

40p EVERY WEEK • No 85 • NOV 3 1984

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Computer

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40p

SPECTRUM PLUS

Sinclair's best-seller grows up



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COVER STORY

Spectrum Plus 30

The Spectrum gets a facelift in the shape of a 48K system, claimed to be completely compatible with existing Spectrum software and Interfaces 1 and 2. But it's the 'professional' keyboard that all the Plus fuss will be about, says John Lettice.



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You must be canny and skilful to survive the tropical rain forest. Part 1 of a challenging adventure for you to type in.

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Yet another new Spectrum in the wings, this page: Acorn finally ready to release 32016, hard disk, and Logo for the BBC B; Quest releases CP/M for QL.

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Quit/datelines 64

Our lively look at the lighter side of microcomputing.

Sinclair speculates five?

Another version of the Sinclair Spectrum could appear in the spring which may mean the earlier version of the Spectrum will be phased out.

When the Spectrum Plus was being discussed within Sinclair Research, one of the options was a version of the Spectrum with built-in Interface 1 and cartridge slot.

This was rejected, and you might think the project was dead and buried, but there's a sequel to the story. The code name for the Spectrum Plus within Sinclair Research was Thunderbird 1, and as keen followers of the TV series will know there are five Thunderbirds.

As PCN was going to press we spoke to Sir Clive himself, who said the codename had simply been 'Thunderbird' or 'TB' but he didn't reject the idea of further upgrades on the original specification of the Spectrum.

He added that a long-term project would be to produce a

fully portable machine with built-in disk storage and a display using non-LCD techniques which suggests the flat-screen TV concept. Sir Clive warned, however, that you should not expect to see it inside 12 months.

It's also unclear whether this was Spectrum or QL technology or something new.

Meanwhile, a source close to Sinclair Research has an interesting tale to tell: The Spectrum and Spectrum Plus will last throughout Christmas but once the circuit boards have been used up we're going to be seeing Thunderbird 2, with Interface 1 built-in.

PCN put it to Sinclair Research that the intention was to run down the production of the earlier Spectrum and replace it with the Plus. We were told at first that this was indeed the case. Subsequent calls, however, brought no confirmation of this, and Sinclair was reluctant to give projections of sales or production levels.

Software houses gear up for Christmas

Christmas is now being seen as a make or break period for software houses. In common with many computer manufacturers, software companies are gearing up for a Christmas bonanza. And many are backing this seasonal push with strong TV and magazine promotions.

An indication of the importance of this selling period is the special Christmas showcase organised by Websters, one of the largest software distributors in the UK. Leading software houses, such as Sinclair,

Ocean, Commodore, Micromega and US Gold were invited to unveil their seasonal offerings.

And the indications are that computer game aficionados will have little space for other goodies in their Christmas stockings. US Gold will continue to license imports from USA chart-topping software houses, among which are Synsoft (Synapse), Datasoft, Sega and Microprose.

Looking ahead to 1985, US Gold plans to release games from Strategic Simulations.



Acorn family continues to grow

Acorn is getting ready to launch a host of new goodies for the BBC micro and the Electron.

The COMPEC show at Olympia (November 13-16) will be the scenario for the launch of the long-awaited 32016 second processor, Winchester hard disk, Logo and ISO Pascal for the Beeb.

And for the Electron there will be the first showing of the new Plus Three disk interface. In a move that will lead to groans about incompatibility with the Beeb, Acorn has settled on a 3.5in disk format for the Beeb's baby brother.

The 32016 second processor is firmly targeted at the scientific and educational market. It comes with 256K of RAM and will probably be bundled with programming languages like C and BCPL with possibly Xenix as the operating system.

The launch of Logo and ISO Pascal has generated a lot of excitement at Acorn.

The Logo comes from ROM with floor turtle drivers and other utilities on disk or cassette. At £69 it is by no means cheap, but it has been developed with the assistance of teachers using Logo in the classroom and as a result is a full feature version of the language.

Taking advantage of the Beeb's hardware, it will also offer sound commands and multiple screen turtles.

The Pascal comes in two versions. The disk option, which needs a 6502 second processor has been validated by the British Standards Institute and given a Class A certificate. According to Acorn, this is the first time that a microcomputer version of Pascal has achieved this much-vaunted status.

The other version on ROM doesn't need the second processor and has only merited a Class B certificate.

U-Micro takes a bite at the Apple

Apple add-on specialist U-Microcomputers has launched what it claims is the world's first 68000 based single user open architecture micro.

The basic model of the U-Man Series 1000 is not cheap at £2,500 but comes well-equipped. For your money you will get a 10MHz 68000, a 6809 to control input/output, 192K of RAM, dual 800K floppy disks, two RS232 ports, Centronics port, general purpose parallel port, clock/calendar, speech synthesiser, noise generator, mono and RGB colour output, plus four expansion slots.

A particular feature of the expansion slots is that they will take Apple II cards as well as larger cards that take advantage of the 68000 16 bit data path. U-Micro is offering immediately 12 bit D/A and A/D cards, a 32 bit line parallel I/O card and an 8 port serial board.

It is offering a choice of operating systems between CP/M68K and UCSD p-system. Languages available include C, Pascal, Basic and 68000 Assembler.

The company's open-architecture policy means that it will be making full details of the micro's design available for people who want to design their own add-on boards. This is one of the features that made the Apple II such a successful machine and the company clearly hopes that it is a philosophy that will make the Series 1,000 take off in the same way.

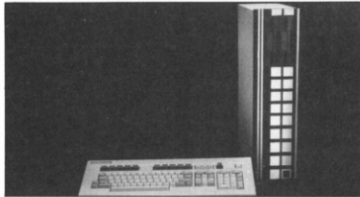
Express help for the small business

The old-timer Osborne 1 will soon be available for less than £500 following the launch last week of an upgraded version.

The Z80 based luggable machine at the moment costs £695 but its new price will mean a saving of at least £200. As part of the package you also get a range of software which includes CP/M, M Basic, C Basic, SuperCalc 1, WordStar and Mail-Merge.

A spokesman from Future Management, sole distributor of Osborne machines (0908-615 274) said: 'People who buy a BBC or Commodore 64 probably need a business machine but can't afford it.'

'If they bought a computer,



U-man 1,000: tower of power

disk drives and monitor they would spend considerably more. With the Osborne 1 they get everything at a low price.'

The US-based Osborne company launched on Thursday a new computer called the Osborne Express which the company says will replace the Osborne 1.

The Express will sell for under £1,500, will be lighter and smaller than the Osborne 1. It will come with a Z80 processor, 80 column display, twin disk drives with 390K each, 7in screen and is said to have an improved character set.

Software that comes with the machine includes: CP/M, M Basic, WordStar, Mail-Merge, Media Master, SuperCalc 2 and two games programs.

Dixons gets its ACT F1 together for Santa

If you're quick off the mark, you could pick up one of the first Apricot F1 micros from your local Dixons.

ACT's F1 machine has been taken on by the high street multiple and is available now, in time for the Christmas rush. The F1 costs £1,374 and uses

the icon and window technology to display graphical representations of tasks to be done. In addition, there's an optional cordless mouse feature.

The 16 bit F1 comes with a mono monitor, 256K of RAM and can hold 720K in its disk drives. Software bundled with it includes a spreadsheet, a word processor, a graphics program and F1 tutorial disk.

Chiller lands in hot water over music

Mastertronic, the budget software house, is the first victim of a clampdown by the music industry. The dispute revolves around the game Chiller, whose soundtrack closely resembles the Michael Jackson hit, 'Thriller'.

Rocksoft, a music agency, claims that Mastertronic has been forced to withdraw the game, but a spokesman for Mastertronic has stated that the company has undertaken to pay royalties and change the soundtrack. He went on to say that whether or not a computer soundtrack was music was open to question.

Negotiations are under way between Rocksoft and Software Projects over the use of the Beatles' song 'When I'm Sixty-Four' in the game Dinky Duo. Rocksoft has asked for a 35 pence royalty on each cassette sold. A spokesman for Software Projects said that a figure of less than five pence would be reasonable.

Rocksoft is keeping a beady eye on the software games market and will soon be talking to other publishers of software about the musical content of their games. The company is also in consultation with software houses over the licensing of the Beatles' hit Yellow Submarine.

As game ideas will no doubt continue to develop from pop songs, this raises the perennial and thorny problem of piracy. Does copying a program which uses a licensed soundtrack constitute infringements of both software and music copyright?



MORE FOR LESS — For a reduction of £100 you can pick up a Kaypro 4/84 with some new added features. At £1,707 the portable micro comes with disk drives that hold 392K, an anti-glare screen, a processor running at 4 MHz and a second RS232C/V24 interface. Block graphics are also included and on the software side, the machine comes bundled with dBase II together with a real-time clock which shows the date, day and time. Kaypro (06296-67547) says the improved version is available now.

Quest makes its own quantum leap

At last, someone has taken an interest in the QL. Quest has made its own quantum leap by providing a CP/M system for it.

Also available will be a selection of disk drives, from a 200K floppy at £249 to a 7.5Mb Winnie at £395, some memory expansion cards (64K at £99 through to 152K at £499), and a storage box-cum-hand rest, to take the expansion cards and fill up that extra bit of desk space.

Running under CP/M, Quest will be marketing the Padmede range of business software packages as well as Tally 1 and Tally 2 running under QDOS.

The main product is the CP/M 68K operating system — very similar to CP/M 2.1. This is available on both cartridge at £79.50, and disk at £49.50. It includes a 68000 assembler, all the standard CP/M system commands, and a Compiler. To run the system you also need the so-called OS card and a 64K RAM expansion (cheapest working system, including QL, costs £577 excluding monitor and printer).

There is an advantage, as far as Quest is concerned as the OS card effectively becomes a built-in dongle (something QLS have made a household word).

The RAM expansion is needed because, for some reason, there is not enough room within the standard QL's

128K to fit CP/M and QDOS at the same time. The CP/M uses all the QDOS system calls and therefore incorporates most of the QL bugs, notably CTRL ALT 7.

The system can be used with Microdrive cartridge or disk and when used with the cartridge, the speed leaves much to be desired. One reason for upgrading to disks, perhaps.

Most Quest products are available by mail order (04215-66321). It hopes to have them in the shops for Christmas.

BBC RAM boards patents war heats up

The running patent battle between Aries and Watford Electronics continues (PCN issue 84).

It seems that the tables have been turned and instead of Aries taking possible legal action — Watford is threatening to do the same. In an official statement Mr Nazir Jessa, Watford's managing director, said: 'We refute any suggestions that Watford's 32K Memory Expansion System for the BBC Micro makes use of inferior components and circuitry.'

Components are sourced directly from at least two major semiconductor manufacturers and are full spec devices. Further, Watford Electronics' Memory Expansion System makes available an additional 32K of

RAM all of which can be used as a printer buffer.

'We are continuing to review all aspects of recent claims and statements made over the past few months and at this point we cannot rule out the possibility of legal action against Aries Computers.'



AT A TOUCH — PC users bogged down with the technicalities of using their quirky keyboard to use a word processing or spreadsheet package, can now use *Keypart 300*. At £224, Edoevres (01-429 2433) has produced a touch tablet which plugs into the analogue or games port of the IBM PC — but still leaves the keyboard free for use when needed. *Keypart* comes with a manual and system software, but if you want to simplify the use of packages like *Lotus 1-2-3* or *WordStar* — *Keypart* could help you out.

IN BRIEF

Apple has a new way of encouraging users to buy yet more Apple products — on the never, never. It is launching Apple Card, a credit card that can be used at any Apple dealer and gives you access to a £1,500 credit limit. And it is almost instantaneous. Just walk in to your local dealer, prove that you already have a valid credit card or cheque guarantee card and minutes later you can spend up to the £1,500 limit and pay the money back by easy instalments.

Spery has responded to the launch of the IBM PC AT and price cuts on the IBM PC XT by making price cuts of its own. The company says it is making ten per cent reductions on its hard disk personal computers to maintain their 'position as the leading competitive products in the marketplace'. You can judge for yourself. The Model 40 with 128K of RAM and 10Mb hard disk now costs £3,233. At the top end of the range, the Model 50 with high-resolution colour display will set you back £3,973.

Husky Computers is still producing new goodies for its Hunter hand-held micro. Latest release is a program custom made to hook the micro up to the Intel Comet electronic mail service. Further details from 0203-668181.

HOMEFRONT



Software houses encourage rip-offs

Some software houses are blatantly encouraging piracy.

I'll give you your attention I'll explain. Two years ago, when only the first syllable of Sir Clive's surname was a household name, tape loading problems — on machines with decent tape handling, at any rate — were few and far between. My own humble Spec-

trum, until its demise at the hands (hands? bauds?) of a particularly vicious Prism modem, loaded everything first time, with the exception of the Psion Flight Simulator.

But the good old days are definitely over. More and more of the souped up programs you meet now are practically protected to death, and all too often this makes loading such a fag that the most law-abiding citizen is impelled to rip the thing apart, file off the protection and produce something that loads a little more often.

I'll give you a couple of examples. The colour card that comes with Jet Set Willy seems, on the face of it, to be an excellent idea. Before you can play the game you must tell the computer what colour is at a given location on the card. The software house is happy, because counterfeiters too, making counterfeit the card too, making piracy more expensive, and the players are happy, because they don't have to deal with the more off-the-wall protection

methods.

Or are they? If you're colour blind you'd be right in thinking it's a daft idea, and if you've only got a black and white TV you'd probably be boiling mad.

But it's not the wrapping that's the biggest problem. Some recent releases use a fairly novel protection method which involves fozking some data into a location in memory, loading the program, then checking to see that the data is still there when the game's loaded.

Fair enough, you may think — if some rotter's written their own loader and omitted to do this they deserve everything they get. But there's a snag here, because part of the protection can often depend on what you poke into where, and if you poke into an area you might find a perfectly kosher version of the program checking the location, finding an alien body and... reset.

Another simple protection method involves filling up the machine's memory, whether

the main program does it or not, then checking the non-functional areas for things that look like cracker programs. 'Allo,' says your micro as it finds a sound box/Interface 1/Centronics interface, 'this bloke's a pirate.' It then pulls the plug, and you've got to undo all your kit before you can load the game.

This, in particular, shows a cavalier disregard for the user's needs. If you can't connect add-ons permanently you're not going to be able to use your micro to its fullest potential, and as far as Interface 1 is concerned this can be a major problem. It's over a year since the Microdrives first came out, yet software houses are still producing games that have Microdrive incompatibility built in.

Sure, it's an easy protection method for them, but it's a king-size headache for everyone else, and I'd be inclined to think that they in particular deserve everything they get.

John Lettice

Ocean finds out what's in a name

Ocean plans to profit from the high reputation earned by Imagine games and will use the name to market arcade-type games. The Ocean logo will be used for other types of games, as well as utilities and educational packages.

Ocean's Imagine purchase goes further than the name, as the company hopes to release an arcade/adventure game from the Imagine programming team which would have brought you the 'mega-game', *Bandersnatch*.

Ocean has tied up a number of deals which seem to ensure future success. The company is to translate top-selling games such as TLL for the Spectrum and will convert a number of US Commodore 64 chart toppers for US Gold.

In a deal with TV AM, you'll soon be able to play Roland's *Rat Race*, and *Airwolf* will be available from November 15, to tie in with the TV series of the same name.

As well as these contractual arrangements, Ocean is shortly to release *The Hunch Is Back* and *Kong Strikes Back* — follow-ups to earlier successes this year.

● Beau Jolly may be seen to be marketing games under the Imagine banner, but in fact only bought the rights to a certain number of games. The last to be released was *Mega-Vault* on the Vic 20 (PCN issue 83), and now Beau Jolly has only *Arcadia* for the Dragon to release. Apparently, Beau Jolly is obliged to pay royalties to

Ocean for these. The company has recently negotiated with the budget games company *Mastertronic*, which is to distribute *Beau Jolly Valuepacks* (compilations of six best Imagine sellers).

Agency promises to help programmers

Budding super-star programmers can get advice from a new service run by Computer Connections.

The company is running an agency service for programmers that will evaluate programs, negotiate contracts with software houses, advise on improving programming techniques and offer out conversion work.

It is offering incentives to programmers who produce innovative and imaginative programs, with a Mediterranean holiday for two as the top prize.

'Our priority is to ensure that all our programmers receive the optimum terms that can be formulated,' said managing director, James Morris.

Further information from Computer Connections, Barrow House, 70 Rhodes Avenue, Pleckgate, Blackburn, Lancs.

Unfair ad puts Oric in hot water

Oric Products International has had its wrists slapped by the Advertising Standards Authority (ASA) over its advertising campaigns earlier this year.

In a comparison with the Commodore 64, Oric was claiming its Atmos 48K computer had more memory than the 64, as the 64 'loses' 26K of its

'Elephantine' memory in high-resolution graphics.'

Upholding a complaint against Oric, the ASA said Oric didn't say that the 64 provides 58K of usable memory when using machine code. Also when programming in Basic, the 64 allows high-resolution graphics to be placed underneath the operating system 'ROM', leaving the available Basic memory unaffected. So the latter is always greater on the 64 than on the Atmos.

In response to the ASA decision a spokeswoman from Oric said: 'This advertising campaign is no longer being run so it isn't relevant.'

Commodore kit for schools quiz

A total of £12,000 worth of Commodore equipment is up for grabs in a 'Top of the Form' knockout competition for

schools around the country.

The British Computer Society Schools' Computer Quiz, sponsored by Commodore, is a chance for the company to get its foot into classrooms, which are already dominated by BBCs and RMLs.

To enter the competition a school must select a team of three pupils — one under 17, one under 16 and one under 15. A total of 16 schools are selected to enter each local branch heat and then the winning teams compete in eight regional finals, with the victors going forward to the national final to be held at Reading University next July.

Each school will be offered the use of two Commodore 64 systems for three months. And the overall winners will receive Commodore Computers and disk drives worth £1,600. For further information contact BCS 01-637 0471.



FIT TO PRINT — Sharp 700/800 micro users can link up to all Epson dot matrix printers with this E79 interface board. Main attractions are software compatibility and direct printing of all Sharp graphic characters. The 8,000 character buffer shouldn't come amiss, either. The device slots into the printer, comes with a 1.5 metre cable, and is available from main dealers. Details from Mills Harris on 024262-341.

VIEW FROM JAPAN



MSX critic may yet eat his hat

I never realized till now how difficult it is to write a column with a foot firmly planted in the mouth. Fortunately, in Japan, we take our shoes off at home, so it could be worse.

Why, exactly, is it that I feel I've dashed myself up a healthy serving of humble pie? What else but MSX, a subject I've

denigrated in this column from time to time. It's a good idea that an international standard that provides for compatibility of software and peripherals among manufacturers subscribing to that standard) extremely poorly executed (8-bit utilising a Z80 compatible cpu while the rest of the world is going for a new generation of processors), said I.

What has made me suddenly feel MSX isn't such a bad thing after all? First, my wife and eldest child have got it in ROM that they need a computer and software more geared to their interests. With its dozen or so manufacturers, MSX is competitively affordable (at least, in Japan) and offers lots of software.

The second reason, which ties into the affordability issue, is that I visited one of the propo-

nents of MSX, Sony, to get their side of the story. 'Hmm. Very interesting.'

MSX computers, unlike their predecessors, are not the brainchild of engineers — they are the brainchildren of marketing people. And as such, in the words of one of the men I spoke with, should be regarded as the people's computer, just as the German Volkswagen made its mark as the people's car. (In its early years, one of the US ads for it had the headline 'Lemon'. The body copy proved it wasn't. So did the people.)

As a 'marketing product' some 500,000 units will have been shipped to retailers in Japan in just over a year. Sales figures show that as far as Japanese consumers are concerned, the MSX is no lemon either.

For the UK, Sony has also

commissioned some 40-50 titles from UK software suppliers in addition to adapting another dozen or so Japanese games, so the units will be launched with good support.

Distribution (a pattern I expect other manufacturers to follow) will be through the existing outlets for video products and through mass merchandisers, computer stores and photo retailers.

So, once the initial purchase of the cpu is made (the monitor can be a conventional TV), there should be many opportunities for the spontaneous purchase of peripherals such as a micro floppy drive, wired or wireless joystick, datacard, or four colour plotter printer, not to mention software cartridges (thanks to compatibility, all either Sony's or someone else's).

Serge Powell

CHARTS

As featured on Radio 1's
Saturday morning Chip Shop.

GAMES

TW	LW	TITLE	PUBLISHER	MACHINE	PRICE
1	1	Daley's Decathlon	Ocean	SP, C64	£7.90
2	8	Jet Set Willy	Soft Project	SP, C64	£5.95
3	2	Beach Head	US Gold	SP, C64	£9.99
4	3	Elite	Acornsoft	AC	£15.00
5	5	Sherlock Holmes	Melbourne	SP, C64	£14.95
6	6	Pjyamarama	Microgen	SP	£6.95
7	4	Zaxxon	US Gold	C64 AT	£9.95
8	11	Avalon	Hewson	SP	£7.95
9	10	Combat Lynx	Durell	SP, C64	£7.95
10	12	Kokotoni Wilf	Elite	SP, C64	£6.95
11	9	Full Throttle	Micromega	SP	£6.95
12	15	Monty Mole	Gremlin	SP, C64	£7.95
13	13	Lords of Midnight	Beyond	SP	£9.95
14	7	Int'l Soccer	Commodore	C64	£9.99
15	18	Dark Star	Design	SP	£7.50
16	—	Battlecars	Games Work	SP	£7.95
17	—	Zombie Zombie	Quicksilva	SP	£6.95
18	—	Frank N Stein	PSS	SP	£6.95
19	—	Falcon Patrol II	Virgin	C64,	£6.95
20	—	Delta Wing	Creative	SP	£7.95

SPECTRUM

TW	TITLE	PRICE
1	Decathlon	£9.99
2	Beach-Head	£9.99
3	Sherlock Holmes	£14.95
4	Pjyamarama	£6.95
5	Avalon	£7.95
6	Combat Lynx	£7.95
7	Full Throttle	£6.95
8	Kokotoni Wilf	£6.95
9	Lords of Midnight	£9.95
10	Dark Star	£7.50

COMMODORE

TW	TITLE	PRICE
1	Jet Set Willy	£5.95
2	Zaxxon	£9.95
3	Decathlon	£9.99
4	Int'l Soccer	£9.99
5	Beach Head	£9.99
6	Falcon Patrol II	£6.95
7	Summer Games	£14.95
8	Monty Mole	£7.95
9	Pitfall II	£9.99
10	Havoc	£9.95

MICROS

BELOW £1,000

TW	MACHINE	PRICE
1	Commodore 64	£199
2	Sinclair Spectrum	£125
3	BBC B	£399
4	Amstrad	£330
5	Electron	£199
6	Vic 20	£140
7	Atari 800 XL	£169
8	Oric	£99
9	Memotech	£199
10	Einstein	£499

ABOVE £1,000

TW	MACHINE	PRICE
1	IBM PC/XT	£2,390
2	ACT Apricot	£1,760
3	Compaq	£1,795
4	Sirius	£2,525
5	Televideo TS1603	£2,640
6	Wang Pro	£3,076
7	NCR Dec Mate V	£1,984
8	Apple 3	£2,755
9	HP 85	£1,917
10	Dec Rainbow	£2,359

These charts are compiled from both independent and multiple sources across the nation. They reflect what's happening in high streets during the week up to October 25. The games chart is updated every week. The prices quoted are for the no-frills model and include VAT. Information for the top-selling micros is culled from retailers and dealers throughout the country and is updated every month. PCN Charts are compiled exclusively for us by RAM/C, who can be contacted on 01-892 6596.

