Issue 126 • 6th April 1991 • 88p

ARE YOU A £20,000 WINNER?
Find out on page 58

NEW COMPUTER EXPRESS

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

THIS WEEK

AMIGA
Drastic price cuts in the US - will the UK follow ?

ATARI
Those new ST Book and Pad specifications in full

PC
Amstrad scraps the 1512 and 1640 PCs **PLUS** Which PC survived a Scud attack?

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REGULAR COLUMNS ON
PROGRAMMING
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& 36 PAGES OF
SHOPPING EXPRESS
BARGAINS ! ! !

EXPRESS EXCLUSIVE

ENSEMBLE:

Is this the new contender for the Windows throne?

NEW PORTABLE POWER PRICING

The £500 hard disk laptop!

Future Publishing
Your guarantee of value

frontend

edited by Colin Campbell

VIRTUALITY CRAZY

Everybody was going Virtuality crazy as the world's first Virtual Reality system for the leisure industry was launched last week. This was no standard computer game launch. Europe's media was there in force to find out what the hell all the fuss was about, and they weren't disappointed.

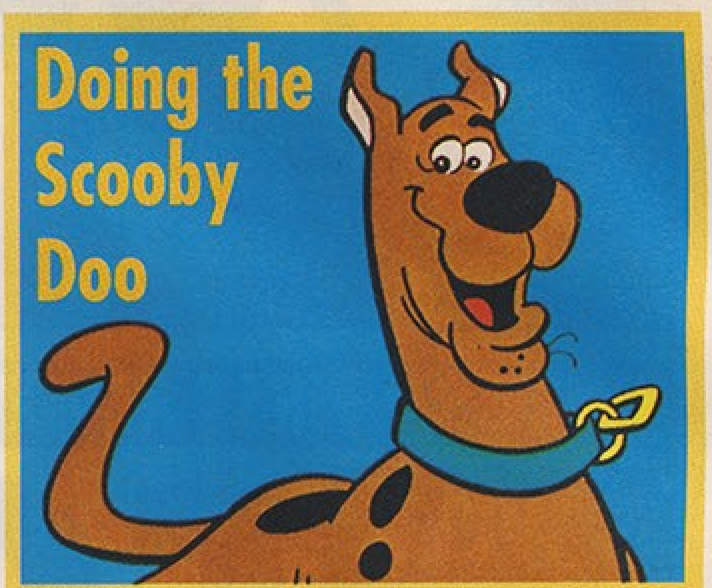
The Virtuality 1000SD brings a total 360 degree, three dimensional computer generated "experience" to anyone who pops his or her head into the alien-like headset.

Games on offer included a *Harrier* jumpjet simulation, and an *Elite* type space adventure. Players can see all around them, and are soon completely engrossed in the artificial world.

W Industries, the British company behind Virtuality, says the system has "undergone stringent health and safety tests" so buyers shouldn't have to worry about cricked necks. However, the state of their finances is a different matter – Virtuality costs £20,000.

● You'll be able to see what Virtuality is all about for yourself on the *Horizon* TV programme

Doing the Scooby Doo



YEEEEEIIIKS! There's a spooky ghost doing the rounds in a secluded theatre/ sports stadium/ museum, and it's scaring the living wits out of everyone it sneaks up on. Just by chance our Scoobs and his gang of "meddling kids" have rolled up, and they're going to find out what the racket's all about.

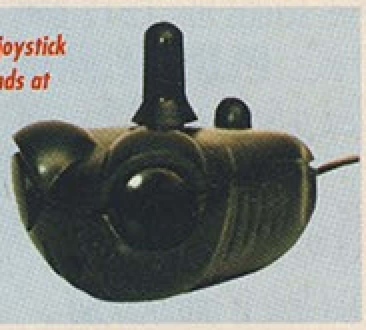
Scooby is not overly pleased with the assignment. He can expect to be locked in cupboards, left alone in dark rooms with his chicken hearted pal Shaggy, and bored to tears by the relentlessly nosey Thelma.

And, at the end of the day, the ghost just might turn out to be a scowling man with a duvet on his head who has a special reason for trying the same trick every other criminal on *Scobby Doo* has for the past ten years.

If this sounds like fun to you, then check out the new *Scooby Doo* game from Hi-Tec. It's out for £3.99 on the 8-bits and £7.99 on the 16-bits later this month. ■

• This creation could be the ugliest joystick yet devised. It comes from our friends at Cheetah, and we're told that it's "the most comfortable controller available".

Called The Bug, it will be allowed into the shops later this month for £14.95.



● Soon you'll be able to conduct a full orchestra from the comfort of your PC. Professor Stan Matthews, from Stanford University in California, has developed a pair of electronic conductor batons to bring out the Bernstein's in you.

The system features a floppy disk with musical score which is connected to a synthesiser and two batons. By waving the right hand baton you can control the time of the orchestra's beat, while the left hand will lead expression and dynamics. ■

Giants backCD-I

Japan's leading software, publishing and consumer electronics companies have thrown their weight behind Philips' Compact Disc Interactive standard, CD-I. Representatives from 183 Japanese companies met in Tokyo late last month to discuss their approach to CD-I. Philips, Sony and Matsushita will all be releasing CD-I players of their own within the next year, and they're all keen to make sure there's plenty of software available.

The battle between CD-I and Commodore's CDTV standard is likely to be a fierce one, with CDTV having the advantage of an earlier release date (now scheduled for early summer).

But Philips and its allies have managed to generate great interest among companies as different as Citroen and Disney.

CD-I is a simple way of accessing masses of cross-referenced information presented in an easy to digest form. It also promises movie quality games. Speech, text, graphics and video can be mixed on one CD.

Meanwhile, Apple has set up a special office in Tokyo to develop a CD-I device for the Macintosh. ■

Atari ATW school deal

In an attempt to woo buyers in the lucrative educational sector, Atari is offering its ST based Transputer Workstation to schools and colleges for half the normal price.

The top end ATW can run at 400 million instructions per second, and there are plenty of opportunities to configure the machine to a user's own requirements. The new price is £2,500.

A spokesman for Atari explained: "The ATW is already in the majority of UK universities. We just want to broaden its appeal." ■

PICK UP A LOW COST LASER

You've probably contemplated blowing all your savings (and more) on a fantastic new laser printer. And then the reality of being broke for the next three years comes home.

Now Mannesman Tally has launched a low-cost laser printer, which the firm is ready to sell for just £699.

Mannesman says that the laser is being targeted at the home user who wants tip-top prints, without the price penalty.

The MT904 includes PC printing standard HP LaserJet IIP and has one of the smallest footprints in its class (36.5cm x 40.5cm). Paper handling includes a 100-sheet feeder and manual feed as standard.

For more demanding applications, a 300-sheet bin is available that sits under the printer, saving more space.

The machine includes 14 resident fonts, and 512Kb memory as standard. MT estimates that the MT904's life is 150,000 pages at a daily workload of 125 pages per day.

For more information call 0734 788711. ■

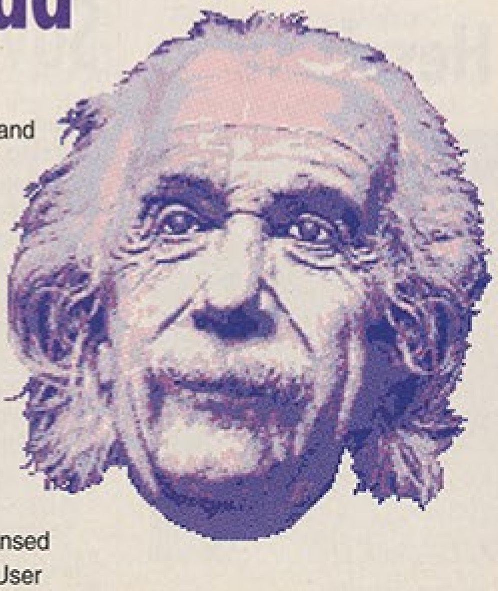
Jez and Argonauts finish long haul

Argonaut Software – the games development team run by ex-whizzkid Jez San, and responsible for such titles as *Starglider II*, has nearly finished its newest game, three and a half years after starting the project.

Birds of Prey, formerly *Hawk*, will be published by Electronic Arts within the next few months. It's an advanced multi-aircraft flight simulation with "realistic flight dynamics and graphics".

Birds is due first on the Amiga (1Mb only) and then PC. No decision has been taken on whether or not to launch onto the ST. ■

Einstein isn't dead



The Einstein User Group – which boasts a membership tally of 1,500 – is to hold a show next month featuring all that's best for the old machine.

The All Micro News Show at the Ratcliffe-on-Soar Sports Club on May 11 will include hardware, software and information on the Einstein, as well as plenty of goodies for other mainstream and obscure pieces of hardware.

Organiser Jason Allum said: "It's a yearly event, but it's not just for Einstein users. There'll be plenty of interest to ST, Amiga and PC owners as well as those hooked on the Coupé, Oric and others."

Entrance fee is 50 pence and the doors are open between 10.30am and 4.30pm. There's an "electronic bring and buy" sale, loads of bargains, and a licensed bar. Call the Einstein User Group on 0473 272002. ■

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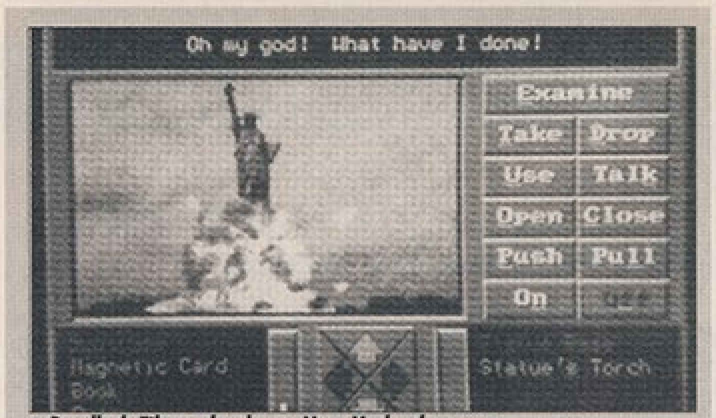
SHOPPING EXPRESS


Oh my god! What have I done!

• Deadlock Files: a hard core New York adventure .

Big thriller for Big Apple

An adventure game set in modern day New York and revolving around a complex plot to overthrow the US Government is to be launched by Accolade.

Conspiracy: The Deadlock Files is grandly described by the company as "a stylish thriller in the tradition of Hitchcock and Le Carre". It's a fully digitised yarn featuring 350 images of the city in glorious 256 colour graphics.

You're an innocent blamed for the murder of a top CIA man. His killers are, in fact, a gang of highly unpleasant financiers bent on the destruction of the American Government.

Within 24-hours you have to find seven files hidden around New York. You'll visit the Empire State and Wall Street, but with the cops, the CIA and your greedy enemies on the case, there won't be much time for sightseeing. It's out on the PC this week for £29.99. ■

Arnor swings behind CPC

After a long gap, Arnor has launched an addition to the *Protext* family for the Amstrad CPC.

Protype is a print enhancer for Epson compatible printers.

It includes seven complete fonts which can handle many of the characteristics of over 40 European languages. *Protype* will be available soon with a retail tag of £30. Call 0733 68909. ■

US cash flows for business software

Americans are spending more and more on business software, according to the Software Publishers Association (SPA).

In the last three months of 1990 more than $1 billion was spent on PC and Mac software – up 22 per cent on the year before.

Sales of DTP software increased by an incredible 68.2 per cent, while database software was up 65.8 per cent. MS-DOS software sales went up 18 per cent while Macintosh sales increased by 12.5 per cent.

Spurred on by the launch of Windows 3, sales of Windows-based applications were up by 198 per cent; that sector now accounts for 10 per cent of all PC software sales.

Americans spent $4.6 billion on business software – 26.2 per cent more than in 1989. ■

Will Commodore follow suit in the UK?

AMIGA: US PRICES TO BE SLASHED

Commodore UK was last week deflecting speculation that it is about to cut the prices of its top-end Amigas. This follows drastic cuts across the Amiga 2000 and 3000 ranges in the US.

The American company has slashed the Amiga 2000 by 16 per cent from $1,895 to $1,599, while the hard disk version is down 26 per cent from $2,699 to $1,999. The power station Amiga 3000 has been reduced by ten per cent to $2,999, while the Amiga 3000-25/50 has been cut by $500 – $3,999 to $3,499.

Commodore US's decision to make its power Amigas much more competitive sparked off rumours that a price cut would be made in the UK. However, Andrew Ball, Commodore UK's spokesman, declined to comment directly on the speculation.

He said: "Yes, the Americans have cut their prices. But it's up to them what they do, and it's up to us what we do. When we're ready to make any price changes we'll let you know."

• Amiga 2000: price drop in the US.

Commodore has always been keen to promote its expensive Amigas as worthwhile options for the business user; the US company has also decided to drop the prices of its MS-DOS compatible bridgeboards which allow Amiga users to run standard PC software.

The A2088D XT bridgeboard has been reduced 29 per cent from $699 to $499 and the A2286AT is down 50 per cent from a pricey $1,599 to $799.

Even so, Commodore UK cannot be swayed by the decision of the larger American company.

The British market has its own quirks, and the presence of the successful Amiga 1500, which acts as a halfway house between the A500 and A2000, makes it difficult to drop the price of the A2000. ■

Computer aids design of Heseltine

Michael Heseltine had to rely on more than his wits when devising an alternative to the doomed Poll Tax. Senior party members have been using sophisticated computer technology to predict the effects of various alternatives.

The Department of the Environment has been feeding statistics into its DEC network. By running PC modelling software, it has predicted how various constituencies would react to the changes.

Not surprisingly, the Tories aren't keen to share the details of their number crunching exercise, but John Major's government is known to be anxious about its image in borderline constituencies.

One of the computer's tasks has been to state which election date would be most beneficial to Mr Major. Computers helped the former PM, Margaret Thatcher, to decide on the date of the 1987 general election. ■

•The man behind the new 'Heseltax'.

Soviet chip beats Intel?

Soviet chip makers are claiming to have developed a processor able to perform calculations 20 times faster than American chips.

The Minsk-based Integrated Corporation claims to have swept aside Intel in the race to produce better and faster computer chips. The company made its statement at a special Soviet/American research and development conference held in San Francisco last month.

Integrated had hoped that the Americans would be eager to tap into this technology, but many are doubtful that it really exists.

Professor Richard Jaeger of Alabama University met representatives of the Soviet company, and discussed the new chips. He said: "Based on what they showed me the idea appears sound, but details on the spec sheet were minimal."

Intel, very proud of its achievements in the processor industry, is not convinced. East Europe business development manager, Simone Cool, said: "I won't believe it until I have seen a viable product. They still can't manufacture 286 chips in volume – so I doubt if they could achieve this." ■

Wyse up

Wyse has launched a top-of-the range 486 to add to its Decision family of IBM compatibles.

The 25MHz monster boasts an internal 8Kb memory cache as well as an external 128Kb cache, so the processor can access RAM at full speed for up to 98 per cent of the time – and a Weitek 4167 math coprocessor handles heavy duty calculations. There are 16Mb RAM on the motherboard and seven slots for peripherals/accessories.

Wyse reckons its beast is "priced favourably" in comparison with competitors' 386 machines. "The demand for 486 machines is growing," offered a spokesman. Decision 486 retails at £2,995. Call 0734 342200. ■

• Wyse 486: full speed ahead.

Elite 1.5 on the way

MicroProse is to release a touched-up version of space-trading game *Elite*, in anticipation of the long awaited release of *Elite II*.

Elite Plus is being described as a 'halfway house' between the original and the sequel. The updated *Elite* has all the addictive gameplay of the original, but features cleaner and more colourful graphics.

"The game needed to be revamped," explained marketing manager Peter Jones. "We've updated the graphics, tuned the gameplay, put it in a new package and updated the manual.

"We're not just tweaking it," he added. "This is real virgin territory we're entering here."

David Braben, author of *Elite*, is still beavering away on the sequel. That isn't expected to arrive until next year.

Elite Plus will be launched on the PC at the end of this month with a price tag of £34.99. ST and Amiga versions will follow if the PC game is a winner. ■

Counterfeit cartridges sold at third of normal price

CONSOLE PIRACY SHOCKS INDUSTRY

Thousands of counterfeited copies of top console games, which are hardly distinguishable from the real thing, are being sold in the UK.

Pirated copies of hit Sega Megadrive cartridges are passing hands here for about £15 – a third of the normal retail price. But the software industry – in association with the Federation Against Software Theft (FAST) – is moving swiftly to combat this latest strain of piracy.

• Alexander: 'we must take action'.

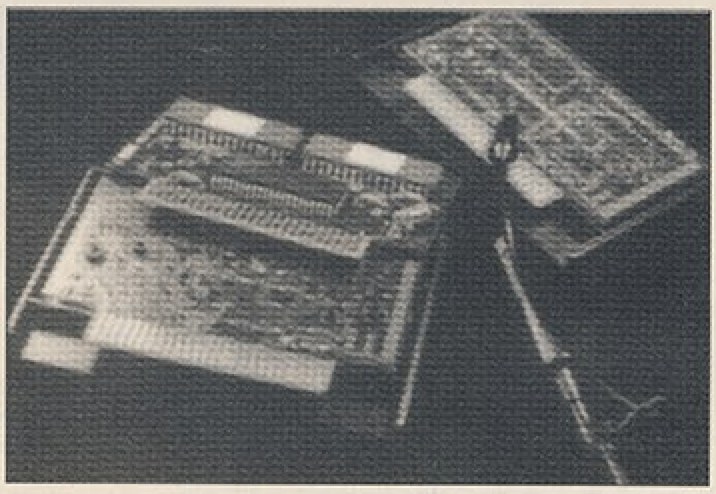
FAST, and Sega distributor Virgin, say that charges are being brought against various individuals. But Virgin Games boss Nick Alexander admitted that the problem is growing.

He said: "We have heard about this and legal action is already underway. This is a lot different from playground pirates and home users copying a friend's software because, in those cases, it is just not feasible to take legal action.

"We want to put a stop to this before people start thinking that there are easy pickings to be had."

The news that villains are already exploiting the mushrooming console market has sent shudders through the cartridge producing community because, spurred on by the promise of a piracy-free medium, software developers have been actively promoting games consoles for years.

Now the cartridge market has attracted professional pirates who are not only prepared to copy games, but are also duplicating packaging and manuals.



• Inside out: cartridges can be copied in a matter of minutes.

Bob Hay at FAST revealed that 98 charges are soon to be brought against individuals involved in one operation. However, he refused to comment any further arguing that it would not be wise to "put people on a warning".

He said that the Megadrive is attracting most activity at present, but said that other consoles had attracted interest.

Until recently the problem was confined to the Far East, and imports were a rarity. But unfortunately cartridge crackers in the UK have learned how to duplicate the games very cheaply. ■

● Turn to page eight to find out how cartridges are being cracked. There's an exclusive interview with a console pirate – and the people who stand to lose the most also speak out...

International talks to limit supercomputers

Leading technological nations could be signing a new agreement which aims to limit the spread of supercomputers.

Japan, America and many European countries are growing increasingly concerned that their supercomputers are being used by certain countries for the development of high tech weaponry.

The Americans and Japanese are currently holding secret negotiations to renew their seven-year old accord under which neither country is allowed to sell certain computers.

Both countries are keen to update the terms of their agreement and to include countries now producing relevant supercomputers.

A US Government official told the New York Times: "We don't want supercomputer exports to go unencumbered from those countries."

Even so Japan and the US are having difficulty ironing out a few disagreements over the definition of a supercomputer. The Japanese say that the definition of a supercomputer should be set at two billion calculations per second, and that a mainframe at 800 million calculations per second.

But the Americans think those figures are too high and they want the limit to be 300 million and 100 million respectively. ■

Cheap Game Gear

The handheld games console price war is becoming ever-more bloody. So much so that last week the trade press reported Virgin is considering introducing its Sega Game Gear for a very tempting £79.

This move comes in response to a recent announcement by Atari that it would be soon selling a 'bare bones' version of the Lynx for the same price.

Virgin is now likely to follow suit with its own handheld game console which, the company insists, is much handier and easier to use than the larger Lynx.

A more expensive version of the Game Gear will be available for buyers who want relevant cables and a bundled game. The Game Gear is due to be officially launched here by mid-summer. ■

• Game Gear: how low can it go?

Two for one Lotus deal

Lotus is to bundle Lotus *1-2-3* 3.1 with the word processor *Ami Pro* at a special low price.

Bought seperately the two packages would set you back £900, but they're being offered together for £450 until the end of June. Existing *1-2-3* owners can upgrade for £140.

A Lotus executive said, "PC users are getting the industry standard spreadsheet with the best analytical capabilities, formating, printing and hard copy output available – with a first class word processor."

THE WEEK IN VIEW

Is Commodore about to push its high-end Amigas into the professional fray? *Amiga Shopper* editor Bob Wade argues that it's about time....

If Commodore does decide to cut the prices of the A2000 and A3000 in the UK it is a move that can only help to establish the Amiga as a viable low-cost alternative in many areas of professional use.

However, this is only one of many measures that need to be taken to firmly establish the higher end Amiga models as 'serious' computers – as opposed to the 'games console' image that the A500 has inaccurately picked up.

The Amiga is already the obviously affordable choice at the bottom end of the video production market, but it could become much more firmly established throughout that area if specific bundles were put together (including genlocks and other required hardware and software) and a significant amount of video trade press advertising done.

Those involved in video work that I have spoken to have nothing but praise for the Amiga until you start talking about the level of support they get from Commodore. I am not suggesting Commodore is not doing anything – it's just not doing enough.

Video could be to the Amiga what desktop publishing was to the Apple Mac.

The concept of the Amiga as an alternative to the PC in a conventional business sense is a non-starter. But what it can provide, from the A1500 upwards, is a degree of PC compatibility that should make it an automatic choice for anyone working in creative media – if only because its acknowledged graphic power is combined with the ability to use much of the top PC software.

Commodore is clearly aware of the need for the Amiga to specialise in certain fields – the launch of the A3000 UX as a Unix workstation is evidence of that.

However, this needs to be followed through. As well as making price cuts Commodore should provide the bundles and the support necessary to make the Amiga the obvious choice for professionals in video, graphics, music, education, DTP.

If Commodore get it right, the possibilities are huge. ■

Disk library

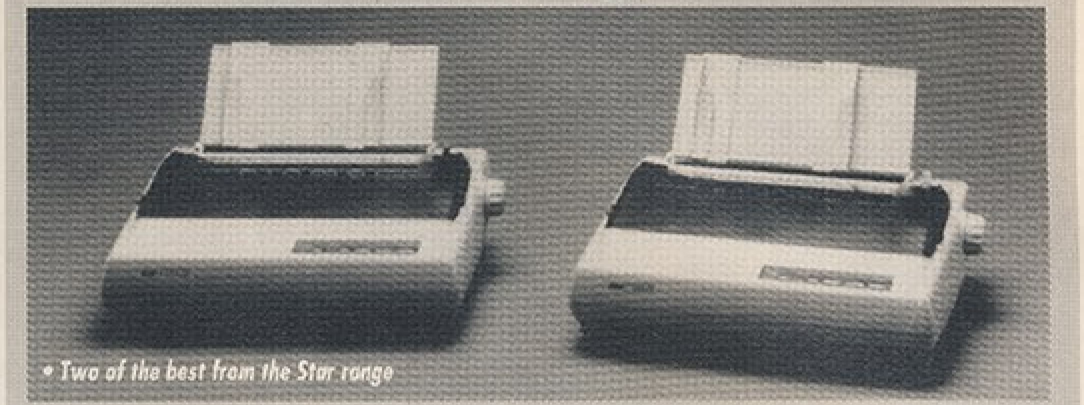
Microsoft was at last week's CD-ROM Expo in Washington to unveil a multimedia reference library on CD, featuring an encyclopaedia, thesaurus, speaking dictionary, two quotations reference books, an atlas and an almanac.

Bookshelf for Windows will run on any PC running Microsoft Windows with multimedia extensions. It retails in the US for $195, and should be launched here in a few months.

Microsoft also unveiled *Multimedia Beethoven: The Ninth Symphony* which features a digital stereo audio track and allows the user to explore any section from the four movements of the symphony.

There's also a chance to delve into the composer's life history, or study the architecture of the symphony. *Beethoven* costs $80. ■

Catch a falling Star...



• *Two of the best from the Star range*

Star has sliced the prices of its Professional series of 24-pin dot matrix printers.

All four are described by the company as 'workhorses' which will serve the professional user well.

The FR10 has fallen from £459 to £399, the FR15 is down from £599 to £499 and the cost of the XB 24-10 has been shaved from £599 to £499.

At the top of the Professional range, the XB 24-15 has come down £200 from £789 to £589.

Outside the Pro series the LC15 – which is actually a wide carriage version of the LC10 – is down £100 to £299.

Buyers of any of Star's printers will be offered a free printing pack including colour ribbon worth £40. ■

How a PC survived Scud hit on Dharan warehouse

GULF VICTORY FOR COMPUADD

American PC manufacturer CompuAdd began boasting last week that its kit had been acknowledged as 'the standard PC of the Gulf War theatre'.

A letter to CompuAdd from the deputy chief of staff, US Army Command, begins: "This is just a short note of appreciation for the quality of your model 425 computer that this headquarters was fortunate to use during Operation Desert Storm and Operation Desert Shield."

It seems thousands of CompuAdd PCs and laptops were in evidence throughout the campaign and "only two failed to boot up, having been damaged in transit".

The letter goes on: "An example of how well your computers are constructed came to light during the unfortunate incident when the Scud missile impacted on the tin-sided warehouse in Dharan. One of your Model 425 computers was inside and was literally blown out the side of the building, landing some 50 feet away.

"Although the impact damaged a couple of boards, the case remained intact and we were able to repair it... it was remarkable that it did not disintegrate, as it was very close to the point where the missile impacted."

Most of the 425s were used for project management, communications and administration in rear support areas, although some laptops were taken into Iraq by front line troops during the ground invasion.

As part of a £17 million deal with the US Central Command in Saudi Arabia, CompuAdd supplied 2,500 PCs to the Gulf, including hundreds of 316SL laptop machines.

Texas based CompuAdd also supplied full networks for use on American navy ships. ■

PCW's flight of fancy

• *PCW: a game at last*

There was a time when PCW owners could expect a respectable release rate of games. But that famous green screen hasn't attracted too much in the way of good quality leisure software for the past couple of years.

Now Digital Integration is to lauch its popular flight simulation *F16 Combat Pilot* for Amstrad's workhorse. *F16* has already appeared on just about every home computer format, and it picked up the prize for best flight sim at the European Computer Software awards last year.

PCW owners can take the cockpit of a £20 million piece of kit for just £25. Call Digital Integration on 0276 684959. ■

NESS on your lap

• *NESS 286: 'rugged and efficient'*

NESS Computers has released a 286 laptop, which it claims is a 'rugged and efficiently portable'.

Measuring about a foot square, the NESS 286 operates at 16MHz and comes with 1Mb of RAM on board, expandable to 5Mb.

For intensive maths processing there's the optional 80287 mathematical co-processor.

As well as the normal 3.5-inch floppy drive there's a 20Mb hard disk, and you can connect an external disk drive through the 25-pin D-type connector.

It retails at £1,099.

You can contact NESS on 081-452 8233. ■

PC1512 and 1640 are wiped off the price list

AMSTRAD FIRES THE OLD GUARD

Amstrad has confirmed that it is phasing out the machines which originally launched the company so successfully into the professional PC market.

The PC1512 and PC1640 – released in 1986 and 1987 respectively – have been wiped off Amstrad's price list. A spokesman for the firm said buyers could now hunt around to find the best prices available as Amstrad no longer has a recommended retail price for either machine.

In addition the highly acclaimed Generation 3 PCs are to be chopped in price. Cuts range from £100 for the bottom end unit to £250 at the top of the range.

The entry-level 3086 with single drive is down by £100 to a very reasonable £350, while the same machine with dual drive and hard drive is also down – by £200 to £600.

The faster 3286 single drive unit has been dropped by £150 to £500 while the hard drive, dual floppy version is down £250 to £750.

The new price structure will come into effect on April 20th.

Amstrad has decided to continue its policy of bundling the 3086 with the DMP3160 printer and *Migent Ability* software, and the 286 will still be sold with a free copy of Lotus *1-2-3*.

A spokesman for Amstrad explained: "Although we are currently running a number of successful software and printer bundles, we feel that we must make a statement on the Generation 3 price, giving the range an ultra-competitive edge over the competition."

On the phasing out of the PC1512 and 1640 a spokesman said: "Those machines are no longer listed, although there are stocks still going through the distribution channels – so you'll be able to pick them up at very competitive prices.

"Both PCs did very well in their time, but now the company must move on."

The 1512 was the first PC to be offered at a price which came well within many small businesses' budgets, and it also appealed to home users. In turn, the 1640 offered more for a similarly reasonable price. ■

• PC 1640: great for its time, but was dating badly

Agenda and modem: phone link

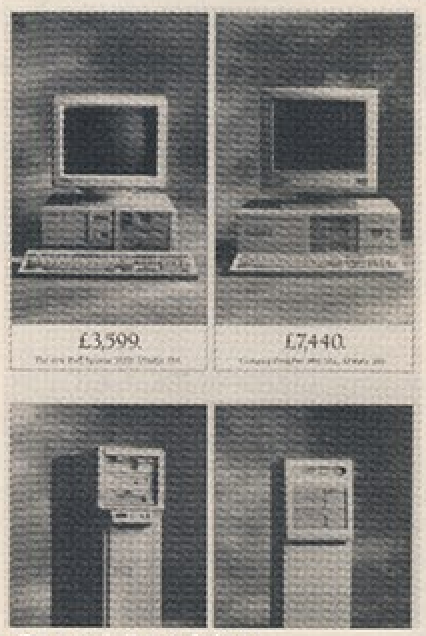
Modem on the Agenda

A data and sendfax modem for the handy Agenda pocket computer has been released by MicroWriter Systems.

Users will be able to send information down telephone lines, or even link up to a printer. The Agenda is one of the few computer products to win the UK Design Council award, awarded in 1990 for its ergonomic one-handed keying system.

The Agenda Modem, developed by Dataflex on Microwriter's request, is a conversion of Agenda's pocket modem for PCs. It offers conventional V21/22/22bis (300-2400bps) operation and costs £349. ■

Dell ad ban



• The ads: Dell is to fight on

Dell Computer has been ordered to stop publishing adverts comparing its PCs to Compaq's.

