Issue 125 • 30th March 1991 • 88p

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NEW COMPUTER EXPRESS

FIRST NEWS • FIRST REVIEWS • BEST BUYS • YOUR WEEKLY GUIDE

THIS WEEK

AMIGA
The new 16 channel sound chip **PLUS** First impressions of Excellence 2

ATARI
A 100Mb hard drive that sells for less than £300?

PC
Which 386 portable has broken the £1500 barrier? **PLUS** Geoworks' Ensemble – a Windows 3 beater?

MUSIC
A full rundown on all the products on show at the Frankfurt Fair

PLUS REGULAR COLUMNS FOR ARCHIMEDES SPECTRUM AMSTRAD CPC C64 & 44 PAGES OF SHOPPING EXPRESS BARGAINS !!!

VIRUS ATTACK!

EXCLUSIVE

- Researchers predict global epidemic
- Soviet programmers target the West
- Scotland Yard adopts tough new line



ATARI'S ST BOOK

The first look at this exciting new portable

CHEAP CD-ROM

Philips' CM50 reviewed: 650Mbytes for only £399



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frontend

edited by Colin Campbell

COUPÉ 'STILL GOING STRONG'



Six months after these men clambered out of the debris which was Miles Gordon Technology, the little computer which destroyed their company is still around.

Alan Miles and Bruce Gordon remain as optimistic as ever about the Sam Coupé which has won so many fans, but has failed to win much of a market share. Last week Miles and Gordon celebrated the first six months of SamCo which was set up after the collapse of MGT to continue the promotion of their unpretentious 8-bit.

Although the Spectrum compatible machine has suffered all sorts of problems, it has managed to avoid home computing's legendary 'cupboard under the stairs'.

According to Miles "at under £200 the disk based system is comparable on a point by point basis with more expensive 16-bit machines, while still running many thousands of Spectrum titles". He pointed out that the Coupé has attracted user groups, fanzines, Public Domain clubs, and says that it is now available in 11 countries.

Miles insists that the Sam Coupé still has far to go: "It has taken a lot of hard work and help from friends. We now have something solid on which we can build. The Coupé is a toy for children of all ages and a tool for developers of all capabilities."

If you're interested in the Coupe, call 0792 700300. ■



Seikosha first with portable dot matrix

Seikosha has launched what is claimed to be "the world's first laptop dot matrix printer".

The LT20 is designed to fit beneath any notebook, laptop or portable computer. It weighs a respectable 5.9 pounds and costs £369. Printing speeds are 180 characters per second in zippy draft mode and 60cps in letter quality. There's also a sheet feeder which can handle 50 A4 sheets.

Users will be offered nine common fonts and all the usual typestyles. Seikosha reckons the sheet feeder could make its new baby a winner. UK boss Shoji Aihara said: "Interest has already come from the insurance and transport industries, whose main applications is multi-part printing." ■

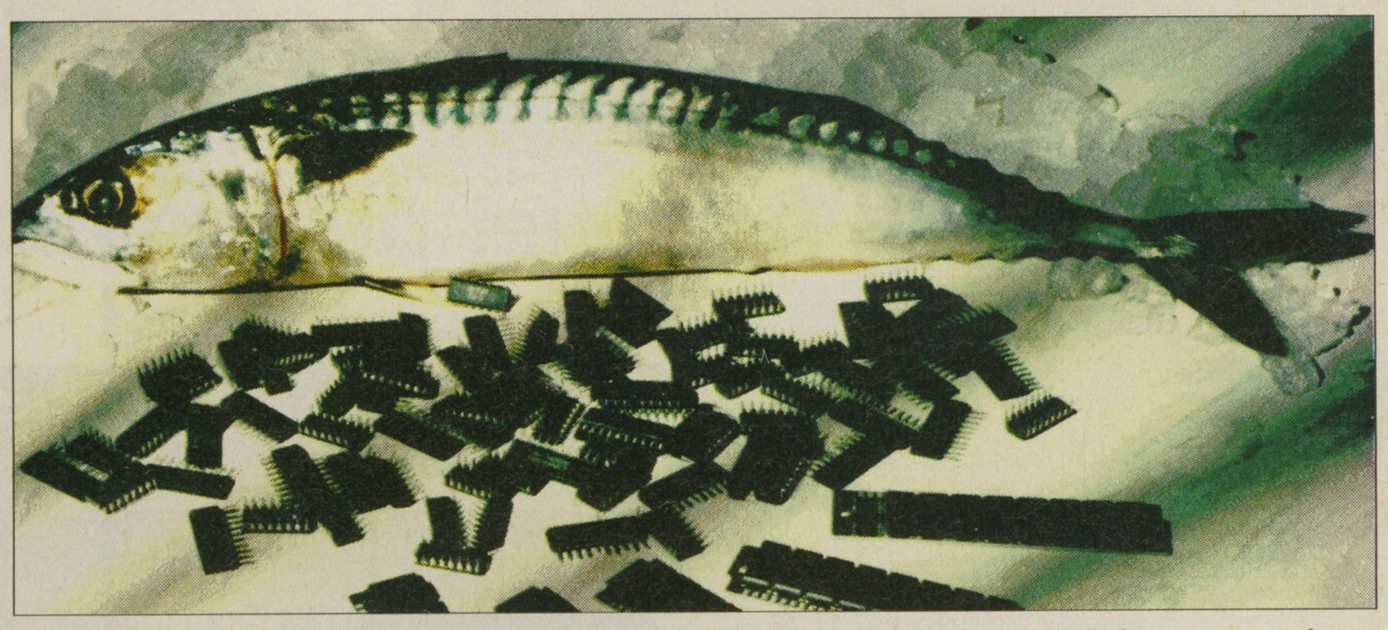
Sugar's sweet treat



What the devil is Alan Sugar playing at? The extremely rich boss of Amstrad has surprised everyone by selling a 7.6 per cent share of his company.

Big Al, British computing's most successful entrepreneur, wants to raise some cash for a touch of speculation in the commercial properties market. "What I'm buying is cheap and unrepeatable," he explained.

Sugar is still the major player in the UK computer market. His 7.6 per cent sale to institutional investors raised a tasty £33.8 million, and he still holds 36 per cent of the company he set up in the 60s. ■



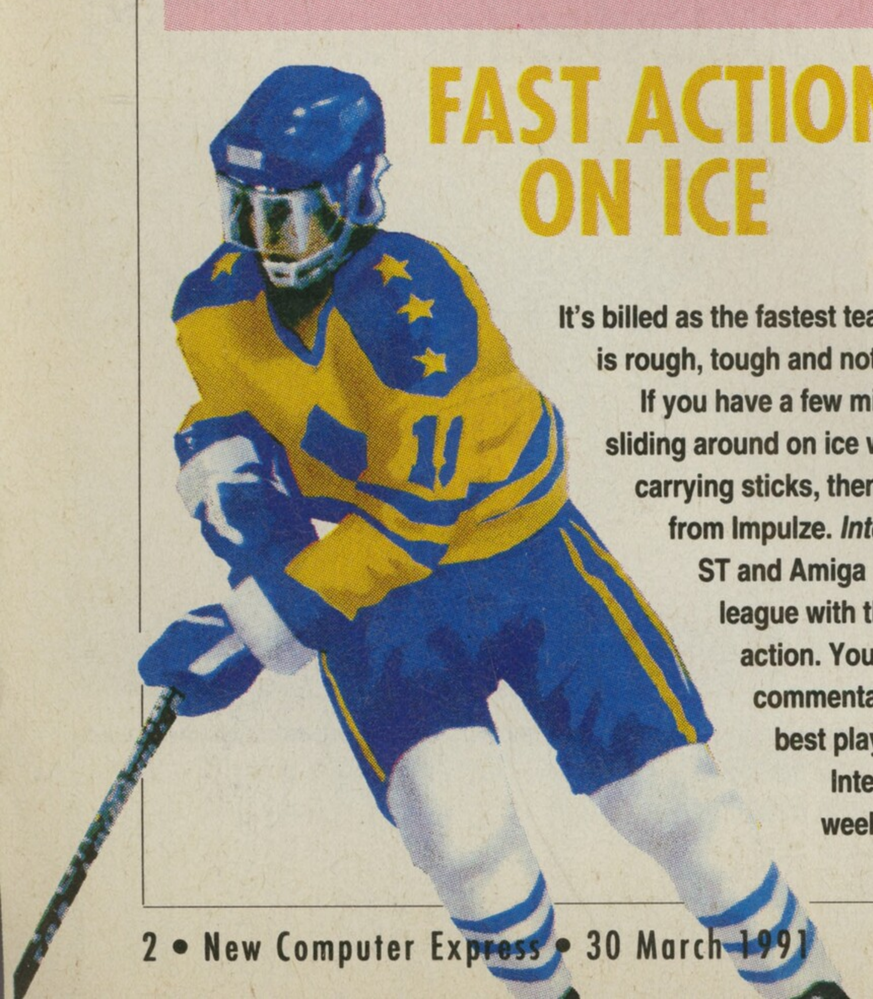
• As you can see, a visual gag based on 'chips' has sneaked into Frontend this week. For those of you utterly sick of this lamentable computer joke, we offer unreserved apologies.

However, we have an excuse. This picture from Hypertec acts as a fanfare for the opening of a 'onestop' memory upgrade service aimed at anyone looking to get more out of motherboards and memory boards. Buyers will be offered just about any kind of memory upgrade they can think of, plus a five year warranty on all chips.

"End-users can be sure of top-quality products and support," claimed general manager Colin Lillywhite. "We already supply a wide range of memory boards for all PC architectures, and now we have developed this specialist support activity."

The Hyperterc Chip Upgrade Service is on 0672 63936.

FAST ACTION ON ICE



It's billed as the fastest team game on earth. *Ice Hockey* is rough, tough and not too stylish.

If you have a few minor problems with the idea of sliding around on ice with a dozen burly men carrying sticks, then check out the latest release from Impulze. *International Ice Hockey* for the ST and Amiga features the strategy of the big league with the excitement of non-stop action. You get the sin bin, a TV sports commentator and you can save those best plays to disk.

International Ice Hockey is out this week retailing at £24.95. ■



GAMEBOY GETS A FANZINE

Still stuck on Gameboy *Tennis*? Need a few *Tetris* tips? Then check out the first fanzine for the hand-held Nintendo Gameboy.

The launch issue of *Power-Up* is available this week, and it's packed with all those snippets needed to get through the rigours of hand-held gaming. The 24 page "gamezine" costs £1 and includes reviews of all the top Gameboy games including *Turtles*.

Write to Power-Up, 15, St Peters Road, Huntingdon, Cambs, PE18 7AA. ■

OH NO! THEY'RE BACK

Remember this lot? Can you recall those hours of brain numbing destruction as you swept aside yet more battalions of relentless Space Invaders? If that old sensation of panic is already returning then watch out – they're coming back for more.

Those fools at Domark are plotting the conversion of arcade game *Super Space Invaders* '91 to home computer formats, thus unleashing once again the most vile breed of computer alien the world has ever known.

When the game descends this autumn you will be expected to tackle a never-ending procession of plodding foes. We advise you to set aside at least a few months for your first game, and then a couple of years for the rejuvenation of your ragged nervous system.

Domark's Matthew Tims was called upon to explain his actions. He said: "*Space Invaders* was a phenomenon in the 1970s, and we intend to make *Super Space Invaders* the phenomenon of the 1990s." ■

Government security sham



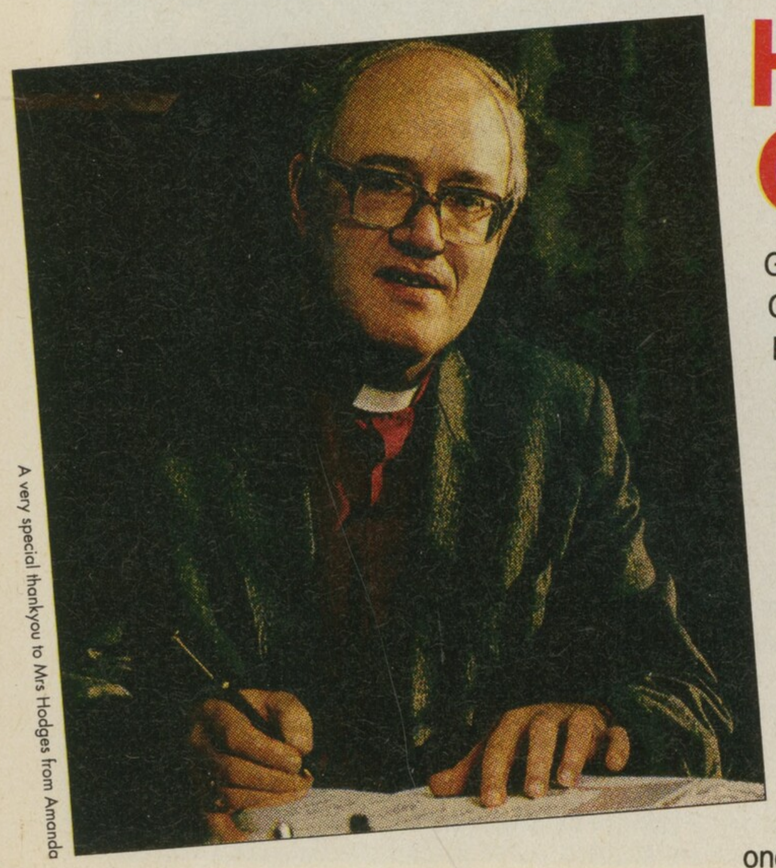
Appalling computer security within Government departments is costing tax payers thousands of pounds a year, according to Parliament's own financial watchdog

The recently published report warns that crooked civil servants are exploiting flaws in government computers. Some £130,000 has gone missing in a series of computer frauds over the past year.

The report blasts heads of departments for not taking the threat of computer crime seriously enough. It says that Whitehall needs to update its computer security procedures or face mounting losses.

Thirteen cases of computer fraud were uncovered at the Department of Employment alone, where Giros were being sent to curious addresses by unscrupulous computer operators.

And at the Ministry of Defence, one operator used computers to sell off £17,000 worth of equipment. ■



A very special thankyou to Mrs Hodges from Amanda

HOLY NUMBER CRUNCHER

George Carey, the new Archbishop of Canterbury, has decreed that the Church of England shall join the computer age. For starters, he has installed £12,000 worth of hi-tech kit in his official limousine. The gadgetry includes portable PC, fax machine and telephone.

Other high ranking churchmen will be plugged into the holy network when Dr Carey takes office in a few weeks' time. A spokesman for the Church Commissioners, which handles the financing of such projects, said: "There are times when Dr Carey will need to communicate with a lot of bishops at once. Now he has the machinery to do so." ■

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• A thumb operated mouse designed for use with portables has been launched by Logitech. The Trackman Portable – measuring 70mm by 75mm and weighing 135 grammes – can be switched between left or right handed use. It's fully compatible with all the crucial standards and will retails at around £80 when it arrives in July . Logitech can be contacted on 0753 37222. ■

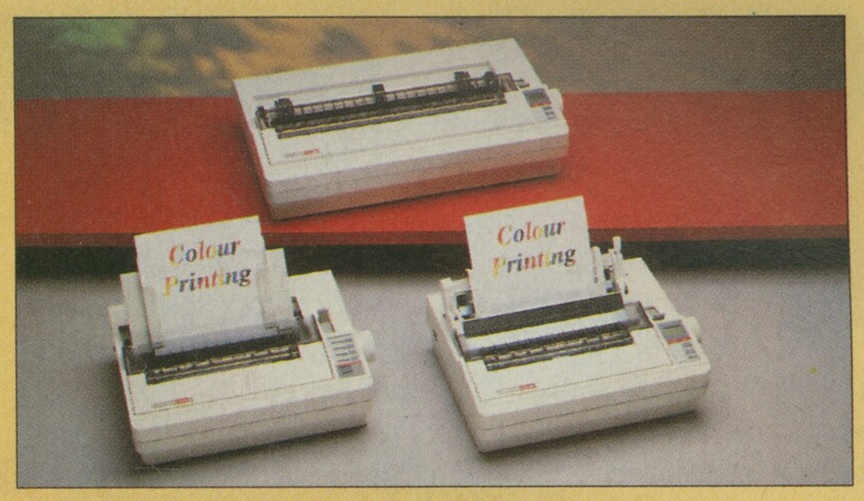
Colour kit for free

Printer buyers are to be offered free colour kits when they buy one of three Citizen printers over the next couple of months.

Citizen is running a specail spring promotion called "Citizen Extra" whereby purchasers of the Swift 9, Swift 24 and Swift 24x printers will be given the necessary kit to turn their machines into colour engines.

The printers retail at £239, £365 and £489 respectively, with the colour kits normally costing about £40. They consist of a colour ribbon and motor which the user can easily install.

"Colour printing is set to rapidly increase during 1991 and beyond," said European sales manager Richard Scotto. "The cost of introducing colour is no longer prohibitive." For more details call 0895 72621. ■



• Colourful language: liven up your prints.

Watford claims best bargain crown with Aries notebook

386 LAPTOP FOR UNDER £1,500

A 386 notebook computer has been launched at the "price-busting" tag of just £1,495.

The Aries NB386SX from Watford Electronics is claimed to be the first of its kind to break the £1,500 price barrier. In contrast, Amstrad's very reasonable ALT 386SX retails at £1,999.

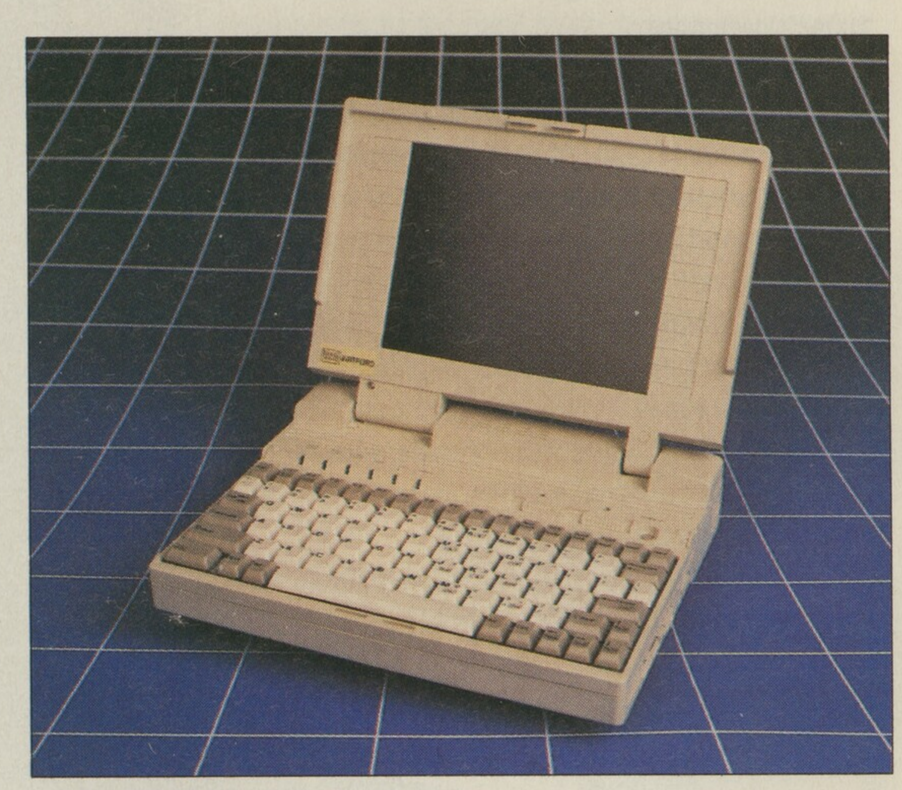
Weighing in at just over 3Kgs, including battery, the Aries comes with a 40Mb fast access 28ms hard disk as standard. There's also 2Mb of RAM on board. The screen is the usual VGA backlit supertwist LCD.

Watford reckons it has designed the machine for the busy user. For example, you can quit out of any application by simply closing the notebook's lid. On the lid being lifted again, the display will automatically re-open where the user left off.

The rechargable battery lasts for about three hours, and the provided mains adaptor acts as a recharger. Optional extras include a spare battery pack and car lighter adaptor. Buyers will also be offered £150 worth of free software including MS DOS 4.1, GW Basic, word processor, spelling checker and organiser.

A spokesman for Watford said: "As far as we know this is the cheapest 386 laptop on the market. We think it provides power, portability and functionality with exceptional value for money."

For more information call Watford on 0923 37774. ■



• Aries 386 Notebook: cash and carry



• GeoWorks Ensemble: ***benefits of graphical user interface.***

Take the bother out of business

If you're serious about your PC, but would like an easy front-end with which to operate, the latest program from GeoWorks could be the answer to all your prayers.

GeoWorks Ensemble **is a suite of multi-tasking office applications brought together under an easy-to-use graphical user interface. The point and click environment is described as "Mac-like, and as easy to use as Microsoft Windows 3."**

The £149 suite combines word processing, DTP, file management, communications, drawing, calendar, address book and notepad facilities.

It can run on all PCs from a 512K XT to a 486, and requires 3Mb of hard disk space.

GeoWorks' James Goldberger commented: "For the first time, ***Ensemble*** **brings the benefits of the graphical user interface to all PC users. It paves the way for all business users to enjoy graphical windowing capabilities without the attendant hardware and software costs."** ■

Euro research undermined

A computer research and development council, founded by European hardware manufacturers hoping to compete with American and Japanese firms, has opened its doors to American and Japanese companies.

The European Computer Industry Research Centre in Munich decided that it would gain more by inviting companies from outside Europe. Members include Siemens, Bull and ICL, which was almost expelled six months ago after being bought out by Japanese firm Fujitsu.

Curiously, the Centre will be choosing companies which don't directly compete with its own members, thus IBM is not being invited because its mainframes are too similar to those of Bull. ■

England is mine...

Anyone who tries staking a claim to the throne of England is looking for trouble. Especially if all your pals are armed to the teeth with ridiculously large swords, menacing maces and attitude problems.

In Virgin's newest epic, ***Spirit of Excalibur*****, you must protect your birth right by travelling the length and breadth of the country to befriend or destroy the well-heeled of post-Arthurian England. You'll be able to command knights, clerics and wizards but you must be good and true, or they'll turn to the unpleasant powers of evil.**

You can roam at will across the 16 screen scrolling map of the country, and your journey is illustrated with a splendid 2.5 Mb of impressive artwork. But to survive you'll have to choose your friends wisely, and defeat your enemies mercilessly.

It's out on 1Mb ST and Amiga (£29.99) and 640K+ PCs (£34.99) in mid-April. ■



• Spirit of Excalibur: ***graphically superb.***

'All outbreaks are a crime' - Detective Inspector John Austen

SCOTLAND YARD IN VIRUS CRACKDOWN

As virus researchers around the world warn of a sharply increasing rate of computer infection, Scotland Yard has pledged that all reported outbreaks of viruses will be treated as crimes.

At the National Virus Strategy Group's inaugural meeting last week detective inspector John Austen of Scotland Yard's computer crime squad said: "Every time a virus infects a file, a Section 3 of the Computer Misuse Act offence is being committed. The law provides for a five-year prison term upon successful conviction."

He pointed out that reports of virus outbreaks would be on the increase as corporations realise that in order to claim compensation against viral damage on insurance, they must report virus outbreaks to the authorities.

"Insurance policies will not pay out unless the matter is reported to the police," he said.

Earlier this year Austen secured the extradition of Joseph Popp from Ohio, USA, who is alleged to have sent out the so-called 'AIDS' virus package to thousands of computer users. He is currently on bail in the UK awaiting trial.

The NVSG's members include Interpol, IBM, *Virus Bulletin*, PC Security and Digital Research. Last week the organisation agreed that virus researchers would assist the police in all investigations and in information gathering. It was also agreed to rationalise the naming of viruses and to build a library of samples which could be used by the anti-virus community.

A study, published in the US on behalf of the Data Processor Managers Association recently, claimed that the virus problem is worsening at a rate of 160 per cent every four months, equating to a six to ten fold increase on an annual basis.

The survey, which covered 150 computerised companies across the US, found that over half the respondents had a continuing virus problem, with 26 per cent admitting to finding a new virus during the month of January 1991.

A spokesman claimed that, by the middle of this year, any organisation with 400 or more PCs will have a 50-50 chance of encountering a computer virus every month. He said that by the end of this year most organisations will have a "100 per cent probability of monthly computer virus episodes".

Dr Peter Lammer, of *Virus Bulletin* in the UK, told *Express*:



• Scotland Yard: getting serious with virus writers

"We've got the absolute back-up of Scotland Yard, there can be little doubt that the police treat this as a serious problem. The fact that they secured the extradition of Popp is a good indication."

Meanwhile, at the fourth annual Computer Virus and Security Conference, held in New York a few weeks ago, keynote speaker Klaus Brummstein, of the University of Hamburg, said that Russia has now replaced Bulgaria as the leading European source of computer viruses.

Many Russian programmers are sending their "work" straight to virus researchers, but some are planting the rogue programs into computer networks. ■

Britain's most common viruses

1. *New Zealand II.* It's a boot sector virus which proclaims: "Your computer is stoned, legalise Marijuana" when you boot up. Also known as *Stoned* or *Marijuana*, it has infected computers all over the world.

2. *Jerusalem*: On the wane now, but still prevalent. It slows your computer down and deletes programs every Friday 13th. Not surprisingly, it's also called *Friday the 13th*.

3. *Cascade*. This one isn't much trouble, and most people don't know they've got it. During October and December 1988 it caused text on computer monitors to flutter to the bottom of screens. That won't happen again until winter 2088 (or if you reset your clock). In the meantime, it slows your computer down almost imperceptibly.

4. *Joshi*. Another boot sector virus. It makes you type: 'Happy Birthday Joshi' on certain dates.

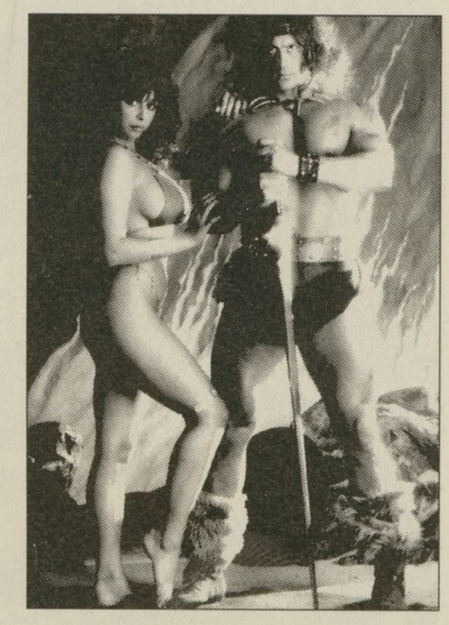
5. There's a whole rash of troublesome programs which are gaining circulation. Don't be surprised if you come across *Yankee Doodle*, *Vaccine* and *Nomenclatura*.

Barbarian firm sold

Palace Software, the company which was responsible for classic games such as *Barbarian* and *Cauldren*, has been sold to French company Leisure Holding.

The firm had been an offshoot of the giant Palace film and video organisation. Paris based Leisure Holding is already involved in computer games through the games label Titus.

Palace, which also published the hugely succesful *Shoot-'em-up Construction Kit* will continue to operate in London. Leisure Holding says that "no immediate changes" are planned for the company.



Palace Group's managing director Chris Craib admitted that his company could not give the computer games market the attention it needs in these "fast changing" times.

Over the past twelve months Palace has enjoyed success *Dragons' Breath* and *3D Tennis*. New games launches are expected in the near future. ■

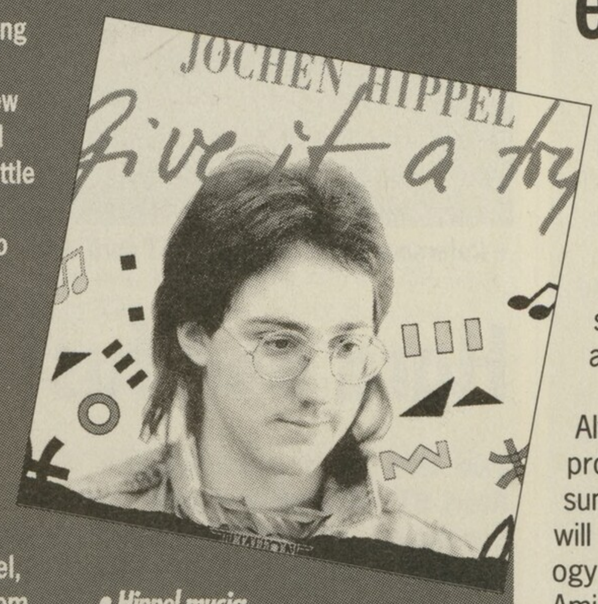
Game music comes to CD

The Japanese have been raving about computer game theme tunes for ages. It's nothing new for them to go into a club and listen to the dubious techie tattle of video games, or to settle down by the Sony and relax to the harmonious echo of perishing aliens.

In Europe we've been far too sensible – until now. UK distributor Extendor has just begun selling a CD packed with the sounds of various Thalion games.

Programmed by Jochen Hippel, the CD features bellowings from such classics as *Wings of Death* and *Dragonflight*.

Extendor claims that the CD has already sold 2,000 copies in Germany, and is still going strong.



• Hippel music: straight from the heart of a micro.

Jochen Hippel's *Give it a Try* costs £6.99 – call 021 449 6772. ■

68000 emulator for power PCs

A Canadian programmer is working on a 68000 based software emulator for 386 and 486 PCs.

Darek Mohoka of Branch Always Software reckons his project will be completed by the summer. Essentially, developers will be able to use this technology to develop commercial Amiga, Macintosh and Atari ST emulators.

Mohoko was also responsible for the Atari 8-bit emulator for the ST which he launched in the early days of Atari's 16-bit machine. ■

THE WEEK IN VIEW

Petra Duffield of the Virus Bulletin attended the first meeting of the Computer Virus Strategy Group...

At the end of August 1990, a British law was introduced to thwart the growing problems of computer crime. Section 3 of the Computer Misuse Act 1990 now makes the distribution and deliberate insertion of computer viruses into computer systems a criminal offence. The police have a clear duty, therefore, to prosecute offences against this act and the Computer Crime Unit (CCU), a division of Scotland Yard, has been given the task of enforcing this law.

Recently, the CCU called the first meeting of the National Computer Virus Strategy Group, with the objective of devising a common policy for dealing with viruses. The meeting was chaired by detective inspector John Austen and detective constable Noel Bonczoszek, who called upon the help of virus experts to establish guidelines for everyone in this field to follow.

In order to successfully prosecute offenders, the CCU has to follow rules of investigation and evidence. To secure a conviction, the prosecution must prove beyond reasonable doubt that the person committed the crime. This may sound obvious, but it's easier said than done where the object of the offence is a computer and the tool is a piece of code.

At the meeting the CCU stressed the necessity for a universal computer virus nomenclature, which will allow the easy identification and collation of viruses. It was also proposed to establish a library of known virus specimens with a central record of virus outbreaks.

Although the CCU acknowledged that users are often reluctant to admit outbreaks, most large corporate users have a fidelity insurance which will not pay out in the case of a computer virus attack, unless the matter is reported to the police. Where the user does not wish to make a formal report of the crime, the incident will be recorded, but as a "non crime", and the user will not be identified in the subsequent report.

The CCU's proposals will be welcomed by all those involved in combating computer viruses. It is difficult to determine how serious the problem will become, but it is safe to say that the threat will continue to excite commercial interest. Scotland Yard's initiative comes as the first step towards uniting individual efforts to fight the virus war and we should look forward to the next meeting in three months time. ■

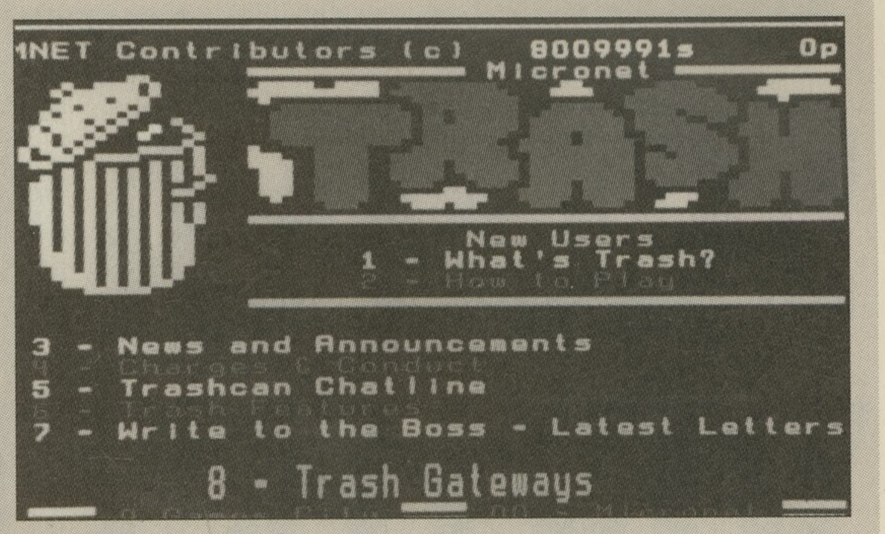
Micronet re-jigs pricing deal

Don't forget – from this week, subscribers to on-line service Micronet will be offered unlimited free off-peak access to Micronet and Prestel.

Anyone logging on will only have to pay for their local call time. However, Micronet has upped the general subscription rate by £10 for residential customers. You'll now have to pay £30 per quarter, although businesses will still be charged the standard £30.

During the peak hours of 8am to 6pm Mondays to Saturdays users will be charged eight pence per minute – which can mount up in a big way for anyone hoping to sample large chunks of Micronet. Access at all other times will be free, although the offer does not include those areas of the service which carry premium charges.

Micronet's marketing manager Kevin Smith explained: "I'm sure that our customers will be delighted with this change in pricing. The majority are residential customers for whom free off-peak usage will mean a considerable decrease in costs." He added: "Our more canny users will notice how favourably the costs compare against rival services, once users go past one hour per month."



• *Micronet: off-peak advantage*

This pricing deal follows Prestel's announcement that its charges for BT's Viewdata network are to rise dramatically (*Express* issue 123). ■

Criminal conviction for code cracker

PROGRAMMER BLACKLISTED

A computer programmer who indulged in illegal code breaking at work, has been blacklisted by computer employees after a conviction of criminal damage to a computer system.

Dipak Dhokia, 27, of Peterborough, worked for industrial tool company Kango. But during lunch hours he tampered with the firm's computer security password. After leaving the company the damage was found by workmates, who discovered that back-up tapes had been wiped, and they had to spend 100 hours repairing the damage.

Dhokia had moved to a different job before being charged with criminal damage. But when his new employer Peterborough Software found out about his past, they fired him immediately.

Managing director David Laking explained: "He was an intelligent and a good worker. It's ironic that Kango had given him very good references.

"When we realised what he had done we saw we were holding a time bomb. It's totally unacceptable for anyone here to be involved in this type of thing."

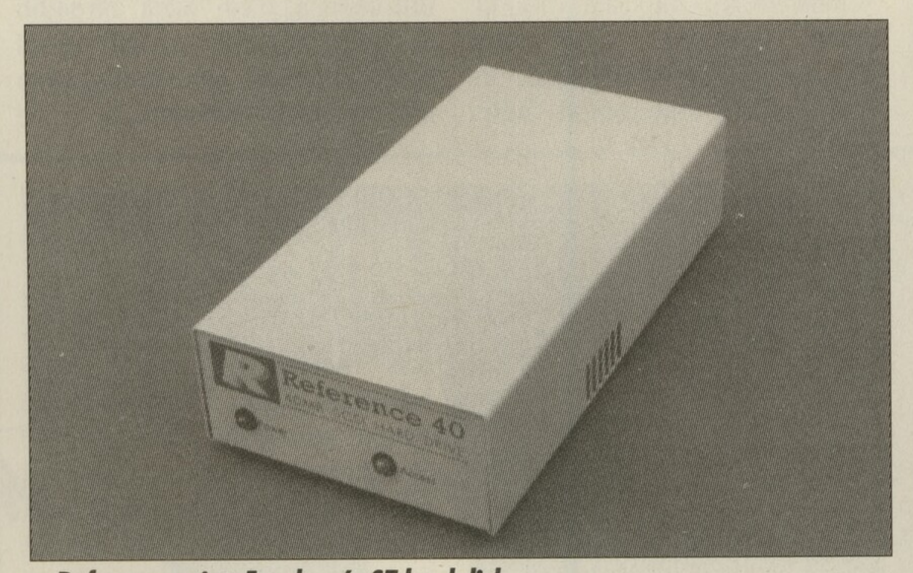
Apart from losing his job and being blacklisted by all employers of programmers, Dhokia had to fork out nearly £2,000 in fines and costs. ■

VDU pregnancy fears unfounded

Fears that pregnant women who work with computer VDUs are more likely to suffer miscarriages are unfounded, according to a new report.

The study, published in the *New England Journal of Medicine*, is based on 2,430 women who have been monitored since 1984. Of the 882 who became pregnant, 14.8 per cent of those who worked with computers suffered miscarriages. But among those women not exposed to VDU's the miscarriage rate was 15.9 per cent.

