

POPULAR Computing WEEKLY

Only 50p.

27 November - 3 December 1986

Vol 5 No 48

Sales shocker for Amstrad software

SPECIAL
supplement

THE SOFTWARE BUYERS' GUIDE

All the best software for
your micro - starts p25

Aliens - see p15

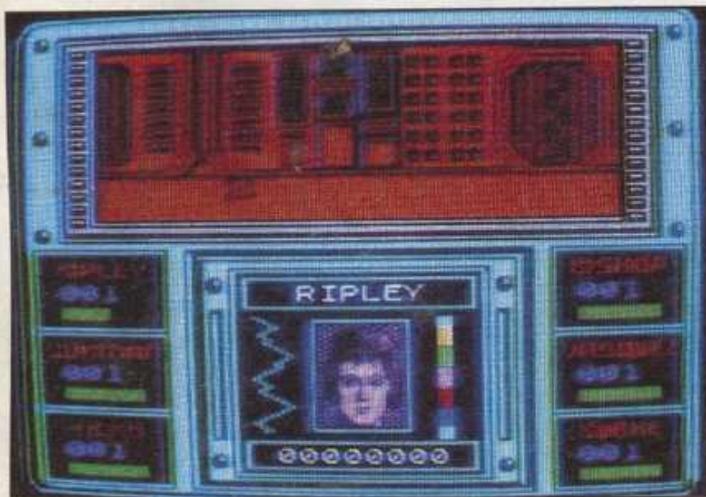
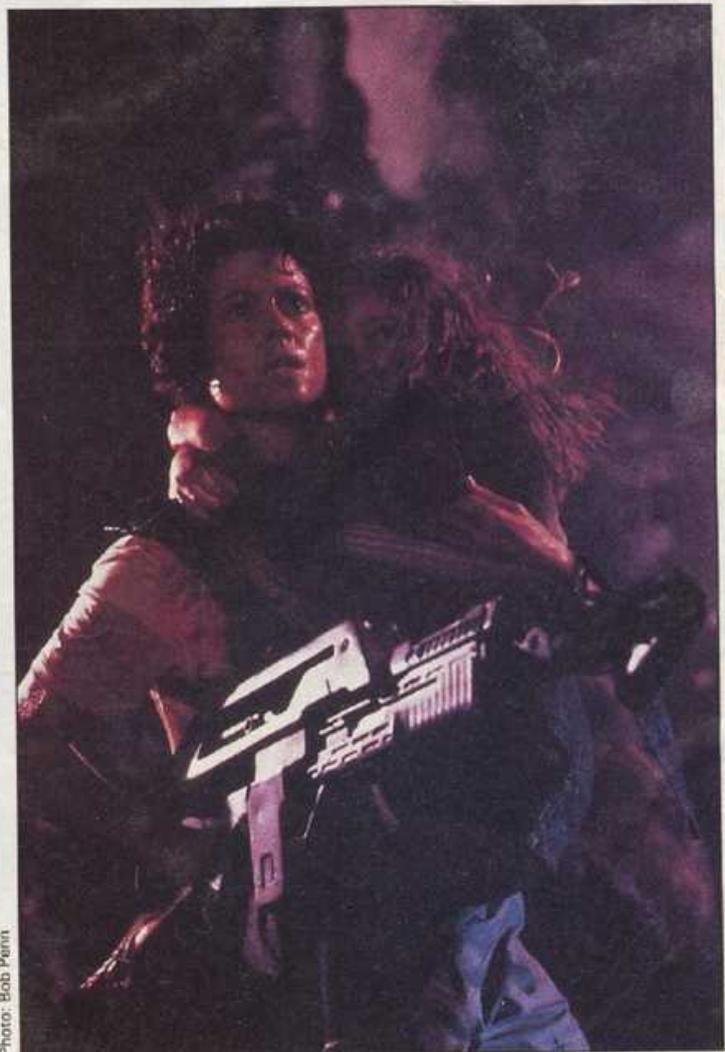


Photo: Bob Penn



Leo Park ©

Full story on page 4

ALIENS

THE COMPUTER GAME



COMMODORE SCREEN

There are some places in the universe you don't go alone.

AVAILABLE ON

ZX SPECTRUM 48K/128K/+	£9.99	AMSTRAD CPC Cassette	£9.99
COMMODORE 64/128 Cassette	£9.99	AMSTRAD CPC Disk	£14.99
COMMODORE 64/128 Disk	£14.99		

ELECTRIC DREAMS SOFTWARE, 31 CARLTON CRESCENT SOUTHAMPTON SO1 2EW TEL (0703) 229694

Mail Order: Electric Dreams Software, 23 Pond Street, Hampstead, London NW3 2PN.

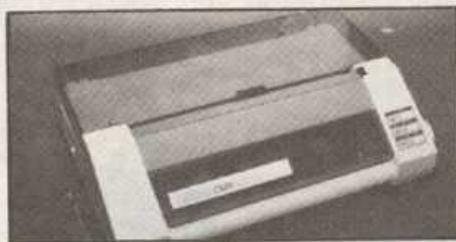
*Electric
Dreams*

SOFTWARE

© Twentieth Century Fox

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Ram discs on the STs provide a fast access system for owners with just one disc drive. Howard Oakley, an

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SPECIAL SUPPLEMENT

THE SOFTWARE BUYERS' GUIDE

Your best buys this Christmas on all the popular machines: sumptuous **Spectrum** programs, beautiful **BBC** games, spectacular **ST** specialities, perfect **PCW** packages, cosmic **Commodore** product, and some awe-inspiring stuff for the **Amstrad CPCs** and **Atari 8-bits**.

Plus . . . the best **budget games** around, and a critical look at various types of magnetic storage media.

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Poor sales threat to CPC software

SOFTWARE sales for the Amstrad CPC machines have dropped drastically recently, to the point where many software houses no longer see the machine as a viable outlet for software.

"Sales have never been brilliant," says Pete Stone of Palace Software, "and lately they've been worse." He says there were surges of sales after the launches of the various CPC machines, but that the machines have produced few if any big hits.

"We'll still do Amstrad games, but it's only worth doing if you produce them on

tape and disc and sell them throughout Europe."

Gargoyle Games has also found the CPC games market to be very unpredictable of late. "Certainly the sales abroad exceed the sales at home at the moment," said Gargoyle and Faster Than Light's Greg Follis. "The sales on disc here are so shaky that, although you get some sales, we prefer not to sell on Amstrad disc in the home market."

Recent figures from Gallup, which produces games software charts, confirm that the sales on the CPCs are very



The 464: few big hits.

low indeed. The Amstrad share of titles sold remains relatively stable around 16-17 per cent, but these are confined mainly in positions 51-150, with only one title, Beau Jolly's *Computer Hits 3*, in one recent top 50. Sales on the CPCs are only a fraction of those on the Spectrum and 64, and in the top 50 even seem to be beaten by the C16

and the Atari 8-bit machines.

The top 50 across all formats does, however, indicate how much the CPCs benefit from conversions, as hits available in Amstrad format run at a healthy 20-25 of the top 50 titles. The Spectrum and Commodore 64 only do marginally better than this, with 30-35 each of the top 50.

Amiga offer boost Commodore sales

COMMODORE'S "special offer" of £500 off the current Amiga looks set to become permanent following last week's announcement of two new versions of the machine. The offer, which brings the machine down to £1,147, is intended to apply only to existing Commodore users, but several dealers contacted by *Popular* were openly flouting this requirement.

One confirmed that technically you did have to be a Commodore owner in order to qualify, but was perfectly happy to sell to anyone at the discounted price. "That's a matter between Commodore and ourselves," he said when asked how it could be done.

A Commodore spokeswoman contacted on the matter refused to comment when asked if Commodore was policing the offer in any way, but insisted that the cut remained a special offer, and did not apply across the board.

The offer itself seems to have had an effect on sales,

with dealers reporting several machines a day being sold, but the new launches (see *Popular Computing Weekly*, November 20) will inevitably have a dampening effect on sales. The souped-up A2500 has 1Mb of Ram and fits above the current A1000, but the new low-cost model is more powerful and is expected to cost around £500.

The new machines may also have affected the chances of Sidecar, the Amiga's PC emulator, appearing in this country. The A2500 will have an emulator of its own, and a source close to Commodore last week claimed that the company had decided not to release A1000 Sidecar in this country after all.

If this were true it would leave a number of existing users high and dry, but a spokeswoman for the company insisted that the product was still expected here. It now, however, seems unlikely that it will be out this month.

Plus 2 hits trouble

BOOTS has stopped selling its first shipments of Amstrad's Spectrum Plus 2 because of reliability problems. A company circular sent out to branches last week says that "quality control tests (of the machine) found a performance defect which Boots finds unacceptable."

Of four major London branches checked by *Popular* two seemed unaware of the circular, and were continuing to sell the machine, but the other two did know, and couldn't say when Boots would resume sales. "There are problems related with quality control on it," said Brent Cross. "We have been told we'll be getting it, but we haven't been told when that's going to be."

The position was similar at High Street Kensington: "I

have this feeling there are none left now. I believe our quality controllers found a fault with it."

Boots will however continue to stock the machine, as improved models are now available. "Stock has now been received which has been passed," said a spokeswoman, "and it's going into our branches now."

Amstrad itself denied all knowledge of the problem. "We've had nothing in writing to indicate there's any substance to the allegations," said a spokesman, adding that the company would act if it heard from Boots.

It seems odd that a retail chain of Boots' stature did not contact Amstrad on discovering the problems with the machine.

QL keyboard launched

SOMEONE still cares about the QL. Schon Keyboards is to sell a keyboard for the QL.

The casing includes new power and Microdrive LEDs, and is similar to the existing

QL case. It costs £54.95.

Details from Schon Keyboards, 15 Northcote Crescent, West Horsley, Surrey KT24 6LX.

Tel: 04865 3836.

Cheapest micro of the year

THE PC8300 is likely to be the cheapest micro on sale this Christmas, but don't get carried away by the £19.95 price tag.

The machine is about the size of a 48K Spectrum and sports similar rubber keys, but has only 2K of Ram fitted as standard.

It can, however, be fitted with 16K and 32K Rampacks, costing £25 and £29 respectively in these configurations. According to Ed Chernoff of International Transistor Corporation, the machine is one of nature's little mistakes. It was produced by a Hong Kong company which wanted to get into the micro business but which unfortunately chose late 1984, when the bottom fell out of the market, to do so.

It never appeared, but Chernoff now has 15,000 machines which he proposes to sell by mail order. The machine appears to have been aimed somewhere between the ZX81 and Spectrum, and is claimed to be

Basic compatible with the ZX81. Anyone with a stock of Basic ZX81 tapes should therefore be able to load software.

Unlike the ZX81 the machine has high-res graphics, and the Basic isn't tokenised (apart from various maths functions). It also has single channel sound, and a monitor output. The display is claimed to be high resolution, but the test machine produced only a monochrome display which seemed to have stability problems similar to the ZX81.

Anyone buying the machine would have to expect to write their own software for it, and as there's no support for it, it wouldn't be possible to get it repaired if it breaks. It is, however, very cheap, and could provide a low-cost introduction to micros.

Details from International Transistor Corporation, 85 Manchester Road, Haslingden, Rossendale, Lancs BB4 6NT. Tel: 0706 216235.

Competition results

Thank you very much to everyone who entered the *Archers* competition - we had a good chuckle over a number of the entries.

The 20 people below will be receiving copies of *The Archers* for their efforts; unfortunately space will only allow the quotation of one lyrical masterpiece, from T Carter of Doncaster:

"Norman stopped what was to be Jeffrey's guest appearance. For meetings spied on platform three, And party interference."

Winners

T Carter, Doncaster; Joe Higgs, London SW2; Mr M E Stamper, Leeds; Jane Sutton, Swindon; Mark Rollings, Gateshead, Tyne and Wear; David Cook, Peterlee; R H Patel, London W5; Daniel Dorman, Bristol; Mrs E

Woodley, Edinburgh; J P McIntyre, Kilmarnock; Fiona Smithson, London SW17; Paul Cahill, Bacup; Mark Anderson, The Wirral; H Lavender, Brighton; Michael Morley, Darlington; Andrea Brown, Gosforth, Tyne and Wear; D G Sharpe, Hatfield; Mrs Mary Huxtable, London E5; Tony Cooper, Maidstone, Kent; P Kelly, Exeter, S Devon.

£4m Miracle

A City investment house has bought a ten per cent stake in modern manufacturer Miracle Technology. Charterhouse Development Capital director Richard Duncan described Miracle's record as one of "profitable growth based on strong innovative management."

The purchase values Miracle at £4 million - something of an achievement, considering Amstrad paid only £5 million for Sinclair.

Software Hotlines

A first for **Infogrames!** The first computer graphic depiction of someone getting their head blown off - coming soon to your Amstrad CPC and Spectrum! This spectacular, if somewhat gory, scene occurs at the very beginning of its latest murder/mystery (due out in the New Year) *L'Affaire Simon*. Simon the Stiff. Cute, isn't it?

It's up to you as investigating officer to find out who-dunnit - and why, when and where. Similar in style to *Vera Cruz*, budding CID or forensic officers are going to have a ball.

Infogrames is also launching a new label for strategy/war type games - not all originated in France either. Called **Command**, the first release will be *Apocalypse*, which was an old **Red Shift** title. Good memories will recall that as an anarcho-syndicalist commune, **Red Shift** was never much into marketing its often quite creditable output, so maybe **Command** will breath new life into this nuclear age diplomacy-style game. Out as before on Spectrum and BBC B cassette (£9.95) but it's available on disc for the first time at £14.95. Should hit the streets before Christmas, with a spanking new Commodore 64 version out soon after.

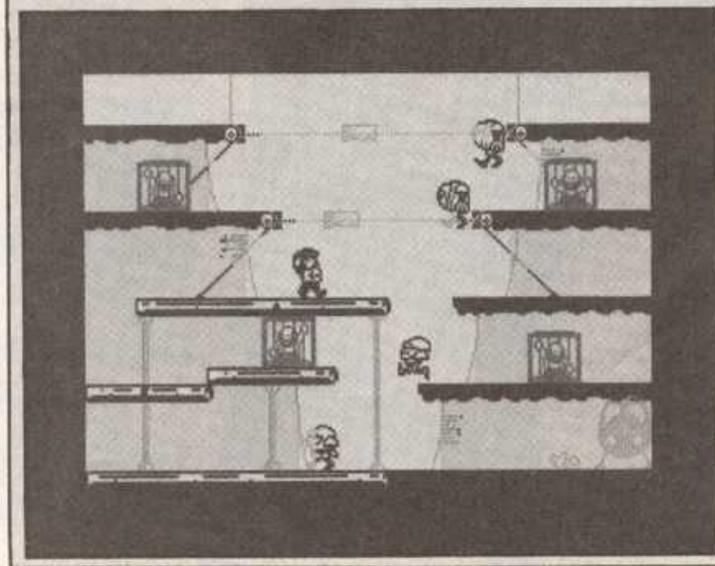
OK, then, hard types. You've put five inches on

your mental biceps by clocking *Exploding Fist*. You've grown hair on your chest and developed a Neanderthal forehead by disembowelling some gooks in *Rambo*. Now's the time to take on the ultimate he-man arcade challenge - *Butch Hard Guy*. Programmed by newcomers **Future Concepts** and brought to you by **Advance Software**, this is described as "a spoof on *Rambo*", in which you must rescue prisoners that have been captured by the Evil Mr Foo. Out the first week in January like almost everything it seems - **FTL's Shockway Rider** has been put back to around that time on Spectrum, Commodore 64 and Amstrad and that'll be something else to look forward to while watching Morecambe and Wise, won't it?

Blood 'n Guts. That's what I like - a company that doesn't pussyfoot around. "All-action and fun", the namby pamby software houses say, when they really mean "you can crush grannies to death in this one, teenagers". But **American Action** has got its finger exactly on the pulse of the nation - "*Blood 'n Guts* is an ancient barbarian decathlon with all the violence and brutality you've ever dreamed about in a computer game".

Should be in the shops by early December (Commodore 64 only, £9.95 tape, £14.95 disc) and with events including the Human Hit and Cat Throwing, well, anything could happen.

John Cook



Mastertronic in business

MASTERTRONIC is moving into low-cost serious software following a deal with Robtek. The budget label is to market Robtek's King Size Utilities, which include word processor, database, home accounts and spreadsheet for Spectrum, Amstrad and Commodore for £4.95.

Geoff Heath, formerly boss of Melbourne House and now head of new business development at Mastertronic, says that the Robtek programs will be out in the next few weeks and that further serious applica-

tions products from Mastertronic are likely to appear in the spring of next year.



Heath: Budget business.

Minerva link for Card Index

MINERVA Systems has released *System Delta Inter-Link*, a program that allows the *Card Index* database and all other *System Delta* applications to link into Computer Concepts' *Inter-Sheet*, *Inter-Chart* and *Inter-Word*.

Data from *Card Index* can be transferred as records matching specified criteria or as a specified range of records. Record layout may be reviewed prior to transfer, and various modes can be defined. Calculator and star commands can be accessed directly from *Inter-Link*. All *System Delta* applications, including *Inter-Link*, are compa-

tible with the Master and Compact series machines.

Details from Minerva Systems, 69 Sidwell Street, Exeter EX4 6PH. Tel: 0392 37756.

Mouse from Wigmore House

WIGMORE House has turned its attention to PC compatibles for its latest mouse.

The new mouse, called the NEOS Serial Mouse 4200, has a resolution of 100 points to the inch, with a slipfree silicon coated ball. It plugs into the PC's serial port, and is compatible with Gem, and *Windows*.

Details from Wigmore House at 32 Savile Row, London W1. Tel: 01-734 8826.

Footnotes

SOME people know how to write a mean press release. CSD seems confident that it can unload its stocks of surplus *Black Hawk* and has hired Mark Rivers, "Sparkling Superbrain," says release A, to "stun the world with his action-packed, super-sophisticated programs."

Mark himself will probably pawn his earring, dump the shades and shave his head when he sees the superstar treatment CSD is giving him, but let that pass; what about the announcement of his first game, *SAS: Operation Thunderflash*? "Using 3D graphics, the game unravels..." Oh dear. Rock Hardman's mission (when he can knit the game back together) is to kill the 48 terrorists (informing them of their rights first, we trust) and saving the bound and gagged hostages who are "spread throughout the embassy".

But how did this happen to them? Aren't these little charges supposed to just blow the windows in? For a small fee *Popular* is willing to translate press releases into sensible English.

On the subject of tongues, Database Exhibitions clearly knows several, depending on circumstances. Readers who recall this high-minded company's banning of copiers from the Amstrad show will be surprised at the prominence given to a "back-up

utility (which) lets users make working copies of all their ST software" in Database's publicity for the Atari show.

Strapped for something to say about the Atari 7800 games console, Database comes up with "its open design allows it to accept a wide range of peripherals such as joysticks". Stunned by the concept of an open-architecture games console we tackled Database spokesman Mike Cowley on the non-joystick peripherals it could use.

"I'm sure it probably can't use anything else at all," he



Rivers: Sparkling moodily.

chortled. After further enquiries he claimed Atari couldn't think of anything at all in the way of peripherals - "so we put down joysticks". We had meant to have a crack at Dave "ave a banana" Carlos this week, but under the circumstances we think we'd better go and lie down instead...

Diary Dates

NOVEMBER

21-23 November

The Commodore Computer Show

Novotel, Hammersmith, London W6
Details: Hardware, software and peripherals for the Commodore range of computers

Price: £3 adults, £2 children, £1 discount for advance booking

Organiser: Database Exhibitions, 061-456 8835

22 November
6809 Show

Old Halls of the Royal Horticultural Society

Details: Show for the Dragon and Tandy Colour Computers

Price: £2.50 adult, £1.75 children, reduction for advance purchase

Organiser: Jenny Pope, Microdeal, 0726 68020

28-30 November

The Atari Christmas Show

New Horticultural Hall, Greycoat Street, Westminster, London SW1
Details: Hardware, software and peripherals for the Atari range of computers

Price: £3 adult, £2 children, £1 discount for advance booking

Organiser: Database Exhibitions, 061-456 8835

29 November

Wight Computing Fair

Ryde Town Hall, Ryde, IoW
Details: Local show covering wide range of subjects

Price: N/A

Organiser: Wight Computing Users Group, 10 John Street, Ryde, Isle of Wight PO33 2PY

FEBRUARY

17-20 February

Which Computer? Show

NEC, Birmingham
Details: Mainly business exhibitors; includes Commodore, and low-cost PC clones

Price: £5

Organiser: Cahners Exhibitions, 01-891 5051

Prices, dates and venues of shows can vary, and you are therefore strongly advised to check with the show organiser before attending. *Popular Computing Weekly* cannot accept responsibility for any alterations to show arrangements made by the organiser.



GOAL! BBC/Electron

The first realistic football simulation for the Electron featuring excellent graphics, music and an intelligent opposition that actually adjusts its skill level during the game depending on current state of play.

Cass. **£7.95**

FUTURE SHOCK BBC/Electron

An amazing new style of Arcade game with inter-active sub plots, using large detailed graphics for superb detail. This game pushes the machine and the player to unparalleled limits for many hours of enjoyment making this a game not to be missed.

Quote from Electron User:- December Issue.
"Future Shock is an excellent program, a game which overflows with character and humour." "Overall Rating 9/10"

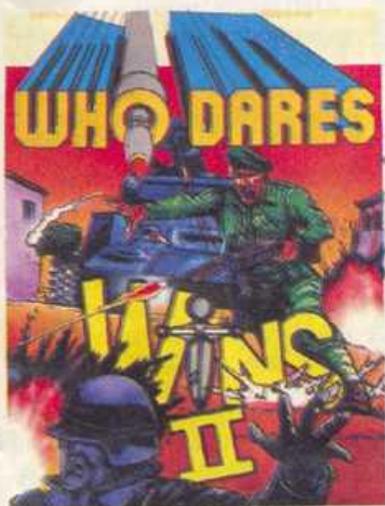
£7.95 Cass.



WHO DARES WINS II C16/+4

At long last a conversion for the C16 of a No. 1 Hit that lives up to its original. Over 40 screens of fighting action (more screens than the original 64 version).

Cass. **£7.95**



JET SET WILLY II C16/+4, BBC/Electron

Over 90 screens of this classic game will give even the most skilful player the ultimate challenge.

£7.95 Cass.



TYNESOFT
COMPUTER SOFTWARE



Can Atari's ST beat Amstrad with price cuts?

ATARI could well be planning price cuts in the spring, turning the screws a little further on Commodore and setting the scene for the long-awaited head-to-head with Amstrad. It's not yet certain that the cuts will go ahead, but it seems that the recent appointment of Bob Gleadow as Atari UK's managing director has reopened the internal debate about company strategy.

At the time of the PCW Show it seemed that Max Bambridge, then general manager of Atari UK, had won that particular battle. Bambridge recognised that Atari had a choice. It could go for stability, keeping prices level on the ST range, establishing the machines better in business and picking up customers in specialist areas like the audio and video industries and desktop publishing, or it

the PC boom burned itself out of its own accord. Bambridge argued that Amstrad wasn't a threat because it didn't innovate, so when the five-year-old PC standard finally declined, Amstrad would need someone else to follow. Such as Atari.

This approach seems eminently sensible, conforms to the way businesses are normally run, and avoids alienating/terrifying the business community by plunging its buyers into a mad helter-skelter of price cutting. It is, however, diametrically opposed to the received wisdom about Jack Tramiel's view of the world.

Tramiel built Commodore by launching wave after wave of products and by cutting prices whenever anyone else got close. Many of the launches didn't actually make it into the shops, some of the



Gleadow: Emphasising games

Commodore, although it's likely that this has been caused more by the need to rebuild the company than by any mellowing process on Tramiel's part.

The reconstruction is, however, now pretty well complete, with the company in good enough shape to mount a successful share offer, and the decks may now be clear for a major assault on the company's rivals.

The recruitment of Bob Gleadow is a sign that something dramatic is likely to happen. Gleadow ran Commodore UK in the days when it looked set to dominate the British games market, and moved on and up long before the bubble burst. He's familiar with Tramiel's old style, and he's experienced enough for the job of head of Atari UK to be a demotion for him - unless he is to be the lynchpin of an expansion programme.

Sources close to Atari speak of the dramatic change in style when he took over from Bambridge. Bambridge wanted to go for business, while Gleadow is emphasising the games machines right now (more support for the 8-bit machines and increased weight on the games consoles). More price cuts on the

ST don't seem to have been decided on yet, but they haven't been ruled out.

If the cuts do go ahead they're likely to be drastic. In order to take on Amstrad the ST has to be priced against the PC. Amstrad's entry level machine is currently £528, while a comparable 520 system costs £597. Atari dealer Silica Shop does, however, currently sell a twin drive ST system for £696, which is around £40 more than a comparable PC system, so clearly there's scope for some price reduction.