A judge in the High Court Chancery Division ruled on 19 March that the ads could not be published until a full trial had been heard.

At the end of January Compaq slapped a writ on Dell to prevent Dell from publishing the ads. Under British law comparitive advertising is allowed so long as it is fair and accurate.

But this first round set-back for Dell won't stop the firm from fighting to keep the ads, which have been running since 1987, and invariably feature Compaq and Dell PCs lined up, with technical specifications and prices compared. ■

Take your time

A new PC program will allow you to instantly switch between up to 99 programs or files at once.

Switch-It 3.23 from Guildsoft cuts out frustrating waiting time. For example it will allow you to rapidly cut and paste between different spreadsheets, databases and word processors.

"Both its switching and data transfer capabilities can save the average PC owner an enormous amount of time," said project manager Mike Holman.

Switch-It will run on any PC with a minimum of 512K of RAM and costs £79. Call 0752 251155. ■

Olivetti boss' trial

Olivetti chairman Carlo De Benedetti is to stand trial on criminal charges arising from the collapse of one of Italy's largest banks in 1982.

The Milan Appeal Court upheld an appeal against an earlier ruling clearing De Benedetti of criminal charges.

Before taking over at Olivetti, De Benedetti had held the vice-presidency of the Ambrosiano bank for two months just before its spectacular collapse.

Ambrosiano – the Pope's bank – went down owing $1,300m. 35 people have already been convicted over the crash. ■

Nintendo to open Tokyo games school

• A new school will be dedicated to students who wish to master the NES.

Nintendo has set up a special university dedicated to train programmers to produce games for the Japanese company's NES console and Super Famicom.

Thousands of budding games programmers are likely to apply for one of the 30 places in the Tokyo school. Those who pass through can expect a healthy career crafting some of the best known games in the world.

The video games school is a joint project between Nintendo, and an advertising agency called the Dentsu Group. Nintendo has called the school 'Mario' after its most famous game character.

Already, Nintendo has been running a once-a-week learning course for would-be Nintendo programmers, and after the first year many of the 16 students are writing their own games. ■

"It's easy... Every system is copyable."

OUTRAGE AT COUNTERFEIT CARTRIDGES

The next console cartridge you buy could be an illegal pirated clone. Here, Rik Haynes discovers how the cartridges are cracked, and what the industry response is likely to be...

Counterfeit cartridges have arrived in such a short space of time, and with such a degree of professionalism, that the software industry has been taken almost unawares.

Some of the copies being sold on market stalls around the country are exact clones of the originals and even software houses and game developers cannot tell the difference. In fact, the only real difference is price.Pirated copies of *Strider* on the Sega Megadrive sell for around £15 instead of the official price of £45.

FAST (Federation Against Software Theft), an organisation funded by software companies, is keen to keep the pirates off-guard. Chief executive, Bob Hay, said: "We're dealing with enquiries relating to cartridge-based software, but I wouldn't say that the market is flooded."

Hay refuses to comment on the size of the problem, the origin of these clones and the length of time they have been available on the market. Nobody has yet been prosecuted for copying cartridge games. "We are dealing with allegations involving Sega Megadrive cartridges and Sega isn't the only cartridge-based product involved," reveals Hay. "It's too early to say anything further. I don't want to put people on warning. One case will involve 98 charges being brought against the people concerned. They are not yet a matter of public record."

'Terry', a self confessed cartridge counterfeiter from the South East, told us any game available on Megadrive, NES, PC Engine, Nintendo Gameboy and the Sega Master System can be copied in less than 10 minutes – provided you have some technical know-how and the right hardware and software. The Commodore 64GS and Amstrad GX-4000 games systems have largely remained untouched because there is not as much profit in copying games on less popular consoles.

"It is easy. It only takes me 30 seconds to read a four-megabit cartridge and roughly 10 minutes to burn it out onto an EPROM," he says. "Every system is copyable. I do it for money. It takes me approximately £5 to make a cartridge which I then sell for £15. You can alter the code, but you don't because it is commercial. They're copied professionally, they look identical to the original. You can't tell the difference. Some are even sold in shops at full-price.

BABBLE BUSTER

- **An EPROM programmer is an electronic device that connects to your computer and reads program files from either the computer's memory or a disk and writes them to an EPROM.**
- **An EPROM is an Erasable and Programmable Read Only Memory chip. High intensity ultra violet light will erase it and leave it 'clean' much in the same way that a drive can 'format' a disk and leave it clean.**
- **The clean EPROM is placed in the programmer where the program is 'burned' on to it electronically. This leaves the EPROM programmed and stable and the software burned on the EPROM is safe there as long as no high intensity ultra violet light is played on it. Any ROM or EPROM can be read by the programmer and the file saved to memory or disk for burning into an EPROM.**
- **EPROMS are used by hackers and crackers as a simple way of transferring ROM software to a medium that can be built into pirate cartridges.**

"*Strider* is currently top of the pirated charts. The plastic cases, covers and stickers are supplied by a company in Glasgow. You have to go to a professional EPROM specialist with any cartridge over four-megabits in size."

ALL YOU NEED IS...

Electronic Arts is one of the leading publishers of Megadrive games in Europe and America. Recent titles have included such hits as *John Madden American Football* and *Populous.*

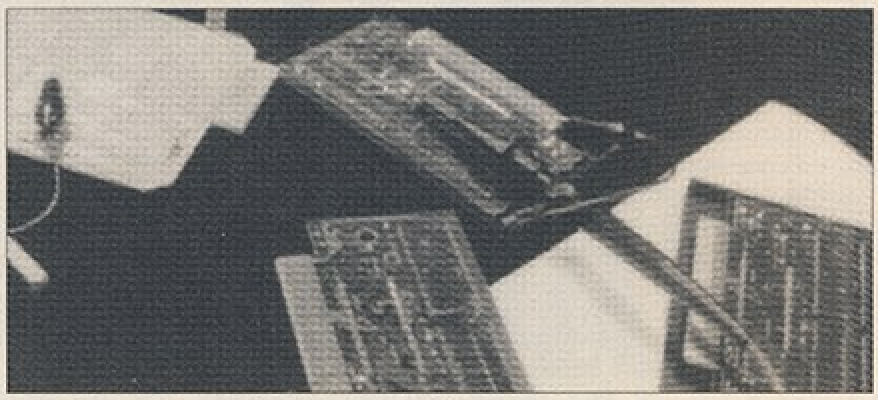
Simon Jeffrey, spokesman for Electronic Arts, said: "Yes, it is easy to copy cartridges. Basically all you need is an EPROM burner. A bit of hardware that allows you to burn code onto an EPROM, a programmable cartridge. They're hard to get hold of and vastly expensive.

"Theoretically, someone could get a cheap EPROM burner from a hardware magazine for a few hundred quid provided you had the technical know-how to make it work. For any kind of extensive mass-copying operation you need to buy the EPROM's from Taiwan. You need a lot of money and to be extremely brainy."

We asked Jeffrey if software companies can prevent piracy. "We don't have security chips in our carts the way that Nintendo does. We don't see any need. Any security measures are seen as a big challenge for the hackers. No matter how clever you are, there's always someone more clever who can bust it. There's no point in investing large amounts of money into something which is going to be broken. You're just throwing money away.

"The people who buy console hardware and software are less technically minded than high-end users of Amigas because there's less opportunity for them to get inside and actually program on it. You can't program or copy a console without extra hardware. It is our goal to provide quality entertainment software to the mass-market. We see the Megadrive as an exciting hardware platform and market. There's not much that worries us yet because this isn't as big a problem as disk-based copying.

"I know there's a few dodgy operations in Taiwan getting hold of Japanese carts. Some are duplicated, others are grey-buying Japanese carts and dumping them on the European and American markets. Counterfeit packaging is very rarely up to scratch, they have poor quality print and lack of full-colour artwork."



• Cracking a game cartridge takes a matter of minutes.

BLOW-CARTS

Peter Molyneux is boss of Bullfrog, the games development team responsible for *Populous* and *Powermonger*. His flair for original arcade-strategy games has met with considerable world-wide success on both computer and console formats.

"I haven't seen these counterfeit carts, but I know that they're around. Not so much in this country, but in Japan and certainly in the Far East," says Molyneux. Bullfrog has more to lose from cartridge copying than many other games developers. *Populous* was one of the first games released on the best-selling Nintendo Super Famicom console and is also available on the Sega Megadrive and coming soon on the NEC PC Engine and Sega Master System. Console versions of *Powermonger* are also on their way and Bullfrog is currently writing a sequel to *Populous* (to be released later this year).

"Megadrive game prices are stupid, some of them are nearly £60. It's ridiculous. Half-megabyte EPROM's cost about £5 each if you buy them across the counter at your local electronics store. If you bought them in bulk the price would radically drop.

"They're relatively cheap. All you need is an EPROM burner which costs £100 and a method of downloading the original games code and data into an EPROM. This stage is usually handled by a PC micro with custom-designed software. The tricky bit is the circuit-board which is made especially to fit inside the console. It's not something that your backroom-boys would do, only if you're going to sell a couple of hundred copies.

He goes on: "It's like any piracy, you can't stop it. You need the computer to suck out the information, hold it, then shove it out again. You can use a special EPROM system that doesn't require a computer, but you lose out on the benefit of being able to alter the game and say, put a new name on the title screen or put more than one game on a cartridge."

The so-called compilation carts are all the rage in the underground circles according to 'Terry'. There is even one NES cartridge with a staggering 63 games on it! Now pirates are working on special Megadrive cartridges which have three games on them, with a switch on top to select which one you want to play.

Super Famicom is generally regarded as the most advanced games console available today and over 500,000 of them are sold every month in Japan alone. Now the Far Eastern pirates are cashing-in on the latest booming market.

Copies of popular Super Famicom games like *Super Mario World* and *F-Zero* have started to appear in places as diverse as Tokyo, Hong Kong, New York and London. So far it has been easy enough to spot these imposters – thanks to shabby stickers and strange mauve cases – but soon the pirates will perfect their deception skills and conquer this new challenge. Soon, you won't be able to tell the difference between the original and a copy. ■

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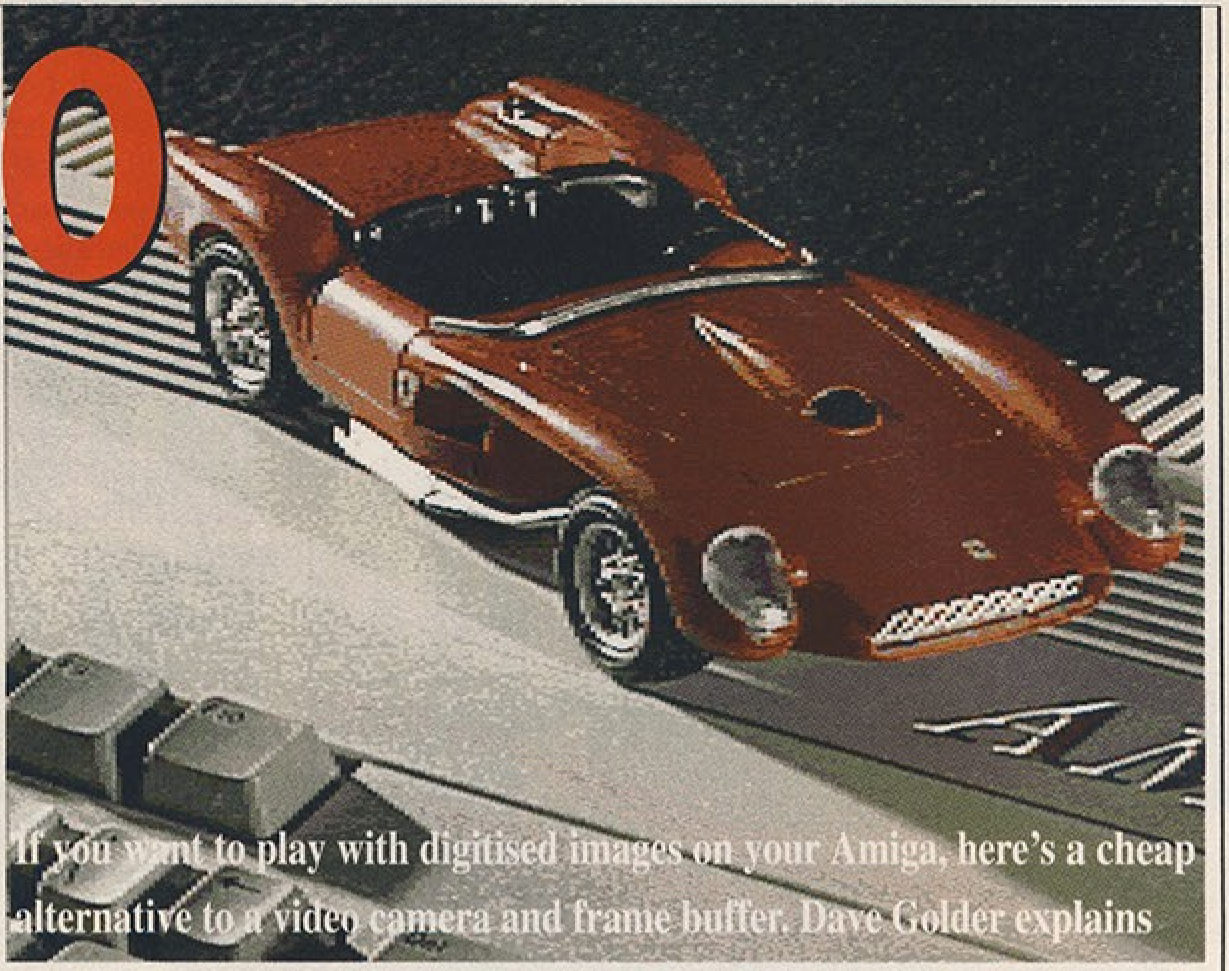
PHOTO PLAY



If you want to play with digitised images on your Amiga, here's a cheap alternative to a video camera and frame buffer. Dave Golder explains

Most budding computer artists are restricted to playing around with computer generated graphics because the technology needed to digitise images from the real world using a video camera remains out of the economic reach of most enthusiastic amateurs, and the results are rarely as sharp as you want. Nik Williams Broadcast believes it can provide the answer with its Pictureware computer picture library for the Amiga.

The library was launched this February with 24 sets of disks, each set comprising two disks of five pictures each. The pictures are available in two formats which will work with the vast majority of Amiga arts and graphic packages, such as *Digi Paint*, *Deluxe Paint* and *Photon*. The HAM (Hold And Modify) files offer over 4,000 colours while the the more commonly used IFF files maintain a very high picture quality with a somewhat reduced 32 colours.

Each set concentrates on a different subject and the range is impressively varied. Titles available at the moment include such diverse offerings as *African Famine*, *The Nudes,* and *Hippos*. And the library is set to continue expanding with the company aiming to make 2,000 pictures (400 disks) available by September.

BROADCAST QUALITY

The actual digitisation quality of the pictures is very impressive. This can be attributed to the fact that the camera used in the digitisation process is a £32,000 Sony Betacam which is used for recording broadcast television standard pictures. Indeed, Nik Williams Broadcast is an independent company involved in television production, and, according to co-proprietor Nik Williams, the library came about, 'almost by accident' when, just prior to Christmas, the company was working on a project for mainstream television for which they needed some digitised images.

'We had *DigiView*, but we couldn't get hold of any decent pictures,' explains Williams. So, basically, the company decided to digitise its own images. 'We assumed there was probably a lot of other people doing the same thing, but we investigated it, and there weren't.'

Williams now believes this is the first computer picture library available to users of desktop computers, which, for an idea which seems so obvious and so simple, is surprising. But the company has not settled for offering a half-baked service. The pictures themselves are the sharpest, steadiest and most colourful you could expect for the file formats and they are available at a very reasonable price. One disk will cost you £4.99 while orders of two or more will set you back just £4.50 each. That works out at less than £1 per picture.

Occasionally some of the pictures, especially dominated by various shades of the same colour, are slightly disappointing on the more limited IFF format, although this is the fault of the format itself rather than the process. Perhaps the library should not be over ambitious in its choice of subjects.

PD CATALOGUE

There are currently two catalogue disks available for 90p in the public domain either from the company itself or from various PD libraries. They list the sets of Pictureware disks currently available (12 on each catalogue) as well as carrying miniature 'sample' versions of all the pictures available. The company plans to release a further catalogue each every month, with details of the 12 latest sets of disks. There are also Pictureware demonstration disks available in the Public Domain, also for 90p, though the quality of these and the catalogue disks – there is noticeable interlace flicker – belies the standard of the real McCoy, so don't be put off.

Williams sees the pictures in the library being used in a similar way as clip art, reckoning, 'they give you a super starting point if you are into computer art.' He suggests they could be used as background for titles, animation and games as well as the basis for creating interesting Hockney-esque artwork. He is also eager for the library to appeal to commercial users, citing DTP and DVP (Desktop Video Publishing) as possible areas where it could be employed.

Whether this latter objective is attained remains to be seen. While the appeal of the library to hobbyists and enthusiasts is obvious, I would have thought that professional users would have preferred to commission their own pictures or even invest in their own digitisation equipment, as this would give them the chance for a much wider and more exclusive range of pictures. The Pictureware library might have an impressive selection, but even with 2,000 pictures, if a company needs a picture of, say, a teapot, then the choice is going to be limited.

TOP SELLERS

According to Williams the top selling disks so far have been the *People*, *Cars* and *Children* categories so there will be further volumes of these among future releases. *The Nude* disk has, apparently, been very popular among arty types. The *Edwardian Photo* disk is very impressive, especially considering the fact that many of them have been digitised from decades-old pictures that were no larger than a cigarette packet.

There is a copyright on the disks, so while copying for private use is unlimited, if you want to use the pictures commercially there is a fee – although again this is not extortionate. It works out at £7.50 for the right to use the picture, regardless of whether it is in its original form or if you have played around with it and/or distorted it in any way, and between 10p and 1p on every copy, depending on how many you need. The pictures on the PD disks, of course, can be used the same as any other PD disk.

For further information, contact the library's general enquiries line on 0792 470503. The 24 hour credit card hotline for ordering is 0792 645946. The catalogue and demo disks are also available from the company and other public domain libraries.

PRE-FORMATTED FLOPPIES

In its search for the best pictures around, the library has amassed hundreds of pictures which have not ended up on the main disks. These have not been wasted, however. Pictureware has placed all these pictures on to specially pre-formatted floppy disks in a variety of formats from big RGB files to small brush files in both IFF and HAM formats and is selling them in packs of 10 for £9. There is nothing regulating what goes on to these disks, so if you order a set you could be getting anything. You might find some absolute gems which you can save, or, if not, you can simply delete them and use the floppies for your own work. ■

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- African Famine 1&2
- Edwardian Photos 1&2
- African Animals 1&2
- Views of Vietnam 1&2
- Motorbikes 1&2
- Hippos 1&2
- Beautiful Sunsets 1&2
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- Castles 1&2
- Cuddly Toys 1&2
- Children 1&2
- The Nude 1&2
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670	Monopoly
595	Cave Runner
1209	Wacko in Wonderland
832	Agatron Games
531	Blizzard
530	Pacman
525	Tennis 1 meg
509	Paradroid
1207	Frantic Freddy
505	Drip
255	Flaschbier
856	Xenon 3 etc
117	Moria RPG
154	Track Record 1 meg
534	Games Disk 1
1179	Chess etc
1184	Mastermind etc

UTILITIES

941	Art of Virus Killing
659	Essential Utils 1
1206	Mandlebrot Maker
567	Noisetracker etc
152	Quick Base
312	Word Wright
337	Ultimate Utils
334	Le' Copiers
613	202 Utilities
341	57 Utilities
1043	MVK V2.0
336	Full Force Utils
342	Acu Utils 22
1208	Database Wizard
1078	Essential Utils 2
1099	Pro Tracker 1.1a
1202	RSI Demo Maker
1146	Icon Magic
1180	Amic
1159	Red Devil Utils 6
1158	Red Devil Utils 7
1157	Exorcist Killers
1151	C-Light
1156	Driver Generator

TOP TEN

1078	Essential Utils 2
1099	Protracker 1.1a
1079	To Kill a Mole (16)
1209	Wonderland
1202	RSI Demo Maker
659	Essential Utils 1
1206	1162 Home Utils
1117	Budbrain 2
1043	MVK V2
1064	Lettrix

MUSIC

1081	Kick Squad 1 meg
1087	Glidescope III
1089	Sonix Systems 4
1093	Hanky Panky
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CONTENTS

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■ Super service

One often hears criticism of dealers in the computer business, but my experiences with such people over the past few years have been excellent and I'd like to publicly thank a few people...

Silica Systems really deserve credit for their service. I bought an Atari STE from them which gave no audio output, so they replaced it at once. After a few months it would no longer format disks – they repaired it. Six months later, the same problem cropped up and Silica speedily repaired the machine – even though the guarantee had expired.

I was just unlucky with my STE. Nevertheless, at all times Silica's staff were extremely helpful and speedy in their response.

I have also purchased many disks for my STE from public domain libraries. I would like to single out Goodman Enterprises and the ST Club for excellent advice and service. For my Amstrad I used WACCI, who have also always given excellent advice and service.

Maybe I have been lucky, but I've bought many items from mail order houses over the years and always had good service – I wouldn't like to pick out any particular names, but I have used the ones with high-profile adverts in magazines such as *Express, Amstrad Action* and *ST Format*.

I'm not saying there are no 'sharks', but overall there seem to be a lot of companies in the computer sector that really make an effort.

Jan Drozd, Sittingbourne, Kent

■ Eyestrain?

I use a computer as part of my job every day and I am concerned about the effect that this might have on my eyesight. Can you tell me what equipment is available – like special glasses or screen filters that can prevent eye trouble – and which are the most effective? Perhaps this could be the subject of an article in a future issue?

B Richards, Dartford, Kent

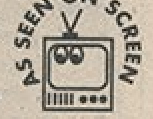
The answer to your question is a bit beyond the scope of one of my replies Mr Richards – there's a host of products on the market which claim to reduce the bad effects of sitting in front of a computer monitor all day.

The first steps to take are as follows: get your eyes tested by an optician, and if necessary, get glasses; make sure that the lighting in your office doesn't make reading what's on screen difficult; take regular short breaks from the VDU; try and set up the computer so that you can glance up from the screen and look across the room or out of a window from time to time – thereby re-focussing your eyes; and try to sit at least three feet away from the monitor.

As to anti-glare screens and glasses and radiation-reducing devices – look out for an overview in a future issue. Andy S our illustrious Ed is trying to slot in a feature on the subject, so readers with advice to offer or interesting experiences should drop me a line.

H F-W

■ Square eyes



Here are some more 'Seen on Screen' machines:

A while ago, *The Money Programme* had a report from America about IBM and visited a business computer centre where there were lots of computers (surprise surprise!). These included a Commodore Amiga 2000 (in its own separate display room), some Apple Macs, a Samsung PC and some IBMs.

There's the proliferation of computers that seem to adorn the desks of all the newsrooms these days. And another place to spot computers is *Grange Hill*, where they've only recently had one installed.

Talking of childrens' programmes, on *Sesame Street* I recently spotted an old-style Commodore 64 which supposedly wasn't working – no surprising really, as the power lead wasn't connected. Super Grover came to the rescue – well, he hopped around on one leg for a bit, anyway. The problem was soon fixed by switching it on from the back (!) and a strange picture appeared on the screen of a blue blob on a black background, which I think was meant to be a spider.

Finally, I spotted a computer in the Scottish Power/Hydro Electric TV advert, along with what looked like an *Outrun* clone. But readers living in England may not have seen this advert...

Scott Kier, Moray, Scotland

Well, for all that assiduous TV-watching I'm going to award you a fiver Scott. A very good multi-mention 'Seen on Screen' missive my man...

H F-W

■ The joy of BASIC

I suppose it was inevitable that an Amigaphile would write to defend the indefensible. My letter in *Express* 121 was basically a comparison with 8-bit machines. The BBC B's nearest equivalent to Workbench – AMX Desk – takes just ten seconds to reload from disk and less than ten seconds to display the set of icons for the disk I tried, which had 24 files. And without me having to buy an extra book to customise it!

As for the BASIC, why should it be necessary for buyers to spend money on a different one? Obviously most do not, and will be put off the genuine joys of programming for life. It's hardly a defence to say that previous Commodore and Atari BASICs were also awful!

And I thought the whole purpose of high-level languages was to distance the user from the hardware and operating system details. The fact remains that 'real life' graphics are always measured Y positive upwards, and a language for beginners – which is what the 'B' in BASIC stands for – should do the same.

As far as I am concerned, the operating system is part of the computer, and should not require 90 seconds of reloading just because a program calls a file that is not present. And the flickering mess and blank screens come on genuine, unpirated games – including those supplied by Commodore. As I said – indefensible.

John Goldsmith, Bury St Edmunds

I get the feeling that this debate could run and run, if I were foolish enough to allow it. But I'm not, so let's have an end to this particular strand.

H F-W

■ Old and active

I'd just like to let you know (with reference to the letters in *Express* 116) that I started computing with a ZX81, progressed to a Commodore 64 and now use a C128D. My main interest is typing in programs from magazines and then checking them for errors with my wife – we are both senior citizens, and have two sons and two grandsons who are so keen on computing that we have to keep up to date!

I type in listings with Easy Script and then print out on a 8023P printer which is loaded through an Interpod.

I love seeing youngsters' faces when I start talking to them – they must think 'what does an old man of 79 know about computing?'

J Clewlow, Tipton, West Mids

Good for you Mr C! Well, that's about an end to this week's letters page. I'm off to Scotland for the Bank Holiday – hence the single page this week. (I'm driving up in the diesel Fiat Uno, so I'm leaving early for once. Normal service will be resumed next week.).

H F-W

Macintosh

NEW FONT FORMAT

As promised last time, here is a brief run-down of Adobe's new font format, which was officially announced at the Macworld Expo a couple of weeks ago.

The technology is not so much a new font format, more of an extension to existing Type 1 fonts. It will, claims Adobe chairman John Warnock, provide, "a new range of dynamic capabilities type users have never had before."

So far, font users have been limited to altering the size of a typeface, or using a program such as Quark *XPress* or *PageMaker* to condense or expand the font. Type has been limited to whatever weights the vendor supplies, and similarly with type style – there is only, for example, one italic version of the font available.

Adobe's new technology, called multiple master fonts, is set to change all this. With multiple masters, the user will be able to generate a virtually infinite number of variations on a single PostScript font. The user will have control over four different areas: the weight, or 'boldness'; the amount of contraction and expansion; the size; and the style – including such things as the 'italicness' and 'serifness' of the font.

Font designers will have to create at least two masters for each of the four controlable aspects of the font – for example, they'll have to produce a very light and a very bold version, a very condensed and a very expanded version, and so on. Then, the user can pick any point in between those two endpoints, and the software will mathematically generate the correct version of the font.

To visualise the whole thing, think of it as a multi-dimensional array, with an infinite number of elements. Or alternatively, as a square, a cube or a hypercube, depending on the number of controls the user has. Or don't try to visualise it at all. (Probably the best bet.)

The first multiple master fonts should be available in the next few weeks, and are expected to cost about the same as current Type 1 PostScript fonts. Oh, and you'll need *Adobe Type Manager* (ATM to its friends) and a special INIT supplied by Adobe to make them work.

RUMOURS...

Did you know that *The European*, Maxwell's continental organ, is totally produced on Macs? It uses Macs for page design, Macs for the illustrations, Macs for creating display ads and Macs for keeping track of the vast piles of unsold copies in newsagents throughout the continent (see *Eyes* passim).

If you have an LC or a IIsi and are fed up with the fact that you can't run programs like earlier versions of *Excel* and *Studio/8* because the program says that you don't have a maths coprocessor installed, help may be at hand in the form of a new shareware INIT called *SoftwareFPU*, by John Neil. This $10 utility fools the Mac into believing that the coprocessor is installed, so that many more programs will work on it. You'll find it (surprise, surprise) on CIX and from many other shareware distributors.

Apple has cut the prices of the Mac IIci and IIfx. The IIci 5/40 drops £200 to £3,695, while the IIfx 4/80 comes down £595 to £5,695 (excluding VAT). So far there has been no information about the SE/30 in the UK, although in the States the price is dropping by $1,000 for the 1/40 model and by $1,700 for the 4/80. Apple has also officially removed the Mac IIx and IIcx from its price lists this week, although again nothing has been heard in the UK – expect an announcement soon.

Apple's court case against Microsoft and Hewlett-Packard in the USA is coming closer to trial, after a federal judge rejected two major

POSTCARD FROM AMERICA

Apple pulled the cover off of its two new printers the other day, the StyleWriter, and the Personal LaserWriter LS. The LS is a snoozer (OK, it's very nice and all that, but you're not going to e-mail your mother), while the StyleWriter is much better.

The StyleWriter is based on the Canon BJ-10e BubbleJet engine, well known outside the Mac world. It's 360dpi (dots per inch) resolution is 20 per cent higher than the normal laser printer. (When they jam, do they become bubble gummed?)

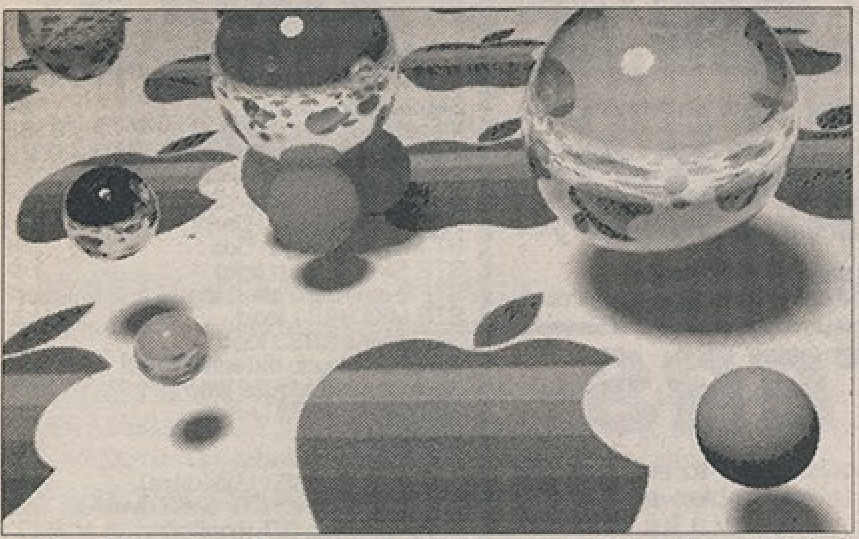
It is a wild looking printer, owing more to kitchen, or beauty appliances, than computer peripherals. I thought it was a small space heater, or a yogurt maker, when I first saw it. The pictures don't do it justice. Many of the new Apple products have curved surface design elements. The front of the StyleWriter is either a wide mouth and lips, or six months pregnant.