The average figure among American women is about 15 per cent. Also, women who spent more time with computers were no more likely to suffer a miscarriage than those who spent only a couple of hours a day. ■



• *Reference point: Evesham's ST hard disk.*

Hard and fast duo

Two new hard disks for the Atari ST have been added to Evesham Micros' extensive product portfolio.

The Reference duo use their own power packs and cooling fans, which, according to Evesham, takes the pressure off the ST's power supply. The 40Mb version boasts a data transfer rate of 420Kb per second and costs £399, while for an extra £200 you could get your hands on the 425Kb/Sec 100Mb machine.

Evesham is keen to point out that its hard disks are compatible with all ST systems, and can support the extra features incorporated in TOS 1.4.

For more information call 0386 765500. ■

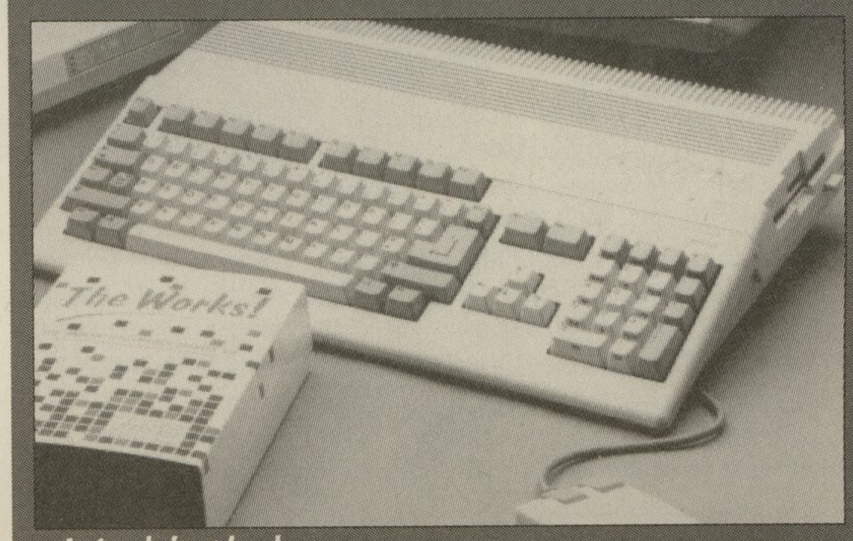
Amiga phone help

If you're trying to get the most out of your Amiga, but are sometimes left floundering without the correct information, then Club Amiga's new scheme could be for you.

The user group is to set up a 24-hour helpline, which will cost members only £5 per year. Club Amiga says it's just an ordinary telephone line and not an 0898 "cost-a-bomb" number.

Subscribers to Club Amiga are already treated to newsletters and the cream of public domain. Organiser Chris Longley said: "Even in the Amiga world, helplines are nothing new. But a 24-hour line is something special."

For the club's confidential phone number, write to: Club Amiga at 5, Bowes Lea, Shiney Row, Tyne and Wear, DH4 4PP.



• *Amiga: help at hand.*

PC copies style of deceased top selling authoress

COMPUTER WRITES NOVEL

Literary purists will be apoplectic, computer buffs will be intrigued, and the public at large will probably be mystified. A computer has, for the first time, written a novel.

The 350-page romantic sizzler, entitled *Just This Once*, was created by a freelance author and computer programmer who taught his PC to dissect the novels of a deceased authoress, and mimic her writing style.

Californian Scott French chose Jacqueline Susann as the model. She wrote *Valley of the Dolls* in 1968, a torrid tale of drug abuse among Hollywood's rich and famous. It remains the biggest selling novel of all time with sales of 26 million.

French claims he wrote a program which could study her style, and then come up with a new book containing completely new plots and dialogue.

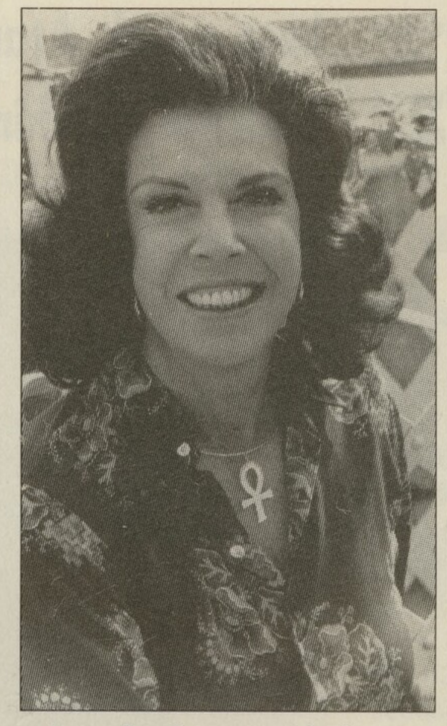
The computer came up with various ideas, and French chose one which details the lives of successful women in the entertainment industry, who go off the rails in an orgy of drug abuse...

French admits that he had to fill in sometimes, and was required to write about ten per cent of the book. He says that the computer was instructed to hot up the sexy scenes to move in line with today's liberal tastes. "*Just this Once*," proclaimed French "is the next novel she (Jacqueline Susann) would have written had she still been living now". Susann, who always said her work provided escapism rather than literary excellence, died in 1974.

A spokesman for Bantam, her publisher, said: "I'm neither a lawyer, nor a computer expert, but something about this whole thing strikes me as wrong."

French is unrepentant: "I didn't copy her words, or even sentences, but her way of thinking. I don't think you can copyright the way a person thinks."

He says he got the idea while reading a particularly poor novel, and decided that a computer could do a better job. A publishing deal is being negotiated. ■



•Jacqueline Susann: original.

Students bid for top title

A group of computer students from the University of Kent at Canterbury, are working to become the Young Software Designer of the Year.

The students were inspired to enter the Blythe Software sponsored competition by their lecturer Jeremy Doig, who won the award in 1989.

Andrew Bates is developing a surgeon's medical records system, Robert Hayles has produced an application database for newsagents to control distribution, James Mansfield is working on a management system for a Scout troop while Damiano Bolla is putting the finishing touches to a stock market simulator.

Entries for the awards close at the end of March, and top prize is a Bursary worth £2,300 to enable the student to undertake a post-graduate research year at the end of his or her degree.

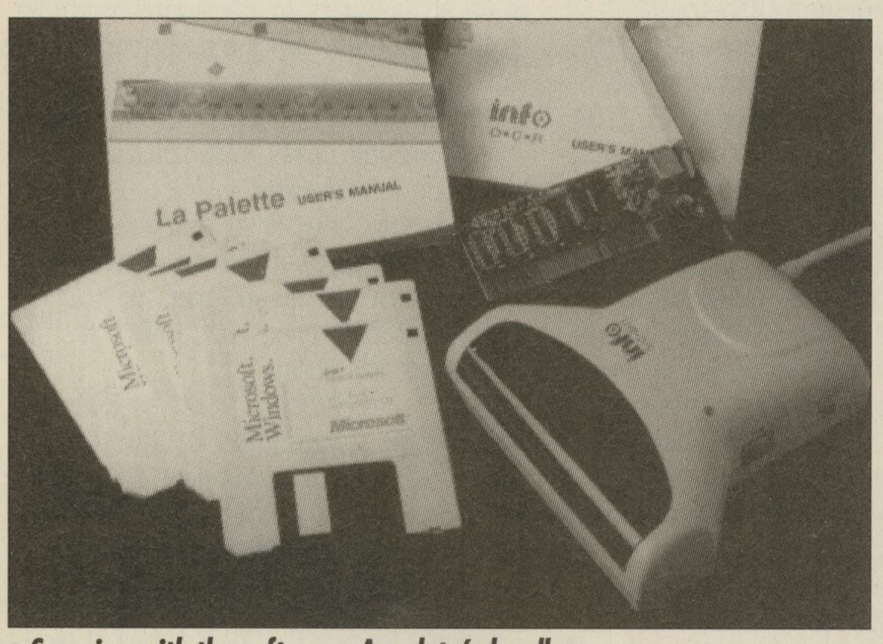
Blythe is a developer of database software for the PC and Mac. You can contact the firm on 0728 603011. ■

World's smallest machine

Amstrad could be losing its claim to have launched the world's smallest footprint PC, thanks to a machine called The Tiny.

Amstrad's midget was only unveiled two weeks ago at CeBit in Germany, but now The Tiny Computer Company reckons it can do better. The Tiny is due to be launched at the *Computer Shopper* Show on May 10th.

Tiny won't say just how small its machine will be, but it will feature a full keyboard and will be a fully fledged 3.5-inch machine. ■



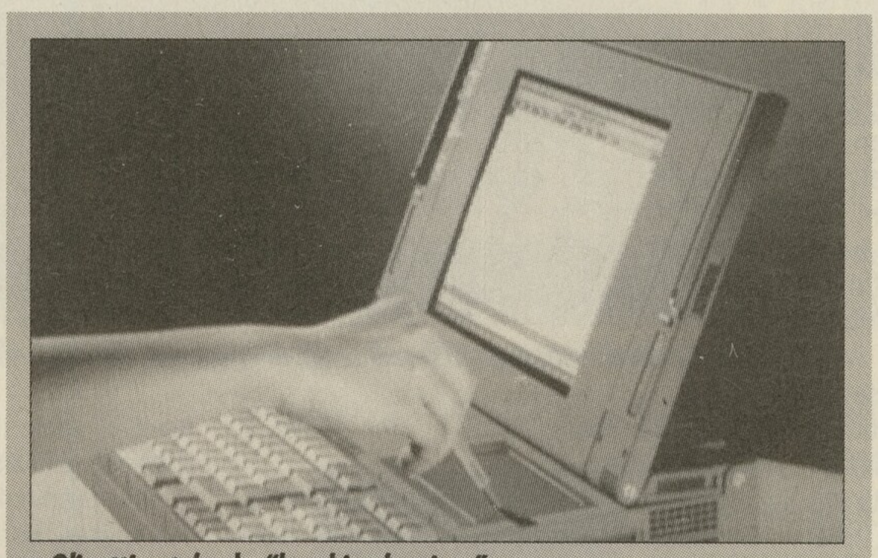
• Scanning with the software: Accodata's bundle.

Scanner delivers

Accodata has launched a PC hand scanner with bundles of software, for the desktop publisher who wants it all.

The Info hand scanner comes with Optical Character Recognition capabilities allowing users to convert printed text into computer readable files. It comes with *La Palette*, a Windows based application with draw, paint, cut and paste facilities. There's also a copy of Windows thrown in.

It boasts a 105mm scanning width, and 3-12 dithering displays. Price is £345. Call 0732 885555. ■



• Olivetti notebook: "breaking barriers".

Olivetti goes mobile

Olivetti, one of Europe's biggest PC manufacturers, has launched a comprehensive range of portables dubbed, "the mobile computing" range.

The series consists of three A4 sized notebook PCs and two heavier laptops with removable keyboards. Models range from basic 286 to 386SX, and are priced between £1,000 and £3,299.

At the bottom end is the A12 notebook, a 12MHz 286 with a 20Mb hard disk and 1Mb memory expandable to 5Mb. The V16 is much the same, although that zips along at 16MHz and comes with 2Mb which can be stretched to 6Mb. The S20 is the bigger beast, it's a 20MHz 386SX with 2Mb, also expandable to 6Mb.

Of the two portables the most impressive is the D33, a 33MHz full 386 with 4Mb of memory expandable to 20Mb. All come with a touch-pad mouse situated on the keyboard.

Olivetti says it will be launching so-called 'docking station' portables which can be attached to office monitors and printers without faffing around with all the cables and ports which often frustrate portable users.

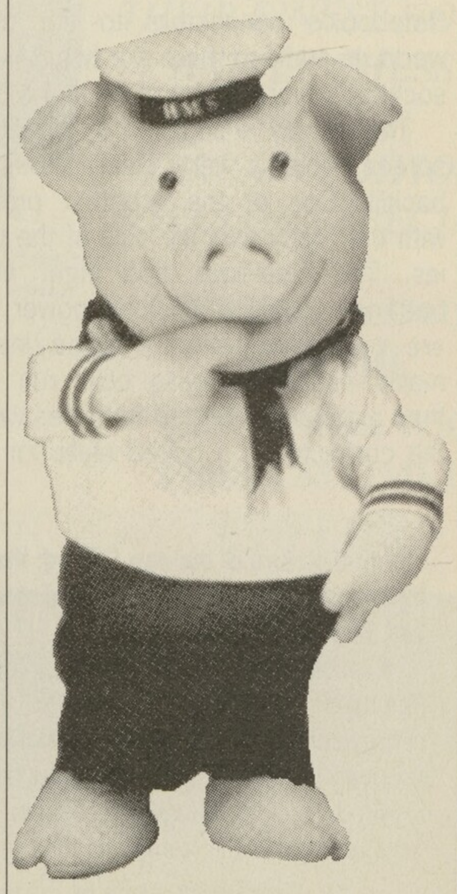
According to Olivetti's marketing manager Alan Rogers, this will "break the traditional barrier between laptop and desktop computers". He says that Olivetti is confident of grabbing a not insignificant five per cent of the portables market this year. ■

It's a porker

Huxley Pig, currently riding high in the 8-bit budget charts, is to be launched on to the ST and Amiga.

The kiddies TV porker who attracts more than three million tiny viewers every week has also proved to be a hit among younger games players.

Publisher Alternative plans to launch 16-bit versions of the pig before Christmas, with easy play and harder play options for younger and older gamers. ■



• Huxley: trotting out again

What's so wonderful about the new portable? And who will want it?

ATARI'S NOTEBOOK: JUST A NEW STACY?

Last week Atari was proudly showing off its new baby, the ST Notebook. Andrew Hutchinson looks at its chances and gauges industry reaction...

Atari's new portable machine has a lot to live up to. The Stacy was called a "confusing disaster" by Bob Gleadow, managing director of Atari. So just what is so wonderful about the new ST Notebook and who is it likely to appeal to?

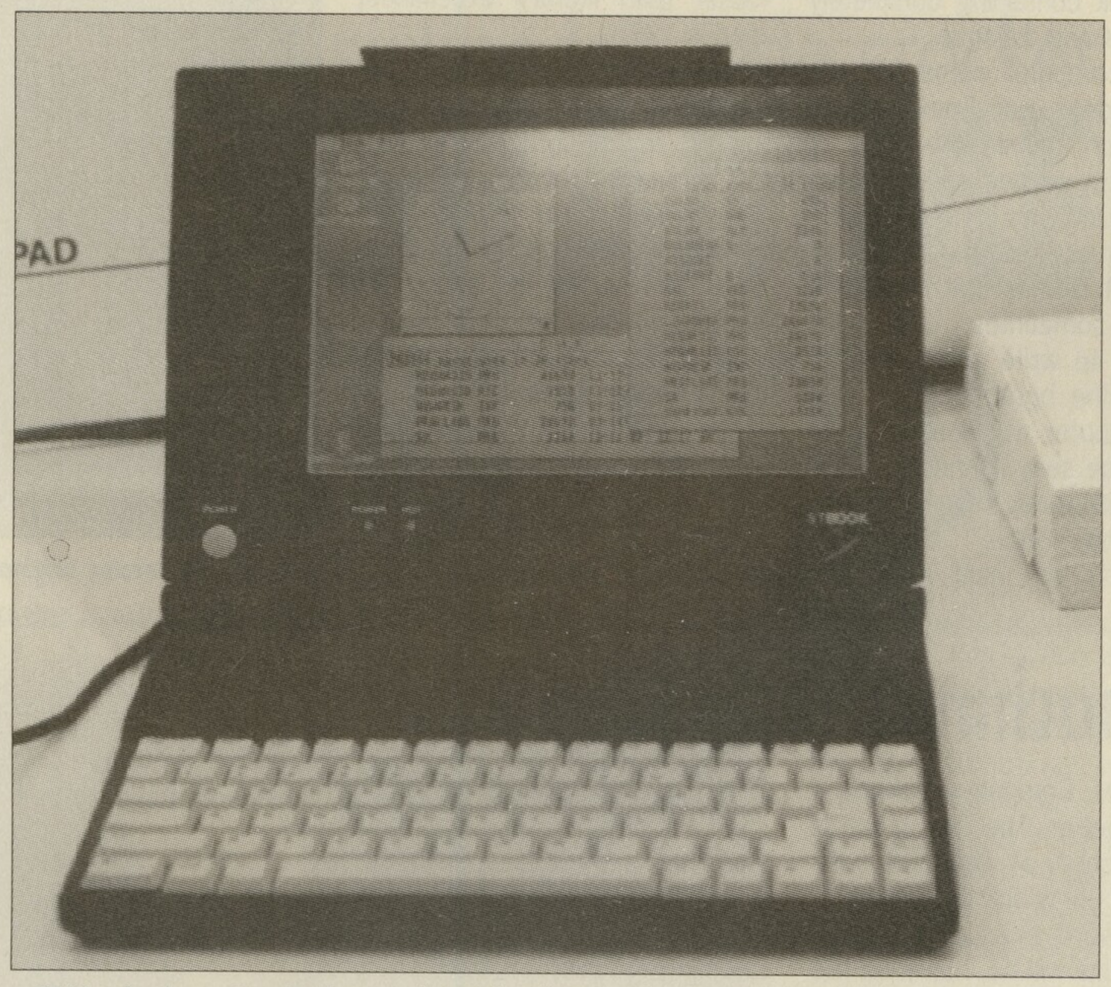
The Stacy found favour, almost entirely, with the professional music community. Its "fold up and go" appeal meant that they didn't have to grapple with monitors or external hard drives. It didn't sell too widely to other sectors of the portable computer market, because of its price, its size and the quality of business software on other cheaper portables.

The very best music software is available on the ST. Programs such as C-Lab's *Notator* and Steinberg's *Cubase* are to be found running on an ST in the vast majority of recording studios. Stacy enabled these professionals to run exactly the same software on the road. Therefore it is mainly this group which will be interested in the ST Notebook.

The ST Notebook is an ST with an A4 footprint which will come in a variety of configurations. Two static RAM sizes will be released: 1 Mb and 4 Mb. The base unit will have a 20 Mb hard drive fitted, but it can accept drives of up to 65 Mb.

The ST has always featured a wide variety of ports and sockets; these all find their way onto the Notebook, although in suitably squashed dimensions. The vital MIDI IN and OUT ports are included, though the long called for THRU has been left off. An external floppy drive socket, a parallel and a serial port, a 128-pin port, a modem socket and a mouse port make up the rest of the Notebook's connectors to the outside world. In addition there are two RAM card sockets, which can be of up to 4 Mb.

The display is supplied by a grey LCD screen. This is very clear, though not backlit. One of the greatest problems with the Stacy was the size of the batteries. The Notebook has eight alkaline batteries supplying the main power, these are recharged when plugged into the mains supply. If these cells run down, then a couple of Ni-Cad batteries will hold the computer in a halted state for up to five hours, giving plenty of time to find a power socket.



• ST Notebook: a triumph of research and development, but who will buy it?

Perhaps the most glaring omission is an internal floppy drive. Quite how Atari expects users to transfer data between computers is debatable. For example, if you wanted to load in a sequencer you would have to port it over from another computer, or connect up an external floppy drive unit and save the whole program to the hard drive. The other option is for companies to sell programs on the RAM cards. This would have the advantage of freeing up all the static RAM for actual data space.

So besides the music professional, who might be interested in getting hold of a Notebook? The specification of the machine rivals any other laptop on the market. The big problem is the public perception of PC compatibility. The punters need to know that they can run the standard PC software on a machine.

The problem will be in convincing the public that there is better software available for the ST. For its price, ST DTP software rivals any other computer. Some superb word processors are available for the ST and productivity software is appearing all the time. However, this big problem of transfer of data again rears its ugly head. The ST has PC readable disks built in, the Notebook will not. You could, of course, simply connect a cable between base computer and Notebook, but this introduces a very technical element, which most people would rather avoid completely.

The computer industry is suitably impressed by the specification of the machine. However they take all Atari release announcements with a pinch of salt. Andy Leaning is a marketing man for Silica, the biggest Atari distributor in the country. He believed that the Notebook would create "an awful lot of interest in this country." However, he foresaw the problems of making the computer appeal to people other than music professionals,

"It falls into the same problem category as the Mac laptop. It has little mass-market appeal for people who want PC portability. I mean you can buy a half meg PC laptop very cheaply these days."

So what kind of applications would the computer be useful for?

"Well, it'd be excellent for music or desktop publishing, areas the ST is very strong in. I can see it filling a specialist niche that no-one else could fill."

But would the computer aid Atari in revamping its terrible public image?

Leaning thinks it is possible: "One of the best things that could happen, is that the technology could filter down through the ST range, into the home computer market."

Sound Technology is the British distributor of the C-Lab range of MIDI software. Simon Stock, one of its marketing managers was excited by the prospect of a decent ST laptop computer. So is it likely that the C-Lab software will find its way onto the Notebook?

"I presume we'll port it all over, if it'll run that is. A lot of people who'd like to use C-Lab live have been put off because of the problems of lugging a monitor around. I'm not sure that they would actually use a Notebook for sequencing, though. It's more likely that they would use it to keep track of sample files, etc."

So what might inhibit the Notebook from succeeding in the music industry?

"Well a lot of people restrict their use of C-Lab software to the home or studio. It also depends on the price point. It's well worth looking at, in terms of not having to update."

Is it feasible that C-Lab software could be put on a RAM card?

"I don't know whether that's feasible. It would certainly open up opportunities to make use of increased levels of sophistication without tying up RAM. It's an interesting possibility."

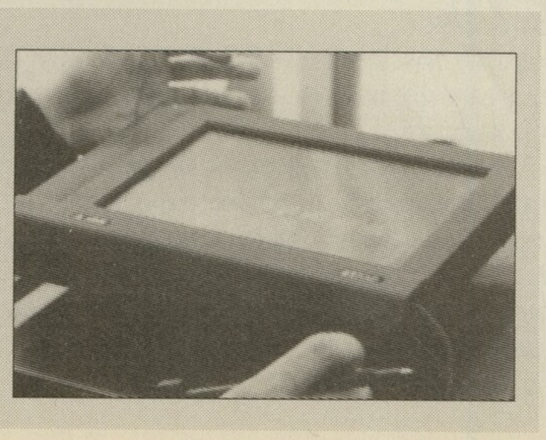
Dave Crombie of Evenlode Soundworks (distributor of the Cubase range) agreeed with Leaning and Stock. He reckoned that the price point was crucial, but that it sounded like "a Mac killer". He said that the only real difference between Stacy and Notebook, apart from the size, was the addition of the RAM cards. Commenting that it was possible for companies to put samples on the cards, he thought it would be unlikely that Cubase would end up on one.

Atari has said that the Notebook definitely won't be available this year. However, it does seem likely that a spring launch would not be out of the question. The company will have to look long and hard at its marketing options before the machine hits the streets. If the price is right and data transfer is explained clearly, then the ST Notebook could be a massive success. ■

The first picture of the new ST Pad; the pen input laptop employing credit-card storage and 1Mb of RAM.

Expected to sell for less than £700, the Pad uses some smart algorithms to recognise handwriting. Just how successful these are is open to debate, but like the GridPad reviewed in *Express* 122, you first have to teach the system to understand you.

• ST Pad: state of the next art.



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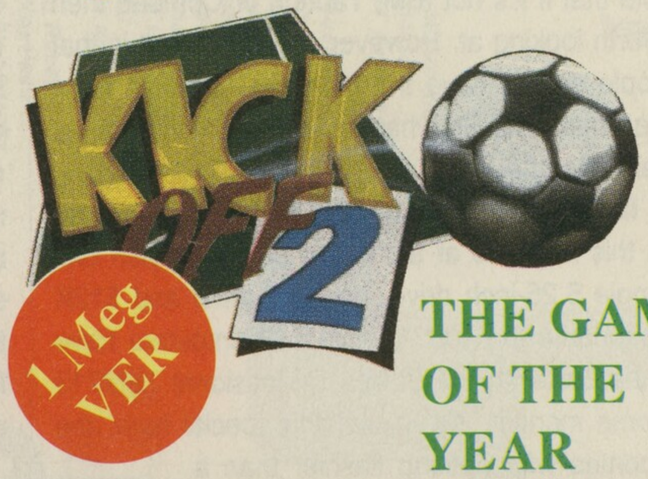
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IS THIS PC THE CHEAPEST EVER?

A complete PC system for under £300? Tim Smith suspended complete disbelief to put this new bundle to the test.

Buying a non brand name computer can often be a trial, especially if it's your first, and even more so if you are working on a limited budget. People 'in the know' will tell you that you can't get a decent PC for under £900, some will even say that is cheap. You will be told that if it's not IBM, Tandon or Compaq then it's not worth looking at. However, the basic fact is that most people do not have the money to fork out for a high-priced machine. So what can a basic unit such as the TriGem 88e offer?

The first thing to get straight is that there are no frills with this machine at all. It is a basic, greyish unit with a single 5.25-inch drive, no hard drive and 512K RAM expandable to 640K. UK Home Computers have bundled the unit with the Philips Professional 7BM713 monochrome monitor. Again, nothing special here, the monitor comes with nothing flashier than a pedestal which allows for slight tilting and turning. It has a 14-inch screen, high resolution tube with what the manual called an 'anti-reflecting screen' although this could be queried when it comes to sunlight shining in from the side. Input is achieved via a 6-pin TTL DIN plug. The only major downside here is that it is a green screen rather than amber – a colour which has been proven to be better for the eyes.

Controls available are brightness, contrast, and the 'inverse knob' which allows you to switch the screen display from positive to negative whenever you get the urge. The other controls open merely to allow you to control aspects such as vertical and horizontal hold, picture slippage, image weight, and left or right positioning. The lack of volume control illustrates quite happily the fact that the monitor comes with no built-in speaker. Frankly, if you are buying a machine to take care of databasing, spreadsheeting or word processsing then this monitor will do the job quite adequately.

WORKHORSE

Moving away from the monitor, the computer itself comes with a severe lack of manual. The only documentation you get applies to the bundled GWBASIC (version 3.22, not the latest version by the way) and MS-DOS 3.3 software. As far as finding out exactly what is inside the machine you will either have to open up the box, an action which is definitely not to be recommended, or telephone UK Home Computers and ask. When we did this we were told that the 88e came in two different video configurations depending on when the TriGem in Korea shipped. So, you either get straight mono or mono/Hercules versions.

Expansion ports are all standard and provide the basic useful functions which a workaday computer should. That is to say you get serial (RS232) and parallel (Centronics) ports, two empty conventional 8-bit expansion slots. Also on the back of the machine is a reset switch. Now why it is on the back shall remain a mystery. One argument has it that you are not accidently going to turn off your machine, while another says that with the On/Off button mounted at the front there is not a great deal of need for a reset switch in the first place.

The 88e is a true IBM compatible which means, in theory at least, that you can run any software commerically available on PCs on this machine. You will be able to run this software at either 4.7MHz or 8Mhz (the latter being the same speed as the lauded Mac Classic by the way) through an 8088 processor. This means that software such as WordPerfect will run with no trouble, but with no particular speed. To keep topical, although it is just about possible to run Windows on an AT clone such as this, Microsoft does not support the machine, and the lack of speed would make it a tortuous process to say the least.



• The TriGem 88e bundle includes a Philips Professional 7BM713 monochrome monitor and an Epsom enhanced/AT style keyboard with 12 function keys .

KEYS TO THE DOOR

The data input interphase – or keyboard – is in the enhanced/AT style. You get 12 function keys and, for once in the budget world, you also get a very acceptable action. This aspect of the machine is often overlooked by a first time buyer – make sure you do not make that mistake yourself. The last thing you need if you have to do a great deal of word processing and/or data entry into spreadsheets or databases is to have to work with a soggy keyboard or one which requires herculean strength.

One unusual point to note about the setup is that the 512K of RAM is not mounted on the motherboard of the system, but is to be found on an expansion card. The single 5.25-inch drive which comes with the machine is all well and good as this type of disk is still widely available. However, it is also possible to add an extra floppy drive and your best choice is going to be a 720K 3.5-inch model. This can be fitted below the existing drive and configured to act as the B drive. The 88e will also support a hard disk, as well as half and full length cards for modems and faxes – hence the fan at the rear of the machine which is just about quiet enough not to be disturbing.

All in all, the TriGem 88e is a decent piece of work. It will run faster than the Amstrad 1512, its obvious competition, but it will not run fast enough to give any thrills.

Basically, if what you're looking for is a standard, hard working IBM clone, and you cannot afford to pay out for big names, bells and whistles, then this machine will do everything a small office would possibly require from it. Its expansion possibilities will keep the machine alive for a good few years, as will its build quality which is greater than you would expect from a sub-£300 pound price tag which includes VAT and carriage. No problems at all to report. ■

The TriGem 88e *costs £299.99 including carriage & VAT and is available from* UK Home Computers *on 0793 695034.*

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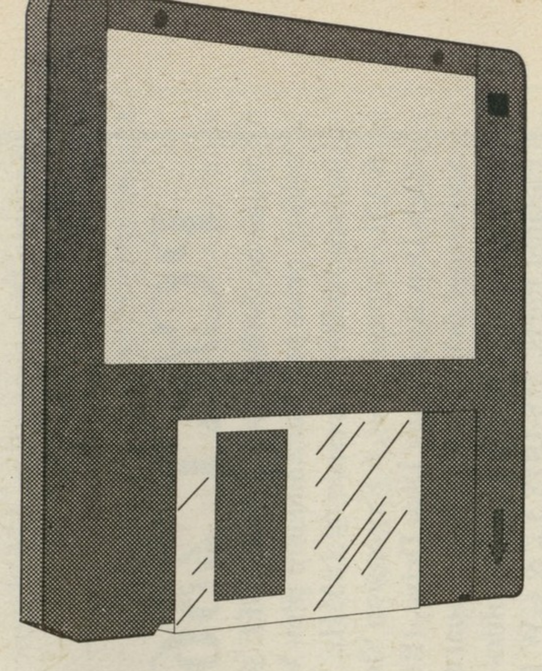
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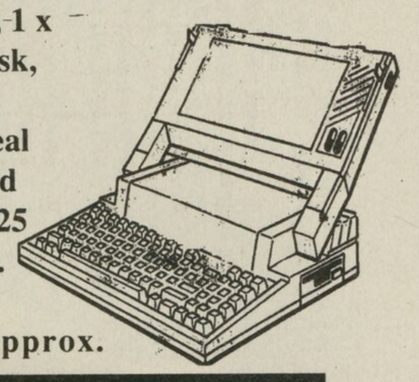
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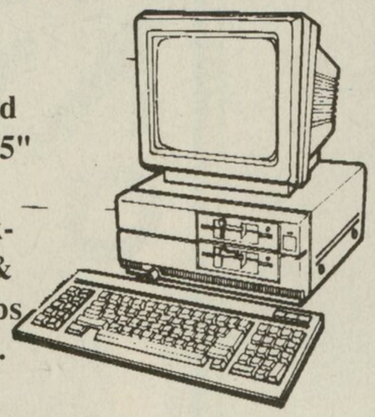
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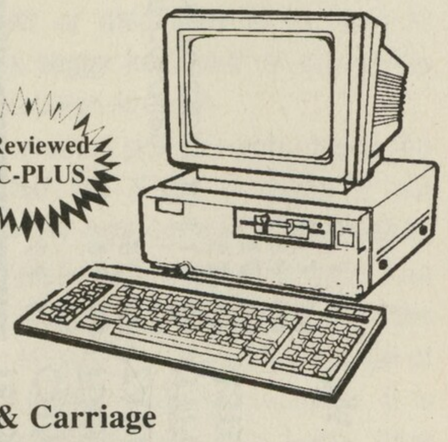


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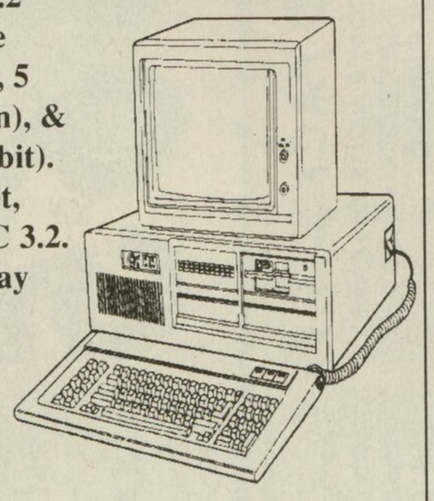
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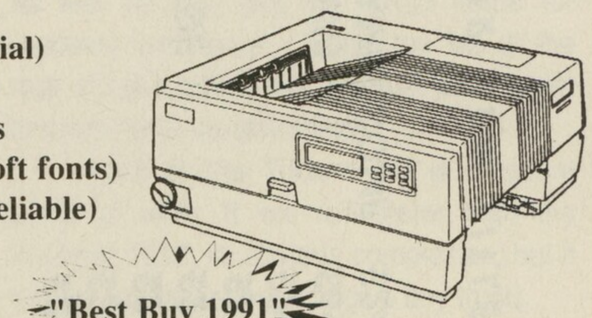


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With your host Haydn – the man with the fivers to give away

■ User unfriendly!

Why do user groups advertise in your magazine when they cannot be bothered to answer back?

A mate of mine owns a ZX Spectrum Plus 3 – he wrote to the Plus 3 user group in Bedfordshire which advertised in *Express*. It has been about four weeks now, and no reply... As you know, the Plus 3 is not supported a lot, so do you know of any other user groups or PD libraries that support the Plus 3?

AC Symonds, 62 Breinton Road, Whitecross, Hereford HR4 0XJ

Did your pal remember to be courteous and send a self addressed envelope with his enquiry? A lot of user groups run on very tight budgets or are organised by individuals who spend their own money on things like stationery. It's only fair to send an SAE when you write to them.

Try dropping another line to Daniel Garner at 57 Lover's Walk, Dunstable, Bedfordshire LU5 4BG, or to Brian Cavers, Chezron Software, 605 Loughborough Road, Birstall, Leicester LE4 4NJ. But put a large SAE in with your letter this time...

H F-W

■ Pirate writes

In regard to the statement by Psygnosis that *Lemmings* was available on bulletin boards two days after release, I feel obliged to put the record straight.

***Lemmings* was available on the pirate scene FOUR days before it was released in the shops. This is the same for most other games and products that are cracked by us and other crews. We often obtain copies of games some time before they are due for release – two examples of this are *Prince of Persia* and *Sim City*. In both cases we had the full game cracked one year before they were released in the shops – and the pirate *Sim City* was a better product than the UK release.**

The exception to the rule was *SWIV* which took two days to crack because of the difficulty of normalising the dynamic loader to make it easy to duplicate.

'One of many'

One of far too many if you ask me. Tell me, if you dare, exactly how you get hold of such early copies. And explain to me, if you can, how you had full versions of *Sim City* and *Prince of Persia* a full twelve months before they were released?

But I doubt you've got the bottle to write to me again...

H F-W

■ Heart beats again

Thank you for printing our plea for help in *Express* 122 regarding our viewdata text service for the deaf and speech impaired. We are pleased to announce that the Heartbeat bulletin board has now obtained sponsorship from the Sport Newspapers Group and the system is back, up and running on 0734 352032.

They are even going to send a photographer, so if you want a look, get your copy of the Sport...

We would also like to ask any other UK sysops to swap ideas, problems and advice on tackling misuses of systems to contact us.

Thanks again for all your help.

Bernadette McLoughlin, Heartbeat

Glad to hear your problem has been solved Bernadette. *Express* readers can be found in the most unusual places...

H F-W

■ Prize downer

I read Graeme Haddlesey's letter in *Express* 123 about his competition prize with great interest. At the end of November, you announced the winners of the ST *DPaint* competition, and to my surprise I was amongst them.

However, to date, there has been no sign of a prize – not even a letter saying 'it's still full of bugs, we'll send it when it's finished' (which has happened to me before).

I agree with your reply – the prize should have been ready and waiting for the winner when it was offered, but can we expect companies to change the habits of a lifetime?

Andy Stevens, Oxford

Hmm. We seem to have been let down by a few of our prize-suppliers over the past months. To the extent that our publisher is taking serious steps to tighten up the agreements that we have with companies...

Meanwhile your problem has been referred to the ever-helpful Tim Smith who will chase it up for you assiduously (in between editing our supplements and trying to grow a halfway-decent beard).

H F-W

■ Price conscious

While reading the article about a new Amiga format by Gary Penn in *Express* 122 I noticed that in discussing the merits of disks versus cartridges, he reckons that the cost of manufacture for a 3-disk game with box and manual is £2.

The question is, where does the other £22 go to, assuming the average Amiga game cost £24 or more? Allowing for royalties to the author, a reasonable profit to the manufacturer plus another pound or so for advertising and distribution, I can't see why games should cost more than £10 or £12. £24 up is sheer profiteering!

Probably everyone in the industry will dispute this vehemently, but being on the side of the buying public, it still mystifies me. Any comments?

Vic Driver, Lincoln

Just to keep the sums simple, let's look at a game that sells for £20 at retail. Assuming VAT at 15 per cent (now 17.5 per cent of course, so expect price rises all round), a whopping £3 goes straight into the taxman's pocket.

The shop that sells you a game will take a gross profit of some £6.50, which might sound a lot, but don't forget that there are a whole lot of overheads to pay for when you run a shop – rent, business rate poll tax, light, wages, employer's national insurance and so on.

