

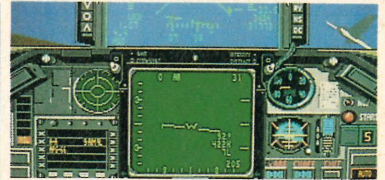
Issue 11 • Jan 21 1989

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Hey, Shopper – save ££££'s on any purchase – page 33

NEW COMPUTER EXPRESS

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FALCON FOUL-UP

Mirrorsoft's big game hits

trouble

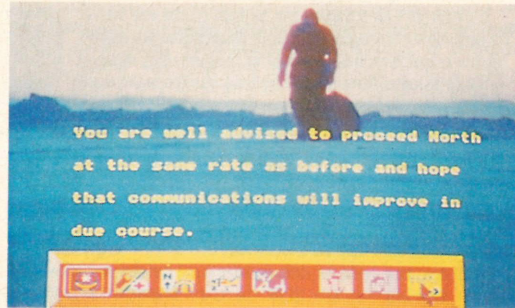
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PRINTER POWER

We name the best buys

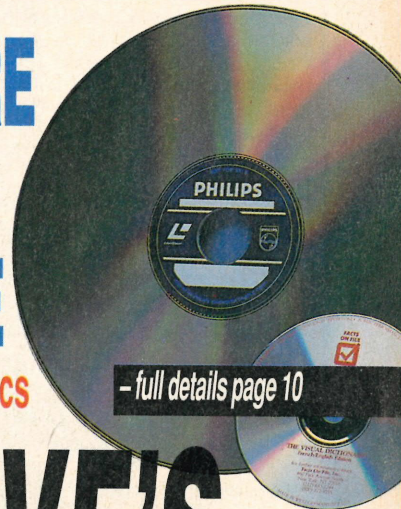


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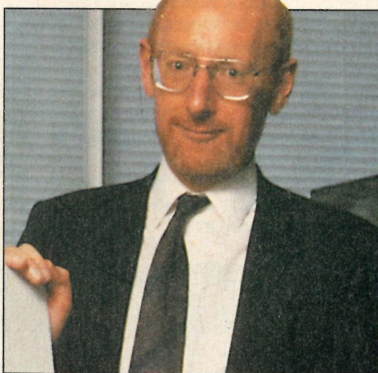


Virgin stakes out new territory with interactive videodiscs

EXPLORE THE FUTURE



– full details page 10



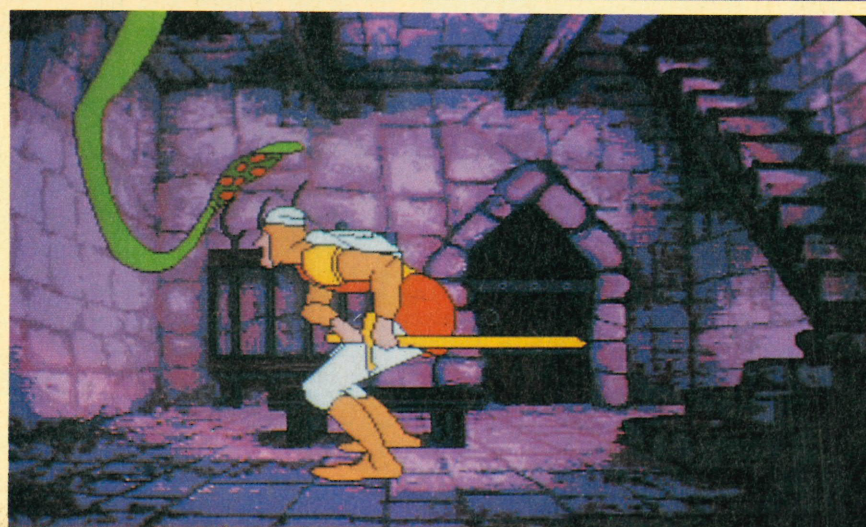
Sinclair breakthrough is "1000 times faster than hard disks"

SIR CLIVE'S COMPUTER REVOLUTION

– page 2

Amiga
Atari ST
BBC
C64
CPC
MSX
PC
PCW
QL
Spectrum

Special sections – pages 36-43



BEST GAME GRAPHICS EVER?

Astonishing conversion of Dragon's Lair reviewed page 28

SINCLAIR TO "TRANSFORM" COMPUTING

Electronics guru Sir Clive Sinclair last week outlined his plans to "transform" computing through a revolutionary new device which could put memory and processor chips together on the same unit.

Sinclair owns 20 per cent of Cambridge based Anamartic, which is preparing to launch the first wafer-

scale integration (WFI) memory device. He claimed to *Express* that the new chip would "completely transform computing".

"You'll be able to use the waferscale instead of a hard disk," he said. "It will mean a one thousand times increase in the speed of memory access compared to current hard disk standards."

He added: "This has been seen as the holy grail of computing for the last twenty years. We at Sinclair Research have solved the problems through Anamartic."

Sinclair has been working on this project for some time. For the past two years he has been seeking funding for research and development. Anamartic itself is refusing to comment on developments, and on the suggestion that its gadgetry will be shown for the first time at the International Solid State Circuit conference in New York on February 15th. The firm is expected to show off a six inch diameter wafer which can store the equivalent of several hard discs.

Waferscale: chips with everything

Conventional chips are manufactured by setting layers on top of a wafer of silicon, slicing them up and throwing away the inevitable number which don't work. This is costly and wasteful but until now there has been no other reasonable alternative, because the more you try to cram on to a chip, the more certain it becomes that some part of it is going to fail, making the whole chip useless.

With WFI all the chips can be kept on the one wafer, effectively making one big chip. What makes WFI different is that most parts are built so they can work in more than one way. Special circuitry built into the wafer then tests the chip and can devise alternative routes round

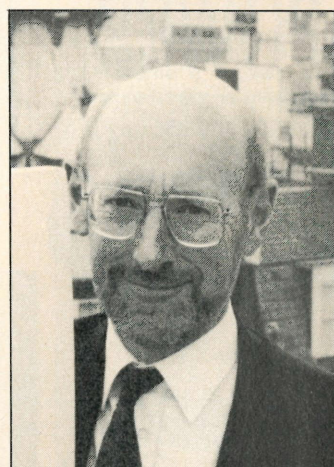
parts that don't work, increasing the proportion of working chips per batch. Testing the chip now involves just testing the special circuitry, saving the time taken to test each part of the wafer individually.

The intentional redundancy built into wafers mimics the way the human brain can work through different pathways, as when a stroke victim who has lost the power to speak can re-learn the skill using slightly different parts of the brain.

Extra speed and performance is attained because all the workings are on one chip, so the different chips don't need to spend time communicating with one another.

Anamartic is currently in negotiation with high end hardware manufacturers. If successful, this technology will first be scooped up by the manufacturers of very expensive super computers and prices are likely to be high, just as transputer technology is available currently in machines such as the Atari Transputer Workstation. These cost a few thousand pounds but deliver performance equal to a machine ten times more expensive. Sinclair said that the home and small business ends of the market would be the last to benefit from such a development but acknowledged nonetheless that cheap computers would be able to use WFI in the near future.

When asked if WFI would make him very rich he replied: "I should very much expect so."



• Sinclair: Wafer scale revolution

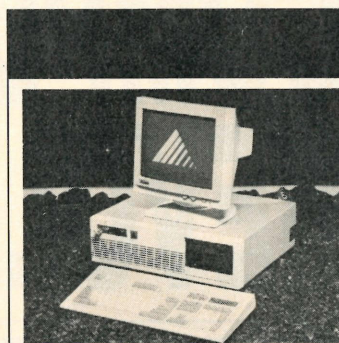
Hungerford memories prompt hasty Hewson name change

West country sensitivity to the Hungerford tragedy of 18 months ago has caused middling software house Hewson to change the name of its forthcoming shoot-em-up.

The firm was to call the game *Kalashnikov* - also the name of the gun used by killer Michael Ryan. However, one member of staff thought it would be seen as bad taste to launch a game with a name even remotely connected to the disaster in which thirteen people died. The game is now called *Custodians*.

"We're in Abingdon which isn't very far from Hungerford and we decided that it would be too close to home," offered a Hewson spokesperson. "One of the members of staff had strong views on the subject and we don't want to offend anyone."

Custodians should hit the streets later this month on the ST and Amiga priced at £19.99.



• Vision 286: Squaring up

Yet another Amstrad basher tries its hand

Ambitious PC manufacturer Vision Technology has launched a sub-£1,000 hard disk 286 AT and is squaring up against the likes of Amstrad.

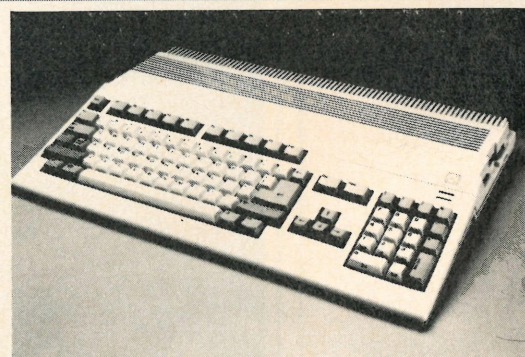
The firm's machines are sold here through Advent Computers which has only been in operation some six months. The low cost PC sector is packed with big name companies and new blood is rare. Firms which do venture into this area though invariably pitch themselves as 'Amstrad bashers'.

The £995 AT12/16D features an 80286 processor running at 12 MHz and 640K of RAM,

20 MB hard disk storage and a 1.3 MB floppy drive. An EGA monitor is also available costing an extra £200.

"Although they're very big, Amstrad are one of our main competitors," said Advent's John Williams. "We're up against a lot of muscle but the packs we offer are good. In six months they've become very popular," he claimed.

Advent is also planning to add another two machines to its current line-up of five. They are likely to be 386 PCs, although prices are as yet unknown.



• A500: Within students' reach

Students wooed by Commodore

As first predicted in *Express* two months ago, Commodore has tied up a deal whereby students will be able to buy computers on tick.

The deal has been co-ordinated between the hardware manufacturer, the National Union of Students and the Midland Bank. A similar offer already exists for Amstrad and IBM computers.

Students can go into their campus NUS shop and order any Commodore computer. While at college they need only pay the interest - described by Commodore as "peanuts". Then, once they have graduated, they have to clear the outstanding balance.

Commodore is also bundling software for the special student deals. PCs will come with

Logotron's integrated business package *Eight in One* which usually retails at £60. The Amiga will come with *Photon Paint* and business package *The Works* (usually priced at £100).

"We're tapping in to the guy who who wants to buy a computer but can't afford it," said Commodore's Peter Talbot. He also acknowledged the value of 'getting 'em in young'.

Meantime, Commodore is gearing up for a big business push at next month's *Which Computer?* Show. UK users are promised their first glimpse of the Amiga 2500 with AT bridgeboard and Unix card (*Express* 3). Which? is being held from February 21st to 25th at the NEC in Birmingham.

Kids get Weird Dreams

Firebird's esoteric arcade adventure *Weird Dreams* is to become a regular feature of *Motormouth*, ITV's Saturday morning kids television show.

For the next seven weeks the game which has been praised for original graphics will be the vehicle for a competition. The winner of that will be off to Egypt for a free trip around the pyramids.



• *Weird Dreams*: Motormouth strikes again

In the special competition viewers are asked to write in and apply to play the game. A few are then called while the show is being

aired. They are invited to answer general knowledge questions - the right answer propels the game's main character on to the next level.

Firebird's programmers have been working on *Weird Dreams* for the past few weeks in order to change it for *Motormouth*'s special version. Programmers have also been adding graphic displays of pyramids and the *Motormouth* logo.

In the past computer games have been featured heavily on Saturday shows such as *Get Fresh* which has used Rainbird's *Starglider* and Melbourne House's *Xenon*. *Weird Dreams* should be generally available by the end of February.

Rodime clashes with IBM over hard drive patents

Hard disk drive manufacturer Rodime is preparing to do legal battle with leading hardware companies including IBM.

The \$160 million a year company claims that its 3.5 inch hard disk drive technology has been ripped off by the world's leading manufacturers of memory devices. Last November the US Patent Office re-issued Rodime's patent for the disk drives with new amendments; two months later the firm is looking for substantial damages.

The 3.5 inch hard drive market is

said to be worth "thousands of millions" worldwide. Rodime admits that it did not invent the 3.5 inch size for disk drives but alleges that its technology has cropped up in competitors products. The 3.5 inch size relates to the actual drive inside the larger case.

According to Rodime an out of court settlement has already been reached with Miniscribe. However, it still plans to take on IBM, Western Digital, Seagate and others.

"Some of the original documents on their products had identical features to our products. They had clearly looked at our products," said Rodime's vice president of operations Gordon Wooley. "It goes far beyond the size of the disk, it has to do with the final product," he said.

He went on to claim that IBM and the other companies had knowingly used Rodime's technology but said that it is quite possible to produce 3.5 inch hard drives without infringing copyright.

IBM characteristically responded thus: "We are studying Rodime's claim but cannot comment because the case is in litigation." On the amount of damages Rodime expects to gain Wooley commented: "Today this is a booming market but it

depends on the extent to which we can prove the case."

Computing with Uncle Sam

Computer professionals looking for a new start can earn over £40,000 a year - if they're prepared to emigrate to the States..

The Americans are keen to get their hands on skilled British computer programmers and operators. According to the US Embassy in London computer professionals made up a significant proportion of those moving to the United States last year - second only to entertainers.

State-of-the-art software engineers can earn anything from \$32,000 to \$75,000 a year in a country where standards of living are higher than in Britain.

The US is short of competent engineers and although it is the most technically advanced country in the world, UK staff are regarded highly. "A three year programmer here is far better than a three year programmer in the US," claimed Roger Coggan, the UK manager of international recruitment agency IBS.

According to another recruitment agency though, the Americans won't hesitate to tell turkeys to get stuffed. "The US is not for wimps," said David Wallder of MH Recruitment.

Freddie joins US Gold

Multi million pound software house US Gold has tied up the rights to spooky cult horror film *Nightmare* on Elm Street.

The Brummie firm is adding this to the already signed Michael Jackson film *Moonwalker* and *World Cup 1990*. Meanwhile, *Gold* last week announced that it had sold more than £10 million worth of software between July '87 and August '88.

Earthquake tragedy prompts Opus help

British PC manufacturer Opus has donated two machines to the Armenian Earthquake Appeal on the request of the Soviet government.

Two of the company's representatives were in Moscow at the time of the disaster to form the *International Computer Club* - a Soviet based organisation the nature of which is being kept under wraps. The Soviet government asked for computers so that donations could be collated and for future planning of the broken cities.

"With whole towns and much of the region's infrastructure destroyed by the earthquake we felt that our computers

could play a vital role in planning," said an Opus spokesman. "It's glasnost all round."

Due to restrictions on technology from the West Opus could only send models of its low end PCIII. Opus is keeping tight-lipped on its involvement in the Moscow based *International Computer Club*. The spokesman claimed that it is being set up for educational purposes initially but conceded that "it may lead to further opportunities". Opus is believed to be the only British company represented and was invited directly by the Russians.

•Opus PCIII: Armenia bound



GAMES TOP TWENTY FULL PRICE

1	Operation Wolf	OCEAN
1	Spec. C64, CPC, ST, Amiga	
2	Robocop	OCEAN
2	Spectrum, C64, CPC	
3	Afterburner	ACTIVISION
4	Spectrum, C64, CPC, ST	
4	Thunder Blade	US GOLD
5	Spectrum, C64, CPC, ST, Amiga	
5	Double Dragon	MELBOURNE HOUSE
3	Spectrum, C64, ST, Amiga	
6	Falcon	MIRRORSOFT
7	ST, Amiga	
7	R-Type	ELECTRIC DREAMS
8	Spectrum, C64, CPC, ST	
8	Giants	US GOLD
6	Spec. C64, CPC	
9	Football Manager 2	ADDICTIVE
9	Spectrum, C64, CPC, ST, Amiga, PC,	
10	Return Of The Jedi	DOMARK
17	Spectrum, C64, CPC, ST, Amiga	
11	Batman	OCEAN
11	Spectrum, C64, CPC, ST, Amiga	
12	Last Ninja 2	SYSTEM 3
14	Spectrum, C64, CPC	
13	Game Set and Match 2	OCEAN
13	Spectrum, C64, CPC	
14	Pacmania	GRAND SLAM
16	Spec. C64, CPC, ST, Amiga, MSX	
15	Who Dares Wins 2	ALLIGATA
RE	Spectrum, C64	
16	Taito Coin-ops	OCEAN
12	Spectrum, C64, CPC	
17	Supreme Challenge	BEAU JOLLY
19	Spectrum, C64, CPC	
18	Elite	FIREBIRD
RE	Spec. C64, CPC, ST, Amiga, PC, BBC, Elec, MSX	
19	Four Soccer Simulators	CODE MASTERS
RE	Spec. C64, CPC	
20	Microprose Soccer	MICROPROSE
22	C64	

GAMES TOP TEN BUDGET

1	Joe Blade 2	PLAYERS
1	Spectrum, C64, CPC, BBC, C16, Electron	
2	Bomb Jack	ENCORE
3	Spectrum, C64, CPC, ST, C16	
3	Yogi Bear	ALTERNATIVE
15	Spectrum, C64, CPC	
4	Through the Trap Door	ALTERNATIVE
4	Spectrum, C64, CPC	
5	Leaderboard	KIXX
19	Spectrum, C64, CPC	
6	Footballer Of The Year	KIXX
7	Spec. C64, CPC, Elec, BBC, Atari 8-bit, C16, MSX	
7	Knightmare	MASTERTRONIC
14	Spec. C64, CPC	
8	Ghostbusters	MASTERTRONIC
2	Spectrum, C64, CPC, Atari 8-bit	
9	BMX Ninja	ALTERNATIVE
12	Spectrum, C64, CPC	
10	Skooldaze	ALTERNATIVE
6	Spectrum, C64	

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NE - new entry
RE - re-entry

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VIRGIN'S SECRET

Arcade machine with movie-quality graphics

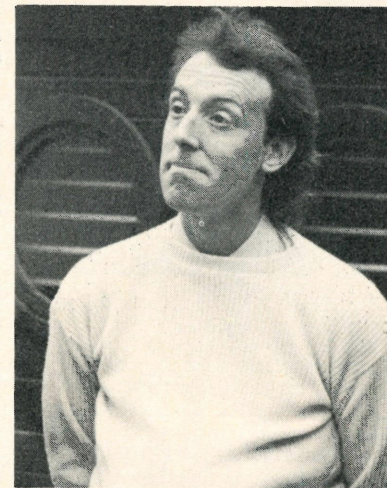
Virgin Publishing is developing an arcade machine which features real video pictures instead of computer generated graphics.

The game is based on a bob-sleigh race and is being secretly put together by a team of software experts. But the project is still in its early stages. "The technology is still far from there," said Virgin/Mastertronic boss Nick Alexander.

If successful the machine may be placed into entertainment arcades as the first 'real pictures' coin-op. This could happen next year at the earliest.

The system works on laser disks — a technology which Virgin has been using for some time. The company believes it can bring out such a machine at a quarter of the price of the *Dragon's Lair* coin-op which cost arcade operators a mighty £10,000.

"It's not intended as a coin-op as yet because it's still very much in an experimental stage," added Alexander. "It's not an enormous investment for us, but it's a reasonable



• Alexander: Movie-style arcade game

amount."

Virgin already has interests in the arcade market having acquired coin-op firm Arcadia through its takeover of Mastertronic last year. The bob-sleigh project will also be transferred to burgeoning home technology Compact Disk Interactive (CDI) when that finally arrives.

Training: the one-to-one approach

Computer training has always been a matter for much debate but one new company reckons it's come up with the best solution yet.

Instead of frantic three day training marathons Complete Computer Service is offering one-to-one training for a few hours a week. These intense sessions, based on the same philosophy as piano lessons, cost anything from £12 an hour. They're being aimed directly at the small businessman baffled by new technology.

the PC and PCW with special training on LocoScript and other word processors as well as databases, spreadsheets and accounting packages.

"There is a real need for training because there's such an enormous amount to learn. The machines are so powerful that people are overwhelmed by them," commented boss Tony Reese. "I prefer to teach in one or two hour sessions."

Reese is based in Bristol and his background is as a programmer and analyst for Rolls Royce.

CCS concentrates mainly on

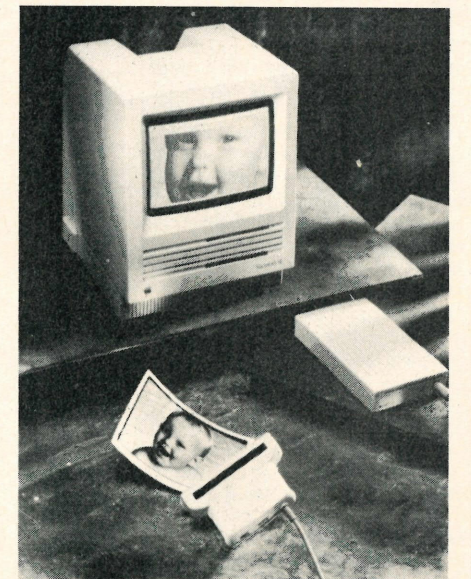
More info on 0272 682321.

Scanner in the works

For the desktop publisher looking for a low-cost method of importing pictures comes the ScanMan handheld scanner for the Apple Macintosh.

Priced at £395, less than a quarter the price of most existing Mac scanners, it can digitise photographs at up to 400 dots per inch. Manufacturer Logi UK claims it's the first handheld scanner for the Mac, which is widely regarded as the best machine for DTP.

"It's ironic that the Apple range, which has been so popular for Desktop Publishing, has not had a handheld scanner," observed Logi UK's Nick Pearson.



• ScanMan: Mac first?

INGRID TAKES BACK SEAT AS LEVEL 9 TURNS RISQUE

Tolkienesque adventure games publisher Level 9 is soon to make its move into more sophisticated territory.