Atari is shortly to launch the 520STF, which has a built-in disc drive and should allow scope for a further reduction. If Atari priced the 520STF at £379 (representing £80 over the standard 520 to account for the disc drive) the machine would be neck and neck with the Amstrad. Clearly this is achievable.

But what about cuts beyond this? Amstrad keeps its prices low by economical design, shrewd component buying and low production costs. So does Atari. Amstrad builds its machines in Korea, Atari builds its in Taiwan. The companies will pay virtually the same for components and construction, so if Amstrad can keep its prices low, so can Atari. If Atari cut its own and its dealer margins to something comparable to Amstrad's it could bring the 520STF out at around £330, and a PC-basher package out at under £500.

Alienating dealers by cutting into their profit margins might not be a smart move, but clearly Atari can undercut the PC without having to do so to the same degree as Amstrad.



Tramiel: Back to basics?



The ST: Business or budget?

could cut prices so spectacularly that the competition would be driven out.

The arguments against price cuts were that the range was already profitable, already good value for money, and would be well-placed to take over the market when

others bombed, but the ones that worked established Commodore as the world's major games machine producer and turned rival Atari into a pile of smoking rubble.

Atari's strategy since Tramiel's takeover has lacked the drama of the old days at

Speech unit for the Memotech Business support

MORE hardware products are coming through for the Memotech computers.

A speech synthesiser is now available from UK Home Computers at £29.95, with an Eprom blower 'in the pipeline', according to the company.

More details from UK Home Computers, 82 Churchward Avenue, Swindon, Wiltshire. Tel: 0793 695034.

THE Small Business Support Group is now selling a membership pack for users who feel they need help in setting up and running a computer system. The pack is sold over the counter by computer dealers for £40, and gives users access to the group's hotline support service.

Details from Small Business Support Group, Bank Buildings, Kennel Lane, Broadway, Worcs. Tel: 0386 852641.

Disc manager

SOFTWARE Support is marketing a disc management aid designed to fit into most 5 1/4 inch disc storage boxes and help users keep track of the files on particular discs, stopping disc space from being wasted. It costs £1 for a single sample and 85p each for orders of 50 or more.

Details from Software Support, 151 Marsland Road, Sale, Cheshire M33 3WE (061 962 9998).



PC Scanner

DIGITHURST has produced a video scanner system for the Amstrad PC and other compatibles. The device comes in the form of an expansion card which converts a standard video signal to a 512 x 512 pixel image at 255 shades per pixel.

Images can be stored to disc, allowing them to be built up into a library and inserted

into text output. The card is supplied either on its own, for use with an existing video system, or with a camera and stand. The scanner and software costs £347, while with video camera and stand it's £700.

Details from Digithurst, 7 Church Lane, Royston, Herts SG8 9LG.

Tel: 0763 42955.

An event NOT to be missed!

Atari Christmas Show

Royal Horticultural Hall, Westminster, London SW1

The first ever Atari Show last spring was an outstanding success. From all over Britain Atari enthusiasts flocked to London to find out all they could about their favourite machine.

Now the record-breaking Atari Show is back - with three days devoted to the exciting developments now taking place in this expanding market. Make sure you don't miss this great Christmas extravaganza!

Friday
28
November
10am-6pm

Saturday
29
November
10am-6pm

Sunday
30
November
10am-4pm

They'll all be there!
Games consoles, 8 bit
machines ... the entire
ST range!



Organised by
Database
Exhibitions

- ★ All the latest software from publishers in both the UK and USA.
- ★ New hardware releases from Atari and other major companies.
- ★ Experts from Atari User and Atari ST User to answer your questions.
- ★ Experience the fascinating world of computer communications.
- ★ Everything on show from stocking fillers to complete Atari systems.

Whether you're a new user or a seasoned addict, you'll find the show overflowing with ideas to help you expand YOUR computing horizons!

Bring this coupon to the Show to get 50p per person off the normal admission price of £3 (adults), £2 (children). Valid for up to four people

**50p
OFF**

**ATARI
CHRISTMAS
SHOW**

Friday Nov 28, 10am-6pm
Saturday Nov 29, 10am-6pm
Sunday Nov 30, 10am-4pm

Royal Horticultural Hall,
Westminster, London SW1

Nearest tube/main line station: Victoria

PCW1

Fat Worm blows a fuse

I am writing with reference to John Cook's rather cruel criticism in Software Hotlines in the week of October 23 of what was, after all, an unfinished version of *Fat Worm Blows a Sparky*. It seems that his thoughtless comments were made after examining only a still photograph of the game.

I accept that *Fat Worm* may not be very appealing as a still picture; it was never designed to be captured in a small number of photos - as I suspect some more publicity-conscious games are. And I take no responsibility for the cover artwork which alone caused me the "shame" John Cook denied me. I do, however, take some credit for the motion of the playing area and the not-so-rigid movements of the inhabiting creatures which I believe make this game more than the "technically middling" achievement John Cook declared it to be.

Julian Todd
author of

Fat Worm Blows a Sparky
John Cook replies: "Alas, would that this was true, Julian, but unfortunately I

endured *Fat Worm* (a finished production version) for round three and a half hours before passing comment."

The resident Ram

In reply to P M Kingston (Letters, November 6), as an owner of an ST with two discs for 18 months I can say that a Ram disc is no replacement for a second drive.

Having said that it does have its advantages. Being memory resident it is faster, almost instantaneous, in access time. It is also a lot cheaper; I know of four reasonably priced commercially available programs, and I have also come across numerous public domain Ram discs and you can't get cheaper than that.

A Ram disc is invaluable in program development by speeding compiling times some 15 fold. They do have their drawbacks though, as with any memory resident system, data must be saved to disc at the end of a session. Any programs that you want to run from Ram discs must first be loaded to the memory drive and run from there.

This is your life . . .

What is a "lifetime"? When I buy 50 of the cheap diskettes which are widely advertised at ever-decreasing prices, what should I expect? Almost without exception the blurb states "guaranteed for life" or "lifetime warranty". Who's life is implied here? Should I expect still to be using them when I apply for my bus pass and pension book?

The lifetime of the disc seem the only alternative. If so, how long does a disc live? If one chokes and expires on a bellyful of spreadsheet after a week, was that its life expectancy, anyway?

What are they trying to tell me in their enticing ads?

Albert E Smith
Canvey Island

PS I should point out that I succumbed and bought 50 bargain discs, which came in a very nice plastic storage box, from a firm in Milton Keynes back in March. They cost about £37 and are still all alive and kicking.

"Guaranteed for life" means just that. The companies do indeed intend you to be using them in conjunction with your pension book - and beyond.

As the ST recognises the originating drive as the designated drive this could cause problems with some commercially available software which insists on looking at drive A for further data. This is mainly copy protected programs but there are some programmers who insist drive A is always the default drive.

ST owners normally don't have to worry about memory

limitations but once you have installed a couple of Ram discs you can soon use up all available memory. A 350K Ram disc with 200K of code will take up 550K and remember a 200K program will also need more memory for variables, etc.

David Burnett
Edinburgh

See page 18 for more on ST Ram discs.

Puzzle

Puzzle No. 235

Hiram P. Money Penny, the well-known Victorian millionaire left the following unusual bequest: 'To my distant cousin Algernon I leave a sum of money to be paid as follows. On the first day of January 1900, I direct the payment of one pound. On the second day, a payment of half a pound, on the third day a payment of one third of a pound, and so on. This payment is to continue in this manner for one hundred years, until 31st December 1999.'

Algernon, under the impression that he was to inherit a fortune promptly went off to celebrate his good luck and it was only later that a cloud of uncertainty darkened his mind.

Can you say:

- 1) How much will he have received at the end of the first year (to the nearest penny).
- 2) How much does the total bequest amount to.
- 3) On which date will the payment have exceeded half of this final total?

There are a couple of minor catches to this question that might trap the unwary!!

Solution to Puzzle No. 230

Answers: Out of the 1440 times displayed, 272 can be read in reverse to produce an actual time. These form 136 pairs of times, only one of which has a difference of between

7½ and 8½ hours. This is the pair 20:50 to 05:02.

Solution: The program first generates each of the 1440 possible times, in hours and minutes. The order of the digits is then reversed and the resulting figure is checked to determine if both the hour and minute values fall within the correct range. The time elapsed between the two times is then calculated (in minutes) and it is checked to see if it is in the range 465 to 495.

Line 140 makes the appropriate adjustment if the time between sleeping and waking passes over midnight.

Winner of Puzzle No. 230

The winner this week is Jennifer Hetherington of Penrith, Cumbria who will be receiving £10.

Rules

The closing date for Puzzle 235 is December 15th. Answers on a postcard please.

```
>
5  TAL=0
10 FOR H1=0 TO 24
20 FOR M1=0 TO 59
30 H1$=STR$(H1): IF H1<10 THEN H1$="0"+H1$
40 M1$=STR$(M1): IF M1<10 THEN M1$="0"+M1$
50 T1$=H1$+M1$
60 T2$=""
70 FOR F=1 TO 4
80 T2$=MID$(T1$,F,1)+T2$
90 NEXT:
100 H2=VAL(LEFT$(T2$,2)):M2=VAL(RIGHT$(T2$,2))
110 IF H2>23 OR M2>59 THEN 160 ELSE TAL=TAL+1
120 T1=H1*60+M1:T2=H2*60+M2
130 SLEEP=T2-T1
140 IF SLEEP<0 THEN SLEEP=SLEEP+1440
150 IF SLEEP>=465 AND SLEEP<=495 THEN PRINT T1$;"
";T2$;" ";T1;" ";T2;
;SLEEP
160 NEXT: NEXT
170 PRINT TAL
```

Running on . . .

I was, at first, pleased by Richard Scott's reply to my Ziggurat of October 30th. Then I read it more fully.

Mr Scott seems to have jumped to a horrendously wrong conclusion, and is doing more barking up the wrong tree than a deranged Shih-Tzu. His assumption that I am just another baa-ing sheeplike IBM worshipper is wrong!

For starters I have only encountered an IBM PC once, and quite frankly I was appalled at the horrible character set (colour adaptor) and the hideous way that the screen flashed with scrolling, I might have been sorely tempted into buying a cheap IBM clone, but only as a second machine. The 8086 is a terrible processor, as it is severely limited to the amount of memory it can access at a single bound, necessitating the ridiculous idea of segmenting, and due to the need for Big Blue compatibility, the improved 80386 will spend most of its time chained down to a slow clockrate and the infamous 640K limit.

Secondly, the Apple IIGS. Since writing my article I have read that Apple are going to offer an upgrade kit, consisting of a new baseboard to bolt into your Apple II case. However, according to the review in *Byte* magazine, some software and some hardware will not work, and they gave an estimate of hardware compatibility at 80 per cent, and software compatibility at 95 to 99 per cent. If I had spent several years and lots of money building up a superb Apple II system, and a huge software collection, I'd repeat to myself "Remember the Apple III!" and hold off for as long as possible.

As for the Mac, well, the Macintosh Plus is a slight improvement on the original, but I would refuse to trust any machine where, in an emergency, I couldn't rip the disc out. Machines that baby the user might be OK to get used to, but I prefer a machine that I can control, and not one that makes me go through some ridiculous procedure for a

simple action like removing a disc from the drive. It also has a closed architecture, which is something I hate.

The ST is supplied with bugged software, so you have to buy a different language before you can do anything useful with it, as the Basic makes a mockery of file handling from all accounts. Personally, for all that, I have half a mind to buy one, although I can't really justify the purchase that much, and if I did, it would end up being used for most of the time as a terminal to my existing machines.

It's true that the Amiga is a very nice machine, but is mind-bogglingly overpriced, and the Atari ST, especially with the new Blitter, is going to wipe the floor with it. The Amiga is really a bit of an enthusiast's machine (a rich enthusiast that is) at the present, but if both Atari ST and the Commodore Amiga can stand in the mainstream market on their own feet, then why do both Commodore and Atari feel it necessary to attempt IBM emulation other than to try and stand with one foot in each market?

OK Mr Scott might ask, what sort of machine do I have? Well, I'll tell him. I use a machine which Mr Scott might view as an anachronism. It has a mere 56K of memory, of which 8K is gobbled by the operating system. It runs a 68B90, an 8/16 bit processor, and runs an industry standard operating system, called Flex. It's an enthusiast machine, and I built it with my own hands (well, and a soldering iron). I wouldn't pay £400 for a wordprocessor, this one costs a mere £125, and unlike *Wordstar*, resides in memory all at once and allows me to produce anything from a simple letter, like this, to a full blown novel if I wanted to, and unlike the so called 'user friendly' software where you need to go through umpteen menus to achieve simple things, I have its power at my fingertips.

Standard, portable, operating systems are where it's coming from.

Antony J Shepherd
Barnsley

This letter was edited for length.

Long live the queens

This week's set of moves in the Readers vs *Colossus* tournament produced a unanimous decision for the first time, in Game Two.

Every single one of you opted to move the queen out to take *Colossus's* bishop. *Colossus* has responded by moving its queen to d8-f6.

The move in Game One wasn't so clear cut, but the majority decision was to take *Colossus's* pawn on c6, with the diagram below for details.

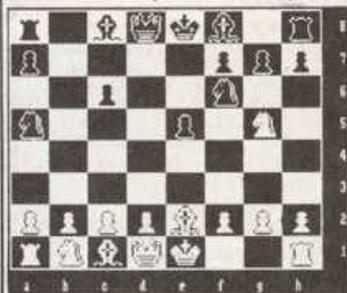
Send your suggestion for the next readers' moves in each game to either Inter-Mediates (*Popular Chess*), Freeport, Sawbridgeworth, Herts CM21 9YA - to save on stamps, although next day delivery cannot be guaranteed - or *Popular Chess*, Unit

2, The Maltings, Sawbridgeworth, Herts CM21 OPG, if you're posting with a stamp as normal. Closing date for entries is December 3.

The move getting the most votes each week will be entered into the games.

Prizes

At the end of each game, a British Museum reproduction Arran chess set will be winging its way to the person who suggests the greatest number of accepted moves. Five runners-up prizes of *Colossus Chess 4* will be awarded to the most consistent entrants. And it's by no means too late to start entering now - there's a good way to go yet.



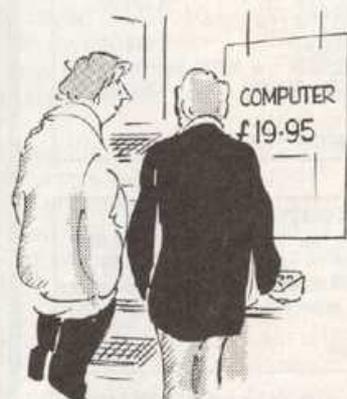
Game one

- | | | |
|---|---------|--------|
| 1 | Pe2-e4 | Pe7-e5 |
| 2 | Ng1-f3 | Nb8-c6 |
| 3 | Bf1-c4 | Ng8-f6 |
| 4 | Nf3-g5 | Pd7-d5 |
| 5 | Pe4xd5 | Nc6-a5 |
| 6 | Bc4-b5+ | Pc7-c6 |
| 7 | Pd5xc6 | Pb7xc6 |
| 8 | Bb5-e2 | ? |



Game two

- | | | |
|---|---------|--------|
| 1 | Pe2-e4 | Pc7-c5 |
| 2 | Ng1-f3 | Nb8-c6 |
| 3 | Pd2-d4 | Pc5xd4 |
| 4 | Nf3xd4 | Pe7-e5 |
| 5 | Nd4-b5 | Pa7-a6 |
| 6 | Nb5-d6+ | Bf8xd6 |
| 7 | Qd1xd6 | Qd8-f6 |
| 8 | ? | ? |



"It's an ideal development machine - there's no software."

The elusive Alphacom

My ZX printer is beginning to show signs of age and I wish to obtain a standby.

I have a Seikosa 250 for my more important work but I still find the ZX printer convenient for *Copy* and *List*.

In consequence I have been trying to find an Alphacom 32 without success. All the shops I have been to, which used to have them in stock a short while ago, now look at me with blank expressions on their faces.

Is the Alphacom 32 still available?

D C A Lock
Caterham
Surrey

Try WAVE, at 53 Shearwater Avenue, Barrow-in-Furness, Cumbria, LA14 3JP (0229 44753). It has been advertising Alphacom printers for sale recently.

Evesham Micros

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Taking a dip with Amstrad

John Lettice takes a look at Amstrad's newest printer and finds it measures up

Amstrad's DMP3000 printer is the sort of product that has made the company's reputation in the micro field. It's attractively priced and styled, and sports various ideas that make it a lot easier to use than run of the mill printers. Someone has clearly put a lot of thought into this beast.

A perusal of the back issues, however, reveals that the someone in question appears to have been C-Itoh with their Riteman C+, now 'badged' by Amstrad for the PC and other machines.

In shape and size the 3000 is pretty much like standard printers — bigger than the one that comes with the PCW and the likes of the Centronics GLP, but not outrageously so. It sports the traditional smoked plastic lid and one-line, form feed and line feed and line feed switches on the right of the front panel, but it differs from the usual format in certain crucial — and welcome — respects.

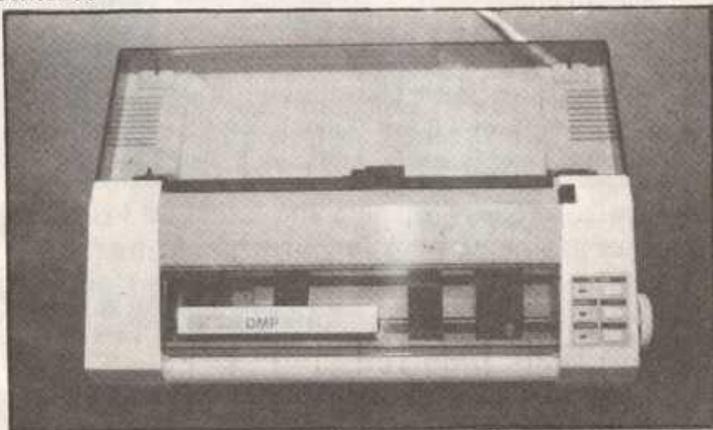
The machine sports twin metal legs which clip out, raising it off the desk by enough for you to be able to slip a small box of paper under it. The method used to feed paper in is odd but logical. Instead of feeding in the back, once round the roller and out the back again, it goes in the front and comes out the back. Paper is pulled in either by tractors right at the front or by friction, taken beneath the print head and then across the roller.

For tractor feed this is marginally more ergonomic, as it stops printed output getting snarled up in the roller, but it's particularly handy for sheet feed, as you just have to shove the paper in the front rather than fiddling around at the back. Sheet feeding isn't as easy as having one of those gizmos that takes a big pile of paper, but very few printers come with them fitted as standard anyway.

The feed mechanism itself is pretty clever. The tractors are two moveable devices that slide along a metal bar at the front of the machine, and again are easier to get at than usual. When you're using sheet feed slots on the inside edges of the tractors allow paper to be slid in, and guide it up to the roller. I had a little difficulty getting single sheets to align correctly, but fine tuning the positioning of the guides improves this a little.

The machine's dip switches are round the back, but although this means they're difficult to get at they're rather

"The Amstrad DMP3000 printer is fine for the serious home user who wants to produce some decent quality output, but if I were buying for a business I'd wait and see what else Amstrad has"



Unusual and welcome

bigger than usual, and rather easier to see, so they can (just) be switched with your fingers. I'd still be a lot happier if people would put dip switches round the front though.

Overall the 3000's design is neat and sturdy enough to put up with a fair bit of bashing, the only major problem being the lid, which just sits on the machine rather than being hinged in any way. It therefore has an annoying habit of falling off when you're peering under it to align paper or fiddling around with the print head.

One side-effect of the print mechanism is the fact that the machine doesn't take ribbons in cartridge form — not exactly, anyway. Instead of having to shove a big plastic thing into the machine you get a dinkier little object that sits at one end of the carriage. You then have to pull the ribbon across to the other side and hook it over the print head, but it's not a particularly difficult operation.

In terms of print quality the machine

doesn't really break any new ground. Draft mode prints out at 105 cps (characters per second) and produces a clear image, but if you want to get better 'word processor' quality you need to resort to NLQ (near letter quality) mode. This doesn't give you a fancier font, but darkens the image up a bit and chops the speed in half.

This mode along with various others is accessed through software, so unless your applications software has the relevant printer driver included you'll need to set it up before printing out or tailor the program accordingly. Traditionally printers have operated in this way, although newer ones like the Epson LX80 allow you to set modes with front panel switches. I'd have thought it logical for Amstrad to do this as well, but the company may have some peculiar notion that its PC setup shouldn't clash with the PCW.

Besides NLQ the machine can produce mini, proportional, condensed and italics, and can also be set to print underline and double width. You can combine these, so a bit of mixing and matching could generate a face that's more suited to business letters.

Although the 3000 was launched in tandem with the Amstrad PC, and is therefore IBM compatible, it can also be switched to Epson compatibility, so it can be used with other micros with a Centronics interface.

This is handy from a marketing point of view, because while for many PC buyers whether a printer is £195 or £295 is neither here nor there, enthusiasts on a budget are quite likely to go for the Amstrad.

So is it worth buying? It's relatively tough and produces reasonable quality output, so it's difficult to fault on price.

I'd say it's fine for the serious home user who wants to produce some decent quality output, but if I were buying it for a business, where it would be hammering out NLQ most of the day, I'd be inclined to shell out £100 extra for something a little more heavy duty. Or maybe wait and see what other goodies Amstrad has in store...

Program Amstrad DMP3000 Price £195 Supplier Amstrad, Brentwood House, 169 Kings Road, Brentwood, Essex CM14 4EF.

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Aliens return... yet again

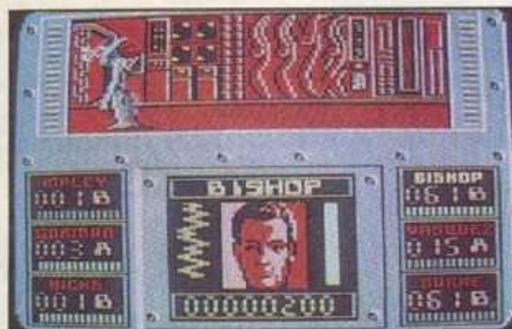
You can mention Sigourney Weaver as long as it isn't sexist, they said. Tricky. Let's just say that Ms Weaver plays a significant part in the magnificent movie *Aliens* and appears in an entirely lesser, digitised form in the computer game.

Too bad, but the good news is that this is the biggest disappointment in *Aliens* the game – which turns out to be

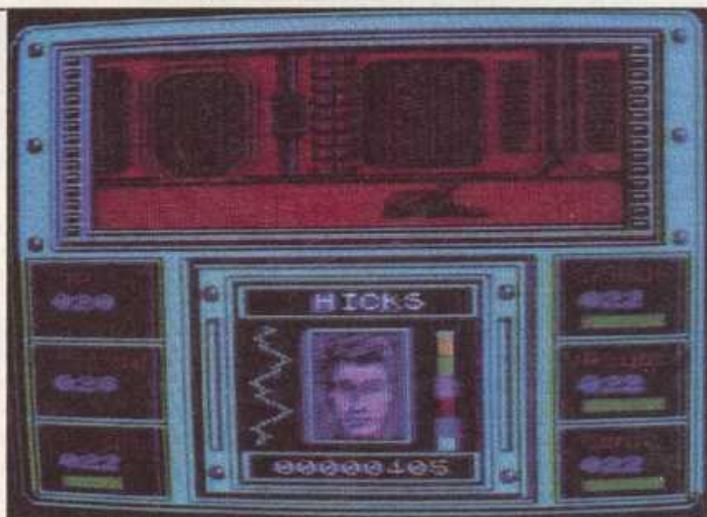
an excellent all-action romp which, unnaturally for a tie-in, often evokes the tension and excitement of the original film.

The game has you controlling a six person team around a large base that has been largely taken over by aliens. The task: genocide – no messing around here – but this is not easy as there are alien warriors, face huggers and eggs to contend with on the way to the alien queen's lair.

You have active control over one team member at a time, their face being shown on the personnel scanner below the main display, which will give you the view from the video



Amstrad *Aliens*



Aliens: Spectrum version

'camera' mounted on their heads. You can scan around the room, and when you see an alien – start firing!

One accurate shot to the head or three to the body will do the dirty deed – but you have to be fast or it will home in on you, the mighty jaws open and that's it.

As you move the team one by one through the complex (individuals can be 'programmed' to move while you control someone else), mapping is probably your first priority, the location being shown by a single number on the display.

You'll find that some rooms

have special functions – finding the armoury will enable you to top up your ammunition supplies for instance and if the aliens get entrenched in the control room (you can tell by the 'bio-mechanoid' growths on the walls), power will start to fail. And alien shooting in the dark isn't fun.

All in all, Electric Dreams should be congratulated on producing a game that captures much of the claustrophobic atmosphere of the film. It's tense. It's nerve tingling arcade strategy. But don't play it on your own.