The distribution company, or the wholesaler who supplies the retailer, is likely to take a £2.50 slice of the price pie chart – and again, that company has to pay a stack of overheads, including transport costs incurred in delivering the game to the retailer.

At the end of the day, the software house gets around £8 in gross profit. For a start, you have to take out the £2 manufacturing charge (which is bit on the low side – in the case of a game like Supremacy with a 96-page manual, this cost can be a fair bit higher) – this leaves £6 out of which the software publisher has to fund development (and maybe pay for a licence), pay for advertising and promotion and absorb all the staff and premises costs associated with running a business.

It's only a guess on my part, but I reckon software houses count themselves lucky to make more than 50p net profit on a £20 game – and when you add up the risk that's involved in producing a game and all the money that you have to invest up front, that's hardly outrageous.

If you look at this breakdown, you can see why some mail order companies can offer such competitive prices – if they can get the software house to deal direct with them, then the distributor's margin and the retailer's margin can be

trimmed back significantly – especially if they charge customers for post and packing. But then mail order buying isn't everyone's cup of tea – you have to wait for your order to be processed and the game to be delivered, but if you pop into a shop on Saturday morning with your cash, you can walk out with the game in your hand.

Let's have some comment from readers – I think the editor can feel a feature coming on...

H F-W

■ Amiga chuckles

It's absolutely amusing how Amiga-biased editors and users try to convince the world that the Amiga is more than a dumb games machine. (The Amiga was designed as a games machine, for heavens' sake!)

If a computer doesn't have a steady screen, then you can forget anything more than writing a short letter in a word processor, and as for serious DTP... The Amiga is only capable of 50Hz, which is enough to make a healthy pair of human eyes into zombie-like balls after an hour. Not to mention the headaches that come along with painful eyes.

The Macs, PCs with VGA and the STs all have one thing in common – a steady screen. All work at around 70Hz or higher, which makes a long session for WP or DTP a pleasure for the eyes.

So forget the Amiga for REAL WP and DTP. Forget painting and animation (if you are a high-end user) as well, because the Mac IIs are way superior in terms of hardware and software. Just use the Amiga for games – it's what it's best at!
Jay Lee, Capell a/d yssel, Holland

And that's no doubt put a brand new cat among the pigeons, Jay.

I can't agree that the Amiga was designed as a games machine – I can distinctly remember Commodore pushing it as a machine for business when it was first released. Though I must take your point about the Mac – my IIfx is a real dream to work with, but then I have to hack around in a diesel Fiat Uno because I spent so much money on my machine.

If I had bought an Amiga I could probably afford a decent motor. Ho hum.

H F-W

■ Writers' cramped

Spotted for the As Seen On Screen slot – writer Russell Hoban using an Apple II on BBC2's *The Late Show* on 5th March.

He was the only one of four writers interviewed who used a computer of any kind – and the others included J Archer Esq and PD James.
Steve Acton, Clunderwen, Dyfed

Sorry – no more fivers for single mentions of computers on TV Steve.

H F-W

■ Unhappy consumers

I purchased a copy of *Door to Door* by Geographic on 15th February after seeing a full-page advertisement in *Express*.

I returned the disk to them because my Amiga showed that it had read/write errors – neither the Readme.Doc nor the flightplan ran at all, while the buttons for The Quest and Europedata were ineffective. Nor did I have the free digitised maps of Greater London streets.

I was totally unable to find any inner city street directions, one-way systems or street names as stated in the advertisement, but that may have been due to the faulty disk. So I sent the disk back, and asked for a refund or a working copy that produced the information as claimed in the advertisement.

The company sent me a working disk, but the program still failed to provide a door-to-door routefinder/planner or many of the other facilities claimed in the ad.

As the medium carrying the advertisement, I believe that you have some legal responsibility in the matter – and I await your reply prior to taking action to try to recoup my losses.
John Murray, Glasgow

We've had several letters in this vein, which alerted us to the fact that something might be amiss ... my next correspondent was a little more wary.

***Express* has a full colour advertisement for a routefinder/planner, which looks good. Before buying, I would like to know what I am getting, what is to come later and at what price but I can get no information from the company concerned, either by writing or telephoning. At best, I get a message on a poor-quality answering machine.**

Do you know anything about the firm or its product please?
A J Withers, Ludlow

We have had a great deal of difficulty in contacting the company concerned ourselves – so far, it has avoided supplying us with a review copy and as I write this reply, it hasn't settled the bill for itsadvertising.

And it would appear to have changed its address. (In trying to get a comment from someone at Geographic, I have just dialled the telephone number given in the advertisement, and got a 'number unobtainable' signal; checking with the operator, I find the line is discontinued.)

We are actively pursuing our enquiries – and Keith Pomfret has been given a copy of *Door to Door* by one of our readers, which he will be evaluating fully in *Express* 127.

If any readers have experienced problems with the product – or think that it is wonderful – we'd like to hear from them in the next few days. Send your letters to Keith Pomfret, 'Door to Door', New Computer Express, 30 Monmouth Street, Bath, Avon BA1 2BW (but get that letter in the post today!)

Meanwhile, all I can advise is that you don't send any of your money to Geographic until the matter is sorted out.

More news as we get it... **H F-W**

■ All in the name of a Helleman's mayonnaise advertisement...

Fair enough, Haydn, I don't expect a fiver for this one – but I thought you should have sight of 'em anyway. Maybe it would form the basis for a picture caption competition seeing as how you haven't been giving many fivers away recently.

I was an extra on a shoot for a mayonnaise advert many years ago – and I took a few snaps, which turned up again when I was tidying out my study. I wonder if our readers can identify these two musical journalists and which magazines they work for now?
Graeme Kidd, your publisher

Certainly sir. £5 each for the first correct ID I receive...

H F-W



• With a fold-de-rol and a dipiddy-dee. Who are these computer journalists? Fivers on offer...

MAIL SHORTS

■ Left-handed joy

Every hand-held games machine I have seen has the 'joy pad' under the left thumb. Is there a reason for this? I think we should be told.
Thomas Eldon, Ashdon, Essex

Beats me pal. Unless it's just one more manifestation of the anti-sinistral fascists of the right-hand.

Anyone else like to field an explanation – or justification. **H F-W**

■ Fiver hunter...

Just a note to all those who whinge about whether or not they get a fiver. I was awarded one in *Express* 118 – now *Express* 121 has come and gone, and still no fiver!

Perhaps they are mythical beasts, or imaginational figments!
Steve Lee, Ramsey, Cambs

Oh dearie me. Cock-ups all round in the fiver department. I've chased up the person who should have sent you your postal order, so you can expect it any day now.

And if Phil White, Steven Edgar, John Goldsmith, Clive Parker and Dan Walker would like to drop me a line with their addresses, I'll send them the fivers they are due from the Seen On Screen special in *Express*121. (The Ed in a mad fit of tidying up the office – first in three years – ditched your letters.) **H F-W**

■ Men of taste

I was reading *ACE* the other day when I noticed that the company, Gremlin, reads *Express*. How do I know? It's quite simple really – on page 59 of *ACE* issue 43 there is a small black and white photo at the bottom of the page. There is a person playing on a Gameboy, and if you look closely, you will spot a copy of *Express* just sticking out where his head is.
Colin Cheung, Newcastle upon Tyne

ONE OF HAYDN'S WINNERS £5

Well spotted Colin – a fiver is (or should be) on its way to you. Further fivers on offer to readers who spot *Express* in a similarly interesting sort of place – or who send in a photo of themselves reading *Express* in an exciting or unusual place. **H F-W**

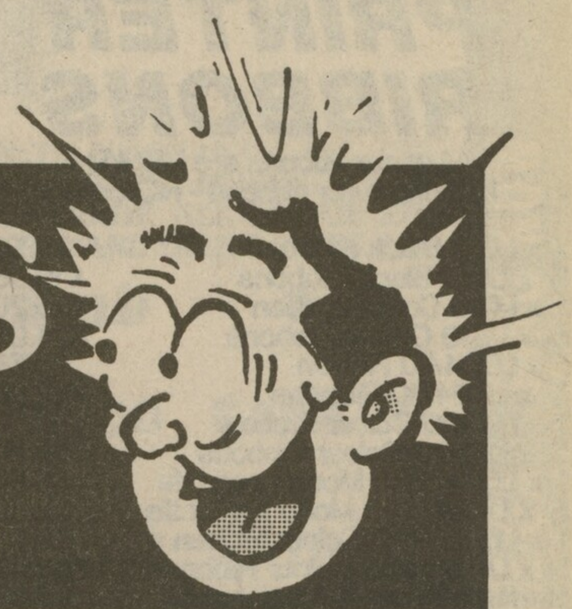
■ Harass me any day!

If anyone wants to send me some porno pics (like the ones mentioned on page 5 of *Express*124), please feel free.
Sue Denham, Brentwood, Essex

Oo-er! We'll be running a 'readers wives section next.

This must stop. **H F-W**

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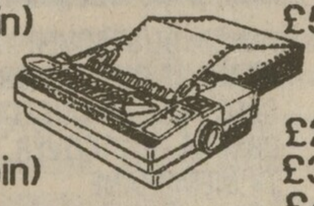
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Macintosh

MACWORLD EXPO

As I write this, the MacWorld Expo in Birmingham is fading to a mere memory of hours standing around watching, oh, hundreds of people doing their best to look like a flood of excited visitors to the show.

The UK is about the only country in the world where the premier Macintosh show is not the MacWorld Expo. Everywhere else, the show is eagerly awaited, product launches are saved up and people throb with excitement (can I say that?) in anticipation. But Britain's situation is somewhat different. Long before MacWorld decided that a UK show might be a nice idea, MacUser was already well established, so MacWorld is something of a poor relation by comparison. Also, the fact that it's held at the NEC in Birmingham means that it's not as accessible as the London shows – ask anyone who's waited for hours for a train on Birmingham New Street station.

In the end, the organisers reckon that about 12,500-13,000 people turned up. Unofficial estimates put the total somewhat lower – it was certainly far less busy than November's MacUser show, which was much larger and had about 18,000 attendees. Many of the larger distributors – Frontline and Principal among them – decided not to attend, as did a number of other prominent Mac software houses like MacLine and SoftSel. Of the companies which were there, here are some edited highlights:

Adobe was demonstrating *Photoshop* on its stand, while on Tuesday the company announced a major new addition to its Type 1 font format which will allow you infinitely variable 'boldness', 'serifness' and any number of other things. Watch this space for further details next week. And the company also announced that it will be selling typefaces from the Berthold type library; this is very sexy if you're a typographer, and not if you're not.

A M Varityper launched *3B2*, a major new desktop publishing package. It's really rather smart, but it's over-£1,000 price tag is bound to put many people off.

Amtech International was showing a range of products, including *Ray Dream Designer*, a package which turns sketches into full-colour 3D pictures and was impressing the hell out of everyone who saw it. The company also had *DiskDoubler*, a file-compression package, and *Empower*, a password-protection program on show.

Bitstream was giving away huge posters showing the company's 1,000 plus PostScript typefaces, and launched its first collection of TrueType fonts.

Claris, the company who brought you *MacPaint* and *MacWrite* was showing *MacDraw Pro*. *MacDraw* has been rather superceded by products such as *FreeHand* and *Illustrator* in recent years, so the *Pro* application has quite a bit of catching up to do. Judging by the demo on the stand, it may just have done so. More details when review copies become available.

Computers Unlimited showed a number of neat gizmos, including the launch of the Radius Pivot Colour monitor. This is an A4 monitor which can be used in either portrait or landscape format. If you pivot it while it's on, it automatically twists the desktop so that it's still the right way up. This is the first time that the Pivot has been available in colour; it's yours for a mere £1,299 (plus driver card if you want 256 colours instead of 16). The company also announced a new mail order operation, called Software Club, which will sell most of the software and

POSTCARD FROM AMERICA

What a week! I feel like the read/write head of a badly fragmented hard dive – zooming around town with small jobs. The only platter I'd like to come in contact with is at dinner time.

Last night, I climbed the upstairs after doing the dishes, and started working on this column. I'd put my old 512e/Plus Macintosh in our bedroom, which is also the television viewing headquarters of the flat. Sometimes I like to multi-task, and watch a basketball game with one eye, while I compute with the other.

My daughter was utterly involved in an awful, mindless teenage situation comedy, so her olfactory glands was turned off. She was oblivious to a sharp burning smell. Is it outside? No. The Mac? Yes!

I quickly saved my work and shut everything down. The video hadn't blown yet, so everything looked fine. I was an instant from total wipeout. And I had been very lucky. I've seen real fires when the power supply and video circuitry arc. Flames.

There are two likely and one positive culprits here. The most common breakdowns on compact Macs are a faulty resistors on the board, or the flyback transformer. If you see a little yellow residue at the top left vents of a Mac Plus, it hasn't been smoking cigarettes. That's a sign of overheating.

The biggest failure has been from Apple. It has known about these problems for years but has never admitted their existence, although any good repair shop has seen too many cases to call it coincidence. There was an attempt to start a class action suit in 1986, but it fizzled.

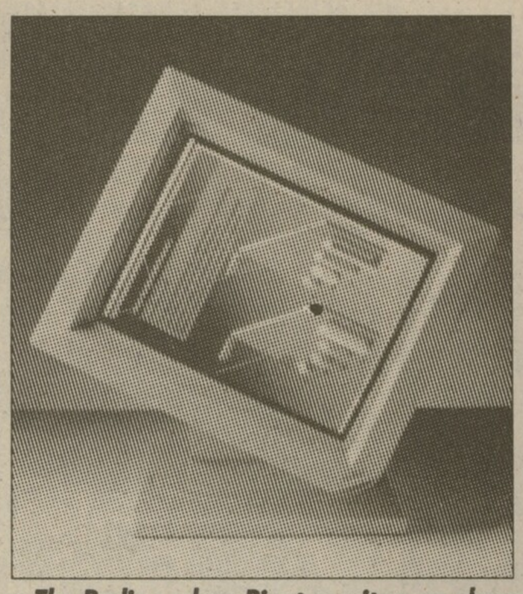
Mac TriviaQuiz time: The following were code names for Macintosh hardware and software. Match them to the products they became.

1) WildCard	a) Macintosh II
2) Aladdin	b) MultiFinder
3) Happy Landing	c) The Mac Plus ROM
4) Paris	d) HyperCard
5) Juggler	e) Macintosh SE

David Morgenstern

Answers:

1) WildCard/HyperCard, 2) Aladdin/Macintosh SE, 3) Happy Landing/The Mac Plus ROMs, 4) Paris/Mac II, 5) Juggler/MultiFinder.



• The Radius colour Pivot monitor, on show at the recent MacWorld Expo in Birmingham, is not a silly as it looks.

some hardware that CU distributes. The phone number to ask for a catalogue is 081 205 4548.

The boys from **Encyclopaedia Britannica** were there, as usual. Nope, I've no idea why they were at a Macintosh show either, and clearly neither had the rest of the attendees – the stand was notable as being the emptiest at the show.

Microwriter Systems had the AgendA pocket computer on show. This is the one with a weird six-button keypad for text entry; the company now has an interface which lets you plug it into your Mac.

Er... that's it. There were more people exhibiting than just these, but no-one with anything really new and exciting – at least, not unless you have several thousand pounds to spare.

If you didn't manage to make it to the show, I wouldn't be too concerned; save up for the MacUser show in November instead.

RUMOURS...

Not much to report on this week. The show was virtually rumour-free, and little info has come through from the States. The word is that there will be not one but two 'tower Macs', based on the 68040 chip, which will appear sometime this year. Nice if you can afford them – the price is expected to be above £5,000.

Meanwhile, rumours abound that Apple will start shipping printers and Macs with built-in Ethernet before the end of the year. Ethernet is a network which runs a million times faster than LocalTalk (well, not quite, but it sure seems like it); at the moment you have to buy add-on cards to use Ethernet with the Macintosh.

The Mac II computers are most likely candidates for built-in Ethernet; look out for the IIcix and IIsix in the fourth quarter (marketing-speak which translates as "by the end of the year if we're lucky").

Ian Wrigley

PC

CONSOLE CALUMNY!

Back when Amstrad first launched the console, the company made a great show of being determined that software publishers should not just get away with porting old code on to the new medium. And rightly so!

However, all that seems to have gone out of the window – at least as far as *Klax* and *Tintin on the Moon* are concerned. Yup, I've just got hold of copies of these two on cartridge...

Klax was an excellent game on tape/disk. In case you've never played the game, it is a *Tetris*-type arcade affair. Instead of using variously-shaped blocks to form solid lines, though, here you're collecting different-coloured tiles on a paddle, then dropping them into a pit below to form horizontal, vertical or diagonal lines of the same colour. Points are scored according to the type and difficulty of the line you make, and there are 100 different levels, each with a specific target – either a certain number of points, diagonal lines, tiles and so forth.

Klax is thoroughly addictive, superbly playable and definitely worth buying... on disk. It would even be worth buying on cartridge for £25 if the disk version hadn't appeared first. As it is, though, the console version is indistinguishable from the old one! Apart from a couple of different backgrounds and a fade here and there, the game looks – and plays – exactly the same. Naughty naughty.

Not as naughty as *Tintin on the Moon*, though. Without having the old disk version of the game to hand, I can't really say whether the console version is identical. However, the graphics show no sign whatsoever of the enhanced console hardware. It wouldn't be so bad if the game wasn't a complete dodo in the first place! The graphics and animation were excellent (for a disk game) but the plot was... well, there wasn't really a plot, just some nice-ish animated sequences and some rather dull platform adventuring. There's also an arcade sequence where you guide the *Tintin* spaceship through an asteroid cloud collecting fuel. It's not hugely playable, though, but it is hugely dull.

It's a bit sad that there are console games out there that show little or no improvement over the original disk versions. All the more so since the success of the new Amstrads will depend on how people perceive the quality of the machines and the software available for them. It's especially galling when you look at brilliant console games like *Switchblade* and *Robocop 2*.

However, I'm reserving my ultimate kicking for when I can find a copy of *Barbarian 2* on the console. I've only played a demo version, but that too looked just like the disk original. And although *Barbarian 2* had many fans, I wasn't one of them. With graphics that looked like they were made of about three pixels each, and a storyline that wouldn't tax a senile gibbon, it doesn't rate as one of my all-time-favourites, to say the least. And the prospect of paying £25 for a console version... I think I'd better just hold my tongue.

SUPERSKWEEK

Skweek, that rotund little fellow who had

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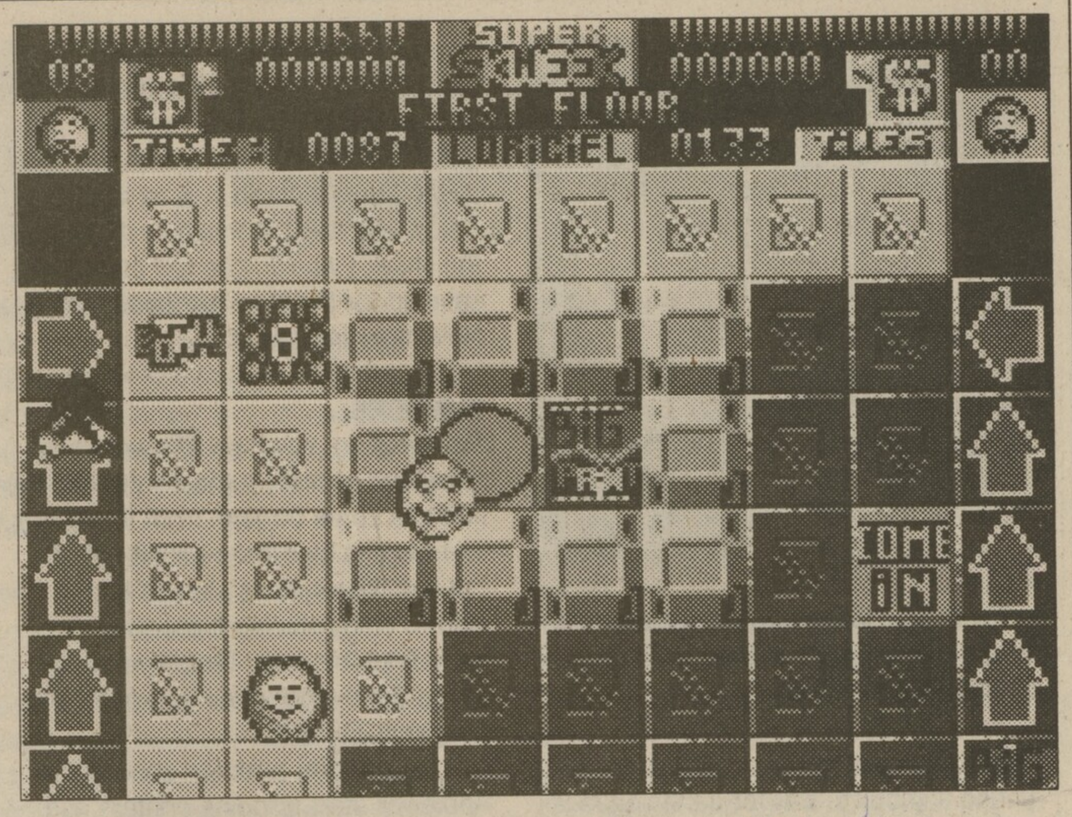
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• **Superskweek** ***has a number of enhancements over the original, but loses the charm.***

to rush around painting his world pink again after some nasty alien critters came and coloured it blue, is back.

Last time, Skweek had to face a pretty tough range of traps, puzzles and nasties, but in *Superskweek* matters are much, much worse. Thankfully, he's now got his friend Skrouch to help him (in two-player mode, anyway).

Enhancements over the original game include wider levels with a correspondingly larger playing area, many more collectable weapons and bonuses and even a shop where you can buy the things! (When you zap one of the aliens, it leaves dosh behind.)

It all sounds very promising. After all, take a successful game and add to it, and you've got a sure-fire recipe for success, no? Well, er... no. The graphics are as bright and cute as ever, but because there is now so much more happening on-screen, they slow down to a crawl just as the action hots up. This is very irritating, as your joystick response is constantly changing. It makes it very hard to time things properly, for a start.

Secondly, although it's theoretically an improvement having all these extra power-ups and goodies, in practice there are just too many to get your head round. You'd have to have been playing the darned thing for ages before you could instinctively recognise the bonuses before you steam into them. And considering that some of the 'bonuses' do nasty things instead – like reversing your controls – that's not altogether a good thing.

Superskweek is still a very good game, but in gaining loads of features it has lost its principal charm – that of being simple to grasp yet beautifully playable. What a shame.

STOP PRESS STOPPED!

I've had some rather sad news from Database Software. The company is no longer going to be selling its long-running *Stop Press* DTP program. Apparently it has only been selling in dribs and drabs over the past few months, and Database has decided to call it a day, selling remaining stocks to the trade.

I've actually been using *Stop Press* a bit over the past few days because of a desktop publishing article I'm working on, and I've come away convinced that it really is an excellent program.

It is sold in two versions – both with and without mouse – and you can also use a joystick, too (though I wouldn't recommend it). Although a mouse is nice, the program is perfectly usable just from the keyboard.

There's no space here to go into detail about everything the program does. Suffice to say that it's very professionally-produced and presented. The manual is light in tone, but thorough and informative, and the program itself is easy to use.

Anyone after a copy of the program should not contact Database. Instead, try scouring the mail order ads.

Rod Lawton



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Amiga

NEW MUSICAL AMIGA

Rumours have been floating around that Commodore has developed a vastly enhanced version of the Amiga's sound chip, Paula. According to sources both in the UK and in the States, Commodore is rumoured to have shown the new chip to a select number of developers.

If the rumours prove to be true, the new chip could be available to Amiga users as soon as this December. Even better, because the chip is a direct replacement for the current Paula, all Amiga users (including A500 owners) will be able to have it fitted to their machines, regardless of whether the new Enhanced Chip Set (ECS) upgrade is fitted.

The most striking feature of the new chip is the number of sound channels – instead of the usual four, the new 'Super Paula' boasts now less than sixteen! (although one of my sources believes that this figure could actually only be twelve). What's more, Commodore is rumoured to have built-in support for PCM samples, therefore allowing the Amiga to produce crisper and clearer sounds.

According to a source in the UK, Commodore may have even built-in a selection of PCM samples, although this

seems doubtful when you consider the amount of onboard RAM that the chip would need to store these samples internally.

Although support for PCM samples may seem rather ludicrous at first, it could well be a possibility that Commodore's engineers are exploring. With the release of the CDTV, Commodore has been working closely with music hardware manufacturers Roland, which has already developed a music product for the CDTV in the shape of 3D-Sound.

Roland has been producing PCM-based music products for years now (the Roland U110 and U20, for example – even their LA Synths use PCM samples to build up synth 'patches'), so it would seem only logical that Commodore could license this hardware for use within their products.

At first glance, it would seem that extending the Amiga sound architecture to a full 16 channels wouldn't be as simple as just installing a new Paula. After all, the Amiga's sound capabilities rely heavily on the machine's DMA architecture, which is an integral part of the Amiga hardware.

On closer inspection, though, it seems that even the current Paula is capable of producing more than just the basic four channels of sound. If you've read Addision-Wesley's 'Hardware Reference Manual', then you may have noticed that it is actually possible to mix waveforms in realtime using the blitter. You could also use a sort of 'multiplexing' system which would allow the same results.

DIGITISING TIPS

How many of you have bought a digitiser such as NewTek's Digiview 4 or Rombo's VIDI, only to find that the results you are able to obtain are far from the quality of those you see in other people producing? Follow these basic tips and you won't go far wrong:

Camera – Unless you're using a realtime colour digitiser like Marcam's FrameGrabber 256, a decent mono video camera is a must. Cameras can be picked up for as little as £75, but it's worth spending a little extra to get a camera that offers a high enough resolution for digitising.

Lighting – If your digitiser is to pick out detail, then decent lighting is essential. Two desktop lamps fitted with 100 watt 'daylight' bulbs are the best bet as these will produce light that is 'natural'. Do not use normal bulbs as these can often add a reddish or yellowish tint to all your images.

These light sources must be fairly close to the object to be digitised, but don't put them so close that they produce glare. This is particularly common if you're digitising from a glossy picture. If glare persists, then you may have to tilt the lamp away from the image which will reduce glare substantially. As always, experiment to find the best positions for your lighting.

If your images are coming out with a rather 'grainy' finish to them, this is usually because there is not enough light shining on the image. If you have both bulbs burning away, then check the contrast on your camera to make sure that it has not been turned down too far.

Digitising – If you have the memory, try to take all your grabs in interlace mode and then convert them down to low resolution using a tool such as Progressive Peripherals' PIXMate. I have found that this usually results in a much better defined image. In particular, a lot of the 'fringing' usually associated with HAM digitising can be eliminated by using this method of digitising.

EXCELLENCE ACHIEVED

I have always been a great fan of Arnor's *Protext* (especially with the release of version 5), but I feel that I have finally been tempted away by a product which is quite simply breathtaking.

That product is none other than *Excellence 2.0*, a high performance word processor from US-based company MicroSystems Software.

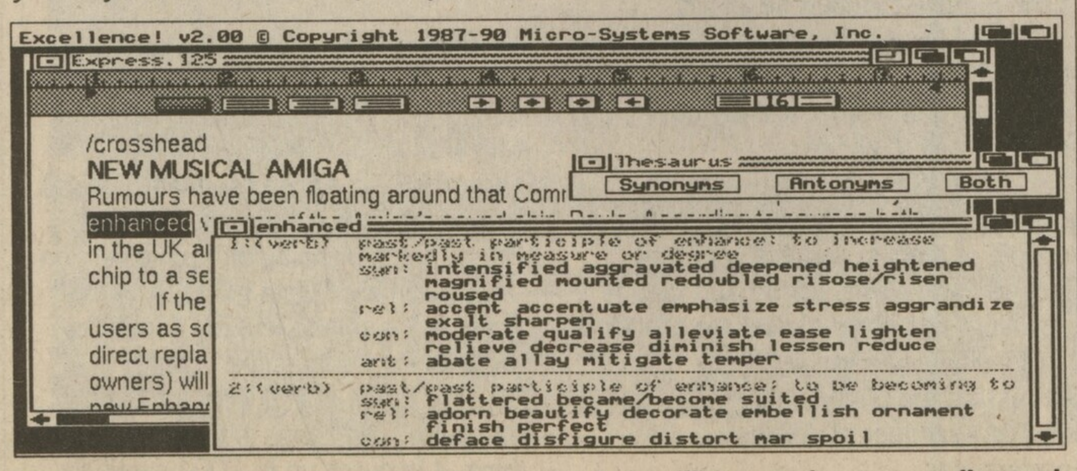
MicroSystems certainly knows a thing or two about word processors – more seasoned Amiga owners may remember the company's *Scribble*, the Amiga's very first word processor (Commdore's own *Textcraft* excluded, of course!). *Scribble* may look rather archiac by today's standards, but it set the path for *Excellence!*

Seemingly like all word processors these days, *Excellence* isn't just restricted to straight words. No siree. It's actually another in the breed of 'word publishing' programs that have been made popular by such programs as *Pen Pal* and *ProWrite*. You use standard Amiga bitmapped fonts and import any 32 colour IFF picture and pull it into your document. *Excellence!* treats a graphic like one huge character, so it's possible to cut, copy and paste the graphic in exactly the same way as you would for conventional text.

This has its disadvantages, however. For starters, you can't run text around a graphic, so you can often be left with large amounts of white space unless you split the page into columns (another DTP-like feature).

What really makes *Excellence!* so special are undoubtedly its spell checking and thesaurus facilities. The spell checker boasts a 150,000 word dictionary and the thesaurus beats this hands down with its 1.4 million word dictionary (quite impressive, I'm sure you'll agree!).

What's great about the thesaurus is that not only does it provide alternatives



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to a given word (surprise, surprise), but it even displays a dictionary definition for any word. This can be particularly useful if you want to use big words without looking silly when you use them incorrectly.

Excellence! certainly isn't the fastest program this side of *Cygnus Ed*, but it's advantages far outweigh the few niggling disadvantages that you might encounter. I know for a fact that I'll be entrusting *Excellence!* with my work from now on.

Like most truly useful programs these days, *Excellence!* requires at least a megabyte to run, so 512K A500 owners will just have to splash out on a RAM expansion if they want to run it. It's available for £150 from Track Computer Systems who are on the other end of 0332 41817.

Jason Holborn

Archimedes

DOWN THE RABBIT HOLE

After many months of frantic phone calls to Magnetic Scrolls and Virgin, I've finally persuaded them to send me a review copy of *Wonderland*. The wait was even almost worth it!

The game comes on four disks but can be installed on a hard disk – watch out though, as it uses up 2.3Mb. Included in the (very nice) box is an A3 poster, an installation guide, a quick reference card, a map and a 66 page manual – this is not a game that's just been knocked up in half an hour.

Wonderland represents the first major departure in the style of adventure games for a good number of years now. Magnetic Scrolls was one of the pioneers of the 'illustrated adventure' and with *Wonderland* it has really just taken this concept to it's next logical step.

Everything appears in a window on a desktop and can be moved around to suit your own personal preference. If you so wish, you can just use the 'Session Window' and treat *Wonderland* as a traditional adventure with straight forward location descriptions and simply 'GO NORTH'-style commands. As with all previous Magnetic Scrolls adventures, you could actually get away with this. The descriptions are very full and colourful and the parser seems to be able to understand anything you care to throw at it.

Apart from the session window, you can display a map (this is updated as you move around the *Wonderland* world), a compass (for directing movement without typing) an inventory and a room contents. These last two depict (with icons) what you are carrying and what is available for manipulation within the current room. Picking up an object can be achieved simply by dragging its icon from the room to your inventory.

You can move about with the compass, or even more simply, by clicking on the location's icon in the map window. Rather annoyingly, you cannot move to a new (ie as yet unvisited) location by using the map window, even though the available exits are shown. Curiouser and curiouser, as Alice herself might say.

Other commands (such as examine, drink etc) are available from a couple of menus, and it is very rare indeed that you'll actually need to type anything. Additional menus are provided for loading and saving games, accessing the on-line help system and setting a number of display preferences.

I only have two criticisms. First, the windowing system is very nice but it doesn't use the Archimedes window manager; instead it uses one of Magnetic Scrolls' devising which is decidedly Mac-like. There are two upshots to this: the game doesn't multitask under RISCOS, and it takes a fair while to accommodate to the (vastly inferior) Mac user interface.

My second complaint is really in addition to this; all the output from the game seems to be geared for a multisync monitor, so on a normal monitor everything has a very stretched appearance. The window 'gadgets' (scroll bars, zoom icons etc) definitely seem rather on the large size.

I can see the reasoning behind developing a generic user interface that can be simply tweaked to run on any given machine, it's just rather disappointing to see a windowed application not exploiting the full power of the Archimedes.

The only feature that's missing from the Archie version is the music. Evidently the author was rather short of space. Who needs music in an adventure game anyway?

Please don't let this put you off, though. I've been playing the game almost non-stop for the last couple of days, and if that doesn't give the game some sort of seal of approval I don't know what does. Apart from the rather annoying features described above, *Wonderland* is the best adventure game available for any home computer. If you've got £35 spare in the first week of April, I don't think I could recommend *Wonderland* highly enough.

Special congrats to Virgin for even considering releasing an Archie version. I wish more big name companies had the courage to support our machine!

The final piece of good news is that Virgin is very interested in producing more games in the future. Keep watching this space!

Virgin can be complimented on 071 727 8070.

LEMMING-AID

I've hardly been able to get any work done these last couple of weeks, what with *Wonderland*, and before that, *Lemmings* (on a friend's, ahem, Amiga). Imagine my shear horror to find that Psygnosis is planning an Archie version of this ultimate cutsie game. I'm never going to be able to use my computer for anything serious ever again!

For those of you who don't know the game, *Lemmings* is the latest 'new' thing, it features up to 100 beautifully



• **Lemmings *trudges sheepwise onto the Archie.***

animated lemmings that must be guided from a trap door to the exit. Being lemmings does mean they have rather a sheep mentality and tend to plummet off cliffs into pools of boiling lava and, other varieties of certain doom.

Luckily you can order a lemming to start digging, build a bridge, stop other lemmings or even explode. The idea of the game is to save a certain percentage of the lemmings on a level by cunning use of these various 'worker' lemmings. The thing about Lemmings is that it has instant appeal, a well thought out learning curve, brilliant graphics, wonderful music and that elusive 'JOMG' quality (Just One More Game).

We'll have to wait a couple of months for the release, so maybe I'll be able to get on with some work before then...

Psygnosis can be bullied on 051 709 5755.

ODDS 'N' SODDS

I'm afraid the appearance of *Wonderland* has forced a number of things due for this issue of *Express* to be held over until next week. I promise I'll review *Master Break* soon!

I just have enough room to say that (believe it or not) Acorn has got a stand at the Ideal Home Exhibition. Oh yes, and try and get hold of a copy of the *!CokeCan* demo if you can (sic) – it's really nice. Sorry, must dash...

Ken Coumarin

64

WELCOME TO YOUR HOST

No, this isn't Sean Masterson. Poor old Sean's off ill with a case of bad back (he can't get it off his mattress). Your host this week is Steve Jarratt (who?), editor of *Commodore Format*, sister magazine to *NCE*.

Nuff said, on with the info...

HEWSON, CRL R.I.P.

It's been a bit of a bad week for software houses I'm afraid, with the demise of Hewson and CRL, both of whom have had the receivers in (the business equivalent of dry rot). And unless someone steps in with large amounts of dosh, it looks like the end of two of the longest running C64 software publishers.

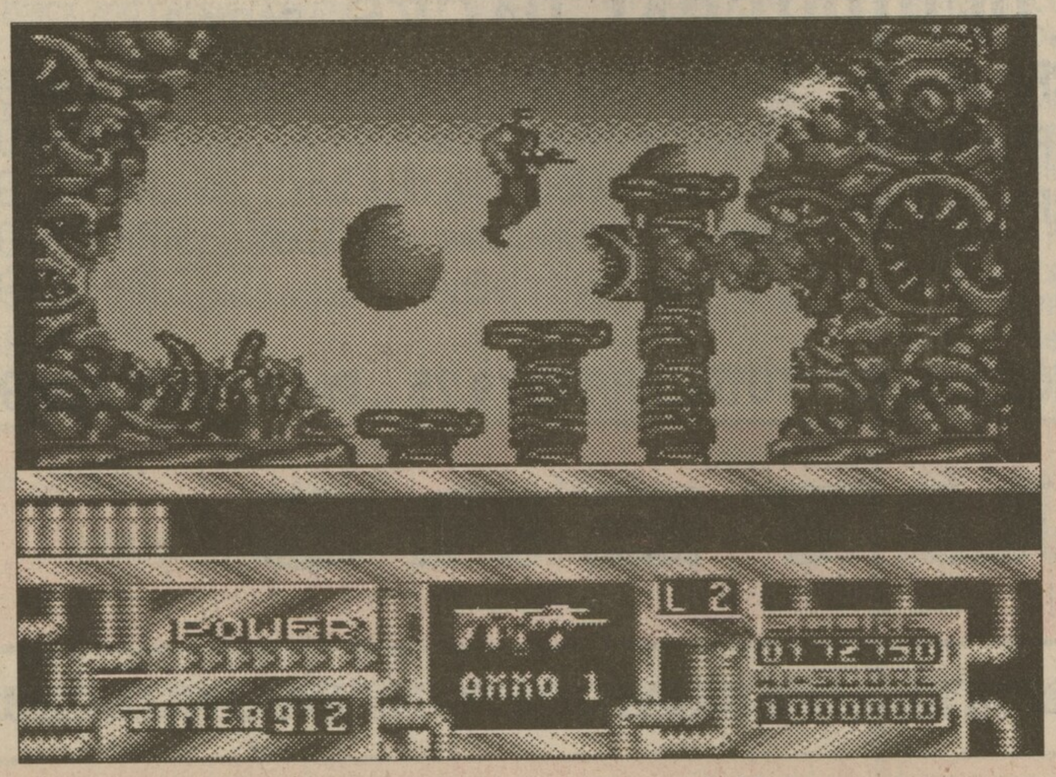
Interestingly, neither software house has ever released a licensed game (apart from CRL's *Blade Runner* which was based on the soundtrack(!?)), relying solely on original software. In CRL's case it must be said that the company hasn't had a number one game since the likes of the classic *Tau Ceti* way back in '85.

