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COMPUTER EXPRESS

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

THIS WEEK

AMIGA
 A1500 price cut imminent
PLUS: The amazing A500 trade-in deal

ATARI
 An ST compatible Unix workstation is announced
PLUS: A stereo ST for only £30 extra?

PC
 WordStar for Windows 3!
PLUS: Where can you buy a 486 for less than £2,000?

CONSOLES
 The joystick you can sit in!

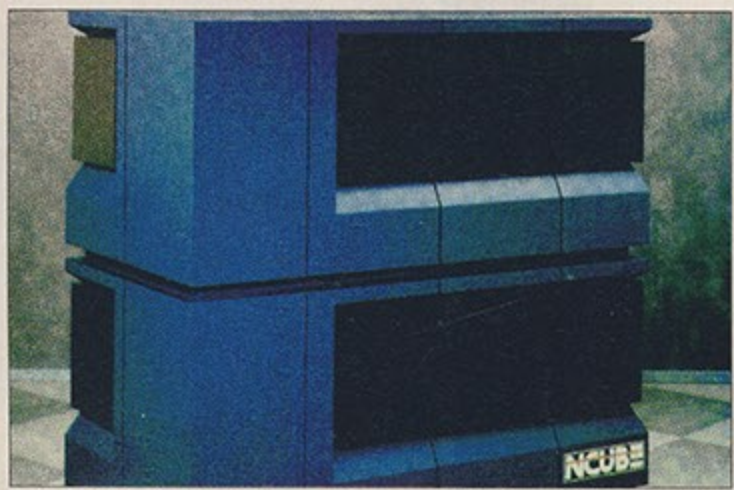
GAMERS
 REGULAR TIPS
 & TRICKS FOR
 MEGADRIVE
 NINTENDO
 ATARI LYNX
 GX-4000
 & 44 PAGES OF
SHOPPING
EXPRESS
BARGAINS !!!



FAXES:
 Why buy a machine when you can just slot in a card?

BUDGET IBM 386 LOOMS

Big Blue's business solution is all set to take on the low-cost Macs – full details on page 7



SUPERCOMPUTERS
 How you could soon have mainframe power at home

SPEEDBALL 2



Stylishly violent

"WE MUST STOP THE SWEATSHOPS"
 BRITAIN'S GAMES AUTHORS SPEAK OUT – SEE PAGE 8



frontend

edited by Colin Campbell

THE WAY OF THE DRAGON



Classic computer game *Double Dragon* is to be made into a movie. The world's favourite beat-'em-up should hit the big screen in the spring of 1992.

A script is being written and publisher Tradewest says it will follow the basic pattern of the game. Arcade fans and computer gamers will remember that *Double Dragon* involves twins Billy and Lee who beat the hell out of hundreds of bad sorts using all manner of martial arts tricks. The point is to indulge in some delicious scumbag wasting while saving a pretty girl.

Tradewest's boss Byron Cook enthused: "Double Dragon has all the aspects of a great movie - good guys, bad guys, a rescue, everything. Plus, there are very few people between the ages of 10 and 25 who aren't aware of *Double Dragon*." ■



Lotus cancels CD launch

Lotus has been forced to cancel a planned launch of a CD-ROM database containing information on millions of American consumers.

Lotus had hoped the CD would catch on with marketing companies, who could use the information to target consumers effectively. But the company had bowed to public pressure and canned the project. The CD was to be launched next month.

Lotus president Jim Maqzi said: "Unfortunately we feel that there have been many wrong perceptions about the product. It didn't contain any information not already available through a variety of publicly accessible databases. It was developed in response to a real business need, particularly among smaller businesses."

He stressed that the CD did not include sensitive information such as credit history, or actual income. ■

BACK TO BASIC

A user group has been set up for fans of that most popular programming language - BASIC.

The BASIC Programmers' Group hopes to build up a library of programs written by users while encouraging further use of BASIC. Founder Mark Blackall commented: "We'd like to encourage use of the program on all machines, allow the exchange of ideas and generally help the BASIC programmer."

He added: "Beginners are especially welcome." BASIC is so popular because it is based on real language, and is therefore simple to use. Call 0924 892106. ■

Computers in the jungle

Computers have reached the office, the home, the school, and now the jungle...

Missionaries in Papua New Guinea's most isolated villages are using Toshiba laptops to translate the Bible into the 700 or so local languages. Since the natives have no electricity, the missionaries have to rely on

battery powered machines.

Most have turned to 12 volt car batteries, but a few are using solar panels. Some have invested in desktop machines such as the Macintosh, which they operate using gas powered generators.

The missionaries are from the Summer Institute of Linguistics, and they've written their own

software which aids grammatical analysis by presenting on screen the source text adjacent to a translated version.

There's also a word processor which can handle languages which, unlike English, aren't read from left to right and which can deal with unfamiliar characters and grammatical rules. ■

Slope off on-screen

It's that time of the year when all the jolly, fun loving sporty types slope off for a spot of skiing. But if you don't fancy the Alpine life there's always the safety of your computer.

Microvalue has relaunched old favourite *Winter Olympiad*, which features five different events, at a budget price.

You can indulge in some downhill racing in full 3D perspective, or there's the ubiquitous ski jump, try that most demanding event the biathlon, or slither down the slalom.

Braver people can have a go on the dangerous bob sled. 8-bit prices start at £2.99 while ST and Amiga owners will have to dig out £6.99. ■



Take a Tally



A new 24-pin dot-matrix printer, featuring a built-in automatic sheet-feeder, has been launched by Mannesman Tally.

Priced at a reasonable £359, the MT82 is, according to the company, targeted at computer users who need a low-cost printer which can make documents look a lot better than your average dot-matrix. "It reflects the growing demand among dot-matrix users for laser printer type features," said the firm's Rob Lyszyk.

In draft mode the MT82 prints at 192 characters per second (cps) and in letter quality at 64 cps. It offers an 80 column width and a selection of resident fonts including LQ Sans Serif and Roman.

For more information call 0734 788711. ■

'MAD HACKER' DODGES JAIL

Appeal court judges have failed to decide if Nicholas Whiteley – dubbed the 'Mad Hacker' – should be sent back to jail for breaking into university computer systems, and allegedly causing thousands of pounds worth of damage.

Last year Whiteley, aged 21, was convicted of destroying hundreds of disks after hacking into university computer networks. He was sentenced to one year's imprisonment. However, Whiteley appealed and after one month in Brixton prison he was released pending the hearing.

At the hearing on January 22nd Chief Justice Lord Lane said the case would have to be studied carefully before any decision could be made. Whiteley claims that he only damaged information held on disks, rather

than the disks themselves. He argues that information is "intangible" and therefore impossible to destroy. Lord Lane warned: "He should understand quite clearly that if the Court makes up its mind adversely to him, the chances are he will have to go back to prison. He must prepare himself for that."

Whiteley, a former computer operator, says he is desperate to clear his name in order to pursue his career. But he isn't optimistic: "I wouldn't bet a million pounds on it going my way. It's an uphill struggle to get our case across. Now it's up to the judges," he said.



PIC: COMPUTER TALK

Whiteley is banned from using computers and is currently living at home and unemployed. ■

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EVERY WEEK

Games Week

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What's the Difference?

The man in the suit is Mr Tim Renton, Minister for the Arts. He's lucky enough to be allowed a fondle with the Science Museum's famous reconstruction of Charles Babbage's Difference Engine.

The Science Museum has confirmed that the Engine will be ready by July when it will take centre stage in a special exhibition celebrating Babbage's 200th birthday.

Babbage designed the computer in 1830 but, due to a lack of funds, could not complete the construction. The Science Museum is spending thousands of pounds on the computer to see if it would have worked. The exhibition will run from July 1st until January 1992. ■



It's the ultimate computer program

This piece of kit (below) would set you back £20 million and is capable of wreaking unspeakable chaos. Highly trained Tornado pilots rely on highly trained computer programmers to get the

most out of the machine.

Tornadoes have been involved in hundreds of sorties in the Gulf over the past few weeks, and every one is the result of hours of computer programming.

Before each mission programmers key relevant information, such as flight plan and position of enemy defences, into their computers. A disk is then transferred into the Tornado. The computer actually flies the plane, and it's the pilot's job to make sure the aircraft is following the computer's instructions. The only time he takes over is when he's attacked by the enemy.

Group Captain Bill Hedges, who commands a detachment of Tornados said: "The computer is central to the Tornado's flying capabilities, and is the main reason our low-level bombing missions have been so successful." ■



Trap for BASIC errors

A new utility will make it easier for BASIC programmers on the Amstrad CPC to trap errors. It will also be useful for spotting the invariable mistakes that slip through when typing in magazine listings too.

KWIKREF/X from Parmigold looks at a program and writes a report to the screen containing a sequenced list of variables and their locations. Lines with changed values are marked for attention.

A further table gives a list of lines referring to other lines which provides a cross referencing grid. KWIKREF/X costs £12.95 on three-inch disk and is available from Parmigold on 0666 837215. ■

Scots show

The Scottish Computer Show will be welcome to those people north of the border fed up with having to travel south to London or Birmingham to see the latest in technology.

The show is at the Scottish Exhibition and Conference Centre in Glasgow on February 26-28. There are hundreds of stands booked with exhibitors as diverse as computer companies, publishers, and service organisations.

The Data Protection Registrar's office will be represented offering advice to individuals and businesses. And there should be a few bargains for the computer shopper. ■

Design on special disks

A range of removable hard disks for Atari PCs and a large scale monitor for the Atari TT is available in the UK from German Atari specialist Elektronik GMBH.

The ProGate external hard disks are available in capacities from 20-440Mb and are all designed in house at Elektronik's Berlin research laboratory.

Software provided with the drives allows 12 partitions per disk, selectable boot partition, write protection and password. There are also compatible tape streamers available for the disks and similar models available for the ST.

Elektronik is on 010-49-30 391 20-02. ■



• Elonex: storage.

Data hungry laptop

An enhanced 386sx based laptop with 100Mb of storage has been launched by Elonex.

The £1,695 LT386SX/P weighs in at 6.5kg and has a 16MHz 386sx, VGA mono display, 1.44Mb floppy, a mouse and supplied with a carry-case, MS DOS 4.01 and Windows 3. More details from Elonex: 081-452 4444. ■

Take control

Amiga owners will soon be able to invest in a useful hand-held mouse device, currently only available for PC users.

The Icontroller fits in the hand, allowing you to control your cursor without taking up valuable desk space. You can move the cursor with a press of the thumb, and it's easy to get at the mouse buttons.

The Amiga version should be out within a few weeks, retailing around the £60 mark. Call manufacturer SunCom on 0453 753565. ■



Name that voice

A voice recognition system which will be used for identification purposes has been launched.

Users must speak into the device, which will take about 10 seconds for the computer to recognise the speaker. Manufacturer British Technology claims the rate of false rejections is as low as one per cent. ■

Computer system to stamp out fraud

A software company believes its new computer system will help stamp out credit card fraud by analysing people's buying habits.

Xpertscore from Leigh-based Attar Software deals with patterns of fraud both in applications for credit cards and the use of cards by a person other than the account holder.

Managing director Akeel Attar says fraudulent credit card applications are a major problem for stores which issue their own credit cards: "The problem is people apply for credit when they can't afford it. They use the card extensively over a period of a few days and are then untraceable because the

address given is false. The program analyses data patterns from a series of examples of credit card fraud. It then identifies patterns showing the policies and techniques used by fraudsters."

Transaction fraud as a result of loss or theft can also be tackled by the system. "Patterns of card use can be analysed for each customer," says Attar. "A card that's normally used for petrol or restaurants and is suddenly used for a trip to Harrods will spark an alert as it doesn't fit with its normal pattern of use. In these cases the account holder can be notified and the item checked to ensure it's a genuine purchase."

A BarclayCard spokesman confirms the

need for controls on credit card fraud: "Fraud is a significant problem. The figures for 1989 showed a loss of £15 million on credit card fraud with Barclays."

He agreed a system to analyse patterns in data would be an effective way of dealing with the problem. "People tend to fall into a more set pattern than they realise in credit card use. You must ensure you have a genuine case as a spending blitz for holidays or birthdays is not uncommon."

"There are, however, certain patterns of spending and certain patterns of fraud. A data analysis system could well prove cost effective in detecting when a credit card has been stolen." ■

Under £1,000 and in the High Street

IBM SET TO LOW COST

IBM is set to launch a 386sx version of its low cost PS/1. The firm is understood to be aiming at a sub £1,000 price point with the existing 286 based PS/1 dropping in price.

PS/1, which was launched six months ago, has achieved some success among home and small business buyers. It currently costs £999 and is available through High Street stores such as Dixons.

The move is being seen as a direct response to Apple's success with its low cost Classic which, in its popular hard disk configuration, costs just under £1,000.

The PS/1 386sx is likely to come with a free copy of Microsoft's 'Mac like' operating environment Windows 3. This would make the machine a low

cost Windows workstation and an attractive option for computer buyers looking for power without an outrageous price penalty.

Dealers are predicting that the machine will be launched within the next two months with stocks available almost immediately. To run Windows the PS/1 386sx must come with 2Mb of RAM on board, and a 40Mb hard disk is almost certain to be included. The 386 chip will allow to machine to run at a nippy 16MHz.

Both IBM and Apple are keen to win a large share of the home and small business computer owner in Europe and the US. Sales of the PS/1 have been satisfactory since launch, although it is Apple's Classic which is attracting the most buyers.

IBM is hoping that keen pricing, with the advantages of

gh Street in bid to bring buyers back

TO LAUNCH ST 386 PC

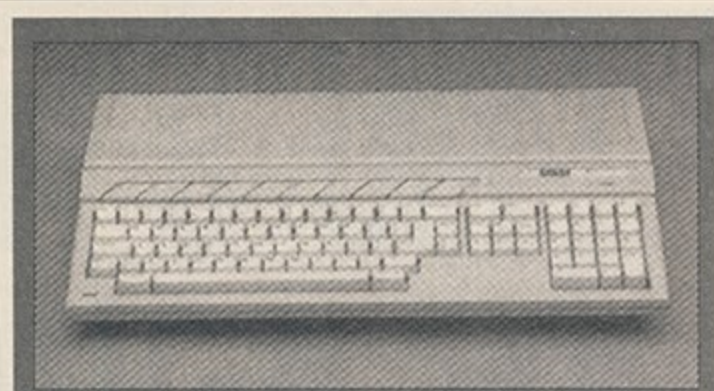
standard compatibility, a fast processor and the easy to use Windows environment will bring buyers back.

Some have criticised the PS/1 for being too little too late. But a more powerful model and a downward adjustment in the pricing of the original will strengthen IBM's position. David Smith of official IBM dealer Worldwide Computers commented: "People say the PS/1 is expensive, and can't be expanded. But if you include the extras that come with it as standard, it's actually very competitive with many low cost 286 machines."

A spokesman for IBM refused to comment on the situation. "We haven't announced anything, and we don't speculate on forthcoming product," he said. ■



• PS/1: faster model coming soon.



• STFM: now in stereo

Sound out ST in stereo

A new £29.95 cartridge allows the ST to play back in glorious stereo and takes advantage of new software written with stereo capability.

Stereo Playback from Microdeal contains a 2 channel drum sequencer which lets you have up to 15 sampled drums and up to 50 drumbeat patterns in memory at one time. This allows you to assemble the patterns into songs of up to 99 patterns. 10 songs can be held in memory at once.

There's also a Stereo demo driver for the Quartet sequencer, and routines to assist you in writing stereo sound into your own games. More information from Microdeal on 0726 68020. ■

Professional PC package

The *Top Copy Plus* word processing package for the PC has been upgraded to *Top Copy Professional* for 1991. The new version offers page preview, on-line thesaurus, and newspaper column type display as well as HP soft font capability.

A further feature is a spooling

save as you type option that avoids accidental loss of documents in the event of pilot error or power failure.

Top Copy Professional costs £228.85 and there are upgrade prices available to users of *Top Copy Plus* and *Top Copy Professional*. Call Top Level Computing on 0453-753955. ■

From the makers of Amiga Format

In the wake of *Amiga Format's* extraordinary success, two more Amiga magazines are to be launched by Future Publishing.

Future, also responsible for NCE, says *Amiga Format's* 80,000 plus readers are demanding magazines with specific themes. The first will be a "total games exclusion zone" called *Amiga Shopper* which will be aimed at the serious Amiga user who is interested in programming, public domain, productivity, buyers guides and, most importantly, bargains.

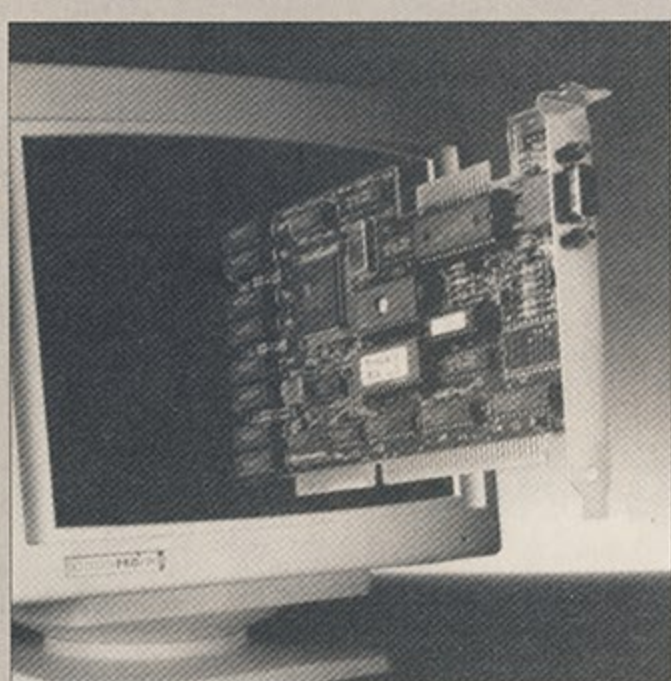
Amiga Shopper will be edited by former *Amiga Format* editor Bob Wade and will cost only 99 pence. A sneak preview sample will be distributed free with the April issue of *Amiga Format*, with the launch proper in May.

The second mag, *Amiga Power* will be 100 per cent games based, with colour throughout. It will cost £2.95 and will come with a complete and "very high quality game" free on the cover every month. Two editors with many years experience

• Amiga Format: Now there are three

in the games market will be combining forces to bring *Power* into being. Matt Bielby transfers onto the title, vacating the editor's chair on *Your Sinclair*, and Gary Penn, until recently editor of *The One*, will be a consultant.

Publisher Greg Ingham fended off fears that *Amiga Format* would be harmed by its two offspring: "You'd have to be a madman to do anything which might harm *Format*. It is the fastest growing computer magazine of all time on sales, and it's still growing. As in the past *Format* will continue to cover all aspects of the Amiga, but readers have said they want specific magazines too, and we agree." ■



• Big deal: monitor and graphics card together.

Citizen offers an easy life

Monitor buyers might do well to check out a nifty little concoction offered by peripherals manufacturer Citizen.

Bargain hunters will be offered the Procard 816 graphics accelerator when they buy the ProCM14i 14-inch colour monitor. The price for this twosome is £899 representing a saving of 12 per cent.

"The combination will offer buyers a total display solution," said Citizen's Simon Cooper. "It makes life easier because the buyer is assured of operational compatibility." ■

Cheap and simple offer going Loco

A new version of Locomotive's PC word processor *LocoScript* was launched last week.

Version 1.5 now includes split screen editing, pop-up keyboard diagrams, phonetic spelling correction, selective spelling checker, ability to search for a file or directory from the disk manager and the facility to control whole directory trees.

LocoScript was originally launched for the PCW and is used by millions. The PC version was released last May to general satisfaction.

Locomotive's Chris Hall said: "For just £125 it delivers a powerful range of word processing features, and an impressive integrated database and mail merge facilities."

Upgraders are being offered cheap and simple options for getting their hands on the program.

Call Locomotive on 0306 740606. ■

THE WEEK IN VIEW

Renegade publisher Tom Watson argues for quality, before big name licenses...

Software publishing has come a long way in its short life. Seven years ago, companies (or more frequently individual programmers) exhibited their wares on trestle tables at informal shows and sold their games in unsophisticated packaging. Nowadays, their operations are substantially more sophisticated with multi-million pound marketing spend, international conferences, high-profile brands, one or two of them even own a fast car. Software programmers are nowhere to be seen.

So, as the industry developed its commercial skills, something was forgotten along the way: the games themselves. Original products started to take second place to licences. Slowly but surely, marketing muscle began to tell and companies engaged in buying wars to see who could gain the supposed top licence.

To many publishers, original products became less important. Some publishers will even admit privately to the 'empty box' scenario - when the licence is felt to be so strong that they don't feel that it matters what is in the box. The industry has started to take too many lowest common denominator decisions.

This carries many dangers:

- If publishers don't push themselves to produce the best games, consumers will all too soon weary of a stream of repetitive products, and buy less.
- Developers become starved of investment for the creation of new work, being strongly 'encouraged' instead to work on licensed material.
- As the future of optical/console systems beckons, a reliance on the intellectual property rights of others will leave our industry starved of creative ambition.

We must be prepared to recognise that we contribute to an industry which is seen throughout the world as having the finest 16-bit development talent. That talent needs stronger and more positive creative direction from its publishers. It needs to be encouraged to work, on a creative basis, with other entertainment industries. To deny or hamper that creativity will ultimately lead to a dependence on the creativity of others, exploiting their work, rather than creating our own.

The status of the developer must be enhanced, the relationships between developer and publisher must improve (another subject) and we must all start to recognise what is really valuable to us - the consumer. ■

Radio bits

Apple is developing a radio-based network to transmit Appletalk-compatible data in the US.

It has already requested permission to use bandwidths from 1850MHz to 1990MHz of the radio spectrum for Data PCS (Personal Communication System). It will transmit data at up to 10 Megabits per second at distances of up to 150 feet.

NCR, which has a comparable system, called Wavelan, running in the states has been refused a licence to set it up in the UK. ■

Gulf War threat to 386 chips

The Gulf War could result in a severe world wide shortage of silicon chips.

Intel, one of the world's leading chip suppliers, has its sole source of 486, 386DX and 386SX chips in Tel Aviv. Further missile attacks from the Iraqis on the Israeli capital would almost certainly halt all production.

The company has begun taking precautions by moving 486 production to the US, but there are no firm plans for alternative manufacturing sites for 386 yet. ■



• Tel Aviv after an early Scud attack.

Amstrad's popular computer deal

PCW PRICE SLASH

Amstrad has slashed £80 off the price of its entry level business computer the PCW 8256.

The machine, which many say brought serious computing into the home for the first time, is one of the best selling computers of the past five years. A £1 million national press advertising campaign has been promised, confirming Amstrad's continuing belief in the PCW.

The £299 price point includes keyboard/monitor unit and a printer, and, as always, the PCW comes with word processing package *LocoScript*.

Amstrad's latest price cut has fuelled speculation that the company is making room for a complete re-launch of the PCW range. A 1990's version would probably feature 3.5-inch drive instead of the traditional (and outdated) 3-inch drive. However, spokesman Nick Hewer said he knew nothing of any such launch, adding that it would definitely not happen before the autumn.

He added: "The 8256 has always been a big seller. The price cut and ad campaign will act as a



• PCW: new lease of life.

stimulant." The PCW range is thought to have sold a good deal more than one million since its launch five and a half years ago.

No promotional plans have been announced for the high end PCW machines.

Meanwhile, Amstrad is preparing for a triple launch at the Hannover Messe in a few weeks time. Smart money is being put on a 486 (probably called the PC5000) and a couple of high-end portables. The PC4000 low end IBM compatible may be launched, although that could be held back until the autumn. ■

Budget 16-bit action

Digital Integration is releasing *Super Gridrunner*, *Colorado* and *SDI* on its budget 16-bit label, Action 16.

Colorado is a western adventure pitting you against 'Injuns' and wild animals. A love story set against the background of international espionage provides the premise of *SDI*. If science fiction 'shoot-em-ups' are more your taste then *Super Gridrunner* will provide all the action you need as you fly a Vorton Hyper X-13 star fighter to save the earth from the "evil Sliemlords of Xtharrgg".

All three disks are out now for the Atari ST and Amiga, *Colorado* also being available for the IBM PC. They each retail at £7.99.

Digital Integration has also, finally, issued a Spectrum version of the acclaimed game *F-16 Combat Pilot*. This classic flight simulator, with five missions, variable weather conditions and laser guided weaponry, is due in the shops now. The disk version costs £19.95 and the tape retails at £14.95. ■



• Colorado: Wild West action.

Bringing Hubble into focus

Computers have been brought in to rescue the reputation of the Hubble space mission.

Specially-developed computer techniques are now digitally focussing the blurred images which the \$1.5 billion telescope has been sending back for the past few months. Instead of helping scientists discover new astronomical phenomena much of the information from Hubble had been virtually useless, because of a basic design flaw in the telescope's mirror.

Now the telescope is sending back the crystal clear images of planets in our solar system as well as new information on stars almost 170,000 light years away. ■

Move up with a cheap 486

If you're looking to move up into the world of 486 PCs you can normally expect to pay a lot of money. However, Berkshire based Factotum reckons it has the best deal with a sub £2,000 machine launched this week.

The firm says its 486/25 costs less than half the price of IBM's own machine, and is "hundreds of pounds" cheaper than any of its competitors.

The basic Factotum 486 comes with a mono monitor, 4Mb of RAM (expandable to 16Mb), a 32-bit memory slot with a hard disk boasting 80Mb capacity. Digital Research's DR DOS is supplied together with a free spreadsheet. Call 081-336 1282. ■

Dealers told to dispose of old computers and offer £70-off deal

TRADE IN YOUR 8-BIT FOR A NEW AMIGA 500

Buyers of Commodore's Amiga are to be offered an impressive trade-in deal on their old computers.

Anyone can swap their outdated machine for a £70-off deal on the Amiga. Dealers say the offer is open ended and will include games consoles and dilapidated computers.