John Cook

Hyperspace, Hyperball

If Odin has anything to do with it, the Hawks and the Vipers will soon be as famous as the Cowboys and the Raiders, as the former two form the combatants in its newest release *Hyperball*.

Set in the far future – but not so far that cheerleaders have found a suitable futuristic substitute for pom-poms – *Hyperball* is one of those new sports that humankind will create to keep the 50 thousand million unemployed off the streets.

Doesn't sound too good so far does it – as the majority of these 'new' sports that have been mooted tend to be variants of Pong or Rollerball.

Not so with this one, thank heavens. *Hyperball* has one of those virtues so rare – originality.

First things first though – when loaded the program starts playing very impressive music and asks you to select one or two player options.

Unless you are that mega-being from the 9th dimension (amongst whose demi-god-like abilities include picking the fastest queue in the post office), I'd suggest you play the thing two player to start with... it's very depressing to get beaten 18-0 by a dumb computer.

You then select your team of three from a selection of rogues and misfits shown across the top of the screen. These galactic personalities include such immortals as Stu Gobwinge, Dwain Mucus and that doyen of the after-game shower Norman Bates.

Still, despite the silly names (Won Tin Lung... ouch) it's worth giving more than a passing look at the various ratings of each – strength, speed and agility – as these significantly affect their performance on the field of play. Having chosen your two fliers and one grounder, it's off to the stadium and on with the

cheerleaders.

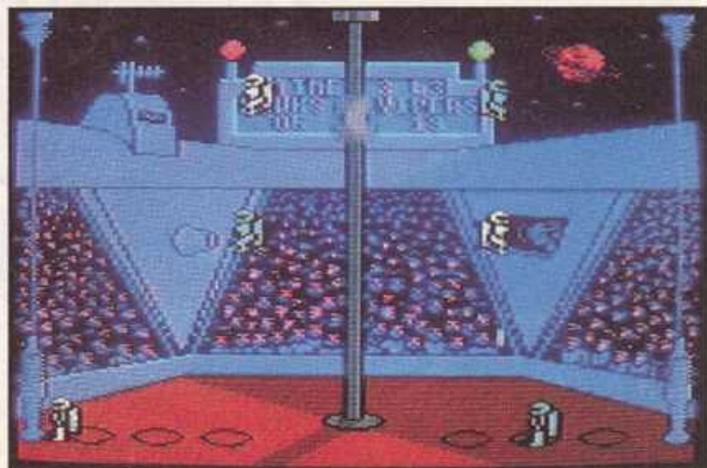
As you can see, the playfield is split in half by a vertical metal pole that the fliers cannot cross. Up and down this pole travels the goal in which you must throw the ball to score – you can score either side.

Quite simply, play starts with the ball being shot on to the field (it travels under zero gravity, but will slow down gradually if not caught), and you must fly around and try to

pick it up by intercepting it. You now have five seconds to throw it (joystick in the direction of throw and fire) or you give away a penalty... not very much time to think. Essentially, that's it.

Like many good things, it's simple enough to pick up quickly, although you'll soon find out that it needs some fair thought to do well at. Another well designed professional effort from Odin.

John Cook



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M-Disk offers ease and convenience

Howard Oakley fits out the Atari ST with something new from MicroDeal

Not only does the Atari ST series offer superb graphics, sound, and the fast and powerful 68000 processor, but it must also provide the most memory for such a cheap machine. However, even the 1040 STF, with a built-in floppy disc drive, could be criticised as being cumbersome to operate without a second disc drive, and that costs money.

If you only have one drive, copying a disc file by file takes endless changes of the disc – particularly troublesome if you wish to copy a single-sided program disc onto a double-sided one when Gem will not allow you to do a straight disk copy).

However, the abundance of memory can be turned into a Ram-based disc with relative ease, and at less than a tenth of the cost.

There are several excellent programs available which provide Ram discs! *M-Disk* (supplied by MicroDeal, at £13 or so, and £20 inclusive of a print spooler); one provided free with the Modula-2 language compiler (£100 complete from Modula-2 Software), and the third supplied as part of the *BackPack* desk accessory cartridge (£45 from Computer Concepts).

Each of these provides a small memory-resident program which sets aside a chosen portion of memory to act

as a rapid-access disc drive, which can be assigned any drive letter from C onwards. You should be a little cautious of letting it be C, because an installed drive of that letter is assumed to be the hard disc, and to contain the desktop files and accessories (which should be copied over to it).

The Ram disc program is placed in a folder named AUTO in your boot disc, so that when you switch the machine on, the operating system automatically installs the Ram disc. The first two versions, and most other Ram discs available, then prompt you for a size in Kbytes K (if you ask for 0K or less than 16K, the program aborts and no disc is installed). Before you can access the disc, you must install it as the correctly labelled drive. You can make a selection of boot discs with different combinations of Ram disc drivers, desk accessories, etc., with the desktop already saved with the additional drives installed. However, sometimes changing screen resolution can lead to apparent loss of the disc – all you have to do is re-install, using the correct letter (the Ram disc is not wiped clean).

Before trying to install a Ram disc, you should check that you are going to be left with enough memory to run programs. My 1040STF reports about 1028K free after booting up, desk accessories can

take a further 30K free or more, *BackPack* itself takes an additional 75K, and the Ram disc program will need some more space. The MicroDeal version has an overhead of about 15K, including the program, the Ram disc's directories and boot records, whereas *BackPack*'s takes about 27K.

So, on a 1040ST, a MicroDeal Ram disc of 500K actually takes 515K, and leaves about 300K after accessories and *BackPack* are loaded, too. *BackPack* only allows certain sizes to be installed, whereas the MicroDeal version offers any in the range 16 to 709K.

The only problems I have experienced with Ram discs occurs when doing a reset without turning the machine off. Sometimes, with the *BackPack* version, you cannot recover the memory used by the Ram disc, or the machine crashes when trying to reboot. The MicroDeal version appears more robust, and does return the memory correctly, but may let the machine think that there is a real drive C, a hard disc. In general, it is wisest to turn the machine off to change the size of the Ram disc.

Finally, does a Ram disc suffice as a second drive? In many situations it is much better, as disc access times are very much shorter. For example, compilation of Modula-2 programs is fairly slow if all the libraries are held on disc, but amazingly quick if they are placed in a 650K Ram disc created by MicroDeal's *M-Disk*. I usually use the *BackPack* Ram disc when I am using word processors like *1st Word*, as a 384K of space is fine for them.

If I want to copy a complete double-sided disc, I can always boot the machine without desk accessories, and use 760K or more to store the files temporarily. However, there are times when a real second disc drive is useful.

Even so, most users should find the few pounds spent on a Ram disc make a one-drive machine much easier to use.



Challenging the trivial

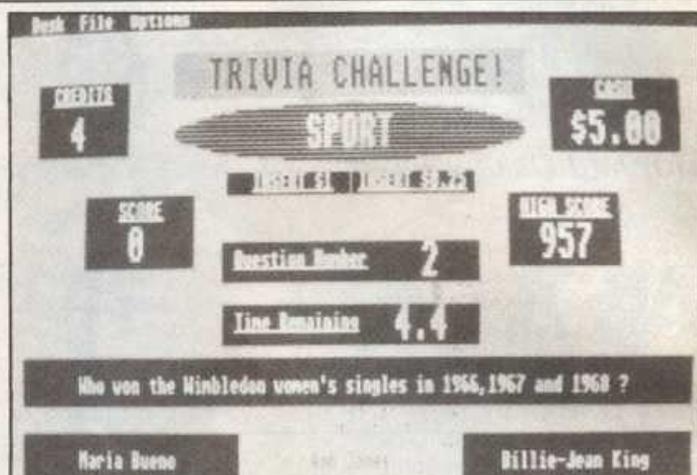
In which lavatory did Paul McCartney compose the words of Yesterday? What was Dylan Thomas' favourite brand of whiskey? How many metric tonnes of black pudding does the Doncaster Co-op sell in the average week? These are three questions that don't appear in Microdeal's *Trivia Challenge*, but that doesn't stop it from being excellent fun.

The presentation is in the form of Trivia coin-op - just like you'll find in most pubs nowadays (whatever happened to Invaders, eh?). You can pick your subject out of General Knowledge, Science, Pop, Art and Sport then insert

your 'money' by clicking on an icon.

Questions are flashed up, and you are given 12 seconds to pick an answer from three presented on the bottom of the screen. Naturally the faster you answer the more points you get. Two wrong answers, and that's your lot.

At 1,000 points, you win \$1.00 and for every 500 above that, a further 50 cents - yup American money, but it looks as if the questions have been well edited as no weird American ones came up in the course of testing and some typically British ones did (that Ken Barlow has been married three times, you know -



shocking isn't it?).

Of the 4,000 questions, 2,000 are General, giving separate categories around 500 each. Admittedly we found there did leave room for some repetition, but it wasn't that bad. In any case, if you want some new questions you can create files of your own and the instructions don't make it sound too

daunting.

Of its type, not at all bad.

Popular Appeal ♦♦♦♦
John Cook

Program Trivia Challenge
Micro Atari ST Price
£19.95 **Supplier Micro-**
deal, Box 68, St Austell
PL25 4YB.

Et tu, strategic readers?

There are, I suppose (and it's not an original thought), two kinds of games players: those who like lots of fast action, colourful graphics, and wizard sound effects; and the strategy players.

Although I enjoy all kinds of games, I prefer those with at least an element of strategy. Cue *Annals of Rome*, the latest from PSS. Strategy is all in this recreation of the days of the Roman Empire - and I couldn't stop playing it.

Unusually, you play no one person or group. You are the collective voice of the Senate - and regardless of internal politics, coups bloodless or otherwise, and the deaths of emperors, the safety of Rome - and the welfare of the Empire is in your hands.

Actual gameplay is at first complicated, but soon becomes straightforward. You have 21 officers at your disposal, of varying ability and loyalty, and it is up to you to allocate command of the Empire's military resources.

You then carry out campaigns against neighbouring states, using your troops either to invade or to reinforce existing garrisons.

Of course, all warfare is expensive, so acquiring new

territory is crucial since the citizens of Rome will not tolerate too much taxation.

You can only move troops between neighbouring countries, and establishing bridgeheads around Europe becomes a top priority. From those you can launch your major expeditions.

After countries have been occupied for a while they become Romanised and will provide auxiliary troops.

In addition to subjugating the locals, you also have to watch what's happening back in Rome, and look out for rival nations on the rise. These change as the game pro-

gresses as former superpowers like Egypt and Thrace are replaced by emergent races like the Vandals and Goths.

The screen display is well thought out and colourful with a map of Europe, North Africa and the Near East forming the major element, and sub-screens showing how your armies are faring, and details of your 21 officers.

Annals of Rome does not concern itself with individual battles and campaigns. Instead it concentrates on the wider sweep of history, the ebb and flow of empires, and the fates of groups hundreds of thousands strong.

If you take your strategy games seriously, or even if you're an arcade gamer who likes the occasional mental challenge, *Annals of Rome* is very nearly a perfect choice.

Versions are now available for Spectrum and Amstrad. A Commodore version should be available soon.

Popular Appeal ♦♦♦♦
Peter Worlock

Program Annals of Rome
Micro Amstrad CPC
Price £12.95 cassette,
£17.95 disc **Supplier**
PSS, 452 Stoney Stanton
Road, Coventry.

The one-footed menace

As our hero Lee (it says here) you have mastered the secret martial art, "Chin's Shao-Lin".

What this mastery means is that you have learned how to kick people. Sudden death with one foot.

I suppose this is a useful technique since, because your hands are not employed in fighting, you can knit a scarf, do the crossword, or cook a dinner for six, while demolishing a group of ferocious opponents with a right

foot more lethal than Gary Lineker's.

This is the scenario of *Shao-Lin's Road*, the latest arcade conversion from The Edge, under the Konami label. Kick your opponents, acquiring magic weapons on the way.

In fact, the picture is not as black as I'm painting it. The graphics are excellent, animation is smooth, and there are some good sound effects in amongst the theme music.

If you defeat the first group of thugs, you go on to a

higher level in which you come up against a tougher type of do-badder.

It's by no means "state of the martial art", but if you can ignore the silliness, you'll get your money's worth.

Popular Appeal ♦♦♦♦
Peter Worlock

Program Shao-Lin's Road
Micro Spectrum 48K
Price £7.95 **Supplier**
The Edge, 36/38 South-
ampton Street, London
WC2.

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Bringing in the storm



Tony Kendle with the usual tips and pokes for a variety of new Arcade games

Competition this Christmas is hotter than ever but there's also far less chance of buying a bad game, I'm sure that there will be a lot more exciting news to come.

Coming to the end of our current David Jones extravaganza it seems a nice touch to fill in with details of the next magic knight game. *Stormbringer* is out on the Spectrum 128K in December and with 48K and other conversions to come over Christmas and January. Just as a teaser here is a summary of the plot and a sneak preview set of clues, which can't be bad. Hang on to this copy - you may need it (although the plot of the 48K version is yet to be finalised).

During the escape back to the past from *Knight Tyme*, there is an accident with the tyme guardian's second hand tyme machine and it splits into two fully functional units both containing a magic knight. The split is not a three dimensional one nor even fourth dimensional - it is a split in the 34th dimension known as conscience. Hence one of the magic knights is a goodie and one is a baddie.

The bad magic knight realises what has happened and redirects his tyme machine to 23rd century Earth. He leaves his tyme machine in orbit and teleports down.

However the bad magic knight, known as the Off-White knight, has returned first and set up a little kingdom of his own. He has also learned the secret of storm cloud summoning (using the hi-tech weather modification equipment on board his spaceship, Stormview, and is intent on blasting magic knight out of existence.

The good magic knight does not want to destroy Off-White as, that is not thoroughly decent behaviour. Instead he must trap Off-White and merge with him to become a whole person once again.

The tips are: smelling objects can provide extra information. When carrying the horse feather it is possible to cheer people up by tickling them. To enable you to buy the services of Robin of Shylock you must give him a golden egg, which are produced by picking up the chicken. It all sounds like more of the familiar fiendish David Jones stuff.

Finders Keepers is not included in the trilogy since it is a different style of game. Any future magic knight games

are intended to use a different style of games environment - it gets boring for me to keep writing the same style of game," says David Jones.

"Magic Knight should hopefully turn up around February in a role playing book I have written which will set the Magic Knight in more problems, when Gimbal the wizard is accused of causing earthquakes and flees from the local villagers who want to lynch him. The magic knight must bring Gimbal back to prove his innocence.

"*Spellbound 128K* should be in the shops now and it, and *Knight Tyme*, works fine on the Plus 2. Here are a couple of extra clues for this version. The ankh can be worn to stop energy loss when walking. This avoids having to use the bottle of restorative fluid with Florin the dwarf. The shield can be worn to avoid damage from the bouncing balls in the odd ball room, ballroom and spare ballroom. The shield is in the basement, which is now a full eight rooms wide, and can be dangerous to collect. MSX *Spellbound* and C64 and Atari *Knight Tyme* are coming soon."

Thanks also go to the authors of *Strike Force Cobra* for the following notes on the game. Hopefully you should all still have the map of the game close to hand (from *Popular*, November 13) because the tips will not be much use without it.

"Starting with a new game (abort via the status report which if necessary)

familiarise yourself with the starting positions for each man.

Number one starts location O4 but the door here is located. Number two starts at O8. Number three starts at A6. Number four starts at E0 standing by a window with a patrolling robot inside.

The aim on this floor is to get all four men inside the building (alive) and in suitable positions to mount an assault on the room below.

The best solution is to take men three and four down the lift at D4 and then with men one and two use both lifts at M7 and N1. However, there are a few problems to be overcome before this can be achieved.

Start with man number three. Dive through the window at 2 twisting right on entry to avoid the electrified blocks. move round avoiding the terrorist on the scooter (who thinks these things up?) to a position where the orb can be shot. Jump on to the block next to the lift control block to activate the lift at location N1 (this will be used later by the other team members).

Now proceed through the door to room D2. When the door is almost open, dive across the gun and through the opening.

Avoid the robot and move down to the other lifting door. This will now open. Step to one side, just standing on the pressure pad. Do *not* enter this room.

More of this next week!

Charts

Top Twenty

- 1 (-) World Games
- 2 (2) Trivial Pursuit
- 3 (1) Computer Hits Vol 3
- 4 (3) Infiltrator
- 5 (5) 180
- 6 (10) Ollie and Lisa
- 7 (6) Thrust
- 8 (4) Uridium
- 9 (12) Ninja Master
- 10 (11) Paperboy
- 11 (7) Kane
- 12 (9) They Sold a Million (3)
- 13 (18) Warhawk
- 14 (15) Ghosts and Goblins
- 15 (-) Five Star Games
- 16 (-) BMX Simulator
- 17 (14) Happiest Days
- 18 (-) Speed King
- 19 (-) Bomb Scare
- 20 (-) ACE

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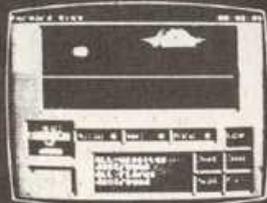
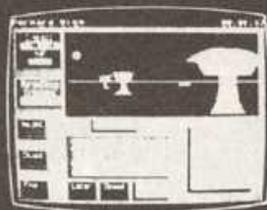
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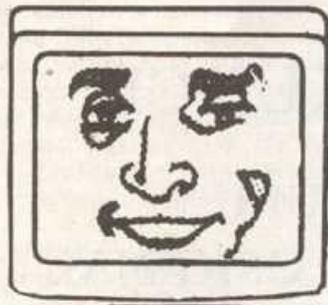


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Back in time with Melbourne; ahead to '87 with Level 9

Tony Bridge goes back to Mordon's Quest and gives you a chance to win a Level 9 planner



The other day amongst the pile of red bills, rate demands and the latest news from Bree, the Grand Elf came upon a huge tube. Nothing to do with lager, but a 1987 adventuring planner from the high command of adventuring, Level 9. Coated with a laminate surface, and complete with a felt-tip pen, it is beautifully illustrated in usual Level 9 fashion with scenes from their adventures and would grace any wall. Level 9 has 50 more of these calendars and nothing better to do with them than to give them as a nice Christmas present to readers of the Corner; to become the envy of your adventuring friends all you have to do is to answer, as they say, this question: *Level 9 has released 11 adventures to date. Can you name the first nine?*

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The Level 9 trolls will sift through your entries and the first 50 correct replies out of the bag will receive one of these fabulous wall calendar/planners in time for Christmas. To make sure of this, the closing date has to be December 12, so be quick!

This isn't the only Christmas present from Level 9 this year; not content with giving us the best of mainline British adventuring, they have now completed a deal with Macmillan stablemates Delta 4 and Fergus McNeill, masters of the adventure parody. What this collaboration will produce no-one but they know, but we'll be in for something good, I'm sure. More news as it is passed to The Elf.

Mordon's Quest is a very well-respected adventure and rightly so, for the scenario, although traditional, is evocative and atmospheric while the puzzles are sufficiently mind-bending to keep even the most demanding of players awake.

The beginning is just the sort of thing I like; a few easily explored rooms in a mysterious house with one or two innocuous objects and an enigmatic impassable location beyond which the player knows must lie more secrets. In this case, a swirling impenetrable mist prevents any further progress – maybe the answer lies in the cupboard which

remains firmly locked, or possibly the unbreakable windows on the first floor.

Well, you can wander around to your heart's content but nothing will happen until you venture outside and attempt to climb the drainpipe. Behold the horrible sight within! In shock, you fall to the ground, and are presumably concussed if subsequent events are anything to go by. For if you return to the house, you'll be confronted by Mordon, the great and oldest "lord of the many realities" – he requests your help in locating the many parts of the machine of alternative realities (or something like that). Needless to say, this task won't be easy and you have a long way to go before a successful end to the affair.

```
You awake from a deep, troubled sleep,
to find you have fallen from a large
four-poster bed.....

You are in the master bedroom, despite
the richness of the bed and the oriental
carpet underfoot, the room is sparsely
decorated. An indefinable atmosphere
permeates the room, as if some great
tragedy once occurred here. Tall sash
windows face north and west. Large
double doors open to the south.

Here you can see:-
A blanket.
Take blanket
Okay.
```

Only text for Mordons Quest, but it's fun

Along with the appearance of good old Mordon, you'll also find that the cupboard which was previously locked has now miraculously swung open, revealing the necessary adventuring torch as well as a Transporter Unit, which you'll find necessary for getting treasures back to base for scoring. I'm pretty sure that the newspaper in the study is just there for atmosphere, but you'll certainly need the blanket in the bedroom and very soon.

With the torch (*Torch on*), you'll be able to negotiate the swirling mists which have hitherto formed an impassable barrier to further progress. Now you'll find yourself in a jungle and it is here that the real game starts. The quicksand is easily dealt with – just drop the blanket. What, you didn't bring along the blanket from the bedroom? You're not going to get very far without it! But once over the quicksand, you'll find

several directions in which to explore.

The native hut looks pretty inviting but beware – unless you know how to get out again, you're in for a long visit. In reaching this location, you'll have stumbled across some thorns, some bamboo and a handful of berries. You tried to eat the berries, didn't you? Yes, so did I and I paid very dearly for it as you will have done. No, you should save these three items for the present occasion – all you have to do is type *use blowpipe* and lo and behold! In one easy action you, have not only assembled a blowpipe but also dipped the thorns in the poisonous juice of the berries and blown the resulting concoction at the pigmy and dispatched him for good.

But now there is a body lying about and there's not enough memory wandering about the average home computer to support useless bodies; so you can bet your life that there is some special use for it. Sure enough, you can pick it up – some way to the south is a rampant carnivorous plant which is blocking your way, and where you way is blocked in an adventure, then you can be sure that there is something very interesting on the other side.

Well, you can try getting past the thing, but you'll very quickly use up your six lives (a nice touch from Melbourne House this, to give the player a half dozen chances of resurrection) – instead just take a look at that body you're dragging about; that's meat isn't it, and that's what the plant wants, isn't it?

One of the weaknesses of the program is shown up here, I'm afraid; it becomes obvious after a while that the plant must be tempted with the pigmy's body, but it took me a long while playing "match the words" until I found the right combination. Typing *feed plant with pigmy* will do the job, though and then you're in a clearing where you'll find a frog. You'll need this later of course, so pick it up and proceed to the waterfall – again, something prevents you from further progress here, so there must be something to be discovered here and the secret lies in sacrificial ceremony.

Dip your toe into the waters of *Mordon's Quest*, you'll enjoy yourself.

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SOFTWARE GUIDE

Pick of the progs

THE POPULAR TEAM PRESENTS THE
ESSENTIAL GUIDE TO BUYING THE BEST
PROGRAMS FOR YOUR MICRO

As a particular home micro becomes better established, it's inevitable that the quality of the software written for it should improve. Those of us who remember the earliest programs written for, say, the Sinclair Spectrum, will be aware that both the demands of the end users and the increasing skill of the programmers leads to standards becoming higher and higher, almost visibly month by month.

Software appearing now for sophisticated machines like the Atari ST - such as Novagen's Mercenary and Rainbird's Starglider - may well look primitive by this time next year. At the moment, though, these programs among many others demonstrate that software really does sell hardware; a nicely packaged computer may look great on the shelves of your local dealer, but you would never consider buying it until you saw for yourself just what software could achieve with it. In this buyers' guide we'll try to give you some idea of which programs - games, utilities, business packages and so on - you should think about for your particular computer, whether it be Acorn, Sinclair, Atari, Amstrad or Commodore. If it's biased towards more recent products, maybe that's because as we've seen standards rise incredibly quickly; so while some of the software discussed may be regarded as "blasts from the past", remember that a year ago it was state of the art, and there are just a few cases where this is still true.

To round up the supplement after discussing each of the popular machines, we take a look at the phenomenal rise of budget games, and give you some advice on buying magnetic media. Don't forget that your computer deserves a Christmas present too; make the most of our software guide and make sure it gets the products it deserves! ◀

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Sinclair Spectrum; the UK's best-loved micro isn't limited to just playing the most innovative games

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Acorn BBC; versatility is the key to software success for this old faithful

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Just looking at the huge software selection explains the popularity of the Commodore 64/128

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1986 has been the year in which Amstrad PCW software really established itself

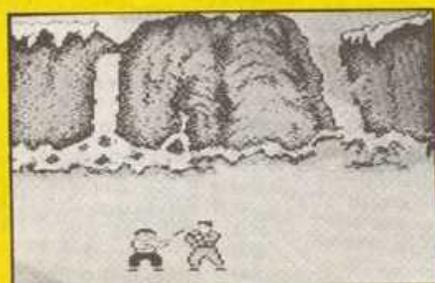


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Atari ST/8-bit programs display their power and stunning graphics abilities

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Amstrad CPC programs reach new height of sophistication



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Budget games; full-price quality at bargain prices, or just cheap and nasty?