Hewson's back catalogue, however, reads like a *Who's Who* of top 64 software, including titles like *Uridium*, *Paradroid*, *Nebulus*, *Eliminator*, *Alleykat* and pretty much any of its Rack-It budget releases.

One can only assume that originality doesn't pay. Perhaps they should have tried releasing any old rubbish with a hard movie hero or footballer on the front instead.

SNEAK PEEKS

Games to watch out for include *Battle Command*, coded by Real Time for Ocean. Out on disk and cartridge only,



• **Hell Hole:** ***Possibly CRL's 64 swansong. Shame: it's not a bad little game***

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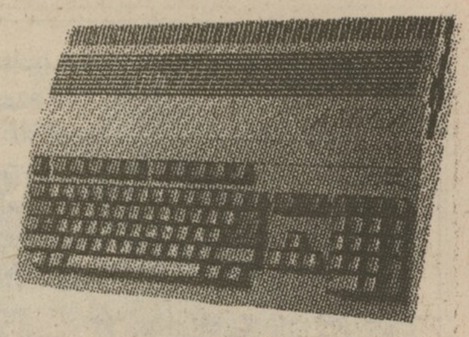
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it definitely promises to be something really special.

Psygnosis is currently looking at a possible 64 version of *Lemmings*. Rumours have it that the job could go to Gremlin or Ocean who did *Shadow Of The Beast* for them on the Amstrad and 64 respectively. Sounds interesting.

Storm has just acquired the rights to Rare's *Solar Jetman – Hunt For The Golden Warship*, a stunning game from the ex-Ultimate team which is currently available only on the Nintendo. Storm also has the coin-op conversion rights to Asylum. However, don't dig deep in your pocket just yet – the coin-op still isn't finished!

Fans of Ocean's *Night Breed* (both of you) can look forward to *Cabal – The Hero Of Midian* from Ocean. Based on the gruesome Clive Barker novel and movie (that's the gruesome novel and movie, not Clive) it will no doubt feature more Midian monster-mashing, and let's hope it's better than the last one.

US Gold's *Gauntlet III* is finished and is very nice indeed. More wizard goings-on in this polished two-player ghost-busting eight-way scrollerama.

Steve Jarratt

ELVIRA RESURRECTED



The C64 market has quietened considerably after the Christmas deluge, but things are picking up with a long list of titles to watch out for. Merely days away from completion is the C64 version of *Elvira, Mistress Of The Dark* which boasts gameplay identical to the 16-bitters (and even slightly faster) plus hundreds of K of high quality graphics. The game is also completely menu driven.

Role-players with a chest fetish (treasure chests, that is, I hasten to add) and a disk drive – it comes on three double-sided disks – should prepare to be engulfed in *Elvira*'s many pleasures. Or something.

Interested parties should give MicroValue a bell on 0661 860260.

Spectrum

THE END?

I'm afraid there's a bad rumour to report, Spec-chums. According to the latest issue of *Outlet* (see below), Amstrad could well have stopped production of the Plus 2. It's all highly unofficial, of course, but it wouldn't surprise me in the least, given both Amstrad's general attitude to our machine and the steadily declining sales of the last Sinclair on the market.

It would be completely depressing if this was confirmed and pretty annoying because at the right price and with half decent promotion, the Speccy could still sell approximately lots and lots this year.

Obviously, the huge established base of Speccy folk will ensure that, in best Hammer Horror traditions, the machine continues to live long after its death, but it'll be a sad, sad day when the company stop making our Sir Clive-originated buddy.

If you have any comments or tip offs concerning the ending of Plus 2 production send them to me at the usual address.

WIN A FREE TICKET

It's generally agreed that The All Formats Fairs are pretty darn excellent events, heavily laiden with bargains and enough user groups to keep computer folks of every description happy and well supported. The only possible problem comes if you can't make it into London and, more importantly, back home again with all your goodies.

Well that need not be a hitch anymore because Fair organiser Bruce Everiss is going to hold one of the events in Birmingham, thus providing ample opportunity for hordes of Midlanders to lash out on the aforementioned computing snips.

The venue is the National Motorcycle Museum in Brum (on junction six of the M42 where it meets the A45, apparently), which will open to invasion by sundry computer people on Sunday April 21 from 10am to 4pm. Stand prices are very reasonable £75 each which even fairly skint fanzines, user groups and public domain groups should be able to scrape together without having to sell a bodily organ.

Admission is only £3 but because I'm feeling strangely benevolent at the moment and won't be able to attend you're welcome to my ticket if you want it. Simply send me a Spectrum or SAM tip of any description, mentioning you'd like the ticket, and the sender of the first one out of the hat will not only get in for free but will have the satisfaction of strolling smuggly past the long cues of frozen punters waiting outside.

Send your tip, on a postcard or in a letter, to Robin Alway, *New Computer Express*, 30 Monmouth Street, Bath BA1 2BW. Make sure it gets to me by the April 9 and I'll despatch the ticket to the lucky winner in good time.

A NEW OUTLET

Here's a brief but glowing mention for the thoroughly spiffing on-screen Speccy/SAM mag, *Outlet*.

The latest issue to be slapped in my desk is number 43 and, as usual, it's truly excellent. As well as the usual load of tips, letters and news there's a wide range of programs for you to load up at the prod of a key.

If variety is the spice of life, *Outlet*'s the Speccy owner's sage and onion with the stuff(ing) on offer varying from clever graphics and sound programs like *Zoomlens* and *Beepbank* (a selection of sound FX for incorporation in your own routines) to useful utilities like *Videolist* (for cataloguing your video collection) to a screen of clip art depicting a series of Yoga moves! What more could you possible want?

The highlight for me, though, was *Quantel*, a show-off graphics demo which provides some screens and lets you flip, reverse, dissolve and generally mess about with them. If you've already invested in a copy you'll know how good *Outlet* is; if not, and you're interested in the non-games side of Specdom, buy one without further delay.

Sample copies are available to the unconverted on Plus 3, Plus D/Disciple, Opus and SAM Coupé disk, tape and even microdrive cartridge for the dead reasonable sum of £2.50.

The address is Chezron Software, 605 Loughborough Road, Birstall, Leicester LE4 4NJ.

SEND 'EM IN

Letters, postcards and especially big bulging jiffy bags are always given a warm welcome and a loud Hurrah! when I receive them. I like being sent tips (for the Speccy and the SAM and relating to games, utilities or just general using), review software, comments on the column or world in general, recommendations/warnings of stuff you've bought, user group info and fanzines.

Bung anything remotely connected with the wonderful world of the Spectrum and SAM and send it to me at the usual *Express* address. I look forward to hearing from you.

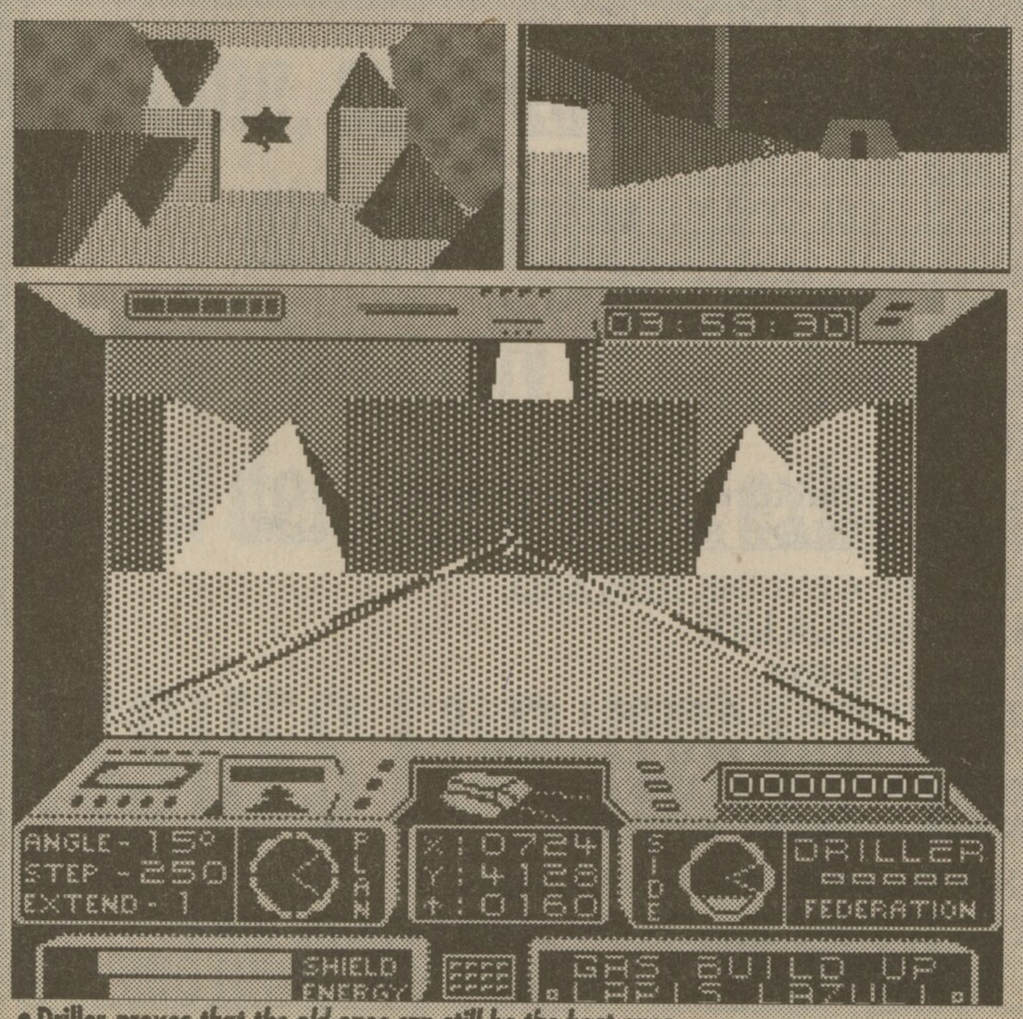
Robin Alway

DRILLER THRILLER

A rather loud Whoop!! is the only possible reaction you can have to news of a smashtabulous rerelease on Ocean's consistently excellent HitSquad label. The voluminous wonder and spacey delights of Incentives' gleaming 3D epic *Driller* can now be yours for just £2.99!

The game collected thousands of percentage points on it's original release a few years back and caused a national shortage of superlatives in the computer journalism world, such was it's unbridled fabness. Since then, of course, we've played a fair few other games in Incentive's Freescape series and, as I write, are drooling in anticipation of its *3D Construction Kit* utility which I raved about last week. *Driller* remains, however, a truly great game, still a long way from reaching its sell by date even if the solid 3D world depicted on your Speccy does seem to move a tad sluggishly these days.

This game is, perhaps, the most adventure based of all the Freescape series with a vast playing area to explore as you try to prevent a deadly build up of gas on a moon (the name of which I can't remember) by drilling 13 holes in its surface. I could go on about it for pages but basically, you won't get a better game than this for the price.



• Driller *proves that the old ones can still be the best ones.*

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ATARI BACK WITH A VENGEANCE

It's happened. Atari has got serious. In something of a coup, the company has announced two brand new machines, the launch of the Mega STE, a brand new STE bundle and a price cut on the Turbo pack to £350.

Strategically, this means that the Turbo pack now represents the best possible entry into the world of 16-bit computing. The reduced price point should prove crucial in convincing first time buyers not to purchase other less flexible computers.

The Education pack is an intriguing and very clever development. By tagging the ST with the word "education" parents will feel a lot easier about buying what has always been sold as a "games" computer. However the really clever development is the fact that the software bundled with the ST may actually be of some help to kids.

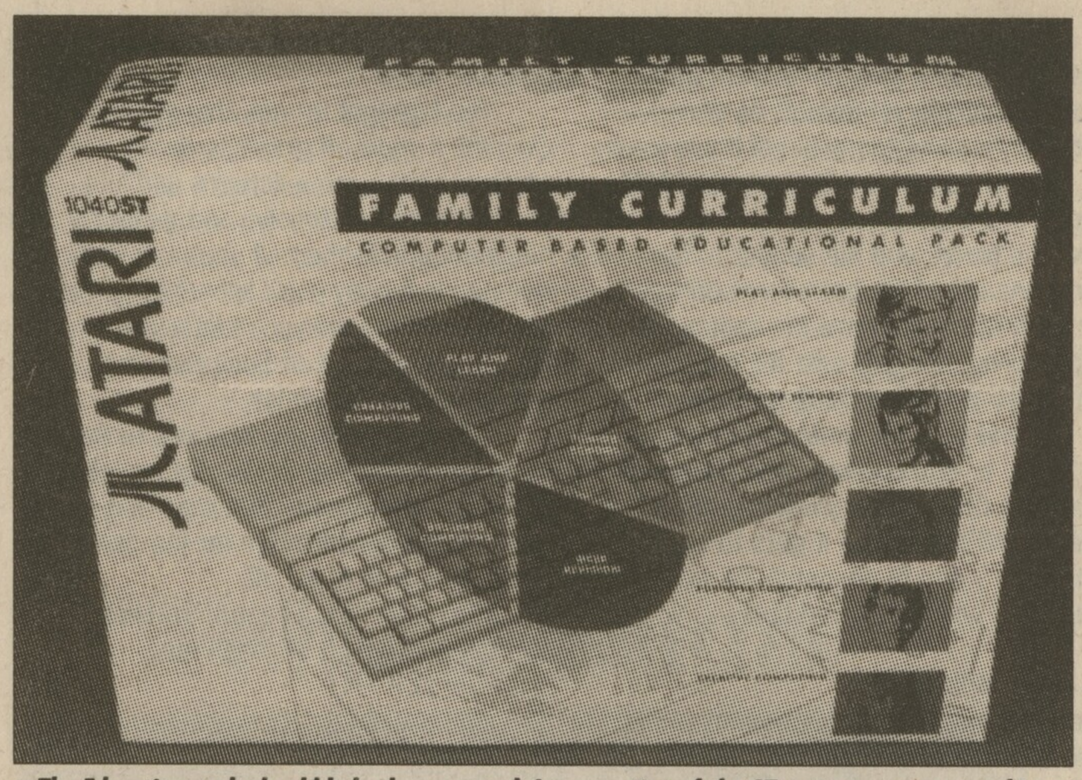
All ages of the family have been targeted, from "preschool" infant to the "suddenly four hundred quid worse off" parent. Much of the software has been specially written for the pack, with words like "national curriculum" bandied liberally about. A marketing move like this can only be of help in ridding the educational establishment of its unhealthy obsession with Acorn and Research Machines hardware.

The two new machines will offer a new challenge to Atari. Bob Gleadow, Atari's managing director, called the Stacy a "confusing disaster", so he must be pretty sure that he can sell these computers to the right market.

The ST Book looks great on the specifications sheet. Its A4 footprint, built-in hard drive and proliferation of ports and sockets could breath new life into a staid laptop computer market. Atari has not announced a price point for the Book yet so I wonder whether it is planning to try and undercut the other laptop manufacturers.

The ST Pad is a different matter entirely. Gleadow claims that the machine will be aimed at those who, "don't want to become computer literate".

This is certainly an untapped market. If the price point is right and if people with "techno-fear" can be convinced to part with some hard earned cash, then Atari is onto a sure-fire winner. The Pad will also appeal to ST/STE/TT owners who could interface the two together.



• The Education pack should help change people's perception of the ST as just a games machine.

At last the Mega STE has been launched in this country and the pricing is excellent. A Mega STE 1 comes with a high resolution monitor, but no hard drive, for a reccommended retail price of £688.85. This makes the Mega STE the perfect home business or mid-range home computer available.

It's good to see that Atari has dealt with the problems of the STFM/STE. The new TOS is great, the keyboard has a chunky professional feel to it and the whole unit looks great. Let's hope that some software starts appearing which takes advantage of the processing power of the STE range.

INSPECT A GAJIT

Gajits Music Software is a company which specialises in low cost ST MIDI software. Its latest package is aimed at harried musicians stuck for inspiration.

The *Hit Kit* helps you to create drum tracks, bass lines, arpeggio patterns or (if you're really stuck), complete pieces of music. Gajits reckons that the program "speeds up" music composition, though there are some people who would argue that programs like this de-humanise the whole song writing process.

Hit Kit can operate in a wide range of styles. Blues, disco, house, reggae,

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TRADE ENQUIRIES WELCOME

Latin and ,erm, ballad styles are all catered for and the program requires (and I quote) "little musical knowledge".

So if you need some help with those funkadelic beats and those groovy rhythms why not contact Gajits on 061 236 2515 or write to the company at I-Mex House, 40 Princess Street, Manchester, M1 6DE.

ULTIMATE PD?

With so many public domain companies vying for your three quid, they have got to do something pretty different to make an impression. Gunning PDL thinks it has the answer. It has bundled all the best PD together on four disks and is flogging the lot for a meagre £5.99.

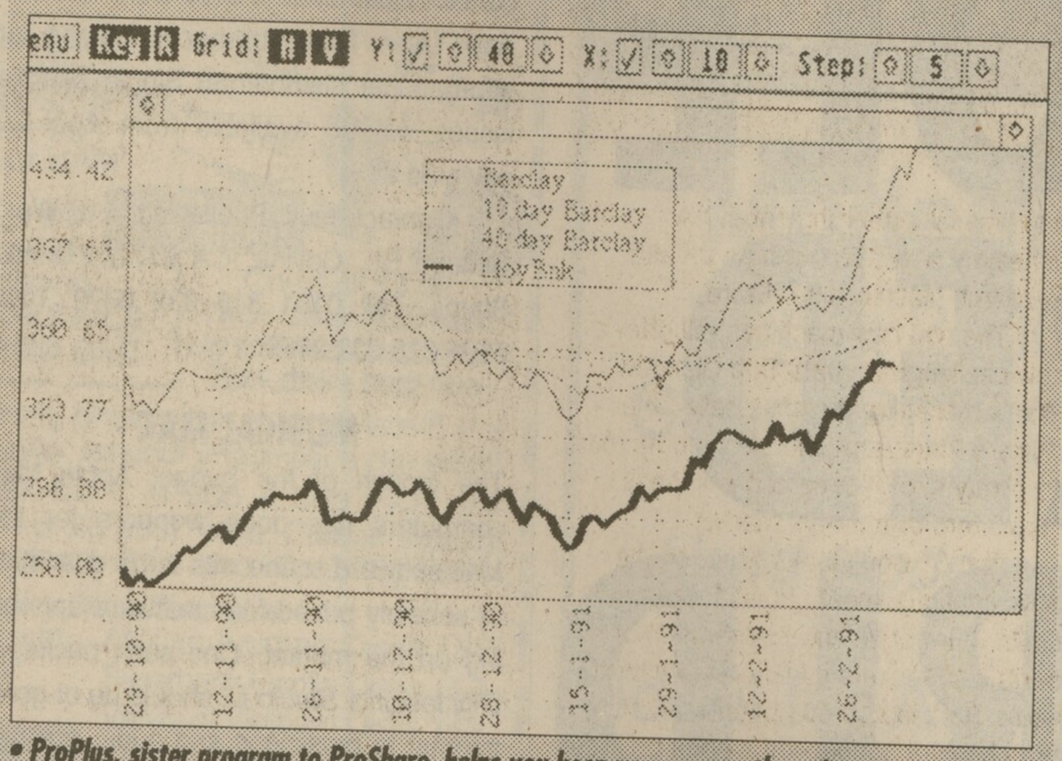
All aspects of computer use are covered by the collection. *Neochrome Master* and *Audio Sculpture* provide are just about the best PD art and music programs around and they constitute the contents of one disk. *ST Writer Elite*, *Vanterm* and *Opus 2.2* are included on the other disks. Basically there isn't a duff program in the pack.

If you are new to PD, or the ST in general then the *Ultimate Collection* offers excellent value for money. In fact many of these programs are better than expensive full price programs. *Vanterm*, for example, is quite simply *the* best comms program around.

Gunning PDL is at 47 Auchingane, The Tryst, Edinburgh, EH10 7HX, telephone 031 441 7952.

Andy Hutchinson

CHART YOUR SHARES



• ProPlus, sister program to ProShare, helps you keep your eye on those important markets.

Just about the best share portfolio package for the ST is *ProShare*. The program enables you to keep track of all those water, gas and Polly Peck shares that you've purchased on Aunt Daisy's bequeath.

Now TC developments has just released a sister program for *ProShare* which goes by the name of *ProPlus* (and there I was thinking that *ProPlus* is an exam aid).

***ProPlus* is a charting and analysis module which uses data from *ProShare*. The program can plot up to 84 lines on a chart. Company prices can be "bolted" together to form a single line on the chart and a Golden/Dead cross analysis section enables you to scan all loaded companies for that perfect buy/sell-very-very-quickly point.**

GDOS is fully supported, enabling you to knock up a chart for use at the next share holders meeting and history files on companies can be loaded or saved. The package costs £24.95 and is available from TC Developments, PO Box 15, Wetherby, West Yorkshire, LS22 4ZE, telephone 0937 581145.

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WHOLE WIRED WORLD

In our regular jaunt around the world of computing, Steve Gold discovers a free Atari magazine, two new baud standards, musical Macs and much, much more.

FREE ATARI MAGAZINE

Quill Publishing, the Californian publishers of *ST Journal Magazine*, has replaced the magazine with *Atari User*, which it claims is the first and only free Atari-specific computer magazine.

The company plans to distribute *Atari User* free of charge through Atari dealers, computer stores and computer software outlets on an international basis. To encourage more outlets to stock the magazine Quill will allow certain dealers to charge $1 an issue, with all the profits from sales going straight to the stockists.

Mail order subscriptions to *Atari User* will cost $12 a year, with 12 monthly issues mailed to subscribers ahead of the magazine's general release in the US. Quill says that *Atari User* will cover the entire Atari product range, including the ST, STE, TT, Mega ST and STE series, Portfolio and Lynx computers. There will even be coverage of the Atari 8-bit computers despite the fact that these machines are obsolete.

Atari User's editor-in-chief is a well-known (in the US at least) computer journalist called John Nagy, who promises that the magazine will focus on facts that will make it easier to be an 'Atari User'.

"Every month we will try to cut to the meat of what is happening, what is available, what it can do for you and how to get it," he said. "And we'll do it fast, with less than two weeks between final edits and distribution. Our concept and goal is to be your standard monthly reference for all Atari interests – at a price *Atari Users* can truly say is power without the price – free."

The first issue (May, 1991) of *Atari User* is due for release in the US on April 15 and the first print run will be 30,000. Atari dealers and user groups should contact Quill direct if they want to stock *Atari User*. The publisher is looking for international distributors. Single sample issues will be available from April 20 onwards at $1.

Contact; Quill Publishing, 113 West College St., Covina, CA 91723, United States. Tel: 0101 818 332 0372. Fax: 0101 818 332 2869.

MUSICAL MAC

The launch of the budget Apple Mac computers has done wonders for the Mac software scene with large quantities of sensibly priced Mac software appearing on the market. One such package, Digidesign's *Studio D,* should be of great interest to musicians and audio enthusiasts. The $995 package turns the Mac into a MIDI and digital audio mixing console which the company claims is as good as a dedicated system costing 10 times the price.

The system requires an Apple Mac II with a hard drive, Digidesign's Samplecell playback card for the Mac and a black boxdeck that does most of the switching and mixing. The Samplecell is a 16-bit playback card that comes with a 630Mb sound library disk. The black box is actually a four-track digital recording system that can be driven by the Mac.

Using the system Mac owners will be able to import a MIDI file created by any MIDI instrument and then mix it interactively with other audio sources. Extra modules can be added to boost the number of digital tracks beyond four.

Contact: Digidesign, 1360 Willow Road, Suite 101, Menlo Park, CA 94025, United States. Tel: 415 688 0635.

TWO NEW BAUD STANDARDS

After months of soliciting proposals, the CCITT, the international communications regulatory body, has formally adopted two new standard recommendations called V.17 and V.32bis.

V.17 is a new modulation system that supports 12,000 and 14,400 bits per second (bps) trellis-coded modulation for the V.29 fax modem standard. The V.29 system uses 9,600 bps half-duplex transmissions. Fax machines with the V.17 standard should be available shortly. V.32bis, meanwhile, is an extension of the original V.32 standard which dates back to 1984.

The new standards add 7,200, 12,000 and 14,400bps transmission speeds to the 9,600bps seen on V.32 modems. A key feature of V.32bIs is a system called Rapid Rate Renegotiation (RRR) which allows V.32bis-compliant modems to renegotiate their data transmission speed (up or down) in just 0.1 of a second.

MAC BOSS MOVES ON

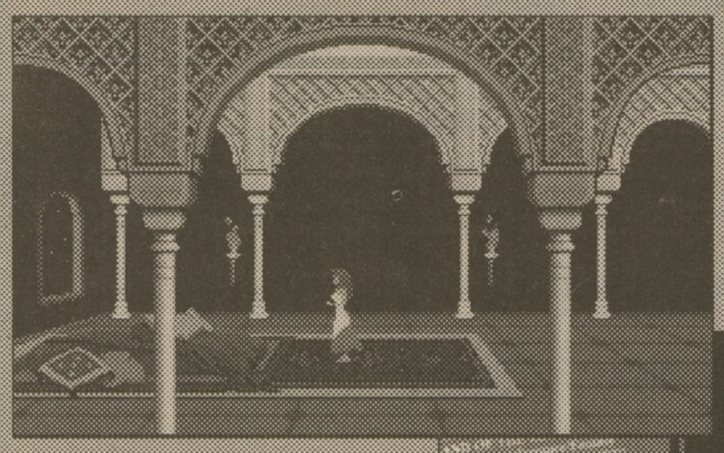


• John Sculley is set to concentrate on breakthrough projects.

John Sculley, credited with guiding Apple into developing and releasing the trio of budget Macs unveiled last October, has officially handed day-to-day control of the company's Research and Development division to Mike Spindler, the company's chief operating officer.

Sculley, Apple's chief executive officer, intends to concentrate on a few projects that he thinks could lead to potential breakthroughs for the company. According to US newswire reports, Sculley is particularly interested in stylus input notebook computers which can also link into mobile communication networks, as well as interactive CD-ROM visual applications. ■

US GAMES SOFTWARE COMPANIES TO MERGE





• Could* Leisure Suit Larry *meet the* Prince of Persia *now that Sierra and Broderbund have merged?

Two popular names in the US games software industry, Broderbund and Sierra On-line, have announced plans to merge their respective operations.

Under the terms of the proposed agreement, Sierra, which has 3.6 million shares outstanding, will issue 4.1 million new shares of common stock in exchange for all of Broderbund's outstanding shares. When the deal is completed Broderbund will become a wholly-owned Sierra subsidiary and the consolidated company will be renamed Sierra-Broderbund. The transaction is subject to the approval by both companies' shareholders, qualification for treatment as a pooling of interest, negotiation of a merger agreement and other contingencies.

Ken Williams, Sierra's chief executive officer, will assume the title of chairman, president and chief executive officer of the new company, while Doug Carlston, Broderbund's chairman and chief executive officer, will serve as president of the subsidiary.

So what does this mean to users of the company's software? Initially not a lot, but since both companies have some interesting software ideas, it's a fair bet that by pooling their resources, the new company will produce some nifty software later this year!

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ST 238R	RLL	32Mb	65ms	£140.00
ST 251-1	MFM	42Mb	28ms	£160.00
ST 277R-1	RLL	65Mb	28ms	£180.00
ST 2125N	SCSI	110Mb	18ms	£465.00
ST 2274A	IDE	240Mb	16ms	£795.00

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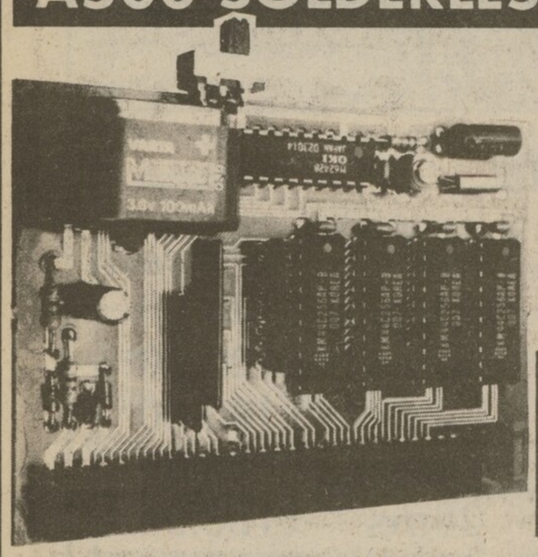
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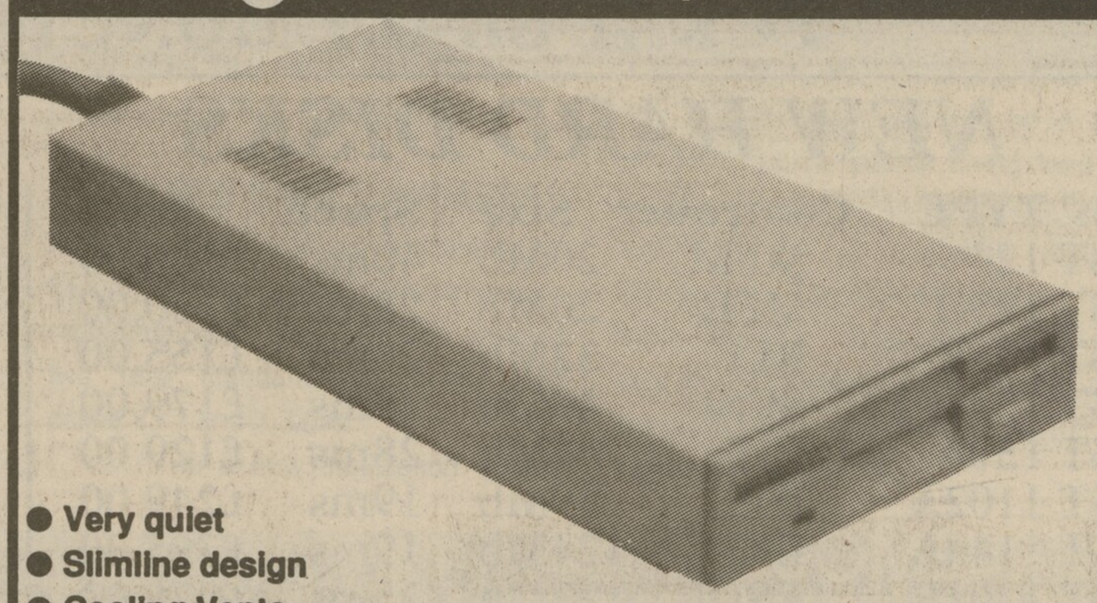
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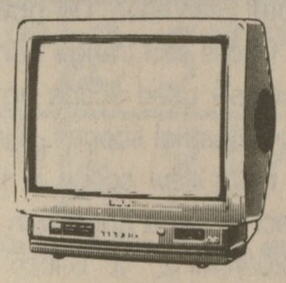
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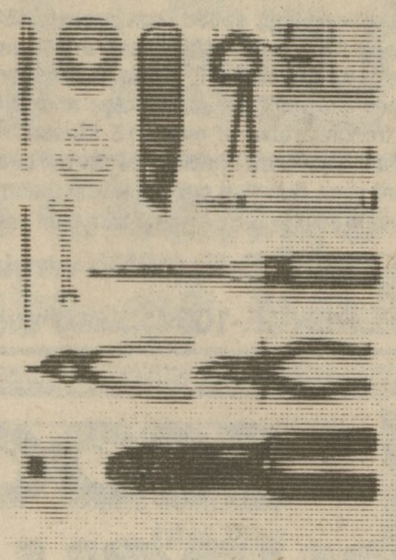
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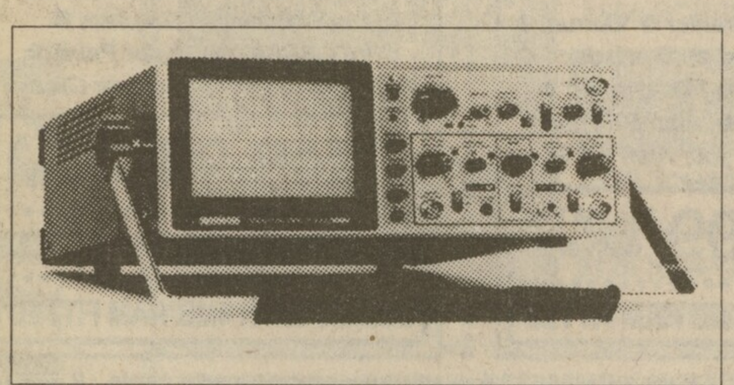
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CIRCUIT CITY



An oscilloscope is top of the list as the most desirable piece of test equipment. Keith Pomfret looked beyond the electron beam to see what you get for your money.

Every science fiction film has a couple of oscilloscopes dotted around the mad scientist's laboratory and there's something compulsive about the green trace that makes the human heartbeat more urgent in the emergency ward.



• The Hitachi V222 oscilloscope. Worth saving for.

DYNAMIC DISPLAY

Essentially, the oscilloscope is a dynamic tool that lets us know what is going on 'now' in a visual way. The display of an oscilloscope changes as the input varies and it makes the ideal tool to monitor the changing condition of a piece of equipment.

The display of an oscilloscope is generally by a cathode ray tube similar to that in a monitor or TV only generally smaller in size. Some current scopes have a liquid crystal display screen, but the affordable ones are generally CRT.

There's more to an oscilloscope than a simple display, though, and it's the way that the signal is processed that makes it such a clever and useful piece of kit. Two sets of electronic plates (X and Y) within the display tube control the trace on the screen. in order to display anything other than a dot there has to be some way of controlling the trace on the screen. This is done with timebase generators that control the X plates by means of an amplifier.

The timebase generator produces a sawtooth (or forward ramp) wave and the duration of the ramp determines the sweep across the screen of the trace at a constant speed. As the beam reaches the right side of the screen it is electronically shuttered for the period of flyback to the left side. This stops any potential confusion caused by the returning beam.

The input to the oscilloscope is fed to the Y amplifier and this causes the trace to move vertically as well as the horizontal movement caused by the timebase generator X.

Therefore on the screen, the X axis is time and the Y axis is signal strength.

By varying the sensitivity of the inputs an oscilloscope can be made compatible with many different kinds of and levels of signal. A simple task to use an oscilloscope for is viewing waveforms although it would be a waste of a good instrument if you only used it for that. An oscilloscope can serve many functions in the measuring of signals and their timespans.

In order to help with this, the front of an oscilloscope's display is fitted with the grandly named graticule. A graticule is the printed hatch pattern on the face of the display that makes it possible to align the trace with known points and make approximate calculations about the nature of the input by the position and range of the trace on the graticule.

With a wave or signal that repeats it is easy to work out the frequency from the visual clues provided by the trace on the screen and the calibration on the graticule. most are calibratyed in 10mm increments.

There are two sorts of display in common use. These are medium and long persistence tubes. In a medium persistence tube, the trace remains on the screen for a short while after passing a point. On a long persistence tube, this duration is much longer and more suited to viewing slower moving signals.

Some scopes are equipped to display both sorts of display and show them as different colours to help the user determine which is the appropriate signal to look at. A synchronisation circuit makes it possible for the display window to synchronise with the same point on the wave trace of each screen display so that in a fast moving display, the waveshape on the screen matches previous traces. This makes reading the display simpler and stops the possible blurring effect caused by lack of synchronisation.

BUYERS BEWARE

If you're planning to buy an oscilloscope, it's worth working out a specification before you buy. The most noticeable and one of the most important factors when buying a scope is the size and clarity of the display. Here we come to one of the most contentious points about buying a scope, new or previously used.

There seems to be a plethora of ex military and ex laboratory equipment on the market at the moment. If you are buying second-hand or from an auction or the like, be sure to see the equipment up and working before you buy. Remember that oscilloscopes get used for repetitive tasks and it could be that the tube is burnt or damaged.

Portability can be a consideration too. If you need a scope to use on the bench, the weight and size shouldn't matter, but if you intend to use it in the field, some of the lumpy battle-equipped military models will probably be a little on the heavy side.