The £70-off plan will bring the price down from £399 to £329. While dedicated users of 8-bit machines such as the Speccy and C64 will be horrified by Commodore's announcement, genuine computer users looking for a good deal will be attracted.

The dealers have been

instructed to dispose of old computers, but Commodore says it would be nice if they were given to charity. Commodore's Kelly Sumner said: "We can't force the dealers' hand, but we have given them that option."

Cynics in the trade were last week claiming that the Amigas are old faulty returns which had been fixed and were being dumped back into the market. Sumner assured Express that this was not the case adding: "That is totally illegal, and we would not do such a thing." The Amigas on offer do not include the free software packs.

Meanwhile, the mid-range



• Amiga: tasty trade-in deal.

Amiga 1500 pack has been cut in price by 15 per cent – effectively changing the £999 plus VAT to £999 including VAT.

Commodore has also announced its middle of year financial results showing that the UK operation is performing bet-

ter than anywhere. Sales were up more than 50 per cent in the UK for the period running up to Christmas (on the same period in 1989). Chairman Irving Gould said Europe now represents 85 per cent of Commodore's worldwide business. In contrast the American operation reported a 97 per cent drop in earnings.

He also claimed that the new PCs introduced last year had performed well, but said it had been the Amiga's success which had represented an upswing in sales and profits. More IBM compatibles are expected to be launched in the UK within the next few weeks. ■

From another planet . . .

The third issue of Californian New Edge computer magazine *Mondo 2000* has hit the UK. The more Virtual among you will remember *Mondo* for its off-the-wall approach to computing and its plain weirdness.

This quarter's issue features reviews on hardware, software, graphics and computer art, debates on Virtual Reality, interviews with strange new-tech types and lots of laughs. The publishers say it's one for computer literate dissidents.

You can pick it up from Virgin Megastore in Oxford Street, London or Forbidden Planet in New Oxford Street, London for £4.75. ■



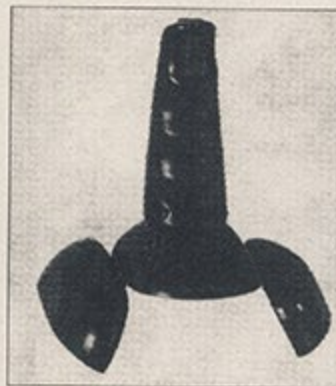
• Mondo 2000: strange

Unix ST?

Atari is believed to be preparing for the launch of a high-end ST running Unix.

A spokesman for the firm confirmed that launches are in the offing, and said the company is looking closely at Unix. He could not, however, comment on speculative talk that the machine would be 100 per cent downwardly compatible with the ST.

Meanwhile, expectations are growing of a new pricing structure for the whole ST range. The spokesman refused to be drawn on this speculation. ■



• Converta: two in one



Open and shut joystick

It's the world's first convertible joystick, and it's being launched this week.

Converta allows gamers to choose between hand-held use and table-top use, giving you a little advantage depending on

what your style happens to be.

Converta is manufactured by KPK (a Welsh firm set up by computer industry veterans). It's compatible with most home computers, and it costs £9.99. Call 0495 302968. ■



• The London International Group, famous for the manufacture of rubber gloves and Durex condoms, has just splashed out £200,000 on a new computer system designed to improve the making and testing of its products.

The IBM based system replaces an outdated mainframe, the company says the new machines will "provide greater flexibility for users".

Soviet silicon valley planned

Senior executives from top American computer companies have been visiting the Soviet Union recently for meetings with president Mikhail Gorbachev.

The Soviets are keen to set up a new "silicon valley" in their own country and are seeking advice from firms such as IBM and Apple. In turn, the Americans are looking for Gorbachev to throw some business their way.

Six possible sights have been chosen, and a final decision should be taken later this year. ■



• Gorbachev: in with IBM and Apple

Society of Software Authors holds second annual conference

BLEAK FUTURE FEARED FOR GAMES WRITERS

by Dave Golder

At the second conference of the Society of Software Authors (SSA) games writers voiced fears of a bleak future with little creative control and sweatshop working conditions and admitted that the initiative for change will have to come from themselves.

Software writers are in danger of ending up salaried skivvies working on formulaised projects in publishers' sweatshops unless they get their act together and take a more professional approach to their work, the SSA claims.

At the Bournemouth conference the resounding message from speakers was: "The writers have got to prove that they can work professionally or they will never get a good deal from the publishers."

As SSA Chairman Jon Dean put it: "A lot of software writers aren't even aware that they're running a business. Authors are good at programming or graphics, but that doesn't automatically give them the skills at negotiating a contract. Publishers can handle this side of things much better because it's part of their business and they're doing it all the time."

The speakers also emphasised that a business led software industry would inevitably lead to a raw deal for the consumer, who would have to put up with uninspiring games and endless sequels.

Mel Croucher, software writer and industry veteran, painted a particularly dark picture in his speech, coining the sweatshop analogy which was to crop up as a theme in many of the following speeches. He fears that if current trends continue, authors will soon have little creative input into games and most will instead be reduced to writing short routines or animated sequences handed down to them by the publishers.

Although opinions varied on the extent



Industry veteran Mel Croucher casts some very gloomy predictions at the conference about writers submitting to the beck and call of the publishers.



• Tom Watson (right) with the Bitmap Brothers: good business sense could preserve their distinctive style of games.

to which this hypothesis would be realised, most agreed that the general idea was looming ominously.

"I think the situation is here to some extent at the moment," believes Dean, "You have a few the well-known programmers like Renegade's Bitmap Brothers who are largely free to do what they want, but the majority of creative people have to take whatever they can get."

The SSA is a voluntary body which was set up three years ago with the intention of achieving a better deal for games software writers. At the moment it has around 50 members, an annual AGM every March and publishes a quarterly newsletter, *Blit*. New members have to sign a 'Declaration of Responsibility'. Dean reckons that the main function of the society is "to help the writers help themselves," but it is keen to stress that it is not a union.

"We're not out to call a strike or hold a gun to the publishers' heads," asserts Dean. "We've got to achieve our aim with the support of the publishers, acknowledge that there can be faults on both sides. We want to end the situation where publishers and authors work in isolation and blame anything that goes wrong on each other."

The feeling at the conference was that there are two main ways that the authors can help themselves improve the situation. Tom Watson of Renegade spoke of the value of authors developing an identity so that their own name would become the marketable commodity. Using the example of Renegade's own Bitmap Brothers, creators of *Xenon* and *Speedball*, he argued that if the games buyers know who wrote their favourite

software as opposed to simply who published it, this would create a kind of brand loyalty, such as with fans of one game written by the Bitmap Brothers eagerly awaiting the next.

He believes that this will give the authors more bargaining power when it comes to negotiations with publishers. "So the companies might just lose a little of their power, but in the end result is a

//We're not out to call a strike or hold a gun to the publishers' heads//

situation which is better for both sides."

Dean agrees to large extent, but points out that The Bitmaps actually have a major stake in Renegade, and

"there's a big difference between developing your own identity and having your own label."

He doesn't feel that authors have to go this far to succeed. "There is more positive than negative to come out of having an identity. More authors get coverage now - names on boxes, mentions in magazines. We are pushing to have them credited at the annual industry dinner. When the awards are read out I would like to hear "The winner is *Captive*, from Mindscape, written by Tony Crowther."

He doesn't think that developers having an identity is necessarily at the expense of the publishers. "Take Bullfrog and Electronic Arts. Bullfrog has written some very good games, the quality shows through and the consumers have recognised that. It has been a good move for them both." But at the same time he is not convinced of the value elevating writers to star status. "Authors aren't usually as good looking as pop stars."

Dean's own view is that authors simply need to take a more professional approach to their work, and stresses that one of the main functions of the SSA is to

help them do just that. "The aim of the conference was about teaching them the business side of things. If they can negotiate a better deal that's a start."

His own talk was about the need for authors to impose business management techniques on their writing schedules and he emphasised that it would be to their own advantage to be honest both with publishers and with themselves when it came to discussing the amount of time a game will take to write.

"There are publishers who will claim that they have been ripped off just because a game has been handed in late. This is just down to bad business management. It is hard for authors to admit that they might take longer than the ideal length of time to write a game. What both sides need to do is plan better."

Dean is pleased at the way the conference ran. "It was probably about 150 per cent better than the last one and hopefully the next one will be 150 per cent better than this one."

He was also pleased to see representatives from four of the major publishing companies there, including Microsoft and US Gold and believes that the society is finally gaining recognition. "We recently had a meeting with ELSPA - the publishers' association - and it has agreed to support us, so I suppose that means that it has officially recognised us."

"Getting our message across has been hard as people tend not to take us seriously. We find it hard to get coverage, but finally we are seeing change."

So while the SSA is not a pressure group making a song and dance, demanding rights for authors, Dean is convinced that its long term approach working in conjunction with, and not against, the publishers is proving successful. "Change will only come if all the people involved on both sides put as much effort into it as possible and the results will be better for both the consumer and the industry."

The SSA helpline is on 0867 35485. ■



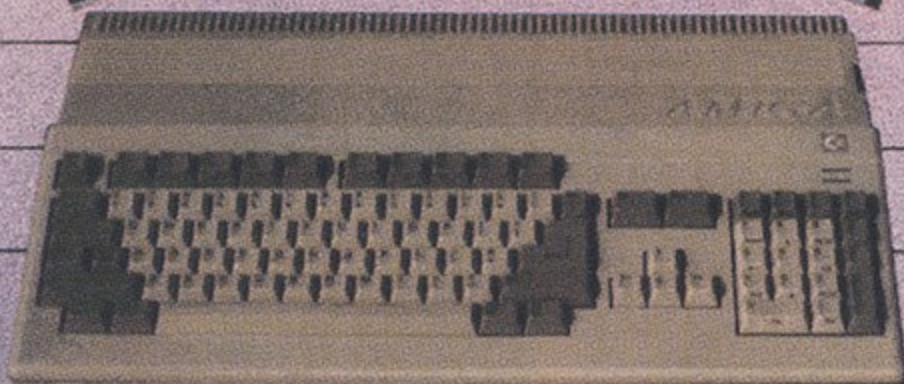
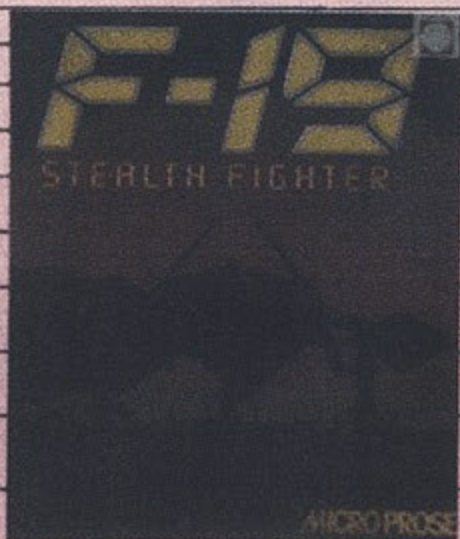
Jon Dean, SSA chairman: "We must help software authors to help themselves."

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SUPERPERSONIC COMPUTING

Supercomputers are breaking new speed records every day, but how do they do it and can the same techniques work on your machine?

The overriding criterion to influence computer design ever since the first mainframes lurched into life in the Sixties has been speed. The search for faster and faster machines has continued for the last decades, finally resulting in the supercomputers we know today.

But the quest for speed has not ended; indeed if anything it has intensified in the last few years. As the potential of simply boosting the computing speed by creating faster hardware has bottomed out due to the limits of the laws of physics, alternative approaches have been brought in to action. These approaches centre around different computer architectures. 'Architecture' is the name given to the layout of components of a computer, but more importantly it defines the way data is transferred and processed by the machine.

The original computers were sequential; the processor received its instruction from a program, it then input the data from memory, processed it according to the instruction and sent the result back out to memory. The first enhancement to this came in the form of pipelining. A processor consists of several parts; the bit which gets the instruction, the bit that gets the data, the bit that does the processing, and so on. Using pipelining,

while one part of the chip is processing an instruction, another part is loading the next one in ready to be done. This can speed up operations enormously.

One step further on than pipelining is vector processing; in this case when a set of instructions are to be applied to a large amount of data each step is performed simultaneously on all the data. This is speedier than taking each piece of data individually and putting it through the complete set of instructions, as the processor can be optimised for each instruction and does not have to reset itself for the next until all the data has gone through. Vector processing is the most common architecture in supercomputing systems.

To increase performance over vector processing systems requires a radical change in the machine's architecture. No longer is one processor enough; instead the problem is broken into several parts which can be worked on simultaneously. The processors in machines like this operate in parallel, and communicate

with each other to transfer data and to allocate pieces of code to each other.

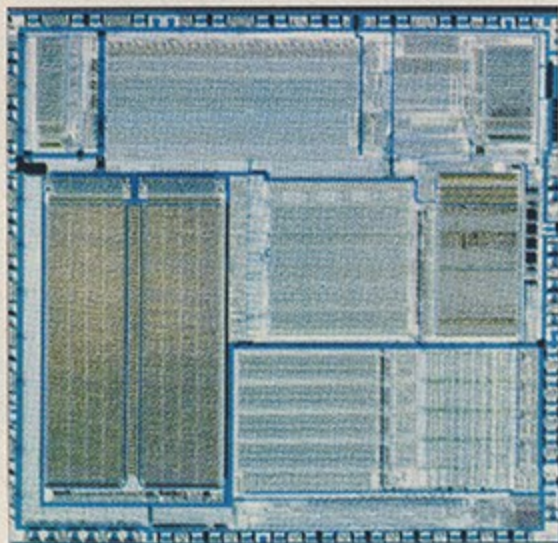
With a parallel processing computer the power is only limited by the number of processors, called nodes, which you add. Thousands of these chips can be strung together, and even if the individual processors are not that powerful, the net effect is stunning. Take the Sigma system, a parallel processing computer consisting of 2,048 i860 processors, each one as powerful as a 486, combining to give awe-inspiring power.

The problem with this kind of machine is programming it. The problem must be analysed in such a way as to be broken down into constituent parts which can be calculated by the nodes. The code to make sure that the nodes communicate with each other properly also needs to be written. Conventional sequential programming methods cannot be used; you need special compilers, but more importantly alternative ways of looking at problems.

These parallel architectures are coming to home computers. The way the Amiga works with its custom sound and graphics chips approaches parallelism, but it is Atari which takes the prize for bringing the technology to the desktop. The Atari TT is to have a card which can

contain up to four T-800 transputers working in parallel, similarly a new version of the Atari Transputer Workstation will allow several T-800s to be wired together. In the PC world, expansion cards are available which contain up to eight parallel processors. Some manufacturers have also started to build multiple 386 processors into their file server machines to increase their power. All these systems require special software; conventional software won't run any faster with a parallel processor board.

The power of parallel processing cannot be long coming to home machines. Imagine the games machine which could be built; one processor handling the graphics, another dealing with sound, a third working out whether your shots had hit, and a fourth loading in the next level from a disk, all at the same time, all at high speed. The cost of microprocessors is now so low that there is no financial reason why this could not be done; perhaps by the year 2000.... ■



• The Inmos T-800 transputer is the powerhouse behind many parallel processing computers; you'll find these inside the ATW and they can be fitted to PCs and TTs.

GLOSSARY OF SUPERCOMPUTING TERMS

ARCHITECTURE: The arrangement of processors, memory and communication links which makes up a computer.

BOUDOIR: Each parallel process accesses only its own memory.

CLOCK CYCLE: The speed at which instructions are performed by the processor. The current record holder is NEC SX-3 with 2.9 nanoseconds.

DANCE FLOOR: Each parallel processor can access all the others' memory.

DISTRIBUTED COMPUTING: Several supercomputers with different architectures linked together, the appropriate machine being used for each kind of task.

GALLIUM ARSENIDE: Material for making microchips which can operate considerably faster than ordinary silicon. Expensive to manufacture.

HYPERCUBE: System of linking parallel processors to three neighbours, all further linked as if at the corners of a cube.

MESH: Interconnections between nodes of a parallel supercomputer.

MIMD: Multiple Instruction Multiple Data: A system whereby each parallel computer element has its own program. Much faster than SIMD, but very difficult to program.

NODE: Processor, often with its own memory and instructions, in a parallel supercomputer.

PARALLELISM: Rather than make one processor that runs faster, split the problem into several parts which can be worked out simultaneously and have a number of processors working together to solve the problem.

PIPELINING: A system whereby different parts of a processor can work on several problems simultaneously, starting the next one before the first has been completed.

SIMD: Single Instruction Multiple Data. A form of parallelism where the instructions are held in a single program which works with several sets of data at once using several processors.

TERACOMPUTER: a fictitious supercomputer with a terabyte of RAM, a teraFLOP of computing power and a data transfer speed of a terabyte per second. At present no-one has got close to a machine of this specification, but work continues apace.

TRANSPUTER: A kind of processor which can be linked together to form a parallel system. Inmos manufactures the most common, the T-800.

VECTOR PROCESSING: If a set of operations are to be performed on a large amount of data then each operation is done on all the data simultaneously, rather than taking the process to completion for each one.

The architecture of 'standard' supercomputers.

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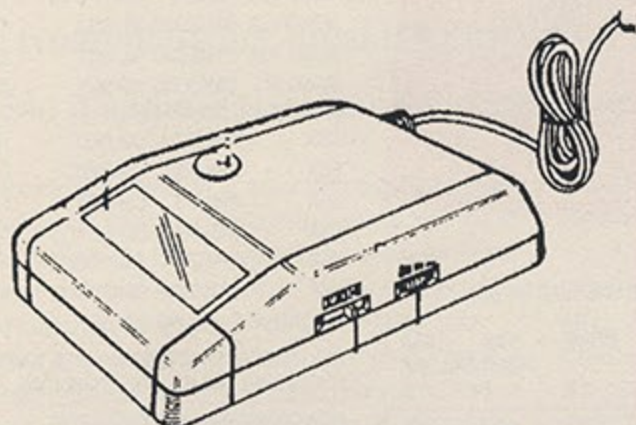
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EXPRESS MAIL

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

■ Veiled threat?

Regarding Alan Gilholm's letter in *Express* 114 in which he complains about the use of the phrase 'Rich Bastard' I'd like to point out that this is not an isolated use of bad language. In particular, your ex-columnist Steve Carey was prone to certain choice words that in no way can be called 'a term of mild derision'.

In your reply, you made the point that in the case of 'RB', it injected humour into the article. Did it need this humour? Surely an equally 'funny' phrase could have been found?

In my capacity as computer editor for the children's paper *Early Times* I often redirect my readers to magazines to allow them to study articles in more depth than I can give. The article in concern would have been superb for reference (bear in mind that *Early Times* has a circulation of 50,000) and could have increased your sales. However, I could hardly recommend it to 8-14 year-olds with that term. Yes, I admit that they used language like that - and worse - in the playground, and I am no proponent of censorship. However, it has a more dramatic effect when written - particularly by people that they may look up to.

I do take all your points into account, but must agree with Mr Gilholm and say that the swearing in that case was far from necessary.

Incidentally, any of your readers who fancy a new computer may like to know that *Early Times* gives readers the chance to win an Atari ST every week.

Peter Orme, Computer Editor,
Early Times

I'm always very suspicious of people who start to make a point with phrases such as 'In my capacity as...' Peter - they're generally about to say some kind of 'positional power trip' on you (as my hippie brother used to say).

And the only trouble with the pseudo penalty we incurred by not being recommended to your readers was that by the time you had rushed into print with a recommendation to buy a copy of *Express* and the Gamers' Guide, it would almost certainly have left the newsagents' shelves and been replaced by the next issue!

Still, you make some fair points (especially about ex-seminary boy Steve Carey) and in the interests of glasnost I've let your plug slip through the net..

H F-W

■ Video naughties

Express has always taken a laudable stand against piracy of software, and the breaking of copyright laws - for this, you are to be commended.

But with this in mind, surely you should be against any action that involves a breach of copyright, and not only that concerning computer software? A few adverts have been published recently in the Goods Wanted section of *Shopping Express*, requesting home video recordings of programmes from BBC and BSB television.

Surely, this is inviting a breach of copyright? I was always under the impression that it was OK to record off-air for your own use, but that it was not permissible to record a programme and then cause it to be heard or seen by others, re-recorded or sold.

Surely, if you're against one type of copyright infringement, you should not condone or enable others to take place?
Steve Lee, Ramsey, Cambridgeshire

PS. Did anybody notice Tracey learning to word process on a CPC 6128 in *Birds Of A Feather* prior to Christmas? And if they did, could they tell me where the 'EXIT' (sic) key is on a 6128?

You've got us bang to rights there, Steve, and we can't even claim that society is to blame. Those video ads just slipped through while we were distracted by the giant pile of adverts offering pirate copies of games. They won't appear again.

And maybe we'll start forwarding these dodgy ads to FAST rather than just binning them - so take heed, you would-be pirates out there. Meanwhile, have a fiver for reminding us of our moral obligations (and spotting that 6128).

H F-W

■ Scuppering pirates

Where I live there is a large network of hackers - they belong to a club that pretends to be a 'law abiding' computer club, but it isn't.

I know some people who belong to this club and hack games - and I also know who supplies the club with a lot of the goods (games to hack, etc). This network is a pretty bad thing, and I have been thinking about telling FAST about it for a long time, but have never brought myself to do it. If I did tell FAST about this illegal racket, what would I have to do? Just make a phone call, or would I have to give FAST some substantial evidence? Also, would there be some kind of reward?

I own a Sega MegaDrive and buy all my games. If I buy my games, why shouldn't other people who own computers buy their own games?

Anon

Exactly. It's dead simple mate. Give FAST a ring on 0628 660377 and they'll explain what's needed. It's highly unlikely that they will ask you to get involved in undercover operations - just a few basic details should suffice. And who knows - there could well be a porky cash reward in it for you...

H F-W

■ Spaced out?

I have been reading the debate in your letters pages concerning the future of Virtual Reality and its social implications.

We have to look no further than the brilliant TV series *Red Dwarf*, or the accompanying book by Grant Naylor to get an insight into what could lay ahead.

There was a (computer?) game called *Better Than Life* which directly stimulated the nerve centres of the player (Game Head) whilst the player's body lay slumped and dying in some corner. The game protected itself in such a way that the player wouldn't even remember starting to play, and was virtually impossible to stop.

Of course, this all just crazy Science Fiction set three million years in the future...

Glyn Pollington, Wollacombe, Devon

Crazy Science Fiction? Just you try working for *Express* - sounds remarkably like *Better Than Life* to me.

H F-W

■ Budget reality

A few weeks ago I read in *Express* about Virtuality, the Virtual Reality system. Well, I had to laugh - you see, I have been enjoying Virtual Reality for several years now - and whereas Virtuality costs 20 grand, my system costs a paltry 50 quid.

Because of my extremely generous nature, I am prepared to tell all to your readers and put these over-priced merchants in their proper place. To build the undisputed Virtual Reality system in the world, simply pop down to your local Dixons and purchase a Casio FX-730P pocket computer. On your way home, nip to the newsagents and buy some Sellotape. Then, when you get home, simply place the computer screen in front of your eyes and Sellotape it to your head (I thought this might be coming - H F-W).

Now you are ready to enter the world

of Virtual Reality. When I first saw this 'jdk-endkenhshnenbtd' displayed, I was convinced that I had fallen into a bowl of Alphabetti Spaghetti and was drowning. Fortunately, all that had happened was that the Sellotape had come loose and stuck across my mouth....

If you are really rich, you could buy some double-sided sticky tape as well, and hey presto, you immediately have a fully-expandable Virtual Reality system - just stick those extra speakers and accelerator boards on as you need them. Magic!

If you have a really big head, it is possible to have quadrasonic sound, 24-bit graphics and the computing power of an N-Cube stuck to your bonce!

The slight drawback is that you have to write your own programs, but where's the fun in buying pre-written ones?

Russ Flaherty, Liverpool

Er, yes Russ. Sure you don't have daily trouble coping with ordinary reality?

H F-W

■ **Misled - or misguided?**

I have just read *Express* 116 and note that your columnist Robin Alway mentions the SAM Coupé User Group and gives an address in Berkshire. I would like to point out that INDUG is the largest SAM Coupé users' group - we are founder members of Team SAM and have supported the machine since its inception nearly three years ago. As members of Team SAM we work very closely with SAM Computers Ltd, although we are, of course, totally independent.

Only SAM Computers Ltd can sanction the use of the name SAM or SAM Coupé, and, as far as we are aware, no person or organisation has been given permission to call themselves the SAM Coupé User Group.

As I know you have a lot of SAM readers and would hate to see them misled by Robin's column, could you please clarify the situation?

R P Brenchley, Format Publications, 34 Bourton Road, Gloucester, GL4 0LE

Claiming that Robin has misled anyone by printing the address of a group calling themselves the SAM Coupé User Group is a bit rich, Mr Brenchley. And it would strike me as being a bit rich if SAM Computers Ltd started getting nasty about the use of the names SAM or Coupé in association with a user group - surely the machine can use all the support it can get?

But being the fair-minded fellow that I am, I took the trouble to print your address in full - but would point out that INDUG is a user group for Spectrum and SAM owners rather than a SAM-specific organisation.

H F-W

■ **Many happy returns...**

What a major Kurfuffle about Old Codgers! (Careful - I could get in trouble if you use language like that - H F-W.) I have been in computing since I was aged 69 and I don't see anything strange about it at all. I currently possess an Atari 520STFM, double drive, colour monitor and printer and my main interests are 3D, graphics and video digitising. And I hope to continue for a long time yet.

I shall be 74 on Monday 28th January, so by the time you receive this letter you can wish me 'Happy Birthday'.

R J Wilkinson, Darlington, Durham

Consider it done, RJ, and I've raided our stock cupboard for a piece of ST software by way of a birthday present. But are you our oldest reader? More claims coming up...

■ **...On your birthday**

When I retired some time ago, my sole experience of computing was with the old ZX81 - this taught me some of the principles of BASIC. I then decided to 'upgrade' to a Spectrum Plus 3 which I kept for a

couple of years, and I still think its a great little machine, for all its limitations. I am now the owner of a 520STFM, and have been making some progress with GFA BASIC in which I can now make some reasonable programs.