44

Magnetic media; choosing discs can be every bit as complex as buying software. Our guide should help you to avoid the pitfalls.

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The software spectrum

THE UK'S BEST-LOVED COMPUTER ALSO HAS THE WIDEST SELECTION OF SOFTWARE. CHRIS JENKINS TAKES A LOOK AT SOME OF THE BEST PACKAGES AVAILABLE

The development of the Spectrum 128 and the Spectrum Plus 2 has kept the machine in the popular eye, and meant that many software companies still make it their first priority for new products.

Obviously the main area of interest is games; serious users tend to go for more powerful, expensive or dedicated machines. This doesn't mean, though, that only shoot-'em-up fans are catered for in the Spectrum software field.

In the word-processing market, once you have added a decent keyboard and microdrive you can take your choice from a number of advanced software packages. There's **Tasword Three**, the microdrive version of the popular classic, which includes all sorts of helpful features such as selectable wordwrap, file merge, slow and fast scrolls, auto-insert, delete and undelete, variable window size and so on.

Alternatively there's **The Last Word**, given free with some models of the Saga keyboard range, which includes redefined charactersets of various sizes, full text editing, search and replace, and a wide range of printer control tokens. Also worth considering is **The Writer** from SofTechnics, which sets out to out-perform all other word processors, and apart from the standard features includes page numbering in Arabic or Roman, many special characters, file compatibility

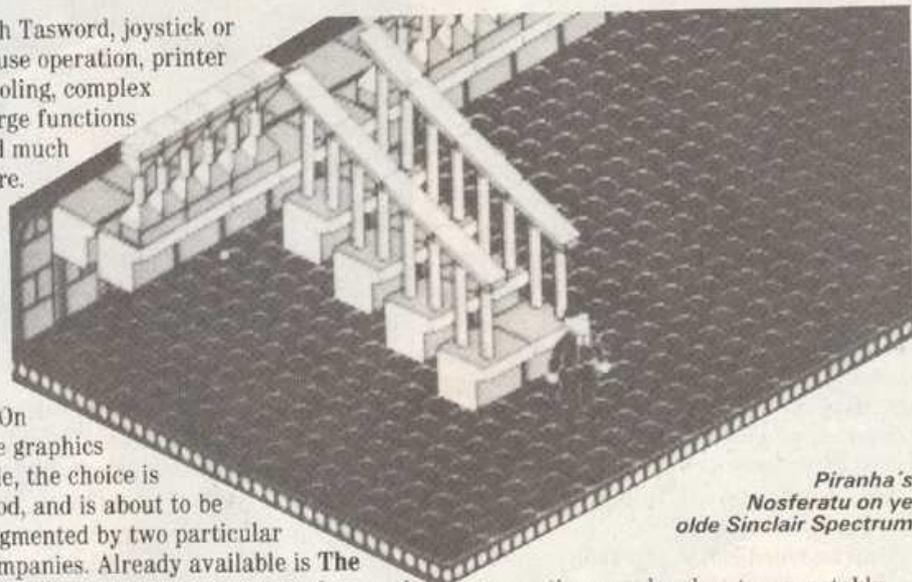
with Tasword, joystick or mouse operation, printer spooling, complex merge functions and much more.

On the graphics side, the choice is good, and is about to be augmented by two particular companies. Already available is **The Artist**, from SofTechnics again, but on the way is **Artist 2**, which adds mouse control, an even more sophisticated window and menu operation, system, very sophisticated block copying, rescaling and merging, and an exciting sprite design and animation routine.

The other main contender is the **OCP Art Studio**, which again features a WIMP environment, powerful editing facilities and sophisticated text entry options. For the Spectrum 128, the **Advanced Art Studio** is also on the way.

Needless to say the Spectrum games

field has been graced by many impressive releases, including several accurate arcade conversions and many original ideas. Gremlin's **Bounder** featured an original scenario; you control an animated tennis ball, bouncing over a surreal landscape avoiding pitfalls and obstacles. Still popular are the "Ultimate-type" animated



*Piranha's
Nosferatu on ye
olde Sinclair Spectrum*

perspective arcade adventures; notably Hewson's **Pyracurse**, Addictive's weird **Kirel**, the off-the-wall Global production **Attack of the Killer Tomatoes**, Sweevo's **World** from Gargoyle, and of course Ocean's toe-tapping **Batman**.

Gargoyle carved out a nice little niche for themselves with a series of beautifully designed animated adventures which, in the style of the classic **Tir Na Nog**, featured loping heroes and hideous monsters. Best of these was **Heavy on the Magick**, though many argue in favour of the more hi-tech **Marsport**.

Another detectable trend was the increasing influence of **Marble Madness**, the coin-op game. Both Electric Dreams' **Spindizzy** and The Edge's **Bobby Bearing** did wonders in simulating the effects of gravity, one on a wobbling inverted pyramid, the other on an appealing spheroid. While both featured surreal landscapes of blocks, planes, angles and causeways, Spindizzy probably had the edge for excitement while Bobby Bearing took the prizes for technical achievement.

If endless screens of scenery and complex puzzles aren't your scene, you would probably have been more interested in the huge selection of shoot-'em-ups which enjoyed a revival after a period out of fashion. Doubtless the best is Hewson's



Mirrorsoft's Sai Combat - thwack!

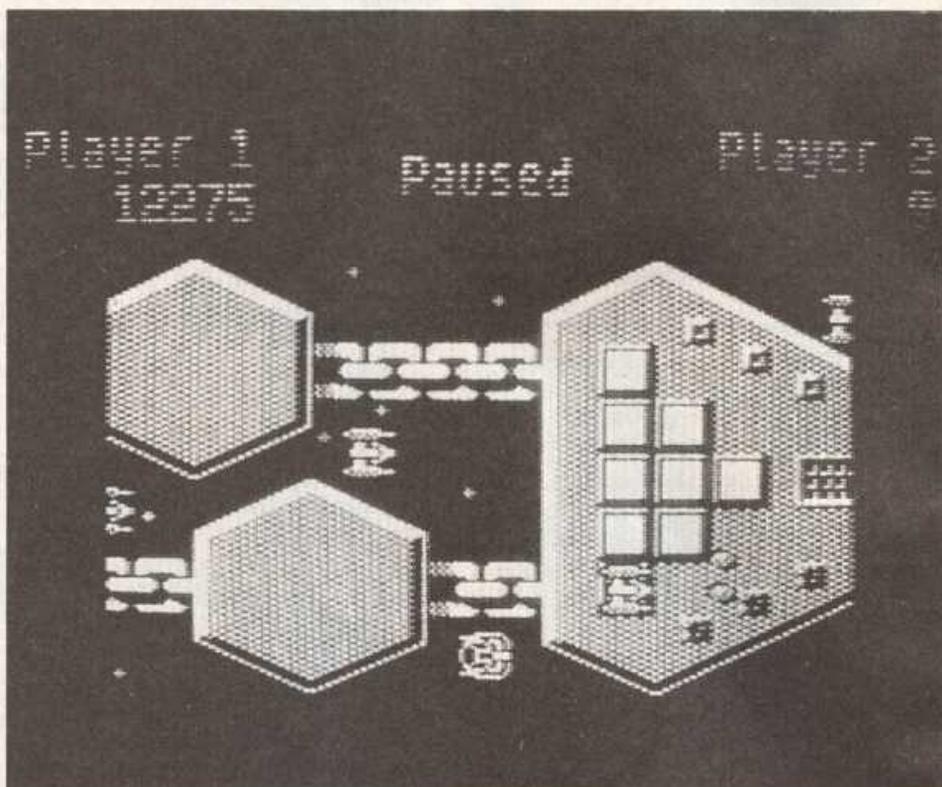
continued on page 28 ►

Uridium, based on the Commodore 64 original. Surprisingly, this retains almost all the appeal of the Commodore version, with fast, smooth scrolling, finely detailed ships and backgrounds, and challenging arcade action. A host of imitators included MicroGen's **Stainless Steel**, Martech's **WAR**, and FTL's impressive **Lightforce**, which added multi-colour graphics to the scenario.

Adventurers, as always, were particularly well catered for. Apart from the usual Quilled efforts, which ran the spectrum from the sublime to the incomprehensible, there were new titles from CRL in the form of Delta 4's **The Boggit** - more sub-Tolkien farce - Level 9's Colossal Cave trilogy re-released by Rainbird as **Jewels of Darkness**, Ocean's **Hunchback**, which featured pretty graphics if not a challenging adventure, the exceptionally silly **Very Big Cave Adventure** from St Brides/CRL, and St Brides' own **Snow Queen**, an oasis of niceness in a desert of ore-slaying and dragon-bashing.

Martial arts programs still jumped kicking and screaming off the shelves; perhaps the best was Mirrorsoft's **Sai Combat**, which at least gave you a big stick to whack your opponent with, rather than your having to beat him to death with your bare hands.

As we noted earlier, another prominent trend was the return of the coin-op conversion. Apart from Elite's version of **Ghosts and Goblins**, the spook-zapper which seems to have a charm all of its own despite a lack of originality, many were based on the multi-player **Gauntlet**. In the last few weeks we've seen **Druid** from Firebird, **Avenger** (sequel to **Way of the Tiger**) from Gremlin, **Dandy** from



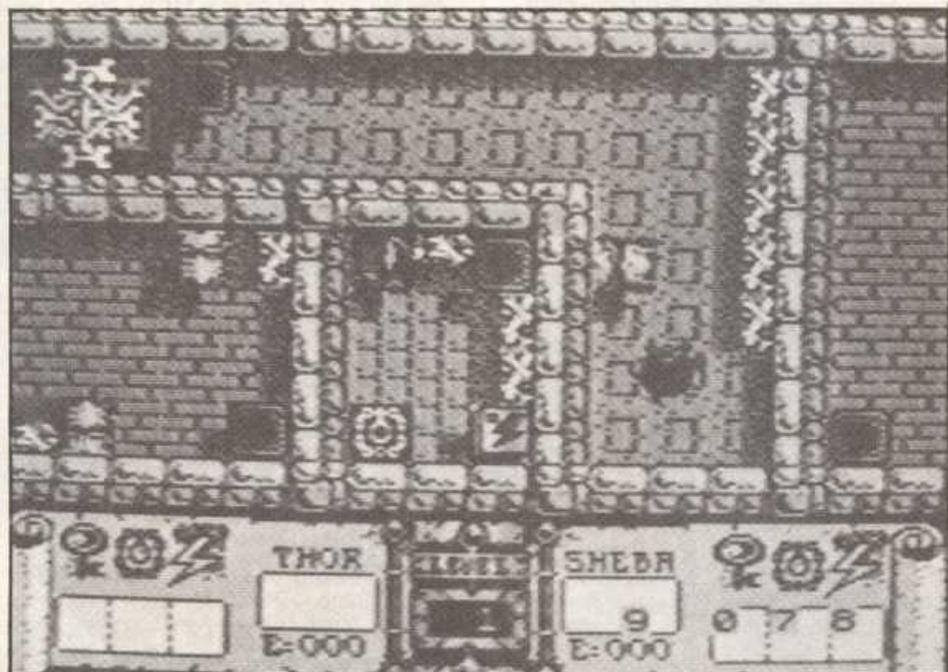
Uridium from Hewson - greatest shoot-'em-up of all?

Electric Dreams, and we're still waiting for the official **Gauntlet** from US Gold. All these games share a semi-perspective view of a complex, multi-level maze, fast-

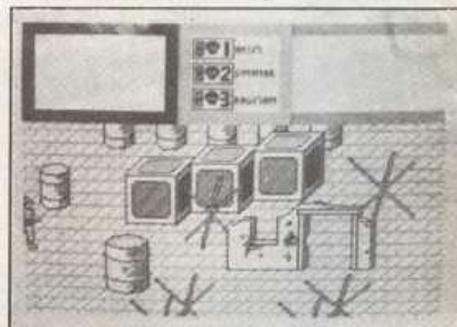
"Still on the horizon are what may well be late entries for the Spectrum game of the year award; Xevious... Starglider... The Pawn... and Aliens..."

moving colourful characters, detailed backgrounds, and a requirement that you spend many hours zapping countless thousands of ghoulies, ghosties, monsters and maniacs. One of these will probably be enough for you.

Still on the horizon are what may well be late entries for the Spectrum game of the year award; **Xevious**, the sophisticated blast 'n' bomb game which threatens to outdo Uridium; the Spectrum version of Rainbird's astonishing **Starglider**; **The Pawn**, adventure par excellence from those terribly nice Magnetic Scrolls people via Rainbird; and the promising **Aliens** from Electric Dreams. For best new Spectrum software



electric Dreams' Dandy - running the gauntlet



Rogue Trooper on the lookout

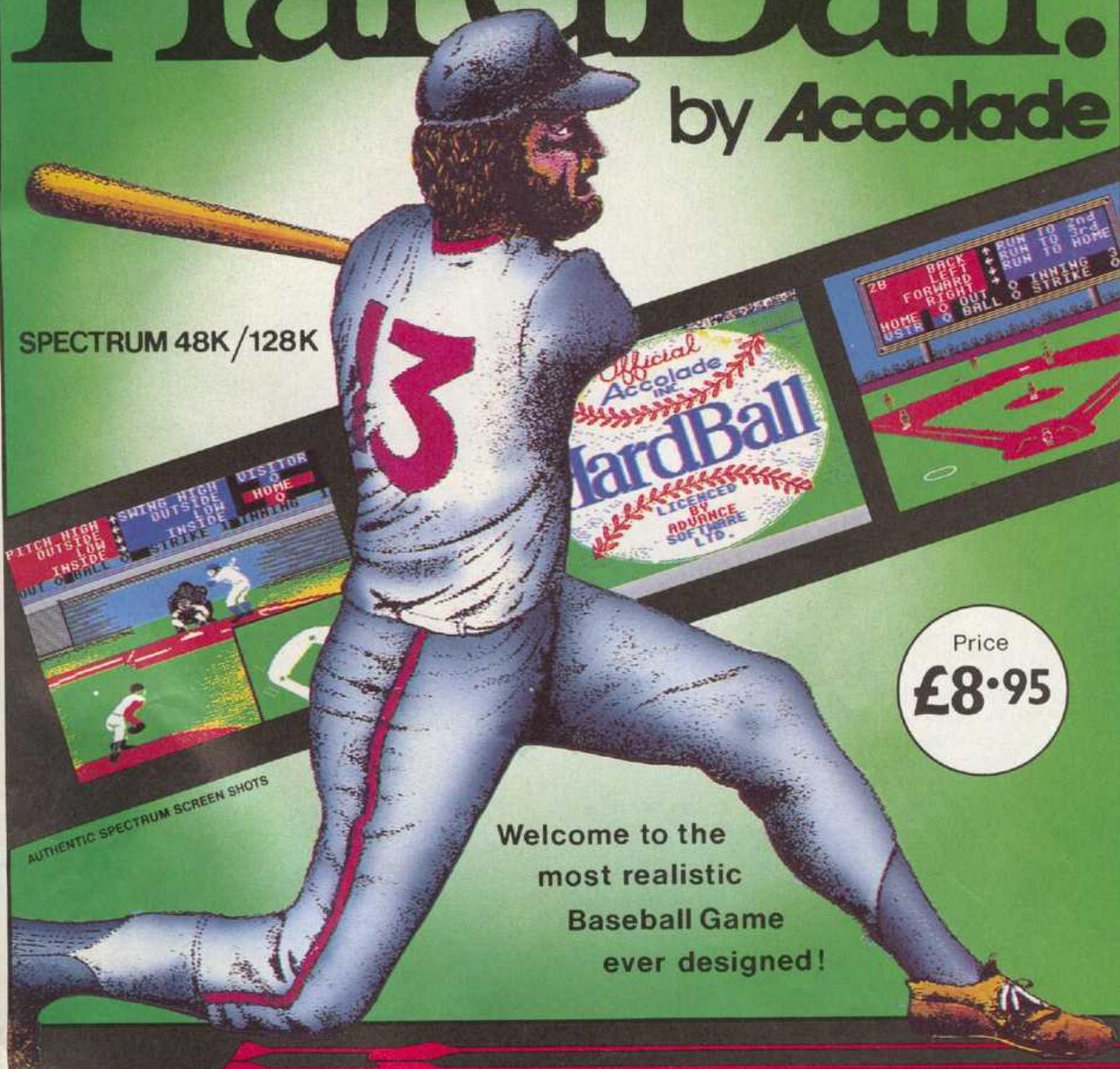
house of the year, I'd be tempted to nominate Piranha, whose **Trap Door**, **Strike Force Cobra** and **Rogue Trooper** all have a good deal going for them in terms of programming skill, originality and playability.

Whatever your interests, the Spectrum has plenty to offer in the way of software - and there's no sign of the flow of original new products letting up.

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The unbeaten Beeb

DUNCAN EVANS ON THE VAST SOFTWARE SELECTION FOR THE BBC B, MASTER 128, AND THE NEW MASTER COMPACT

With the old BBC B being short in the memory department (due to its age you see) the only real practical way to implement languages is to use plug-in Roms. If you have a Master then the situation is somewhat different, but Roms are still the most efficient way of getting access to a new language.

Acornsoft produce standard versions of **Pascal, Lisp, BCPL, Logo and Micro Prolog** at very reasonable prices.

Wordwise

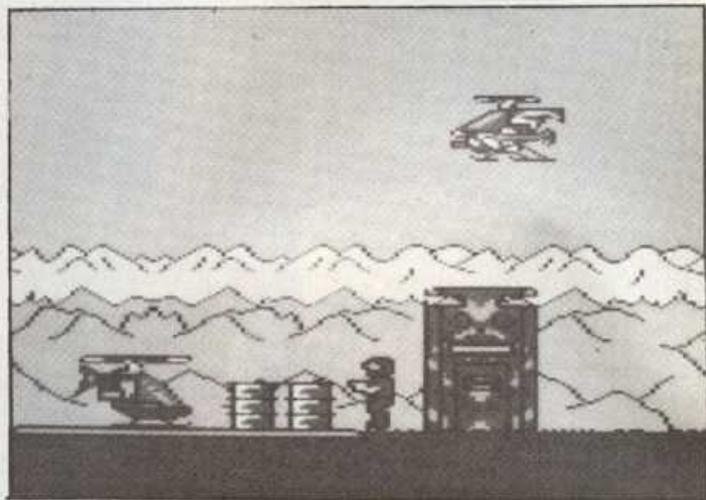
The two best known word processors are Computer Concepts' **Wordwise** (and **Wordwise Plus**) and Acornsoft's **View** with the former offering simplicity and larger document sizes against the latter's more comprehensive functions. Computer Concepts' latest attempt to mop up the undecided and convert existing word processor users is **Inter Word**, undoubtedly a good product but only worth upgrading to if you feel your present system is too limiting.

Now available as a plug-in board is **Mini Office 2** (Database Software) which provides a word processor, comprehensive database, spreadsheet, graphics and communications systems. All the modules are integrated so data from one program can be used in another. For sheer value

for money **Mini Office 2** is unbeatable though if you want a specific application and not the rest then it's worth looking elsewhere.

Moving on to the creativity department, **Artroom** from Clares Micros for the Master series is completely icon based, has a graphics library and supports a mouse, enabling sophisticated pictures to be designed. The illustrations can only be monochrome, the package being designed for dumping said drawings to paper for inclusion in newsletters and the like.

One of the best games out at the moment has to be **Repton 3** (Superior Software) with its combination of fiendish puzzles and arcade precision reactions needed to avoid, trap and kill hatching monsters. The graphics are nothing to shout about but it makes up for this by being horribly addictive. Superior in fact seems to be releasing a good deal of



Stryker's Run. Superior's arcade classic

quality software just now. Witness **Strykers Run**, a sideways scrolling game in which your commando type figure must shoot and bomb his way through the massed ranks of the enemy. With large and colourful graphics (and those on the extended Master versions are even better) this is one of the top shooting games at the moment.

For plain old fashioned shoot 'em ups **Galaforce** (Superior again) may seem like a step backward but

it's so fast and addictive that this is easily forgiven. For BBC owners pained at taunts of 'no Uridium', salvation is at hand with **Psycastria** from Audiogenic Software Ltd. Not particularly metallic looking but good fun for all that.

Arcade adventures are well represented by those old favourites **Knight Lore, Nightshade** and **Alien 8** (all from Ultimate) and newer releases such as **Ravenskull** (Superior again!), **Wizadore (Imagine)** and **Futureshock** (Tynesoft).

The big releases this Christmas have to be Domark's **Trivial Pursuit** (the game of no importance whatsoever). Firebird's **Sentinel** (a staggeringly original and innovative strategy game) and **Cholo**, also from Firebird. Actually Cholo won't be out until after Christmas but it's worth saving up for now, with its **Elite** style roots.

Speaking of **Elite**, if you still haven't got a copy, or you've just purchased your Acorn machine, then it's still worth coughing up the readies for.

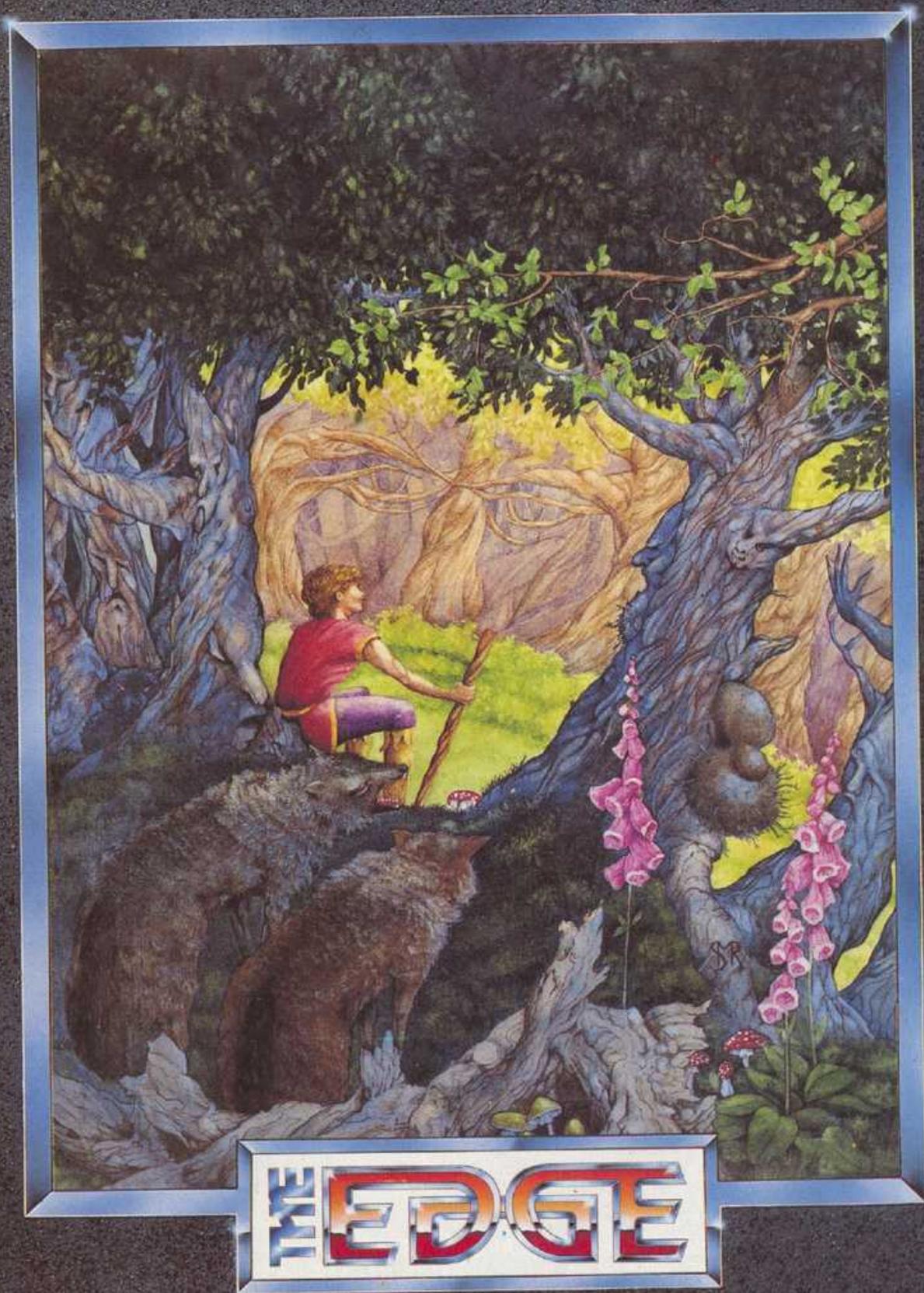
If blasting and arcade adventure thrashes are too much then the range of adventures from Level 9 which include **Snowball, Return to Eden, Dungeon Quest** and the old standard **Colossal Cave**, are just about the best available on the BBC.