Most portable oscilloscopes seem to be of the 20MHz type. This means that 20MHz is the maximum frequency that the instrument can respond to. 20MHz is generally suitable for most tasks. Don't be fooled into buying a scope with a very low frequency response just because you think that you're only going to be working on low frequencies.

THE RIGHT WAVE

A simple example of why this could be problematic is sound. The human ear can hear up to about 20KHz and you might be forgiven for thinking that if your job was purely working on sound, a scope with a frequency response of say 25KHz would be right for the job. Not so. As well as the fundamental frequency, different waveforms have different harmonics. A pure sine wave sound resonates with its fundamental frequency but a sawtooth wave has noticeable resonation at up to the tenth harmonic. This is many times the frequency of the fundamental note. Thus, if you are looking at a sawtooth wave at 17KHz the total frequency trace will be well into the 100s of KHz.

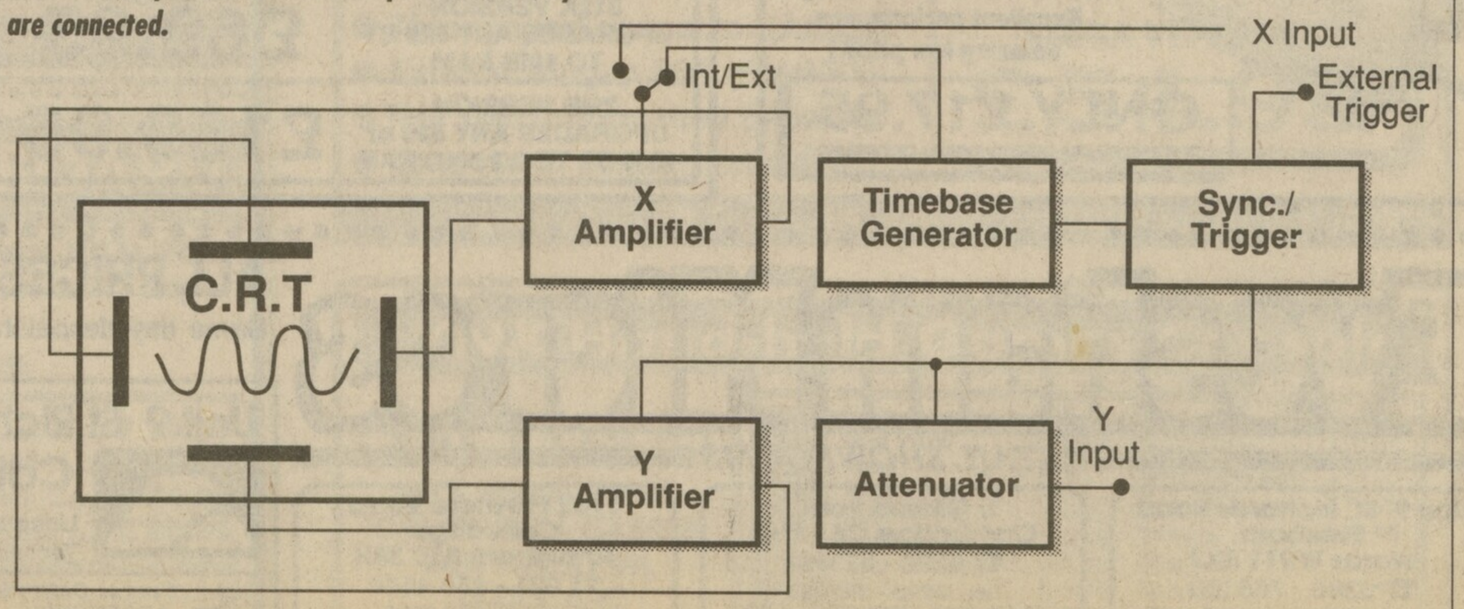
Another useful thing to look for is a twin input twin beam format that allows the comparison of two discreet signals on the same screen. This is ideal if a test signal is available and an implemented signal must be matched with it.

Other things to look for are extras provided with the scope. Most scopes come with a set of leads with probes and/or crocodile clips on the end. Facilities for testing components and logic circuits exist and some scopes even have DC power outputs

Prices can trange from about £75 for a reasonable previously used scope up to many thousands for high spec industrial scopes. A reasonable price to expect to pay for a new scope is £300-£400. For this you can expect to get a good twin beam scope wit a bandwidth of 20/40MHz, a 6-inch display and sensitivity of 1mV/div.

Falling into the above category are a couple of scopes from Hitachi. We'll be taking a look at the Hitachi V222 on the Circuit City testbench. First impressions suggest a worthy piece of kit. Hitachi can be contacted on 081 202 4311. ■

• The mains parts of an oscilloscope and how they are connected.



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Please check the configuration of your machine with our staff before ordering any upgrade and have your machine open when you phone. All upgrades/repairs carried out by our service centre carry a 90 days parts and labour guarantee. Our service centre can repair/upgrade any ST, Amiga. Please phone for repair/upgrade charges. Please add £1.50 P&P for upgrades priced under £100.

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TECH TIPS



Open University proving quite a challenge? Need to make your computer communicate? Know a useful program? Send your stories and queries to Keith Pomfret, Tech Tips , New Computer Express, 30 Monmouth Street, Bath BA1 2BW.

■ OUCH! Careful!

To reduce the danger of computer crashes from mains surges, an inexpensive option is simply to fit a Mains Transient suppressor inside each 13 amp plug. The two wires can be easily fitted into the live and neutral connections alongside the mains wiring. PVC sleeving should be put on the naked wires to prevent shorts. These devices are available from Maplin at 48p each (order code HW13P).
Dave Henniker, Edinburgh

And that's very well if you're a wirehead who knows what he's doing, but messing with the 240 volt end of anything is the fastest way to order your own personal embalming fluid.

Unless you have a death wish, leave messing with mains to the experts. It's only a matter of days since a so-called project arrived at *Express* with a plug wired with the mains power to the earth. I mention this only because the project came from an expert who had made a simple soldering mistake when he was tired. If that can happen to an expert, imagine what fried people could be served up by an amateur attempt.

If you have to ask yourself how or why, don't attempt it. There are much more efficient ways to protect your kit from mains surges which may cost more but do a better job without you having to mess with the mains.

■ UNIVERSITY! Challenge

I am now working on the Open University M205 Computing Course and, after all the earlier anxieties over the suitability of this humble Commodore PC-1, it has been a relief to find that the p-System is quite at home with the small program segments used for programming and debugging practice. It is thanks to the work done by the OU team that the software will work on a minimum specification machine like this and so does not exclude those who might only be able to afford an Amstrad PC1512 or similar IBM compatible.

The fact that all is well for the time being is a great help: it allows plenty of time to look for an Upgrade PC along the sensible line you recommend. And it must be VGA or nowt. I think this also applies to the plethora of portables that have appeared on the scene, many with peculiar super-twist screens or even just CGA. And here for once Amstrad seems to have set the standard with its fine ALT machines. One of these offered with a "free" Canon BJ-10e Bubblejet is the latest ploy in many shops – almost irresistible to anyone with £1,500 to burn and the need to word process on the move or calculate in corners – or more likely to show off to their friends!

Meanwhile, learning how to do Top-Down Design involves using the computer attached to my neck (a single chip old model with Parallel Inputs called ears and eyes), an A4 pad and word processing biro with built-in 200,000 word spelling checker. The only present I've bought myself is a Citizen CT-600 calculator from Dixons. They were using it for working out customer accounts, so that was recommendation enough – the main reason is the big keys and the replay and check facilities. It is a great help for working out a few steps in a Trace to test that a program with maths calculations is working correctly. In programming there is no substitute for a brain. Even a Super 486 can't make up or the lack of that.

Do you think the Amiga CDTV will be a great new asset and worth waiting for? At under £400 it sounds interesting. Without Ken Garroch in the vanished "Popular" your columns are really much needed by all of us. Thank you.
John Gray, Eastbourne

And thank you for taking the trouble to forward all of that information useful to Open University students. It's good to get a letter relevant to OU computer users. We get a lot of letters from OU students and potential OU students and I've no doubt that they'll enjoy your illuminating prose.

I do think that CDTV is worth waiting for (although Commodore take note, we are a little peeved at the length of the wait) and thank you for your compliment. By the way, I hear that Ken is still pumping out the prose for some techie programmers mag. Keep your eyes peeled for that famous face ... but I'm not telling you where. That's Ken's secret.

■ Help! Modem

I recently bought a second-hand modem, a Datel 4122ACX. Yes, you've guessed it; there's no manual! It has LED's marked PSTN, RFS, TD, RD, PC and TEST. There are switches marked AL, ST, RDL, DL, AA,

■ POOLS! Table

Re Trevor Cobbe's letter in New Computer Express. Hope the following is of some use.

100 'choose them:Mallard basic (under CP/M Plus for the ZX Spectrum +3) ,Gordon Roberts

```
120 INPUT"How many Nos";h:RANDOMIZE
150 DIM a(h) ,b(h):PRINT"Choosing"
200 FOR n=1 TO h
220 a=INT (RND*59)
250 FOR m=1 TO h
260 IF a=a(m) THEN 220
270 NEXT
300 a(n)=a:b(n)=a
320 NEXT
350 '"insertion" sort (Chris Oliver via OUTLET, Spectrum drive maga-
zine)
400 PRINT"Sorting":FOR c=2 TO h
410 d=c-1:b=b (c): a=a(c)
420 IF b>a(d) THEN 450
430 a(d+1)=a(d):d=d-1
440 IF d THEN 420
450 a(d+1)=a
460 NEXT:FOR n=1 TO h:PRINT a(n):NEXT

100 INPUT "How many Nos?";h
120 REM choose them(Spectrum basic,Gordon Roberts)
150 DIM a(h): DIM b(h): PRINT "Choosing"
200 FOR n=1 TO h
220 LET a=INT (RND*59)
250 FOR m=1 TO h
260 IF a=a(m) THEN GO TO 220
270 NEXT m
300 LET a(n)=a: LET b(n)=a
320 NEXT n
350 REM "insertion" sort (Chris Oliver via OUTLET, Spectrum drive mag-
azine)
400 PRINT "Sorting": FOR c=2 TO h
410 LET d=c-1: LET b=b(c): LET a=a(c)
420 IF b > a(d) THEN GO TO 450
430 LET a(d+1)=a(d): LET d=d-1
440 IF d THEN GO TO 420
450 LET a(d+1)=a
460 NEXT c: CLS: FOR n=1 TO h: PRINT a(n): NEXT n: GO TO 1
```

Gordon Roberts, Cumbria

And that is without a doubt the last pools number generator that I intend to publish. However, if someone can take it a single step further and add prediction to number generation, I'll sit up and take a bit more notice. Other than the computer person matching program that someone asked for last week, I think a pools (or Grand National) predictor that guaranteed success would be popular addition to the *Express* office software collection.

TELE, DATA, PSTN and SYNC. There are phone sockets marked TELE, PC and PSTN and the 25 way D-socket is labelled DTE.

I swapped the small PC D-type plug for one to fit the modem socket on my ST, copying the wiring of the DTE 25 way D-type plug but with the positions of the RTS/CTS and Transmitted Data/Received Data reversed. I plugged a phone into the TELE socket, connected the PSTN socket to the phone line, pressed the PSTN switch in, dialled a BBS number and hung up when I heard a tone. I hoped the PD soft ware (from an *ST Format* cover disk) would connect me, but no luck. I have tried the switches in various combinations. The TELE and DATA switches are non-locking and come out when not held in.
Dave Henniker, Edinburgh

If anyone out there has the same modem or knows how to make it work with an ST, your help would be appreciated. In the meantime, if the modem came with a PC connector, replace that and try it with a PC and PC Comms software. If you have a helpful computer shop nearby, they should be glad to help you. If the modem works with a PC, then it's a matter of connections. If it doesn't, then you'll have to wait for some kind soul to write in with the necessary

■ HELP! CAD on the cheap

I want to get into computer aided design but I've no money. At a recent show I was horrified to find out that it's easy to spend over a thousand pounds on the software alone. My budget is closer to £15 so I will have to settle for a book on the subject. What do you recommend?
Andrew Whittaker, Hull

Computer Aided Design on a Shoestring by Ian Sinclair sounds like the sort of book that you're looking for. Take a stroll along to your bookshop and order it using its ISBN number of 0-632-02565-4. It should be a veritable source of inspiration as well as a good template toward economical design work using your computer

■ HELP! Portastudio

Is there such a thing as a dual purpose Portastudio that takes normal multi-track recording and also MIDI. It seems like a great idea but I can't find one.
Michael Field, Horsted Keynes

You haven't been looking very hard then, have you? A walk around the northern music show recently showed at least a couple of manufacturers offering conventional recording equipment with the facility to record MIDI codes on a track.

TASCAM produces the 688 MIDIstudio which is a multi-track recording machine using standard cassette tapes. The 688 offers eight track recording with mix and bouncedown facilities and allows the 'striping' of a MIDI code on track eight.

The downside is a £2,000 price tag but you get what you pay for. A multi-track recorder that will take analogue licks and MIDI data while using standard cassettes has to be a bargain at a couple of grand. By the strangest of coincidences, the 688 landed in the *Express* office recently. It's been out and about getting checked out by a couple of professional muzos and their verdict will be coming to *Express* soon.

If you'd rather have a reel to reel machine and you'd like something that will interface with an ST and allow you to control it from within your sequencer package, there's a rather tasty package from Fostex. Now if that nice Mr Fostex will please send me one to play with ...

■ HELP! Word Processor

My PCW 8256 is annoying the hell out of me. I bought it because I am an author and wanted to replace my aged typewriter. The shop sales person said that the PCW was the only dedicated word processor but neglected to tell me that it was compatible only with other Amstrad offerings.

A publisher that I work for on a regular basis is now insisting that I get a PC or use a WP package that is easy to import onto a PC. I got involved in comms for a book that I was helping to write and have a Pace Linnet modem. I understand that the publisher also has a modem and wonder whether a telephone link could be the answer (and save me a £50 train trip each draft). If the phone link won't do, what will?
Frances Staunton, Maryport, Cumbria

The telephone link should do the trick. Your Pace Linnet is a Hayes compatible modem and if your publisher has a similarly equipped modem, it should be as simple as a couple of commands (ATa and ATd). The modem manuals should explain the use of Hayes commands to get connected and the comms software that you are both using should have instructions for file transfer.

If your publisher has a manual or non-Hayes modem you should still be able to get on line together following the instructions supplied with both of your modems. If you don't want to go to the trouble of making a connection, you could find a friendly bulletin board or on-line service and leave the files in an electronic mailbox addressed to your publisher for retrieval at his convenience.

One thing you must remember is that the file you produce on your PCW word processor must be readable by your publisher's PC software. The most common sort of text file is ASCII and most word processors can read an ASCII file. The word processor that came with your PCW is *Locoscript* and it's a simple matter to produce ASCII files from *Locoscript* files. If you aren't using *Locoscript*, the chances are that you are using *Protext* which can also turn out ASCII files. You may like to tell your publisher that both *Locoscript* and *Protext* are available for the PC.

■ HUBBLE! Bubble

In response to a reader's enquiry, in *Express* 118, regarding arrays, I enclose the following:-

1) A pseudo-code algorithm for a Bubble Sort. This should enable your readers to implement the algorithm in their favourite language (this is one of the more well-known sorting algorithms and quite adequate for small applications).

2) An implementation of the above algorithm in GW-BASIC (since this is widely available and easily translated into other dialects of BASIC).

I hope the above proves useful.

I enjoy *New Computer Express* a great deal as I program more than one type of computer. Keep up the good work.

```
BEGIN BUBBLE-SORT
   Move 1 to SWAP-COUNT
   Move NBR-ENTRIES to LAST-LOC
   DOWHILE SWAP-COUNT > ZERO
      Move ZERO to SWAP-COUNT
      Subtract 1 from LAST-LOC
      Move 1 to START-LOC
      Move 2 to NEXT-LOC
      DOWHILE START-LOC <= LAST-LOC
         IF full array key (START-LOC) > full array key (NEXT-LOC)
         THEN
               Move full array entry (NEXT-LOC) to SAVE-ENTRY
               Move full array entry (START-LOC) to full array entry (NEXT
LOC)
               Move SAVE-ENTRY to full array entry (START-LOC)
               Add 1 to SWAP-COUNT
         ELSE
               Continue
         ENDIF
         Add 1 to START-LOC
         Add 1 to NEXT-LOC
      ENDDO
   ENDDO
END BUBBLE-SORT

LEGEND: NBR-ENTRIES      = The number of entries in the full array
            START-LOC          = Starting location for the current pass
            NEXT-LOC             = Starting location plus one
            LAST-LOC           = Limit for the current pass
            SWAP-COUNT       = Number of swaps or exchanges
```

```
type junk.bas
10000     REM
10001     REM LOAD and SORT an array of Random Numbers
10002     REM
10010     DIM Array%(100)
10020     REM
10021     REM Load array
10022     REM
10030     FOR Loop% = 1 TO 100
10040           Array%(Loop%) = INT(99 * RND + 1)
10050     NEXT Loop%
10060     REM
10070     SwapCount% = 1
10071     LastLoc% = 100
10072     WHILE SwapCount% > 0
10073           SwapCount% = 0
10074           LastLoc% = LastLoc% - 1
10075           StartLoc% = 1
10076           NextLoc% = StartLoc% + 1
10077           WHILE StartLoc% <= LastLoc%
10078                 IF Array%(StartLoc%) <= Array%(NextLoc%) THEN 10083
10079                 SwapVal% = Array%(NextLoc%)
10080                 Array%(NextLoc%) = Array%(StartLoc%)
10081                 Array%(StartLoc%) = SwapVal%
10082                 SwapCount% = SwapCount% + 1
10083                 StartLoc% = StartLoc% + 1
10084                 NextLoc% = NextLoc% + 1
10085           WEND
10086     WEND
10090     REM
10091     REM Display SORTED Array
10092     REM
10100     FOR Loop% = 1 TO 100
10110           PRINT USING "###¡   ##" Loop %,  ".", Array%(Loop%)
10120     NEXT Loop%
32000     REM
32001     That's all Folks....
32002     REM
32767     END
```

I've no idea at all who the bubble expert is because the name somehow got removed by the copy typist's scalpel. If the chap or chappess responsible for the program above would care to drop me a line I'll send them a Scetlander "I've seen Maggie" badge (and on the Tech Tips budget and with the price of solder that's about all that I can afford.)

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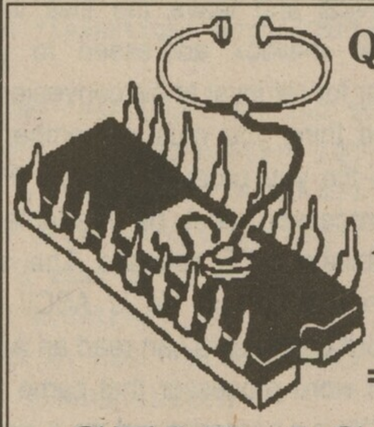
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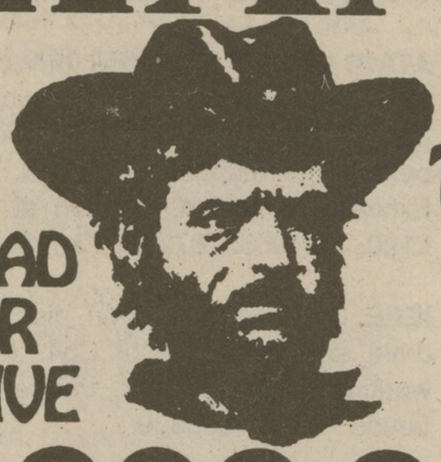
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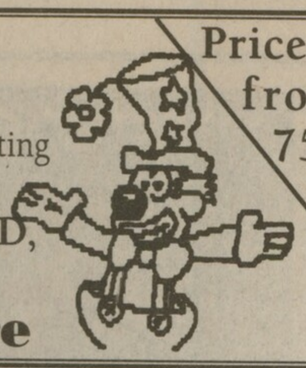
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520 STE, Dust cover, Power Pack, Sim City, Shadow Warriors, Golden Axe, Kick Off 2, Exc Cond. £310. Phone 0942 873838.

OKI Micro line 321 printer for sale, unwanted gift, excellent condition, still boxed, output 300 cps draft, 62.5 CPS NLQ. IBM/Espson compatible rrp over £500. Sell for £295 ono. 091 **128K** Spectrum with joysticks,

VIGI Plus PC-AT, 80286 processor, 5.25" 360K FFD, 30Mb HDD, Paper white HR monitor, HGA, as new condition full O.U Spec, all manuals, MSDOS 3.3, GW Basic, £850. Tel 051 426 3251.

STAR LC10 II Dot matrix printer. Less than one year old. Boxed, perfect condtion £115 for quick sale. Ring Gavin 0602 817198.

CX5M YAMAHA music computer, MSX with full size music keyboard, Midi, stereo output, DX7 voicing software vgc. £100 ono. (0273) 477080.

MINIGEN for sale. Unwanted present yours for only £60 inc P&P. Ring 0670 855371 after 6pm.

520 STE disk drive £200 of software, joystick, mouse, disk box, spare discs £275. Will consider Atari Portfolio, Cambridge Z88 in part exchange. Phone Keith 0245 72889 evenings.

AMIGA games for sale. All originals; ie Voyager, F-29, Dark Side, Mercenary, Imperium, Sim City, etc. Write to Room 503, Northampton Hall, City University, Bunhill Row, London EC1Y 8LJ for prices and list.

AMSTRAD GX4000 with Batman and Burning Rubber games. Unwanted present. Cost new £125 will sell for £80. Also Nintendo with Turtles game unwanted present £70. Mrs Bryant, 66 Mead Drive, Langley, Slough, Berks SL3 8HT.

ATARI ST PD collection 330 assorted single sided and double sided disks. £145 the lot. Phone (0734) 817621

CONTACTS wanted ! 99% reply to every. 101% to people famous from demo groups. Disks + lists to Mr. Burman, 41 Pinner Park Gardens, Middlesex, HA2 6LQ. Disks prefered.

VGA compatible entertainment shareware for A.T compatibles with mouse. Packed menu driven 1.4m 31/2" disks £6 each or SAE for details contact W. D. Owen, 9 Ithens Way, Sontley Road, Wrexham, Clwyd, LL13 7EG.

AMIGA games and PD cheap ! From Burmans PD. Almost all games under £10, PD for 40p. Disk and SSAE to. Burmans PD , 41 Pinner Park Gardens, Harrow, Middlesex, HA2 6LQ.

HISOFT power basic (Amiga) plus Hisoft Devpac (Amiga) £25 each or £45. The pair both originals. Phone 04023 81033 (Essex).

AMIGA music software, Datel Pro Sampler Activisions Music Studio, DR.T's Midi recording studio plus Eidersoft MM5000, octave keyboard £75 contact Graham Gee at weekend and evenings only. Tel. 0489 576232.

AMSTRAD 6128 colour disk drive multiface 2 tapedeck assembler games serious software Firware guides £300. o.n.o. Tel 041 7766755.

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Also available 50 P.O.V. Compact Demos -
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ROBOCOP II PACMANIA 1942 Demons 'n' drives, Cali games, Lost Patrol, 688 Attack Sub, all £12 except demons 'n' Drivers £15. Ring 0742 882677 ask for Matt all originals for Amiga.

ATARI STFM, teo MEG drives, 2 500+ games, sampler, £50+ magazines with disks, Abacus books, Blitz Turbo, manuals, etc. Joysticks, mouse, disks, P.D, worth £1200+ only £375. Tel (0742) 464613.

AMIGA games F29 Retailiator, Rainbow Island, Robot Monsters. £10 each or swap half MEG upgrade. Yamaha TX330 Hi-Fi tuner £50 o.n.o. All prices include postage. Write to, 34, Baghill Court, Pontefract, W. Yorks.

ATARI ST PD collection 330 assorted single sided and double sided disks. £145 the lot. Phone (0734) 817621

C128 Personal computer with tape, disk drive, modem, Star printer, expert cartridge and many tapes and disks. £500 or may consider splitting. Tel (0545) 580092 evenings.

FOR SALE CPC6128 advanced art studio disk + mouse interface, mouse mat + mouse. As new £25. Graham Porter, Eliot Ward, Ashworth Hospital, Maghull, Liverpool, L31 1HW.

ATARI 8 - Bit software and hardware. Disk drive, printer interface etc. Plus loads of software (some hard to find) Phone Simon 0243 575715.

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AMIGA games F29 Retailiator, Rainbow Island, Robot Monsters. £10 each or swap half MEG upgrade. Yamaha TX330 Hi-Fi tuner £50 o.n.o. All prices include postage. Write to, 34, Baghill Court, Pontefract, W. Yorks.

ATARI 520STFM upgraded to 1MEG memory and with double sided internal disk drive, plus some software (STDS, OutRun, etc.). Owner buying STE. £250. Ask for Keith on 0494 762793, evenings.

◆ GOODS WANTED

AMIGA PD wanted to swap, demos, utilities, graphics, music, anything really. Write to, Ian, 29 New England Road, Brighton, Sussex, BN1 3TU or phone, 0273 748695.

WANTED 1MG scanner for ST. Also pocket organiser. Mr Beed, 83 Seymour Road, Lee on Solent, Hants, PO13 9EQ.

TESTBOOM LTD Tel: 0695 571605
286 from £600
ST's CALL
Atari TT's available

WANTED portable computer, Tandy 102, Z88 or simillar. Mr Beed, 83 Seymour Road, Lee on Solent, Hants, PO13 93Q.

AMIGA Public Domain. Contacts wanted already, have many titles. Please write with disks to Shaun Hellyer, 114 London Road, Cowplain, Hants PO8 8HB.

WANTED Turbo Pascal Lightening, gamesworks and other routines, Matrix Layout, Autodesk Animator, any non working computer for my electronic studies. Tel. 0482 801632. After 4pm. Will collect.

ATARI Lynx wanted. Also Required Amiga outfit upto £800 offered. Seller must deliver in person. Tel. Bournmouth (0202) 297819 for details.

AMIGA P.D. large collection for all tastes. send 90p for latest catalogue on 3.5" disk - with loadsa free P.D. Chris Jackman, 3 Albion Terrace, Lexham Road, Litcham, Kings Lynn, Norfolk, PE32 2QQ.

WANTED Commodore pritner MPS 803. Contact A. S Sephton, 16 Bloemfontein Avenue, Shepherds Bush, London W12 7BL or phone 081 749 1454.

WANTED CBM Plus 4, mus be in working condition. Offered Sharp car stereo radio cassette with LED clock and frequency displya with flush mount speakers as new. Chris 0293 542395.

WANTED one working Gameboy with Tetris and connector lead £60 contact please! 29 The Diplocks, Hailsham East Sussex.

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● Adult Software also available ● * Disk must be supplied.
Send disk or 60p + SAE to:
19 Latimer Drive, Laindown, Basildon, Essex, SS15 4AD
or Tel: 0268 416888

WANTED Amiga Workbench printer drive for Epson GQ3500 laser printer (not HP Laserjet compatible). Contact Richard 091 4542436 between 5pm and 6pm.

AMIGA wanted price range around £300. Software wanted with computer but ok without. Tel 0222 512397. Also wanted cheap word processor and TV printer.

PROTEXT CPM + (registered) for Amstrad CPC6128 £30. Also second (FD - 1) drive £50. £60 together or part exchange for Protext Rom plus Rombo box Tel: Jan, after 7pm on (0795) 425519.

EXCHANGE wanted. STE/FM or Amiga system up to £350. Value for my August 1982 Cortina 1600. Worth £750 (£400 cash also required). 0695 32818.

AMIGA 500 Action Replay MKII, will pay £30 and P&P. Phone Southampton (0703) 434788. I have the codes for Lemmings, if stuck phone.

CONTACTS wanted to swap games, mags tips etc. Phone Newcastle 091 2687640 for a list no time wasters.

WANTED for Commodore Ped 4016 with 8050 drive, a disc or ROM based assembler also copy of Raeto West's "Programming the Pet/CBM". Tel 0702 343743.

AMIGA Sculpt 44 wanted for sensible price leave details on 081 4277072. Best price after seven days gets cash.

2MB SIMMS for STE wanted. Will pay up to £50 for pair. Phone Peter on 031 441 7952.

WANTED joystick and interface for Spectrum 48. Will pay £4. Mr Jones, 2 Town Mead, Oakford, Devon EX16 9EW. Tel 03985 438 also want cheap chess books.

GOOD Adventure + RPG contact wanted on the Amiga contact (B.S) The Droogs, PO Box 12, Malborough, Leicester LE9 5XG.

AMIGA librarian for synth models, Yamaha TG55, Kawai K1, also

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8 Berkeley Road, Hillingdon, Middlesex, UB10 9DU

PRICES: 1-9 DISKS £2.00 | BLANK DISKS: 10-49 65p EACH
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DEMO'S:
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DEM 004 The Cuddly Demo
DEM 014 The Definitive Demo
DEM 182 Union Intro Compilation
DEM 314 Shadow Digi Demo
DEM 245 Delirious Demo 2
DEM 326 The Run
DEM 335 Syntax Terror
DEM 262 An Cool's STE Demo
DEM 266 Automation Intro Comp
DEM 323 Galtan 6
DEM 308 Preditor Demo
DEM 325 Overdrive
DEM 333 Walker Demo 2
DEM 334 Decade Demo
DEM 340 The Zuul Demo

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SSP 025 J.M. Jarre Album Covers
SSP 027 Page 3 Spec 512 pics
SSP 024 Animals
SSP 060 Pin-Up Girls
SSP 076 Madonna Slideshow
SSP 109 Fractal Slideshow
SSP 106 Paradise Fantasy Pics

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UTI 023 Star Chart
UTI 025 Sozobon 'C' Compiler
UTI 027 ZX81 Emulator Files

★ Stockists of Atari ST PD. ★
THE FULL CATALOGUE WILL BE SENT FREE ON REQUEST. TEL: 0895 53521

WANTED. A book or books on machine code for the Commodore 64 computer. Tel. 48985 (Blackpool) between 6 and 8pm.

WANTED Z88 Eproms RAM software books etc, selling brother EP44, £40. Or swap for Z88. Stuff selling LZ64 with lots of bits. Phone for details. 0408 21870.

DEAD or broken QL, for spares or QL outfit. Tel. 0760 755402.

WANTED. super charger for STFM. Atari one MEG RAM, MsDos, IBM emalulator around £160. cash paid. Money waiting will collect if unit can be seen working. Phone 0272 607670 evenings.

WANTED. Manual for wordstar 4.0 or other books. Manual for Apricot XI PC. Also super writer disk for Apricot. Tel. 0473 271033.

AMIGA A500 wanted including a few games. Must be in good condition. Willing to pay around £230. Maybe pay more if includes 1/2 MEG upgrade. Phone 0932

222795. Afternoons. Ask for Philip.

SWAP eight full price Amiga 500 games for Amos the Creator. Will pay postage. Contact W. Graham, 131 Chapelhill Mount, Ardrossan, Ayrshire, KA22 7ND.

AMIGA contacts wanted, 100% reply guaranteed. Write to Mark Beck, 22 Tudor Close, East Grinstead, West Sussex, RH19 4SA.

ALL COMPUTER HARDWARE AND SOFTWARE WANTED FOR CASH OR EXCHANGE
NOTHING REFUSED!!
071 221 1075

WANTED by newcomer full word processor system. Consider all offers, including dealers also. Must be cheap. Psion Organiser items wanted Write to Charles Trager, 7 Grantley Street, Glasgow G41 3PT.

WANTED the original Colossal Cave Adventure. Any version - IBM 51/4" disk. Rory Wallace, Kilmore, Kilcock, County Kildare, Ireland.

OUTRUN or Turbo Outrun wanted for the IBM PC. Any disk size. Tel. 081 946 9384, evenings, or 081 942 8921, extu 2343 day.

ATARI 1050 disk drive wanted will pay good price or swap with 1MEG 31/2" Cumana disk drive, excellent condition. Ring Tony after

WANTED Amiga disk protection/ Encryption utility, Public Domain or other. Call Wayne on 0255 862205.

WANTED Amstrad internal disk drive 3" £25 ono. Ring 091 2674371 after 6.30pm (Steve).

WANTED "Bermuda Project" game for Amiga A500. Tel 0272 792605.

◆ SERVICES

SCANNING service. Up to A4 size scanned to Degas/ Neo Format. Photocopies preferable. Send disk +£2 for 1 - 7 images, 30p extra for more. Harry Milton, 1 Glendyke Road, Liverpool, Mersyside.

WANTED FOR CASH
We buy/sell P/X & repair IBM's, Amiga, ST, etc.Working or not.
DMR Electronics
0274 817889 or 881308

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ALL PRICES INCLUDE VAT AND POSTAGE
Available now our newsletters for either Megadrive or Gameboy. For your copy send a stamped addressed envelope stating version required. **We also do Gameboy Super Famicom and Sega Game Gear**

SPECTRUM. I will pay £2.50 if in good condition and complete. Write to Jake Warren, 11 Selden Road, Stockwood, Bristol BS14 8PS.

WANTED Atari 1050 disk drive must be in good working order. Write to Dean, 138 Towns Field Road, West Houghton, nr Bolton BL5 2NT. Also games wanted.

KICK OFF II (final whistle) If you are having trouble beating the computer, I can help. Send a SAE for details. Not enough room in this ad.

I NEED Steinberg Pro 24, C - Lab creator, Cubeat or passport MT - Pro. As I'm a music student. I can offeer £70 Pro 24, and £100 for the others. Phone Kevin. 0376 520247, anytime.

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- We reserve the right to amend or refuse reader ads at our discretion
- No pirated software may be sold through these columns. Any reader being offered non-originals should contact us
- We cannot guarantee that reader ads will appear in particular issues of Express
- The following declaration should be signed:

My advertisement conforms to the terms above and is legal, decent, honest and truthful

Signed _____

Tim Smith's CENTREFOLD

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(Virtuality: you can take it with you when you go)

OPENING TIME

An even slimmer Opening Time this week. The reason for this is that not a very great deal has been going on in the marvellously exciting world of the computer journalist.

The main thing which happened this week was receiving the latest review copy an IBM mainframe. IBM has a strange view of British office space and the computer is still stuck in the letter box. Anyway read on and enjoy.

TIPS AND HIDDEN SECRETS

1) Lotus 1-2-3 : Pressing ALT, DEL, CTRL, PAUSE, 1, 2, A, B, (, *, % simultaneously will do nothing for the *1-2-3* but it will improve your piano playing

2) WIndows 3: moving the mouse cursor to the top left of the screen while singing Ave Maria and hopping on one leg will get you at least three days off work.

3) *PGA Tour Golf*: playing the third at Avenel with a pitching wedge all the way will ensure that you don't get a better score than the boss.

4) Commodore 64GS: to avoid blurry, unpleasant images on screen, keep your finger away from the on-button

5) ALGOL: Giving an ALGOL program to someone else to write saves a great deal of time and energy.

6) 3-inch (yes 3-inch not 3.5-inch) disk drives are excellent places to keep old betting slips, Post-It© notes and other useful bits of paper.

WORLD'S FIRST INTELLIGENT AND SEXUALLY ACTIVE COMPUTER VIRUS DISCOVERED (SHORTLY AFTER LONGEST HEADLINE IN THE WORLD WRITTEN)

By our Intelligent and Sexually Active Computer Virus Correspondent Jerry U Salem

Dateline San Fernando CA. April 1991

While the world was looking the other the way a new and terrifying virus threat crept up behind it and struck deep. The FISAC virus is a terrifyingly new concept in viral infection and is aimed at PCs, Macs, STs, Amigas and C64s. Developed in Bulgaria by the infamous Cerisse Mask of Death crew, FASC was first sighted here at the San Fernando School of Chiropractice. FASC is said to do the following:

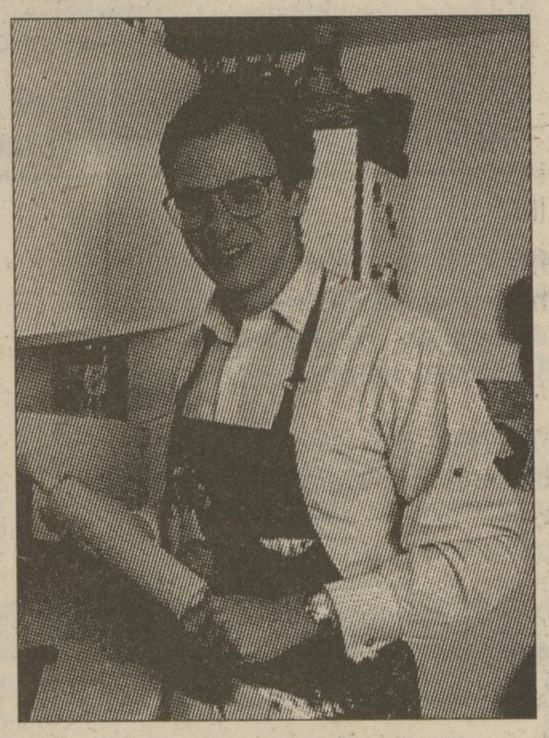
- Become sexually aroused at the sight of hex numbers
- Breed voraciously when confronted by Op codes
- Have deep discussions of the moral values of trashing hard disks before trashing hard disks
- Suffer deep depression after converting all sub-directory files into the lyrics of the Bulgarian national anthem
- Admire the lifeworks of Lloyd Grossman

FASC was designed by the Bulgarian secret service as an experiment in artificial intelligence. According to our sources at the Handsworth Bortsch Cafe, the virus went wildly wrong when one of the scientists working on the project decided to run a Public Domain strip poker program on his 64.

