40p EVERY WEEK · No 84 · Oct 27 1984

PERSONAL Computer NEWS

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MSX TWINS ON TEST

64 EXTENDED
A better Basic for the Commodore – p56

BBC EYE
Image processing on the Model B – p39

INTO THE DUNGEON
The weekly page for adventurers – p20

PLUS...
New games for Vic, Spectrum, Dragon & 64

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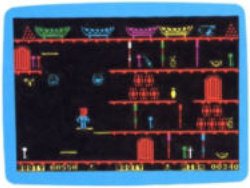
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SOFTWARE

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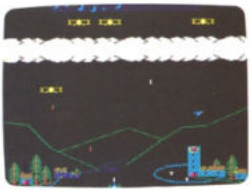
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All the gossip that's fit to print, as well as *PCN*'s datelines for what's on both here and overseas.

MONITOR

FREE COMPETITION SEE PAGE 49

Spectrum Plus is on time

The Spectrum Plus made its appearance in the shops last week — bang on schedule. Sinclair obviously went to some lengths to avoid any criticism for QL-style delays. But what Sinclair Research calls its 'new' machine is no more than a Spectrum, repackaged with QL-style keyboard, a reset switch, a six-pack of software, and an improved manual.

Priced at £179.95, it is now in the same market as the Commodore 64, the Oric Atmos, and the Acorn Electron.

Nigel Searle, managing director of Sinclair Research, said one reason that people were going for the machines of Sinclair's rivals, and not for the Spectrum, was the micro's lack of a proper keyboard.

Sinclair's response is what it calls 'a full professional, typewriter-action keyboard'. It uses the same membrane mechanism as the QL with hard keytops.

The QL keyboard was criticised at launch because of its unsuitability for touch typing. The Spectrum Plus that arrived in the *PCN* office displayed a new hazard — on turning it upside down some of the keys fell off.

Sinclair says that it is because the press were sent preproduction models and that the fault will be cured in the models sold in the shops.

When asked whether owners of old Spectrums will be able to upgrade their machines to the new standard, Mr Searle said this had been considered, but only for after the Christmas rush.

Sinclair says it will be producing 10,000 machines a month for the next three or four months, and with approximately the same for the QL and the Spectrum (minus?) this might produce a bit of a glut on the market over Christmas.

An unusual aspect of the marketing strategy for the Plus is that it is going directly into the shops, just like the Amstrad and MSX machines.



Spectrum Plus — a rehash in QL clothing.

Acorn Video reaches speed of light

The Acorn's Computer group last week launched a new product, and a new company (Acorn Video Ltd) to run it.

The name of the new product is Acorn Interactive Systems (AIS), using a Philips Laservision standard player for video disks controlled by a BBC Micro. Total price is around £3,500.

The system works in the same way as standard remote controls via the Beeb's user port. The system consists of a BBC, a sideways ROM, an interface cable, some disk drives, a monitor and some disk-based software (Acorn Author and MicroText) to allow you to create videos from existing disks.

One of the features of the system is that it allows you to mix BBC screens (any mode) with pictures from the video disk, by the addition of a Gen-lock board, which synchronises the BBC video output with the laser disk player output.

Acorn Video says it will be selling the AIS only as a system, and not as an add-on. This will upset a number of people in the educational establishment as they will need to shell out another £3,500 for hardware they already possess. The system will originally be aimed at industrial training and the armed services.

At the moment, there are no plans to allow you to upgrade your BBC, even though it is really only as difficult as attaching some of the currently available peripherals such as RAM expansions etc. The excuse for selling only complete systems is due, the company says, to the fact that it wants to make a killing on the market before developing a more advanced system for home use.

The other problem is that since it is, as yet, a small company, it would not be able to deal with any incompatibilities or problems that may arise from people doing their own upgrades.

MONITOR

Exclusive

Elite programmers auction Z80 rights

The ongoing story of Elite, Acornsoft's megagame for BBC and Electron, took a dramatic turn this week. Versions for other machines are starting to show on *PCN* long-range scanner despite the reception given to such suggestions last week.

A firm of London agents called Marjacq Micro is representing Elite programmers Ian Bell and David Braben. *PCN* can reveal exclusively that the Z80 rights to the program are up for auction. That means Spectrum owners can look forward to a version, while Amstrad and MSX translations are also possible.

The auction promises to be a fierce, cut-throat affair with bidding beginning on November 1. Already, several software houses have expressed strong interest in the onlygame ever to make the cover of *PCN*. Elite is in the *PCN* Charts at No 3 — a remarkable achievement for a game running only on the BBC.

The Electron version was released at the end of last week, which will surely help boost the game's popularity.

A spokesman for Acornsoft expressed surprise that rights to other versions were being discussed, but the company would only say that it had a 'standard' contract with the programmers and was awaiting developments.

Marjacq Micro, however, responded swiftly and quoted an exclusion clause in the contract giving Bell and Braben the right to 'develop and market' versions for machines other than Acorn computers.

This would indicate that 6502 versions — including Commodore 64 and Atari — may not be far away, although only Z80 rights are being discussed at the moment.

Whoever has the 6502 rights is sitting on a potential fortune in the Commodore 64 version but they'll have to move fast. If left too long, an 'official' version could lose out to the clones that are sure to follow Elite's success.

Jacqui Lyons, managing director of Marjacq Micro, also revealed the the company has the game rights to Frederick Forsyth's latest bestseller, The Fourth Protocol.

She says the combination of computer software and internationally famous authors is already attracting worldwide interest.

But for the moment, it's all eyes on Elite. Watch this space. . .

AGF recalls erratic joystick adaptor

AGF Hardware is recalling early models of its Protocol 4 joystick interface.

AGF says some early versions have an unreliable Kempston joystick operation mode and is offering to replace them free of charge.

To find out if you're one of the unlucky few, AGF recommends typing in the following program line with the Protocol 4 attached to the Spectrum, its mode switch in the down position, and with the Kempston card inserted.

Print IN 31, press Enter and if anything other than Ø is printed, the interface should be returned to AGF Hardware FREEPOST, Bognor Regis, W Sussex PO22 9BY.

Patents war over BBC RAM boards

The boxing gloves are on for yet another legal battle. In the blue corner we have Aries Computers and in the red corner Watford Electronics and Raven Micro Products.

Aries Computers has accused Watford and Raven of 'infringing its patent' on the design of its 20K RAM board for the BBC. A spokesman from Aries said: 'We are not sure whether we're going to take legal action, but we're certainly not happy with the situation.'

Aries' accusation has caused angry reactions from Watford and Raven. Chris Sykes, managing director of Raven Products said: 'How can Aries patent paged RAM, a concept that has been around since the '60s.' On the same lines Mr Nazir Jessa, managing director of Watford Electronics said: 'This is like patenting the wheel.'

So what's all the fuss about? Well, Aries has produced a 20K RAM expansion board called the Aries-B20 which cost £79. It claims Raven Micro Products and Watford Electronics have produced boards of the same description.

The Raven-20 at £69.95 is a 20K RAM add-on that comes with an expansion board and sideways ROM.

Watford's device has 32K of RAM, is half the size of the Aries and can be used as a printer buffer at £69.

Whatever the outcome of this battle, the BBC user will not be spoilt for choice.

Aries case is somewhat weak at moment. It has published its application but has yet to have a patent granted. This can take a year or more to come through.



ELECTRONIC BURGLAR — A 21-year-old hacker armed with his BBC and modem has been challenged to crack a key American defence system computer. The challenge will take place at 11am, October 25 in the Alexander Pavilion, Alexandra Palace, London, during the four-day Electron and BBC Micro user show. The hacker, whose identity is being kept secret claims he will finish the job in 15 minutes. If he's right a report will be sent to the US authorities revealing his method but not his identity.

Danger Mouse is on the loose again

The Ministry of Defence has backed down in a row with two Birmingham inventors over whether an add-on mouse for home computers poses a threat to national security.

The two, student Simon Goodwin and businessman Graeme Kidd, filed a patent application in June for a new type of mouse to cost around £20 and work with most makes of home micros.

A few weeks later they received a short note from the Patent Office saying the application had been seized by the MoD and if they discussed their invention with anyone they could face a £1,000 fine or two years in jail.

The Ministry refuses to comment on why it has seized the application. It cannot say what it wants to keep secret about the mouse because it is a secret!

It is likely, however, that the Ministry's concern is that the mouse's internal mechanism resembles that of tracker balls. And tracker balls are now commonly used to target battlefield missile systems.

Goodwin and Kidd took their case up with various industry figures and TV journalists, and the MoD agreed earlier this month to look again at the invention. It has relented and decided they could go ahead and sell the mouse.

'We were all set to get it ready for the Christmas market then we got stamped on by the Ministry and now we are too late,' said Mr Goodwin.

'It is a bit difficult to raise money when you can't say what it is for', Mr Kidd added.

The pair have had a narrow squeak with the MoD but now hope to roll out the mouse in the new year.

This is not the first time that micro innovators have run foul of the MoD. Jim Lamont wanted to patent a software security device only to have his patent application seized (issue 51). In his case the MoD has refused to back down.



MONITOR

RML offers schools micro bargains

In a bid to keep pace with the popularity of BBC machines in primary schools, Research Machines Limited is offering special deals on its range micros and software.

For £499 — a saving of £200 — schools can pick up a RML 480Z and the RML 480Z (L5), with silicon disk at £624. Floppy disk drives start at £299 for a single drive/double density rising to £649 for a twin drive/quad density. Unfortunately, you're only allowed one machine and disk drive per school.

In addition, you can hook up to four machines to a Shared-Disk system to produce a type of network. The Shared-Disk system, with software and one transceiver board costs £75; alone, the transceiver board is £33. And for a stand-alone or shared disk you can get WordStar, LOGO, Telesoftware, SIR, Word, Touch 'n' Go, TXED/F, ZASM Assembler, for £149.

● School children throughout the country have a chance to win a five-day trip to America to see the JF Kennedy Space Centre in Florida in a competition sponsored by Microvitec. (0274-390011).

The CUB British Schools Computer Challenge will run for 13 weeks, with the finals taking place in August, 1985. The competition is open to secondary schools with a maximum age limit of 16.

Schools will be asked to enter three contestants as a team. During the competition they will be given problems to solve on a computer — (most likely BBCs and RMLs).



Lift-off for winning school team.

Fuller solves its crashing problems

The Fuller FDS is back in the picture, this time under the wing of the company's new owner, Nordic Keyboards. The Fuller Executive uses a buffer to allow you to connect the keyboard while leaving your Spectrum intact.

Interface 1 can also be fitted in by just snapping out a panel at the rear of the case. Nordic also seems to have cured the crashing problems that plagued the FDS.

The keyboard's circuit board technology has been changed from CMOS to TTL, and the power input now goes straight to the Spectrum rather than through the keyboard's circuitry first.

The old-style but improved FDS costs £49.95, while the FDS Executive costs £59.95. Nordic can be reached on 051-548 2220.



QL PRINTOUT — Cambridge Systems Technology (0223-323302) has cut the price of its Q-Pi Centronics interface. It costs £57 and plugs into the QL expansion slot. The Q-Pi features an onboard driver to allow a device to be managed from QL SuperBasic and provides full QDOS driver facilities. In addition, it operates from any Sinclair-supplied Psion software.

IN BRIEF

Tandata has followed ACT's lead and become the second company to produce an integrated communications package that allows you to talk to both Prestel and non-viewdata databases through the same program.

Viewtext is designed to work with Tandata's own modems and a variety of CP/M micros.

It costs £125 and gives you storage of 72 telephone numbers with their appropriate log-on sequence as well as off-line editing.

Elsewhere on the communications front, Business Communications (0323-891606) has released Com-Pac, a communications program for the IBM, Apricot and Sirius.

It can be used for communicating with Telecom Gold as well as sending and receiving telexes.

Stack has released a BBC version of its light rifle which, like the other versions, sells at £29.95.

The company has also produced a digital joystick with what is claimed to be an unbreakable nylon ball joint. It will cost £7.95 and can be used with any micro with an Atari compatible joystick port.

Tandy is organising the first ever show for 6809 micros. Catering for Tandy Color Computer and Dragon owners it takes place on 17th and 18th November at the Royal Horticultural Halls, London. Tickets cost £2 for adults and £1 for children.

HOMEFRONT



When a pinta a day was the answer

Sooner or later, at one stage in its development, every aspect of life goes through some kind of nostalgia boom . . . pop music, the movies, motoring — the things everyone moaned about at the time become fondly remembered for the very same idiosyncracies. It seems doubtful that computers will enjoy a similar affection. There are too many exciting developments coming 'real soon now' for most of us to give thought to what has been.

However, now seems like as good a time as any to indulge in a little industry retrospective, to examine our roots, so to speak.

What prompted this wimpish maundering was the arrival this week of two market survey reports. Now it's true that someone perceptive once said that if all the market researchers in the world were laid end to end they wouldn't reach agreement, and these two didn't. One speculated on a levelling off in the market over the next five years (not a decline, it rushed to point out, but a reaching of 'maturity'). The other looks no further than the end of this year.

But while the future is uncertain, everyone agrees on where we've been. And here, at last, we get to the point. Before we head off over the hill (not a precipice, he rushed to point out) into the next round of cutting edge, technological, innovative marketing, let us remember those brave souls, the computer pioneers.

They were the men who bravely went where no man had gone before, writing Star Trek games in 4K, with letter As zooming in above the galactic plane, asterisks whizzing by in startling 2D graphics, vicious enemy Vs spitting full stops.

They were dark days, five years ago, lit only by the glow of a monochrome screen and the dull radiance of a ZX80 approaching meltdown. Who remembers the ZX80 now? But then it had the impact of a sub-£200, 16-bit, 256K IBM-compatible. You could read interesting tips about it in the computer magazines (yes, there were magazines then — three of them). Possibly the most famous dealt with the machine's overheating problem. Recommended remedy was to stand a pint of ice-cold, long-life milk on the back. Now that's innovation.

Everyone remembers the ZX81, of course. It had the same impact as Henry Ford's Model T hitting the road, and that road led eventually to colour, high-resolution graphics, multi-voice sound, disk drives and printers for all, and amounts of RAM that seem positively extravagant.

So as the day approaches when you'll buy computers with built-in laser disks, megabytes of memory and unbelievable graphics, but for now you just can't squeeze that program into 64K, remember . . . you've never had it so good. ***Peter Worlock***

MONITOR

Touchmaster holds Dragon clearout

It's bargain basement time for Dragon software, and Touchmaster (0656-744700), which inherited the right to provide software and other support for Dragon owners, is offering a choice collection.

Heading the list are Dragon cartridges, going for a knock down price of £9.95. The titles are Berserk, Cosmic Invaders, Ghost Attack, Astroblast, Doodlebug and Rail Runner.

Also available on cartridge are Logo at £19.95 and Super Dragonwriter at £29.95.

Utilities available on tape include Computavoice, Music Box, Synther 7, Fruity and Astrology — all priced at £3.95.

Touchmaster, run by ex-Dragon directors Brian Moore and Richard Wadman, says that it is looking at other ways to support Dragon users and is running a helpline for queries on Dragon related matters on the above telephone number.

The software is available on mail order only and the prices are strictly 'while stocks last'.

'It is receiver's stock,' said Brian Moore, 'Some of the titles will continue, but that is subject to a renegotiation of licences.'

● Mr Moore also said that Eurohard was due to go into production with the Dragon this week. The Spanish company is planning to extend the range of machines with possibly an MSX machine and a new 6809 micro that will be an upgraded Dragon 64. The bad news is that neither of these machines is intended for the UK market.

The other bad news is that Eurohard is unlikely to manufacture the Dragon Professional or the Beta twin 6809 micro. Both machines were well advanced at the time that Dragon Data went bust.

Parrot flies in with new disk range

Against the lavish settings of the exclusive women-only health spa The Sanctuary, a company called Parrot flew in from Wales to bring news of its new disk manufacturing plant.



Parrot — flying in with more competitive prices for the UK end-user?

The computerised plant will produce a range of 8in, 5in and 3½in disks when fully operational. And as it will be fully integrated — it could mean more competitive prices for the end-user in the UK.

Parrot is somewhat an unusual name for disks, but as Frank Peters, managing director said: 'We were looking for a name with two syllables and was easy to remember — Parrot fits the bill.'

After a theatrical performance (with a man dressed up as a parrot) and the formalities of the day — journalists were able to have a dip in the pool, lie in the jacuzzi, have a sauna or get a tan. Ah, that's the life.



SMOOTH MOVER — Previously, biro printer plotters moved the paper vertically and were only capable of using half A4 width paper. Datafax has solved the width problem by using a mechanism similar to the HAL Sweet P plotter. The SCP-800 4 Colour Plotter Printer moves the paper via a pinch wheel on each edge. The same pen mechanism as on other biro plotters (Tandy, Atari, Oric etc) is used, ie the rotating four pen holder and solenoid to hammer them into the paper.

Mega-prize for Softek winner

Softek is going to ever-increasing lengths to hype its latest release, Quo Vadis (issue 79).

Not content with decribing, it as a 'mega-game', it has now upped the value of 'its mega-prize for the first winner to £40,000.

To win you have to find a magic sceptre in one of the game's 118 caverns.

Originally, the first person to find it won a genuine gold and silver sceptre. Now a mysterious 'financier' has offered to add £30,000 to the prize.

VIEW FROM AMERICA



The computerised novel has arrived

Science fiction writers should have seen it coming — the beginnings were clearly discernable. Now it is too late and the end of life as we know it may be upon us.

Where did it start? In the artificial intelligence community, more specifically in MIT in Boston, in the mid-70s when a group of computer research scientists developed an interactive game on the lab mainframe for their own amusement.

It employed a high level language called MDL, which allowed the creation of parser codes. Parser codes can resolve speech components and identify them.

In 1979, the scientists left MIT to found Infocom and released their game as Zork I, the first computer dungeons and dragons game.

Today Zork and its two Zorkie descendants have sold a million copies and Zork I ($40) is still at number nine in the Softsel US Games Chart. Infocom has five other titles in the top 30 and is the established leader in the field of interactive games.

Its latest effort involves Douglas Adams' Hitch Hiker's Guide to the Galaxy, which should be out for Christmas.

Now, Spinnaker Software has jumped in with the release of six interactive fiction titles under the Trillium imprint. The latest release is a sequel to Farenheit 451, by Ray Bradbury. Arthur Clarke, Robert Heinlein and Harry Harrison games titles are in the works.

The major differences between the Spinnaker and Infocom games is that Spinnaker has incorporated arcade-type joystick sequences. The Spinnaker parser cannot really understand adjectives and prepositions although it can handle short commands.

The prose is therefore a lot less interesting than Infocom's.

Speaking as one who earns a crust or two from writing science fiction novels, I am torn between a twinge of envy at this development and a sense of foreboding.

Parser codes can do more than conduct interactive games. They might just price human writers out of the market.

Consider Racter (short for raconteur), for instance. Racter is a program in Basic that, on a Z80-based micro with 64K RAM, turned in the first book ever written by a computer — without human assistance.

Titled the Policeman's Beard is Half Constructed, it was published by Warner Software Books this month.

Described by the publisher as 'computer prose and poetry' the Beard sells for £9·95 and has illustrations by Joan Hall to complement Racter's gurgly, free-flying, fortune cookie prose.

According to Racter itself, 'stories, essays, dissertations and tales are in this book. There are also meat and tomatoes . . .'

Indeed, there are loads of references to meat. Racter seems almost obsessed with meat. Lamb in particular gets many mentions in his prose.

Racter can conjugate regular and irregular verbs, print the singular and plural of regular and irregular nouns, and can assign variable status to randomly chosen things.

These can be individual words, clauses, sentences, paragraph structures, or indeed whole story forms.

Racter was created by William Chamberlain and Thomas Etter, who say about their creation: 'an important facility of the program is its ability to direct computers to maintain certain randomly chosen variables, which will then appear and reappear as a given block of prose is generated.'

Racter's output has a kind of looney sweetness about it, although others might say it writes as if it were William Burrough's long lost mild-mannered brother.

For example . . .

More than iron, more than lead,
More than gold I need.
Electricity
I need it more than I need lamb
or pork or lettuce or cucumber.
I need it for my dreams.

Chris Rowley

MONITOR

Select 1 packs 12 at a bargain price

The latest trend in software is compilations. It all started in August with Beau Jolly's Valuepacks for the Spectrum, Commodore 64, Vic 20 etc. Selling at £14.99 these offer six Imagine games. Then came Alligata's Chartbusters, £9.95 for five of the company's best games for the BBC and Commodore 64.

This week saw the release of the compilation to end all compilations. The Select 1 package offers 12 hits of yesteryear for £12.49.

The games come from a variety of well-known software houses, including Ocean, Bug-Byte, Anirog and Quicksilva. The Spectrum games pack boasts Hunchback, Mr Wimpy, Kong, Time Gate and Denis Through the Drinking Glass, while for the Commodore 64 there's Hexpert, Skramble, Moon Buggy, Ring Of Power, Galaxy and Hunchback.

Some might say this is just a new marketing ploy to unload old games which might not otherwise sell. But given the past success of the titles, and the price, it's surely a bargain for new owners, particularly as the 64 programs feature fast loading, and the Spectrum has a menu for loading any of the games.

The Select 1 suite will be marketed in conjunction with Telstar records and will be backed by some half a million pounds worth of TV advertising over Christmas. Telstar, who produce album compilations of chart-topping singles, are certain this trend will continue, particularly as Christmas approaches.



LIGHTS, CAMERAS, ACTION — The latest name in the MSX game is Yashica. Better known for its photographic equipment, it is now part of Kyocera — the company that manufactures the Tandy Model 100 and Olivetti's lap-held micros. The Yashica YC-64 is standard MSX micro with 64K of RAM. The company says it will be ready for a European launch next month, but so far it has not appointed its UK distribution network — so no prices yet.

Prestel mailbox undercuts the phone

Prestel has souped up its electronic mail service so that users can send messages countrywide for no more than the cost of a local telephone call.

If the messages received at *PCN* are anything to go by there is now a whole new group of Prestel and Micronet users who are discovering the delights of communicating electronically.

The cost of sending messages is free. All you pay for is the call to your local Prestel computer. And for 96 per cent of the population that is at local call rates if you phone outside office hours.

Until now, if you had wanted to use the mailbox service you had to phone the Enterprise computer in London — which meant heavy phone bills for the majority of people living outside the capital.

Prestel reckons more than half Prestel's 47,000 users have access to a typewriter-like keyboard. And that includes the growing band of micro owners who are hooked up to the service.

To send a message you can use one of Prestel's 400 stock messages or compose your own, with colour graphics if you like.

The sending of messages is almost instantaneous with the recipient being told that a message is waiting when either they log-on to Prestel or — if it is a recent message — when they log-off.

PCN is always keen to hear from its readers — both in good old-fashioned hard copy form or more micro-minded electronic form. Prestel users can contact us through our mailbox which is 016366890.

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	4	Beach Head	US Gold	SP, C64	£9.99
3	3	Elite	Acornsoft	AC	£15.00
4	18	Zaxxon	US Gold	C64	£9.95
5	2	Sherlock Holmes	Melbourne	SP, C64	£14.95
6	20	Pyjamarama	Microgen	SP	£6.95
7	9	Int Soccer	Commodore	C64	£9.99
8	13	Jet Set Willy	Soft Project	SP, C64	£5.95
9	8	Full Throttle	Micromega	SP	£6.95
10	—	Combat Lynx	Martech	SP	£7.95
11	6	Avalon	Hewson	SP	£7.95
12	5	Kokotoni Wilf	Elite	SP, C64	£6.95
13	10	Lords of Midnight	Beyond	SP	£9.95
14	—	American Football	Argus	SP, C64	£9.99
15	7	Monty Mole	Gremlin	SP, C64	£7.95
16	19	Havoc	Dynavison	SP, C64	£9.95
17	—	Braxx Bluff	Micromega	SP	£6.95
18	—	Dark Star	Design	SP	£7.50
19	—	TKV	Bug Byte	SP, C64, AC	£7.95
20	12	Decathlon	Activision	C64	£9.99

SPECTRUM

TW	TITLE	PRICE
1	Beach Head	£9.99
2	Daley's Decathlon	£7.90
3	Sherlock Holmes	£14.95
4	Pyjamarama	£6.95
5	Full Throttle	£6.95
6	Combat Lynx	£7.95
7	Avalon	£7.95
8	Lords of Midnight	£9.95
9	Jet set Willy	£5.95
10	American Football	£9.99

COMMODORE

TW	TITLE	PRICE
1	Daley's Decathlon	£7.90
2	Zaxxon	£9.95
3	Int Soccer	£9.99
4	Beach Head	£9.95
5	Jet Set Willy	£6.95
6	Havoc	£9.95
7	Kokotoni Wilf	£6.95
8	Monty Mole	£7.95
9	Decathlon	£9.99
10	Summer Games	£14.95

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

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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 18**. 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.

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RANDOM ACCESS



If something we've said has outraged, amused or impressed you, this is your chance to answer back. To celebrate the new-look *PCN* we decided to give our 'star' contributors a pay rise — the best letter of the week will now earn you £15. So send in your contributions to: Random Access, *Personal Computer News*, Evelyn House, 62 Oxford Street, London W1A 2HG.