The firm is best known for traditional adventures, and recent titles like *Ingrid's Back* have only slightly varied the theme. But now it is planning to moving out of middle earth and into high society with up to date and risqué plots. Level 9 appears to have been inspired by games such as Activision's *Leisure Suit Larry* which have made headlines due to their modern-day scenarios and sometimes adult humour.



• The Level 9 team — turning their backs on Ingrid?

"We've developed a system which will allow us to do these games quite easily," explained partner Pete Austin. "There'll be a lot of 3D graphics, animation and humour."

But Level 9 doesn't plan to leave behind its goblinsque roots completely: "We'll try and keep the two together unless one becomes dominant". No details are available on its first new-approach adventure — which will in any case be preceded by a more traditional offering.

Scapeghost should arrive before Easter and features a ghoul coming to terms with his inability to walk through walls and his inability to do the one thing adventurers love most — picking up objects.

SOFTWARE? MAIS NON

Software has been banned from France. Not the actual thing itself, you understand, but the word.

French language purists are desperately blocking their Gallic ears to new words from English speaking countries. You're not supposed to listen to a walkman in Paris, for example, but a baladeur, thanks to the Académie Française, the guardian of the French language. The latest offending bon mot is "software", henceforth to be replaced by "logiciel".
C'est la vie.

EASY PC ADD-ONS

PC owners baffled by the armada of add-ons and peripherals available might fancy taking the time out to browse through The PC Upgrade Handbook.

Published by Sigma at £12 it features hints on low cost upgrades from adding extra memory to local area networks.

NEW COMPUTER EXPRESS

OUR OPINION

Waferward?

Has Sir Clive done it again? Wafer Scale technology has been everyone's dream for a decade now, and if Anamatic really have produced a viable product they will have taken a significant lead in the race to the next type of computer.

But who will benefit? You won't get wafers in home machines for ten years yet. Just like the transputer, such technology will only reach users of big, costly systems initially. For the moment the alternative approach to upgrading specifications as used by the ST, Amiga, Archimedes et alia will dominate the home user end of the market. Don't throw away your machine yet.

Loan wolf

Commodore's scheme giving students cheap micros will cheer up a lot of students, but can be seen two ways. The generous view says it's encouraging that the bank now appears to see the micro as a legitimate study and work tool, not just an expensive toy that you play games on instead of going to lectures. The cynical view says Commodore are just buying off students early and looking forward to their future fat salaries going into Commodore's coffers.

Either way you'll see a lot of Amiga software in the campus shops. And a lot of empty lecture halls.

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FALCON FLIES INTO TROUBLE ON ST

Mirrorsoft's high flying aircraft simulation *Falcon* has run into compatibility problems on the Atari ST.

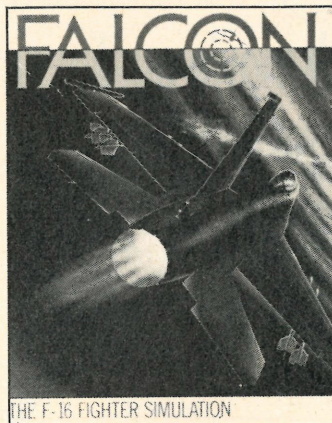
The program - currently at number six on the all formats chart - will not run on some of the machines. Mirrorsoft says that its "sophisticated" protection for the game meant that a small number of machines would refuse to boot it.

The firm was keen last week to assure all users that the problem had been dealt with quickly, and that any one experiencing problems should send their disks in for modification "within a day". It said there had been only a small number of complaints.

Atari has slightly changed its drives for the ST six times since the machine was launched. Despite the changes they stayed inside a specification which all software developers recognise. However, each drive has its own individual quirks.

Mirrorsoft's protection was based on reading certain tracks on the disk and then hopping back to those tracks at the start of the game itself. However, some of the ST drives will not read the higher end tracks such as 82 and 83 which Mirrorsoft had depended on. Thus the game would not start.

"Atari ran out of its disk drives for a certain period and so found a replacement," explained Mirrorsoft's Tom Watson. "Normally there would not be any difference except in cer-



THE F-16 FIGHTER SIMULATION

• Falcon: Copy protection foulup

tain environments such as protection." The firm has tweaked all copies of the game so that the protection now reads compatible tracks.

Not surprisingly Atari had a different perspective. "Not all drives can get up to those track numbers but that's beyond the specification anyway," offered a spokesman. "We've had about six different drives but as far as software development goes that doesn't matter because they're all within our ordered spec.

"Problems will occur if people start basing their protection on the individual quirks of one type of disk drive. If that works on one it doesn't mean it'll work on them all," he said.

Despite this problem Mirrorsoft is toasting the success of the program. Considering it is only available for PC, ST and Amiga the title has performed well in a chart dominated by big Christmas multi format arcade releases.

PCW users slow on comms takeup

More PCW owners should be getting their hands on modems and logging onto bulletin boards.

That's the view of David Axford, head of the PCW File User group. He has recently been forced to close down the group's newsletter due to "financial burdens" but has re-opened the mag on a bulletin board. Unfortunately, the proportion of modem toting PCW owners amounts to less than one per cent.

"People don't seem to realise the advantages of a modem. For that investment you can have access to many PCW public domain programs as well as all the tips and news," explained Axford.

His bulletin board is included on the BOOG network and is "absolutely free apart from the cost of the call". Axford was forced to close down the £18 a year monthly mag after its readership dipped from 500 to 150. "It was becoming too expensive," he said.

Axford can be contacted on 0428 56438.

PC2000 IN THE CLUB

The Amstrad User Club is planning to form a "Gold Card" club for PC2000 users.

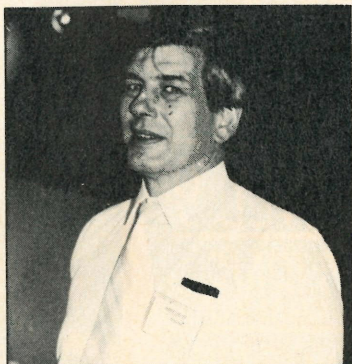
The 'corporate club' will offer training, software, technical support, a bulletin board and discounts for shows. It's believed that Lazhold, the company behind the nationwide club, is also secretly planning to launch its own Commodore club.

Amstrad man goes it alone

Former Amstrad software sales manager Mike Mordecai has launched his own distribution company AV Marketing.

The firm will distribute, among other things, Amstrad's own products. He told Express: "I felt it was time I tried launching out on my own. If I put in the same effort now as I have done during my time at Amstrad, I'm sure the company will be a big success."

Earlier reports suggested that Mordecai had been made redundant by Amstrad. In fact he resigned from the company during the same period that a string of redundancies was enforced.



• Mordecai: Launch

How to run a business on a QL

Hitchin based SD Micro-systems is to launch a QL version of its integrated accounts package.

The firm limits its activities to the QL and CPC - the package is already available on the latter. "We regard

them as the true home professional computers," said boss Steve Denson. "They're the best for small businesses. Something like the PCW is OK but it runs out of puff on more complicated business applications."

The Stock Accounts System costs £39.95 and includes invoice production, stock adjustment and sales ledger. No plans are afoot to transfer the program to other mainstream formats such as the PC.

How to automate an ST

Public Domain specialist South West Software Library is offering an ST macro-generation program which can record the user's keyboard and mouse activities.

The sequence can then be played back at the touch of a button. SW suggests that this can simplify

tedious tasks such as sorting out a database or printing reports. The firm is confident there is no commercial program like it in the UK.

PD software is non copyrighted and often placed in the Public Domain by programmers bound under contracts not to produce

commercial software. Retrace, like all SW PD software, costs £3.00. The company recently added another 40 disks of ST applications, utilities and games to its catalogue. More details from The South West Software Library, PO Box 562, Wimborne, Dorset BH21 2YD.

The CRUCIAL COMPILATION

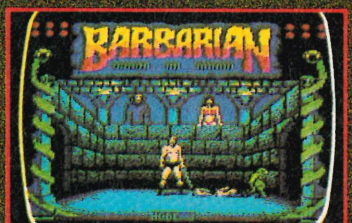
KARNOV
GRYZOR
BARBARIAN
The Ultimate Warrior
CRAZY CARS
SCHWARZENEGGER
PREDATOR
TARGET RENEGADE
PLATOON
The first casualty of war is innocence.
ocean

LAST NINJA REPLACES CRAZY CARS ON THE COMMODORE

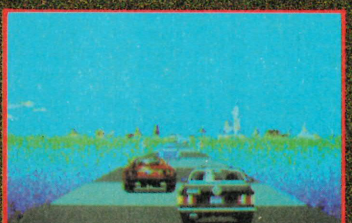
THE IN CROWD
ocean



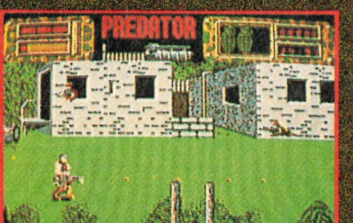
GRYZOR Featuring all the game-play of the arcade original, *Gryzor* takes you into a thrilling alien world of force fields, fanatical guerillas and strange enemy defence systems - but you have the fire-power and maybe, with a 'little' skill, grit and split second timing, you can infiltrate the aliens' headquarters. Play *Gryzor* once and you'll be hooked!
© 1987 Konami



BARBARIAN THE STORY SO FAR... The evil sorcerer Drax has agreed that if a champion can be found who is able to defeat his demonic guardians, the Princess Mariana will be released. From the wastelands comes an unknown barbarian, a mighty warrior, wielding his broadsword with deadly skill. Can he vanquish the forces of Darkness? ONLY YOU CAN SAY.
© Palace Software Ltd



CRAZY CARS You are racing in the world's craziest race: "The American Cross Country Prestige Cars Race". If you are able to complete the race before the time runs out, you will get a faster car. You start with a Mercedes 560 SEC, and only the world's best drivers may drive a Ferrari GTO. PREPARE TO START, READY? GO!!!
© Titus Software Ltd



PREDATOR You've heard about Predator, the Schwarzenegger movie - now you can play the leading role. Take a crack commando unit into the South American jungle to rescue a bunch of trapped diplomats. Should be easy enough...and so it would be, if it weren't for the mysterious alien who keeps on taking out your men.
© 1987 Twentieth Century Fox Film Corp. All rights reserved.



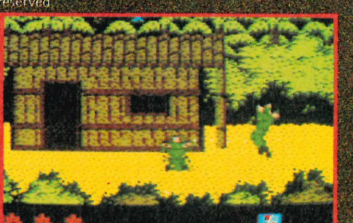
KARNOV Join Karnov, the fire-breathing Russian stoneman, on his hazardous quest to defeat the evil dragon Ryu and find the Lost Treasure of Babylon. Karnov is a vast 4-way scrolling game that combines both strategy and fast action in nine challenging levels of gameplay. It is recognised by arcade addicts everywhere as one of the best games of its kind. Karnov also has something special in the way of characters - have you ever been killed by a skeleton on an Ostrich?
© Electric Dreams Software Ltd



COMBAT SCHOOL Konami's arcade hit now for your home micro and already a No. 1 hit. Seven gruelling events featuring the Assault Course, Firing Range, Arm Wrestling and Combat with the instructor himself! Combat school throws down the challenge to the toughest of thoroughbred gamblers.
© 1987 Konami



TARGET RENEGADE Every move you make, every step you take, they're watching you. Fight your way through the precinct - the back alleys, the car parks, fight your way through the villainous community, the skin-heads, the Beastie Boys, the bouncers. This is just the tip of the iceberg on your chilling quest to confront "MR. BIG"



PLATOON Lead your Platoon deep into enemy territory, you can almost feel the humidity, sense the threatening dangers as you encounter the enemy and his many booby traps. Having found the underground maze of tunnels, enter at your peril! Enemy soldiers lurge at you from the murky waters within, but this is the only way you can find vital information. If you come out of this alive, you'll be just one of the few!
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To the Top of the World...

Unless you happen to be at one of 2,000 schools that possess the Laserdisc hardware bought to run the BBC Domesday system, you'll be unlikely to catch a glimpse of Virgin's North Polar Expedition. But hang on in there. This exciting project is paving the way for entertainment in the nineties - Compact Disc Interactive. Andy Storer visits the future and comes away feeling on top of the world.

The North Polar Expedition project has been designed from the outset with Compact Disc Interactive in mind. The aim was to write a leading-edge retrieval system that could be used as a live and profitable testbed for CDI applications.

Virgin Publishing saw the potential for testing the system and product in the educational market and set about commissioning the necessary groundwork to realise a project first conceived five years ago.

A surrogate journey

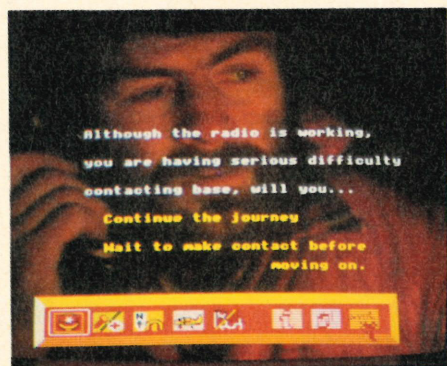
Back in February 1982, Sir Ranulph Fiennes and two companions set off on a 450-mile trek across the frozen wastes of Northern Canada in a bid to reach the North Pole. Six months later they were picked up by the expedition's support ship near Spitzbergen, having successfully completed the mission after floating south on ice for 90 days.

In *North Polar Expedition*, up to five students can elect to take on the role of the original team members and retrace their historic footsteps. There's a leader, of course, ably supported by a mechanic/medic, Navigator/ Radio Operator, Supply pilot and Land/Sea Base Controller.

Initially, each member has to answer a range of on-



• Setting your compass bearing is represented by a moving sequence of stop-frame stills



• Hi-res photographic images are used to show various vital decisions

From ice caps to school caps

A Los Angeles-based company, Armand Hammer Productions, shot a 105-minute, award-winning documentary of the expedition on 35mm film. This footage and the accompanying sound-effects form the basis of Virgin's first multi-role, educational adventure conceived by their Interactive Video Manager, William Beckett. Along with Fiennes' own visual material - some 500 slides and 20 minutes of 16mm film - all 54,000 frames of *North Polar Expedition* reside on a single 12" videodisc running on a Philips LV ROM player. Hooked up to a BBC Master with dual floppy drives to handle the database editor, on-screen overlays and information retrieval system, any single frame can be accessed in less than half a second.

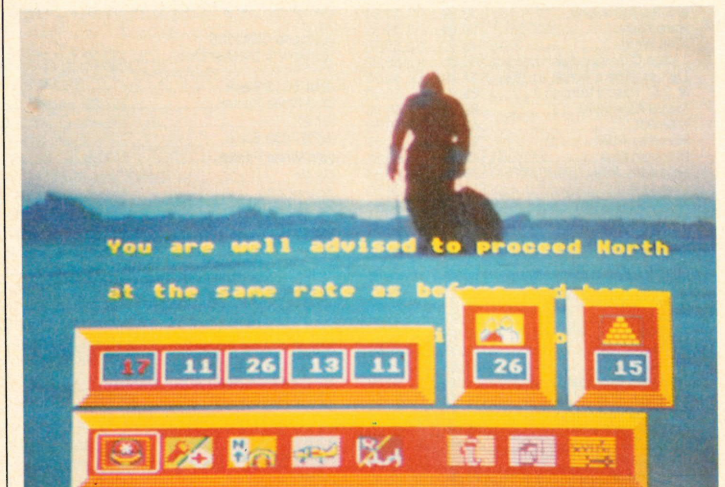
Programmed over 10 months by Virgin's Tony Green using the BCPL language, this interactive game or simulator - no one knows quite how to refer to it - is designed for use in schools as a group interaction learning process.

screen questions designed to establish the team's ability to meet the task at hand. By clicking on a hand-held tracker ball, answers are chosen from several displayed options overlaid on short film sequences and static slides. An information icon can be clicked to reveal pertinent background data on the question. Correct answers bump up individual scores

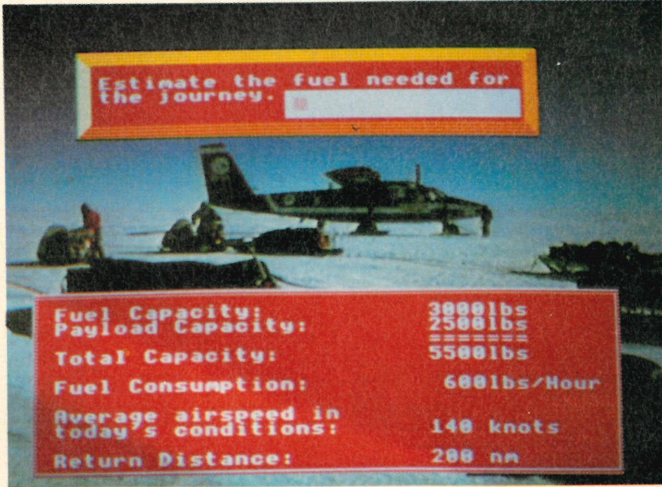
and contribute to the overall team morale and resource level.

Once your initial chances of success have been determined, you set your compass heading, choose a landmark and you're off. The trek is structured around the 60-100 days it takes to reach the Pole, and at the end of each day you're told the wind direction and visibility, your team's position, distance travelled, speed to date, speed required, days since last airdrop and food remaining. You also have to regularly radio this data to the Land/Sea Base Controller and Supply Pilot after aligning and tuning your transceiver.

Each day is spent negotiating a variety of problems and weather conditions thrown up randomly



• Trudging through the tundra. The icons bottom screen refer to the team members while the numbered ones represent individual scores. The large icons show the whole team's morale and resource levels



• Before your supplies can be airlifted the pilot has to take some decisions himself

with CDI

Techno-shock

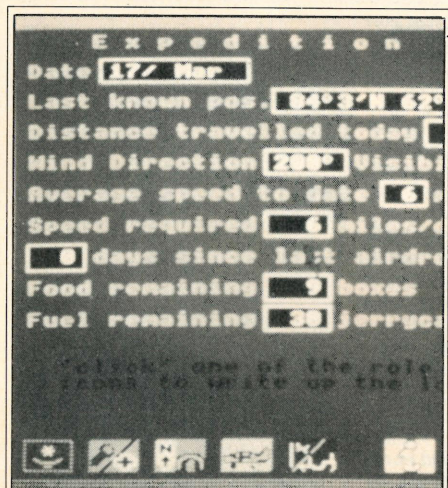
CDI represents the convergence of a range of media and signals the death-knell for magnetic tape-based entertainment and storage. Only videotape is likely to survive in the long term.

The system will provide digital sound with, at long last, digital video, and is envisaged as a group usage medium similar to TV. Virgin have plans to release an interactive encyclopaedia and several expert system packages such as DIY and car maintenance incorporating detailed still and moving sequences.

A CDI game based on the music industry where you get to manage a pop group is also on the cards. This will feature CD quality hi-fi sound and video along with biographical material. (Where are you *Sigue Sigue Sputnik*?)

CDI future?

CDI players are will probably be launched in the UK in mid 1990 and will cost around £1,000. By 1992 they are expected to cost between £300 and £400 and to have attracted worldwide sales of 100,000. They will be able to play existing audio CDs as well as CD ROM applications.



• Your end of day log showing performance



• A 12" Laser disc alongside another of Philips' exciting innovations - a 5" CDV disc. These are capable of combining six minutes of audio-visual play with an optional 20 minutes extra sound. And yes, you guessed it - they'll mainly be used for music promo material.

Laservisuals

A 12" laservisual disc running on Philips LV ROM Format can store up to 650 Mbytes of moving pictures, still frames, text and audio. A laser beam is used to retrieve data from a surface of reflective and non-reflective pits. Film and stills material is telecined onto 1" videotape before being lasercut onto masters. However, the system is read-only - program data has to be updated with accompanying software and can only appear as text overlays.

The Japanese are the biggest fans of Laserdisc systems, having bought 1.5 million of them. Half a million units have been sold in the States and the rest of the world has bought a quarter million.

The Philips and Pioneer systems form the main basis of the interactive video market, which is estimated to be growing at a rate of 50 per cent each year. In the UK the BBC are the premier producers of product - to date they've released interactive programs on volcanoes, ecology and the British countryside, and are currently working on *London* - a training and information project based on the capital.

Virgin publishing are also planning to produce further laser-based products. In the pipeline is a business travel package and an intriguing arcade action product (see news story on page 5).

Philips' firsts

The *North Polar Expedition* package costs £199 and includes a 12" videodisc, 2 BBC-compatible 400k disks, Sir Ranulph Fiennes' book of the expedition *To the Ends of the Earth*, a teacher's guide, and manuals with maps for each team member. If you want to buy the system off the shelf - which means contacting Watford Electronics - it'll cost you around £4,000.

The first widely available laserdisc application was the *Domesday Project* produced by BBC, Acorn and Philips in 1986. It's an encyclopaedia of Britain in the eighties and comes on two video discs comprising 150,000 pages of text, 55,000 stills, 10,000 sets of statistics and an hour of video sequences. Based around Ordnance Survey maps featuring 270,000 place names, it's possible to zoom progressively from satellite scale right down to street level and pick up details on housing, land use, society, economics and environment.



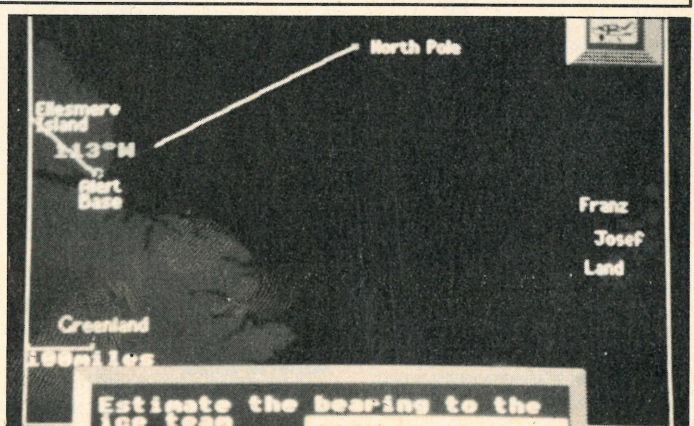
• The Domesday system uses the same tracker ball control as North Polar Expedition

by the program. Again, these are overcome by successfully answering multiple-choice questions randomly addressed to individual team members. In this way, no two journeys will be the same.