BYE

SPECTRUM		COMMODORE 64	
GAME	OUR PRICE	GAME	OUR PRICE
DARK STAR	7.90 5.90	ZMSALABIM	9.95 6.99
KOKOTONI WILF	6.95 7.15	ESTRIPPOK	8.95 7.50
DAILY THOMPSON DECATHLON	6.90 5.25	BLACK HAWK	7.95 5.50
BEACHHEAD	14.95 10.50	PITFALL II	9.95 5.50
WHEEL LIGHTNING	14.95 10.50	ASTEC	8.95 7.25
SHERLOCK HOLMES	14.95 10.50	AMN	8.95 7.25
HOBBIT	14.95 9.99	WARLOCK	8.95 7.25
MULE	9.95 7.99	HOBBIT	14.95 9.99
MISQY	14.95 9.99	TALES OF ARABIAN NIGHTS	7.95 5.50
GARRI WOLF	9.95 7.99	DAILY THOMPSON DECATHLON	7.95 5.50
LOGS OF MIDNIGHT	6.95 6.99	HORNO	7.95 5.50
JACK & BEANETS	5.95 4.50	BEACHHEAD	9.95 7.75
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(Mediterranean Goddesses)"
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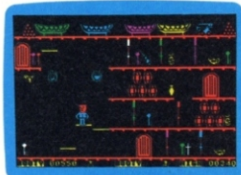
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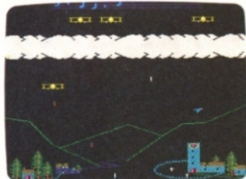
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RANDOM ACCESS



Has anything we said struck you as outrageous or worth fulsome praise? Let us know how you feel about the issues covered in PCN. Air your views in this column — and you could earn £15 for the best letter of the week. Don't hesitate — send your words of wisdom to: **Random Access, Personal Computer News, Evelyn House, 62 Oxford Street, London W1A 2HG.**

Sweet solution to storage problem



At last! The problem of convenient storage of Microdrive cartridges is no problem. For those programmers with a refined taste in chocolates the interior of a 200g box of Bendicks Bittermints provides an ideal environment for the storage of eleven cartridges.

It is, however, advisable to eat all the chocolates before using the box in its new role.

In the small hours of the morning one can come perilously close to pushing a peppermint cream into the eager mouth of the Microdrive itself — a deplorable waste of good chocolate.

John Alderson,
Richmond, N Yorks.

Tasty idea — here's fifteen quid for more chocolates and cartridges — Ed.

Whatever next — HMS IBM?

In your October 6 issue you stated on your software Preview page that British Telecom has established its own software house called Firebird. I would like to know why British Telecom is going into software, especially at a time when it is about to be privatised.

If it were already privatised, then it would be acceptable as an expansion. If it were only selling its software via Prestel, Micronet, etc. it would also be acceptable, as these use the telephone lines.

I don't mind private companies entering the micro market but British Telecom and the BBC are state-owned companies established to operate telecommunications and to broadcast information. They were never intended as computer makers or software houses.

If this carries on, British shipbuilders will be producing IBM compatibles next!
Allan Kelly
Birkenhead, Wirral

So what do you care as long as they make money and turn out a decent product — Ed.

Amstrad comes up trumps with me

I'm writing with regard to Alan Sturges' letter (issue 83) about his choice of computer. I'm not doubting the standard of the MTX 512, however I feel his attack on some of the other computer manufacturers was a little below the belt.

From the way he tells his story, he primarily rejects the Electron and the BBC from his shopping list, because Acorn did not send him any literature on its machine. A rather harsh decision on all counts.

This then reduced his list to the Amstrad and the MTX 512, as these manufacturers did send him information.

So then he wrote again, but sadly no information arrived. After this he believed Memotech was the only company committed to its products. Another harsh decision as 'Amstrad has rounded off its line of micro products by launching a dot matrix printer for the CPC-464 and DDI-1 disk units ... Amstrad will deserve another pat on the back for the pace at which it is producing add-ons for the CPC-464.' — PCN the same week.

Not only this, but it has an excellent user's club, with a first class magazine. Maybe Alan did have a bad experience with Amstrad, but like thousands of other Amstrad users, I've found it came up trumps.

Simon Veryard,
Chiddingfold, Surrey.

Newbrain users have plenty of power

I agree with Robert Harvey (issue 81) that industry standards are a good idea, though I don't think much of MSX. Its benefits are more to software and hardware houses than to computer owners.

But I must take him to task for including Newbrain in his list of machines that suffer for want of an industry standard system to run. Both 32K and 96K Newbrains can run that industry favourite CP/M. The disk system is standard, with frills, and any disk format can be accommodated — OPEN # STREAM knows of users with Sony 3.25in drives as well as the many thousands running CP/M 2.2 on standard 5.25in floppies.

The current list of hardware for Newbrain on sale in the UK includes EPROM/ROM boxes, RS232C to Centronics adaptors, joysticks, 64K paged memory expansions (still in current production) disk controller modules, speech synthesis and network control modules.

For software, a substantial range of professional and leisure programs exists including over 3Mb of public domain software distributed by the OPEN # STREAM user group.

Finally, there are two flourishing user groups in the UK, one in Holland, five in Denmark and one each in France and Italy.

Phillip Crookes,
OPEN # STREAM, Bromley.

Software range should be extended

Having read your open letter to Acornsoft, regarding *Elite* and while wholeheartedly supporting the point you make, will this policy apply to all micros?

For a long time now, owners of BBC (and more recently, Electron) micros have watched many programs zipping up the charts, having in most cases that 'nose pressed up against the window' look.

When a program appears that all micros users would enjoy, exclusively for one or two micros, will PCN use its influence to recommend to the appropriate software house to extend the range of the program over a number of micros, in the form of further 'open letters' and not only when BBC and Electron users seem to have a winner?

Steve Carter,
Gillingham, Kent

Yes, we will apply the same principle, although in many cases this is redundant since software houses generally produce versions for the popular machines — Ed.

Now here's a bright idea

Judging from your advert for programs and articles from readers, it would seem that you are in desperate need of such items.

I, therefore, suggest that you devote a page each week to ideas, where readers could write in stating what sort of games, utilities etc, they would like to see included in PCN.

The programmers among us would then be able to write the programs knowing that there would be a demand for them.

D Bailey,
Folkestone, Kent.

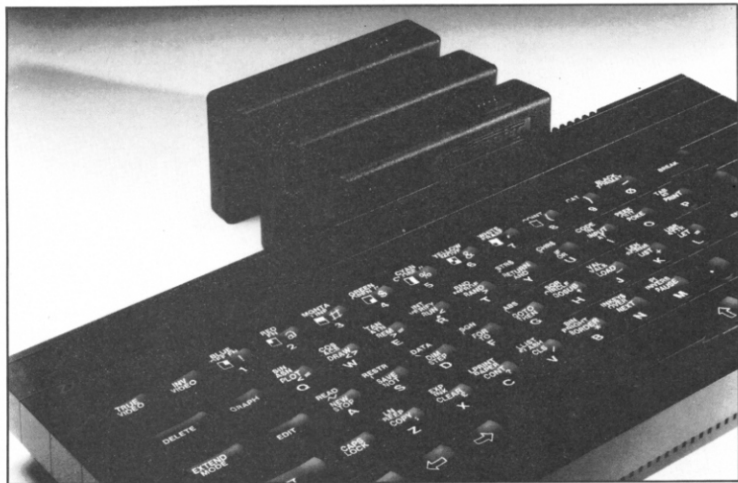
PS — How about more reviews, both software and hardware, for the Electron. If you are short of Electron reviewers, then maybe I could offer my services.

It's not reviewers we're short of but products — and conversions from other machines aren't new. On the 'ideas' idea, what do other readers think? — Ed.



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Choosing a disk system for the Beeb

Q I am a very satisfied owner of the BBC model B, but I am fed up with waiting for adventure games to load.

A I have decided to get a disk system for my BBC as I could then use this for keeping accounts as well as loading adventures. I am unsure of which one to buy so could you please help me out? I am prepared to spend up to £250 on the right system.

*Mark Beynon,
Pontypridd, S Wales*

A Before you get your drives (or drive) you will need to get a disk interface fitted to your BBC.

There are a number of these available including those by Acorn, Waford and Amcom. Of these the Acorn disk interface is probably the most common and the more limited, allowing only 31 files per disk. The disadvantage, at the moment, of the others is that some Acornsoft programs will not run under them, notably Elite. The cost of the interface varies between £80 and £100, including fitting. This leaves you about £150 for your drive.

The advantage of the BBC disk interface is that it uses the 8271 disk controller and so allows a number of different drives to be attached to it. The different makes available include Canon, Teac, and Cumana, but there are a few others.

For a single 100K drive you can expect to pay around £140, but you may be able to come to some arrangement with the dealer who fits the DFS. The thing to remember is you may need help, and a format disk from your dealer.

A format program is something you will certainly need for your disks. If you buy Acorn's complete system (including disk drive) then you will get one of these with it. Alternatively, you may be able to buy a Cumana format program (much prettier), or somebody else's.

Boiling it all down, you need a disk interface, a disk drive (from the range compatible with the BBC), and a format program. The latter may be available on disk or ROM, and you should be able to get all this for just under £250.

Can I build my own Sinclair computer?

Q My son wants to build a small computer and thinks the Sinclair ZX81 or Spectrum is available in kit form. Is this so?

*K Hierom,
Middlesbrough, Cleveland*

A Neither of the Sinclair machines is now available in kit form, although there are several machines that are. One of the best is the Microtan from Microtan Computer Systems in Dulwich. Phone them on 01-693 1137.

The main board starts at around £60, keyboard at £80 with further expansion options available including memory boards, colour graphics and disk controller.

Software search for Oric Atmos

Q Does Solo Flight from US Gold run on the Oric Atmos? Will Combat Lynx from Durell run on the Atmos?

A Finally, can you give me the address of Downsway, which makes a programmable joystick interface for the Atmos?

*Francis Rafferty,
Belfast*

A Solo Flight has not appeared in a version for the Atmos and appears unlikely to do so. You're in better luck with Combat Lynx, though. A version for the Atmos is promised, although we haven't seen one yet.

The last address we have for Downsway is Downsway House, Epsom Road, Ashted, Surrey, but it's been quiet for a while so we would advise you to check things out before sending any money.

Error message under CP/M on the C64

Q I recently bought the CP/M cartridge for the Commodore 64. I have been trying to write a very small 8080 assembly language program with no success.

A I continually get various error messages which do not appear in any book on CP/M.

A Can you give me a step-by-step guide on entering and executing an 8080 assembly language program

and where I can store it in memory? Also can you tell me where I can get CBasic to run on my 64?

*Nigel Shore,
Billingshurst, W Sussex*

A Starting from the bottom, we know of no software whatsoever which is available under CP/M on Commodore disk format. This was always likely to be the fatal fault with the CP/M cartridge.

Your best bet is to get in touch with a user group. The last address we had for the UK CP/M Users Group was Lesley Spicer, 11 Sun Street, London EC2M 2QD. You could also try Jack Cohen, secretary of the Independent Commodore Products User Group, at 30 Brancaster Road, Newbury Park, Ilford, Essex IG2 7EP.

When we reviewed the CP/M cartridge we had absolutely no trouble in executing Z80 programs entered from one of the standard CP/M reference books, and found the cartridge manual perfectly adequate. So, we'd advise you to contact the organisations above for their advice.

Plotting dumps on a 1520 printer

Q I recently bought a 1520 printer/plotter for my Commodore 64. Is it possible to dump a text screen to the printer, and how about a graphics screen?

A I would also like to buy a monitor/assembly to learn machine code.

Q Can you recommend one?

*L Sanderson,
Aston, Birmingham*

A Dumping text screens is fairly simple. Just PEEK the screen locations, convert the screen code found to its CH# equivalent, and print it.

Dumping graphics screens is much more difficult — and virtually impossible on the 1520. The trouble is that computer displays are generated by a series of dots while your printer/plotter generates the image as a series of lines. If the graphics screen is line drawings it should be fairly easy to convert the program creating the image to send it to the printer instead of the screen.

As to assemblies, one of the best is Commodore's own macro assembler on disk. If you don't

have a disk drive, try the Mikro cartridge from Audiogenic (0734-664646).

Obtaining book rights for your own game

Q I have read a few good books in my time and since I own a computer I am interested in how I can get the rights to them. For example, if I wanted to make a game out of The Phantom Tollbooth, who do I consult?

*J Reichental,
Rathgar, Dublin*

A There's no clear cut answer to this, since copyright can belong to different people. Indeed, some rights belong to one person while others belong to ... others.

Generally, copyright starts out in the hands of the author. When a book is published, all or only some rights will be handed over to the publisher. Film rights may go to someone else, and so on.

Your best bet initially would be to contact the publishers of the books you're interested in and find out who owns the rights to license a computer game.

Adding text to a TV picture

Q Is there any way with a ZX81 to superimpose the text output on to a television screen while still maintaining the normal picture?

*D Morris,
Cheshford, Essex*

A Yes and no. Helpful, aren't we? Yes it can be done but neither easily nor cheaply. Television companies do it all the time for fancy effects but they have lots of electronics wizards and comparatively unlimited budgets.

You start by having your television signal and computer signal completely synchronised, then have the computer count down to the point on the screen where its output is to be displayed, flip out the TV signal, flip in the computer signal, count to the end of the computer display, then swap signals again. Of course, all this happens in a split second so it appears instantaneous. However, as you probably realize, you need some fairly sophisticated electronics.

MICROWAVES



Have you any stunning routines that you can pass on to other readers? Share your hints and tips through our weekly Microwaves column. If your tip is printed, you get £10 and there's a £50 cheque waiting for the best Microwave of the Month. Send them to Microwaves, Personal Computer News, Evelyn House, 62 Oxford Street, London W1A 2HG.

Voice your data on the Spectrum

Does your heart sink when you confront those long lists of decimal data (such as machine code) that you suspect may well have been mistyped? The arduous task of checking the data is a daunting prospect.

If, however, you have a ZX Spectrum and a Currah Micro-speech unit you can use this

program to read out the data to you. This saves much eye and neck strain, or means you can do without a second person to read the data statements out to you.

This program shows one of the serious uses of the Currah Speech unit. Note that the delay in line 10 (set to 100) can be changed to suit you.

P Broadbent, Edinburgh.

```

10 LET keys=0: LET delay=100
20 DIM a$(10,12): FOR i=1 TO 1
0: READ a$(i): NEXT i
100 INPUT "start address";start
t
110 INPUT "finish";finish
200 FOR i=start TO finish
210 LET contents=PEEK i
220 LET b$=STR$(contents)
230 PRINT i;" ";contents
240 POKE 23692,255
250 LET c$=""
300 FOR j=1 TO LEN b$
310 LET d$=CODE b$(j)
320 LET c$=c$+a$(cd-47)
330 IF c$(LEN c$)=" " THEN LET
c$=c$(1 TO LEN c$-1): GO TO 330
340 LET b$=b$(2 TO )
350 NEXT j
360 LET c$=c$
400 PUSE delay
410 NEXT i
500 PRINT "specified block proc
essed"
510 INPUT "more? (y/n)";y$: IF
y$="y" THEN GO TO 100
1000 DATA "z(ee)ro", "won", "(tt)
00)", "id(th)r(ee)", "f(ower)", "f(ii)
v", "s(iks)", "seven", "(aa)tu", "(nn)
(ii) (nn)"
    
```

250-letter WP for your Oric

This routine for the Oric 1 or Atmos produces a useful, even if rather crude, word processor.

It allows you to type 250 characters onto the screen, which you can then check and

edit. You are warned that you have typed 250 characters with a ping. The words will then be passed to a printer when you press the return key.

The routine may also turn out to be easily convertible to other machines.

John Williams, Taff's Well, Mid Glamorgan.

```

10 B$=""
20 GETA$
30 IFA$<>CHR$(127)GOTO60
40 PRINTA$;
50 X=LEN(B$):B$=LEFT$(B$,X-1):GOTO20
60 IFA$=""GOTO20
70 PRINTA$;:B$=B$+A$
80 IFLen(B$)>245THENPING
90 IFA$<>CHR$(13)GOTO20
100 LPRINTB$
110 PRINT
120 GOTO10
    
```

Lining up on the Spectrum

This is a simple program for the Spectrum which when merged with an existing program will enable you to LLIST a range of program lines to the printer instead of having to print the whole program. This will help you print out a particular routine or split up a program listing to mount in a book.

9905 defines a function p for extracting a two-byte number with the most significant byte first plus a function n for the same thing but with the least significant byte first.

9907 the start and end of the Basic program is obtained from the system variables.

9910 asks for starting line number and checks for invalid entry.

9935 start of main printing loop

```

9900 REM LINE LISTER
9905 DEF FN p(n)=PEEK n+256*PEEK(n+1): DEF FN
n(n)=256*PEEK n+PEEK(n+1)
9907 LET prog=FN p(23635): LET vars=FN p(23627)
9910 CLS : PRINT "LINE LISTER";INPUT "START
LINE=";LINE$: IF NOT LEN a$ OR VAL a$<1 OR VAL
a$>9999 THEN GOTO 9910
9915 LET start=VAL a$: PRINT AT 2,0;"START";start
9920 INPUT "STOP LINE=";LINE$: IF NOT LEN a$ OR VAL
a$<1 OR VAL a$>9999 THEN GOTO 9920
9930 LET stop=VAL a$:PRINT AT 2,16;"STOP";stop
9935 IF prog = vars THEN STOP
9940 LET line=FN n(prog): PRINT AT 4,0;"LINE";line:LET
length=FN p(prog+2): IF line=start THEN LET
prog=prog+length+: PRINT AT 4,16;"SKIPPING"; GOTO
9935
9950 IF line=stop THEN STOP
9955 PRINT AT 4,16; INVERSE 1;"ASSEMBLING";PRINT
9960 DIM l$(length+4): LET x=LEN STR$(line:LET l$(4-
x+1 TO 4)=STR$(line)
9965 LET z=5: FOR x=1 TO length-1
9970 LET y=PEEK (prog+x): IF y=14 THEN LET x=x+5:
LET l$(x+1 TO LEN l$-6)=GOTO 9960
9975 LET l$(x+1)=CHR$(y):LET z=z+1
9980 NEXT x:PRINT AT 4,16;"PRINTING ";PRINT l$(1 TO
z-1):LPRINT l$(1 TO z-1): LET prog=prog+length: PRINT
AT 6,0; OVER 1: LET TO 2-1): GOTO 9935
    
```

9940 the next line of the Basic program is read, the line number is extracted and displayed, the length is obtained from the next two bytes and the line is skipped if it is less than the start line number.

9965-9976 this routine copies the print image of the line into the array, dealing with the Spectrum's format for a numerical constant using CHR\$(14).

9980 signals that the line will now be printed.

Type in the program and save it to tape. Then load the program you want to list and merge the LLIST program. RUN 9900 or GOTO 9900 will preserve any variables. If after printing some of a program, you want to list some later lines, use GOTO 9910 to specify new start and stop lines.

David R Parker, Hemel Hempstead, Herts.

SX 64 screen signal taps into video

I have discovered that in addition to using the small screen provided with the Commodore SX 64, it is possible to view the screen on our TV set via a Sanyo video recorder.

This is achieved with a standard combined sound and vision lead, and a BNC connector.

Attach the connector to the Video In socket at the back of the recorder. Place the 5-pin

DIN plug from the cable into the video socket on the SX64. The two phono plugs go into the BNC and Audio In socket on the recorder.

You should now have both sound and vision output from the computer to the TV set. But you must switch the Tuner/Ext In switch to Tuner In.

You can also record signals output from the SX 64 on to video tape.

W Lovelock, Bangor, Guynedd.

Congratulations

Mark Williams of Ashton in Makerfield, Wigan wins £50 for his useful Microwave about

sounds on the Oric and Atmos (PCN 81), which has been chosen as the Microwave of the Month for October. Could you be next month's winner?

R EADOUT



'Understanding and Using dBase II' by Rob Krumm, published by Brady Communications at £21.55 (paperback, 308 pages).

Learning to use dBase II must be a major headache for many businesses these days, otherwise why would so many books on the subject be flooding the market? If you are faced with the problem of mastering this complex, user-unfriendly program you could do worse than reach for Mr Krumm's book.

The author has managed to break down his gargantuan subject into small, easily digested sections. His style is lucid as he takes the reader through creating files, entering data, editing, sorting and much more.

I found I learned a lot just from the first chapter without

having the program to practice on. But by the middle of the second chapter my memory was overloaded with more than 20 commands.

And this is an inherent fault of dBase II. It is undoubtedly a powerful and versatile database, but more than that—it is a programming language in itself. This becomes particularly apparent when dealing with command files. These are thinly disguised programs the user can set up to deal with frequent operations. If properly implemented this facility can be extended to develop menus and make dBase II easier to use by customising it to the user's business needs. But what a slog to get there.

dBase II has the potential to be a great database but not while a trainee must consult a long list of commands to finish even the smallest task. But I strongly recommend this book.



'The Commodore 64 Collection' by Roger Valentine, published by V&H Computer Services at £4.95 (paperback, 162 pages).

Books of programs are still the most common and most popular

buy. This one starts out with better aspirations than most, and aims to help you program and understand programming, as well as giving you 50 routines to try your hand at.

Some of the programs, however, turn out to be the sort best left on the shelf. Their usefulness is as a learning aid for they seem to perform otherwise quite useless tasks—why have a quiz to see if you can remember the 128 PEEK and POKE codes on the 64 when there's a perfectly good table of them on pages 132-134 of the user manual?

