
220 FOR N=0 TO 384 STEP 16
230 TOT=0:NL=NL+10
240 FOR J=0 TO 14 STEP 2
250 READ DAT
260 TOT=TOT+DAT
270 POKE_W BASE+N+J,DAT
280 END FOR J
290 READ CK:BEEP 100,2
300 IF CK<>TOT
310 PRINT 'ERROR IN LINE  ';NL
;' OR ';NL+5
320 BEEP 2000,5
330 fe=1
340 END IF
350 END FOR N
360 IF fe=1
370 PRINT \'Correct it and the
n GOTO 200'
380 STOP
390 END IF
400 :
410 REMark === MAIN ===
420 :
430 MODE 4
440 WINDOW 512,256,0,0:PAPER 0
:CLS
450 WINDOW 512,200,0,0
460 REGLA=BASE+396
470 MAG=BASE+276
480 LISTA=BASE+406
490 ALEAT=BASE+172
500 BORRAR=BASE+152
510 CONTI=BASE+18
520 SCRN=BASE+210
530 REG$='0123001000'
540 POKE LISTA+512,3
550 FOR I=0 TO 9:POKE REGLA+I,
REG$(I+1)
560 :
570 DRAW
580 ROTULO
```

```
590 ELEGIR
600 STOP
610 :
620 DEFine PROCedure ROTULO
630 WINDOW£0,448,52,32,204:CLS
£0
640 CSIZE£0,1,0
650 CURSOR£0,2,2
660 PRINT£0,'  RAND    POINT
 BARS    COLOR';
670 PRINT£0,'     CONT     OLD
   SWOP'
680 CURSOR£0,2,17
690 PRINT£0,'  ZOOM     SEQ
 RSEQ     LAST';
700 PRINT£0,'
   RULE'
710 :
720 FOR Y=0,15
730 FOR X=0 TO 384 STEP 64
740 BLOCK£0,62,1,X,Y,6
750 BLOCK£0,62,1,X,Y+13,6
760 BLOCK£0,1,13,X,Y,6
770 BLOCK£0,1,14,X+62,Y,6
780 END FOR X
790 END FOR Y
800 END DEFine
810 :
820 DEFine PROCedure RES(X,Y)
830 OVER£0,-1
840 BLOCK£0,59,10,X,Y,4
850 OVER£0,0
860 END DEFine RES
870 :
880 DEFine PROCedure ELEGIR
890 X=66:Y=2:OP=2
900 RES X,Y
910 REPeat ELECCION
920 A=CODE(INKEY$(-1))
930 SELect ON A
940 =200:DERE
950 =192:IZQU
960 =208:ARRI
970 =216:ABAJ
980 =10:EJEC
990 =90,122:AP=OP:OP=8:EJEC:OP
=AP
1000 =83,115:AP=OP:OP=7:EJEC:O
P=AP
1010 =67,99:AP=OP:OP=5:EJEC:OP
=AP
1020 END SELect
1030 END REPeat ELECCION
1040 END DEFine ELEGIR
1050 :
1060 DEFine PROCedure DERE
1070 IF X>380:END DEFine
1080 RES X,Y
1090 X=X+64:OP=OP+1
1100 RES X,Y
1110 END DEFine
1120 :
1130 DEFine PROCedure IZQU
1140 IF X=2:END DEFine
1150 RES X,Y
1160 X=X-64:OP=OP-1
1170 RES X,Y
1180 END DEFine
1190 :
1200 DEFine PROCedure ARRI
1210 IF Y<15:END DEFine
1220 RES X,Y
1230 Y=Y-15:OP=OP-7
1240 RES X,Y
1250 END DEFine
1260 :
1270 DEFine PROCedure ABAJ
1280 IF Y>2:END DEFine
1290 RES X,Y
1300 Y=Y+15:OP=OP+7
1310 RES X,Y
1320 END DEFine
1330 :
1340 DEFine PROCedure EJEC
1350 CURSOR£0,20,40
1360 SELect ON OP
1370 =1:RAND
1380 =2:POINTS
1390 =3:BARS
1400 =4:COLORS
1410 =5:CONT
1420 =6:OLD
1430 =7:SWOP
1440 =8:ZOOM
1450 =9:SEQ
1460 =10:RSEQ
1470 =11:LAST
1480 =12:
1490 =13:
1500 =14:REG
1510 END SELect
1520 BLOCK£0,420,10,20,40,0
1530 END DEFine
1540 :
1550 DEFine PROCedure RAND
1560 INPUT£0,' Seed ';SES$;
1570 IF SES$='':END DEFine
1580 SE=SES$:STORE
1590 CALL ALEAT,SE
1600 PRINT£0,' ... wait ...'
1610 DRAW
1620 END DEFine
1630 :
1640 DEFine PROCedure REG
1650 :
1660 CURSOR£0,20,32:PRINT£0,RE
G$
1670 CURSOR£0,20,42:INPUT£0,R2
$;