Since it's estimated a successful traverse of the ice cap might take an expert 1-2 hours, a 'game-save' facility has been built into the software. Interestingly, there's no chance of you dying. A death would make the rest of the expedition impossible, since every role is vital to the safety of all. Instead, if a team member becomes too injured to continue they are simply airlifted out and replaced.

Every stage of the expedition is supported by a diverse range of moving footage, stills, maps, diagrams and audio spot-effects, interrupted by windowed information and update screens. All input is by icon control except for questions demanding numeric information - i.e. the bearing you propose to take or your estimate of the distance you've travelled. So don't get the impression all you'll see are the icy wastes of some vast white desert - there's a whole host of activities and decisions to keep you on your toes. Which is just as well really as otherwise they'd probably drop off. ●

• Just remember, when you reach the North Pole the only direction is South!





A CRACKER WRITES... JUST OK that's it. I've had enough of this B—crap. I'm now going to tell you naive little people who think England is the land of fair play with strawberries and cream! Soft Ware piracy rules along with Hackers, Crackers and all other covert operations in the computer industry.

My short message is this, FAST are wasting their time because I and about 2000 thousand other user in and around the South West of England are getting our hands on software for about £2.00 each. You name we've cracked it, played it and copied it. If you think I joking, well figure this. I and my friends have received copies of SUPERMAN and that not even released yet.



• Crackers: Are they illiterate yobbos?

Don't worry if your baffled Express Mail, because every month I will send you a sample disk of just some of the games were messing with.

Every package published each week, I would have already Cracked, played, copied. HAH by suckers. George

• **But its still stealing isnt it? I mean you wouldnt be so proud of yourself if you had mugged an old woman would you or maybe you would I dont know, its a shame that the attitude of you're letter gives Crackers the image of being illiterate yobbo's HAH well thats just not true is it? because THERE NOT, many of my best freinds are crackers and most of them can read and rite just as well as you or me can.**

I'D HAVE X FOR BREAKFAST I read with great interest your recent article with the interview of Mr. X, who was your mysterious cracker. I am also a program cracker, but not living the same type of low life that your Mr. X is.

I started cracking programs about 5 years ago when I was given my first computer, a BBC model B, which was a delight to use. The amount of software available was excellent. Then about 18 months ago I decided that the programs from the 8-bit sector were just not challenging enough, and it was time to go 16-bit. After spending 3 months reviewing PCs (OK, but not enough games software), Amigas (technically excellent, but very overpriced), I plumped for an Atari ST, and the advert was very true: 'Power without the price'.

I criticise Mr. X because all the programs he deals with are copies, and he

only has copies in his collection, whereas I had over 200 cracked programs for my Beeb, and have well over 30 for my ST, but I also have the originals, and do not pass on copies of cracked programs. I crack commercial software for a variety of reasons:

- 1 To enhance the game by adding extra lives, infinite energy etc, to enable me to see into the depths of the game;
- 2 To strip away the copy protection and thus make the game load faster, and cleaner;
- 3 To improve my programming knowledge by studying the code used to write the programs, and the copy protection;
- 4 In many cases the only way to make a legitimate backup is to strip the copy protection away.

I find nothing wrong with what I do, as I buy the original of any program I intend to crack, and do not pass on these cracked programs to anyone else. They are for my own use only. Xeer

ARCH FIENDS

I started an Archimedes user group about six months ago with a few friends here in Dublin. Since then Arc users users from all parts of the British Isles have joined us and we now have about 500 members throughout

the UK and Ireland. Through our monthly newsletter 'Archer' we spread news, software and ideas. Our main emphasis is on programming rather than hardware projects. Recently we have also payed attention to users in education, since the Arc is replacing the old beebes.

One of our aims is to promote the use of this computer, which seems a seriously underrated machine, especially now that both Unix and the new RISC OS are available for it.

The group may be contacted at: **OF Smyth, ARMUG, 41 Beech Park Road, Dublin 18.** Our sub is £20, which includes twelve newsletters and regular software offers. Ossian Smyth, Dublin, Rep of Ireland

JOIN THE AA

The machine-specific column, 'Your Format' is an excellent idea since it saves me ploughing through pages of irrelevant material to find the relevant. In that slot I find a reference to a magazine entitled 'A*strad Act'on' made by its editor Steve Carey. Is there such a magazine and does it cater for my CPC464? I haven't seen it in the shops in Lisburn. A Cooper, Lisburn, Co. Antrim, N.I.

• **Yes, Amstrad Action is a real magazine. It is usually called AA, though this is not to imply that its writers are either drunk or broken down. It caters for all CPC owners and if you can't find a copy in your local newsagents, you can order one from The Old Barn, Somerset, Somerset TA11 7PY, price £1.50.**

AUNTIE BEEB

I was infuriated to see the BBC Micro referred to as 'the dull old Beeb' in your

Dear Reader

Two more pages packed with a small selection from our postbag and Rob Ainsley's replies. Got something to say? Make your voice heard in computing's liveliest letters page! Send to: **Express Mail, 4 Queen Street, Bath, Avon BA1 1EJ**

PS. Sorry, NO personal replies, whether you include an SAE or not. We're too busy putting Express together!

magazine. The Beeb is the most successful 8-bit computer and there is no justification for this remark. I think maybe the writer of the article should try using a BBC and realize for himself its potential. Peter Cumberland, Epsom, Surrey

• **Well, it's certainly old, it's definitely called 'Beeb' and the use of the definite article in the phrase is incontrovertible, so we're left with the word 'dull'. Unkind maybe, but I've met few people who would describe the Beeb nowadays as exciting, stunning, breathtaking etc. Like a Morris Minor, it does a good workhorse job very reliably and successfully but can't really be described as glamorous any more.**

BOUND TO LOOK STUPID

The public debate over the superiority of your magazine and *Popular Computing Weekly* is almost as great as the Amiga v Atari debate. The truth of the matter is that Express is far superior simply because it has columns devoted to different micros; it has a generous letters page; it has an extremely easy to read format; and it has articles in it which did not appear in other mags four weeks earlier. I buy every magazine which features the Amiga; I like them all for different reasons, but if I had to choose between *Popular Computing Weekly* and *New Computer Express*, you would get my money... L Bound, Bolton, Lancs

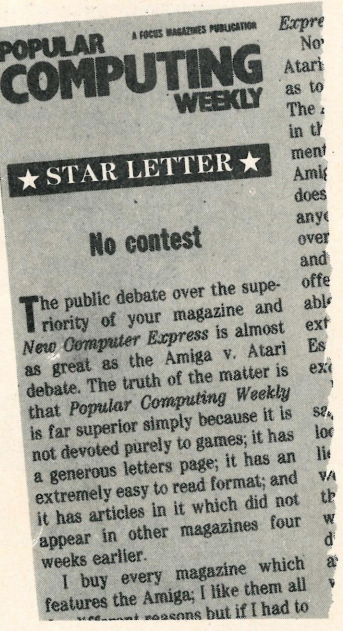
• **Thank you for your kind words, Mr Bound. Funny how they are almost exactly the same words as in your prize-winning letter to *Popular Computing Weekly* last week, but in a different order. Now rearrange these words to make sense: you'll prizes sunbeam no us get from sodding.**

PIRACY IS REALLY COOL

I have never before written to a computer magazine, but wish to make my comments heard regarding software 'piracy'. The asking price of games software for the 16-bit machines of £20 plus is scandalous. The software companies (and magazines) continually defend this sham by stating that 16-bit takes 'longer to program' and that the software is of 'superior quality'. This argument is patently rub-

bish. It can be said that due to the vast memories of the 16 bitters, less time has to be spent trying to cram a program into a limited space. As for quality, the 16-bit machines have the speed, processing and graphics capabilities of a higher quality than the 8-bit machines. The software companies are trying to claim credit for producing a better product when it is the machine itself that provides the superiority. You could hardly expect to market a game of Spectrum quality on an ST or Amiga!

I am therefore happy to agree with the distribution of 'pirated' software as the software companies are pricing themselves out of the legitimate market. I do not buy any games software with a hyped-up price on principle. There is in



my opinion no game worth £20 plus. It is clear that such prices are set in order to force the younger members of our society in the main, to part with their cash. This is the most sinister aspect of the pricing policy.

I know you will say that when more ST and Amiga computers are in use, competition will force down prices. This is true, but when you think about it, software houses will be selling a cheaper product in smaller numbers to a wider public and

PG FOR DENNIS THE MENACE?

Oh boy, I just can't believe it, 'Computer violence'. Are you kidding me? I've heard it all now. Bored with trying to ban violence on the TV, these people are now turning their attention to computer games. Are they real? It's totally absurd. After playing Barbarian or Veteran on my ST, I have no inclination to maim or bludgeon anyone to death with a large blunt instrument! My younger brother often has his friends around to play on the computer, and not one of them has inflicted any damage to anyone else, although they may pull the dog's tail from time to time!

Dr Radecki said that some kids are spending over fourteen hours a week playing video games, and that they are a complete waste of time. However, doesn't this time spent playing computer games keep kids off the streets where they could inflict "real" damage, and get

into "real" trouble? Computer gaming is a hobby OK, so come on guys, lay off, leave the kids alone. I can only assume that you're jealous. You didn't have computer games when you were young, but they do, so let them have their fun. Really, you're just too narrow-minded. Next you'll be trying to ban the "Beano" or "Dandy". Try putting an 18 sticker on them! M Thomas, Crumlin, Gwent.



- If you start banning things which contain violence regardless of how artistic or comic it is intended to be, then you'd have to ban:
 - a) Tom and Jerry
 - b) Dennis the Menace
 - c) Shakespeare (King Lear, Cymbeline, Macbeth etc.)
 - d) The Bible
 ...and just about every modern work of literature from Ulysses to The Satanic Verses.

still be making a healthy profit (look at the budget software houses). At the moment they are sitting back, happy in the knowledge that they are selling to a limited market of customers eager for their releases, therefore guaranteeing an uptake of their product due to lack of competition. This gives them an ideal opportunity to charge a high price.

My advice to the public would be not to buy new releases until the price drops due to lack of sales, and to wait and buy second-hand when yet another disillusioned buyer finds that he has paid the price of all that hype. That is one sure way of getting the software houses to stop charging these ludicrous prices. Ray Best, Nottingham, Notts

• **A bit confused, sorry: first your quotation marks imply that the 'superior quality' of, say, an Amiga game is an illusion, but then say you can't expect a Spectrum game to be marketed on an Amiga. No, the difference isn't just hardware: there's a trade-off in the programming between ease of writing for such a powerful processor and big memory and extra design effort needed to develop those quality graphics.**

No game worth £20? Come on, you've just spent £400 or so on a machine to play them on. Non-buying of games you think are too expensive is one thing and may or may not bring prices down; nicking them in the shape of pirate copies is another and will certainly push prices up.

MORONS

You invited comments from the public, so here goes! I deplore the current vogue for software which emulates a low category of arcade release. There seems to be a craze for the vertically or horizontally scrolling "shoot em-ups" without any mental input. Basic moron fodder, which you help to promote.

I know the argument - if it sells it must have good points - but really that could apply equally well to something as undesirable as narcotics. Whatever happened to quality? We are a varied public with varied tastes and the software industry should reflect that, instead of pandering to an easily exploited teenage market with a violent bias. Alan Boxwell, Bristol, Avon

• **Hmm; I'm not sure about quality and shoot-em-ups being disjoint. There are some very good shoot-em-ups and some very bad 'intelligent' games. It's our duty to the large proportion of our readers who are interested in arcade style games to give them fair coverage. Sure, a lot of games are hackneyed, forgettable, unimaginative and pointlessly violent - but if they are we do our best to point this out, and hopefully guide the readers and therefore the market in some small way to improved quality. I agree totally that gaming software must move away from its current obsession with shooting things if it's to become legitimate leisure, but it's still early days. Change will be slow and must come from within - ie. from you, the buying public. As this first generation of computer users gets older maybe we'll see things changing and a wider base of game styles developing? I hope so.**

PROGRAM YOUR PCW

At the moment I own an Amstrad 6128 and I am hoping that someone could advise me whether to purchase an Amstrad PCW 8256 for some simple programming. D Makin, Essex

• **The poor underrated PCW is in many ways an ideal machine for programming because it's relatively straightforward, robust and inexpensive. Mallard BASIC comes with the machine free and is a good version of the language with JET-SAM, special filing commands for writing databases. Otherwise you have a wide range of programming software you can buy: Pascal, C, Forth, BCPL, Modula, some good assemblers, graphics routines - HiSoft (0525 718181) do most of these among others.**

PROTECTION RACKET

All this talk about computer pirates - what about a word or two about us users? Some software houses seem to have forgotten we exist. Their sole concern seems to be to develop such sophisticated protection devices that no-one can get at their programs.

I for one am fed up with programs that are hard to load, or fail to load at all, or are deliberately inconsistent with peripherals; or are made tedious to use on account of idiotic codeword routines. All in the name of "protection". In fact, the more sophisticated the protection devices become, the more the challenge incites the "cracking crews". The only practical effect is to make life difficult for the ordinary user (the vast majority) who shells out his hard-earned cash in the High Street store.

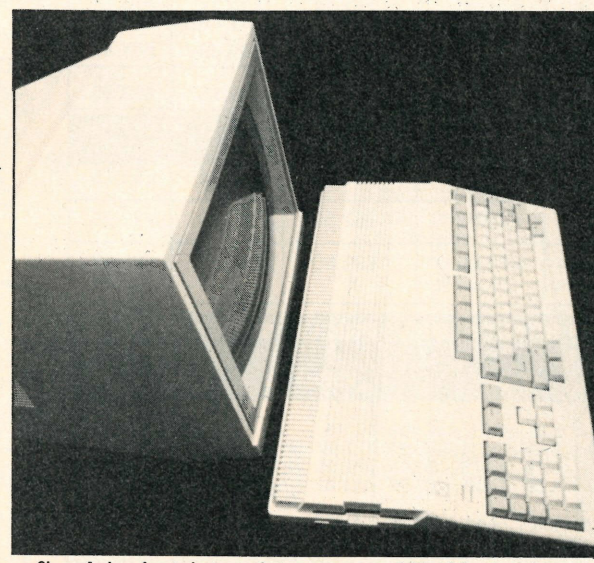
I'm glad to see that a change is beginning to occur. For instance, Ashton Tate, makers of dBase III, have taken out the protection routines from their products, on the grounds that (a) piracy is now recognised as a crime; (b) most people are not criminals; and (c) a product that is user-friendly and can be easily backed up better than one which is hostile. The sooner more companies follow their example the better. Roger Musson, Edinburgh, Scotland

• **It would certainly be nice to see games houses following Ashton Tate's example, though I suspect it will be a long time. More people are likely to rip off a game they would otherwise have bought than they would a business database such as dBase III; you need a manual to use it, and besides it has lousy animation and rotten graphics.**

AND IT DOESN'T DAMAGE LAMP-POSTS

In an article in Issue 9 you make some very unjust and incorrect statements about Workbench and CLI on the Commodore Amiga computer. This article was called INFURIATING and in some ways it certainly was!

Throughout the article you state that



• Cheap Amigas for students - or just easy terms available...? See Loan Arranger

the DOS is a "dog" and that the Amiga's operating system is "not a patch" on the ST or Mac's systems. Whilst I agree with your comments about the speed of disk access, I do not think the reviewer has ever used the Amiga to the full as there is

no way that the ST's GEM environment is either as adaptable, complex, or comprehensive in its capabilities as AmigaDOS. GEM is faster to use, but that, as far as I've been able to see, is where its superior capabilities end.

Having had the opportunity to look very closely at both machines before deciding to buy an Amiga A500 18 months ago, my mind was finally made up by the Amiga's much more flexible if slower Workbench and CLI (now superseded by Shell on Workbench 1.3). Also I know quite a few ex-Atari ST now Amiga owners, who say more or less the same thing. However, that's not to say that improvements to AmigaDOS would not be welcome as it certainly is not perfect by any means, but it's not as bad as your article portrays it, and it is certainly not as limiting as GEM on the ST.

Apart from that small criticism, I find your magazine a positive bargain... Keep up the good unbiased coverage!!!! J Simon, Oakham, Leics.

• **Well, it wasn't that much of an insult. Quite appropriate really: a dog is a man's best friend (Amiga, gedit?) and also takes a few seconds to retrieve things.**

MSXTREMELY PATIENT

A couple of years ago I purchased the MSX game 'Elidon', released by the software house 'Orpheus'. My employment gives me the opportunity to use photographic facilities which I have used in the mapping of this game.

Over 4,000 screens and about a years work later, I started to play the game. To play 'Elidon' you guide a fairy through a maze of woodland scenes. You then pick up seven potions in a certain order to take to seven flowers. After all the hours I have spent on this enchanting game I discover that there is no seventh potion. An arrow which generally indicates its location (lower right of the maze) points outside the extreme perimeter of the game!

Can anyone help me? Orpheus seem unobtainable! Maybe just by a chance in a million the programmers (Paul B Kaufman, John B Marshall, Geoff Phillips and Jon Maskill) of this game read 'Computer Express'. S P Kowalski, Hucknall, Notts.

LOAN ARRANGER

I am writing with reference to the special preview issue of NCE free with the December issue of ACE. On page 2 you mention that students may be able to purchase the Amiga at sub-retail prices. Could you give me more information on this? Marc Carper, Dundee, Scotland

• **No cut-price Amigas I'm afraid, but a loan scheme will enable you to borrow the dosh for your machine - plus special bundled software - and pay off just the interest. When you get a job you clear the balance. See the news item on page 2. The way student grants are going, this is a scheme you'd better get used to...**

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GAME27 - MONOPOLY
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Your computer's speed and graphics power - or lack of them - are really of little interest to anyone else. They'll judge you by the quality of your letters, the look of your novel manuscript, the readability of your listings, the clarity of your newsletters...and that means the quality of your printer.

There are hundreds of different models: 9-pin, 24-pin, inkjets, lasers - but which is for you? And which are the best value? Express Essentials tells you what you need to know - and names the best buys

Choosing a printer is probably more difficult than choosing a computer: there are variations in the way ink is put on paper, the speed of the process, other considerations like paper feed, and the subjective questions of print quality.

Unless you use your micro exclusively for writing letters you can forget daisywheels, and lasers remain too expensive for home use. So, for the vast majority of applications, you can restrict yourself to two main kinds of printer: impact dot-matrix machines with 9 and 24 pins; and ink-jet models.

A TASTE OF MONEY

There are something like 300 different makes and models of printer available. And since there are only a handful of different technologies, and a few "extras" like speed and easier paper handling, price is the most competitive way for one manufacturer to score against its rivals.

It's also the easiest way to narrow down your field of choice: set your budget and then consider the possibilities in that price range.

Price forms one corner of a price-performance triangle, with the other two corners occupied by print speed and print quality. As a general rule you can count on having a cheap, fast printer with less than brilliant output, or a cheap, high-quality printer that works at a crawl. But you have to pay heavily for speed and quality together.

The prices given here are not recommended retail prices. Printers are more heavily discounted than any other computing item, so we've given

typical advertised prices from a variety of retailers. If you can find the same printer for less than our price you can be sure you're getting a good bargain. By the same token, if you're being asked to pay considerably more, shop around for a while before parting with your money.

MY PRINTS WILL COME

Manufacturers are very kind to themselves when quoting print speeds, usually given as characters per second (cps). Normally, you'll see two figures: one for draft and one for near-letter quality (NLQ) type.

These figures are always optimistic because they're based on artificially easy printing tasks. When the printer has to deal with real-world jobs that include lots of paragraphs and carriage returns, the genuine speed has to be at least a little lower than the manufacturer's ideal.

It's also difficult to translate cps speeds into something more understandable. As a rule of thumb, there are six characters in the average word, about ten words to the average printed line, and about 50 lines to the average printed page.

So a speed of 30 cps (about average for NLQ printers) translates to about six words per second, and about 350 words per minute. The average novel would take nearly five hours to print out (a typical laser printer could knock it out in half an hour).

HANDSOME PRINTS

For many users the quality of the output is perhaps the single most important factor after price. But although there is a temptation to go for the best-looking results, you should take other factors into consideration.

If most of your printouts are file copies for your own use, speed might be more important than producing good looking type that no-one else is going to see.

There is a direct trade off between print quality and speed. Although 9-pin printers have something of a reputation for poor print, it's reputation that isn't really justified. The better 9-pin machines can produce output very close to that of low cost 24-pin and ink-jet models.

But they manage this by printing each line twice, one on top of the other, slowing down the print process considerably. 24-pin printers are a lot quicker - often three or four times as fast - because they can put the same number of dots on the paper in fewer 'passes'.

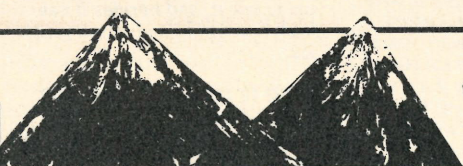
THE PRINTS AND THE PAPER

This is something that often gets overlooked when shopping for a printer, although if all you need is a model that can churn out reams of text or program listings on tractor paper then you can probably get away with giving it little consideration.

However, for users with greater needs - perhaps requiring mixed usage of tractor paper for data dumping, and single-sheet headed stationery for correspondence - paper-handling can bear a lot of examination.