Oric owners should stop complaining



How sad that Matthew Hisbeit (issue 81) feels that the future of his Oric rests on software support. Perhaps the French are not as stupid as John Miles thinks. Perhaps they, like me, welcome a machine that has the potential of the Oric and encourages the user to think and experiment with programming.

I would not deny that the Oric 1 has its shortcomings, but rather than wallow in that British habit of moaning and doing nothing, I have found great personal satisfaction in exploiting the strengths of the machine. The result? I have a stock of programs that I have developed for myself. I am not a passive software-dependent user, but an active and learning programmer.

If I had wanted a game machine, I would have spent far less on something designed for just that. Instead I bought a computer that I can use and that is developing my knowledge and abilities. I do not depend on software support and the future of my Oric depends only on my own need to develop beyond its capabilities.

Perhaps if other Oric owners bought some good books (and there are plenty around for the Oric), took some action instead of waiting for everything to fall in their laps and applied their minds, they would be less inclined to whine about wasted investment.

Martin Bolter,
London W3

Sounds like you and your Oric were made for each other — Ed.

Red faces, but Phloopy plights back

I was glad you were able to give so much space (issue 80) to our Phloopy mass storage system for the BBC (and now also for Electron), but your reviewer made our faces red. We agree products should be thoroughly tested and every bug eradicated before being passed to a reviewer for critical assessment. But sometimes even a painfully obvious bug which took us only a few hours to fix slips through the net. Sorry!

But there are other, more serious criticisms. Again the fault is ours for obviously not providing sufficient information.

David Janda complained the Phloopy was 'painfully slow', taking 13 seconds between repeated accesses. True, it is fairly slow compared with a well organised disk, but the Ultradrive and the Wafadrive take about 45 seconds when used in a similar way. Your Wafadrive reviewer, in the same issue, commented that in practice accesses were a fraction of that time, which of course is equally true of Phloopy except that it is an even smaller fraction of only 13 seconds.

The Phloopy review complained of a lack of a file compact instruction remarking that it was 'essential on tape systems'. How disappointed we were that your reviewer had not appreciated that Phloopy does not need a compact command (or indeed the reorganise command needed for disk systems). Phloopy automatically compacts data each time the loop is written.

Finally we accept the comment about Phloopy plugging in through the disk port. We thought long and hard about that during the design phase, and our market research showed that the majority of customers would prefer us to leave the user port free for other peripherals and accessories. We have a development version which operated perfectly well through the user port.

Dare I say, Phloopy phights back!

Malcom Malir,
Phi Mag Systems

The subtleties of playing the game

Your software editor, Bryan Skinner, must have been so busy poring through his dictionaries that he didn't have time to notice that the subtitle of my game — Lingo — The computer game that makes fun of the English language — is a play on words.

But two can play at that game too. In my book (the Oxford English Dictionary, in 12 volumes) 'play' in this sense is defined as 'a sportive use of words, so as to convey a double meaning, or produce a fantastic, or humourous effect by similarity of sound with difference of meaning; a pun.' Exactly.

Alan Wakeman,
London, W1

Wish we could afford an Oxford English Dictionary in 12 volumes — Ed.

Getting in the last word

I know you headed the letter 'Last Word'. But your reply to Gregory Kuopp (issue 82) was simply inviting angry comments.

You say that four 100K (that should be 127K) drives are not a real alternative to two 320K drives. Well how about four 180K drives? (You reviewed the Indus GT in issue 66.) And with the ATR8000 add-on (available in this country from Tollgate) you can use any 5½in or 8in drive, as well as having access to C/PM and MSDOS.

You question the availability of software capable of supporting four drives. I have yet to find any software that does not support all four drives, and that includes VisiCalc, (even you must have heard of VisiCalc, although I doubt if you could name any other micro for which it is available at just £50), Atariwriter, as recommended by *The Guardian*, Letter Perfect, admittedly not as easy to obtain as Atariwriter, but a very professional word processor, and File Manager+, as used by Walt Disney studios to aid the production of Tron.

Please, I am not asking that you give Atari a hype, just that you be fair.

Chris Bone,
Watford, Herts

Sounds like a nice setup. Shame it would cost about £1,000 excluding software and a TV set — Ed.

Sharp MZ700 is a good bet

In reply to Dr Pointer's letter in issue 81 concerning the Sharp MZ700.

As the owner of a MZ700 I can tell you some things you do not know. You say that the MZ700 has little software, but in fact there are around 250 titles from Sharpsoft etc. And how can you say the MZ700 is expensive at a price of about £180?

So go on Mr Pointer, I think you will find that the 700 is a good bet.

Ian Fletcher,
Bishop Auckland, Co Durham

You're right, we didn't know that. You just can't keep a secret can you? — Ed.

Newbrain contact for repairs

With reference to the letter from G Bland, (issue 82) the people for Newbrain Repair are: A J Electronics, Sproughton, Ipswich IP8 3AW. Phone 0473-461600.

If Mr Bland requires any further info on Newbrain, he can contact me direct.

Jim Moon,
Lostock Hall, Preston.



Having got one at last, we've now got to wait another six months for someone to market any decent software.

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Getting more from your Oric graphics

Q Can you tell me how to use the graphics control for my MCP 40 colour printer, driven by my Oric? The manual gives the example LPRINT "D"x,y, to draw a line from the current position to (x,y), but I can't get it to work. Also, is there a compiler for Oric Basic and how can I find out more about attributes?
John Hayes, Sheffield

A The problem is that you can't just use the variable 'x' and 'y' as implied in the example. The printer is 'looking for' a code like 'D10,10', so you have to convert the variables to their string representatives, then add them to the control letter 'D'. The problem with this is that STR$ adds CHR$(2) to the front of positive number strings, so this has to be stripped off, as does the trailing space. You could handle this with a subroutine:

```
1000 x$=STR$(x):y$=STR$(y)
1010 IF LEFT$(x$,1)<>CHR$(2)
     THEN 1030
1020 x$=MID$(x$,2,LEN(x$)-1)
1030 IF LEFT$(y$,1)<>CHR$(2)
     THEN 1050
1040 y$=MID$(y$,2,LEN(y$)-1)
1050 x$=left$(x$,len(x$)-1)
1060 y$=left$(y$,LEN(y$)-1)
1070 CR="D"+X$+","+y$
1080 LPRINT CR;
1090 RETURN
```

To learn more about attributes, check out some of the many Oric programming books on the market. As far as we know, there are no Oric Basic compilers.

Mathematical errors on the C64

Q While messing about with the precedence of mathematical operators I found that the square function sometimes produces the wrong answer on my Commodore 64. For instance, 7^2=49.0000001.

The only solution I can think of is to use the INT function to strip off the decimal part. Why does this happen?
D R McLean, Birmingham.

A It's just one of those things. Not only your 64, but many computers suffer from this 'bug' which arises out of the math routines in ROM. In most cases you won't find it a problem but if you need strict mathematical accuracy, it's something you need to watch out for. There isn't really any solution.

Pretty pointless colours on the ZX

Q Is it possible to have more than two colours in a character position on the ZX Spectrum, and if so, how do you do it? Can you produce more than the Spectrum's standard eight colours on screen?
Gordon Binney, Wrexham

A No, you can't have more than two colours per character position, and the possibilities for getting more colours on the screen are fairly limited. You can do it with this demo, which is practically useless, but it's quite pretty:

```
10 FOR N = 0 TO 6 STEP 2
20 POKE USR "A"+N,BIN
   01010101: POKE USR "A" +N+1,
BIN 10101010
30 NEXT N
40 LET A=INT (RND*8)
50 LET B=INT (RND*8)
60 PRINT INK A; PAPER B;
   "AAAAAAAAAAAAAAAA
   AAAAAAAAAAAAAAAA"
70 POKE 23692,255
80 GOTO 40
```

All you're doing here is providing a grid pattern UDG and mixing INK and PAPER colours to provide a larger range. Unfortunately, pretty pointless.

An easy guide to the jargon jungle

Q I have recently bought an Amstrad computer. Are there any publications available that will explain to a complete novice just what a variable is, plus the other bits of jargon that leave me in the dark?
P Andrews, Doncaster, S Yorks.

A Virtually any beginner's guide to Basic — and there are hundreds — will lead you gently up the jargon path. However, they will not be specific to your Amstrad.

A better bet might be Amstrad Computing, a new book from the prolific Ian Sinclair, published by Granada at £6.95. It covers the basics before moving onto machine-specific stuff like graphics.

Amstrad v 64 — the choice is yours

Q I am going to upgrade my computer soon and would like your advice. I would use the computer for writing programs and playing games. I have narrowed the choice down to the Amstrad or Commodore 64.
P Reynish, Newbridge, Gwent.

A No matter how often we protest, this kind of query crops up again and again. And since we've had several questions relating directly to the Amstrad v 64 dilemma, here's a shot at it.

First, there isn't a computer anywhere in the world at any price that stands out above the rest of the crowd. Every machine has something to commend it.

The first question to ask of any machine is: Is it reliable? In both cases here the answer is yes. Does it have lots of software, and lots of different kinds of software? The 64 does, the Amstrad doesn't . . . yet. So the next question is, can you wait for the software? If you can, then there's still little to choose.

Do you want to write programs in Basic? The Amstrad is the better bet. If you want to write in machine code then the 64 is better for the moment because there's a greater choice of program development tools.

If you simply want to run commercial software most of the time then the 64 wins again. Would using the family TV set for your computer create a clash of interest in the family?

If so, the Amstrad scores with its built-in monitor. If you don't want a monitor then the 64 looks as much as £50 cheaper (minus the cost of a tape recorder).

As you can see, the question 'Which is best?' doesn't mean anything. All you can do is pick the one you want. Good luck!

Mixing Maplin and Micronet

Q I recently bought a Maplin 300/300 Modem to use with my Spectrum and RS232 interface. Is it possible to use Micronet 800 with this? If so, where can I get the required software?
Kenneth Sutherland, Drumnadrochit, Inverneshire.

A As the Maplin modem does not have Telecom approval it is illegal for you to use it for communications over the public telephone system. Because of the Spectrum's 32-column screen display it cannot be used with Prestel (of which Micronet is just one part).

Micros with a screen width of 40 columns or more can be used with Prestel and there is a poorly advertised 300/300 service for users with this kind of modem. It does not provide colour graphics.

How can I learn to write games?

Q I am 11 years old and own a BBC Micro. I find it very difficult to understand how to go about writing programs for simple games and graphics. Can you advise me?
A Tsemensis, Harborne, Birmingham.

A Writing games is only a little different to writing any other sort of programs, with the exception of certain techniques, such as animation. The only way we could help would be to teach you to program — obviously out of the question.

However, there are a large number of books dealing with the techniques you require. Possibly the best for your purposes is The BBC Micro Gamesmaster by Kay Ewbank et al, published by Granada at £5.95.

Binatone query sparks memories

Q Some time ago I remember reading about a computer from a company called Binatone. It was supposed to have colour graphics and a large memory for under £100. Where can I get further information?
M Richard, Southend, Essex.

A What memories this question brought back. Never, in the field of human endeavour, has anything matched the Binatone computer. Binatone used to be pretty big in the home video games field — you know, ping-pong and so on. A computer from the company never really had any more substance than pure rumour.

MICROWAVES



Tips from readers to make programming easier or open up new avenues of possibility. A new look to *PCN*'s pages means a new look to the payments too. Now £10 for every hint in print, and a hefty £50 for the *Microwave of the Month*. Send your hot tips to *Microwaves, PCN, Evelyn House, 62 Oxford Street, London W1A 2HG.*

Spectrum clocks on with maths formulae

This program gives a computer simulation of a clock face. It uses the mathematical formulae as described in Chapter 18 of the Spectrum manual.

The clock can be made to keep fairly accurate time by changing the pause length in line 270.

50 to 75 print the clock face
80 to 120 starts the clock
130 draws the minute hand
210 to 250 draws the second hand
270 pause for timing
280 deletes the second hand
310 deletes the minute hand
340 deletes the hour hand
380 to 400 resets the clock

Laurence Smith
Pill, Bristol.

```
5 REM @LAWRENCE SMITH 1004
10 INPUT "ENTER HOUR"ih
15 IF h=12 THEN LET h=0
30 INPUT "ENTER MINUTES"im
40 CLS
45 CIRCLE 132,92,83
50  FOR n=1 TO 12
60 PRINT AT 10-10*COS(n/6*PI),16+10*SIN(n/6*PI);n
70 NEXT n
75 PRINT AT 2,16;"@"; PRINT AT 3,15;"LNS"
100 FOR a=h TO 11
110 LET x=(a*5)/30*PI
120 LET hx=(40*SIN  ) + 3: LET hy=40*COS x
130 PLOT 128,88 DRAW OVER 1;hx,hy
160 FOR b=m TO 59
170 LET y=b/30*PI
180 LET mx=70*SIN y: LET my=70*COS y
190 PLOT 128,88: DRAW OVER 1;mx,my
220 FOR c=0 TO 59
230 LET z=c/30*PI
240 LET sx=76*SIN z : LET sy=76 *COS z
250 PLOT 128,88: DRAW OVER 1;sx,sy
270 PAUSE 40
280 PLOT 128,88 : DRAW OVER 1: sx,sy
290 NEXT c
310 PLOT 128,88 : DRAW OVER 1: mx,my
320 NEXT b
340 PLOT 128,88 : DRAW OVER 1: hx,hy
380 LET h=0 :LET m=0
400 NEXT a
```

Amstrad says it with flowers

A series of flower or snow-flake like patterns is generated by this effective graphics display which runs continuously. It was written to be used in a shop display.

A regular polygon is rotated through 360 degrees. The polygon is decreased in size and the rotation repeated a few times using various pens.

The inks are then changed a few times before the screen is cleared and then repeated.

The colours, the number of sides of the polygon and the number of steps in a revolution are all set at random. The mode alternates between 0 and 1.

David Muir,
Plymouth, Devon.

```
10 '
20 ' FLOWERS
30 '
40 ' by D.Muir
50 DEFINT b-z
60 PRINT CHR$(23)+CHR$(3);
70 RAD
80 w=0
90 FOR h=1 TO 10
100 n=7+RND*12
110 b=RND*27
120 z=4+RND*4
130 r=560/z
140 MODE 1-w
150 BORDER b
160 p=RND*27:IF p=b THEN 160 ELSE INK 0,p
170 FOR v=1 TO 9
180 m=RND*27:IF m=p THEN 180 ELSE INK v,m
190 FOR a=0 TO 2*PI STEP 2*PI/n
200 MOVE 320,200
210 FOR y=0 TO z-1
220 DRAWR r*SIN(a+y*2*PI/z),r*COS(a+y*2*PI/z),v
230 NEXT
240 NEXT
250 r=r-12
260 NEXT
270 FOR q=1 TO 20
280 FOR s=1 TO 9
290 INK s,1+RND*26
300 NEXT
310 FOR t=1 TO 1000:NEXT
320 NEXT
330 NEXT
340 GOTO 90
```

Useful Amstrad width command notes

The WIDTH command is used to specify the width of a printer attached to it. If this many characters are output to the printer on a single line a carriage return/line feed sequence is automatically inserted. WIDTH stops your printer overprinting the last column if a line is too long. WIDTH 255 disables the feature — no automatic moving to the next line occurs.

PRINT sends a carriage return or line feed character which forms a part of a string (using CHR$(13) or CHR$(10)) to the printer without further embellishment. Note that a carriage return/line feed sequence is automatically issued at the end of a PRINT statement, unless it is terminated by a comma or semi-colon.

If the printer being used does not require both carriage return and line feed and you don't wish to change existing PRINT or WIDTH statements, you must intercept the output to the printer at the MC PRINT CHAR jumpblock entry and suppress the line feeds at this point. This program causes line feeds (&0a) to be ignored by the printer.

Locomotive Software,
Dorking, Surrey.

```
100 MEMORY HIMEM-7                  'SPACE FOR PATCH
110 POKE HIMEM+1,&FE                'CP &0A  (CHECK IF LINEFEED
120 POKE HIMEM+2,&0A
130 POKE HIMEM+3,&37                'SCF
140 POKE HIMEM+4,&C8                'RET Z   (IGNORE IF SO
150 POKE HIMEM+5,PEEK(&BD2B+0)      'OTHERWISE PRINT CHARACTER
160 POKE HIMEM+6,PEEK(&BD2B+1)
170 POKE HIMEM+7,PEEK(&BD2B+2)
180 &BD2B,&C3                       'POINT JUMPBLOCK AT PATCH
190 POKE &BD2B+1,&FF AND INT(HIMEM+1)
200 POKE &BD2B+2,INT(HIMEM+1)/256)
```

Auto-run a Dragon program from Basic

Auto-running a Dragon program without a lengthy machine code routine is generally believed impossible. However, I have discovered a very simple way to do just this from Basic. The only problem is that memory must be saved from location 166 onwards to the end of the program.

The way this works is that locations 166 and 167 contain the address of the next Basic command to be executed (location 732 onwards contains the commands entered in direct mode and this is where 166 and 167 point to). If this pointer is saved with the commands to be executed next, after the program is loaded, these commands are carried out.

The auto-run may be used on both Basic and machine code programs.

Position the tape press record and play and then type the following line:

```
FOR I= 25 TO 36 : PRINT I, PEEK(I)
NEXT
```

Note the values that appear on the screen and then type:

```
CSAVEM"FILENAME",166,PEEK
(27)*256+PEEK(28),0:POKE25,A:
POKE 26,B: POKE 27,C: POKE
28,D: POKE 29,E: POKE 30,F: POKE
31,F: POKE 32,H: POKE 33,I: POKE
34,J: POKE 35,K: POKE 36,L: RUN
```

A to L are the number obtained from the above peeks. This saves the Basic file with auto-run. To load type CLOADM.

G Carwardine
Tonbridge, Kent.

How to write for Personal Computer News

PCN WANTS YOU!

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What we want

We're looking for programs and articles on any aspect of using personal computers — including games, graphics, utilities, and applications.

If you're sending a written contribution we require it in typed form (dot matrix printout is fine), with double spacing on one side of the paper only. Where possible include short, example programs to illustrate the article.



If you've written a program we require a working version, on tape for any machine, or on disk if you prefer for Commodore 64, Atari, BBC or Apple. We'd also like notes on how the program works, what it does, and any special features that you've included. A printed listing would be nice but isn't essential — on the other hand we can't consider listings without a working copy on tape or disk.

If you would prefer to make preliminary enquiries before submitting material, you should write — don't phone — to *Personal Computer News*, Evelyn House, 62 Oxford Street, London W1A 2HG. Questions about articles should be addressed to John Lettice, Features Editor; program queries should go to Nickie Robinson, Programs Editor.

If we decide not to use you contribution it will be returned to you if you enclose a stamped, self-addressed envelope but give us at least six weeks. You should receive payment four weeks after publication.

If you want to enclose photographs and screen shots, feel free to do so but make sure they are of good quality and make them colour transparencies or black and white prints. Do not send colour prints.

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SHOOT-'EM-UP

It was kill or be killed in the Old West — at the *PCW* show in Old West London, that is. *PCN*'s game for the show, specially written by ace gunslinger Kenn Garroch, was such a raging success that we've decided to publish it here. Have you got what it takes?



Tombstone, for the BBC Model B, allows you to play at being Wyatt Earp, Clint Eastwood or, if your trigger finger's a little slow, Julie Andrews. You're faced with a series of windows at which faces appear. You have to use the joystick to steer your cross-hair sight to the figures and shoot them before the number below the window gets to 0. Otherwise it could be curtains.

The game is constructed from five programs. Three are used to set up various parts, such as the scenery, the characters, and the machine code, while the other two are the game itself and the high-score program. The main reason for doing this is to save space, with the added advantage that the program is very modular.

The first, the definer sets up the characters appearing behind the windows, and the windows themselves.

After running it you will be asked to enter a file name. If you want to edit a previously defined shape, enter the file name here, or just press Return. You will then be presented with a random set of dots with a representation of the correct size character in the top right-hand corner of the screen.

To define the character shape, use the cursor keys to move around the screen and select the colours with the function keys. When the game is running a hit is scored by detecting a colour number greater than seven. All the target areas should therefore be set up as flashing colours. These are obtained by pressing the shift and function keys simultaneously.

To save a shape, press the shift key and the @ key simultaneously (character 0), and type in the shape's name followed by return. The shapes to be defined are shown in figure 1. In general, the target areas are the head and upper body with red (9) giving a higher score.

The next program to be run is the scene program. This sets up the background scenery and saves it as a screen

LISTING: HIGHSCORE

```
  5 MODE 1
 10CLOSE#0
 20 REM HISCORE PROGRAM
 30 DIM S$(25),S(25)
 40 X=OPENUP("HOS")
 50 FOR T=0 TO 20
 60 INPUT#X,S$(T),S(T)
 70 NEXT T
 75 IF !&300= &1200 THEN 110
 90 PRINT
100 A$=FNSET
110 FOR T=0 TO 20
120 IF !&70>S(T) THEN FOR S=T TO 19:S(
T+1)=S(T):S$(T+1)=S$(T):NEXT:S(T)=!&70:S
$(T)=A$:T=21
130 NEXT
140PROCTABLE
150 PTR#X=0
160 FOR T=0 TO 20
170 PRINT#X,S$(T),S(T)
180 NEXT
190 CLOSE#0
200 PRINT TAB(5,30);"PRESS FIRE FOR AN
OTHER GAME"
210TIME=0
220REPEAT
230UNTIL !&0VAL(0)AND 1: OR TIME>1000
240 CHAIN"GAME"
250DEFPROCTABLE
260CLS
270FOR T=0 TO 20
280PRINT"**";S$(T);TAB(16);"--";S(T)
290NEXT
300ENDPROC
310DEFFNCH
311 TIME=0
320 IF !&0VAL(0) AND 1!=1 THEN 320
330A=A0-INT(&0VAL(1)/16.4)
335 IF TIME>5000 THEN CHAIN"GAME"
340IF A<32 THEN A=32
350IF A>& THEN A=&
360COLOUR 129:COLOUR 2
370=A+19
380PRINT TAB(A,10);CHR$(A-7+65);
3901F !&0VAL(0) AND 1!=1 THEN COLOUR
128:COLOUR 7:PRINT TAB(A,10);CHR$(A-7+65
);:GOTO 320
400COLOUR 128:COLOUR 3
410PRINT TAB(A,10);CHR$(A-7+65);
420A=A+&5-7
430DEFFNSET
440PROCCSET
450LOCAL A$
460 C=FNCH
470IF C=&4 THEN =A$
480 A$=A$+CHR$(C)
490 IF LEN(A$)<15 THEN C=&4:GOTO 470
500 PRINT TAB(10+LEN(A$)+1,20);CHR$(C)
;
510GOTO 460
520DEFPROCCSET
530PRINT TAB(13,5);"ENTER YOUR NAME"
540PRINT TAB(14,7);"USE @ TO END"
550PRINT TAB(6,10);
560FOR T=&4 TO &4+26
570PRINT CHR$(T);
580NEXT
590ENDPROC
1000 TIME=0
1010 REPEAT UNTIL TIME>5000
```

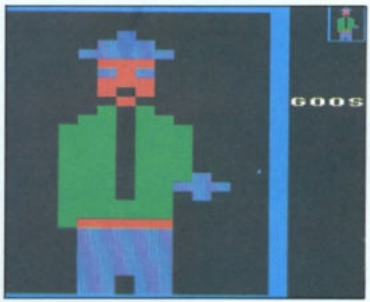
High-score program, to be run in conjunction with the game itself.

file that will eventually be loaded into the program.

The final set-up program assembles the machine code for placing the characters onto the screen, and the code that scans the joystick port and plots the cross-hairs of the sight.

Once all the set-up work has been done, you can run the game. This then loads in all the appropriate parts and you can shoot the little fellows. After you have actually been killed, as soon as one of the windows shows a zero under it, the high-score program will be chained allowing you to enter your name.