A TrueType INIT comes with package, allowing users running 6.07 System software to run the outline font technology that Apple and Microsoft have been working on. TrueType was supposed to come out with System 7.0. Since it makes the new brainless printers look great, and it's been ready to go for months, they pushed it out the door early. Apple technical specs say that these fonts can be used on a 1Mb Mac. It can run, but not without an occasional run-in with your applications.

It's painfully slow in printing – by design! InkJet printers spray ink on the page, which must dry before the page can be handled. Some printers drop the page into a holder while they're still a little "wet." Users can smear the ink if they're too eager to see their words in black and white. Apple engineers slowed printing time down to a couple of minutes to allow a page to dry before falling out of the front.

What I wonder about are the StyleWriter's operational temperatures, 15C and 30C. A laser engine works between 10C and 32C. Does the ink start to coagulate at 15C? Perhaps we'll have to buy hot printer bottles to keep the bubbles bubbling through the cold winter nights.

David Morgenstern



• *Although Diamond wouldn't co-operate with my screen-grabbing software, this background shot should give you some idea of the quality of the game's graphics.*

defence arguments. The case goes back to 1988, when Apple filed a suit claiming that Windows 2.03 and H-P's *New Wave* violated Apple's copyrights. How on earth Apple and Microsoft are able to collaborate on TrueType on the one hand, while fighting each other in court on the other, is beyond me. Still, all's fair in love, war and the fight against PostScript.

Aldus' cheap (£200-ish) page layout program *Personal Press* still hasn't appeared for review. The company's habit of running ads saying that things are "now shipping" when, in fact, they are only shipping in the States, is reportedly beginning to get on the nerves of some potential purchasers, who are looking to other suppliers or grey importers to provide them with the goods...

DIAMOND GEEZER

The latest shareware goody to hit the Macs here on the Rebel Alliance floors at Future Towers is a whizzy game called *Diamond*. It costs $20, and is like a supercharged version of *Breakout* (remember that?). But there are enough new twists in *Diamond* to make it highly addictive – lunch hour resounds to boings, squeaks and sampled *Ferris Bueller* soundtrack. Available from CIX, and all the usual blah blah blah, if you only get one game for your Mac, get *Diamond*. Oh, and it won't work on an LC with a 12-inch monitor.

Ian Wrigley

PC

SUPER MONACO GRAND PRIX

What a coincidence – the Formula One Grand Prix season has just started, and US Gold's *Super Monaco Grand Prix* appears on the Amstrad!

So far, the only version of this racing game I've played is on the Sega Megadrive. Needless to say, there's not much comparison. But it did leave me hoping for a fast, smooth, exciting GP game...

US Gold has gone for 16-colour mode in its conversion to the CPC. Is this wise, we ask ourselves? It certainly gives the Amstrad graphics a lot to do. First impressions of *Super Monaco* are of a colourful, but blocky game. The sense of speed is good, but the screen update is a bit jerky. It's the sort of game that cannot really be done justice on the CPC.

But first... the plot. Well, there isn't one really, in as much as Grand Prix racing is more or less about jumping in a car and going as fast as you can. There are 16 races all over the world to compete in, and to make it to each one you have to have done well enough in the one before.

You start off driving a qualifying lap. Here you have the track to yourself, and you simply have do one circuit in the quickest possible time. This governs your grid position for the race itself, which is pretty crucial because on each lap of the race (the total number of laps, plus the one you're on is displayed on-screen) you're given a target position. If you're running at or above this position, you keep racing. If not, it's game over. Needless to say, as the race goes on, the limits become increasingly tougher.

It acts just like the timed stages in *Super Hang On*, only with a bit more imagination. Also, it seems to work 'intelligently'. I've been doing really badly sometimes, and the computer has set me a pretty easy target. Yet on the same circuit I've been running around third or fourth and been given a target of eighth or above pretty early on. Of course, in the heat of the action, you've rarely got time to study the instruments...

Despite the fact that the hardware is struggling Super *Monaco Grand Prix* really is exciting. Once you become used to the blocky graphics and juddery updates, you start experiencing a sense of speed and a feel for the game. And when you look more closely there are plenty of impressive features. The backgrounds are different for each circuit, the tracks have hills and dips (and Monaco itself has its famous tunnel), the other cars are well drawn and you have a big fat mirror at the top of the screen to see just what they're up to (always assuming you're in front).

Considering what's been done, *Super Monaco Grand Prix*'s graphics are very good indeed. Sound is good too, with an upbeat title tune and realistic engine sounds. I'm not quite so sure about the squealing tyres on the corners, but there we are.

And the game is very well-judged in

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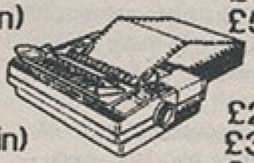

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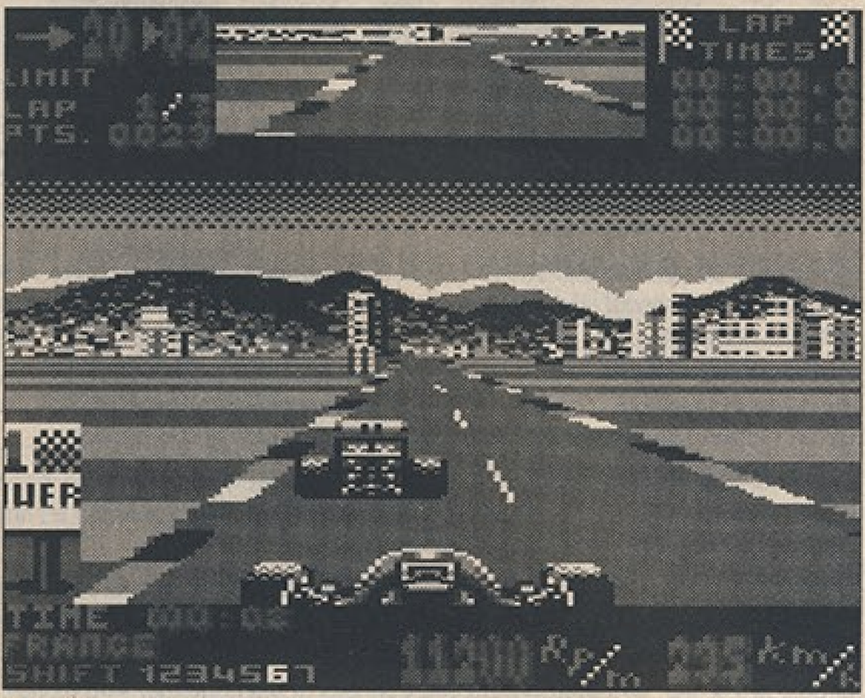


• **Super Monaco Grand Prix:** *the graphics might be a bit over ambitious but its still good.*

terms of difficulty, too. You'd have to be a complete clot not to get round a lap or two the first time you play, but it's going to take a long time (and a lot of circuit knowledge) to progress more than a couple of races into a season.

US Gold is heavily into arcade conversions, and with arcade hardware becoming ever more powerful, it's not surprising that the Amstrad struggles (*Line of Fire* was awful). And do we want all these coin-op licences anyway? Well, we do want *Super Monaco Grand Prix*. It's graphically ambitious – almost too ambitious – but US Gold has pulled it off. It's a very, very good game.

DTP ON THE 464

Last week I was going on about desktop publishing and the demise of Database's *Stop Press* (remaining stocks have been sold off to the trade). Well, 464 owners will be familiar with those "I can't get no software" blues anyway, because that machine has never been taken seriously by, er, serious publishers, especially in the DTP field.

All that could change, though, thanks to Bit-7 Computer Software in Kettering. *Page Setter 64* is a program supplied both on tape and disk, and will work on an unexpanded 64K machine.

It consists of three basic modules – a text editor, graphics editor and page layout section. You load all three separately. The text editor's a bit basic, and the manual won't win any prizes for clarity. But you do get a choice of fonts. And when you come to design your page you can insert graphics, flow text around them and basically do just about all of the things you could with a package costing much more. Output quality is excellent.

Best news of all is the price – just £10 on tape or disk. The address to write to is: Bit-7 Computer Software, 221 Rockingham Road, Kettering, Northants NN16 9JB.

DINAMIC IN A FLAP

Remember that golden oldie *Phoenix*? Spanish software house Dinamic certainly does. Indeed, it's producing an new, up-to-date version called (wait for it) *Mega Phoenix* .

I have no details on the gameplay at the moment (what gameplay?), but I do have in front of me a screenshot, which seems to consist almost entirely of molten, leaden death, swarming enemy vessels and a ship the size of the Ark Royal (remember that?). More news when I get it.

CHEATS CORNER

Just space for a couple of keypress cheats... in *Hong Kong Phooey*, to get infinite energy, call up the options table and hold down the keys T, H, U, G, I simultaneously. And for infinite lives in *Blazing Thunder*, hold down the keys S, L, I, M, E on the options table.

Both cheats are from Stephen Troup of Kings Lynn. Well done Stephen!

Rod Lawton

Amiga

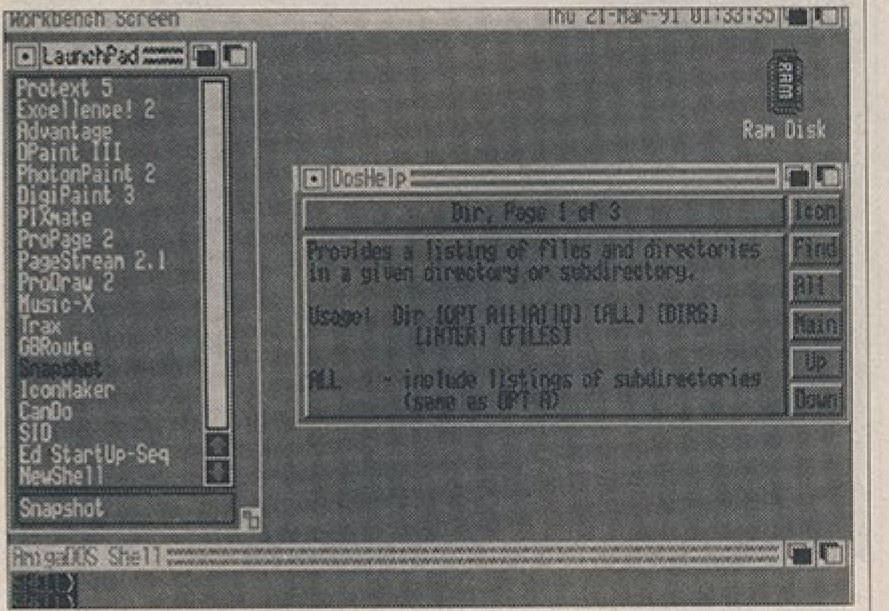
HYPERHELPERS BLASTOFF!

As reported in *Express* a few weeks back, Checkmate Digital has taken on the distribution of INOVAtronics' range of Amiga productivity software. Thanks to Steve Jones at Checkmate, I've been playing around with a couple of the company's products, mainly *HyperHelpers* and *CanDo*.

I'll be covering both these products in depth in a future issue of *Express*, but I must just mention one aspect of the *HyperHelpers* package which I have found particularly useful.

As reported, *HyperHelpers* isn't just a single program, it's a collection of useful utilities to enhance the usability of the Amiga. The one that I've found particularly useful is *LaunchPad*, a handy menu-like program that is an absolute must for anyone who owns a hard disk.

LaunchPad allows you to build up a menu containing frequently used programs on your hard disk. This menu, which sits in a small window on your workbench screen, allows you to load any program on to your hard disk with a



Dir, Page 1 of 3

Provides a listing of files and directories in a given directory or subdirectory.

```
Usage: Dir [OPT A|I|AI|D] [ALL] [DIRS]
           [INTER] [FILES]

ALL    - include listings of subdirectories
         (same as OPT A)
```

• *HyperHelpers: makes the Amiga a far friendlier machine to work with.*

double click of your mouse button instead of searching through the directory structure of your hard disk to find the program's icon.

OK, it doesn't sound like a particularly earth-shattering program, but what's great about *LaunchPad* is that when invoked from your StartUp-Sequence, you can have immediate access to any program without having to click on a single icon. You can even run CLI commands from the workbench, which is really useful.

I now have *LaunchPad* installed permanently on my hard disk; as soon as my machine boots, I can load *Excellence! 2.0* (which I use to write all my copy), *DPaint 3*, *GBRoute*, *ProPage 2.0* or just about anything else simply by clicking on its name in the LaunchPad menu.

HyperHelpers will retail for £50. Expect a full review soon, but in the meantime you can find out more by phoning Checkmate on 071 923 0658.

TFMX UPGRADED

Digital Distribution International (0753 686000) has released further details of its soon to be released music creation system, TFMX II.

Programmed by German software publisher Demonware, the new program boasts many new features to further enhance what is generally regarded as one of the best Amiga sound chip composers available. Here's what it has to offer:

MIDI support – The new editor is now fully MIDI compatible. With the right interface connected to your Amiga, you can now enter performance data directly from your MIDI keyboard. External MIDI synchronisation allows an Amiga running TFMX to be used as a dedicated sound module.

Pattern editor – The previous release of TFMX was criticised for being rather difficult to use, but Demonware has corrected this with the inclusion of an all-new Pattern editor which adds graphical sequence editing to the system. Unlike most programs of the type, TFMX has an editor based on a conventional score display.

Sound Synthesis – Samples eat memory, lots of memory, which is why Demonware has built in a new Sound Synthesis module that allows you to create sounds using Paula's internal registers. These have the advantage of using substantially less memory than conventional samples, while having a trendy 'acid-like' analogue feel to them.

Sampler – Now you can grab and edit samples from directly within TFMX using its built-in sample editor. TFMX provides direct support for any sampler that connects to the Amiga's parallel port.

Tool editor – Details are a little sketchy about this one, but it seems that TFMX II will allow you to create your own editing tools using a tool editor utility. That's all I can tell you.

Other features – Full search and replace (within a music editor?), a PAL-size screen, more macro commands plus much more besides.

MED GOES COMMERCIAL

On the subject of music software, fans of the much acclaimed PD music composer *MED* will be pleased to learn that not only is there a new version available (review next week), but *MED* programmer Teijo Kinnunen has announced the impending commercial release of his composition system.

According to Teijo, the new program looks all set to give heavyweight music packages like *Music-X* a run for their money.

The new program has one major feature, which has a name that virtually explains itself; put simply, *OctoMed* will allow you to compose tunes on your Amiga using a maximum of eight different samples simultaneously. OK, *Oktalyser* has beaten *OctoMed* to it, but *OctoMed* apparently achieves this impressive feat without loss of sound quality (something that *Oktalyser* most certainly doesn't do).

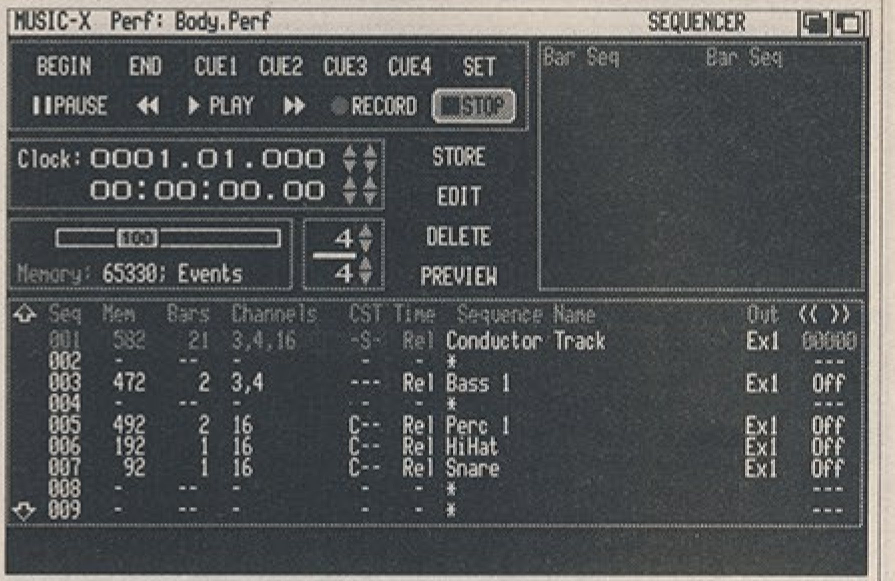
Other new features include powerful *Music-X*-like sequence editing, using a sort of 'semi-stave' approach. At the time of going to press, this was all that was known about *OctoMed*, but I'll pass on more details as soon as they become available.

The program should be available in about two months, priced at about £50-£75. For further information, contact the exclusive UK distributor AmigaNuts United on 0703 785680.

MORE FLIPPIN' MUSIC...

Crikey! The Amiga music scene seems to be a hive of activity this week! Not only have *TFMX* and *MED* been upgraded, but there's even news surrounding MicroIllusions' Amiga industry standard MIDI sequencer system, *Music-X*.

Unfortunately, the news is far from being good. According to a source close to *Music-X* programmer David Joiner, *Music-X 2.0* has been put on ice 'indefinitely' while Joiner works on a range of projects for Commodore's



```
Clock: 0001.01.000
       00:00:00.00
Memory: 65330: Events        4
                             4
Seq Mem  Bars Channels  CST Time Sequence Name      Out  << >>
001 582   21  3,4,16    -S- Rel  Conductor Track    Ex1  00000
002 -     --  -          -   -   *                       ---
003 472    2  3,4       --- Rel  Bass 1             Ex1  Off
004 -     --  -          -   -   *                       ---
005 492    2  16        C-- Rel  Perc 1             Ex1  Off
006 192    1  16        C-- Rel  HiHat              Ex1  Off
007  92    1  16        C-- Rel  Snare              Ex1  Off
008 -     --  -          -   -   *                       ---
009 -     --  -          -   -   *                       ---
```

• **Music-X:** ***Has version 2 finally bitten the dust?***

soon to be released CD-based Amiga machine, the CDTV.

The news isn't all bad for *Music-X* owners, however. MicroIllusions has announced the development of several add-on modules which will extend the power of its acclaimed sequencing system. They are as follows:

Deflam – How many times have you recorded a complex sequence into *Music-X* live, only to find loads of extra notes that you accidentally touched as your hands zipped around the keyboard? With the new Deflam module, any notes shorter than a specified length can be automatically removed.

Scatter – Does your music sound rigid and lacking real feeling? If so, then *Music-X*'s new Scatter tool is for you. Scatter attempts to inject 'feel' into your music (also called 'humanising') by adjusting certain aspects of note parameters (adding errors, basically!).

PrintEvent – Guess what this does! Yep, you've guessed it. PrintEvent allows you to get a printout of the sequence data displayed within the *Music-X* Event Editor (the one that displays your sequences as a list of numbers).

Music-X is also starting to attract interest from third party developers. Music specialist Monumental Music has announced that it is to release a number of *Music-X* compatible protocols for popular synths. These are very much 'still in development', but Monumental promises me that they will cover such synths as the Yamaha PSR range of home synths, the Casio Tonebank and CZ range, the Roland D-series LA synths, Kawaii,Korg M1, T3 and the Yamaha SY series.

Jason Holborn

Archimedes

FACING FACTS

First off this week, two new companies seem keen on raising the summit of the Archimedes outline font mountain: well-known Longman Logotron, which already includes a couple of outline typefaces in its wonderful *Revelation* painting package, and an Edinburgh-based newcomer Design Concept.

The 18 packages from Longman Logotron include Braille, Morse and Semaphore, all pictorial 'fonts' that might be of great use in schools – the Semaphore, for instance, is made up of pictures of cartoonish characters holding flags.

Other decorative faces available include a building bricks lookalike called Brix, and an LCD-type design called Digital. They can all be used with Longman Logotron's own *Pendown* junior wordprocessor, as well as any other RISCOS package that makes use of the font manager.

Design Concept has been advertising its wares for a couple of months now; there are a few typefaces complemented by a couple of small utility programs. The typefaces include Ainslie, an upright handwriting-style face, another LCD and Acropolis, a font which will undoubtedly be much beloved of Greek restaurateurs.

They aren't as carefully hinted as the Acorn or EFF faces, and so the screen representation in smaller sizes isn't as good as you might expect, but then at £2 each, who's complaining. They are fine when printed out. These are all the sorts of faces you wouldn't use too often, and they are better for decorative headlines than for screeds of text you actually have to read. But for some types of documents, like posters for example, they can be just the thing to add a little zing.

One important point is that faces like these, and many in the huge EFF catalogue, do not have any PostScript equivalents. That means that there is no sensible way to print them if you have a PostScript laser printer, nor can you send any work to a typesetter. Here's where dot-matrix printers, direct drives and LaserJets have the jump on Postscript – any typeface you can see on screen can be printed out. If you want PostScript, then you have to limit yourself strictly to a relatively small set of compatible faces.

Longman Logotron is on 0223 323656, Design Concept is at 30 South Oswald Road, Edinburgh EH9 2HG, and the Electronic Font Foundry catalogue can be ordered free by telephoning 0344 872923.

DESIGNER SHADES

Among Design Concept's other offerings is *Shade*, a tiny utility that creates a Draw file consisting of lots of rectangles. Hmm. But the clever bit is that the rectangles are coloured, shading gradually between any two colours you select.

One use is for graduated tints in DTP files: select a frame, fire up *Shade*, select the start and end colour of the graduation, and drop the drawing onto the DTP frame. If you don't want the graduation vertical, group and rotate all the rectangles in *Draw* before putting them on the page. Simple and brilliant and just£1.50.

There's also *CountWord* for when you're using Edit and want to count how many words you have written, and all sorts of other stuff at prices only a little above what you'd pay for a blank disk.

NAUGHTY BOYS...

In an out of court settlement, Aleph One (purveyor of Arm 3 upgrades to the gentry) has received compensation from CJE Micros for unauthorised use of Aleph's software. As ever, the amount of damages remains 'undisclosed', though that's just what everyone really wants to know.

CJE admitted sending out lightly altered copies of the Aleph One Arm 3 cache control utility to people who bought CJE's competing Arm 3 upgrade. The author of the utility, Nick van Someren, has donated his money to charity. CJE is now writing its own replacement software, which will be sent to all the affected customers.

Rather more than slapped wrists, chaps. The Acorn market may be one in which most people are 'pals', and everyone knows everyone else. But this doesn't mean anybody can use anybody else's software. It's illegal and wrong.

A DATE FOR YOUR DIARY

This year's BBC Acorn User show, the top event of the year for Arc fans, will be in October, over the weekend of Friday 11 to Sunday 13. And it moves to its third venue in as many years; after Alexandra Palace and the Horticultural Hall, it's Wembley Conference Centre's turn to host the event. It's a bit like the Eurovision Song Contest, innit?

In fact, October could be a good date. As revealed in *Express* 122, Acorn's planned new portable Archimedes has been put off and looks like being launched in the autumn. By then, there could be something else to partner it. A marketing director of Acorn once said to me, and I quote, "In the computer business, you have to do something pretty spectacular once every four years."

This autumn marks the fourth anniversary of the launch of the first Archimedes, the 310. Don't say you weren't warned.

TYPING TECHNOLOGY

Iota is an unashamedly ambitious young company – it aims to become top dog in the Acorn software market within two years. Its first releases aren't yet to hand, but they will be a typing tutor and *Junior Database*.

Until pen-based computers become the norm, there will always be new people who need to learn to type. In the early 80s, you could wade thigh-deep in typing tutor programs for home micros, but more recently they seem to have fallen out of favour; perhaps today's 16- and 32-bit micros are too advanced for such a mundane job.

So Iota's new typing tutor software makes an attractive option. As well as starting by teaching you to type 'ASDF' and ';LKJ' as with any good typing course, it gives you on-screen prompts to stop you looking down at your fingers, and summaries showing where on the keyboard you make most mistakes. Iota is on 0223 421542 if you're still at the hunt-and-peck stage.

LAYING IT ON THE LINE

Acom looks like challenging Arcterm 7's short-lived reign as the sole RISCOS comms program that's fully multi-tasking and desktop-friendly.

On the 8-bit Beeb, Acom and Acom Host were Acorn's preferred viewdata systems, and original author W G M Roeling was also responsible for the Beebtel network viewdata system attached to many school Econets.

Recently announced by ECD Computers of Delft in Holland, the new Acom is primarily a Viewdata terminal for RISCOS, with a 32-number phone directory and downloading using CET or Xmodem protocols. But it also offers scrolling terminal emulation too (VT52, 100, 200, ANSI and so on).

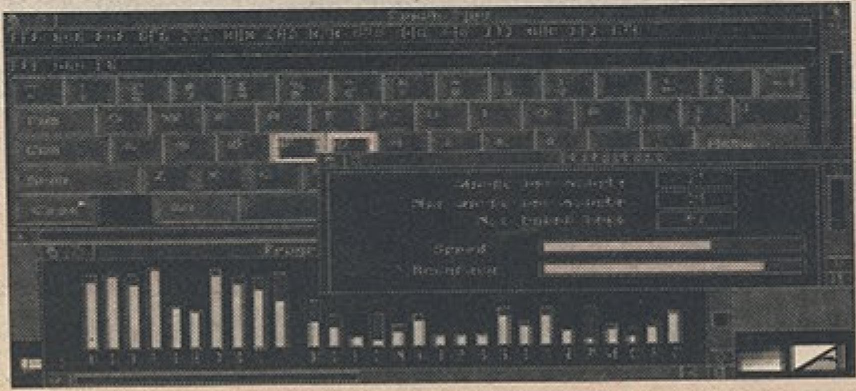
It lacks the scripting language of Arcterm but adds a better help system for new users and a full Viewdata editor for preparing Viewdata frames off-line. And ECD intends to offer upgrades to CEPT profile 2 (French Minitel) and to the much better resolution of profile 1 (German Bildschirmtext), in addition to the standard Prestel profile 3 graphics. Currently, you can only get the two better standards via Longman Logotron's non-multitasking and rather long in the tooth Arccomm software.

ECD is on 01031 15 147643.

COMING UP...

Over the next few weeks, I will be taking a look at a couple of newies from ace software house Fourth Dimension, and a bumper bundle of imaging news: *AIM 2*, a new framestore and Foster Findlay's *X Image*..

Ken Coumarin



• *Learning to touch type need not be a slog with the new program from Iota.*

64

FRACTALS

Fractals are complex patterns created using simple mathematical formulae. They look as if you need some heavy duty equipment and programs the length of *War and Peace* to bring them into being,but in fact, things need not be so complicated. The following program, sent in to me by Chris Wrad of Northampton shows how easy it is to create stunning graphics on your C64 like the ones below. The picture take quite a while to build up!

While the program is running press any key to stop the drawing, and press any key again to quit the program

```
10  DIM A(4), B(4), C(4),
D(4), E(4), F(4), P(4)
20  DATA 4
30  DATA 0,0,0,.16,0,0,.01
40  DATA .2,-.26,.23,.22,0,
1.6,.07
50  DATA -.15,.28,.26,.24,
0,.44,.07
60  DATA .85,.04,-.04,.85,0,
1.6,.85
70  READ M
80  PT=0
90  FOR J=1 TO M
100 READ
A(J),B(J),C(J),D(J),E(J),F(J)
,PK
110 PT=PT+PK
120 P(J)=PT
130 NEXT J
140 GOSUB 500
150 XSCALE=25
160 YSCALE=16
170 XOFFSET=140
180 YOFFSET=10
190 X=0
200 Y=0
220 PK=RND(1)
230 IF PK<=P(1) THEN K=1:GOTO
240
231 IF PK<=P(2) THEN K=2:GOTO
240
232 IF PK<=P(3) THEN K=3:GOTO
240
233 K=4
240 NX=A(K)*X+B(K)*Y+E(K)
250 NY=C(K)*X+D(K)*Y+F(K)
260 X=NX
270 Y=NY
280 IF N>10 THEN
XX=X*XSCALE+XOFFSET:YY=Y*YSCA
LE+YOFFSET:GOSUB 600
290 GET A$:IF A$<>"" THEN
GOTO 310
300 N=N+1:GOTO 220
310 GET A$: IF A$="" THEN
GOTO 310
320 POKE 53272!,20:POKE
53265!, 27:POKE
53280!,14:PRINT CHR$(147)
330 END
500 REM ** SET UP THE
GRAPHICS SCREEN **
510 POKE 53265!, PEEK(53265!)
OR 32
520 POKE 53272!, PEEK(53272!)
OR 8
530 BM=8192
540 FOR I=BM TO BM+7999:POKE
I,0: NEXT I
550 FOR I=1024 TO 2023:POKE
I,13: NEXT I
560 POKE 53280!,13
570 RETURN
600 REM ** PLOT A POINT ON
THE SCREEN **
610
BY=BM+320*INT(YY/8)+8*INT(XX/
8)+ (YY AND 7)
620 BT=7-(XX AND 7)
630 POKE BY,PEEK(BY) OR
(2<UP-ARROW>BT)
640 RETURN
```

Having run this main program you can change some of the lines to make new patterns such as a tree or a weird thing called a 'Sierpinski Triangle'.