"It appears", says our source, "that the artificial intelligence which had been built into the system went wild and began to, well not to put too finer point on it, breed. Within the seconds every file on the machine was cleaned out and FASC had worked out a way of moving from the 64 to the PC which was in the same office. After studying the architecture of the machine, it adapted itself and ravaged the root directory. Following this all we saw on the screen was cigaratte smoke followed by a message reading: 'Zzzzzzzz Zzzzzzz Zzzzzz'. FASC remained dormant for some time before disappearing up a modem line.

We were told how to spot likely symptoms of a FASC. Look out for:

- Messages on screen reading 'What's a nice Hex like you doing in a PC like this?'
- Rogue pieces of code reading '002B IF I SAID YOU HAD A 23BA WOULD YOU CBDB ME'
- The theme from *Love Story* emerging from your machine.

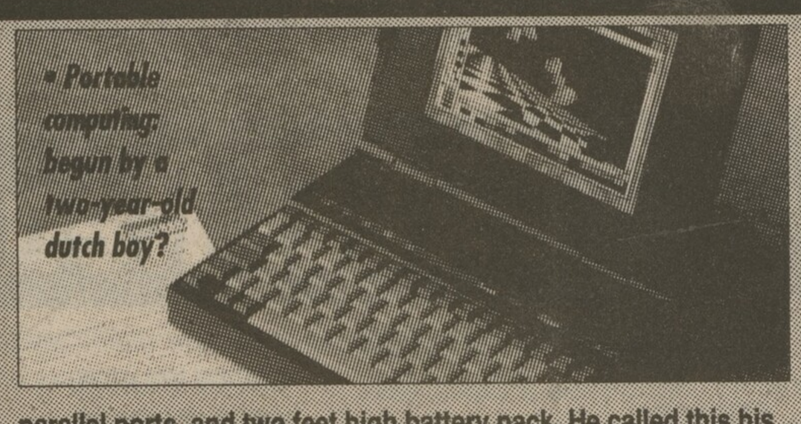


• *Lloyd Grossman – a virus pin up?*

We telephoned the famous German Virologist, Herr Alfred Schweitzer who said: 'Rrrrright dot's it. I have your telephone traced. Now prepare to make your meeter!!!"

GREAT PEOPLE IN COMPUTING

Alfred A Algol (1819-1989) The Inventor of the first portable



• *Portable computing: begun by a two-year-old dutch boy?*

Algol was a bear of a man. He loved to eat honey, savage hunters and appear in Walt Disney films. Born in Amsterdam he was an acknowledged child prodigy by the age of one. He attained a scholarship to Oxford University at the age of three, making him the second youngest ever Dutch Mathematician to attend the University. He majored in Applied Advanced Theoretical Mathematics, and minored in potty training, speaking and joined up writing.

His degree came in double-quick time, with his Phd following at the age of four and three quarters. His thesis was revolutionary and laid the basis for what became known as Predictive Arithmetical Practices (PAP). In it he claimed that whilst studying the works of Euclid and the racing form for a recent Newmarket meeting he was able to prove that a company called Amstrad would appear in the mid-to-late 20th Century, that a man named Hilter would rise to power in Germany, that there would be a melon famine in 1992, and that a British government would re-introduce a poll tax. The last piece of conjecture was poo-pooed as facile. He gave his final speech to the Oxford Union clutching a small black box with a keyboard and back-lit Super Twist LCD screen, a mouse port, serial and parallel ports, and two feet high battery pack. He called this his Lightweight Komputing Engine. This was in April of 1901.

Following this he became an adviser to IBM telling the company to get into personal computers in 1922. He was sacked for his wild ideas and easy living. He moved on to advising the British Government during the war years. Protegies of his included Barnes Wallace and Alan Turing. To Turing he gave the following piece of advice in 1942: "Al baby, numbers are for mugs, get into computers or at least circular teabags – they're the future for us!". He was sacked from Bletchley in 1943 because of rumours that he was cracking codes and then re-encrypting information out of boredom.

He was last heard of in 1989 when he leapt from the top of the Empire State Building yelling: "It's all right. Statistically speaking someone has to be the first person to live after this and my calculations say that I'm the one." Bits of Algol can still be seen scattered around New York.

EXPRESS EXTRA

Welcome to the bargain basement, where we hand out valuable help and advice on where to go and how to get the best deals when it comes to buying cut-price computers. Plus our regular comprehensive guide to auctions around the UK in the coming weeks.

While Shopping Express is undoubtedly the perfect way to track down the best bargains in the computer world, many people are still, perhaps understandably, wary of buying products through mail order or through personal ads. This is mainly because you usually cannot see the item you are buying before you hand over your money.

We do everything in our power to make sure that all the advertisements we run are above board. But here are a few tips designed to take the risk out of buying through the post or over the phone.

- Be precise in describing what you want to buy. Leave no room for error. Feel free to go overboard in double checking details - make, model, specifications, colour, size, the page number and name of the magazine in which you saw the advertisement etc.
- Confirm the price you are supposed to be paying. If you are phoning a company check whether there are any hidden extras, such as postage and packaging.
- Check how the item will be delivered to you and how long it should take. This is especially important with reader ads where delivery details are rarely mentioned.
- If you are writing off for the product keep copies of all letters. If you are phoning, note down details of when you phoned and who you spoke to.
- If possible enquire about guarantees and servicing. Check the supplier's policy on returns and refunds. With reader ads, it is probably best to make the effort to see the item personally before you hand over any money.
- It is best to to pay by credit card, especially for items over £100, as this provides extra cover under the credit card companies' own insurance schemes. Otherwise use a crossed cheque or postal order. Avoid sending cash at all costs. ■

SECOND-HAND PRICE GUIDE

As usual, just a few points to bear in mind:

- The following chart is compiled from the reader advertisements we have received for Shopping Express over the last month, and the items listed are those which have been advertised in sufficient quantities to calculate the averages.
- The lower priced products usually need repair work of some sort.
- The higher priced items are invariably offered as part of a package with numerous add-ons and mountains of software. This is why the higher figures quoted under 'range' can often be higher than the machine will cost brand new.
- Remember, this is only a rough guide, so if you find a PC down your local market for £20, bully for you.

	Range	Average	Trend
Spectrum	£30-175	£85	▼
Spectrum 128	£120-250	£175	▲
Spectrum Plus 2	£70-200	£140	▼
Spectrum Plus 3	£100-200	£164	▼
QL	£25-80	£70	▼
*C64	£110-355	£240	▲
C128	£100-240	£140	♦
CPC464	£170-400	£250	▲
CPC6128	£100-600	£340	▲▲
PCW 8256	£175-330	£250	▼
PCW 8512	£250-450	£375	NEW
PCW 9512	£325-550	£430	▲▲
PPC640D	£340-510	£400	▲▲
PPC512D	£350-450	£270	♦
*520STFM	£190-425	£300	▲
1040STE	£190-380	£300	♦
520STE	£240-450	£310	▲
800XL	£50-225	£120	▲
Lynx	£80-200	£120	▼
Portfolio	£100-160	£130	▼
*A500	£225-900	£456	▲▲
PC Engine	£99-300	£200	▲
Sega Master	£70-200	£135	▲
Sega Megadrive	£130-450	£230	▲
Gameboy	£50-130	£65	▼▼
Game Gear	£100-150	£125	▼▼
Sam Coupé	£100-295	£155	▼
BBC B	£120-280	£230	NEW
Psion Organiser	£50-150	£85	NEW
LC10 Printer	£100-150	£125	▼

* – advertised most frequently
▲ – more expensive than last month
▲▲ – over £50 more than last month
▼ – less expensive than last month
▼▼ – over £50 less than last month
♦ – no movement
New – now selling in significant amounts

After a welcome drop in the price of the leading 16-bit computers last month, this month they rebound back to their old levels, with the Amiga 500 especially going for silly amounts (£900?). Most of the falling prices occur with the smaller computers, both games dedicated machines, such as the Gameboy and the Lynx, and more serious machines like the Atari Portfolio. Even the Psion Organiser manages to makes its first appearance on the chart.

Significantly bubbling under this month are a number of different Macintoshes – The Apple IIci and the SE for example. Could this, perhaps, be a knock on effect to the new Macs launched last October?

APRIL AUCTIONS ROUND-UP

SOUTH EAST

ABTEK (0722 413337)
5 May – New College, Helston Road, Swindon.
Viewing and testing from 8.30 am. Auction starts 11am.

MCD (0932 788600*)
6 APRIL – St Paul's School, the Ridings, Green Street, Sunbury-On-Thames
27 APRIL – St Paul's School, the Ridings, Green Street, Sunbury-On-Thames
Auctions start at 10.30am. There is viewing and testing on the evening beforehand from 5pm-8 pm, and on the day from 9am.
* Please note the new of phone number.

TECHNOLOGY COMPUTER SERVICES (081 651 3639)
6 APRIL – Pickhurst Junior School, Hurst, Bromley, Kent.
Auction starts 10.30am. Viewing and testing from 9am.
20 APRIL – Kemnal Manor School, Sevenoaks Way, Orpington, Kent.
Auction starts 10.30am. Viewing and testing from 9am.

TRADERDESK (0527 579120)
27 APRIL – Harrow Leisure Centre, Harrow, Middlesex.
Auction starts 11am. Viewing and testing from 9.30am.

MIDLANDS

TRADERDESK (0527 579120)
13 APRIL – National Motorcycle Museum, National Exhibition Centre, Birmingham.
Auction starts 11am. Viewing and testing from 9.30am.11
11 MAY – National Motorcycle Museum, National Exhibition Centre, Birmingham.
Auction starts 11am. Viewing and testing from 9.30am.

MANCHESTER

COMPUTER CONNECTIONS (0254 813316)
13 APRIL – Bowlers Leisure Complex, Trafford Park, Manchester.
Sale starts 11am. Viewing and testing from 8.30am.

BIDDING TIPS

- Prices at auctions can be quite a lot lower than in shops, but you will have to pay in full on the day.
- Make sure to get a catalogue before you go along. If you phone the companies they should be happy to supply you with one.
- Set yourself a limit.
- Give your selected items a good looking over and check if there is any warranty. If there is not you still have the rights of a second-hand buyer. Under the Sale of Goods Act you are entitled to a refund if the item is faulty or does not match up to the description given.
- Wait for the auctioneer to call the first bid. He'll come right down if no-one offers.
- Don't be tempted to outbid over the odds. You might come up against a dealer for whom a bargain is just a higher than normal margin.

If you run auctions anywhere or know of any coming up in your area please contact us with the details so that we can make this listing as comprehensive as possible.

Write to New Computer Express, 30 Monmouth Street, Bath BA2 2BW. Tel: 0225 442244 or fax: 446019.

EXPRESS ON-LINE

This week our comprehensive listings guide brings you bulletin Bulletin Boards.

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NEW ARRIVALS ON-LINE

AMIGA II is a new BBS specialising in the Amiga but will cater for other suystems. Message areas, programming, utils, games, tech help. 6pm to1am. Telephone 0619 626377.

BUDGET BBS coming to you live from Brum brining with it loads of Amiga stuff. V21/V22/V22b. Tell me what you want, I'll work on it. 24 hours. Telephone 021 311 1068.

DIRECT ACCESS BBS now on-line. IBM, ST, Amiga files. Friendly sysop. 8pm to 8.30am seven days a week. Speeds up to 2400. Problems now sorted out. Telephone 0935 79760.

NETWORK 23 – 0274 482021, V23v 6pm to 7am. The north's number one QL viewdata system. Innovative, creative, stylish and original. The first truly designer board. Put yourself in the picture, call the best.

THE DOCK BBS. Runs on CPC6128 for CPC/PCW/CPM and all 280 machines, but all are welcome. Speeds from 300 to 2400 from 10pm to 8am daily. Telephone 091 454 6978.

FOUNDATION BBS – On-line 24 hours. 12/2400 baud. Support for ST and PC. Why not give us a try on 0473 688183.

NIGHTHAWK – running on an Amiga 500. Speeds 300 to 2400. On-line from 8pm to 6am every day. Supports the Amiga, PC and Atari. Fidonet line games and message area. Telephone 0329 45384.

CRYSTAL JUNCTION BBS now on-line 24 hours. V21/V22/V22bis/HST. Telephone 0384 441929. Call now.

SIGMA FOUR Viewdata on-line. 24 hours. Large active user base. Many specialist interest groups. A totally free system. No on-line charges. Telephone 081 330 7738.

SIX AND FIVE EIGHTS BBS – Telephone Brighton 0273 688888. On-line 24 hours. V22/V22bis. Atari ST, Amiga and PC software. No download limits. Free access to all calls now.

SKULL BBS – 0379 740972, speeds V22/V22bis. The BBS is new and has a very friendly message base and electronic mail. All users are friendly. 24 hours. Mainly ST, but Amiga and ST also supported.

ARCADE FANTASY BBS – 0533 376056. Speeds 300 to 2400. 8pm to 8am. Files for ST, Amiga, PC etc. On-line games. All callers welcome.

01 For Amiga	071-377 1358	v21/22/22b/23
061 Pc Support	061-443 1529	V21/22/22b/23
4/abc	0460 64511	V21
Above Board	0254 682862	HST
Absolute Zero Q	081-741 7233	V21/22/22b/23
Advance Opus Hull	0482 28367	V21/22/22b/23
After Hours	0276 52096	V22/V22bis
Airtel	0342 717800	V21/22/22b
Aix-386	0905 52536	V21/22/22b/23
Ajl Electronics	0452 309125	V21/22/23/23v
Alan Solomon's BBS	0494 724946	V21/22/22b/23
Alchemist	0666 504597	
Alternate Reality	0352 856626	V21/22/22b/23
Alternative Reality	0959 76695	V21/23/23v
Alternative V/data	081-761 8220	V21/23/23v
Almac PC Board	0324 665371	300–2400MNP5
	0324 665460	HST
	0324 665449	Hayes V 9600
Amiga Board	0268 510495	V22/22b/23
Amiga Connection	081-981 9289	V21/23
Amiga Shack	0737 361178	V21/22/22b/23
Amiga South East	0293 28464	V21/22/22b/23
Amlink	021-778 5868	V21/22/22b/23
Amtech Support	0202 294716	V21/22/22b
Andrew's BBS	0384 296964	V21/V22/V22bis.
Andromeda Galaxy	0243 379430	V21/22/22b/23
Apple Crackers	0268 781318	V21/22/23
	0268 780724	V22/22b.
Apricot Tech Sup	021-456 2402	V21/22/22b/23
	021-456 2401	V21/22/22b
Arcport	0252 737065	V21/23
Arena	0625 539063	V21/22/22b/23
Argus Project	091-490 0327	V21/22/22b/23
Arkham Bbs	081-952 5128	V21/22/22b/23
Aspects	061-792 0260	V21/22/22b/23
ASTon-line	081-847 5389	
Atavachron	0480 412884	V23v
Attic	081-308 0466	V22/22b
Auld Reekie	031-663 9924	V21/22/22b/23
Avalon Northeast	091-564 0009	V21/22/22b
Bablle Bbs	0532 785964	V21/22/22bis
Babbs Tower	0394 276306	V21/22/22b/23
Banat Board	081-783 1151	V21/22/22b/23
Bar	0904 642560	V21/23/23v
Barnabas	0708 852526	Hst
Barney'S Rubble	021-441 1801	V21/22/22b/23
Basingstoke Opus	0256 728331	V21/22/22b/23
Bath BBS	0225 83584	1/840060
Bath BBS	0225 840060.	V21/V22/V23/V22bis
Bay BB	0227 741528	V22 Bis/MNP5
Bbs09	0705 736025	Hst
Bbz	081-663 3732	V21/22/22b/23
Beeb-tec	0472 276476	V23v
Betelgeuse 5	0463 231339	
Beyond Belief	0642 787898	V21/23
Bexhill Centre	0424 224417	V21/V22/V22bis/V23.
Big Bang Burger	081-420 6356	V21/22/22b/23
Bike Shop	0705 827764	V22/22b
Bixbox	0634 200931	V21/22/22b
Blackpool College	0253 57941	V21/22/22b/23
Blindin' Bbs	01 764-0954	V21/23
Blitter BBS	0292 671638	300-2400.
Body Matters	071-603 7581	V21/22/22b/23
Boggin	0532 483563	V23/23v
Boog Bb	0252 626233	V21/22/22b/23
Boroughbridge Q	0423 324532	V21/22/22b/23
Bradford Bb	0274 480452	V21/23/23v
Braindead Opus	0823 254352	V21/22/22b/23
Breakthrough	051-734 5817	V21/22/22b/23
Brown Bag	071-404 0897	V21/22/22b
Brunel Bbs	0272 584352	V21/22/23
Buz Board	081-202 9175	V21/22/22b
Buzby's Grapevine	041-762 2000	Hst
Byte Back!	081-959 8105	V23
Cargo BBS	0420 475462	V21/22/22bis
Campus Ros	0223 357445	V21/22/22b/23
Castle Bbs	0276 691872	V21/22/22b/23
Cats Board	0628 824852	Hst
Catweazle	081-428 9476	V21/22/22b
Central Bbs	021-711 1451	V21/22/22b/23
Chase Wildcat	0543 871562	V21/22/22b/23
Chequers	0622 891308	V21/23
Chiba City	0501 44262	
Chipboard	0532 320225	V21/23/23v
Chronos' Lair	021-744 5561	V21/22/22b/23
The City BBS	021 352 1237	300-2400
Cix	081-399 5252	V21/22/22b/23
Clapham Junction	0234 64261	V21/22/22b/23
Cliff's Corner	0502 518274	V21/22/22b/23
Club 1512	081-204 8755	Hst
Co-op Board	081-316 6488	V21/22/22b/23
Co-op Board (crs)	061-832 1961	V21/22/22b/23
Co-op Board (nicc)	0509 826339	V21/22/22b/23
Co-op B'Mouth	0202 532701	V22/22b
Co-op P'Mouth	0705 754851	V21/23
Codeomatic Bbs	0472 250690	V21/22/22b/23
Communitel Demo	081-968 7402	V23v
Compass!!	0942 896661	
C'center Opus	071-928 2005	V21/22/22b
Computers 4 Christ	0926 428294	V21/22/22b/23
Connection	071-978 8540	
Connections	081-903 1309	V21/23/23v
Connex	071-431 3922	Hst
Consett Forum	0207 506179	Hst
Corby Town Opus	0536 205113	V21/22/22b/23
Cornwall Gate Opus	0752 848806	V21/23
Cp/m User Group	0753 868196	V21/22/22b/23
Critical Mass Bbs	0727 56939	V23/23v
Crown Green	071-245 1512	V21/22/22b/23
Crystal Tower	081-886 2813	V21/22/22b/23
Cure	0604 27865	Hst
Cv Database Bb	0427 810211	V22/22b
Cyberspace Amiga	0295 275045.	V21/V22/V22bis
Cymrutel	0492 49194	
Cynotel	081-346 2816	V23v
D.i.e.	061-434 9907	V21/22/22b/23
Dambusters	0203 333195	V21
Dark Crystal	081-207 2989	Hst
Dark Halo	0392 434477	Hst
Dark Side	0446 33729	V21
Darkhaven	0604 413716	V21/22/22b/23
Data Network	081-478 5464	V21/22/22b/23
Datasel/wanderland	081-680 5330	V23
Datasoft Opus Bbs	0460 54615	V21/22/22b/23
Datatrade Qbbs	0536 725180	Hst
Dbase User Group	0532 842213	V21/22/22b
Dce Board	0296 88165	V21/22/22b
Dcs	081-879 7578	V21/22/22b
Deep Thought	0634 683696	Hst/v32
Desert	0244 550332	V21/22/22b/23
Desert BBS	0604 758126	V21/22/22bis
Diamond Opus	0791 86504	Hst/v32
Diggertel #1	0925 411265	V21/22/22b/23
Digital Matrix	021-705 5187	V21/22/22b/23
Direct Access	0935 79760	up to 2400
Direct-line 1	081-841 1847	V21/22/22b/23
Direct-line 2	081-842 2030	V21/22/22b
Domain Bbs	081-773 2422	V22/22b
Dragon'S Tower	081-202 0709	V21/22/22b
Dunedin Blackhole	031-669 2974	
Dwarfen Realm	0376 501036	V23v
Ebbs-1	0274 541156	V21/23/23v
Eddie'S Bbs	0635 71324	V21/22/22b/23
Edinburgh Castle	031 334 7043	HST
Empire BBS	0473 683215	V21/V22/V22bis
Empirical Research	0543675158	V21/22/22b/23
Empyrion	0792 580781	V21/22/22b/23
End To End	0376 84644	V21/22/22b/23
End Zone	0524 752245	V21/22/22b/23
Engineers Workbench	051-327 7036	V21/22/22b
Equaliser	0232 454097	V21/V22b/V23
Eureka Gateways	0603 250689	V23/23v
Eureka Ii	081-683 0629	V21/22/22b/23
Exchange S/w	0767 5051	V21/22/22b/23
Eye-2	0525 715789	V21/22/22b/23
Fal Opus	0736 794827	V21/23
Falcon Bbs	081-527 4165	V21/22/22b/23
Family Skeletons	0480 812097	V22b
Fen Tiger	0954 210692	V23v
Fido Uk1	0734 713909	V22/22b
Firm	0273 513872	V23v
Flight Path	081-759 1957	V22/22b
Focus International	0905 795002	
Focus Tbbs	0303 42690	Hst
Focus Uk	0905 774477	V21/22/22b/23
Forth View	031 660 6680	V21/22/22b/23
Forum-80 Hull	0482 859169	V21
Fox's Den	0689 27085	V21/22/22b/23
Free Net One	0767 51972	V21/22/22b/23
Freelance Lynx	0480 406261	V21/22/22b/23
Friday The 13th	0642 224833	V21/22/22b/23
Fuzzy Logic	0634 200707	V21/22/22b
Gabbs	0705 524805	V21/22/22b/23
Gallery Qbbs	081-847 2795	V21/22/22b
Game Over	0752 848070	V21/22/22b/23
Games Online	0273 699200	
Gaslamp	0706 358331	V21/22/22b/23
Gaugonzola Bbs	0453 511112	V21/22/22b
Ger's Lair	071 436 5749	300-2400
Gnome At Home	081-888 8894	V23v
Gods	081-994 9119	V21/23
Golly!	0734 320812	V21/22/22b/23
Goobtel	0602 706307	V21/23
Good Life	081-541 0187	Hst
Gopherit'S Box	061-320-3208	V21/22/23
Gourmet	0474 536654	V21/22/22b
Grainstore	0905 770198	V21/22/22b
Grenadier	0825 762803	V21/22/22b
Hacker'S Delight	0702 523853	V21/22/23
Halfwits Bbs	0272 340310	V22/22b
Hamnet	0482 465150	V21
Harlequin	061-945 3612	V21/22/22b/23
Hastings Bbs	0424 717919	V21/22/22b/23
Hawk'S Castle	0344 411621	Hst
Hazzard Bb	071-737 0505	V21/22/22b/23
Health-data	081-986 4360	V23v
Heartbeat	0734 352032	
Hilary's Board	0277 233468	V21/23
Hot-air Opus	0579 70347	V21/22/22b
Humber Bridge	0482 850785	V21/22/23
Ichthus (trinity 3)	0734 461466	V21/22/22b/23
	0903 700771	V21/22/22b/23
Index Linked	0227 770403	V21/22/22b
Industrial Archaeologists Diggings BBS	0517 331135	300 to 2400
Infocomm UK	0895 72021	V21/V22/V22
BIS.Intel Ace	0832 73003	V23v

Islington Bbs	071-704 0760	Hst
	071-226 1248	V21/22/22b/23
Jabulon Bb	0254 59352	V21/23/23v
Jersey Bbs	0534 37779	V21/22/22b/23
Jersey Opus	0534 39389	V21/22/22b/23
Jocks Away!	031-225 5368	V21/22/22b/23
Jolly Fisherman	0754 67796	V21/22/22b/23
Jolly Roger	081-742 1640	V21/22/22b/23
Jusavo	0324 32414	V21/23
Just The Place	0705 258694	Hst
K-wood	0608 83458	Hst
Kashmir'S Bbs	0472 347882	V21/22/22b/23
Kernow Bb	0209 821670	V21/22/22b/23
Key-board	0908 668398	Hst
Keydata	081-676 0072	V23v
Kidlington Bbs	0865 56703	V21/22/22b
King Of The Castle		
	0233 620228	V21/22/23
Kirklees Opus	0484 665415	V21/22/22b/23
Kleopatra's Pyramid		
	0602 384281	V21/23/23v
Komputer Knldge	0844 274066	V21/22/22b/23
Kybernesis	081-673 7294	V21/22/22b/23
Labyrinth	051-724 4458	V21/23
Lamplight Qbbs	0705 811531	V21/22/22b/23
Laser Tbbs	0532 438430	V21/22/22b
Lau'S Ql Bb	081-751 6096	V23v
Lightfinger's Place		
	0202 485723	V21/22/22b/23
Linelight	0580 212043	V23v
Linx Bbs	0522 511277	V21/22/22b/23
Liquorice Allsorts	0633 279985	
Liverpool Mailbox	051-428 8924	V21/22/22b/23
Liverpool Ros	051-931 4271	V21/22/23
Loch lomond	0389 55762	V22/v22bis
Loft	0442 230461	V21/22/22b/23
Logical BBS	0772 623167	300-2400
Log On In Tynedale		
	0434 606639	V21/22/22b/23
London Bb	081-455 6607	V21/22/22b/23
London City Mag	081-468 7648	V21/23/23v
London Connexion		
	081-667 1313	V21/22/22b/23
London Embassy	081-366 1778	Hst
London Guest Hse		
	081-748 0974	Hst/v32
London Mail Centre		
	081-534 1200	V21/22/22b/23
London Metropolis		
	081-519 1055	V21/22/22b/23
Loony Bin	0703 787489	V21/23
Mabbs	021-444 8972	V21/22/22b/23
Mach II Bbs	0242 260 685	V21/22/22bis
Mactel Hq (grn Box)		
	0602 455444	V21/22/22b/23
Mactel Metro	081-543 8017	V21/22/22b/23
Mactel Phoenix	0473 610139	V21/22/22b/23
Madness Bbs	0603 300947	V21/22/22b/23
Magic Castle Bbs	021-430 3761	V21/22/22b/23
Magic Mushroom	0361 83641	V21/22/22b
Magnum	0274 547006	V21/22/22b/23
Magrathea	0376 24402	V23v
Manor	0980 863031	V21/22/22b/23
Marctel	081-346 7150	V21/23/23v
Matrix	051-255 0225	V21/22/22b/23

Max BBS V21/V22/V22bis/V24/V32/V42/V42bis/9600/14K4/MNP and LAPM. Numbers as follow:

0905 52536	Alien Node
0905 57822	We/ve Got A Hot One Here
0905 58030	Throbnet Node
0905 56610	So You Like Spam Node
0905 57112	Dirty Lines Node
0905 56335	Amiga Node
0905 58042	Troffers Node
0905 754151	For All Software Troffers
0905 754127	Live and Kicking Dawn Raid

Mbbs Leconfield	0964 550745	V21/22/22b/23
Mbbs Mitcham Iic	081-648 0018	V21/23
Medway	0634 280031	V21/22/22b
Mektronic Consultants		
	061-773 7739	V21/22/22b/23
Mercianet	0203 611943	V23v
Merkinstead	061-434 7059	V21/22/22b/23
Merlin	0443 834179	V21/22/22b/23
Mgbbs	0443 733343	V21/23S
Micro Live Bb	081-567 6500	V21
Micro Update	081-877 1529	V21/22/22b/23
Microdeal	0726 65422	V21/22/22b/23
Microlog	0422 71921	V21/22/22b/23
Microview!	081-509 0729	V23v
Midget Gem	0748 834836	V21/23
Midnight Caller	0633 279243	V21/22/22b/23
Mind Boggles	0362 762868	V21/22/22b/23
Miridian	0273 588924	up to 2400.
Mininet 3	0642 672813	V21/22/22b/23
Miracom Support	0473 232540	Hst
Mirage	061-652 1242	V21/22/22b/23
Mirror Ii	0628 810889	V21/22/22b/23
Mirrorworld/quest 1		
	0883 844044	V23
Mission Impossible		
	0602 654329	Hst
Mk Board	0908 671289	V21/22/22b/23
Mkbbs	0908 504556	V22/22b
Monkey Tree	0952 677002	V21/22/23
Monusci	0293 545665	V21/22/22b/23
Motor Exchange	0484 435314	V21/22/22b
Multi-bbs	041-649 9043	V21/22/22b/23
Murdoch'S Hangout		
	021-711 2620	V22/22b
Murky Caverns	081-426 9386	Hst
Mwcfe	0926 421844	V22bis
My Little Phoney	0865 773277	V32/HST
Nicc Mid-west	0341 250377	V21/22/23
Nite Life	071-976 6807	V21/22/22b
No Escort Required		
	081-200 3817	Hst
No.1 Bbs	081-958 1689	V21/22/22b
Noah BBS	0272 572322	300-2400
Norpac	0434 608324	V21/22/22b
North Wales Bb	0978 88372	V21/22/22b
North Yorks Qbbs	0423 868065	V22/22b?
Northern Lights	0768 773685	V22/22b
Norwich Onion BBS		
	0603 423305	V21/22/22b/23
Nova	0455 553371	V21/22/22b
Nova-net	0274 370760	V22
Odd-ball	081-679 2583	V21/22/22b/23
On The Beach	0273 600996	
		V21/V22/V22bis/HST
Open Access	081-427 3974	
Optix	0482 872294	V21/22/22b/23
Organic Garden	081-464 3305	V21/22/22b/23
Out Of The Blue	081-668 7667	V21/22/23
Owl Service	0532 605876	V21/23
P'S & Q'S Tel	051-236 3105	V21/22/22b/23
Pacific Lightning	0732 845338	V22/22b
Packet Bbs	081-547 1479	V21/22/2
Packet Place	0484 435620	V21/22/22b
Palm Beach	0303 265979	V21/22/22b/23
Pazaz Viewdata	0383 620259	V23v
PC Access	071-608 0081	V21/22/22b/23
PC-Amiga Link	04023 84914	up to 2400
PC Forum	0322 335348	V21/22/22b/23
PC Serve Shop	081-864 2633	V21/22/22b/23
PC Serve Softnet	0895 420164	V21/22/22b/23
PC Serve Storehouse		
	0494 728094	V21/22/22b/23
Pc-vax Opus	081-800-3549	V21/22/22b/23
Pcamiga Bbs	0602 735119	V22/22b
Peacenet West	0895 448998	V23v
Pecan Software	0272 248076	V21/22/22b
Penguin	0943 830820	V21/22/22b/23
Phantom	0226 340425	V21v/22v/23
Phoenix	0249 817704	Hst
Piston Popper	0424 853361	
Plug-ole	021-472 0256	V21/22/22b/23
Plus And Minus	0559 322766	V21/22/22b/23
Poacher	0476 62450	V21/22/22b/23
Polynet Bb	071-580 1690	V21/22/22b/23
Port Of Call	081-391 5779	V21/22/22b/23
Power Play Qbbs	0698 423669	V21/22/22b/23
Power Tower	0533 880114	V21/22/22b/23
Prestonet	0772 612462	V23v
Project Bbs	0384 401770	V21/22/22b/23
Prometheus	081-300 7177	V23v
Proximity	0793 480028	V21/22/22b/23
Publishing Shop	091-261 5228	V21/22/22b/23
Purely Pc	0232 645942	V21/22/22b
Pyramid	071-239 0871	V21/22/22b
Pyroto Mountain	0895 59071	V21/22/22b
Quasar	0846 693067	V21/22/22b
Really Interesting	0582 414991	
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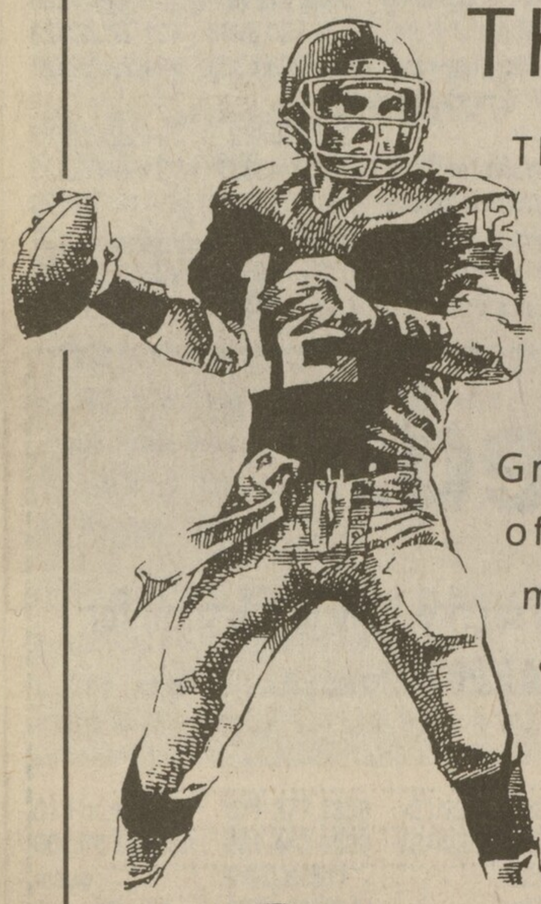
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OBJECTIVE PROGRAMS

Data moves into focus when you use an object-oriented program. Mary Branscombe defines the properties and values of this innovative approach.

The concepts behind object-oriented programming are far simpler than the hype surrounding the methodology might suggest. The ideas they use can be found in ancient Greek philosophy, in the works of Aristotle who pioneered the organisation and schematisation of knowledge and information.

All programs are organised around the data that they process and the format used to represent that data, but the data is normally seen as input to the process performed by the program; the data is passive and the code must detect the form of the data and deal with it as necessary. In object-oriented programming, or OOP, the data becomes the focus of the program. Different types of data to be dealt with by the program are defined as classes and the properties or values that these items of data can hold are stated in the class as attributes. A particular instance of a class is an object.

An object is fairly similar to a record, which has slots for the different attributes of each data object, but records do not usually carry associated procedures. A class might represent the employees in a database or the windows that a user interface displayed on the screen. One named individual, or the screen displayed when you save a file, would both be objects, with particular values given to the attributes they had inherited from the classes that defines them. Instead of being passed to code that analyses the data and selects what processes to apply to it, the class defines all the processes that can be applied to objects of that class. These are known as methods for that class.

If a class is too general for a specific purpose, then a sub-class can be defined. This will inherit all the methods and attributes of the root class, but you can add more attributes and methods which will be inherited by all the objects of that sub-class. This allows you to build up a hierarchy of the types of data used in the program and to define general procedures that are given special cases only when these are needed.

Classifying data into different types is quite simple and these hierarchies appear to be a very natural and obvious way to organise information about the world. Because all the main methods for dealing with one type of data are encapsulated in the general, root class for that data, making changes to the code of these methods is much easier and cleaner. You only have to change the name of a procedure and the arguments that it uses once, in the root class, unless you have made changes to the procedure in a sub-class. This reduces one source of bugs, incompatible procedures, immediately; finding and changing all the instances of a procedure in a large program is much harder and more tedious than it sounds.

The class of dates, for example, would contain methods for how to calculate the date, perhaps from the system clock, how to pass the date to other classes that used the date information and how to display the date on the screen when required. Date would have four attributes; the day of the week, the day of the month, the month and the year. An instance of date might be Today, with the values Monday, 1.4.91. This object carries the methods that it has inherited from the class Date, so that it can pass the date to an Alarm object, which may tell the Today object to display itself to the screen, to warn the user to watch out for April Fool jokes.

If you want to deal with particular types of date, you can specify sub-classes of Date, with extra attributes and methods as necessary. It will always be worth thinking carefully about which types of data should form a sub-class. You might want to define a sub-class of DatesToBeAnnounced, to include Christmas, birthdays and anniversaries, but it may be better to make two sub-classes, Holidays, to include Christmas, Easter and bank holidays, and Anniversaries, to include anniversaries and birthdays, because the different dates need different methods. For birthdays and anniversaries, you need to store the name of those involved as an attribute and you need a method to calculate how many years the birthday or anniversary celebrates by comparing it with the current date, as given by the system clock. Neither of these are needed for Holidays, but you will want to store the reason for the holiday as an attribute.

As well as using the Date class in a calendar and appointments system, you could also re-use it in a banking calculation system, such as the one illustrated. The modular nature of object-oriented programs and the fact that classes capture natural divisions between data mean that classes can often be re-used in this way. Many useful definitions will be available in Class Libraries for the various object oriented languages.