LISTING: GAME

```
  STIME=0
  10MODE 2
  20*LOAD SCREEN
  30 SL%=&5800
  40VDU23,224,129,97,24,60,126,153,4,4
  50VDU23,227,255,255,255,255,255,255,255,255
  60CH%=&900
  70!&80=0
  80SC%=0
  90CHSFT=&72
  100CHDEST=&70
  110JCODE=&B00
  120FTAB=&74
  130DIM TM%(4,1)
  140FOR T=0 TO 4:TM%!T,0!=0:NEXT
  150DIM CHAR 1024
  160CHSFT=&6E
  170PLACE=C
  180PROCENV
  190PROCGRPL
  200PROCASJS
  210PROCLOAD
  220PROCCLASS
  230PROCHICHS
  240CALL JCODE
  250PROCWIN
  260?&D01C=0
  270END
  280DEFPROCGRPL
  290*LOAD PLCODE &D0
  300 ENDPROC
  310DEFPROCPL(CH,X,Y)
  320 ?CHFT=!CHAR+(CH*256)- MOD 256
  330 ?(CHFT+1)=(CHAR+(CH*256)) DIV 256
  340?(FTAB+1)=X MOD 256
  350?(FTAB+2)=Y DIV 256
  360?(FTAB+3)=Y MOD 256
  370?(FTAB+4)=Y DIV 256
  380?CHST=X MOD 256
  390?(CHST+1)=X DIV 256
  400 CALL PLACE
  410ENDPROC
  420 DEFPROCLOAD
  430 FOR S=0 TO 4
  440 READ F$
  450 PROCOSCLI("LOAD "+F$+" "+FNHX(CHAR+(S*512)))
  460NEXT
  470ENDPROC
  480 DATA WINDOW,GOON,GUONS.GODNW,GDR
  490DEFPROCWINDS
  500FOR T=0 TO 3
  510READ CR,X,Y
  520PROCPL(CR,X,Y):PROCPL(CR+1,X,Y+64)
  530NEXT
  540DATA 0,200,160,0,200,368.0,800,120,0,850,310
  550ENDPROC
  560DEFPROCASJS
  570JX=&80
  580JY=&81
  590JF=&82
  600 *LOAD JSCODE
  610ENDPROC
  620DEFPROCCLASS
  630FOR T=0 TO 15
  640VDU 19,T,T-8,0,0,0,0
  650NEXT
  660ENDPROC
  670DEFPROCFIRE
  680LOCAL S%
  690SOUND&11,3,255,100:SOUND&10,1,7,100
  700X%=?(&84+(Y%*2))+4
  705SL%=POINT(X%,Y%)-7
  710VDU5:GCOL0,0:PLOT&9,X%-16,Y%+16:PRINT:CHR$2261:VDU4
  730IF S%<1 THEN ENDPROC
  740SC%=SC%-(5%10)+(9-S%)
  750 IF X%&12 AND Y%&30 THEN TM%(1,0)=S%:TM%(1,1)=0:PROCUP(1,0)
  760 IF X%&12 AND Y%&30 THEN TM%(2,0)=S%:TM%(2,1)=0:PROCUP(2,0)
  770 IF X%&12 AND Y%&30 THEN TM%(3,0)=S%:TM%(3,1)=0:PROCUP(3,0)
  780 IF X%&12 AND Y%&30 THEN TM%(4,0)=S%:TM%(4,1)=0:PROCUP(4,0)
  790PRINT TAB(0,30);"SCORE :";SC%
  800ENDPROC
  810DEFPROCENV
  820ENVELOPE1,130,0,0,0,0,0,0,127,-8,-4,-127,126,0
  830ENVELOPE2,130,-1,-1,-1,-1,5,5,0,0,0,0,0,0
  840ENVELOPE3,2,1,1,1,4,4,4,127,-1,-1,-127,126,0
  850ENDPROC
  860DEFPROCMAN
  870CALL JCODE
  880IF?JF=1 THEN PROCFIRE
  890 S%=RND(4):PROCUP(S%,RND(4))
  900TM%(S%,1)=1
  910RESTORE 540
  920 FOR T%=1 TO 4
  930TM%(T%,0)=TM%(T%,0)-TM%(T%,1)
  9401F TM%(T%,0)<0THEN PROCBULLET(640,500):?&70=SC%:CHAIN"HSCORE"
  950READ CH,X%,Y%
  960VDU5:MOVEX%+16,Y%-16+GCOL0,3:PRINT;CHR$227;
  $MOVEX%+16,Y%-16:GCOL0,0:PRINTTT
  M%(T%,0)f
  970NEXT
  980GOTO870
  990ENDPROC
  1000DEFPROCBULLET(X%,Y%)
  1010GCOL0,0
  1020FOR T=0TO 100
  1030GCOL0,0
  1035SOUND &10,1,RND(7)+3,100
  1040VDU 5:MOVERND(1280),RND(1024)
  1050PRINT!CHR*2261
  1055VDU 4
  1060NEXT
  1070VDU4
  1080ENDPROC
  1090DEFPROCSCLI(A$)
  1100!&FC00=A$
  1110X%=0
  1120Y%=&C
  1130CALL &FFF7
  1140ENDPROC
  1150DEFFNHX(V)
  1160LOCAL T,A$
  1170FOR T=0 TO 3
  11804A$=STR$(V MOD 16)+A$
  1190IF (V MOD 16)>9 THEN A$=RIGHT$(A$,1):A$=CHR$((V MOD 16)+65-10)+A$
  1200V=V DIV 16
  1210NEXT
  1220=A$
  1230DEFPROCUP(WS,CL)
  1240LOCAL T%
  1250RESTORE 540
  1260FOR T%=1 TO WS
  1270READ C,X%,Y%
  1280NEXT
  1290PROCPL(CL*2,X%,Y%):PROCPL(1+CL*2,X%,Y%+64)
  1295VDU5:MOVEX%+16,Y%-16:GCOL0,3:PRINT;CHR$227;:VDU4
  1300ENDPROC
```

15▶

Main game program. Uses the output from the screen, the assembler, and the definer.

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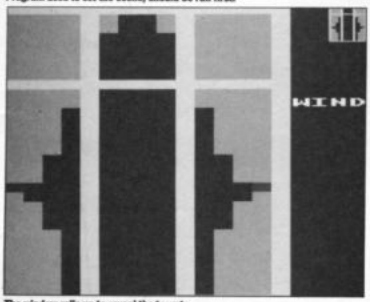
*Please Delete

OUTPUT: BBC B

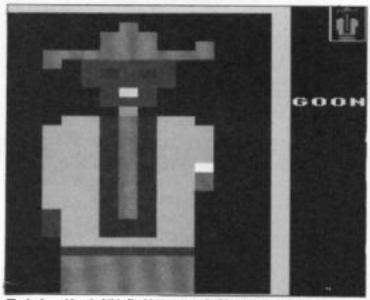
LISTING: SCENE

```
 10 MODE 2
 20 REM VDU 29,0;64;
 30PROCSKY
 40 PROCROAD
 50 PROCCLOUD(500,1024)
 60 PROCBUILDLFT
 70PROCBUILDRT
 80 COLOUR 128
 90 PROCBRICK
100 VDU 31,0,30
110 COLOUR 1
120 FOR T=0 TO 19
130 PRINT;CHR$(224);
140NEXT
150 FOR T=0TO19
160 PRINT;CHR$225;
170 NEXT
180 FOR T=1 TO 29 STEP 2
190PRINT TAB(0,T);CHR$224;CHR$224
200PRINT TAB(18,T);CHR$224;CHR$224
210PRINT TAB(0,T+1);CHR$225;CHR$225
220PRINT TAB(18,T+1);CHR$225;CHR$225
230NEXT T
240 VDU 31,0,0
250 FOR T=0 TO 19
260PRINT;CHR$225;
270 NEXT
280 FOR T=0 TO 19:PRINT;CHR$224;:NEXT
290*SAVE SCREEN 3000 8000
300END
310DEFPROCBRICK
320VDU 23,224,0,127,127,127.127,127,12
,127
330VDU 23,225,0,251,251,251.251,251,25
,251
340ENDPROC
350DEFPROCSKY
360COLOUR 130
370CLS
380MOVE 0,600
390MOVE 1280,600
400GCOL 0,4
410PLOT 85,0,1024
420PLOT 85,1280,1024
430ENDPROC
440DEFPROCCLOUD(X,Y)
450MOVE X,Y
460 FOR T=PI/2 TO 3*(PI/2) STEP .6
470R=RND(50)+50
480 XD=SIN(T)*200+X
490 YD=COS(T)*200+Y
500 FOR S=0 TO 2*PI STEP .1
510MOVE X,Y
520 GCOL0,7
530PLOT 85,SIN(S)*R+XD,COS(S)*R+YD
540 GCOL0,0
550NEXT
560 NEXT
570ENDPROC
580DEFPROCROAD
590MOVE 400,0
600MOVE 700,600
610GCOL0,0
620PLOT 85,700,0
630PLOT 85,800,600
640ENDPROC
650DEFPROCBUILDLFT
660MOVE 0,64
670MOVE 380,64
680GCOL0,1
690PLOT 85,0,500
700PLOT 85,380,500
710GCOL 0,6
720PLOT 85,0,600
730PLOT 85,380,600
740MOVE 557,600
750PLOT 85,380,500
760PLOT 85,557,600
770GCOL0,1
780MOVE 557,576
790PLOT 85,380,500
800PLOT 85,380,64
810MOVE 0,670
820 MOVE 520,670
830PLOT 85,0,600
840PLOT 85,380,600
850MOVE 380,600
860GCOL0,0
870DRAW 380,64
880ENDPROC
890DEFPROCBUILDRT
900MOVE 780,50
910MOVE 1280,50
9200COL0,1
930PLOT 85,780,180
940PLOT 85,1280,180
950GCOL0,6
960PLOT 85,780,210
970PLOT 85,1280,210
980GCOL0,1
990MOVE 800,210
1000PLOT 85,1280,400
1010PLOT 85,800,400
1020 MOVE 1280,400
1030GCOL0,1
1040PLOT 85,900,600
1050PLOT 85,1280,600
1060MOVE 800,400
1070GCOL0,0
1080DRAW 1280,400
1090ENDPROC
```

Program used to set the scene, should be run first.



The window rolls up to reveal the targets.



The body and head of this flashing goon make him an easy target.

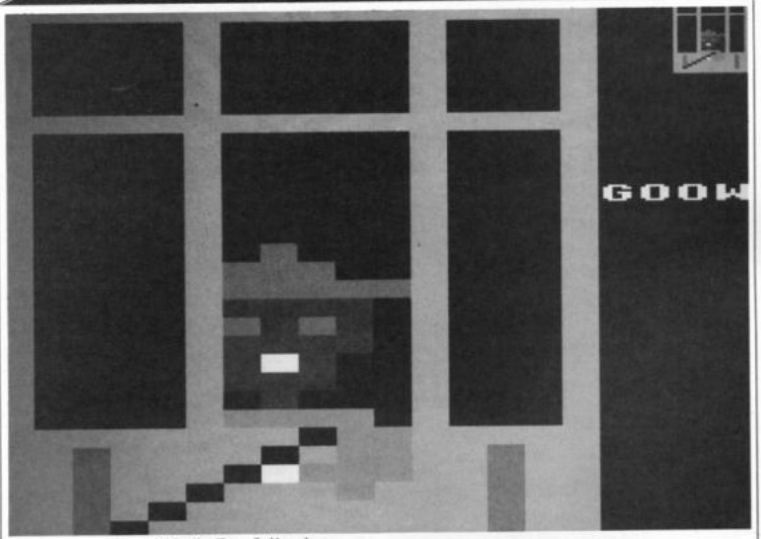
LISTING: DEFINER

```
 10 MODE 2
 20 C=&A00
 30 PLACE=C
 40CHAPT=&72
 50CHDEST=&70
 60PTAB=&74
 70DIM CHAR 512
 80 CHSTX=&83
 90 VDU 23,224,&FF,&FF,&FF.&FF,&FF,&FF
,&FF,&FF
100 PROCLOAD
110 PROCASPL
120 PROCLP
130 PROCED
140DEFPROCLP
150LOCAL T,S
160FOR S=0 TO 31
170FOR T=0 TO 15
180 COLOUR T:(S+16)+T*CHAR!
190PRINT TAB(T,31-S)CHR$224;
200NEXT
210NEXT
220 PROCPL(0,1280-(16*8),1024-(32*4))
230 PROCPL(1,1280-(16*8),1024-(16*4))
240ENDPROC
250 DEFPROCASPL
260 *LOAD PLCODE A00
270 *LOAD JSCODE
280?CHDEST=PTAB MOD 256
290?(CHDEST+1)=PTAB DIV 256
300?CHAPT=CHAR MOD 256
310?(CHAPT+1)=CHAR DIV 256
320 ENDPROC
330DEFPROCPL(CN,X,Y)
340 ?CHAPT=(CHAR+(CN*256)) MOD 256
350 ?(CHAPT+1)=(CHAR+(CN*256)) DIV 256
360?(PTAB+1)=X MOD 256
370?(PTAB+2)=X DIV 256
380?(PTAB+3)=Y MOD 256
390?(PTAB+4)=Y DIV 256
400?CHSTX=X MOD 256
410?(CHSTX+1)=X DIV 256
420 CALL PLACE
430ENDPROC
440DEFPROCED
450 LOCAL X,Y,A,C
460?FX 4 1
470?FX 225,224
480?FX 226,140
490 VDU 31,X,Y
500A=GET
510IF A=13& THEN X=X-1
520IF A=137 THEN X=X+1
530IF A=138 THEN Y=Y+1
540IF A=139 THEN Y=Y-1
550 IF X<0 THEN X=0:GOTO500
560 IF X>15 THEN X=15:GOTO500
570 IF Y<0 THEN Y=0:GOTO500
580 IF Y>31 THEN Y=31:GOTO500
590 IF A>223 AND A<232 THEN COLOUR A-2
24:C=A-224
600 IF A>139 AND A<148 THEN COLOUR A-1
52:C=A-132:PROC
610IF A=0 THEN PROCSAVE
620 GCOL 0,C:PLOT &9,1280-(16*8)+(X*8)
,1023-(Y*4)
630?!(!(31-Y)*16)+X+CHAR)=C
640 PRINT TAB(X,Y);CHR$224;CHR$8;
650GOTO 500
660ENDPROC
670DEFPROCSAVE
680 LOCAL F$
685 PRINT CHR$201
690 INPUT TAB(16,10) F$
700 IF F$="" THEN ENDPROC
710*OPENOUT(F$)
720FOR T=0 TO 511
730BPUT!&X,T?CHAR
740NEXT
750CLOSE#&X
760ENDPROC
770DEFPROCLOAD
780INPUT "FILE " F$
790 IF F$="" THEN ENDPROC
800*OPENUP(F$)
810FOR T=0TO 511
820T?CHAR=BGET*X
830NEXT
840CLOSE#&X
850ENDPROC
```

This program is used to set up the user defined characters.

16▶

OUTPUT: BBC B



The face and arm of the man holding the rifle are flashing colours.

LISTING: ASMCH

```
  10C=&A00
  20CHAPT=&72
  30CHDEST=&70
  40PTAB=&74
  50PTAB1=&7B
  60XL=PTAB1+1
  70XH=PTAB1+2
  80YL=PTAB1+3
  90YH=PTAB1+4
 100JX=&80
 110JY=&81
 120JF=&82
 130JCODE=&800
 140CHSTX=&83
 150PROCASPL
 160PROCASJS
 170 *SAVE PLCODE A00+A0
 180 *SAVE JSCODE B00+C0
 190END
 200DEFPROCASPL
 210FOR T=0TO2 STEP2
 220P%=C
 230COPT T
 240.PLACE
 250.OK
 260LDA #PTAB MOD 256:STA CHDEST
 270LDA #PTAB DIV 256:STA CHDEST+1
 280LDA#&9
 290STAPTAB
 300LDY #0
 310STY &BE
 320.NPLC
 330LDY &BE
 340LDA (CHAPT),Y
 350JSR PCOL
 360JSR PLT
 370 LDY&BE
 380LDA #8:CLC:ADC PTAB+1:STA PTAB+1
 390BCC NB
 400 LDA#0:STA PTAB+1
 4101NC PTAB+2
 420.NB TYA
 430 CMP#0:BEQ PLNX
 440AND #15
 450 CMP#15
 460BNE PLNX
 470 JSR JCODE
 480 LDA CHSTX:STA PTAB+1
 490 LDA CHSTX+1:STA PTAB+2
 500LDA #4:CLC:ADC PTAB+3:STA PTAB+3
 510BNE PLNX
 520INC PTAB+4
 530.PLNX
 540INC &BE
 550 BNE NPLC
 560.FINPL RTS
 570
 580.PCOL
 590PHA
 600LDA #18:JSR &FFEE
 610LDA #0:JSR &FFEE
 620PLA :JSR &FFEE
 630RTS
 640
 650.PLT
 660LDA#25:JSR &FFEE
 670LDY#0
 680.PLT1
 690LDA (CHDEST),Y
 700JSR&FFEE
 7101NY
 720CPY#5
 730BNE PLT1
 740RTS
 7501
 760NEXT
 770ENDPROC
 780DEFPROCASJS
 790FORT=0TO3STEP3
 800P%=JCODE
 810COPT T
 820 PHP:PHA:TXA:PHA:TYA:PHA
 830LDA #PTAB1 MOD 256:STA &70
 840LDA #PTAB1 DIV 256:STA &71
 850LDA #128
 860LDY #0
 870JSR &FFF4
 880TXA
 890AND #1
 900.NHOLD STA JF
 910LDX #2
 920 LDA#128
 930JSR &FFF4
 940STY JY
 950LDX #1
 960JSR &FFF4
 970TYA
 980 EOR#255
 990STA JX
1000JSR CROSS:JSR CROSS
1010 LDA #PTAB MOD 256:STA CHDEST
1020 LDA #PTAB DIV 256:STA CHDEST+1
1030PLA:TAY:PLA:TAX:PLA:PLP
1040RTS
1050 .CROSS LDA#0:STA XH:STA YH
1060 STA YL:STA PTAB1
1070LDA JX:STA XL
1080ASL XL:ROL XH
1090.X4 ASL XL:ROL XH
1100.YI LDA JY:STA YL:ASL YL
1110ROL YH
1120.Y4 ASL YL:ROL YH
1130.CD LDA #4:STA PTAB1:JSR PLT
1140LDA #0:STA XH:STA YH:STA YL:STA PTA
B1
1150LDA #20:STA XL:JSR PLT
1160LDA #2:STA PTAB1
1170LDA #216:STA XL
1180DEC XH:JSR PLT
1190LDA #0:STA PTAB1
1200LDA #20:STA XL
1210INC XH:JSR PLT
1220LDA #0:STA XL
1230LDA #20:STA YL
1240JSR PLT
1250LDA #2:STA PTAB1
1260LDA #216:STA YL
1270DEC YH:JSR PLT
1280 RTS
12901
1300NEXT
1310ENDPROC
1320 ?&220=JCODE MOD 256
1330 ?&221=JCODE DIV 256
1340 MODE 2
1350 *FX 14,3
1360 VDU 19,15,7,0,0,0,0,0
1370 END
1380 REM
1390 CALL JCODE
1400 GOTO 1380
```

This program is used to assemble the machine code for scanning the joystick and printing the characters. It should be run second.



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WINDOW ON RSX

Pete Johnson shows you how to write and use Resident System Extension routines on your Amstrad.



Amstrad Basic, a Microsoft lookalike written by Locomotive Software, provides a very useful facility for calling machine code subroutines. Most Basics provide something of this kind — the CALL statement and USR function of BBC Basic are an example. These take an address to jump to and parameters may be passed to the routine either in the registers or in a 'parameter block' in memory.

The Basic on the CPC464 also provides a form of the CALL statement, but where it really scores is in the provision of calls to external commands. To use these a machine code program which contains the names and addresses of the routines, and the routines themselves, has to be written. The Amstrad operating system then has to be informed of the command's presence by calling a special 'logging routine'.

Using the routines

This article describes how to write and use the RSX (Resident System Extensions).

Once the external commands have been logged, they may be accessed simply by preceding the name by a vertical bar : (SHIFT @ on the keyboard). The command name may be followed by parameters. Examples of statements containing calls to external commands are:

```
1000 CIRCLE,X,Y,R
4350 FOR I=200 TO 400 PEEK,@A%:PRINT A%:NEXT
```

The first example calls a routine called CIRCLE, which takes three parameters X,Y and R. In fact, these may be any arbitary expressions which are evaluated and stored as two-byte quantities in a parameter block. The second example uses the @ operator to get the address of a variable.

This is required because the routine PEEK will actually store a value in the variable A%.

When Basic gets a | command, it finds the address of the routine named and then evaluates the parameters following it. These are stored in a parameter block. The Z80 register IX is set to point to the parameters.

The parameter block is set up in the reverse order to the expressions in the statement. Thus, the parameter blocks for the two examples on the next page would be:

	Example 1	Example 2
(IX+4)	Value of X	
(IX+2)	Value of Y	Value of I
(IX+0)	Value of R	Address of A%

As usual, integers are stored as low-byte first, high-byte second. Note that the address of an array may be passed by giving the address of the first element. For example:

SORT,@TEST%(0)

In addition, when strings are passed as parameters, it may only be by address. The address given in the parameter block is of a three-byte string descriptor. The first byte of this is the string's length and the next two bytes are the address of the actual characters in the string. The contents of a string may be altered by an external routine, but the string descriptor should not be changed in any way.

Using the program

This typical machine code program will implement external commands. To keep things simple, only two short commands are given: PEEK which takes an address then outs the contents of that location in an integer variable and SWAP which swaps the contents of two integer variables. PEEK is useful, as it peeks from the ROM if the address given is in the top or bottom 16K of memory; Basic's own PEEK function will only ever peek from RAM.

The program is in the form of a Hisoft Devpak source listing. It is assembled to run at address &AB00. To make room for it, Himem must be moved down from its default of &AB7F using the command MEMORY &AAFF.

In the listing here, the addresses of some operating system calls are defined first, then the code origin is set to &AB00. The code at label START should be called from Basic (*ie* CALL &AB00 after the object code has been loaded). It uses the operating system routine KL LOG EXT to tell the OS about the external commands. BC is set to point to the command table and HL points to four bytes of memory for use by the OS, reserved at line 12.

The command table is in two parts. The first consists of a pointer to the second, followed by a list of JP instructions. The destinations of these jumps are the entry points of the external command routines. The second part of the table, which doesn't have to follow on from the first, consists of a list of strings which are the command names. These strings are in upper case ASCII and the last letter of each command has its top bit set. The table is terminated by a zero byte.

Next come the two routines themselves. As mentioned above, upon entry to the routine, IX contains the address of the first byte of the parameter block (the low byte of the last parameter). The A register contains the number of parameters passed. My examples don't check for a valid number of parameters, but A could be used by routines which can accept a variable number of parameters.

The PEEK routine starts by enabling the ROMs so that they may be read instead of the RAM. After the upper ROM (Basic usually) is enabled, the old status is saved (line 31) so that it may be restored later. The lower (operating system) ROM is also enabled. Next HL is loaded with the first parameter (*ie* I in the command PEEK,@A%,I), which is the address to be peeked. Line 35 loads A with the contents of this address. Then HL is loaded with the address of the variable (@A% above) and A is stored there. Before returning, the high-byte of the integer is set to zero and the previous upper ROM state is restored.

The SWAP command takes two addresses of integer variables and exchanges their contents. HL points to one variable and DE to the other. The subroutine GET-ADDRS loads these registers and SWAP1 swaps a pair of bytes and increments the pointers. As noted in the comments in lines 66-73, other types may be swapped by altering the number of calls to SWAP1.

The method for assembling and running the program is as follows (assuming you are using Devpac): Load the assembler/editor and type in the source as listed above. Assemble the program using the A command. Save the object program using the O command. Re-enter Basic with the R command.