1680 IF R2$='':GO TO 1760
1690 PRINT£0,' ... wait ...'
1700 IF LEN(R2$)<10:R2$=R2$&FI
LL$(' ',10)
1710 FOR I=1 TO 10
1720 IF R2$(I)<>' ':REG$(I)=R2
$(I)
1730 END FOR I
1740 FOR I=0 TO 9:POKE REGLA+I
,REG$(I+1)
1750 STORE:DRAW
1760 BLOCK£0,200,20,20,32,0
1770 END DEFine
1780 :
1790 DEFine PROCedure POINTS
1800 INPUT£0,'No.of points ';N
PS$;
1810 IF NPS$='':END DEFine
1820 INPUT£0,'  Color ';COLS$;
1830 IF COLS$='':END DEFine
1840 PRINT£0,' ... wait ...'
1850 NP=NPS$:COLOR=COLS$
1860 CALL BORRAR
1870 IP=512/(NP+1)
1880 P1=256+IP:P2=768-IP
1890 FOR I=P1 TO  P2 STEP IP
1900 POKE LISTA+I,COLOR
1910 END FOR I
1920 STORE:DRAW
1930 END DEFine
1940 :
1950 DEFine PROCedure BARS
1960 INPUT£0,'Length ';LBS$;
1970 IF LBS$='':END DEFine
1980 INPUT£0,' Space ';EBS$;
1990 IF EBS$='':END DEFine
2000 INPUT£0,' Color ';COLS$;
2010 IF COLS$='':END DEFine
2020 PRINT£0,' ... wait ...'
2030 LB=LBS$:EB=EBS$:COLOR=COL
S$
2040 CALL BORRAR
2050 FOR I=0 TO 1023 STEP LB+E
B
2060 FOR J=0 TO LB-1:POKE LIST
A+I+J,COLOR
2070 END FOR I
2080 STORE:DRAW
2090 END DEFine
2100 :
2110 DEFine PROCedure COLORS
2120 INPUT£0,' Enter new color
s (0123)';co$
2130 IF LEN(co$)<>4:END DEFine

2140 STORE
2150 C1=2*co$(1):C2=2*co$(2)
2160 C3=2*co$(3):C4=2*co$(4)
2170 RECOL C1,C1,C2,C2,C3,C3,C
4,C4
2180 END DEFine
2190 :
2200 DEFine PROCedure CONT
2210 PRINT£0,' ... wait ...'
2220 STORE
2230 CALL CONTI
2240 END DEFine
2250 :
2260 DEFine PROCedure OLD
2270 PRINT£0,' ... wait ...'
2280 STORE:DRAW
2290 END DEFine
2300 :
2310 DEFine PROCedure SEQ
2320 INPUT£0,'SEQ ';A$;
2330 IF A$='':END DEFine
2340 PRINT£0,' ... wait ...'
2350 CALL BORRAR
2360 J=LISTA+512
2370 FOR I=1 TO LEN(A$)
2380 POKE J+I-1,A$(I):POKE J-I
,A$(I)
2390 END FOR I
2400 STORE:DRAW
2410 END DEFine
2420 :
2430 DEFine PROCedure RSEQ
2440 INPUT£0,'SEQ ';A$;
2450 IF A$='':END DEFine
2460 PRINT£0,' ... wait ...'
2470 CALL BORRAR
2480 L=LEN(A$)
2490 FOR J=0 TO 1023-L STEP L
2500 FOR I=1 TO L
2510 POKE LISTA+I+J,A$(I)
2520 END FOR I
2530 END FOR J
2540 STORE:DRAW
2550 END DEFine
2560 :
2570 DEFine PROCedure ZOOM
2580 A=128:B=0:LX=256:LY=100
2590 OVER -1
2600 BLOQUE
2610 PRINT£0,'Move with arrow
keys.';
2620 PRINT£0,'  (ESC to quit)'
2630 REPeat ZZ
2640 AA=CODE(INKEY$(-1))
2650 SELect ON AA
2660 =192:IZQ
2670 =200:DER
2680 =208:ARR
2690 =216:ABJ
2700 =10:BLOQUE:ZUM:EXIT ZZ
2710 =27:BLOQUE:OVER 0:END DEF
ine
2720 END SELect
2730 END REPeat ZZ
2740 OVER 0
2750 END DEFine ZOOM
2760 :
2770 DEFine PROCedure BLOQUE
2780 BLOCK LX,LY,A,B,4
2790 END DEFine
2800 :
2810 DEFine PROCedure IZQ
2820 BLOQUE
2830 A=A-8:IF A<0:A=0
2840 BLOQUE
2850 END DEFine
2860 :
2870 DEFine PROCedure DER
2880 BLOQUE
2890 A=A+8:IF A+LX>512:A=A-8
2900 BLOQUE
2910 END DEFine
2920 :
2930 DEFine PROCedure ABJ
2940 BLOQUE
2950 B=B+10:IF B+LY>200:B=B-10
2960 BLOQUE
2970 END DEFine
2980 :
2990 DEFine PROCedure ARR
3000 BLOQUE
3010 B=B-10:IF B<0:B=0
3020 BLOQUE
3030 END DEFine
3040 :
3050 DEFine PROCedure DRAW
3060 CALL BASE
3070 END DEFine
3080 :
3090 DEFine PROCedure STORE
3100 CALL SCRN,1
3110 END DEFine
```

```
3120 :
3130 DEFine PROCedure LAST
3140 CALL SCRN,2
3150 END DEFine
3160 :
3170 DEFine PROCedure SWOP
3180 CALL SCRN,3