As with many books of this type, it looks like it has been set on a daisywheel, and the programs have been spooled out to a dot matrix printer. It may lend a certain authenticity to the work, but it's not so easy to read. The tacky chapter headings (Play it again, Sam and Kids' stuff) don't help either. Fortunately, delving deeper reveals some useful programs, including an effective disk or cassette based cardbox system.

As a programming primer this is one way to approach the subject (and get results), but it's not a book of programs that might save you the cost of a piece of software. **PL**



'Computer Terminology Explained' by I D Poole, published by Bernard Babani at £1.95 (paperback, 81 pages).

If you've been baffled by words such as buffer, memory map or bus driver this concise computer dictionary should help.

Mr Poole unravels the meanings of the computer words you're mostly likely to come across when you first dive into the micro arena.

Stretching from A for absolute address to Z for zero suppression, brief explanations of many useful terms are given. For instance 'Debug— to remove the errors or bugs from a program'. In addition, there's a reference guide to the more common Basic commands for most micros.

The author has tried to cram in as many useful words as possible. But there's a lot of wasted space which could have been put to better use.

I suppose at £1.95 this isn't such a bad book. But unlike a dictionary I don't think you'll pick this book up too often unless you become familiar with micros. **SG**

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SURVIVAL OF THE FITTEST

Super-sleuths with an eye for a challenging adventure will find *Survival*, by E H Wilson more than a match for their wits. Here we set the scene and give a few background notes: next week, we'll run the rest of the program.



You will have to be both courageous and intuitive to embark on this action-packed adventure for the Commodore 64.

In *Survival*, written by E H Wilson of Lyngine in Kent, you are flying above a tropical rain forest when a bright flash of light from a small clearing below catches your attention. Unable to resist the temptation to do a bit of mystery-solving, you circle the area until you spy a small clearing large enough to land in. However, visibility is not good as a dense

mist has enveloped the forest. Too late, you realise that you have misjudged your landing. Your plane plummets to the ground...

When you regain consciousness, you are slumped over the controls, badly bruised and with a very painful headache. Apart from this, you are amazingly unscathed. Clambering out of the plane you notice it is very badly damaged and you will need some help to get it going again.

Luckily, your radio is still operational

and you manage to get an SOS through to base.

Help is on its way. In the meantime, you sit back to rest your weary head. As you lie there you remember the reason for attempting to land, the flashing light, and despite the need for rest you set off to investigate...

Program notes

2-6

Initialise variables

8-28

Subroutine called each time a command is required. A

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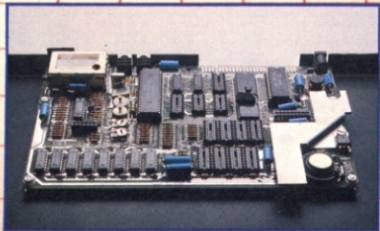
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COMPACT: COMMODORE 64

◀ 13

deals with the verb
 114-854 Cover all the verb routines. These are looked at in association with the noun and location or any other relevant factors
 114-120 Quit routine. Will save your progress so far

122-128 Help routine
 130 Look routine
 132-140 Inventory routine. If relevant variable within interger array set to 1 then the object is in your possession
 142-144 Score routine. If you've only

146-178 Drop routine. Sort out duplications, check that you have the object and go to appropriate action for dropping certain objects in certain rooms. Object number

16 ▶

```

318 00S0B56
320 IFND<37>DORND<37>BTHENPRINT<16> THERE'S
NOTHING HERE TO CLOSE<1>GOTO100
322 IFND<ANDOR>1THENPRINT<16> THE FORCE
OF WATER PREVENTS IT CLOSING<1>GOTO100
324 IFND<ANDOR>1THENPRINT<16> IT'S ALR
EADY CLOSED, NINCOMP<1>GOTO100
326 IFND<3BANDD0>1THENPRINT<16> IT'S AL
READY CLOSED, FOOL<1>GOTO100
328 IFND<3BANDD0>1THENPRINT<16> THE DOOR
CLOSES<16>P<147,1>=0<08<131>=C
330 IFD<0THENDOR>1361=>A CLOSED DOOR<
332 GOTO100
334 IFND<0THEN69
336 IFD<0N1<><ANDOR>3THENPRINT<16> Y
100 HAVEN'T GOT IT<1>GOTO100
338 IFND<3THENOSUB1296A>GOTO100
340 IFND<2THENPRINT<16> DION'T YOU REMEB
ER HOW IT DIED?<16>Z<22-108<12>=0<050B1
290GOTO100
342 IFND<33THENPRINT<16> BLECHHH, <N1
OT A GOOD IDEA,<1>GOTO100
344 PRINT<16> WRRR...LOVELY<16>
346 PRINT<16> THE ROCK DISAPPEARS IN A
AZE OF INDI- GESTION, SHOWING THE WAY A
HEAD<16>
348 08<1321>=0<P<129,1>=29<GOTO100
350 IFND<0THEN69
352 IFND<3THENOSUB1296A
354 IFD<0N1<><1>THENPRINT<16> YOU'VE NOT
HING THAT HE WANTS<1>GOTO100
356 IFND<52THENPRINTAC<P<178,0>=77
358 ZZ<22-108<121>=0<GOTO100
360 IFND<0THENPRINT<16> DRINK! WHAT?<1>GOT
0100
362 00S0B56
364 IFND<0THENPRINT<16> EHM?<1>GOTO100
366 IFND<12THENPRINT<16> YIEUCH...!08<1
121=0<08<111>=1<GOTO100
368 IFND<0THENPRINT<16> GIE LIE WIE L
01RISHT<16>RISHT<16>DOWNDOWN<16>DOWND<16>
LIE WIE GIE RISHT<16>DOWNDOWN<16>DOWND<16>
DOWND<16>GIE LIE WIE GIE 01, <E AMHNNH...!
08<101=0<08<111>=1<GOTO100
370 PRINT<16> SOMETIMES YOU CAN BE SO <
GIE LIE WIE PRINT<16> D<1>=1<GOTO100
372 IFND<0THENPRINT<16> DIFFER LIE WIE H<
LIE WIE T<1>=1<GOTO100
374 IFND<12THENPRINT<16> HEDGES<1>GOTO100
376 IFND<2ANDPC<79THENDOR>=61GOTO350
378 PRINT<16> IT WON'T WANT <E TIE HIE L
LIE T<1>=1<GOTO100
380 IFND<0THEN69
382 PRINT<16> OJOOD GRIEF! <E WHAT IS D<
LIE OJ YOU THINK YOU'RE DOING LIE HIE
01LIE W<1>=1<GOTO100
384 IFND<0THEN69
386 00S0B56
388 IFD<0N1<><1>AND<08<284<1>=1THENPRINT
<16> WHAT ON EARTH WIT?<1>GOTO100
390 IFPC<1>ANDPC<46THENPRINT<16> THERE
'S NOTHING HERE WORTH CUTTING<1>GOTO100
392 IFND<3THENOSUB1296A>GOTO100
394 IFND<0THENPRINT<16> THE TIMBER IS C
UT TO SIZE<16>08<140>=CUT TIMBER<16>10<10
GOTO100
396 IFND<042THENPRINT<16> POINTLESS!<1>
GOTO100
398 IFCL<2>THENPRINT<16> THERE'S NO POIN
T IN FLAILING ABOUT AT A RANDOM, IS THER
E?<1>GOTO100
400 PRINT<16> THE PARAG CUTS THROUGH TH
E HEDGE, <E HOWEVER THE WAY EAST<16>=
2
402 PRINT<16> HOWEVER, THE RUSTY BLADE S
HATTERS AT THELAST STRIKE, MAKING IT WOR
THLESS<16>
404 P<13,21>=1<08<1191>=13<22-108<11
91=>A FILE OF STEEL SPIKERS<1>GOTO100
406 IFND<0THEN69
408 00S0B56
410 IFD<0N1<><1>THENPRINT<16> YOU DON'T
[RVSON]<16>CIE HIE 01LIE P<1RVSON?> WITH
A PARAND<1>GOTO100
412 IFD<08<24<1>=1THENPRINT<16> WHAT WITH
?<1>GOTO100
414 IFND<04THENPRINT<16> THERE'S VERY L
ITTLE POINT IN LIE TIE HIE AIE T<1>=1<
GOTO100
416 IFBT<1ANDD0A>1THENPRINT<16> THAT'S TH
E LAST OF THE WOOD<16>08<140>=0<GOTO100
418 PRINT<16> CHOPPING TIMBER MAY BE YOU

```

```

R IDEA OF FUN,BUT IT'S NOT MINE, <E T3H
NK OF<16>
420 PRINT<16> SOMETHING TO DO WITH IT, PLE
ASE<1>GOTO100
422 IFND<0THEN69
424 00S0B56
426 IFND<022THEN434
428 IFD<0N1<><1>THENPRINT<16> YOU HAVE
N'T GOT IT, CLOT<1>GOTO100
430 IFD<0N1<><1>THEN08<122>=0<08<1231>=1
:PD=0:PRINT<16> THEN THERE WAS LIGHT<10
GOTO90
432 IFND<3231>0THENPRINT<16> IT'S ALREA
DY LIT, FOOL<1>GOTO100
434 IFD<0N1<><1>=1<08<131>=1<08<131>=1<08<131>=1
:JUBBING TWO LIE 010Y LIE S<10UTS TOGETHER
?<1>GOTO100
436 IFND<5THEN444
438 IFND<6THEN458
440 IFND<042THEN464
442 PRINT<16> IF YOU CAN SEE A POINT IN
<E TIE HIE AIE T<1>, YOU'RE ABIGGER LIE
8 THAN <E T<1> THOUGHT<1>GOTO100
444 IFPC<21THENPRINT<16> YOU'RE TOO FAR
AWAY<1>GOTO100
446 PRINT<16> THE BUILDING FLARES UP AS
IF IT WERE MATCH-WOOD, THE ASHES SLOW
ING<16>
448 PRINT<16> THE FOUR WINDS, <E THE
HEAT CRACKS THE MUD PATHWICH CRUMBL<
E
450 PRINT<16> DUST<16>DOWN<16>DOWN<16>DO
WND<16>DOWN<16>CP<22>P<121>=0<08<15>=0
452 FORR<10D0:IFD<0N1<>=21THENDOR<16>=22
454 NEXT
456 00S0B56:GOTO100
458 IFPC<30THENPRINT<16> THE OIL BLAZES
RAPIDLY, BUT NOTHING ELSE HAPPENS<16>10
GOTO100
460 PRINT<16> THE HEAT OF THE FLAME REL
EAS THE GHOST, LEAVING THE WAY OPE
N<16>
462 P<138,21>=3<08<1351>=0<08<161>=0<GOTO1
00
464 IFPC<30RCL<1351>=1<N3D POINT
UNTIL YOU KNOW WHERE YOU'RE GOING<16>
GOTO100
466 IFD<0N1<><1>THENPRINT<16> YOU'RE ALREADY
DONE THAT<1>GOTO100
468 PRINT<16> THE HEDGE FLARES UP QUICK
LY, SPARKS FLYING<16>IFWA<16>1THENPRINTE
X8<050B1298
470 PRINT<16> THE FIRES FINALLY BURN OUT
, EXPOSING A FAINT TRAC TO THE SOUTH<16>
472 IFWA<16>1THENPRINTPL<FOR<10D0:IFD<0
11>=2THENDOR<16>=0
474 IFWA<16>1THENNET
476 P<13,21>=1<08<111>=21<GOTO100
478 IFND<0THEN69
480 00S0B56
482 IFPC<2THEN492
484 IFPC<31THEN504
486 IFPC<220RCP<23THEND512
488 IFPC<30RCP<40THEND520
490 PRINT<16> THERE'S NOTHING HERE WORTH
CLIMBING<1>GOTO100
492 IFD<0ASANDC<46THENPRINT<16> DION'T
BE DAFT<1>GOTO100
494 PRINT<16> FROM YOUR VANTAGE POINT
THE WIND YOU CAN JUST SEE OVER THE HEDG
E<16>
496 PRINT<16> TJO THE SOUTH A FAINT TRAC
LEADS INTO THE FOREST<16>IN OTHER DIREC
T<16>
498 PRINT<16> THE JUNGLE IS IMPENETRAB
LE <E YOU CLIMB DOWN<16>C<16>1<GOTO100
500 IFD<0ASANDC<46THENPRINT<16> WHAT
FOR?<1>GOTO100
502 IFD<0N1<><1>=1<THENOSUB1296A>GOTO100
504 PRINT<16> YOUR VANTAGE POINT AT THE
TOP OF THE TREE GIVES A BREAKTAKING
VIEW<16>
506 PRINT<16> ON THE FAR HORIZON A THI
N PLUME OF SMOKE RISES FROM A NEAR-EXTIN
CT<16>GOTO100
508 PRINT<16> VOLCANO, <E TJO THE WESTA S<1
ML, CONICAL HILL RISES, ON THE SURMI
T<16>
510 PRINT<16> OF WHICH A CURIOUS BUILDING CA
N BE SEEN, IS YOU CLIMB DOWN<16>C<16>2<10
GOTO100
512 IFND<041THENPRINT<16> PLAINLY RIDICU

```

```

LOUS<1>GOTO100
514 IFPC<22THENPC<231>GOTO98
516 IFPC<23THENPC<221>GOTO98
520 IFND<03THENPRINT<16> EHM?<1>GOTO100
522 IFD<0N1<><1>=1<08<131>=1<08<131>=1<08<131>=1
:ERE<1>GOTO100
524 IFPC<53THENPC<481>08<131>=CP<1>GOTO98
526 IFPC<46THENPC<571>08<131>=CP<1>GOTO98
528 IFND<0THEN69
530 00S0B56
532 IFND<3THENOSUB1296A>GOTO100
534 IFND<30THENPRINT<16> YOU BURN YOUR H
AND, BUT HE IS IMPOSSIBLE MOVE<16>GOTO1
00
536 IFND<30THENPRINT<16> YOUR HAND PASSE
S RIGHT THROUGH<16>GOTO100
538 PRINT<16> WHAT ON EARTH'S THE POINT
OF LIE TIE HIE AIE T<1>=1<GOTO100
540 IFND<0THENPRINT<16> HE KILL LIE WIE HIE
AIE T<1>=1<GOTO100
542 00S0B56
544 IFND<3THENOSUB1296A>GOTO100
546 IFND<30THENPRINT<16>GOTO100
548 PRINT<16> YOU ARE NOT CARRYING ANYTH
ING POWERFUL ENOUGH, <E I THANK THE GOD
D<16>GOTO100
550 IFND<30THENPRINT<16> HIT LIE WIE HIE
AIE T<1>=1<GOTO100
552 00S0B56
554 IFND<3THENOSUB1296A>GOTO100
556 IFD<0N1<><1>THENPRINT<16> YOU HURT Y
OUR HAND, BUT NOTHING HAPPENS<16>GOTO100
558 IFPC<30THENPRINT<16> THERE'S LIE WIE
LIE HIE 010Y LIE LIE 010Y LIE LIE TIE H
LIE AIE T<1>=1<GOTO100
560 IFND<31THENPRINT<16> 08<108<171>=A P
ADLOCKED GRATING<16>
562 IFD<0N1<><1>THENPRINT<16> P<15,21>=511
08<171>=AN OPEN GRATING<16>GOTO100
564 IFWA<0THENPRINT<16> THE PADLOCK STILL
L HOLDS IT SHUT<16>GOTO100
566 IFD<0N1<><1>THENPRINT<16> MAKE LIE WIE HIE
AIE T<1>=1<GOTO100
568 00S0B56
570 IFND<32THEN482
572 IFND<16THEN590
574 IFND<3THEN486
576 IFND<3THEN802
578 IFND<31THEN110
580 PRINT<16> IS ANOTHER <E N3D<1>GOTO100
582 IFD<0N1<><1>=1<08<124<1>=1THENPRINT<16>
YOU HAVE THE TOOLS<16>GOTO100
584 IFD<0N1<><1>=1<08<131>=1<08<131>=1<08<131>=1
:YOU HAVEN'T THE MATERIALS<16>GOTO100
586 PRINT<16> 01, <E H<16>1<08<131>=CP<108<129
1=0<08<131>=PRINT<16> YOU NOW HAVE A LA
SSE?<16>Z<22-1
588 00S0B56
590 IFD<0N1<><1>AND<08<131>=1<08<131>=1<08<131>=1<08<131>=1
:PRINT<16> YOU NOW HAVE A LASROO<16>GOTO100
592 IFD<0N1<><1>=1<08<131>=1<08<131>=1<08<131>=1<08<131>=1
:PRINT<16> YOU ARE Y
O GOING TO HOLD IT TOGETHER<16>GOTO100
594 IFD<0N1<><1>=1<08<131>=1<08<131>=1<08<131>=1<08<131>=1
:PRINT<16> WHERE'S T
HE TIMBER?<16>GOTO100
596 IFD<0N1<><1>=1<08<131>=1<08<131>=1<08<131>=1<08<131>=1
:PRINT<16> DID YOU PRO
POSE TO KNOCK IN THE NAILS BARE-HANDE
D?<16>GOTO100
602 PRINT<16> A1 FINE WOODEN BOAT<16>:T<16>=1<08<131>=1<08<131>=1<08<131>=1<08<131>=1
:PRINT<16> THAT'S TH
E LAST OF THE WOOD<16>08<140>=0
604 00S0B56
606 IFD<0N1<><1>=1<08<131>=1<08<131>=1<08<131>=1<08<131>=1<08<131>=1
:PRINT<16> THERE'S N
O WOOD<16>GOTO100
608 IFD<0N1<><1>=1<08<131>=1<08<131>=1<08<131>=1<08<131>=1<08<131>=1
:PRINT<16> WITH WHAT
?<16>GOTO100
622 PRINT<16> THAT'S A FINE PAIR YOU HAV
E THERE<16>08<131>=CP<10A>=0
624 IFBT<1ANDD0A>1THENPRINT<16> THAT'S TH

```


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WISE UP ON WINDOWS

The QL's windows are easy to use and versatile once you understand them, which you will after reading this illuminating article by Tom Short.

One of the most attractive features of the QL is its ability to divide the physical screen into a number of 'mini-screens', or windows. The contents of these windows can be manipulated by using facilities available in SuperBasic. But before looking into QL windows it is worth describing how SuperBasic handles the physical screen.

There are two screen modes on the QL. In the lowest resolution mode, the screen is divided into 256x256 pixels and can display eight distinct colours (black, blue, red, magenta, green, cyan, yellow, and white). In this mode, flashing is available as an option, but there is a limitation on the smallest size of character which can be displayed (see below).

This mode is set using either:

```
MODE 256
(ie 256 pixels across the screen) or
MODE 8 (ie eight colours)
```

The higher resolution mode divides the screen into 512 (horizontal) x 256 (vertical) pixels and can display four colours (black, red, green, and white).

This mode is set using either:

```
MODE 512 OR
MODE 4
```

Coordinate systems

There are three distinct ways in which the screen can be viewed: (a) the pixel coordinate system; (b) the graphics coordinate system; and (c) a modification of (a) that I call the character coordinate system.

The pixel coordinate system originates at the top left hand corner. The y-axis proceeds downwards from 0 to 225 and the x-axis proceeds to the right from 0 to 511. The division of the screen horizontally into 512 units is true for both screen modes. The system automatically adjusts to 256 pixels in the lower resolution mode.

The graphics coordinate system has its origin in the bottom left-hand corner of the screen and the y-axis proceeds upwards from 0 to 100 units. The x-axis proceeds to the right from 0 to 148 units, assuming that the whole of the physical screen is being used. Both the value of the origin and the number of vertical divisions can be redefined using: SCALE. The default setting is equivalent to SCALE 100,0,0. The first parameter is the number of divisions in the vertical

direction and the next two are the x and y values of the origin.

Therefore SCALE 200,50,70 will divide the vertical distance into 200 units and the origin in the bottom left-hand corner will be (50,70). The horizontal axis scale will adjust in proportion so that any figure plotted with a change of scale will change in size but not have its shape distorted.

A number of graphics commands are provided in SuperBasic that use this coordinate system (see Table 1). Note that the execution of the scale command does not rescale images already plotted on the screen, but only affects those plotted subsequently.

The character coordinate system stands at the top left of the screen like the pixel coordinate system. The screen is, however, now divided into rows and columns. Since the character size can be varied under software control on the QL, the number of rows and columns that take up the whole screen at any one time depends on the character height and width.

In the 256 mode there are potentially 42 columns and 25 rows for characters with the default size, while in 512 mode default sized characters are organised as 85 columns and 25 rows.

Width and height parameters are related to numbers of pixels as follows:

Height	Pixel Positions
0	10
1	20

Width	Pixel Positions
0	6
1	8
2	12
3	16

Character size can be changed using: CSIZE width, height

It is important to realise that for the purpose of calculation, the screen is assumed to consist of 512 pixels across the screen in both modes. In 256 mode the smallest character size is 2.0 or 12x10 pixels. A string of characters can be placed on the screen using the character coordinate system by means of the AT facility. For example:

```
AT 20, 10: PRINT "A character string"
```

The string will be printed with the first character at a position 20 characters from the left and 10 characters from the top. If you are unfortunate enough to be using a first release QL with version FB SuperBasic, the two parameters following the AT keyword must be reversed.

Windows

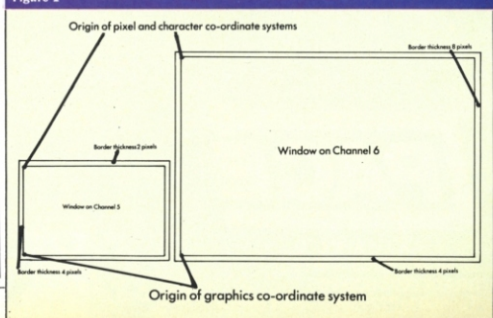
Windows are like 'mini-screens' placed on the physical screen and images within them can be manipulated using SuperBasic. A maximum of 16 windows can be defined, although in some circumstances this is reduced.

Windows can only be rectangular with their sides parallel to the physical screen, so in order to set one up its dimensions and position only need be specified. We must also have some way of referring to it, to distinguish it from others. This is achieved by using a channel number and the window is created with an OPEN statement. As an example, suppose we want to create a window 100 pixels wide, 50 pixels deep, positioned 40 pixels from the left edge of the screen and 20 pixels from the top. A possible OPEN statement is:

```
OPEN#5,SCR_1,100X50A40X20
```

Here we are using channel number 5. The SCR is a standard QDOS device name and stands for screen output. The 100X50 indicates the window size and A40X20 is the position. The X can be thought of as 'by' and the A as 'at position'.