Early printers only took tractor paper (also called fanfold, the concertina-like paper with extra strips of holes down the sides). Modern models support both tractor and friction feed (the latter for single sheets) but how they do it varies enormously.

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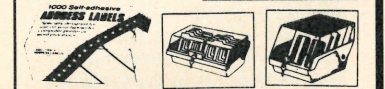
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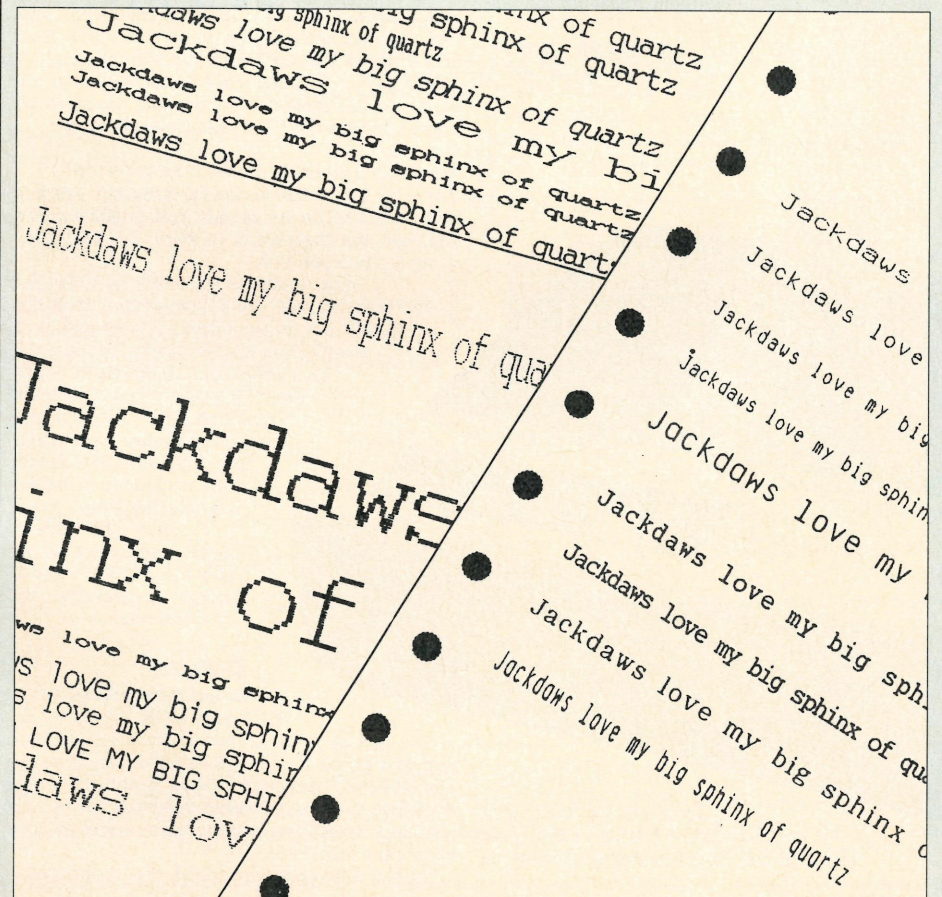
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The best allow you to "park" the tractor paper quickly and easily while you switch to single-sheet. And if you expect to use a lot of single-sheet paper a sheet feeder can make life a lot more pleasant.

BEST BUYS

Budget

Citizen 120D • 9-pin dot-matrix • £130

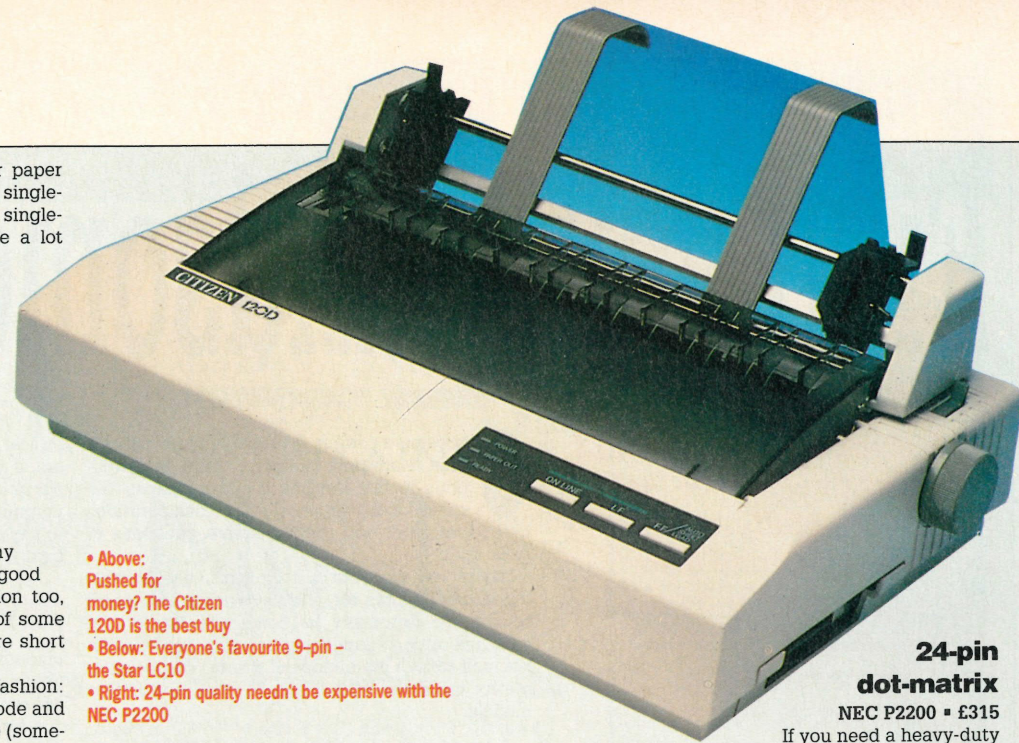
The Citizen 120D has been around for quite a while now - indeed, it's just about at the end of its commercial life. But that's why it's generally available at ridiculously low prices - we found it advertised for as little as £100.

The Citizen won't set records in any department, but for the money you get a good little workhorse. "Little" is a fair description too, since this machine is about half the size of some printers, which could be important if you're short on desk space.

It covers all the essentials in reasonable fashion: quoted print speeds are 120 cps in draft mode and 25 cps in NLO. The draft is highly readable (something that occasionally gets overlooked in the rush to NLO), while the better font is adequate for correspondence. It also does a surprisingly good graphics dump.

Paper handling is far from sophisticated, but again the 120D does the job. It handles single-sheets well, automatically grabbing the paper and feeding it to the top of the page. Tractor feed is handled by a clip-on unit which can be left in place if you want to use occasional single sheets but the fanfold paper must be removed.

One extra attraction for C64 and 128 owners is that a special interface is available that allows the 120D to be used directly from the Commodore serial port.



• Above: Pushed for money? The Citizen 120D is the best buy
• Below: Everyone's favourite 9-pin - the Star LC10
• Right: 24-pin quality needn't be expensive with the NEC P2200

**9-pin dot-matrix
Star LC-10 • £195**

This is everybody's favourite printer at the moment. Although it's not the fastest printer around (120 cps draft, 30 cps NLO) the LC-10 has a number of features that set it well ahead of the competition.

To begin with, standard print quality is excellent, with the NLO as good as that of some 24-pin printers. But - unusually for a printer in this class, and especially at this price - the LC-10 also supports extra fonts, providing three alternatives in Courier, Orator and Sans Serif. Graphics output is also good.

The LC-10 scores heavily too on paper-handling. Single sheets can be automatically positioned from a sheet feeder, while fanfold paper can be parked at the push of a button, allowing single sheets to be used without removing the fanfold.

To cap it all, for an extra £30 you can add a colour facility which, while not brilliant, is financially a lot more attractive than a £1,000-plus Xerox ink-jet.



In total, there's nothing to criticise in the LC-10 and a great deal to commend it. Outstanding value for money.

**24-pin dot-matrix
NEC P2200 • £315**

If you need a heavy-duty printer, built to last and capable of excellent print quality, this is the machine. With both IBM compatibility, the P2200 boasts respectable print speeds of 140 cps in draft and 47 cps in NLO.

The standard font is big and chunky, producing eminently readable text although lacking a little style for business correspondence. However, there are four additional fonts built in and these cater for just about every eventuality, with a standard Courier-style typewriter font, a very attractive correspondence typeface, and two alternative sans serif faces.

What sets the P2200 apart from the crowd is its innovative approach to paper-handling. Paper can be fed from the front or the rear, whichever is most convenient for your particular desktop, and fanfold paper can be parked for using single sheets instead.

All features are controlled from a clearly-designed panel at the front of the printer, and the P2200 wins extra points for its unique menu system: current settings are printed out and then altered using yes/no buttons on the front panel.

NEC has established itself as the leader in the 24-pin printer market (the company produces no other kind) and the P2200 shows its pedigree.

Honourable mention: Epson LQ-500 • £315

Epson is the world leader in computer printers with a reputation for quality and reliability. The LQ-500, the cheapest of its 24-pin printers, lives up to the reputation.

Print quality is excellent in both text and graphics, and it's a shade faster than the P2200, but in an effort to keep the cost down Epson has trimmed a few corners.

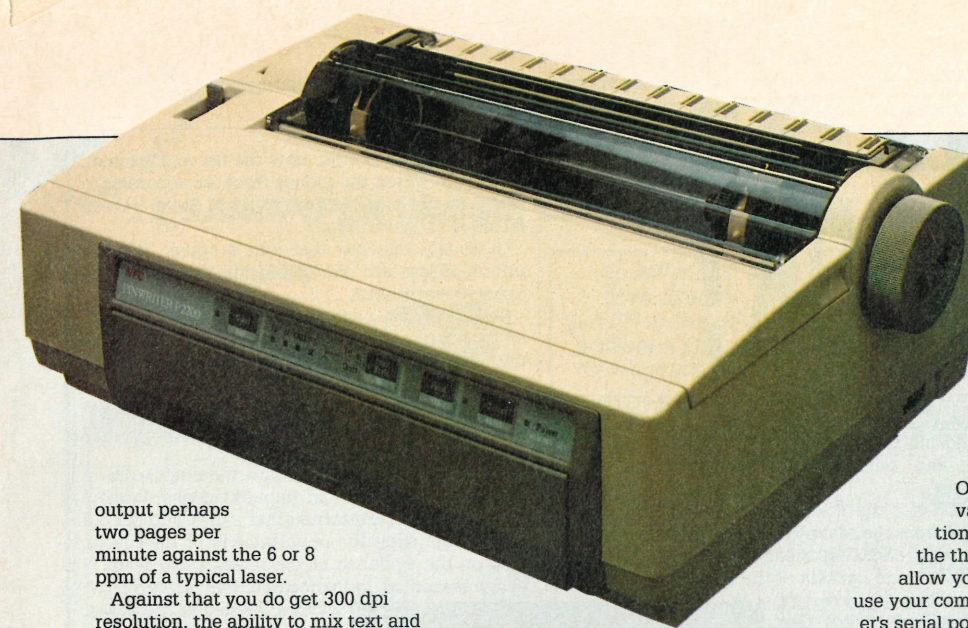
As a result, the LQ-500 loses out to the NEC on the range of features provided. For example, it lacks the easy-to-use control panel, and the LQ-500 falls well short in paper-handling facilities.

But the Epson name counts for a lot and the LQ-500 is well worth considering for business use.

**Deluxe
Hewlett-Packard Deskjet
• Ink-jet • £690**

For all of us who would like a laser printer but can't afford it, Hewlett-Packard has provided the answer. Although some quibblers have described the Deskjet's print quality as "almost as good as a laser", few mere mortals would be able to spot the difference.

The real difference is in speed: the Deskjet can



output perhaps two pages per minute against the 6 or 8 ppm of a typical laser.

Against that you do get 300 dpi resolution, the ability to mix text and graphics, and if noise levels are a factor for you the HP Deskjet is among the quietest printers you can buy.

MÉNAGE A TROIS

If you're lucky enough to have more than one computer but a single printer, you might be aware of the dangers in constantly plugging and unplugging connectors when switching between machines.

A better solution, and more convenient, is a switcher box. Essentially just a box with two or more input ports and one or more output ports, the switcher allows you to leave both computers hooked up to the printer and lets you simply select between them at the flick of a switch.

More expensive models sense incoming data and do the switching automatically.

vice versa. And reversing the process would let you have one computer attached to two printers - perhaps a cheap dot-matrix for graphics work and a daisywheel for business correspondence.

Prices start at around £20 for a simple two-to-one parallel box. You can also combine switcher boxes and print buffers, getting the advantages of both in a single unit.

THE PRICE OF FRAME

For all the impressions of miniaturisation in computers, everybody knows that once you start adding to your system you end up with the desktop equivalent of urban sprawl. The computer, monitor, disk boxes, mouse mat, and a couple of books or magazines soon occupy the largest desk-top - or dining table. Add a printer, and things

A break for adds

The notion of buying add-ons for your printer might seem a little strange, but there are several items you might consider that can speed up your printer, make it easier to use, or otherwise overcome some of its limitations.

The most impressive gains can be made by adding a hardware print buffer to your system. Although it can't speed up your printer, it can increase the overall system speed by freeing your computer for other work more or less instantly instead of keeping the computer, and you, hanging around waiting for a slow printer.

The buffer is basically a large chunk of memory that connects to the computer printer port on one side, and the printer on the other. When you want to print a document, the computer just dumps it to the buffer at high speed and then thinks the print job is complete.

The buffer, meanwhile, feeds data to the printer at the printer's pace.

With prices ranging from under £100 for a 64K buffer to around £150 for a 256K buffer, a dedicated print buffer can be a much cheaper solution than buying a new, faster printer.

threaten to plunge to their doom on the carpet. A printer stand can at least alleviate the problem by raising your printer off the desk and providing somewhere for your paper to live.

The cheapest are simple wire or plastic frames with prices starting around £10 to £15. Others, with prices up to £30, are things of beauty in terms of robust construction and providing input and output trays, allowing you to leave a long document printing without fear of it spilling onto the floor where the cat, dog, or the youngest member of the family will devise all manner of ways of destroying it. ●

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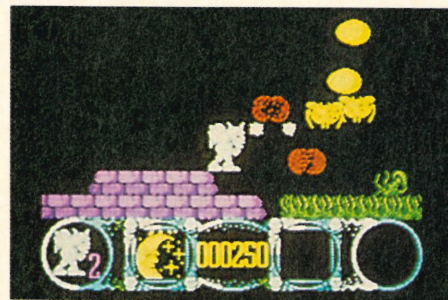
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Hitman's Heyday

Rik Haynes previews six hot new releases, including a heroic Hewson hat-trick

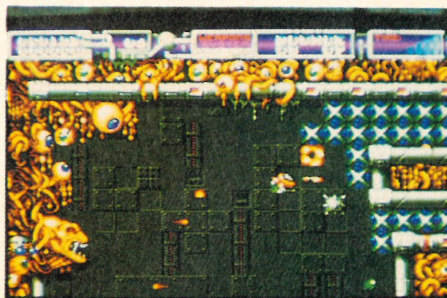
STORMLORD HEWSON

Raffaello Cecco, creator of *Cybernoid*, *Cybernoid II* and *Exolon*, now gives you the chance to play *Stormlord*, in a mission to free the imprisoned fairies from the evil queen. It's a good job the action looks tougher than the scenario! Available soon on Spectrum, C64 and CPC, with ST and Amiga versions on their way later in the year.



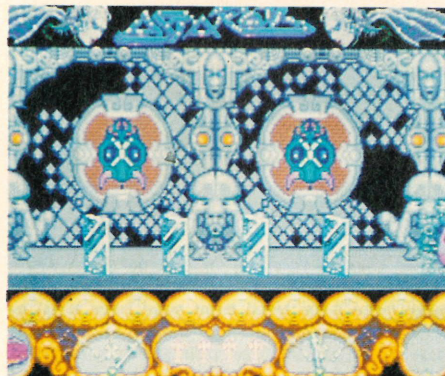
CYBERNOID II HEWSON

Already out on the 8-bits, ST and Amiga *Cybernoid II* is the sequel to *Cybernoid* (what else?), featuring extra levels, animated landscapes and Black Holes. The aim of the game is to rid the Federation storage depots from a bunch of marauding pirates using your latest Battlestar spaceship, equipped with such handy weaponry as bounce, seeker and tracker bombs.



ASTAROTH HEWSON

Pete Lyon, graphic designer on many a Microdeal title, has taken some time off from the Cornwall-based company to produce the graphics on a new arcade adventure from Hewson. You play Ozymandis, a fearless brigand who sets out into a dark and hazardous labyrinth filled with mysterious traps and ferocious monsters in a bid to destroy Astaroth, the angel of death, and steal her hoard of precious and magical treasures. Out soon on ST and Amiga.

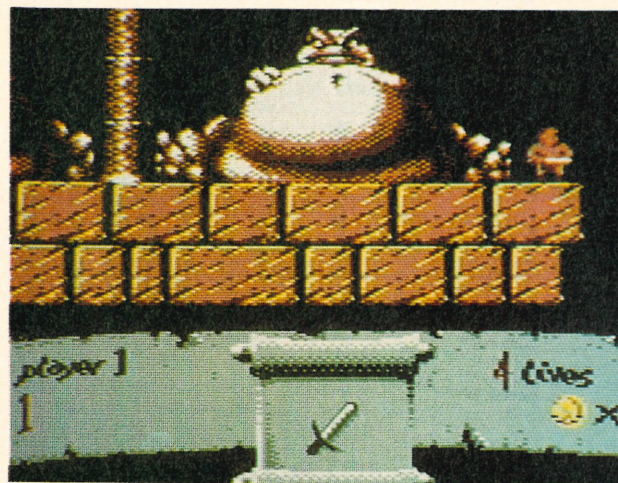


TYGER TYGER FIREBIRD

Fans of the C64 bulletin board Compunet will be pleased to know that Paul Docherty, alias Dokk, is currently working on the graphics for this "all-way" scrolling arcade adventure programmed by that old Netter, Gary Liddon.

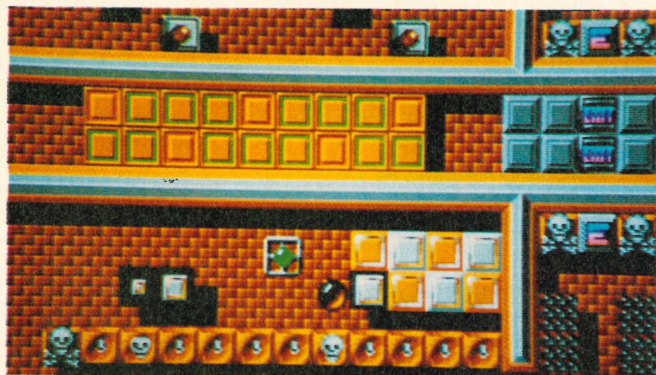
As Sumo type Lance Tyger you'll have to battle your way through a mystical land ridden with monstrous beasts in an ongoing onslaught of obese obscenity.

To be released in the near future on Spectrum, C64 and CPC.



TITAN TITUS

Marking a departure from the more usual Titus offering of *Crazy Cars*-type game-playing, *Titan* lets you play an eight-way scrolling game of bat and ball. To be released shortly on C64, CPC, ST, Amiga and PC, with the Spectrum version following a little later.



STAG EAS

STAG is a space trading game concentrating on the survivors of an annihilated Earth, and their attempts to build a Space Trading Company in conjunction with a bunch of aliens. The trouble lies in the load of Space Pirates wanting to make a quick profit out of your hard endeavours. Out shortly on ST and Amiga.



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Do you already own a computer
If so, which one do you own?

A la modem

Teaching your micro to use the phone can open up a whole new world: free software, bulletin boards, home banking, linkups to giant data banks...but first you need a modem. Peter Worlock explains.

Computer communications has always been one of those idealised dreams of personal computing. When the electronic brains of science fiction posed a threat to mankind, their ability to link up with their brethren around the world was always taken for granted. And the wristwatch computer, linked by radio to larger systems, is another cliché of pulp SF and Saturday morning serials.

But while most aspects of personal computing have raced beyond the dreams of authors and film-makers, comms has so far failed to live up to expectation. The cause is not so much technical as economic. Unfortunately, while the trend in pricing of computers and software has been consistently downwards, the cost of using the phone has gone up and up.

However, provided you keep the costs in mind, communications can open up whole new areas of interest, as well as providing access to public domain software and many sources of instant advice.

Speed

Data transmission speeds are one of the fundamentals of communications and affect your choice of modem, and how you can use it.

Speeds are measured in two ways: baud rates and bits-per-second (bps). The two are usually used as if they were synonymous, but there are differences. Baud rates refer to the number of modulations per second, so only when one modulation equals one bit of data do baud and bps match (higher speed modems usually modulate much more than one bit at a time.)

However, for practical purposes baud and bps can be used more or less interchangeably.

The transmission rate that has been in use longest is 300 bps which equates to about 2,000 bytes or words per minute. At that rate, a comparatively short public domain program of 16K would take more than eight minutes to transmit, and a single screen from a dial-up database would need a full minute to be updated.

These speeds are obviously less than satisfactory, so the industry quickly made a jump to 1,200 bps - four times faster. The next "standard", already widely used, is to 2,400 bps and, having skipped 4,800 bps altogether, 9,600bps modems and services are beginning to appear.

The most commonly used speeds in the UK are usually referred to by the standards set by the Consultative Committee on International Telegraph and Telephone, thankfully known as the CCITT. These standards are:

- V21 300
- V22 1,200
- V22bis 2,400
- V23 1,200/75

V23 is an oddity employed by Prestel and since adopted by a few privately-run bulletin boards. The reason for the split-speed rate arose because of the nature of Prestel, which works on full-screen displays of data. A fast-ish transmission is needed to handle these and Prestel decided on 1,200 bps.