3190 END DEFine
3200 :
3210 DEFine PROCedure ZUM
3220 STORE
3230 CALL MAG,A,B
3240 END DEFine
3250 :
3260 REMark DATA LINES FOR M.C
ODE
3270 :
4000 DATA 18938,404,18426,1424
4005 DATA 12348,255,9948,20936
,82679
4010 DATA -4,9340,2,0,24910,15
420
4015 DATA 198,-10756,39110
4020 DATA 0,128,24842,24896,20
942
4025 DATA -12,28672,20085,1195
53
4030 DATA 18426,1380,18938,240
0
4035 DATA 19450,338,28673,4659
,94264
4040 DATA 255,-11725,0,-11725,
1
4045 DATA 18561,5173,4096,4636
4050 DATA 6530,0,21056,3136,10
24
4055 DATA 26338,12348,255,7068
7
4060 DATA 9948,20936,-4,20085,
17402
4065 DATA 1324,12860,256,82807
4070 DATA 16962,28679,5681,409
6,-7661
4075 DATA -7404,-7661,-7403,25
289
4080 DATA 21057,20936,-16,5508
,8192
4085 DATA 5509,8193,21570,9094
9
4090 DATA 3138,128,26332,20085
,18426
4095 DATA 252,17025,13372,9875
8
4100 DATA 255,9921,20938,-4,28
672
4105 DATA 20085,18426,232,9852
5
4110 DATA 12348,1023,13313,184
98
4115 DATA -19710,514,3,6018,32
007
4120 DATA 0,-7662,-7023,-7662,
-6511
4125 DATA 20936,-24,28672,2072
6
4130 DATA 20085,17402,3266,831
6
4135 DATA 2,0,9340,2,58413
4140 DATA 25600,3073,1,26382,3
073
4145 DATA 2,26384,3073,87588
4150 DATA 3,26386,24602,8920,-
19000
4155 DATA 26362,24594,8409,100
276
4160 DATA -19000,26362,24586,8
208,8401
4165 DATA 8896,-19000,26358,64
811
4170 DATA 28672,20085,16890,32
00,-6527
4175 DATA -7295,-4222,-11839,3
8964
4180 DATA -11838,8828,2,0,1234
8,99
4185 DATA 12860,31,22330
4190 DATA 14352,13372,1,13884,
3
4195 DATA -7604,-7531,-7547,18
930
4200 DATA 20939,-8,-6052,20938
,-18
4205 DATA 13372,1,-6052,43120
4210 DATA 13884,3,-7604,-7531,
-7547
4215 DATA 20939,-8,20938,33074
4220 DATA -18,8837,9029,128,-1
1268
4225 DATA 0,4,-11780,-5068
4230 DATA 0,2,20937,-70,-11780
4235 DATA 0,64,-11268,-2115
4240 DATA 0,128,20936,-90,2867
2
4245 DATA 20085,123,0,69854
```

BACKGROUND MUSIC by John Russell

The two programs contained on mdv enable the user to generate a machine code program which will play music in the background while another program is running. To create a piece of music, load the MUED program either by DRUN mdv-Boot or by typing, when the computer is first switched on:

e=RE8R(10000);LBYTES MDVL1_MU2,a: CALL a+132;LRUN MDV1_MUED (enter)

This will load the MUED program. To obtain instructions on how to create and edit music, how to control the playing of the music and how to lead the machine code program which is created by MVED, type-in 10 to the "How many notes?" prompt, and choose option 4 — instructions — in the main menu. MV_GEN is a Basic program which generates the machine code program MV2 used by the music editor. Running MV_GEN saves the program MV2 to mdv1.

To get the music generation suite running, re-set the computer, type-in and run MV_GEN with an mdv cartridge in MDV1, re-set the computer, type-in MVED and then save MVED. The program can be started by the boot program on the cartridge, or by typing the foregoing line of Superbasic.

Warning: interrupt-driven programs such as sprite handlers and concurrently-running programs, as well as programs which disable level 2 interrupts, may interfer with or even stop the playing of music from the system.