● For the tree:

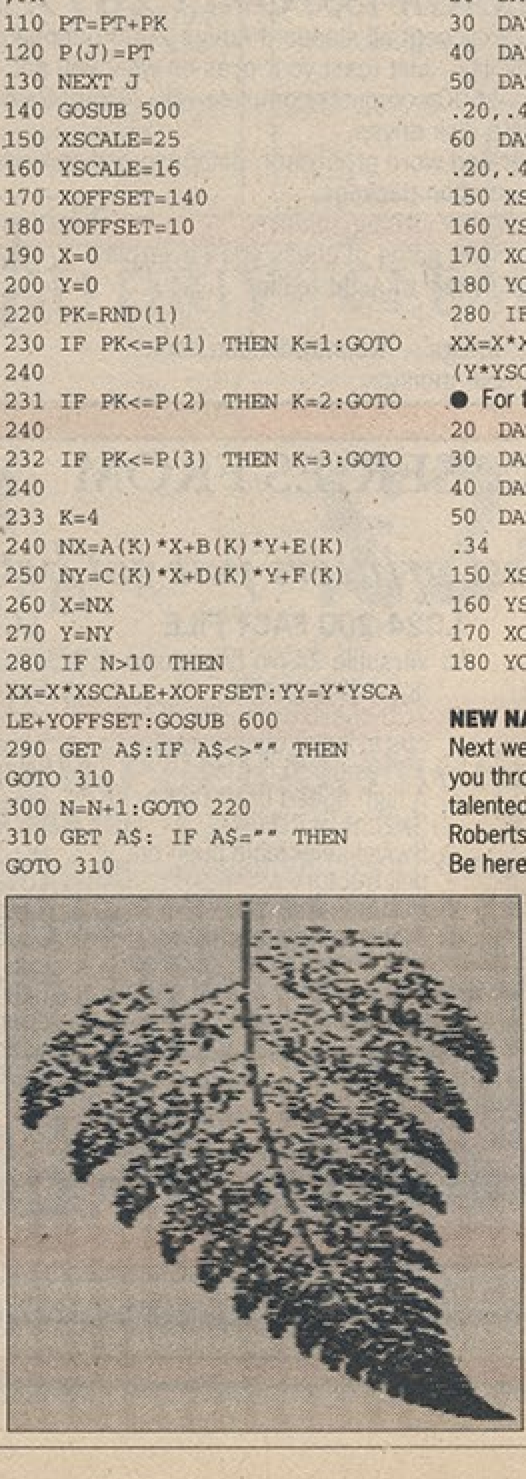
```
20  DATA 4
30  DATA 0,0,0,.50,0,0,.05
40  DATA .01,0,0,.10,0,.20,.15
50  DATA .42,-.42,.42,.42,0,
.20,.40
60  DATA .42,.42,-.42,.42,0,
.20,.40
150 XSCALE=370
160 YSCALE=265
170 XOFFSET=160
180 YOFFSET=50
280 IF N>10 THEN
XX=X*XSCALE+XOFFSET:YY=200-
(Y*YSCALE+YOFFSET):GOSUB 600
```

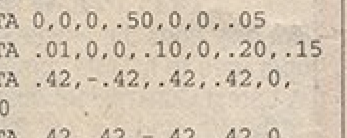
● For the triangle:

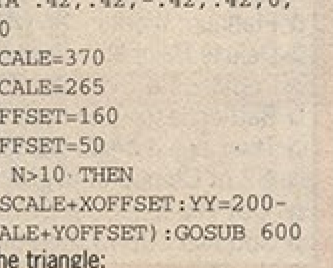
```
20  DATA 3
30  DATA .50,0,0,0.50,0,0,.33
40  DATA .50,0,0,.50,1,0,.33
50  DATA .50,0,0,.50,.50,.50,
.34
150 XSCALE=120
160 YSCALE=110
170 XOFFSET=50
180 YOFFSET=50
```

NEW NAME

Next week you have a new host taking you through the world of the C64, a talented young chap called Andrew Roberts who promises a few surprises. Be here for the start of a new area.







• The main program creates the fractal on the left. The top picture above is the triangle and the one on the bottom is the tree, both created by the sub-programs.

Spectrum

INDIE RAVE

Calling all mystic troll-bashing adventuring types. Here's a bumper bargain selection of stuff that should be right up your street, no matter which far away land, planet or other dimension it's located in.

Zenobi Software, undoubted king of the Speccy adventure scene, has more adventures on offer than any sane person could play, let alone complete. Luckily most adventurers are completely hatstand and should therefore be interested in what the company has to offer. Foremost in the throbbing multitude available are the two volumes of mail order adventure compilations – *The Best of the Indies.* Both are endorsed by bearded guru and all round nice bloke Mike Gerrard, who's written the adventure section in *Your Sinclair* since the Messianic period.

The six games gathered on *The Best of the Indies Volume One* have all been raved about by Mike when originally released and with good reason too. Even stingy old me went mad about the first game to load, *Double Agent.* It represents something a bit different from the usual format of adventures with a neat line in schizophrenic gameplay.

The screen's divided into two halves, one for each of the secret agents. You switch control between them as you try to foil the usual dastardly aliens and recover a crystal. One of the agents under your control is strong but a bit thick; the other is decidedly weedy but intelligent. The devious author starts them in locations where the other's respective talents are needed to progress.

Double Agent is more of a puzzle-based game with no graphics or purple prose and it's sure to provoke severe brain strain in even the most battle hardened adventure experts.

Cloud 99 by Linda Wright is another game that had lots of nice things said about it on its original release. The plot provides a much needed break from the usual fantasy/sci fi stuff. Inspired by a dream, you are expected to investigate the slightly surreal goings on concerning Jack Frost and the weather city of Cloud 99. It's all a bit bizzare but beautifully presented and packed to the edges with yet more devious and downright difficult puzzles.

The Labour of Hercules is next up and is a corking good legendary game featuring all your fave Greek mythological characters. The idea is to complete the 12 tasks of Hercules, as in the legend. Each task is excellently structured, seemingly impossible to complete at first but so obvious when you know how.

The next one, *Domes of Sha,* is set on somewhere called, in typical computer game style, OLAXAS, but don't let that put you off this spiffing and rather large text based quest.

The Secret of Little Hodcome is one of Zenobi's own adventures and fraying around the edges a bit when compared to the rest. It's well structured, though, as you try to rid the hamlet of Little Hodcome of an evil so unspeakable I can't speak about it. No doubt Jeremy Beadle must be involved in it somehow. Mike Gerrard describes it as a good introductory quest and I'd back that all the way.

Bringing up the rear is *Retarded Creatures and Caverns,* a top notch spoof of the original prototype mainframe adventure game. Starring Zenobi star *Bulbo,* a Hobbit-inspired character, it's full of more zaniness and wackiness than a whole month of kid's Saturday morning TV. The bearded one awarded it a Mega Game and he doesn't band those around without good reason. As with all Zenobi games it's well worth typing in any swear words you know...

Best of the Indies Volume One costs a paltry £3.99 and is recommended to any one of a remotely adventurous nature. Order from Zenobi Software, 26 Spotland Tops, Cutgate, Rochdale, Lancashire OL12 7NX.

• *Learn how to make Robocop really invincible with our handy cheats for Robocop 2.*

ROBOHINTS

S Wells of Somerset has just very kindly heaved a huge batch of tips on my desk in the name of helping his fellow Spec-chums. So a round of applause, if you please, to welcome this comprehensive sorting out of *Robocop II.*

Good old S sent me the solutions for the two memory bank sub games after levels one and two. He tells me R=Right, L=left, U=Up, D=Down and F is for Fire.

Got that? Here then, is the solution for the first one:

Part One: 2U, 1R, 1D, 1R, 4D, 7L, 1U, 2L, 2U, 4R, 1U, 2R, 3U, 2L, 1D, 1L, 1U, 1L ,1D, 2L, 1U.

Part Two: 2D, 2R, 1U, 2R, 4U, 2L, 1D, 1L, 2D, 5L, 4D, 2R, 3FR, 3FL, 2FU, 2FD, 1U, 1R, 1U.

Part Three:1F, 1D, 3L, 3U, 2L, 2FR, 2FL, 3U, 1FR, 2FL, 3U, 1FR, 1FL, 3R, 1U, 1R, 2D, 2R, 4D, 2FU, 3R, 1D. **Part Four**: 1U, 1L, 1U, 1L, 2FD, 2L, 2U, 6R, 1FD, 1R, 1D, 1R, 3D, 2L, 2LF, 3R, 3D, 4L, 2U, 3FR.

Providing I've typed it out correctly that should see you through. The second memory bank piece can be similarly dispensed with by following this set of instructions.

Part One: 1R, 3D, 1R, 1U, 1R, 1U, 1L, 2U, 1R, 3U, 3FL, 3FR, 3L, 2D, 2L, 1FR, 4FL, 3D.

Part Two: 1FR, 1L, 2D, 1FD, 3R, 1D, 1R, 5U, 1FR, 1U, 1L, 1U, 3FL, 3FR, 5L, 1D, 2L, 4D.

Part Three: 1FR, 3L, 1D, 2L, 2D, 1FU, 1FR, 1FL, 2R, 2FU, 2R, 2FR, 1U, 2R, 2FR, 1U, 2R, 1FU, 1D, 2R, 4U, 1L, 2U, 1R.

Part Four: 2L, 4U, 3FL, 3FR, 2L, 1D, 1L, 2D, 1R, 3D, 1R, 1U, 3R, 2D, 2R, 2FR, 5U, 2R, 4FD, 4FU, 1R, 2D, 1L.

And there's more *Robocop II* jiggery japery from S with the codes for the lifts which are on level three, apparently – LIFT ONE = 4, LIFT TWO = 14, LIFT THREE = 7, LIFT FOUR = 40, LIFT FIVE = 19, LIFT SIX = 8

You've now got absolutely no good excuses for not completing the whole thing. If you're still too pathetic to finish it I suggest forging a note from your Mum or feigning an old sporting injury. Thanks S!

SEND 'EM IN

Have you got any tips, pokes or cheats for Speccy or SAM games? Send everything you know to Robin Alway, *New Computer Express*, 30 Monmouth Street, Bath BA1 2AW.

Robin Alway

ST

WRITE ALL OVER YOUR ST

By now you will have heard about Atari's new wonder computer, the ST Pad. You know, the one that uses a stylus as opposed to a keyboard for inputting the information. Well, hot from the *Z-Net* on-line newsletter, I have some more information about this exciting machine's technical specification.

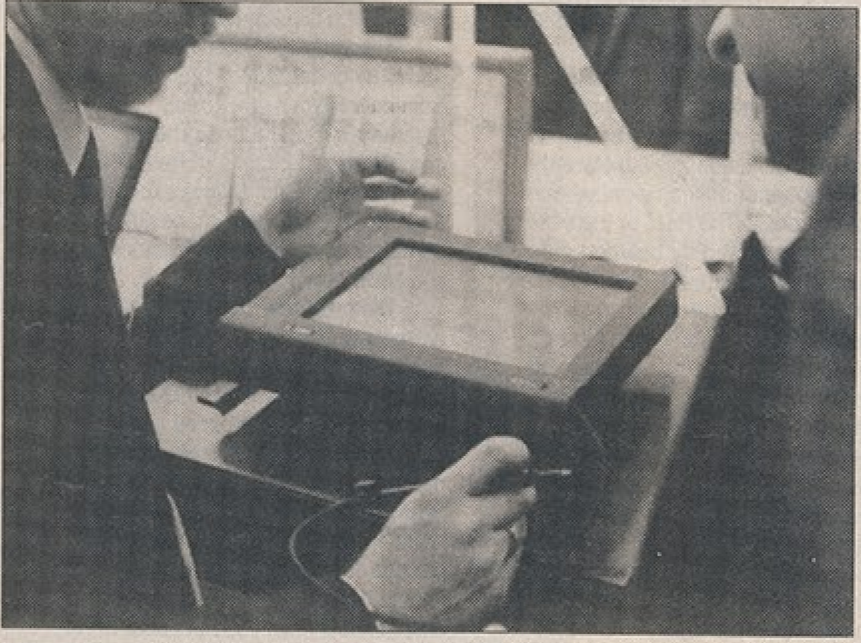
The ST Pad runs off the standard ST 68000 central processor, running at 8MHz. It has an A4 footprint and is 3.5cm thick. It will come in two memory configurations, 1MB and 4MB, both without a hard drive. In terms of interfacing, there's a MIDI port, an RS232 and a parallel interface, a DMA port and a Bus connector.

One of the options, will be a standard keyboard, which is compatible with Mega STs. It can run for up to 10 hours before needing a recharge, which is surprising when you consider that the batteries have to drive a 640/400 resolution LCD screen.

The unit can accept and understand a wide range of character types, including Japanese and cyrillic. What is more you can swap between writing text and drawing sketches quickly and simply. Once you have finished writing or sketching the computer will drop into a halt mode during which time it will notdraw power from the battery; it will then automatically start up again as soon as you pick up the stylus.

ST Pad comes with two silicon drive slots. These can be used for two purposes, either as extra RAM or to load in applications software. These can be up to 4MB in size, which means that programs of considerable size can be quickly and easily loaded.

There is no word as yet on release dates or possible prices. But if the unit does come in at under £600 it will be a major coup for Atari and a mould breaking machine.



• *The ST Pad has the potential to be a groundbreaking machine.*

FIRST CALAMUS-AID

Admit it, *Calamus* is a hard program with which to get to grips. We all know that it's the most comprehensive DTP package available for the ST, but wading around in those icons is comparable to finding your way around the Gobi desert with only a piece of sandpaper as a map.*CalAssistant* is a memory resident help program for *Calamus*. It actually sits on top of *Calamus* as an accessory program, which means that you can refer to it at any point in the proceedings.

The program uses text, icons and pictures to explain each command and adds to these with hints and tips on getting the most out of that particular function. What's more each help section will refer you to the appropriate page in the *Calamus* manual.

Spar Systems, programmer of *CalAssistant*, tells me that the whole package runs in only 90K. However the company adds that it will only run in monochrome mode and you will need a hard drive if you want the software to run at anything approaching full speed.

CalAssistant is available from Spar Systems, 381 Autumn Avenue, Brooklyn, NY 11208, USA, telephone 0101 718 2353169. The recommended retail price is $34.95.

TITLED TV

If you have a video camera and an ST, then the thought has probably crossed your mind that you could combine the two. One of the most obvious applications for this kind of thing is creating title sequences for your own film making efforts.

TV Titles 2.0 is a program which enables you to create professional looking titles that can be dumped to video via a standard television lead. Used in conjunction with a genlock, you could overlay professional sub-titles or comments on images.

The actual titler program consists of a flexible mouse driven front end. Images or text, can be treated to a variety of effects and then run in a set sequence. More than one sequence can be held in memory at a time, making long titles possible.

The displayed text or image can be scrolled, spiralled, dissolved, faded, wiped, venetian wiped or shuttered. These effects can be cued precisely by means of the delay function. All the colours are fully definable and these can be "flashed" or colour cycled to produce animation effects.

When you're happy with the title sequence you can plug the video in and run the program. This kind of program is almost certainly of use to small video outfits as well as home users.

If it sounds like your kind of thing then telephone Caledonia PDL on 0463 225736 or write to 250 Oldtown Road, Hilton, Inverness, IV2 4PT. *TV Titles 2.0* costs £25 inclusive of postage and packaging.

GET YOUR BACKUP

Anyone who's used a hard drive for longer than two weeks, knows the one golden rule: always back it up.

You see, hard drives are irresponsible pieces of hardware, the sole purpose of which is to crash at the worst possible moment, like when you've just saved your memoirs to disk.

Previously the best backup utility around was a nifty progette by the name of *Turtle*, which was icon driven and very flexible. A brand new backup program has been brought to my attention and it goes by the (rather stupid if you ask me) name of *The Good Backup Utility (GBU)*.

The *GBU* maintains a shadow of your hard drive, either on another partition or on a series of floppy disks. It sets itself apart from other back-up programs by using an incremental save feature. What this means is that you'll only have to save to floppy or hard drive programs which have been altered, added or deleted.

This intelligent saving means that it will be considerably quicker than other utilities which simply bung the whole hard drive down on 40 or so disks. In effect, this means that the more often you backup, the less time it takes.

GBU is interruptable. This means that you can hit the space bar and stop it saving. Then when you have a bit more time, the program will remember where you have saved up to and carry on from that point.

The program works on all versions of TOS as well as all versions of ST. The programs costs a mere $29.95 and is available from "The Computer Bug" in Hadley, MA, USA. Telephone the company on 0101 412 584 7722.

Andy Hutchinson

WHOLE WIRED WORLD

A new PC emulator for the Amiga enters beta testing phase, Tandy slashes PC prices and launches a budget CD drive, while Apple sets up a new Mac factory...

BUDGET EMULATOR FOR AMIGA

Most Amiga users will be aware of *Transformer*, a PC emulator for their machines. Trouble is, *Transformer* only runs properly on a 68000-based Amiga, so users of 68020 and 68030-based machines can experience more than their fair share of problems – as if they haven't enough running DOS!

Mark Tomlinson of Christchurch in New Zealand has got round this problem by developing a PC emulator specifically for the 68020 and 68030-based Amigas. And the great thing is, he's only asking US$30 for the program.

To promote the package, Tomlinson is distributing a demo version to the online networks, such as Compuserve and Genie. The demo has two limitations: just one floppy disk drive is supported, and only 2Mb of hard disk space can be used.

According to Tomlinson, his program is still in its beta test stage, so bug reports are welcomed. The final version will be shipped free to all beta testers.

To run *IBM B*, as the package is called, Amigans will need a 68020 or better-equipped Amiga fitted with at least 2Mb of fast RAM – the package won't run on a 68000-based Amiga. The reason for gobbling so much memory, Tomlinson says, is that the emulator allocates 1Mb of memory to the PC's virtual address space. A maths co-processor is not required, but later versions of the *IBM B B* emulator may use one to emulate an 8087.

For further information contact: Mark Tomlinson, 30 Kirner St Christchurch, New Zealand.

Email via Usenet – tomlinson@elec.canterbury.ac.nz

• Video Toaster: new dawn for the Amiga?

AMIGA EXPO IN NEW YORK

While Cebit-goers were tramping home from Cebit in Hannover in late March, New York City played host to Amigaworld Expo. The show, which spanned three days, brought a host of Amiga goodies to the fore, not the least of which was Newtek's *Video Toaster*, which got its first major hands-on airing to the public.

Newtek managed to rally staff from ASDG and GVP (two Amiga mainstay companies) together for its press launch of the *Toaster*. Mark Randall of Newtek discussed how Apple developed the Macintosh platform as a revolutionary machine that would bring high end graphics power into the homes of many.

After initial success , sales of the Mac dropped abruptly after only six months on the market. Everyone thought this would be the end of the machine, according to Randall. Then the Laserwriter was introduced, and the Mac found its niche in the DTP market, and the rest is, as they say, history.

Randall then said that the *Video Toaster* is to the Amiga what the Laserwriter was to the Mac – it is the tool that will bring the Amiga to the forefront of the desktop video marketplace and take the Amiga out of the doldrums. He said that many people have approached Newtek saying 'Wow – what a breakthrough – too bad you picked the wrong machine to create this thing for – if only you had done this for the IBM or Mac...'

Randall claimed that the reality is that the Amiga is the only machine Newtek could have chosen for the job, because it is the only true video machine. The *Toaster* would not have been possible on any other platform.

GVP staff told show-goers about their role in the *Toaster*'s future by explaining the importance of its accelerators to achieving the maximum power that the *Toaster* is capable of.

GVP's 33 and 50 MHz accelerators for the Amiga are great time-savers when it comes to rendering with *Lightwave*, the three-dimensional modelling package bundled with the *Toaster*, and are a boon for the quick loading of stored graphics images

Elsewhere at the show, Mast Technologies was demonstrating its *Colourburst* 24-bit video board for the Amiga that is expected to sell for under $600 – not bad for a true 24-bit colour card that offers stunning images.

Among several other interesting new products on show were: ICD's *Novia 20i* internal 20 MB Hard Drive for the A500 Amiga; Sunrize Industries' *AD1012* and *AD1016* digital audio cards which can handle 12-bit and 16-bit sound respectively, with up to 100,000 samples per second – availability of hard disk storage space is the only limitation on sample length; Softlogik's *Art Expressions* structured drawing package; GVP's *Scala* presentation package, and Oxxi/Aegis' *Presentation Master* – a much-needed object-oriented business presentation tool for the Amiga, which is similar in capability to Aldus *Persuasion* on the Mac

USA AMIGA PRICES SLASHED

And now for some good news – Commodore US has shaved pricing on the Amiga 2000 and 3000 series by between 10 and 26 per cent in a bid to make the machines more price competitive. The A2000 drops 16 per cent – down to $1,599 – while the A2000HD falls by a full 26 per cent down to $1,999. The A3000 Model 16/50 falls the least – by 10 per cent to $2,999, while the Model 25/50 has been shaved 12 per cent – down to $3,499.

TANDY'S $199 DOS COMPUTER

In a US bargain-bin sale, Tandy has cut pricing on its 1000HX PC to just $199 – the machine is a complete PC in an Amiga A500-style casing, complete with DOS in ROM, a floppy drive and built-in *Personal Deskmate 2* software. The only thing missing from the package is a monitor, which Tandy will sell you for as little as $60.

Tandy UK is still charging around 300 pound notes for the machine. But if it's being phased out in the US, it's a fair bet that it's not long for UK consumption either. Watch this space.

As if a $199 PC wasn't enough, Tandy has also storm-trooped in with a sub-$400 CD-ROM drive. The CDR 1000 unit is supplied as a direct replacement for a disk drive on a PC and loads like an audio CD system, with disks slotting into a tray that rolls back into the main casing, just as on an audio unit.

No disk caddy is required, as with competing systems, so what's the catch? Well, the drive isn't the fastest on earth, not does it have a fast data transfer rate – 150K per second is the best it can manage. Still, the $399 price tag for the hardware includes an 8-bit interface card for the PC and driver software, as well as all the necessary connections.

HP AND LOTUS ALLIANCE FOR POCKET COMPUTER

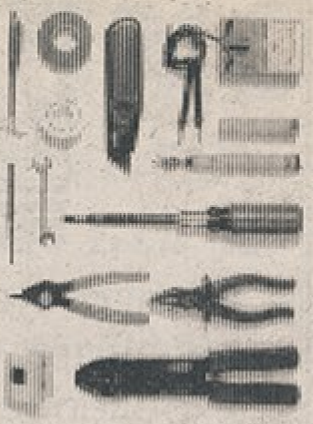
Reports from the US suggest that Lotus is working secretly with Hewlett Packard to develop the HP 95LX, a palmtop computer in the same vein as the Atari Portfolio. The unit will reportedly contain an appointment calendar, calculator and software to maintain a complete Filofax-style diary system. ROM cards are the order of the day for storage. The machine is being readied for a summer launch with a target price of $695.

MAC PRODUCTION UP BY 30%

A former Data General plant in Colorado Springs that has been on the market since 1989 has been purchased by Apple Computer in response to the increased demand for its new line of low-cost Macs. The 340,000 square feet facility becomes Apple's fourth plant and will require between 800 and 1,000 people to run.

Apple currently has production facilities in Freemont, California, Cork, Ireland and in Singapore,so why the expansion? According to Apple, the plant became necessary when, even after extending the Singapore and Cork plants to round-the-clock operations and airlifting Mac Classics in from Singapore on almost anything with wings, including planes from Aeroflot, the Russian airline, it proved impossible to satisfy the massive demand for Macintosh computers. ■

CIRCUIT CITY



Building a NICAM TV tuner/decoder sounds like a tall order, but fear not – Keith Pomfret and Michael Stirling put on their platform shoes and rise to the occasion.

When Circuit City recently found the Amstrad MP3 TV tuner alive and well in Shropshire, Scart monitors suddenly became TV sets and TV detector vans were seen buzzing around wherever there was a computer to be found.

It was a useful idea, and a pleasant reversal of the more normal use of a TV as a monitor. As the 90s progress all kinds of media are merging: computers are being used to control CDs, sound and vision are digitally encoded and genlocks are combining computer output with video and broadcast signals.

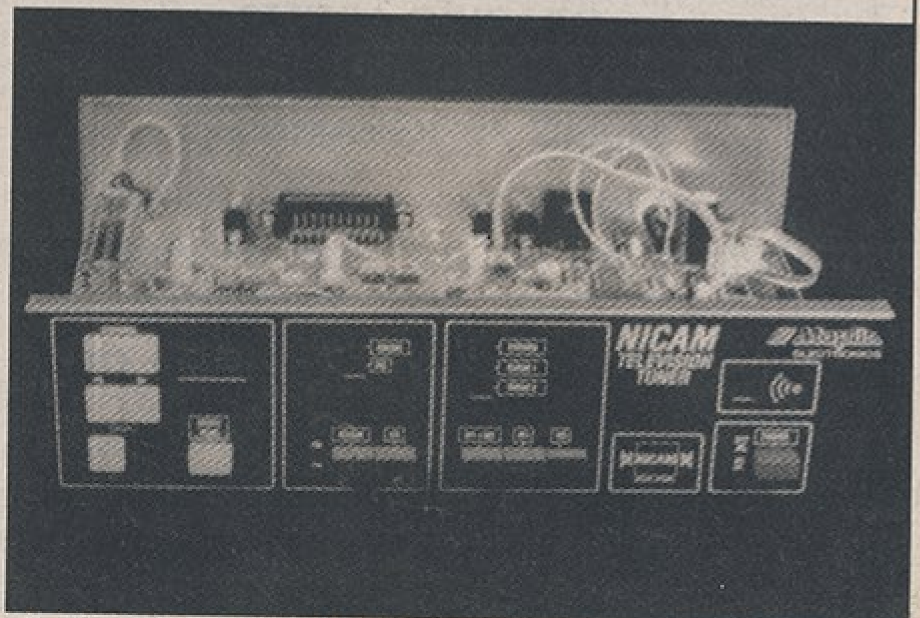
But while we're waiting for the broadcasting giants to decide on which wide screen TV standard they are going to throw the corporate weight behind, we've at least got NICAM stereo sound.

NEW SOUND FOR OLD

If your current TV doesn't have NICAM, you don't want to trash it for a new NICAM one, or if you've a Scart Computer monitor that you'd like to use as a second TV with digital sound, the Maplin NICAM Tuner system is probably ideal for you. It's a comprehensive kit that contains all of the parts to build a NICAM Stereo sound decoder, a TV tuner and multiple outputs.

It is possible to build the kit a module at a time to save cash but, if you can afford it, £139.95 will provideyou with a black box that takes the incoming TV signal, strips the encoded NICAM signal from it and can output that to Scart, Phono and DIN connections.

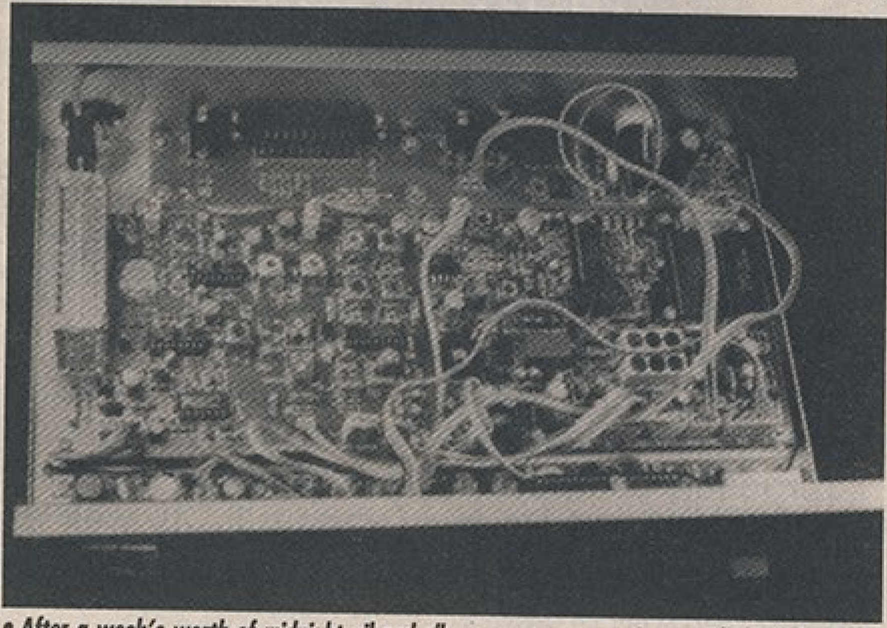
The video element is available as a modulated signal, a composite video signal or via the Scart output. An advantage of all these video and audio outputs is that the Maplin NICAM kit is widely compatible. But important to many builders is the tuner element replicating the tuner of a colour TV. The benefit here is that the Scart output can be used to feed a monitor that conforms to the Scart standard. Thus, the monitor on your Amiga, Arch, ST, or even CPC may display TV programs.



• The NICAM TV tuner/recorder. A black box that wouldn't look out of place beside your stereo, but which can turn your scart monitor into a TV – but don't forget your licence.

To make best use of the unit's ability to decode the NICAM signals, you'll need some sort of stereo or hi-fi. It's perfectly possible to feed the digital stereo signals into a Scart monitor with sound capability, but to appreciate digital spatial stereo a better system is called for.

The two uses that we put the NICAM decoder to were as a second TV via the Amiga, and as a way of using the expensive B&O hi-fi in the lounge to add surround-sound digital stereo to last year's almost new FST television. In the case of the Amiga, we tried connecting the NICAM decoder to a stereo Scart monitor and making the audio connections to the monitor. Sitting close to the screen as one would when working at the keyboard, the spatial effect of the digital sound was apparent but sitting further away for normal viewing, a different solution was called for. A pair of bookshelf speakers and a mini stereo amplifier from Trilogic were the answer and in a small room (3m x3m) the new TV Amiga with digital sound brought a new level of entertainment to the computer.



• After a week's worth of midnight oil and elbow grease on a project rated 'fairly hard' the inside story - a well laid out, internal design.

On a more serious computing level, the digital output meant that digital sampling could be taken straight from a broadcast signal without the hiss that normally accompanies TV broadcasts.

The only down side of that is that TV broadcasts carry copyright and you should get permission before sampling them in the same way that you'd get permission if you wanted to sample Madonna's latest offering.

The addition of a genlock to the system meant that it was possible to combine video, audio, text and picture files to produce an interactive database where all of the sources were either digital or digitally processed.

In the lounge we aimed for leisure. Here we wanted the current TV to be enhanced with NICAM digital sound. The four speaker Hi-Fi was attached to the decoder unit and the speakers re-positioned to make the screen the focal point of the room. Result, TV programs enhanced with digital sound and movies that make the cinema redundant.