If the thought of solving adventures is too much then how about trying your hand at writing them with the aid of **Graphic Adventure Creator (GAC)** from Incentive. A little patience, some careful planning and a dose of imagination are all that is required to produce a worthwhile game.



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Rainbird's impressive OCP Art Studio

Surprising 64

PETER WORLOCK LOOKS AT THE
WORLD-BEATING COMMODORE 64'S
VAST SOFTWARE SELECTION

The Commodore 64 (and the C128, too) boasts one of the biggest software libraries of any personal computer. Whatever your favourite pastime games, programming, or business applications - you'll probably find at least one, and probably a dozen, programs to suit your taste and your budget.

Obviously it is important to list more than a handful of the best programs in each category. What I've attempted to do here is choose the "essential" software - the packages that deserve a place on every 64 owner's collection.

Adventure game enthusiasts are particularly well served by the 64.

To start with, two excellent compilations from Level 9 (distributed by Rainbird) are **Jewels of Darkness** containing Colossal Cave, Dungeon Adventure and Adventurequest, and **Silicon Dreams**, containing Snowball, Return to Eden and The Worm in Paradise. At just £14.95 each, they represent unbeatable value for money.

The entire range of Infocom adventures is available for 64 owners with disc drives and these must rank among the all-time greats. Distributed by Activision, especially worth seeking out is the **Zork Trilogy**, and **Hitch-hiker's Guide to the Galaxy**, while whodunnit fans can test their skills of detection in **Deadline** and **Witness**.

More recently, Rainbird's **The Pawn** is unique in the excellence of its graphics. It's also a great adventure in its own right.

For those who prefer their adventuring to have a taste of role-playing games, there are two outstanding products: **Wizardry**, one of the classic "dungeons and dragons" type games, but I think it has been surpassed this month by Electronic Arts' **The Bard's Tale**, marketed by Ariolasoft.

War gamers should look first to the range of combat games from Strategic Simulations Inc, whose products are marketed here by US Gold.

Traditional games include **Normandy Beachhead**, **Tigers in the Snow**, and **Germany 1990**. My own favourite is a real-time armoured conflict called **Combat Leader** which, after two years of constant play, has not lost its appeal.

On the arcade front, the 64 is unrivalled. Sports simulations start and end with Epyx (again handled by US Gold), particularly the superb **Summer Games** and **Winter Games**.

However, a close contender on the sports field is **Leader Board** from Access (US Gold, of course). This golf simulator is the US and British champion (but don't go near the ST version or you'll never bring yourself to touch the 64 again).

Epyx also produced the more recent **Super Cycle**, a motorbike race simulation that features excellent graphics and non-stop action. But you might consider Mastertronic's superb **Speed King**, nearly as good and a great deal cheaper.

For those who prefer four wheels to two, Firebird's **Revs** is the one to go for - damned difficult to drive, though.

Still on simulations, would-be air aces need check on only two packages, both from SubLogic. The first is **Flight Simulator II** which allows you to fly all over the United States. Wonderful 3D, colour graphics and an unrivalled out-the-cockpit view.

The second is **Jet**, in which you can fly land-based or carrier missions.

If you prefer less simulation and more entertainment, Novagen's **Mercenary** is the game to go for. Part flight simulator, part 3D shoot 'em up, part adventure game, **Mercenary** has no rivals.

Of course, no games collection is complete without a version of chess, and the master on the 64 is **Colossus 4** from CDS. With 3D or 2D display, variable levels from easy to mind-breaking, and just about every feature you could want.

The choice of traditional shoot 'em ups is almost infinite, but Hewson's **Uridium** is probably still out in front. For combined death-dealing and wheeler-dealing, **Elite** from Firebird still lives up to its name.

Your first choice for programming products should be the **Laser** series from Ocean on its IQ label. An extended basic adds essential sound and graphics commands for Basic programmers. **Laser Genius** is a first-rate programming tool for machine-code buffs, featuring assembler, disassembler, monitor, and a useful interactive de-bugger. And if you can't get to grips with machine code, but still need extra speed, there's **Laser Compiler**.

If you'd prefer to experiment with new languages First Software supplies a range including **Pascal** and **Ada**.

Perhaps your only interest in programming is to write your own adventures. In which case there are two outstanding packages worthy of investigation. **The Quill**, from Gilsoft, is perhaps the best known, and it now has a number of extension packages including **The Illustrator** for producing graphic adventures.

Its rival is the **Graphics Adventure Creator** from Incentive Software. Which you choose will be a personal decision - both have their supporters.

Speaking of graphics, again, there are many options, but only two real contenders: the **OCP Art Studio**, from Rainbird, and Wigmore House's **Artist 64**.

My feeling is that any art package these days must be icon-driven and employ drop-down menus and OCP Art Studio gives you these.

However, of **Artist 64**: "it cannot be praised too highly", despite the fact that it does not offer the familiar WIMP environment.

Try to check out both before you buy. But if this is impossible, buy either. You won't be disappointed!

Take a user base of over half a million, which has bought a machine in order to gain access to cheap professional word processing, and it will soon start crying out for extras.

First, the databases and spreadsheets, which mean that more office work can be transferred to the newly acquired micro-cum-souped-up-typewriter.

Secondly, additional word processing features to make up for perceived shortcomings in the bundled software and, thirdly, games, to provide a bit of light relief.

In the 15 months since the launch of the PCW 8256, it (and the 8512) has gained an impressive software base, encompassing just about anything the micro user expects or wants. The inclusion

Business or pleasure

of the CP/M Plus operating system in the machines has ensured that a huge range of - mainly business style - programs has been sitting waiting for conversion to 3 inch discs. Those much-fabled 'market forces' have done the rest.

The stampede to add databases, spreadsheets, accounting programs et al on the PCWs was largely pioneered by New Star Software, headed by ex-Amsoft boss William Poel. New Star took on a considerable number of ageing CP/M products, and slashed the price to one more appropriate to that of the machines.

It would be impossible to list New Star's catalogue here, but a program worth looking out for particularly is **The Cracker**, a versatile graphic spreadsheet (which you'll probably find rather eccentric if you've used micro spreadsheets before).

On the database front, New Star is also worth pursuing, but **Cambase**, from Cambrian Software Works, is a powerful tool and easy to get into.

Sagesoft has produced accounts/payroll packages - **Sagesoft Popular Accounts** and **Sagesoft Popular Payroll** - for the PCWs, which are easy to use and should meet most people's needs.

Wordstar

All the companies mentioned above have other business orientated products on their books, if you wish to look at more specialised programs.

Most first time word processor users will find **Locoscript** more than adequate for their needs. It's simple to use and organise and has most facilities you would want for simple documents.

If you're used to word processing at work, you've probably used **Wordstar**,

CHRISTINA ERSKINE DISCOVERS THAT THE BEST AMSTRAD PCW SOFTWARE NEED NOT BE ALL WORK AND NO PLAY

which is available on the PCWs, either in the form of **Pocket Wordstar**, from the original manufacturer Micropro, or **NewWord**, from New Star, which is billed as an 'upgrade' to Wordstar, and was written by the Wordstar authors.

If you've upgraded to the PCW from, say, a Spectrum or CPC, and are used to **Tasword**, there is **Tasword 8000** from the same company. Here the editing commands are easier to grasp than **Wordstar**, but it's not as fast.

Happy with **Locoscript**, but missing some of the additional features such as mail merge, word counts or spelling checkers? Here again the independent companies have been busy. Arnor's **Prospell** is a spelling checker which will work with most word processors on the PCW as well as **Locoscript**. The dictionary can be altered and updated to take account of unfamiliar words you use regularly.

However, **Locomotive Software** (**Locoscript** author) and **Amsoft** have now rectified original omissions with **LocoMail** and **LocoSpell**. Since they are designed specifically for **Locoscript**, both the mail, merge program and the spelling checker are particularly simple to use.

A quirky product which fills some more specialist areas is **AnsibleCheck** from **Ansible Information**. This comprises an indexing facility, a word count, and most

fascinating of all, a vocabulary checker, which will tell you which words you have used most often - this is sometimes an eye opener!

The PCW machines were never meant to play games, but that hasn't stopped the likes of **Ocean**, **The Edge** and **Digital Integration** from having a go.

Personally, I would recommend five 'best buys' here. On the arcade adventure front, go for either **Fairlight** (**The Edge**) or **Batman** (**Ocean**). Both have the same style of detailed graphics, so it will largely depend on which storyline you prefer.

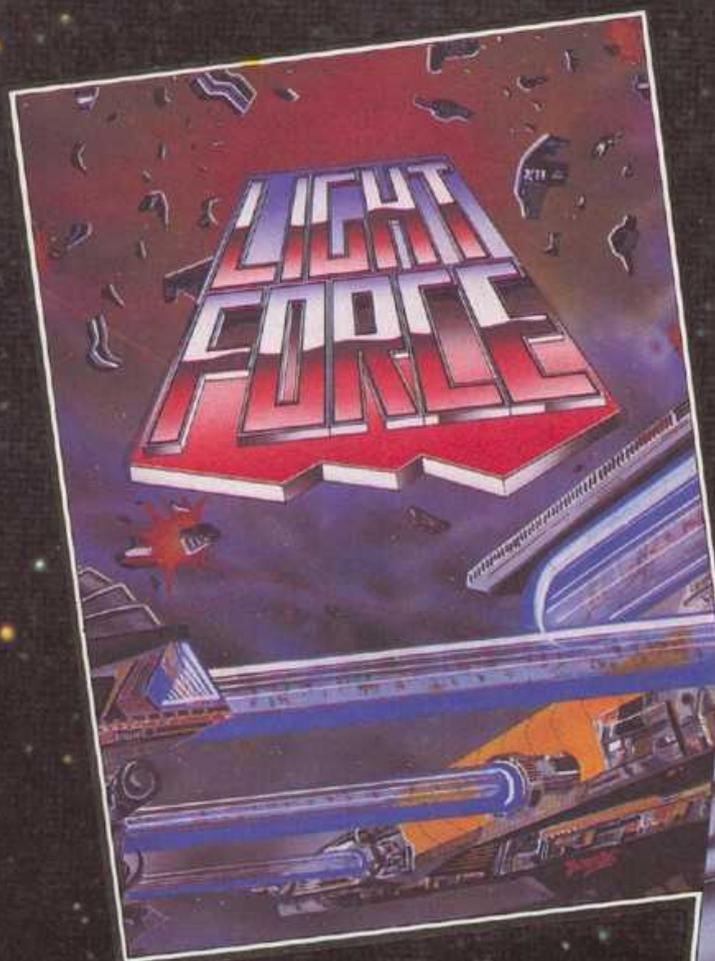
For adventures, you really can't do better than **Infocom's** range, and that oldie-but-goodie, **Hitchhikers' Guide to the Galaxy**. If you've already given up on **Hitchhikers**, most of the rest of the **Infocom** series is available. And if you want to buy British, there's **Jewels of Darkness**, the Level 9 middle earth trilogy, now published in one package from **Rainbird**.

Scrabble

Flight simulators are decidedly thin on the ground, but **Digital Integration's Tomahawk** is a good addition to anyone's collection, and has the distinction of being the only helicopter simulation for the PCWs, while **Mirrorsoft's Strike Force Harrier** is worth a look.

Board games have by and large translated well on to the PCW, and **CDS's Colossus Chess** is a particularly powerful and flexible package. However, my star buy for this Christmas is **Leisure Genius's Scrabble** implementation. It's the best of all the micro Scrabbles so far, it looks gorgeous, it plays a mean game, and will have you up until all hours trying for that elusive 50 point bonus. ◀

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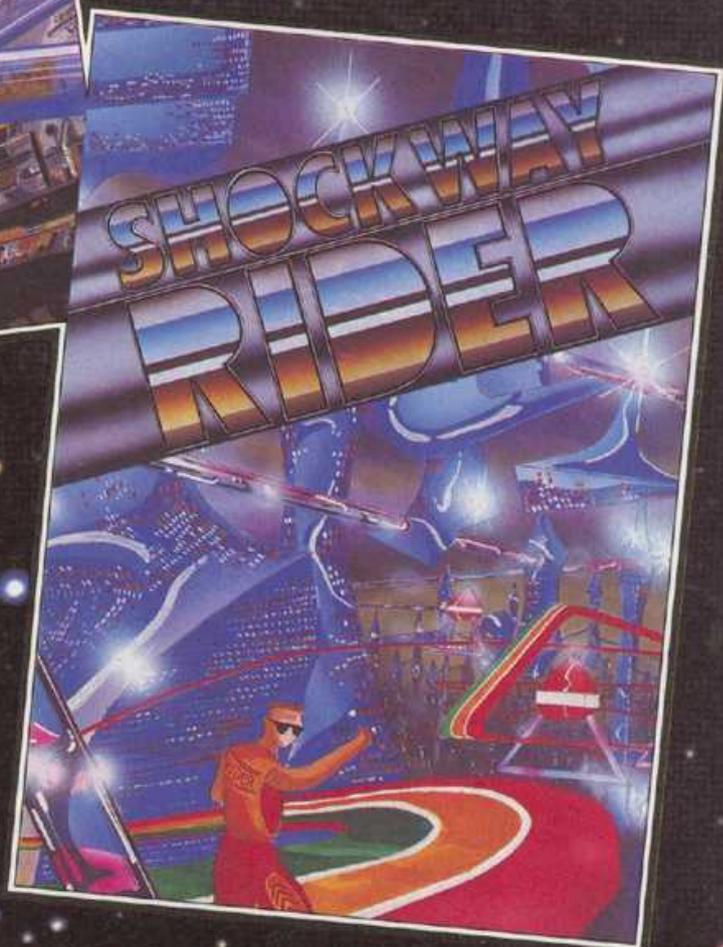


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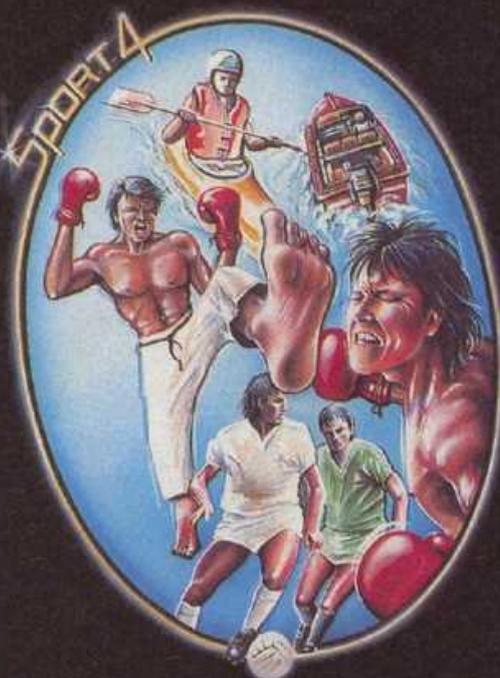
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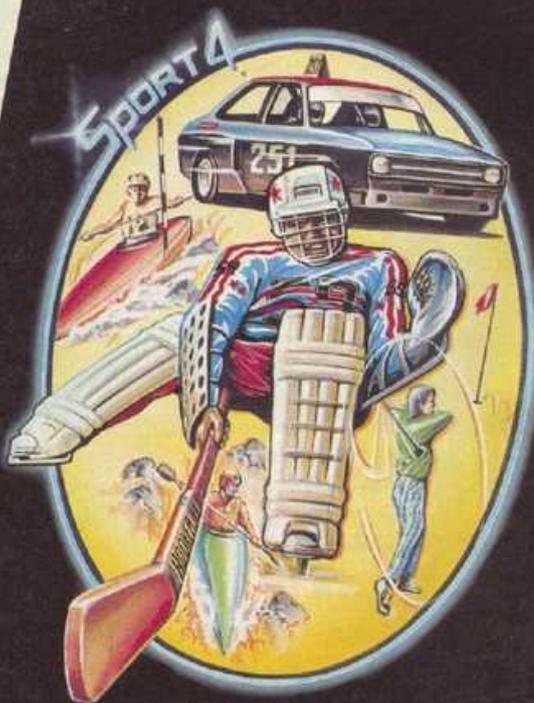
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FirST among equals

DUNCAN EVANS ON SOFTWARE FOR THE MOST IMPRESSIVE MACHINE ON THE HOME MARKET, THE ATARI ST

If your ST is intended for business use then there are many packages available based on very well known products. **VIP Professional** (VIP Technologies) is an integrated spreadsheet, database and graphics program which has all the features, and more, of **Lotus 1-2-3**. Not only is VIP Professional completely compatible with Lotus 1-2-3, but the latest version also incorporates all the facilities offered by Gem.

The other package with famous roots is **dBMan** (Verasoft), a **DBase III** clone which allows you to create and customise databases. If you are desperate for the official product then there's always its predecessor, **dBase II** by Ashton Tate, running under CP/M and available through First Software.

For stand alone products of a similar ilk, with data being transportable between them, **KSpread** and **KGraph** (business charts and graphics) from Kuma Computers are available.

Although the ST is bundled with a word processor it does have its limitations. Alternatives range from **KWord** (Kuma), **Haba Writer 2** (Haba), **Colour Writer** (Robtek), **Boffin** (From Software Punch, featuring graphics capability), **1st Word Plus** (the upgraded version allowing use of graphics, from GST) up to **Microsoft**

Write (Microsoft) and **Bos Writer** (BOS) a Wordstar-like package for £460.

Given the machine's colour and graphics abilities, games for the ST always promised to be something special. An oldie but still the best in the arcade adventure category is surely **Brataccas**, from the ex-Imagine people Psygnosis, featuring large and wonderfully animated characters, a cut away display of buildings' interiors, and set on the prison world of Brataccas. Following in a similar vein is **Time Bandit** (Microdeal) which admittedly has less impressive graphics but they are more colourful. At first glance Time Bandit appears to be just a shooting game but in order to solve the mysteries of the sixteen time gates some thought must be paid to puzzles which are almost adventure like. Perhaps the best feature of the game is the two player mode where the players each have a small screen containing their Bandit displayed simultaneously. To co-operate or to shoot the other player in the back then adds a little spice to the proceedings.

In the arcade department **Starglider** (Rainbird) currently holds sway with its 15 second sampled music track and 3D wireframe graphics. The action comes thick and fast as you tear along the surface, or above it, of Novenia blasting away with lasers and TV guided missiles at the invading Ergon forces.

Cutting a swathe across traditional boundaries is the **Mercenary Compendium** from Novagen Software, which includes elements of arcade action, adventure puzzles and flight simulator graphics. Those graphics may not match Starglider's but for sheer speed and smoothness Mercenary is in a class of its own. As a pilot who is suddenly stranded on the Planet of Targ your task is simply to escape. However, Targ Central City is half under the thumb of the invading Mechanoids (with a name as corny as that



Starglider from Rainbird

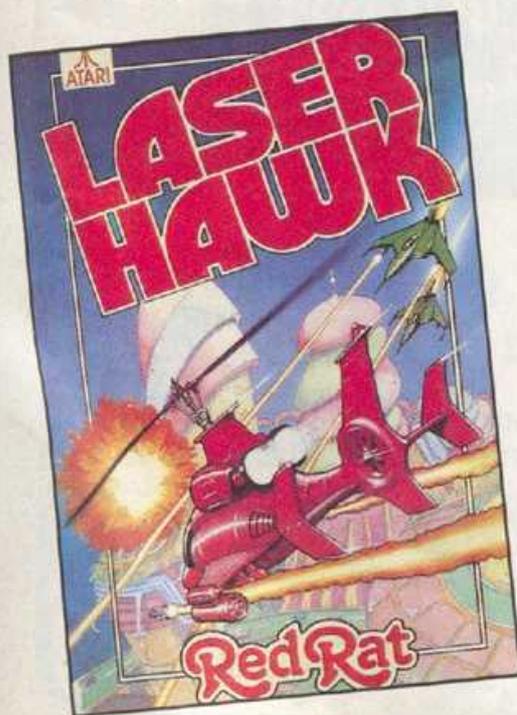
they have to be the bad guys) and half in the control of the resident peace loving Palyars. In order to get off the planet you've got to acquire money by performing services for either side.

If you played Spy Hunter or Joust in the arcades you can now relive those days again with **Major Motion** from Microdeal and **Joust** from Atari. While Major Motion looks as good and plays as well as the original it does vary further down the course. Which is more than can be said for Joust which is a carbon copy of the arcade game. And that's no bad thing.

Going back further into the mists of time shoot 'em ups in the tradition of, "Me laser base. You diving aliens. Kill, kill, kill" are represented by **Fire Blaster** from Paradox. Simple and unpretentious stuff.

Killing of a different kind can be had in **ST Karate** (Paradox again), although the excuse this time is one of trying to attain mystical enlightenment - Millwall supporters take note, the next time you're hauled in front of a judge you can always say, "Sorry your honour but I 'ad to gob 'im to achieve mystical enlightenment."

A cure for all this violence can be had in the form of sporting simulations. Top of the pile and by far the best game on any computer this year is **Leaderboard** from US Gold. A golf game sure, but a golf game of such brilliance that the competition fades to insignificance in comparison. The graphics of golfer as he plays his stroke, the fairway, trees, bunkers, lakes, rough and greens, and the ball disappearing into the distance are of arcade quality. Leaderboard is further enhanced by the



provision of a Tournament disc (for a reasonable tenner) which provides four even harder courses to enjoy.

Moving into the athletics field the main contenders are **Arena** (Psygnosis) and **Winter Games** (US Gold). Arena has the more conventional track and field events and in fact much larger and better graphics for the competitors. Having said that they aren't too well animated whereas as the smaller folk in Winter Games are. Also Winter Games easily takes first place in the sound department by providing a tune for every event and given that most of the events are portrayed against a different scene there is more variety in the graphics. The snow covered trees and running river in the Biathlon are especially good.

Exhausted by all these exertions you can always turn to something more cerebral and roll out the thinking games. **Chess** (from Psion) comes top of the pile in this department, with its clear 3D display, host of playing options, very strong game play (even in the bottom third of its 28 levels) and the provision of fifty classic games on the disc to analyse and play.

A lot of thinking is necessary to solve **The Pawn** (Rainbird) especially since some of the solutions don't follow hard

and fast logic. Still, with a decent parser, drop down menus and the best illustrations to be found on any adventure game **The Pawn** ranks as a must for any student of the genre.

Cousins to the adventures, and far more adventurous in concept are those strange beasts known as role playing games (RPGs). Now, this type of game has as much to do with the actual hobby of role playing as picking your nose. Selecting and provisioning a party and occasionally killing things are the nearest they get to the real thing.

Rat attack

Rogue and **Phantasie** (both imported by Silica Shop) are variations on the usual theme of find Important Treasure/Kill Mr Evil but whereas Rogue only deals with one character, Phantasie lets you have up to six. Rogue has the better graphics generally (although for the fight scenes the adversaries in Phantasie are much larger and colourful) and the faster gameplay but overall Phantasie has more variation and requires more thought.

Word for Word (Silica Shop import) rounds off the 'Ugh, I need my brain for this' department. While it initially just looks like a poor Scrabble clone there is

actually the provision for completely redesigning the playing area, the number of tiles and points distribution in order to produce a set-up identical to Scrabble.

If you have more of an artistic urge then **Degas Elite** (Batteries Included), the follow up to Degas, is the best in that field, while **Fleet Street Editor** (Mirrorsoft) holds sway over the desktop publishing market, enabling megalomaniacs of every persuasion to produce their own magazine/newsletters.

Red Rat Software is one of the few UK companies actively supporting the 8-bit Ataris with the titles including **Screaming Wings** (a fast and furious 1942-style game), **Domain of the Undead** (action in the 'Ghosts & Goblins' mode), **Space Gunner** (a sort of Jet-Pac meets Defender), **Laser Hawk** (Scramble variant), **War Copter** (Raid on Bungeling Bay) and **Technicolour Dream** (a graphic art utility capable of stunning effects). Not only does Red Rat do a good job in supporting these neglected machines with new product, the company also does it at a bargain price; games on disc start at £4.99 while cassettes start at £2.99. Along with recent Mastertronic titles such as **S.W.A.T.**, Red Rat's products should help to make it a merry Christmas for Atari 8-bit owners.



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1986 was the year in which Amstrad CPC software really grew up, with a host of new titles setting new standards, particularly in the field of multi-colour graphics.

Perhaps the most impressive applications package available is **AMX Pagemaker**. Designed to work with the AMS Mouse, Pagemaker allows you to produce newspapers, posters, leaflets - in



Sorcery - Virgin's classic

arcade/adventure gameplay; the first set on an alien planet which you must scavenge for abandoned technology, the second set in underground labyrinths inhabited by fierce dragons. Both presented a considerable challenge as well as displaying the CPC's graphics abilities.

Cauldron 2, from Palace, was another arcade adventure which used the Amstrad's colour palette to the full. The

CPC gets in a spin

fact any kind of "graphic document" - in much the same way as desk-top publishing packages on more sophisticated machines like the Apple Macintosh. Operating in the CPC's highest resolution, mode four, Pagemaker offers word processing features, preset of user defined typefaces, a graphic design routine, cut and paste, and, with the AMX Video Digitiser, the ability to capture video pictures and include them in your layouts. The Pagemaker system works on the 6128, or 664 with extra 64K RAM, or 464 plus 64K RAM and disc drive.