```
100 REMark BOOT for MUED
110 MODE 8:CLS
119 PAPER£0,4:INK£0,2
120 a=RESPR(10000)
130 CSIZE 3,1
140 AT 2,2:PRINT "LOADING TUNE
 EDITOR M/C"
150 LBYTES mdv1_MU2,a
160 CALL a:CALL a+132
170 AT 3,1:PRINT "LOADING TUNE
 EDITOR BASIC"
180 LRUN mdv1_MUED


10 a=RESPR(478):RESTORE 110
20 h=0
30 l=120:tot=0
40 FOR n=261686 TO 262134 step
 2
50 h=h+1:READ a
60 IF h=9:if a<>tot:PRINT 'Err
or in line';l:STOP:ELSE tot=0:
l=l+10:READ a:h=1
70 tot=tot+a:POKE_W n,a
80 NEXT n
90 READ check
100 IF check<>tot:PRINT 'Error
 in line ';l:STOP
110 SBYTES mdv1_MU2,261686,450
120 DATA 12408,272,17402,4,201
76,1,12,836,51111
130 DATA 20311,0,0,0,28672,168
90,418,21320,87611
140 DATA 18426,86,13331,12924,
1,21314,21314,27410,114806
150 DATA 3120,0,-26624,26372,2
1577,24816,24848,20553,94662
160 DATA 24810,14153,2,3120,0,
-26624,26134,17914,59509
170 DATA 44,30214,-12087,21064
,5336,20939,-4,-28471,37035
180 DATA 20808,20085,17914,22,
-12087,5456,5,5480,57683
190 DATA 1,6,-28471,20085,0,0,
28674,20034,40329
200 DATA 8826,-13772,12408,272
,17402,4,20176,3,45319
210 DATA 24,845,20302,52,845,2
0294,78,845,43285
220 DATA 21332,0,0,0,18938,250
,3156,0,43676
230 DATA 26132,16890,222,17402
,86,8521,4,28700,97957
240 DATA 20033,14524,-1,28672,
20085,18938,216,3092,105559
250 DATA 0,26610,16890,188,287
01,20033,18426,200,111048
260 DATA 28689,20033,14524,0,2
4796,20032,124,1792,109990
270 DATA 17402,170,17914,200,9
034,2,17914,156,62792
280 DATA 13138,6,12988,1,18172
,256,25016,17402,86979
290 DATA 140,12817,21313,27396
,12929,20085,8297,2,102979
300 DATA 3088,0,26114,24910,41
12,18560,12928,21329,111041
310 DATA 21064,4112,17914,126,
5248,21010,21128,9032,99634
320 DATA 2,18426,106,28689,309
0,0,26120,18426,94859
330 DATA 86,20033,24578,20033,
12329,6,21312,13120,111497
340 DATA 6,26294,17914,88,9034
,2,17914,44,71296
350 DATA 13138,6,24740,21064,1
8426,59,5784,21011,104228
360 DATA 5976,1,5976,2,5976,5,
5976,6,23918
370 DATA 20085,21133,913,18965
,26378,0,0,0,87474
380 DATA 0,0,0,2816,0,0,256,25
68,5640
390 DATA 0,-21846,0,0,0,0,256,
0,-21590
400 DATA 0,0
END
100 OPEN £3,scr_440x30a32x96:P
APER £3,4
110 PAPER 4:INK 0:CLS £0:CLS
120 CSIZE 3,1:AT 2,2:PRINT "BA
CKGROUND MUSIC (EDITOR)"\ TO 5
;"BY J.RUSSELL 1987"
130 INPUT £0;"No. of notes ";b
140 mstart=252590
150 FOR n=mstart TO mstart+b*2
+7 STEP 2:POKE n,10:POKE n+1,4
```

```
160 POKE_L mstart,0:POKE_L mst
art+4,0:POKE mstart+6,10:POKE
mstart+7,4
170 mstart=mstart-1
180 CLS:AT 3,10:PRINT "1  Play
"\ TO 10;"2  Edit"\ TO 10;"3
Quit"\ TO 10;"4  Instructions"
190 h$=INKEY$(-1)
200 IF h$<"1" OR h$>"4":GO TO
190
210 h=h$
220 SELect ON h
230 =1:play_tune
240 =2:editor
250 =3:quit
260 =4:instruct
270 END SELect
280 GO TO 180
290 DEFine PROCedure editor
300 CLS:CURSOR 200,50:PRINT "?
":CURSOR 200,120:PRINT ">"
310 CSIZE 0,0:AT 0,0:PRINT "P-
-Change pitch      D--Change du
ration     C--Change params"
320 PRINT "E--Exit to main men
u     F--Forward     B--Back    G
--Goto note  I--Insert"\"W--De
lete"
330 AT 16,0:PRINT "A-41 Af-38
B-36 C-33 Cf-31 D-28 Df-26 E-2
4 F-22 Ff-20 G-19 Gf-17 a-15
   af-14 b-12 c-11 cf-10 d-9 d
f-8 e-7 f-6 ff-5 g-4 gf-3"
340 pos=1
350 STRIP 2:INK 7
360 CLS £3:CLS £0
370 note 1,pos:IF pos>1:note 0
,pos-1
380 IF pos<b:note 2,pos+1
390 REPeat ed
400 k$=INKEY$(-1)
410 IF k$=="f":
420 IF pos<b:PAN £3,-35:PAN £3
,-35:PAN £3,-35:PAN £3,-35:pos
=pos+1
430 IF pos<b:note 2,pos+1
440 GO TO 670
450 END IF
460 IF k$=="b":
470 IF pos>1:PAN £3,35:PAN £3,
35:PAN £3,35:PAN £3,35:pos=pos
-1
480 IF pos>1:note 0,pos-1
490 GO TO 670
500 END IF
510 IF k$=="g":GO TO 1820
520 IF k$=="e":STRIP 4:INK 0:R
ETurn
530 IF k$=="w":GO TO 1850
540 IF k$=="i":GO TO 1940
550 IF k$=="c":GO TO 1000
560 IF k$=="p":pitch
570 IF k$=="d":duration
580 k=CODE(k$)
590 IF k=32:
600 getpos pos
610 IF (get(f,1)<>0 AND get(f+
1,1)=255) OR (get(f,1)=0 AND g
et(f+7,1)=255):GO TO 630
620 BEEP 0,pit,pit2,grx,gry,wr
p,fuz,ran
630 IF dur=0:PAUSE:ELSE PAUSE
1.4*dur
640 BEEP
650 END IF
660 CLS £0
670 END REPeat ed
680 getpos pos:t=f
690 IF get(f,1)=0:d=8:ELSE d=2
700 getpos b
710 DEFine PROCedure pitch
720 INPUT £0;"Pitch ";pits
730 IF pits<0 OR pits>255:GO T