The unit's enhancement of audio signals made

SHOPPING LIST

- **NICAM kit from Maplin, price £139.95 – or call them on 0702 554161**
- **Other peripherals can be obtained from Trilogic on 0274 678062**
- **Expensive Hi Fi and TV from Bang &Olufsen, somewhere in Scandinavia**
- **Genlock from HB marketing on 0753 686000**
- **House containing small room originally acquired from Barratt Homes**

THE BUILD UP

Michael spent a week of his spare time turning the heap of components into a fully functional NICAM tuner and decoder. This is what he found:

- **The documentation could have been better; but with the help of the Maplin constructors magazine, I was able to complete the kit**
- **A little confusion was caused by the inclusion of resistors of both old and new colour codings but the constructors guide did explain the colour coding.**
- **During construction I worried about dull solder joints. When I switched from Ersin to Tandy solder the problem went away. The reason? Ersin solder is 60/40 per cent lead to tin; Tandy is 60/40 per cent tin to lead.**
- **General component quality is good. The PCBs are of high specification although C17 and C18 (display PCB) had holes too closely spaced for a good fit.**
- **I enjoyed building this kit and burned quite a lot of midnight oil to complete it in a week. Not for the beginner and full use of diagnostic tools and equipment was needed to test the various sections. As well as tools for construction, a digital multimeter, an analogue multimeter and an oscilloscope were used for diagnostic checking and tuning.**
- **Total time spent on the kit 25-35 hours including diagnostics Difficulty, fairly hard.**

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The Sales Curve's fast growing software label **STORM** wants top quality Development Teams and in-house programmers to code its future releases.

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If you have a proven track record on Amiga, ST, C64, Spectrum, Amstrad, Nintendo or Sega, contact:

THE SALES CURVE LTD
Unit 17, 50 Lombard Road,
London SW11 3SU
Or phone the Development Manager,
Rob Henderson, on 071 585 3308

TECH TIPS

Struggling to learn a programming language? Need some help to get the best sounds from your ST? Got any tips? Send your stories and queries to Keith Pomfret, Tech Tips , New Computer Express, 30 Monmouth Street, Bath BA1 2BW.

■ HELP! BASIC database

I have struggled for a couple of years to write a database program for my PC. I learned computing on a BBC B which had the BASIC language on a ROM, so this is the language that I feel comfortable with.

I want the database to record the details of members of a computer club of which I am the secretary. The problem is that as I get the program to work, I dream up another utility that would make it better. I'm on Version 12 now and being realistic, the program is never going to get to the stage where it works 'properly'.

All of the bolt-on loops and routines bring with them a time overhead and it can take half a minute to dig out a record. I now realise that I have a couple of alternatives: I can either learn a new language or move on to using a commercial program.

I was against the idea of a new language but we're changing the computers where I work from PCs to a mini system and there are a couple of originals of *RapidFile* going free with original disks and documentation.

What I need you to tell me is, would *RapidFile* do the job for me and is there any way of speeding up my program without learning a new language?

John Fetter, Dulwich

If you want to take the easy way out, *RapidFile* will certainly do the job. It will run on any true XT or AT clone and offers features that will hold your name and address lists, mailing labels, checks, calculations, inventory, form letters, accounts and reports.

To help you even further, there's a spelling checker and a thesaurus. If there's an original going begging, grab it with both hands. *RapidFile* comes from Ashton Tate (the folks responsible for *dBase*) and will be worth its weight in gold to you.

If you want to speed up your own program, print it out and take a long look at it. BASIC programs become clumsy and cumbersome when you add bits as you need them. It may be that you've done the same sort of routine several times in the program. Perhaps you can combine several routines into one module – which should make the program more compact.

You didn't say which dialect of BASIC that you're using, or whether it is compiled or interpreted. If you are using an interpreted BASIC, get hold of a compilable BASIC, make the necessary dialect adjustments and your program should run a good deal faster once compiled to code instead of being interpreted an instruction at a time.

■ HELP! Amiga s-s-samples

I have an Amiga 500 with 1Mb and an extra drive. When I bought it (second hand) it came with a piece of software called *Audiomaster II* which is a sampler and player. There are a few demos on the disk and I am impressed enough to want to try sampling myself.

A friend has offered me the Trilogic Mk 2 stereo sampler and I want to know whether this will work with *Audiomaster*. I also want to know if I'm breaking the law taking samples from my CDs. My Dad says I am (he's a stiff) but my Mum says if I only do it for my own fun, no one will know and it doesn't matter.

Mike Brough, Coventry

The Trilogic Sampler will work with your *Audiomaster* software. Incidentally there should also be some sampling software with the sampler hardware. It's quite basic but it's good fun and an easy way to learn about sound manipulation.

There's also a new version of *Audiomaster* out - *Audiomaster III* is everything that its predecessor was and more besides. If you want to get hold of a copy of the latest version, give Silica Shop a ring on 081-309 1111.

To address your other question, sampling copyright material without permission from the copyright holder is theft. It's no different from any other theft. By sampling other people's work you potentially deprive them of the benefit (financial or otherwise) of their own work.

Having said that, I'm sure that everyone that has ever played with a sampler has fed something commercial into it if only to find out what Madonna sounds like backwards. The harm isn't done by the occasional giggle caused by manipulating a well known sound but by the danger that people will pass off other people's work as their own. The golden rule has to be: If in doubt, don't.

If you are going to sample sound, why not try to be original and look for new sounds instead of borrowing other people's. This isn't as difficult as it sounds. With a cheap (£20) microphone and a tape recorder, I went out to look for sounds and came back with some quite splendid noises. Perhaps the best was a slapping bass guitar sound that was made by plucking the alternator belt of a 38 tonne Foden truck with a tyre iron and then manipulating the frequency and content in a sampler. This may sound like an extreme example but it serves as proof that there are plenty of usable sounds out there without borrowing someone else's.

■ HELP! Flat ST

What are flatties in my ST? I was hoping to upgrade the RAM from 512K to 1024K but the shop I took it to said that it is a nearly impossible job because the memory is made up of flatties. I have searched the manual and can find no mention of this.

I've since found a company advertising in a magazine that will do a memory upgrade to any ST but before I send it off, I want to solve the flatties puzzle

Neil Beecham, Maidenhead

I think that the flatties that you refer to must be surface-mounted chips. These are attached directly to the circuit board instead of being attached by legs into sockets. As there are no sockets, your local dealer probably thought that the job would be too much hassle.

It shouldn't be too difficult though. There are several companies specialising in ST memory upgrades. One of the simplest routes is via a a circuit board that fits over the memory management unit in the ST and allows the memory to be upgraded to 1Mb.

If you are competent with a screwdriver and you don't mind waving bye-bye to any remaining warranty, you could always get the board from Third Coast Technologies and have a go at fixing it yourself. Only do this if you are confident of your abilities though. Don't risk a good computer to save a few quid. Third Coast is on 0257 426464.

■ HELP! PC gamer

What do I need to plug my joystick into a PC? I have an IBM XT clone and an Amiga and a couple of joysticks. Most of the Amiga games only use one joystick at a time so I may as well have the other one attached to the PC. The XT has no joystick socket but most of the PC software can use a joystick so how do I plug one in?

Ade Walker, Newcastle upon Tyne

First the bad news. The joysticks that you use with your Amiga are a different sort to the ones used with a PC and won't work with it. The joystick used by the Amiga and most other computers is digital. That means that as you move the stick to one of the positions, a switch closes and makes a circuit that can be on or off.

A PC joystick is analogue. A couple of potentiometers measure the changing signal across the X and Y axis of the device and from their output the PC can work out the exact position of the joystick shaft. This is a more accurate, but more complicated system.

In order to interface your PC with an analogue joystick, you'll need a Games I/O card. This is generally a half- or one-third-length card with the necessary 15D socket for an analogue joystick.

Now the good news. It needn't cost an arm and a leg to set your PC up for joysticks. A games card can cost as little as £12.50 (All Formats show recently) and an analogue joystick can be had for about £20. And of course you could keep an eye on the *Shopping Express* reader ads for a good deal...

■ HELP! Amiga soundcard

Although the Amiga has undoubtedly the best sound of any computer, it can still be limited if in use as a sound module for MIDI. If I bought the Checkmate 1500 or Bodega Bay and a bridgeboard, could I run the Roland LAPC1 soundcard or is there a simpler way to achieve this result? It seems a bit expensive but it's what I want.

Tim Emmanuel, Golders Green

A much simpler and much easier way to achieve the same result is to attach a standard MIDI interface to the Amiga and then add a sound module to that using standard MIDI cables. The LAPC1 is a PC card with the sound capabilities of a Roland MT-32 sound module. You can generally buy an MT-32 fairly cheaply second hand, which would get you where you want to be hardware-wise.

All you'd need then would be some decent MIDI software and you'd be set up nicely. Your interface could cost you anything from about £20; a decent suite of MIDI sequencing software can be had for under £100 (Try *MRS* from Doctor T) and the MT-32 shouldn't set you back more than £100.

To do it the way you'd planned would cost you over £1,000 in hardware and software and you'd be no better off so far as sound goes.

■ HELP! What's in a name?

I heard that it's possible to replace the nasty 9-pin printer of a PCW with something a little better. An article in a PCW mag showed a PCW with a Star 24-pin printer attached. Is it possible to go a step further and run a laser printer from the PCW?

In the office where I work we have two laser printers (Epson) and these are shared by five computers. I noticed that a spare 'spur' under my desk seemed to be part of this set up. On asking, I was told that there used to be six computers attached to the printers. The set up involves a manual switch box - before you can use a printer, you have to switch it to your computer. The laser printers are used in Epson emulation mode and no-one would mind if I were to add my PCW to the office printer system.

I use *Protext CPM* on the PCW and I'm sure that this can be configured to drive an Epson printer.

May Vale, Truro

You will need a parallel interface on your PCW in order to connect it to the Epson laser set-up, but other than acquiring that bit of kit, the rest should be plain sailing and completely free!

Of course, you'll need to configure *Protext* so that it knows to drive an Epson Printer instead of the Amstrad nasty ninepin. Instructions on how to do this are in the *Protext* manual.

The parallel interface connects to the PCW via the edge connector at the rear of the monitor cabinet, and a standard parallel cable will connect the interface to the printer. Set the switch box to your spur and you'll be printing crisp laser copies from your PCW.

■ HELP! Amiga sound

After a year of eye-screwing-up we've graduated from a TV to a monitor for our Amiga A500. Following your advice some time ago, I purchased an Amstrad monitor from the Amstrad CPC series and my pictures are much clearer. Unfortunately, the monitor has no sound and although we've successfully connected the twin stereo phono outputs on the Amiga to the Hi-Fi, Dad doesn't like *Outrun* through his precious Bang and Olufsen.

Is there a purpose made mini stereo for the Amiga or can you suggest an alternative approach?

Tracey Laing, Telford

There are several companies advertising stereo amplifier and speaker add-ons for the Amiga. For a ready-made solution you could contact Trilogic on 0274 691115 – they do a teeny amplifier and a choice of either car-type stereo speakers or rather elegant bookshelf speakers.

If you want to mix and match yourself, try your nearest Tandy where they do a wide variety of amplifiers and speakers that could be adopted for your system.

■ HELP! Warranty worries

I was asked by security at Heathrow to open up my laptop so that they could check that it didn't have a Semtex battery. I argued and was allowed to prove that it worked by loading up and running some software from the hard disk. The thing that worries me is that as a regular traveller, I often take a laptop on a plane to work with. So far, it hasn't got as far as total disassembly but one day soon it may.

If I am forced to take the lap top appart to satisfy the curiosity of security men, will the warranty suffer? Will the manufacturer refuse to look at the machine if it has been tampered with in this way?

Gus Chandri, Birmingham

There's no simple answer to this - it all depends on the manufacturer. In simple terms, if you open up a computer it normally invalidates the warranty. This is a reasonable condition imposed by manufacturers to stop people meddling with the insides of the machine and then getting damage put right for free.

If you are forced to open the machine up, you should contact the machine's manufacturer and dealer as soon as possible afterwards. Explain the circumstances that the machine was opened in and ask them to inspect it and confirm that the warranty won't be affected.

They aren't obliged to do this and will probably charge you for the service, but with lap tops costing up to £8,000, your warranty could be worth a lot of money.

If the machine has only been opened for inspection and no damage has been done inside, there isn't any real reason why they should not want to extend the warranty coverage.

■ TIP! Punch drunk

I took 25 720K PC disks (3.5 inch variety) and using a hole punch, added the extra hole needed to persuade my PC that they are in fact 1.44Mb disks. The hole punch was on the desk anyway and the job took ten minutes. The PC will read and write to all but two which give a media error. That isn't much of a penalty when you consider that I've got the equivalent of an extra 23 disks for free.

What annoys me is that I've spent the last two years and a lot of my firm's money buying the expensive disks.

Roland Watkins, Glasgow

You aren't the first and you won't be the last person to realise that a minor modification to a disk can double its capacity. Although you have what seems to be a low failure rate (eight percent) you may find that the failure rate increases. The media on a 720K disk isn't as dense as that on a 1.44Mb disk and people using converted 720K disks have reported a high failure and data-loss rate.

If it is your company's valuable data that you are penny-pinching with, think again. The extra cost of guaranteed 1.44Mb disks is worth paying when you measure it against the cost of losing valuable data.

■ HELP! MIDI compatibility

My son pointed out the MIDI ports on his Atari ST when we planned to buy a keyboard for his sister for a forthcoming birthday. He is under the impression that if we buy a MIDI keyboard for his sister, they will be able to utilise his ST as a multi track recording studio for it. Is this true? He has a sequencer software package that he got in the public domain for a couple of pounds. Will this be what he needs?

Ron Bentham, Manchester

He is right. As long as you buy a keyboard with MIDI ports, you'll be able to use the ST and the sequencer to drive it. If you can get a multi-timbral keyboard this will be even better as you will be able to assign different MIDI voices to different tracks.

This means that you could for example record a bass on track one, piano on track two, strings on track three, and a couple of solo instruments on tracks four and five and percussion and effects on the remaining tracks.

You would be able to play back your orchestration in multi-timbral mode playing all of the tracks together.

The other good thing about MIDI is that it's expandable and grows with you. Tracks that you record on a £100 micro-keyboard today will play back on any instrument equipped with MIDI. This means that something recorded at home could be taken to a studio and played back on a £250,000 Synclavier. As your system grows you don't actually lose anything that you have worked on. Your compositions can grow too.

■ HELP! CPC Plus

The CPC Plus seemed like a good logical progression with its cartridge port and, having all of our software on disk, we bought the new machine. I have to say that it's a disappointment.

All of the exciting new features only work in the cartridge mode so we haven't made much of a gain on the original machine unless we buy cartridges.

I've learned enough CPC BASIC to write programs for my own entertainment and even taught the kids to play screen spirographs with Logo. I want us to get more out of the machine so it's time to learn machine language or assembler or whatever it is that produces all of the commercial games.

Is there a book which will teach me a bit about low level programming specific to the Amstrad CPC?

There are several books that fit the bill and whichever one I suggest, I've no doubt that someone else will suggest a 'better' one. Still I'll risk that. *Machine Code for Beginners* on the Amstrad (ISBN 0-7447-0025-6 at £6.95) should do the job without breaking the bank.

It was written by Steve Kramer seven years ago but for my money, offers a logical well defined approach to machine code programming. If you have difficulty getting a copy there are several other books that cover programming the Z80 processor of the Amstrad CPC series.

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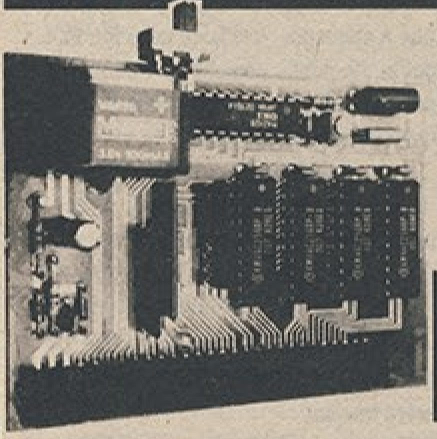

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Tim Smith's CENTREFOLD

Write to 30 Monmouth Street, Bath BA1 2BW
(Like RAMS to the slaughter)

OPENING TIME

Welcome, welcome. Forgers, thieves and cut-purses. That's what the news seems to be about at the moment. First we have viruses, then we have crackers, and now we have cartridge counterfeiters. Where will it all end? In my opinion the likes of these scum-bums should have various parts of their anatomies inserted into cut-sheet feeders until they promise not to do it again. All right, this sounds a little harsh in the present liberal climate but just look at Revolutionary France in the 1780's and onwards. The guillotine sat there in the centre of Paris doing its business. Were there any computer viruses, hackers, crackers or forgers? There were not! I rest my case. Don't get me wrong, I'm not calling for the return of capital punishment for these so-called self-styled 'people' just for a little more justice. That's that for now, rant over.

Computer games, now there's another rant which could be had. Did you know that *Super Mario Bros* has already sold so many copies that everyone on the planet has one even if they don't know it. Go on, look in the bread bin, or under the sofa or behind the dog, and you will spot a copy. Secret files downloaded recently show that Nintendo has began a marketing drive on Mars. The theory behind this practice is that if you get a brand name into some one's head when they are young, then you have for them for life. Well it works with the Catholic church. Nintendo's marketing folk decided to take that theory to its limits and, as it says in the file: " Getting product awareness instilled into five year olds is effective in the long term. So why not go further and hit a market before it has even evolved!".As I write, PR people are sticking speakers which play the theme tune and sound effects to SMBs into pools of primeval slime hoping that this will have a positive effect in the future. Marvellous what foresight can do innit?

A Centrefold Computer Marketing Clever Class: Lesson 1. Selling Yourself

By our media correspondent
Paul Boogle-Bargle-Hogarty

Hi there, Boogle-Bargle-Hogarty's the name and selling's the game. Let's touch base on a few concepts here. Figures suggest that there are now more computers on the market than there are people who want them. This goes double for peripherals, disks, screen filters. This scenario presents a challenge; even on the second hand market, can you achieve 'the sell'? I've been talking to a few people, putting some concepts on the stoop and seeing if the cat licks them up. One of the ideas which was on the hardball-quality-upside axis was to have a computer embedded in your head. Shows brand loyalty, shows commitment, shows other marketing people that you will do most things in the cause of 'the sell'. What follows is a look at one man who picked up this concept and ran with it. We will call him Mr X. Will we call the computer in his head, Dick.

As you can see from the illustration, the effect of a computer in the head is quite devastating.

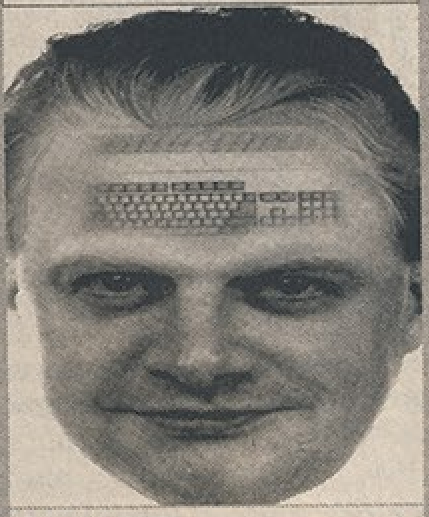
Unhappily, the process can go horribly wrong leaving your genuine attempt at serious marketing looking like a pathetic, absurd, mockery and an insult to the intelligence of the buying public; known in the trade as 'the punter'.

The final pics show what can happen if your marketing cosmetic surgery is carried out by cowboys.

BEFORE (Correct)

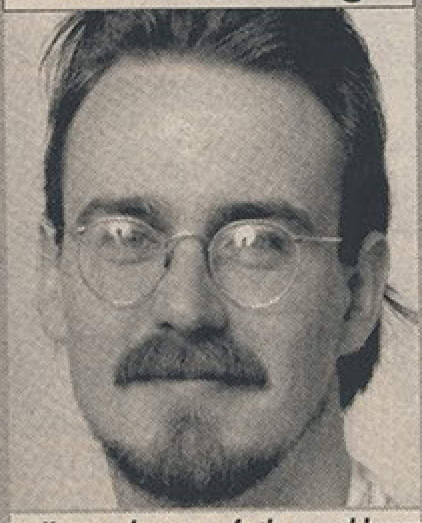
• Here we see Mr X with only the merest hint of airbrush surgery. Won't sell many computers that way. But later that same day some thing happened...

AFTER (Correct)



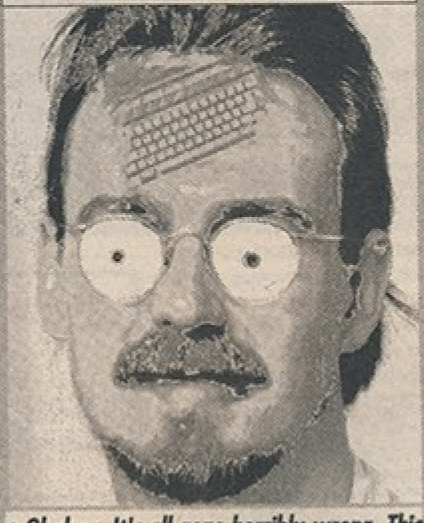
• Mr X discovered new 'Computer-in-the-forehead' a revolutionary new way to make a mint. Also included in the range is 'Telephone-in-the-skull'

BEFORE (Wrong)



• Here we have a perfectly normal human being. Nothing wrong here, until he went to a firm of cowboy marketing cosmetic surgeons in the quest for 'the sell' ...

AFTER (Wrong)



• Oh dear. It's all gone horribly wrong. This man would be lucky to sell a £2.50 Mac. Marketing surgery has blown it. From now on, Mr Y will have to live with this image.

GREAT PEOPLE IN COMPUTING

Barry Crambic: Programmer and Inventor
Born: 12/11/31
Died: 12/11/91

Barrington Crambic was a figure of Godhead proportions to many people in the computer world. He made his mark in 1947 when he was found under his bed in Crowthorne asking if the war was over yet. He was then be told by his father, a professor of computational coincidence at Bracknell University, that the strange marks he had made on the underside of his bunk were in fact a major break through in programming. According to the professor, later quoted in his son's biography *Barry Crambic: Genius or Perv?* : "The young lad had made the marks in an act of creative terror. I immediately recognised them as the basis for a portable programming language which I later called PERV (Programming Environment in Relative Variables)."

The basic problem for Barry was that he could only work in war torn areas under his bed, in a state of utter terror. This meant that the rest of his creative life was spent in Vietnam, Korea, and Beirut. He leaves behind him a bed. ■

◆ FOR SALE

2 20 MEG hard drives for PC, + XT controller card. £180 o.n.o. Phone Simon - 021-459-0800 evenings or weekends.

HYUNDAI PC/XT for sale; inc: 20 meg hardcard, 31/2"/51/4" disk drives, 640k, RAM, A4 mouse, original sofware, books, and lots more. Spring bargain at £450 o.n.o. Contact Andy on 0253 724607.

AMIGA 500 with 1 meg upgrade Cumana 2nd drive Rascal U22 modem Amstrad 3610 printer all with leads and manuals plus software and joystick £500.00. May split. Phone Tony 0375 380660.

AMIGA brand new 12mths guarantee, screen GEMS pack plus PD. Software all for £250. Ring 081-961-3758 between 10am and 1.30pm only. Ask for Linden. Monday to Friday.

TOTAL PD. Public Domain for the ST. Send a SAE to Chris Palmer, 27 Stanmer Villas, Brighton, East Sussex, BN1 7HQ. We sell, buy and swap PD. Sends us your lists.

COMMODORE 64 software collection (cassette). All £1 each! All originals. Free software with every order! Only one of each! First come, first served! Also Vic-20 s'ware. SAE for lists. Tel: 061 737 6912.

MEGADRIVE Scart (takes all carts) plus nine games and two joypads, including Mickey Mouse, Strider, Magical Hat and Batman, sell for £280 o.n.o. Telephone Martin 0685 76361.

AMIGA brand new 12 mths guarantee . Software including Photon Paint 2, C- Light, 3D animation, demos. £400. Ring 081-961-3758 between 10am and 1.30pm only. Ask for Linden.

AMSTRAD PC1640 ECD SD (360k), mouse DOS, manuals, techinal reference, keyboard cover, £425 call Robin: 0273 698059 after 6pm.

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

RICHO RP1600 printer DEC RK07 drive TS11 tape deck green screen monitor suit BBC RL02 10Mbyte cartridges plus many BBC shares etc. Offers, 0737 551090.

CITIZEN sheet feader, good condition, was £74.95 will sell for £30. Ring Wells (0749) 769250 after 5pm. Also looking for good 2nd hand printer £150 tops for Amiga 500.

A500 1meg 2nd drive plus Vorter 40meg HD with leads Ecs ie, Fatter Agnus, for only £450 will split A500: £200 Vortex HD £300. Contact D. Tweedie, Hms Harworth, BFPO ships, London.

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

AMIGA 500 , still boxed, over £650 worth of games. 2 joysticks. Immaculate condition. Worth over £1000 sell for only £550. Phone James on (0206) 384019 after 6pm. Thanks.

MAGAZINES for sale ST Action from issue 1, £1 each +p+p. PCW from 1985,£1.20 each+p+p. Also wanted ST PD. Phone 0734 733757 7pm-10pm. Ask for Neil.

APRICOT F1 PC 720k disk drive, 9" monitor, cordless keyboard. Lots of software, and manuals. £120 for quick sale. Phone Jon 081-946-9472 evenings.

NEO GEO for sale with NAM 1975, majician cord, joystick, memory card, power pack (Scart) £400. Call Scot on 0422 206191.

ATARI software Fleet Street Pub 3 brilliant DTP program as new £80 o.n.o. Protext versions, unwanted gift £55. Turbo ST £10. Tel:: 031 334 8919.

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DAISYWHEEL printer Silver Reed Exp 600 parellel interface, cables, spare ribbon. VGC hardly used. Around £200 for quick sale. Phone Jon 081-946-9472 evenings.

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ATARI 800XL with 1050 disk drive and £200 of software, books and cartridges. £165 o.n.o. Atari 1029 Dot Matrix printer £60 o.n.o. or £200 o.n.o. The lot. Tel: 0935 706972.

MAGAZINES (with disks) ST Format issues 8-20, ST user issues 53-61 £1.50 each. Wanted " Mapping The Atari". Ring 0420-88462 or 0822-852796.

AMSTRAD 464 games must be won! Win 40 Amstrad games in a raffle to be held on 15th of April. Tickets 20p each, send name/address/ money. 29 Romney Close, Little Neston, South Wirral, Cheshire, L64 9RJ.

ATARI 520STFM plus 1/2 meg upgrade excellent condition, Atari hi-res mono monitor (sm124) PD software all for £300 o.n.o. Open to offers though for quick sale (reasonable) Tel: 031-334-8919 now.

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

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EPSON PC-E computer, 20Mb ard disk, mono monitor, MSDOS 3.3, user pack, just three months old, boxed as new, £590 buyer collects (Kent), Phone (0795) 872280. Also Nintendo Gameboy as new £50.

SPECTRUM 48K+ including software etc £45 Spectrum 18k+ including software etc £85 two microdrives and 20 cartridges £30 Spectrum books, magazines etc. Phone Steve 081-517-6772 evenings.

ATARI SF314 external disk for Atari ST, all leads, £30 o.n.o Tel: 041-339-4719.

C64C, 1541/II disk drive, 3 good utility cartridges, two joysticks, loads of disk games, best offer or swap secures. Tel: 041-339-4719.

SEGA Mega Drive with three games only 2 months old. Sell for £140.00 Also PC engine with five cards £150.00. Phone Keith before 3pm after 9.30pm. 051 9312 4673.

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

ATARI ST originals: Operation Wolf, Falcon, Outrun (with soundtrack tape), Where Time Stood Still, Marble Madness, Elemental. £5 each (all boxed). Phone Steve 0530 243096.

FOR SALE Atarii ST FM discovery pack, standed pack, o.n.o. £250. STOS, first basic Neochrome and 4 games (Carrier Command, Space Harrier, Outrun Bomb - Jack) + joystick and more games. Tel Oxford. 243365. Azeem 4pm-9pm.

ATARI ST orignals for sale, Virus Thrust, Elite, Lancaster, Stac Archipel, Goldrunner, Cards, Chamonix Challenge, £5 each. Also PD wanted. Phone Neil. 0734 733757, 7pm-10pm.

ST ORIGINALS - for sale due to timewasters many at £2.50. Also PD library (300+) disks £200 - mastersound sampler £15 midi contacts wanted. Phone 0742 425525 (Ian).

ST 520 upgraded to one meg memory, one meg Cumana drive massive software collection, joystick, bound magazines, many many extras £375 for further information. Phone 0482 571088 ask for Steve.

DELL Dell system 220 IBM 100Mb hard disk VGA CO 1.48Mb inc colour monitor, DOS PAC plus original manuals £2299. Excellent condition 081 459 8800. Ask for Martin O' Donnell between 10am to 7.30pm.

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SEGA megadrive games. Thunder Force 3, Shadow Dancer, Aero Blasters, Strider, Golden Axe, Cyberball, Rainbow Island, Sword of Sodan, Esliat, Super Monaco. Sell for £5 each or swap. Telephone: (0302) 344529.

AMIGA 500 for sale. 1 meg upgrade, lots of software including Midwinter, Powermonger etc. +sampler. Sell for only £300. Also megadrive for sale, bargain at £90. Call Paul on 081 566 7251.

ATARI 520STFM, joystick, mastersound, 100+ ddisks including many original recent top games, PD software, many magazines. All excellent condition. Best offer over £250 secures. Telephone Steve 091 2724146.

C LANGUAGE, Turbo C, C++, Pascal, Turbo Pascal language tutorial disks for 1BM or Clone £9.95 each M. Din, 4 Trelawney Drive, Tilehurst, Reading, RG3, 5WQ.

ATARI 520STE 1meg memory external drive Blitz Turbo Copier Replay 4 Sound Sampler, Software Batman Falcon etc. Loads Magazines. Sell £450. Contact Andrew Colchester (0206) 864573.

BARGAIN! Spectrum +3 and Amstrad 2160 printer, many games, disks, word processor and two joysticks. All leads supplied. Will spilt if your'e desperate. The lot for £120! Ring 0483 771769.

FOR SALE. Amiga games, Singles A Books, and magazines - Ace, New Computer Express, The Games Machine, Your Amiga, Zero. Contact Andrew Wong, 10 Gerllan, Tywyn, Gwyneod, LL36 9OE. Tel: 0654 711122.

COMMODORE 64C, disk drive, joystick, disk and tape software, magazines, disk notcher: no splitting, quick sale! GEOS, Geopublish, mouse, 512k RAM: £160. 5 Dobson Place, Inkersall, Chesterfield, Derbyshire.