When I can acquire a reasonably-priced manual for 68000 assembly language, I intend to have a go at learning Assembler. All I can say to your older readers is 'carry on computing'; it should give you a great deal of fun.

Perhaps I should mention that my birthday is on 1st February, and I will be 72 this year.

A Vest, Chester-le-Street

Happy Birthday to you too, Mr V - a mystery prezzie is also on its way to you. There's one more contender for the 'oldest reader' accolade...

■ **Unlucky with elecky**

My first computer was a ZX81 bought by mail order something over ten years ago. Alas, it was electrocuted when I got a new TV which turned out to have a live aerial socket.

My present machine is a CPC6128. It died just before Christmas, and I assumed it, too, had been electrocuted as my refrigerator and four lamp bulbs failed at the same time. But the Electricity Board assured me that there had been no voltage surges.

My favourite dealers (The Computer Shop of Poole) came rapidly to the rescue and supplied me with a replacement monitor in part exchange.

By the way - I am 73 (and a bit).
John South, Creekmoor, Poole

Well there we have it. 73-and-a-bit doesn't beat Mr Wilkinson who leapt into his 74th year last week. Are there any 75-year-old readers computing away out there?

H F-W

MAIL SHORTS

■ **Missed out**

As I was reading *Express* 115 I noticed the front cover (Well done! - H F-W). 'So that was Christmas... but now the dust has settled *Express* can reveal' it said.

I ripped open the magazine, dying to know how the SAM Coupé got on through Christmas. I searched, and I searched, and I searched...

I noticed that you had mentioned every computer under the sun - except for the SAM Coupé!

Paul Strang, Lancashire

Well, the man who wrote the piece tells me that the SAM was left out because it is not a mainstream home computer. Yes, I know, all you SAM owners will moan and groan - but it's not in the major High Street multiples, and the feature was looking at their sales.

H F-W

■ **Beard bother**

Simon Butcher forgot to mention Alan Sugar in his list of computer people with beards and glasses. OK, so his beard isn't quite ZZ Top style, and he doesn't appear to wear glasses - but he may wear reading spectacles.

Maybe Mr Sugar would care to write in and tell us whether he wears an visual aids?

Daniel Walker, Reigate, Surrey

Then again, maybe he wouldn't. I wouldn't put money on a letter from Mr Sugar - but I could be surprised. Over to you Alan...

H F-W

■ **Half shell, half-baked**

Out of curiosity, would a pirated version of the Turtles game be Mock Turtle?

Ron Bullock, Deepcar, Sheffield

Probably not. But would a World Student games featuring three students be a complete cock-up? (Tenuous Sheffield-related joke there, readers.)

H F-W

■ **Fiscal Wizard**

I have just looked in my Empire Stores catalogue and found that I can buy games cartridge for Sega, Atari and Nintendo consoles for as little as 80 pence a week. If I could buy Amiga software this way, I'd buy a damn sight more than I do at the moment.

D Preston, Tunstall, Staffordshire

Have you ever worked out how much you pay in total via your catalogue?

H F-W

■ **TV Graphics**

Just to add to this 'I've seen the Amiga on TV' thingy, is it true that they use the Amiga on ITV's *Catchphrase* to do the animations? The graphics look like they've been done on *Deluxe Paint III*. Can anyone confirm this?

Steven Lord, Hebden Bridge



Yup, you're right. According to Chris Allen of a TV graphics company called Fingers, the A500 and A1000 were in fact used for the graphics in the current series - eight computers in all were harnessed to the task, with the A500s being slaved to the A1000s and Syquest drives used to store the graphics data.

The Amiga usurped some American Mindset PCs which were used in the earlier series - Amiga genlock boards made life much easier for the production team, but regular Amiga crashes made life more complicated.

We might bring you the full story in due course, dear readers... meanwhile, here's a fiver for your trouble Steve.

H F-W

• *Up for the century: Catchphrase host Roy Walker will be fronting the 100th episode of the show on 10th February - aided and abetted by Amiga graphics.*



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Macintosh

RECOMMENDED PD

Quite a lot of the software which I've mentioned over the last few weeks has been shareware, so it's probably a good idea if we give some details of where you can get hold of the stuff.

Incidentally, to avoid upsetting anyone, I ought to say that it becomes cumbersome to refer all the time to 'public domain and shareware software', and that therefore sometimes in this piece I'll use the term 'PD' to refer to both public domain and shareware programs. Yes, I know that there's a difference. But I'm too lazy to type the whole thing in every time. So there.

The largest supplier of PD and shareware for the Macintosh in the UK is something called Translatum International. It is the sole UK and European distributor of the software in the Educorp collection which, in turn, is one of the largest collections in the USA - from where about 95 per cent of shareware comes.

Its fees for disks are reasonable: £7 for one disk, £6 per disk if you order two or more plus postage and VAT. Now, this is where it gets complicated: Translatum also has its own software library, in addition to the Educorp collection. For a £15 membership fee, you get access to the Translatum library, a catalogue on disk, two free disks - one full of fonts, one of Desk Accessories (DAs) - and a £2 voucher. Your membership lasts until you have received twelve issues of the Translatum newsletter, which could be two or three years, as it's fairly erratic.

Are you following this so far? Keep going...

If you're a member of the Translatum club, disk prices drop to £6

for one disk and £5 per disk when ordering more than one (again, plus postage and VAT).

Assuming your brain has been able to cope with the details so far, the best thing to do is order the Educorp catalogue, a 300-plus page book detailing all the programs available. To do this just send a cheque for £2.50 to: Translatum International Software Club, Saithaelwyd Ucha, Carmel, Holywell, Clwyd CH8 8NU. If you don't feel up to writing that lot on an envelope, its phone number is 0352 710276, or if you're rich enough you can fax Translatum is on 0352 714769.

The catalogue is certainly worth buying, and if you're likely to be ordering much software, membership of the club makes sense. Disks are dispatched promptly, and since the club phone number is the owner's home number, there is service even after normal office hours (although I would suggest you don't try it after about 7pm...).

Next up is the Macintosh User Group UK. I've mentioned these boys before; the user group magazine is good, the telephone helpline is excellent and any Macintosh user should think seriously about joining.

Individual subs are £30 per year, and membership entitles you to access to the software library, from which disks cost £6 each. All members receive a catalogue, and updates are printed in the mag. You could, if you wanted, take out a 'PD subscription' for £55, which entitles you to a disk every month containing the latest PD and shareware releases, although it's a bit expensive unless you're fairly sure that you'll use most of what is sent to you.

POSTCARD FROM AMERICA

California has been enduring the worst drought of the century, but like ants running to a picnic, the rain is predicted to fall on the revelers' heads. Complaints will not be allowed, since we're all supposed to be praying for non-perspiration airborne water.

The frustrated sweat of Mac salespersons around the supply of new Macs was evident in *The Top Ten Things to Say When Your Customer Wants to Buy a Macintosh Classic*, faxed to the Berkeley Macintosh Users Group. Some of the gems included:

"Huh? You'll have to speak louder!"
"Say! Did you know the female gibbon gestates for 236 days?"

"A wise choice, but listen - I've got a great deal on a couple of uses Mac Pluses..."

"Let's see now. It appears that we're all out now, and there's a waiting list of 3,572 names. Funny, we had plenty of them in this morning."

Stress can do that to marketing types. Some people think Apple is in the driver's seat, especially with the recession. When a customer walks through the door, cash in hand, nobody wants to tell them to wait a month or two. That money may be feeding the cat by that time.

THE INTERFACE DEBATE

Think that the debate on computer user interfaces is over? Think again.

The way we interact with our technology is more than a matter of personal preference - it's an international political battle.

The dangers of standing too close to the microwave oven was evidenced by Randall Fields, chairman of Mrs Fields Inc. Mrs Fields is the cookie stand found in every US shopping mall. Randall gave the keynote address at the last Portable Computing Expo. He flamed the Macintosh, and all graphic user interfaces (GUI) for computers.

"The Macintosh must have been designed by the Soviet Union to limit American productivity," was one of his no-brainers. He said he couldn't "understand why Bill Gates would want to take our economy down the tubes by introducing Windows." He foamed at the mouth in his opposition to icons. I've often wondered if these rabid anti-GUIs have ever really used a Macintosh, other than a brief look-see in a computer shop.

A computer is a sorry substitute for human intelligence, but so are a lot of executives.

David Morgenstern



• Polar: the penguin's cute, and the game's tricky. How can you say no?

The Mac User Group UK also runs a bulletin board, and membership of the group gives you access to the PD and shareware available on the board. For a membership application form, call The Mac User Group UK on 0865 58027.

Another company which has a Macintosh PD and shareware section is Kingsway Computer Services. Its catalogue is only 24 pages long, and doesn't have a vast range of software, but on the other hand the disks only cost £4.99 each, including VAT and postage. And if you order ten disks at the same time, you get one free. Certainly, if the Kingsway collection has the stuff that you want, it's the cheapest option. Kingsway Computer Services is on 0742 750623.

Finally, a company called Shareware Marketing is apparently producing a Macintosh catalogue of PD and shareware disks. I know nothing else about it, except that it's free, and that the company claims to be "the

largest disk vendor in the world by revenue". Its number is 0297 24088 - remember to specify that you want a Macintosh catalogue, as otherwise you're likely to end up with a PC one.

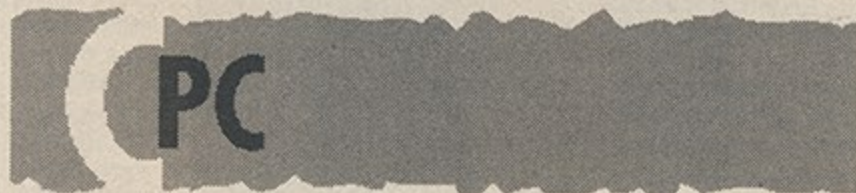
DA DELIGHT

If you're bored with action games, try getting hold of a rather neat DA called Polar. Apparently it's a simple version of Pengo, although since I've never played Pengo I can't comment on that.

Essentially, you guide your penguin around, pushing about bombs, ice cubes and hearts in a frictionless environment, attempting to get the hearts into a house. It sounds easy, but I can assure you that it ain't.

I found it on CIX, in mac/files, although it may well be available elsewhere. It's certainly worth a download if you want a little light mental relaxation in between spreadsheets or whatever.

Ian Wrigley



SCHOOL CAN BE FUN!

Some long-awaited news this week from Database Software, up North. The company is just putting the finishing touches to Fun School 3, and the three packages that make up the three age groups look to be absolute corkers.

Fun School 2 broke all records in its time, proving the only educational package to storm the charts. Fun School 3 is even better. I've just got my sweaty hands on the Under-5s pack, and I'll be putting it through its paces very soon.

WHERE ARE THE CARTRIDGES?

If Amstrad's sales of the GX4000 console and Plus machines were disappointing over Christmas, it might have something to do with software availability - or lack of it!

I've actually been phoning around a few dealers to find out what games are currently available. What I've discovered is that just because no fewer than twelve console games are featured on the special in-store demonstrators, it doesn't mean that you can actually buy them all.

The most clued-up dealer I managed to speak to had only six titles in stock. These were: Batman - The Movie, Operation Thunderbolt, Barbarian II, Robocop 2, Crazy Cars II and Fire & Forget II. I know that Gremlin's Switchblade is now reaching dealers, but that still only brings the total up to seven. What is going on?

Well, Amstrad did circulate a letter claiming that there would be twelve titles available on cartridge as long ago as last December, but there was the somewhat predictable rider that the

information was based on information supplied by the publishers.

And they are now as much in the dark as I am. Amstrad's cartridge duplicating is not yet, it seems, running as quickly as it's supposed to - to say the least. And many publishers are putting their console games on hold while they work out what the new machines are going to do. Certainly, if the punters don't see the software on sale, they're going to think twice about buying the machine. All this is leading to something of a catch-22 situation, I suspect. Watch this space...

ROBO IS BACK!

But there is happier news too. I've just got hold of a review copy of Robocop 2 from Ocean. First impressions are of a tough game with some slightly iffy animation as old Robo leaps about. Those are only the first impressions, though - the game, once you get into it, is a lot, lot better than that. For a final verdict you'll have to wait until I've got stuck in a bit further.

FRESH FANZINE

"More wit than Kylie Minogue!" says a coverline, "More type-ins than we know what to do with!" screams another, "More features than a thing with lots of features!" wails a third. What is all this?

It's the cover of a new fanzine, in fact, by the name of AOK. The authors are Simon Tarplin, Matthew Harrodine and Paul Escott, although a box in the magazine explains that they are on the lookout for contributors.

AOK issue one has a review of the new Amstrads, a flight simulator round-up, a competition to win a camera, a

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	Philips 8832	(0.42)	£110
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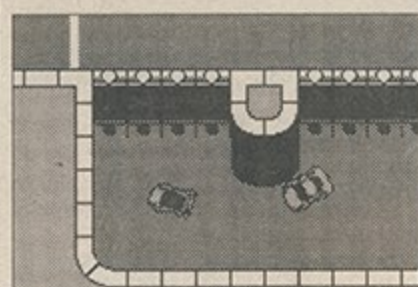
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• *Supercars: Tough racing at the hairpin. It's the first lap, and already you're second...*

couple of game reviews and some type-ins. Just a couple of words of advice lads. DTP programs on the CPC can offer loads of typefaces, but there probably only about two or three that are actually readable at body text size, and they're the ones that printers do as standard. Also try to have every page using the same headline and body copy style - it gives the mag a much more unified look.

Other than that, the mag is bristling with enthusiasm and originality. If anyone is interested in becoming either a subscriber or a contributor, write to AOK at: 31 Colebrook Road, Shirley, Solihull, West Midlands B90 2LB.

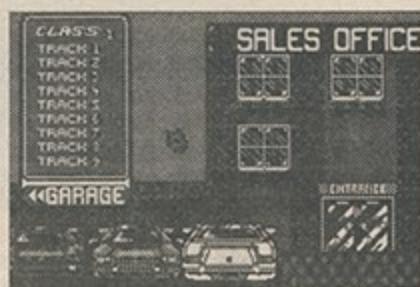
SUPERCARS

Gremlin Graphics has got a real head of steam up at the moment. First there was *Shadow of the Beast*, then *Switchblade* on the console, then the brilliant *Lotus Esprit Turbo Challenge* - and now there's *Supercars*.

It's another driving game sure enough, but a long way from *Lotus Challenge* in style. It's a viewed-from-above effort reminiscent of the classic *Super Sprint*, but instead of the whole track being visible at once, you only see a section at a time, the screen scrolling as you move around the circuit. This does mean bigger, better graphics, but you don't get a simultaneous two-player mode (it would have to be a split-screen display if you did).

You start off pretty easily, racing against three computer cars on a none too difficult track. You'd have to be pretty crap not to win, basically, and when you do you pick up a nice, fat, juicy cheque for £20,000. The significance of this becomes apparent between races, when you get the chance to visit either the garage or a new car showroom. In the garage you can buy goodies like a turbocharger, side armour (you'll find out why), missiles and more. You can also repair your bodywork, refuel, get some fresh rubber and fix your engine.

You're going to need all that because although the races start off easy enough, the more you compete in, the tougher they get. Not only do the



• *What do you do - race, go to the garage or browse around the showroom?*

computer cars get faster and more determined, the tracks start to develop puddles of oil, water and something which behaves suspiciously like glue...

Ultimately, the bog-standard motor you start off with is not going to have what it takes to compete in the later races, even with all the goodies you can bolt on in the garage. It's just as well, then, that you can trot off to the showroom when you've got enough cash and buy yourself a bigger, better, faster motor. There are half a dozen waiting in the showroom, but you're going to have to win quite a few races for each upgrade.

The graphics in *Supercars* are simple, but neat and very effective. The scrolling is pretty smooth, too. Sound consists of a soundtrack that plays all through the race, only drowned out by terminal tyre squeal as you pile into yet another corner at twice the speed you should, plus the ominous thumps as your already knackered bodywork smacks the walls again.

Supercars plays very well indeed. The control method is simple, and the cars behave convincingly on the track, sliding gracefully as you overcook the corners. One nice touch is that you can prompt massive oversteer if you let go of the Fire button (Fire is accelerate) half way through a corner.

There are nine tracks on which to race, and although the first few will seem easy, things get a lot tougher very soon after that. Once you've completed your season, you then move onto 'Class 2' racing which is tougher again. After that there's Class 3 and I haven't got more than two races into that one, despite many hours of practice. The subsequent classes can be accessed with passwords, so there's no need to return to the earlier levels once you've completed them.

Supercars won't win any prizes for originality or accuracy, but it is a very polished and playable version of a favourite old game style. It is also tough enough to keep you going for ages. If only there had been a two-player mode, though - those human versus computer races do get a bit dull eventually...

Rod Lawton



HARD HITTING KEYBOARD

I always thought synthesizers were the only kind of keyboards that were velocity sensitive, but Smartek in the States has proved me wrong.

It has just launched what it claims is the world's first velocity sensitive keyboard. We're not just talking first for the Amiga here, mind you. No siree, Smartek's product is an absolute first

on any computer. It's available for a number of machines including the Amiga, Mac, PC, ST and even the Sega Genesis (that's a Megadrive, to us UK computer users).

The keyboard comes complete with two utilities - one useful, one perhaps not so useful. The first is a patch program for the AmigaDOS keyboard driver which will allow the Amiga to auto-

matically interpret how heavily keys are struck. As an example application, Smartek claim that it can be set up for word processors so that when a key is pressed hard, the text style is changed. When you hit the key a bit lighter, the text changes back. The second application is apparently designed to help teach typewriting. Basically, the machine will tell you when you are hitting the keys too hard by going, "ouch".

1500 GOOD REASONS TO BUY

Commodore's latest baby has finally arrived and, thanks to a sympathetic bank manager and Andrew Ball at Commodore, I've finally got my hands on one. It should retail for around a grand and here's what it has to offer. **The machine** - Anyone who has ever owned an Amiga 2000 will instantly recognise the 1500. Apart from the rather tacky black and white badge on the front of the machine, the 1500 is basically a revision 6.2 B2000. If you don't believe me, just open up the machine and read the model number on the PCB!

OK, the 1500 isn't a new machine, but that isn't necessarily a bad thing. For starters, the 1500 is based on the very latest release of the 2000, so you actually get a machine that is fully-compatible with all 2000 plug in cards and peripherals (including the Video Toaster, Flicker Fixers, Processor accelerators et al). Not only that, but you'll also be able to upgrade the machine to Workbench 2.0 and the Enhanced Chip Set when they are made available to existing 2000 users.

The machine comes equipped with a single megabyte of RAM. Just like the latest release of the B2000, the 1500

includes the ECS Agnuschip, so that megabyte of RAM is completely accessible by the customchips.

Further RAM will be treated as fast RAM, but having 1Mb of chip RAM still proves to be exceptionally useful if you're into DTP or Desktop Video (although A3000 users are spoilt with 2Mb of chip RAM!).

Also bundled as standard is an extra 3.5inch floppy (which, surprisingly, Commodore do actually fit before shipping) and a high quality colour monitor. As if trying to keep up with Philips' new trendy looking monitor, Commodore have restyled the 1084S (yes, it is stereo!) once again.

Deluxe Paint 3 - Well, what more can I say about Electronic Arts' acclaimed paint and animation system other than the fact that there's simply nothing TO touch it. If Commodore decides to use DPaint 3 within future bundling deals, I can see the Amiga paint package market dying a very quick death (that is, until DPaint 4 is launched!).

For those of you who have been living on Mars for the past five years, DPaint is a powerful paint system that allows you to produce artwork using up to 64 colours simultaneously (using ExtraHalfBrite). Version 3 of DPaint now includes animation facilities, allowing you to breathe life into your artwork.

Platinum Works - If you need a decent word processor, a database or perhaps even a spreadsheet, then MicroSystems' acclaimed suite of productivity software will more than fit the bill. Noteworthy among the packages bundled is *Platinum Scribble*, an enhanced release of MicroSystems' well respected word processing system. *Scribble 2*. All the standard functions you'd expect from a topflight word processor are there, plus comprehensive spell checking and thesaurus facilities.

Also included are special versions of MicroSystems' other software including the *Analyze!* spreadsheet, *Organize!* database, *Online!* communications and a number of extra utilities (including asides-ways printing utility for *Analyze!*). *Platinum Works* certainly isn't either new of particular groundbreaking, but it should prove to be more than adequate for most people's requirements.

Populous - EA's award winning *Populous* gives you the chance to play God with the people of a small planet. When it was originally launched, the game received rave reviews from just about every games reviewer worth their salt. The idea of the game is to help your own people populate randomly generated islands by making the land fit for habitations. While this is taking place, your opponent (the Devil) is doing

likewise. Obviously such cohabitation can't last, so both yourself and your opponent can wreak devine vengeance on your eachother's people by sending earthquakes and floods against them.

Their Finest Hour - Perhaps Commodore thought that a simulation of modern air warfare would provoke bad publicity, so it has plumped instead for US Gold's simulation of the battle of

Britain. Combining strategy and 3D combat action, *Their Finest Hour* is a pretty good game that is sure to keep you enthralled for hours.

Battlechess - A true Amiga classic. Even if you hate chess, you'll love *Battlechess*. Some would say that gameplay has taken second place to graphics and sound, but *Battlechess* is one of the few chess games that will appeal to all. Absolutely brilliant.

Sim City - If you think you have the solution to urban decay, then Infogrames' *Sim City* could well be your cup of tea. In this game, you can play the role of both mayor and town planner in this dynamic real-time simulation of city life. Build houses, factories and airports, organise urban transport, hire police, fireman, bulldoze entire neighbourhoods, collect taxes; these are just a few of the tasks that will be your responsibility.

In a special mode, you can even cause tornadoes, floods and fires at your whim. Even better, you can save San Francisco from the great earthquake of 1906, or even Tokyo from Godzilla. Both *Sim City* and *Populous* include expansion disks to further enhance two very good games. In the case of *Sim City*, there's even an editor which allows you to edit cities to your precise requirements.



• The Amiga 1500, well worth the asking price.

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DISPLAY ENHANCER LAUNCHED

Users jealous of the quality of the A3000's display will be pleased to learn that Commodore has finally made the A3000's Display Enhancer hardware available to both 1500 and 2000 users as a plug in card. What's more, this official flicker killer card beats all competitors in the price department at just £99. For applications such as DTP and CAD that require a high resolution display, the card promises to deliver a rock steady image when used in conjunction with a multi-sync monitor. Contact Commodore on 0628 770088.

A-MAX 2 UPDATE

Still waiting for the launch of A-Max 2 Plus, the plug-in card version of

ReadySoft's acclaimed Macintosh emulator? If so, then the news isn't good. According to UK distributor, Entertainments International, ReadySoft still hasn't finished the card. Indeed, the American company seems to be keeping rather secretive about the whole affair.

When I recently phoned EI for some information on this product, I was surprised to learn that not even it had received any form of information. Not a single picture, press release or even a bit of text describing specification-type details. Despite this lack of information, EI maintains that the card should be available in March. Personally, I'll only believe it when I see it!

Jason Holborn

Archimedes**SYSTEM ANTICS**

Applications often come with a system folder on the disk. This should contain the relocatable modules needed for the application to run; the shared C library, floating point emulator and ColourTrans module are pretty well universal now.

From time to time, there are new versions of these and other modules, and it's a nightmare trying to keep all your floppy disk's system folders up-to-date. If you don't update them all, you risk a crash when an old module in memory is replaced by a new version as you start a new, more recent application.

The answer is simple: keep just one floppy (plus a backup) with a System folder, and put all your new modules in that. It may mean a couple of disk swaps when you fire up a new application, but that's less trouble than updating all your disks every time there's a C library upgrade.

How do you keep your system up-to-date? Check the dates of any new modules you receive (use the desktop and display Full Info in the filer windows), and the version numbers (load the module by double-clicking on it, then type f-12 and *Help Modules).

SysMerge is an Acorn utility for keeping your system folder up to date without all this messing about. It comes free if you get the new printer drivers from your dealer or from SID (Acorn's own bulletin board), but not if you get them by buying Clares' Schema. You run SysMerge, and drag your old system folder plus another system folder - which may contain newer versions of some modules - on to it. Only the new modules are transferred to your old System.

A quick techie tip: make sure that in the Boot and Run files within your system folder, Wimp\$Scrap is set to <Obey\$Dir>.ScrapFile and not System:ScrapFile. Some programs (Schema for example) can't transfer data to other applications if Wimp\$Scrap is set incorrectly. Load the Boot and Run files into Edit to check.

A BETTER FILESERVER?

While the 'stars' of the recent BETT show were undoubtedly Longman Logotron's Revelation (discussed last week) and Digital Services' Squirrel

(below), there were a number of other new products that caught my eye.

Third on my list was the latest Acorn Level 4 Econet fileserver software. This keeps files on an Archimedes, and distributes them around a network of Archimedes, Masters and model Bs. It runs as a RISCOS task, but is still a bit faster than the existing FileStore (a dedicated hardware fileserver). You can add almost any size of hard disk you want, and publish resources like Next Technology's CD-ROM around the network too.

Mostly it's better than FileStore because of the management tools - it makes network management a lot simpler. Harassed school network managers should check this out.

But beware, one of the major new features aimed at the classroom, the 'broadcast loader' that allows two or more machines on the net to load the same files at once, isn't quite ready yet and will only work with Archimedes, not old Bees. Also, when asked about tape backup units, the Acorn person said, and I quote, "Err..." Full points to the man in the smart suit for pointing out I may need only a couple of gross of floppy disks to back up my fileserver.

For existing, mostly 8-bit networks, the SJ Research fileserver are probably still better. But Level 4 does make it simpler and cheaper to set up 'workgroup' nets of just a few Arcs, and is a great way to share a big hard disk and a PostScript printer between, say, five people.