O 720
740 durs=dur
750 redo
760 END DEFine
770 DEFine PROCedure duration
780 INPUT £0;"Duration ";durs
790 IF durs<1 OR durs>255:GO T
O 780
800 pits=pit
810 redo
820 END DEFine
830 DEFine PROCedure redo
840 getpos pos
850 IF get(f,1)=0:
860 put f,1,0:put f+1,1,pit2:p
ut f+2,2,grx:put f+4,3,gry:put
 f+4,4,wrp:put f+5,4,fuz:put f
+5,3,ran:put f+6,1,durs:put f+
7,1,pits
870 ELSE
880 put f,1,durs:put f+1,1,pit
s
890 END IF
900 pit=pits:dur=durs
910 note 1,pos
920 END DEFine
930 pos=b
940 b=b+1
950 getpos b:REMark now enter
note default values
960 put f,1,20:put f+1,1,2
970 REMark now get back to ind
icated note
980 getpos pos
990 GO TO 360
1000 getpos pos:IF get(f,1)<>0
:expand_note
1010 getpos pos
1020 put f,1,0
1030 INPUT £0;"Pitch 2"!pit2:I
NPUT £0;"Grad_x"!grx
1040 INPUT £0;"Grad_y"!gry:INP
UT £0;"Wrap"!wrp:INPUT £0;"Fuz
zy"!fuz:INPUT £0;"Random"!ran
1050 put f+1,1,pit2:put f+2,2,
grx:put f+4,3,gry:put f+4,4,wr
p:put f+5,4,fuz:put f+5,3,ran:
put f+6,1,dur:put f+7,1,pit
1060 GO TO 360
1070 DEFine PROCedure expand_n
ote
1080 getpos pos+1:t=f:getpos b
+1
1090 FOR g=f TO t STEP -1
1100 POKE mstart+g+6,PEEK(g+ms
tart)
1110 NEXT g
1120 getpos pos
1130 END DEFine
1140 DEFine PROCedure note(d,c
)
1150 getpos c
1160 IF get(f,1)=0:BLOCK 100,3
0,140*d+20,80,0:STRIP 0:ELSE B
LOCK 100,30,140*d+20,80,2:STRI
P 2
1170 CURSOR 140*d+20,80
1180 PRINT pit2;"      ";grx
1190 CURSOR 140*d+20,90:PRINT
gry;"  ";wrp;"  ";fuz;"  ";ran
1200 CURSOR 140*d+20,100:PRINT
 pit;"          ";dur
1210 getpos pos
1220 END DEFine
1230 DEFine FuNction get(ge,ty
)
1240 a1=mstart
1250 a1=a1+ge
1260 IF ty=1:RETurn PEEK(a1)
1270 IF ty=2:RETurn PEEK(a1)+2
56*PEEK(a1+1)
1280 IF ty=3:
1290 df=PEEK(a1):df=INT(df/16)
1300 RETurn df
1310 END IF
1320 IF ty=4:
1330 df=PEEK(a1):df=df-(INT(df
/16)*16)
1340 RETurn df
1350 END IF
1360 END DEFine
1370 DEFine PROCedure put(ge,t
y,no)
1380 a1=mstart
1390 a1=a1+ge
1400 IF ty=1:POKE a1,no:RETurn
1410 IF ty=2:POKE a1,no&&255:P
OKE a1+1,INT(no/256)
1420 IF ty=3:
1430 df=PEEK(a1)
1440 df=df&&15:df=df+16*no
1450 POKE a1,df
1460 RETurn
1470 END IF
1480 IF ty=4:
1490 df=PEEK(a1)
1500 df=INT(df/16)*16
1510 df=df+no
1520 POKE a1,df
1530 END IF
1540 END DEFine
1550 DEFine PROCedure play_tune
1560 POKE_W 252144+410,b
1570 POKE_L 252144+414,252584
1580 POKE_W 252144+420,0
1590 POKE_W 252144+418,b:POKE_
W 252144+412,0:MST
1600 CLS £0:PRINT \ TO 4;"Pres
s any key to stop"
1610 MON
1620 PAUSE
1630 MOF
1640 CLS £0
1650 END DEFine
1660 DEFine PROCedure quit
1670 CSIZE 0,0
1680 getpos b+1
1690 PRINT "Length =";314+f;"
bytes"
1700 CLS £0:INPUT "Device+File
 name  ";a$
1710 SBYTES a$,252144+132,f+31
4
1720 PRINT "Finished saving--u
se a=respr(";314+f;")\  lbytes
 ";a$;",a\  call a\ to install
 machine code+data (\=ENTER)"
1730 STOP
1740 END DEFine
1750 DEFine PROCedure getpos(c)
1760 POKE_W 252144+120,c
1770 DOW:f=PEEK_W(252144+122)
1780 h=252144+124:h=h-252589
1790 pit2=get(h,1):grx=get(h+1
,2):gry=get(h+3,3):wrp=get(h+3
,4)
1800 fuz=get(h+4,4):ran=get(h+
4,3):pit=get(h+6,1):dur=get(h+
5,1)
1810 END DEFine
1820 CLS £0:INPUT £0;"Goto whi
ch note ?>";pos
1830 IF pos<1 OR pos>b:GO TO 1
820:ELSE pos=INT(pos)
1840 GO TO 350
1850 getpos (b+1)
1860 y=f
1870 getpos pos
1880 IF get(f,1)=0:u=8:ELSE u=
2
1890 FOR e=f TO y
1900 POKE mstart+e,PEEK(mstart
+e+u)
1910 NEXT e
1920 b=b-1
1930 GO TO 350
1940 getpos(b+1):y=f
1950 getpos pos
1960 FOR n=y TO f STEP -1
1970 POKE (mstart+n+2),PEEK(ms
tart+n)
1980 NEXT n
1990 b=b+1
2000 put f,1,40:put f+1,1,4
2010 GO TO 350
2020 DEFine PROCedure instruct
2030 CLS:CLS£0:CSIZE 3,1:INK 0
,4,3:AT 0,8:PRINT "INSTRUCTION
S"
2040 CSIZE 0,0:INK 0
2050 AT 2,5
2060 PRINT "To create a piece
of music, you must choose opti
on 2 (EDIT) from the main menu
. Now you can step forwards, a
nd backwards through a series
of  'boxes' which represent n
otes of pitch 4, duration 2. Y
ou can change the  pitch (a sc
ale at the  bot
tom of the  screen  shows whic
h  pitch numbers  represent  w
hich notes), and duration of a
```

```
ny of these notes, by pressin
g the appropriate key and typi
ng in the new figure (and ENTE
R). Duration is measured in 1/
50ths of a second."