SOME great Amiga originals boxed titles, immaculate condition! Very fair prices, quick answer SAE, 13 Bournville Lane, Birmingham, B30 2JY OR Tel: 021 459 7576. Also fast PD swaps wanted!

PC DITO for Atari ST for sale. Brand new. Still in cellophane wrapper. Cost £79, but will accept £50 o.n.o. Phone Fraser on 031 553 2356 for details.

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AROUND 1000 disks of PD for Atarii ST/E for sale or exchange. To retrieve D.S. catalogue disk dend SAE and disk to A.U.G, 27 Rosslyn Terrace, Edinburgh, EH6 5AU.

ATARI ST-1meg memory drive. Software includes: STOS, Hard driving, Space Harrier, Colossus Chess X etc. Sell for £280 o.n.o. Phone Chris on: (0603) 715 023.

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LOADS of ST software! All originals. Kult, Drakkhen, Interphase, Castle Master and many more! From £2 - £8. For details send an SAE to; Mike Norton, Colindale Nurses Home, Colindale Hospital, Colingdale, London.

ATARI 520 STFM for sale. S/S 1NT. Drive plus around 20 original games, mainly chart toppers. Excellent condition. Well looked after (family friend). Offers around £200. Ring Dave: 0914 430 1719.

AMIGA games for sale: Xenon 2, Lotus Espirit, Nija Warriors, Super Cars, Black Tiger, Thunder Strike, Voyager, plus others. At most half price each. Ring Trevor on (0934) 833730 after 6pm.

AMSTRAD PC151CM with 51/4" and 31/2" drives plus 32meg hardcard. Comes with MSDOS, DOSPlus, GEM, word processor, spreadsheet, database and comms package plus loads of software £650. Tel : 0214216634 evenings.

MINIGEN Genlock for Amiga. As new, boxed. £75 o.n.o. Tel: 021 421 6634. evening. R5232 interface for Amstrad 6128 £50 (Pace Model). Tel 021 421 6634 evening.

AMSTRAD 1512 double disk drive. Monochrome monitor spare disks, manuals plus Panasonic KX-P1081 printer. All in excellent unused condition. Offers: Stu 081 337 6056. Must collect. Phone after 4pm any day.

COLLECTORS magazines ST/Amiga Format 1-13 no disks plus Amiga Format 1-21 with disks £60 or unregistered Amiga Devpac 2 (new). Buyer collects. Phone 04023 81033 (Essex).

NEW megadrive with cartridges, PAL and Scart inc leads £140. Ring 0420 88462 or 0822 852796.

PD's for just 30p yes just 30p. Send a SAE with stamp ffor a list to:-PJ's Demos, 63 Park Lane East, Anlaby Park, Hull, HU4 6TU.

ATARI 520STFM upgraded to one meg RAM one meg Cumana drive mega software collection, Scart, lead, microswitch, joystick bound magazines £375 for further info. Ring Steve 0482 571088.

APPLE II Europlus with 1 disk drive works and has DOS 3.3. Swap for BBC 5.25" and 3.5" dual drive with PSU or 3.5" enterprise unit. Call Richard (0573) 26032.

AMSTRAD games inc Big Foot, Paperboy, Haria Attack, Space Hawks, Sultans Maze, Electro Freddy, Roland on the Ropes, Roland in the Caves, and many more, All games £1.00. Phone Keith 890503.

286 EGA PC fitted CO PRO £850 at CGA PC £350 for full detais Tel: Gainsborough (0427) 616995. Ask for Stephen. Also DVA 4000 MCA BUS multi media PC card £400.

AMIGA PD library for sale 650+ disks. Buck or separate (75p) send 50p+ SAE for details to Mark Knight, 20 Mayfield Crescent, Patcham, Brighton Sussex BU1 8HQ. Bulk Phone (0273) 557113.

ATARI ST/STE PD software, 100's of disks available, including: demos, games, utilities, art, word processor etc. Send a blank disk and SAE or just £1 for latest disk and based catalogue, Star PD to: 1 Solva Road, Clase, Swansea, SA6 7NX.

HAND scanner for Amiga Geniscan 4500 with version 3 software and Photon Paint will scan up to 400 DP1 VGC £110 inc p+p. Phone (092575) 5316.

AMSTRAD PCW8512 word processor/computer. Includes keyboard, monitor, printer. Micro design II DTP software. Superb condition - less than one year old. Also games, books and disks. £450 Tel: (0443) 813942.

MODEM V21/V23 + PSU only £30. Atari STE 0.5 meg RAM upgrade (sipps) only £20. Phone (0602) 507999 evenings.

FOR SALE popular computing weekly form April 1986 to August 1988 totalling 117 issues. Original Forerunner of N.C.E. Serious offers to: Simon 134 Draper House, Hampton Street, London. SE1 6SY.

CHECKMATE 1500 (Amiga) 20 meg hard drive fitted internally plus external drive 1 meg memory Naksha and Amiga mouse, joysticks plus 400 disks many originals "eg" Amos. Plus Scart to Amiga lead £850 o.n.o.

2 GAMEBOYS, one with 4 games, £100, one with one game £50, or both for £140. Tel Chris 0457 837914.

MONITOR, CGA resolution giving 640 x 200 in colour. Users 9 pin D/plug connector £115 call Freddie on Bedford (0234) 224509 between 9-5 Mon-Fri.

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

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

ROBOCOP II PACMANIA 1942 Demons 'n' drives, Cali games, Lost Patrol, 688 Attack Sub, all £12 except demons 'n' Drivers £15. Ring 0742 882677 ask for Matt all originals for Amiga.

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MSX SONY + 100 + games, data recorder, scart, leads, many books. Cost new, £900+, sell for £120 o.n.o. Also Melbourne House complete Programmers Guide. Offers. Ring 0993 841055.

AMSTRAD CPC tape, disk and ROM software for sale. Also Sdisk, ROM board and AMX mouse. Send SAE for large list. Keith Hankin, 5 The Leasow, Aldridge, West Midlands, W59 OFF.

AMIGA PD, over 100 titles and quickly growing. Catalogue disk has magazine and PD on it, send £1, p+p free to: Paul Harthen, 43 Boyds Walk, Dukinfield, Cheshire, SK16 4AX.

A500 power supply, hardly used £20 o.n.o. Citizen 120D Serial printer interface cartridge £15 o.n.o. Amstrad CPC464 boxed with manual, some software and lightpen £45 o.n.o. Tel. 0759 318802.

AT ONCE 286 PC Emulator for the Amiga A500 complete with MSDOS V3.30 and all manuals and packaging, less than six months old. Also Full installation support, £145. (Leeds) 0532 610662.

BBC B computer (issue 7) 051.2 colour monitor dual 40/80 disk drives cassette joystick ATPL ROM/RAM board, Modem, 40 disks, books, magazines, cassettes can be seen working £280. Tel Reading. (0734) 697014.

CPC 6128 colour, Rick Dangerous, Castle Master, Brunword, Fiendish Freddy etc. Loadsa tape games, tape recorder and loadsa magazines £270 o.n.o. Offers to Martin Kremenstein. 1 Derwent Drive, Maidenhead, Berks SL6 6LA.

ATARI ST games. Super hang on, overlander, Space Harrier, Cosmic Pirate, Bubble Bobble, £10 each.

BBC B issue 7 DFS 827.1. 1 MEG 40,80 track disk drive. Lots of good games. 25 blank disks £175. Tel. 0270 71280 (Crewe).

AMIGA screen sems, Ashcom 1/2 MEG upgradable epansion, cumana 2nd drive, 6 A.F. disks, Powermonster, Indy 500, some P.D, 6 months old, all boxed as new £450. Tel Crewe. 766784.

ST GAMES for sale, all originals. Kick Off 2, Deathtrap. Pop Up. Hard Drivin 2, Narc V12 Eluira. Also over 50 Pre 1990 originals. Write to, Mark, 22 Hamley Road, Fleetwood, Lanc, FY7 7HW. Send SAE.

SEGA master system + Golden Axe, Wonderboy II and Golvellius for sale. Also extra control and magazines, only £80 o.n.o. Phone 0932 222795. Evenings for Philip.

GAMEBOY and games (Tennis, Batman, Turtles and Skate or Die) for sale. Only a few months old. Good condition, £100 o.n.o. Phone 0932 222795, afternoons. Ask for Phillp.

AMIGA DTP software, Propage V1.3 £70, Propage V2.0 £105, Prodraw V2.0 £60, outline fonts £60, All originals Tel. 0272 644934 (Bristol).

AMIGA P.D 75p unbranded £1.10 branded (p+p inc) send SAE for catalogue also send disk or list for exchanges to. Darrel Beckwith 1065, Manchester Road, Linthwaite, Huddersfield, HD7 5LS. All letters answered.

EPROM programmer, plugs into any IBM expansion. As new. See Datel Ad for details. Cost £110, £70 o.n.o. Tel. 0760 755402.

MACINTOSH software word 3 and power point both new and unregistered £20 each o.n.o. Conact Simon on Leamington 0926 312212 (evenings).

SEIKOSHA GPI/VC printer for sale. Suits C64, VIC etc. Complete with mini office 2 (tape). Boxed, complete and in immaculate condition. Contact Steve, 98 Crebilly Road, Ballymena, County Antrim. B742 4DS.

ACORN Electron plus 21 games P.S.U. all leads manual etc. Excellent condition ideal 1st computer. £45 o.n.o. Please phone 0532 869425, after 6pm for more details.

GAMES for C64, Amstrad 464, BBC/Elecetron C/6 plus 4 and word processor for Spectrum. Tel. 0926 400085 and reasonable offers please. Also power supply for C64.

ATARI 520STE, three months old, £250 Amstrad PPC 512D boxed, one year old, mouse. £350. Both with software. Trying to raise money to start own business, so will haggle with close offers.

SPECTRUM +2 with over £750 worth cf software, Timex 2040 printer, two joysticks, many magazines, computer books and all compatible leads. Excellent condition. Only £220 o.n.o. Tel. (0530) 416697, evenings.

FOR SALE Brother 150 boxed nearly new, was £440 plus VAT going for £330. Ring John (day only) 081 876 8261.

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AS EASY AS A B C

To use an object-oriented language, you'll need to know a little about programming in C. Mary Branscombe starts at the beginning . . .

The C programming language is called C because it comes after B, a variant of the BCPL language. C was designed and implemented by Dennis Ritchie and initially became popular in connection with the Unix operating system. Later versions of Unix are actually written in C, which should give a clear indication of the power of the language. The compiler written by Kernighan and Ritchie, known as K&R C, was a standard for many years, but there is now an ANSI standard for C, which has been used as the basis for C++, the object-oriented extension to C that we'll look at next.

C is a compiled language; programs are written in source code and compiled into object modules. These are linked to the library routines that are used for file handling and the like, so that the process of program development in a C environment involves an edit-compile-link cycle. The major differences between different C implementations will be in their function libraries, so that calls to these should be the only part of the code that needs to be modified if you move C source code to another compiler.

Comments in C start with /* and end with */, so /*this is a comment*/.

C can seem particularly terse and confusing so, as ever, it is important to use comments to document your program fully, for your own sake.

A C program is made up of several modules or functions and the main body of the program is contained in main. This has the form:

```
main()
{...
}
```

The brackets are used for any parameters that the function uses. The braces enclose the main code of the function, which usually begins by declaring variables.

C is a strongly typed language and the type of a variable must be declared when the variable is declared, because the type of the variable determines how much space it takes up in memory. Declarations are of the form: int no_of_characters, no_of_chapters; Variables begin with a lower case letter. You should not use any commands as variable names and as usual, you should use meaningful variable names; no_of_characters is better than chno. A semi-colon (;) is used to end every statement in C.

The data types found in ANSI C are: int, integer; short int, an integer between -128 and 127; long int, an integer in a much larger range; float, a number with a decimal point; double, a floating point number with 12 significant digits; char, a character and enum, an enumerated type. Enumerated types are useful for a limited number of constants where the name is important and the value is simply a way of distinguishing the constants. For example:

```
enum days
{Sunday, Monday, Tuesday, Wednesday,
Thursday, Friday, Saturday } yesterday,
today;
```

The days of the week have been used as symbolic constants which have the values from zero to six. We also have two variables, yesterday and today, which can store values of the type enum days. More variables can also be declared if we need them:

```
enum days tomorrow, christmas_day;
```

Variables can be global, local, static or non-static. Local variables are used within the function in which they are declared. Global variables are declared at the beginning of the program or the main function and they can be accessed from any point in the program. Global and static variables have a permanent memory location while local and non-static variables are stored in a temporary stack. The memory used by a local or non-static variable is freed when the program exits from the functions which use them. When a variable is declared, we can give it an initial value:

```
int age_one=24, age_two=27;
char ch_one='A';
```

If no value is given, the variable is initialised with a value of zero. If a variable is given a value within the program, this is done by an assignment statement:

```
int running_total;
running_total = 126 + 50;
```

gives running_total the value of 176.

When we pass a value to a variable, an assignment statement can only be used if we know the value already. If you want to store or calculate with a value to be read from a file or input by the user, things are a little more complicated.

INPUT AND OUTPUT

A C compiler will not define input or output statements, so these will have to be included from the library. The statement used at the beginning of a program to include the standard input and output functions, stdio, which are stored in a type of file known as a header file is:

```
#include <stdio>
```

When the code is compiled, the contents of the header file will replace this line of code.

To read a character from the keyboard, or from a file, into the variable ch_one, we use the library function:

```
ch_one = getchar();
```

To print the character stored in ch_two, we use:

```
putchar(ch_two);
```

If we want to output more than one character at a time, we need to format the text and then print it to the screen, using printf, print formatter. There are a number of options to be used with printf, in the form:

```
printf("<output_format>", <variable_list>);
```

For numbers the most useful format is %d, which prints the number in decimal, as an integer. To print out a given string of text, inserting the values of variables from the list, these formatting commands can be placed inside the text string for the output format. So:

```
printf("There are %d characters in the %d
chapters of this book", no_of_characters,
no_of_chapters);
```

will print:

There are two characters in the 25 chapters of this book assuming the values of the variables are two and 25 respectively.

The string of text enclosed in brackets actually gives printf an address in memory where it can find the text, rather than passing the text directly. To read from the keyboard, we use scanf, scan formatted text, which also needs an address. The format is:

```
scanf("<input_format>",
<list_of_variable_addresses>);
```

The input format uses the same codes as printf, so that %d expects an integer. Rather than telling scanf what is already in the variables were we want to store what we read in from the keyboard, we need to tell it where to put the information read in. This is why we pass the address of a variable and this is done by using the notation &variable. To get the value of a variable whose address we know, we use *address. To read in two values and store them in the variables a and b, we use the command:

```
scanf("%d%d", &a, &b);
```

There are more functions in stdio.h for opening, reading, writing to and closing files. Other function libraries will be available with a good compiler. The math.h library will include functions such as the sqrt square root function used in the example code. ■

C SO FAR

These commands are used in the following code to calculate the hypotenuse of a right-angled triangle. The \n command prints a new line.

```
/*to calculate the hypotenuse of a triangle,
with the other two side lengths given by the
user*/
#include <stdio.h>
#include <math.h>
main()
{
int a, b, sq_one, sq_two, hypotenuse;
printf("enter the length of the two sides: ");
scanf("%d %d", &a, &b); /*read in values*/
sq_one = a*a;
sq_two = b*b;
hypotenuse = sqrt(sq_one + sq_two);
printf("\nHypotenuse is: %d\n", hypotenuse);
}
```

WHAT YOU GET

A good C compiler will offer a programming environment as well as just an implementation of the language; it should provide a debugger to help you correct code, and probably an intelligent editor that will help with missing brackets and the like. Another useful tool is a code animator, that shows a graphical representation of what your code does; for example, how long the program spends in each loop and when it branches from a conditional statement.

- C offers low level control - but that doesn't make it impossible to use.
- Many functions are provided in libraries that you can include in your program.
- C can look terse and unfriendly - adding comments will make all the difference.

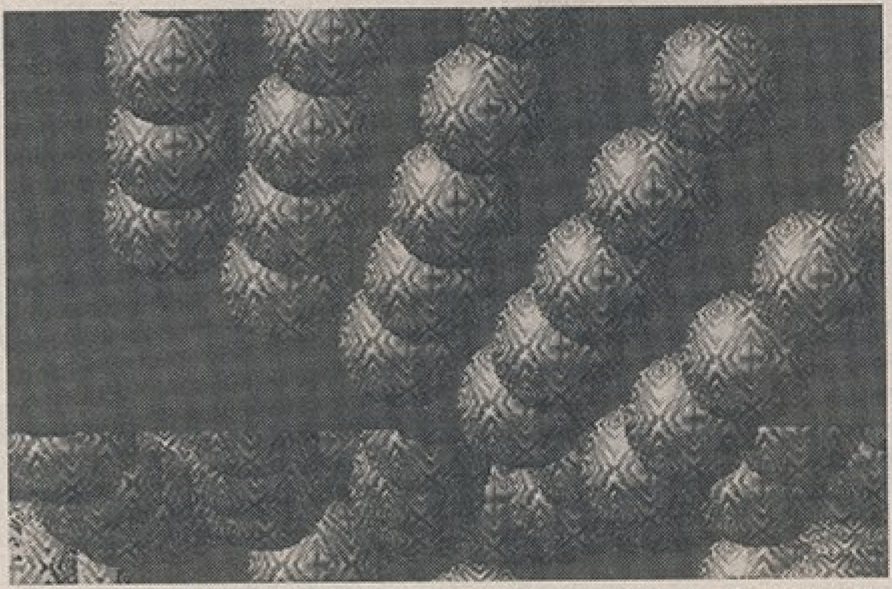
THE PD COLUMN

Frank O'Connor discovers some handy desktop utilities for the Amiga and a game that is not a load of Boulderdash in this weeks overview of the Public Domain.

Followers of the PD scene will have noticed that among the wealth of software to crop up on their machines (especially ST and Amiga owners) a good percentage is impressive – if staid – scrolly demos.

A couple of really nice examples have turned up on the Amiga this week. The demos are a collection of short, colourful graphic routines, some of which are totally and utterly mindwarping. The graphic demos themselves, while hardly likely to change the world, are accompanied – like most demos of this type – by a funky soundtrack.

This brings up an interesting question. Is there a program available on the PD scene for either the ST or the Amiga which is able to synchronise some neat effects with a stereo system? A sound/light convertor shouldn't be all that difficult to build. We often see suitably impressive graphics accompanied by their own groovy score, but it would be nice to listen to your favourite track, while your Amiga or ST jumped loops in sync with the music.



• The spinning balls demo might be a bit more impressive accompanied by your favourite track.

For example, bass notes could cause deep colour changes, trebles could influence shapes generated on screen, and *New Kids On The Block* could cause a total system failure. Seriously though, if anyone out there in PD land has a program capable of synchronising graphics with an remote sound source, drop a line to the PD column here at *Express*.

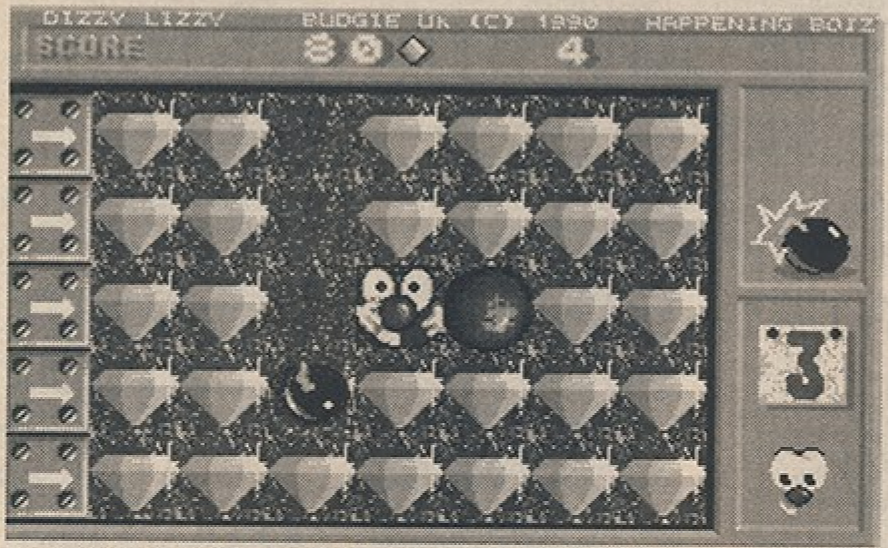
AMIGA GOODIES

A handy item for any Amiga owner to have on their desktop would be the latest utilities disk from Amiganuts United.

Not only does the disk have a nice, comprehensive range of utilities, but they are all very professionally presented, and easy to use. The options available on loading the disk are all selected with the mouse, making things as simple and intuitive as possible. The people who program public domain utilities, are generally technically minded, writing programs for others of a similarly techie persuasion, so it's nice to see the occasional piece of serious – or at least useful – software designed with the novice in mind.

The programs on the disk are mostly disk utilities, but there are a couple of complete system checks, allowing you to make sure that the fundamental components of your Amiga are in good working order.

The first utility, *Boot Shop*, allows you to create and use special boots, and also offers some degree of virus protection. The second program, *Fast Disk*, is a speed loading program, a sort of disk-based turboload if you like. Next is a program called *Noisetracker* – a very comprehensive sound-handling utility, offering sample-manipulating facilities in a simple icon-driven environment.



Dizzy Lizzy (by Budgy from Paradise Games) surrounded by diamonds – but next to a bomb

A potentially useless program, however, is the *Keytest*. This simply displays a representation of the Amiga's keyboard, and hitting the appropriate key on the computer, highlights its counterpart on screen. All well and good, but the thing is, you would surely only use this program if something went wrong with a key on the machine, in which case you would know it was faulty already! Still, better safe than sorry.

Also on the disk are a fairly simplistic IFF covertor, and a *Boot Menu Construction Kit*, which allows you to create much faster boot menus.

The next utility, the *Disk Coder*, is a simple password system for your disks which is handy to keep out prying eyes.

Finally, there is a sort of glorified catalogue program called *Disk Scanner*, and a complete system check, which tests the processor, audio and graphics chips. All in all, a useful and competent package, which even less serious users cannot afford to be without.

DEJA VU

Anyone remember that gnarly old computer classic *Boulderdash*? The one with that little termite dude, Rockford? Well a piece of software arrived recently called *Dizzy Lizzy*.

This game comes from Budgy, courtesy of Paradise Computers. Now it's not that the two games are similar or anything, just that they both involve guiding a cute little guy (well girl in the latter case) around a scrolling cavern.

Funnily enough they also both involve collecting diamonds, avoiding falling rocks and using the effects of gravity and inertia to make screens easier to deal with. So yeah, maybe there are a few similarities, but hey, they're only itsy, bitsy superficial ones.

The object of the game is to collect a set amount of diamonds, usually hundreds of the darn things. The diamonds are scattered around a large, scrolling screen, and are often out of reach, blocked by rockfalls.

Many of these rocks are supported by diamonds, and collecting a diamond lying directly under a rock, will cause that rock, and any above it to fall to the bottom of the screen, or to the next row of diamonds. This effect can be used to your advantage, and is often the only way to reach inaccessible diamonds.

Hampering your progress are two very irritating things; the first is a nasty little creature, who's pathetically cute features hide the inherent evil of his nature. The blighter will chase you around the screen, and only stop when he kills on contact.

The other danger is the presence of little black bombs. If the bombs fall, they will detonate, and rather than destroying stuff, they create walls. These walls can trap you, or completely cut you off from the rest of the diamonds.

Further levels can be reached by means of a password system, a system which at times is fussy beyond belief. If you a mistake while inputting a password, you have to wait an annoyingly long time for the chance to re-enter the password mode. Though the game starts off simply enough, things get very difficult very quickly, and the number of hazards with which you have to cope increases dramatically.

The graphics are hardly world stopping, and the sound is the usual ST chip warble. Fussy people might say the scrolling was among the most diabolical of all time, but great fun can be had rushing around the maze, and *Boulderdash* fans will lap it up. ■

WHERE TO GO

AMIGANUTS UNITED

Amiganuts United is a well established supplier of Commodore Amiga PD, and they can often be found relaxing at: Amiganuts United, 169 Dale Valley Road, Southampton. SO1 6QX

PARADISE COMPUTERS

That lot at Paradise Computers, when not being international playboys and jetting round the world to glamorous places, will often be found at 9, Westfield Crescent, Brighton BN1 8JB.

EXPRESS ON-LINE

Our comprehensive listings service this week featuring User Groups.

NEW ARRIVALS ON-LINE

AMIGA LOST GAMES CLUB – We are setting up a gropu to program Amiga games and send out demos to the different publishers so we need designers, coders, artists and musicians for the Amiga. Ring 0782 266964.

AMIDOS AMIGA PD SWAP CLUB – Send blank disk for details. No enlistment fee. Send SAE for prompt reply to 25 Salamanca Road, Cheltenham, Glos GL52 5LA.

AMIGANAUTS Disk Fanzine – Two disks, issue one out now. Only £2.50. Loads of PD demos, reviews etc. SAE for info or cheques/POs to N Gilling, 1 France Furlong, Great Linford, Milton Keynes, Bucks, MK14 5EM.

AMIGA SOFTWARE EXCHANGE SERVICE – small friendly swap service. Good selection. SAE for information to 13 Bournville Lane, Birmingham B30 2JY. Free PD swaps. Telephone 021 4597576.

JOEL'S PD GAMES – for Amiga users. PD disks only 90p each. For a catalogue send an SAE to Joel's PD Games, 389 Scalby Road, Newby, Scarborough, North Yorkshire, YO12 6TG. Please add a blank disk.

THE DISK issue two for Amiga users. Packed with PD including Power packer, Superecho, Game, Textra, Poipol, Demo, Iconmaker and loads more. Send £1 to S Lord, 6 Stubbing Brink, Hebden Bridge, West Yorkshire, HX7 6LR.

PC INDEPENDENT USER CLUB – Helpline service, bi-monthly journal, shareware/PD, local meetings, bulletin board, £29-£50 pa (£36 businesses, £19 students) Free 30 day trial 0732 771512.

AMIGA OWNERS – PD software to swap and sell. New library for Irish Amiga owners. Phone John at Limerick (061) 312257 or write to 21 Lower Careys Road, Limerick, Ireland.

ATARI ST demos/PD wanted. If you can write demos or want exclusive titles. Write to ST Demos, 8 Bertelin Road, Beaconside, Stafford, ST16.

3JJ.BBC-B PD – From just 14p per disk. Send SAE to BBC-B PD, 21 Whitehorse Street, Hereford, HR4 OEP. Send 50p plus disk for sample and catalogue. Send 20p for three page catalogue.

CLUB AMIGA answers your questions on software and hardware on its 24 hour helpline. Join now. Send £5 to Club Amiga, 5 Bowes Lea, Shiney Row, Tyne and Wear DH4 4PP.

INERTIA ADVENTURES – A ray of light in the dark cavern of the text adventure. Do you dare to enter this saga? Proceed by phoning 0265 51851 for details.

MG SOFTWARE – Atari ST Public Domain, only 65p and £1. Send SAE for catalogue to MG software, Cornerways, Beckingham Street, Tolleshune Major, Essex M9 8LL.

ABC AMIGA BEGINNERS' CLUB – PD library review. More info in beginners' pack. Send £1.50 to Ian, 110 Whitehill Park, Limavady, Co Londonderry, N.Ireland, BT49 0QG. Tel: 0504 765174

ACORN 8-BIT PD SOFTWARE – Write to Alan Blundell, BBC PD, 18 Carlton Close, Blackrod, Bolton, BL6 5DL. Send SAE for £1.50 for sampler disk

ACORN ARCHIMEDES.RISC USER 117 Hatfield Road, St Albans, Herts.

ACORN ARCHIMEDES Archive, 18 Mile End Road, Norwich NR4 7Q

AMATEUR RADIO (CBM) – Simon Lewis GM4PLM Commodore Radio Usrs Group, 69 Irvine Drive, North Clippens, Linwood, Paisley

AMIDOS AMIGA PD SWAP CLUB – send blank disk with an SAE or £1 for a starter catalogueand details on how to join. A prompt reply given to all members and new applicants.

AMIGA AND PC PD CLUB – Contact Prestel MBX 011115474 or send stamp to 48 King William Drive, Cheltenham, Glos, GL53 7RP

AMIGA CHEAT DISK FANZINE – JS Smith, 45 Maplecroft Crescent, Sheffield S9 1DN.

AMIGA DISK MAG –with a new style with over 100 pages of news, reviews, art, music, and PD on two disks. Send £3 to Paul Harthen, 43 Boyds Walk, Dukinfield, Cheshire, SK16 4AX

AMIGA HELP CENTRE – A group to help novices. For CLI help disk and registration send £10 to Simdev, 29 Avon Square, Hemel Hempstead, Herts.

AMIGA HELPLINE SERVICES – Free club for young and old. Send SAE toG Keenan, 21 Skirsa Place, Glasgow, G23 3EE.

AMIGA LA FANZINE – Only £2 including membership. L Stacey, 3 Norfolk Close, Bewbush, Crawley, West Sussex, RH11 8GJ

AMIGA PD – over 600 disks. Only 75p each. For catalogue send SAE and 50p to Mark Knight, 20 Mayfield Crescent, Patcham, Brighton, Sussex, BN1 8HQ or tel 0273 557113. Special bulk prices on orders over 50 disks

AMIGA PD – Software for sale. If you live in South Wales then look no further. Disks only £1.50 inc P&P. Write now to SWAPD, 38 Syon Park Close, St Mellons, Cardiff. All the latest in demo, music, utils etc

AMIGA PUBLIC DOMAIN – only 85p per disk. Send SAE for details to Paul Brown, 14 Elmfield Road, Rossington, Doncaster, DN11 0BP or call 0302 865148 after 7pm.

AMIGA PUBLIC DOMAIN – JJ Meachen, 59 Lee Road, Harwich, Essex, CO12 3SB.

AMIGA PUBLIC DOMAIN USER GROUP – Ashley Tarver, 5 Saunders House, Binswood Avenue, Lemmington Spa, Warks, CV32 5RZ

AMIGA SHAREWARE – Send SAE for lists to 4 Sedgewick Close, Atherton, M29 9EF

THE AMIGA TEAM – A group to help novices. Help given in programming – Assembly, BASIC, C, Logo, Pascal and CLI. For registration and introduction pack send £10 to 11 Beech Grove, Northallerton, North Yorks, DL6 1JY

AMOS/STOS PD LIBRARY – send SAE for a catalogue to 25 Park Road, Wigan, WN6 7AA. Telephone 0942 495261 before 6pm.