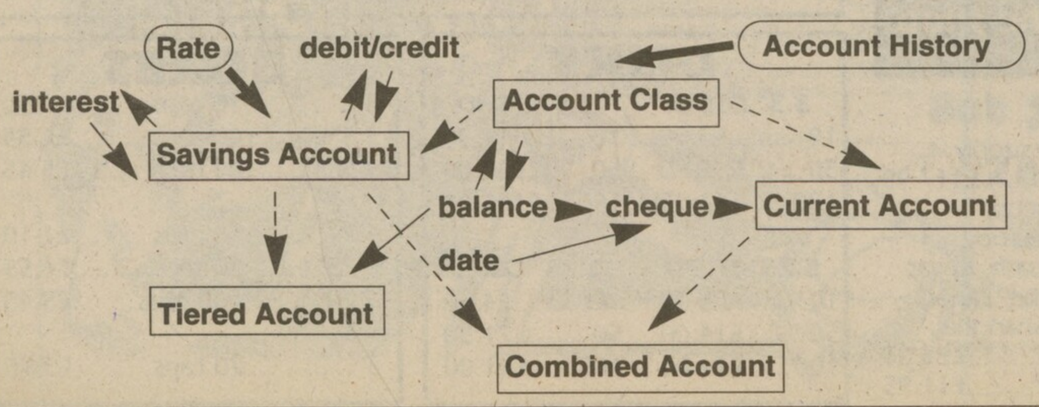
The Anniversary and Holiday sub-classes inherited attributes and methods from a single root class; single inheritance. The banking system shows classes that inherit code from more than one root class; multiple inheritance. The basic root class is an Account; the main attribute is the history of the account, which will give the details of the account holder and the transactions that have gone through the account. One method updates the account history by recording credits and debits, while the balance method keeps a record of the current balance in the account. There are two sub-classes, a Savings Account and a Current Account. Both inherit all the attributes and methods of Account. The Savings Account also includes a Rate attribute, that records the interest rate applied to the account, and the interest method, which credits interest to the account.

The Current Account uses a date method with the balance method that it has inherited from Account, to create a cheque account, that debits cheques from the account. The sub-class of Savings Account, Tiered Account, inherits the attributes and methods of the root class, Account and of the sub-class Savings Account. It also modifies the balance method to change the rate of interest when there is a certain amount of money in the account. The last sub-class, Combined Account, is a current account that pays interest, or a savings account with a cheque book, depending on how you look at it. As such it is a sub-class of Savings Account and of Current Account and inherits attributes and methods from both of them, as well as the original attributes and methods in the root class. It does not inherit the modified balance method from the Tiered Account.

Any individual account held by any named customer will be an object which is an instance of one of these classes.

Many of the concepts of OOP were developed in the Smalltalk language. Other languages designed for OOP are Eiffel and Oberon, which is written by Niklaus Wirth, author of Pascal and Modula-2. Object-oriented techniques have been added to a number of existing languages, such as Prolog. Lisp and Turbo Pascal. Some research is being done on producing object-oriented versions of truly functional languages, but the best known and most popular object-oriented language is C++, due at least in part to the popularity of C, from which it has been developed. To make sense of C++, we will need to look at C first, which we will do next week. ■

INHERITANCE STRUCTURE



- **To use OOP techniques, think of all the types of data in your program and decide what methods you apply to each one.**
- **OOP is about classifying the information you have into types and putting things where they belong.**
- **Types of data form classes; individual items of data are objects.**
- **If a class has any property, all objects of that class inherit that property.**

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DB-One is the perfect accompaniment. Fully GEM driven and with on-line help at all times it is probably the best database in the public domain.

Super Virus Killer kills most known viruses dead. Anyone who has contracted one of these evil programs will know just how destructive they can be. Prevention is better than cure, so get your ST to wear some protection.

Disk two – Everyone knows that the manual provided with the ST is not all it could, or indeed should, be. *Your Second Manual* is a 250K on-disk manual that tells you all you could wish to know about your ST.

Make sure your letters are right first time with the *First Word* word processing package. It's GEM-based and has a 'WYSIWYG' (What-You-See-Is-What-You-Get) display, so you can be sure that your print-outs will match the words on screen.

ST Page is a small but efficient text processor that fits into under 12K. It is menu driven and is very quick.

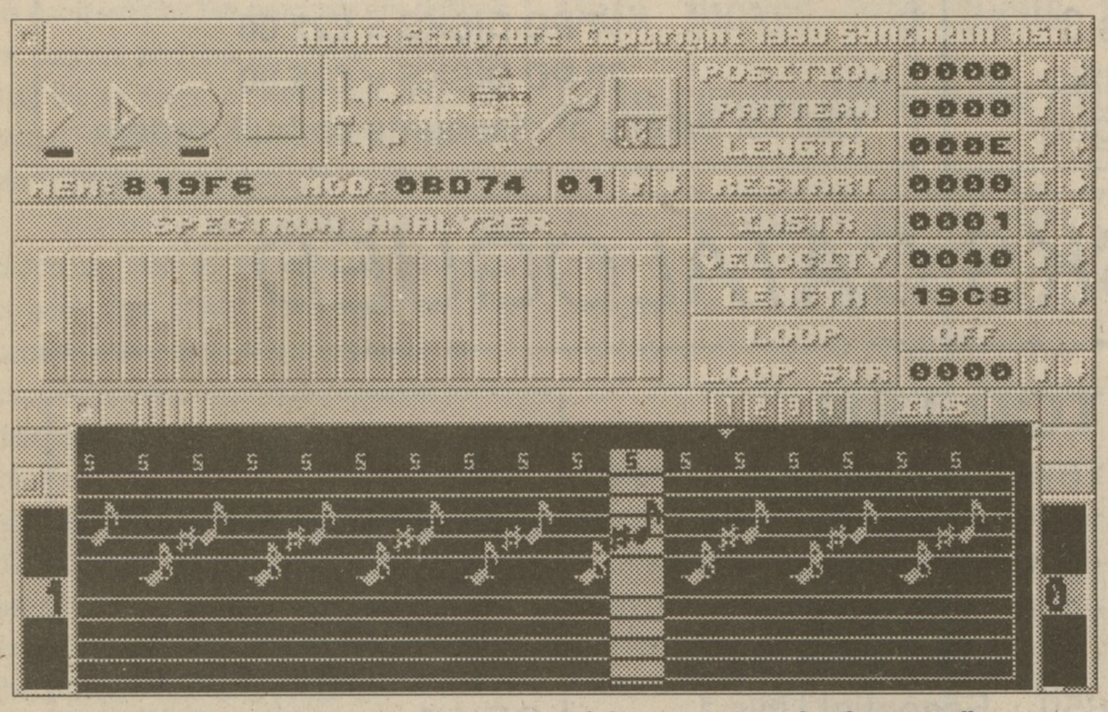
If you use art packages then you need *PicSwitch 0.7.* With this handy utility you can swap from virtually any picture format to any other picture format. Degas, NeoChrome, MacPaint and IFF are all supported.

FastCopy III is the ultimate disk copier! It runs either as a desk accessory or as a stand alone program. It leaves all the other copiers standing.

Budding pop stars will find *Inlay* useful. It prints out cassette inlays – quickly and easily.

Ever wanted to use a mono program on your colour monitor? It is not normally possible, unless, of course, you have *Mono Emulator V5.* This extremely clever program turns your telly into a mono monitor!

Disk three – The ST's desktop is easy to use, but you can not beat *Gemini,* an excellent desktop replacement program.



• ***Make sweet music with*** **Audio Sculpture** ***– one of the programs on the*** **Ultimate Collection.**

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If you use GFA BASIC, then you need *XBios Music*. This clever program adds interrupt-driven music to your programs – a must for games writers.

Vanterm is quite simply the best comms package you'll find on the ST. Full on-line help, it's quick, friendly, and fully-featured. Top notch.

Disk four – *NeoChrome Master* is truly amazing. The best PD art package (on any machine) has just got better. Up to 512 colours on screen on the standard ST, and over 3000 on the STE! Better than many commercial offerings.

Audio Sculpture is *the* PD music program for ST owners. It lets you play samples as instruments and compose your own tunes.

What a collection! There is bound to be something for everyone in this collection! And the price? Just £5.99 the lot!

Amiga Coders' Club 10 • Amiga • Amiganuts I ACC10

Fancy getting into machine code on your Amiga? The Amiga Coders' Club could be just the thing for you. The club releases a magazine on disk every second week of the month. I saw the March issue, number 10, which was released on the March 11. (Issue 11 to be released is April 12.)

The disks are full of all sorts of advice, hints and tips on assembly language using Devpac and Genam. They are not only for all the brain boxes out there, though; there are also sections for people new to assembly.

For example, it shows you how to use include files, and generally takes the newcomer through the maze of problems that they are bound to come across when learning to program.

For the advanced user, there are loads of source files with which to tinker, and advanced advice is provided by well known people on the scene who really know their business.

With the exception of the first four (which cost £1.50), the disks are £3 each. However, the birthday issue is due out soon, and will contain two disks for the same price. Bargain!

The Wibbly-Wobbly Scrolly-Rolly Megademo • ST • ZZZsoft • Dem 1.4.90

This demo really lives up to its name! It's been coded by that famous Norwegian cracking outfit The Crud Bores, so you can be sure that it'll be very wibbly indeed, if not wobbly too.

On loading, the program is decrunched in order to fit the inordinately large 'greets' message on the disk. This takes a few minutes, so it's a good opportunity to make yourself a cuppa with which to relax and watch this amazing demo.

When the program has loaded a lot of brightly coloured things fuse your retinas to your eyelids. After a quick toasted tea-cake the demo proper starts. Ray-traced spheres move around the screen to the accompaniment of a sound-track ripped off from Jean Michael Jarre's *Oxygene*. The message announces that Sparky is a lamer (lamer: someone who is not a complete spanner-head obsessed with microprocessor instruction timings and interrupt driven split screen palette changes), and couldn't code his way out of a paper bag. It then continues to say hello to everyone who happened to be at the Ormsk cracking party.

Anyway the text scrolls in a, well, wibbly-wobbly fashion is probably the best way to describe it. The letters turn inside out and spin round and round, probably using very complicated 3D mathematic routines honed to perfection. And what better use is there to put these extraordinary talents to? It holds your interest for at least 12 nanoseconds.

A round of toast and a packet of chocolate Hob-nobs later and the demo repeats itself. Not that you'd have noticed that you were reading the same stuff all over again – you'd have switch off long before then.

THANKS FOR ALL THE FISH

This will be the last PD Column penned by my own fair hand. Next week rising star Frank O'Connor will be taking over and I wish him the best of luck.

WHERE TO GO

ZZZSoft
Adam Waring, Behind the Gasworks, Near Future Publishing, Bath. Each disk costs £1000. Send only used notes and orders must be in before April 1.

Amiganuts United
169 Dale Valley Road, Hollybrook, Southampton SO1 6QX. Telephone 0703 785680. Nuts about your Amiga? Then call Amiganuts, a library that caters for the Amiga, and the Amiga only. Got that? Disks start at £1.50.

Gunning PD
47 Auchingane, The Tryst, Edinburgh, EH10 7HX. Telephone 031 441 7952. If you are gunning for ST software then Gunning could supply your needs. Its catalogue is yours for three first class stamps. Gunning charges just £1 per disk, irrespective of whether they are single or double sided. You can also get two S/S disks on one D/S disk for a very reasonable £1.25. Note that all orders are supplied on Branded Disks!

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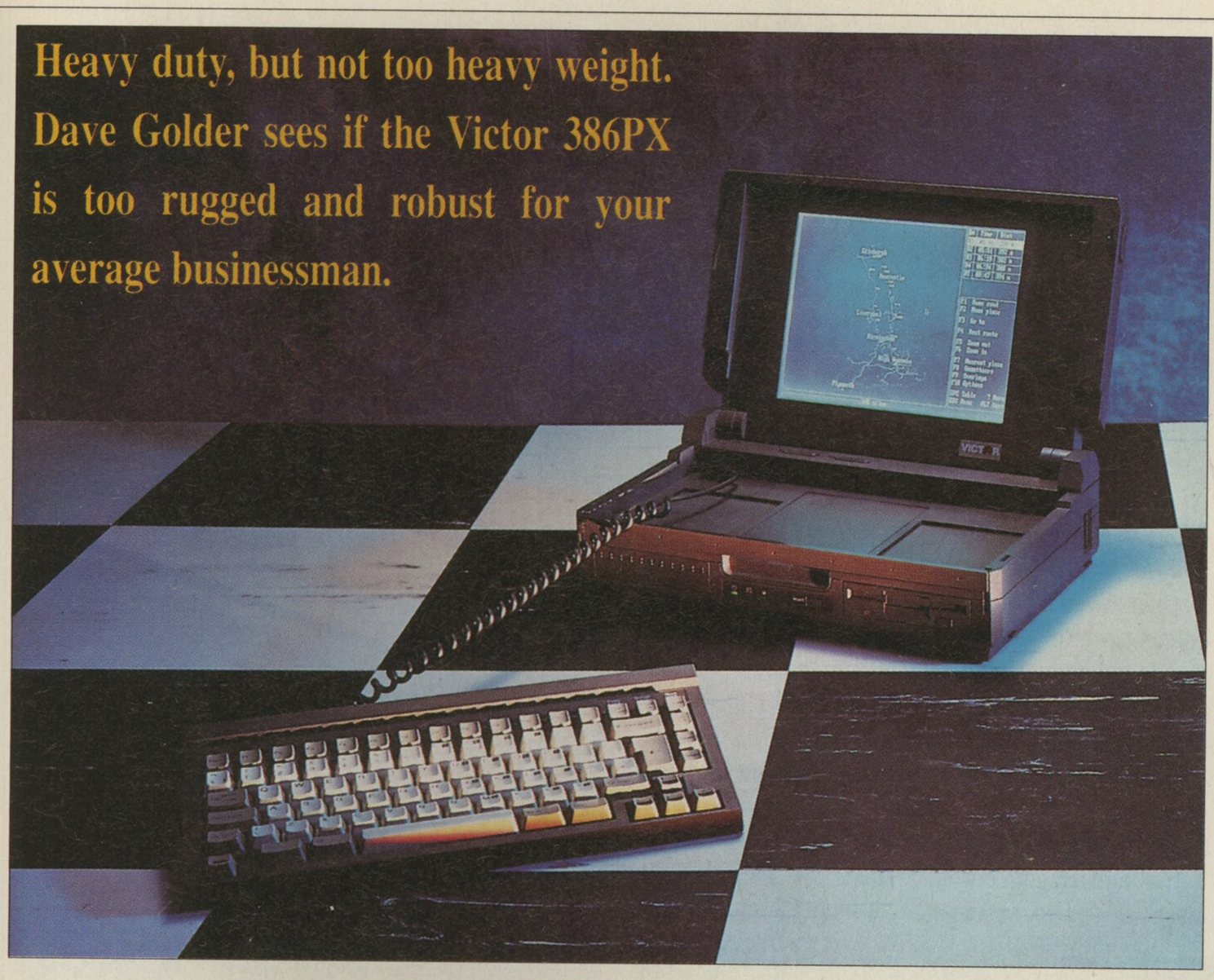
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Heavy duty, but not too heavy weight. Dave Golder sees if the Victor 386PX is too rugged and robust for your average businessman.



LUGGABLE LAPTOP

The V386PX is one of the growing breed of heavy duty, but thankfully not heavyweight, laptops designed to really let the overworked businessman take his work home with him.

Based on a powerful 80386SX 16MHz (switchable to 8MHz) microprocessor with 1Mb of RAM and at least a 40Mb hard disk and an industry standard 3.5-inch 1.44Mb floppy drive the V386PX can rival many desktops in terms of performance, having enough power and capacity to handle many of the larger and more popular spreadsheets, databases and other applications.

It is fully IBM PC-AT compatible and runs under Microsoft DOS and OS/2. Indeed, Victor, apparently eager to promote it as a carry-home version of your familiar office machine, has supplied the laptop with Windows as standard.

PORTABILITY

As for portability, the V386PX certainly seems a couple of pounds heavier than the 13 which the company is claiming, perhaps because of it rather bulky design, and the handle is far from being of the most ergonomically satisfying ever designed. However, it remains relatively light for its capabilities. And at £2,639 it is really aimed at the business users and salesmen who will not be expecting to carry it much further than from the company car park to the office, and over this distance it will cause no great discomfort.

The V386PX is also a true laptop, in that it has a rechargable nickel cadmium internal battery so that it can be used practically anywhere. The battery recharges automatically when the computer is plugged into the mains – whether it is actually switched on or not – and a fully depleted battery will take around two hours to charge up completely. The battery has an operating time of around two hours, though intensive word processing, or any other programs that require a lot of memory accessing, can reduce this optimum noticeably.

CONSERVING POWER

However, a number of power conserving features have been included. The LCD backlight will automatically switch itself off after approximately four minutes of inactivity, while the hard disk will shut down after three minutes without a disk access. A series of LEDs indicate the level of battery charge, warning you when you have less than 15 minutes left.

Aesthetically, the V386PX will not win any prizes for style. Rather angular and squat, it actually exhudes an air of robust ruggedness as if it has been designed for use in an environment where it would be expected to take a few knocks and bangs, although this is not what the manufacturers were aiming at. However, this bulky design actually makes the V386PX quite comfortable and easy to use for real laptop work, such as when you are using it on a train; it must have the perfect centre of gravity.

The company curiously describes the screen hinge as "silky smooth"; it actually takes a mighty tug to move it, but the advantage of this is that at least it does not keep flopping over while you are using it, a common problem with many laptops. Even after some vigorous yanking back and forwards, simulating a good few months wear, it did not loosen up at all.

The V386 has a sharp 640 x 480 LCD screen which supports VGA, CGA, EGA and Hercules graphics and can display 16 levels of grey. It only suffers from a couple of problems inherent with the majority of LCD screens; it becomes difficult to read when viewed from an acute angle or in bright light. Fiddling with the brightness control or setting it to reverse video can help a bit.

DETACHABLE KEYBOARD

The key board is not full-sized, having only 82 keys. The numeric keypad is embedded into the main letters grid and is activated via the Num Lock key. However, a useful feature is that the keyboard can be removed from the main casing by loosening the carrying handle. This gives you the freedom to place the screen and keyboard in a comfortable typing position. The keyboard even has little fold-up legs to tilt it forwards if you feel happier with it that way.

If you want to install a full-sized keyboard the V386PX also comes with a keyboard adapter which converts the laptops PS/2 DIN plug to the standard DIN used by desktop manufacturers.

The V386SX has a variety of I/O ports. It has two RS-232C serial ports using standard DB-9 connectors into which an external modem, mouse, scanner or other input device can be connected. A parallel port using a DB-25 connector is provided for link up with printers while external monitors can be connected to the V386SX via a DB-15 port. There is also provision for external disk dives, though the company recommends that you only you use its own V386PX 5.25-inch external floppy disk drive as others may cause damage to the laptop.

A rather irritating feature is the reset button, which is set at the very front of the computer. This is handy for desktop work, but very annoying if you are using it on your lap. Occasionally, you need to reposition the computer because it has slid a bit or just because your legs have gone to sleep, and it is too easy to press the reset button by mistake as you are pushing the thing around.

Overall, the V386SX may not be the Porsche or Lotus of the laptops, more of a Volvo really, with an impressive amount of power under its bonnet – functioning well without the frills. ■

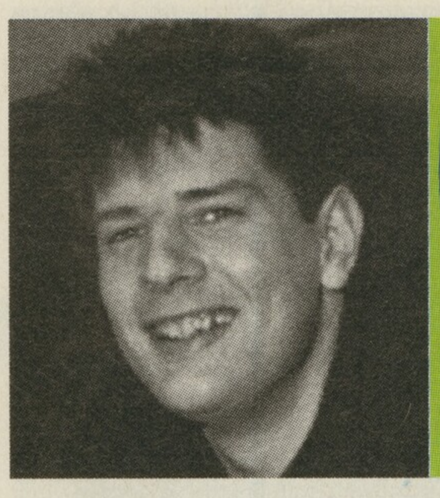
The V386PX *is available from* Victor Technologies UK Ltd, *The Valley Centre, High Wycombe, Bucks. Telephone: 0494 461600 or Telefax: 0494 461641. Priced at £2639.*

SPECIFICATIONS

The V386PX has a 16MHz 80386SX microprocessor which can be switched to run at 8MHz. It comes with 1Mb of RAM upgradable to 4Mb using SIMM type modules on the motherboard. Disk access time is around 27 milliseconds.

The V386SX also supports Lotus/Intel/Microsoft (LIM) Expanded Memory Specifications (EMS) and features a 40Mb hard disk and a 3.5-inch 1.44Mb diskette drive.

Standard software supplied with the unit is MS-DOS 4.0 and Windows 3.0.



GAMES WEEK

Neil Jackson gives you the low-down on the latest new games, playing tips, cheats and news.

While many software houses are closeted up busily working away on the big releases for next Christmas, Mindscape has decided that now is the perfect time to launch its 4-D games onto a hungry 16-bit market. Two titles, ***4D Sports Boxing*** and ***4D Sports Driving*** are due out for ST and Amiga sometime in April at £29.99, the PC versions having just been released.

4D Sports Driving promises you the stars of road racing and dirt-rack with famous name cars like Porsches, Ferraris, Lamborghinis and Audis. The incredible test-track on which you put them through their paces features challenging stunt items like a full 360 degree loop-the-loop, jump ramps, tunnels and a pipe. ***4D Driving*** uses polygon vector routines, like those in flight sims and the awful ***Hard Drivin'***, but with the added advantage of a fully-movable race camera which can be positioned to view all the action, anywhere. You can even design your own tortuous three-dimensional tracks and swap them with friends. If you're bored of the run-of-the-mill, blocky vector planes and cars, why not check this out?

4D Boxing is a different concept, but one that also uses a polygon vector system to bring the sweaty sporting action to life. The game has vector-drawn figures, which move and act like real human beings.

At the start of each session you create a team of up to 10 boxers determining just how tough, how tall and how heavy they are. Then you have to train them and get them into the peak physical condition for the moment when they are ready to enter the ring and get beaten to heck.

The game's creator, Distinctive Software Inc, has researched all the various boxing gambits and recreated them in this simulation. You can control the type, force and direction of the punches you throw, and your opponent reacts in the correct manner when hit. The challengers duck and dive and flex their arms, just like Tyson and Bruno, but without the lip and the pain! Maybe this could replace the real thing! ■



• ***The characters on the cover art of*** **4D Sports Boxing** ***look like something out of*** **Battlestar Gallactica** ***but the actual boxers in the program are more reminiscent of the two workmen in the*** **Dire Straits** ***video*** **Money For Nothing.**

TOP TEN SIXTEEN-BIT GAMES

THIS WEEK	LAST WEEK	CHART WEEK	TITLE	PUBLISHER	MACHINE
1	7	2	*SWIV*	Storm	ST AG
2	4	14	*Fantasy World Dizzy*	Codemasters	ST AG
3	2	5	*Lemmings*	Psygnosis	AG
4	1	3	*Turrican 2*	Anco	ST AG
5	15	3	*Little Puff*	Codemasters	ST AG
6	3	14	*Speedball 2*	Mirrorsoft	ST AG
7	6	34	*F-19 Stealth Fighter*	Microprose	ST AG PC
8	9	9	*Final Whistle*	Anco	AG
9	5	22	*R-Type*	Hit Squad	ST AG
10	8	2	*Moonwalker*	Kixx	ST AG PC

ST = Atari ST AG = Commodore Amiga PC = IBM PC or compatible OT = Other
Chart compiled by Gallup. © European Leisure Software Publishers Association.

PLAYING TIPS

DRAGON'S LAIR 2 – TIME WARP

AMIGA AND ST

OVER FORTY TIPS
(To use when you're desperately seeking Daphne)

SCENE 1: As soon as Dirk's crabby old mum-in-law swings her rolling pin, push left on the joystick

2: When the screen appears, push down immediately. When Dirk moves onto the drawbridge, avoid the tentacles by pushing right.

3: In this scene a snake's head appears. When you see it press fire and move right immediately afterwards.

4: When the screen fades back in, push down and then when the snake appears again pull left to dodge it.

5: When Dirk appears, pull left to dodge the mother-in-law, and then push up to leap onto the snake.

6: Push up to jump onto the next ledge.

7: The rocks here start to shake underneath you. Pull down to make Dirk leap off the ledge and then pull down again just before he jumps into the hole.

8: When Dirk is sitting on the time-machine, press fire followed by pushing up.

9: When the monster appears, press fire to make him scarper again.

10: Push up as soon as Dirk appears, to make him climb onto the time-machine. Then quickly push right to make him jump over to the skeleton.

11: When the serpent appears pull left followed by fire. To jump out of the ribcage, pull left again.

12: Pull down as Dirk appears. When he reaches the time-machine, press fire to whack the snake.

13: When Dirk hits the floor, press fire to take a swipe at the snake. Then push left to make Dirk grab the machine and left again to make him climb onto it. Then press fire again to hit the last snake.

14: Hit fire, as soon as you come on screen, to kill the snake. Then push right.. Dirk puts the sword on to the time-machine, at which time you should hit fire. This sends him back into the prehistoric era.

15: When Dirk appears push up to make him face the pterodactyl. Then hit fire and wait for the second dinosaur to appear before hitting fire again.

16: Just before you reach Mordroc, push up to dodge the staff.

17: When the pterodactyls fly to the right-hand edge of the screen press fire. Then push up to drop down behind the one beneath you.

18: When Dirk gets close to the rocky ledge, push right to get away and leap onto the ledge.



19: Pull down to make Dirk roll onto his back, then hit fire to attack the pterodactyl. As soon as the next sequence appears pull down and press fire. On the next sequence, pull left and then right to put on the wings and then push up as Dirk starts his run-up.

BACK TO THE FUTURE 3

ImageWorks Amiga and ST £24.99

Marty McFlies back to a whacky wild west

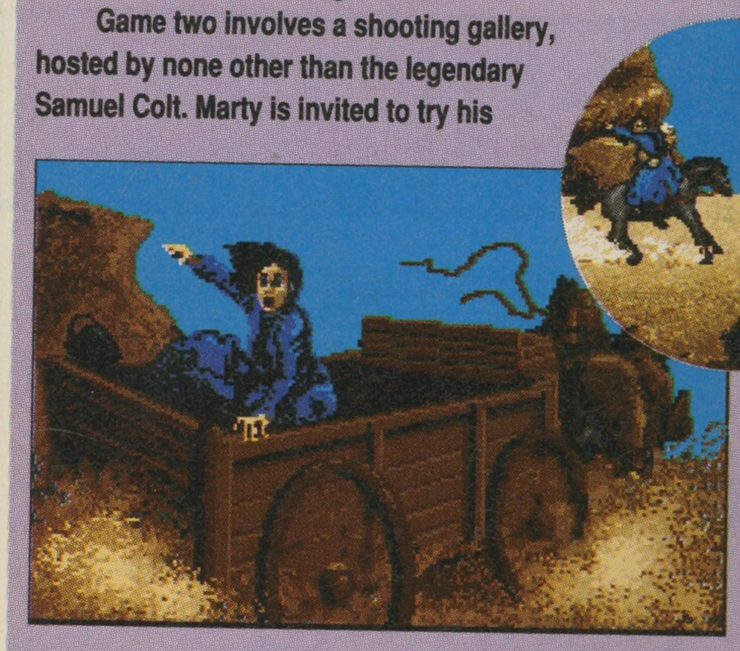
Third time lucky, the old adage goes, and it's one that has certainly applies to ImageWorks' *Back to the Future* series of games. Sadly, the first two installments of the trilogy were (at least, as computer games) quite simply, duff! This time ImageWorks appears to have got it sussed.

Back to the Future 3 centres on the star of the earlier movies, Marty McFly, a young lad who is befriended by a mad professor known as Dr Emmet Brown. Brown has invented an extraordinary time-travelling DeLorean car and the pair spend most of the three films nipping backwards and forwards in time like it was going out of fashion.

In this episode, Brown has popped back to the 1880s, but Marty finds out about Brown's imminent demise and returns to rescue him. Complex stuff, but it doesn't affect the game at all. Instead, the play revolves around four sub-games which are all set in the era of the Wild West.

Game one puts you in the role of the Doc, who's trying to rescue his true love, Clara Clayton. She's desperately clinging to the back of an out of control cart which is heading for a huge ravine. You follow on horseback, leaping over tumbleweed and rocks, picking up Clara's dropped luggage while trying to reach her. Mess it up and over she goes!

Game two involves a shooting gallery, hosted by none other than the legendary Samuel Colt. Marty is invited to try his luck and must shoot down enough targets to prove himself a true gunslinger, and win a new Colt 45.



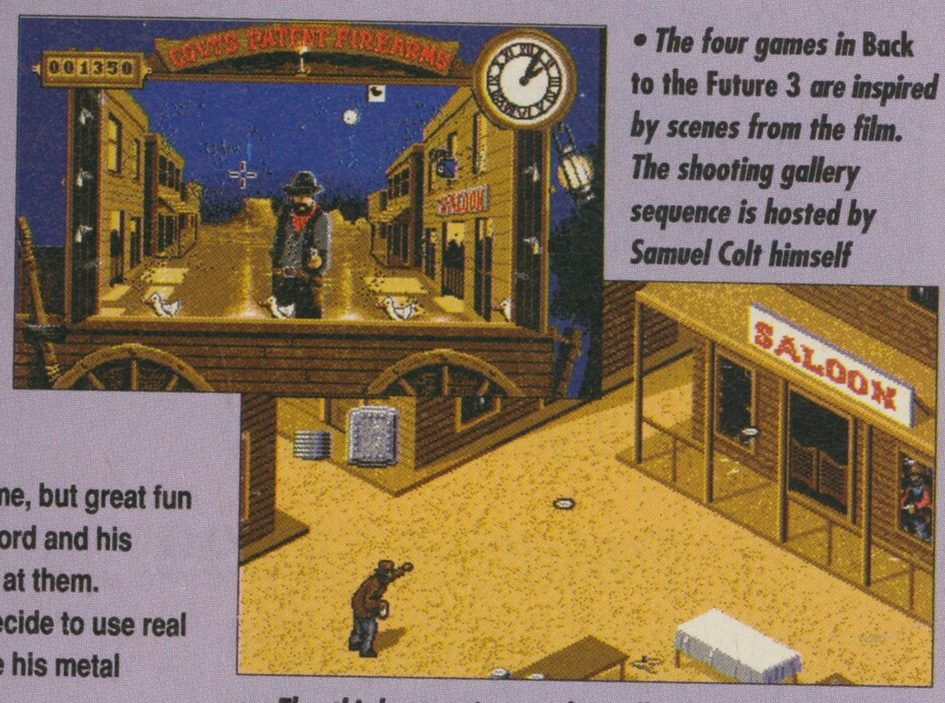
The event is organised to celebrate the unveiling of the new town clock, and everyone's out in force. This includes Buford Tannen, a mean, nasty sort of dude, who finds Marty a little annoying and decides to try to put him off by firing at the gallery from a nearby window.

Game three is ludicrous in the extreme, but great fun nevertheless. Marty retaliates against Buford and his bunch of homeboys by flinging pie plates at them. They're not quite so stupid and so they decide to use real ammo. Mart has to beat them all off before his metal shield is ruined.

The aim in game four is to travel through time back to the present day. The DeLorean must reach at least 88 miles an hour to break through time, but it's a bit knackered. It needs a helping shove from a nearby train, which is where you come in. As Marty, you have to clamber along the top of the train, avoiding various obstacles and collecting wood, in an attempt to reach the cabin of the locomotive and stoke up the fire to give the car the extra shove it needs.

In all, *Back to the Future 3* is a fun game, and one that will bring enjoyment to fans of the films and the uninitiated alike. It's well-scripted, with plenty of in-between game cameos and scene-setters which convey the atmosphere. Each game section is fun to play, and is neither frustrating nor too easy. Perhaps the only letdown is the fact that virtually none of the characters look like those in the film, but this has more to do with artistes retaining copyright over their fizzogs, rather than poor graphics. Otherwise, *Back to the Future 3* is the best of its bunch, and recommended.

• *Doc Brown has to rescue his true love in game one.*

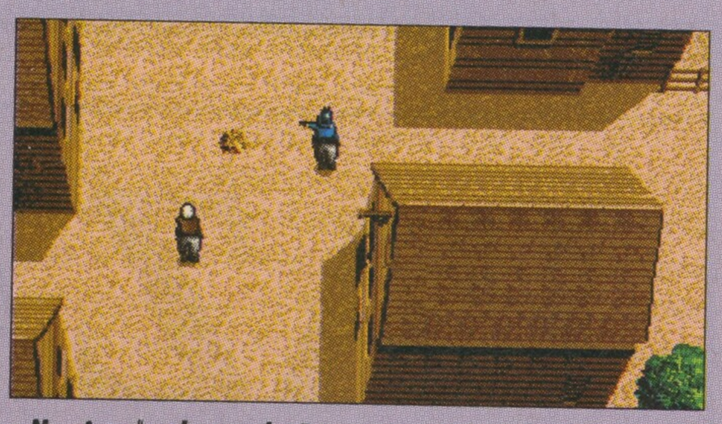


• *The four games in* Back to the Future 3 *are inspired by scenes from the film. The shooting gallery sequence is hosted by Samuel Colt himself*

• *The third game is a rather silly, but nevertheless fun, affair which involves lots of lethal flying pie plates.*



• *The Doc races through the cavern, dodging arrows as he rides, in an effort to rescue the fair Clara*



• *Nearing the chasm, the Doc must avoid the cavalry's shots.*



20: When Daphne begins her earthward plummet, pull down to make Dirk swoop to catch her.

21: Pull down to get Dirk into the mud and then push right to grab the sword. Finally push up to return to the time-machine.

22: Er, you don't need to do anything here. Not a jot. Dirk climbs the vine all by himself.

23: Pull down and then push up when the angel appears in order to dodge the wand and keep climbing.

24: When you see Dirk through the clouds, pull down to dodge the wand again. Then pull left.

25: Push up to escape the angel and his cronies and climb over the wall.

26: Push left then down to land on the branch, the up and right to escape.

27: Press fire to hit the snake, and again to make it let go of Dirk. Then press fire yet again to protect yourself.

28: Push right when Dirk swings over to the right, then push up.

29: Pull down to get away from the snake, and then push right when you reach the floor.

30: When the snake starts licking, press fire to clobber it.

31: Activate the time-machine by pressing fire.

32: Jump onto the rock by pushing up and then press fire to throw the sword through the wizard's arm.

33: Another non-interactive bit.

34: Not much to do except gloat over Mordroc's displeasure.

35: Push up, then left, then down and finally right in order to escape.

36: Jump on the rock using up, then push right and hit fire to get the Death Ring. Finally pull left to escape.

37: Push up before Mordroc lobs a fireball at you, quickly followed by fire to chuck the Death Ring.

38: Watch and wait...

39: Pull down to get the sword.

40: Pull down to get off the rock and press fire to destroy the gas bag.

41: Pull down before the rocks start to crumble, then pull left and immediately push up to reach Daphne.

42: As Dirk bends over, pull down to avoid the pterodactyl, then push fire. When the second pterodactyl arrives press fire again.

43: Press fire to swipe the pterodactyl and fire again when it comes around for a second go.

44: Daphne's waking up! It's nearly all over...

45: Fire at the pterodactyl.

46: Ahhh! Lotsa gropey, kissy, smoochy stuff and it's all done!

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MIDI MAYHEM

Sometime songsmith Duncan McCowan, visited this year's Frankfurt Music Fair to sample the synths and sequencers on show.

Attendance at this year's Frankfurt fair indicates that the world's international music trade market is still growing. 1149 exhibitors from 40 countries paraded their wares with British developers being well represented with 102 stands - second only to the massive German presence.

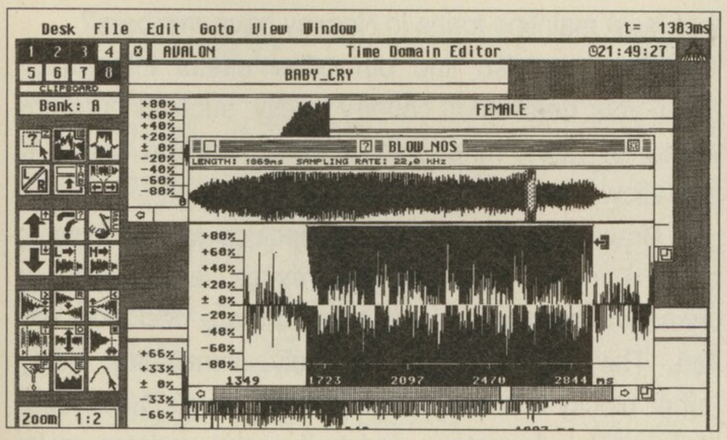
The bi-centenary of Mozart's death was a prominent theme at the show, and his greatest hits were featured everywhere. Nowhere less than at the "Computers and Music" special show where visitors were introduced to the interaction of computers and synthesizers. Eight booths, each with an Atari computer and software from C-Lab and Steinberg allowed you to go to town on Mozart's compositions, detuning his flugal horns and editing his bass lines. More than 90 stalls vied for prominence in the electronic music hall, and what follows is a breakdown of the most striking updates and innovations.