GOING NUTS OVER DATABASES

Next please. I must be losing my grip. I didn't take any notice of the ads for the new Squirrel database from Digital Services. Yet if I'd only noticed the letters S, Q and L...

What drew me in was, in fact, a natty demo: two Arcs, one monitor, no people. One Arc was running Squirrel for real, the other was feeding it pre-recorded mouse movements to control it, as well as doing the spiel - the commentary to the whole demo routine had been sampled!

A more in-depth look at Squirrel showed it to be a rather groovy database manager. It's not 'relational' (for the techies, it's a flat file manager),

but it is easy to use. Setting up a new database is a matter of drawing the fields into a window with the mouse. Fields can be plain text, numbers, dates, drawings, sprites or Maestro music files, and you can make it look pretty by setting colours, typefaces, size and so on for each field. You don't have to specify which fields will be 'key' fields (as for example with Minerva's FlexiFile) because all the fields are automatically indexed.

Searching for items in the database is simple; you just drag the fields you want to check onto a search card, type in the data you want to match, and click. You can match just one field (like search for all your Pickettywitch LPs), or combine criteria together with And and Or (search for all the films with both Doris Day and Cary Grant in them). Squirrel can present the Ands and Ors in a neat graphic that makes it easy to check you're going to get what you expect out of a search. This, I like a lot.

It works on a network, and is 'multi-user' with record-level locking so several people can be using the database at the same time, I'm told (I haven't had a chance to try this bit yet, but I expect a small parcel in the post any day now).

The eponymic SQL is a 'structured query language', very much flavour of the month in database circles, but too complex for normal people to use. It's strictly 'wireheads only'. Now Squirrel can translate your easy search commands into real SQL commands, which can be sent off to another database to do the actual searching. In principle, anyway. If this works as it should, then Squirrel could be an epoch-making product for complex networked databases. Even if it doesn't, it looks like a great database manager for the rest of us.

At a shaving under £150, it costs the same as its obvious rival FlexiFile, but seems to be much easier to use. You trade the semi-relational aspect of FlexiFile whereby you can link items in two separate databases, for a better, more graphical approach to searching and a more attractive on-screen presentation. You can do a lot of the standard database and pretty presentational stuff with a package like Genesis II too, but the multi-user bit and graphical view of search criteria in Squirrel are worth their weight in something or other.

RISCBASIC UPGRADE

If you use Silicon Vision's RISCBASIC compiler, upgrade now to the latest 2.06 version which has an improved compiler. It's RISCOS compliant, so you can compile files by dragging Basic program icons onto the compiler.

Silicon Vision is also offering a Desktop Development Environment (DDE) which allows you to compile files by dragging them onto the compiler icon on the desktop from Edit, Twin or the BASIC Editor, and passes files back to these applications with syntax errors already marked. If you've registered an earlier copy, the DDE upgrade is £50. New copies of RISCBASIC 2.06 include both the compiler and DDE for £150.

LET YOUR FINGERS DO THE WALKING

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Ken Coumarin



NOT A LOT OF PEOPLE KNOW THAT

When the old 8086 chips (or indeed, any of the other Intel 80x86 chips) wake up in the morning the first thing they do is look for an instruction. Keen little horrors aren't they?

You might think that a good place to look for your first instruction would be at address zero, but not Intel. It decided that a much better place to look for one is at address FFFF0H, or just 16 bytes short of a megabyte - so that's where the 8086 and all similar chips do look.

This is the reason why your PC's BIOS is right up there at the top of memory, hanging in space as it were. Clearly, since the chip is always going to look there that's a good place to put the instructions that start your PC doing something useful. It follows that forcing the chip to stop doing whatever it's currently doing and go there Right Now will reset the machine. Most reboot utilities do exactly that.

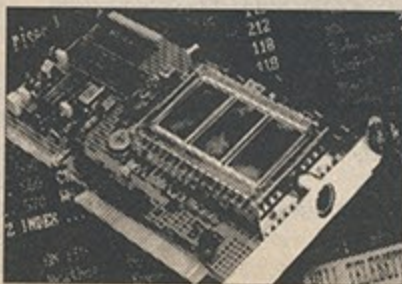
Of course, that's a cold boot, and it results in the PC going off and checking memory, looking for ports and all the other things that take time. Ctrl-Alt-Del by contrast, performs a warm boot. It

assumes that your machine has already been checked once and it's OK, so it simply re-initialises the PC and puts you back at the prompt - a much faster process.

You can do a warm boot by jumping to a specific memory location but it's much better to use Interrupt 19H, provided for that very purpose.

SHARE AND SHARE ALIKE

One of the major sales points of Microtext's teletext adapter has always been the ability to quickly refer to information on Ceefax and Oracle. Unfortunately the difficulty has been getting the computer to make use of that information directly. Microtext



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supplies the relevant device drivers with the adaptor so that programmers, even BASIC programmers, can get at the info, but that leaves the rest of us a bit out in the cold.

ST owners have long had applications software which supports the adapter directly for functions such as analysing a share portfolio, and now PC owners have some of the same facilities.

A free program has been written by Microtext which lets you download all the share prices you are interested in to a text file by typing a single command. This isn't anywhere near as sophisticated as the Atari program, but it's a start, and it's free. Also I'd much rather deal with importing a text file into a spreadsheet than writing code for device drivers.

To operate the software you write two lists, one of channels and teletext page numbers, the other of names of major companies. The program refers to the two lists and then checks Ceefax. The share prices are then output to a file, either labelled for direct reading or as a list of numbers for incorporating into a spreadsheet.

The program is available direct from Microtext on 0705 595694.

WORDSTAR FOR WINDOWS

Bowing to the inevitable, there is to be a version of WordStar for Windows. I must confess I find this a strange idea, as the main thing which sets WordStar apart from its rivals was its user interface. I still find myself hitting Control-K X on my Mac! Of course under Windows WordStar will have exactly the same interface and command key sequence as every other Windows program.

The other oddity about the new WordStar is given away by its name: WordStar Legacy. Yes, that's Legacy as in the Windows word processor. It appears that WordStar has bought

Legacy from NMI, and will be incorporating the source code into its product. Whether that means it will just be selling Legacy in a new box is not clear.

The PR company did send a nice little graph indicating where it thinks WordStar Legacy would fit in to the word processing market, but after staring at it for half an hour I was none the wiser.

WordStar Legacy will be available from March 1, with no price yet announced. More on 081- 6433 8866.

LASERJET SOLUTION

When you run a program under Windows, all the printing goes through the printer driver which is part of Windows. The LaserJet printer driver is not held in very high esteem; it's slow and a bit cranky in operation. Hence SuperPrint.

SuperPrint is a new improved whizzy LaserJet printer driver which offers PostScript-like features such as scalable printer fonts on the fly and alterable line screens for graphics. The product also claims that it prints text and graphics faster than the Microsoft driver. The examples which Zenographics sent me certainly are of a higher quality than the equivalent ones printed with the ordinary driver. And another major plus is that SuperPrint provides on-the-fly screen fonts as well, banishing the jaggies.

SuperPrint has a competitor in Adobe Type Manager, but the two programs operate in a totally different way; SuperPrint offers finer control, whereas ATM is much easier to use. Whichever you prefer SuperPrint is worth investigating if you have a LaserJet and run Windows.

For more details contact SuperPrint's UK distributor Bit UK on 0420 83811.

Stuart Anderton and Steve Patient

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64

BOARD UPDATE

You're going to have to wait another week for details of how Heroquest is shaping up on the 64 (see Express 117) but the news just in is that US Gold is planning a special AD&D day to launch the next titles from SSI (which will include the sequel to the excellent *Champions of Krynn*). I'll bring you more details of the games when the dice rolling day comes.

At the other end of the entertainment spectrum is *Creatures 2* (see Express 116). All I know about this so far is that the deranged torture screens that put the icing on the proverbial cake the first time around will feature more heavily in the sequel, though when I spoke to the people at Thalamus they said they didn't want to lose the balance of the original's gameplay. Good for them.

BACKTRACKING

This is the beginning of the quietest time for games releases. Christmas costs software houses almost as much as they make. They can't keep it up

forever. Nor can we, for it works both ways.

A few years ago, on another magazine, February was noted as being the month in which most reader submissions came in. The conclusion was that people were spending more time with the games they had and less time devouring new ones. And this kind of consolidation isn't restricted to games players. *Commodore Format's* technical editor is almost snowed under with readers' programs at the moment.

It's the ideal time to launch the kind of programs so inaccurately described as productivity software. Incentive is just about to do this with the *3D Construction Kit* (Express passim). It sounds like the kind of program that would have been lapped up by both PD fans and entrepreneurs alike five years ago. In fact, five years ago, Incentive brought out a similar productivity tool called GAC (*Graphic Adventure Creator*) on the 64 which did just that. People used it successfully as a high level adventure-writing language and some of the results that filtered through the PD

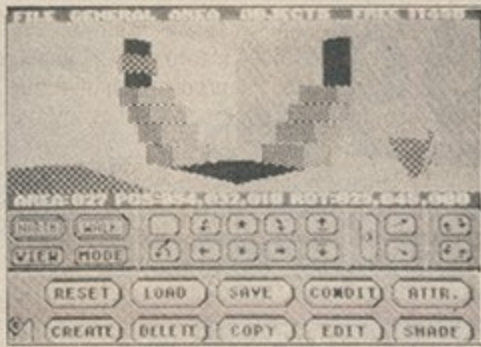
chain were very promising. Even though nobody ever released a game that really used GAC to its full potential, it created at least one small company (now sadly no longer with us).

It would be good to see the same thing

happening with 3DCK if it can really handle large (adventuring size) scale models with built in triggers. Public domain demos might never contain a scrolling message again. Fat chance.

Despite the potential of the kit to kick people's imaginations up the backside there seems to be less motivation among 64 users now than back in 1985/6, even though there are at least as many active users of the machine now as there were then. Part of the reason why a flood of exciting kit-based demos isn't on the agenda is that five years ago innovative programmers were finding out for the first time what a lot of the current crop of programmers take for granted - how to get a glitch-free scroll or how to get sprites into the border. The 64 doesn't have the frontier quality it used to have.

But part of the reason is also the feeling that 64 users are less active than they used to be. We have a wider games software base now than when GAC was actually seen as a major commercial threat to a similar



• 3-D Construction Kit: will it's worth ever be fully realised?

productivity tool that was already established at the time (ie *The Quill*). It's funny. Almost every enthusiast you talk to now, regardless of the machine they own, will happily wax lyrical about the potential of

virtual reality. And yet with what might be the first affordable form of it (albeit a microcosmic version) just around the corner, the chances of it making a major impact in the way people use their 64s is slim. Oh, well. Might as well look forward to autumn then. That's when the next clutch of carnage clones are due.

FINAL FACTS

Those of you who would like to stun the tired world of 64 users with your undoubted talents but who haven't yet mastered the art of programming might be interested to know that world famous Phil South is currently running a BASIC tutorial in *Commodore Format*. In conjunction with this august journal's own series on the same it could take you quite far.

And finally, I've seen *St Dragon* (by Storm) and there are plenty of nice things I could say about it instead of moaning that its main problem is that it's too easy to finish. Ah, my life.

Sean Masterson

spectrum

EXPAND YOUR SAM

The new year seems to be starting pretty well for the SAM Coupé. SAM Computers Ltd has three shiny new products for its machine which can only be considered A Very Good Thing Indeed.

Firstly there's MasterDOS. This is an extension to Coupé DOS for advanced users and programmers. For the £14.95 asking price MasterDOS allows root directories to be created (as in MSDOS) so you can store, for example, FLASH! screens separately from games. Rather impressively, you can also set up a RAM disk with the utility so that fast loading and copying is possible. Meanwhile advanced programmer types will go a bundle on the way MasterDOS permits random access and serial files.

The program has been written by SAM BASIC author Andy Wright and SAMCO claims it will "be an invaluable tool for anyone who takes their SAM Coupé seriously."

Next there's some ware of a decidedly harder variety with SAMCO's 1Mb memory pack. This should satisfy Coupé owners lusting for more power with the interface providing an extra 1Mb of external memory. Unfortunately it can't be used in conjunction with BASIC but expect software writers to make use of all that rippling extra memory soon.

If you really want a big memory you can whack four of the packs together and own a SAM Coupé with a throbbing, pulsating and potentially world dominating 4.5Mb. Power mad types can buy a memory interface for £79.95.

The increasing amount of hardware for the SAM means congestion problems around the Coupé's single expansion interface. Hence the release of the SAMBUS, a nifty piece of kit allowing a further four interfaces to be connected up to our blue footed chum. SAMCO has also thrown in a real time clock and because some interfaces demand extra power you can also connect an optional power supply unit to the SAMBUS enabling it to handle any add on you care to throw at your Coupé, from printer to Peruvian Rug Weaving Robot. The price is five pence short of £50 with the optional power supply costing £19.95.

As well as all the above nifty sounding stuff the Coupé should be getting its first spread sheet fairly soon. GM Software of 48 Main Road, Cryant, Neath SA10 8NP is currently slaving over a hot SAM working on GM-Calc. It's quite a way from completion at the moment but the finished one should be menu controlled and configured to 26 columns by 15 rows with each cell comprising nine characters. I've already mentioned their £4.95 database



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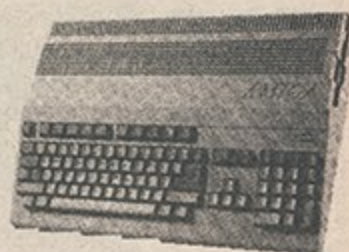

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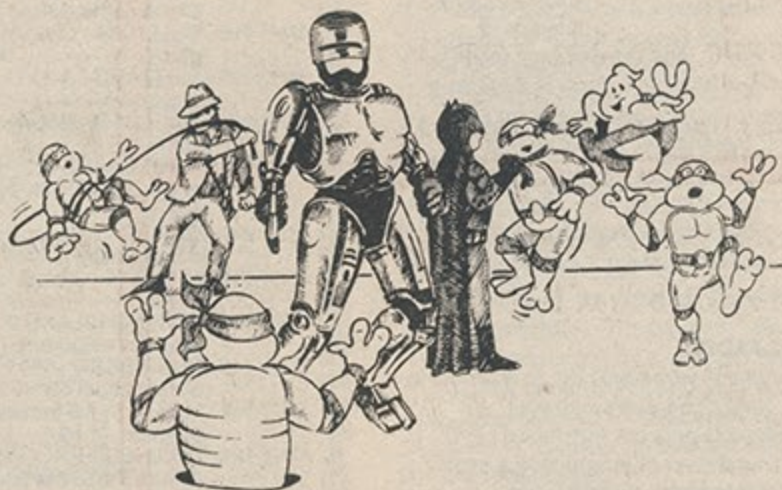
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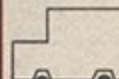
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program in a past column. More details in a future column.

ANNOY YOUR NEIGHBOURS

Robert Jacobs of London has written asking, nay demanding, to know more about the Cheetah SpecDrum. He wants to know simply "if its any good" and "how well does the Speccy recreate an authentic drum sound?"

Well, perhaps surprisingly, I can confirm it's very good indeed and tell you that to my ears at least the drum sound is easily good enough to annoy the neighbours. That's providing you have suitably loud amplification, of course, as the SpecDrum needs to be connected up to a stereo or ghetto blaster so that you and your immediate family to enjoy the variety of loud thumpy thumpy noises it can produce.

It's been around quite a few years now which means you can often buy it for bargain prices. For example, Dattel Electronics (Tel 0782 744707) is selling them for £14.99 complete with extra Latin and Afro drum kit software. What an absolute bargain!

RETURN OF THE POKE MONSTER

He's back! After an absence of at least a week or two it's good to see the triumphant return of our old pal and mucker, Miktor - aka Mark Harris of Faversham, Kent. As per usual his planet-sized brain has managed to come up with another load of pokes and cheats.

Here's an infinite credits poke routine for Chase HQ II. To get it

working simply type it in, save to tape if you want, then type RUN and start your Chase HQ II tape from the beginning.

```
10 CHASE HQ II (CREDITS)
20 CLEAR 3E4 : FOR N=63615 TO 63664
30 READ A : POKE N,A : NEXT N
40 PRINT "START 'CHASE HQ II' TAPE"; USR 63615
50 DATA 221,33,254,174,17
60 DATA 16,16,62,255,55
70 DATA 205,86,5,48,241
80 DATA 33,1,2,34,0
90 DATA 191,195,93,175,33
100 DATA 169,248,17,144,91
110 DATA 1,20,0,237,83
120 DATA 51,190,237,176,195
130 DATA 13,191,62,255,50
140 DATA 190,149,195,223,190
```

And there's more. Here's a correction to one of Mark's cheats I printed a month or so ago. *Midnight Resistance* - Type I AM AN OCEAN GAMES TESTER. In game W + FIRE Weapons, B + BACKFIRE Backpack Also 128K only, redefine keys and type WE WANT TO HEAR MUSIC.

Another huge dollop of fawning thanks go to Mark!

Have you got any hints, cheats, pokes, routines or tips for the Speccy or SAM? They can help with games, utilities, programming or just plain using. Send everything relevant to: Robin Alway, The Spectrum Column, *New Computer Express*, 30 Monmouth Street, Bath BA1 2BW.

Robin Alway



HANDS ON EXPERIENCE

There's little doubt that MIDI has revolutionised the face of modern music production. However there must be an army of musicians out there who remain baffled by the whole process. Hands On Midi software has recognised this and produced a very unique product in the process.

Hands On has transcribed some of the more popular songs of recent years into a MIDI format. What this means is that if you own Steinberg Pro 24 sequencer, you can load up the MIDI file and see exactly how a song is constructed, drum patterns and all. Apparently some of the musicians whose music has been converted by Hands On, have purchased the song to see how MIDI works for themselves. Two programs, namely Gig and Masterclass are available now.

Songs in the catalogue include *Ride On Time* by Black Box, *Bad* by someone called Michael Jackson and *Toccatta and Fugue* by Rap Meister Bach. The appeal of the software is limited to owners of Pro 24 so it would seem sensible for Hands On to convert the data to some other formats, like Notator or Cubase.

Contact Hands On at Midi Software Ltd, 14 Lodge Road, Bedhampton,

Havant, Hants, PO9, 3LL, or telephone 0705 452628.

COMPUTER SHOPPER SHOW, PART 27

The latest in a seemingly endless line of computer shopper shows is in the pipeline. The box-shifting sections of the computer industry love these events because they can off-load zillions of dated games on the public for five quid a throw. But if you know what you're looking for then it is possible to pick up the odd bargain. The spring shopper show takes place from the 10 to 12 of May at Alexandra Palace, in London.

INGLISHE AZ SHEE IZ WRIT

Let's face it, you can't all write as well as us journalists (pause while sub-editor wets himself laughing). The major problem with most people's writing is bad grammar (innit) and up to now there's been little you can do about that. Enter an enterprising chap by the name of Phil Comeau, who lives in Canada.

Mr Comeau has written *Gramslam*, a grammar checker which works along very similar lines to a standard spell checker. The program searches out phrases and words which are wordy or repetitive and compiles a report on them. This means that you can search through letters, memos, essays and the

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Version 3, costs \$42.95 (excluding airfare costs) and is available from Phil Comeau, 43 Rueter Street, Nepean, Ontario, Canada, K2J 3Z9. Telephone 0101 613 825 6271.

TRACKER CUT

Phil Harman of MPH has just revealed that *TCB Tracker*, that stonking piece of music software, has taken a major price cut to £24.99. The program, which previously retailed at over £40, enables you to play four part songs comprised of samples. These can then be played back without the program in a machine code or Basic program. MPH Software is on 0603 503382.

UK DOUBLE CLICK DISTRIBUTERS

The replacement desktop by Double Click software which I covered in last week's column is now available from a British distributor. Softville Computer Supplies is selling the natty software for £20.55 (inc. P&P). The company is also distributing *DC Utilities* for the same price. Write to Softville Computer Supplies, Unit 5, Stratfield Park, Elettia Avenue, Waterlooville, Hampshire, PO7 7XN or telephone 0705 266509.

COMPUSERVE ST

One of the more interesting aspects to arise out of the communications

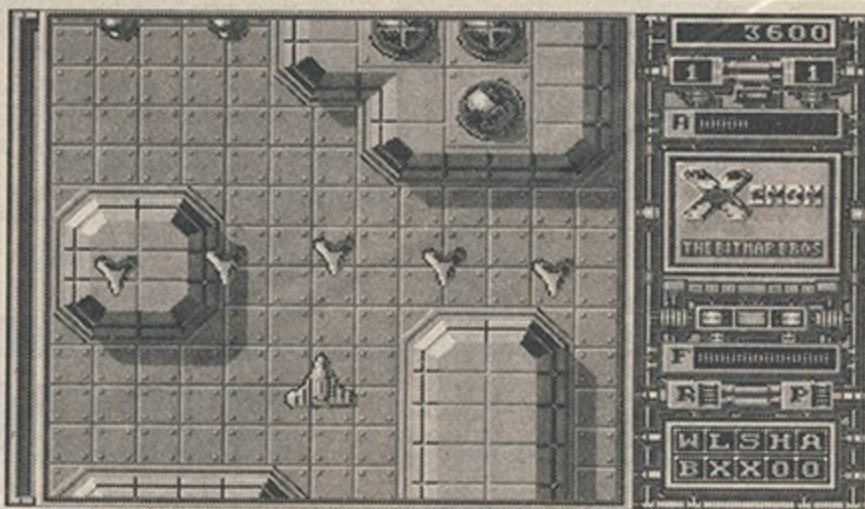
revolution, is the ability to communicate with foreign computers. Of particular interest are American databases, which boast massive subscriber support. The biggest of them all is CompuServe, which through a network spread across the states enables you to access vast amounts of data.

Of particular interest to people reading this column is the Atari section on CompuServe. Three main forums enable American ST owners, access to both hobbyists and professional companies alike. The Arts forum includes thousands of pictures in all popular formats as well as graphic utilities.

The Z-Net and *ST Report* on-line newsletters are also in this forum. In the productivity forum you'll discover masses of public domain software, covering everything from games to business. The third section is the Vendor's forum. Here, 20 of the largest American hardware and software companies have their own libraries, where updated software and news is uploaded for public consumption.

While these three forums are likely to be of most interest to ST owners, it would be stupid to just restrict CompuServe usage to these areas. Electronic Mail, shopping, on-line news, cooking, recipes and holiday guides are just a few of the other areas you could access.

CompuServe is reached through the Istel or Packet Switching Network in this country which means you only pay a local telephone call charge. You then pay



• *Xenon*: just one of a horde of old titles coming out at budget prices.

the equivalent of \$22 per on-line hour, along with a once only subscription fee of £19.95. For more info call CompuServe free on 0800 289458.

PLAY LIKE A GOD

The Bitmap Brothers, those saviours of ST gaming, have come up with a brand new game. *Gods* is an eight way scrolling platform game which boasts aliens with an IQ. The Bitmaps decided that they could bring new light to the jaded platform format by combining strategy and puzzle elements with a hard shoot-'em-up flavour.

The mythologically-influenced aliens can perform party tricks, such as dodging your bullets and chasing you through mazes. However if they prove to be too tough for your tastes, the program will detect this and make life

easier for you. *Gods* will be available from Renegade by mid to late February.

BUDGET BLASTING

Software houses, aware of the fact that everyone's skint after Christmas, have released a whoop of cheap games. Mastertronic, have let loose *Silkworm*, *Gemini Wing*, *Xenon* and *Double Dragon* on their 16 Blitz Plus label, each retailing at £4.99. The Action Sixteen range of games offers better titles at twice the price including *Colorado*, *Hostages* and *Gridrunner*.

Software house Kixx has also released some old games on budget. However it has gone for a middle of the road price of £7.99. *Thunder Blade*, *World Class Leaderboard* and *Blateroids* are three of the games in their series.

Andy Hutchinson



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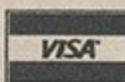
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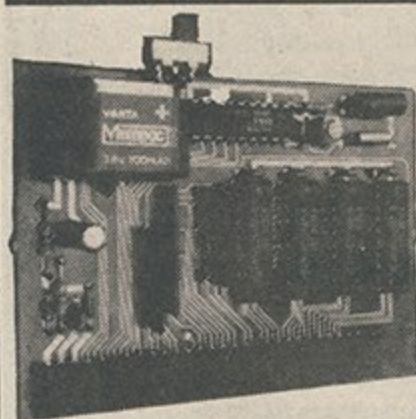
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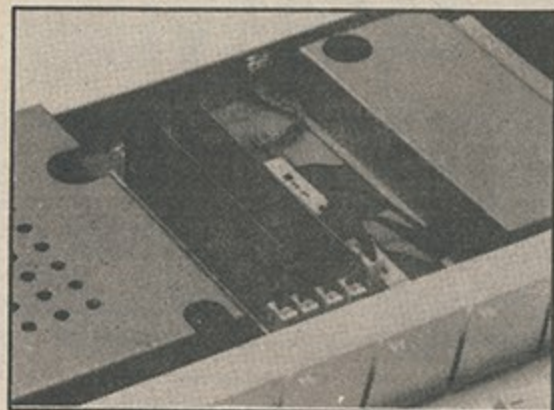
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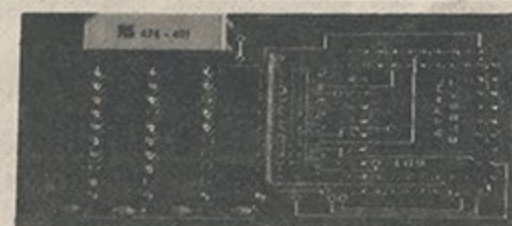
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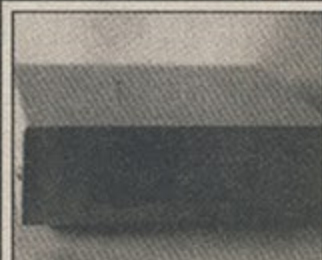


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OPENING TIME



Er... Centrefold. Let's just call it Centre for the moment and forget that it's a page floating around somewhere in the middleish of the mag.