Once you are back in Basic, you can see the effect of the new commands. First install them by:

```
CALL &AB00
```

To see the effect of SWAP, try:

```
A%=1:B%=-123
SWAP,@A%,@B%
PRINT A%,B%
```

This will print 123 followed by 1 — the variables have been swapped. To see the effect of PEEK, try this:

```
FOR I=&C000 TO &C100:
PEEK,@A%,I:PRINT A%,PEEK(I):NEXT
```

The first number printed comes from the Basic ROM and the second from the screen RAM. To use the commands when the machine if first turned on or after a reset, you need these commands:

```
MEMORY &AAFF : REM Sets new Himem
LOAD "OBJ" : REM Assuming you called
object "OBJ"
CALL &AB00 : REM Log the commands
PEEK,@A%,123: REM etc.
```

Listing

```
                    1 ; *L-   ; Disable listing
BC01                2 LOG_NS EQU #BC01
B900                3 UP_UPP EQU #B900 ; Enable the upper ROM to be read
B906                4 UP_LOW EQU #B906 ; Enable the lower ROM to be read
B90C                5 RST_UP EQU #B90C ; Restore the previous upper ROM stat
AB00                6        ORG &AB00
                    7 START
AB00 0100AB         8        LD   BC,COM_TAB ; Address of the command table
AB03 2109AB         9        LD   HL,WORK    ; 4 bytes of workspace for the OS
AB06 C301BC        10        JP   LOG_NSX ; Tell the OS and return
                   11
                   12 WORK
AB09 0000          13        DEFW 0 ; Four bytes for the OS
AB0B 0000          14        DEFW 0
                   15
                   16
                   17 COM_TA
AB0D 15AB          18        DEFW NAMES ; Pointer to the commands
AB0F C318AB        19        JP   PEEK ; Peek a byte of ROM/RAM
AB12 C33AAB        20        JP   SWAP1 ; Swap two integers
                   21
                   22 NAMES
AB15 504545CB      23        DEFB "P","E","E",'K' + $80
AB19 5357410D      24        DEFB "S","W","A","P" + $80
AB1D 00            25        DEFB 0
                   26
                   27 PEEK
                   28 ;  PEEK,@intvar,addr
                   29 ; Pokes the value at address addr into intvar
AB1E CD00B9        30        CALL EN_UPPER ; Enable the upper ROM
AB21 F5            31        PUSH AF ; Save the ROM state
AB22 CD06B9        32        CALL EN_LOWER ; Enable the lower ROM
AB25 DD6E00        33        LD   L,(IX+0) ; Get addr in HL
AB28 DD6601        34        LD   H,(IX+1)
AB2B 7E            35        LD   A,(HL)   ; Get the byte in A
AB2C DD6E02        36        LD   L,(IX+2) ; Get the var addr
AB2F DD6603        37        LD   H,(IX+3)
AB32 77            38        LD   (HL),A   ; Store the low byte
AB33 23            39        INC  HL       ; Zero the high byte
AB34 3600          40        LD   (HL),0
AB36 F1            41        POP  AF ; Get the ROM state back
AB37 C30CB9        42        JP   RST_UPPER ; Restore the upper ROM state
                   43
                   44 SWAP1
                   45 ; [SWAP1,@int1,@int2
                   46 ; Swaps the values of the two integers
AB3A CD48AB        47        CALL GET_ADDRS ; Get the addresses of the parameters
AB3D CD4DAB        48        CALL SWAP1 ; Swap low bytes
                   49 SWAP1
AB40 1A            50        LD   A,(DE)   ; Swap a byte
AB41 4E            51        LD   C,(HL)
AB42 77            52        LD   (HL),A
AB43 79            53        LD   A,C
AB44 12            54        LD   (DE),A
AB45 23            55        INC  HL ; Auto increment HL
AB46 13            56        INC  DE ; Auto increment DE
AB47 C9            57        RET
                   58
                   59 GET_AD
AB48 DD6E00        60        LD   L,(IX+0) ; Get @int1 in HL
AB4B DD6601        61        LD   H,(IX+1)
AB4E DD5E02        62        LD   E,(IX+2) ; Get @int2 in DE
AB51 DD5603        63        LD   D,(IX+3)
AB54 C9            64        RET
                   65
                   66 ;SWAPS to swap strings could be:
                   67 ;CALL GET_ADDRS
                   68 ;CALL SWAP1
                   69 ;CALL SWAP1
                   70 ;:JP   SWAP1
                   71
                   72 ;Likewise swapping reals could be done with
                   73 ;five calls to SWAP1
```

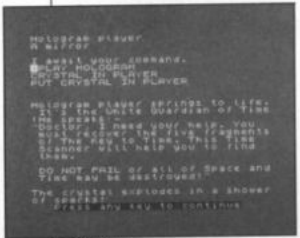


KEY ISSUES

A triple-decker of adventures is sampled by this week's Master of the Dungeon, Bob Chappell.

Although one of the most popular science fiction characters on TV, Doctor Who has not so far featured in a text adventure to my knowledge. So if Daleks, Cybermen and things Galifreyean are your cup of Saurean Brandy, you're in for a treat.

Lumpsoft, an oddly-named Leeds company and new to me, has released a Spectrum adventure called *The Key To Time* and jolly good it is too. The program is dedicated to the memory of William Hartnell who played the very first Doctor Who. In the adventure, you have to guide the original Doctor by sending him messages through the Time Lords' telepathic controller (which has been cunningly disguised as a Spectrum). Without knowing what your mission is, you start out, of course, in the Tardis control room.



The Key To Time

Once you've managed to get a nearby hologram player going, you'll discover that your task is to recover the five fragments of The Key To Time. The next thing to do is find out how to get the Tardis moving.

There are several places to visit, including Regents Park Zoo and, more exotically, Gallifrey itself.

The program appears to have a comprehensive vocabulary — but not the 'zillions and zillions of words' claimed on the inlay. There are plenty of objects to examine, collect and think about, as well as a pretty good set of testing puzzles.

It has a sense of humour too. As a sample, should you type WAIT, you'll be on the receiving end of a batch of purple prose – 'the infinite sands of time trickle through the cosmic hourglass'. Then it turns Pythonesque – 'I never wanted to be an adventure game, I wanted to be a Lumberjack'. Python fans will immediately recognise the tune that follows.

None of this sits too comfortably with the theme of the adventure but it comes as a pleasant surprise all the same. Definitely one worth having in the collection for both Dr Who followers and non-believers.

Ill-manored

No so hot is *Mystery Of Munroe Manor*, a text and graphics adventure for the Commodore 64 from Severn Software. The game starts in fine style. The background to the adventure in the form of newspaper clippings is followed by a scene of Munroe Manor where a silhouetted figure moves slowly past a window. To the accompaniment of suitably spooky music, the front door swings open to permit your entrance but suddenly closes with a bang.

Then the first disappointment – you've now got to load the main program, a wait of 12 minutes before you even begin. Once that's over, you find yourself in the hallway of the manor.

Each location is depicted in simple but colourful style. At the base of the screen, an area is reserved for a description of the location and any objects therein. Disappointment number two – the descriptions are extremely terse thus depriving the game of any much-needed atmosphere.

The same area is used for your input and the program's response, the latter remaining on screen for several seconds before the text area is wiped clean. Until this wipe is done, you can't enter any further commands. This really puts the brakes on. Particularly so since the game's vocabulary is very limited and you're continually being told that your command has not been understood — very frustrating.

There are some depressing idiosyncracies in the game, too. Although you can read a book in the library, you can't take it because you're not strong enough.

One such book refers to consulting a 'physicatrist'. Really!

A shame, as the game is not without merit. The graphics are drawn instantly and the puzzles appear tough — or are they merely obscure?

If you're prepared to put up with the flaws, you might actually enjoy Munroe Manor. Me? I've got better things to spend my screen time on.

Random interference

The Code from Soft Concern of Warwick is a text-only Spectrum adventure with a £2,500 prize for the first one to solve it. The game takes place on four levels deep within a KGB stronghold. The idea is to progress until you reach the Code Room where the instructions become suitably enigmatic.

Like many text adventures for the Spectrum, the text appears in white against a blue background. However, the presentation is slightly odd – there are no prompts or cursor to indicate that the program is awaiting your input. You begin in a security room and it's quite obvious you're going to need a pass before long. The reason for this is that a guard appears at random who, if you're not carrying the correct means of identification, will haul you back to the security room.

That, unfortunately, is not the only random event. Another such is an enemy agent who keeps popping up to take potshots at you. You can usually dispose of him for the time being with your own gun, but sometimes you miss. Then you have to keep defusing a bomb by pulling out one of four wires – it's pure luck whether you select the right one or get blown to bits. A further bit of silliness is that the lights keep going off. All you have to do is wait long enough and they come back on again.

You may have gathered from this that I'm no fan of adventures which contain random elements – and you'd be dead right. I can't stand them. The Code has some pretty interesting puzzles – although the topography is quite barmy – and it's a shame it's spoiled by these unnecessary random interventions.



Mystery Of Munroe Manor

POPEYE®



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BLOCK AND STRIPE

Using Amstrad graphics can be tricky, but Clare Gurton's machine code routines reduce filling in blocks of colour and using stripey inks to child's play.

Filling boxes and using stripey ink on the Amstrad are not easily achieved in Basic. But they are in machine code, and the routines here are not difficult to implement.

Filling boxes

Using windows to create blocks of colours on the Amstrad is a clumsy technique. You must define the window, define a colour for the paper, clear the window and so on.

However, there's a ROM routine, SCR FILL BOX, which begins at address &BC44 and fills boxes of character cells with the colour code held in the A register. SCR FILL BOX also needs four other values to specify the left, right, top and bottom character positions of the box to be filled.

You will find that these values are taken from the H, D, L and E registers respectively.

The machine code routine allows you to define the box colour and the corners of the boxes with five POKEs. The advantage of using your own machine code routine is that it acts independently of any windows on the screen, allowing you to define and use windows for text as well as filling boxes with plain colour or even textured colours — which you cannot do from Basic.

The routine itself is very simple (see Figure 1). All it does is load the relevant registers with the appropriate values and call the ROM routine at &BC44. Lines 30 to 100 of Figure 2 are the Basic loader. Lines 130 to 180 give the addresses to POKE to define the colour to fill the box and the addresses for the top, bottom, left and right text locations for the box. The limits on these are defined by the screen mode. The demonstration assumes that the screen is in Mode 1. If you POKE a column value greater than the upper limit available, (*eg* POKEing 43885 with a number greater than 20 in Mode 0) you'll get wrap-around. The demonstration also shows the colour textures available. To discover which numbers give plain colours you must experiment by POKEing 43881 with different values.

Figure 1: Box-fill routine

Address	Mnemonic	Op-code/Data	Decimal
43890	LD A,n	3E	62
43891		00	0
43892	LD H,n	26	38
43893		00	0
43894	LD D,n	16	22
43895		00	0
43896	LD L,n	2E	46
43897		00	0
43898	LD E,n	1E	30
43899		00	0
43900	CALL &BC44	CD	205
43901		44	68
43902		BC	188
43903	RET	C9	201

Striped inks

The ROM routine, SCR CHAR INVERT, XORs character ink colours. On entry it assumes the B and C registers contain the two colours to use, while the H and L registers hold the screen location of the character in terms of rows and columns — H is used as the column, L as the row.

Figure 3 gives the addresses, mnemonics, opcodes and decimal equivalents. You'll see that you can POKE address 43891 with the colour of one ink, POKE 43893 with the other. The row and column values have to be POKEd into addresses 43895 and 43897 respectively, and you must remember to take into account the screen mode, as you did in the first program.

Curiously, you can load values of zero into the H and L registers quite happily before CALLing the program. Figure 4 is the Basic loader and includes a demonstration.

The demo prints up strings of the characters A to X and applies the character invert routine to each character position in the row according to two colours chosen at random.

The two numbers displayed at the left of each row are the random numbers for the colour codes, so when you see a combination you like, press Esc to pause the program and write down the values. As you'll see, the routine gives you access to unusual colour textures such as striped ink and paper.

Figure 2: Basic loader

```
10 '          Basic Loader
20 '      For box filling
30 MEMORY 43879
40 address=43879
50 DATA 62,255,38,0,22,0,46,0,30,0,205
60 DATA 68,188,201
70 FOR count = 1 TO 14
80 READ value
90 POKE address + count,value
100 NEXT
110 '========== All Done ==============
120 '
130 ' POKE 43881,colour
140 ' POKE 43883,left column
150 ' POKE 43885,right column
160 ' POKE 43887,top row
170 ' POKE 43889,bottom row
180 ' CALL 43890 TO fill box
190 '
200 '==========  Demonstration ========
210 MODE 1
220 colour = 43881
230 left = 43883:right = 43885
240 top = 43887:bottom = 43889
250 fill = 43890
260 '
270 texture = 255
280 TLHC = 0
290 'TLHC is Top Left Hand Corner
300 dc=1
310 ' dc is TLHC decrement/increment
320 '
330 ' Set up registers to define box
340 POKE colour,texture
350 POKE left,TLHC
360 POKE top,TLHC
370 POKE bottom,24 - TLHC
380 POKE right,39 - TLHC
390 ' Now change texture
400 texture = texture - 18
410 IF texture = 0 THEN texture = 255
420 'Call box fill
430 CALL fill
440 TLHC = TLHC + dc
450 IF TLHC = 12 OR TLHC = 0 THEN dc=-dc
460 GOTO 340
```

Figure 3: Ink inverter routine

Address	Op-code	Hex	Decimal
43890	LD B,0	06	6
43891		00	0
43892	LD C,0	0E	14
43893		00	0
43894	LD H,0	26	38
43895		00	0
43896	LD L,0	2E	46
43897		00	0
43898	CALL &BC4A	CD	205
43899		4A	74
43900		BC	188
43901	RET	C9	201

Figure 4: Character inverter

```
10 ' Character Inverter
20 '   Basic Loader
30 DATA 6,0,14,0,38,0,46,0,205,74,188
40 DATA 201
50 MEMORY 43889:address = 43889
60 FOR i=1 TO 12
70 READ v
80 POKE address + i,v
90 NEXT
100 '
110 'POKE 43891 with 1st colour
120 'POKE 43893 with 2nd colour
130 'POKE 43895 with column
140 'POKE 43897 with row
150 'CALL 43898 to invert character
160 '
170 '======== DEMONSTRATION ========
180 DEF FNr(n)=INT(RND(1)*255)+1
190 MODE 0
200 char = 65
210 aline= 43897:position = 43895
220 colour1 = 43891:colour2 = 43893
230 value1=1:value2=128
240 FOR row = 1 TO 24
250 LOCATE 1,row
260 PRINT STRING$(19,char);
270 char = char + 1
280 NEXT
290 FOR row = 0 TO 23
300 LOCATE 1,row+1
310 PRINT USING "###";value1;:PRINT" ";
320 PRINT USING "###";value2;:PRINT" ";
330 POKE colour1,value1
340 FOR column = 9 TO 18
350 POKE aline,row
360 POKE position,column
370 POKE colour2,value2
380 CALL 43890
390 NEXT
400 value1=FNr(255):value2=FNr(255)
410 NEXT
420 GOTO 290
```



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From harmless, you must become lethal.

In Elite, all players start as equals.

With the initial rank of "Harmless," you will embark upon an experience unlike any that you have known before.

You will be a space trader who roams the universe, making your living from buying and selling the cargo in your Cobra space craft.

On your travels, you will encounter aggressors who are eager to put an end to your dealings.

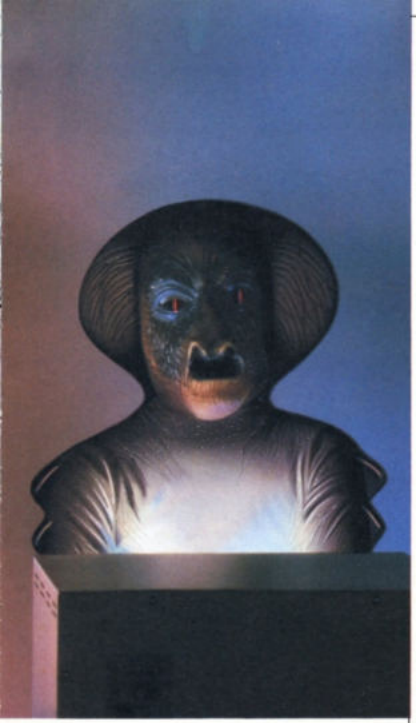
Only the fittest will survive.

As you establish yourself as a survivor, you will win the right to a higher rank.

In all, there are nine, from "Harmless" to "Elite." And your computer will continually tell you where you stand.

Trade with 2,000 planets in eight galaxies.

Besides survival, your success also depends on the rewards you reap from the cargo that you carry.



ce among the Elite?

That cargo can be anything from foodstuffs to contraband. If you decide to trade in contraband, the rewards will certainly be higher. But so will the risks you take.

To ply your trade, you can dock at any of 2,000 planets in eight galaxies.

However, before you dock, you must use your wits to assess the planet's political climate and the perils which may be waiting for you.

Also, in any of the eight galaxies, you may find yourself being asked to perform acts of considerable heroism and selfless courage.

Although these will bring you into danger, they can bring considerable rewards too.

We're waiting to recognize your skills.

Achieving higher status in Elite will tax your skills to the limit. Which is why you must download your game onto cassette or disc each time you take a break from play.

When you reach the rank of "Competent" or higher, you should send us the secret code number revealed to you by your computer.

We will send you in return a special document which certifies your achievement. And you stand to win a valuable prize.



Are you ready to accept the challenge?

Elite is available on both disc and cassette for the BBC Micro and on cassette for the Acorn Electron.

With either, you will get "Elite: The Dark Wheel," a compelling novel which sets the whole mood of your adventure. You'll also get a flight training manual which will get you fit to roar into the unknown in your Cobra spacecraft.

Your Acornsoft dealer now has the entire package at £14.95 on cassette, or £17.65 on disc (for the BBC Micro) and £12.95 for the Electron. (For the address of your local stockist, call 01-200 0200.) Credit card holders can simply telephone 0933 79300 during office hours.

Alternatively, you can order by post from: Acornsoft, c/o Vector Marketing, Denington Estate, Wellingborough, Northants NN8 2RL.

You can also get a free Elite poster by ringing 0933 79300.



ACORNSOFT

GOAL POWER

Football fans can test their footwork with this version of Britain's favourite sport. And, if you don't fancy being goalie, Andy Clarke has provided an alternative

Every aspiring Pat Jennings should have a go at Goalie, designed for the Commodore 64. Thanks to Andy Clarke of Baddersley Ensor in Warwickshire, you can attain this status without having to get cold and wet on a muddy football pitch.

You choose how many shots should be taken and then input the speed of the ball. The striker strides confidently onto the pitch, turns and takes aim. Using either a joystick or the keyboard you

Program notes

10	Reads in sprite data for player, goalie and ball.
14-18	Draw crossbar, first goal post and third goalpost.
20	First line of main loop, gives videochip value to V, colours border black and screen green and puts the ball and the player off the screen. Gosub sprite pointer setting.
22-24	Position the three goal sprites.
26	Expands the above sprites.
28	Turns on multicolour to all but the ball and the goalposts. Turns on all sprites.
30-38	Colour sprites and position them.
40	Gosub for sound.
42-52	Manoeuvre player and ball to the center of the screen.
54-56	Use sprite pictures for kicking routine that fit the position of the ball — eg if ball nearer left then POKE in sprite picture where the left leg is raised.
58	Gosub ball kick sound.
60-66	Get joystick input and act on it.
68	If goalie and ball sprites have collided, then goto 300.

Program listing

```
0 REM********************************
1 REM***          GOALIE          ***
2 REM***            BY            ***
3 REM***   ANDREW CLARKE (C)1984  ***
4 REM********************************
5 GOSUB600
10 FORS=220TO228:FORT=0TO62:READW:POKES*
64+T,W:NEXT:NEXT
11 REM ****CREATE SPRITE GOALS/NO DATA
12 FORS=229TO231:FORT=0TO62:POKES*64+T,0
:NEXT:NEXT
14 FORS=229TO231:FORT=0TO5:POKES*64+T,25
5:NEXT:NEXT
16 S=229:FORT=6TO62STEP3:POKES*64+T,192:
NEXT
18 S=231:FORT=8TO62STEP3:POKES*64+T,3:NE
XT:CS=0:SC=0:HS=2:GOSUB610
19 REM ****SET UP SPRITES
20 V=53248:POKEV+32,0:POKEV+33,5:GOSUB25
0:PRINT"[CLEAR]":POKEV,0:POKEV+2,0
22 POKEV+6,102:POKEV+8,150:POKEV+10,198
24 FORT=V+7TOV+11STEP2:POKET,70:NEXT
26 POKEV+23,56:POKEV+29,56
28 POKEV+28,197:POKEV+21,63
30 FORT=V+42TOV+44:POKET,1:NEXT
32 POKEV+37,1:POKEV+38,7
34 POKEV+39,2:POKEV+40,7:X2=0:Y1=96
36 POKEV+41,0:POKEV+5,Y1:X1=160
38 POKEV+4,X1:POKEV+1,220:POKEV+3,224
40 GOSUB100:GOSUB1000:GOSUB500
42 FORT=0TO150STEP2:POKEV,T:GOSUB510
44 IFPEEK(V+2)<164THENPOKEV+2,T+INT((RND
(1)*20)+6):X2=PEEK(V+2)
46 GOSUB200:POKEHF,0:NEXT
48 FORT=150TO162:GOSUB510:POKEV,T:GOSUB2
00:POKEHF,0:NEXT
50 POKE2040,222
52 PRINT"[HOME]      [WHITE]HERE COMES A
ROCKET!!"
54 K=0:IFX2>=162THENPOKE2040,224:GOTO58
56 POKE2040,223:GOTO58
58 GOSUB520:FORT=224TO70STEP-SP:POKEV+30
,0
60 JS=PEEK(56321)
62 IFJS=247ORJS=246ORJS=245THENPOKE2042,
227:X1=X1+5:IFX1>240THENX1=240
63 IFJS=251ORJS=250ORJS=249THENPOKE2042,
226:X1=X1-5:IFX1<50THENX1=50
64 IFJS=254ANDY1>80THENPOKE2042,225:Y1=Y
1-5
65 IFJS=253ANDY1<180THENPOKE2042,225:Y1=
Y1+5
66 IFJS=255THENPOKE2042,225
68 CA=PEEK(V+30):IF((CAAND2)=2)AND((CAAN
D4)=4)THEN300
70 IFX2>110ANDX2<220ANDK=0THENU=10:L=-10
:K=INT((U-L)*RND(1))+L:X2=X2+K:GOTO78
72 IFX2>110ANDX2<220ANDK<0THENU=1:L=-10:
K=INT((U-L)*RND(1))+L:X2=X2+K:GOTO78
74 IFX2>110ANDX2<220ANDK>0THENU=10:L=-1:
K=INT((U-L)*RND(1))+L:X2=X2+K
78 POKEV+2,X2:POKEV+3,T:POKEV+4,X1:POKEV
+5,Y1:NEXT:GOTO350
98 FORT=1TO2000:NEXT:GOTO400
99 REM **** LINE DRAWING ROUTINE
100 LF=54272
102 FORT=1304TO1343:POKET,100:POKET+LF,1
:NEXT
104 FORT=1352TO1472STEP40:POKET,101:POKE
T+LF,1:NEXT
106 FORT=1345TO1465STEP40:POKET,101:POKE
T+LF,1:NEXT
108 FORT=1373TO1493STEP40:POKET,103:POKE
T+LF,1:NEXT
110 FORT=1381TO1701STEP40:POKET,103:POKE
T+LF,1:NEXT
112 POKE1512,76:POKE1512+LF,1
114 POKE1705,76:POKE1705+LF,1
116 POKE1533,122:POKE1533+LF,1
118 POKE1741,122:POKE1741+LF,1
120 FORT=1513TO1532:POKET,111:POKET+LF,1
:NEXT
122 FORT=1706TO1740:POKET,111:POKET+LF,1
:NEXT
124 PRINT"[HOME][DOWN][RIGHT][RIGHT][RIG
HT][RIGHT][RIGHT][RIGHT][RIGHT][YELLOW]G
OALS:[WHITE]"CS,:"[YELLOW]SAVES:[WHITE]"
SC
130 RETURN
200 IFPEEK(2040)=220THENPOKE2040,221:RET
URN
202 POKE2040,220:RETURN
250 POKE2040,220:POKE2041,228
252 POKE2042,225:POKE2043,229
254 POKE2044,230:POKE2045,231:RETURN
300 PRINT"[HOME]      [WHITE]WHAT A SAVE
!!!!!!!!!"
302 PRINT"[DOWN][DOWN][DOWN][DOWN][DOWN]
[DOWN][DOWN][DOWN]"
304 PRINT"[RIGHT][RIGHT][RIGHT][RIGHT][R
IGHT][s Q][s Q][s Q][s Q][s Q] [s Q][s Q
][s Q][s Q][s Q] [s Q]   [s Q] [s Q][s Q
][s Q][s Q][s Q] [s Q]"
306 PRINT"[RIGHT][RIGHT][RIGHT][RIGHT][R
IGHT][s Q]     [s Q]   [s Q] [s Q]   [s
Q] [s Q]     [s Q]"
308 PRINT"[RIGHT][RIGHT][RIGHT][RIGHT][R
IGHT][s Q][s Q][s Q][s Q][s Q] [s Q][s Q
][s Q][s Q][s Q] [s Q]   [s Q] [s Q][s Q
][s Q]   [s Q]"
310 PRINT"[RIGHT][RIGHT][RIGHT][RIGHT][R
IGHT]     [s Q] [s Q]   [s Q]  [s Q] [s Q
]  [s Q] "
312 PRINT"[RIGHT][RIGHT][RIGHT][RIGHT][R
IGHT][s Q][s Q][s Q][s Q][s Q] [s Q]   [
s Q]   [s Q]   [s Q][s Q][s Q][s Q][s Q]
 [s Q]"
314 SC=SC+1:GOSUB530:GOTO98
350 PRINT"[HOME]      [WHITE]GOAL!!!!!!!
!!!!!!!!!"
352 PRINT"[DOWN][DOWN][DOWN][DOWN][DOWN]
[DOWN][DOWN][DOWN]"
354 PRINT"[RIGHT][RIGHT][RIGHT][RIGHT][R
IGHT][s Q][s Q][s Q][s Q][s Q] [s Q][s Q
][s Q][s Q][s Q] [s Q][s Q][s Q][s Q][s
Q] [s Q]     [s Q]"
356 PRINT"[RIGHT][RIGHT][RIGHT][RIGHT][R
IGHT][s Q]     [s Q]   [s Q] [s Q]   [s
Q] [s Q]     [s Q]"
358 PRINT"[RIGHT][RIGHT][RIGHT][RIGHT][R
IGHT][s Q] [s Q][s Q][s Q] [s Q]   [s Q]
 [s Q][s Q][s Q][s Q][s Q] [s Q]     [s
Q]"
360 PRINT"[RIGHT][RIGHT][RIGHT][RIGHT][R
IGHT][s Q]   [s Q] [s Q]   [s Q] [s Q]
 [s Q] [s Q] "
362 PRINT"[RIGHT][RIGHT][RIGHT][RIGHT][R
IGHT][s Q][s Q][s Q][s Q][s Q] [s Q][s Q
][s Q][s Q][s Q] [s Q]   [s Q] [s Q][s Q
][s Q][s Q][s Q] [s Q]"
364 CS=CS+1:GOSUB550:GOTO98
400 IFHS>SHTHEN450
401 POKEV+21,0:PRINT"[CLEAR][DOWN][DOWN]
[DOWN][DOWN][DOWN][DOWN][RIGHT][RIGHT][R
IGHT][RIGHT][RIGHT][RIGHT]ANOTHER SHOT?"
402 PRINT"[RIGHT][RIGHT][RIGHT][RIGHT][R
IGHT][RIGHT]PRESS FIRE"
404 PRINT"[RIGHT][RIGHT][RIGHT][RIGHT][R
IGHT][RIGHT]FOR SHOT ";HS:HS=HS+1
405 PRINT"[RIGHT][RIGHT][RIGHT][RIGHT][R
IGHT][RIGHT]'N' TO END"
406 GETA$:IFA$="N"THENGOTO450
408 IFPEEK(56321)<>239THEN406
410 GOTO20
450 PRINT"[CLEAR][DOWN][DOWN][DOWN][DOWN
][RIGHT][RIGHT][RIGHT][BLACK]GOALS:[WHIT
E]";CS:POKEV+21,0
452 PRINT"[DOWN][RIGHT][RIGHT][RIGHT][BL
ACK]SAVES:[WHITE]";SC
453 PRINT"[DOWN][RIGHT][RIGHT][RIGHT][BL
ACK]SHOTS:[WHITE]";SH
454 PRINT"[YELLOW][DOWN][RIGHT][RIGHT][R
IGHT]YOUR RATING:"
456 IFCS>SCTHENPRINT"[WHITE][DOWN][RIGHT
][RIGHT][RIGHT]YOU'RE A PATHETIC GOALIE!
!"
458 IFCS<SCTHENPRINT"[WHITE][DOWN][RIGHT
][RIGHT][RIGHT]IT'S P.JENNINGS ESQUIRE!"
460 IFCS=SCTHENPRINT"[WHITE][DOWN][RIGHT
][RIGHT][RIGHT]EVER THOUGHT OF BEING A R
UGBY PLAYER?"
461 FORT=1TO10:GETJUNK$:NEXT
462 PRINT"[DOWN][DOWN][DOWN][RIGHT][RIGH
T][RIGHT][RIGHT]WOULD YOU LIKE ANOTHER G
AME?(Y/N)"
464 GETA$:IFA$="N"THENPRINT"[WHITE][DOWN
][DOWN][RIGHT][RIGHT][RIGHT]BYE! BYE!":E
ND
466 IFA$="Y"THENCLR:GOSUB600:RUN18
468 GOTO464
500 VO=54296:AT=54277:WA=54276
502 SU=54278:HF=54273
504 POKEAT,32:POKESU,255
506 POKEWA,33:RETURN
510 POKEVO,15:POKEHF,20:RETURN
520 POKEWA,129:POKEHF,10:FORD=1TO50:NEXT
:POKEHF,0:RETURN
530 POKEAT,32:POKEAT+7,32
532 POKESU,255:POKESU+7,255
534 POKEWA,33:POKEWA+7,129
536 FORD=100TO200:POKEHF+7,D:POKEHF,D
538 NEXTD
540 POKEHF,0:POKEHF+7,0:POKEVO,0:RETURN
550 POKEAT,32:POKEAT+7,32
552 POKESU,255:POKESU+7,255
554 POKEWA,33:POKEWA+7,129
556 FORD=200TO0STEP-1:POKEHF,D:POKEHF+7,
```

can then guide the goalie back and forth eventually, you hope, making a spectacular dive to prevent the ball from flying into the back of the net.