However, at the time 1,200/1,200 modems were rare and expensive, and using Prestel is more or less a one-sided conversation, so while the Prestel computer transmits at the faster rate it was decided that the user only needed a very slow transmission.

Faster speeds are not only desirable to cut down on the boredom factor (who wants to spend 15 or 20 minutes staring at a blank screen while downloading public domain software?). Many dial-up services charge a connection fee of so many pence per minute, and you're also paying British

Telecom for every minute you use the phone. In communications, time is literally money.

Protocols

In order for two computers to talk to each other, they not only have to be transmitting and receiving data at an agreed speed, they also have to agree on the form the data will take. These factors are set by protocols.

The term protocol is used to cover various aspects of communications, often including the transmission speed, such as how many bits are data bits, whether start and stop bits will be used, what form of error-correction and whether synchronous or asynchronous transmission is to be employed.

In most of these cases, what's at stake is the real rate at which data is transmitted. As speeds increase, so does the risk of errors. Error-checking allows the two modems to watch for errors and have any dodgy blocks of data re-transmitted. But this obviously reduces the effective speed of data transfer, since much of the data might be sent twice.



"A whole new world of free bulletin boards..."

Similarly, in synchronous transmission the two modems are sending and receiving data at preset intervals, removing the need for start and stop bits and therefore reducing the two-bit overhead for each character, speeding up transmission by that amount.

Another variable in the transmission equation is half and full-duplex. In half-duplex, the two modems take it in turns to talk, whereas full-duplex allows each modem to talk and listen at the same time. If an error occurs in half-duplex the receiving modem has to wait until the transmitting modem stops before it can interrupt and request re-transmission. Full-duplex allows the modems to handle error-checking and handshaking without stopping the flow of data.

Extra features

Many modems now support a number of useful features that can make communicating easier. Early modems, and some cheaper models today, require you to dial the number, wait for the connection to be made, and then quickly cut in the modem to take over the communication. Models featuring auto-dial do all this automatically.

The counterpart to auto-dial is obviously auto-answer, but this is less useful unless you're planning to run your own bulletin board or you expect a lot of incoming calls to your computer.

More desirable is a modem that provides a way of monitoring its status. This usually takes the form of a series of LEDs that show what's happening at various stages in the comms process; more expensive models provide a small LCD screen.

Software

The key to comms software is that the program should match the features provided by your modem. Obviously, there's little attraction in acquiring a 2,400 bps modem and then buying software that will only support 1,200 bps transmission.

But a much greater problem is gaining control of special features of the modem. Things like auto-dial and automatic setting of protocols (which can allow your modem to detect and automatically match the settings used by another modem) are hardware features you won't be able to use unless your software can specifically control them.

What's the fuss about?

With your micro you can access a variety of services over the phone. You can do bank transactions, book holidays, access information instantly onto your screen through data banks and organisations like Prestel, even get 'public domain' software over the phone free from user clubs and 'bulletin boards'. Such software varies from the ridiculous to the sublime but at its best can rival commercial programs - all for the price of a phone call.

Apart from the obvious requirements of a computer and a telephone, you need two things: a modem and some suitable software.

The modem is an electronic "black box" that sits between the computer and the telephone and its job is to convert the signals from your computer into a form that can be transmitted over the phone lines, and to reverse the process with incoming data. This process is known as MODulation-DEModulation, hence the term modem.

Virtually all modems connect to your computer via an RS232 serial interface. Some machines (Amstrad PCW, Commodore 64, early Spectrums etc.) require the interface to be bought separately.



• No computer is an island - not with a modem

The most common set of features are now provided by manufacturer Hayes in the Hayes AT command set (AT stands for ATtention and has nothing to do with the IBM AT). Many American software packages assume (or work best with) a Hayes-compatible modem, so watch out for this.

Another potential stumbling block specifically affecting British users is the viewdata system used by Prestel/Micronet, which employs a series of pre-defined block characters. The one computer to come equipped with the viewdata character set is Acorn's BBC series, so other computers wishing to use Prestel need special comms software.

There are two approaches to the problem. The first is to acquire software that provides an alternative character set to give you viewdata-compatibility. A second type of software deals with the problem by stripping out non-standard characters and substituting one of the standard ASCII graphics (often an asterisk). The catch with the latter approach is that you lose out on graphic screens.

Beyond these basic features, software can provide a multitude of facilities that make communications easier and more powerful.

For example, if your modem has auto-dial, many software packages provide a phone book in which you can store the numbers of the dial-up services you use, and which can be automatically called by the computer. Other programs take this idea further and, having established a connection with the remote system, type your log-on number, password and any other basic information needed to use the system.

Another very useful feature is the ability to use some aspects of your comms set-up in background mode. In other words, to be able to have your computer transmit or accept data and store it while you get on with some other task.

**Next week:
Who ya gonna call?**

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Technobabble

A weekly assault on computer jargon

Comms

Acoustic coupler

A special form of modem that physically connects the phone to the computer by holding the mouth- and ear-pieces in rubber cups.

Prono to noise problems and only works with old-style handsets, not the modern Trimphone or slimline models.

On-line

General term relating to the process of computer comms. A computer currently operating with a modem is said to be "on line", and a dial-up database like Prestel is called an "on-line service".

Card modem

Also called internal modems, these models contain the modem electronics on a PC-compatible expansion board. The advantage for PC owners is a lower cost, since they have no casing and don't need a connecting cable.

Error-correction

Essential feature, particularly at higher speeds. There are several "standards" in error-correction but at speeds up to 2,400, Xmodem and Kermit are the most common, while for higher speeds MNP protocols are becoming widespread.

● This week sees the arrival of *Dragon's Lair* – the six-disc extravaganza bringing cartoon quality graphics to an Amiga near you.

Otherwise, apart from the dubious merits of a strip poker sim (What do you think? Should we drop 'em?), it's all pretty much violence and aggression of one sort or another. But, take it from us, this is the state of play with 90% of releases. We've got the scars to prove it.

CRAZY CARS 2

TITUS

ST • £19.99dk
Due out on Amiga, PC, CPC, Spec, C64



• Watch you don't cop it from the crazy cops

Somewhat outrun by *Out Run* when it appeared on 16-bit formats last year, *Crazy Cars* would have nevertheless given the most overrated conversion of all time a run for its money. Here's the sequel, once again released ahead of its rival's successor – *Outrun Europa*.

● **GAMEPLAY**
You take the wheel of a Ferrari F40 in a race against time, and storm across 4 states of the States dodging cop cars attempting to drive you into oblivion.

You have a choice of two gears, a very responsive mouse, joystick, keyboard control and onboard radar to help you locate the cops and the route ahead of you. There are turnoffs all along your route. Miss the right one, and it usually means fatally crashing into state boundary barriers.

Hitting F2 drops down a map window which can be scrolled to find the start and finish points of your route.

On successfully crossing a state border you collect bonuses to add to your score. And...er...that's it. Apart from actually keeping the car on the road on course of course.

● **GRAPHICS AND SOUND**

Crazy Cars 2 is pretty impressive in the road wars graphics dept. Background scrolling is smooth and sprite definition first class. The surround-screen meters and instrumentation are also slick and sharp. A minor let-down is the irritating screech of the Ferrari's tyres as you enter another out-of-control spin.

● **OTHER VERSIONS**
Amiga, PC and 8-bit formats will all be available by mid/late February.

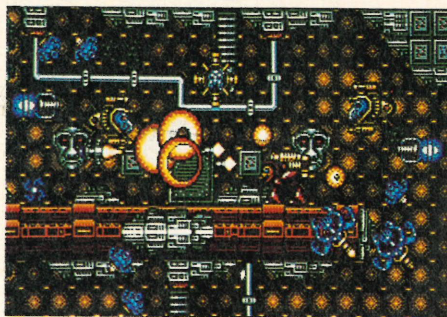
● **EXPRESS VERDICT**
Great fun and well presented, but you get the feeling it's a little too easy to complete the 4 levels and it would benefit from, say, another 40. It hangs in well there with the competition but is that really saying a great deal?

★ ★ ★ Andy Storer

CUSTODIAN

HEWSON

ST • £19.99dk
Also on Amiga



• Tasty graphics matched by strong playability

Custodian has been designed and programmed by Chris Hinsley and Nigel Brownjohn – the team also responsible for the ever elusive *Verminator* – and is a mixture of shoot-em-up and exploration-em-up promising some attractive audio-visuals and fun gameplay.

● **GAMEPLAY**
You're the protector of nuclear-powered tombs here, in an ongoing battle against marauding alien energy-parasites, so its a good job you've got the chance to arm yourself with some serious weaponry ranging from 10mm rocket shells to megaclear smart bombs.

Getting down to play, you control a strange and mean-looking head on legs complete with jet-pack. You whizz around an eight-way scrolling complex destroying any aliens daring to challenge you, while searching for alien pods to take to the alien pod annihilation chamber (*Where else? – Ed*) for orderly disposal.

As you progress through the scenery, you'll discover not only teleports (guess what these do) but also ammunition silos which will replenish your stocks of ammo – provided you've got enough dosh.

● **GRAPHICS AND SOUND**
Custodian has impeccable audio-visual presentation from start to finish. Graphics are very pleasing with colourful and well-designed sprites and backdrops which move smoothly around the screen. Your sprite is worthy of particular note as it's so weirdly-shaped and wonderfully animated.

Audio consists of the usual laser-sound spot-effects, and are of a good standard, thankfully not distracting your attention from the business of blasting.

● **OTHER VERSIONS**
Amiga *Custodian* is likely to be almost identical to its ST counterpart, albeit with audio improvements.

● **EXPRESS VERDICT**
Custodian is a fast-paced, action-packed game – an unusual combination for an exploration game – and all the more refreshing for it. With its enlivening in-screen games and options, good quality audio-visuals and absorbing gameplay, *Custodian* certainly deserves consideration for purchase by both exploration and shoot-em-up fans alike.

★ ★ ★ Rik Haynes

TEENAGE QUEEN

INFOGRAMES

Amiga • £19.95dk
Due out on ST, PC

Infogrames' latest is light years away from the spacey sci-fi of *Captain Blood* and *Purple Saturn Day* and the combat capers of *Hostages*, *Wanted* and *Action Service*. It's a down to earth strip poker sim.

● **GAMEPLAY**

The teenage queen in question giggles her way through a series of hands as you attempt to amass enough credits to take off all her clothes.

Every hundred or so points you score she adopts another suggestive pose revealing a little more of her body. Thankfully, she plays quite a mean game of poker too and is not averse to bluffing.

The cards you're dealt always allow for a good hand to be made – there's no boringly wide distribution of cards – and you don't need a great deal of brain-power to see the obvious one, two or three cards you need to replace. As such, gameplay is pretty gripping.

● **GRAPHICS AND SOUND**

There are ten hand-drawn screens of the Queen in various positions and the look is distinctly cartoon-like. Actual gameplay is clearly depicted by icon-driven windows. Sound is confined to digitised giggles which are distinctly French – there's no way an English rose could sound so innocently filthy.

● **OTHER VERSIONS**

The ST and PC versions will be released later this month, but as are yet unseen.

● **EXPRESS VERDICT**

Definitely one of the better strip poker sims but then we can't be seen to encourage this kind of product can we? Let's just say the poker play is okay.

★ ★ ★ Andy Storer



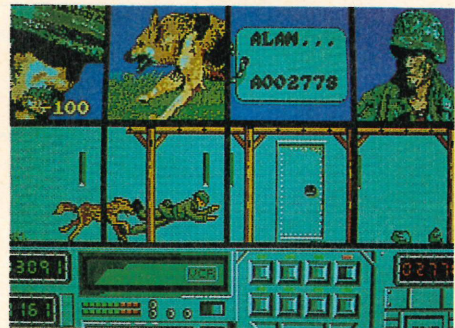
• Send in those letters, girls...

ACTION SERVICE

COBRASOFT/INFOGRAMES

Amiga • £19.95dk
Also on ST, PC
Due out soon on C64

Action Service throws you into the hectic world of a cobra commando about to face untold dangers, strenuous training exercises and enemy held territory. It's all in the name of duty, for the honour of the regiment and the pay-cheque at the end of the month...



• Nice video (displays), shame about the game

● **GAMEPLAY**

During play you travel over a horizontally-scrolling landscape riddled with traps, enemy troops and obstacles which you have to negotiate while being 'scrambled' at by your superior officers, who look down at you from the top TV-displays. Luckily, like any respectable commando

TECHNO COP

GREMLIN

Amiga • £19.99dk
Also on Spec, C64, CPC, ST
Out soon on PC

Techno Cop places you in control of a futuristic copper, with a just a bit of techno, assigned to wade through the scum of the city, taking out any criminals that dare halt your progress for truth, justice and the occasional bribe.

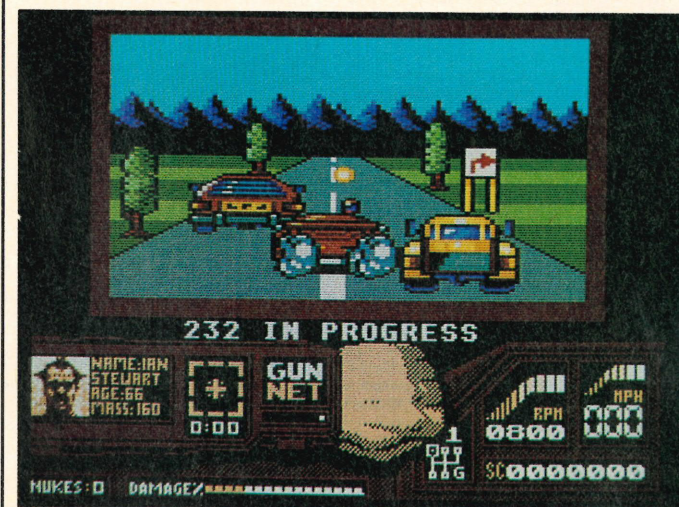
● **GAMEPLAY**

The game is split into two sequences. The first sees you in your VMAX twin turbo nutter interceptor (car, to you and me) with an open road ahead and a cannon on the roof rack.

As you travel down the road, you're notified of yet another criminal offence, with the digitised face and statistics of the perpetrator appearing on your dashboard. So it's a mad rush to the scene of the crime in order to do a bit of apprehension, destroying any Sunday drivers along the way while trying not to scratch the paintwork.

Then it's on to the other sequence, with you leaving the comfort of your car to venture out into the depths of the city, using your wrist command computer to track down the criminal and bring 'em back dead or alive. Of course, having a .88 magnum (it'll blow your body clean off, punk) and a net gun will help your hopes of respect from any thugs (or innocent bystanders) along the way.

Once that crim is out of the way, it's back to the road again, in your ongoing mission to clean up the city.



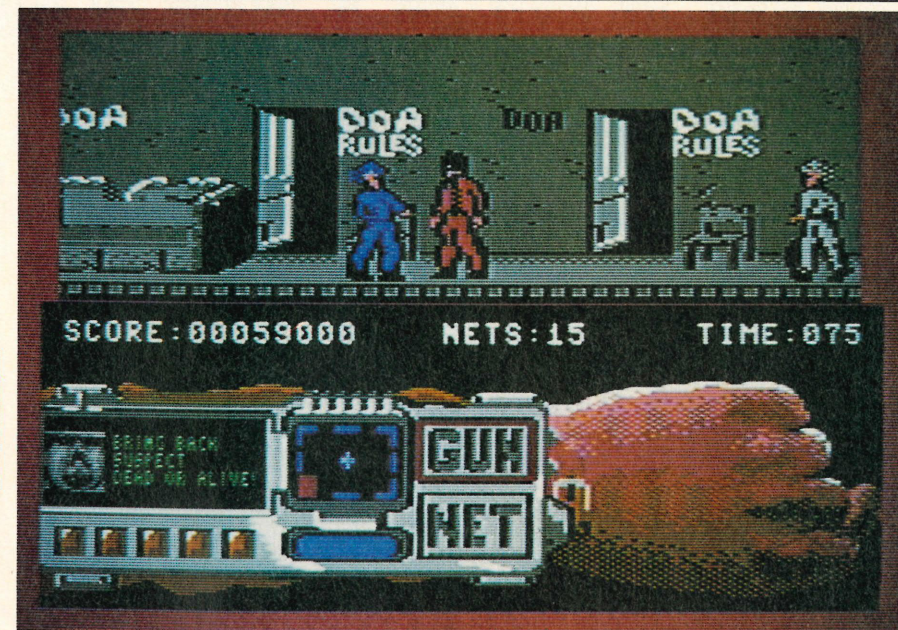
• ST: Speeding down the highway, dodging the Sunday drivers

you can summon a wide variety of agile manoeuvres and destructive weapons to aid you in your mission of no-mercy.

As an added bonus, *Action Service* contains not only a video replay option, but also the chance to construct and edit your own scenarios.

● **GRAPHICS AND SOUND**

Audio-visuals are straight translations from the ST version – although the sound is a little crisper – comprising simplified, uninteresting and inadequate sprites and backdrops, and sampled sound-effects and speech



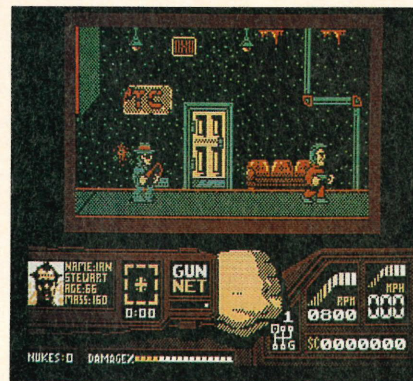
• C64: Taking on the scum of the city

Unfortunately, the opposition gets tougher as you play through the game. So it's lucky you can add some optional extras to your car – like a nuclear bomb. Overkill, or what?

The road sequence plays in a similar fashion to *Roadblasters*, while the capture sequence feels like another Gremlin release, *Death Wish Three*. This diversity helps the game along, but ultimately lasting interest just isn't there.

● **GRAPHICS AND SOUND**

Audio-visuals are of a high standard with wonderfully colourful, nicely-designed



• ST: Running away from a mysterious character in a trench coat...

sprites and backdrops in both the road and the capture sequences. Audio consists of standard sampled spot-effects for the car engine, gun, explosions, etc but all are of good quality.

Perhaps the worst audio-visual element is the way the criminals die during the capture sequence – they actually explode in a flood of blood, only to be replaced by a corpse helplessly spluttering on the floor. Gratuitously too sick.

● **OTHER VERSIONS**

ST *Techno Cop* matches Amiga graphics but has inferior audio quality. The PC version is on its way

and should be here by the beginning of February. C64 *Techno Cop* performs the best out of all the 8-bits with colourful, slightly blocky visuals and a good range of sound spot-effects. Next in line is the Spectrum version which is somewhat less colourful and noisy but still manages a playable game. Last, and by every means least, is the CPC version which moves along at the speed of a tortoise with four broken legs, and produces audio which sounds like it's being played from a goldfish bowl.

● **EXPRESS VERDICT**

Techno Cop has all the hallmarks of a typical Gremlin game – bright and breezy graphics, non-taxing gameplay with simple aims and tasks, and loud but apt sound-effects. It should appeal to the younger gamer, although parental guidance would perhaps be prudent because of the violent demise of the criminals in the capturing stages of the game.

★ ★ ★ Rik Haynes



• C64: Posing outside your turbonuttermotor

● **EXPRESS VERDICT**

Action Service is another in a long line of highly original games sourced from France, but unlike its associates – *Captain Blood* and *Purple Saturn Day* – it suffers from low quality audio-visual presentation. This factor, coupled with its dull and repetitive gameplay, ultimately leads to its dubious worth as a purchase. Hopefully, *Action Service II* will provide improvements in audio-visuals and gameplay.

★ ★ Rik Haynes

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War in Middle Earth	T 9.99	January 19	Melbourne House

AMSTRAD PCW

Fish!	24.99	January 25	Rainbird
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ARCHIMEDES

Fish!	24.99	January 25	Rainbird
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BBC

Football Director	D 12.99	Out Now	CDS
Football Director	T 9.99	Out Now	CDS
Mini Office 1	T 2.99	Out Now	Summit

ATARI ST

20000 Leagues			
Under The Sea	19.95	Out Now	Coktel Vision
Barbarian II	19.99	January	Palace
Batman - Caped Crusader	19.95	Out Now	Ocean
Billiards	19.95	Mid Jan	Ere/Infogrames
Bismark	24.99	Out Now	PSS
Captain Fizz	14.95	Out Now	Psygnosis/Psyclapse
Circus Games	24.95	Out Now	Tynesoft
Cosmic Pirate	19.99	Jan/Feb	Outlaw
Crazy Cars II	19.99	Out Now	Tynesoft
Dark Fusion	19.99	February 7	Gremlin
Dragonscape	19.95	February 16	Software Horizons
F-16 Falcon	24.99	Out Now	Mirrosoft
Federation Of Free Traders	29.99	January 30	Gremlin
Freedom	19.95	Out Now	Coktel Vision
Galactic Conqueror	19.99	Out Now	Titus
Galdregon's Domain	19.99	January 27	Pandora
Game Over II	24.95	Out Now	Dynamic
Gary Lineker's Hotshots	19.99	February 14	Gremlin
Heilbent	19.95	Out Now	Novagen
Heiter Skelter	14.95	Out Now	Audiogenic
Hotball	24.95	Out Now	Satory
Incredible Shrinking Sphere	19.99	January 25	Electric Dreams
Iron Lord	24.99	Early Feb	Ubi Soft
Joan Of Arc	19.99	Out Now	Silmaris
Manhattan Dealers	19.95	Out Now	Ubi Soft
Night Hunter	19.99	Out Now	Exxos
Purple Saturn Day	24.95	Out Now	Exxos
Spitfire 40			
& Strike Force Harrier	24.99	Out Now	Mirrosoft
Superman - Man of Steel	24.95	Out Now	Tynesoft
Technocop	19.99	Out Now	Gremlin
Teenage Queen	19.95	January	Infogrames
The Munsters	19.99	Out Now	Again Again
Tiger Road	19.99	Imminent	Capcom/U.S.Gold
Track Suit Manager	19.99	Out Now	Again Again
Wanted	19.95	Out Now	Infogrames
War in Middle Earth	24.99	February	Melbourne House
Zany Golf	24.95	January 25	Electronic Arts
Zero Gravity	19.95	Out Now	E.A.S.