2070 PRINT "To obtain a rest,
set the pitch of a note to 255
. Each note in the piece is r
epresented by eight figures
contained in a black or red bo
x on the screen. The note upo
n which actions will be taken
if you press a command key is
 shown between
the on-screen arrows."
2080 PRINT "The numbers inside
 each box represent,"\ TO 20;"
Pitch2   Grad_x"\ TO 20;"Grad_
y   Wrap    Fuzzy    Random"\
TO 20;"Pitch    Duration"
2090 PRINT "You may change
the sound parameters ( ever
y parameter except pitch, dura
tion), of a note, by pressing
'C', and typing in the new par
ameters, pressing ENTER after
 each parameter."
2100 CLS£0:PRINT£0; TO 30;"Pre
ss <SPACE>"
2110 k=KEYROW(1):IF k<>64:GO T
O 2110
2120 CLS:CLS£0
2130 PRINT TO 5;"The note's co
lour will change to black (if
it was not already ), and the
sound parameters of every sub
sequent note (until the next b
lack note is reached) will be
come the same as those that y
ou just typed in. Black notes
take up 7 bytes
 of memory, red notes take up
2."
2140 PRINT TO 5;"Pressing 'W'
allows a note to be deleted, t
he deleted note is the onecurr
ently between the arrows. I
f a black note is deleted,
then all subsequent notes (un
til another black note is reac
hed) take on the sound parame
ters of the not
e preceding the deleted note."
2150 PRINT TO 5;"Pressing 'I'
allows you to insert a note. T
he note is inserted to theleft
 of the note between the arr
ows, and has pitch 4, duration
 10. This note can be edited,
or deleted in the usual way."
2160 PRINT TO 5;"Choosing the
GOTO option allows you to move
 to any note in the piece,simp
ly type in the position of the
 note in the piece (the number
 of notes in front of it), and
 press enter."
2170 PRINT TO 5;"Pressing <SPA
CE> will play the note current
ly between the arrows."\ TO 5;
"When you have finished edit
ing, then you may press 'E' to
 exit the editing stage, and r
eturn to the main menu."
2180 PRINT TO 5;"Now choose th
e PLAY option, this will play
your tune. Press a key to stop
 the tune and return to the ma
in menu. If you are not satis
fied with your tune, choose th
e EDIT option for further edit
ing."
2190 CLS£0:PRINT£0; TO 30;"Pre
ss <SPACE>"
2200 k=KEYROW(1):IF k<>64:GO T
O 2200
2210 CLS£0:CLS
2220 PRINT TO 5;"If you are sa
tisfied with the way that your
 music played, then choose opt
ion 3, this allows you to save
 the machine code program that
 has been generated to a devic
e (eg. mdv1_FILENAME). Simply
follow the prompts."
2230 PRINT TO 5;"To re-load an
d play the tune simultaneosly
with another program, type in
what you are told to, when the
 program was saved, do this as
 soon as you switch on the
computer, now programs can b
e typed in or loaded as norma
l. It is wise
to write down the number of
bytes you were told to reserve
 down ie, a=respr(WRITE THIS N
UMBER DOWN !)."
2240 PRINT TO 5;"Three extensi
on commands to SuperBASIC are
 added when you CALL the mach
ine code. These are:"\ TO 10;"
MON--turns the music on"\ TO 1
0;"MOF--turns the music off"\
TO 10;"MST--sets the music to
the beggining of the tune."
2250 PRINT TO 5;"These keyword
s can be freely used in a Su
perBASIC program(the tunewill
 also play if any m/c routin
es are called, as long as th
ey do notdisable level 2 inte
rrupts, or interfere with the
polled list), although MST mu
st always be us
ed before the FIRST, MON comma
nd."