Figure 1



We can now operate on this window in SuperBasic. For example, we can set the background colour with:

```
PAPER6,7
```

This sets the window on channel 5 to colour 7 (white). This becomes apparent when we clear the window with:

```
CLS6
```

Table 1 indicates the SuperBasic commands that will accept a channel number in order to manipulate the contents of a window.

In order to appreciate how some of these commands work with windows, let us set up two windows on channels 5 and

The two parameters after the channel number indicate the thickness of the border (in pixels) and its colour. The thickness specified is actually that of the horizontal components of the border. The vertical components at the sides are twice the specified thickness. Therefore, the smaller window (channel 5) will have a border thickness of two pixels horizontally, four pixels vertically and colour yellow (6) and the larger (channel 6) will have a border of four pixels horizontally, eight pixels vertically and colour cyan (5).

The addition of a border takes place within the inner edge of the window and therefore decreases its effective size. The notes on the pixel and graphics coordinate systems apply equally well to individual windows. The origins of the coordinate systems in the current example are shown in Figure 1.

To illustrate the effect of executing graphics operations in windows, we will define a procedure to draw a simple stick figure (see Figure 2):

```
2000 DEFINE PROCEDURE stick(channel)
2010 REMARK Draw head radius 5, centre
(100,85)
```

```
2020 CIRCLEchannel,100,85,5
```

```
2030 REMARK Draw arms
```

```
2040 LINEchannel,88,70 TO 112,70
```

```
2050 REMARK Draw body
```

```
2060 LINEchannel,100,80 TO 100,40
```

```
2070 REMARK Draw legs
```

```
2080 LINEchannel,95,20 TO 100,40 TO
```

```
105,20
```

```
2099 END DEFINE PROCEDURE stick
```

This stick figure can be placed in each of our example windows by the program:

```
100 wsetup
```

```
110 REMARK Draw figure in window on channel 5
```

```
120 stick 5
```

```
130 REMARK Draw figure in window on channel 6
```

```
140 stick 6
```

The result of running this program is shown in Figure 3. The following points should be noted.

1 Each window has its own graphics coordinate system. The same figure has been drawn in each but it has been scaled so that the window height (excluding the border) is 100 units on the graphics coordinate system. This means procedures that use graphics facilities can be written independently of the final window into which they are to be drawn. It is worth inserting a SCALE statement into the above program to see the effect. Since SCALE can take a channel number, the scaling

Figure 3



can be handled differently in different windows.

2 Each window is twice as long as it is wide in pixel units. Since each window is 100 graphics units high, you might expect that drawing the body of the figure at $x=100$ would place it in the centre of the window. Unfortunately this is not the case. The reason is that each pixel is not square but rectangular and, therefore, 50 pixels horizontally does not cover the same distance on the screen as 50 pixels vertically. The graphics coordinate system, however, does use the same scale horizontally as vertically.

3 We can try changing the position of one of the windows in the above program so that the two windows overlap. This can be done by modifying the appropriate OPEN statement in wsetup or alternatively using WINDOW.

The following program lines will redefine and clear the window on channel 5 so that it overlaps with that on channel 6:

```
104 WINDOW5, 200,50,250,50
```

```
106 CLS5
```

The window has been redefined so that it is 150 pixel units from the left of the screen. If a border is required on this redefined window, it must be added again. For example:

```
108 BORDER5,2,6
```

Running the modified program will still show the image of the original window on the screen with the redefined window covering it. The two images in the window overlap as shown in Figure 4.

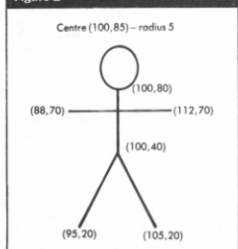
Back to the beginning

You can now appreciate that all screen activity on the QL takes place in windows. The system uses three predefined windows on channels 0, 1 and 2. The default arrangement of these depends on whether the TV or monitor option was chosen when the QL was initialised. With the monitor option, the default mode is 512 and the three default windows are shown in Figure 5.

With the TV option, the default mode is 256 and windows 1 and 2 coincide in their positions on the screen as shown in Figure 6. In this case, the window sizes are smaller to take account of the fact that most TVs do not display the full extent of the screen.

Each window has a particular use. The channel 0 window contains the current command or program line as it is entered, the edit line, and also displays the error messages. Channel 1 is the default channel. Most program opera-

Figure 2



6 with the following specifications: (see Figure 3)

	Channel 5	Channel 6
Window size	100x50	200x100
Window position	50x75	175x25
Background (paper) colour	blue	magenta
Foreground (ink) colour	white	black

The following procedure will set up the windows:

```
1000 DEFINE PROCEDURE wsetup
```

```
1010 MODE 8
```

```
1020 OPEN5,SCT,100X50A50X75
```

```
1030 OPEN 6, SCT,200X100A175X25
```

```
1040 PAPER6,1
```

```
1050 PAPER6,3
```

```
1060 INK6,7
```

```
1070 INK6,0
```

```
1080 CLS6
```

```
1090 CLS6
```

```
1999 END DEFINE PROCEDURE wsetup
```

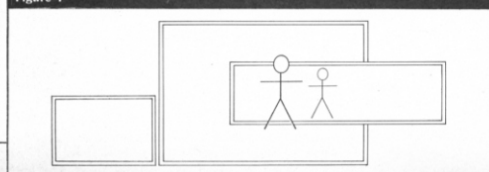
The procedure can be executed by simply typing its name: wsetup

A coloured border can be added to each window by inserting the following lines:

```
1100 BORDER5,2,6
```

```
1200 BORDER6,4,5
```

Figure 4



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Figure 5

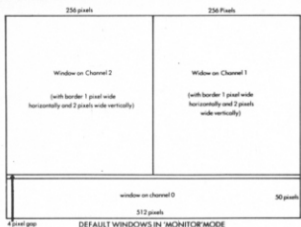
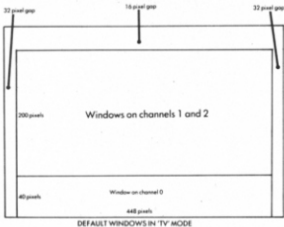


Figure 6



tions such as PRINT, CLS, INPUT, FLASH, BORDER will operate on channel 1 if no other number is specified. Channel 2 displays the program as it builds up and is also the default for the LIST command.

In through the window

If we wish to input to a window by means of an input statement, an alternative form of OPEN must be used because scr_ is a write-only device.

The alternative that allows both output and input is the console device, con_. The method used for opening this

is similar to scr_, except that the size of the type-ahead buffer associated with the window must also be specified. For example, an alternative to line 1020 in the procedure wsetup could have been:

```
1020 OPEN: CON, 100X50A50X7580
```

The figure 80 means that 80 characters can be typed before the type-ahead buffer overflows and characters are lost. Input statements, such as the following, can now be executed:

```
INPUTS,VALUE
```

This will wait for input to be provided in the window on channel 5.

All opened devices should be closed before a program terminates. In Super-Basic this is: CLOSE\$

Although its image may still appear on the screen, the window no longer exists.

From these simple examples, the versatility of the QL windows can be seen. Examining Table 1, you will see that there are other powerful facilities for manipulating the contents of windows. These include the ability to pan and scroll in either direction, to see part or all of the contents of a window, and draw hollow and filled figures.

Table 1

KEYWORD	DEFAULT WINDOW	COORDINATE SYSTEM	ACTION	NOTES
ARC	1	graphics	Draws a circular arc	Joins two points with a circular arc. Curvature indicated by specifying the angle turned through.
ARC_R	1	graphics	Relative ARC	Like ARC but point is taken relative to the last point.
AT	1	character	Positions text cursor	In version FB parameters are reversed. In version PM, only works on channel 1.
BLOCK	1	pixel	Draw filled rectangle	Dimensions, position of top left hand corner and colour need to be specified.
BORDER	1	pixel	Adds border to window	Thickness and colour must be specified.
CIRCLE	1	graphics	Draws circles/ellipses	Centres, radii, eccentricities and angles of orientation must be specified.
CIRCLE R	1	graphics	Relative CIRCLE	Uses relative coordinates for centres.
CLOSE	1	—	Close window	De-assigns channel number to window.
CLS	1	—	Clear window	Specifies which part to clear. Default is whole window.
CSIZE	1	character	Sets character size	Sets size of characters printed in window.
CURSOR	1	pixel graphics	Position cursor	Can use combination of graphics and pixel coordinates.
DIR	1	—	Lists Microdrive files	
ELLIPSE	1	graphics	Same action as circle	
ELLIPSE_R	1	graphics	Same as CIRCLE_R	
FILL	1	—	Fills solid area	Switches filling on and off.
FLASH	1	—	Character flashing	Switches flashing on and off. Only in mode 8. Only text flashes.
INK	1	—	Set foreground colour	
INKEYS	1	—	Input character	Function returns value entered. Optional wait period specified.
INPUT	1	—	Inputs data	Optional prompt.
LINE	1	graphics	Draws straight line	Two points specified. Also used to move graphics cursor.
LINE_R	1	graphics	Relative LINE	
LIST	2	—	Lists program	All or part of program listed.
MOVE	1	graphics	Moves graphics cursor	Turtle graphics.
OPEN	1	—	Creates window	See text for details.
OVER	1	—	Sets overprinting	Allows printing of one character over another, combining the two. Also sets strip colour.
PAN	1	pixel	Pans window contents	Whole or part of screen panned left or right.
PAPER	1	—	Sets background colour	
PENDOWN	1	—	Sets 'write' mode	Turtle graphics.
PENUP	1	—	Unsets 'write' mode	Turtle graphics.
POINT	1	graphics	Plots points	One or more points can be specified.
POINT_R	1	graphics	Relative POINT	
SCALE	1	graphics	Change scale	See text for details.
SCROLL	1	pixel	Scrolls window contents	Scrolls all or part of window up or down.
STRIP	1	—	Sets strip colour	Sets local character background colour. See also OVER.
TURN	1	graphics	Relative TURNTO	Turtle graphics.
TURNTO	1	graphics	Turns turtle	Turns turtle through specified number of degrees.
UNDER	1	—	Sets underlining	Set character underlining on or off.
WINDOW	1	pixel	Redefines window	Specifies new dimensions and position of existing window.

OUTPUT: SPECTRUM

MASTERMIND THE ENGINA

You'll need both rapid reactions and a good head for logic problems to master this game for the Spectrum. Paul McGuire has included elements of the board game Mastermind in an action-packed arcade environment.

Codebreaker, for the ZX Spectrum, is a combination of an arcade game and Mastermind. Your goal is to move your man down a scrolling passage, avoiding the walls of the passage and any mines that appear in it.

When you get to a coloured block you should pick it up, using the zero key. The object of the game is to crack the code by storing the blocks in the correct colour order in the alcove at the top of the screen.

It's possible to store two extra blocks at the side until you're ready to use them. If

you press 1 while carrying a block, it will be swapped with the one opposite.

The program contains instructions in the form of a demonstration.

Program notes

- 5 Calls subroutine to initialise user defined graphics.
- 7 Checks for instructions, and if so goes into demo mode (9855).
- 10 Runs subroutine to print title screen (9000).
- 10-20 Set up variables and the string data for the passage.

- 40 Varies positioning of passage walls using variable 'a'.
- 43 Prints blocks.
- 44 Prints mines.
- 48 Checks to see if left or right cursor is being pressed, and alters value of x accordingly.
- 49 Checks for vertical height, and if in the top half of the screen go subs 9200.
- 9100-9110 Check for dead players.
- 9200-9500 Handle moving blocks and yourself around the top of the screen.
- 9600-9700 Check to see if the blocks are in the right place.

Listing

```

5 GO SUB 9000: POKE 23659,0:
BORDER 0: PAPER 0: INK 7: CLS
7 PRINT AT 10,5: "DO YOU WANT
INSTRUCTIONS? PAUSE 10: PAUSE
0: IF INKEYS="Y" THEN GO SUB 900
5
10 CLS : GO SUB 9000: GO SUB 9
500
15 LET SC=0: DIM B(2): LET B(1
140 LET B(2)=B(1): LET C$="2345
67": LET DS="0000": LET C2=7
20 LET C0=0: LET CD=0: LET C1=1
45 IF SCREENS (10,X)="" AND
C10 THEN IF ATTR (10,X) =132 OR
ATTR (10,X) =6 THEN GO TO 9100
47 PRINT AT 10,X: INK C2: "B":
LET C=C+1
48 LET X=X+(INKEYS="6")-(INKEY
S="5")
49 IF INKEYS="7" AND X=15 THEN
PRINT AT 10,15: "1": GO SUB 9000
50 IF C=60+1 THEN LET B=C+1
TO LEN B:-(2)+B(LEN B): LET B
=C+1
55 LET C=C+1
60 LET SC=SC+1: PRINT AT 1,19:
"SCORE=";SC
100 LET L=USR 3583: GO TO 40
9000 INK 6: PRINT AT 0,0: "1":
FOR N=1 TO 8: PRINT AT N,0: "1": FOR N
,0: "1": NEXT N: PRINT AT 9,0: "1"
9810 PRINT AT 9,14: " "
9815 FOR N=3 TO 8 STEP 2: PRINT
AT N,0: INK 6: PAPER 6: "1":
NEXT N: FOR N=0 TO 7: PRINT AT N
,7: PAPER 6: INK 6: " "
9820 PRINT AT 0,12: " "
9825 PAPER 6: "1": PAPER 0: " "
9830 PRINT AT 1,2: FLASH 1: INK
3: PAPER 6: "1"
9890 RETURN
9100 IF ATTR (10,X) =132 OR ATTR
(10,X) =6 THEN GO TO 9110
9105 LET Z=ATTR (10,X): LET Z=Z-
1: LET C2=Z: LET CD=1: LET SC=C
+5
1020: GO TO 47
9110 FOR N=1 TO 20: PRINT AT 10
,X: OVER 1: FLASH 1: INK 3: CHR$ (

```

```

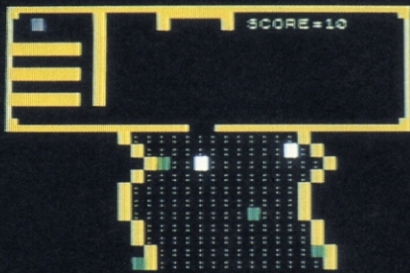
32+N): BEEP .01,10: NEXT N: PRUS
E 30: CLS : GO TO 9000
9200 LET X=15: LET Y=9
9210 LET O=X*(INKEYS="B")-(INKEY
S="7")
9220 LET Y=Y+(INKEYS="6")-(INKEY
S="7")
9230 LET X=X+(X(2)-(X(30)): LET Y
=Y+(Y(2)-(Y(30))
9240 IF ATTR (Y,X) =54 THEN PRINT
AT OY,OX: INK 0: " " FOR N=3 TO 7
O 42: IF D$(X(1)-X(2))="B" O
R D$(X(1)-X(3))="B" THEN PRINT 1: CHR$ N: BEEP .01,10:
NEXT N: PAUSE 30: CLS : GO TO 90
80
9245 IF Y=2 AND X=2 THEN PRINT A
T Y,X: "1": LET OX=X: LET OY=Y:
GO TO 9000
9250 PRINT AT 1,19: "SCORE=";SC:
PRINT AT Y,X: INK C2: "B":
9255 IF X<0 OR Y<0 THEN PRINT
AT OY,OX: " "
9260 IF INKEYS="0" AND Y=0 AND X
=15 THEN PRINT AT 0,15: "1": LET
R#="1": "1": "1": "1": "1": "1": "1": "1":
GO TO 40
9300 IF INKEYS="0" AND X=2 AND Y
=4 AND CD=1 THEN PRINT AT 4,1: 2
NK C2: BRIGHT 1: "1": LET B(1)=C2
: LET CD=7: LET CD=0: GO TO 9210
9310 IF INKEYS="0" AND X=2 AND Y
=6 AND CD=1 THEN PRINT AT 6,1: 2
NK C2: BRIGHT 1: "1": LET B(2)=C2
: LET CD=7: LET CD=0: GO TO 9210
9320 IF INKEYS="0" AND X=2 AND Y
=8 AND CD=1 THEN PRINT AT 8,1: 2
NK C2: BRIGHT 1: "1": LET B(3)=C2
: LET CD=7: LET CD=0: GO TO 9210
9330 IF INKEYS="0" AND X=2 AND Y
=10 AND CD=1 THEN PRINT AT 10,1: 2
NK C2: BRIGHT 1: "1": LET B(4)=C2
: LET CD=7: LET CD=0: GO TO 9210
9340 IF INKEYS="0" AND CD=1 AND
Y=2 THEN IF X=13 OR X=14 OR X=15
OR X=16 THEN LET D$(X-12)=STR$
C2: PRINT AT 1,X: INK C2: BRIGHT
1: "1": LET C2=7: LET CD=0: GO TO
9210
9350 IF INKEYS="0" AND CD=0 AND
Y=2 THEN IF X=13 OR X=14 OR X=15
OR X=16 THEN LET D$(X-12)=""
THEN LET C2=VAL D$(X-12): PRINT A
T 1,X: INK 0: "1": LET CD=1: LET C
D=(X-12)=0: GO TO 9210
9355 IF INKEYS="2" AND X=2 AND Y
=6 AND CD=1 AND B(2) =0 THEN PRI
NT AT 6,1: INK C2: BRIGHT 1: "1":
LET B(2)=0: LET B(1)=C2: LET C
D=Z: GO TO 9210
9357 IF INKEYS="2" AND CD=1 AND
Y=2 THEN IF X=13 OR X=14 OR X=15
OR X=16 THEN IF D$(X-12)="" O

```

```

HEN LET Z=D$(X-12): LET D$(X-12
)=STR$ Z: PRINT AT 1,X: INK C2:
BRIGHT 1: "1": LET C2=VAL Z: GO
TO 9210
9360 GO TO 9210
9500 LET C$="234567": LET P$=""
FOR N=1 TO 4
9510 LET P=P+INT (RND#6)+1: IF C$(
P(1))="" THEN LET P=P+C(P): LET
V=C(P)
9515 GO TO 9510
9520 NEXT N: RETURN
9530 IF D$(1)="" O R D$(2)="" O
R D$(3)="" O R D$(4)="" THEN LET
T=X=2: LET Y=2: LET OX=X: LET OY
=Y: GO SUB 9000: PRINT AT 2,2: "
1": GO TO 9250
9610 BEEP .01,10: IF D=P THEN
GO TO 9750
9620 LET RC=0: LET RP=0: FOR N=1
TO 4: IF P$(N)=D$(N) THEN LET P
=P+P+1
9630 FOR N=1 TO 4: FOR F=1 TO 4:
IF D$(N)=P$(F) THEN LET RC=RC+1
9640 NEXT F: NEXT N
9650 LET AS=STR$ RC: "1": ARE THE
RIGHT COLOURS
9660 IF RP=1 THEN LET B$="1": THERE
IS 1 IN THE RIGHT PLACE": GO TO
9700
9670 LET B$=STR$ RP: "1": ARE IN THE
RIGHT PLACE
9680 PRINT AT Y,X: INK C2: "C":
FOR N=1 TO LEN AS: PRINT AT 0,1+N
: A$(N): BEEP .01,RND#5: NEXT N:
FOR N=1 TO LEN B$: PRINT AT 0,1+N
: B$(N): BEEP .01,RND#5: NEXT N
9710 FOR N=1 TO 50: NEXT N: PAUS
E 30: FOR N=1 TO 20: PRINT AT 0,
1+N: " "
9730 LET X=3: LET Y=2: LET OX=X:
LET OY=Y: PRINT AT 2,2: "1": GO
TO 9250
9750 PRINT AT 1,3: "1": AT 2,2: "
1": BEEP .01,10: FOR N=1 TO 7: PRIN
T AT 7,20: INK N: "A": BEEP .003,
10,RND: NEXT N: PRINT AT 9,14: "
1"
9760 PRINT AT Y,X: "1": LET X=6:
LET CD=0: LET E$=" "
9765 GO TO 1 STEP -1: LET E$=E$(6)E
$(1 TO 5)
9768 IF OY=V: LET OX=X: LET X=X
+(INKEYS="6")-(INKEYS="5"): LET
Y=Y+(INKEYS="6")-(INKEYS="7"): L
ET X=X+(X(2)-(X(30)): LET Y=Y+(Y
(2)-(Y(30))
9783 PRINT AT 2,12: INK 5: E$
9785 PRINT AT 1,19: "THE": "1": STR$
N: "1"
9790 IF ATTR (Y,X) =54 THEN PRINT
AT OY,OX: " " FOR N=3 TO 5: P
RINT AT OY,X: OVER 1: FLASH 1:

```



Your goal is to take the blocks in the bottom part of the screen and place them in the right order at the top.

```

: INK 3;CHRS N; BEEP .01,10; NEX
T N; PAUSE 30; CLS : GO TO 9900
9775 IF ATTA (Y,X)≠54 THEN PRINT
AT OV,OX;" " FOR N#32 TO 52; P
RINT AT Y,X; OVER 1; INK 3; FLAS
H 1;CHRS N; BEEP .01,10; NEXT N;
PAUSE 30; CLS : GO TO 9900
9780 IF X=20 AND Y=7 THEN LET CD
=1; LET C2=4; PRINT AT 7,20;" "
9785 IF Y=3 THEN IF X=13 OR X=14
OR X=15 OR X=16 THEN IF INKEYS=
"0" AND CD=1 AND ES(X-11)≠"D" TH
EN GO TO 9960
9790 IF Y=3 THEN IF X=13 OR X=14
OR X=15 OR X=16 THEN IF INKEYS=
"0" AND CD=1 AND ES(X-12)≠"D" T
HEN FOR N#32 TO 52; PRINT AT Y,X
: OVER 1; FLASH 1; INK 3;CHRS N;
BEEP .01,10; NEXT N; PAUSE 30;
CLS : GO TO 9900
9800 PRINT AT Y,X; INK C2;"C"; I
F OV<(X OR OV<Y) THEN PRINT AT O
V,X;" "
9805 NEXT N; PRINT AT 0,3;"YOU R
AN OUT OF TIME"; BEEP .5,10; CLS
GO TO 9900
9810 REM *****
9815 FOR N#50 "A" TO USR "D"+7
9820 READ R; POKE N,R; NEXT N; R
RETURN
9830 DATA 0;BIN 110;BIN 111,253
.253;BIN 0101111;BIN 01000110,0
.255,255;BIN 11011011,255;BIN 10
11101;BIN 11000011,255,255
9835 DATA 255,255;BIN 11011011,2
55;BIN 1000011;BIN 1011101,255
.255,255;BIN 1100111;BIN 110000
11,R;BIN 11100111;BIN 11000011,R
.255
9840 LET SC=SC+(N#100); BEEP .5
.15; FOR N#7 TO 0 STEP -1; PRINT
AT 0,X; INK N;"C"; BEEP .01,10;R
ND; NEXT N; PAUSE 30; RANDOIZE
USR 3330; CLS