AMSTRAD BUSINESS USERS - Amstrad Professional User Club, enterprise House PO BOX 10, Roper St, Pallion Ind Estate, Sunderland SR4 6SN. Tel 091-510 8787

AMSTRAD CPC USERS - Tony Baker, United Amstrad User Gp, 26 Uplands Crescent, Fareham, Hants PO16 7JY. Tel 0329 234 291

AMSTRAD CPC HOME USERS – Steve Williams, WACCI, 9 South Close, Twickenham TW2 5JE. Tel 081-898 1090

AMSTRAD LOCAL GROUPS - Amstrad Groups Federation, 4 Sutton Road, Gorton, Manchester

AMSTRAD PC SOFTWARE - Colin Smith, Colbar, 10 Penwood cl, Westbury, Wilts BA13

AMSTRAD PCW - PD software: Bob Ellis Tel 0432 761860 Queries: David Axford Tel 0428 56438

AMSTRAD PCW - Bob Ellis "Rowan" 100 St Peters Close, Moreton-on-Lugg, Hereford HR4 8DW. 0432 761 860

AMSTRAD 1512/1640/PPC - PC Independent User Group, The Computer Advice Centre 87 High Street, Tonbridge, Kent. Phone 0732 771 512

AMSTRAD BUSINESS USERS – Amstrad Professional User Club, Enterprise House PO BOX 10, Roper Street, Pallion Industrial Estate, Sunderland SR4 6SN. Telephone 091-510 8787

APPLE II USERS – tel 051 9284142.

APPLE MACINTOSH. John Lewis, Macintosh user group, Macintosh House, 11 South Parade, Summertown, Oxford OX2 7JL

APPLE SYSTEMS – Irene Flaxman, Apple 2000, PO Box 3, Liverpool L21 8PY.

ARABIC COMPUTING – Rich Lackey, Arabits, 9 Bellview road, Worthing, West Sussex BN13 1EY

ARCHIE PD – for 2.4Mb sampler pack send three E Format disks, SAE and £1 to Archie PD, Dept NCE, Highover, Udimore, Near RYE, East Sussex

ASHTON TATE SOFTWARE - Silvia Robinson, Baseline, Ashton-Tate, 1 Bath Road, Maidenhead, Berts 0628 33123. Prestel page 43221

ASTAC – a new Atari ST and console mag. For details send an SAE to Astac, 383A Drayton High Road, Hellesdon, Norwich, Norfolk, NR6 5BG.

ASTMATIC AARDVARK PD FACTORY – the best for PC, ST and Amiga. Send £1 for a demo disk toHighover, Udimore, Nr Rye, East Sussex, TN31 6BG.

ATARI ALL MACHINES – Colin Hunt, BaPAUG, Wimborne Road, Oakdale, Dorset BH15 3EF

ATARI AND ST PC EMULATOR SUPPORT CLUB – SAE to 153 Parrock Street, Gravesend, Kent, DA121ER

ATARI CONNECTION PD – High quality disks only. Only 99p per disk. Wide selection – utils, demos, games etc. For disk catalogue send disk to ACPDL, 72 Lancelot Avenue, Strood, Kent

ATARI PORTFOLIO - D Gilpin, Atari Portfolio User Group, 84 Cambridge Avenue, Gidea Park, Romford RM2 6QU. 0708 730764

ATARI ST DIY HDISK BUILDERS CLUB – information on how to build from scratch an HDisk system for your ST. Help given on what you'll need and how to connect it all up. Call 0495 272092

ATARI ST OWNERS – public domain from £1.50 per disk. Write to22 Merryfields Avenue, Hockley, Essex, SS5 5AL

ATARI ST SOFTWARE – write to 16/32 PD library 35 Northcote Road, Strood, Kent ME2 2DH

ATARI ST - Paul Glover, The ST Club, 9 Sutton Place, 49 Stoney Street, Nottingham NG1 1LX. 0602 410241

ATARI ST/STE HELPLINE – We can scan, digitalise and provide loads of clip art. SAE to Nist 53, Lenaghan Park, Belfast, BT8 4JB

ATARI ST USERS – ELECTRON. 2 disks plus 40 page mag. Reviews, articles, games, advice, electronics, software library (PD 50p each) and Chess. £3.50 inc membership (refundable). Andrew Betts, The Mount, Wood Lane, Gallowstree Common, Reading, Berks, RG4 9BG

ATARI ST USERS ASSOCIATION – provides support for all Atari ST/E users. Help and advice given. Quarterly club magazine and disk. Also exclusive PD library for members. For further information write to ASTUA, 18 Poplar Close, Biggleswade, Beds, SG18 oEW

BBC MICRO - BEEBUG, 117 Hatfield Road, St Albans, Herts AL1 4JS. 0727 40303

BASIC PROGRAMMERS' GUIDE – for all BASIC programmers. Phone Andy on 081-648 4326.

BATPUG – Turbo Pascal user group also open to other PC Pascal programmers. Costs £10 per year. Write to 12 Clegg Avenue, Cleveley's, Blackpool, FYS 9BJ. Send an SAE for sample.

BURMAN'S PD – Amiga PD for 40p. For a catalogue on disk, a few demos and a game send a stamp and disk to Burman's PD, 41 Pinner Park Gardens, Harrow, Middlesex, MA2 6LQ

BYTER PD – For list and latest titles of Atari ST and Amiga PD write to Byter PD, PO Box 182, London, SE6 1BZ

C64 PD CLUB – E Masaba, 84 Garmoyle Rd, Liverpool L15 3JH

C64 PUBLIC DOMAIN – Phoenix, 64 Plumberow, Basildon, Essex

C LANGUAGE – Bi-monthly newsletter, C source library and BBS. £14pa. Contact Francis Glassborow, 64 Southfield Road, Oxford, OX4 1PA.

C USERS GROUP – Francis Glassborow, 64 Southfield Road, Oxfoed OX4 1PA. For everyone interested in the C and C++ programming languages. Publishes a bi-monthly newsletter.

CAMBRIDGE Z88 - Roy Woodward, Z88 Owners' Club, 68 Wellington St, Long Eaton, Nottingham

CD ROM - UK CD-ROM User Group, High Wings, Salem, Treforys, Abertawe 0792 844 370

CHESHIRE 16-BIT USERS CLUB – Amiga, ST, PC, Arc at Radley Common community centre, off Poplars Avenue, Orford, Warrington, Friday nights. All welcome. £1 admission.

CHESS COMPUTER PROGRAMMERS and interested players send an SAE to Steve Roe, 25 Nene Walk, Worksop, Notts or ring BBS 0909 479080

CHOICE – on-line help. Tel 0308 23224

CHESHIRE NIMBUS USER GROUP – Geoff Nelder, Queens Park High School, Handbridge, Chester

CHURCH ADMINISTRATION - Rev Stoker Wilson, Church Computer User Group, St John's Vicarage, Greenside, Ryton, Tyne & Wear NE40 4AA. 091-413 8281

CID (Computers and Integration for the Disabled) is a registered charity. Write to Gordon, Chelsea Road, Inverurie, Aberdeenshire, ABS 9QZ or tel 0467 24202

CLERGY/MEDICAL EDUCATION – Mr T Jones, FREE-ED Shareware/PD 85 Stoke road, Taunton, Somerset TA1 3EL. Tel 0823 321 481

CLUB AMIGA – Discounts, 24 hour help line. For more info send an SAE to Club Amiga, 5 Bowes Lea, Shiney Row, Tyne and Wear, DH4 4PP

CMS PD LIBRARY – Sam Coupé PD software for only £1.50 a disk. Send an SAE and a blank disk (or 70p) for a disk catalogue to CMS PDL, Dept NCE, 70 Donald Drive, Chadwell Heath Romford, Essex, RM6 5DU.

COBOL LANGUAGE - Allen Reavie 22 Mourneview St, Portadown, Northern Ireland. BT62 3AW

COLECO ADAM - Keith Mamer, UKAS 33 Homer Road, Croydon CXR0 7SB

COMMODORE ALL MICROS - Jack Cohen, ICPUG, PO Box 1309, London, N3 2UT. Tel 081-346 0050 after 6pm

COMMODORE 64 CLUB has been on the go for the last five months and new members are welcome. For more details send an SAE to The C64 Club, 20 Finlow Place, Dundee, Scotland

COMMODORE AMIGA - UK Amiga Users Group. Contact 144 Charles Street, Leicester LE2 0OD. Telephone 0533 510066 voice; 0533 517615

COMMUNITY COMPUTING - Community Computing Network 2nd Floor, 35 Pink Lane, Newcastle, NE1 5DW. Tel 091-261 0317

COMPUCORP. Compucorp University users group c/o Compucorp, Cunningham House, Westfield Lan, Kenton, Middx

COMPUNET – write to Independent Compunet Club, 148 Furzehill road, Boreham Wood Herts. WD6 2DX

COMPUTER LYNX – Amiga disk magazine. Only £1.50 plus 50p p&p. Huge range of PD from £1 per disk. Write to 187 Perrysfield Road, Cheshunt, Herts, EN8 0TL.

CONFERENCING - Compulink, suite 2, The Scantuary, 23 Oakhill Grove, Surbiton, Surrey KT6 6DU Voice 081-390 8446. CIX BBS 081-399 5252

CPM & MSDOS Users Group – 42 Birkbeck Road, Wimbeldon, London SW19 9NZ. Tel 081-543 0824

CRYPTOGRAPHY & CODES - Mike Barlow, American Cryptogram Association 5052 Chestnut Avenue, Pierrefonds, Quebec HBZ 2A8 Canada

DATAEASE USER GROUP – High-Tech House, 10 Blackfriars Street, Norwich, NR3 1SJF

DATA PD LIBRARY for Amstrad CPC users. Send SAE, tape/disk and 50p to Kingsmill 202 Park Street Lane, Park St, St Albans, Herts AL2 2AQ

DIGITAL PD LIBRARY – for the Amiga. All disks priced at only £1. Write for a full catalogue to Digital Pd, 20 Vere Road, Hillsborough, Sheffield S6 1SB.

THE DISK – Packed with a variety of Amiga PD. S Lord, 6 Stubbing Brink, Hebden Bridge, W Yorks, HX7 6LR. Also latest PD available for £1

DISABLED - Jeff Hughes, Special Needs User Group, 39 Eccleston Gardens, St Helens WA10 3BJ 0744 24608

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DRAGON - Paul Grade, National Dragon Users Group, 6 Navarino Road, Worthing, Sussex or tel 0903 207585

ECONET - Michael Ryan, Econet User Gp, Balkeerie Cottage, Eassie by Forfar, Angus DD8 1SR

EDUCATION – Charles Shannon, TECUG, 35 Wellington St, Gravesend, Kent DA12 1JG. Tel 0474 567 931

EIGHT-BIT BACK-UP 8-bit user group for all. 25p plus SAE. to: 8-bit back-up, 1 Northolme Close, Grays, Essex.

EINSTEIN PD – Amiga PD all disks only 80p for the latest list send SAE to The Forge, Pipers Lane, Godmanchseter, Cambs, PE18 8JN

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ELMSOFT PUBLIC DOMAIN SERVICE for the ST any weekend at Camden canal market, Haven Street, London

EMULATE. For Amiga, Amex. Monthly newsletter. Write to Pat 12b Northbrooks, Halrow, N Essex

ENTERPRISE – William Creaser, 6 Provident Street, Shaw, Oldham, DL2 8AQ. Independent Enterprise User group. Tel 0706 881382

ENTERPRISE - Tim Box, Independent Enterprise User Group, 50 Holdenhurst Avenue, Finchley, London N12 0HX. Tel 081-346 8032

ENET (like Econet) - T K Boyd, Enet (Amcom) User Gp, Seaford Cottage, Petworth, West Sussex

EXMOORE SOFTWARE – Queen Street, Lynton, N Devon EX 35 6AQ

FIND YOUR LOCAL CLUB – British Association of Computer Clubs. Database of all user groups in the UK. Banc y rhosyn, 14 Bron Y Glyn, Bronwydd Arms, Carmarthen SA33 6JB.

FORTH Language – Douglas Neale, FIG (FORTH Interest Group) UK, 58 Woodland Way, Morden, Surrey SM4 4DS

FRACTALS/CHAOS THEORY - Andy Lunness, 69 Bronte Avenue, Bury, Lancs BL9 9RN. Telephone 061-764 6469

GARFIELD'S PD – Amiga PD software to swap or for sale. Send 99p for disk catalogue to 40 Penrhos Cres Rumney, Cardiff, South Wales

GENEALOGISTS - Computer Group, Society of Genealogists, 14 Charterhouse Buildings, London EC1M 7BA. 071-251 8799

GENERAL AMIGA – disk based magazine for the Amiga. Only £1.50 per issue. Send order to 19 Earn Court, Alloa, Clacks, FK10 1PT

GENERAL HOME MICROS - Steve Winter, Chic Computer Club, PO BOX 121, Gerrards Cross, Bucks SL9 9JP 0753 884473

GEOS USER GROUP – for C64 and 128 owners. Disk based magazine. Send blank disk to GUG (UK) 110 Deansway, Woodloes Park, Warwick CV34 5DQ

GUG (UK) – GEOS User Group for C64/128. Also non-GEOS PD library. Send disk and return postage for GEOS, SAE for non-GEOS to GUG (UK), 110 Deansway, Woodloes Park, Warwick CV34 5DQ

GUNNING PD PD – Atari ST PD library. Disks only £1 each and supplied on branded disks. Send three first class stamps to 47 Auchingane, The Tryst, Edinburgh, EH10 7HX for disk catalogue. Wow!

GROUND FLOOR USER GROUP – support for all serious users of PC, ST, Amiga and PCW. Meets monthly in Calderdale, West Yorkshire. Further information from Jae on 0422 844991 days or 0422 845789 eves.

GUAGE - Martin Houston CUG (UK) Houston Technology Ltd, 14 Arden Oak Rd, Sheldon Birmingham BS26 3LX. Telephone 021-722 3168

HOUSING ASSOCIATIONS - Caroline Maries, Micro Users Ltd, Beaver Housing society, 23 Lewisham High Street, London SE13. Tel 081-318 1126

HEALTH WORKERS - Sue Mckendrick, Healthlink, 164 Windsor Rd, Ashton-in-Makerfield, Wigan WN4 9ES. Voice: 0942 712 385

IBM PC USER GROUP – PO BOX 360 Harrow HA1 4LQ.081-863 1191 BBS 081-863 6646

JOMAC USER GROUP – Spectrum and Amiga tips and pokes sent every month. Write with SAE to Jomac's, Filey Grove, Rhodes Street, Hull

JUPITER ACE – John Charter, Jupiter Ace Forth User Group, 17 Spring Wood Close, Dunston, Chesterfield S41 8BS. Tel 0246 237555

LOCAL AUTHORITIES – Local Authority Micro User Group, John New, Borough Engineer's Dept, Municipal Offices, North Quay, Weymouth, Dorset DT4 8TA.. Tel 0305 785101 ext 272

LOTUS PRODUCTS - Lotus User Group, 79-80 Peascod St, Windsor, Berks SL4 1DH. Telephone 0753 841686

LYNX – R B Jones, Lynx User Group, 39 Ashton Close, Needingworth, St Ives, Cambs

LYNX DISK USER GROUP – J Koushappas. 172 Pasteur Gdns, London N18. Tel: 081 807 3859

MAC SOFT – six games for the Amstrad CPC6128. Send SAE, blank disk and 50p copy charge to Macsoft, 2 South Meade, Maghull, Liverpool, L31 8EF.

MACH MAC PD – The best there is. Explosively good public domain for the macintosh. £1 for demo disk and catalogue of over 900 disks. Write to MMPD, Highover, Udimore, Nr Rye, East Sussex.

MAGNETIC MEDIA HANDLE WITH CARE – Amiga disk fanzine with news, reviews, music, games, utilities, userhelp. At least two disks per month. Each issue £2.80. Write to Magnetic Media HWC, 25 Rigbourne Hill, Beccles, Suffolk NR34 9JC.

MEGADRIVE CONSOLE CLUB – Used and new games sold, also exchange system and games brought from £6-£22. Write to Andrew Stanford, MCC, 15 Fields Park Drive, Alcester, Warwicks, B49 6QR or Tel: 0789 764039 after 6pm

MEMOTECH FILE – 93b StJohns Road, Biddulph, Staffs ST8 6LL

MEMOTECH - Phil Eyres - Memotech Owners Club, 23 Denmead Road, Harefield, Southampton SO2 5GS. Tel 0703 585106

MICROSOFT WORD - Lesley Port, Folly House, Madeira Walk, Bachelors Acre, Windsor, Berks. Tel 0753 831001

MICRO-DESIGN USER GROUP – a new group for those PCW owners requiring assitance and advice with this DTP package. Large clip art library available. Phone Phil on 0709 543390

MID CORNWALL COMPUTER CO-OP – Atari ST. 8 Victoria road, Roche, St Austel, Cornwall PL 26 8JF. Telephone 0726 890473

MIDI/MUSIC – Spectrum music machine/MIDI user group. Magazine on tape, plus programs and lots more. For more details contact Sean Sanderson on 05242 62258

MOTOROLA 68xxx MICROS – write to Rick Applegate, 68 Microgroup, 8 Great Cob, Springfield, Chelmsford, Essex. BBS tel 081-316 7402

MSX SYSTEMS – write to Keith Neal, MSX Link, Austerby House, 80 Austerby, Bourne, Linconshire PE10 9JL

NASCOM/80-BUS/CPM - Scorpio Systems, PO BOX 286, Aylesbury, Bucks HP22 6PU.Tel 0296 624868

NEW BUG COMPUTER CLUB – Support for all machines. Metts weekly at Oxclose Multi-Purpose Centre in Washington each Tuesday at 7pm. All welcome, visitors 50p

NEWBRAIN - Ron Bury, NewBrain Support Grp, 70 Cranberry Lane, Darwen, Lancs BB3 2HL. Tel 0254 771891

NIMBUG – write to 13 Belle Vue Ave, Gosforth, Newcastle-upon-Tyne NE3 1AH. Tel 091-285 7806

NINTENDO GAMEBOY – I would like to start a user group for the Game Boy. Write to Justin Spencer, 2 Rose Villas, Thurnholmes Farm, Owston Ferry, Near Doncaster DN9 1BE or Tel 042772588

NW ARCHIMEDES USER GROUP – Meets every Friday at Citizens Advice Bureau, next to Spectrum arena in Birchwood, Warrington. Ring Paul on 051-426 3915 after 6pm

OLIVETTI PC1/PCS USER GROUP – Help with all aspects of these machines. Tel 0924 892106 or write to 68 Queen Elizabeth Drive, Normanton, W Yorks

OS/2 - Karen Burns, OS/2 User Group,Cecily Hill Castle, Cirencester, Glos LG7 2EF. Tel 0285 655888

OSBORNE/CPM/MSDOS – write to Jeremy Browne BOOG, 102a Aldershot Road, Fleet, Hants GU13 9NY. Tel 0252 621745 voice or 626233 BB

PAGESTREAM USERS GROUP – all Atari/Amiga owners of *Pagestream* send large SAE to PUG, 70 Offerton Lane, Stockport, SK2 5BS. Include all your tips please.

PAS PD for the ST. Send 75p for the latest details and disk catalogue (refundable). Write to PAS, 97 Holland Street, Ebbw Vale, Gwent NP3 6HY.

PC SOFTWARE – PC Serve, 1147 Greenford Rd, Greenford, Middx UB6 ODP. Tel 081-864 2611, BBS 081-864 2633

PCW PD CLUB – It's new, it's fresh. Swap PD for PD, up to three disks full at a time. Bi-monthly newsletter soon. All PCW owners welcome. Write to 3 Moorend Ave, Chorley Wood, Birmingham, B37 5SD.

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PERFORMANCE PD – PD for the ST. 30 Prospect Road, Oulton Broad, Lowestoft, Suffolk, NR32 3PT. Tel: 0502 513923. Disk list £1. Cheques/POs payable to Performance PD.

PHILOSOPHY APPLE - G Haines, Chinese Room Club, 43 Cornwallis Gdns, Hastings, East Sussex TN34 1LX. Tel 0424 714 102

PICK OPERATING SYSTEM - Hugh Kellt, UK Pick Users Assocn, PO BOX 907, London N10 2SB. 081-462 4666

POWER PD – 90p per disk. Wide range. Send 90p for current Amiga catalogue on 3.5 inch disk to Chris Jackman, 3 Albion Terrace, Lexham Road, Litcham, Kings Lynn, Norfolk, PE32 2QQ.

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RESEARCH MACHINES - Steve Rochford RM National User Group, George Stephenson High School, Southgate, Killingworth, Newcastle NE12 0SA. Tel 091-268 2002

REVELATION (PICK) – write to Malcolm Frame, UK Revelation User Group, 136 Saint Albans Road, Watford WD2 4AE or Telephone 0923 35515

R:BASE – write to Mrs Tansy Beal, R:Base User Group c/o Room A2044 BBC Woodlands, 80 Woods Lane, London W12 0TT. Telephone 081-576 7187

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SCHNEIDER EURO PC - Alex Kefford, SEPUG, 11 Crabbet Road, Three Bridges, Crawley, West Susex RH10 1NF

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SPANDEFANG SOFTWARE – 68000 AC Coders magazine. Send £2 for sample to 4 Cambridge Terrace, Harrogate, North Yorshire, MG1 1PN. Atari, ST, IBM PC. 3.5 inch disk included in price.

SPECTRUM PLUS 3 USER GROUP – monthly magazine. 57 Lovers Walk, Dunstable, Bedfordshire, LU5 4BG

SPECTRUM DISCOVERY CLUB – magazine on disk for the Opus Discovery Disk Drive and the Sam Coupé. BD Mumford, 57 St Saviours Road, West Croydon, Surrey, CR0 2XE

STEN – the ST enthusiasts newsletter issue three now ready. Send a disk and SAE for your copy now. Postal Trivia League starting. Interested? Write to 14 School Road, Morningside, Newmains.

STOS magazine, out every month.Send an SAE for full details to 11 Shore Crescent, Bishops, Waltham, Hants SO3 1DZ

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TEXAS T199/4a - Peter Brooks, International TI User Group 96 Banbury road, Oxford OX2 6JT. Telephone 0865 510822.

THUNDERNEWS – CBM 64 user magazine on disk/tape. Send sae for details and competition to 159 Hough Road, Wallsall, West Midlands WS2 9BG

TIUGUK – TI99/4A user group UK for S/W on disk, tape and module. Offers magazine and help. Write with SAE for more details to Peter Walker, 24 Bacons Drive, Cuffley, Potters Bar, Herts EN6

TRANSPUTER - Howard Oakley, Transputer User Group, Brooklands Lodge, Park View Close, Wroxall, Ventnor, Isle of Wight

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TYPECAST PDL – Atari ST/STE PD. Solely for DTP, WP, Art, clip art, no games. Send disk and SAE for disk catalogue to 31 Hartfield Crescent, West Wickham, Kent.

UNIX USERS – UKUUG Secretariat Owles Hall, Buntingford, Herts, SG9 9PL. Tel 0763 73039 /73255 (fax)

VENTURA PUBLISHING - VPU (Ventura Publisher User group) Linda Liddell VPU c/o LLA Lound House, Forncett St Mary, Norfolk, NR16 1JP. Tel 0508 41580

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WORDPERFECT – Michael Norman, Wordperfect User Group (UK) Dove Barn, Manor Farm, Wootton Woodstock, Oxon, OX7 1DX. Tel 0993 812 670

WORDPERFECT – Dr Ian Barton, A Perfect World, High Rigg, Alma Rd, Tideswell, Derbys SK17 8LS. Tel 0298 871 925

Get yourself listed!

If you run a user group or bulletin board, don't miss out – fill in this form for a free entry and send it to Express On-line, 30 Monmouth Street, Bath BA1 2BW.

Name of group/BBS (delete as applicable) ....
Address: ....
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- Write your ad in block capitals on the grid below using one letter per box.
- Also, please let us know if any of the information is out of date

THE £500 HARD DRIVE LAPTOP

Power portables needn't break the bank. Keith Pomfret searched the world of advertsing and found one at an incredibly cheap price.

A year ago the thought of any true laptop costing under £500 was enough to raise an eyebrow. In the last 12 months, new models have arrived and prices have dropped. First to break the £500 barrier was the Bondwell B200. A reasonably specified machine, it was still without a hard drive.

The Epson Equity has been around for some time and falls into the category of 'heavy lap top'. This means that it has a battery pack and can work away from the mains, but weighs in at over 10 pounds. The original Equity had 2,720K and 3.5-inch drives, but in this version, one has been replaced by a 20Mb hard disk. Distributor for the hard drive Equity is UK Home Computers and boss Ron Gladwin said: "We're offering what people want ... a hard drive laptop. But our price is one that they can afford."

If the sub £500 laptop was an unheard of make from the Far East it would be enough to make us look twice, but to be a product from a quality manufacturer like Epson makes it worthy of immediate note.

VALUE

For your £499 (plus VAT) you get the Equity LT lap top computer configured with a 3.5-inch floppy disk and a 3.5-inch 20Mb hard drive. The machine has 640K of memory and a supertwist LCD display. The LT is a true portable with an AC power pack that can power the machine from a mains socket and charge the on-board battery. There is a socket to allow the connection of a colour CGA monitor. An expansion socket has room for a single 8-bit half card and Epson produces an optional modem card to fit it. A second slot is used by the controller for the hard disk.

It is possible to add an external 5.25-inch drive and the floppy disk controller can handle two floppies of either size. The hard disk controller card is generic to the internal drive.

INTERFACES

Printers are reached by a standard 8 bit parallel port conforming to 25D female configuration. As this port is also used for an external disk drive, it is either printer or disk drive unless a splitter box is fitted.

The serial port is an RS232C programmable asynchronous port and has a 9-pin D male connector. If the serial port isn't to be used for comms or suchlike, connection to a serial printer offers a workable solution if the parallel port is in use with a disk drive.

The monitor/display connector is the normal 9 pin D connector and allows the display to be echoed to a standard colour monitor. The LCD screen has a 1.4 aspect ratio and display characteristic of 200x640 pixels in graphics mode and 25 lines of 80 characters in text mode.The LCD screen is of standard reflective type.

With a fully charged battery, Epson claims NiCad has a life of five to seven hours usage. Depending on hard drive access, we found a more reasonable time to be two to four hours. With a disk intensive application, a couple of hours had the warning light winking, but simple word processing with drive access every 15 minutes or so almost doubled that. The mains unit works from 200/240v AC and puts out enough power to recharge the 9.6v NiCad battery pack while running the machine, although it charges more quickly if it isn't in use.

• Unbelievably cheap – the Epson Equity hard drive laptop.

CPU AND MEMORY

The processor in the LT is the NEC V30 switchable between the standard XT rate of 4.77MHz and a turbo 10MHz. ROM is 16K and RAM is standard 640K with parity. There is no provision on the main board for memory expansion.

SIZE IS EVERYTHING

The Equity LT is quite a lump by laptop standards. It is 12.2 inches x 13.6 inches x 3.2 inches The basic hard drive model that we reviewed was 6.22kg. The LT opens up in the traditional clamshell mode to reveal a good solid keyboard. The keyboard is of high quality and unlike many of the smaller models, doesn't cut corners. It is an 85 sculpted key unit and unusually for a laptop has a proper numeric keypad. There are 10 definable function keys, 17 keys in the numeric/cursor cluster and 58 keys in the QWERTY layout.

The LT is heavy and the handle was designed in the days before Epson had heard of ergonomics. This might have been a problem, but for the low price and anyway, UK Home Computers are bundling a carry case with the LT so the handle won't see much use.

As it comes the LT has a standard LCD CGA screen. A backlit version is available as an option as is a converter to allow connection to the cigar lighter in a car (or cigarette lighter if it's a cheap car).

The backlit screen is a full transmissive type.

SOFTWARE

The Operating System that comes with the Equity LT is MS/DOS 3.3. This is still preferred by many who have not come to terms with the later 4.01 version. With a hard disk drive of only 20Mb the later version isn't needed for disk management as the internal hard disk doesn't exceed the 32Mb storage limit set by this earlier version of the operating system.

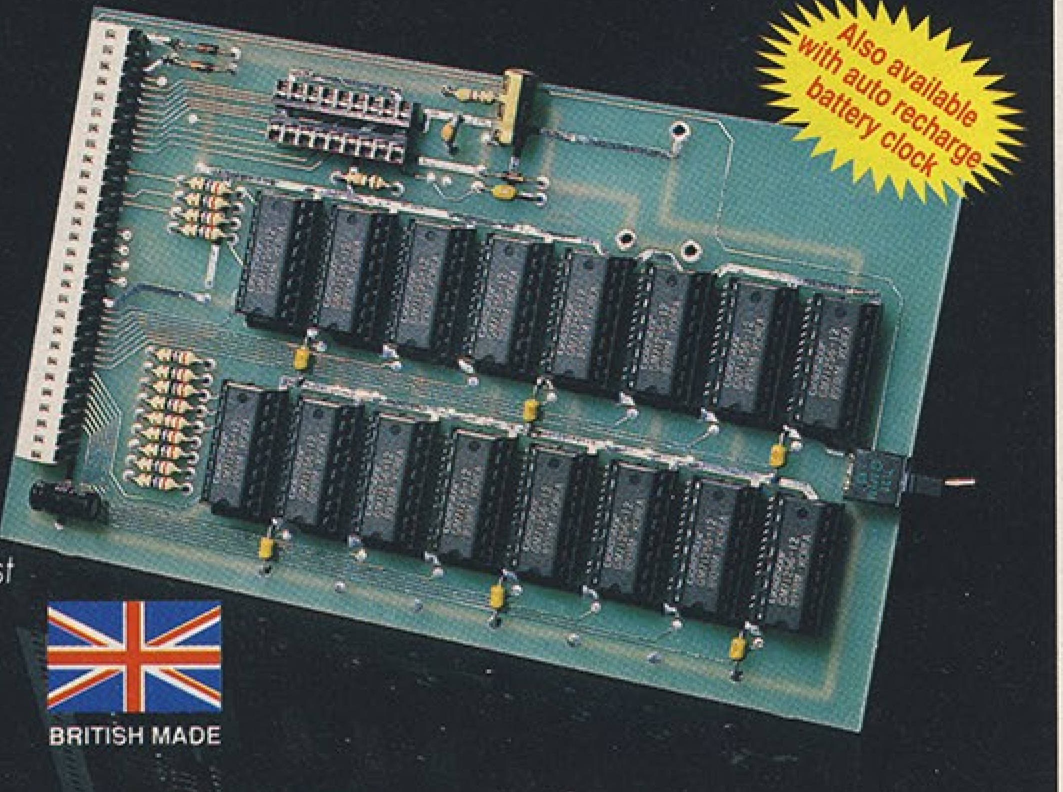
Also included is GW Basic. This popular variation of the BASIC language seems to be almost a statutory requirement with PCs and is a usable, if not much used environment.