Equally impressive in its own way is **Mini Office 2** from Database.

This all-in business program offers a simple wordprocessor, database, spreadsheet, label printer, business graphics pack, and comms routine. At £14.95 on cassette and £19.95 on disc you might be excused for not expecting too much, but in fact **Mini Office 2** is so comprehensive and easy to use that it could well satisfy all your requirements for "serious software" in one go.

Ocean's IQ utilities filled the bill for frustrated programmers, with **Laser Basic** offering a huge selection of commands making it easier to program sounds, sprites, interrupt-driven animation, screen backgrounds and game elements such as collision detection. For the more advanced programmer, **Laser Genius** includes a machine code editor, assembler, monitor and analyser, which together provide a complete development package.

Music

On the musical side, **The Music System** from Rainbird proved that Arnold can be as tuneful as many another micro; developed from the Commodore 64 version, **The Music System** includes a very sophisticated window/icon/menu system, which allows sounds to be defined, arranged and chained to produce complex tunes with a four-octave range and a 1000-note limit. The **Advance Music System** on disc, also includes a feature which allows short tunes to be linked

SPINDIZZY SET THE STANDARD FOR OTHER GAMES MACHINES TO BEAT - BUT THE AMSTRAD CPC HAS MUCH MORE TO OFFER THAN GAMES

together into massive compositions.

Notable among graphics packages is CRL's **The Image System**, which in addition to the normal line/circle/brush business gives you the capability of warping screens into 3-D Top of the Pops-type images. For lovers of the real hard stuff, Campbell's **Masterfile** for the 6128, and 464/664 with extra RAM, is now in its third revision; it's now a completely variable data filing system with user-definable field lengths and formats, data sharing between files, complex sorting and increased operational speed.

Needless to say, the CPC's are also well supplied with language packages, notably from HiSoft with the Pascal 80, Forth and Turbo Basic programs. Last but by no means least, Incentive **Graphic Adventure Creator**, which allows you to write and illustrate your own complex adventure games, is as good on the CPC's as it is on the BBC, Commodore 64 and so on; a compulsory purchase if the lure of adventure is irresistible but your machine code programming isn't up to it.

On the games front, most impressive is the way in which the CPC's high-quality monitor has been exploited to the full in a number of impressive arcade games. The first I remember being knocked out by was Virgin's **Sorcery**; since then, of course, we've seen **Sorcery Plus**, much the same animated ghoulie-zapping and problem-solving but with a larger playing area.

Activision invaded the Amstrad games market in a big way, making a considerable impact with the Lucasfilm titles **Rescue on Fractalus** and **The Eidolon**. Both games feature a form of semi-random background generation using fractal graphics, together with a complex

bouncing pumpkin, animated skeletons and cackling witches added to the spooky atmosphere created by Richard Joseph's remarkable music.

Ultimate-style perspective graphics games also enjoyed a revival, with Imagine's **Movie** demanding some clever deductions and swift reactions as your private eye investigates the headquarters of a notorious criminal.

On the simulation side, nothing could really match Digital Integration's **Tomahawk**; complex controls, fierce combat and realistic graphics add up to a really impressive helicopter simulator which is just like the real thing - only safer.

Zoids, from Martech, proved that the Amstrad could outdo any other home computer when utilised to its full potential; this very complex graphic adventure/strategy/shoot-'em-up puts you in control of a powerful robot creature, using a clever WIMP system to represent your combat status as you make your way across Zoidstar.

Spindizzy

Best value of the year was probably Electric Dreams' **Spindizzy**; based - whatever anyone else says - firmly on the coin-op classic **Marble Madness**, **Spindizzy** features colourful, surreal landscapes of causeways, planes, slopes and pitfalls, and pits you in charge of a spinning gyroscopic probe searching out diamonds while racing against the clock.

Ones to look out for before Christmas; Rainbird's **Starglider**, which looks like being a smash hit on every format from Atari ST to Amstrad CPC. Wire-frame animation of the most impressive kind, combined with fast action shoot-'em-up and just a touch of strategy to test your brainpower. Also **The Pawn** on the 6128 - maybe??!

Amstrad CPC games have never looked so good. In the coming months, we may see even more impressive games and utility programs as the potential of this powerful machine finally becomes more widely recognised. ◀

Best on a budget

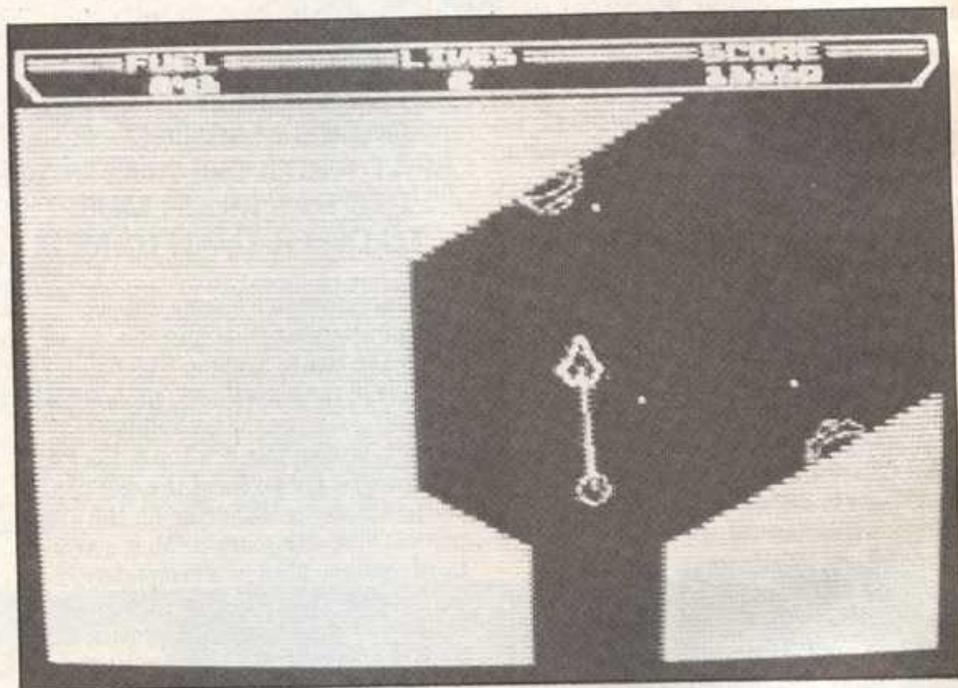
JOHN COOK TAKES A LOOK AT THE CHEAP GAMES WHICH CAN CHALLENGE THE CLASSICS OR MAKE YOU REACH FOR THE SICKBAG

No mistaking - 1986 was the year that budget software came good and that's something that has had the major full price houses quaking in their boots. To quote the MD of a leading games company, "they seem to be producing full price product at budget prices." Specifically, he was talking about Mastertronic, who have been consistently taking a 20% plus market share throughout the year, compared to Firebird who tend to hover around the 10% mark. With the other budget labels (and at one time this year it seemed like there was a new one every week) taking up to 20% or more, this has had a profound effect on the big boys - usually retaliating by setting up labels of their own.

Americana was one such effort from the US Gold stable, but its output has been patchy to say the least. One diamond amongst the dung, however, was **Go for the Gold**. A straightforward sports simulation - but with frills such as speech. A great little addition to any Commodore owners budget collection.

Elite managed to get into the budget playground by buying up rights to old games and re-releasing them as £2.99 Classics. Such games as **Microsphere's** Skooldaze could be picked up on this label - hello good buy.

Bug Byte have now resurfaced as the budget games arm of the **Argus Press Software** group - although it's true to say that they still haven't achieved the consistency of the established labels. One of the better releases was **Ollo** (with **Ollo II** on the flip side) a headbanger of a



Firebird's Thrust - best cheapo of the year?

shoot 'em up on the Commodore 64.

Previously something of a hit in Australia, this was home grown in the Antipodias by Kyle Hodgetts, who is in the middle of writing an excellent Commando variant **Star Trooper** for **Argus**. This won't be a budget release, alas, but is well worth looking out for. **Bug Byte** are also releasing some of the **Argus Press** back catalogue at the £2.99 price tag. The much slagged, but worthy **Aliens** is well worth the money, and **American Football** may not be the best around, but would grace any Superbowl party.

The budget hit of the year - if not in sales then certainly media impact - must have been **Firebird's Thrust**, which started out on the 64 and then spread less successfully to other formats. Drawing on elements from those golden oldies **Gravitar** and **Lunar Lander** it involved manoeuvring a ship around tortuous caverns, picking up a free swinging cargo and then attempting to get it back to the surface. To my mind the single most exacting game I played this year. If you

haven't already acquired the Commodore version, then this is a must for Christmas. On BBC, released by **Superior Software** at a far from budget price, it is still worth the redds, but sad to say the Spectrum, Amstrad and Atari conversions aren't quite so good. Still, at £1.99, well worth a walk down the shops... assuming you're not living in the middle of the Gobi desert that is.

Thrust II however, still in early pre-production stages, seems to play much better on other formats. Due out in early December, this is going to be another for the Christmas stocking if indications are anything to go by.

The other **Firebird** budget hit this year is an example of a curious phenomena that seems to be unique to this particular market. The 'it's so bad I must buy it' syndrome. **Ninja Master**, so bad it was turned down by at least one other major label, did very well indeed in the middle of this year. Why such a yukky piece of



Mastertronic's Bump Set Spike

continued on page 43 ▶

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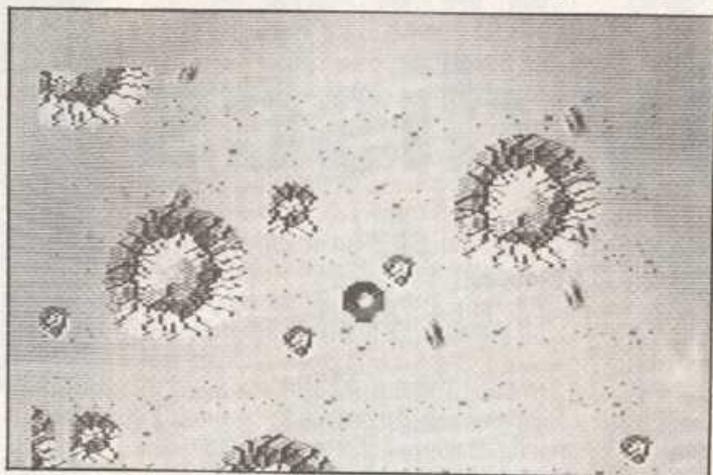
◀ continued from page 40

tat should do anything but plummet into the depths of obscurity is one of life's little mysteries - but just goes to show that in the budget scene, anything can happen. Take Mad Nurse, for instance. On 64, again from Firebird, the main thread of the plot has you controlling a nurse rushing around three levels of a hospital nursery, picking up babies and putting them back in their cots, before they stick their cute little fingers in an electric socket or drink the contents of one of the many specimen bottles scattered around the ward. A sure-fire hit... 200 hundred million years of human evolution has been leading up to this, you know.

Other Firebird Silver Range releases up to Christmas include Rebelstar on Amstrad (an excellent little strategy game), Microrhythm on 64, something that must be the best value music utility ever, Chicken Chase (re-released on major formats from the defunct Super Silver label), Gunstar, billed as a fabby Spectrum shooter and Park Patrol, an

Activision US game that never previously made it to this side of the water.

Mastertronic still dominate the business of course - although it will be interesting to see if this continues into next year. Big hits of the past year that are still worth getting hold of include any of the Magic Knight series by David Jones, arcade adventure action Master of Magic



Olo - Bug-Byte headbanger

by the Darlings (more of them later) and Storm, the first of the Gauntlet clones to make it to the market (out on Amstrad and Spectrum). A look at any of these titles will show you how far budget

software has come from its humble beginnings. Great stuff, great value.

Christmas highlights from Paul Street include Flash Gordon (Commodore 64) and Terminus (Spectrum). Go for it.

By contrast, Alpha Omega, the CRL label, consistently failed to produce anything of note, while the revamped, repackaged Sparklers didn't - although Mad Doctor is a must for any Mel Brookes fan. These minor labels can occasionally come up with the goods 'though - a great example of which is Survivors from Atlantis. Boulderdash type strategy with an original twist - highly recommended.

Finally, one to look out for the future. Code Masters must be the newest budget label to hit the streets, yet it has a pedigree as long as your arm. Run by the Darling clan - the people behind so many of the Mastertronic hits - games such as Terracognita, BMX Simulator and Red Max suggest they may well be able to repeat that success on their own. But whatever happens, you can be sure that '87 is going to be an interesting year for players on a budget.



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Head to head with floppy discs

CHRIS JENKINS ON THE DESIGN AND MANUFACTURING METHODS AFFECTING YOUR CHOICE OF DISCS

In the heat of decision over which software package to buy, don't forget that your choice of blank magnetic media can be equally important. Buying cassettes is relatively easy; any specifically packaged C15 or C30 intended for computer use is likely to have been manufactured with a fair degree of quality control, to the same standards as ordinary audio tape.

Choosing discs, though, demands a greater standard of quality. If you use business systems which operate on 8 inch discs, or home systems operating with 5¼, 3½ or 3 inch diskettes, you'll want to be sure that the data you store can be retrieved efficiently and reliably.

Whether you use discs for word processing, program storage, saving sound samples or producing backups of tape data, the decisions are the same; branded, unbranded, single- or double-sided, single- or double-density, and so on. But many

computer users don't even know how discs are manufactured and tested, so the decisions become more difficult.

Like cassettes, discs consist of a coating of metallic oxide covering a plastic base. In most cases, when bought the discs are completely free of information; the disc formatting process, which varies according to the disc operating system of your computer, lays down a "guide track" for the disc drive to arrange information around. This is why most discs are referred to as "soft sectored" - although manufacturers such as Memorex supply IBM-format discs pre-formatted if you want to save time.

Having formatted your disc, you'll want to store some data on it! This, of course, is done by magnetising the oxide particles on the surface. Clearly the formulation of the oxide is of paramount importance to the efficiency of the disc, so much so that some manufacturers go to the effort of

developing their own formulations. Maxell, for instance, uses an iron/cobalt crystalline structure on the Epitaxial range. This is claimed to give a regular structure, the thickness of which can be easily controlled to give an unusually thin, efficient recording medium.

The thickness of the magnetic coating is only one micron; it's bound onto the polyester base material in such a way that the tendency of the particles to align themselves to the magnetic poles is removed. While not a requirement for audio tape, this is crucial for computer discs to remove unwanted "modulation" effects.

Circles

The particles on the disc are magnetised in concentric circles, alternating between north and south polarities. Between each circle, each of which contains a number of tracks which can hold one bit of information, you should be able to see a polarity transition band - if you ever remove a disc from its sleeve to examine it.

High density discs simply have more closely packed transitions. The result is that you can store more information on one disc, assuming that your computer's disc operating system allows you to do so.

Floppy discs are so named because the disc itself is flexible. The jacket protecting it, though, has to be rigid enough to keep the disc from harm. Memorex discs, for instance, are supplied with jackets which are along the entire length of the edge, rather than just spot-sealed at several points.

Apart from preventing dust and other undesirable objects entering the jacket, this also prevents excessive warping. Memorex discs also include a synthetic





fibre liner which cleans and protects the disc as it rotates in the drive, and an anti-static lubricant to prevent build-up of dangerous charges, as do most other good makes.

Just as important as precision in the manufacturing process is the checking process which comes before packaging. Not all users realise that there is no difference between a single- and double-sided disc; both sides of the disc are always coated, and in theory it would be possible to flip over any 5 1/4 inch disc, cut a new write protect notch and use the other side. In practice, however, the reason that you pay more for a double-sided disc is that both sides, rather than just one side, have gone through a thorough testing process. A typical testing process will write a test pattern onto a disc, then feed it back and compare it with the original, checking for missing pulses, extra pulses, signal resolution, and often the replacement of the centre hole and write protect notch, too.

Unsatisfactory discs are discarded, while perfect ones are passed through a de-gaussing field to erase them completely, then packed.

Surface

In the case of 5 1/4 inch discs, the read-write slot is open, exposing the disc surface. This means that you have to take extra care with this type of disc, while 3 1/2 and 3 inch discs are more durable. They have sliding metal autoshutters which protect the disc when it is outside the drive, and only move out of the way once the disc is safely inserted. 3 1/2 inch disc design owes a great deal to experience gained in precision plastic moulding of video cassette cases; here other problems

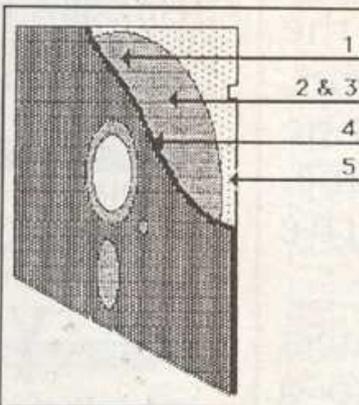
arise, though, such as binding the disc to its hub and ensuring that disc rotation is smooth.

Although the 3 1/2 inch system designed by Sony is becoming the standard for many home computers, there seems to be no end to the work being carried out to improve data storage methods for home and business computers. Maxell, for instance, now produces the MD2-EH 5 1/4 inch disc, which has a capacity of 6.5 MB, four times that of conventional 1.6 MB high density discs. Also on the way is the 2 1/2 inch Ultramini, resembling the 3 1/2 inch disc we know, but designed to be used with portable computers. Further off is the optical disc cartridge, resembling an encased audio compact disc. This will be able to store 2.6 gigabytes of information in 16,000 track per inch format; compare this with the 96 TPI of a conventional high-density disc.

There are over 300 different disc drives on the market at the moment, so it's impossible to give precise guidance on what discs to buy. However, now that we know the background to disc manufacture we can make a few general points.

Branding

Firstly, unbranded discs. Many companies, such as Disking, sell unbranded products, often loose-packed. Don't be afraid to go for these if they represent a saving, especially in bulk purchases. Most unbranded discs are manufactured by well-known companies

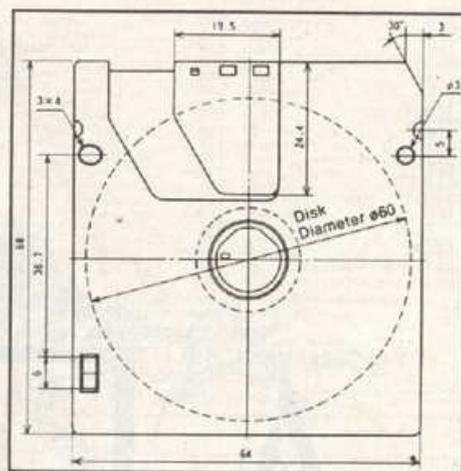


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leaving discs in direct sunlight, and so on. Armed with a little commonsense and some knowledge of the high technology which goes into disc manufacture, you should be able to approach your disc drive with more confidence in future!

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you don't require the extra storage, don't pay for it!

Lastly, look out for the guarantee provided with the products. Despite all the rigorous testing, it's always possible that a fault will develop, and most magnetic media manufacturers now offer very good coverage. Maxell, for instance, offers an unlimited guarantee of replacement except in case of intentional damage for any disc which proves to be faulty, and many other companies are now sufficiently confident of their quality control standards to make similar offers.

As a footnote, don't forget that whatever disc you buy, it should be treated with respect; investing in a good storage case is wise, and you should remember little points like writing labels before sticking them on the disc, avoiding

to the same high standards as are applied to branded products; like the cereal at Saverite, which is just the same Wheaty Crunch Snackies in a plain box.

Secondly, be aware of the capabilities of your disc drive. If you have a single-headed drive, there's no point buying double-sided discs unless you're prepared to flip them over. Conversely, if you have a double-headed drive, single sided discs may give problems if you end up with a faulty unchecked flipside.

Bear in mind the density of the discs you need. 80-track, high-density, 96 TPI (tracks per inch) all mean that the data storage capacity is higher than normal. If



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Tape Commands

Colin Speed

This program adds the commands listed below to Spectrum Basic.

Once the listing has been typed in and debugged, entering *Randomise Usr* 63000 will activate the commands. Beware using *Run*, *Clear* or *New* as they will turn off the extension.

Hsave saves a Basic program as a headerless file.

Hload loads headerless Basic programs.

Hload Line xx loads headerless files and jumps to line *xx*.

Hsave Code a,b saves code at address *a*, length *b*, as a headerless file.

Hload Code a,b loads headerless files at address *a*.

Hsave Screen\$ saves the screen as a headerless file.

Hload Screen\$ loads it back again.

Vsave n\$ saves all variables as a Basic file under the filename *n\$*. The

variables can be reloaded using *Merge n\$*.

PSave n\$,a,b saves program lines *a* to *b* with filename *n\$*. Useful for saving individual subroutines from within a larger program.

PLoad n\$ loads Basic program *n\$* and returns to Basic. Works on all Auto-run programs.

Read is a standard header reader. Exit by pressing space.

List a,b lists program lines *a* to *b*, ignoring any control characters. Also any numbers which have been disguised will have their true values shown.

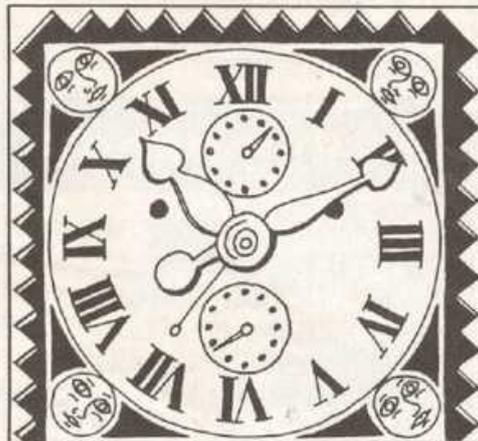
List 1 a,b is the same except that the address in memory of each line is displayed.

Pron diverts output from *List* and *Read* to the printer.

Proff returns output to the screen.