```

```

9905 PRINT AT 0,0; FLASH 1; PAPE
R 0; INK 2;"
YOU DIE
9910 BEEP .5,15; FOR N#0 TO 7; P
RINT AT 6,15; INK N;"B"; BEEP .0
1,10;AND; NEXT N; PRINT AT 6,10;
"THANKS MATE"; PAUSE 40; FOR N#1
5 TO 38; PRINT AT 6,N; INK 7;"B
"; BEEP .1,5; NEXT N; PRINT AT 6
.31;" "
9920 PRINT AT 10,12;"SCORE=";SC;
PRINT AT 13,3;"DO YOU WANT TO P
LAY AGAIN?"
9930 IF INKEYS="" THEN GO TO 990
1
9940 IF INKEYS="Y" THEN RUN
9950 IF INKEYS="N" THEN STOP
9960 GO TO 9901
9965 CLS ; PRINT AT 0,11;"CODE 0
REAKER";AT 0,11; OVER 1;"
"; PAUSE 50; GO SUB 9900; P
RINT AT 11,0;"THE IDEA OF THIS
GAME IS TO GO DOWN AN ADVANCING
TUNNEL, AVOID-ING MINES (M), FLAS
H 1; INK 4;"M"; FLASH 0; INK 6;"
0"; INVERSE 0
9989 PRINT AT 11,0;"TWO EXTRA BL
OCKS CAN BE STORED IN THESE SPA
CES AND BE SUOPED"; PLOT 120,90
; DRAW -105,35; PLOT 120,90; DRA
U -105,50; PAUSE 0; FOR N#11 TO
14; PRINT AT N,0;TAB 31; NEXT N;
INVERSE 1; PLOT 120,90; DRAW -1
05,35; PLOT 120,90; DRAW -105,50
; INVERSE 0
9990 PRINT AT 9,11;" "; BEEP .
01,10; FOR N#20 TO 6 STEP -1; PR
INT AT 0,N; INK 7;"B"; BEEP .1,
10; NEXT N; FOR N#7 TO 2 STEP -1
; PRINT AT N,6; INK 7;"B";AT N#1
6;" " BEEP .1,10; NEXT N; FOR
N#5 TO 2 STEP -1; PRINT AT 2,N;
INK 7;"B"; BEEP .1,10; NEXT N;
9991 PRINT AT 11,0;"WHEN AT THIS
QUESTION MARK AND YOU HAVE FOU
R BLOCKS STORED, IT WILL TELL YO
U HOW MANY ARE THE RIGHT COLOUR
5 AND HOW MANY ARE IN THE RIGHT
PLACE"; PAUSE 0; FOR N#11 TO 16
; PRINT AT N,0;TAB 31; NEXT N; P
RINT AT 1,3;" "
9992 PRINT AT 11,0;"THE CONTROLS
ARE :"; FOR N#13 TO 16; PRINT
AT N,7;" "; NEXT N; PRINT AT 13,
0;"5";AT 14,0;"6";AT 15,0;"7";AT
16,0;"8"; PRINT AT 13,13;"MOVE
LEFT";AT 14,13;"MOVE RIGHT";AT 1
5,13;"MOVE UP";AT 16,13;"MOVE DO
WN"
9993 PRINT AT 17,0;"0"
PICK/DROP" "2"
PAUSE 0; FOR N#11 TO 18; PR
INT AT N,7;" "; NEXT N;
9994 PRINT AT 11,0;"AFTER CRACKI
NG THE CODE YOU THEORAD THE KEY
,LINE YOURSELF UP WITH THE KEY
-HOLE AND PRESS '0' WHERE YOU WI
LL BE TELEPORTED OUT"; PAUSE 0;
RETURN

```

FEATURES

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+

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ON SCREEN AT ONE TIME

+

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+

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+

+

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+

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+

+

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+

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+

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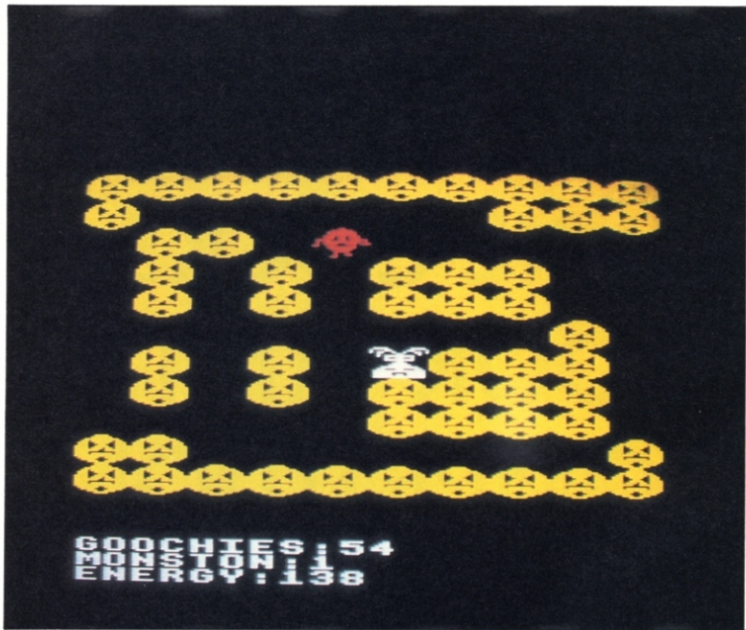
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OUTPUT: BBC

PLUM PICKINGS

Eat till you drop in this gluttonous game loaded with goochies and guards,
from William Prew.



Mr Plum, from William Prew, is a rather cute little game for the BBC. It is written as a series of procedures, each defining a section of the game.

PROC-variables set up the starting conditions of the game, although a number of other variables are set up between lines 110 and 120.

As the name implies, **define-chars** establishes all of the user defined characters, such as the goochies, you, the guards, and possibly the monstons (whatever they may be). Also defined within this procedure are the envelopes to be used with the sound commands.

The playing screen and the goochies are set up by **print-screen**. It also places the guard onto the screen and starts the energy and score displays.

move-plum scans the keyboard and updates the position of Mr Plum, the score, and energy, etc.

goochies updates the number of these little beasts, and makes the appropriate noises.

move-guard moves the guard around the screen using **procs** lateral and vertical. The procedure also checks whether you have moved on top of it, or it on top of you — either way you are DEAD!

The next two procedures are used to move the guard horizontally or vertically. Following this is the music procedure. This doesn't actually play any music as such, it simply plays a sequence of notes one after the other.

wait simply does a loop for delaying tactics, etc.

new-monston updates the number of monstons and executes a **PROC**music.

'When you're splatted, you're splatted', as they say. If the game gets to this point, then you have been.

inst gives the playing instructions and then waits for you to press the space bar.

fame is where you get the opportunity to cheat *ie* you can put whatever score you like into the **score** array and your name into memory at name (just to depress your friends).

amend attaches your name to the high score list, if you rate it. If not, read the previous paragraph.

materialise, the last of the procedures, plays the music at the beginning of the game. If you find that this gets in the way of your high scores, then take out half of line 225. ▀

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DUNGEON

RULING CLASS

one book he now has his first adventure published, with a second on the way.

You can tell from the title that we're back in familiar adventure territory, as the program itself acknowledges: 'Another tale of danger, excitement and greed.' You must infiltrate the Palace to nab all the treasure you can, and store it somewhere safe. Though it draws rather heavily on *Colossal Cave Adventure* (a headless ghost continually throws an axe at you, and a thief takes your treasure to deposit it in a maze) there's nevertheless enough originality in the writing to recommend it. *EAT GHOST* produces an interesting response, and as you wander the cloisters and corridors you must deal with a blacksmith, a watchdog, piles of rubble blocking the way, a maze of mystical chambers, a pit to cross, a dragon and our old favourite the lamp and tinderbox.

There are a few irritating bugs. You can find a shovel, but if you dig in the wrong place you get a variety of responses such as 'WHAT'S A ROD?' or 'WHAT'S A N?'. In one place where there's Magic Dust, *GET DUST* produces 'WHAT'S A DUST?' None of these are fatal bugs, however, unlike some programs where they cause it to crash, and if you're looking for an old-fashioned adventure with doors to find and guards to bribe, you could do worse than *Mountain Palace Adventure*.

Three very different end results, then, from using other people's programming knowledge, but make no mistake about the amount of

Mike Gerrard tries his hand at a little social climbing but finds he prefers to stick to battling ghosts, rather than trying to meet the right people and wear the right clothes.

Anyone can write an adventure these days, or rather anyone has the means to write an adventure. Whether they also have the necessary imagination and determination is another matter. The range of material that is possible can be illustrated by three adventures all written with a little help — two using Gilsoft's *The Quill* and one with the aid of a book, *Exploring Adventures on the Commodore 64* by Peter Gerrard... a name I seem to have seen before somewhere.

Pride of place belongs to *Hampstead* from Melbourne House (£9.95 for 48K Spectrum version, Commodore 64 due soon), if only because there will be numerous glossy colour adverts for it. If you had any doubts about *The Quill*'s usefulness, when *Hampstead*'s authors finished the game using Gilsoft's utility, about half a dozen software houses were all ready to bid for it, and the authors had the luxury of choosing which company should publish their adventure.

The reason for that interest is that *Hampstead* is different — possibly too different for most

explains what 'on the dole' means for those who may have already attained *Hampstead* and therefore do not understand such terms.

Note that you must attain *Hampstead*, and not merely get there. After all, finding the location is easy enough, as anyone can get there on the tube or even on a bike (and you won't go anywhere without your bike clips). But to attain *Hampstead* you must meet the right people, do the right things, wear the right clothes, and of course have pots of money. If you go to *Hampstead* without the trappings, you're given a percentage score and must start again, or resume a saved game.

The first few tasks are too difficult, and bear more than a passing resemblance to *Urban Ustart* (muggings, indecent exposure, dingy streets). But then they get harder and it's the kind of adventure where you can reach a place and only then

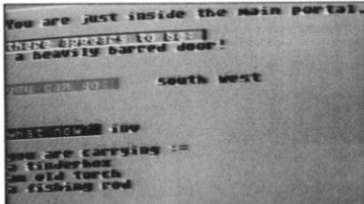
me rolling on the floor, and it's hard to see *Hampstead* taking off with the majority of adventurers who want to kill at least 16 dragons before their lamp goes out. *Denis Through The Drinking Glass* was another attempt to do something different (again using *The Quill*), and although it was a personal favourite of mine it could have sold better. Perhaps *Hampstead* will be the exception, with the weight of Melbourne House behind it.

At the opposite end of the spectrum, so to speak, is *Buffer Adventure*, another *The Quill* adventure set in the *The Buffer Shop* in Streatham, a Sinclair specialist. Once in the shop, your aim is simply to get out again, and to do this you must travel through the various departments and deal with the shop staff. Fine as an in-joke, and the kind of thing that uses *The Quill* quite well, but the terrible jokes and comments about the staff hardly recom-

You are in your Bathroom.
A cracked washbasin contains the
remains of last night's Chicken
Vindaloo and chips....

Not a pretty sight!

Tell me what to do:



To attain *Hampstead* you must start at the bottom of the social ladder.

adventurers. Whether you like it or not depends entirely on your sense of humour, as it's an adventure about the pretensions of social climbing. From your smelly council flat, you aspire to the dizzy heights of *Hampstead*, that prestigious address in London NW3. Your first task (apart from switching off the TV which is showing 3-2-1, a wise move) is to find your UB40 so you can claim some dole money. The booklet that comes with the game

discover you should have brought a particular object with you, rather than the one that initially seemed more useful... though what use a banana and cod sandwich is to anyone, I don't know. There's the obligatory maze, an industrial estate, which I've managed to get into, but am as yet unable to leave despite trying to mark my place with bike clips, and banana and cod sandwiches.

The humour raised a smile or two, though never exactly had

The ubiquitous torch and tinderbox in *Mountain Palace Adventure*.

me to someone looking for a challenging adventure.

More in the traditional style is *Mountain Palace Adventure* by John Ryan for the Commodore 64 (£7.95, Ducksoft). It's hard to recommend a book written by your own brother without being accused of favouritism, but its effectiveness is illustrated by the fact that John Ryan hadn't even seen a home computer 12 months ago, and simply by following the techniques from

effort involved in writing an adventure. Having written one myself using *The Quill*, I know it takes time, but once mastered it is a joy to work with. Using a book takes even longer, because you're learning programming techniques, not just how to find your way round *The Quill*. Whichever you choose, there's no excuse for not producing the goods if you feel you have an adventure inside you. Just don't ask me to solve them all...



SIR CLIVE STRIKES BACK

It has long been suspected that Sinclair was going to strike back at its competitors with a brother for the Spectrum. John Lettec evaluates the Sinclair's chunky answer — the Spectrum Plus.

The new Spectrum Plus shares the same styling as its older brother, but it's a little smaller. The Plus seems to be designed to be the machine that, for a price (almost £180), gives you a half decent keyboard. This has always been seen as one of the major problems with the traditional Spectrum, and although Sinclair is said to have thought of it as a business rather than a games machine initially, serious use of the machine has been limited.

Since the Spectrum's launch over two years ago, the market has changed. The Spectrum was the first reasonably-priced colour computer, and in 1982 the opposition was strictly limited. The Vic 20 had been released, but cost an arm and a leg by today's standards. The Spectrum came out of the traps just around the same time as the BBC B and the TI994A, both of which were fearfully expensive compared to the £175 Sinclair was asking for the 48K model.

Things became a little more difficult with the launch of the Commodore 64, and, this winter Sinclair faces an

onslaught from two more products from this stable — the C16 and Plus 4, as well as the Amstrad and the MSX machines. Machines with full-travel keyboards and decent sound are now cheaper than they've ever been, and the old format Spectrum is starting to look a little exposed.

Industry pundits have therefore seen one of two courses (and possibly both) as being inevitable for Sinclair. The existing Spectrum, or Spectrum Minus as it might now be called, could have its price tag cut, in order to help Sinclair maintain its market share, or it could be the subject of a facelift that added a proper keyboard.

This particular pundit has been suggesting Sinclair was about to do this for some time now, and the fact that I've had more categorical denials than you've had hot dinners leaves me particularly aggrieved at the moment. My particular prejudice was in favour of a real keyboard with built-in Interface 1 and 2, and preferably a Composite Video output, and I still maintain that I'm right

and Clive's wrong, but it wasn't to be. Not this time, at least.

Features

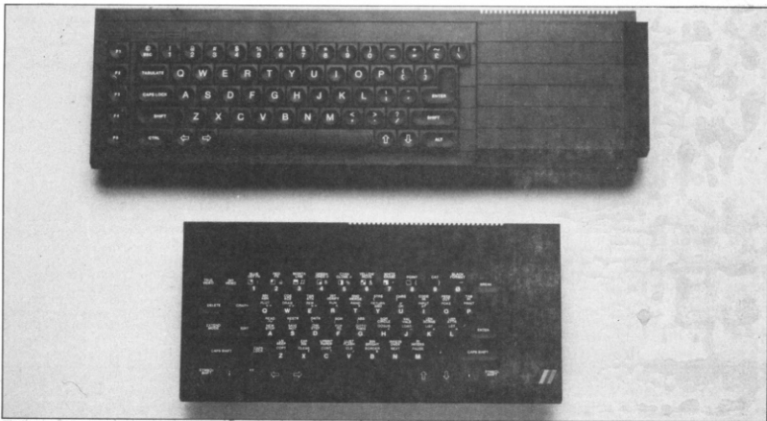
Essentially Sinclair has launched an add-on keyboard for the Spectrum, and therefore it should be judged by the standards of existing add-on keyboards. There are more extra functions than on any other keyboard, and all the punctuation keys you need for word processing have been added.

The extra keys are full stop, comma, inverted comma and semicolon in the punctuation department, and true and inverse video, delete, extended mode, graphics shift, caps lock and break. There's an extra symbol shift and an extra caps shift, and a dinky little space bar in between the four cursor keys.

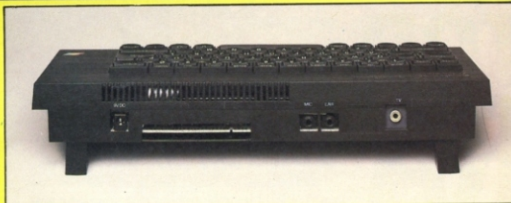
Sir Clive is noted for his spirited defence of his keyboards, but if he starts claiming that the Plus keyboard is a stroke of ergonomic genius I'll personally go round to Sinclair Research. The full stop key is in the conventional position, more or less, but the comma, semicolon and inverted comma keys are tucked into the bottom row, just below the caps shift keys.

As IBM contrived to do this on its industry standard keyboard, Sinclair is in good company here, but most other micro manufacturers have the sense to put the shift keys in the bottom deck. I can see a lot of people getting annoyed about their prose being full of extraneous punctuation.

From the programmer's point of view the layout's a lot more sensible. Deathless prose merchants may curse at the fact that the symbol shift is just below the caps shift, but this makes producing



The lines and key sizes are the same as the QL, but note how cramped the Plus keyboard looks in comparison.



The rear view of the Plus, showing a leg. Tilted forward, there is enough space for Interface 1.

shifted characters and commands a lot easier.

Similarly, the graphics and extended mode shifts are handy for programming, as are the edit and delete keys. The break key, however, is odd. The existing break (caps shift and space) still works, and it's probably as easy to hit these deliberately as it is to hit the new one. This could, however, be brushed accidentally. In a sense, I think you'd be better off with the old system.

The good news is that accidentally brushing the break key isn't likely to have any effect. The trouble is, that's the bad news as well, because the keys all have a wobbly, soggy, unresponsive feel to them.

The construction is similar to that of the QL keyboard. The keytop presses down onto a switch, which presses down onto a membrane underneath. The feel of the smaller keys isn't too bad. The larger ones only have one switch with a sort of rocker device to support them, and

they wobble from side to side a lot which could be a nuisance.

The keytops are the same design as those on the QL, but because the Spectrum version has a lot more written on each key, the overall feeling is quite cramped.

Again, like the QL, the keys aren't pitched, but this is dealt with by two sprung legs that tilt it forward, leaving enough space underneath for Interface 1. Fitting Interface 2 is a different matter — if you've got the legs up it sticks out into the air, so plugging a cartridge in could be tricky.

The only other new feature is a reset switch, wired in on the left hand side of the case. There was some talk about a circuit board revision, but there seems to be little difference between the one in the review model (issue 4b, already!) and the issue 3 board.

Verdict

As far as price is concerned, the Spec-

trum Plus is aimed fairly and squarely at the Commodore market. Ranged against the 64 and the Atmos, it looks reasonable value — a contender at first — but it worries me that for the worst we're seeing a Sinclair machine that doesn't clearly outclass the opposition.

Sinclair may claim that this style of keyboard is just as good as full travel ones, but there are any number of people out there who'd beg to differ, and I'd respectfully suggest it's high time Sinclair Research got a typist on its design team. To produce a doubtful keyboard on a machine that apparently sets out to cure the problem of the Spectrum's keyboard seems to me more than a little flat-footed.

As it is, the new-look Spectrum needs to have software and peripherals taken into account before it can be unreservedly recommended as a good buy, even by a bigoted Sinclair partisan like me.




It fits! The Plus with peripherals attached.

Sinclair has launched a machine that could clearly have been cheaper or better.

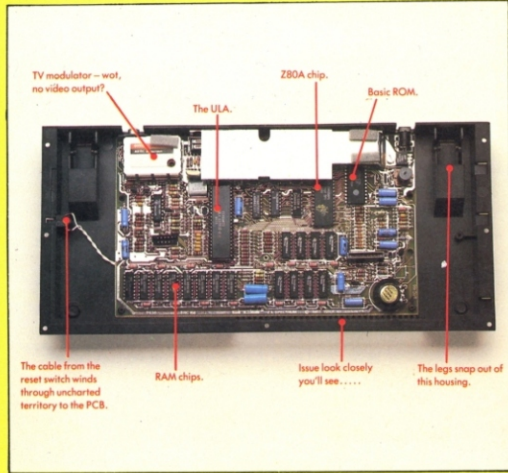
The new keyboard can't, taking economies of scale into account, cost anything like £50, and at £130-£140, the Plus would have been a clear winner. Similarly, for a few bob more, an Amstrad with built-in Interface 1 and cartridge slot could have been produced.

The clincher as far as I'm concerned is the lack of a Composite Video output. This costs one socket and two blobs of solder, and failing to put it on the Plus is just plain silly.

But all isn't lost. All Clive has to do is what I've been telling his people to do for months. Discontinue the Spectrum Minus (I've heard dark rumours about this, more anon), drop the price of the Plus to around £130, and produce a new machine, call it the Spectrum Squared, at around £190. This would have built in Interface 1, a Centronics interface and um . . . a real keyboard? 

SPECIFICATIONS

Price	£179.95
Processor	Z80A
ROM	16K
RAM	48K
Text screen	32×22
Graphics screen	256×192
Interfaces	TV, cassette, edge connector
Language	Sinclair Basic
Availability	Everywhere



TV modulator — wat, no video output?

Z80A chip.

Basic ROM.

The ULA.

The cable from the reset switch winds through uncharted territory to the PCB.

RAM chips.

Issue look closely you'll see

The legs snap out of this housing.

DESKTOP EXTRA

For the desktop Xtra, taking on the rest of the IBM-compatible field is apparently not enough. The UK distributors see it as a rival to the real thing, the IBM PC, says Ian Scales. Selling at slightly less than the IBM, this stylish system could prove them right.



The ITT Xtra is about as standard a PC compatible that you'll find, but it is obviously being marketed as direct competition for the industry leader.

There is presumably some sort of saturation point to be reached in the IBM-compatibles market. So far there's little sign of it with more and more 'standard' machines in various guises — transportables, portables, multi-processors and straight desktop computers — appearing on the market.

Far from settling down, leaving IBM the lions' share, the compatibles are claiming to be doing better than ever. In particular, the portable versions don't seem to have suffered from competition from IBM's offering.

Back on the desktop, one of the more notable new arrivals is the ITT Xtra. This is about as standard a compatible as you can get and must be rated a contender, not because it competes with the other close-compatibles like the Compaq — but because the pricing and general thrust of its marketing suggests ITT and its UK handlers, STC, see it competing against the IBM itself.

Pricing it between five and ten per cent below the IBM PC over the range of configurations, STC seems to think the machine will sell on its own merits as a well-supported, reliable and stylish investment. Does it justify this strategy?