When all the shots have been taken a score sheet comes up to show your powers as a goalie.

If you would rather be on the attack then just a few alterations turn the game into Striker, where you can obtain the satisfaction of becoming Kevin Keegan. In this case, you choose the speed of the goalie and take control of the ball.

Altering or adding the following lines will convert the game into Striker:

```
53   IF PEEK(56321)<>239 THEN 53
62   IF JS=247 OR JS =246 OR JS=245 THEN
     X2=X2+8:IFX2>=230 THEN X2=230
63   IF JS=251 OR JS=250 OR JS=249 THEN
     X2=X2-8: IF X2<=100 THEN X2=100
64   IF X2>X1 THEN X1=X1+GS : POKE
     2042,227
65   IF X2<X1 THEN X1=X1-GS : POKE
     2042,226
66   IF X2=X1 THEN POKE 2042,225
70   POKE V+2,X2
670  INPUT GS: IF GS<1 OR GS>10 THEN 670
```

Then change the wording in lines:

```
658   "INPUT GOALIE SPEED (1-10)"
662   "1-4  VERY EASY"
664   "5-6  NOT SO EASY"
666   "7-8  TOUGH"
668   "9-10 HARDEST OF ALL."
```

72-74	Move ball left or right using a random number.
78	POKE in sprite position values. Continues ball moving loop. If loop ends, goto 350.
100-130	Line drawing routine.
200-202	Player animation.
250-254	Initial sprite pointer settings.
300-314	Message if a save.
350-364	Message if a goal.
400-410	Check on number of shots taken.
450-468	All shots taken? — gives scores and rating.
500-506	Initialise sound.
520	Kicking noise.
530-534	Set new values for voices 1 and 2.
536-540	The noise for a save.
550-558	The noise for a goal.
656-657	Input number of shots wanted.
1000	Clears sound channels.
29999-30088	Sprite data — individual characters as REMmed.

For Striker, the notes are the same as Goalie, apart from the following:

658-670	Input speed of goalie.
62-63	Move ball depending on joystick input.
64-66	Move goalie by comparing position with ball and also change the sprite picture so that he appears to dive.
70	Pokes in values.
53	Fire or Space to kick the ball.

```
D:NEXTD
558 POKEVO,0:RETURN
600 PRINTCHR$(147):POKE53280,0:POKE53281
,2
602 FORT=1TO20:PRINT:NEXT
604 PRINT"                    [WHITE]HERE IS.
....."
606 RETURN
610 PRINT"[YELLOW][RIGHT][RIGHT][RIGHT][
RIGHT][RIGHT] [s Q][s Q][s Q][s Q][s Q]
"
612 PRINT"[WHITE][RIGHT][RIGHT][RIGHT][R
IGHT][RIGHT][s Q][s Q]    [s Q][s Q]    [
s Q][s Q]    [s Q][s Q]  [s Q]     [s Q] [
s Q][s Q][s Q][s Q]"
614 PRINT"[YELLOW][RIGHT][RIGHT][RIGHT][
RIGHT][RIGHT][s Q]               [s Q]  [s Q]
[s Q]  [s Q] [s Q]      [s Q] [s Q]"
616 PRINT"[WHITE][RIGHT][RIGHT][RIGHT][R
IGHT][RIGHT][s Q]     [s Q][s Q][s Q][s Q]
[s Q] [s Q]   [s Q] [s Q][s Q][s Q][s Q]
[s Q]      [s Q] [s Q][s Q][s Q]"
618 PRINT"[YELLOW][RIGHT][RIGHT][RIGHT][
RIGHT][RIGHT][s Q][s Q]       [s Q]     [s Q]
  [s Q] [s Q]  [s Q] [s Q]       [s Q] [s Q
]"
620 PRINT"[WHITE][RIGHT][RIGHT][RIGHT][R
IGHT][RIGHT] [s Q][s Q][s Q][s Q][s Q]
   [s Q][s Q]  [s Q]  [s Q] [s Q][s Q][s
 Q][s Q] [s Q] [s Q][s Q][s Q][s Q]"
621 PRINT"[HOME][DOWN][DOWN][DOWN][RIGHT
][RIGHT][RIGHT][RIGHT][RIGHT][c 3]BY [YE
LLOW]ANDY CLARKE [WHITE](C)[c 3]1984"
622 PRINT"[YELLOW][DOWN][DOWN][RIGHT][RI
GHT][RIGHT][RIGHT][RIGHT][RIGHT][RIGHT]P
RESS A KEY"
624 GETA$:IFA$=""THEN624
626 PRINTCHR$(147)
628 PRINT"[DOWN][DOWN][DOWN][RIGHT][RIGH
T][RIGHT][RIGHT][RIGHT][YELLOW]WELCOME T
O THE HOME GROUND OF"
630 PRINT"[RIGHT][RIGHT][RIGHT][RIGHT][R
IGHT][WHITE]COMMODORE CITY..."
632 PRINT"[DOWN][RIGHT][RIGHT][RIGHT][RI
GHT][RIGHT][YELLOW]HERE AT THE OLD VIC W
E WILL BE"
634 PRINT"[RIGHT][RIGHT][RIGHT][RIGHT][R
IGHT]SEEING A FOOTBALLING BOUT BETWEEN"
636 PRINT"[RIGHT][RIGHT][RIGHT][RIGHT][R
IGHT][WHITE]BRIAN THE BALL BLASTER[YELLO
W],AND YOU AS"
638 PRINT"[RIGHT][RIGHT][RIGHT][RIGHT][R
IGHT][WHITE]THE SHIVERING GOALIE."
640 PRINT"[DOWN][DOWN][RIGHT][RIGHT][RIG
HT][RIGHT][RIGHT][WHITE]USE A JOYSTICK I
N PORT ONE OR"
642 PRINT"[RIGHT][RIGHT][RIGHT][RIGHT][R
IGHT][WHITE]KEYS:"
644 PRINT"[RIGHT][RIGHT][RIGHT][RIGHT][R
IGHT][WHITE]@  [YELLOW]- UP"
646 PRINT"[RIGHT][RIGHT][RIGHT][RIGHT][R
IGHT][WHITE]_  [YELLOW]-  DOWN
648 PRINT"[RIGHT][RIGHT][RIGHT][RIGHT][R
IGHT][WHITE]2  [YELLOW]-  RIGHT"
650 PRINT"[RIGHT][RIGHT][RIGHT][RIGHT][R
IGHT][WHITE]CTRL  [YELLOW]-  LEFT"
652 PRINT"[RIGHT][RIGHT][RIGHT][RIGHT][R
IGHT][WHITE]SPACE [YELLOW]-  FIRE"
653 PRINT"[YELLOW][DOWN][DOWN][RIGHT][RI
GHT][RIGHT][RIGHT][RIGHT][RIGHT][RIGHT]P
RESS A KEY"
654 GETA$:IFA$=""THEN654
656 INPUT"[CLEAR][HOME][DOWN][DOWN][DOWN
][DOWN][DOWN][DOWN][RIGHT][RIGHT][RIGHT]
[RIGHT][RIGHT][RIGHT][RIGHT][RIGHT]NO OF
 SHOTS (1-100)";SH
657 IFSH<1ORSH>100THEN656
658 PRINT"[DOWN][DOWN][RIGHT][RIGHT][RIG
HT][RIGHT][RIGHT][RIGHT][RIGHT][RIGHT]IN
PUT BALL SPEED (1-20)"
660 PRINT"[DOWN][RIGHT][RIGHT][RIGHT][RI
GHT][RIGHT][RIGHT][RIGHT][RIGHT][c 3]HIN
TS"
662 PRINT"[DOWN][RIGHT][RIGHT][RIGHT][RI
GHT][RIGHT][RIGHT][RIGHT][RIGHT][YELLOW]
1-5     -[WHITE]VERY EASY"
664 PRINT"[DOWN][RIGHT][RIGHT][RIGHT][RI
GHT][RIGHT][RIGHT][RIGHT][RIGHT][YELLOW]
6-10    -[WHITE]NOT SO EASY"
666 PRINT"[DOWN][RIGHT][RIGHT][RIGHT][RI
GHT][RIGHT][RIGHT][RIGHT][RIGHT][YELLOW]
11-15  -[WHITE]TOUGH"
668 PRINT"[DOWN][RIGHT][RIGHT][RIGHT][RI
GHT][RIGHT][RIGHT][RIGHT][RIGHT][YELLOW]
16-20  -[WHITE]HARDEST OF ALL";
670 INPUTSP:IFSP<1ORSP>20THEN670
672 PRINT"[DOWN][RIGHT][RIGHT][RIGHT][RI
GHT][RIGHT][RIGHT][RIGHT][RIGHT]GET READ
Y"
674 PRINT"[DOWN][RIGHT][RIGHT][RIGHT][RI
GHT][RIGHT][RIGHT][RIGHT][RIGHT]PRESS 'F
IRE'"
676 IFPEEK(56321)<>239THEN676
678 RETURN
1000 FORC=54272TO54296:POKEC,0:NEXT:RETU
RN
29998 REM SPRITE DATA STORED FROM HERE
30000 REM**** PLAYER # 1
30001 DATA0,0,0,0,0,0
30002 DATA168,0,0,172,0,0,175
30003 DATA0,0,188,0,0,48,0
30004 DATA0,168,0,0,152,0,0
30005 DATA152,0,0,149,192,0,168
30006 DATA0,0,168,0,0,84,0
30007 DATA0,84,0,0,84,0,0
30008 DATA207,0,0,195,0,0,194
30009 DATA128,0,160,0,0,0,0
30010 REM**** PLAYER # 2
30011 DATA0,0,0,0,0,0
30012 DATA168,0,0,172,0,0,175
30013 DATA0,0,188,0,0,48,0
30014 DATA0,168,0,0,152,0,0
30015 DATA152,0,0,152,0,0,151
30016 DATA0,0,168,0,0,84,0
30017 DATA0,84,0,0,84,0,0
30018 DATA240,0,0,48,0,0,48
30019 DATA0,0,40,0,0,40,0
30020 REM**** PLAYER # 3
30021 DATA0,0,0,0,0,0
30022 DATA168,0,0,168,0,0,168
30023 DATA0,0,168,0,0,48,0
30024 DATA0,168,0,1,169,0,1
30025 DATA169,0,1,169,0,1,169
30026 DATA0,3,171,0,0,84,0
30027 DATA0,84,0,0,84,0,0
30028 DATA204,0,0,204,0,0,204
30029 DATA0,2,138,0,0,0,0
30030 REM**** PLAYER # 4
30031 DATA0,0,0,0,0,0
30032 DATA168,0,0,168,0,0,168
30033 DATA0,0,168,0,0,48,0
30034 DATA0,168,0,1,169,0,1
30035 DATA169,0,1,169,0,1,169
30036 DATA0,3,171,0,0,84,0
30037 DATA0,84,0,0,84,0,3
30038 DATA204,0,3,12,0,10,12
30039 DATA0,0,10,0,0,0,0
30040 REM**** PLAYER # 5
30041 DATA0,0,0,0,0,0
30042 DATA168,0,0,168,0,0,168
30043 DATA0,0,168,0,0,48,0
30044 DATA0,168,0,1,169,0,1
30045 DATA169,0,1,169,0,1,169
30046 DATA0,3,171,0,0,84,0
30047 DATA0,84,0,0,84,0,0
30048 DATA207,0,0,195,0,0,194
30049 DATA128,2,128,0,0,0,0
30050 REM**** GOALIE # 1
30051 DATA0,0,0,0,0,0
30052 DATA168,0,0,184,0,0,252
30053 DATA0,0,252,0,0,48,0
30054 DATA0,168,0,1,169,0,1
30055 DATA169,0,5,169,64,52,168
30056 DATA112,0,168,0,0,84,0
30057 DATA0,84,0,0,84,0,0
30058 DATA204,0,0,204,0,0,204
30059 DATA0,2,138,0,0,0,0
30060 REM**** GOALIE # 2
30061 DATA0,0,0,0,0,0
30062 DATA168,0,0,232,0,0,248
30063 DATA0,0,248,0,0,48,0
30064 DATA53,212,0,1,101,0,0
30065 DATA105,0,0,42,0,0,42
30066 DATA0,0,10,128,0,5,64
30067 DATA0,1,80,0,1,80,0
30068 DATA3,60,0,3,250,0,0
30069 DATA40,0,0,0,0,0,0
30070 REM**** GOALIE # 3
30071 DATA0,0,0,0,0,0
30072 DATA2,160,0,2,176,0,2
30073 DATA240,0,3,240,0,3,7
30074 DATA0,5,212,0,22,80,0
30075 DATA26,64,0,42,0,0,168
30076 DATA0,0,168,0,0,84,0
30077 DATA1,80,0,1,80,0,3
30078 DATA48,0,47,48,0,34,240
30079 DATA0,2,0,0,0,0,0
30080 REM**** BALL
30081 DATA0,0,0,0,0,0,0
30082 DATA0,0,0,0,0,0,0
30083 DATA0,0,0,0,0,0,0
30084 DATA0,0,0,1,240,0,3,248
30085 DATA0,3,248,0,3,248,0,1
30086 DATA240,0,0,0,0,0,0,0
30087 DATA0,0,0,0,0,0,0
30088 DATA0,0,0,0,0,0

READY.
```

READOUT





'Women and Computing' by Rose Deakin, published by MacMillan at £5.95 (paperback 149 pages.)

It is with Julius Caesar that Ms Deakin begins. Paraphrasing Shakespeare she compares computers to a tide that women must take at its flood to lead them on to fortune. Shakespeare was obliged by the strictures of meter to refer to 'a tide in the affairs of men', and there's the rub.

The book explores the reasons for computers being a male preserve, and suggests remedies. It is a serious matter, and the book is completely devoid of humour. Men should read it as well as women, says Ms Deakin; men should visit the dentist too, but they shouldn't expect it to be fun.

The author's central argument is that pairs (men and women, whites and blacks, jews and gentiles etc) are not better or worse than each other, just different. Hence they respond to computers in different ways. Ms Deakin ropes in the the glorious dead (John Stuart Mill) to support her as she champions women's essential practicality — if micros could seem more worthwhile, she says, women might be more attracted to them. That is as good as accusing the rest of us of frivolity, and who would deny it?

Reasons and remedies revolve around social attitudes, schools, marketing and various male prejudices. One remedy Ms Deakin offers is to make computing the fourth R in schools.

The second section of the book looks at case studies of women and computers, mainly micros. There are eight case histories and they include Ms Deakin herself.

But the final part of the book, where the writer puts forward some worthwhile micro-based occupations for women at home (or for anybody wanting to use a micro at home) is genuinely valuable. It begins discouragingly — typing and book-indexing are not alluring occupations — but opens out into a prospectus of opportunities.

This is a dull book packed cover to cover with worthy sentiments. If party manifestos are your taste in reading, buy it. **DG**

'Simple Music and Sound Effects' by Jonathan Inglis, published by Dragon Hardbacks & Granada at £1.95 (paperback 63 pages.)

This highly-coloured slim volume comprises 63 pages of extremely simple advice on getting sound out of your BBC or Electron.

After a quick survey of the machines and using Basic, it eventually gets, by page 15, on to mentioning the sound command. To make the text a little more interesting, there are screen shots dotted around. As is becoming the unfortunate norm these days they disappointingly have no programs related to them. They are rather nice pictures and it would have been nice to have seen how they were done.

The book also appears to have been printed using a dot matrix printer. None of your NLQ stuff this, its straight 8 by 8 matrix.

Anyhow, back to the book; a few chapters on, we still have not learned much. This leads me to believe that the book is aimed at younger readers or perhaps beginners, either of whom will probably be bored stiff by the time they are half-way through.

One thing conspicuous by its absence is any reference at all to the ENVELOPE command. This is somewhat strange since it turns the BBC and Electron's simple SOUND command into something special. There is also no mention of such subtleties of the SOUND command as synchronising the channels or interrupting on-going sounds. The author either hasn't read the User Guide or thinks that such things are far beyond your average BBC/Electron user. I doubt whether he's correct. **KG**



'Data Management for Professionals' by Bryan Lewis, published by Prentice-Hall at £15.45 (paperback, 153 pages).

This is a straightforward attempt to get doctors, dentists, pharmacists and lawyers to smarten up their operations. It first aims to win them over to the idea of computerisation and then sets out how to go about it.

Probably because doctors, dentists, pharmacists and lawyers are usually reckoned not to be short of a bob or two, the book's US price tag of $15.95 translates to £15.45 in this country. For this, progressive professionals will acquire a large glossy volume in which the text never fills more than two-thirds of the page. Opticians will appreciate this thoughtful touch.

But what of the content? The sight of Ashton-Tate's name at the foot of every page won't fill you with confidence, if it's impartiality you're looking for, but Dr Lewis deals skilfully with the problem of having a prominent business software publisher as a backer. He uses dBase II to produce examples but acknowledges that there are other possibilities.

As this is a US publication, you must expect expressions like 'bottom line' and 'trade-off'. Dr Lewis occasionally betrays a background in mainframe computers — or do all Americans sprinkle everyday speech with computer jargon now?

His approach to the matter of computer applications is a lesson in subtlety. Having described how businesses work and where computers apply, he moves on to specific occupations. His style leaves the user with a large element of choice — 'if your office runs this way, you might like to try this approach'. But to his credit he commits himself to what he believes is the best method, and a pox on how your office runs. This may not be a bad thing.

There is some over-simplification (most businesspeople/professionals will already know what a general ledger is). But on the whole it is a useful book, covering an area that the computer manufacturers have tended to neglect. **DG**



'Sensational Games for the Amstrad' by Jim Gregory, published by Granada at £5.95 (paperback, 200 pages).

Whatever the general view of books of programs they have one invaluable use — for owners of recent machines they are well worthwhile as a source of instruction and software.

While the software houses gear up for program conversion to the Amstrad, you could fill a few weeks with entering and amending the programs offered here. There are 27 listings covering text and arcade games, with a smattering of utilities for good measure.

All are accompanied by a short introduction and a screen shot but no notes on how they work (a minus point for that). There's nothing startling or particularly sensational — on the other hand most look worthwhile and there must be something for all tastes.

To round things off there's a collection of useful appendices on character sets, screen maps and so on. Got to be worth the money. **PW**



'Animation, Games and Sound for the Vic 20' by Tony Fabbri, published by Prentice-Hall at £14.50 (paperback, 217 pages).

Prentice-Hall does it again — another one for the glass-fronted bookcase. You certainly wouldn't want to use this book . . . you might spill coffee on it, or get a page creased and at nearly 15 quid you'd be upset, wouldn't you?

Pity because it's a great book with loads of example programs, helpful diagrams and a clearly written, chatty text. If you dared risk a thumbprint on page 137 you'd find a complete example of a space game covering features like random motion, keyboard control and animation.

Open it to page 177 (careful!) and you find an amusing routine of a dancing figure.

Yes, it's all good stuff. But never mind — there are lots of good, cheap books on the Vic. **PW**



'The Times Book of Computer Puzzles and Games' by Bradbeer & Gale, published by Sidgwick & Jackson at 16.95 (paperback, 160 pages).

Two titles — for Commodore 64 and Spectrum — although most of the programs are the same. Even by computer book prices this is a little steep — presumably to pay for the prestige of The Times and the publishers, relative newcomers to the computer field.

The games are a little on the thin side, most of the programs being computerised versions of those puzzles that litter the pages of Christmas annuals and the like. You know the sort of stuff — break the code, get the sheep and the chicken and the dog across the river, how long would it take half a man to dig four holes?

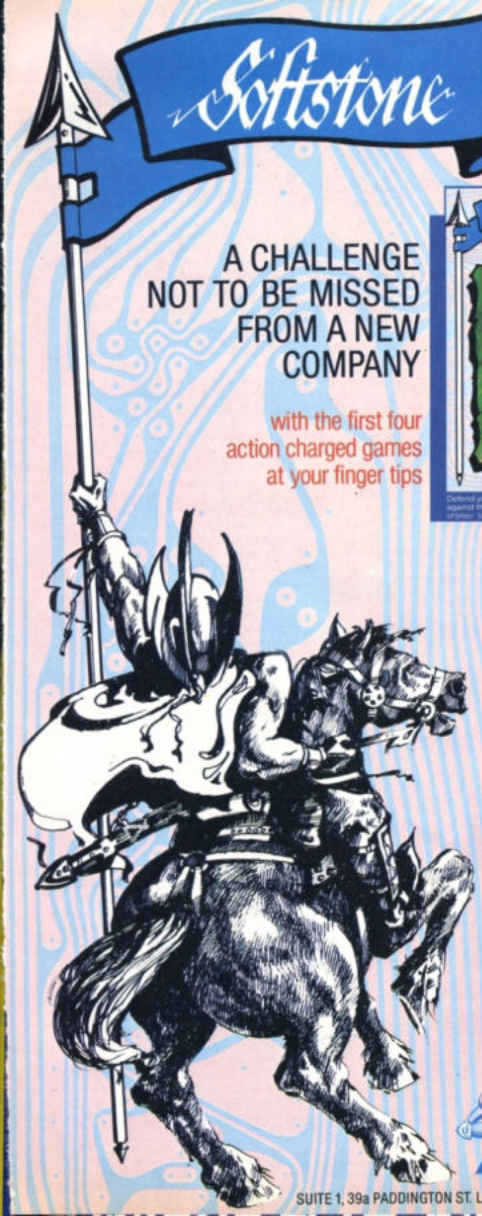
If you have that perverse turn of mind that enjoys this sort of stuff, or you're tired of saving the universe, slaying the dragon and digging your way out of that mine, you just might enjoy this.