When any of the new save commands

is executed the normal prompts are displayed. *Waitoff* causes them to work immediately while *Waiton* returns the condition to normal.



```

10 CLEAR 62999: LET add=63000
20 FOR n=1 TO 81
30 READ a$:a: LET tot=0
40 FOR f=1 TO LEN a$ STEP 2
50 LET x=16*(CODE a$(f)-48-7*(a$(f)>"9
"))+CODE a$(f+1)-48-7*(a$(f+1)>"9")
60 POKE add,x
70 LET tot=tot+x
80 LET add=add+1
90 NEXT f
100 IF tot<>a THEN PRINT "ERROR IN DAT
A - Line ";n*10+190: BEEP .5,0: STOP
110 PRINT AT 0,0:"LINE ";n*10+190;" OK"
120 NEXT n
130 PRINT "DATA OK"
140 SAVE "TAPE"CODE 63000,1845
150 RANDOMIZE USR 63000
160 PRINT "Now you can try the new com
mands"
200 DATA "2AB25CA7ED423802CF152A3D5C112
CF6732372C92137F6",2369
210 DATA "E53A3A5CFE0B2861ED7B3D5C3333F
DCB017E200D2A5D5C",2309
220 DATA "225F5C212CF6E5C3B71221E1FCF07
E00FE0C2808FE1028",2682
230 DATA "04FE142008CB462807212CF6E5C37
D1BCB4E28133A3A5C",2088
240 DATA "32815C2311425CEDA0EDA0AF12C30
6F7CD0313FD3600FF",2705
250 DATA "2A595CDA711212CF6E5C3B4122A5
D5C2B7EFE2A2096DD",2652
260 DATA "21F4FCDDCB007E208C2A5D5CE5DD4
600DFCBEFDD23DDBE",3330
270 DATA "002015E710F4FD3600FF2A5D5C225
F5CE1DD6E01DD6602",2436

```

```

280 DATA "E9480600DD09DD23DD23E1225D5C1
8C5DFFE0D2809FD36",2564
290 DATA "000BFE3AC237F6FD3600FFFCB017
EC0ED7B3D5C212CF6",2991
300 DATA "E321B712E5C3761BED7B3D5C212CF
6E3FD3600FFC3761B",2995
310 DATA "21E2F0CB86CBCEFEAA2003E7180CC
B8FEFAF2006CB06E7",3427
320 DATA "CD7A1CCDE0F621E2FCDD210040110
01BCB4E2021CB4628",2562
330 DATA "0DCD41F8C5C41F8D1C5DDE118102
A535CESDDE1ED5B59",3447
340 DATA "5C1BA7EBED52EBDD5D53AE2FCCB7
F28133EFD0D116AF",3381
350 DATA "11A109CD0A0CFD0C02EECD0415D1D
DE13EFFCDDC204C306",3124
360 DATA "F721E2FC7EE6F077DF21E2FCFEAAC
BDEFEAA2003E71829",3811
370 DATA "CB9FECA20040C0CE1806FEAF201BC
BD6E7CD821C3AE2FC",3327
380 DATA "CB4F200EDFFE2C2009E7CD821C21E
2FC0CB0CDE0F6DD21",3325
390 DATA "00401100183AE2FCB5F202FE6062
824CD41F83AE2FCB",2590
400 DATA "4F2012C5D0E1C8472817DDE5C041F
8C5DDE1D1180FED43",3272
410 DATA "425CAF32445CDD2A535C11E8FD3EF
F37CD56053AE2FCB",2890
420 DATA "57C206F7DD22595CDD2BDD360080C
DB0162A535C7EE6C0",2905
430 DATA "200923235E2356231918F2224B5C2
1E2FC0B4EC206F7CF",2299
440 DATA "08CDA22D3801C8CF0ACDE0F621E2F
C08FEC306F7CDE0F6",3660
450 DATA "21E2F0CB86CBCEFEAA2003E7180CC

```

```

D9CF82A595C2BED5B",3603
460 DATA "4B5CA7ED52DD750BDD740CDD360DF
FDD360EFFDD360F00",2728
470 DATA "DD3610001106F7D52A4B5CE53AE2F
CCB7FCA8409C37109",2738
480 DATA "CDF12B78A7200879A72804FE0B380
2CF0EDD21925CDD36",2459
490 DATA "0000C5DDE5E123E5060A36202310F
BEBD1C1EDB0C9CD8C",3136
500 DATA "1CFFFE2CC28A1CE7CD7A1CCDE0F6C
D41F8ED43DFFCDD41",3737
510 DATA "F8ED43DDFCCD9CF82ADFFCED5BDDF
CA7ED52DA06F7ED4B",4221
520 DATA "DDFCCD31F9DA06F7E5ED4BDFFC03C
D31F9C1A7ED42DD75",3970
530 DATA "0FDD7410DD750BDD740CDD360DFD
D360EFF2106F7E5C5",2865
540 DATA "3AE2FCB7FCA8409C371092A535C7
EE6C037C0E556235E",2982
550 DATA "23E5A7EBED42E13008D15E2356231
918E6E1C921E2FCB",3128
560 DATA "C6FE0D2809FE3A2805CB86CD8C1CC
DE0F63AE2FCB4720",3098
570 DATA "1BCDF12B78A7C2ABF879FE08D2ABF
821E2FC0CB6A72805",3555
580 DATA "CB86CDADF8DD21E3FCDD5E136FF2
3E5D1133620010900",3268
590 DATA "EDB03FEFCD0116111100AF37DD5C
D5605DDE1F5DDE5C",3313
600 DATA "07FAE1F130D17EA720CD233AE2FCC
B47200D060A11935C",2672
610 DATA "1ABE20BC231310F8DD4E0BDD460CC
D051F2A535CE5DD5E",2369
620 DATA "0FDD561019224B5CE1DD5E0BDD560
C1936802322595CDD",2096

```

Programming: Spectrum

```

630 DATA "B016DD2A535C3EFF37CD56053002C
F08CF1A3AE2FCCB77",2660
640 DATA "C0DD7E00FE04D011C009CD0A0C060
ADDE5D1131AD710FB",2652
650 DATA "C9CDE0F63ADCFCDD01163A485CE63
80F0F0FD3FE3E7FDB",3060
660 DATA "FE1FFBD206F7AFDD21E3FCDD3600F
F11110037DDE51408",3004
670 DATA "15F33E0FD3FECD6205DDE130CFDD7
E00FE0430C8218C5C",2933
680 DATA "36FFCD16FB11E4FC060A1AD71310F
B3E0DD73E17D73E05",2484
690 DATA "D7AFD7DD7E00A7280EFE01284AFE0
22856FE03282B1897",2439
700 DATA "AFDD4E0DD460E210F27A7ED42380
93ECAD7CD01FB3E2C",2456
710 DATA "D7CDF9FA3E20D73E04CD16FB3E0DD
7C32DFACD01FB3E2C",3115
720 DATA "D7CDF9FA3E20D73E04CD16FB3E0DD
7C32DFADD7E0EE61F",3174
730 DATA "C660D73E28D73E29D718C5DD7E0EE
61FC660D73E24D73E",2871
740 DATA "28D73E29D718B2DD4E0BDD460C180
EDD4E0DD460E1806",2073
750 DATA "DD4E0FDD4610CD2B2DCDE32DC911B

```

```

1FCC30A0C3AE2FCE6",3021
760 DATA "F832E2FC21000022DDFC22DFCDDF
E21200621E2FCCBD6",3301
770 DATA "E7E0D2819FE3A2815CD821C21E2F
CCBC6FE2C2009E7CD",2986
780 DATA "821C21E2FCCBCCEDE0F62A535C3AE
2FCE6032828F5CD41",3334
790 DATA "F8ED43DDFCED43DFFCF10B4F2810C
D41F8ED43DDFC2ADF",3943
800 DATA "FCA7ED42DA06F7ED4BDDFCDD31F9E
5CD6B0D3ADCFCDD01",3771
810 DATA "162ADDFC22495CE17EE6C0C206F75
6235E23E53AE2FCCB",3174
820 DATA "4F280A2ADFFCA7ED52DA06F719CB5
728193E0DD7D53E05",2553
830 DATA "CD16FB01C1C50B0BD5CD0FFBD13E0
DD73E0DD70600EB11",2830
840 DATA "E803A7ED5219301504116400A7ED5
219300B04110A00A7",1704
850 DATA "ED52193001043E17D778D7AFD7E5C
1CD0FFB3E20D7E123",2884
860 DATA "23EB21E2FCCB9EEB7EFEEA2016EBC
BDECB56EB280ED73E",3560
870 DATA "0DD7E52B562B5EE119C39BFB7E23F
E8D2004D7C39BFREB",3089

```

```

880 DATA "21E2FCCB5EEB2052FE30383AFE3A3
036F5E57E23FE0E28",2930
890 DATA "14FE2E28F6FE4528F2FE6528EEFE3
0381CFE3A301818E4",2868
900 DATA "D1F17E235E2356234E234623E5CDB
62ACDE32DE118B1E1",2865
910 DATA "F1FE0E2817FE1039A7FE18300823F
E16389E23189BF20",2424
920 DATA "3897D7189411050019188ECDE0F63
E0332DFC0C306F7CD",2722
930 DATA "E0F63E0232DFC0C306F7903E42415
34943BA2341525241",2563
940 DATA "59BA244152524159BA3E425954455
3BA42595445530D41",2116
950 DATA "646472657373BA020000000000800
05441504520202020",1387
960 DATA "202044000A0044000568736176651
5F705686C6F616489",1680
970 DATA "F706776169746F6E49F8077761697
46F666654F8057673",2561
980 DATA "6176655FF8057073617665C8F8057
06C6F616450F90472",2635
990 DATA "65616424FA046C6973741CFB04707
26F6E9BFC0570726F",2511
1000 DATA "6666A6FC80",750

```

Programming: Amstrad CPC

Xen Plus

Simon Goodwin

Continuing on with the listing, the various commands are detailed below.

IGCoord.x,y,@n% returns the screen address equivalent of the x and y graphics co-ordinates in the variable n%.

ITCoord.x,y,@n% is as above except it deals with text co-ordinates.

IBox,n draws a box with size n at the current graphics cursor position.

IDPrint,@a\$ outputs a\$ in double height form to either text or graphics

cursor position.

IPut,x,y,source places a shape from the specified source address on screen at co-ordinates x,y. This allows multi-coloured shapes to be printed very quickly.

ISize,length,width defines the dimensions of the shape to be placed on screen by **IPut**.

```

1240 DATA D0,56,05,D0,6E,02,D0,66
1250 DATA 03,ED,53,1E,9C,22,20,9C
1260 DATA CD,C0,BB,3A,22,9C,47,DD
1270 DATA 2A,23,9C,CD,88,9C,2A,20
1280 DATA 9C,2B,2B,ED,5B,1E,9C,CD
1290 DATA C0,BB,3A,22,9C,47,DD,2A
1300 DATA 23,9C,CD,88,9C,C9,00,00
1310 DATA 00,00,00,00,00,3E,0D,CD
1320 DATA 5A,BB,3E,0A,CD,5A,BB,C9
1330 DATA 21,B2,98,E5,D5,C5,CD,65
1340 DATA 9C,C1,D1,E1,3E,00,32,64
1350 DATA 9C,7E,FE,FF,28,1D,FE,5B
1360 DATA 38,09,F5,3E,01,32,64,9C
1370 DATA F1,D6,80,CD,5A,BB,3A,64
1380 DATA 9C,FE,01,20,03,CD,25,9C
1390 DATA 23,18,D0,C9,00,3E,42,CD
1400 DATA 1E,BB,C8,CD,06,BB,C9,DD

```

```

1410 DATA 7E,00,CD,5A,BB,DD,23,10
1420 DATA F6,C9,CD,75,BB,DD,7E,00
1430 DATA CD,5A,BB,DD,23,10,F6,C9
1440 DATA 3E,05,CD,5A,BB,DD,7E,00
1450 DATA CD,5A,BB,DD,23,10,F1,C9
1460 DATA 21,00,00,78,06,10,CB,21
1470 DATA 17,ED,6A,ED,52,38,03,0C
1480 DATA 18,01,19,10,F1,47,C9,00
1490 DATA 00,00,00,00,00,00,00,00
1500 DATA 00,00,00,00,00,00,00,00
1510 DATA 00,00,00,00,00,00,00,DD
1520 DATA 5E,00,DD,56,01,1A,47,13
1530 DATA 1A,6F,13,1A,67,13,7E,C5
1540 DATA E5,CD,E2,9C,E1,C1,23,10
1550 DATA F5,C9,CD,A5,BB,11,AF,9C
1560 DATA 06,08,CD,06,B9,7E,F5,CD
1570 DATA 09,B9,F1,12,23,13,10,F2

```

```

1580 DATA 06,08,21,AF,9C,11,B7,9C
1590 DATA 7E,12,13,12,13,23,10,F8
1600 DATA 3E,FE,21,B7,9C,CD,A8,BB
1610 DATA 3E,FF,21,BF,9C,CD,A8,BB
1620 DATA 3E,FE,CD,5A,BB,3E,0A,CD
1630 DATA 5A,BB,3E,08,CD,5A,BB,3E
1640 DATA FF,CD,5A,BB,3E,0B,CD,5A
1650 DATA BB,C9,DD,4E,00,DD,46,02
1660 DATA ED,43,3D,9D,09,10,08,DD
1670 DATA 5E,04,DD,56,05,62,6B,11
1680 DATA 04,00,CD,7E,9D,EB,DD,6E
1690 DATA 02,DD,66,03,CB,3C,CB,1D
1700 DATA CD,1D,BC,DD,5E,00,DD,56
1710 DATA 01,ED,4B,3D,9D,C5,E5,1A
1720 DATA AE,77,23,13,10,F9,E1,01
1730 DATA 00,08,09,30,04,01,50,C0
1740 DATA 09,C1,0D,20,E8,C9,7A,2F

```


Programming: Commodore

```

1615 J=PEEK(56320)
1617 GOSUB 700
1620 IF J<>127 THEN GOSUB 600
1625 IF J=127 THEN POKE 706,1:POKE 707,0:POKE 714,1:POKE 715,0
1635 IF (PEEK(V+16)AND2)=2 AND PEEK (V+2)>80 THEN GOSUB 8000:GOTO 1900
1640 GOTO 1610
1900 POKE V+23,0:POKE V+29,0:POKE V+21,0:PRINT "D":POKE V+28,223
1901 POKE 53280,6:POKE 53281,6
1902 POKE 53282,11:PRINT "J"
1905 POKE 2041,240:POKE V+16,34
1910 POKE 2042,249:POKE 2043,249:POKE 2044,249
1915 POKE 704,0:POKE 705,0:POKE 706,0:POKE 707,0
1920 POKE 708,255:POKE 709,0:POKE 710,255:POKE 711,0:POKE 712,255:POKE 713,0
1925 POKE V+42,7:POKE V+43,7
1930 POKE 688,1:POKE 689,1:POKE 704,1:POKE 705,0
1940 POKE V+41,13:POKE V+42,13:POKE V+43,13:POKE V+37,5
1950 REM *****LEVEL 2*****
1955 PRINT "*****"
1960 PRINT "*****"
1965 FOR N=1 TO 6
1970 PRINT "*****" : NEXT
2000 PRINT "*****"
2005 POKE 2042,246:POKE 2043,246:POKE 2044,246
2010 POKE V+40,15
2015 POKE V+3,140:POKE V+11,155:GOSUB 900
2050 POKE 690,A:POKE 698,A
2055 J=PEEK(56320)
2060 IF J<>127 THEN GOSUB 600
2065 IF J=127 THEN POKE 706,1:POKE 707,0:POKE 714,1:POKE 715,0
2070 IF (PEEK(V+16)AND2)=2 AND PEEK (V+2)>80 THEN GOTO 2100
2075 GOSUB 700
2080 GOTO 2050

```

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Screen Shift

Luke Razzell

This program for the Spectrum shifts a block of memory from 50000 onwards into the display and attribute files. This is useful for making a previously loaded *Screen\$* appear instantly.

Type in the Basic program, run it and save with *Save "filename" Code 30000,25*. Since it is relocatable, it's possible to load the code anywhere in user Ram.

To call the machine code use *Randomize Usr 30000*.

```
10 FOR a=30000 TO 30024: READ n: POKE
a,n: NEXT a
20 DATA 1,0,64,33,0,27,17,80,195,26,2,
3,19,43,124,254,0,32,246,125,254,0,32,24
1,201
```

GP-100A Screen Dump

John R Owen

A screen dump for your QL again. Just in case GP-100A owners were feeling left out here's a routine to add onto the end the relevant image creating program. Simply call the procedure and away you go.

```
32002 DEFine PROCedure scndmp
32003 LOCa! a,b,d,dc,bm
32004 OPEN #5,ser1: PRINT #5,CHR$(8)
32005 REMark last col'n special case
32006 FOR a=131198 TO 163839 STEP 128
32007 b=PEEK(a) || PEEK(a+1):
PRINT #5,CHR$(b || 128);
32008 NEXT a
32009 PRINT #5
32010 dc=7: bm = 32512/2
32011 d=131196
32012 REPeat prt
32013 FOR a=d TO d+32640 STEP 128
32014 b=((PEEK(a) || PEEK(a+1))&127
)*256 + (PEEK(a+2) || PEEK(a+3))
32015 b=b && bm
32016 b=b DIV (2^dc)
32017 PRINT #5,CHR$(b || 128);
32018 NEXT a
32019 PRINT #5
32020 bm=bm /2: dc=dc-1
32021 IF dc = 0 THEN
32022 dc=8: bm=32512
32023 ELSE
32024 d=d-2
32025 END IF
32026 IF d=131070 THEN EXIT prt
32027 END REPeat prt
32028 END DEFine scndmp
```

Revolve

Iain Andrews

This Commodore 64 program constantly scrolls the @ character. It does this by copying the character set into Ram and then redefining the @ and cursor characters. The first two blocks of data can be changed to define these as you like.

Then, using the hardware interrupt vector, byte 1 of the character is put into the place of byte 8 while scrolling bytes 2 to 8 upwards. The speed of this can be changed by using *Poke 49159,speed*, where *speed* ranges from 1 (fast) to 255 (slow).

To turn the scrolling off enter *Poke 788,49:Poke 789,234* on the same line. To turn it back on use *Poke 788,0:Poke 789,192*.

```
10 PRINTCHR$(147);CHR$(142);CHR$(8)
15 PRINTSPC(12)"PLEASE WAIT"
20 POKE56334,PEEK(56334)AND254:POKE1,PEEK(1)
AND251
30 FORA=0T0511:POKE12288+A,PEEK(53248+A):NEXTA
40 POKE1,PEEK(1)OR4:POKE56334,PEEK(56334)OR1
60 FORA=0T07:READB:POKE12288+(160*8)+A,B:NEXTA
70 DATA 255,255,195,195,195,195,255,255
80 FORA=0T07:READB:POKE12288+(0*8)+A,B:NEXTA
90 DATA 3,6,12,24,48,96,192,129
100 FORA=49152T049196:READB:POKEA,B:C=C+B:NEXTA
110 IFC<>5763THENPRINT"ERROR IN DATA.":END
120 POKE53272,PEEK(53272)OR8:POKE788,0:POKE
789,192:PRINTCHR$(147);CHR$(5)
130 PRINT" @@@@ @@@@ @ "
140 PRINT" @ @ @ @ "
150 PRINT" @ @@@@ @ @ "
160 PRINT" @ @ @ @@@@ "
170 PRINT" @@@@ @@@@ @ "
180 DATA 238,48,192,174,48,192,224,1,240,3,
76,49,234,162,0,142,48,192,189,0,48
190 DATA 72,232,224,8,208,247,162,6,104,157
,0,48,202,224,255,208,247,104,141,7
200 DATA 48,76,49,234
READY.
```



With Kenn Garroch

Learning the Basic

H Nesbitt of Torbay, writes:

Q I am thinking of buying a computer to learn Basic programming. Is there a standard for Basic and if so, is there a machine that runs it? I think that programming would be a good hobby but would like to start in the right place.

A There is a standard for Basic set by the ANSI (American National Standards Institute) but there are few machines that use it, the Enterprise being one of the few. A more obvious standard is that set by Microsoft since a great many machines use Microsoft Basic in one form or another.

The problem with standard Basics is that different machines have different capabilities, graphics, sound, and so on. A standard Basic could not really hope to cover all of these since they are so varied in the way they work.

Basic (Beginners All purpose Instruction Code) was originally written as a language to help learn the 'basics' of programming with a view to moving on to bigger and better languages such as Fortran (this was in the dim and distant past).

Nowadays, most people who learn programming at college tend to start with Pascal since this is a more 'grown up' language and is used commercially, although, like Basic, it was originally a beginners' language.

Meanwhile, Basic has taken over in the home micro market with hundreds of different

versions, each tailored to an individual machine.

There is a general subset that pretty well all machines adhere to, a major exception being the Spectrum. Once you have grasped the main ideas, using the language is simply a matter of getting a good reference manual for the particular machine, and looking up commands that you're not sure of.

A good machine to start on is the BBC since its Basic has all the bits you will need to write reasonable programs plus a great many extras. Unfortunately, the BBC is a little on the expensive side and you would probably be best going for an Amstrad since this also has a decent Basic but at a much more reasonable price.

We interrupt this program...

M Bennet, of Cheltenham, writes:

Q I wonder if you could enlighten me about interrupt programming on the BBC; how to set up background routines, etc.?

A The user interrupts on the BBC B are known as events; such things as an ADC conversion or a vertical synch pulse are among a few of the events that can be used to trigger a background routine.