COMMODORE 64/128

Action Service	D 14.95	January	Cobra/Infogrames
Action Service	T 9.95	January	Cobra/Infogrames
Circus Games	D 14.95	Out Now	Tynesoft
Circus Games	T 9.95	Out Now	Tynesoft
Dark Fusion	D 14.99	February 7	Gremlin
Dark Fusion	T 9.99	February 7	Gremlin
Exploding Fist +	D 12.99	Out Now	Firebird
Exploding Fist +	T 9.99	Out Now	Firebird
Fish!	D 19.99	January 25	Rainbird
Fish!	T 9.99	January 25	Rainbird
Gary Lineker's Hotshots	D 14.99	February 14	Gremlin
Gary Lineker's Hotshots	T 9.99	February 14	Gremlin
Grand Prix Circuit	D 14.95	January 19	Accolade/EA
Grand Prix Circuit	T 9.95	January 19	Accolade/EA
Hostages	D 14.95	Mid Jan	Infogrames
Hostages	T 9.95	Mid Jan	Infogrames
Incredible Shrinking Sphere	D 14.99	January 25	Electric Dreams
Incredible Shrinking Sphere	T 9.99	January 25	Electric Dreams
Iron Lord	D 19.99	Early Feb	Ubi Soft
Iron Lord	T 12.99	Early Feb	Ubi Soft
Jordan v Bird			
One on One II	D 14.95	Out Now	Electronic Arts
One on One II	T 8.95	Out Now	Summit
Mini Office 1	T 2.99	Out Now	Summit
Project Firestart	D 14.95	January 20	Electronic Arts
R-Type	D 14.99	Out Now	Electric Dreams
R-Type	T 9.99	Out Now	Electric Dreams
Rocket Ranger	D 14.99	January	Cinemaware
Serve and Volley	D 14.95	Out Now	Accolade/EA
Serve and Volley	T 9.95	Out Now	Accolade/EA
StarRay	D 14.95	Out Now	Logotron
StarRay	T 9.95	Out Now	Logotron
Street Gang	T 1.99	January 25	Players
Superman - Man of Steel	D 14.95	Out Now	Tynesoft
Superman - Man of Steel	T 8.95	Out Now	Summit
T.K.O.	D 14.95	Out Now	Accolade/EA
T.K.O.	T 9.95	Out Now	Accolade/EA
Tank Attack	D 14.99	Out Now	CDS
Tank Attack	T 12.99	Out Now	CDS
Technocop	D 14.99	Out Now	Gremlin
Technocop	T 9.99	Out Now	Gremlin
The Double	T 2.99	Out Now	Summit
The Munsters	D 14.99	Out Now	Again Again
The Munsters	T 9.99	Out Now	Again Again
Tomcat	T 1.99	January 25	Players
War in Middle Earth	D 19.99	February	Melbourne House
War in Middle Earth	T 9.99	February	Melbourne House
Word Style	D 19.95	Out Now	Supersoft
Word Style	T 17.95	Out Now	Supersoft

ELECTRON

Mini Office 1	T 2.99	Out Now	Summit
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IBM PC & COMPATIBLES

20000 Leagues				
Under The Sea	5.25	19.95	Out Now	Coktel Vision
Abrams				
Battle Tank	3.5+5.25	24.99	February 15	Electronic Arts
Battlechess	3.5	24.95	Out Now	Interplay/EA
Battlechess	5.25	24.95	February 9	Interplay/EA
Billiards	5.25	19.95	February 9	Ere/Infogrames
Circus Games	5.25	24.95	Out Now	Tynesoft
Crazy Cars II	5.25	24.99	End Feb	Titus
F-16 Combat Pilot	5.25	24.95	End Jan	Digital Integration
Fast Break	5.25	24.95	January 26	Accolade/EA
Freedom	5.25	19.95	Out Now	Coktel Vision
Galactic Conqueror	5.25	24.95	Out Now	Titus
Grand Prix Circuit	3.5	24.95	Out Now	Accolade/EA
Grand Prix Circuit	5.25	24.95	Out Now	Accolade/EA
Halls of				
Montezuma	5.25	24.95	Out Now	SSG
Hostages	5.25	24.95	Mid Jan	Infogrames
Manhattan Dealers	5.25	24.95	Out Now	Silmaris
Offshore Warrior	5.25	24.99	Out Now	Titus
Rack'em	5.25	24.95	Out Now	Accolade/EA
Speedball	3.5+5.25	24.99	Out Now	Image Works
Star Goose	3.5+5.25	24.95	Out Now	Logotron
StarRay	3.5+5.25	24.95	Out Now	Logotron
Strikefleet	3.5	24.95	Out Now	Electronic Arts
Strikefleet	5.25	24.95	Out Now	Electronic Arts
The Bard's Tale II	3.5	24.95	Out Now	Electronic Arts
The Bard's Tale II	5.25	24.95	Out Now	Electronic Arts
The Train	5.25	24.95	Out Now	Accolade/EA
Times of Lore	5.25	24.95	Imminent	Microprose
War in				
Middle Earth	5.25	24.99	February	Melbourne House
Wasteland	3.5+5.25	24.95	February 1	Electronic Arts
Zany Golf	3.5+5.25	24.95	Out Now	Electronic Arts

MACINTOSH

Fish!	34.99	February	Rainbird
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MSX

The Munsters	T 9.99	Out Now	Again Again
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SPECTRUM

Barbarian II	T 9.99	Out Now	Palace
Captain Blood	T 9.95	Mid Jan	Exxos
Circus Games	T 8.95	Out Now	Tynesoft
Dark Fusion	T 7.99	February 7	Gremlin
Emlyn Hughes			
International Soccer	T 9.95	Imminent	Audiogenic
Exploding Fist +	T 7.99	Out Now	Firebird
Fire & Forget	T 8.99	Out Now	Titus
Gary Lineker's Hotshots	T 7.99	February 14	Gremlin
Incredible Shrinking Sphere	T 9.99	January 25	Electric Dreams
Mini Office 1	T 2.99	Out Now	Summit
Skateball	T 8.99	Out Now	Ubi Soft
Street Gang	T 1.99	January 25	Players
Superman - Man of Steel	T 8.95	Out Now	Tynesoft
Tank Attack	T 12.99	Out Now	CDS
Technocop	T 7.99	Out Now	Gremlin
The Archon Collection	T 8.95	Out Now	Electronic Arts
The Double	T 2.99	Out Now	Summit
The Munsters	T 9.99	Out Now	Again Again
War in Middle Earth	T 9.99	January 19	Melbourne House

SPECTRUM+3

Barbarian II	D 14.99	Imminent	Palace
Captain Blood	D 14.95	Mid Jan	Exxos
Cash Book	D 17.95	Out Now	Supersoft
Dark Fusion	D 12.99	February 7	Gremlin
Emlyn Hughes			
International Soccer	D 14.95	Imminent	Audiogenic
Fish!	D 15.99	January 25	Rainbird
Gary Lineker's Hotshots	D 12.99	February 14	Gremlin
Icon Graphix 128	D 17.95	Out Now	Audiogenic
Instant Recall	D 19.95	Out Now	Supersoft
Mini-Putt	D 14.95	January 30	Accolade/EA
Skateball	D 14.99	Out Now	Ubi Soft
Technocop	D 12.99	Out Now	Gremlin
The Archon Collection	D 14.95	Out Now	Electronic Arts
The Munsters	D 14.99	Out Now	Again Again

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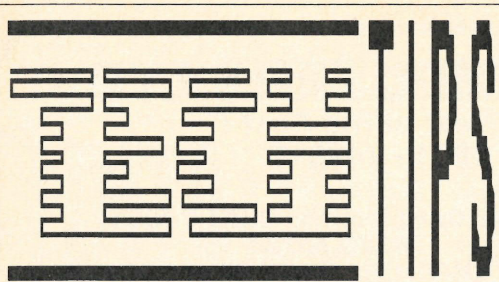
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The place for your questions and suggestions

HELP! Comm-fusion

I have recently bought a Commodore 128 and have seen in magazine adverts referring to modems. I would be grateful if you could answer some questions about them.

What are modems, and can I use them with my TV? What price do they start at, what would I use them for, and where can I get one?

B A Stephens, High Wycombe, Bucks
• Phew! A bit of a tall order that one, B A, and rather more than we have room for here. But never let it be said that Express spurned a reader in distress.

Turn to this week's *Learning Curve* and you'll find a complete introduction to modems, baud rates and all the other arcana of computer communications.

HELP! Basic understanding

I would like to humbly ask your advice on a small matter. I am new to computers and programming, but I would like to learn Basic on my new 520ST.

I understand the version of Basic on the language disk is a bit cumbersome, so I was wondering if you could recommend a better version, particularly for a novice like myself.

Nigel O'Neill, St Albans, Herts
• You're right - ST Basic is a bit of a loser, even though Atari is now including a slightly improved version which fixes some of the bugs and shortfalls of the original. Not recommended.

There are three good alternatives. First, Computer Concepts' *FastBasic*. In technical terms, this has a lot to commend it, being a close relative of BBC Basic and including many features from that earlier language, including Procedures and an in-line assembler. It was also the most popular alternative for a while, so there are lots of books available and some of the ST-specific magazines carry a lot of articles on *FastBasic* programming.

Against that, Computer Concepts has more or less given up on the ST, so the question of on-going support is open to doubt. *FastBasic* is available for around £35 on disk or £70 in cartridge format. Second, *GFA Basic* from Glentop is a very unusual implementation of Basic. It includes some very powerful commands and functions, but many of these are implemented in a non-standard way. There's nothing really wrong with this, but wherever possible in computing it's usually better to stick with standards.

GFA Basic is very fast, and can be speeded up further with the use of the additional compiler, which gives you the added bonus of being able to produce standalone programs that can be run without loading Basic first. The interpreter and compiler cost around £35 each, but to use the compiler you need the interpreter too, which makes it a little expensive.

The most recent addition to the ST's repertoire of Basics is HiSoft's compiler. This is available in two versions: *Power Basic*, which costs £50; and *HiSoft Basic*, which includes extra facilities for £80. Both are based on the industry-standard *Microsoft Basic* on the IBM PC (which has been closely implemented on the Macintosh and Amiga) so there is lots of support in terms of books and magazine articles. Our sister magazine *ST/Amiga Format* publishes regular tutorials for *HiSoft Basic* - although as a beginner you might struggle with books since they are not dedicated to your machine.

Because it's a compiler you also get very fast, standalone programs. I'd probably come down in favour of *HiSoft Basic* (or *Power Basic* if you're on a tight budget), although all three are very good products.

What really puzzles me is this talk of 8-bit and 16-bit, and where do PCs fit in? Perhaps you could explain why MS-DOS is still hanging in there too. I work with an Amstrad PC1512 and some 1640s and I can't understand why anyone uses PCs when C64s are easier to use. Please explain everything before I pull all my hair out.

Hugo Minney, Witton Gilbert, Co Durham
• Hope you saw *Learning Curve* in Express issue 5, Hugo. It should have answered your questions about 8-bit and 16-bit, and so on. As to why MS-DOS is still hanging in there, the answer is really very simple. It's because most companies have millions of pounds invested in MS-DOS PCs and even more millions in MS-DOS software, and they're not about to throw it out and buy a whole new shooting match.

MS-DOS is a long way from the perfect operating system, but it works. It's been around for a long time now, its faults are understood, and whatever you want to do with a computer in business, you can get a program that runs under MS-DOS.

You may think the C64 is easier to use, but I reckon that's because you're not doing anything complicated - no offence meant. Have you ever tried to create a 200 x 2000 cell spreadsheet on a C64? Run a 20,000 client database? Write a 20,000 word annual report incorporating extracts from the corporate accounts in both numerical and graphic form?

The reason businesses don't use the C64 are pretty obvious: the 40-column screen is hopeless for business, the disk drives are slow and have very limited storage space, and there's very little software available (2,000 variations on the scrolling shoot-em-up make little impression on business buyers).

HELP! ST quiz
Please could you answer the following questions on the Atari ST:
1. What is involved when fitting a 1Mb RAM upgrade?

2. Do you know how good the Pye 1022 monitor is? Evesham Micros make it sound brilliant, so why is it only £200?

3. With PC-Ditto and a 5.25" disk drive how much PC software would I be able to run? Would there be much loss in speed?

Paul Yates, Exeter, Devon
• 1. You buy the appropriate chips, take off the lid of your ST, and solder the chips (16 of them) into the sockets provided for the purpose. Then you replace the lid and - bingo! - you now have a 1040 ST. Unless you make a mistake, in which case you may have some dead RAM chips or a dead ST.

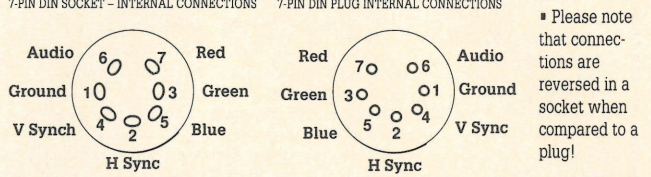
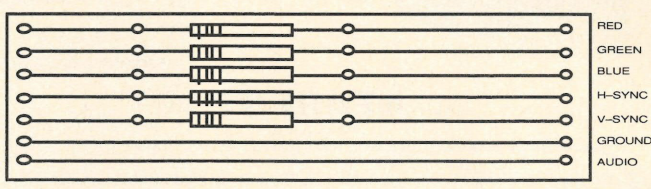
In practice, unless you're a dab hand with a soldering iron and really know what you're doing, have it done professionally.
2. Suspicious, aren't we? If Evesham Micros say it's pretty good I'd be inclined to believe them, but in any case £200 is a pretty good price but not outrageously cheap for a medium res TV/monitor. If you shop around you can get a variety of colour monitors for only a little more than that.
3. PC-Ditto will run a lot of software -

generally anything that can be classed as "well behaved". This means most of the big name packages, including word processors, databases, spreadsheets, and so on. Games could well be a problem though, since many games do naughty things with PC hardware which PC-Ditto cannot support.

The real catch, though, is speed. As you suspect, PC software will run at speeds between "slow" and "very slow". It's hard to quantify that, but PC-Ditto will run much slower than a standard PC and most PC users find that intolerably slow.

HELP! Enigmatic code
Am I even more ignorant than I thought (careful how you answer that)? In Express issue 6 Peter Worlock says Pascal and C are no good for games, which must be written in machine code for speed, and elsewhere in the same issue Realtime Software say they code their games on PC's and cross-assemble to target machines.
But I've always thought the whole

CONNECTIONS		PRINTOUTS from external port view	
ATARI	MONITOR	ST SCART SOCKET	FERGUSON RGB
1 SOUND	6		
6 GREEN	3 1.5K RESISTOR	4 1	7 6
7 RED	7 1.5K RESISTOR	8 5	3 1
9 H SYNC/SYNC 2	4 1.5K RESISTOR	12 9	5 4
10 BLUE	5 1.5K RESISTOR		
12 V SYNC/SYNC 1	2	13	2
13 GROUND/EARTH	1		



TIP Soldering on

Here's a prizewinning tip for all those DIY-ers who want to run Ferguson MCO1/MCO5 monitors from their Atari STs:

Parts required:
5 x 1.5K ohm resistors
a small piece of veroboard
an adaptable box 1.5" x 3" x 1"
12" 10-core screened cable
7-pin DIN panel-mounted socket
7-pin DIN plug
soldering tools

Method for use with your own lead (if you have one):

1. Mount 7-pin DIN socket at one end of box
2. Make a hole for the screened cable at opposite end of the box
3. Solder 7-pin DIN plug to one end of the cable
4. Solder the five resistors to the veroboard, ensuring there is a break in the tracks between the ends of the resistors
5. Solder seven small lengths of wire between the DIN socket and the veroboard

Unfortunately, I no longer make complete leads, as I cannot get 13-pin DIN plugs anywhere. In fact I have several people waiting patiently (or not) for leads at the moment. If anyone knows where I can get a regular supply of 13-pin DINs I would be very grateful.
C Parker
14 Cross Lanes,
Pill,
Bristol BS20 0JQ

• Please note that connections are reversed in a socket when compared to a plug!

HELP! Enigmatic code

Am I even more ignorant than I thought (careful how you answer that)? In Express issue 6 Peter Worlock says Pascal and C are no good for games, which must be written in machine code for speed, and elsewhere in the same issue Realtime Software say they code their games on PC's and cross-assemble to target machines.
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dedicated to performing one task, but the PRINT statement is a general tool for outputting text to the screen. It should be obvious that a dedicated instruction will be quicker and much more efficient in many cases than a general routine.

So a program written in machine code, or assembler, will almost always be more efficient, and therefore faster, than the equivalent program written in a compiled language like C, Pascal or Modula-2.
As to the way in which cross-assemblers work, there are a couple of approaches and the simplest is merely a case of number manipulation.
As we've seen, a program in assembly language is simply a list of instruction codes and numbers on which they can operate. When this is assembled into pure machine code you're left with nothing but a list of numbers. All the assembler really needs to understand is which codes translate into which numbers for the appropriate microprocessor (6502 instructions are different from those on the Z80, which in turn are different to those on a 68000).

The next step up is assembly language. In assembler, every instruction like LDA or MOV translates directly to one binary number. Obviously, this one-to-one translation makes for highly efficient coding.
Compilers, even though they do convert the high-level source code of C or Pascal into binary, don't have anything like a one-to-one equivalence. A simple PRINT statement in a high-level language has to be translated into several - perhaps dozens - of binary codes. Furthermore, each instruction in machine code or assembler

control of the development computer. The benefit of this approach is speed of program development: the programmer doesn't have to constantly load and re-load the assembler and source code, and the program under development. The assembler and source code are permanently held in the development system while the program is permanently held in the target system, and the programmer can switch from one to the other in a fraction of a second.

Slightly more complex, but much more effective, is a system that not only cross-assembles and produces code for a different target machine but which also allows you to control the target from the development machine.

All that changes is a small control program that resides in both machines. Now the assembled program can be downloaded to the target just as if it had been loaded normally. And it can be run as normal.
However, the control program in the target machine can be activated by the development system to stop execution of the code and show various processor registers, variables and other useful debugging information. The code can also be single-stepped, still under

AMIGA				ATARI ST				
CAPTAIN BLOOD		DEFENDER OF THE CROWN		THREE STOOGES		XENON		
RRP	SRP	RRP	SRP	RRP	SRP	RRP	SRP	
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JOAN OF ARC	49.94	24.98	54.94	24.94	54.98	25.98	44.98	24.98
KRYSTAL	54.94	24.98	59.94	24.94	59.98	25.98	49.98	24.98
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MENACE	44.90	20.96	49.90	20.92	49.94	21.96	39.94	20.96
PACMANIA	44.90	19.96	49.90	19.92	49.94	20.96	39.94	19.96
PHOTON PAINT	94.94	46.98	99.94	46.94	99.98	47.98	89.98	46.98
POWERDROME	49.90	24.96	54.90	24.92	54.94	25.96	44.94	24.96
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But one day we loaded the disk and the screen came up with "Failed to load in boot sector" and we have not been able to get the computer to accept any disks since.

We've looked carefully through the manual and tried various things. We took the disks to a friend's CPC 6128 and our disks worked fine there. Our computer is working OK otherwise.

Is it something we've done, and if so, can we put it right? Please help.

Jamie (11yrs) and Simon (9yrs) Pattison, Doncaster
• What a disappointment! At least it worked for you on Christmas Day.

You've almost certainly got a dodgy disk drive, since you've eliminated all other possible causes. If your disks are OK (and they are), and if the computer is OK (and it is), then the drive is all that's left.

Fortunately, you don't have to worry about putting it right. Your machine is under warranty, so get your Mum or Dad to take it back to the shop it was bought from. Don't accept the offer of a repair - insist on a new computer, which is what you're entitled to.

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HiSoft BASIC includes full MENU support, with event trapping and powerful sprite routines, using the OBJECT keywords.

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For larger programs and for those with strong editor preferences we also supply an editor-less compiler for traditional disk-to-disk compilation methods.