Features

The Xtra is a PC-compatible — a good one in fact. STC claims full compatibility with PC DOS 2.0 and the system ran Open Access and Symphony without a hitch. In fact I experienced no compatibility difficulties at all and have yet to hear of any from other quarters.

Styling is impressive. The Xtra has a nice two-tone cream and brown appearance which seems to exude the qualities of careful design, manufacture and backup.

Documentation

The pre-production user guide was photocopied from what appeared to be

the standard A4-size ring-bound binder. There is a companion guide to the DOS and similar treatment is afforded to each manual for the STC-backed applications packages.

The user guide featured very detailed set-up procedures and step-by-step, illustrated instructions on card configuration. And another bonus, STC has even seen fit to include a glossary of computing terms as a finishing touch.

Set-up

The Xtra is divided into the traditional three modular units — keyboard, screen and processor/storage box.

The screen stands on its own adjustable base which raises it about 5in from the work surface. The user is able to swivel the screen plus or minus 67 degrees and tilt it down five degrees or up 25. The contrast control knob is, for once, in an optimum position on the front right-hand side of the screen base.

The processor can appear under the screen, PC-style, or it may be up-ended and placed alongside the screen and keyboard. Unless you can contrive to rig the processor under the desk, beside the desk or otherwise out of the way, neither configuration is much of a space-saver.

With the screen on top of the processor unit, the configuration tends to reach high-rise proportions, while placing it beside the unit ends to leave less room on the work surface for other activities.

All the units are nicely finished with rounded edges in very sturdy-looking moulded plastic. The colouring is described as hazel and ivory—the overall effect is pleasing and subdued. The standard RS232 and Centronics interfaces are located at the rear, although unfortunately, there is no recessing here to protect the sockets.

Display

There is the usual range of options. Colour is available via a 12in RGB display unit in either 640 × 200 high-resolution or 320 × 200 in low. Colour cards are provided as an extra (Xtra could be an unfortunate name, come to think of it), although I didn't test this feature. The review unit came with the monochrome green screen. Amber monochrome is also available for the ergonomically-minded.

The green screen seemed a little harsh, even though there is a fair degree of persistence with the display. A characteristic of this is a ghostly after-image on the screen after the character or cursor moves on somewhere else. It's

supposed to take the roughness out of the display and make it more pleasing and restful to the eye. In this case it seems to fall somewhat short. The horizontal lines in the characters seem to send out more light than the verticals.

Matters don't appear to have been helped much by the Xtra's character set which is fairly elongated and skeletal. STC quotes a seven by nine character matrix nesting within a nine by twelve character cell. They seemed difficult to get used to, but perhaps that impression was coloured by the fact I usually look at a more compact character set.

On the subject of the screen, one of its more notable features is its ability to turn off the display after 15 minutes of keyboard inactivity. The display then reappears when keys are pressed again. This saves wear and tear on the phosphor coating, especially where the system's constantly used with a package like Open Access which puts up a standard border arrangement in every application.

Keyboard

The keyboard features the familiar IBM layout. It has the usual adjustable feet and the more solid, stiffness of a computer keyboard with none of the loose-tooth feel of the IBM version.

The shift key appears where it should — on the inside of the back-slash. Indicator lights for Caps Lock and Numeric Lock have been added, and there is also a serial interface socket.

The only drawback with the keyboard is the ridging on the perimeter of the

unit which prevents many of the now ubiquitous function key templates from sitting nicely.

Many compatible manufacturers, in their enthusiasm to 'improve' keyboard styling, did not foresee this problem and the results are quite frustrating — you have to balance the stubborn template somewhere else or put up with it constantly falling off the keyboard or skewing about. Picky I know, but it's the little things which can drive you to distraction.

Processor box

The Xtra has five IBM-compatible expansion slots in the chassis. The floppy disk drives are 360K and the hard disk has 10Mb.

It's nice to see a machine that allows easy access to its insides for open-heart operations. Many machines these days require too much removing of screws and eventually bending of metal plates — a positive disincentive to delving. The Xtra is easily disassembled by removing a couple of screws and sliding the body off the chassis.

Expansion

Expansion facilities are very good. As mentioned earlier, the RS232 is standard, as is the Centronics printer interface.

The machine comes with 128K of RAM and an additional 128K can be added to the motherboard. Going higher requires the insertion of the Xtra Combo board. As well as providing another 128K, it features a real-time clock,

35 ▶



Although it features the usual layout, the Xtra's keyboard has none of the loose-teeth feel of the IBM.



How to teach your Micro a thing or two

Thousands of home computer owners have yet to discover their microcomputer's potential to help with many of the problems and decisions that come up every day in the home or office.

Perhaps you have always promised yourself that you would teach yourself programming, but have been put off by manuals which seem to assume a lifetime spent studying computer science and mathematics. Maybe you have looked at other computer books, but have yet to find one which is free of unnecessary jargon or where the program examples bear some relevance to real life and not space invaders.

Relax, your search is over.

The 'Learn BASIC' tutorials from Logic 3 are the latest development of a teaching method pioneered by Professor Andrew Colin and perfected

by testing on 3 generations of students at Strathclyde University. The 'Strathclyde Method' has been translated into 8 languages and used by over 300,000 microcomputer users.

'Learn BASIC' is a jargon free, step by step, course in computer programming, which explains everything clearly in English, not computer talk. In a matter of hours you will be writing your first programs.

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- Logic 3 Spectrum Club
- Logic 3 Commodore Club
- (64 and VIC owners only)

I have a:-

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- Commodore 64
- Acorn Electron
- BBC Microcomputer
- Dragon

Name
 (BLOCK CAPITALS PLEASE)

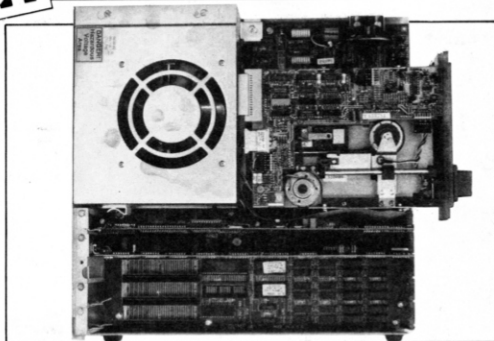


Address

 (Postcode)



HARDWARE PRO-TEST: ITT XTRA



Cooling fan, disk drive, speaker unit are situated above the main board.

second printer port and the facility for adding two more mini boards, piggy-back fashion, each with a further 128K. In case you've lost count this comes to the maximum, under ITT DOS, of 640K.

The graphics board can generate graphics and/or colour and comes with composite video, RF modulator and a light pen interface.

The 10Mb hard disk fits into the lower disk drive slot in the processor unit. The controller takes up an expansion slot.

The base Xtra configuration involves one disk drive; the user then has the choice of either adding the second floppy or purchasing the hard disk.

STC is also selling a companion printer, PC-style. It's the Sprint 11 Plus letter quality printer. I didn't test it, but the literature says it produces letter quality printouts at 40, 55 or 70 characters per second.

Software

STC bundles a version of Microsoft Basic with the machine on disk, in preference

to the ROMed Basic in the IBM, for instance. This seems a fairly sensible cost-cutting exercise, as many users will content themselves with packaged application software.

ITT DOS is really MSDOS, if it needed mentioning—the most standard operating system these days. And this means there is a wealth of software available for the Xtra. Third party operating systems BOS, CPM/86 and PCDOS are also available.

A good job of garnering support and testing products seems to have been undertaken before the machine's release. As usual, STC is supporting half a dozen packages itself. As well as the DOS and Basic, it's touting an Asynchronous Communications program, Easy Writer with Easy Speller, Wordstar and Multiplan.

The company is also in the process of evaluating a wide range of further applications programs and system software available through third party houses. It's also looking at vertical software including everything from stock control, sales ledger, purchase ledger through to invoice and sales analysis.

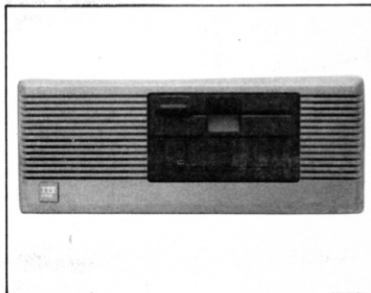
There are 11 database programs from dBase II to Everyman. Eight financial modelling packages, including, of course, Lotus 1-2-3, nine word processors, plus dozens of sundries from quantity surveying to critical path analysis.

Verdict

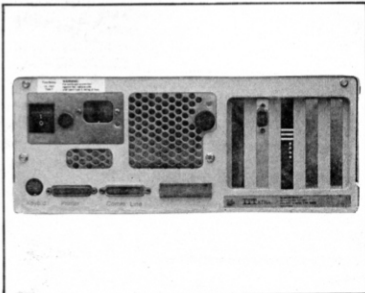
The Xtra promises to be a major contender in the IBM-standard micro market. The micro's major selling point is the profile of ITT and the promise of solid support and back-up that the logo entails. The machine is also very compatible with the IBM PC and seems to be able to run all but the very misbehaved of PC software.

SPECIFICATIONS

System	ITT Xtra
Processor	8088
ROM	32K
RAM	128K to 640K
Screen	Monochrome 8x25 characters; 640x200 (high-resolution), 320x200 (low-resolution)
Keyboard	84 keys, ten function keys, numeric pads (IBM style)
Interfaces	RS232, Centronics
Operating system	ITT DOS (MSDOS)
Price	Floppy system £2,104; hard disk £3,932 plus VAT
Distributor	STC Business Systems 01-300 7788



The Xtra is nicely finished and styled. There is the option of an integrated 10Mb Winchester disk drive and plenty of software.



From the top left — the power input and on/off switch. At the bottom, I/O connectors for the keyboard, printer and RS232, and, right, the expansion slots.

COMPETITION

WIN A TOSHIBA MSX MICRO..FREE

Here's your last chance to win a great MSX system absolutely free in this easy-to-enter competition.

Look at the six pictures below. If you can identify the six old favourites, you could win this valuable newcomer. To help you out we've listed eight computers — but two are red herrings.

If you've an eye for a good micro, you could own a 64K, full colour Toshiba computer, complete with cassette recorder and software. The first correct entry out of the hat wins.



1



3



5



2



4



6

The computers:

Acorn Electron
Oric Atmos

Apple IIe
IBM PC

Atari 800XL
Sinclair QL

Spectrum
Commodore 64

Entry Form

Name

Address

Current computer Telephone

I think the computers are:

1 2

3 4

5 6

I do/do not wish to be included on mailing lists.

Send to: Toshiba Competition, Personal Computer News, Evelyn House, 62 Oxford Street, London W1A 2HG. All entries must be received by Friday, November 30. The judges' decision is final. No correspondence will be entered into. The competition is not open to employees of VNU, Quickset, Chase Web Offset or Toshiba.

For home or business the IBM compatible Advance 86^a

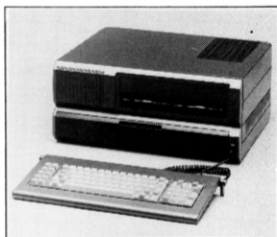


16 Bit Micro-Computer Under £350*

For the home user start with Model A with its massive 144K RAM and outstanding typewriter style keyboard that fits within the base unit for portability and storage.
Note the large return key and position of the numeric keyboard. Fast retrieval from storage and fast action on games is achieved by the use of the Intel 8086 True 16-bit micro-processor running at 4.77 MHz.
The Advance 86 runs IBM PC software.

Specification

CPU Type	True 16-bit 8086 running at 4.77 MHz.
RAM	128K or 256K with parity plus 16K video
Languages Included	Basic
Type of Keyboard	Full 84 keys tactile
Keyboard Facilities	10 programmable keys
Character Set	256 in ROM
Method of Display	TV, RGB, Comp/Sync colour or monochrome monitor
Display Facilities	Full screen handling, 4 screen paged
Text	80 x 25 or 40 x 25
Graphics Resolution	320 x 200 or 640 x 200
Colours Available	16
Graphics Facilities	Scroll, reverse image
Cassette Recorder	Audio
Interfaces Included	Cassette port, light pen, joystick, Centronics
Sound	Built-in speaker
Operating System	Built-in ROM
Printers	Any using Centronics parallel interface
Comments	Hardware and software compatible with IBM PC Upgradeable to Model B Provision for 8087 Arithmetic Processor
Warranty	12 months



The business user can upgrade to Model B by adding the Advance Expansion box containing 2 x 5.25" disc drives providing 720K storage at £740 + VAT.
The Advance 86 Model B offers the business micro-computer buyer an IBM compatible disk-based system with twin drives, with Perfect Writer/Speller, Calc and Filter Software (MS/DOS) included for only £1086.95 + VAT.

Advance 86 Models A & B are designed and marketed by Advanced Technology UK Ltd. Made by Ferranti in Oldham. Delivery within 30 days from receipt of payment. 128K memory expansion £108.70 + VAT.
Advanced Technology UK Ltd.
8A Hornsey Street, London N7 8ZH
Tel: 01-609 0061 for leaflet.

On site warranty for 12 months by National Advanced Systems (part of National Semiconductor) one of the largest companies in the U.S.A. for Model B.
* Ex VAT.

Benchmarks

The standard Benchmarks were run using Advance Basic, which is the equivalent of Microsoft GWBasic and Basica on the IBM PC.

Machine	BM1	BM2	BM3	BM4	BM5	BM6	BM7	BM8	Av.
Advance 86 — 8086	0.8	3.3	7.3	7.4	8.1	14.6	23.9	26.0	11.4
ACT Apricot — 8086	1.6	5.2	10.6	11.0	12.4	22.9	35.4	34.4	16.7
IBM PC — 8088	1.2	4.8	11.7	12.2	13.4	23.3	37.4	30.0	16.8

To Advance Technology UK Ltd., 8A Hornsey Street, London N7 8HB

- Please send Model 86A, Micro-Computer & Keyboard I enclose £399 including VAT
- Please send Model 86B which includes Model 86A plus Expansion Box & Software. I enclose £1250 inc. VAT.
- Please send 128K Memory Expansion £125 inc. VAT. Cheque/Barclaycard/Access No.

Name _____ Company _____
Address _____ Address _____

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Apricot & 2x315K Drives	£1236
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ON A LEVEL KEY

Kenn Garroch tinkles the ivories to test the LVL keyboard for the BBC but finds that the software lets it down.

What can you do with a BBC computer that has a sound chip that provides three voices and full envelope capabilities? You could try getting an LVL keyboard for it.

First impressions

The LVL system comprises a 37-note keyboard, from C to C, a disk of software, and an optional kit to enable you to attach an external speaker. The Keyboard plugs into the user port and the disk goes into the drive.

Pressing shift/Break gets you going with the screen, revealing a selection of instruments, controls, and other options. These include sustain, assorted percussion, and control of the note length and pitch. The pitch allows you to set the frequency within the range of the BBC's sound chip. The frequency can be altered in semi-tones, which is odd since the BBC's sound chip can be altered in demi-semi tones (quarter tones).

All of the selections are made by pushing keys on the BBC's keyboard. The preset voices are on the first two rows of the QWERTY keyboard with the synth/programmable sounds on the bottom row. The function keys are used to select the sustain and the percussion. If the voice has a built-in sustain, then pressing f0 turns it on or off.

Two types of percussion are available. One plays every time you hit a note, and the other is obtained by pressing the appropriate function key.

The percussion 'noises' are, putting it mildly, not very good. The cymbal sound is a hiss very similar to SOUND 0, -15, 4, 50 and the bass (drum presumably) is a low frequency crackle. There is also a triangle which comes out as a high pitched 'pip'.

In use

After setting everything up, I was ready to begin playing my masterpiece. The



The LVL keyboard with optional amplifier.

immediate, obvious drawback was the three-note limitation. This is the computer's fault and not LVL's, but it does mean that you will probably have to alter your playing style from full, two handed, chords to a harpsicord method *ie* play as many single notes as possible as fast as possible.

The logic of the program is such that the higher notes (generally the tune) take precedence over the lower. After you get used to it, you'll find that the three-note idea is not too much of a limitation.

The preset voices available are: piano, horn, clarion, organ, melodia, viola, violin, piccolo, mandolin, xylo, Hawaiian, steel, and vibes.

There are also three so-called synthesiser voices. These have preset sounds, one of which gives the impression that all the death stars in the galaxy have suddenly decided to attack. It's a nice sound but not terribly useful when playing Claire de Lune. Perhaps the 1812 could be brought more up-to-date. The other two voices are fairly nondescript.

There are also four programmable envelopes available. These are set up in exactly the same way as with the Basic Envelope command, so a little knowledge of this is quite useful, and probably fairly essential.

It would have been nicer if there was some graphic display to do this with. As it is, you have to listen to the sound and alter the parameters before you get what you want. This can be a little time consuming and can even prove somewhat difficult.

The preset voices don't sound anything like the original instruments, and in fact, all sound rather similar. This is not really surprising when you consider that the BBC does not have any filter or tone control.

However, it is not quite the limitation it may seem at first sight. By mixing the three built-in voices at different volume levels and frequencies, it is possible to produce a much wider range, even if it is

limited to a single note for each one.

One available feature allows you to make each note play a major or minor chord. Playing a C will give you a three note triad/chord, either major or minor, depending on your menu selection. This can be useful when playing accompaniment or, if you are quick enough to flick your hands between the music keyboard and the alpha/control keyboard, accompanying your own playing. It is also quite useful if you have access to a multi-track recorder.

Verdict

The LVL keyboard is a nice idea but it lacks decent software. The Basic program supplied with the review machine was missing a number of things that should have been easy to implement, such as a sequencer, volume controls, and voice mixer.

The keyboard itself has a pretty good feel. It would cost about £30 to build your own to a similar standard, if you wanted to write your own software.

Alternatively, you could buy an LVL and write your own software. Scanning the keyboard is simple. Just use the following program to see which keys are depressed:

```
5 REM LVL KEYBOARD SCAN ROUTINE
10?FE62=63
20 FORT T=0 TO 36
30?FE60=T
40 PRINT T; " ";?FE60 AND 64
50 NEXT T
60 GOTO 20
```

Note that there is a spare line on the 6522 i/o, so other items (such as a better sound generator) easily can be attached to the userport. ■

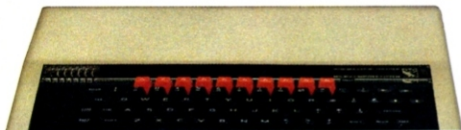
REPORT CARD: 1 TO 5

Features	●●●●●
Documentation	●●●●●
Performance	●●●●●
Overall value	●●●●●

Product LVL Keyboard Machine BBC
Price £99.99 Availability From LVL
Dealers, 0602 394000

Unicorn. Five new channels.

Here's the full



The ZEP 100

- Z80 Extension Processor
- 4MHz Z80A
- 64K RAM
- 24K ROM

The object of any upgrade kit is to improve processing ability and to increase data storage capacity. The UNICORN ZEP100 is the first stage upgrade channels which opens channels into the world of serious computing.

The ZEP100 is the proven 8 bit second processor for the BBC Model B micro. A Z80 extension processor which enables the use of the well established CPN operating system, giving access to the vast range of applications programs and languages available for all CP/M[®] micros. When fitted to a BBC model B microcomputer with compatible high quality disc drives it provides a complete business or scientific computer which can run large applications programs or use advanced languages, with the ability to switch back to standard BBC programs at any time.

Any ZEP100 can be linked, via the Econet[®] option on the BBC, to a network of other TORCH computers to

provide a workstation running on TORCHNET. Full TORCHNET

operating systems software is provided to allow access to information anywhere on the network, or to communicate with other computers.

The 64K ZEP100 is supplied with full software support including word processing, spreadsheet, database and utilities. **The ZEP100 - around £299 (ex. VAT).**

The new UNICORN range from TORCH Computers gives the enthusiast and professional user a choice of upgrades which takes the BBC Model B Micro to the ultimate height of performance.

The result of TORCH'S total commitment to the BBC Micro is the only complete range of high performance hardware available. Offering every BBC Micro owner five new upgrade channels, UNICORN will transform your BBC into a fully communicating workstation, a CP/M[®] compatible business machine or the ultimate in high powered 32-bit data processing.

At the top of the range, THE UNICORN, offers the power and sophistication of System III UNIX[®] whilst other channels make available the flexibility of languages such as FORTRAN, PASCAL, BCPL and COBOL. All models, with the exception of the HDP240, provide BBCBASIC (Z80) on the Z80 rather than the Model B's 6502.

Tune in to the Channel that most suits your requirements. Whichever level you choose you can be sure of a system with infinitely expandable potential for a confident future in the world of computing.



Channels for the BBC. programme.



The ZDP 240

- 4MHz Z80A ● 64K RAM
- 24K ROM
- Twin, double sided 400K floppy discs
- Independent integral power supply



The UNICORN ZDP240 (Torch Z80 Disc Pack) is the proven upgrade for the BBC Model B micro-computer. Offering the use of more powerful and flexible languages such as Fortran, Pascal, BCPL and Cobol, it provides 800K of disc storage plus a Z80 second processor with 64K RAM running TORCH's own CP/M* compatible operating system based in ROM.

This advanced design means that almost all of the 64K RAM provided by the Z80 board is available for CP/M* programming use—an advantage no other BBC micro upgrade can offer.

If your BBC micro has the Econet® option, there is a further benefit the ZDP240 can offer. TORCHNET can link together up to 254 upgraded Model B's on a local area network, so for enthusiasts, Clubs and Schools it is a simple and low-cost way to achieve networking facilities.

The discs can be used for storage under the Acorn DFS system or for CP/M* programs and data.

A comprehensive software package is provided with the disc pack. It includes word and data processing and a spreadsheet program, along with utility programs and manuals.

The TORCH Z80 Disc pack is recommended by the CTA for government use. **The ZDP 240—around £699 (ex. VAT).**



The HDP 240

- 20Mbyte hard disc Winchester
- Double sided 400K floppy disc
- Integral power supply

For users who need much more storage capacity than is available on floppy discs and who require the large speed gains that a Winchester hard disc provides, the third new channel is now available.

The UNICORN HDP240 combines a 400K floppy disc drive with a 20Mb hard disc and its associated controller. The pack connects directly to the disc and 1MHz bus sockets on the BBC Model B.