2260 PRINT TO 5;"Having two pr
ograms running at the same tim
e on the QL will probably inte
rfere with the sound. Only one
 tune can be stored in the QLs
 memory at a time. To play you
r own sound in a program, use
MOF:BEEP ......:MON."
2270 PRINT £0; TO 30;"Press <S
PACE>"
2280 IF KEYROW(1)<>64:GO TO 22
80
2290 CLS:CLS£0
2300 END DEFine instruct
```


text87 VERSION 2.00

Just over a year since the release of **text87**, we are proud to present the new version 2.00 of our advanced wordprocessor. Version 2.00 offers all the features of the earlier versions of **text87** plus the following:

- ★ On-screen pixel-accurate justification.
- ★ Optional display of the ruler for the cursor line.
- ★ Optional display of the name of the current typeface in addition to the WYSIWYG display of founts.
- ★ Up to 10 typefaces (selected by the user from those supported by the printer drivers) are available for quick insertion in the text. The Program remembers these selections for the next editing session.
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- ★ New 80 page manual.

text87 is extremely fast. Running on the Atari ST with the QL emulator, it outperforms most multifount wordprocessors running on the ST, AMIGA or the Macintosh Plus and matches the fastest ones. Even on the much slower QL it is more than a match for many of those wordprocessors. On QLs with 512k memory expansion **text87** can handle large documents of over 400k characters.

text87 can print multiple-line headers and footers, print in up to 4 columns, and change line spacing in different parts of the text. Many dedicated and generic printer drivers are supplied for different families of printers. Once selected, the printer driver is automatically loaded and becomes an integral part of the Program. With any Diablo or Qume compatible daisywheel printer (including Epson, Brother, Juki, Panasonic, etc) **text87** can handle multiple daisywheels, proportional spacing, bold, underlined, superscript and subscript text even on models, which do not provide commands for these features. On Epson and compatible dot-matrix printers different character widths and styles can be mixed on each line with microjustification. Proportional spacing is also available with some dot-matric printers. The number of different print styles supported by each driver varies between 48 and over 200. The whole range of QL accented characters is supported on all Epson and IBM Proprinter compatible dot-matrix printers.

fountext88 is the graphic printer driver for **text87**. Used with Epson compatible dot-matrix printers, it provides desk-top publishing facilities with thirty high-quality founts (not ordinary QL founts) in different styles and sizes up to 72 pixels high. With **fountext88** you can use graphic founts without the limitations in text editing and document size imposed by page makeup programs. **fountext88** can load up to 32 founts and allows you to use them in any combination in the text. On QLs with 512k expansion, maximum text size can be up to 300k depending on the founts loaded. **fountext88** can be configured for two print densities and a choice of single pass or overlapping double pass print. A special 24-pin version is supplied at no extra cost.

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2488 is a set of state-of-the-art text-mode printer drivers for Epson and NEC 24-pin printers. When used with **2488**, **text87** is the only QL program that can take advantage of the advanced features of 24-pin printers such as multiple character founts, proportional spacing, double width, double height, condensed, etc. For example, the driver for the NEC P2200 supports 12 typefaces each in 5 sizes and in a range of up to 12 further combinations of highlights, resulting in over 500 different print styles!

text87	**£45**	**fountext87**	**£25**
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Other software:		**Qram**	**£29**
Taskmaster	**£25**	**Qtyp**	**£29**
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CTRL -	program slow down
CTRL +	program speed up
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MICRODRIVE

KEY

B = Superbasic; A+O = assembler and object code; M+B = machine code and Basic loader; A+B+O = assembler and Basic loader and object code; S = supercharged; L = QLiberated; f1 = monitor mode; f2 = TV mode

1. DIY ASSEMBLER by Giles Todd (B) **£5**
A complete two-pass assembler which assembles all 68008 code and supports the directives DRG, END, EQU, DC and DS.

2. MINI MONITOR by Richard Cross (A + O) **£3**
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4. GOLF by Shergold and Tose (B f2) **£2**
Up to 50 courses of varying difficulty with lakes, rivers, bunkers and trees. *QL User,* May, 1985.

5. PALADIN by Williams and Holliday (A + O) **£5**
All-machine code space-invaders game used as the basis of the games programming series beginning in April 1985.

7. PACMAN by Steve Deary (B) **£1**
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8. FAMILY TREE by Andy Carmichael (B) **£3**
Archive database for assembling and displaying large family tress. *Theory of Relativity, QL User,* July/August 1985.

9. COMPOSER by James Lucy (L) **£3**
Completed in *QL User*, October 1985, this QLiberated program allows you to compose, play and edit music, including tempo, staccato, legato and sharps.

17. CAD QL by Tony Quinn (S) **£4**
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19. STARPORT 2001 by Karl Jeffrey (M + B) **£3**
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24. DESIGN 3D by J. F. Tydeman (S) **£4**
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25. STELLARIS by D. Carmona (B f1) **£4**
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29. BRIDGE by Peter Etheridge (B) **£4**
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32. ADVENT2 by Phillip Sproston (B) **£4**
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33. CLOCK by Leslie Fahidy (B f2) **£3**
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34. QL CONVERSION/CALCULATOR (f2) **£2**
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35. QWHIST by John Wakefield (B) **£3**
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36. MAIL MERGE by Stanley Sykes (B f2) **£1**
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37. THE DOUBLE by P. G. Ives (B f2) **£4**
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40. ROULETTE by Santiago Rubio (B) **£3**
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44. COMPRESS by David Marsh (B) **£2**
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45. SUPERBREAKOUT by R. Davidson (M + B) **£2**
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48. YAHTZEE by Jason Price (B) **£2**
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52. SPACE PODS by Simon Quinn (M + B) **£3**
Your lone ship must protect six energy pods against the aliens. Machine code. *QL World*, December 1987.