ABS	AND	APPEND	AREA	AREAFILL	AS	ASC	ATN
BAR	BASE	BEEP	BIN\$	BLOOD	BREAK	BSAVE	CALL
CALLS	CASE	CDBL	CHAIN	CHDIR	CHR\$	CINT	CIRCLE
CLEAR	CLNG	CLOSE	CLS	COLLISION	COLOR	COMMAND\$	
COMMON	CONST	COS	CSNG	CSRLIN	CVD	CVI	CVL
CVS	CVSIEEE	DATA	DATE\$	DECLARE	DECR	DEF	DEFDBL
DEFINT	DEFLNG	DEFSNG	DEFSTR	DIM	DO	ELLIPSE	ELSE
ELSEIF	END	EOF	EQV	ERASE	ERL	ERR	ERROR
EXIT	EXP	FEXISTS	FIELD	FILES	FIX	FOR	FRE
FUNCTION	GET	GOSUB	GOTO	HEX\$	IF	IMP	INCR
INKEY\$	INPUT	INPUT\$	INSTR	INT	KILL	LBOUND	LCASE\$
LEFT\$	LEN	LET	LIBRARY	LINE	LOC	LOCAL	LOCATE
LOF	LOG	LOG10	LOG2	LOOP	LPOS	LPRINT	LSET
MENU	MID\$	MKD\$	MKDIR	MK1\$	MKIEEE\$	MKL\$	MKS\$
MOD	MOUSE	NAME	NEXT	NOT	OBJECT.xx	OCT\$	OFF
ON	OPEN	OPTION	OR	OUTPUT	PAINT	PALETTE	PATTERN
PCIRCLE	PEEK	PEEKB	PEEKL	PEEKW	PELLIPSE	POINT	POKE
POKEB	POKEL	POKEW	POS	PRESET	PRINT	PSET	PTAB
PUT	RANDOM	RANDOMIZE		READ	REDIM	REM	REMAINDER
REPEAT	RESET	RESTORE	RESUME	RETURN	RIGHT\$	RMDIR	RND
RSET	RUN	SADD	SAY	SCREEN	SCROLL	SELECT	SGN
SHARED	SIN	SLEEP	SOUND	SPACE\$	SPC	SQR	STATIC
STEP	STICK	STOP	STR\$	STRIG	STRING\$	SUB	SWAP
SYSTAB	SYSTEM	TAB	TAN	THEN	TIME\$	TIMER	TO
TRANSLATE\$	TROFF	TRON	TRON	UBOUND	UCASE\$	UNTIL	USING
VAL	VARPTR	VARPTRS	WAIT	WAVE	WEND	WHILE	WIDTH
WINDOW	WRITE	XOR					

HiSoft BASIC - Reserved Words

HiSoft BASIC is a no-limits language; string variables may be up to 16Mbytes in length and there are no limits on array sizes either (subject to available memory). Code generated is fully 68010/020/030 compatible.

Compiled programs have no run-time overhead; all compiled programs share an Amiga library, which may be distributed with programs without charge. Compiled programs multi-task, of course, and as they all share

the same library, memory usage and disk space is kept to a minimum. There is also an option to produce completely stand-alone programs which include only as much of the library as they need.

HiSoft BASIC - now BASIC programming on the Amiga has come of age.

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- ✓ Compatible with Microsoft QuickBASIC 3 on the PC, Atari ST BASIC, AmigaBASIC and most other BASICS,
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- ✓ optional line numbers, lots of compiler and run-time options allowing tremendous flexibility both at compile & execution time,
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- ✓ 5 types of variable, integers, long integers, single- and double-precision floats and strings of any size,
- ✓ no limits; no program size limit and no variable size limits,
- ✓ interactive environment; invoke the compiler from the easy-to-use Intuition editor and all errors will be reported, in English, giving you the option to go straight back to the editor for correction or to carry on compiling. You can run your program from the editor so it's just like using an interpreter - but faster!
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10 things you always wanted to know...

...about programming languages and tools

Simon Williams visits a team of expert computer linguists. His report now, from deepest, darkest Devon...

When you get your teeth into a new game or run up an application for the first time, do you ever spare a thought for the programmer, and wonder how he set about writing it?

Programming languages are getting very sophisticated these days, with innumerable libraries of pre-written routines and extras which make life easier. The programming scene in the UK is thriving and one of the biggest importers of languages and programming tools in the country is Grey Matter, set just off Dartmoor in South Devon. There, a stalwart 20-strong language support team has a good few ideas on the state-of-play of programming.

The support team, most of whom are programmers in their own right, spend their days answering calls from customers who have bought language software or are thinking of doing so and have a particular problem to solve. Although each member of the team has particular specialisms, most have a wide knowledge of different packages. Phones rule, and take precedence over non-phone activities!

Grey Matter – now and then

Grey Matter started in 1980, when brothers-in-law Iain Rangeley and John Cross set up a consultancy and software import business behind the maxim 'do things right by the customer'. Thus they concentrated from the outset on providing strong after-sales support for any product bought from them. They deliberately went for the programming market, as British programmers were then very underserved in comparison with their American counterparts.

The business has grown and prospered, but the emphasis has remained on customer support. Grey Matter employs no salespeople, but relies instead on word of mouth from satisfied customers and on some advertising.

Grey Matter's elongated barn of a building looks and feels like a cross

between a university library and the 'electronic office' so often talked of but yet to be seen in the plastic. The pervading interest with programming languages stretches right down to the two cats which patrol the premises. Ada, who will take a swipe at you any time, and Smalltalk, who is very user-friendly, are not the only ones with open windows and mice on their minds.

One of the most exciting developments, still in the early stages of planning, is a distributed information system which Iain and John intend to put together in the next few years. This will provide every member of the support team with a PC on an ultra-fast network (the software is being custom-written in-house to cope with the huge flow of data and the number of file servers on the network – potentially every station). The intention is to scan documents relevant to every piece of software stocked, and to hold them in compressed *graphics* files. All the information currently held in hundreds of loose-leaf binders will then be available to anybody offering support over the phone.

The information held in this way is likely to run to tens or even hundreds of Gigabytes – well above the capacity of most current mainframes, and only really feasible on a distributed system.

Phone lines

Nearly everyone at Grey Matter has some quirky enquiry to relate. For example the person who rang to complain that his language software didn't run properly. It turned out he was running his PC in sub-zero conditions in a barn on a Dartmoor farm, and his machine was suffering from condensation. This only became apparent because the caller's teeth were chattering!

There was also a call from a salesman in a certain high street multiple who had been supplied with software on the wrong format of disk. When told that the disk he needed was of a different format, he came back with "What does the format matter?" ●



Fact file

- 1 Over 95 per cent of the language software supplied by Grey Matter is PC-specific. This is partly because of the huge number of PCs in use, but also because of the very wide range of programming tools available in this computer format.
- 2 Over 50 per cent of the language software relates to the C programming language. Most of the rest is devoted to BASIC (QuickBASIC being the most popular), Modula 2 and Pascal.
- 3 C is the most popular language taught in US colleges, while Modula 2 enjoys a similar status over here. The large number of Unix installations in America accounts for the US choice, whereas the increased structure of Modula, and the fact that it's a European language, makes it the UK favourite.
- 4 The favourite version of C among the support team is not Borland, Microsoft or Zortech, but Watcom, which is faster and more compact than any other. There aren't at present as many pre-written libraries available for it, though.
- 5 Most useful language compilers don't adhere to any standard version of the language. Most of the best ones include 'switches' to cut out the extra features, though. This way you can check how close to the standard your program comes, and how easy it will be to transport to other versions of the language.
- 6 As Microsoft's new operating system, OS/2, becomes more popular, there may be a swing towards Modula 2 as a preferred programming language. This is because Modula 2 includes code to handle multi-tasking (running more than one program at once).
- 7 The latest version of the C language, known as C++, is highly regarded. It is available in the well-known version from Zortech, and a new one from a company called Glockenspiel!
- 8 The buzz-word language products of 1988, 4GLs (Fourth Generation Languages) have proved too bulky and slow for general use. Many people are now returning to conventional languages like C, Pascal and Modula 2.
- 9 Program Generators, on the other hand, are becoming increasingly popular, and several now produce code in any of several computer languages.
- 10 The most common reason for customers phoning Grey Matter for technical support is that they haven't read the manual thoroughly!

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Amazing Discovery

Things certainly seem to be picking up on the Amiga games scene. While companies such as US Gold still continue to push lacklustre games ported over from the Atari, several very exciting titles are keeping tired computer journalists such as myself awake during these cold January nights.

It really is quite embarrassing at times to compare some of the absolute trash pushed out onto the market by UK software houses with some of the software that is arriving from both the continent and the States. As always, there are exceptions, such as Grandslam's PacMania and Jez San's cult classic, StarGlider II, but decent home-grown Amiga products are few and far between.

My vote for Amiga software house of the month must undoubtedly go to the American company Discovery Software. Discovery, formerly better known for its disk copiers than games software, has in recent months published some very hot titles indeed.

Top of the bunch is surely the excellent *Sword of Sodan*, a game I have been playing for a couple of weeks now. I can safely say that I'm hooked. In terms of audio visuals, there is absolutely nothing to touch it. *Sodan*, the programmer, is probably better known to Amiga enthusiasts as the co-author of the excellent *Tech-Tech* demo. If you haven't seen it then beg, borrow or steal a copy. *Tech-Tech* is one of THE premier demos on the Amiga.

Second on my list of 'must haves' is another title from the Discovery Stable, *Hybris*. If like



• Hybris: Greatest ever Amiga shoot-em-up?

me you love nothing more wasting aliens, then *Hybris* will appeal to you. With its pure arcade action and superlative audio visuals, *Hybris* is one of the best shoot-em-ups on the Amiga, and as anyone who knows me will confirm, praise such as this is very rare

Jason Holborn

indeed. Still, for the definitive review, check out *Express* next week...

Last, but definitely not least, is *Dragon's Lair*. Not from Discovery this time, but fellow American software house, *ReadySoft*. I've finally been able to get my hands on a review copy and have been playing it ever since (between sessions of *Sword of Sodan* and *Hybris* that is!). Want to impress someone with your Amiga? easy, just load *Dragon's Lair* and you'll blow them away. Makes me feel sad for all those misguided soles who bought Atari's.....

GFA vs HiSoft

Yes, it was inevitable. The battle of the BASICs has started. Which is best? HiSoft or GFA BASIC? Listening to the various claims coming from the two software houses concerned could leave you in bit of a muddle. However, I've been able to tinker around with both for a couple of weeks now and these are my initial impressions.

GFA BASIC is undoubtedly a more sophisticated and powerful implementation than HiSoft's offering, but it gains this by sacrificing compatibility with AmigaBASIC. HiSoft BASIC, on the other hand, is highly compatible with AmigaBASIC but still manages to sport some impressive enhancements.

In my opinion, going it alone by dropping AmigaBASIC compatibility will probably turn out to be a grave mistake on the part of the GFA designers.

GFA BASIC offers some wonderful features, such as a built in file requester that can be called from a single BASIC command, *FILEREQUEST*. Unfortunately, GFA does suffer from some major bugs. I was actually able to crash the language every time when using the *ALERT* statement.

The greatest asset offered by HiSoft BASIC is undoubtedly the inclusion of a compiler. No compiler for the current version 3 of GFA BASIC yet exists, even on the Atari, so be prepared to wait a fair amount of time for an Amiga version to arrive.

Choosing between the two really comes down to a matter of personal taste. A bug-free GFA BASIC complete with compiler would be the ideal choice but until that arrives, HiSoft BASIC is the one to go for.

Doctoring your Disks

How many times have you been carrying out a disk-intensive task on the *Workbench* when all of a sudden a requester pops up informing you that the Amiga was unable to validate your disk and it is now corrupt?

And then, to seemingly rub salt into your wounds, the Amiga then suggests you run the *DiskDoctor* program on the disk. What *DiskDoctor*? What is the machine talking about, you may well ask? Read on, as all can now be revealed....

DiskDoctor is another one of those hidden gems (or should that be Intuitions - sorry, bad joke) that Commodore forgot to tell you about. Try as you might, you won't find an icon for it anywhere. *DiskDoctor* is actually a CLI command hidden away with all the other little CLI commands in a rather obscure directory on your *Workbench* disk. The only way to access this mavelous program is through the CLI. Don't panic, though! This won't hurt a bit.

The first thing to do is to drop down into the CLI. You can do this by double clicking on the CLI icon found inside the System drawer on your *Workbench* disk. After a few moments disk access, a CLI window will appear. To actually run *DiskDoctor*, type in the following at the prompt:

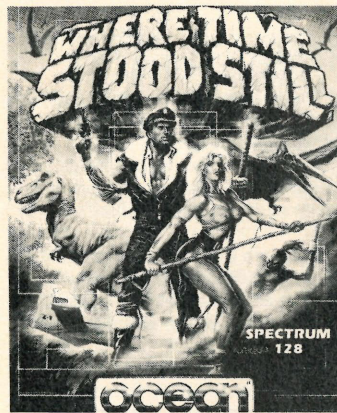
DISKDOCTOR DF0: <Press RETURN>

Once the *DiskDoctor* has been loaded, you will be prompted to insert the corrupt disk into your internal drive and then press the RETURN key. Don't use this command on a disk unless you really have to, though, as strange things have been known to happen.



Broadening horizons

Isn't it about time software houses started writing some titles specifically for 128K Spectrums? The Specky has had increased memory for a long time now, but how many pieces of software have used it to anything like full capacity?



I can think of only one title; Ocean's *Where Time Stood Still*. It was well-liked by public and press alike, but surprisingly didn't persuade anybody else to write a 128-specific title. Most software companies have acknowledged the +2/+3 pretty half-heartedly with enhanced music or elimination of multi-load.

I reckon we deserve better; a 128K version on the flip side of the standard game at the very least. When you consider how much people like *Incentive* have managed to squeeze into 48K, imagining the results they could achieve if they used the beefier Spectrum as their target machine is enough to make you drool with anticipation.

Priceless antique

Sorry to rave about another budget re-release this week, but I'd never forgive myself if you missed some of the classics currently abounding in the re-run market. Zeppelin's *Battle Tank Simulator* might be the 128th budget game to have "simulator" in its title, but don't be put off, because behind the Code Masteresque name hides a definite golden oldie if ever I saw one.

It's none other than *Tank Duel*, an ancient rip-off of *Battlezone*, that old vector graphics arcade machine with the periscope thingy to look through.

A well-executed period piece, it still plays excellently and was Real-time Software's first ever release (they moved on to do *StarGlider*, *Carrier Command* etc.). Now there's a fact to impress your friends with.

Strategic advance

Next time all you arcadesters are tucking into the latest alien blasting orgy, spare a thought for the poor, neglected strategy fan weeping in the corner because he has nothing to play.

Fear not, my special little strategy contingent, somebody likes you - Electronic Arts, to be precise.

Its duo of two very strategic games, *Archon* and its brother *Adept*, collectively known as *The Archon Collection*, has just made it onto the Spectrum.

Rik Haynes gave the Amiga version four

stars in issue 9, and despite the fact he's a bit of a Commodore, I'm inclined to agree with him. The Spectrum graphics are very unimpressive - pre-1985, in fact - and sound is virtually non-existent. Still, in this type of thing it's the gameplay which should dominate, and on the Spectrum version it most certainly does.

I can't promise you that it's 100 per cent free from arcade additives, but you'd have to be a demanding sort not to enjoy it.

Outlet outlet

Aarrgh! A small bug managed to creep into issue 9's column. When reviewing *Outlet* magazine, for some unknown reason I said the free sampler Cheznor Software kindly supplied to all enquirers "isn't actually available at the time of writing, though" (not one of my better sentences, as you can see). What my weary fingers should have bashed in was something which would have indicated the sampler is not available on tape at the moment. Any Plus D, Opus, Disciple or Micro-drive owners who send a blank disk/cartridge will receive the sampler (Tape-based people can get a proper issue of *Outlet* for £2.75). Cheznor Software can be found at 605 Loughborough Road, Birstall, Leicester LE4 4NJ. Hope that clears it up.

Archon tips

- Cast an imprisonment spell on the opposition's strongest icon and then shift time to prolong the entrapment

- If you like living on the edge, teleport your strongest icon to the heart of the enemy side and attack anything in your way. Unsubtle, but effective

- Try to fight icons of about the same power. Picking on the weaker character might seem effective, but more than likely it'll sap energy much needed for the really strong villains

- Only revive your powerful icons and don't heal a shapeshifter; after battle they regenerate
- In combat, keep moving and hide behind obstacles when you need to re-arm

Serious gap

In the festively extended Christmas *Spex*, you may remember a letter asking for more space to be devoted to serious Spectrum applications instead of banter on these frivolous games.

I said my humblest apologies and agreed a bit more talk concerning such matters would most definitely appear in future columns. *Scout's Honour* and all the rest of it.

Well a few columns have passed and still not much serious scribbling has appeared. Were these politician pre-election type promises? Well, no, the main thing preventing coverage as detailed above is the simple fact that no so-called serious applications or hardware has come anywhere near me. And who can blame it?

If any software houses which markets utilities or hardware is reading this, I beg you on bended knee to get in contact. Surely you're not allergic to free publicity?

If I've stirred you into action, write to me at the address at the bottom of this column.

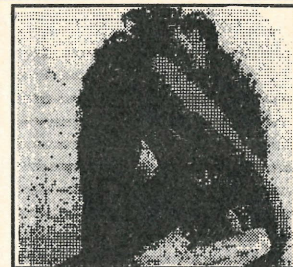
Write away!

Mail levels are still at an all-time low. I'd really like to hear from anyone who has got something to say about the *Spex*, as well as those with gaming or programming tips. I can't promise any financial reward, but surely the honour of appearing in such a prestigious place is more than enough for you?

Send everything to me at SPEX, New Computer Express, Future Publishing Ltd, 4 Queen Street, Bath BA1 1EJ.

Robin Alway

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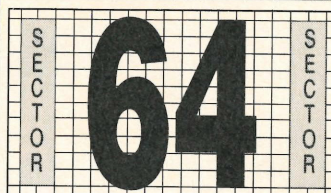
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Great machine! No software

The CBM 128 seems to have been forgotten today, though we hoped it would be a success when it first appeared on the British market in 1985 (we were among those who bought one). The problem was, the new machine had a built-in '64' mode, which meant there was little incentive for software houses to cater for it separately.

The great advantages of the 128 included its nice Basic and sprite editor, not forgetting its high quality machine language monitor, which 'Our Mic' uses for writing his 64 games, instead of maybe a PDS or an Assembler. A disadvantage with its size of memory was the major bank switching needed.

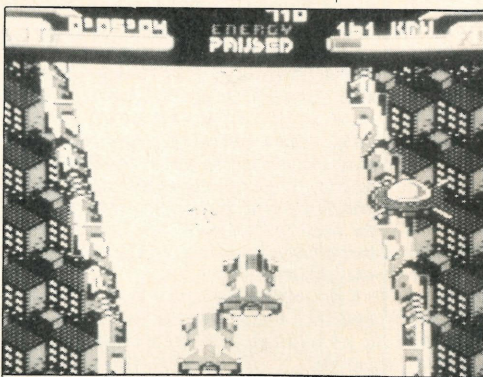
The CBM 128 has a co-processor, a Z80, with a 2MHz clock rate, which runs faster than the 64's standard processor, the 6510. There is a bug in the machine's 64 mode in location #53296 which if set to a wrong value will muck up the display and double the speed in 64 mode. This is why many games such as *He-Man* and *Yabba Dabba Doo* didn't work, but this was actually used to advantage in *Alleycat*, by Andrew Braybrook.

Another great thing about the 128 is that you can program in Z80 as well as 6502/6510, making it more flexible.

On their way

There's a nice, lengthy list of software coming from US Gold:

LED Storm • £9.99cs, £14.99dk (any day now)



• LED Storm

Last Duel • £9.99cs, £14.99dk (any day now)

This game takes you through 6 levels of arcade action in a bid to rescue a princess.

The Deep • £9.99cs, £14.99dk (any day now)

Human Killing Machine • £9.99cs, £14.99dk (February)

This game has similarities to *Street Fighter*. It has you travelling through five different countries and taking on ten different opponents.

You start off in Moscow as a Russian soldier called Igor with his companion Shepski. You then go to Amsterdam as Maria with your

partner Helga (who will punch up anyone at the nightclub). Next is Barcelona, as Miguel and his bull Brutos. From there you go to Germany as Hans and waiter France. Finally, you end up in dreaded Beirut as Sagan, accompanied by friend Merkaca.

Zak McKracken • £9.99cs, £14.99dk (February)
Vigilantes • £9.99cs, £14.99dk (March)

Another *Street Fighter*-type game.
Out Run Europa • £9.99cs, £14.99dk (April)

The follow-up to *Out Run*, the Sega game that sold over 300,000 units.

Battle Hawks • £9.99cs, £14.99dk (April)
Forgotten Worlds • £9.99cs, £14.99dk (May)

Strider • £9.99cs, £14.99dk (July)
Indiana Jones: The Last Crusade • £9.99cs, £14.99dk (Aug/Sept)

C64 demo writers

It was interesting to see a letter in another weekly mag from a reader talking about hackers and crackers - and quoting "ASH&DAVE" and "IAN&MIC" as examples.

Unfortunately, clean demo writers (enthusiasts) are mistakenly confused with crackers, and we can assure all our readers that neither we nor "ASH&DAVE" have ever had need to do this.

A cracker is a person who buys a game then cracks it by putting in all the latest cheats and then writing an intro, which is similar to a demo, for the start of the game. They will then swap their new crack all over Europe for another program in return.

People tend to think that if you write demos you must be a part of all this. Yet most demo writers, like the ones on *Compunet* and ourselves, write demos purely for pleasure. Also, writing demos is a good, fast way of showing your programming powers: for example, you might write a demo showing exactly how many sprites you can have on the screen while maintaining full screen colour and memory scroll. This sort of thing gives software companies a good idea of your talents and ability.

It is quite wrong to say that if you write demos you must be a cracker.

Hardware

Southampton-based Megaland has two printers on offer. The LC10 Commodore printer is £159.95 and a colour version of the same printer £199. Contact Megaland on 0703 330544, or write to Megaland, 42-44 Millbrook Road East, Southampton.

Also, before we forget, Megaland has the new 1581 Commodore disk drive. As we

reported previously, the new drive uses the same disks as the Amiga/ST. This means 1Mb (1,024K, for those who don't know) of memory instead of the 166K on the 5.25" 1514 drive. The new drive costs £115.

Cheats

Thanks again to Robert Troughton for these cheats.

The first is for that colourful Gremlin game *Mask II*. On the title page select code entry and type "MAYHEM",

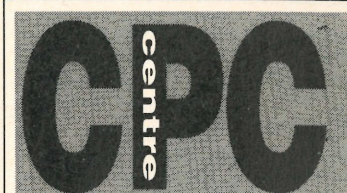
then move into the teleport to enter the next level. Also, you can type "PETALS OF DOOM" to be invisible, and if you type "TRANSMOGRIFY" you can move into the teleport and go to the moon.

Robert's second cheat is for the Mastertronic game *Rogue*.

POKE 27190,234
POKE 27191,234
POKE 27192,234
SYS 26667

This will give you unlimited strength.