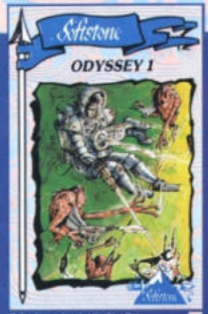
On the other hand, £6.95 will buy a cracking good new program. **PW**

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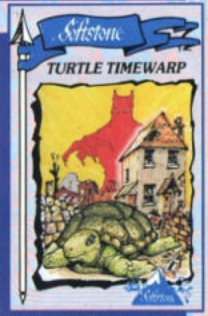




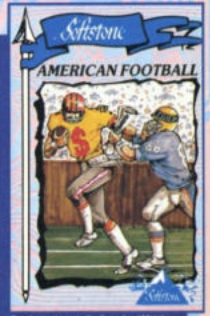
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SHADOW WORLD

Bob Morgan has a whole host of extensions for you in the 8K Shadow ROM in the ZX Interface I

Spectrum users who come across the commands OPEN # and CLOSE # (extended mode, symbol shift, keys 4 and 5 respectively) on the keyboard, will wonder what they're for.

Reference to page 115 of the Spectrum manual lists these two commands, along with MOVE, ERASE, CAT and FORMAT, pointing out that they can only be used with 'the extra attachments' — namely the ZX Microdrive and Interface 1.

The reason for this is that the routines necessary for the implementation of these commands are to be found not in the standard 16K ROM present in every Spectrum — but in the additional 8K 'Shadow' ROM located in the ZX Interface 1. The shadow ROM also houses routines which extend the operation of the standard Spectrum commands: SAVE, VERIFY, LOAD, MERGE, LIST, PRINT, INPUT, INKEY$, CLS and CLEAR.

These extensions to Spectrum Basic open up a wonderful world of communications with other devices, including the option of networking groups of Spectrums. In addition, it also offers a sophisticated file-handling facility comparable to those available on larger more expensive systems.

Channels

The significance of the OPEN # and CLOSE # commands thus becomes apparent. Before a file, or a device, can be used it is first necessary to 'open' it so that it can provide input or receive output. Then the file or device must be 'closed' so that input may be received from a different source, or output directed to an alternative destination. The terminology adopted by Sinclair for the Microdrive and Interface 1 is to refer to the file or device as a channel.

Listing 1: streams

```
  10 BORDER 0: PAPER 0: INK 9: C
LS
  20 LET a$="PCN week!! for the
latest news !"
  30 FOR n=0 TO 3: REM IF NO PRI
NTER, CHANGE 3 TO 8
  40 IF n=3 THEN PRINT #2; PAPER
 n; FLASH 1;" PRINT TO STREAM ";
n
  50 PRINT #n; PAPER n; FLASH 1;
" PRINT TO STREAM ";n; FLASH 0;
a$;a$;a$
  60 PAUSE 1+80*(n<>3)
  70 IF n=3 THEN LPRINT #2; PAPE
R n; FLASH 1;"LPRINT TO STREAM "
;n
  80 LPRINT #n; PAPER n; FLASH 1
;"LPRINT TO STREAM ";n; FLASH 0;
a$;a$
  90 PAUSE 1+80*(n<>3)
 100 NEXT n
 110 PAUSE 100
 120 FOR n=0 TO 3: REM IF NO PRI
NTER, CHANGE 3 TO 8
 130 BORDER n: PAPER n: CLS : IF
 n=3 THEN PRINT #2; FLASH 1;" LI
ST TO STREAM ";n
 140 PRINT #n; FLASH 1;" LIST TO
STREAM ";n: FLASH 0: LIST #n,14
0+(n=3)*60
 150 PAUSE 1+100*(n<>3): CLS
 160 IF n=3 THEN PRINT #2; FLASH
 1;"LLIST TO STREAM ";n
 170 PRINT #n; FLASH 1;"LLIST TO
STREAM ";n; FLASH 0: LLIST #n,1
40+(n=3)*60
 180 PAUSE 1+100*(n<>3)
 190 NEXT n
 200 BORDER 0: PAPER 0: INK 4: C
LS : LIST #2,120
 210 PRINT #0; INK 6; FLASH 1;"T
O RUN AGAIN, PRESS ANY KEY ..."
 220 PAUSE 0: RUN
 230 SAVE "streams" LINE 10
```

Thus a Microdrive file, the ZX printer, the keyboard, another Spectrum in the network, the display screen, the RS232 interface — all these are channels. Information passes to or from these channels along streams. There are 16 available, designated by the numbers 0 to 15 preceded by the hash symbol/#./ Streams #4 to #15 are free for the user to set up his own stream-channel links.

Streams are linked to channels by means of the OPEN # command, for which the appropriate syntax is: OPEN # channel number;'channel specifier'. For example: OPEN #7; 'm'; 2; 'datafile' associates stream seven with the file named datafile on the cartridge currently in Microdrive 2.

Subsequently, a command such as PRINT #7; a$ may be used to print the string a$ to the file. Alternatively, the file might be used to supply numerical data to the current program by including a statement like: INPUT #7; a;b;c.

In this example, 'm' is used to denote a Microdrive channel; other types of channel are denoted by 'n' for the network, 't' and 'b' for the RS232 interface. There are also three established channels 'k', 's' and 'p' denoting the keyboard, display screen and ZX printer port respectively.

For these established channels, the separators in the OPEN # statement must be commas rather than semicolons. These and other details are in the Sinclair Microdrive and Interface 1 Manual.

Insight

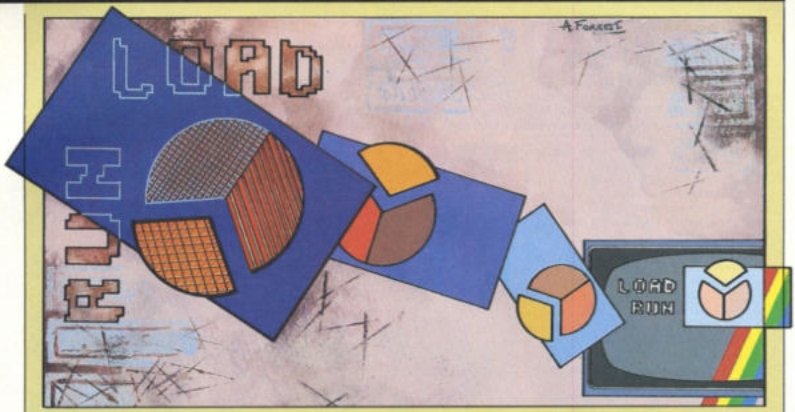
Those still saving up for their interface and Microdrives can gain some insight into the use of channels and streams by playing a few tricks with a standard Spectrum. These are possible because streams #0 to #3 are available without Interface 1, and are already dedicated to particular channels.

Streams #0 and #1 output information to the lower part of the display screen (reports, input prompts, etc) and input data from the keyboard. Stream #2 outputs information to the upper part of the display screen (program output, screen listings, etc). Stream #3 outputs information to the ZX Printer port (for hard copy of listings, screen displays, etc).

On a standard Spectrum, those Basic commands which are concerned with input and output have a default stream which is implicit in their use.

Thus, INPUT is equivalent to INPUT #1 since input normally comes from the keyboard. PRINT and LIST are equivalent to PRINT #2 and LIST #2 since the normal destination for the information output by these commands is the upper part of the display screen. However, LPRINT and LLIST normally output text to the printer so these instructions are short for LPRINT #3 and LLIST #3.

In fact, if the trouble is taken to specify a stream, then there is no longer any



Listing 2: windows

```
   10 BORDER 0: PAPER 0: INK 9: C
LS
   20 LET b$=" OUTPUT TO LOWER PA
RT OF SCREEN "
   30 LET t$=" OUTPUT TO UPPER PA
RT OF SCREEN "
   40 FOR n=0 TO 21
   50 CLS
   60 FOR j=0 TO n
   70 PRINT #1; PAPER 1;b$
   80 NEXT j
   90 FOR j=0 TO 21-n
  100 PRINT #2; PAPER 2;t$
  110 NEXT j
  120 PAUSE 20
  130 NEXT n
  140 PAUSE 0: RUN
  150 SAVE "windows" LINE 10
```

distinction between the commands PRINT and LPRINT, nor between LIST and LLIST. Thus PRINT, PRINT #2, LPRINT #2, LIST, LIST #2 and LLIST #2 all direct output to the upper part of the display screen, while LPRINT, LPRINT #3, PRINT #3, LLIST, LLIST #3 and LIST #3 all produce hard copy on the printer.

Stream #0 is normally used to display reports to the lower part of the screen, but in fact it is quite possible to PRINT or LIST to stream #0 and also to stream #1. Both give the same effect of lines of output scrolling up from the bottom of the screen. The only snag is that once generated, the output text is normally wiped out by the immediately following report and this happens so fast that it is impossible to read the text.

This problem can be circumvented by delaying the report by incorporating a futile loop; PRINT #0; a$: FOR j = 1 TO 1000 : NEXT j allows sufficient time for reading the output. A more elegant solution is to use PRINT #0; a$: PAUSE n where n is a large number to introduce a delay which can be discontinued by depressing any key; if PAUSE 0 is used the delay is infinite and the computer simply awaits a key depression before executing the following statement.

This is by far the simplest method of printing on the bottom two (or more) lines of the Spectrum screen and obviates the need for memory POKEs. An illustration is provided by statements 210 and 220 of listing 1.

There are several ways in which PRINT #0 can make an effective contribution to programming. For example, it is sometimes necessary to use the entire "normal" screen of 22 lines to display a picture, graph or text to be viewed for as long as the user requires before the program moves on to the next task. Here the bottom lines can be used to invite the appropriate keyboard prompt to signal that the user is ready to continue.

Another example is where a screen is to be displayed during the loading of program or code; again, the bottom lines can be used to display an appropriate message such as 'please wait 30 seconds'.

The accompanying program streams, which will run on any Sinclair Spectrum, illustrate the effects of unconventional stream — channel linkages. The results are mostly frivolous, although it makes a pleasant change to see listings or other text pouring up the screen instead of down.

Windowing

The program also shows that it is possible to split the Spectrum screen display into upper and lower regions of any size as long as the total number of lines does not exceed 23.

The accompanying program windows (listing 2) give a simple demonstration of the use of screen windows.

This brief excursion into channels and streams may stimulate you to conduct a few experiments of your own. A word of caution is necessary here, for it is all too easy to 'hang' the machine, particularly during attempts at using INPUT # or INKEY$ # with unconventional streams; it will then be necessary to switch off to free the machine, losing your program.

Some insight into the uses, and limitations, of channels and streams can only enhance your understanding of your machine. Just think what you could do with Interface 1 and a couple of Microdrives.

Further Reading

Sinclair ZX Spectrum Basic Programming by Steven Vickers, edited by Robin Bradbeer, Sinclair Research.
Sinclair ZX Interface 1 and ZX Microdrive by Cambridge Communication, Sinclair Research.
Spectrum Microdrive Book by Dr Ian Logan, Melbourne House.

TOKYO SHOWS

One year on from the announcement of the MSX, John Lettice finally gets his hands on the fabled machine, or machines as the case may be. He subjected the Toshiba HX-10 and Goldstar FC-200 to rigorous scrutiny to see how they measure up.

A tidal wave? A volcano ready to blow its top? Or a Japanese invasion? All of these things have been thought about the ever-impending MSX standard, and some of them have even been said, but over the past few months this particular volcano has given a distinct impression of being full of eastern pummice.

It's well over a year now since MSX was first announced, and since spring it's been difficult to open a magazine without tripping over another article about the blessed things. If you read magazines with your feet, that is . . .

In effect the position was that you could have practically any MSX machine you liked, provided that it wasn't actually going to be sold in this country.

So for months, journalists and programmers have been hunched over Japanese market machines, trying not to notice the exotic styling that seems to go down well over there, and suspending operations only long enough to phone up the manufacturers and ask when the real thing was arriving.



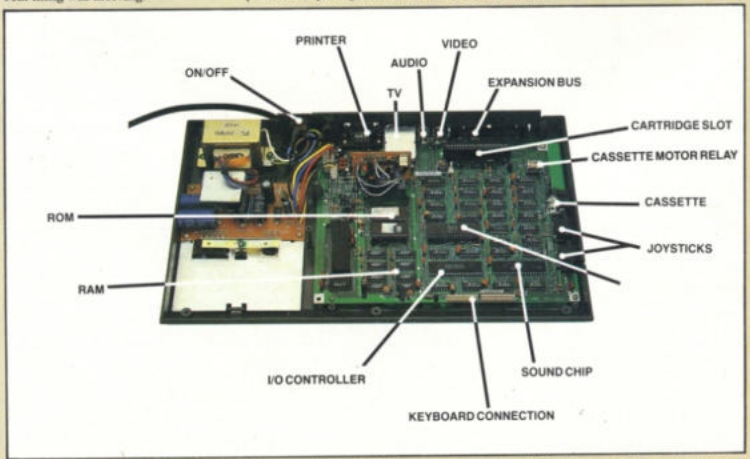
Note the pen holder to the right of the cartridge slot — this isn't really designed to hold your biro.

The manufacturers themselves got more and more sheepish as deadline after deadline came and went, and started offering consolation prizes of 'um . . . hand-built prototype — er . . . tell you what, how'd you like a UK case with Japanese insides? Ah . . . it's just a question of them wiring in a couple more keys . . .'

And so it comes about that the most reviewed machines in the history of microcomputing haven't actually been reviewed yet in the UK, if you see what I mean.

But just when I thought it was safe to go back in the office the tidal wave broke over my desk in the shape of a Toshiba HX-10 and a Goldstar FC-200.

The Toshiba's main claim to fame is that it's the first MSX machine to appear in the shops in this country. The Goldstar is still a rarity, but has added novelty value because of its Korean origins.



If Goldstar and Microdealer (the UK distributor) can get their act together in fairly short order they'll probably embarrass a few members of Japan Inc on two counts: they'll have beaten a

number of manufacturers to the punch, and their £230 price-tag will look more realistic than the rest of the MSX pricing, which is liable to be up nearer the £300 mark.

Presentation

Because they're built to a standard MSX specification you'd naturally expect the Goldstar and the Toshiba to look a bit like one another. But the resemblance is so close it's spooky. The cases are both two-tone grey, with the various control, shift and function keys dark grey arranged round an off-white main keyboard. Red stop keys, green graphics shifts and blue cursor clusters on both machines complete the sense of deja-vu.

Both machines came with English manuals, but the English in the Goldstar manual is peculiar enough to make it practically unintelligible. This will however be replaced by a fully English version when the machine hits the shops.

Documentation

There seems to be a basic format for MSX manuals, consisting of alphabetical reference sections, a couple of shortish chapters dealing with how to get started, and an excellent reference section giving you memory maps, ASCII codes and I/O maps.

I'm making an assumption here, as the only other MSX manual I've seen is for a Japanese Hitachi, and I'm afraid I've been letting my Japanese slide a little recently, but the format looks similar to the Toshiba manual, and the provisional Goldstar documentation has a certain amount in common with both of them.

The Microsoft aspect of MSX probably accounts for the similarity between the Toshiba manual's format and that of Tandy manuals. From an educational point of view this is by no means the best way of presenting a machine, but the plus point is that most of the information is there if you want to look for it.

One major flaw in the Toshiba manual is that there's no documentation of the pinouts of the interfaces. The Goldstar manual has these, and this more than compensates for the fact that it's written in Koreanspeak.

Construction

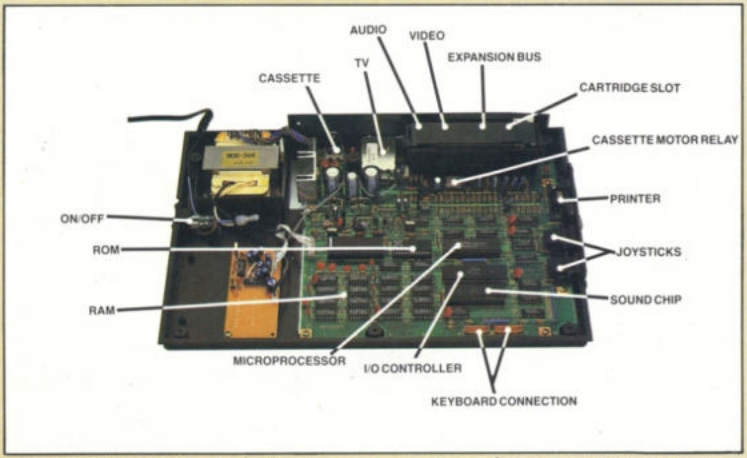
The similarity in the appearance of the machines extends to construction quality. They're both solidly cased in rigid plastic with an internal power supply and liberal use of grilles for cooling purposes. There are also fairly large heat-sinks visible through the base of the machines, with the monster heat-sink award going to Toshiba.

The keyboard displays where the similarities are most obvious. The legends on the keys are slightly different, but the keys themselves look like they've come out of the same mould, never mind the same factory.

Part of the MSX idea is that it provides a basic specification that manufaturers can improve on if they wish. So, provided the machine can operate as MSX, the individual manufacturer can add in facilities that exceed the specification. Yamaha, is producing a machine that is at least 50 per cent music synthesiser.



All the MSX machines will have a standard ROM cartridge socket. Power is automatically switched off while inserting a cartridge.



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◀ 33

The Toshiba and the Goldstar, however, are pretty much standard; the Goldstar's claim to individuality being a quaint little light pen holder on the right of the cartridge slot. Both machines' cartridge slots have automatic cut-out switches so that you can put in cartridges while they're powered up, and the expansion ports are simply jumble-lead affairs connecting the cartridge slots' lines to buses at the back.

At the launch of MSX in this country earlier this year there was something of a controversy about expanding the system. The earlier Japanese systems seemed to all have different expansion facilities, so effectively they seemed incompatible. It was difficult to see how they could use standard MSX peripherals.

It took some heavy third degree questioning before an MSX spokesman confessed that they were intended to be run from the cartridge slot, and considering the guffaws that greeted this, his reticence was understandable.

Back to my Japanese Hitachi manual. I don't understand the words, but a diagram shows some funny stuff coming out of the cartridge slot. This explains why some of the machines have two slots.

Some smart person, however, must have worked out that running peripherals from a cartridge slot would strike the warped western mind as hugely funny — so the extra slot has been transmogrified into a full bus.

The bus itself is a male plug while the cartridge socket is female, so I imagine peripherals sold in the Japanese market will have their connectors inverted to allow them to work with UK machines, but I'm willing to be corrected on this one.

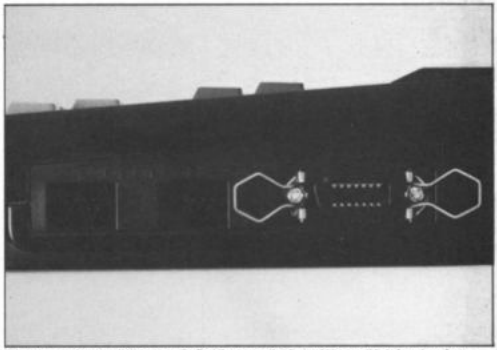
Alternatively, the bus may not be MSX standard at all, as it's difficult to see if all the lines from the cartridge slot are connected. I wait with bated breath.

Another improvement is the presence of a Centronics interface on both. This is marred slightly by the exotic nature of the socket, which is a small and very alien looking D plug. Other sockets present are video, audio (nice touch), TV, cassette and twin D-type joystick ports.

The Goldstar has another jolly little extra. You can remove the fuse through a hole in the back, so you can replace it without opening the case.

The PCBs of both machines are fairly tidy, as indeed they should be considering the length of time the MSX companies have had at their disposal for designs and redesigns. The Toshiba has one of those wires that shout loudly: 'Oh dear, shouldn't we have connected these two?' But apart from that it's clean.

One little oddity about the review Goldstar was that the ROM was on two EPROMs rather than the Toshiba's one ROM chip. The memory map in the manual shows an 8K Korean character set above 8000, which may partially explain this. No doubt Goldstar will be editing this out as the Japanese have removed the Kanji lock from their machines.



The presence of two joystick ports on the Toshiba means that it should be possible to have two player games and the non-standard printer seems to be an MSX standard.

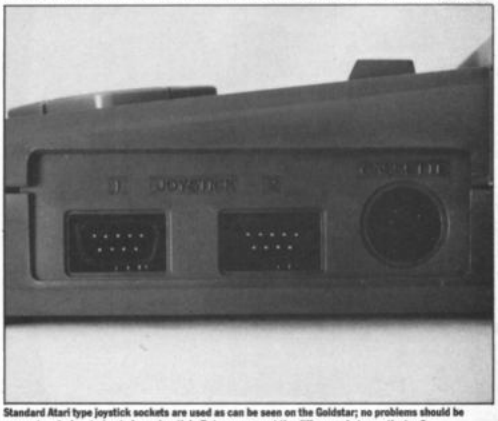
In use

Functionally the Toshiba and the Goldstar are identical. The differences in keyboard feel and layout are negligible, and the Basic's exactly the same, so at this point I suppose I could just as well be reviewing a machine called the Goldshiba.

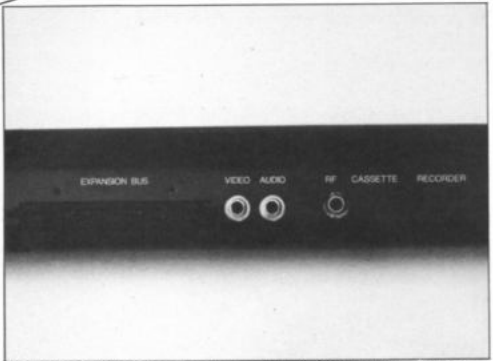
But before I do, a short digression. Economic imperialism being what it is, we in the UK are continually running up against the 'no pound sign' problem. These foreign machines come over here, take the typewriters off our desks and then spit hash signs at us, to the point where I never really know what # will come out of the printer looking like.

Some manufacturers stick a pound sign on the keyboard which produces a hash sign on screen and goodness knows what on the printer. But Toshiba, although the company clearly realised the problem late only in the day, has kindly cludged a pound sign key in. The bottom right-hand side of the keyboard may not be the most ergonomic place to put it, but it's the thought that counts. However, I haven't got a printer cable, so

36 ▶



Standard Atari type joystick sockets are used as can be seen on the Goldstar; no problems should be encountered when trying to buy a joystick. But can you spot the difference between the two?



The expansion bus will take a ribbon cable connector similar to the BBC. You should be able to annoy your neighbours by connecting the audio socket of the Toshiba to your hi-fi.

◀ 35

I'm in no position to tell you what the printer thinks it is.

Back to the Toshistar. Both machines slot into the MSX logo screen/commercial break before dropping you into Basic on power up, and although it doesn't do this for long, I can see it getting irritating.

The Basic is of course beautiful, virtually ideal for the beginner to computing, but as I used the machines I started to get an impression of plodding slowness. Switching to a graphics screen takes the machine just enough time for you to think: 'Why has the screen gone blank?' There are other instances in Basic where the machines seem to be snoring gently between bursts of activity.

Fortunately, interrupts are fairly easy to handle on the machines through the built in ON INTERVAL command, which allows you to call subroutines at intervals based on the 1/60th of a second interrupts generated by the display chip.

This would make it relatively easy to speed up the parts of a program that count, so it may be a little unfair to criticise the machines on speed.

A few more compensating jollies include sprites using a similar interrupt facility, and are relatively easy to use. You can have up to four of them or one line, and up to 32 on screen. Graphics have their own graphics macro language, which allows you to draw on the basis "U10L50D30" — this translates as up 10, left 50, down 30.

I made a desultory effort to turn these into full-fledged turtle graphics, but it turned out to be more complicated than it looked.

The other major feature is the music macro language, which uses a similar system to produce eight octaves' worth on three channels. All in all, these babies can sing and dance quite competently.

Verdict

If you want to learn about programming, the MSX machines are well worth considering along with the BBC B and the excellent value Amstrad. If you just want to bang your head — and despite the abuse that's heaped on the heads of games players, I see nothing wrong with this maligned activity — the price of an MSX machine is liable to be a bit steep.

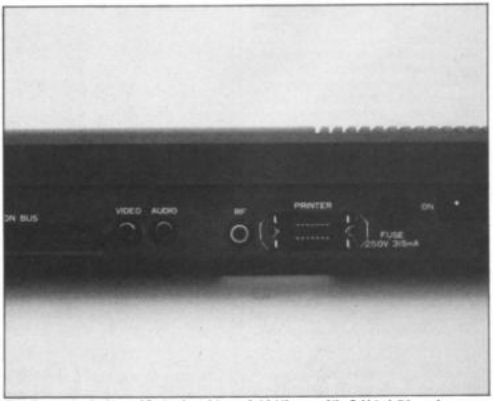
It is of course possible to use MSX machines for business, and upgradeability is one of their main selling points. But so far I've only heard about the peripherals, not seen them, and you'd have to be pretty reckless to lock yourself into a business system before you saw the price and capabilities of the add-ons.