I think it had something to do with mentioning the PCW a few weeks ago in such glowing terms. Still we can't moan really can we, a page of compact rib ticklingness (or at least a page of you - Sub) will suffice - it's not the quantity, it's the quality that counts. Frankly I work on the principle that computing is making everything in the world smaller by the minute, supercomputers in the hand, colour screens the size of matchboxes. And being only four feet three myself this is a trend which I find admirable.

Anyway, what's been happening this week. Future Publishing has announced some more magazine launches, recession? We dismiss it. So everyone here as been down at the local bistro L'Expensive Vache, celebrating. Antoine Le Monde de Canard, the owner of said restaurant, has a great line in artistic erotica, a delicious chocolate cream pie and an Archimedes which seems to run Zarch non-stop.

PLAYING FOR KEEPS

We talked of a software house last week, which for purposes of not getting slapped round the inside of the thigh with a wet fish, I did not name. This week there's a much more pleasant story...

Did you see the Super Bowl? I think it consisted of two teams of huge American lads with shoulder pads (you mean that's not their real shape? - sub) called the Sexy Sloux and the New Yorkshire Big Chappies hammered hell out of each other for a few hours.

Anyway, a couple of hacks from sister magazines went up to Electronic Arts in order to play them at John Madden Football on the Megadrive. Guess who won? We did! Normally I wouldn't class myself along with the other hacks, but everyone loves a winner.

THE GEEK



This week.... he got beaten up by his brother's hard disk

LETTER SPRAY

This week you can see Tim Smith being roundly abused by a range of irate readers who disagree about his views on nearly everything.

Dear Tim,
Why are you always going on about machines which you don't actually own? It's all very well trying to be funny, and I say trying because more than often as not (I - TS) you're not, but why also try to make people think that you're something which you are not? Just get on with the humour if you can and stop the bragging.
Yours, Robert Dawson, Calcott, Berks

Dear Robert,
How do you know that I don't have

these machines then, eh? You don't do you? You're presuming aren't you? Well stop presuming and I might stop bragging.

Dear Tim,
Please stop these bloody stupid Sunday Sport type stories you little *****
Yours, Anon

Dear Anon,
As you will be aware I had to cut this letter massively because of the foul and abusive language therein.

To use an oft quoted phrase from Shakespeare's immortal Othello, when Iago turns upon a jealous Othello and says: "It's not clever nor grown up to swear."

Dear Mr Smith,
Thanks for the Geek, he's really quite good, grovel, grovel.
Yours, Susan Davidson, Aberdeen

Dear Sue,
What, no abuse? The readers will be upset

FACTS ALOT

One of the strangest phrases ever to crop up in programming was the Crippled Leap Frog Test. The only thing anyone knows about it is that it is a variation on the Leap Frog Test.

The Bell 103 low speed modem standard is the most widely used in the United States

Channel Four's Manageress never actually turns her PCW on.

A CENTREFOLD EXCLUSIVE

TANDON 286 CONTROLS WORLD BANKING SYSTEM

It can be exclusively revealed that a stand alone Tandon laptop is the core system behind the little known Conspiritorial Masons, P2, G7, Triad, Tom-Tom Macoute, Tong World Banking Cartel and Social Club.

The CMBC are known to:

- Eat babies
- Plant viruses for fun
- Enjoy the way Wimbledon play
- Not back-up data
- Run the economies of most western countries

The CMBC as it is known has been underpinning western finances for some 25 years without anyone knowing. A reliable source, Mr Charlie

FACTS ALOT

The APL (A Programming Language) er... programming language was developed at Harvard and IBM between 1956 and 1967. The ubiquitous Ken Iverson was one of the people behind it.

LISP (List Processing) was invented by John McCarthy at MIT in 1957.

Gingridge of 14 Halpern Halls, Brislington, who wishes to remain nameless for obvious reasons, but asked too damn much for the story, told a Centrefold reporter that until December 1990 the CMBC had run the business from a CPC464. They only upgraded when their pirated versions of Protext and SuperCalc 2 corrupted: "They had made no back-ups", slurred Gingridge over a blatantly tapped telephone line from his secret hideout at 11b Sauté Street, Sutton Coldfield, "and they were all very angry about it. They decided on the Tandon because the Grand Aardvark himself received the machine with software for Christmas."

During the period of changeover five countries applied for receivership, three states put all their money in plastic carrier bags and left for Australia, and Great Britain applied to the Nat West for a £200,000,000,000 personal loan over 18 months.

A spokesGrandMoose for the CMBC denied the existence of the organisation when we spoke with him: "Never heard of them. What is this Beadle's About or something? I'm just a fishmonger." When our reporter explained that he had one trouser leg rolled up and his left arm through his legs, the spokesGrandMoose was more



• A stoney faced spokesperson for the CMBC.

forthcoming: "Gaw blimey old chap yes, the CMBC have been going for years. The Stock Exchange Crash, that was us after an office party. The Great Depression, that was us after another office party. We love a good laugh. Of course we have other computers, we use a Cray to work out the holiday roster and an Amiga to play Kick Off, but apart from that we're not really into high-tech. You're not going to print this are you?"

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The IMG scanner is a device for scanning photocopied material at horizontal resolutions of up to 1000 Dpi on an ST, when used in conjunction with an Epson compatible printer.

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WANTED: Amiga A500 users interested in forming a user group. Also ust write if you're into programming, PD, swaps, etc. Stephen Hamer, 98 Crebilly Road, Ballymena, County Antrim, BT42 4DS.

WOULD Roy Woodfine please contact Clive Parker about the hard disk drives. I am still at the same address. Phone (0275) 375496. Please return the money paid.

◆ ANNOUNCEMENTS

TYPECAST! New PD library for the Atari ST/STE. Solely for DTP, WP and Art. No games, send SAE + disk for disk catalogue to: Paul Sealy, 31 Hartfield Crescent, West Wickham, Kent.

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WANTED Amiga: mouse, manuals, software and Mastersound. Cash waiting for any of the above. Tel: (0630) 58329 after 5pm.

WANTED: Atari ST system, fair price paid for good system offered. Telephone (0495) 272358 no silly balloon inflated prices please.

WANTED: Amiga Action Replay cartridge mark II. Swap for: Carrier Command and Starglider 2 or offer up to £30. Phone Simon (evenings) on (0623) 644179.

WANTED: Vic 20 power pack. Tel: Northampton (0604) 700632.

ATARI 1040 wanted. No monitor needed, but I am also interested in music software such as Creator or Cubase (with manuals). Ring Mike daytime: 071 926 4673 eves: 071 587 1327.

WANTED: Amiga 2-3 meg demos. Good price paid. Tel: Viper on (0473) 713715 between 6-9pm only please!

WANTED: Cheap computer for friend. Atari to Spectrum. Anything working considered. Please send details to: Nigel Richardson, 17 Butter Hill, Carshalton, Surrey, SM5 2TW.

WANTED: A500 with Fatter Agnus and Kickstart 1.3. Also wanted Megadrive Pal. Good prices paid. Phone (0424) 211928 after 6pm, 7 days, consider Pix with Lynx, Record deck, or TV400.

CIRCUIT CITY



Many of the ideas and projects in Circuit City can benefit from books. Keith Pomfret dusted his bookshelves and found a rain forest of knowledge hiding on the teak.

If you are going to delve inside your machine, it's important that you know what is in there and what it does. The book that came with the machine is generally next to useless when it comes to a sortie inside the machine and beyond the warranty.

An afternoon in a good library or bookshop will show you that everyone and their pet dog is writing about computers nowadays. In the local bookshop, the technological revolution has beaten religion into second position for shelf space. A book on the operating system of the computer isn't too difficult. Machine-specific references on the documented bits that the manufacturer doesn't mind us playing around with are easy to come by, but general books on what does what and how are rarer.

As bookshops don't generally keep a pet wirehead on hand to consult you're on your own. The first thing to get is the technical manual for your machine and the best place to get it is from the manufacturer. It sounds easy if you say it quickly. However, persuading some manufacturers to let you know what's going on inside is a task in itself.

No-one wants to help you because they disapprove or it's their living. You've hardly said "help me," before they run out a list of excuses and grumbings about qualified personnel and invalidated warranties. There's no simple way, but I'm sure with a little application (and a lot of phone calls) you can do it.

After you have the tech manual (and it's not always an easy book to get), it's an idea to try and learn what all the different components can do and a bit about the history of computing and the theories of logic and calculation that lie behind the keyboard.

SECOND-HAND?

If you're lucky you'll have a couple of second-hand bookshops close by. While these aren't much help for machine specific information, there are generally a few

books on the shelves about the theory of things. It's easy to look at the chips in your computer and ignore them as 'complicated circuits' but the only thing that differs between the microchip and the traditional circuit is scale. Inside the black plastic body of a chip there is nothing more complicated than a transistor and if you can learn how basic transistors, switches, diodes and capacitors work, you will be a long way towards understanding microchips.

A book picked up from the junk box of our local bookshop for 20 pence entitled *Electric Currents and Circuits* has been the basis of all my articles on how basic components function. Three text books long discarded by an HND student have offered me practical solutions, ideas and most of all help. These volumes cost me the princely sum of £2.25 for the lot.

MACHINE SPECIFIC

Computer shops and radio rallies proved a useful source of manuals for obsolete kit. Paragraph one of Murphy's Law requires that whenever a piece of equipment is sold, borrowed or given away, all of the relevant documents must be removed and hidden. Paragraphs two and three of the said law require that the person purchasing the equipment knows nothing about it and knows no-one else with any knowledge.

Thus the manuals and documents are passed around bookshops, bootsales and radio rallies until they surface, dog eared and mildewed several months later.

Another focal point for manuals, etc, is the regular All Formats Computer Fair at the Horticultural Halls in London. I've found several useful machine specific books and manuals at the All Formats including a manual for an obsolete IBM line printer, a full technical reference for an Osborne (and the Osborne to go with it) and even a schematic for a modem that had been on the shelf for two years because we had no information on it. ■

ALL IN ONE

Another solution to the knowledge problem is the *Electronics Repair Manual*. This is a weighty volume that tips the scales at £44.95, but is well worth the cash if you want to delve into anything electronic. It is a large format loose leaf binder with over 800 pages including checklists, troubleshooting, supply information, data, basic principles and most importantly, safety.

The loose leaf format means that it will lie flat on the bench. More importantly, the publisher uses this loose leaf format to allow updates by either replacing sections or adding to them. The supplements come in at at least 160 pages and are billed at £22 plus post and packaging.

The *Electronics Repair Manual* is available from WEKA on 071-388 8400. For a full depth review of its 800 plus pages keep your eyeballs welded to Circuit City.

A GOOD READ

Instead of searching endlessly through rows and rows of book shelves – a much easier way to find the books you want is to use the Dewey Decimal System. Most public and many academic libraries categorise their books using this system – each subject and its divisions have a classification number and these numbers are further sub-divided by a decimal point (hence the name). Most libraries put the classification number on the spine of the books and somewhere on the appropriate bookshelves. For example, the *Fax User's Guide* is in category 621.385.

The 600s are technology (applied science) and section 621 is applied physics. Not perhaps the first place that you'd look for a book on fax machines, but as you peruse the Dewey list, you'll find clues to the whereabouts of books that you'd never have guessed.

Categories 004 and 005 in the general section are computer science/data processing and computer programming respectively. It's worth asking the librarian for a photocopy of the Dewey classification list in order to enable you to do a bit of digging on your own.

USEFUL NUMBERS

Here are a few Dewey numbers you may find useful in the public library. It isn't a complete or comprehensive list but it's a start.

003	Systems
004	Data processing, Computer science
005	Computer programming, Programs, Data
006	Special computer methods
016	Dictionary catalogues
118	Force and energy
119	Number and quantity
160	Logic
161	Induction
162	Deduction
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346	Private law
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Trust 486-253 VGA Big Tower £3795.00

80486 25Mhz; 4Mb RAM; 8 Expansion slots (2 8-bit & 6 16-bit); 1.44Mb 3.5" FDD; 210Mb SCSI hard drive; 1 serial 2 parallel; 102 Key keyboard; 16-bit 1Mb VGA card; VGA colour monitor.

Hewlett Packard DeskJet 500 £499.00

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WHOLE WIRED WORLD

A Wordperfect upgrade, a cheap answer to PostScript and much more from our man across the Atlantic, Steve Gold.

WORDPERFECT 4.1 UPDATE

Another new edition of *WordPerfect 4.1* for the Atari ST has begun shipping in the US. This latest version, with file dates of the 6 December, has several enhancements over and above the earlier, 1 November 1990, update.

According to Mike Squire of the *ST Report* newsletter, the new version is well-behaved with a wide variety of mouse and screen accelerators, so the package should work with the Mega STE series, as well as the TT030 machines. WordPerfect, in fact, says that the new update is guaranteed compatible with the TT030 machines. *ST Report* is more cautious, probably because there are so many varieties of the TT030 in circulation.

The key features of the 6 December update are that the initial colour palette resembles that of the GEM Desktop, and if colours are changed within the *WordPerfect* environment, the colour combo is retained for future sessions. When the package is exited, the GEM Desktop's colour palette is unaffected by the changes.

While WordPerfect is emphasising the update's included support for the TT030 series, *ST Report* notes that this new version is infinitely less buggy than the 1 November edition.

OK. Now for the bad news. Even if you upgraded to Version 4.1 with the 1 November 1990 edition, you'll still have to pay \$15.50 plus shipping for the new version. But with around \$10 to add for airmail postage and packing, that's not too bad.

Strictly speaking, UK users of *WordPerfect* should contact the company's UK office. While yours truly has found the UK staff efficient, even I doubt that the 6 December edition of *WordPerfect 4.1* is available from the UK

offices, so I'd advise interested readers to contact WordPerfect US direct with their credit cards at the ready.

Contact: WordPerfect Corporation Atari Products Division, PO Box 731, Orem, UT 84059-0731, United States. Tel: 0101-801-225-5000.

BUDGET TIMEBASE CORRECTOR

One of the biggest problems with video editing systems on the Amiga and even PC-compatible machines is that the video signals need some form of time-base correction to stop the images jittering. This is why video editing sys-

tems, even on the Amiga, end up costing well into five figures (and that's dollars and not pounds).

Until now, that is. Digital Processing Systems (DPS) of Scarborough, Ontario in Canada, has come up with a Personal Time Base Corrector which can be used with the Amiga and PC compatible machines.

The Personal TBC system consists of a PC-style card that fits the Amiga (without the need for a PC bridgeboard) or a PC compatible computer. The \$995 system is designed to be compatible with Newtek's Video Toaster system as well as the majority of other video editing systems for the Amiga and the PC.

The system works with both PAL and NTSC video signals being fed into a personal TDC card and then into the video editing software environment. Up to four cards – and therefore video sources – can be used with each PC or Amiga, and DPS reckons the results are of a broadcastable standard. Genlock capability is also supported as standard.

Contact: Digital Processing Systems, 55 Nugget Avenue, Scarborough, Ontario M1S 3L1, Canada. Tel: 0101-416-745-8090 Fax: 0101-416-754-7046

ULTRASCRIP FOR ST DUE SOON

UltraScript is the name of a new page description language (PDL) that is very close to PostScript, yet is a whole lot cheaper to license. The software of the same name – due out later this year for the Atari ST – is a joint development between QMS/Imagen and Atari, with Atari handling the marketing.

The full version of UltraScript is scheduled for shipment in the third quarter of this year. According to the *ST Report Confidential* newsletter, the software operates as a terminate and stay

resident (TSR) package that intercepts printer calls from most DTP software on the ST, routing it through the necessary printer drivers to achieve the necessary graphics and fonts.

What's most attractive about UltraScript is that its able to convert pure UltraScript print commands and route them out of the ST as PostScript commands. This means that DTP systems based on UltraScript can drive PostScript-compatible laser printers without the need for an expensive PostScript license! Watch this space.

AMIGA 3000UX ARRIVES

After several months of waiting, Commodore's Amiga 3000UX Unix workstation is now shipping. At least, that's the word from the company's US headquarters. The machine runs AT&T's Unix System V Release 4 operating system and is based on a standard 16MHz 68030 Amiga 3000 chassis.

Two versions of the machine are available in the US, the Model UB with 4Mb of RAM plus 100Mb hard drive at \$5,499; and the Model D with 8Mb of RAM and a 200Mb hard drive at \$6,999.

Both models can be expanded to 18Mb on the motherboard and feature an Ethernet board, Unix system software, mouse and a single 3.5 inch floppy drive as standard within the above prices.

What's interesting is that Commodore is claiming that the 3.5 inch floppy drive is multi-format. From that I'd guess that the drive will read and write to pretty well any 3.5 inch disk format – maybe even Apple Mac disks.

Contact: Commodore Business Machines, 1200 Wilson Drive, West Chester, PA 19380, United States. Tel: 0101-215-431-9100 Fax: 0101-215-431-9156. ■

PORTFOLIO PROGRAMS A-GO-GO

Since Atari US shuffled its pricing on the Portfolio at Comdex Fall last November, sales of the machine have gone through the roof, with the predictable result that there has been an explosion in the amount of software developed for the machine.

Gregg Pratt over at Atari US is co-ordinating a lot of the packages for the tiny PC. His list of available packages is growing almost daily, so it's worth dropping him a line or a fax to enquire about specific packages.

In the meantime, here's a short list culled from the Atari Portfolio forum on Compuserve:

POWER BASIC (Spectra Publishing) is a full-fledged powerful BASIC compiler that allows users to write application programs for the Portfolio that can be tailored for specific needs.

PORTFOLIO STOCK TRACKER (Lifestyle Software) keeps track of user's stocks and shares. The program supports hard copy printout.

ATARI TURBO TRANSLATOR (Organised Solutions) translates approximately 1,000 phrases and 2,000 words into six languages (English, Swedish, German, Italian, Spanish and French).

PERSONAL FINANCE (Bytesize Software) is an easy-to-use tracking program that allows input and sorting by category. This software package can also be used to record time/expenses for anyone who has to maintain an hourly time sheet for billing purposes.

SCIENTIFIC CALCULATOR (Atari) contains approximate scientific transcendental functions so that users no longer need to carry a scientific calculator in addition to their organiser.

PORTFOLIO BRIDGE BARON (Lifestyle Software) is for people who want to learn how to play Bridge or improve their game strategy. It includes 91 challenging deals as well as a variety of both elementary and advanced declarer strategies.

PORTFOLIO WINE COMPANION (Lifestyle Software) allows users to catalogue their wines, choose just the right wine for the occasion and keep track of their wine cellar value and composition.

PORTFOLIO ASTROLOGER (Lifestyle Software) uses the three main astrological calculation bases (Placidus, Koch, and Equal House) to provide a complete natal chart, influences, a planetary map, daily data and even the interpretation of the data. The program allows for hardcopy printout.

Further details from: Greg Pratt, General Manager, Atari Computer, 1196 Borregas Avenue, Sunnyvale, CA 94088, United States. Tel: 0101-408-745-2000 Fax: 0101-408-745-2088.

● If you're on-line, the Atari Portfolio forum on Compuserve has to be the source of public domain and shareware software for the pocket PC. The forum has more than 2,000 members, meaning that the £7.00 an hour off-peak it costs to access Compuserve's direct dial port in London is well worth the money. Tel 0800 289458.



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SIN500 with 2Meg installed.....	£175.95
X-RAM OK (for A500/1000).....	£175.95
X-RAM with 2Meg installed.....	£279.95
X-RAM with 8Meg installed.....	£529.95
Octabyte OK (for B2000).....	£140.95
Octabyte with 2Meg installed.....	£249.95
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HELP! Eight score draws

I have just started BASIC programming and have written a very simple program to provide me with 11 random numbers for a pools coupon. I would like to be able to sort the numbers into ascending order for ease of entry and have read of various sorts, eg, bubble and shell - however I cannot successfully write any sort into my program. I would be obliged if you could help please. Could you also please tell me if there is a short program to obtain 11 different numbers in the range 1 - 58? Mine does seem rather long-winded.

Trevor Cobbe, Leicester

I'm not falling into the trap that you've set me. The last time that I dusted off my programmers hat to answer a query, several better/faster/more elegant solutions landed in the Tech Tip mailbag. I will however risk starting a 'my favourite programming language is better than your favourite programming language' debate by throwing the challenge to all our codeheads. So there you have it. Go forth and may the source be with you. (Groan - Ed)

STAR LETTER! But no prize

Here is some help for George Garven, Ayrshire whose problem you entitled. BAH! Silly boy. There are always a couple

of good reasons for having a TV/monitor.

1) It's the only type of monitor you possess, and you will be surprised at the quality of the display in all modes except for interlace.

2) It's the only TV you possess that gives better quality than a modulator. The problem occurs when a member of your family wants to watch *Home and Away*, *Neighbours*, etc. This means you have to close all applications and save work 20 minutes before these programs come on, because the computer automatically takes over the TV set when switched on, thereby not allowing the composite picture or sound through no matter which channel is selected.

The problem is the Euro connector. If the source ie, Amiga/videos supplies the switch over signals the set is automatically put in monitor mode. To stop this from happening, open up the connecting cable at the 23-pin connector Amiga side, locate pin 22 and pin 23 - these should be clearly marked. As it is these pins that supply the source signal for the automatic changeover they have to be desoldered and cut back or capped so they do not touch each other or anything else. Once this is done you can reassemble the connector, plug in and switch on.

You can now select between monitor or TV sure saves powering everything

down every time someone wants a look at the teletext to see if his gee gee fell in the last race. *New Computer Express* is great, good work men. (Don't forget us wimmin - sub)

V. Keizars, Edinburgh

The thought of allowing anyone to interrupt a session on the Amiga to view antipodean dross where the music is only one step up from a Z81 is enough to drive anyone to distraction.

Honestly, I've seen animation programs on the Amstrad CPC with more realistic movement than the acting on Australian soaps. Still, there's no accounting for taste and with the current climate, I have to admit that it's not a bad idea being able to flick to a TV for the latest news reports. Thanks for your input on the subject. If I was a sadist, I'd send you a video of *Prisoner Cell Block H* for the week's star letter but I'm not so I won't.

TIP! Spectstrad monitor

I recently purchased an Amstrad CTM664 monitor (the one that comes with the CPC6128) in the January sales for only £20 with the express purpose in mind of converting it to work with a 128K Spectrum. I have now completed this relatively simple conversion and thought that the informa-

tion I had gathered to complete the conversion may be useful to your readers.

The simplest conversion is for owners of Plus 3 and Plus 2 Spectrums, and consists of an adaptor lead to fit between the spectrums RGB/Peritel socket and the monitors input lead. You will need an 8-pin male 180 degree DIN plug (for the spectrum end) and a 6-pin female 240 degree in-line socket (for the monitor end). Both of these are easily available from Tandy.

Five connections need to be made between the plug and the socket. It is best to use four core screened cable, and use the screen to connect between pins two and five. The earlier Sinclair black cased 128K Spectrum uses a separate bright line which is not accepted by the monitor. It is however possible to combine the bright signal with the red, green and blue signals so that the colours are displayed correctly.

The modification can be included in the adaptor cable between the Spectrum and the monitor and consists of three small signal diodes (IN4148 or similar), and three 75 ohm resistors. Each diode needs to be paired with a resistor, with the end of the diode marked with a ring on the far side from the resistor. Connect the diode end of all three pairs to the bright output from the computer (pin three), and connect the loose resistor ends of the pairs to the red, green and blue outputs (pins six, seven and eight). The diodes must be the right way round for the modification to work, but the orientation of the resistors is not important.

As the CTM664 monitor does not have any sound output a separate amplifier will be needed to hear the 128K's sound. I used the Tandy mini amplifier/speaker (£10) connected to the Spectrum's tape/sound socket. It is also possible to use the monitors redundant power supply line to power the amplifier.

David Smith, Sunderland

Yet another use for the Amstrad monitor. We had one in the office attached to an Amiga, a colleague swears by it for his STE and I'm told that they even do quite a good job when attached to an Amstrad CPC.

HELP! Germany calling

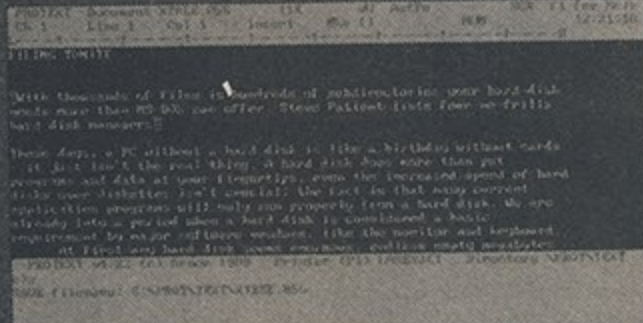
I am at Grimsby College of Technology and Arts, and currently a computer student. One of my core subjects is European

HELP! Word processing package

I am searching for a word processing package that would most closely match my requirements and wonder if you could make any useful suggestions, as I am unable to ascertain the information from your WP shopping guide or from advertisements; nor do I wish to be lumbered with a large phone bill making enquiries on various items. Using an Atari 520STE, my requirements would include proportional spacing facility, the ability to call up multiple font styles and sizes from the screen (these being displayed as they would be printed), a spelling checker and if possible (although not essential), a thesaurus. I would also seek the ability to switch off automatic page numbering. Furthermore, this would hopefully fit within an £80 budget. Would I need to expand the memory to cope with such a requirement?

I. Spake, Feltham, Middx.

I'm not sure that your requirements can be matched within your price range. I'd have thought that the closest that you'd come to your ideal wordprocessor would be *Protext 4* from Arnor at around £100. This supports proportional printing, has



Protext - an ideal word processor.

a good quick spelling checker and is used professionally by several of the mags here at Future (*Amstrad Action*, *Amiga Format*, *ST Format*, *8000 Plus*, *PC Plus*, and *Classic CD* to name but a few). The sort of features you are asking are more the realm of the document processor or DTP than a simple word processor. Shop around and keep an eye on the pages of Shopping Express but I think you could do a lot worse than to settle for *Protext*.