53. GRAPHIC WRITER by S. M. Walker (B) **£2**
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54. ZAPMAN by L. Miles (M + B) **£3**
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55. ADVENTURE PLAYTIME by A. Pemberton (B) **£3**
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57. SPELLED by Timo Salmi (B) **£3**
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58. RADAR by Nigel Ford (B) **£2**
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59. DUNGEONS by Geoffrey Evelyn (B) **£4**
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60. SPEEDMIND by William Henderson (B) **£3**
A mastermind-style game played with coloured pages. You have 12 attempts at breaking the code against the clock. *QL World*, January 1988.

61. COMPANDER by A. Quigley (M9 **£1**
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EXCHANGE

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63. VICIOUS VIPER by Ian Humphreys (B) £3
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64. TAKTIX by Nigel Ford (B) £3
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65. DUAL DOMINOES by Helmo Geske (B) £4
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66. FTIDY by Howard Clase (B) £4
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67. LEAGUE SECRETARY by C. B. Storey (B) £3
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68. TAB—EDITOR by Richard Williams (B, compiled) £3
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69. WORDSEARCH by David Watson (B) £3
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71. CRITICAL MASS by Patrick Carter (B) £4
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72. BOXES/FOX AND HOUNDS (B) £4
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73. MULTIPLICATION TABLES by Ron Allpress (B) £3
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74. GRAPH PLOTTER by John Banks (B) £3
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75. BUSINESS GAME by David Smith (B) £4
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76. BACKGROUND MUSIC by J Russell/CARPET by G V Reynes £4
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In the past, you may have ignored our adverts. This is not an advert, but rather a formal policy statement. Please take the time to read it.

In our policy statement on the back cover of the February issue of "QL World", we described how we would guarantee to support users of the QL, CST "Thor", and all compatibles, including the QL derivatives, the ICL OPD ("One Per Desk",) and the Merlin "Tonto", through a subscription to "QL SUB", for as long as you need it. This remains our commitment as we specialise, and offer full-time support for the above machines only.

Users who do not subscribe will not abandon the QL, but will read other magazines. We will distribute advertising among various publications as new users, of which there are a growing number, require support from a magazine in a newsagents. We cannot increases our advertising over all, so we will be unable to advertise in "QL World" every month as before. This was the only reason for us having no more adverts since February.

Super User Bureau, now known as "QL SUB", was formed by me and my wife, Julie, in October 1987, to satsify a demand for support that we thought was unavailable . . . Dedicated full-time support, by users,for users. We always have been a very small organisation, doing what we can. Perhaps adverts like this have misled some people into thinking that we are a large organisation with huge financial backing. The truth is that our glossy back-page advertising has been achieved more by good fortune.

Somebody, somewhere, has developed a particular dislike for us, (or has come to see us as a threat), and has been promoting a couple of stories about us. a) We have gone bust; and b) We are making lots of money by using local government grants and when we have stopped getting grants (plus £40 a week from the government!) we'll close down and run for it. Just wait until they find out that we are really aliens invading earth! We credit readers with more intelligence than to fall for such stories, so would like to thank those concerned for making us laugh so much.

Since our first advert, over 850 QL, Thor, and QL compatible users have subscribed and over 2,400 users have been in contact with us from a huge range of countries, asking us for help on problems as diverse as how to expand their QLs, how to connect printers, how to overcome shortcomings in Quill, and how to fix bugs in their Archive or Pascal programs. We are proud to have been able to solve most problems that we've had.

We have failed to produce our magazine on the regular basis that we had planned, a problem that we have fought consistently to overcome. The vast majority of our SUBscribers have been very supportive, and have stood by us during the difficult months when both the future of the "QL SUB" magazine were in doubt, being convinced that we were genuinely committed to giving them support.

Problems that have contributed to such delays have included a number of printing problems, staff problems, the loss of our database, and the long-running saga of our new offices, booked for the start of March 88, and still not ready now. These were problems — in no way any excuse.

At every stage we have fought these delays, overcoming the printing problems, gaining better staff, and at the time of writing moving into the new offices. As any SUBscribers will tell you, we are now back on our feet, and have ensured that "QL SUB" will never be in doubt again — it is here for today, and for tomorrow, and is offering real support.

No matter who you are, or where you are, if you use a QL, "Thor" or QL compatible, then contact us. We will keep you up-to-date with the QL market with a free "QL SUB" newsletter, and catalogue. However, we promise not to pester you with unwanted junk-mail or application forms. Contacting us now, direct, instead of hearing "stories" about us from third parties, could prove to be one of your better decisions. It will cost you nothing at all — ignoring this statement could cost much more.

You have my word that SUB will continue to offer support to all users.

Richard J. Turner.

Richard J. Turner,
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