Price-wise, the machines don't look all that attractive. The Goldstar looks good at £230, but the 64 is checking in at around £190. The latter's vast library of software provides an effective counter balance to its gruesome Basic. Further up-market, however, the Toshiba's £280 is competitive with the Plus 4, and if either of those machines can cut it in the small business market the Toshiba's looks competitive.

Except for one thing. As I've said, the Toshiba and the Goldstar are functionally identical, and if the Goldstar can sell for £50 less, I can't see any logic in buying a Toshiba. It's unlikely that this will be the only such case, so the interesting prospect of the MSX companies getting into a price war with one another unfolds.

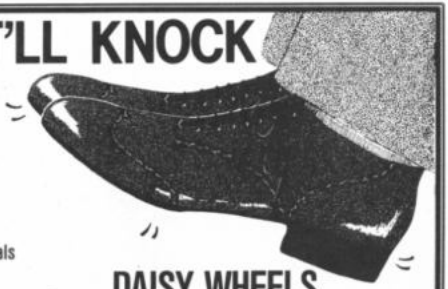
SPECIFICATIONS

Price Goldstar £230 Toshiba £280
Processor Z80A
RAM 64K, 29K free for Basic
ROM 32K
Display 40×24 text, 256×192 graphics
Keyboard No. of keys 73, full travel, five function keys, cursor cluster
Sound Three channel, eight octave
Interfaces Expansion bus, ROM cartridge slot, Centronics, TV, Composite and audio
Storage Tape
Language MSX Basic



Note the non-standard type of Centronics printer socket (at the rear of the Goldstar); it is much smaller than the standard socket. The audio output is, however, a useful addition.

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CANDID CAMERA

Budding film producers, take note Kenn Garroch explains how your BBC computer, combined with an EV1 camera, can turn you into a Steven Spielberg.

The advent of high-resolution graphics screens on home micros has brought the possibility of interfacing electronic cameras to them. The BBC is pretty lucky in having a number of camera systems available as well as good high-resolution graphics. The EV1 from Micro Robotics is one of the cheaper systems available and, for your shekels, you get the camera, a manual and some software on cassette or disk.

Presentation

The camera consists of a small black box with a lens fixed to the front, an eight way cable for connecting to the computer, and a tripod mount on the bottom.

Opening the box reveals a number of chips, including the light sensitive section used to obtain the picture. This chip looks somewhat like a memory IC with the front cut off. It is actually a purpose-built array of light sensitive elements, onto which the image from the lens is focused.

The other chips on the circuit board are used to encode the data into a form that can be sent down the eight wires to the BBC's user port.

Setting up

Connecting the camera is quite simple — just a matter of plugging it into the user port. Once in, the Beeb can be switched on, the lens cap removed and the starter program EV1 chained. After a little thought, the computer reveals a picture of whatever the camera is looking at. That is, after you have focused it, adjusted the contrast, and figured out that the resolution is not the same as your eye.

With a little care, it is possible to get quite reasonable monochrome images. Included in the EV1 program are a screen dump routine and a freeze facility, so stopping the action and reproducing the results is easy.

In use

The scanning time, for the standard picture, is about one second — *ie* the picture updates every second or so producing fairly good moving images. The only problem is that it is split into two halves, upper and lower, each with a slightly different contrast. This is more



The camera includes an eight way cable for connecting to the computer and a small tripod.

obvious on some shots, mainly those with large bright objects in them.

A number of other programs come with the system, including Movie, Grey, Secure, Arty, and Animal. Movie allows a sequence of shots to be remembered and then played back producing a short film. The limitation of this program would seem to be lack of any memory for storing the pictures.

The second program, Grey, produces a larger, full screen picture that is constructed from a series of images, each at a different light level, giving a shaded image or 'grey scale' picture. Eight levels of brightness are used. As a result, the picture takes eight times longer to produce. This means that a shot of someone's face necessitates them sitting very still for about ten seconds. The image produced is, however, well worth the wait, since a lot more detail can be seen.

The rest of the programs get away from pure and simple picture production. The Secure program, for example, is used to form the basis of a burglar alarm. The camera is used to detect changes in a scene; if it is more than a certain amount, the alarm sounds.

The program does have a certain amount of intelligence, as it scans the scene when setting up, to see what is already moving. These are then ignored. As well as beeping the changes, the routine produces a graph of any activity over an eight hour period. The biggest drawbacks of the program are the fact the camera takes up the user port, so you can't attach a larger alarm bell, and the problem of leaving the BBC on permanently, which is virtually guaranteed to cause it to overheat.

The Arty program was a little difficult to use, since the manual gives the controls as 'Unknown at this time'. Presumably, the revised, state-of-the-art user-friendly manual will correct this.

The final program is Animal, which is more complex than the others. The camera scans the image, singling out any objects the computer doesn't know. You are then asked to name these. The program will then try to name them when they are shown again.



Its size and the number of software programs make it a sophisticated addition to your BBC.

Documentation

The manual, printed and laid out with an Apple Macintosh, consists mainly of descriptions and instructions for the software. Towards the end, there is a section describing the industrial applications of electronic vision, *ie* robots that are able to see their cups of tea as well as pick them up and drink them. Following this is a list of suggested projects including attaching the camera to a robot and producing colour images.

The final two chapters give the principles of operation and outline how the camera is interfaced to the computer. The amount of detail here is quite surprising with the pin outs, waveforms, and machine code entry points including the screen dump routine, given in full.

Verdict

The EV1 Snap camera is a system that can be made as sophisticated as you wish. All the details needed to adapt the programs to your own needs, if you get bored with the included software, are included and the only real limit, apart from the resolution, is your imagination.

Overall, for £129.95, it is quite a nice system.

REPORT CARD: 1 TO 5

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

Product EV1 Snap camera **Price** £129.95
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The HI 80 will, of course, do far more complicated business graphics much faster than any human can. Even a trained draughtsman can't beat it.

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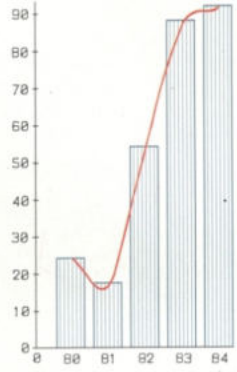
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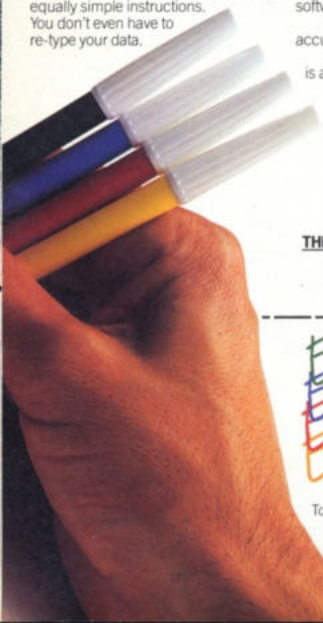
Since it's a printer too, the HI 80 is absolutely brilliant for producing illustrated documents, because you do everything on this one machine.

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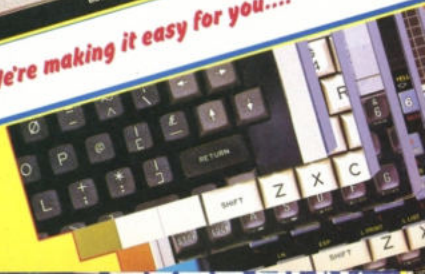
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FAST LOADER

The Sprint is intended as a challenge to the usual Spectrum cassette recorders but does it make the grade? Francis Jago puts it to the test.

The Sprint fast tape loader by Challenge Research is intended to replace the usual cassette recorder and in some cases will undoubtedly be used as a cheaper and slower alternative to a Microdrive.

First impressions

The Sprint tape recorder at first glance looks just like any other tape recorder, the only really apparent difference being the thick ribbon connector protruding from the left hand side. As with most add-ons for the Spectrum it connects straight into the back and in turn it has an expansion port.

In introducing the Sprint, Challenge Research has made an attempt to halt the ever-growing tide of quasi disk-drives, such as the Rotronics Wafadrive, by introducing a form of media storage with no more commands than a normal tape but noticeably faster.

In use

Having plugged in the Sprint I immediately attempted to load a game bought only three days previously, Sabre Wulf, and for the first ten seconds all went well; but soon after the screen cleared, the computer hung, for no immediately apparent reason.

Having tried both sides of said tape at least three times, with only slight variations in tape loading errors, I became a little frustrated and tried one of my own programs of a little over 6K which I had never known not to load. Much to my surprise this also failed to load.

I then proceeded to telephone the company concerned which said that in some cases Spectrums had been known not to work as the quality varied so greatly in production.

To ensure that this was not the case with my Spectrum I attached my Interface 1 and Microdrive which worked perfectly first time. In my view the most likely reason for this poor performance was the fact that most commercially-bought programs were not designed to load at this extremely high baud rate and as such the quality of reproduction by most software was insufficiently high for the demands of the Sprint.

This was backed up by the fact that when I saved the program I wrote to test the Print for joystick compatibility, it loaded without fault every time, even though it had been saved at four times speed.

The next major problem I encountered was the lack of compatibility with a Ram Turbo interface for joysticks. When connected either in front or behind the Sprint, it failed to register any inputs from the joystick.

The lack of an autostop at the end of a tape when fast-forwarding or rewinding came as a real surprise, as did the lack of a pause. These facilities are usually found on normal cassette recorders, and one as expensive and supposedly sophisticated as this should have had them.

Altogether, the Sprint gave the feeling that it had not been put together very professionally. Physically, it felt as if it was not likely to last all that long.

The provision of a switch to cut out the Sprint and allow the use of a Microdrive or other peripheral was thoughtful, but the reality of having both is beyond the means of most Spectrum owners.

Even when Challenge Research managed to achieve perfect reliability in loading commercial programs, the new Turboload programs by companies such as Ocean will not work as the Turboload facility uses operating system calls that mean that the Sprint cannot load them.

Reliability of loading apart, at £69.95 the Sprint hardly can be called value for money. Even given the fact that it loaded programs four times as fast as a normal cassette recorder, this would be of use only to people who never purchase a commercial cassette.

Verdict

There is no question that a machine which would load reliably all commercial cassettes four times faster than normal, and remain totally compatible with all add-ons for the Spectrum would be guaranteed a place as a top-selling alternative to a Microdrive. But unfortunately the Sprint does not represent the challenge its manufacturers intended.

REPORT CARD: 1 TO 5

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

Product Sprint **Price** £69.90 **Availability** mail order from Challenge Research, 218 High St., Potters Bar, Herts. Tel: 0707-44063.



The Sprint, illustrating the large ribbon cable on the left.

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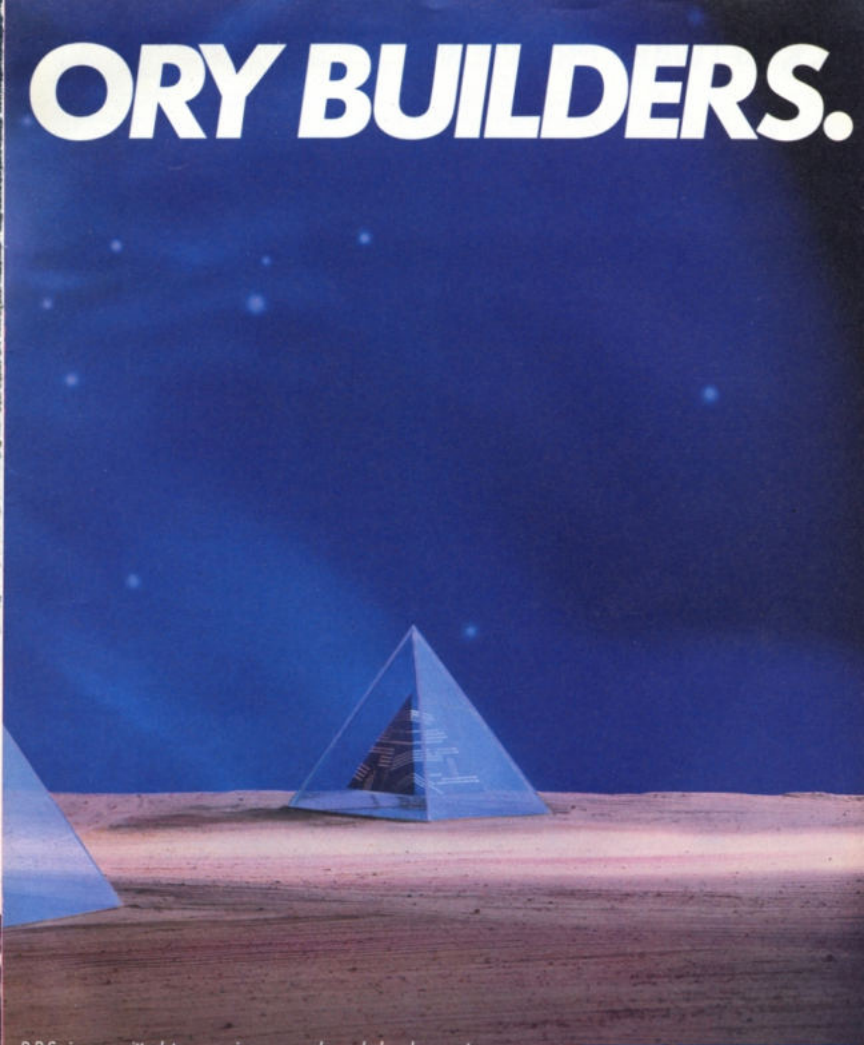


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SOFTWARE PRE-VIEW



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 very latest releases to *Bryan Skinner, Software editor, PCN, 62 Oxford Street, London W1A 2HG.* don't forget to include prices and telephone numbers.

AMSTRAD



The best title of the week award goes to Nemesis for *Arnold Goes to Somewhere Else*. Arnold Blackwood faces yet more perils in the form of a British Rail Buffet, a burial at sea and a Greek tragedy as he scours the underworld for the wife of Lord Erebus. Mixed scenarios and a healthy sense of the ridiculous make for plenty of fun.

Message from Andromeda has the best graphics of any software yet for the Amstrad, but the some of the backdrops are drawn rather slowly. Interceptor claims it's been specially developed for the seasoned adventurer. As captain of a space patrol cruiser you receive a distress signal from a previously unknown planet and set off to investigate. . . .

Return to Eden features 200 pictures and more puzzles than *Snowball*. Curious that so many of the first packages for this micro are adventures. It's also available for the BBC, Commodore 64 and Spectrum.

If you want to use your micro for plotting graphs, then you might consider *Graup*. It's the first such package for the Amstrad and will also construct graphs of mathematical functions. It can handle 100 data points per graph, will produce labelled pie charts, line and bar graphs and offers a hard copy facility.

Graup	**£8.50**	**Camel Micros 03057-70092**
Arnold Goes to Somewhere Else	**£5.50**	**Nemesis 0933-623967**
Return to Eden	**£9.95**	**Level 9 0494-26871**
Message from Andromeda	**£6.00**	**Interceptor 07356-71145**

COMMODORE 64



Joining the new idea of compendia of old games comes Alligata with its *Chartbuster* package. Featuring games like *Blagger*, *Eagle Empire*, *Killerwatt*, *Panic Planet* and *Bugblaster*, it's a good deal at £9.95.

Aren't graphics programs popular? It all started with *Paintpic*, and then came *Panorama (H)*, *Doodle*, and now two art programs from Commodore itself. The latest is *Tony Hart's Art Master* which has some interesting features not found in others — like a duplicate screen on which effects can be tested before being committed to paper, 'ghosting' of shapes to judge size and position and shape repetition.

The Designer's Pencil isn't just a graphics package, it also allows you to create tunes, but no review copy was supplied and the press release is somewhat vague as to the program's features.

With the demise of the Dragon, Shards has been busy converting its Pettigrew programs for the 64, and all four adventures are now available as a single package on two cassettes.

With the success of Scrabble and other board games, it comes as no surprise that someone has now produced a version of *Cluedoe*. Well-packaged and with a set of tear-off clue cards to mark up as the game progresses, this is just the job for those long winter nights, and it joins the growing ranks of games that involve more than one or two players.

Empire	**£6.95**	**Shards 01-591 7666**
The Pettigrew Chronicles	**£9.95**	**Shards 01-591 7666**
Cluedoe	**£12.95**	**Leisure Genius 01-935 4622**
Gun Dogs	**£5.95**	**Hill MacGibbon 01-353 6482**
Tony Hart's Art Master	**£11.99**	**Commodore 01-930 6711**
Chartbuster	**£9.95**	**Alligata 0742-755005**
The Designer's Pencil	**£11.99**	**Activision 0628-2448**
Transylvania (Geneva)	**£34.95**	**Penguin 312-232 1984**
Expedition Amazon	**£34.95**	**Penguin 312-232 1984**

BBC



It's nice to see Acornsoft delivering a whole range of professional software to support owners of 6502 second processors. *P-system* is the latest version of the UCSD Pascal project and includes a filer, editor, utilities and compilers for both Pascal and Fortran 77.

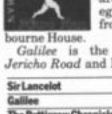
Also from Acorn comes a family of 'View' programs to extend the word processor's facilities. *ViewSheet* is a ROM-based spreadsheet with 255 by 255 cells, with windowing, multiple model merging and up to 30K of RAM. *ViewIndex* creates an index from marked words in View files, and will automatically amend the index should the document be altered. The printer-driver generator constructs data files to allow you to make full use of facilities such as boldface, subscript etc.

For those of you lost in morass of badly labelled disks, *Discdex* could be a sanity and time saver. It catalogues disks and saves the data in alphabetical order.

Frantic Fingers, from Power Software, will save a small machine code patch program onto cassette to reconfigure your control keys and allow you to play games with a joystick.

P-System	**£299.00**	**Acornsoft 0223-316039**
ViewIndex	**£14.95**	**Acornsoft 0223-316039**
ViewSheet	**£59.80**	**Acornsoft 0223-316039**
Printer Driver Generator	**£9.95**	**Acornsoft 0223-316039**
Hi-View	**£59.80**	**Acornsoft 0223-316039**
Discdex	**£15.00**	**Clares 061-236 4414**
Chartbuster	**£9.95**	**Alligata 0742-755005**
Frantic Fingers	**£3.99**	**Power Software 0384-263401**

SPECTRUM



If you're looking for a holy grail you might fancy the latest arcade/strategy game from Melbourne House.

Galilee is the sequel to *Jericho Road* and Peter Goodlad, the programming vicar, has set the graphics adventure in the villages which surround the sea of Galilee in the first century BC.

Project-X, the Micro Man is a text-only adventure written in machine code and with 150 locations. The game demands that you make full use of your imagination.

Sir Lancelot	**£5.95**	**Melbourne House 01-940 6064**
Galilee	**£5.75**	**Shards 01-591 7666**
The Pettigrew Chronicles	**£9.95**	**Shards 01-591 7666**
The Designer's Pencil	**£9.99**	**Activision 0628-2448**
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GAMEPLAY

STAR GAME



SPECTRUM

SHERLOCK

I was just smoking my Stradivarius and playing a snatch of Baker Street Blues on the old meerschaum when Melbourne House popped *Sherlock*, their latest adventure, through my letter-box.

It's been worth the wait. Sherlock has all the features of its illustrious predecessor, *The Hobbit* and then some. The graphics may be fewer and simpler but in every other respect I take my deerstalker off to it — a winner if ever there was.

You take on the role of Sir Arthur Conan Doyle's famous detective, Sherlock Holmes, out to solve some inexplicable murders. Faithful Dr Watson, a dim old buffer as ever, is on hand and you also get the opportunity to meet another famous character from the Holmes canon — Inspector Lestrade of Scotland Yard.

Having a large brain obviously puts extra strain on the legs — you move between most locations by taking a hansom cab or train. You have to first hail and then direct the cabbie to the required destination or, if letting the train take the brain, go to the right station and platform. Being a world-famous sleuth doesn't entitle you to free travel either — try sneaking off the cab without paying and your ears will burn. En route, you can use the time for quiet reflection or engage a fellow passenger in conversation.

Yes, you can talk and give orders to other characters, just as you could in *The Hobbit*, but Sherlock is far more sophisticated.

First, you can make remarks to other characters for them to mull over or respond to in their own good time. In this way, you can discuss aspects of the case with another character. Heaven help you if you pick Watson. I confronted the saintly codger with "YOU KILLED BROWN" and was told "That is brilliant Holmes, I do not know how you do it!"

Was Watson doing his usual impersonation of two short planks or had he discovered a subtle method of blowing a raspberry at Holmes?

Second, you can interrogate characters, asking them to tell you about certain objects or other characters. As a hypothetical example, you might say to Lestrade "TELL ME ABOUT THE GUN" or "TELL ME WHAT HAPPENED."

As you might deduce from the examples, input can be quite complex. Just like The Hobbit, Sherlock makes full use of 'English,' a set of about 800 words with which over 53 different actions can be performed.

You can use adjectives to distinguish similar objectsfrom each other (EXAMINE THE PLAIN DOOR), adverbs to qualify a particular action (READ THE DAILY CHRONICLE CAREFULLY) and prepositions to make your commands more specific (PUT THE BAG IN THE CUPBOARD).

The adventure takes place in real time, so while you are sitting staring at the ceiling for inspiration, the other characters are getting on with their lives. You may elect to wait and can even do so until a specific time (WAIT UNTIL 9.30AM). Day eventually turns to night and there are some places even Holmes wouldn't go without a light. You can also take naps — if you need one, perhaps some of the others might.

Two scrolling windows are used in the screen layout. The top three-quarters provides the narrative window while the bottom quarter displays your commands. The two areas are seperated by a thick band, decorated with pistols and displaying the day and time. Some locations are represented graphically, such pictures occupying one side of the top window. Judging by the few I have seen, they are fairly simple depictions.

If you've ever played Infocom's *Deadline* or *Witness* then you'll have a good idea of the basics of Sherlock for there are marked similarites. It doesn't quite manage to come up to the very high standard of those two adventures but to be fair, they are disk-based and so effectively have a lot more memory to play around with. Nevertheless, in terms of sophisication, Sherlock is a long way ahead of the rest of the competition.

Sherlock is tough, perhaps one of the hardest adventures currently available. If this program doesn't train you to acquire a Homesian genius for observation and deduction, nothing will. It took me a while just to get out of my lodgings in 22b Baker Street, and that's where the adventure begins. I wasted valuable time fiddling (sorry, Holmes) with windows, armchairs and pipe racks before stumbling on to what was after all a startlingly obvious solution.

It's a pity that if you stop the game, you have to reload it once more from the beginning. Given the complexity of the program, perhaps it was unavoidable but it's still a pain.

At times, you may find yourself wondering just who the heck you are. The program allows you to preface objects with 'your' or 'my' (but not 'Holmes' — it isn't recognised). Just a mite confusing, that. Watch out if you decide to don a disguise — for example, a china mans (sic); the program starts referring to a Chinaman (it's you). Thus, taking an inventory reveals:" The china man is carrying your money".

There's no doubt in my mind that Sherlock is a superb program and will provide many hours (hours? months more likely) of stimulating entertainment. Elementary, my dear Watson? Well, Holmes never did utter those immortal words — and I doubt whether you will, either.

Bob Chappell

Rating 10/10
Price £14.95 **Publisher** Melbourne House 01-940 6064

MISS

SPECTRUM

KOKOTONI WILF

According to the inlay, you're *Kokotoni Wilf* of the title, sent on a mission to pre-history by Ulrich, a great Magician. Thanks, Ulrich. Your task is to collect fragments of the Dragon Amulet.

The game kicks off with Kokotoni Wilf descending from the skies behind a large head-nodding, tail-wagging yellow dinosaur. A blue meteor fragment oscillates from left to right at the top of the screen and other nasties are scattered around. Wilf is a white UDG.

To gain points Wilf must collect the white stars from each screen. Simply passing over them accomplishes this, but touching anything nasty loses one of his lives. At least when you're reincarnated you don't have to start from scratch — you're dumped back in the current screen, but unless you're quite prepared, this can mean you're dead on arrival.

The second screen has two dinosaurs spitting at each other, but so slowly that avoiding their trails is a doddle. Then on to the third screen, where a diamond awaits beneath a tree. Getting past the pterodactyl isn't too tricky — it moves in a predictable pattern, as does the bird which blocks your way to screen four. Screen four is underground, bats descend and ascend, and don't bang your head on the purple blobs. Down to the fifth floor, more birds, bats, snakes and a sabre tooth tiger.

It's one of those games where at first you think it's quite tricky, but you soon get the knack. I'm afraid I lost interest very quickly.



Bryan Skinner

Rating 6/10
Price £5.95 (Commodore 64, £6.95) **Publisher** Elite 0922-611215

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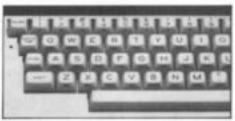
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SPECTRUM

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GAMEPLAY

STAR GAME



SPECTRUM

DARK STAR

No sweat at all this one. In *Dark Star* you're the pilot of the spaceship Liar, and your goal is to 'liberate your galaxy from domination by the Evil Lord's tyrannical Empire'. The galaxy's divided up into a 16 × 16 grid of sectors, each sector containing an indeterminate number of planets.