Studies for which I must write a thesis on telecommunications within Germany. I appreciate your time is very precious and would be most grateful for any information you could provide.

Mr. Siu Yee Lo, Grimsby

As a computer student you will be aware of the value of modem communications as a value of gathering information. I wouldn't suggest that you pop the phone bill up by ringing the fatherland but if you scan the Express On-Line lists you should be able to find a local BBS with some sort of echo mail that passes and collects messages to and from Germany. A couple of well placed messages in the net mail boxes could bring you a wealth of first hand information on your chosen subject.

If you haven't access to some sort of communications equipment, you could always leave a message in the reader ads (using the form provided) and hope that one of our benevolent readers can help out.

■ HELP! Typing errors

Having bought an Amstrad PCW8256 about 12 months ago and also at the same time became a regular reader of *8000 Plus* I started to do one or two of its listing programs. Not having success with them, due to my incompetence with my computer or so I thought until I tried the listing in the December issue. Having tried to get it in my computer half a dozen times I finally took it to my nephew only to find he has the same sort of problem, also his chums as well. This convinced me that I was not at fault, but the listing must be.

When I have put all the data in the computer and completed all the instructions, and ready for the final test, which is simply to type prompt, nothing happens.

The keyboard freezes, none of the keys function. Other friends have their screen fill from top to bottom with the list of prompts. So could you please help? I would be most obliged.

By the way I have another problem, I bet your saying under your breath, "got a right one here", but please have patience with an old man. The two master disks that come with the Amstrad PCW, both have DIR. I can get them on the screen, but how do you get them to work on individual files? It's the same with say, public domain - I just can't get them to work.

Mr LW Garner, Kings Norton, Birmingham

I asked my colleagues on *8000 Plus* and as well as assuring me that all of the offending programs were in fact faultless, they offered to run them to prove it.

That being the case, I'm afraid that it's your typing (and that of those around you) that is at fault. Go through the listings with a fine tooth-comb and look out for Is where there should be 1s, Os where there should be 0s and other errors of punctuation and letter juxtaposition.

To persuade a program to run, first load CP/M. when you have the a> prompt on the screen, put the disk containing the program that you want to run in Drive A. Type dir and you will get a list of the files on that disk. At the A> prompt, type the name of the file that you wish to run, bearing in mind that it should have an extension of .COM or .SUB (For example PROTEXT.COM or TIMSMITH.SUB).

■ Help! 64 driver

I have recently purchased a Commodore 1351 mouse and OCP *Art Studio* for my Commodore 64. I have a Commodore 1526

printer for which a driver has to be set up for before I can print out pictures. I don't know where to start. The computer asks a series of questions about the printer in order to set up a correct driver. I don't know a lot of the answers needed. I wrote a letter to Commodore asking them for help, they replied twice, but both sets of answers varied slightly and both sets didn't work. Please help! I am desperately in need of these answers as I need to be able to print out hi-res graphics for a CAD project I am doing at school. I have enclosed the print configuration questions and listing (if it helps) and hope someone on this planet can help me

Christopher Warrington, Worksop

I'm as puzzled as you on that one. If the instructions from Commodore don't work and you've tried every possibility and double checked your implementation of the instructions, the only thing left to do is hope that some kind reader of Tech Tips can help you out. In the mean time check out the list of user groups in Express on Line. there could be someone there ready to help you.

■ HELP! Amiga keymap

A plea from a desperate Amiga man - my A500 keyboard is a normal QWERTY keymap but on using shift and the number two for the quote marks it prints @, also using shift and the number three for a pound sign it gives a \$ sign.

On phoning the firm which supplied my computer they told me I could change the keymap using the Workbench. After following the instructions given exactly, nothing happened. After numerous phone calls I was told I had the American workbench disk and to send it back to be exchanged for an international Workbench. I did. After more phone calls

and a wait of three weeks I got the international disk back. I went through the complete instructions again. Nothing happened. I still have a keyboard which prints in the American style. I have read and reread the manuals in case I may have missed something out, but I cannot see anything. I get the keymap icon up, then scan menu and get info. I then press select button on Add, then select the string symbol, I then print "keymap" gb press return and then select save. I then double click on the keymap icon. Please, please any help or advice would be really appreciated.

John Carr, Salcombe, Devon

In order to make the permanent change to your disk so that it defaults to the UK keymap, you'll have to edit the startup sequence. First copy the Workbench disk and only edit the copy. This way if you make a mistake, you will be able to make another copy to start again.

The instructions on how to copy a disk are in the manual. Startup sequence is a file that you will find in the system directory. Your problems are being caused by a line in the startup sequence with `setmap usa1` in it. The startup sequence should be loaded into a word processor and the offending line edited to change from `setmap usa1` to `setmap gb`. If you haven't got a word processor you can use ED. The instructions for using ED (a very basic text editor) are in the manuals that came with your Amiga. Simply put the yellow cursor over the '1' in `usa1` and hit the delete key four times. This will rid you of `usa1`. Then type `gb` in its place. Hold down the Control key and hit the X key. This will save your changes and exit from ED. You can now reset the Amiga (with the key sequence Control-Amiga-Amiga) and you should have the GB keymap. ■

■ HELP! Amiga display

I have owned an Amiga A500 now for three years and I was hoping that you could help me with a number of problems.

1) Is it possible to connect a PC VGA monitor to an Amiga without extra circuitry? If so could you please show me how and what I would need. It would not be the first time I have made up leads for the Amiga, ie modem leads.

2) If so does the VGA hold any improvements over the Commodore 1084S or the Philips 8833 range of monitors and if so in what ways?

3) Is it possible to connect a PC hard disk to the Amiga. I have a 32 meg hard disk and would like to fit it up to my Amiga instead of forking out over £300 for the Commodore model. If it is possible please show me how.

I would be most grateful if you could help me. I have searched high and low for answers to these questions.

I have bought NCE from issue one and rate it as the best mag for up-to-date news.

Paul Trouton, Co. Armagh.

It's possible to connect some kinds of VGA monitors to an A500 but it isn't necessarily easy. The sync rate of an Amiga is 15.625KHz whereas many VGA monitors have a sync rate of double that. The only easy way to do the job is if you have a multi-sync VGA monitor that

has the ability to run at the Amiga's sync rate unmodified.

With a multi-sync VGA monitor it should be a simple matter of making a lead. The pin connections for the Amiga 23 way video output is in the user manual and similar information about the VGA monitor should be either in the monitor's manual or available from your supplier.

Using a VGA monitor with an A500 wouldn't really offer you any great advantage over a Philips or Commodore model unless you upgraded to the top level A3000. PC hard drives can be fitted to Amigas, but it isn't an easy job. As well as an in-depth knowledge of hard disks, controllers and SCSI interfaces there could be an extensive hardware modification too. If you can't figure out how to do it on your own, the job's not for you.

The only light at the end of the tunnel comes from a device called Megastor. This is a PC hard drive designed to connect to a PC via the parallel port. Experiments are currently underway to see if it is possible to persuade it to work with a PC under hardware emulation. (ATonce or KCS Power PC Board). Should this be successful it may offer an alternative route to an Amiga hard drive. Watch Circuit City for details.



• High quality colour from a VGA monitor?

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TRAINING FOR YOUR FUTURE

Recursion is usually looked on as an advanced and complicated technique reserved for esoteric problems in Artificial Intelligence – too confusing and irrelevant to the ordinary programmer. Most of this attitude probably stems from the ludicrous definitions often given to the technique; anyone faced with the statement "recursion: see recursion" could reasonably assume that an important tool would not seem so pointless. The other argument against recursion is that it is inefficient.

Recursion is a technique where a function can call a copy of its own code to solve part of the problem that it is working on. If you want to calculate the factorial of a number, you calculate the factorial of the number immediately before, working backwards until you find the base case or termination condition – a number whose factorial you already know. As each calculation follows the same formula, you can use the same code for each number, and then combine the results for the total.

A well-written iterative loop may incur less of an overhead than the embedded calls generated by a recursive function; this is assuming that the loop is well written and that there are no time-wasting mistakes to be repeated each time around the loop. The main advantage of recursive functions is that they are easy to write and understand, and this makes them easy to maintain. For all but the smallest section of code, this is a major consideration and may outweigh questions of efficiency, unless you are really short of memory. Also, recursive functions create their own arguments and variables for each new call, since a new copy of the code is used, so recursion does its own book-keeping.

Anything that you can do using recursion, you can do using iteration, but some things are easier when written recursively. If you consider a simple loop, written as:

```
loop: DO
    instruction1
    instruction2
    ...
LOOP
```

then you can write this recursively as follows – List is a label given to the list of instructions:

```
List: instruction1
      instruction2
      ...
```

CALL List

The DO loop will be implemented by a jump to the beginning of the loop each time the keyword LOOP is reached – this code actually produces an infinite loop. When the List function is called, control does not jump back to the beginning of the definition of List; instead, a new copy of the code that makes up List is copied to the current program area, so that any variables created within the first instance of List will be created again, in the second copy. This means that all the variables are local; if you want to use a control variable, to keep a tally within the recursion, you will have to pass it from copy to copy as a parameter. If you are using recursion to calculate a final value, you must pass in a parameter to hold the value; this argument will be passed down through the copies until the value is calculated and then passed back up as the recursion 'unwinds'. This means that, like any repeated code, you must include a termination condition – something to tell the program when to stop. This is known as the base case. For each function, you will also need the general recursive case – what the function does every time except the last one –

- Recursion works by calling duplicate copies of the original routine.
- Parameters must be used to pass data in and out, and results must be carried up from the lowest level of recursion.
- If code comes after the recursive call, it will be executed in the last copy of the function first.
- Recursion is best for repetitive problems that can be solved in stages.

RECURSION REVISITED

Mary Branscombe takes you beyond the statement 'recursion: see recursion' and explains the functions of this complicated technique.

and definitions to cover any special cases – if the input data is out of range, for example.

Recursion can be used in most languages; in Prolog and Scheme (Jerry Sussman's version of Lisp), it is the main method of repeating code. Recursion is best used where a problem can be solved by breaking it down into smaller sub-problems. It is excellent for handling hierarchical data, for example that stored in trees. As each point in a tree is either a terminal node or the beginning of another tree, the tree is actually defined by recursion and so recursion is the most natural method for searching through the structure.

SOLVING FACTORIALS

The factorial of a number is the product of all the preceding numbers. The factorial of four, written 4!, is 4x3x2x1, or 24. The factorial of one is one. To calculate this using a recursive function, the algorithm would be:

```
if n<>1 then
    n! = nx(n-1)!
else n! = 1
and the code would look something like this:
factorial(n, result)
    m=n-1
    IF n<>1 THEN CALL factorial(m, result)
    ELSE result = 1
    result = resultxn
RETURN
```

The number to be factorised in input in n; if this is one, the function returns one without making any calculations. Otherwise, n is decreased by one to give a value for m and another copy of the code is called to calculate the factorial of this number. If m contains the value one, this copy will return one in result, otherwise it will decrease the value of m again and pass this to another copy of the code. This process continues until m is equal to one; obviously, this does not work for negative numbers. When a copy of the function returns one as the value of result, this is multiplied by the value in n in the copy immediately before the final copy. This calculated value is then returned to the copy before that and multiplied by the value of n stored there, until the original code is reached and the final value calculated.

If the original number is three this will be decreased to two in the first instance of factorial; two is not equal to one and so a copy of factorial is called. The value passed in is two, which is decreased to one, which is multiplied by two, giving two; this result is returned to the previous instance of the code and multiplied by three, to give the final result, six. When implementing this algorithm, you will need to reject negative numbers – as they can't be decreased to one, the recursion will carry on until the machine runs out of memory. You will not be able to calculate the factorial of numbers larger than 15 because the result will be a larger number than

the computer can handle, you should check for this in your code. The program looks like this in C:

```
/*comments
 *recfact.c
 *calculate factorials recursively
 */
#include ,stdio.h>
#include ,stdlib.h>
#define NDIGITS 10
long factorial(short);
int
main(void)
{
    char input[NDIGITS + 1];
    /*buffer for input*/
    short number; /*initial number*/
    long result; /*resulting factorial*/
    /*get input from the user*/
    printf("Type a non-negative integer
    and press return");
    gets(input);
    number = (short) atoi(input);
    /*calculate and print the factorial*/
    result = factorial(number);
    printf("The factorial of %hd is %ld\n",
    number, result);
    return EXIT_SUCCESS;
}
long
factorial(short n)
/*recursive factorial calculation)
{
    if (n <= 1)
        return 1L;
    else
        return (n*factorial(n-1));
}
```

The main() function sets up a character array as a buffer and gets the input from the user. This will be given as a character, so atoi is a library function used to convert it into a number. The value of this is stored in number and passed to factorial. If the argument is less than or equal to one, one is returned – 1L indicates that this is a long integer. The return type has been set as a long integer to handle the large numbers generated as factorials and all results must be in this form. If the argument is greater than one, factorial calls itself with an argument of one less than the argument it received, and so on until the argument is reduced to one. When this happens, all the functions return one after the other, returning the final value to main().

This code does not reject numbers above 12; try modifying it to do so. If you do not program in C, try the algorithm in a language you do use. Remember there must be a point at which the recursion bottoms out. ■

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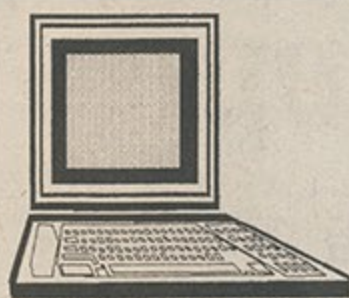
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STE owners know that they have a technically far superior machine to its ancestor the ST, especially as regards its sound capabilities. And yet little has ever been written specifically for the machine.

The *STE Soundtracker* goes one step towards changing all that. It allows you to play those samples in glorious stereo that previously have been only available to Amiga owners. The quality of the music is truly astounding, and what's more, a total of thirty music disks translated across from the Amiga are being prepared.

So if you have an STE, and feel like giving it, and yourself, a treat, then this

THE PD COLUMN

MC Adam 'Bad' Waring gives you the low down on sampling and rapping on your ST, some crucial clip art for the Amiga and a pair of well wicked games.

may just be the program for which you've been looking.

Rrap • ST • Trust PD • DEM124

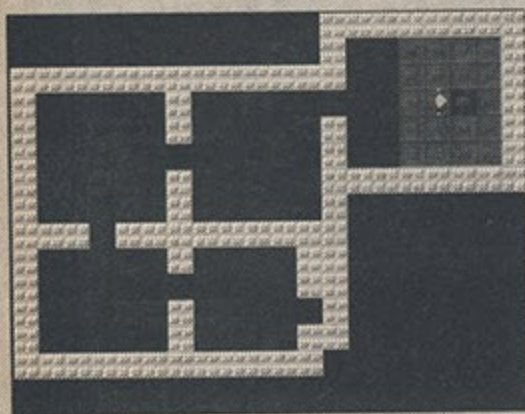
Fancy yourself as a bit of a DJ but you don't want to swap your computer for a twin deck? Then you can cut into the

groove with *Rrap*, the do-it-yourself rapping kit for the ST.

In essence it plays back pre-programmed samples. The fun bit is that by simply pressing a key a sample replays itself rapidly and repeatedly thus forming the basis of a backing track. There are a number of samples built in, mainly taken

from digitised speech samples from demos, and short, repetitive tunes. These are selected with the mouse so you can quite quickly become a proficient rapmaster just by pointing and clicking.

And that's just about all there is to it! A fairly useless piece of software actu-



• Soko shuffles onto your ST with the classic.

Soko ST • ST • Trust PD • GAM44

An old favourite makes it onto the ST. You play a factory worker whose task is to shift stacks of boxes through a warehouse. You do this by pushing them along the floor then placing them in predetermined spaces. It's been written in STOS, Mandarin's supercharged games Basic package to which so many PD programmers seem to be turning.

Problems arise because you can only push, not pull, the crates. Should

you push one into a corner, or get it stuck in some other position, then it's impossible to get the thing out again. The factory layouts are constructed in such a way that it's very easy to find yourself in a jam.

There are 50 levels to the game, and even the first is tricky, but not too hard, to solve. Your little bloke struts around with well-defined little steps. In fact the whole game, if not a graphical masterpiece, is very pretty throughout.

But despite having an arcade-style look the game definitely tests the mind more than the reflexes. Time and time again you find that you've made a mistake, usually when it's a tad too late to do anything about it. Once you accustom your thinking to the 'laws' of the game, though, you can spot the possible problems in advance. Be warned though. Once you start on a puzzle you may find it impossible to stop until it's finished!

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ally, but it should provide a brief distraction when you're stuck twiddling your thumbs.

AMOS Paint • Amiga • Amiganuts • Disk 911

You too could be well on the way to becoming a world-famous artist with the help of *AMOS Paint*, a PD art package for the Amiga.

With *AMOS Paint* you will be able to draw pretty pictures on your screen with the aid of your mouse, and, of course, a dash of hand-eye co-ordination.

The utility offers many tools for would-be Van Goghs. You can draw lines, boxes and circles. In fact many of the tools you might find on a full priced art package are available on this program for next to nothing.

The painting environment is very simple to use. Should you want to add a dash of colour underneath the area covered by the icon bar, it obligingly moves out of the way. One thing it doesn't provide are guaranteed results. All my pictures were rubbish. Oh well, practice makes perfect.

It works best on a machine with at least one megabyte of memory. A500 owners can use the package as well but will have to sacrifice the undo function. As a result mistakes can't easily be rectified, which, if your artistic abilities are anything like mine, is a function which will be sorely missed. ■

1 Across 2 Down • Amiga • Amiganuts • Disk 877

1 Across 2 Down is, you might not be surprised to learn, a crossword program for the Amiga which lets you solve the puzzles on screen.

The main display is a large crossword grid. You can scan through the across and down clues easily with the mouse. The clue is displayed on a line at the bottom of the screen. When you think you have the answer, just tap it in and it appears as if you'd filled it in with a biro.

Two disks are used: a program disk which has the actual crossword software, and a data disk that holds the puzzles. There are eight brain-teasers

supplied on the initial disk, and further disks are promised to be released just as soon as they've been compiled.

So, how difficult are the puzzles? Well, I'm just about capable of solving the quick crossword in our local freebie (as long as it has the answers on the last page) and I found the questions in puzzle one fairly straightforward. Then again, subsequent releases could prove to be more of a challenge.

At any rate, *1 Across 2 Down* provides a high tech way of spending your tea break without first having to nip round to the corner shop to get yourself a newspaper.



• Tea break standard crosswords on the Amiga in *1 Across 2 Down*.

WHERE TO GO

The disks reviewed in this column and many others besides can be ordered from the following PD libraries:

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"The most realistic high 'g' flight simulator for the home computer"
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(The first European to have flown a MiG-29 Fulcrum)



• **Beastbusters:** blood and guts, guts and guns, and more guts.

PREVIEWS

News of Activision's demise is still proving to be a little premature. It seems that the ailing American giant has several products waiting in the wings for release over the next couple of months. And what's more they're all either designed or programmed in Britain!

Hunter is a radical game which the company has done pretty well to keep under wraps for so long. It features some amazing filled vector graphics and more gameplay than you can shake a very large and powerful stick at.

You're a soldier, working for "Our Side" and you have many missions to fulfil. Depending on the style of game you choose, you may have one long mission that takes you all over the world and lasting several hours,



GAMES WEEK

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

or one of a bunch of shorter missions which have a more racy action feel.

All missions involve the use of a number of special items to help you in your quest. Scattered all around the world you find cars, trucks, ambulances, bicycles, hovercrafts, helicopters and boats waiting to take you away. Vector rabbits and ducks wander about the landscape, waiting to be caught and eaten, and villages contain all kinds of dwellings, usually with goodies inside.

While roaming around you meet other soldiers, nurses and civilians, some enemy, some friendly and some equally rude to both sides. An enemy uniform comes in handy for some low-grade espionage and the gun is even handier when you've been sussed! Activision is currently looking at a March release date for this tasty looking Amiga and ST treat.

Activision is also ready to announce the release

date for *Beastbusters*, an SNK arcade conversion featuring all kinds of blood bespattered zombie nonsense. In an *Operation Wolf*-style, *Beastbusters* puts you head to head with all sorts of rotting nasties that splurge and disembowel in true Cronenberg fashion. Look out (through your fingers) for this during April.

Also lurking in Activision's new Reading HQ, you'll find *Deuteros*, the long-awaited sequel to *Millennium 2.2*. *Deuteros* is set a thousand years after the completion of its predecessor, somewhere around the year 3300 AD.

At this time, the once-strong empire of solar system colonies has collapsed. Old alliances have faded into obscurity, colonies have all declared independence and the moonbase has been forgotten since the Earth was terraformed. Legends and myths recall those historic times, but nobody is sure whether it's fact or fiction. ➤



CONSOLE ZONE

SEGA MASTER SYSTEM

The white stone in *Ultima IV* is located in the mountains of Serpents Spine.

NINTENDO GAMEBOY

Thanks to Dominic Brookman from Kenilworth in Warwickshire for these *Golf* tips. Novices should start on the Japanese course as it has far fewer trees and hazards. Practice the back spin and the super shot as they could lead to

birdies. When in the rough use the pitching wedge for the best possible shot. Pay attention to wind levels especially when you are on the greens. Aim for birdies and eagles; and you're get treated to a spectacle of yourself jumping about with delight.

SEGA MEGADRIVE

The passcode for the final HERZOG ZWEI round is JLJOIGLAOKN

ATARI LYNX

Thanks to Nicholas Wells from Norfolk for this *Gates of Zendacon* tip. Enter TRYX as a code. As soon as your ship appears, go down and right to go straight through the platform. Dodge the walls and go in the first gate. You will be on a secret level.

NINTENDO ENTERTAINMENT SYSTEM

Enter this *Metroid* password to change Samus into a woman: JUSTIN BAILEY

SPEEDBALL 2

Atari ST and Amiga • £24.99

After two years waiting, the illustrious Bitmap Brothers (of *Xenon* fame) have released the sequel to their smash hit *Speedball*. The name of this offering? *Speedball, er, 2*. Not such a good start really, but never mind.

The game, like its predecessor, is based on a futuristic sport, pumped to the hilt with violence, aggression, excitement and action – all the things you really need for another smash hit. It's a team game, with two hordes battling over control of a large metal sphere (called, er, a ball) and attempting to place it into a large open-ended hole (called, er, a goal) at either end of the flat, metal-panelled floor (called, er, a pitch).

Each game consists of two halves of 90 seconds during which you control one team. The other team can

be controlled by the computer or by another person, depending on your social standing, personal odour, etc. The ball is fired from a machine which pops up from the floor and then, basically, all hell breaks loose. There are no foul rules, out-of-play rules or many rules at all really. In fact you actually get extra points for disabling the opposition members!

When a player has the ball, a large letter appears above his head, telling you whether he's a midfielder, attacker or a defender, and depending on his abilities whether you need to tackle him or just smack him in the gob. You control the method, and hopefully the remaining members of your team will back you up. Occasionally they just nip off somewhere else for a quick

scrap, leaving you to fend for yourself.

All around the outside wall of the pitch are special icons, which include warp-gates (for transporting the ball downfield), score-multipliers and electro-bouncers (for making the ball unstoppable). You'll also find money and a variety of power-ups appearing on the pitch itself.

Speedball 2 can be played in a number of different game-formats – knockout, league, cup and exhibition matches. The first three types involve management too, which forces you to build up your team's abilities over a period of time. You can train your players and give them extra speed, stamina and intelligence, providing you win the required points from each game.

Speedball 2, while being a sequel, is still a fantastic game. Sound effects are superb, with all manner of cyber-punky crashes, smashes and "oofs" emanating from your monitor. Graphically, it is again superior. The images are stunningly well drawn, with perfect highlights and "chrome-look". And the game is fast. Very fast! So fast that sometimes you'll need to use the extra Replay option to see what really happened.

If you missed *Speedball 1*, don't make the same mistake with *Speedball 2* – it's too good to overlook. If you've got *Speedball 1*, then the incredible amount of extras in *Speedball 2* practically makes it a different game. Go on, you still want it really!

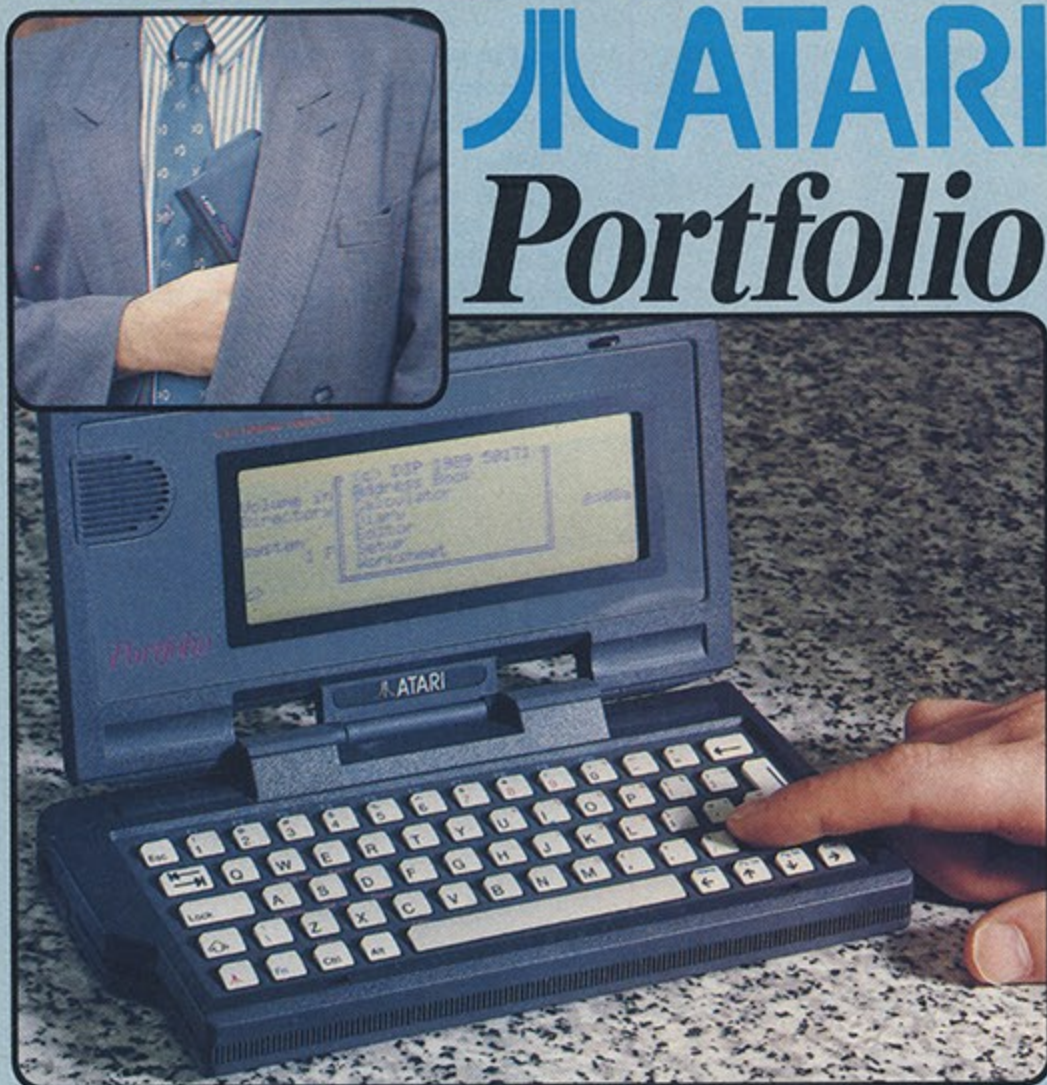
Will you balls up?