In conjunction with a ZEP100, it provides a powerful business computer for running CP/M* programs with large amounts of data. The floppy disc can be used for storage with the Acorn DFS system, and both discs can be used by other TORCH systems on the TORCHNET local area network. **The HDP240—around £1995 (ex. VAT).**



The HDP68K

- 8MHz MC68000 ● 6MHz Z80B
- 256K RAM (68000)
- 64K RAM (Z80)
- 20 Mbyte hard disc Winchester
- Double sided 400K floppy disc
- Integral power supply

The fourth channel in the UNICORN range is for users who need the extra processing power of a 68000 32 bit processor, as well as the Z80 running standard software. The UNICORN HDP68K provides the ultimate in performance, offering an extra 256K RAM and a 68000 processor running at 8 million cycles per second. It also contains a Z80 processor to allow the running of existing TORCH software. **The HDP68K—around £2495 (ex. VAT).**



The Unicorn

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PERIPHERALS PRO-TEST: COMMODORE 64

NO PARALLEL BARS

Commodore 64 owners can now use virtually any parallel printer with the help of this interface, says David Janda. It is a cartridge with all the necessary software on EPROM.

One thing that can be said about Commodore design is that it's different. This may in some cases be a good thing, but when it comes down to peripherals, it can work against the user. The Commodore 64 cannot use a standard cassette recorder, nor can it use disk drives other than the ones designed by Commodore itself.

Printers are another example. There is no 'standard' Centronics interface on the 64, so you are again stuck with using the MPS-801/2 type printer. To be fair, the benefit of using this type of printer is that all the graphic characters can be reproduced. If your printer is an Epson (or an Epson clone), it is possible to reproduce all the 64's graphic characters using a MW-350 interface.

Features

The interface can operate in two different modes — emulate and transparent. Both these modes may be selected by flipping the dipswitches on the MW-350, or by software using variants of the OPEN command.

In emulate mode, the MW-350 will emulate the 1525 printer. This is achieved by a cpu (and software) within the MW-350, translating the printer commands into the commands that your particular printer understands. The commands available in this mode allow you to do double width printing and use tabs as well as dot addressable graphics and their associated commands. Most importantly, if an Epson-type dot matrix printer is used, the complete Commodore character

set will be reproduced including graphics.

Also available within emulate mode are a couple more handy features that are not available on Commodore printers. The first, and most impressive is a readable listing option. Accessing this function by specifying one as a secondary address in the OPEN statement will translate control codes into words (see listing 1).

As mentioned, graphic and control characters are printed 'as is' in this mode, so in the extended emulate mode graphic characters are printed in a form of shorthand. If, for example, a listing contains the two graphics on the V key, they would appear in the listings as [s V] [c V] (see listing 2).

The second mode is transparent. Here, the interface does not attempt to interpret any codes sent to the printer, so it is possible to send control codes that initialise special features of the printer. A problem occurs here, since you have to set a dip switch on the interface to get into transparent mode, and if you wish to alternate between modes within the same program, you can emulate the transparent mode from within the emulate mode.

Setting up

Unlike the ordinary type of cartridge, the MW-350 attaches to the serial bus socket on the 64 via a cable. A ribbon cable connects to the printer, and if your printer is of the Epson variety (no +ve live rail), then it is necessary to attach a third cable to the cassette port.

The documentation that accompanies the unit is also worth noting. Clear step-by-step instructions on setting up and using the interface are presented in a well-written, relaxed style.

The final stage is to adjust the six dip switches on the interface and test the



The MW-350 with its many leads.

unit. The first three switches are for selecting the type of printer to be used while the other three set defaults for line feed, mode (trans or emulate) and device (as in OPEN x,y,device). Then everything can be powered up and a test made by pressing a push button on the interface which prints diagnostics (listing 3).

In use

I tested the unit on my 64 with disk drive and cassette unit attached, as well as my Shinwa CP-80 (Epson lookalike) printer. The drive operated normally even with the MW-350 plugged in the back.

Using the various modes was good fun, and on the serious side, it really does make listings easier to read if detokenised. When printing 'as is', I used double strike mode on my printer.

Verdict

The interface was a joy to use. The only other feature one could wish for is a high-resolution dump of some kind as, for example, the Grappler from Orange Micro (USA-based) has. But for most purposes, the MW-350 would be fine.

But the crunch is the almost 90¢ price-tag. I can understand that the price of EPROMS has gone up, and a cpu costs good money but this is still too high. ❑

REPORT CARD: 1 TO 5

Features	●●●●
Documentation	●●●●●
Performance	●●●●●
Overall value	●●●

Name Micrografix MW-350 Centronics graphic printer interface Manufacturer Impex Designs (UK), Metro House, Second Way, Wembley, Middx.

Listing 1

```
10 PRINT "[DOWN][DOWN][DOWN][DOWN][RIGHT]
[RIGHT][RIGHT][RIGHT][UP][UP][UP][UP][R
IGHT][RIGHT][RIGHT]"
20 PRINT "[RVSON]ABC[RVSOFF]ABC"
30 PRINT "[s A] [s Z] [s X] [s S]"
```

```
10 PRINT "██████████TTTT███"
20 PRINT "ABCABC"
30 PRINT "◆◆◆◆"
```

Listing 2

```
[s D][s F][s G][s H][s J][s K][s Y][s T][s R]
```

Listing 3

```
MICROGRAFIX INTERFACE STATUS REPORT          RELEASE 1.5
-----
PRINTER  BUFF  MODE  LNFD DEV# LMAR RMAR FLEN 123456
EPSON    NONE EMULATE AUTO 004 000 000 000 *-----
```

SOFTWARE PRE-VIEW



We take a peek at the new software packages, and give you a taste of things to come. Note to software publishers: If you wish your company's product to be included, please send only the latest releases to **Bryan Skinner, Software editor, PCN, 62 Oxford Street, London W1A 2HG.**
Don't forget to include prices and telephone numbers.

BBC



If you want to extend the use of your BBC, Squirrel Software's *Moneywise* is a home accounting system which goes further than that. It includes an annual summary facility and produces bar charts which can be dumped to printer or disk.

Here and There with the Mr Men contains four programs designed to teach direction and route-planning.

Preparing for winter? Then you might try *Polar Perils*. Adrift on an ice floe you must spear the ravenous Polar Bear before screen two.

It's good to see Mastertronic turning out games for the BBC, not just because BBC games tend to be costly, but also because new releases for Auntie's micro are dropping off these days.

Challenger is pretty simple: destroy all aliens and things called Quads, don't run out of fuel and warp out when in trouble.

Moneywise	£9.95	Squirrel Software 061-789 4120
Polar Perils	£7.95	Squirrel Software 061-789 4120
Carols/Trees	£4.95	Chalksoft 0905-55192
Challenger	£1.99	Mastertronic 01-402 3316
Micro Art 3	£3.00	Micro Arts 01-720 4456
Here and There	£7.95	Mirrorsoft 01-353 0246

COMMODORE 64



Invest £14.99 in *Spirits of the Stones* and you could be on target for a cool million pounds. The program/book package could give you a head start in the treasure hunt based in the Isle of Wight. But don't dig out your spade, this one's an armchair job. The program consists of fairly straightforward arcade-type games, but gives you clues to riddles in the book.

Those who work out the locations of some 40 diamonds on the island can claim from Commodore their share of the royalty fund, made up from 50p for each program sold.

Commodore has also just released a neat music package, *Music Maker*, complete with piano keyboard overlay. While it may lack the sophistication of products such as *Musical*, it will give novices hours of entertainment, and extends the range of the use of the machine.

Cuthbert fans will welcome *Microdeal's Cuthbert Enters the Tombs of Doom*, with over 200 screens, weird beasts and prizes to be won.

Select 1 should interest new 64 owners as it's a compilation of a dozen chart-toppers from yesteryear, and at £12.49 is a real bargain.

If you've ever seen *Jet Boot Jack* on the Atari, you'll rush out and buy English Software's new release. *Henry's House* looks good on paper and we'll be reviewing it soon.

Tazz is not for the claustrophobic. Armed with a gun you find yourself in a room whose walls are closing in. Blast the nasties and move to the next, harder, diminishing location.

Gala-File is a spin-off from a 64 user's group. It's a cassette-based database which handles up to 1000 records with 100 user-definable fields.

Sort and re-sort are catered for and there are four independent search levels and password protection.

Henry's House	£8.95	English Software 061-835 1358
Witchswitch	£8.95	English Software 061-835 1358
Soldier of Fortune	£7.95	English Software 061-835 1358
Jet Boot Jack	£7.95	English Software 061-835 1358
Sherlock	£14.95	Melbourne House 01-940 6064
Cuthbert & the Tombs of Doom	£6.95	Microdeal 0726-3456

Strike Force	£6.99	Bubble Bus 0732 355962
Fuzz	£6.99	Bubble Bus 0732 355962
Space Ace 2101	£7.95	Ozisoft 07356-71163
Star Race	£1.99	Mastertronic 01-402 3316
Cadcam Warrior	£9.95	Taskset 0262-673798
Select 1	£12.49	Computer Records 01-603 1249
Gala File	£7.95	Gala-Soft 116 Church Parade, Canvey Island, Essex
Twelfth Night	£7.95	Penguin 01-351 2393
Romeo & Juliet	£7.95	Penguin 01-351 2393
Spirit of the Stones	£14.99	Commodore 01-930 6711
Music Maker	£29.95	Commodore 01-930 6711

SPECTRUM



Power Software is definitely a name to watch. All its games we've seen have been well above average, and *Catwalk* and *Billy Bluebottle* are no exception. In *Catwalk* you take Snooky the cat out for a stroll in search of food. The animation's superb, you'll almost believe the Spectrum has sprites and we'll be reviewing it soon. *Billy Bluebottle* is a supernatural insect, and while the graphics don't match *Catwalk*, the game is fiendishly difficult. Your task is to rescue fellow houseflies from grisly fates in the domestic environment, such as flyspray, flypaper, being crushed in the lift and so on.

Atrium is a new idea: it's a computer mediated board game, which is partly why the game's so pricey. For your £19.95 you get a high-quality colour game board and magnetic pieces. Two players take the part of the Royal Navy slam-

ming it out with the US marines, and the Spectrum keeps the score, calculates damage etc.

If you've ever wanted to be everybody's favourite person, *Fahrenheit 3000* should appeal. It's one of those near impossible *Jet Set Willy* games, your mission is to prevent the Winfrith nuclear reactor from melting down—leap the nasties, collect the power packs (when they're red), make it to the 64th screen and pull the switch. Fame and glory will be yours, as well as a mystery prize, if you can solve a puzzle after all that.

Sports games aren't quite dead and in the aftermath of the Olympics, Melbourne House has brought out *Sports Hero*. Taking a different line from most sports games this year, you must progress from local sports fanatic, to university scholarship, finally winning a place in the Olympic team if you're up to it.

Lancelot will be reviewed shortly. First impressions are that it's a Manic Miner variation, very well done.

Atrium	£19.95	PD Marketing 01-402 6667
Fahrenheit 3000	£5.95	Softstone 01-486 5266
Sports Hero	£6.95	Melbourne House 01-940 6064
Lancelot	£5.95	Melbourne House 01-940 6064
Billy Bluebottle	£5.90	Power Software 0384-370811
Cat walk	£5.90	Power Software 0384-370811
Bouncing Bertie/Eskimo Capers	£3.50	Power Software 0384-370811
BMX Racers	£1.99	Mastertronic 01-402 3316
Space Walk	£1.99	Mastertronic 01-402 3316
Select 1	£12.49	Computer Records 01-603 1249
The Prince	£7.95	CCS 01-858 0763
1942 Mission	£5.95	CCS 01-858 0763
Insurgency	£5.95	CCS 01-858 0763
Blue Riband	£5.95	CCS 01-858 0763
War Zone	£5.95	CCS 01-858 0763
Volcano	£7.95	Computer Magic 0932-231011
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SPECTRUM

BRAXX BLUFF

Braxx Bluff is certainly a challenge. As commander of a small space craft, it is your task to land on a strange planet, find a marooned crawler, and return its crew to base before they die.

At the start of the game, you're docked with a mothership. After undocking, your aim is to land on a runway by trying to keep a minute dot in the centre of a circle displayed at the sides of the screen. In doing so, you are able to accumulate credits but be quick as your ship is rapidly losing altitude. Get-

ting at least eight credits will allow you to press a fire button, which ignites retros, enabling you to land safely.

Once you have succeeded in landing, you enter the Walker phase. Here a beeping tone and score indicate the crawler's proximity. But there are rocks and vultures to prevent you from reaching your target. Obtaining at least 20 credits at this point will allow you to move onto the next level (which is so difficult that I was unable to reach it). The first phase (the land-crawler) entails trying to keep your crawler on a road. A clunking noise will determine whether you are straying from the trail or not.

Once you have reached 50 credits, you move onto the next phase, the Sea-Crawler. Here the object is to find the mothership. But beware! The rocks are



fatal. You are able to locate the ship by a direction finder (the higher the tone and score, the closer you are). Once at the ship you go on to the last phase, the

Finale. You board the mothership, and are greeted by the commander's puzzled face and congratulations. You should have acquired at least 70 credits to finish, and for each crewman alive, you receive an extra few credits.

Although the response of the controls is a bit sluggish at times, the graphics are quite good. This is surely a game for those determined people who will never give up until they have won.

Karen Isaac

Rating: 7/10
Price: £6.95
Publisher: Micromega
01-233 7672



COMMODORE 64

FIREQUEST

The Edge, a new division of Softek, have released this sequel to Ugh, and what a splendid entry into the market it is.

Ugh, if you didn't know, is a caveman and in *Firequest* he's searching for fire, of course. The game makes use of the whole screen for each scene; you won't find any half-pint picture at the top with a score/status panel occupying the rest of the screen.

The game takes place over seven different screens, each of which must be conquered be-

fore you can get to the next. As an added incentive, if you make it to the end, The Edge offers you the chance to enter a compet-



ition. The idea is to submit a title for a sequel to *Firequest*, based on the final scene.

Screen one features a large cavern. Ugh has to climb and

jump around, dodge intelligent spiders, swing on creepers, and make it to the volcano across the ravine. Next he must tote three bundles of faggots to the volcano which is spitting out fireballs. Fumeroles (vapour-puffing crevices) and a netherdhal man add to Ugh's problems.

Later screens feature earthquakes, more volcanic eruptions, electrical storms, bats and a startling sabre-toothed tiger. Each scene is full-size and quite different. A demo mode provides a fair preview of all the scenes — but only a glimpse of the last, for obvious reasons! All of the screens present a tough

challenge so don't expect to get to the last one without a fight.

You can switch between musical and other sound effects (all of a high standard) and may use the keyboard or joystick. Quite the most impressive feature is the animation of Ugh himself — almost of cinema cartoon quality.

With more games of this quality, The Edge are going to be a force to reckon with. *Firequest* is a great start.

Bob Chappell
Rating: 9/10
Price: £9.95
Publisher: The Edge
01-240 1422/7877



COMMODORE 64

AH DIDDUMS

Have you ever been attacked by a lump of modelling clay? No, neither had I until I played *Ah Diddums*.

This original game takes place in a toybox where Teddy resides with numerous other toys. Teddy has to build a staircase with bricks to reach the baby who is crying for him.

The only problem is that in trying to do this good deed, poor old Teddy is mobbed by the other toys. A bad case of jealousy. To stack the bricks you pick up those of the same

colour as the background and take them to the white brick at the top of the screen. They are then put in the correct position to build a staircase.

Don't get the idea into your head that this is an easy game, even if you get past the fifth toybox (I didn't). There are still another 96 to keep you busy. The further into the game you advance the more the toys take a dislike to you and do all they can to prevent you getting out.

In the first three levels toy soldiers fire their guns at you. The bullets could have been bigger; you almost need a microscope to see them.

At level four, trains trundle across the top of the screen.

Unless you get in their way they won't kill you but they will scatter any bricks that you have painstakingly placed in position. There are also spinning tops, weebles and the dreaded



lumps of modelling clay which will swamp you, given half a chance.

The only consolation is that

the clay won't come to life unless you kill all the toys in that particular level. So the best plan is to kill all but one.

There are two skill levels to this game; the easy one allows you to kill the toys, but in the harder level they are only stunned, disappearing while they recover.

The graphics are quite good, as is the animation. If you can't get off the first few screens you may find the game a bit monotonous. But it certainly provides a challenge.

Susan Cooke
Rating: 7/10
Price: £5.50
Publisher: Beau Jolly (Imagine)
01-567 9710.



DRAGON

YUMPING YOSSER

This game is unusual because it was written using the Sprite Magic program. Knight Software has found a way to produce a run-time system for Sprite Magic programs — let's hope the company makes this widely available.

Yumping Yosser is basically a levels or platforms game, but the graphics show what can be

achieved with the Dragon and are up to the highest standards.



The aim is to get Yosser from the bottom right of each screen to the top left, where he collects

a key to give him access to the next screen.

There are 15 levels, with names like Glen's Garret, Nellie's Room, Longleg's Lair and the like. Marie's Maison is my favourite — the beasts which inhabit it are pulsating angry faces.

But each screen is very much like the last — green background, half a dozen levels or platforms, patrolled left and right by monsters. 'All' you have to do is jump from platform to platform, avoiding the monsters and accidents.

Each screen is certainly more difficult than previous ones but since you can't shoot the monsters, it boils down to a game of patience while you try different approaches.

The general impression is one of competence, but it's a pity that a more original and exciting theme wasn't chosen.

Bryan Skinner
Rating: 6/10
Price: £5.95
Publisher: Knight Software 0642-454883



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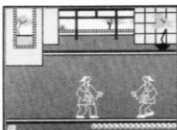
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SPECTRUM

KUNG FU

Are you a Kung Fu expert? Even if not you'll still enjoy this game, especially if you challenge a friend. Instead of firing endless bullets at your enemy you now have the chance to show your true strength.

You use four keys, each one giving a different movement. The idea is to flatten your opponent as many times as you can while taking care to defend



yourself. It's not that easy — one minute you may be thinking you've performed a perfect kick but the next minute you're flat on your back seeing stars.

The music adds to the atmosphere of the game with its Oriental touch, even if it is a bit

monotonous. The graphics for the two players are made up of large line drawings and are beautifully animated, though they could be more colourful.

You may find the game more exciting if you play with a friend as you may then have more chance of winning. It also makes the competition closer. No matter how hard you try when you play the computer, it always seems to come out tops.

If you perform some fantastic stroke but miss it in all the excitement there is an option to replay the last bout — as many times as you like.

Depending on how well you do you are awarded a coloured belt. I only ever received a white one, which I gather is the lowest.

I thoroughly enjoyed playing this game because it is different from the usual sort. But it's a pity the game doesn't vary at all, by having different moves the further you advance for instance.

Susan Cooke



Rating 7/10
Price £6.95 Publisher
Bug Byte 051-709
7071

COMMODORE 64

CAVE FIGHTER

Cave Fighter is one of those curios that pop up from time to time and proves there's still life in an old theme.

You control a rather too small cave man — no, not of the Ugh variety, more of a potholer. Control is joystick only but allows you to climb, shoot, walk and jump to different heights. The latter is rather necessary, since to move around the network of underground caves you'll have to use the dangling ropes and jump from these to platforms.

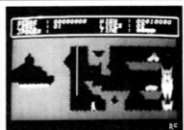
To jump you just hold the fire

button down until the power meter indicates the required strength, then release and it's up into the air. You can move the intrepid explorer in mid-flight — just as well because sometimes ropes dangle right above hazards.

The aim of the game is simply to get through as many of the caves as possible in the time allowed. And of course to knock up as many points as possible.

There's plenty of action here, from the simple green caterpillars, despatched without a moment's thought, to the purple pteradactyls which can be shot while you're in mid-bounce — a tricky manoeuvre.

Then there are the spitting flowers. These are a bit nasty



as they can appear just off screen. Then when you move you suddenly see them, and the deadly poison coming at you, and it's odds on there's no way you've got time for a quick leap onto a ladder or platform.

There are many other hazards, 16 beasts of one form or another and 31 caverns to explore. Bubble Bus has thoughtfully allowed you to

alter your number of lives (one to 99) before you start, as well as the starting level (one to 31). The different levels look much the same, apart from a change of colours and the different types of sprite, but the screen layouts get more and more tricky.

The graphics and sprites are quite well done and the action's nice and smooth. Thankfully, there's no background music as such, more a series of musical effects like whistles. All in all, a good buy.

Bryan Skinner



Rating 8/10
Price £6.99 Publisher
Bubble Bus 0732-
355962

SPECTRUM

PSYTRAXX

Described as a mega game, *Psytraxx* boasts 1,000 screens of playing area, something unknown to the Spectrum.

The hero is a small, dome-headed, pincer-handed robot who has been let loose inside a gigantic network of rooms — the 1000 screens. The entire network is supposed to be the internal circuitry of a tyrannical Emperor Robot who created and placed the microdroid there.

Now the microdroid has de-



cid to avenge his fellow oppressed droids. To complete his mission he must seek out the key program cards to deactivate forcefields, gain access to the CPU and pull the Emperor's plug.

The game has a basic similarity to *Berzerk* — you have to move from chamber to cham-

ber, dodging or firing at the inhabitants. Although the microdroid can move in any direction, he can only fire his tiny bolts to the left or right.

The opposition turn out to be animated chips, transistors and sundry other computer components. Each of these appear first as dispersed molecules before forming into a more solid and mobile state. Contact with the enemy spells immediate loss of one of three lives.

Each room has several obstructions and at least one exit. This may be blocked by a force field which can be deactivated by collecting program cards. Once an exit is used, the screen

changes instantly to the next room. The microdroid can recharge his ever-draining batteries by passing over little green fuel cells.

The graphics are colourful, if fairly simple, and the animation of the various enemies is neatly and humourously done (chips with moving legs!). The game theme can hardly be said to be original, but it has been implemented with style.

Bob Chappell



Rating 8/10
Price £7.95
Publisher The Edge
01-240 1422

COMMODORE 64

AD INFINITUM

Who says shoot-em-ups are dead? Not me, especially after playing *Ad Infinitum*, which could well be one of the best in its class.

The main game area is a black square to the left of the screen. Here the stars scroll past under your red ship which you can move to left and right and roughly half-way up.

To the right are gauges showing the player number, the level (in hexadecim notation), the

number of lives left (you get six per turn), the fuel level and the critical mass of your laser.

At each level (and there are 256 screens) alien vessels appear, and these are very well done — good choice of colours, shapes and movement patterns. Naturally, your task is to clear each screen of aliens without touching or being shot by enemy craft. Not too easy because by the time you're up to level 2C (hex, remember) — the laser goes critical and takes out the entire ship when it goes.

Every now and then you're faced with an asteroid storm — coloured spheres cascade down



the screen. They can't be shot and are deadly, but some will give you extra fuel if you can catch them. I haven't yet survived one of these. You can also refuel by docking with the mother-ship which turns up occasionally.