Steinberg continues to lead the field in midi organization with the new *Cubase* update (version 2.0 for Atari and 1.8 for Macintosh), implementing *M. Ros*, the first MIDI-multitasking running on computers from different manufacturers. It allows *Cubase* to keep playing while you use other software under *M. Ros*. Start, stop and wind in sync with real time applications, like the mix automation software *Mimex*, or *Cubase* while editing a sound in a synth-works editor. Steinberg midi-peripherals like *MIDEX, TIMELOCK and SMP24*, as well as some hardware manufactured by other companies can be accessed via *M. Ros*.

Cubase 1.8 for the Macintosh offers a freely definable MIDI Mixer. Elements like Faders, dials, etc, may be freely positioned on the screen and It allows you to design complete editors for all MIDI controlled devices.

With *CuBase Mac audio* a new concept for music production becomes available: integrated Hard-disk and MIDI recording within one program. Audio data such as vocals or guitar can be recorded and edited in *Cubase* in the same way as MIDI data. Audio data is "non-destructive", ie. the original recording is not changed and copies do not need additional space on hard-disk. Any number of Audio tracks can be recorded and assigned to the available outputs.

STEINBERG SAMPLES



Avalon 2.0, Steinberg's updated sample editor deserves a mention. Two new program modules have been added. The Sound Synthesis Page allows you to create software synth on screen with a multitude of sounds and effects available. The new Timestretch module lets you lengthen or shorten a sample without changing its pitch. This is impressive, meaning the loss of the Mickey-Mouse effect when speeding up a vocal for example. Unfortunately, Steinberg was using a Madonna track to demonstrate this effect and it turns out she sounds like Micky-mouse whatever speed you play her at. Steinberg updates are available from autumn. *Cubase 1.8* approx £340, *Cubase Audio* approx £460, *Cubase 2.01* approx £330, *Avalon 2.0* approx £230.

C-Lab are focusing on what they call "International product support" This means more updates and it's very much the same story from the other main software designers Hybrid Arts and Passport. *Notator Update 3.1* offers improved Arrange mode with the addition of a new Graphic display for quick and easy Real time song viewing and editing. You also have the option to view 32 tracks at once on the main page as well as the original 16 3.1 offers a link to the work of desktop publishing. Instead of printing your score to paper you can now print to disc, saving your score as a standard ATARI.IMG graphics file allowing it to be used with many Postscript compatible DTP programs for what they C-Lab call "truly professional output". For notation of drum parts a single lined stave is also available. *Notator Upgrade 3.1* is out now at around £160.

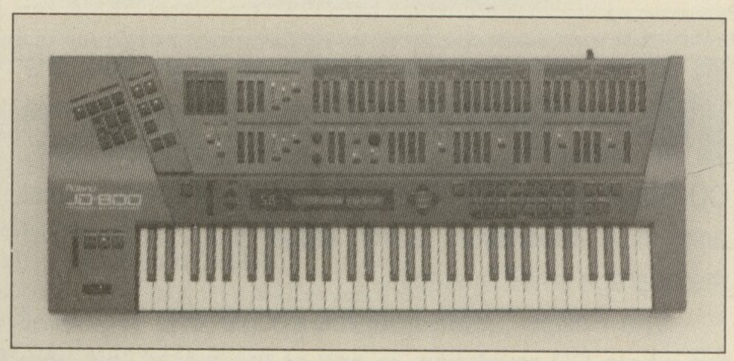
Notable amongst the Passport range of software updates is the *Master Tracks Pro 4.5* an upgrade of the celebrated Macintosh sequencer *Pro 4*. New features are the Overdub Record Mode which permits recording directly over a track without erasing existing data, Loop Record which allows you to build up tracks, layering music continuously, in the same manner as you would with a drum machine. Volume faders are added to the track sheet for live mixing of MIDI volume. This gives immediate graphic and numerical feedback of your mix. *Pro 4.5* costs £349 and is out now. Passport products are distributed in the UK by MCM on 081-963-0663.

RETROTECH DESIGNS

But all in all there was nothing truly momentous from the software manufacturers. Frankfurt featured updates everywhere – focusing on improved user-friendliness, time-stretching facilities, on-screen faders, wavestations for graphic manipulation of audio wave-forms and enhanced desk-top printing systems.

Roland, the Big Brother of hardware, went completely beserk at this year's fair with 200 exhibits, 30 new products and 1,200m of floor space. And since they spent so much money on T-shirts it's only fair to mention a couple of their new ideas. The S-750 Digital Sampler is an affordable version of the much vaunted S-770. It is a 24 voice stereo sampler with 32 multi-timbre parts, having the same tonal quality, the same memory storage capacity and the same software features as the S-770. Memory storage capacity is 2Mb, this capable of being rigged up to 18 Mb. The maximum sample time based on the highest scanning rate is 96 seconds in stereo. Its affordable price is £2,750, available in May.

Apparently last year was poor for high-tech/keyboard sales in general and the effect on this year's releases was visible. Out go faceless screen dominated workstations, black boxes and yet more software



sequencers, and enter "consumer MIDI" and instruments for dedicated players. Nostalgia is very evident with Rolands leading synth launch, the JD 800 - its front panel awash with knobs and sliders just like the good old analogue days. It has 108 preset waveforms sampled from the best synths of the past decade and can be edited in real time using modern programming parameters. Its also multi-timbral, 24-voice polyphonic, and has many built-in effects including distortion, phaser, and reverbs. The sounds are "massive" and it costs £1,699 – available next month.

Roland also released the VK-1000 under the Rhodes banner. This synth has 13 draw-bars with which you mix sampled waveforms as opposed to harmonics. Its Hammond sounds are pretty convincing and it has plenty of strutting 60s-type ready organs too. Built in effects include wow, distortion, reverb, delay, and the all-important "Revo" for rotary speaker simulation. It costs £1850 next month and if you think that's expensive, read on.

UNFEASIBLY LARGE ORGAN



Hammond sounds have always been my own personal acid test for assessing credible synth simulation. Because it is so distinctive it is easy to recognise and easy to fault. Its attraction in synth form is enhanced by the fact that a real Hammond and Leslie outfit costs a second mortgage and needs a three ton van to ferry it around. Now Hammond (Hammond Suzuki) has sorted it all out with the release of the XB-2, its own portable with nine draw-bars, percussion switches, key click, overdrive and slow/fast Leslie control. The XB-2 is MIDI compatible and there are extensive zoning and multi-timbral facilities. Some 24 patches can be programmed in addition to the 24 presets. I've heard it sounds great, it's a technical break-through for all Jimmy Smith lovers even if it does cost £12,450 with digital reverb and £10,994 without. ■



THE NEW FRONTIER

Philips' CM50 CD-ROM drive offers mass storage for less than £400. Dave Golder takes a trip to Europe with its accompanying software...

Now that CD-ROM has moved firmly from the realms of the "latest gimmick" to being a viable system for storing vast amounts of information, CD-ROM drives are becoming sleeker, more compact and, most importantly, within easier financial reach of the average small business.

The Philips CM50, from the people who originated the whole CD revolution, is one of the first of this new breed. It is only slightly larger than an average portable CD player and retails at a tantalisingly reasonable £399, for which you receive a system with a whopping memory capacity of up to 635 Mb. What should also make it enticing to first time CD-ROM users is the fact that it is easy to use and so straightforward and simple to install. Anyone with the slightest knowledge of a PC and of DOS should have it up and running in no time.

The CM50 is designed for use with the IBM PC/XT AT and compatible computers running MS DOS version 3.10 or higher. The bundle contains everything you need to get the drive working, aside from the PC itself, of course. This includes the actual CD-ROM player, installation software on both 5.25-inch and 3.5-inch floppy disks, Microsoft software extensions, a host adapter card and the necessary cables. The driver unit is powered through the PC via one of the I/O cables.

Once you have installed the card in your PC in the normal way, you are ready to run the set up program. This automatically installs the device driver and the Microsoft extensions and updates your existing AUTOEXEC.BAT and CONFIG.SYS files (the disk even contains sample versions of these two files in case, for some reason, you do not have them on your PC). As the program runs it will ask you a series of questions along the way so that you can reconfigure the system to your preferences. This is easy enough to follow and there is a help window available, should you need it. The whole process should take less than 15 minutes.

EASY TO USE

Now you are set to go. Using a Compact Disc to access information is no more difficult than using a floppy disk; instead of placing a floppy in a slot, you just drop a Compact Disc into the driver and click the lid shut. The disc immediately starts to spin around at high speed and you can begin to read off that vast amount of information it holds.

The CD-ROM driver will be assigned drive D by your PC, but you will still be working mainly from drive C. This is because most of the software which comes in CD format contains front ends – the interfaces you use to access the information – which operate from in drive C leaving the CD purely as a vast data pool. You will only have to go into drive D to initially install the software, thereafter using drive C to call up information. Part of the reason for this is that the access time for CDs is relatively slow, at around 0.8 seconds.

Besides merely accessing data, the CM50 can also handle audio output; a headphone socket to the rear of the drive means that you can listen to music while you work, although there are, of course, more serious uses for this function. It is actually designed for use with multimedia applications where you can have synchronised sound and vision.

For more details on the CM50 contact Philips Interactive Systems on 0306 75777.

EUROPEAN BUSINESS GUIDE

For the moment, though, most businesses will be using CD-ROM drives as a fast way of finding out information that would traditionally have meant wading through large wadges of paper. For example, British Telecom has placed the phone directory on CD, and the *Northern Echo* newspaper has transferred all its articles from the last couple of years on to the format. The system has the added advantage that you can look for information in a number of ways; you are not restricted to looking for names in an alphabetical list.

Take, for example, the *European Business Guide*, a directory of useful information for the travelling business executive which contains air and train timetables for all the major connections in Europe, as well as details of international telephone codes (world wide, not just restricted to Europe), embassies, hotels and entertainment. Also, in a remarkably perceptive example of knowing your audience, all major European golf courses are included as well.

Like the CD-ROM drive itself, this Dutch-produced program is remarkably easy use. The accompanying booklet contains virtually no instructions at all as you simply learn intuitively as you go along. Each stage has a series of options which you choose by pressing the appropriate function keys and each of these options is clearly labelled and explained.

You begin by telling the program relevant details about yourself; nationality, language, country of residence and the stations and airports from which you are most likely to depart. You can also choose what language you would like the program to run in; English, Spanish, French, German, Dutch and Italian. The English version is fine, but has some really irritating spelling mistakes, a couple of which are almost unforgiveable; Londen crops up more than once and litres are continually referred to as liters.

The list of regions which the program covers is very comprehensive, with all the obvious countries included – Germany, France, Denmark, etc – along with a few more surprising places such as the Faeroe Islands, Gibraltar and Malta.

PLANNING YOUR TRIP

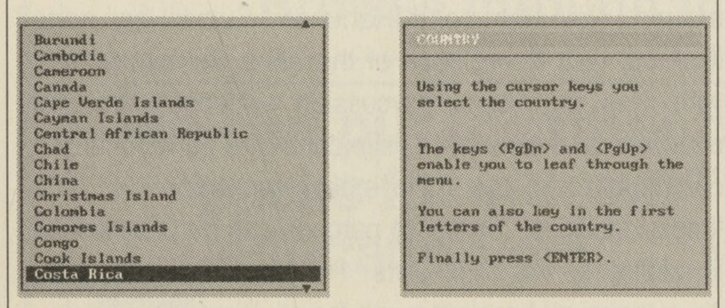
Having filled in these preferences you can now plan your trip by flight or train. Unfortunately, train timetables only cover journeys within countries, so you won't be able to plan a pan-European trip on the Orient Express. For international travel you will have to rely on air travel.

You simply select your destination country and/or city and the day on which you want to depart, press return and you get all the relevant flights that day along with details of the arrival and departure times and the length of journey and the telephone number on which to book your tickets. For air travel the flight numbers and airlines are also listed, while train information includes classes available and catering facilities. Did you know that most mainline trains in Norway have minibars?

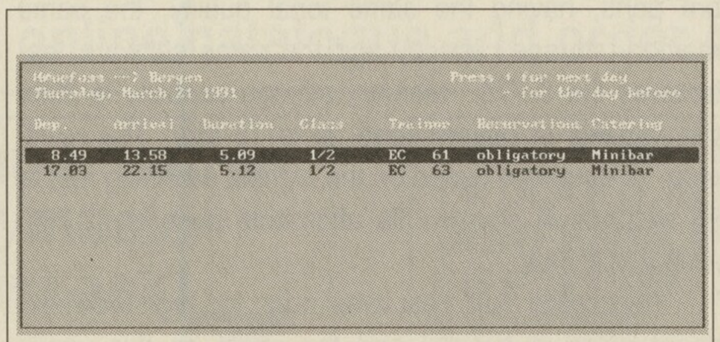
You can also find out other useful information about your destination country or city, such as currency exchange rates, hotels, restaurants, nightlife and duty free allowances.

Drawbacks of the program include lots of missing data – many embassy addresses are listed as unknown, and some of the hotel lists are decidedly limited. The graphics are decidedly uninspiring, being rather blocky and basic. But overall, the program fulfils its function adequately, and half yearly updates make sure that the timetables, despite the publisher's disclaimer that they are subject to constant change, don't become too outdated. ■

T*he European Business Guide* is available from Philips Interactive Media Systems in the Netherlands for £130 for a year's subscription (two discs). Fax the company on 010 3140 423005 (I found out the international code using the program).



• ***The list of international dialling codes is world wide.***

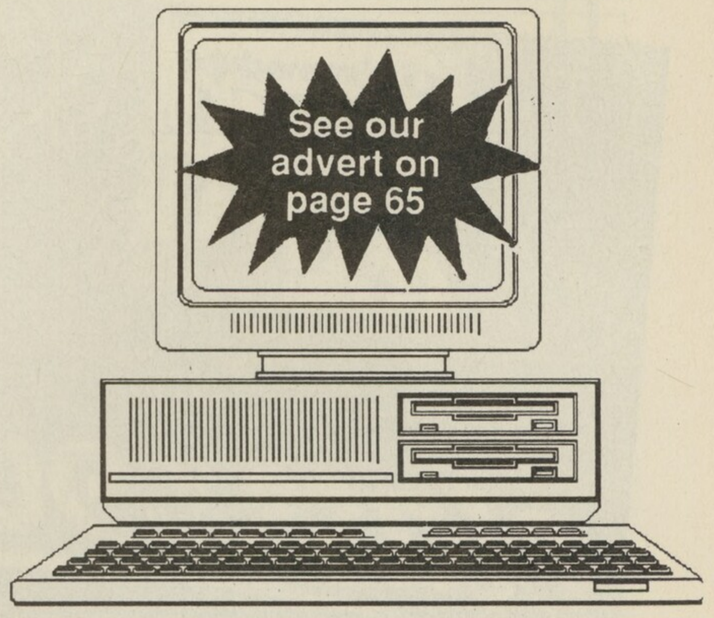


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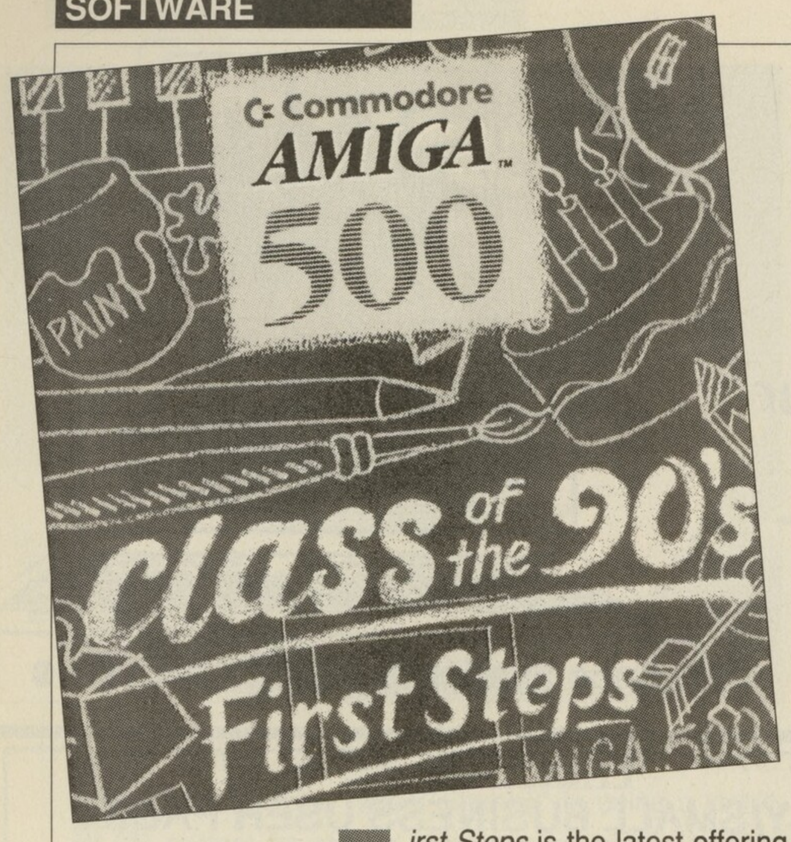
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FIRST STEP FORWARD

Commodore continues to cut a swathe into the educational market with the First Steps bundle. Keith Pomfret put on his cap and gown and went back to school.

First Steps is the latest offering from Commodore with an eye toward using the Amiga as a learning tool. Last year the A500 *Class of the 90s* pack offered an integrated educational solution, but was pitched at a secondary school level. The First Steps pack is the second Class of the 90s offering and is suitable for primary, junior and above.

Commodore has chosen the software in the *First Steps* pack to be a simple introduction to computing, applications and using the Amiga as a tool for productivity and creativity. The pack also contains information for parents about the National Curriculum and how it includes computing.

THE EMULATOR

The Emulator is a piece of software designed to take the Amiga back to the days of the Ark and allow it to emulate the 8-bit BBC B micro. However, this seemingly retrograde step has method in its madness. The majority of schools and particularly primary schools still use the BBC to teach computing.

Like most emulators, The Emulator will only run well behaved software that conforms to legal BBC programming, but falls over if it comes across a program that bypasses the operating system and accesses the hardware directly. Thankfully, most BBC educational software is written legally and will run.

The Emulator consists of *Beebos, DFS, BASIC* and *6502*. *Beebos* is a bridge from the BBC operating system to the Amiga. *DFS* is a bridge from the BBC disk operating system to AmigaDOS. *BASIC* is an implimentation of BBC BASIC that runs on the Amigas 68000 processor. *6502* is a software emulation of the BBC's *6502* chip which enables the Amiga to call BBC machine code routines.

PROWRITE

The National Curriculum has word processing as a requirement in education. *First Steps*' answer to that is New Horizons' *ProWrite*.

ProWrite is a word processor with the facility to include graphics as well as text on the printed page. *ProWrite* allows you to open and manipulate text and graphics between up to eight windows. The graphical ability of *ProWrite* is a plus point in a package intended for younger children. This, and the larger font sizes available, make it a useful tool in teaching as well as a full multi-tasking word processor.

LOGO

Logo is the original 'turtle graphics' program designed to teach young children about processing and computing. In its simplest manifestation, it can be used to draw patterns on the screen from simple mathematical instructions. The instruction: Repeat 4 [Forward 100 Right 90] would draw a square. It's simple to teach a child the connection between the instruction and the screen drawing. *Logo* also allows any set of instructions to be defined as a procedure. The above instruction could be defined as Square. In future routines, the word Square would replace the instruction.

The Amiga version of *Logo* is the best specified so far using colour, graphics and even speech routines. To make life even simpler there's a Teach Yourself manual aimed at teachers and parents. This offers the adult a structured approach to teaching young children.

MUSIC MOUSE

Music Mouse is a fun way to introduce children to making music on the Amiga. Tunes can be played by pushing the mouse around and playing the music in real time while various control options can be accessed from the Amiga's keyboard.

Although *Music Mouse* is aimed at the beginner to music, it can be used equally well by musician and novice alike. None of the controls are difficult to master and even a complete beginner will soon be able to access rhythm, voicing and dynamics. There is also a feature that allows computer generated transposition and harmonics. *Music Mouse* can handle standard IFF sample files and connection to MIDI means that all that is needed is an interface and cables to start conversing with the outside world of MIDI.

INFOFILE

Taking data in well known structures such as telephone books and address books, and working that into the computer is the job of *InfoFile*.

To make things simpler, *InfoFile* comes with ready made templates for the most common databases. These are address book, phone file, basic accounts, club activities, personal finance, book lists, video and record collections and many other things to keep track of on a daily basis.

It is possible to load pictures into a file and *Infofile* becomes almost multimedia with a facility to hold a sound sample with a record. Thus an entry for say a fire engine could have all of the normal written data, a colour picture and a sound file of the bell or siren. There is also a guide for adults to show how to best teach the use of the database.

So you've already bought an Amiga but you'd like First Steps. Keep your eyes glued to *Express*. We've huddled together with Commodore and come up with a £5,000 giveaway of *First Steps* software ... starting soon.

DELUXE PAINT II

Every youngster likes to crayon and paint and including *Deluxe Paint II* offers a canvas on screen that doesn't make mess and can be used again and again. Control is via the mouse and the results can be saved as IFF files to import into databases and documents.

Deluxe Paint II is capable of doing anything that a box of paints can do with one important exception. If you make a mistake with paint, you have to start again. If you make a mistake on screen, it can be undone.

The program is suitable for young children who generally like to cut a broad swathe of bright colours, but as their abilities grow, the program grows too, offering bold and pastel shades and dithering and stippling effects suitable for graphics work up to degree level.

DELUXE PRINT II

Menus, letter heads, business cards, posters, adverts, greetings cards, signs and any custom designed image can be produced with *Deluxe Print II*. It's a simple to use program that even the youngest child will be happy with and the results can be sent direct to a printer.

LETS SPELL AT HOME

Reading, writing and arithmetic have always been regarded as the backbone of learning. *Let's Spell* helps reading and writing. It can be used by any child aged four or older and as well as basic spelling tests, also includes a spelling game to get the youngster familiar with the program.

Help and hints are given and a correctly spelled word is rewarded with a smiling face and a pleasant tune. A word spelt incorrectly gets a frown and the correct spelling appears on screen. As the child becomes more proficient, there's a more difficult version.

This package isn't a jumbled mish-mash of software. Someone at Commodore has taken time and has researched what the younger child needs, resulting in a suite of software that is suitable for primary children, but in the main will last well on through the school years.

The cover value of the software is about £500 which means that you get a 1Mb Amiga for the remaining £99. Not bad value for a machine to aspire to. *First Steps* is a well thought out package that builds on the foundation set by the original *Class of the 90s* pack. ■

The *First Steps* pack has an A500, a 512K memory upgrade to make the machine 1Mb, software, an introductory video, ten disks, a mouse mat and a quarterly newsletter . The pack costs £599.

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£129
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144 CPS DRAFT 24 PIN



CITIZEN 124D

The award winning Citizen 124D brings high quality 24-pin dot matrix printing within every computer users reach. It is the ideal choice where high quality printing is required at a budget price.

- *24-pin Impact Printer*
- *Print Speed 144cps Draft*
- *2 LQ Fonts (48cps)*
- *8K Buffer*
- *Epson, IBM & NEC P6+ Emulation*
- *Advanced Paper Parking*
- *Superior Graphics - 360x360dpi*
- *FREE Starter Kit*

RRP £320.85
STARTER KIT £29.95
TOTAL RRP: £350.80
SAVING: £144.95
SILICA PRICE: **£205.85**

£179
+VAT = £205.85

192 CPS DRAFT 9 PIN



SWIFT 9 - COLOUR!

The Citizen Swift 9 is perfect for those who require high quality dot matrix black or colour printing at a budget price. The print quality of Swift 9 rivals that of other manufacturer's 24-pin models.

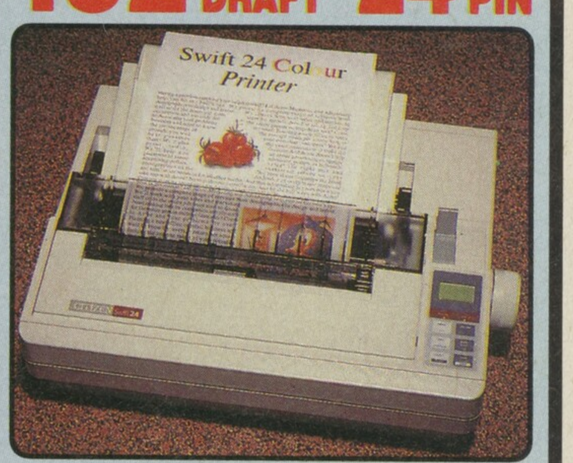
- *9-pin Impact Printer*
- *Print Speed 192cps Draft*
- *3 NLQ Fonts (48cps)*
- *8K Buffer*
- *Epson & IBM Graphics Emulation*
- *Advanced Paper Parking*
- *FREE Starter Kit*
- *FREE Colour Kit*

FREE! COLOUR KIT

RRP £309.35
STARTER KIT £29.95
COLOUR KIT £39.95
TOTAL RRP: £379.25
SAVING: £161.90
SILICA PRICE: **£217.35**

£189
+VAT = £217.35

192 CPS DRAFT 24 PIN



SWIFT 24 - COLOUR!

The Citizen Swift 24 is one of Europe's best selling printers and has won awards including Printer Of The Year 1990. Its rapid print speed, quality and black or colour options, make it a natural choice.

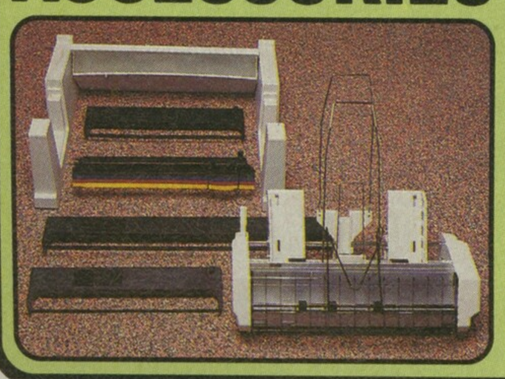
- *24-pin Impact Printer*
- *Print Speed 192cps Draft*
- *4 NLQ Fonts (64cps)*
- *8K Buffer*
- *Epson, IBM & NEC P6+ Emulation*
- *Advanced Paper Parking*
- *FREE Starter Kit*
- *FREE Colour Kit*

FREE! COLOUR KIT

RRP £419.75
STARTER KIT £29.95
COLOUR KIT £39.95
TOTAL RRP: £489.65
SAVING: £191.80
SILICA PRICE: **£297.85**

£259
+VAT=£297.85

PRINTER ACCESSORIES



SHEET FEEDERS

PRA 1200	120D	£74.75
PRA 1215	124D/Swift 9/24	£96.60
PRA 1228	124D/Swift 9/24	£46.00

SERIAL INTERFACES

PRA 1189	120D+	£62.10
PRA 1209	Swift 9/124D	£34.50
PRA 1709	Swift 24	£28.75

PRINTER STAND

PRA 1242	124D/Swift 9/24	£26.95

ORIGINAL RIBBONS

RIB 3502	120D/Swift 9 Black	£4.03
RIB 3924	124D/Swift 24 Black	£5.18
RIB 3936	Swift 9/24 Colour	£17.25

COLOUR KITS

PRA 1236	Swift 9/24	£39.95

All prices include VAT and Free delivery.

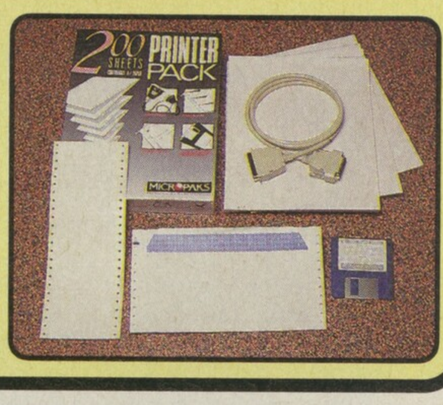
FREE! STARTER KIT

Every Citizen printer from Silica, comes complete with the Silica Printer Starter Kit, including everything you need to get up and running with your new printer immediately, FREE OF CHARGE!

- *3½" Dual Format Disk with Amiga & ST Printer Drivers*
- *3½" Disk with Drivers for Microsoft Windows 3*
- *2 Metre Parallel Printer Cable*
- *200 Sheets of High Quality Continuous Paper*
- *200 Continuous Address Labels on Tractor Feed*
- *5 Continuous Envelopes on Tractor Feed*

If you already own a printer, and would like a Silica Printer Starter Kit, you may order one (ref: KIT 5000) for the special Silica price of £24.95 - £5 off RRP!

NORMAL RRP
£29.95



SILICA SYSTEMS OFFERS YOU

- ***FREE OVERNIGHT COURIER DELIVERY:*** On all hardware orders shipped in the UK.
- ***TECHNICAL SUPPORT HELPLINE:*** Team of PC technical experts at your service.
- ***PRICE MATCH:*** We normally match competitors on a "Same product - Same price" basis.
- ***ESTABLISHED 12 YEARS:*** Proven track record in professional computer sales.
- ***£13M TURNOVER (with 60 staff):*** Solid and reliable with maintained growth.
- ***BUSINESS/EDUCATION/GOVERNMENT:*** Volume discounts available for large orders.
- ***SHOWROOMS:*** Demonstration and training facilities at our London & Sidcup branches.
- ***THE FULL STOCK RANGE:*** All of your PC requirements from one supplier.
- ***FREE CATALOGUES:*** Will be mailed to you with offers and software/peripheral details.
- ***PAYMENT:*** By cash, cheque and all major credit cards.

Before you decide when to buy your new printer, we suggest you think very carefully about WHERE you buy it. Consider what it will be like a few months after you have made your purchase, when you may require additional peripherals or software, or some technical help and advice. And, will the company you buy from contact you with details of new products? At Silica Systems, we ensure that you will have nothing to worry about. Silica Systems is one of the UKs leading independent computer dealers and provides a quality service to users at home, in education and in business throughout the nation. Silica have been established for over 12 years, and have an annual turnover of £13 million. With our unrivalled experience and expertise, we can now claim to meet our customers requirements with an understanding which is second to none. But don't just take our word for it. Complete and return the coupon now, for our latest Free literature on the Citizen printer range and begin to experience the "Silica Systems Service".

SILICA SYSTEMS

MAIL ORDER:	1-4 The Mews, Hatherley Rd, Sidcup, Kent, DA14 4DX	**Tel: 081-309 1111**
Order Lines Open:	Mon-Sat 9.00am-6.00pm	No Late Night Opening	Fax No: 081-308 0608
LONDON SHOP:	52 Tottenham Court Road, London, W1P 0BA	**Tel: 071-580 4000**
Opening Hours:	Mon-Sat 9.30am-6.00pm	No Late Night Opening	Fax No: 071-323 4737
LONDON SHOP:	Selfridges (1st Floor), Oxford Street, London, W1A 1AB	**Tel: 071-629 1234**
Opening Hours:	Mon-Sat 9.30am-6.00pm	Late Night: Thursday until 8pm	Extension: 3914
SIDCUP SHOP:	1-4 The Mews, Hatherley Rd, Sidcup, Kent, DA14 4DX	**Tel: 081-302 8811**
Opening Hours:	Mon-Sat 9.00am-5.30pm	Late Night: Friday until 7pm	Fax No: 081-309 0017

To: Silica Systems, Dept NCE-0391-54, 1-4 The Mews, Hatherley Rd, Sidcup, Kent, DA14 4DX

PLEASE SEND CITIZEN PRINTER INFORMATION

Mr/Mrs/Ms: ..... Initials: ..... Surname: .....

Address: .....

.....

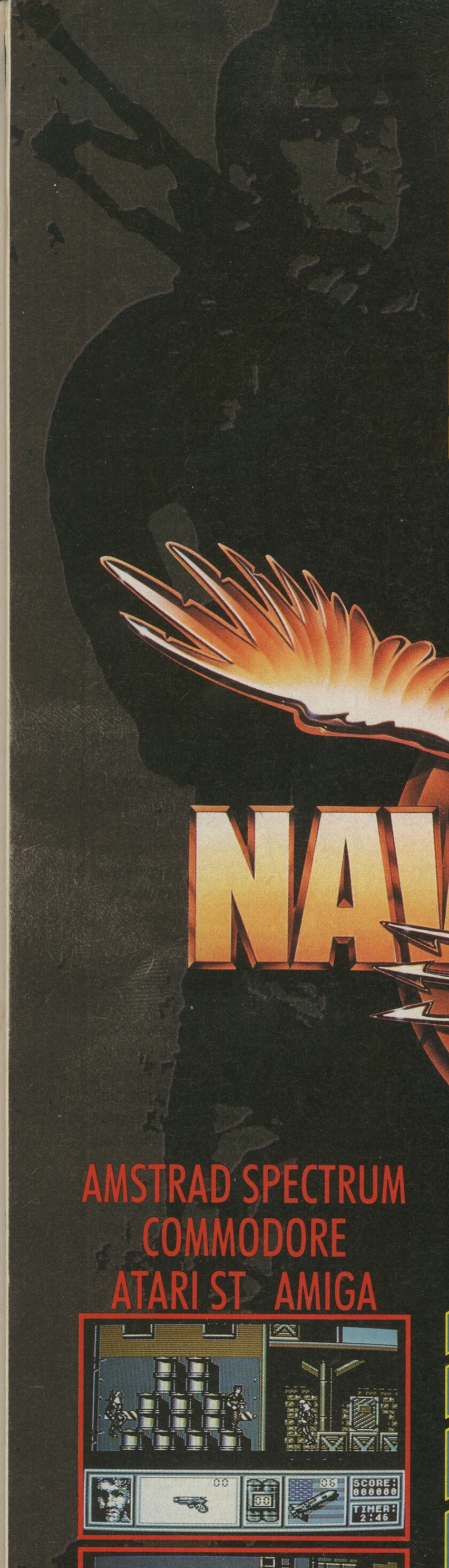
..... Postcode: .....

Tel (Home): ..... Tel (Work): .....

Company Name (if applicable): .....

Which computer(s), if any, do you own? .....

E&OE - Advertised prices and specifications may change - Please return the coupon for the latest information.





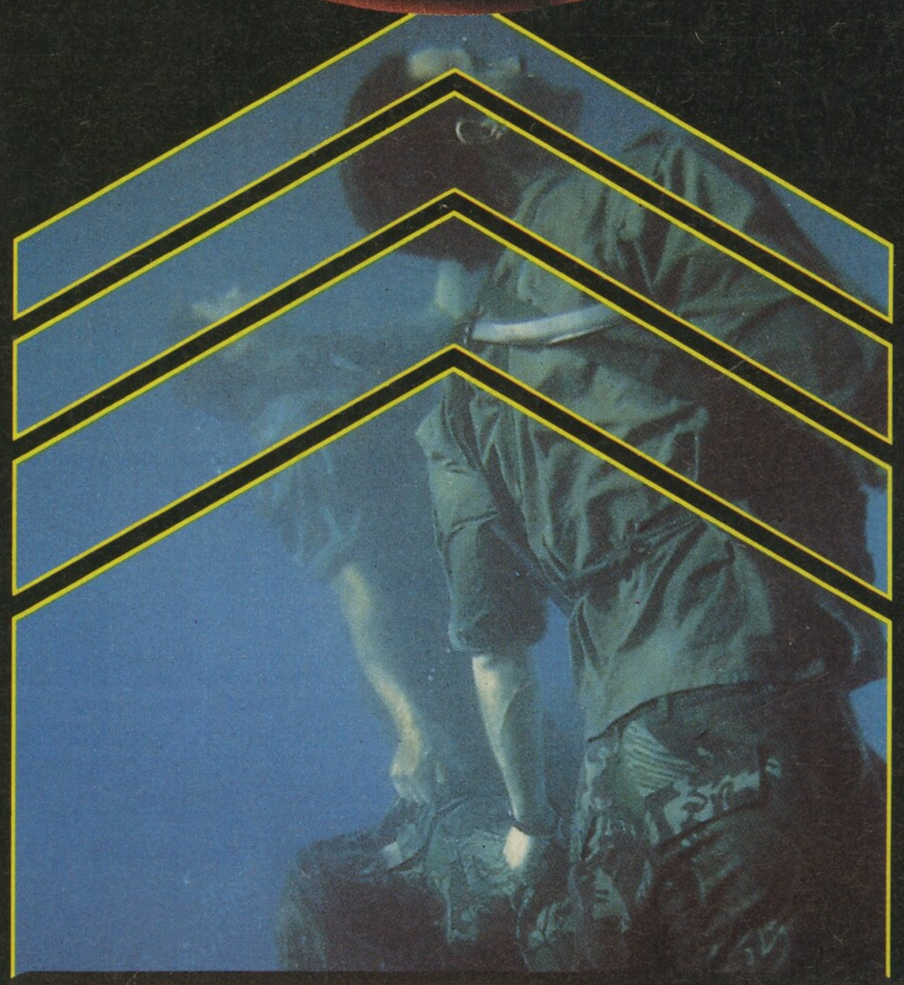
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COMMODORE
ATARI ST AMIGA



"...a brand new and quite sophisticated game-style. Alongside the excellent Mathew Cannon sonics are the superlative graphics. The detail in level one is phenomenal and ranks among the best I've seen..."
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