• **Speedball 2:** Futuristic football violence and team mis-management to boot!



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- ★ **Character Set:** Extended IBM ASCII (255 characters).
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- ★ **Applications:** calendar and diary, address and phone book, Lotus 1-2-3 compatible spreadsheet, text processor, communications software.

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includes word wrap, line and column count, string search, in fact most of the functions you would find in a word processor. It handles printer and word processor control codes and allows easy transfer of files between Portfolio and your desktop PC.

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COMING SOON!

In addition to the excellent software built-in to the Portfolio Free of Charge (see right), other software and peripheral products, such as the sophisticated Pocket Finance package and serial/centronics interfaces are available. And it doesn't stop there. Many manufacturers have recognised the potential of the Portfolio and have already started to design new peripherals and software. Products currently under development include: Serial interface with built in mini modem, Apple Macintosh interface, business, utility and programming software plus a range of adventure and battle strategy games. For further free details on the Portfolio range, fill in the coupon below and return it to Silica Systems now.



MEMORY CARDS

Portfolio can store and retrieve data and programs from its own RAM, or from small credit card size memory cards, that slot into its built-in card drive. The cards are available in three sizes, 32K, 64K and 128K, so you can carry a library of data in your pocket. The card drive also accepts ROM cards, which can contain commercial or custom software.



POWER SUPPLY

Portfolio is powered by three AA batteries which will run for up to six weeks with normal use, or from the mains using an adaptor. All the peripherals take their power from the Portfolio, so no extra batteries or adaptors are required. A "battery-low" warning and memory back-up ensure that information is not lost when the batteries are changed.



INTERFACES & PERIPHERALS

Portfolio can communicate with other computers and supports a growing range of peripherals via a built-in 60 pin bus connector. Peripherals available include serial and parallel interfaces and memory expanders (to 640K). You can also add a card drive to your desktop PC, to enable it to read/write to Portfolio's cards.

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• Deuterios: (top) A thousand years after Millennium 2.2 and the Earth's wrecked again. (Bottom) Spread your influence throughout the galaxy and re-establish your former status.

Your job is to investigate, first by locating the old moon-base (to prove that it exists) and then exploring the rest of the solar system to find any remaining colonies.

Deuterios is a vast game, much larger than its predecessor. In it you'll discover all kinds of weird and wonderful devices, ships and shuttles. The command-issuing system is a much-refined version of *Millennium's*, but it grows in its abilities as you progress through the game. Just as certain tasks become repetitive, you'll discover something to make it a whole lot

easier. And as you'd expect, you'll be getting all kinds of heat from someone, somewhere, who has a score to settle. *Deuterios* is due out for Amiga and ST at the end of March.

Finally, the sequel for *R-Type*, cunningly called *R-Type 2*, is also due from the company sometime early this year. The word is that it will be released just as soon as ARC, the development team working on the game, has finished the code and the product has been tested. More news when we get it. ■

TOP 10 SIXTEEN-BIT GAMES	THIS WEEK	LAST WEEK	CHART WEEK	TITLE	PUBLISHER	MACHINE
	1	NE	1	<i>Final Whistle</i>	Anco	AG
	2	1	7	<i>Powermonger</i>	Electronic Arts	ST AG
	3	5	20	<i>F-19 Stealth Fighter</i>	Microprose	ST AG PC
	4	6	12	<i>Lotus Turbo Challenge</i>	Gremlin Graphics	ST AG
	5	4	8	<i>Teenage Mutant Hero Turtles</i>	Mirrorsoft	ST AG PC
	6	16	6	<i>ESWAT (SG)</i>	SEGA	OT
	7	2	20	<i>Kick Off 2</i>	Anco	ST AG PC
	8	3	8	<i>Robocop 2</i>	Ocean	ST AG
	9	NE	1	<i>BAT</i>	Ubisoft	ST AG
	10	NE	1	<i>Chaos Strikes Back</i>	Mirrorsoft	ST AG

For the week ending 19th January 1991
 ST - Atari ST AG - Commodore Amiga PC - IBM PC or compatible OT - Other
 Chart compiled by Gallup. © European Leisure Software Publishers Association.

PLAYING TIPS

LOOM

Amiga, ST and PC

Here's a few weird things to try if you're getting bored or stuck in Lucasfilm's *Loom*, or if you've completed it and didn't know there was more to do!

- Leave the egg-chamber without opening the egg.
- Spin Open and Close on the clam at the dock. (You could also wait until you can play the "F", lead the gulls out to sea, then return and play with the clam.)
- Spin Dyeing and Bleach Green on the tapestries in the Sanctuary.
- Spin Night Vision on the sky above the cliff top.
- Look at Cygna's gravestone, Open the sky from the cliff top, then go back and look at the gravestone again.
- Open any of the graves (before Mandible does, of course).
- Try to Fill the graves.
- Close the owl holes.
- Try to sail /itals>past/ the waterspout to the mainland.
- Open and Close the chalice.

- Fill the chalice before double-clicking on it to summon Master Goodmold.
- Read the grave-markers in the dome, after you've talked to Master Goodmold about the goblet.
- Spin Terror on the workers in the Scythe Room while Bobbin is invisible.
- Reverse the Invisibility Draft on the workers while in the Scythe Room.
- Dye the dozing shepherd's sheep green, then wake him up.
- Dye the lamb in the manger.
- Leave the hut without looking at the lamb.
- Try Terror on the lamb (you rotten swine you!).
- Look at the dragon.
- Look at the dragon's gold.
- Spin Terror on the dragon before turning the gold to straw.
- Open and Close the pool in the caverns.
- Each of the three Spheres shows three scenes; did you

find them all?

- Did you find the Sphere in the Caverns? Empty the pool.
- Sneak into the forge as Bobbin, over and over again.
- Spin Wake on Rusty again.
- Go in and out of the Forge gate, while disguised as Rusty.
- Change the straw in the Forge cell to gold.
- Fill and Empty the wood bin.
- Twist the sword Edgewise is making instead of blunting it.
- Try to leave the Forge graveyard without healing Rusty.
- Spin reflection on Rusty's corpse.
- Dye the dead sheep and the shepherds green.
- Spin Terror on the dead and dying shepherds.
- Try to heal Master Goodmold.
- Heal the holes instead of Closing them.
- Try to spin as draft on Chaos.

And here's a list of Drafts and where they're located:

DRAFT	WHERE FOUND
Transcendenc	Any of the Spheres
Opening	Loom Chamber (from the egg)
Night Vision	Woods (from the owls)
Straw into Gold	Dark Tent (from the spinning wheel)
Dyeing	Dye Tent (from the dye pot)
Emptying	Dye Tent (from the flask)
Twisting	At Sea (from the waterspout)
Invisibility	Mainland Forest (from the sentries)
Sharpening	Crystalgard (from the scythe)
Terror	Crystalgard (from the Sphere)
Sleep	Meadow Fence (from the sheep)
Healing	Shepherd's Hut (from Fleece)
Reflection	Cavern under Dragon's Mountain (from the pool)
Silence	Loom Chamber (from Chaos, via Loom)
Shaping	Loom Chamber (from Chaos, via Loom)
Unmaking	Loom Chamber (from Chaos, via Loom)



The ST's impressive reputation in the music world is almost entirely attributable to the fact that the ST came with built-in MIDI ports as standard. Musicians have been exploiting the enormous potential of the ST's MIDI ports from the earliest days, and because of this you can lay your hands on music software which costs as little as £2.50 or as much as £500, depending on the size of your wallet and your passion for music.

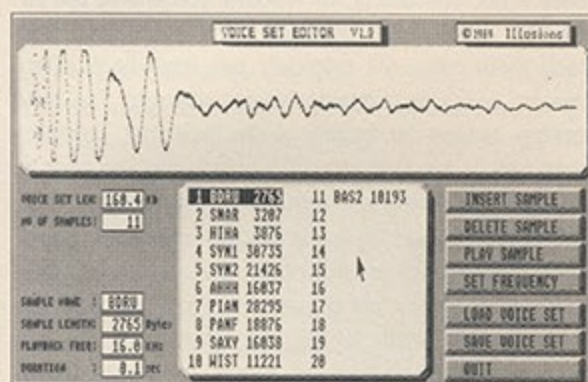
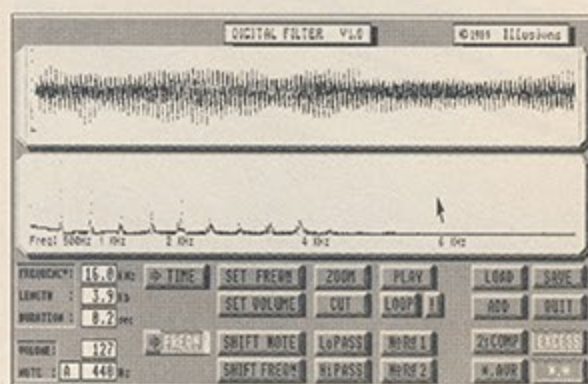
ST manufacturer, Atari, revelled in all this attention and at the end of '89 it released a portable version of the ST - the Stacy - armed with MIDI ports and hard drive. Now you can even take an ST onto the stage and use it to pull in those crowds.

MIDI is a serial link similar to RS-232. It transfers data from one MIDI device to another in digital 'packets'. Connections are made through 5-pin DIN sockets and on most MIDI devices you'll find a MIDI OUT, which transmits signals, MIDI IN, which receives them, and sometimes a MIDI THRU, which passes signals through the instrument to other devices. In the ST, MIDI THRU is hidden on two spare pins of the MIDI OUT socket.

The ST music scene isn't limited to MIDI. In fact, you can create a wealth of tunes without ever plugging anything into those innocuous ports on the side of your machine. One option is to program the ST's internal sound chip. While the sound quality isn't particularly impressive, it does provide a useful step into the heady world of music.

QUARTET

ALL STS • MICRODEAL • £49.95



What do you do with a digitised sound once you've got it into memory? Play it back several times, reverse it, squash it, move sections. Then what? Microdeal has come up with the answer - a composing tool which uses sampled sounds as the instruments. What's really astonishing, though, is that it's possible to have four channels of sequenced sampled sound playing simultaneously.

Up to 20 instruments can sit in memory, and each note can have any of the memory-resident samples assigned to it. Complete sets of instruments can be loaded and there are over 100 individual ones provided.

Quartet provides two MIDI modes: Poly Play and Record. In either mode it's possible to alter the current sample by pressing the instrument-select keys on your synthesiser. Poly Play takes the sample selected in Quartet and enables you to play your instrument using

MUSICAL GREATS



The ST is absolutely unbeatable in terms of music. Mark Higham looks at why no other home micro has been met with such enthusiasm from the music world and reviews some of the best sound programs.

up to four channels. The Record mode is arguably more useful, since it enables you to play your MIDI instrument and have the notes automatically appear in Quartet's active staff.

Because of the way Quartet works, compositions lasting several minutes take up very little memory. A typical song might take up 3K. The sampled data might add another 32K and the replaying routines a further 16K. That's little more than 50K for a hit composition.

Quartet is amazing. Play around with it and you just won't believe the sound you hear coming out of your ST. You don't need a sound sampler to use the program as there are so many instruments provided. If you're an enthusiast interested in making music, Quartet is the package to beat all others.

MUSICAL

ALL STS • £39.95 • EVENLODE SOUNDWORKS • 0993 898484

If you're a beginner looking to compose and eventually perform music of a high calibre, MusiCAL has been designed for you. It's a set of five programs that lead you through the principles of music.

Unit One is a simple composing program that uses an external MIDI keyboard. The idea is that you make up little short patterns of music in four on-screen boxes.

Unit Two uses the internal voices instead of MIDI and is a great way of showing the physical shape of sounds and soundwaves. You have five preset sound shapes and when a note is played, you get to hear it while the waveform frequency fills in the sound shape.

Unit Three tests your ear by giving you notes and asking you to tune another note to it. The note is altered by a large slider, but you don't hear the note change as you adjust it.

Unit Four is a simple composing program that uses what is technically known as a pentatonic scale - five notes arranged in the same order as the black notes on a keyboard.

Unit Five involves percussion only. You write in drum patterns using three lines of music - one for each instrument.

MusiCAL, and particularly the accompanying text, is a well thought out package. It would have been an advantage to make all the units work without the aid of MIDI instruments, something that is not too hard to do, because it would free up one more MIDI instrument for the classroom if necessary. There's no doubt that at this price it's a bargain and it could even suit mature pupils who wanted to start on a computer assisted music primer course

MASTERSOUND

KEMPSTON DATA • £34.95



This comes from the programmer who created Prosound and the whole environment bears more than just a passing resemblance to its predecessor.

Mono input is taken from a cassette player and fed into the cartridge. Once the sample has been grabbed it appears in the display window as a wave pattern with peaks and troughs representing the volume.

The sample can be subjected to all sorts of punishment using the icons and shifting pointers. A useful feature not present in Prosound is the ability to fade the sample in and out and also to make volume increases in selected areas. With options to zoom in on areas of the sample, you can ensure that editing is as precise as you need. The sequencer is the best side of the package, allowing you to load up to 18 samples and then play them back in a pattern. This works by enabling you to assign sections of the sample to the 18 keys on the keypad and then programming them to be replayed in order.

With the samples compatible with most others on the market, it's simple enough to progress onto more expensive packages at a later date or even to follow the current trend in stealing tracks from games. However, the sequencer is not compatible elsewhere.

Master Sound is a tool for playing with music rather than designing professional sounds. The environment is simple to get used to and surprisingly effective results can be obtained in no time at all. This is one of the best samplers around, offering the kind of quality to match more expensive models. ■

Mark Higham is editor of ST Format magazine. These articles are reprinted from his book, Get the most out of your ST, available from Future Publishing Ltd, The Old Barn, Somerton TA11 7BR. Price £9.95.

Faxes have been with us for nearly a quarter of a century. A small fax terminal can sit on one corner of your desk or even in a slot in your PC and give you the ability to transmit complicated documents anywhere in the world instantaneously. It wasn't like that when the first of these machines appeared though.

The first facsimile (fax) machines were large noisy mechanical monoliths that languished in baths of noxious chemicals and produced a smell not dissimilar to a linoleum factory. These huge document processing engines were prone to breakdown and the quality of their output was questionable to say the least.

At the beginning, the fax was the domain of the multinational corporation, the broker and the public utility. Ideally the first generation of fax would live in a room on its own, preferably as far away from civilisation as possible. The size, noise and smell meant that the fax wasn't a user-friendly office trained instrument. At the time it had the mail, Telex and telegrams to contend with and was the last option when a document had to be sent in a way that guaranteed it would be received immediately.

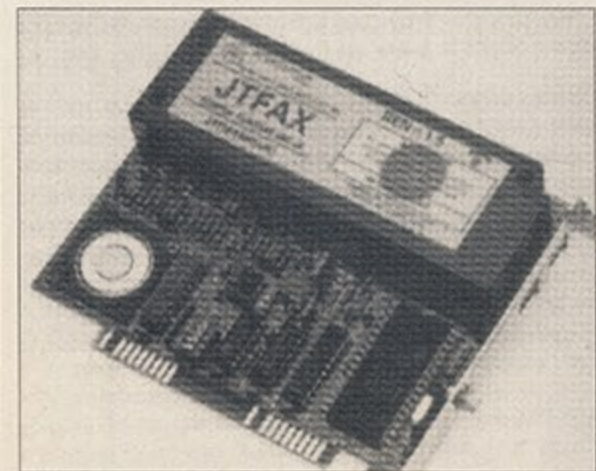
Faxes use the same phone lines as voice communication and so can be routed to any one of the billion or so phone lines in the world. As long as there's a fax machine on the line at the other end, a document can be sent as simply as dialing a number and chatting.

Unlike computers, there is generally one set of protocols for fax. If there's a fax machine at the other end of the phone line that supports the same group of data transmission as yours, you're in business. While the computer world still flounders around with over a dozen environments and operating systems, fax offers one system divided into four well documented groups.

A stand-alone fax machine is a combination of several things. In order to transmit an image down the phone lines, it needs to be able to read the image into a form that can be processed electronically. So the first part of the fax is the scanner. In a simple fax, a document would be fed into the machine and scanned as it passes the scan head. The scan head reads the paper and produces a bit image of the document.

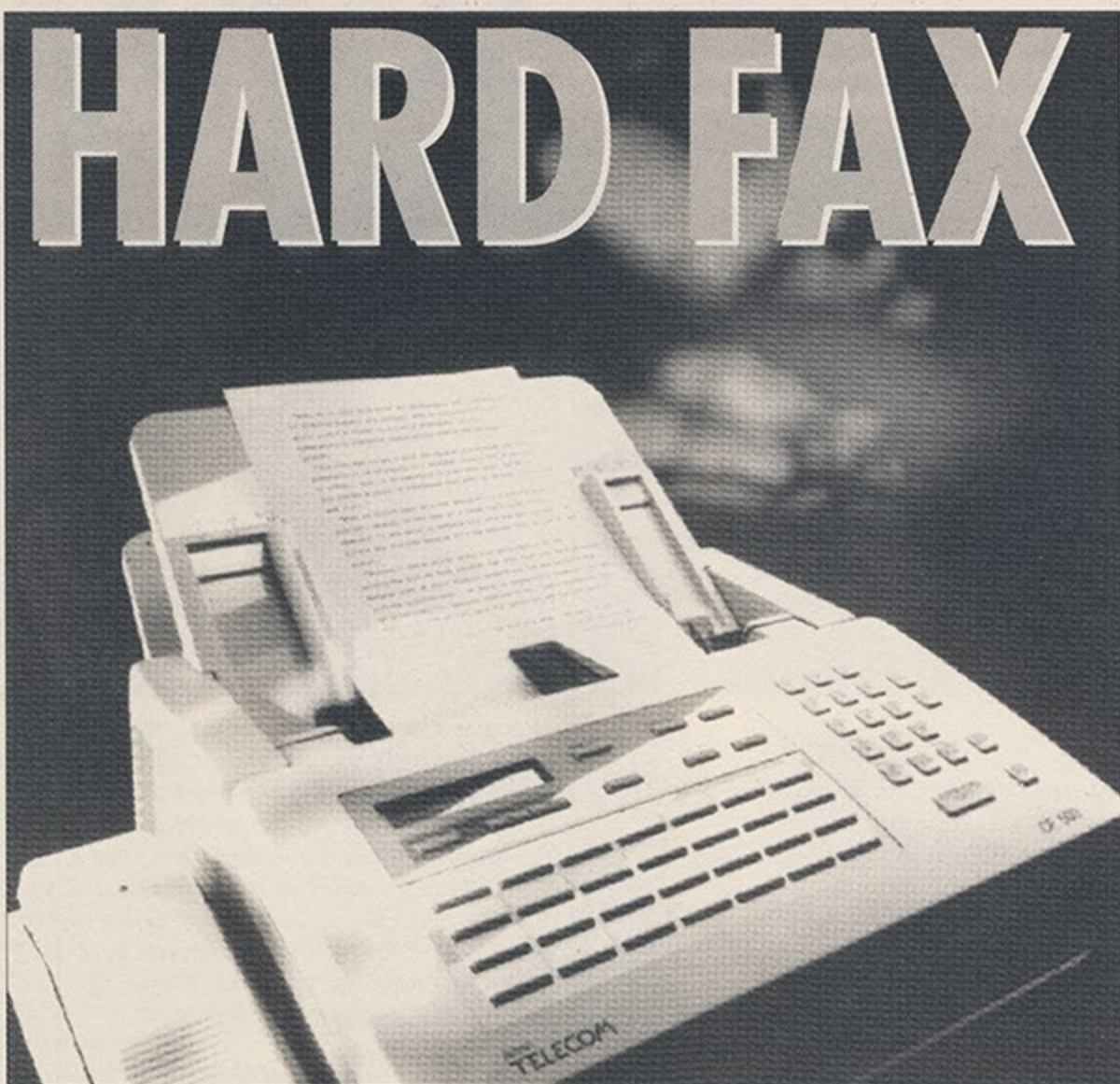
The fax takes the bit image and converts it into a form that can be electronically parcelled for transmission over the phone lines. A dedicated modem in the fax modulates the data into an audio signal that can safely be carried over the public phone network while retaining data integrity.

In receive mode, the internal modem of the fax demodulates the signal and converts it into a form that can be sent to the fax's internal printer. Thus a fax is a scanner, processor, modem and printer. Most modern faxes have the ability to short cut the system and read directly from the scanner to the printer. This makes them a useful occasional photocopier although it's an expensive and slow way to generate photocopies and the thermal paper used by most faxes doesn't produce the best copies.



• The InterQuadram JT fax board sits inside a PC and lets you send faxes at the touch of a key with no paper involved.

With fax machines came yet another means of communicating information – and not just in words. Keith Pomfret looks at what these machines have to offer and which type is best for you.



• British Telecom's CF500 facsimile can act as the hub machine in a fax network.

Other bolt-on features can allow a fax to work unattended, sending messages at night when lines aren't busy and calls are cheaper. With all this talk of scanners, modems and printers, you could be forgiven for thinking that fax is an arm of computer technology. Life's never that simple though. While fax uses similar technology to computers, its protocols are different.

GROUP STUDY

The fax protocol was rationalised and defined by the Consultative Committee on Telegraphy and Telephony (CCITT) in Geneva. It initially agreed on a standard protocol for fax and this currently consists of four groups. The original steam-driven clanking faxes of the Seventies were group one. This is a fairly primitive analogue system. A group one fax can take around eight minutes to transmit a page and the quality of the output is what you would expect from earlier technology. If you are considering buying a fax and someone offers you a group one machine, steer well clear unless the vendor is benevolent enough to pay your phone bill too. A cranky group one machine can make a 300 baud modem look positively nippy!

Group two faxes are analogue machines too and can simply be described as the turbo version of group one. Life-expired group two machines are readily available on the market, but before you consider purchase, you should see the output from the machine and perhaps even take a stopwatch to it. A page can take three or four minutes on a group two machine.

Group three brings with it the magic word digital. After the image is scanned in, the data is digitally

encoded. This group is the most common of the four and the most widely used. If you are planning to purchase a fax, fax card or fax modem, you should opt for one with group three capability. The extra cash that group three costs will magically pay itself back when Telecom sends its quarterly ransom demand. The only possible reason for buying a machine that supports group one or two is if you will regularly have to send a fax to someone who has a machine that can only support either of the earlier analogue protocols. Some group three machines and cards are backwards compatible, that is they will connect to group one and two machines. It's worth finding out whether or not the machine that you choose can communicate with earlier machines. If it can, you will gain the benefits of compatibility, but a group one or two machine can never hope to match the speed and resolution of later faxes. When you transmit to a lesser machine, you come down to its level of resolution and your transmission will be at the same speed as the slower machine.

A group three machine that conforms to the minimum standard for group three as laid down by CCITT will transmit the same document as a group one machine at least eight times as fast. Because the protocols are only a minimum requirement, some manufacturers have tweaked them to provide even faster and more error free transmission. A desktop fax can be capable of transmitting a page in less than 15 seconds. With the advent of digital read-encoding in group three the modified Huffman protocol was born. In simple terms, modified Huffman describes the way in which the scan data from the analogue scanner is

encoded and compressed for transmission along the phone wires.

If you buy a group three machine that has been tweaked by the manufacturer to offer more features than the group three requirement, you should be able to communicate with any other group machine but some of the tweaks may be manufacturer-specific. That is you may only reap the benefits of them if you are transmitting to a similarly equipped fax from the same manufacturer. If these features are noticeable in the price, it's worth considering whether you're ever going to get back what you paid for them.

Finally, group four is a pure digital system designed to work on ISDN digital networks. It hasn't reached the same spread or popularity as group three and, although it's quick efficient and productive, it looks as if group three will remain the de facto standard for the foreseeable future.

PRETTY AS A PICTURE

The resolution of a fax or any other processed document for that matter refers to the amount of detail in the picture. In a fax, the image is recreated a dot at a time. The number of dots per given distance is the resolution. The higher the number, the better the resolution. This magazine is produced through a Linotronic typesetter that is capable of 1,270 x 1,270 dots per inch (dpi). An office laser copier or laser printer can support a resolution of about 300 x 300 dpi.