All events are dealt with by a routine whose address is held in locations &220 and &221 so by writing a machine code routine and putting its start address in the above locations, it becomes an interrupt driven routine. For example:

```

10 DIM C 100
20 D=471
30 D=M472
40 FOR T=1 TO 3 STEP 3
50 P=0
60 I=OFF T
70 DEC D
80 BEQ 100
90 RTS
100 I=100
110 LDM ON
120 STR D
130 LDM #0
140 JRM OFFEE
150 RTS
160 I
170 NEXT T
180 T=50
190 T=100
200 T=200
210 T=300
220 T=400
230 T=500
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270 T=900
280 T=1000
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A joystick for your thoughts

Now in its third triumphant year, the *Popular Readers' Poll* is the awards list that makes the companies sit up and listen.

This is your opportunity to name names and vote for your personal best and worsts of 1986 – games, utilities, programmers, hardware.

This year we've got an added incentive to get you to fill out

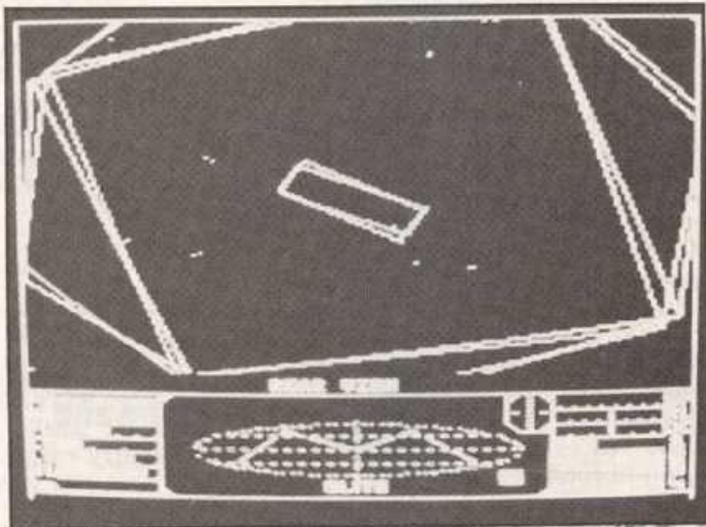
the form. We've got 50 Konix Speed King joysticks to give away to 50 lucky entrants picked at random on the closing date.

As this is an annual poll, we're looking for 1986 products only. However, anything launched in November or December 1985 should be OK, since most of their sales will have been this year.

Program of the Year (overall)

Last year's winner: *Elite* (Firebird)

This is the highest accolade you can pay a computer program, the game that had you hooked to the screen for weeks on end, or the utility which transformed your computing power, or the application which infinitely expanded your horizons.



Last year's winning program, *Elite*

Please write answers in the boxes below

Arcade Games of the Year

Last year's winner: *Elite* (Firebird)

Shoot 'em ups, arcade adventures, basically anything that you'd get the joystick out for. But which one really brought out the sweat on your brow and gave you sleepless nights?

Simulation of the Year

New category

A wide variety here – flying, martial arts, athletics, motor racing, space travel. Cast your vote for the most addictive and realistic simulation of all.

Adventure Game of the Year

Last year's winner: *Lord of the Rings* (Melbourne House)

Tingling with atmosphere, fraught with fiendish puzzles, an absorbing plot... we're looking for the best adventure of them all.

Business Program of the Year

Last year's winner: *Mini Office* (Database)

More people are using their micros for some form of business use, whether domestic accounts, club newsletters, or full blown spreadsheets and databases. We want to hear about the one that transformed your business.

Utility Program of the Year

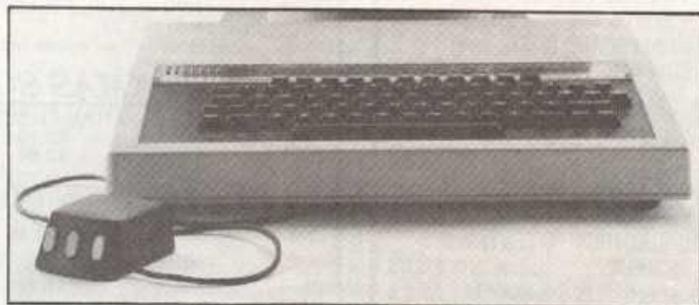
Last year's winner: *The Art Studio* (Rainbird)

Programming languages, machine code monitors, graphics aids, music composers, communications software, the list is ever increasing. In there is a gem of a program which deserves this award. Which is it?

Peripheral of the Year

Last year's winner: AMX mouse

Your chance to vote for the add-on which made you wonder how you ever survived without it.



AMX Mouse

Best Software House

Last year's winner: Melbourne House

Consistency and excellence is what we're after here. The company whose programs you look out for, because you know they're going to be great.

Best Programmer

Last year's winner: Roy Carter and Greg Follis (Gargoyle Games)

It could be their graphics, their sound, their plotlines, or the overall style. Who is the programmer, or programming team you most admire?

Most Exciting New Computer

Last year: Amstrad CPC 6128

Plenty of launches this year to choose from – the Amiga, the 128D, the 64C from Commodore, Acorn's Master series and Master compact, the Amstrad PC and Spectrum Plus 2, a new Einstein, and the games consoles are on their way back.

Most Overrated Software House

Last year: Ultimate

The advertising is brilliant. The managing director appears on *Wogan*. Your friends have life-size posters of the in-house programmers on their bedroom walls. The product packaging makes you gasp. The releases are always a disappointment. Stand up and be counted here.

Computer program you Most Regretted Buying in 1986

Last year: *A View to a Kill* (Domark)

Somebody told you it was the best thing since sliced bread. You loaded it up, trembling with anticipation... and what a let-down. Name names in this section.

Please send in your completed poll form (if you don't feel qualified to vote in one or two of the sections, don't worry, just leave it blank) to Readers' Poll, *Popular Computing Weekly*, 12-13 Little Newport Street, London WC2H 7PP, to reach us by Wednesday, December 10. The results will be published in the issue dated December 18.

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The latest bulletins on boards

David Wallin brings you up to date with bulletin boards



A question from Nick Morris to begin with this week. He has asked for the numbers of some Bulletin Boards that specialise in the Amstrad. The other week, I printed the number of ROS-PCW which specialises in the PCWs and now I've done some scouting around for the numbers of some more Amstrad boards and some CP/M boards:

- FIDO-PD: 0342 315636 (300/300 & 1200/75)
- FIDO-TeePee: 061-494 6938 (300/300, 1200/75, 1200/1200 & 2400/2400)
- London Underground: 01-863 0198 (300/300 & 1200/75 Viewdata)
- MBBS Leaconfield: 0401 50767 (300/300 & 1200/75)
- NBBS Cheshire: 0270 767025 (300/300 & 1200/75)
- Pete's Palace: 0206 862354 (300/300 & 1200/75)
- RDS-Gamlingay: 0767 50511 (300/300 & 1200/75)
- Softnet 1: 0895 420164 (300/300 & 1200/75)
- Softnet 2: 0895 52685 (300/300 & 1200/75)
- Tug II: 021-444 1484 (300/300)

New Bulletin Boards

Firstly, a Spectrum-run viewdata board. This board runs on a Spectrum with drives (presumably Microdrives, although Grandalf, the sysop, didn't specify). This is apparently the first Spectrum run viewdata board, and is called Firefly. As it's viewdata the baud rate must be 1200/75. The hours are a bit odd, Tuesday-Sunday, 9-8 pm and off-line Mondays for software writing. Lastly, the all important phone number which is 0737 363122.

Secondly, another Micron board. This one's called Derby and is not so much a new board but a new version of an old one called TDK. Derby concentrates on Spectrum 128s and is the official board of the National Spectrum User Group. The number is 0394 278924 (Times: 6 pm-10 pm ring back, 10 pm-8 am auto-answer, 8 am-6 pm off-line). You may find

the board not running, though, as it is on a test period so dial as soon as you can.

Another board you might like to try is the Sinclair Board. It is run by Stephen Adams, who is well known for his Spectrum terminal software. It's a CBBS board and the number is 01-249 3238. The baud rates are 300/300 and 1200/75 with an 8NT protocol (standard BB data protocol - 8-bit data word. No parity and one stop bit). Lastly, it's on-line 24 hours a day and is based in Dalston, London.

Yet another Micron board goes by the odd name of RedDragNet, based in Cardiff (hence the Red Dragon). It runs outside office hours - 6pm-6am Monday to Friday and 24 hours at weekends - and the number is 0222 892375.

It's very much a Welsh board, and although most of it is written in English, there are some features in Welsh. Leave a message to the sysop (in either language) at Prestel mailbox number 91999867 or RedDragNet mailbox number #001.

On to bulletin boards for the posh machines and Bulletin AT (BAT), an FIDO board for Amiga, IBM and compatibles and the 68000 machines. BAT is sponsored by Computer Supplies of Swansea, and Amiga users can get a discount (though it appears you'll have to log on for details of this). Details of the board: V21, 22 and 23 (30/300, 1200/75 and 1200/1200), 8 bits, No parity, one stop bit, 6pm-9am weekdays, 24 hours at weekends, and the number is 0792 297845.

The reincarnated Adventurers Club, which Tony Bridge's readers should know well, has announced that it has teamed up with the Hendon Fido-Net bulletin Board. ACL has a Sig (special interest group) on the board, where members can contact them 24 hours a day with messages, etc. This Sig also contains excerpts from past members' dossiers, which should make interesting reading.

Mud-related files can also be downloaded from the Sig, which also has on-line adventures on offer. Contact Hendon Fido-Net on 01-200 7577 all round the clock. The board is only 300/300 and

1200/75 at the moment, but 1200/1200 is in the pipeline.

Finally, this week, let me recommend *Comm+*, the software which I use extensively for bulletin board accessing. A powerful package, it is written by Margolis and Co and marketed by a number of companies to complement their modems and serial interfaces. *Comm+* is written for CP/M and therefore will work on a wide range of computers - installed versions are available for the PCW 8256 and Tatung Einsteins for around £85. Stand alone versions cost around £185. A PC version for IBMs and compatibles is also available - called *Multi-Comm*, it costs £150.

With *Comm+* off-line, you can manipulate *Comm+*'s features through the Disc commands, Memory commands and Utilities menus. This is where you can reorganise messages, text, etc, before sending through the modem, and thus not adding to the phone bill while you do so. This is also where you can do your 'disc housekeeping'.

With six emulations available, *Comm+* will access a large number of services without any trouble. The emulations comprise Viewdata (40 or 80 column), ADM3, ADDS, VT-5, ANSI and Hazeltine. If you're stuck on which one to choose, you can switch them all off totally.

JCF, or Job Control File, is a neat feature of *Comm+* and largely accounts for its calling itself a 'processor' rather than a 'program', since JCF gives it some programming capability.

JCFs, the programs written to run under *Comm+*, are created as standard Ascii files, and greatly add to its versatility, comparing favourably to *Tasks* on Sage Soft's *Chit-Chat*, for example. The manual, helpfully, goes into some considerable detail on JCFs.

Comm+ may be powerful, but user-friendly it is not. On some versions an autodial JCF is available which simplifies start-up and browsing around - it lets people simply dial up services via a simple phone directory provided. Check whether it's built in or which versions are available for your computer before you buy.



Marching to a micro drummer

Mark Jenkins looks at the cheapest micro drum machine yet, and answers more letters

Hardware drum machines intended as add-ons for micros have been getting cheaper over the last few months, but I don't think they'll get any cheaper than this... how does £1.99 sound to you?

In fact the latest piece of artificial skin-bashing for the Commodore 64 isn't a hardware unit at all - it's a cassette in Firebird's Silver range, which up until now has featured only games. But Simon Pick's *Microrhythm* is a fully-featured musical instrument with some very impressive sounds.

The drum sounds used by *Microrhythm* are sampled from the real thing (or more likely from a larger drum machine) using the system familiar from sampled sounds on many C64 games. The quality of reproduction is pretty high, although, of course, you'll benefit from connecting the audio and earth pins of your Commodore's rear-panel output to a hi-fi input (see the diagram in the *Programmer's Reference Guide*). If you don't do that, the ultimate quality of the drum sounds is decided simply by the quality of your monitor speaker.

Microrhythm only has one screen, divided into *Bar Write* at the top and *Song Write* at the bottom. *Bar Write* consists of 16 positions which can be boxed using the cursor keys; you can then tap any of the buttons QWERTYUIOP@*† to enter a sound - bass drum, snare, three toms, rimshot, open and closed hi-hat, cowbell, clap, tambourine, crash and gong. All these are quite modern "hip-hop" sounds, but other sound sets are apparently on the way as well, and it will be possible to create and save your own set of sounds.

The bass drum is quite full, the snare crisp, the toms OK but with an odd tendency to repeat in a fast buzz if you hold the keys down. The cymbals and gong are particularly impressive - always the most difficult to sample, they come out clear if a little hissy.

You can only enter one sound on a beat but you can choose any bar length desired to create 3/4 (Waltz time) or other time signatures. If you don't want to enter beats in this "star time" mode, you can start the bar playing by hitting @ (a helpful metronome can be switched in and out using M) and tap notes in while the bar is playing. Tempo is variable

using < and > (although this wasn't mentioned in the preliminary handbook) and you can alter the pitch of each sound from -9 to +9 (this wasn't mentioned either). Using F creates a flam (a quick double strike) on a beat, and the flam speed can be altered using the D and G keys.

Combining these techniques can produce some very impressive effects, with changing pitches, fast rolls and flams, and the only problem is that the tempo control is very coarse, particularly towards the higher settings.

"The latest piece of artificial skin-bashing for the Commodore 64 is a cassette... Simon Pick's Microrhythm has some impressive sounds"

On to the *Song* section, which simply allows you to type in a list of bars and run them together as a song. The screen goes blank during this process for maximum accuracy in playback, as it does in the real time mode which simply allows you to play drum sounds by hand from the Qwerty keys. It's possible to enter a bar repeat using the <-key, but there were no instructions for how to use this function on the preliminary sheet. Four songs can be stored and recalled using the A, B, C and D buttons, and each has a *Stop* command automatically inserted at the end of its list of bars. You can delete patterns from the middle of a song at will.

You can save and load songs and sound sets to tape, and copy bars from one location to another to simplify creation of new variations. So, overall, *Microrhythm* is very easy to use, although improvements could be made - the coarseness of the tempo control and the over-simple layout of the *Song* function spring to mind. It's very easy to get lost in a simple stream of digits which disappear to left and right of the screen, so a slightly more informative song display would have been appreciated.

However, *Microrhythm* remains a su-

perb bargain for beginners and more advanced composers alike.

Just space for a couple of quick letters. J Grant of Northampton has written in asking if it's possible to add the Yamaha FM synthesiser module to a non-Yamaha MSX micro. The answer is yes - the SFG-05 FM synth module from Yamaha costs around £100 from music shops, has Midi in and out sockets, and offers eight-note polyphonic or multi-timbral playing controlled by any of Yamaha's composer cartridges. You'll need to spend about £2 making up an interface connector using a bit of copper-clad board - the Yamaha X-Series Users' Club have all the details on a sheet which includes mail-order purchase codes for the hardware you'll need from Maplin Electronics. And no, the Shofuku cartridges from Rittor which we mentioned a couple of weeks back aren't compatible as they're designed for the DX7 synth, but looking in the back pages of the music monthlies or joining the X-Series User's Club (£5 per year) will give you access to thousands of new FM sounds.

Chris Jordan from Hybrid Technology has written to point out that tied notes going across bar lines are not unique to *Oliver's Music Composer* (*Popular Computing Weekly*, October 30); they're also available on the *Music 5000* for the BBC, which in addition allows multiple ties, tied triplets and duplets, and individual ties on separate notes of a chord, plus slurs on a staff, which Chris claims is unique. Point taken - perhaps we should have said that those facilities are unique on the Spectrum, unless, of course, you know better...

Yamaha X-Series Users' Club, Yamaha UK, Mount Avenue, Bletchley, Milton Keynes MK1 1JE (0908 71771).
Firebird Software, 74 New Oxford Street, London WC1 (01-631 5206).
Hybrid Technology, Unit 3, Robert Davies Court, Nuffield Road, Cambridge CB4 1TP (0223 316910).

If you have any queries or tips for this column, please write to Mark Jenkins at Popular Computing Weekly, 12-13 Little Newport Street, London WC2H 7PP. Mark would also welcome examples of your own music on audio or program tape, or disc.

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IKE - this is an advanced character designer, and as the screen shot shows, it is an icon/menu operated program which lets you design icons and character sets for use in your WINDOS II programs.

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Set brush size - f or when you want thicker lines

DOODLE alone is worth the asking price, but with WINDOS II and IKE as well, how can you afford to miss out? But don't just take my word for it - this is what Chris Jenkins of Popular Computing Weekly said - (Oct 30),

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DOODLE has many of the features of advanced packages...

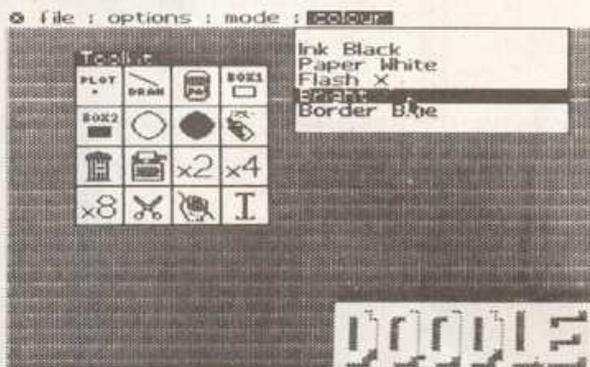
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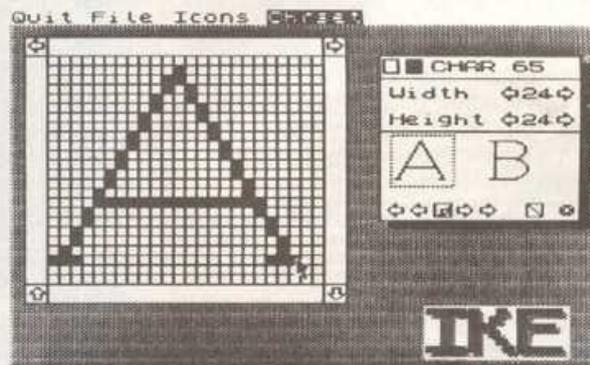
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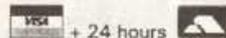
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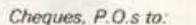
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Program Powerball Type Arcade **Micro** C16/Plus 4
Price £1.99 **Supplier** Mastertronic, 8-10 Paul Street, London EC2.

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Program Who Dares Wins II Type Arcade **Micro** C16/Plus 4 **Price** £7.95 **Supplier** Tynesoft, Addison Industrial Estate, Blaydon Upon Tyne, Tyne & Wear NE21 4TE.

C16 version of the Alligata program that had the writs flying left,

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Program Music Composer Type Utility **Micro** C16/Plus 4 **Price** £9.95 **Supplier** Tynesoft, Addison Industrial Estate, Blaydon Upon Tyne, Tyne & Wear NE21 4TE.

Commodore 64

Program Silicon Dreams Type Graphic Adventure **Micro** Commodore 64 **Price** £14.95 **Supplier** Rainbird Software, 74 New Oxford Street, London WC1.

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Program Destroyer Type Strategy/Arcade **Micro** Commodore 64 **Price** £14.99 **Supplier** US Gold, Unit 2/3, Holford Way, Holford, Birmingham B6 7AX.

Detailed naval action in WW II from Epyx - realistic enough to have to keep a bucket by the computer. Disc only.

Program Deathwake Type Arcade **Micro** Commodore 64 **Price** £2.99 **Supplier** Bug-Byte, Argus Press Software, Victory House, Leicester Place, London WC2.

Program Mission Omega Type Arcade/Strategy **Micro** Commodore 64 **Price** £9.95 **Supplier** Mind Games, Argus Press Software, Victory House, Leicester Place, London WC2.

Build your own robot team then manipulate them through a reactor complex to prevent a malfunction. Against the clock brain strain for the understressed.

Program Psycastria Type Arcade **Micro** Commodore 64 **Price** £8.95 (tape) £11.95 (disc) **Supplier** Audiogenic, PO Box, 80, Reading, Berkshire.

After the personal heart-break and tragedy of programmer Gary Partis - his fiancée Tracey (or Tracey X as she is known in journalistic circles) left him during the coding - we at last have the finished product. And now we know why she left.

Program Flash Gordon Type Arcade **Micro** Commodore 64 **Price** £2.99 **Supplier** Mastertronic, 8-10 Paul Street, London EC2.

How do they do it? An epic struggle to defeat the Evil Ming in three parts. Great sound. Great graphics. Great gameplay. Great value. Great.

Spectrum

Program Deathwake Type Arcade **Micro** Spectrum **Price** £2.99 **Supplier** Bug-Byte, Argus Press Software, Victory House, Leicester Place, London WC2.

Program Xeno Type Arcade **Micro** Spectrum **Price** £7.95 **Supplier** A'n't, Argus Press Software, Victory House, Leicester Place, London WC2.

Excellent one or two player arcade game. Ever play penny football? Well, this is it on your computer, but it can get fast and furious. Highly recommended for competitive types.

Program Esperanto First Half Type Educational **Micro** Spectrum **Price** £5.50 **Supplier** Lez Peranto Ltd, 74 Devonshire Way, Shirley, Croydon, Surrey CR0 8BS.

Four programs, three booklets, four-part audio tape all for under six quid. You can tell these guys aren't doing it for the money. If you want to hear them talking Esperanto at you in person, go and see them at the December 13 Microfair on Stand 139.

Program Fairlight II - Trail of Darkness Type Arcade **Micro** Spectrum **Price** £9.95 **Supplier** The Edge, 36-38 Southampton Street, Covent Garden, London WC2.

Follow-up to the wonderful *Fairlight I* - and it's unlikely that anyone is going to be disappointed by this if they enjoyed the former. And as it's twice the size, you can't say that you're not getting value for money. Multi-load on the 48K.

Spectrum 128/Plus 2

Program They Call Me Trooper Type Arcade **Micro** Spectrum 128/Plus 2 **Price** £8.95 **Supplier** CRL, CRL House, 9 King's Yard, Carpenters Road, London E15 2HD.

Program Star Glider Type Arcade **Micro** Spectrum 128/Plus 2 **Price** £14.95 **Supplier** Rainbird Software, 74 New Oxford Street, London WC1.

Like the 48K Spectrum version but with a re-designed character set and speech.

Program Advanced DCP Art Studio Type Utility **Micro** Spectrum 128/Plus 2 **Price** £24.95 **Supplier** Rainbird Software, 74 New Oxford Street, London WC1.

Program Fairlight II Type Arcade Adventure **Micro** Spectrum 128/Plus 2 **Price** £9.95 **Supplier** The Edge, 36-38 Southampton Street, Covent Garden, London WC2.

See 48K section - but is single load on the 128/Plus 2. It also says: "This is probably the first true 128K game for the ZX Spectrum." Is that anything like probably being the best lager?

Atari ST

Program Back Up Type Utility **Micro** Atari ST **Price** £24.95 **Supplier** Microdeal, PO Box 68, St Austell PL25 4YB.

Program Time Blast Type Arcade **Micro** Atari ST **Price** £9.95 **Supplier** Tyne-soft, Addison Industrial Estate, Blaydon Upon Tyne, Tyne & Wear NE21 4TE.

A day in the life of...

It occurs to me that I've spent more than £900 on Amstrad computing hardware and software, including such things as listing paper and new ribbons (but not including my special swivel chair of Swedish design for me to rotate more professionally on). Considering my innate meanness it's interesting to consider how this came about.

Why, when I didn't need to, have I spent so much money? Am I insane? I could have bought a secondhand Electron for under £50, or an Oric for even less. But at least the children can hold their heads up in the playground. I'll tell you about it.

Finally unable to bear the sight of my children... I'll rephrase that. Unable to handle the guilt engendered by my children peering over the edge of my desk at the magic screen glowing greenly in the darkened room, I bought them a computer, another Amstrad.

This act of largesse didn't extend to buying the monitor for it, I had a modulator instead, it's cheaper. Their little smiling faces gaze at me in adoration as I put a plug on the lead and stick it into the mains. It doesn't work, the picture is off the side, on the floor, up the wall and hanging around my left leg.

"It's the modulator," I cry, the children looking at me in contempt. What we need, I explain to my wife, is a television with an RGB input. As I rent my set, the problem

seems simple and straight forward to solve, best of all, not too expensive.

Go to Tandy, young man, as generations have gone before you, for you will need a connecting lead. (I hadn't given this aspect nearly enough thought.) So my wife does, and they tell her she can't connect a 464 via an RGB socket. "Rubbish, of course I can," I say, and we decide to phone Alan, the bloke with the beard and the money. He isn't in, but a very nice receptionist says it's perfectly all right. Lots of running around trying to find a seven pin Din for one end, a six pin Din for the other, and a nine core cable to connect them. Did you know that the wires inside a nine core cable are 'finer than a human hair'!

I drag out my trusty soldering iron and put it on the gas ring to heat up. "Don't worry," I say. "I've soldered more wires than you've had breakdowns in the old Avenger." Which way round do you look at a Din plug to read the numbers? Good grief, they go all over the place. Typical committee work, far too easy to number them in sequence.

"There are no holes in these pins," I scream.

"Put your glasses on," she screams back.

Oh yes, there they are. Aren't they tiny? Do you realise the whole of this plug is smaller than the end of my soldering iron? "Can you do it, daddy?" "Of course I can do it, if you'd all just let me

get on with it. Don't you realise how difficult it is to fit these invisible wires into non-existent holes?" Mutter, mutter.

Eventually, heart pounding, I slip the relevant ends into the relevant holes, turn on the machinery; and it all works perfectly.

That surprised you didn't it? I always knew it would work. Number one child settles down to bomb the hell out of the Argies, unconcerned by possible international repercussions.

Inspired by the knowledge that nothing is beyond me I send off for a C compiler from CPMSDOSUGUK. As everyone (or at least those of us *au fait* with these things) knows, C is the language of choice for serious posers. Real Men don't use Basic.

I will tell you a thing about those who write stuff for the public domain; they know in their heart of hearts that the public are people just like themselves, able to follow cryptic instructions with Holmes-like logic.

So here I sit, with a compiler (written by Ron Cain and run using a C interpreter to compile it first time. Shades of Desperate Dan here.) That I know works, and works quite well. The compiler cost me £2, which is a bargain, the disc cost me £5 which isn't, and a book on the language cost me £10, and I need another one. Eventually I shall find the time to do something with it all.

S Patient

NEXT WEEK

Gauntlet

Much talked about, and much imitated, the official computer version of the arcade smash *Gauntlet* is on its way, courtesy of US Gold. We review the completed Amstrad version.

Batman

Tony Kendle presents a comprehensive cheat routine for the very popular *Batman*.



Mini Office Rom

Database's value-for-money business suite of programs is now available on Rom for the BBC. We test its capabilities.

Public Domain

Continuing our series on public domain software with some more games for the PC.

Amstrad assembler

A compact Amstrad CPC assembler/disassembler for you to type in and use, by Robert Osborne.

Hackers

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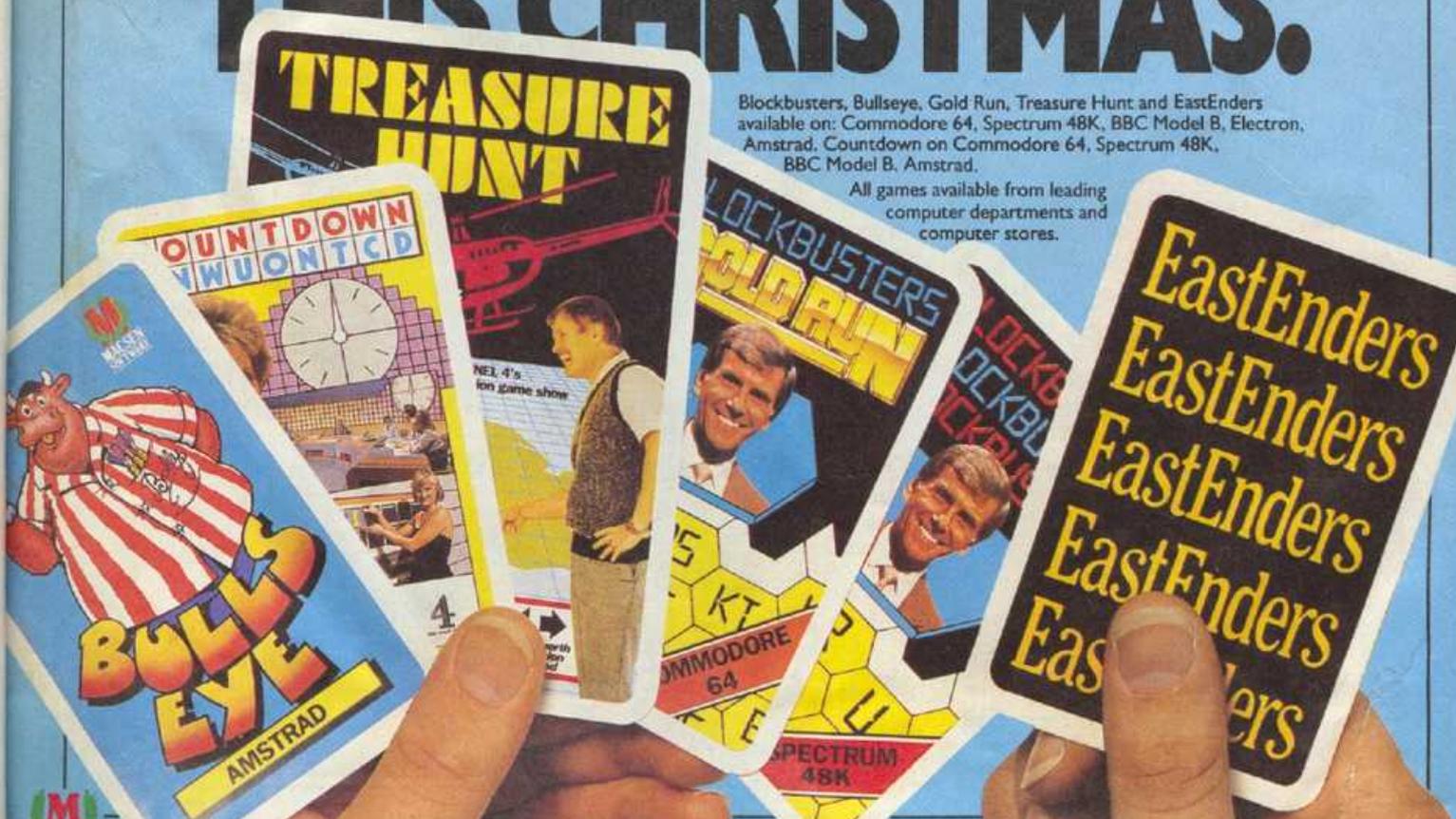
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LEGEND OF KAGE



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of the game

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