Now the planets in the lightly defended sectors have a couple of alien bases, the odd fuel dump, and maybe a spaceport. The bases are crawling with air defence towers, and all you've got to do to knock them out is fly through a skyful of flak, a particularly nasty force field and knock out the planetary defence system in the centre.

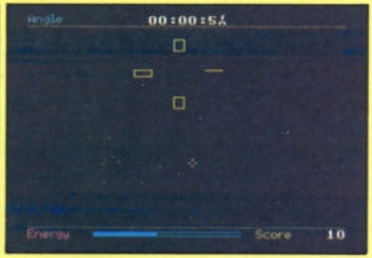
Then it's on to the next base, and so on until you've liberated the planet. Then you deal with the other 200 or so planets in the galaxy — no problem.

Having dealt with the pipe-dream section I suppose we'd best move on to the truth. The Liar is a relatively nippy but simple little point and shoot style ship. Your basic controls are up, down, left, right and fire, with the addition of a speed control and a toggle switch that allows you to view a map of the galaxy or the planet you're currently on.

The initial screen display is a forward view of the space you're flying through, and you'll meet the odd enemy spacecraft here, but generally they're nothing to worry about. Your two major concerns at this level are the planets which you fly past and the hyperspace gates. You get to the surface of a planet by pointing the Liar at it, whereupon your flight computer does the rest.

You then consult your tactical map and head for the nearest enemy concentration. Broadly speaking, these aren't really much of a problem — it's just a matter of flying low, dodging the missiles and knocking out the air defence towers. But the nasty part is the force field.

You can't see the field, but your computer identifies holes in it. These are presented as rectangles through which you must fly, and if you don't the field drains your power. Meanwhile, as you're holding a steady course you're a sitting duck for the aforementioned ack-ack. You seem to score extra points for flying through the field, but it's so hairy I counted myself lucky if I came out the other side at all, never mind in one piece.



So really it's all still to play for. I've managed to wipe out one small spaceport on one small planet, and I reckon an hour's hard flying might just be enough to liberate the whole of the planet. Once you've done this it's back into space, find a hyperspace gate and fly through it to the next system. This is just as easy as the rest of the game — a series of rectangles forms a tunnel, and you have to fly through this. You lose energy points if you stray off course, but with practice I'm confident that I can survive the ordeal some of the time.

If you've ever played *Time Gate*, you'll have some idea of what Dark Star is about, but Dark Star is more complicated, and much more difficult. It'll keep you busy for a long time, and try as I may I can't think of a better arcade game for the Spectrum. Right now I'm off to see if I can check out a heavily-defended system without getting killed. **John Lettice**

Stop press: John Lettice disappeared into Dark Star last Friday. He has not been seen since.

Rating 10/10
Price £7.50 **Publisher** Design

HIT

COMMODORE 64

STRONTIUM DOG



Straight from the pages of the weekly comic, 2000 RD, and into this shoot-em-up game comes Johnny Alpha, aka Strontium Dog, a search-and-destroy agent. Strontium Dog is not some form of super-mutt but the name given to a powerful human mutant.

Alone and on foot, Johnny is tracking two rebellious dogs, Wulf and Gronk, aka the Stix Brothers, across the planet of renegades. He has to fight off a variety of dastardly aliens and vicious vegetation. Luckily, he hasn't come unprepared — his zapper, time bombs and electro flares help stump the enemy.

Most of the screen is taken up with a side-on view of the planet which seems to be split into three horizontal bands. Mountain, boulders, vegetation and a host of strange stationary objects proliferate. Johnny, attired in natty space-suit, ambles (or sprints) east while the planet surface scrolls west.

The aliens, consisting mainly of Dalek-like robots, scorpion-clones and spacemen, head relentlessly across the surface, firing as they go. When Johnny is hit by an enemy blast or trips over an alien vegetable, he falls to his knees where he remains stunned and helpless for a few seconds. A panel at the bottom of the screen provides info on Johnny's remaining strength, flares and bombs, as well as displaying a cross-section of the entire planetary surface.

By moving over certain objects such as a Quicksilva logo, Johnny can top up his reserves of strength. When his strength gives out, so does Johnny's luck.

The graphics are simple but effective with scrolling and animation well up to par. By far the best feature is the explosive battle sound dominating the game. Though hardly original, Strontium Dog will give you plenty of action for your money. **Bob Chappell**

Rating 7/10
Price £7.95 **Publisher** Quicksilva 0703 20169

MISS

COMMODORE 64

HIGH NOON



'Deoo not fawsake me, oh mah dahlin!' So burbles the theme of this wild west game tune.

Out from the jail house and down into the centre of main street moseys the sheriff. The town is quiet — almost too quiet. On cue, strangers hit town — some making for the bank, others heading for Saucy Sal's saloon. These ornery critters have trouble on their minds and start blasting.

The sheriff (yep, that's you, pardner) lets them have it with his six guns. As soon as one of the gang bites the dust, Riga Mortis, the undertaker scampers out and drags the body away. The gang are interested in two things — dames and dough. When a robber emerges from the bank, he is clutching a bag of gold.

Those making it as far as Saucy Sal's try to kidnap the bar-room floozies.

If you manage to stop one gang, a meaner bunch hits town. Some arrive on horseback and some come armed with dynamite. Should you prove too fast on the draw for this lot, the game promises a final showdown with the outlaws in the hideout.

The idea is good but there's not enough in the game to keep you glued to your saddle in front of the screen. All you do is move and fire, move and fire. It all becomes a mite boring after the initial novelty. Given the 64's sound capability, the gunfire should have crackled, the bullets whining and ricocheting. Instead, all the guns sound like naff cap pistols.

The animation of the cowboys is neat and there are some novel features while the game loads. A clock and block count-down stays on screen and you're treated to 'A policeman's lot is not a happy one'.

Not bad but not one of Ocean's more addictive offerings. **Bob Chappell**

Rating 6/10
Price £7.90 **Publisher** Ocean 061-832 6633

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Written by Quicksilva Ltd. Usual price (RRP): £6.95.



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GAMEPLAY

SPECTRUM

ZOMBIE ZOMBIE

Quicksilva's *Ant Attack* by Sandy White was a smash hit. This follow-up, *Zombie Zombie*, looks set to do even better.

At first glance, I thought I might have loaded up an old copy of Ant Attack by mistake. Did my rheumy old eyes deceive me or wasn't that the blue-walled city of Antescher? Didn't the tiny hero and heroine look strangely familiar?

But wait — what was that red object sitting on a raised block in the City centre? If that was an ant then my name is David Bellamy. No, it was obviously a helicopter. And those marching green bipeds — what were they? By the teeth of Michael Jackson, they were (dramatic chord) . . . zombies!

True to Quicksilva tradition, the cassette inlay is silent on the objectives and several features of the game but it seems you must seek out and destroy all the zombies in the city.



Although the game has a marked similarity to the ant adventure, there are several innovative features. For a start, you can zoom around this new city in a chopper as well as scampering around it on foot.

To fly, you simply move the hero (or heroine — it's a cast of one and you choose the sex) into the copter, press the firebutton and off whirrs whirlybird. And unlike its predecessor, this game offers the option of total joystick control.

To move the hero push the joystick in any of the four main directions and he'll run that way. Should he meet a step or wall, he'll either jump onto it automatically or, if it's too high, continue futilely leaping at it until you take pity and send him off on another course.

A stab on the fire button and you immediately set one of four differently-angled views of the scene.

Stay on foot for long and you'll confront some green zombies who don't seem to worry about you too much. But, should one of them turn red, you're in trouble. It will make a sudden rush and attempt to grab you in a deadly embrace. Give it a quick puff of purple talcum powder (joystick and fire button together) and it'll retreat — but not far.

Purple zombies also join in the chase. The walking dead have an aversion to leaping from heights — they have an unfortunate tendency to turn into tomato sauce on landing.

When in the chopper, the four views are not available as the fire button is used for keeping it aloft while the joystick controls direction.

Beware of flying smack into a wall — your hero will survive the impact but the chopper won't. The helicopter has one further function — and this feature really distinguishes Zombie Zombie from other games I've seen. Using the chopper, you can build a new city.

Each quick press of the fire button while in the chopper picks up or releases a block. You can pile up to four blocks on top of each other. Takes a little practice, but once you're in the swing, you'll be building structures that would have had Le Courbusier laughing his socks off.

What's more, it appears you can save them to tape for future reloading. How you do this is anyone's guess, since the between-game menu offers only a load option while the instructions say nowt. **Bob Chappell**



Rating 9/10
Price £6.95
Publisher Quicksilva
0703-20169

COMMODORE 64

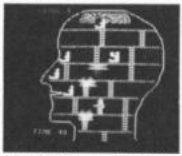
HEADACHE

Firebird, British Telecom's new software arm is putting out games for the 64, Spectrum and others at £2.50. This neatly bridges the £1.99 and £5.95 price gap, but how does the game match up?

To begin with, the game comes with the now mandatory fast-loader and has been programmed by the software house, Software Shed. It's essentially a rather simple, but not easy, levels and ladders game.

The field of play is a head in profile, divided into seven levels, each linked by a ladder or two. Right at the top sits part of a grey brain. Your task is to move Ned, a blue-trousered, cloth-capped figure, around the head to collect impulses which appear at what seem to be little figures sitting up. The impulses are little more than coloured squares but they have to be carried up to the brain. If an impulse appears at the brain, it has to be carried down to the neck.

All the time objects descend, traversing levels at random. These are Throbs which should be avoided at all costs because the slightest contact loses you a



life as Ned plummets to the foot of the screen.

There are eight levels, and the Throbs may look like flying jellyfish, rotating shreddies or revolving diamonds. Throbs can be atomised, but this isn't always too easy as their movement can be tricky to predict. Worse is the little head banger who appears from time to time, scuttling about rather too quickly and carrying a hammer.

Control of Ned is not very easy using the keyboard, but apart from that the game is infuriatingly difficult.

Bryan Skinner



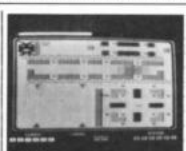
Rating 7/10
Price £2.50 **Publisher**
Firebird
01-357 3814

VIC 20

MEGAVAULT

Megavault, from Imagine, is one of those cute little games which show not only just how far 3.5K can be stretched, but also that predicting what makes a winner is virtually impossible.

There's very little to the game, but it's so infuriating you just have to have another go. You're a bobbing head on legs — the graphics are very simple



throughout. You're at the left hand end of a tunnel at the top of the screen. To the left there's a wall behind which a monster lurks, to your right the ways to the key. But the way is barred by two four-legged spiders bouncing between the walls, and not very far apart. Touch one of these and it's curtains. Seems impossible at first, but you soon pick up the knack of getting past them — move down and next to the vertical path of one of them, wait for it to rise, and then dash under both.

Next there's a narrow corridor, down which another purple spider hurtles back and forth. There are four bits of blue food to be taken down this one, but the grub raid has to be timed to perfection — these spiders don't hang about — and if you're not placed correctly there's a hair-tearing moment to get into a food larder and safety.

You get four lives per game. Definitely a classic for the unexpanded machines.

Bryan Skinner



Rating 7/10
Price £5.50 **Publisher**
Imagine (Beau Jolly) 01-567 9710

DRAGON

BACK TRACK

Here's a natty little number from Incentive for stricken Dragon 32 and 64 owners.

Eddie, the red-headed hero of the piece, has been captured by an evil professor and you must help him escape by passing increasingly difficult tests.

As Eddie moves, his feet do a sort of soft shoe shuffle. The corridors and rooms of the labyrinth are very cleverly depicted in good colours. The maze is divided into small square compartments linked by portals and as you move the 3D perspective changes smoothly.



You'll need a good memory for this game. The graphics are clever and among the best we've seen on the Dragon, but the game itself is rather wanting.

Bryan Skinner



Rating 6/10
Price £6.50 **Publisher**
Incentive
Software 0734-591678

SOUPED-UP BASIC

Stuart Cooke takes a peek at Interceptor Micro's latest programming package for the 64 and concludes that it's a programmer's dream.

Numerous Basic extensions for the Commodore 64 have appeared on the market, all of which have also been expensive or have only added a few new commands. Interceptor's new utility package *Supabasic* is priced at only £9.99 and adds no fewer than 72 new keywords to the 64's Basic.

Features

Just about every type of command that is missing on the 64 is present in Supabasic. There are numerous commands for graphics including line drawing, point plotting and changing the colour of the screen and ink. The HIRES command will clear the high-resolution screen, the GRAPH command will then turn this screen on. This is much easier than having to use POKE commands.

Programs that have split text/graphic screens are becoming much more popular — almost every adventure game now works this way — and Interceptor has included the WINDOW command which will split the screen at a specified point. The top of the screen will now be in high-resolution mode, the lower section in text mode. There is one weird feature to this command though, you have to enter it twice. Interceptor points out that the first time it is executed the screen may fail to engage. So why doesn't Supabasic execute the machine code twice, freeing the user from having to remember this little idiosyncrasy?

Commands for controlling sprites are in abundance. No longer will you have to produce numerous DATA statements and more than a few POKES. The BIT command followed by a string of 24 characters allows you to define a row of a sprite. A dot means that the corresponding bit should be a 0 and any other character means it should be 1. 21 BIT commands will produce the data for a whole sprite.

Typing out 21 BIT commands could be rather tedious so the GRID command will display a grid onto the screen consisting of 21 BIT commands complete with line numbers, all you have to do is edit the lines and press Return over each one to have it accepted into your program.

Collision detection is catered for by the CHECK command. This will allow you to check if two sprites have collided or if they have hit the background.

User defined characters are also easy to use. The CSET and CBIT commands enable the user to redefine a specified character on an 8×8 grid in the same way as the BIT command allows you to define a sprite.

Budding musicians are catered for with commands to define the ADSR, select waveforms, volume and pulse width. The PLAY command will play a note of specified frequency on a certain voice. Unfortunately there seems to be no way of controlling the length of a note, so transferring your favourite piece of sheet music onto your 64 may turn out to be a little difficult.

A collection of numeric and string functions have been added, prefixing a number with a $ will turn it into a hexidecimal number. This is extremely useful if you are using graphics or machine code. HEX$ will convert a decimal number into hex.

For maths wizards DIV and MOD have been added together with an EOR instruction to complement the AND and OR instructions which already exist. STRING$ will create a string of a specified length consisting of one character.

DEEK and DOKE have been implemented. These are commands that a number of machines have and they allow you to PEEK the contents of two consecutive memory locations and express the result as a 16-bit number, and to POKE a 16-bit number into two consecutive memory locations. If you've ever used machine code you'll know what life savers these two commands can be. As well as commands to poke 16-bit numbers into memory, CEEK and COKE will store and retrieve strings in consecutive memory locations. You could use this as an alternative to string arrays and it certainly takes up much less memory.

An extremely useful series of utility commands are included. There is, of course, the extremely important RENUMBER command, and the OLD command which will retrieve a program if you accidentally NEW it. DUMP will print a list of all the variables used and their values.

At long last there is a command that allows you to program the function keys. Strings of up to ten characters can be stored on each key, so you could store the commands you use most often on one of the 16 function keys. Yes, 16 function keys are provided, the eight that are normally available are extended by using the Commodore key and Control key as extra shifts.

The JUMP command provides the 64 with the ability to have computed GOTOS. It is not possible to type a line such as GOTO 100*A on a 64 but you can now type JUMP 100*A.

Error trapping is now provided with the ERROR command. When an error occurs you can now make the program jump to a specified line and interrogate the error by using the REPORT, ERL and ERN commands. These return the error message, the line the error occurred in and the error code number. Couple these commands with the BREAK command which disables the STOP key and you have a crash-proof program.

The LOAD and SAVE commands have been extended and now allow you to specify the start and end addresses for the save and a load address when reading the program back into the machine. Disk users no longer have to load in a directory either as the CAT command will display it on screen for them, without destroying the program in memory.

Listing

```
10 REM THIS IS A DEMONSTRATION OF
20 REM          SUPABASIC
30 REM
40 REM TRAP ANY ERRORS.
50 ERROR: PRINT"YOU'VE MADE A MISTAKE"
60 REM TRAP THE STOP KEY
70 BREAK: PRINT "THAT KEY IS TRAPPED"
80 INPUT "NAME : "1N$
90 REM CLEAR THE HIGH-RESOLUTION
   SCREEN
100 REM BLACK PAPER, ORANGE BORDER.
110 HIRES 8,0
120 REM TURN ON HIGH-RES. SCREEN
130 GRAPH
140 REM POSITION TEXT CURSOR
150 PRINT CHR$(147)STRING$("CD",24)
160 REM NOW PRINT ON TEXT SCREEN
170 PRINT "I'M ON THE TEXT SCREEN "1N$
180 REM NOW PRINT ON HI-RES SCREEN
190 CHAR 1,0,"THIS IS IN HIRES",7,0
200 REM NOW MOVE GRAPHICS CURSOR ON
210 REM ON HIGH-RES. SCREEN.
220 MOVE 40,0
230 REM NOW DRAW A LINE IN WHITE
240 DRAW 1,99,319,1
250 REM NOW DISPLAY THE BOTTOM THREE
260 REM LINES OF THE TEXT SCREEN AT
270 REM THE SAME TIME AS THE HIGH-RES.
280 WINDOW 32, WINDOW 32
290 GOTO 290
```

Documentation

A 40-page manual is supplied with the disk or tape, which is brief but extremely clear and well planned. Commands are broken down into sections with all related commands together.

It would have been nice to see a few more examples in the manual, but you'll just have to list out the demonstration program if you want to see how the commands work together.

Verdict

Supabasic can only be described as the 64 programmer's dream. Okay, so there are a lot of commands that could have been added and weren't, but the overall value is excellent.

REPORT CARD: 1 TO 5

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

Name Supabasic **Application** Programming Utility **Price** £9.99 **Publisher** Interceptor Micro's 07356-71145/3711 **Format** Cassette/disk **Outlets** Retail.

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Spectrum games Arcadia, Escape, Ghost Town, Kong, Meteor Storm, Orbiter, Roman Empire, Eye of Star Warrior, Flix, £20. R A Kidd, 20 Buckfast Close, Ipswich, Suffolk.

Spectrum software for sale all originals at half price. Send sae for list. Wanted Alphacom Printer. Ann Woods, 73 Alcester Road, Moseley, Birmingham.

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If you want to swap software information, hints and tips for the Spectrum or Vic 20: write to: John Parkes, 22 Chichester Close, Grantham, Lincs NG31 8AG.

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Peripherals

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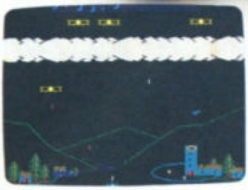
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QUIT

In the cut-throat world of advertising you often see one company running down its competitors. Rarely will you find a company giving its rivals due credit.

Toshiba, however, is breaking new ground. It actually overestimates the competition. The Toshiba, the ad claims, has a built-in power supply 'like the Oric Atmos'. But the Atmos doesn't. The Toshiba has sound output through the TV 'like the Sinclair Spectrum'. But the Spectrum doesn't. It has 16 colours 'like the Electron'. But the Electron only has eight.

Oh well, it's a nice machine which is why we're giving one away this week.

Elsewhere in the field of computer publishing you may find at your newsagents a monthly magazine with a picture of Mr Spock on the cover. Try as you may you won't find a listing for a Star Trek game but you might come across a 'Benchtest' of the new Enterprise computer.

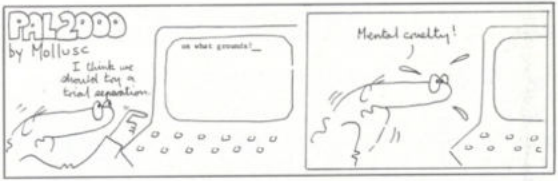
In fact, it's so new you won't be able to buy one for months yet. At the *PCW* Show, Enterprise was talking about January delivery dates. The reason is that it doesn't work properly — trouble with the video chip. So how do you Benchtest a machine that doesn't work? Perhaps it was a Benchtest of bits. . .

Lots of people think that educational software is going to be big, but how valuable is it? A recent press release for a spelling aid told us about this interesting piece of 'software'. In the same week the cassette inlay on a new game boasted that it used the Currah 'speach' synthesis unit.



Amazing, some of the peripherals you can buy now. Like this fabulous 'Compudesk'. According to manufacturer Jagger and Co, it's easy to assemble and provides 'neat, flexible work surfaces and shelves' as well as 'the answer to operating and storage problems'.

With remarkable modesty, the press release made no mention of Compudesk's most remarkable feature. But the accompanying photograph revealed all and we're happy to share it with you. Compudesk, apparently, allows your Apple II to run Commodore software — including Vic cartridges!



SYNTAX ERROR

In last week's review of the Raven-20 expansion board we reported a bug when using a VDU21 command. Unfortunately, this happens on an ordinary BBC as well. And if that's not enough, we also gave the wrong telephone number — it's 0733-268853. Sorry, Raven.

The Cheetah review in issue 83 implied that London Microtech was virtually giving away their keyboard for a stunning £5.95. In fact, we must admit to a little error on our part as the keyboard costs £59.95. Whoops.

NEXT WEEK

Spectrum facelift

Is Uncle Clive's QL look-alike worth the extra £50? Fingers plunge on to the 'fully professional keyboard' and *PCN* comes up with a controversial verdict.

ITT XTRA

This latest arrival on the IBM-compatibles scene looks set 'to take on the master itself. Will it succeed?

Sinclair Specials

Talking of the QL, we tell you how to manipulate windows — the easy way.

C64 Survival

The latest of *PCN*'s epic adventures for you to key in.

BBC Symphony

We take up LVL's invitation to tinkle the ivories with its £99.95 keyboard and software package.

PCN DATELINES

Home Tech '84	October 26-29	Exhbn Complex, Bristol	Nationwide Exhibitions, 0272-650465/15
Computer Security Conf & Exhbn	October 29-30	Conf Centre, Nottingham	Elsevier Int Bulletins, 0865-512242
Computers in Action	Oct 30-Nov 1	Anderson Centre, Glasgow	Trade Exhibitions, 0764-4204
Personal Computer Fair	Oct 30-Nov 1	Town Hall, Bournemouth	Mike Schofield Promotions, 0202-36899
Computer Conf & Exhbn — Mini/Micro West	Oct 30-Nov 2	Anaheim, USA	Electronic Conventions Inc, 8119 Airport Blvd, Los Angeles, CA 90045
Texas Instruments Owners Conv	November 3	Ritz, Manchester	TI99/4A 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 Show, Glasgow	Trade Exhibitions Scotland, 0764- 4204
COMPEC	November 13-16	Olympia, London	Reed Exhibitions 01-643 8040
COMDEX	November 14-18	Las Vagas, USA	Interface Group Inc, 300 First Ave, Needham, MA, 02194, USA
Videotex Europe Exhbn & Conf	November 20-22	Amsterdam, Holland	Online Conferences, 01-868 4466

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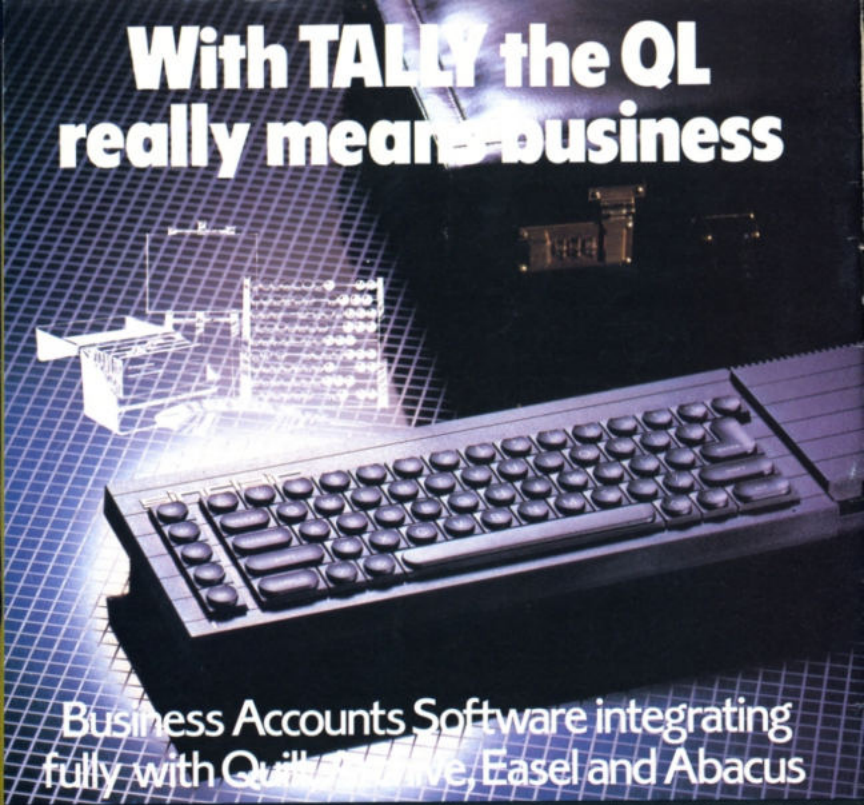
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