All players will welcome the

'continue' feature. When you've lost all your lives, if you hit C within five seconds you can carry on playing from that level — none of this back to square one rubbish.

Ad Infinitum is a very nice item, even if it doesn't quite live up to its Latin tag. But 256 screens is probably enough for even the most hardened, trigger-happy space fiend.

Bryan Skinner



Rating 8/10
Price £7.95 Publisher
Mr Chip Software
0492-79026



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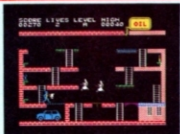
SPECTRUM

TURMOIL

Oh dear, the sheiks aren't very pleased. In fact you could say that they're furious. You've just been siphoning oil from their supplies to fill your car, and now they're out for revenge.

Turmoil falls into the category of a platform game. There are 26 levels to complete, if you can get that far. Each level gets more complicated the further you advance into the game, with lifts, moving conveyor belts and more Arabs.

To get the oil you have to collect a canister from a shelf and take it up a series of ladders



and along platforms to a dripping tank. Holding the canister under the tank you can collect five drips, which you then have to take to a grid on the screen.

Pressing the appropriate key or the fire button on the joystick allows you to drop the oil through the grid. With each drop, part of your car will

miraculously appear.

Six drops are needed to complete the car which then drives onto the next screen. While you're trying to produce your car you're constantly being chased by raving Arabs. If they catch you they will batter you to death with their sticks.

Throughout each screen tools will appear on different shelves. Collecting these and taking them to the garage will gain you extra points.

You'll be glad to know you aren't totally helpless against the sheiks — drops of oil will have them dancing on the floor. If you spill some in front of them you can watch them slither and slide, out of action for a while.

Turmoil is easy to play. You don't have to be exactly in position before you climb the ladders.

The graphics and sound are quite good, though the usual colour problems associated with the Spectrum are apparent.

Turmoil will probably be a popular game although it's similar to many others. You may have difficulty completing all 26 levels with only five lives, but it's enjoyable. **Susan Cooke**



Rating 7/10
Price £6.95 Publisher
Byte 051-708
7071

SPECTRUM

BATTLEZONE

Although there have been quite a few versions of this type of game, this is the only one to be officially approved by Atari, the original designer.

The title sequence should be familiar to anyone who has played *Battlezone* in the arcades. The lettering appears in the distance and spins smoothly, end over end, towards you.

The scenario is similarly faithful to the original. You're looking out from a tank across a plain towards a mountainous

skyline. Imposed on the scene is a large central cross-sight. When an enemy is in range and lined up, the edges of the sight flip — your signal to fire.

Since the view from your tank is limited, a radar display at the top of the screen helps pinpoint the enemy's position. You can be attacked from the rear, as well as left, right and front.

As reinforcements to the ordinary tanks, the enemy has super tanks and diamond-like flying saucers at its disposal. There are also assorted cubes and pyramids strewn around the plain; these can be used as shields when confronting the



enemy. All the objects are three-dimensional, not solid but wire-frame.

Your tank has two caterpillar tracks, each of which is controlled independently. Moving your tank around without getting into a muddle takes some practice. In fact the mountains

never seem to get any nearer or further away which makes it just that bit harder.

Movement is smooth and natural, the scene slips effortlessly in the appropriate direction. Any objects or tanks in view change in perspective as you or they alter position.

The game may now be a bit old hat to do well in the charts, but if you're looking for a first rate implementation of the original, this has to be it.

Bob Chappell



Rating 8/10
Price £6.95
Publisher Quicksilver
0202 891744

COMMODORE 64

EUREKA

A favourite theme of TV science fiction writers involves transporting you to an earlier age. Armed with your twentieth century sophistication you are supposed to hold your own against the kind of foe that dished out death-dealing blows to your forebears.

This five part epic with a crock of gold at the end is faithful to the theme. Work your way through the five and you face dinosaurs, surly Romans, ancient Britons, Nazis, and modern villains.



We tested the second part, where all roads are supposed to lead to Rome. Without the full-colour Eureka booklet with instructions and hints, twentieth-century sophistication came at a premium. But in the end (which invariably came sooner rather than later) all roads led to death: drowned at

sea as a galley slave, crushed by a runaway horse while minding your own business on a street marked 'Cave Equis', mauled by a lion, and slain in a struggle with a Roman soldier.

The epic begins as a less-than-straightforward adventure; its vocabulary is limited but includes some Latin, and the game doesn't accept abbreviated commands. When it takes three cracks to kill Androcles you might well tire of typing Androcles before you finish him off.

Only one road leads to Rome. The others take you into an endless grove of cypresses and to an implacable lion.

It's tempting to say that the adventure/epic is complicated enough to give you many hours of harmless pleasure. It's tempting to say that Virgil does the same. The difference is that Virgil didn't offer £25,000 to whoever completed his 12 books. The software is pricey and unexceptional, but adventures usually hold rewards of a different kind — you might well find that Eureka will do this for you.

David Guest



Rating 7/10 Price
£14.95 Publisher
Domark, 228
Munster Rd,
London SW6

COMMODORE 64

LAZY JONES

Own up, wouldn't you simply love a job where you could play arcade games all day?

Well, so would the character in the latest release from Terminal Software, *Lazy Jones*. Fortunately the hotel in which *Lazy Jones* works has a good supply of games in the guests' bedrooms and he quite often (ie whenever possible) sneaks in to see if he can get a new high score.

Unfortunately the manager of the hotel has found out about *Lazy's* vice and is out to stop him. The hotel has three floor

and because the manager can only patrol one floor at a time, he's got himself the help of the ghost of a previous manager and *Lazy's* cleaning trolley. Contact with any of these causes *Lazy* to expire from a heart attack.

Your aim is to guide *Lazy* around all of the rooms in the hotel and play the game in there. Once a room has been visited you can't go back there until all rooms have been completed. Don't forget to look out for the Boss and his cronies while moving around.

Once inside a room you will be confronted with a large TV screen and after a short wait the



game will appear. Variations of just about all of your favourite games will be found, from *Frogger* to *Space Invaders*. None of the games are superb and the graphics are nothing special. However, this in no way impairs the enjoyment of playing the games, and some of them are extremely difficult.

Music also plays a large part in the game and it's claimed that every room has its own tune.

In practice the music is very similar from one room to another. Guess which tune the game 99 *Red Balloons* plays?

Lazy Jones is one of those games that can be summed up simply by saying it is fun. If you ever find yourself at a loose end you could well find yourself loading this cassette.

Stuart Cooke



Rating 8/10 Price
£9.85 Publisher
Terminal Software
061-761 4321



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OPERATING ROOM

One of the QL's problems was that Sinclair couldn't get the OS and Basic into the ROM Ralph Bancroft looks at the GST's new OS.

When Sinclair was planning the QL, it followed a sound industry practice of not relying on one team for the design of its operating system.

A not particularly well known Cambridge software house, called GST Computer Systems, was commissioned to write an operating system (OS) to an exacting specification. Its solution was a powerful multi-tasking OS that had many of the features of Unix yet, was capable of being put on ROM.

Unfortunately, it took up more than 32K of ROM space — the amount that the QL designers had put aside for the OS and the Basic language. Sinclair went to a fall-back option of an OS designed by an in-house team to overcome the space problem.

The rest, as they say, is history. Even by cutting corners and leaving out a few facilities, Sinclair's own staff couldn't squeeze the OS and Basic into 32K of ROM. As a result, the first QLs that came out had an extra 16K ROM cartridge hanging off the back.

GST has now released its OS under the name 68K/OS for both end-users and companies using the QL board in their own products.

Features

GST's 68K/OS is a powerful multi-tasking operating system that owes its origins to Unix and other minicomputer operating systems.

The multi-tasking capability allows you to run several programs at once. How many depends on the size of the program and available memory.

It also has a 'pipe' facility to transfer data from one program to another. Pipes can be used with 'filter' programs that reprocess data.

An example of their use is in text processing. The output from a text editor can be written to a named pipe that transfers the data to a text formatter which in turn sends the final output to a printer.

The microdrive filing system uses a series of neat tricks to speed access times. With regards to the QL, 68K/OS supports screen windows and bit-mapped colour graphics.

Installation

The operating system provided was easy to install on a 'dongled' QL. The dongle was removed and the two 68K/OS ROMs substituted for Sinclair's ROMs. For later versions of the QL,

GST will be providing a circuit board that plugs into the internal expansion port.

Documentation

This is at times complex and confusing. It comes in the form of a fat ring binder and includes a substantial programmer's reference guide.

The detailed reference guide would certainly be an essential aid to anyone wanting to get to grips with the workings of the OS. But I would have welcomed a better presented introductory guide with illustrations and screen shots for those who merely want to use the OS to run programs.

In use

The difference between 68K/OS and QL SuperBasic becomes apparent as soon as you power up. Instead of the usual TV or monitor choice of the QL, 68K/OS gives a choice of five screen formats: four colour/85 columns for use with monitors; four colour/80 columns for use with monitors that tend to clip the edges of the display output; four colour/60 columns for use on TVs; eight colour/42 columns for RGB monitors; and eight colour/40 columns for use on TVs.

A little experimentation is advisable to find the best option for your particular set-up.

Selecting the screen format runs a program called Adam, which is a menu driven command program that splits the screen into several multi-coloured windows.

These windows display a command line, default program menu (programs on ROM or selected microdrive tape), default data menu and the log.

This last screen seemed an unnecessary luxury. It lists all the programs that have been run since you powered up the machine and whether the program runs have been suspended or killed.

At the bottom of the screen is a status line used to indicate the options that can be selected using the function keys.

To use a microdrive tape it first has to be 'mounted'. This is done by specifying the 'md:' followed by the drive number and then the directory name. Once mounted its directory appears in one of the screen windows.

A program can be run by either writing it on the command line or moving the cursor down the program menu and hitting return. As befits its

origins 68K/OS files are referred to by a comprehensive path name that includes device, directory, name and type. So a full path name could be something like md:GST/date.prog.

Fortunately, some of these components are optional and others are automatically provided by the selection of default values. And despite the complexity of 68K/OS I soon found it easy to use and certainly more friendly than say CP/M or MSDOS.

Having loaded up more than one program it is a simple matter of switching between tasks. For each program a single line window appears at the top of the screen. At times I found this annoying, like when you wanted to use the full screen for text editing or using GST's Draw program. However, it did help in keeping track of which programs were still running.

Verdict

GST's 68K/OS is the first affordable operating system for personal computers with functionality. It is also the operating system that Sinclair should have made its first choice for the QL.

Being in ROM it is instantly available — no booting of disks required. The limitation is that not all the features have been squeezed into ROM. Copy, Date, Format, Print and Rename are all commands that are annoyingly on tape and not in ROM.

I would have thought that with GST having to produce a plug-in card to implement the OS on the QL, it should have gone to the extra expense of adding one or two extra ROM chips to make these commands readily accessible.

Of course, the biggest drawback of 68K/OS is the complete lack of applications software. GST has released an assembler and is planning a word processing program. It is also bundling with the OS a text editor and terminal program.

However, the real test is whether independent software companies release versions of their QL software to run under 68K/OS. In the longer term the operating system's success depends on whether other manufacturers take up the system.

In the meantime, keen machine code programmers who want to turn their QL into a proper multi-tasking micro will find that 68K/OS is well worth the investment.

REPORT CARD: 1 TO 5

Features	●●●●●
Documentation	●●●●●
Performance	●●●●●
Overall value	●●●●●

Name 68K/OS Application Operating system
Machine Sinclair QL Publisher GST Computer Systems Ltd, 91 High Street, Longstons, Cambridge 0954-81991 Price £99.95, Assembler £39.95 Outlets Mail order.

COMPUTER CRAYONS

Become an artist with none of the mess associated with paints and brushes. The Electronic Colouring Book will allow Beeb users to exercise their creativity to the full, says Simon Williams.

There have been many graphics packages for the BBC micro, but the Electronic Colouring Book is the first program to specialise in the colouring of pre-defined pictures on a Mode 2 screen. It's a well engineered package with a lot of scope for hours of entertainment, and will appeal to any Beeb user.

Presentation

The package comes with an Acorn-style cardboard folder containing a cassette and brief instruction manual. The eight-page booklet gives details of how to run the program, which keys to use and an outline sketch of each of the 18 drawings supplied. It's a pretty easy program to use and the documentation covers all its features well.

Getting started

To load the program you need to *RUN the first section. The whole thing performs as if written in machine code and loads fairly quickly. The display then blanks to a white background and draws strips of all the available colours in a column down the right hand side of the screen. An arrow indicates which colour is currently selected.

Each palette block could have been larger, as selection with the crosshair cursor was quite awkward on occasions. To load the first drawing the L key is pressed and a name? prompt has to be answered with the appropriate drawing title, obtained from the instruction manual.

The drawing is then built up a block at a time as it's loaded from the cassette. On completion a small cross, the colouring cursor, appears in the centre of the screen. There is no sound to indicate the drawing is complete and, if you don't have remote control on your cassette recorder, you can read on to the next drawing.

Colouring the drawings is simplicity itself—even easier if you use the J key to select joystick control. Otherwise you have to use the cursor keys, which are programmed to move in big leaps if held down or by a pixel if pressed momentarily. I found the difference between the two modes rather too extreme and was grateful for the proportional joystick to test out the program.

Features

Moving the cursor over any of the coloured bars automatically selects the fill colour, which you then place on the drawing by moving the cursor to the right point and pressing the fire button.



The fill routine is very smooth and fast and will cope with any of the irregular areas to be found within the drawings.

These all seem to have been adequately tested to ensure that there are no areas of 'bleed-through', where more of the picture than you intend would be coloured in. The first four drawings come complete with sample colour schemes which may be loaded from the cassette separately from the drawing and show what can be done with the package.

I found the cursor a little jittery in use and it was quite difficult to fill areas when only a few pixels in size. But without filling these areas, annoying white specks were left in the finished picture.

Any area that was filled in error could be rescued by moving the cursor onto it and pressing the D key, whereupon it reverted to the original background colour, normally white. I say normally because it is possible to exchange all elements of white and black in the drawing with a single key press; a peculiar effect.

In addition, the E key will change each colour in turn to another from the palette at intervals of one second. This is done using the Beeb's colour palette and doesn't require the drawing to be refilled. The Q key will stop the process and the R key will restore your original colour scheme.

It's not easy to remove the colour from an entire drawing, but the screen may be cleared with the C command. Once finished the drawing and its colours may be saved to tape from within the program.

It would, therefore, be possible to set up a series of slides for later use. Unfortunately it will still be drawn and coloured in its own time on reloading.

One final feature of the program is the option to draw your own pictures. By selecting the word draw at the base of the column of colours, the cursor may be moved around, fixed at a point with the fire button and a line 'rubber-banded' from there. Further depressions of the button will fix the new point — it's rather like joining the dots.

New areas may be started by extending the hand at any time back to 'draw', when the current line will disappear and the cursor will return. Although very simple, this technique will allow complex original drawings to be built up and coloured in the same way as the pre-defined ones.

Verdict

This is one of the few packages which really does live up to its claim to appeal to young and old alike. I found it quite fascinating and could have spent many more hours doodling away.

MULTI COLOURED MODES

It may well have occurred to the more observant reader that the BBC micro is only supposed to have eight colours, ignoring the 'cheat' flashing colours. This is very true, if you rely on the colours available directly from the computer.

At an early stage in its career, however, some clever programmer hit on the idea of simulating extra shades by mixing colours in a pre-defined pattern. This may be made up of alternate horizontal or vertical lines or, as in this case, a chequer of two existing colours.

This works rather better with some combinations than others, but at its best produces tones that are almost indistinguishable in clarity from the 'genuine' colours.

REPORT CARD: 1 TO 5

Features	●●●●
Documentation	●●●●
Performance	●●●●
Overall value	●●●●

Name Electronic Colouring Book
Application Graphics Price £9.95 Format
Cassette Other versions None Publisher
Addison Wesley Outlets Retail.



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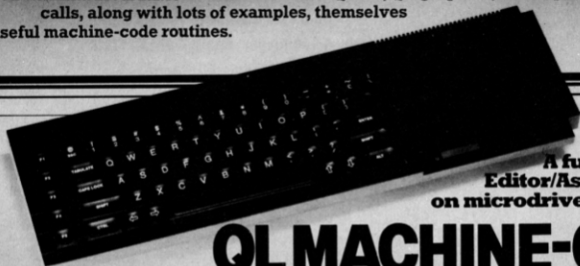
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 Buy a ship, provisions and cargoes to trade between the harbours of the Coral Islands. Make a fortune if the weather and pirates let you live long enough to master seamanship and economics. A Strategy-adventure game with graphics for 48K.

Jersey Quest (ES Cassette)

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Morse Tutor (E4 Cassette)

This one has it all: 6-19 words/minute, variable spacing variable number of groups of random letters numbers or mixed random sentences, own message, single characters (including punctuation), variable pitch FEEDBACK via screen, printer or SPEECH (phonetic alphabet via Currah a/Speech on 48K version only), and repeat facility. Takes you to and beyond RYA and Amateur Radio receiving standards. 16K and 48K versions on one cassette. 48K only on Microdrive cartridge.

Spectrum Programs on Microdrive

All the above are available on Microdrive cartridges at a price of £4.50 for one cartridge = the price of each program as shown above. E.G. a cartridge with Tradedwind and Morse Tutor would be £13.50. As a bonus, Gavin Monk's Indexed Loader is included free with each cartridge.

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WDSOFTWARE, C.I.
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IMAGE III is also available for the IBM PC and Apple computers.

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The TV Picture Store Board used in IMAGE III was developed by British Telecom Research Laboratories and is manufactured under licence by Eltime Ltd.

What does the software industry need if it's not to shrink even further? Absolutely right... interesting programs with a wide appeal. So, we're happy to bring you news of two companies who deserve everything they're going to get. The first is the US arm of K-Tel Software which offers *Plantin' Pal*.

This amazing little program tells you everything you wanted to know about 40 vegetables... soil, climate; when to plant... For only £34 you and your computer can master courgettes.

The second publisher is the all-British Solar Publishing which has announced *The I Ching* and *The Love Oracle*. Without any trace of embarrassment, Solar says the programs 'answer the questions everyone asks... are we compatible? Does my partner love me? Do we have a future together?'

If you ask these sort of questions PCN can save you a lot of money. If the answer to the first two is no, the answer to the third is also no. The solution? Buy a computer that does love you.

On a more sensible note, here's an unashamed free plug. If you want the ideal stocking filler for the computer person in your life, check out *My Computer Doesn't Love Me* starring the world famous Pal 2000 (new readers lower your eyes about four inches). Published by Chalk and Cheese Publications of Bulwer Road, Barnet, Herts, it costs only £1.95.

Still on the subject of software, watch out for a batch of new games from CCS. You can't miss them — they carry a jolly attractive logo which proclaim them as 'Cambridge Award Winners 1984'. You might think that CCS has been remarkably fortunate in signing up so many good games.

Cambridge Awards are awarded by CCS which then publishes the winning games. Now, we're not saying there's anything wrong with this... just clarifying a possible point of confusion.

And on that subject, we feel Amstrad might do a little clearing up on its current TV advertising. The hi-fi division is claiming a unit which offers tape-to-tape copying at double the normal speed...



Welsh rarebit

Here's another Laughline competition (yes, we know we haven't announced the winner of the last one yet). The picture was taken at the product launch of a company called (you've guessed) the Parrot Corporation. All we want is suggestions as to what the parrot is saying to the gentleman from the Welsh Development Agency, or vice-versa. Send your entries to Laughline, PCN, 62 Oxford Street, London W1A 2HG by Friday, November 16. £20 to the winner.

SYNTAX ERROR

A couple of minor problems with the Spewdice listing in issue 83, but nothing a programming genius couldn't sort out. You should CLEAR 63500, not 63500 as printed. Switching to normal mode in the Instructions section should be done from within a Basic program, and under Print commands CLS, is dealt with by PRINT CHR\$ 3. The semicolon is needed. In the Lprint Commands section, wherever the text says PRINT it should say LPRINT.

The Mishaps and Gobbledigook Dept has been working overtime in PCN's art studio again. You don't have to be Sherlock Holmes to see that the pictures on page 48, issue 84 have been transposed. Apologies to Melbourne House and Elite. Mr. Chip's latest game, *Ad Infinitum* (reviewed page 49 this issue) also has the wrong screen shot, for the same reason. More apologies.

NEXT WEEK

Speak up 64

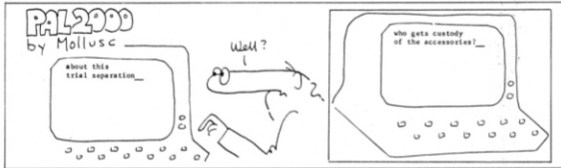
Smart talk from the flashy Covox speech synthesis unit for the Commodore 64.

Output

We command the BBC, circle the Amstrad, survive the 64 and go ape on the Spectrum.

Arm wrencher

The Zenith 160, otherwise known as the Zipper, promises 100 per cent IBM compatibility. But is it a movable desktop or a true portable?



PCN DATELINES

Event	Dates	Venue	Organisers
Texas Instruments Owners Conv	November 3	Ritz, Manchester	T199/4A Exchange UK, 0273-503968
Schools Computer Fair	November 6-7	Bloomsbury Crest Hotel, London WC1	EPC, 01-580 6321
Australian Computer Exhbn	November 6-9	Sydney, Australia	Riddell Exhbn Promotions Pty Ltd, 137-141 Burnley Street, Richmond 3121, Australia
Yorkshire Business Computer Fair	November 7-8	Pembroke Halls, Manchester	Business Computer Fairs, 0202-513829
Scottish Home Computer and Electronics Show	November 9-11	Anderston Centre, Glasgow	Trade Exhibitions Scotland, 0764-4204
COMPEC	November 13-16	Olympia, London	Reed Exhibitions 01-643 8040
Schools Computer Fair	November 14-15	Pembroke Halls, Manchester	EPC, 01-580 6321
COMDEX	November 14-18	Las Vegas, USA	Interface Group Inc, 300 First Ave, Needham, MA, 02194, USA
6809 Show	November 17-18	Royal Horticultural Halls, London SW1	Computer Marketplace Exhibitions, 01-930 1612
Artificial Intelligence Seminar	November 17-18	Middlesex Poly, London	Intellect Seminars, Steve Torrance, 01-801 3434
ZX Microfair	November 17-18	Alexandra Palace, London N22	Mike Johnston, 01-801 9172
Humberside Computerfair	November 18	Winter Gardens, Cleethorpes	Grimsby Computer Club, 0472-694047
Videx Europe Exhbn & Conf	November 20-22	Amsterdam, Holland	Online Conferences, 01-868 4466

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