Ian + Mic



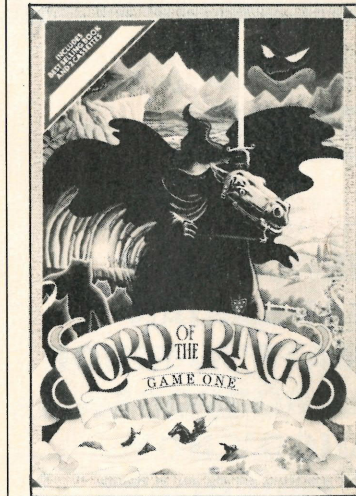
Bush fire

Afterburner (stunningly good for an arcade conversion, I reckon) has arrived - and it would take a better man than I am to abstain from just a wee bit of gloating that it coincides with real life activity involving F14s in the Med.

And while we're on about magnificent men and their flying machines, Microprose has finally finished *Airborne Ranger*, which is nice (finishing it, I mean). For a game that occupies both sides of a disk or a couple of tapes, you'd have thought it would take weeks to master. But no! Completion of the various missions is surprisingly easy - and I speak as one who has trouble getting airborne at all with most of Microprose's hefty flying sims.

It is a pity the thing looks so naff, though. *Pirates*, an earlier Microprose release, used loads of bright blocky graphics ported over from another computer. *Airborne Ranger*, by contrast (pun intended), is rather plain (also intended). This habit of using just a few colours is difficult to comprehend, when - as you well know - the CPC has the best colour-to-resolution ratio of any 8-bit home micro.

Still, with each of the 12 missions subtly different, set in different terrain, and with different objectives and tactics, *Airborne Ranger* has given me the best late nights on my CPC I've had since *Total Eclipse*. The Microprose label is as ever a guarantee of quality - and it's not often you can say that of CPC games! (Two other examples: Electronic



• Hobbit-forming Lord of the Rings gets another licence to thrill

Arts and Incentive.)
So long as you've got your elf...

J.R.R. Tolkien heads for another appearance on the CPC, courtesy of Melbourne House's fantasy wargame *War in Middle Earth*. It follows three famous adventures: *The Hobbit* (more bugs than the Natural History museum), *Lord of the Rings* and *Shadows of Mordor*. Opinions were divided, but they sold well - probably, it's fair to say, in large measure due to the fame of the books on which they're based.

Anyway, *War in Middle Earth* covers the events of Frodo's quest to destroy the One

Ring and the attempts of the Fellowship to raise the races of Middle Earth against the forces of Sauron, Dark Lord of Mordor. If you want the world to remain a nice place where hobbits can wander around in safety then you'd better start practicing your Nazgul dodging and orc bashing.

Bard mania

Wearing my *Amstrad Action* hat (well, T-shirt actually), I must say I've never seen anything quite like it. We're used to receiving lots of games maps, pokes and hints, but surely no game has prompted so many and such detailed letters as we have had for Electronic Arts' brilliant *Bard's Tale*. Whether it's because the game lends itself especially well to map-making and so on, or whether something about the game inspires addiction (certainly true of your correspondent) I don't know. Anyway here's a few hints.

All Greek to him

George Kassimatis, an enterprising Athens-based pal (ooh, we're so cosmopolitan in the CPC corner), has succeeded in connecting a video to his CPC colour monitor. Problem is, the screen's black and white only! He took the composite video and fed it into all of the Amstrad monitor connections except earth, which is connected to the ground of the composite signal. Anyone out there help in producing a full colour picture? Send info to: George's Problem, CPC/NCE, 4 Queen St, Bath, BA1 1EJ. Crisp (salt 'n' vinegar flavour) tinner for a workable solution.

Devising your party

- It's generally agreed that the right balance is vital: too many fighters and you're at risk from magical creatures; too many magic types and you won't live long!
- When rolling for character attributes, always try hard to give all characters a high constitution, so they gain bonus hit points when they increase levels. Other attributes will increase in time, but if you start with low bonus hit points you're stuck with them. 17 or 18 is excellent (impossible for magic users I know, but go as high as you can).
- Add up the attributes and aim for 62 or more: 66++ is excellent; 58 - and you're in trouble.

One or two ideas for getting going

- Start cautiously. Stay near the Temples of Healing at the centre. Walk around only in daytime (go into the Adventurer's Guild if necessary).

- Equip characters with the best gear you can afford - fighters especially. Kick doors to select your opponents, and only attack weak things (Cowardly? Sure, but safe too!).
- If you're killed, don't bother with revival, unless the fee is very low or you're particularly rich. Simply load back the latest saved party...
- Which leads us to the most obvious but also the most important tip of all: save regularly!

What immortal aardvark can shame thy fearful symmetry?
Tyger Tyger, Firebird's upcoming release, has you playing a Sumo-style character called Lance Tyger and travelling about a mystical land looking for aardvarks and other monstrous beasts to slaughter (A word of advice: always suspect anything, be it game or magazine, that features aardvarks). You start off with only a sword to keep said monsters at bay, but other more powerful weapons can be purchased from the gold that you just happen to find lying around on the floor. Will you get to a final confrontation or just end up being squashed by an angry aardvark? You'll have to try it and see.

Steve Carey

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You'll Pisces yourself

It was heartwarming to look at the Forthcoming Releases section in this week's issue. The clanky old Amstrad PCW had as many new pieces of software on imminent release as the hi-tech Archimedes and the Apple Macintosh. Who says the PCW software market is dying? Here's our 8-bit

In memoriam

If you want to print a document in LocoScript and work on another one while it's printing, try copying the document to the machine's M drive and printing it from there. Things will work very much faster - and you can even work on the disc version of the document being printing.

Amstrad doing just as well as its 16 and 32-bit contemporaries!

OK, so there was only in fact one piece of software scheduled for release - the Magnetic Scrolls game *FISH*. Described as a 'wacky adventure', it features such humorously titled characters as 'The Seven Deadly Fins'. Most amusing.

Thesis your life

Protext really is the most underrated program for the PCW. Most people dismiss it as a word processor-with-a-word count, a faster rival to *LocoScript* which isn't so

good at laying out text on the page. (*Pro-text* users will know to their cost how you can't mix different size letters in the same line or even document without hassle.) A certain member of the team responsible for *LocoScript* described *Protext* as a 'text editor with a format command tacked on the end').

Protext, though, isn't just a very fast text processor. It is really a word processing programming language and can be used as a powerful free text database - ideal for writers, journalists, authors and academics.

For instance, you can work on two files at once, letting you keep your file full of notes in the 'background' and work on your main document at the same time.

Then you can swop to the notes, find a useful block of text, copy it to the main document, and continue - all in seconds.

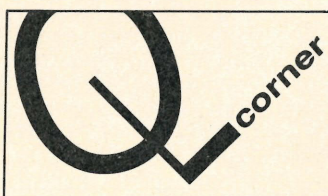
You can also write series of commands which can be executed at a single keypress.

A mate of mine writing a thesis has put such a routine together, jokingly called *COMPILE*. When he types *X COMPILE Protext* asks him for a keyword; it then searches all the files on that disc and copies any paragraphs containing that keyword into a new file. Another routine searches the new file for references and compiles a bibliography at the end.

He claims to have put together an otherwise unmodified paper in five minutes with this method. The paper was discontinuous, rambling and had no theme to it. No-one noticed.

Protext is available from Arnor on 0733 68909.

Rob Ainsley



Antics

A friend recently received a copy of the ANT PC Emulator for the QL. Though advertised as available in November, it wasn't delivered until mid-January, four weeks after the cheque was cashed.

A preliminary test revealed that the ANT product is definitely NOT to be recommended. It is disappointingly slow, and while we tried it on a variety of PC programs, it ran very few of them successfully. We tried different hardware, but it made no difference. If we said this emulator didn't

work at all, we would be being a bit unfair - but only just.

Adding insult to injury, the ANT package had no manual (other than a 4-page disk file), and was accompanied by a sheet admitting that the emulator "still contained quite a few problems"! ANT went on to say that only "small" PC programs worked satisfactorily with it...

We tried to contact ANT for assistance, but to no avail - there is no phone number in its documentation or ads (or with the monthly they advertise in - we tried!) and BT have no record of ANT at all.

There is an alternative PC and MS-DOS Emulator from Digital Precision. *The Solution* costs £79.95 from them at 222 The Avenue, London E4 9SE (tel: 01-527 5493). If

you don't have a recent copy of MS-DOS, add £50 and Digital Precision will ship MS-DOS v4.0 and GW-Basic too.

Pipedreams Part 2

More on the dream computing system I've been thinking of... What if you could have a double co-ordinate system, serving both graphics and text characters, accessible both in pixels and in character units? Even better, if the graphics were in colour with switchable resolution, selectable scaling, variable origin and had optional turtle commands. It would be incredibly flexible if the two systems could be used side by side.

Imagine if the BASIC could be used to write perfectly structured programs while, unlike C, still providing interactive debugging and full error trapping, eliminating the need for dreadful GOTOs and GOSUBs and labyrinthine code by means of functions, procedures with local and global variables,

Alternative lifestyles

Microfairs are already dominated by QLs - there's hardly a Spectrum in sight. The second Alternative Micro Show, scheduled for April 1st (no kidding) at the New Horticultural Hall near London's Victoria Station, may go the same way. The first AMS, held at Aston Villa, was attended by Miracle, Digital Precision, Firsham and PDQL, and there were loads of bargains. Worth attending.

REPEAT... UNTIL, select ON structures and versatile FOR... END FOR logical ranging (FOR x=2, 3, TO 17 STEP 2,-4,PI) and multiple NEXT exits. The only advantage C would have over this BASIC would be the library function. But if this wonderful BASIC could be made user-extensible, so toolkit commands could be added at will, even that plus point would evaporate.

Eric Simmonds



Violent opinions

This week my theme is Games; Do shoot-em-ups and beat-em-ups encourage violence? Or, is sexism in computers training a whole generation of young thugs? The question may seem trivial, the kind of thing dredged up by the tabloids in a dull moment, but I do believe there is a serious topic here which is never really addressed by the computer industry.

All these thoughts surfaced in my mind as I was blasting aliens to infinity in *Galaforce 2*, part of the latest release from Superior, *Play It Again Sam 6*.

This is an excellent example of the genre. It is fast, furious, mindless, and totally violent, but in a very abstract kind of way.

Now I don't believe that games such as *Galaforce 2* encourage actual violence, and even the beat-em-ups like *The Last Ninja* are not too harmful; *in themselves*.

But I do believe that the overwhelming preponderance of such themes in the games world does encourage an attitude that tolerates such violence in the real world.

Sexist software

Secondly, most computer games almost totally exclude of women, both in terms of plot and characters. This is bad, because girls, who let's face it are half of the population, are often put off computers at a very early age.

Few, if any computer companies take account of the different way of thinking that women have; they tend to be more 'intuitive', as opposed to the coldly 'logical' male. So my tip, and plea, this month goes out to all you male programmers out there. Think of women when you are writing your program, and do your bit to make the world that little better a place. After all, the BBC is the thinking person's computer.

Andrew Brown

Play It Again Sam 6

A quick review of this new compilation from Superior is in order. As mentioned above, Galaforce 2 is fast - mind-blowingly fast - particularly on the Master 128, where sometimes the aliens are coming at you so quickly they are just a blur.

It is, however, very playable - more so than Galaforce 1 - and even I managed Advanced Pilot level in reasonable time.

The scenario is the same as before but with some added elements such as collectable capsules which can give help, or hindrance. Also, you can select your starting galaxy from the sixteen available, assuming you have already reached that point.

Of the other games, Sentinel will need no introduction, being ranked up with Elite as one of the best games EVER, and Hunchback is a real bonus for Electron users, being new to that machine.

Together with Hopper (the original Acornsoft implementation, not Superior's copy), this is a 100 octane compilation, and well worth the money.



software is aimed at too high an age group, and is far too hard for the younger user. This type of game is fun for all ages, and is highly recommended.

Error checking

Just before Christmas, a friend of mine purchased a few Mastertronic budget games. One of these was *Master Chess*.

"How are you getting on with *Master Chess*?" I enquired.

"Quite well," he replied, "At least I'm winning."

Budget classic

Rally-X is from Bug Byte's Arcade Classics series, price £1.99. The game is a direct conversion of the Capcom arcade game, and is one of the most authentic conversions of an arcade game I have yet seen on an MSX.

If you can't remember the game, let me give your memory a little jog. You guide a little racing car around a maze which is viewed from above. There are flags scattered around the maze which you have to collect, while on your tail red cars try to prevent you clearing the maze. When a red car appears behind you, press the fire button and smoke belches out of your tailpipe to send it into a spin.

You have a radar screen to the right of the playing area which shows you the position of the board and Black kept on playing!

"Carry on," I said, "let's see what happens." He proceeded to clear all the black pieces off the board, whereupon the program claimed they'd reached a stalemate and asked if he wanted another game!

I told Mastertronic a year ago that this game was unplayable (on the JVC and Toshiba, at any rate), yet the bugs are still there. If you are looking for a good chess program for the MSX, go for *Colossus 4 Chess* from CDS or *The Chess Game* from Aacksoft.

"You do realise the game is seriously bugged?" I said.

He looked at me disbelievingly and carried on playing. Within a short while he had the Black's king in check. It was removed from the board and Black kept on playing!

I told Mastertronic a year ago that this game was unplayable (on the JVC and Toshiba, at any rate), yet the bugs are still there. If you are looking for a good chess program for the MSX, go for *Colossus 4 Chess* from CDS or *The Chess Game* from Aacksoft.

Keith Neal

Vera Cruz tips

- Look in the shadows in part 1 for objects
- Press "INS" over the notebook in Cruz's bag, then press it again to open the book
- Look under her left hand fingernails for a small clue
- Ask for statements from Nadine, the caretaker (Simon Duplat) and the bar keeper at the Bar of Poplars
- The car's registration is 9111 CD 6 9

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Issue 4: Sega's 16-bit console, best value PC, games that change your life

Issue 5: PC 200 fiasco, DTP guide, computer art, Unix explained

Issue 6: MGT Coupe, careers in computing, Realtime profile, cracking

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Concerned of Maidenhead, Bucks

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Alternatively, you can do what all US firms do in such circumstances: slap a writ for damages on somebody else and trust that in the subsequent furore everyone will forget the tax claim. Your best bet is to have a pop at Atari. It's always up for a spot of publicity and who knows, it might even collude with you.

I'm at my wits' ends. For the past six months I've been trying to connect my MSX -

(Handwriting illegible, postmarked Lincoln)

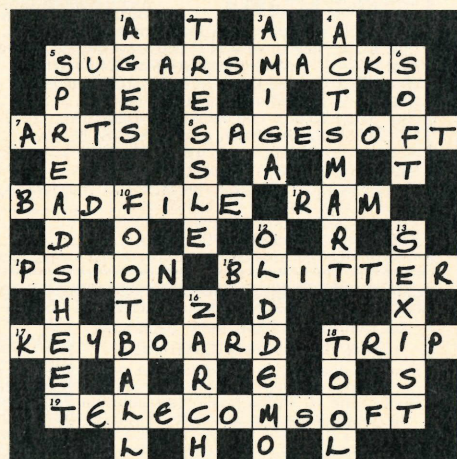
No offence, old heart, but your problem goes deeper than you think. Forget your connection and better still, forget your MSX. It's a demonstrable fact that anyone with an MSX sooner or later is compelled to believe that an international conspiracy prevented the MSX standard from ruling the world. The diseased idea will take hold of you until you break out in a rash of letter-writing to publications whose editors are all fully paid up members of the conspiracy.

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That crossword solution in full

In response to the multitude of phone calls and letters, here are the answers to last week's crossword. And no, there aren't any prizes. New readers should study the answers and work out the questions. They won't be getting any prizes either.



ing it several times in the past, only to miss the boat. How can we now release it with credibility? Anon.

Lotus, it's simple. Just bang on about the many thousands of man years it takes to produce the definitive software package. Weigh in with the Responsible Company angle: that you always want to do the very best possible for all your users. Hit 'em with a load of blurb about Major Technological Breakthroughs like 1-2-3 Version 3 not happening overnight. Pump up one of those striped shirt advertising whizzes to contrive a pseudo-sophisticated tagline such as "The everyday can happen tomorrow. Perfection takes just a little longer..."

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Please help me. I think I'm becoming addicted to hype. Just like all the others, I thought I could handle it. I'd just try it once, just for the experience. Everyone else in the computer market was doing it, so why shouldn't I? But now I'm hooked. I just can't stop having these amazing fantasies about machines, and really can't distinguish between dreams and reality. You're my last hope.

J Tramiel, Sunnyvale, California

Jack, you've just got to stop. Easier to say than do, I know. But you've got to start actually launching some machines rather than just talking about them. Start with the ST Console: work it out of your system. Then move on to the ST Plus. Who knows? You might even get round to launching your strange CD Rom device.

But you've also got to watch these ST shortages. You're now having fantasies about products not existing. Every year, you say that STs will be in short supply. But Jack, the consumer is wising up to you.

The choice is yours.

Shoot from the Lip... the week's most quotable sayings

"I'd much rather we didn't talk about this as a split. That's a loaded word which implies dissatisfaction and unhappiness. I'd rather describe it as the natural evolution of two companies."

Electronic Arts' senior vice president Tim Mott, on the split with Accolade.

"In the future, the marketplace for scanners will be as large as that for joysticks."

Cameron Macsween, eponymous boss of Cameron which - inevitably - makes scanners.

"The promoters of desktop publishing have a lot to answer for. They have led many to believe that mere possession of a sophisti-

cated software package will transform their lives. The truth is the barrage of hype has led to many disappointed buyers."

Computer columnist David Tebbut on the empty DTP dreams.

"I'm not saying you can run a multi million pound company on OLs or CPCs but for a one man band - which most small businesses are - they're ideal."

CPC and QL business software specialist Steve Denton.

"These three day training sessions aren't much good. They're far too intense; you come away punch drunk." One to one computer trainer Tony Reese.

NEXT WEEK

The crucial consumer

Buying software or hardware? Don't get caught out! Express reveals the smart ways to do your computer shopping

Amiga BASICs

Which is the best for you? HiSoft and GFA's new offerings on test

Unfair advantages?

The student who took his English exams on a PC

Machine specifics

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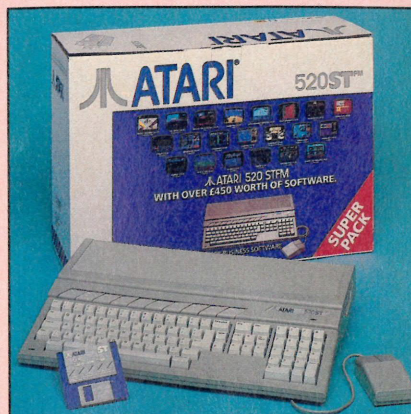
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The MEGA ST computers are styled as lightweight keyboard with a separate CPU, connected by a coiled telephone style cable. There are two versions of the MEGA ST, one with 2Mbytes of RAM and the other with 4Mbytes. Each version has a 1Mbyte double sided disk drive built-in to the CPU unit. The MEGA ST's do not come with modulator built-in and must therefore be used with a monitor. With every MEGA ST purchased, we will add the 'Professional Pack' software (worth £384.83) detailed above, plus the Silica ST Starter Kit (worth over £200) both Free Of Charge. Return the coupon for further details.



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If you already own an Atari ST computer and would like to be registered on our mailing list as an ST user, let us know. We will be pleased to send you copies of our price lists and newsletters FREE OF CHARGE as they become available. Complete the coupon and return it to our Sidcup branch and begin experiencing a specialist ST service that is second to none.

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520ST-FM EXPLORER PACK WITH BUILT-IN 1Mb DISK DRIVE



The value for money offered by the Atari ST range is reflected in the Explorer Pack featuring the 520ST-FM computer with 512K RAM. The 520ST-FM computer now comes with a built-in 1 Mb double sided disk drive as well as a free mouse controller and a built-in TV modulator. The new 520ST-FM Explorer Pack includes the 520ST-FM computer, the arcade game Ranarama, a tutorial program and some useful desktop accessories. In addition, if you buy the Explorer Pack from Silica, we will give you the Silica ST Starter Kit worth over £200, FREE OF CHARGE. Return the coupon for details of our Starter Kit and of the full ST range.

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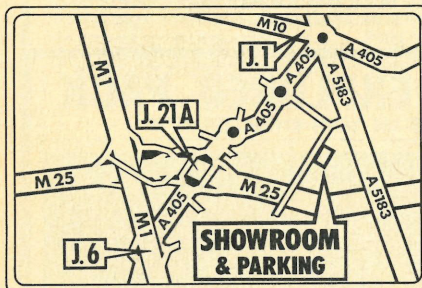
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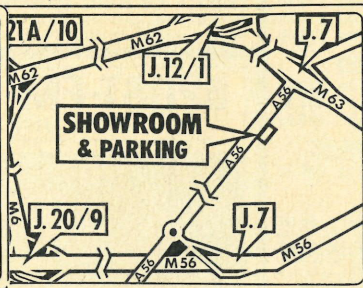
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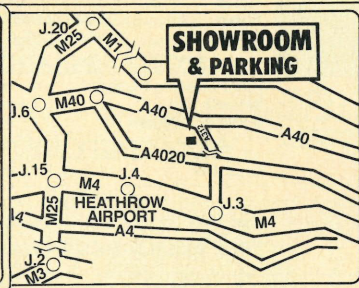
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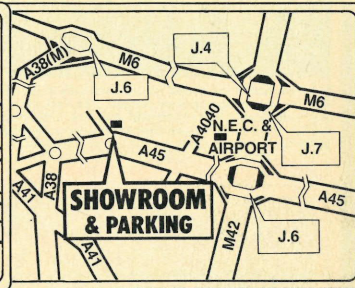
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