A group three fax machine has different horizontal and vertical resolution. The image generated consists of 98 vertical by 203 horizontal lines per inch. This means that a fax can contain more detail than the image on a computer screen, but isn't as good as a laser printer. A further development within group three is a 'fine' mode which doubles the vertical resolution to 196dpi. The image is 203 x 196 dpi which effectively doubles the resolution. Other methods of adding grey scales and halftones further enhance the image but at best, the output from a fax is very photocopy-like.

Group four, with its full digital protocol, will offer higher resolution and the research and development departments of the major fax producers have shown some almost photographic faxes but for now, we'll have to be satisfied with group three.

PAPER

With a stand alone fax, the choice is between plain and thermal paper. Most faxes use thermal paper which is a thin glossy paper covered with a transparent dye that turns dark when heated. The paper is expensive and doesn't offer a quality of copy that is pleasant to handle, but being on a roll means that it can support long documents. Standard A4 page width is the most common sized fax, but larger machines are available. A useful feature is a cutter which automatically cuts the paper at page breaks.

Plain paper fax machines produce faxes that look like photocopies and indeed use the same sort of paper as a photocopier. The technology that they use to produce the fax is similar to a photocopier with toner powder being attracted to a drum and then transferred to paper.

A computerised fax using, say, a PC with a fax/scanner card could produce its output to printer or file. The quality of the output depends on the printer, although using a 300x300dpi laser printer wouldn't increase the resolution beyond standard fax levels.

COMPUTER FAX

The recent idea of using the processing power of a computer with some extra hardware to allow it to output to a phone line in fax format wasn't enthusiastically received at first because of the difficulties encountered if the document to be faxed wasn't a file on the com-

puter. Cheap widely available scanners and optical character reading software have changed this and it's possible to perform all of the functions of a group three fax from your computer.

If you own a PC, you are well catered for. There are boxes that plug into the serial port of your PC with all the fax technology on board. This is a good solution if your expansion slots are filled but the widely available fax cards are tidier and a simpler integrated solution.

The PC fax card allows the computer to convert PC generated (or scanned) documents into modified Huffman code and send them directly down the phone to another fax machine.

Some PC fax cards serve more than one purpose with scanner or SCSI interfaces to allow the PC to interface with scanners and mass storage devices. The dual card is useful if expansion slots are at a premium. Optical character recognition software that works with a scanner can be useful to fax users too. This allows the user to scan a document and 'read' the text into a document on the computer rather than taking an image of the document.

Other machines such as the Macintosh are well catered for with fax peripherals, SCSI interfaces, etc, but home computers are limited in what's available. If you own a computer that doesn't have a wide variety of fax peripherals, all isn't lost. A fax modem connects to the serial port of the machine and there are already suites of software to allow Amiga and ST to connect to fax modems originally designed for the PC or Mac. The software isn't widely available in the UK yet, but if the US is anything to go by the Amigafax and STfax is just around the corner. For machines without a dedicated fax interface available or software to allow connection to a fax modem there is still a simple solution. It is generally possible to send ASCII data to a serial port and this in turn can be read by a fax machine that has a serial port as well. This doesn't limit you to expensive fax machines. Even some of the affordable Amstrad machines can do this. To put this ability to the test I prepared a document on a word processor first on a PCW and then on a CPC and had no problems sending them to a couple of fax machines. Of course, you've no way of receiving a fax on these systems and even on some of the well specified PC systems it becomes difficult as the incoming faxes are an image file and these take a lot of storage.

On board software can compress image files, but even after this, a single page could take up 70K of disk space. Thus a 14-page document could take a

THE RIGHT CONNECTION

There are three basic ways to use your computer with fax. The first and simplest is the traditional way. A document is output from the computer to a printer in the conventional way. It could be anything from a memo to a report or spreadsheet. This is then fed into the stand alone fax machine and the document is scanned and sent along the phone lines to the waiting fax at the other end. This method has the advantage that the computer isn't tied up in the sending of the fax which can be transmitted at a convenient time.

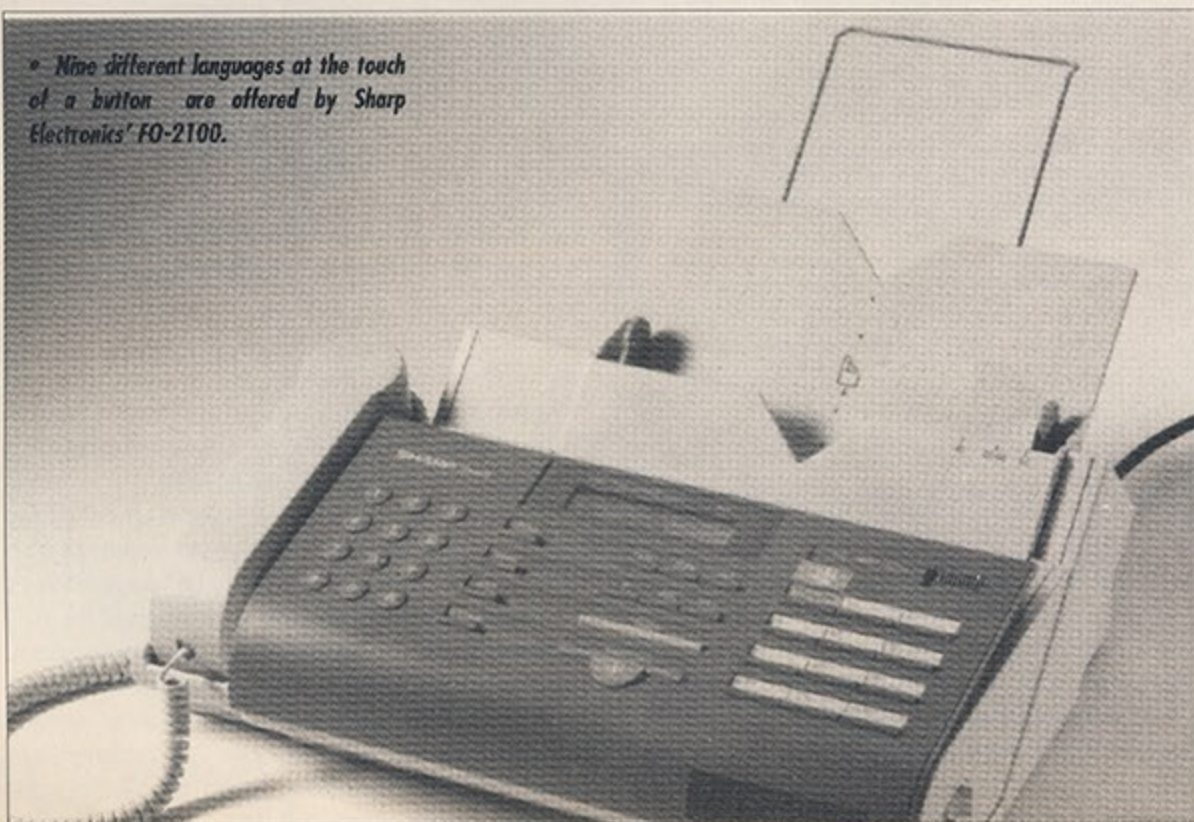
Secondly, some fax machines have a dedicated serial or user port that can be connected to a computer using a suitable cable. This allows basic text files to be sent in ASCII format from the computer to the fax and on to the recipient. Until this facility is more widely used and is expanded to cover high resolution bit image graphics it will be limited to ASCII text. There are a couple of systems which can take a suitable image file from a computer to transmit but as yet systems like these aren't common.

The third option is the dedicated computer fax. This can come as a card for a PC or a standalone fax modem. In its simplest form the software allows it to 'print' a data file to the fax in much the same way as the lead between a computer and fax allows this. With clever software and additional hardware though, it is becoming possible to emulate any feature of a fax with a computer. For example, there are PC fax cards that also include the ability to connect direct to a scanner. This allows you to scan a document in, process it with the fax software and output to printer and/or fax.

megabyte of hard disk space. A busy company receiving faxes to a PC from its salesforce could easily fill a 40Mb hard disk in a day, so the advantages of PC fax against a stand-alone machine should be considered.

COST

There's no hard and fast rule about what a fax machine will cost. In an afternoon travelling around Bristol, we found second-hand pre-group three faxes for as little as £120. A new fax machine of reasonable specification was on sale for £400. A couple of hundred pounds more and the features started to overtake the basic specification. Finally for a lofty £4,000, we were offered a machine that would send several documents to different numbers at pre-determined times while allowing other faxes to ring up and download from it. ■



• Nine different languages at the touch of a button are offered by Sharp Electronics' FO-2100.

Databases are the second most popular 'serious' program on the Amiga, after word processing. Basically, they're intended to store big catalogues of information and supply some kind of index system so that you can get at the information you need when you want to. This may seem a tad pointless, but it can be interesting and also useful if you have any big collections of information. You might want to make a catalogue of your record collection, for example, or hold details of your video library.

RECORD BREAKER

Information in a database is stored as a series of 'records' each of which has a number of fields to give further information about it. Each record in a video database, for instance, would be a video. (A record that's a video? Hang on a minute!) Each video record would be split into fields containing: first and foremost, the film's title; perhaps some kind of index number; the director; the star; year of release; running time.

Once you've got all the information in there, there are a couple of things you can do with it. First, you can sort it - which would be an easy way of putting the titles into alphabetical order, for instance, but if you were curious you might want to sort all your films according to year of release. By sorting on two different fields at the same time, you could put them into alphabetical order within each year.

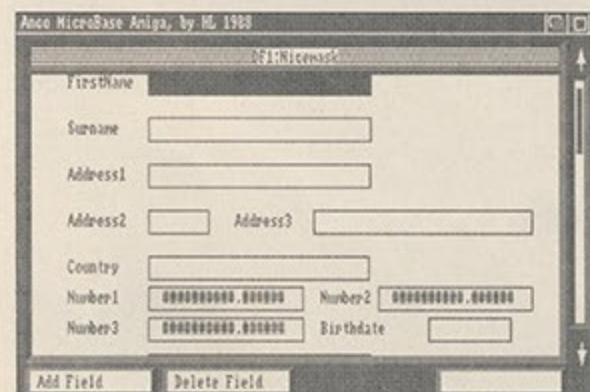
Second, you can search. This allows you to pick out one particular record by looking for a unique quality (a video's title, for example) but also allows you to pick out a number that has something in common: all films that were directed by Paul Verhoeven, for example. Again, by searching on two fields you can find records that share the same qualities: all films made by Paul Verhoeven and starring a certain actor.

BUYING ADVICE

The problem of which package to go for must be resolved from two main considerations. Firstly, is it easy to use? It is pointless buying an "all-singing" package with a programming language if the person using it has no idea of how to program. Secondly, is it affordable? This will depend on individual resources. It is pointless saving money by buying a package incapable of the job demanded. Conversely, it is unwise to spend more money than needed.

These points apply to all software - especially that in the business sector. Make sure that the needs of the application are completely understood before searching for software to ease the task. Meanwhile, here's a run-down of the sub-£100 databases on the market.

MICROBASE (ANCO • £19.95)



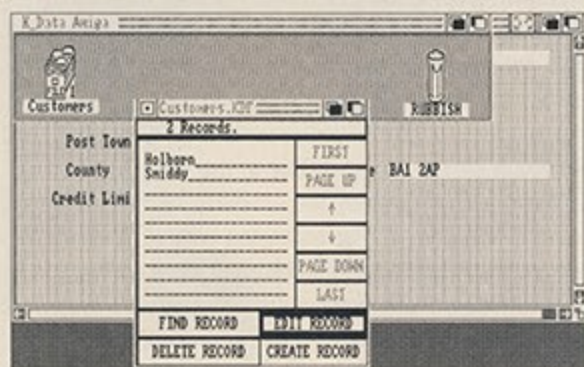
For those on a budget there is only one choice, and although it comes from a company better known for its "adult" card games and one particularly infamous footy game, it performs surprisingly well. Anco's *MicroBase* is a true entry-level database with an entry-level price. It does nothing to rave about - but it is capable and solid. At the price, *MicroBase* is good value for money and an excellent introduction to databases.

AMIGA DATABASE



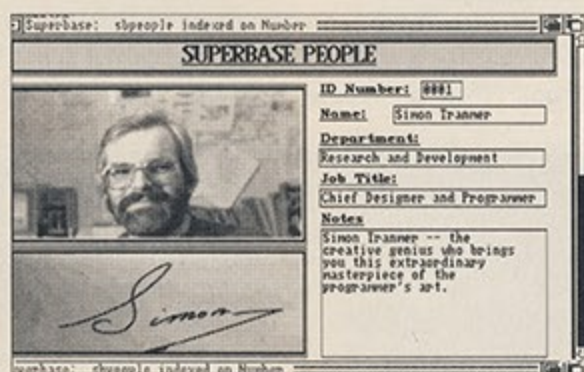
If you're not sure what a database is - or you know but are not sure what to do with one - Damien Noonan is here to help you with the best Amiga packages on offer.

K-DATA (KUMA • £49.95)



Claimed to be the best-selling flat-card system for the Amiga. Supplied on one disk, it comes in two versions - one for unexpanded A500s and an enhanced version for larger machines. The main fault with *K-Data* is its constant insistence on redrawing and moving windows which tends to make operation slow. Otherwise it is stable enough to be usable under most conditions.

SUPERBASE PERSONAL (PRECISION • £59.95)



This was the first database to use the revolutionary system of a control panel which resembles a video recorder. This not only allows the user to search through records very quickly, it is also a very easy system to learn. External fields allow graphics and text files to be attached to the database - *Superbase* supports all Amiga IFF graphic modes including HAM.

Three separate modes are available for editing and viewing data: Record view displays the records as a list of fields; Form view allows fields to be "dragged" freely around the screen; and Table view displays the data horizontally with the field names heading each column. Editing is not possible in Table view. *Superbase's* real power lies in its extensive reporting capability, which is unrivalled in this price bracket. This program has become de facto the leading Amiga database in many respects. It is very good.

MICROFICHE FILER (£69.95)



Features a clever interface: the idea is to locate records by scrolling a small magnification window over a larger sheet of "microfiche" - such as those found in libraries. When compared to traditional techniques, this concept seems strange initially, but it soon becomes second nature. *Microfiche Filer* is idiosyncratic in many ways. Nevertheless, its strengths far outweigh its weaknesses in most areas. This is an everyday database, tailored to simple jobs - fun to use and powerful enough for most home user tasks. Not one for the professional though.

PRODATA (ARNOR • £99.95)



Comes from the purveyors of the fine word processor *Protect*. Like *Protect*, *Prodata* is aimed at those users content with largely keyboard-based operations and is completely devoid of pop-down menus. That said, it is the most powerful of the flat-card databases and has the professional feel, a comprehensive manual, and support for dozens of printers. ■

Damien Noonan is editor of Amiga Format magazine. These articles are reprinted from his book, Get the Most Out of your Amiga, available from Future Publishing Ltd, The Old Barn, Somerton TA11 7BR. Price £9.95.

THE ATARI ABC

Now, there's a PC-AT compatible that not only solves problems like other AT compatibles, it also solves the one problem that its predecessors have created ... affordability.

Silica Systems are pleased to present the new Atari ABC. The ABC is a 286 AT compatible that runs at over 5 times the performance of the IBM XT. This is achieved by combining the power and speed of a 16-bit 286 processor, with Atari Corp's development experience and engineering capabilities, which use the very latest in design technology. However, the Atari ABC's are available at 'XT prices' and many XT owners will wonder why they paid more, but got less!

The ABC is a reliable, high performance computer, built to exceptionally rigorous standards. It is well designed, to a state of the art specification, maintaining maximum expansion capability for the future. This includes up to 4Mb of RAM and 3 AT expansion slots. Plus, unusually for a PC at this price, the ABC has the ability to install two or three extra drives, with the cabling already inside the CPU.

The ABC has a host of impressive features, all built-in as standard, encouraging simple installation and ease of use. In addition, the ABC's small footprint and quiet operating, mean that you will notice it less on your desk than other PC's. Except, of course, when you begin to take advantage of its AT power.

At its remarkably low price point, the ABC is ideally suited for home, office and educational use and will take full advantage of the vast range of PC compatible software. And, with 12 months FREE on-site maintenance (8 hour response), you can rest assured that your ABC will be fully supported.

The ABC is the latest addition to a comprehensive range of both 286 (8Mhz or 12Mhz) and 386 (16Mhz and 20Mhz) PC's, from the Business Systems Division of Atari Corp. Atari's PC range offers an unsurpassed combination of reliability, compatibility and expandability, with unique features like Atari's 44Mb removable hard disk on their PC4. Return the coupon NOW for further details of the complete range of PC products from Atari's Business Systems Division.

**ABC
TURBO**
AVAILABLE: JUNE 90

To put the ABC even further ahead of the competition, we have introduced a special 'Turbo' version, which includes a super fast RLL hard disk controller to increase the data transfer rate from 150KBytes/s to 800KBytes/s, with a performance index of 4.801. Plus! to provide exceptional graphics with an outstanding colour resolution of up to 1024x768, we have included a Super VGA graphics adaptor and a 14" VGA colour monitor (which also supports 1024x768 resolution), all for an additional price of only £300. Check the ABC Turbo against the competition, at only £1299 (+VAT) with 30Mb hard disk, Super VGA colour graphics capabilities, plus 12 months on-site maintenance, it offers unbeatable value.

LOW PRICE - HIGH SPEC!

CPU+MOTHERBOARD

- 8Mhz 80286 16-bit CPU
- Landmark Speed = 10.3Mhz, Norton SI Test = 9.0
- Latest NEAT (New Enhanced AT) technology chip set
- Has user selectable bus, DMA speeds & wait states
- Programmable to operate at 0 or 1 wait states
- 640K RAM base memory (expandable)
- Motherboard expandable to 4Mb RAM memory
- Real time clock with battery back-up
- Full 16-bit data line capability
- Socket for 80287-8 numeric Co-Processor
- 3 16-bit AT expansion slots (max)

DISK

- 32Mb RLL hard disk - 150KBytes/s transfer - 60ms access
- Fast disk controller - 800KBytes/s transfer - Turbo version
- 1.44Mb built-in 3 1/2" floppy disk drive
- Space for two 5 1/4" and two 3 1/2" drives (max)

I/O

- Parallel port built-in (25-pin Centronics)
- Serial port built-in (9-pin RS-232)
- Mouse controller port built-in (9-pin serial)

GRAPHICS

- Super VGA video graphics controller - 512K - Turbo vers
- Super VGA: 256 colours in 800x600 res - Turbo vers
- EGA video graphics controller built-in
- EGA: 16 colours available from a palette of 64
- EGA: 256K of dedicated Video RAM built-in
- MDA, CGA and Hercules graphics controller built-in

PHYSICAL

- Low noise operation
- Ergonomic small footprint (38cmx41cmx15cm)
- Keyboard - 102 key enhanced AT (12 function keys)
- Keyboard - has 2 position height adjusters

PLUS!

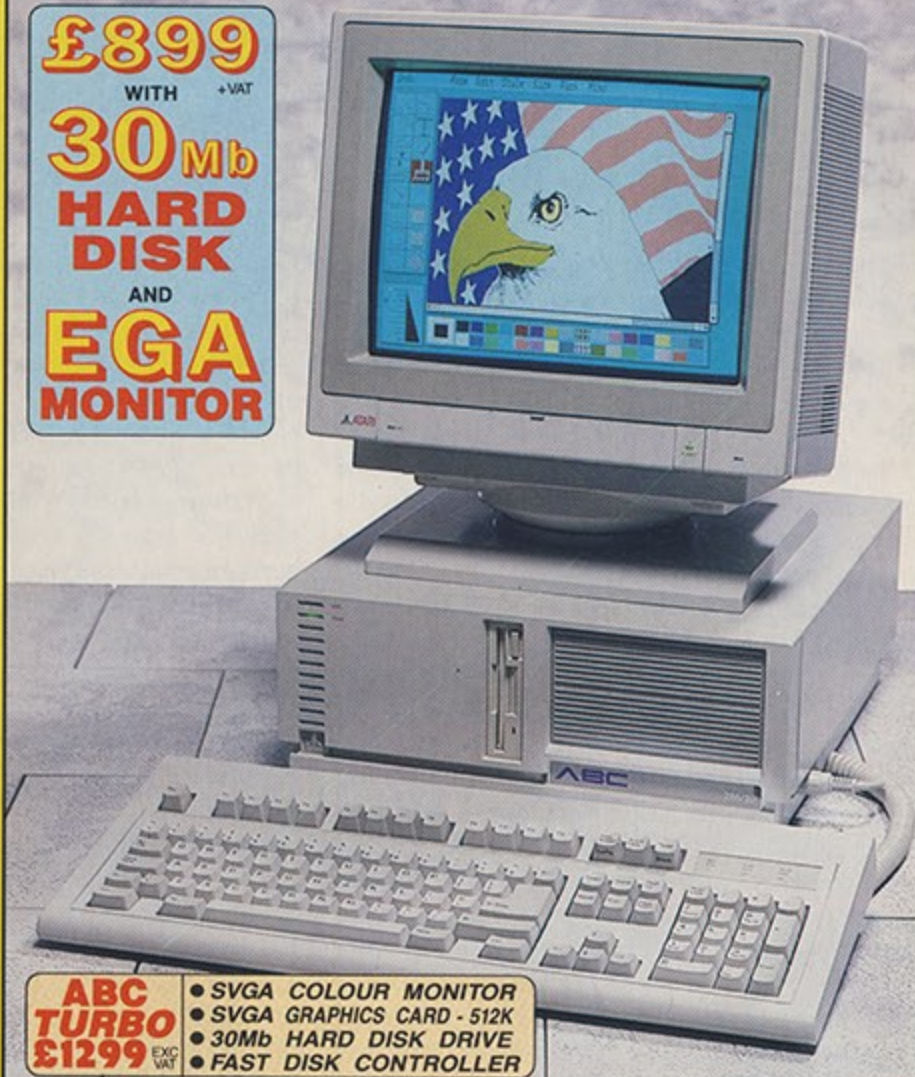
- Fully OS/2 compatible (requires 4Mb RAM)
- Supports Industry Standard Networks
- MS-DOS 3.3 with GW BASIC 3.22
- 12 Months FREE on-site maintenance included

286 AT

WITH 30Mb HARD DISK & EGA MONITOR - £899

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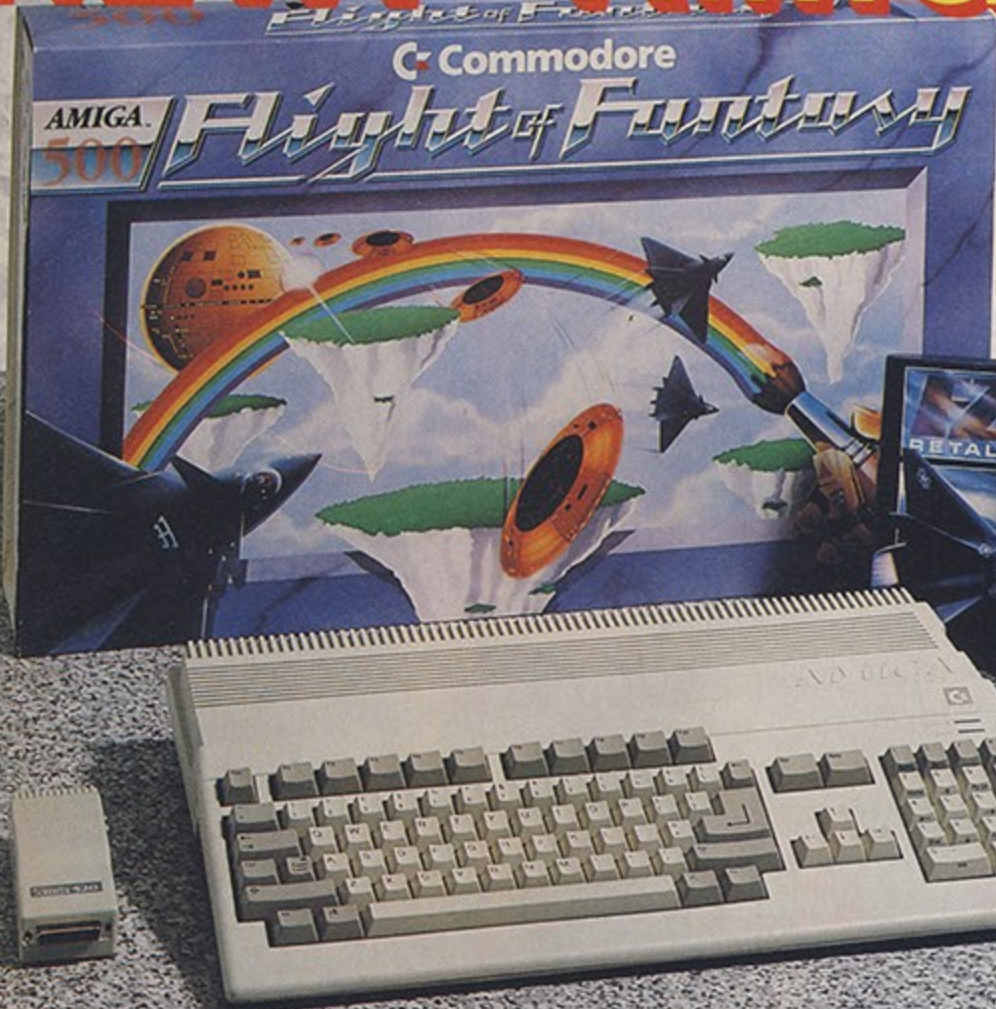
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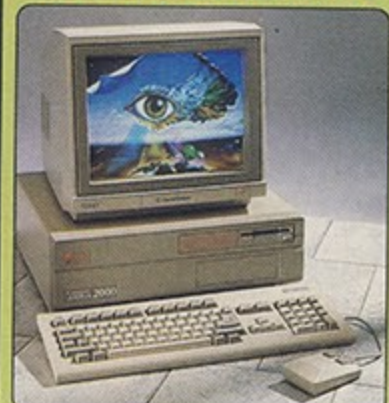
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