The Equity took everything that we threw at it software wise and its LCD screen was no worse or better than other similar machines. It drove a monitor with no problem and if you have need for a computer in the office and on the move and you don't require the use of expansion slots or a graphics standard better than CGA, the Equity LT could be a cost conscious answer. With a cheap CGA monitor you'd still be the best side of £650 and have a hard drive PC that could be used in office or out and about. The feature of the LT that makes this most workable is the 'proper' keyboard with a separate cursor cluster/numeric keypad and full travel sculpted keys.

The Epson Equity is cheap, sturdy, of good parentage and from an established company. The first hard drive lap top to break the £500 barrier is the best bargain that we have seen for ages.

Epson Equity LT Hard drive costs £499 plus VAT and includes carry case MS DOS 3.3 *and* GW BASIC. *Contact UK Home Computers on 0793 695034.*

On page 61 of *Express* 124, the telephone number for the *PC Collection* supplier was wrong. It should have read: *The PC Collection* is available from Millgate Resources on 0628 784001.


Also available with auto recharge battery clock

GAMES WEEK

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

This week Entertainment International seems to be having a bit of a bonanza, and is announcing no fewer than five titles which they expect to see on sale this year. Its most prestigious must be ***Wrath of the Demon*** from Readysoft, the brains behind such games as ***Dragon's Lair*** and ***Space Ace***.

But why is ***Wrath of the Demon*** any different from the aforementioned games, which, let's face it, were not exactly the most interactive of pastimes, were they? Well, at long last Readysoft is able to do justice to its particular game-style, using the advanced hardware inside the Amiga CDTV system. ***Wrath of the Demon*** utilises the massive storage space inside the new machine to stack away over three megabytes of graphics. That amounts to a cool 600 screens-worth of action, plus 1,400 frames of animation, with more than 100 colours on-screen!

The game conforms to the usual wafer-thin plot; you have to help the hero kill the evil demon whose henchmen are trashing the kingdom and get off with the gorgeous princess. Oh well, at least it promises to be colourful. No dates available for release yet, but Games Week will keep you posted.

A slightly less mega-techie title is ***Eye of the Storm***, a 3D vector-graphics space-game. Entertainment International says it features over 120 different types of objects, including fish, plants, mammals and faces. There are even a few techno-advancements in this too: underwater scenes are accompanied by realistic sound effects, and Gouraud shading is used to give the objects in the game true 3D appearance. ST, Amiga and PC owners can look forward to this sometime in September this year.

San Francisco in the late 21st century seems to be a popular place and time for game-scenarios at the moment. We have already seen ***The Killing Cloud*** from Vektor Grafix, and now it's time for ***Cyber Space***, Entertainment International's futuristic role-playing game. In darkest 'Frisco, the natives are revolting (cue obvious joke) against the rule of the MegaCorporations. Punks and Netheads are laying waste to media stars and Cybernetic mercenaries in an attempt to stop the corporations from controlling the world by television, radio and print. ***Cyber Space*** has complex rules of travel, combat and espionage, which suggests it's a deeply-involved strategy-game. You can create a wealth of characters and develop and enhance them as you progress. Look out for this in October, on PC, ST and Amiga.

Still in the Sci-Fi roleplay vein, Entertainment International is releasing ***MegaTraveller 1 – The Zhodani Conspiracy***, during April on ST, PC and Amiga. This features sophisticated character generation, with five military classes and more than 70 talents and abilities. Eight different solar systems contain 28 planets where you will find all kinds of puzzles, subplots and interesting encounters. You have more than 30 weapons systems at your disposal, but will you have the skills to use them? Medicine, flying, communications, bribery and laser-armaments are all areas which you can learn about to help your character. Aficionados of the ***MegaTraveller*** board-game system will already be aware of the depth and quality of the system – newcomers will find it a powerful introduction into the role-playing genre.

Finally, the company has announced ***Volfiev*** – the Taito coin-op conversion. This simple but addictive shoot-'em-up features giant crabs, killer ladybirds and an eyeball-spewing head! I wonder if there's any plot? Look out for this in June for PC, ST and Amiga. ■

TOP 10 ALL FORMATS CHART

THIS WEEK	CHART WEEK	TITLE	PUBLISHER	MACHINE
1	17	*Teenage Mutant Hero Turtles*	Mirrorsoft	ST AG SP CO AM OT
2	16	*Dizzy Collection*	Codemasters	SP CO AM
3	3	*Turrican*	Anco	ST AG SP CO AM
4	6	*Big Box*	Beau Jolly	ST AG SP CO AM
5	2	*SWIV*	Storm	ST AG SP CO AM
6	3	*Mickey Mouse (SG)*	Sega	OT
7	12	*Total Recall*	Ocean	ST AG SP CO AM
8	12	*Golden Axe*	Virgin	ST AG SP CO AM
9	16	*Robocop 2*	Ocean	ST AG SP CO AM
10	5	*Lemmings*	Psygnosis	AG

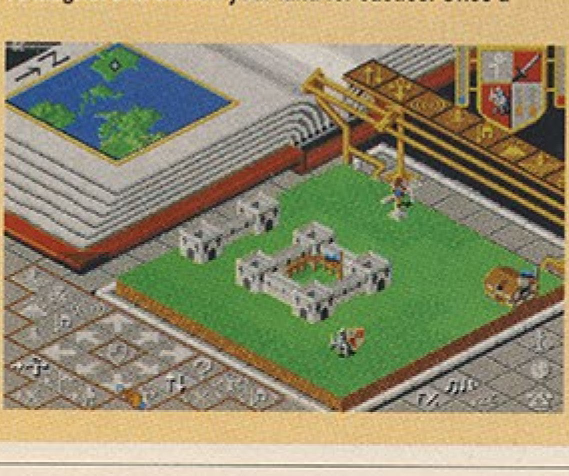
ST = Atari ST AG = Commodore Amiga SP = Spectrum CO = Commodore AM = Amstrad OT = Other
Chart compiled by Gallup. © European Leisure Software Publishers Association.

Tip of the Pops

POPULOUS
Amiga and ST

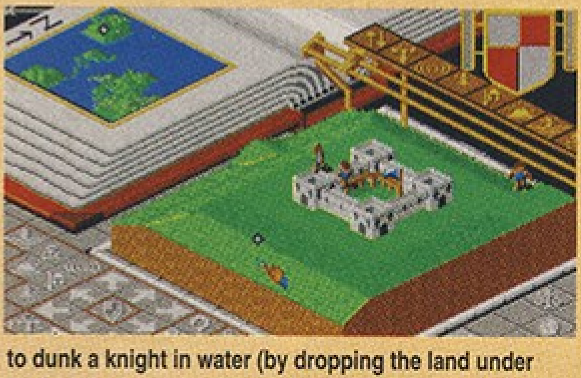
Start each game by using Raise/Lower to make at least one large castle. Place the Shield icon on the castle's flagpole and wait until the green strength bar reaches halfway. Then raise the land at one corner of the castle to kick out the traveller. When he's out, lower the land again to rebuild the castle and then repeat the whole process. With this method you have more manna and more travellers to work with.

When you are about to Knight your leader, place the Papal Magnet on a clear piece of ground and raise the land into a cone, about three levels high. Then select Go To Magnet and search your land for castles. Once a traveller has been evicted, raise the land at one corner and then immediately lower it to regain the castle. Go back to your leader (who will now be considerably stronger thanks to the increased absorption of travellers) at the Papal Magnet. Check the place for swamps – the leader should be okay if he's on a cone, as only flat land can be swamped.



When you and the computer are closely matched and have similar forces, go to the area on the map where your buildings and his meet. Go as deep into his territory as you can while still retaining at least one of your houses on screen. Then raise the land as far as you can (at least four levels) to totally wreck his buildings. This is actually more useful and costs less manna than a volcano, plus you can reclaim the land later without having any rocky lumps to worry about.

After the computer has Knighted, if you are still low on strength follow the knight around and destroy your own buildings before he reaches them. In this way, you slightly lower the knight's energy each encounter, without letting him destroy the land around the buildings. This makes rebuilding easier. A strong leader can kill a weak knight, so follow the knight about with the Papal Magnet and select Go To Magnet while kicking your people out of the castles. Don't miss an opportunity to dunk a knight in water (by dropping the land under him) as this also decreases his energy, especially in the earlier levels.



Often, the computer will swamp a large mass of your land and the first warning you get is the sound of drowning people. Pause the game as soon as you hear this, and look around for your Papal Magnet. It's likely to be a the central point of the swamp. If the area's too big to deal with by normal Raising/Lowering, just earthquake the whole lot. The swamps disappear, and you are left with a more simple repair job.

Knight your leader as soon and as often as possible (even if it looks like you are losing). You collect loads of points for knights, though slightly less than using the Armageddon option.

BRAT
Mirrorsoft £24.99
AMIGA and ST

Romper rogue on the road

After the usual sequence of software house ident and programming team credit, there follows a short animated sequence which puts *Brat* head, shoulders and nappy above the rest. Complete with crisp sampled sounds, you witness the small angelic Nathan turn into a streetwise dude with an excessive baseball cap and shades. "Time to party, dudes," he cries before plastering the screen with the game's title using his squirt gun.

Next is the game's main menu, where you will find three different types of demo, a password-to-level entry system and the main route into the world of *Brat*. You can choose which part of the world you see in the demo and then sit back and listen to the excellent in-game tune whilst picking up a few playing tips from the invisible hand which leads Nat the Brat through part of the demo level. When you reckon you have cracked the methods involved, you can enter the game, but always in the same place – Toyland.

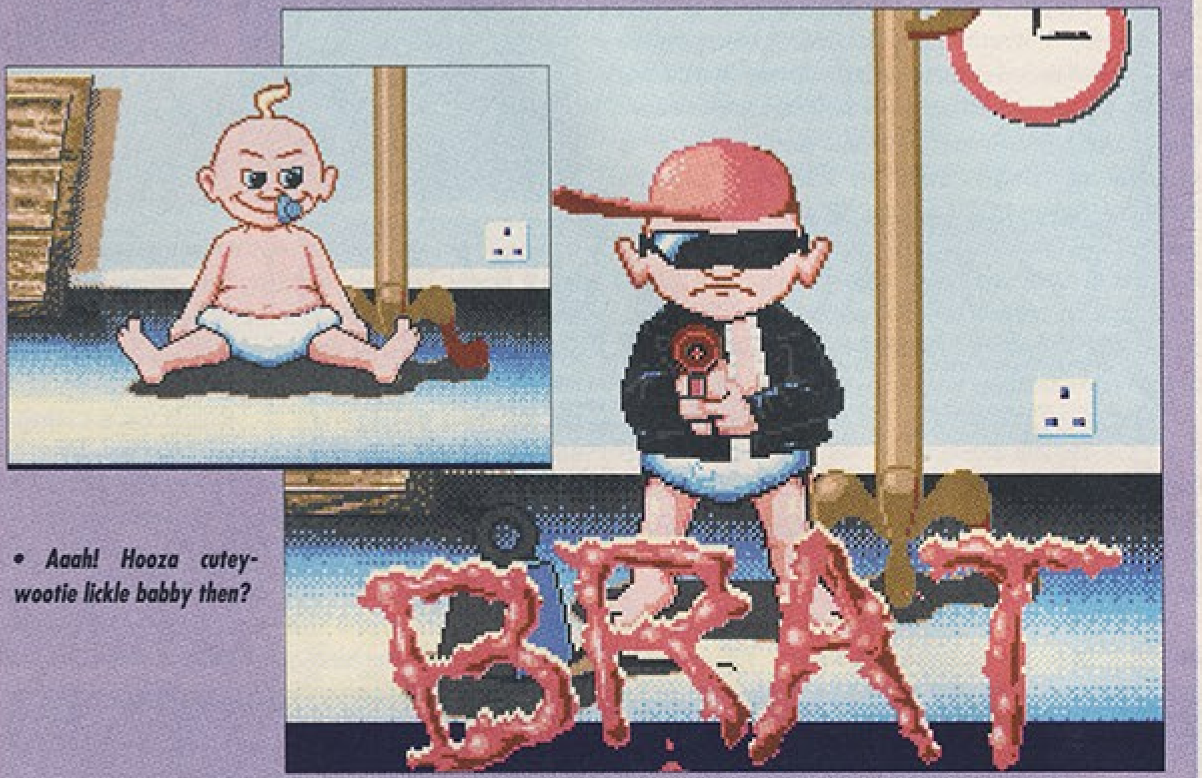
Here your task is to direct Nathan safely through a toy-infested route by placing arrows in his path. The game's isometric 3D layout can force you to look twice at everything to start with, but you soon get used to working out straight paths in all directions. Then you click on the toolbox panel, selecting and placing the right icons to make Nathan turn at the corners, or pause him momentarily to gain a bit of route-deciphering time. Most of the time he will just toddle along, collecting bits and pieces as he goes, occasionally booting a toy or two out of the way. The bits he picks up you can use, and there are all kinds of things you need. For example, Nathan will pick up dynamite for blowing up track-blocking rocks, and weights for holding things down. But it is up to you to work out where to use them.

Meanwhile, as you are busily trying to crack all the logic puzzles, time is marching on. Time, in the form of the upward-scrolling screen, can be halted (providing Nathan's picked up the right bits), but only for a short while. If Nathan gets too close to the top of the screen (or worse still, goes beetling off in the wrong direction) he will be knocked off.

Sometimes keeping Nathan on the right tracks is nigh-on impossible. Occasionally, there is not even a track at all! Then you need to include bridge-building in your repertoire, as well as direction-finding. Later levels include sliding bridges which can spell disaster unless you have Nathan under perfect control. But even perfect control can elude you – each direction sign, stop signal, and bridge-part costs money which Nathan has to collect in the form of coins and gems. And if you can't direct Nathan to pick it up, well...!

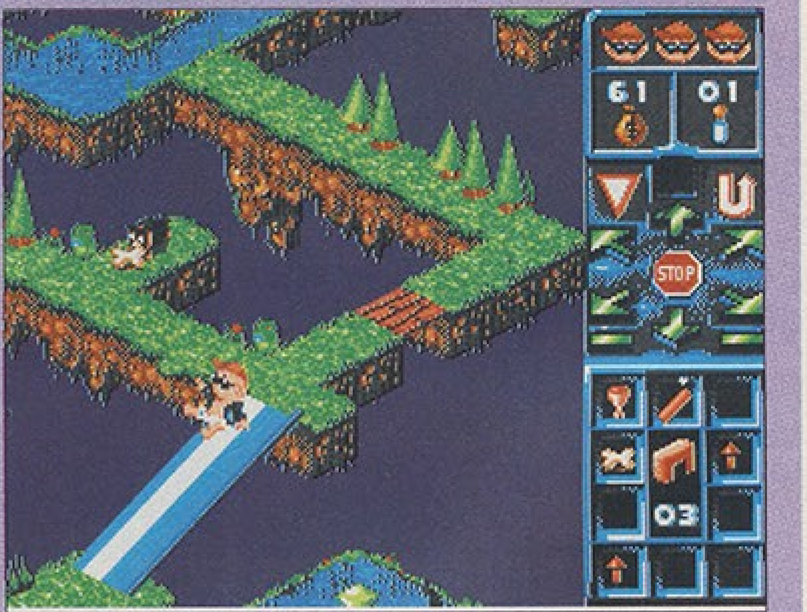
There is really a lot to contend with, and your first few attempts are likely to be punctuated with cries like, "Ah, but I know what to do next time...", until you find you have been at it for ages. *Brat* is definitely one of those games that calls you back time after time, especially when you actually get to see Nathan's lives run out. Being put down by a one-year-old infant shatters your self-respect and makes you want to prove yourself!

Most games are made from hard slog, late nights and plenty of coffee. *Brat* looks like one of these but it has an extra ingredient: it is a concept which has been thoroughly worked through on every level! Even the voices in *Brat* are the voices of a real mum and her son! From start to finish, *Brat* is an enjoyable, amusing and beautifully polished piece of entertainment which reflects the care and attention that has been lavished on it. Now that's what real games are made of.

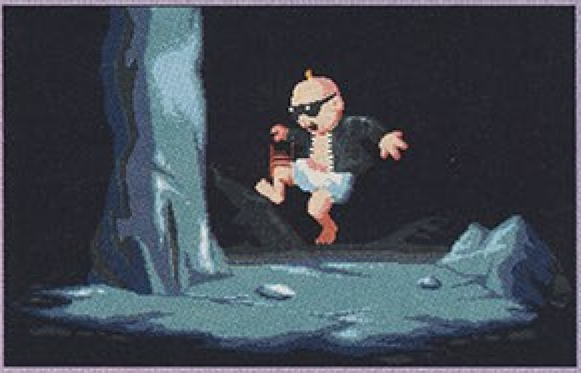


• Aaah! Hooza cutey-wootie lickle babby then?

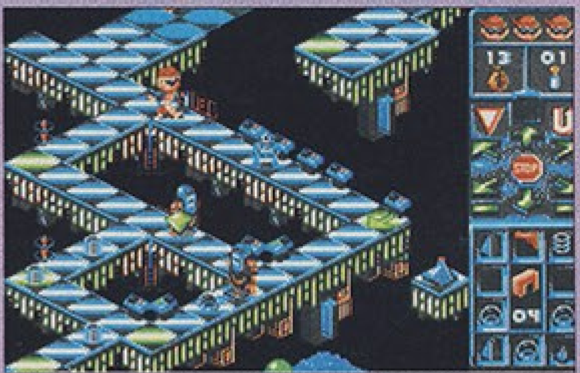
• Er! Certainly not Nathan, the supercool infant terrible, star of Brat.



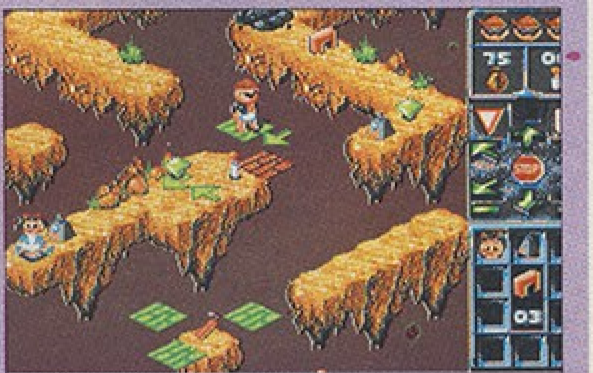
• Whee! Where else would you find a slide, but the Park? Beware of the fat rotweillers who give chase, and keep an eye open for killer sharks in the boating pools.



• Mess it up and Nathan falls off the edge of his dream-world. Babysitting was never fraught with this much danger before!



• Direct Nathan through the Moon Base, where robots roam and giant pits open up underneath his tiny feet.



• The contents of Nathan's toy cupboard have escaped. Get through Toyland, dodging the Jack-in-the-Box and the Tin Soldiers.

SCSI HARD BARGAINS

Buying a hard disk off the shelf can be a hard decision to justify, if only in terms of price. Instead, why not build one for your ST? Andy Storer test drives Ladbroke's 105 Mb hard disk.

Life's never been the same." "I don't know how I got by without one". "It transformed my whole way of working." "Give me back my hard drive or I'll extract your lungs through your nostrils."

These are just some of the responses you're likely to come across when you ask the average hard disk owner what difference a small magnetic platter made to his computing life. So what's the big deal?

Well, with some computers you just can't get by without one – the Mac immediately springs to mind here as its operating system has to be loaded off disc every time you want to do... well, anything. Okay, the ST's much better supported in this respect as all calls and functions reside in ROM, but it's still a drag to search through trays of disks for that essential utility you need right... *now.*

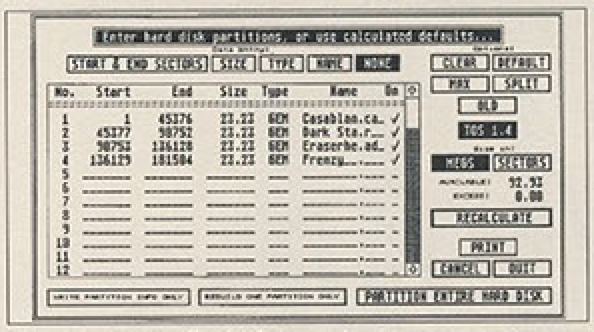
Also, floppies tend to go down far more often than a hard disk – so much so that they're best regarded as temporary media – and in addition, these days even games software comes on so many disks you're changing between them left, right and centre. Finally, loading off hard disk is so much faster than floppy – and we don't need comparative timings to prove that do we?

No. (But in case you're wondering the answer's 11Ms.)

HARD DRIVING

So in the meantime you might like to take a look at one of the Quantum hard drives available from Ladbroke; either the 52Mb for £420 or the 105Mb for £530. These are both 3.5 inch mechanisms, with their own power supplies, and come in plain cream cases.

The external power supply means that they're not trying to suck any more current from the already overworked ST power supply. This is good news for your ST which won't have to run above its approved specification and, more independent, good news for the hard drive. The independant power supply offers the Ladbroke drive (shouldn't that be Ladbroke Grove... Ed) smoother and more stable power than if it were trying to overdrive the ST's internal power supply.



Enter hard disk partitions, or use calculated defaults...

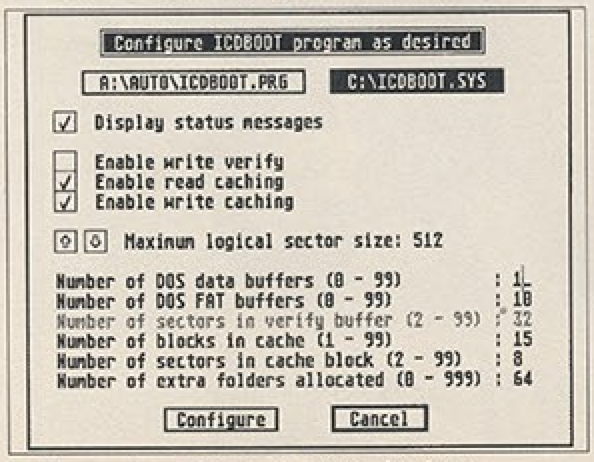
```
No.  Start    End     Size  Type  Name          On
 1       1   45376   22.22  GEM   Casablan.ca.. ✓
 2   45377   90752   22.22  GEM   Dark Sta.r... ✓
 3   90753  136128   22.22  GEM   Eraserhe.ad.. ✓
 4  136129  181504   22.22  GEM   Frenzy....... ✓
```

92.92
0.00

•*From the ICD Handbook, the menu for drive partitioning*

They also feature DMA Out ports which means, if you're so inclined, you can daisychain up to eight SCSI devices to each other. With up to eight hard drives and other SCSI devices hanging off the back of your ST, it's good to know that the controller can work in octopus mode. This single controller can manage up to 255 partitions occupying one gigabyte of storage space.

This kind of partitioning means that you can divide all those Mbytes up into logical devices, each occupying say 10Mbs, which can be assigned different drive names. As such, Drive C could hold all your ST system software while D holds the Spectre GCR Macintosh emulator and Drive E one of a choice of PC emulators.



Configure ICDBOOT program as desired

A:\AUTO\ICDBOOT.PRG
C:\ICDBOOT.SYS

☑ Display status messages

☐ Enable write verify
☑ Enable read caching
☑ Enable write caching

Maximum logical sector size: 512

```
Number of DOS data buffers (0 - 99)                 : 1
Number of DOS FAT buffers (0 - 99)                  : 10
Number of sectors in verify buffer (2 - 99)         : 32
Number of blocks in cache (1 - 99)                  : 15
Number of sectors in cache block (2 - 99)           : 8
Number of extra folders allocated (0 - 999)         : 64
```

• *The menu for configuring the ICD Hard Disk Drive.*

This logical approach to device assignation can also be used to compartment a drive for different applications. Logical drive D: could be for word processing, E: for DTP, and so on, making it easy to keep track of files in mass storage.

The great rush toward single logical devices on the PC brought by the later versions of MS/DOS hasn't necessarily made PC computing easier and even with later versions of DOS, many users are returning to the use of small logical devices rather than a single physical one.

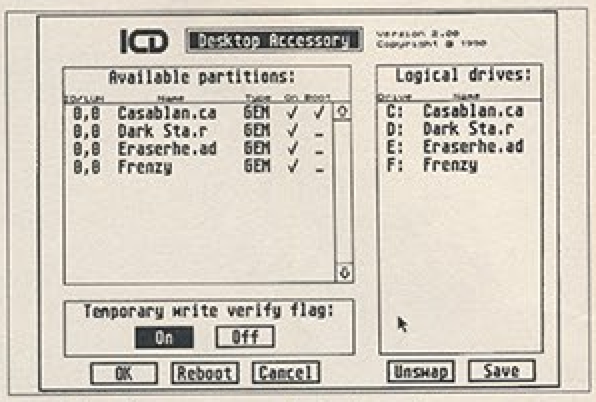
ACCESSORIES

There are a useful suite of utilities provided with the Ladbroke drive. Although the ICD disk (double-sided, incidentally; return it and a single-sided replacement will be sent free of charge) is supplied already formatted there's a program which does this job, allowing you to customise the disk format to your use.

A small elegant wad of code performs the function of enable and disable for the autoboot function, thereby leaving this decision in the hands of the user – not the machine.

To make total control of the hard disk environment a reality, there's a desk accessory that allows up to 64 partitions per drive to be selected, switched on and off, renamed, etc, while on the fly. And an access prevention feature can protect data from prying eyes and small fingers.

The 11Ms access time of the Ladbroke drive is attained in two ways. First, the drive has a rapid (typically 20Ms) access time. A RAM disk cache optimises this so the perceived speed is the 11Ms claimed.



Available partitions:

```
ID/LUN  Name           Type  On  Boot
0,0     Casablan.ca    GEM   ✓   ✓
0,0     Dark Sta.r     GEM   ✓   -
0,0     Eraserhe.ad    GEM   ✓   -
0,0     Frenzy         GEM   ✓   -
```

Logical drives:

```
Drive  Name
C:     Casablan.ca
D:     Dark Sta.r
E:     Eraserhe.ad
F:     Frenzy
```

Temporary write verify flag: On

• *And, from the same source, the Desktop Accessory menu .*

Finally, the documentation provided is a slim A5 manual that takes the user through each step of installation use and feature in a simple to follow form.

SOFT OPTIONS

ICD hard drive kits start out at around £70 and basically supply you with everything except the hard disk itself. These you can pick up as bare items from a company like UK Home Computers on 0793 695034 for around £100 for a 20Mb unit. The ICD kit comprises the Host Adapter, allowing you to communicate with other SCSI devices, the controller and shielding, the casing, a fan, a power supply unit, the required cables and the mounting hardware. This DIY enterprise is not difficultand will be a Circuit City project in the near future.

Finally, are you wondering whether £420 for 52Mbs of storage space isn't just a little expensive when a 1Mb STE only costs £370? Perhaps. But think of the advantages and, once you're convinced, shop around. ■

HARD ALTERNATIVES

If you fancy some hard driving of your own, here's a list of suppliers and contacts:

Ladbroke (0772 203166):
3.5 inch hard drives: 52Mb, £420;105Mb, £530
Full Circle Technologies (0622 677173):
Vortex Datajet hard drive and AtOnce PC emulator £535
Power Computing (0234 273248):
Slimline hard drives: 20Mb, £325; 40Mb, £425; 110Mb, £599. Build your own interface units from £69 up to £99
Rewriteable optical drives: 600Mb, £2,995 (with additional magneto-optical removable cartridges at £249 each – any chance of some review kit at long last fellas?)
Evesham Micros (0386 765500):
NEC hard drives: 40Mb, £399; 100Mb, £599
Atari Megafile: 30Mb, £439; 60Mb, £589
FirstChoice (0532 637988):
Atari Megafile Removable 44Mb, £799
Other Megafiles as above. ICD 40Mb, £489.Vortex 40Mb, £520
Best Prices Mail Order (0903 700714):
Atari Megafile 30Mb £389, 60Mb £530.

UK HOME COMPUTERS

PC /AT 286 - 16MHz.

80286 Processor @ 8/16MHz, 200 Watt PSU, 102 key keyboard, AMI Bios, 8 Internal expansion Slots, 1 Mb RAM, expandable to 8Mb on-board (SIMMS), 1.2 Mb floppy disk drive, 2 Serial & 1 Parallel Port, Real Time Clock with battery back-up, 3 disk drive slots (for Hard Disk/Tapestreamer etc.), MS-DOS 3.3 & GW-BASIC 3.2. This price doesn't include a monitor or Graphics Card.

Graphics Cards available from £29.95p to £89.95p.

£449.95p

inc. VAT (carriage £15.00 Overnight)

EPSON LAPTOP/HARD DISK

4.77/10MHz V30 Processor, 640K RAM, 1 Serial & 1 Parallel Port, CGA external Monitor port, (standard 9-pin output), 1 x 720K 3.5" floppy disk drive, 1 x 20MB hard disk, rechargeable ni-cad battery (5-7 hours usage), mains adaptor, MS-DOS 3.3 & GW-BASIC, Real Time Clock & Battery Back-Up, 85 key sculpted keyboard with 10 function keys, weighs only 6.25 kg. & measures only 310mm x 345mm x 79mm. Complete with soft carry case. Full IBM Compatibility. Recommended price approx. £1500.00p

12 month 0n-site warranty available from only £25.00p

£499.95p

plus VAT (Total inc. Carriage £574.95p)

HARD DISK BONANZA

90Mb 5.25" Half-Height(badged EPSON). Access time 18ms. 1024 cylinders, 5 heads, 36 sectors. Complete with ESDI controller (16 bit), cables, & formatted. Usual price over £600. Our special limited offer price is just **£299.95** inc. VAT

SEAGATE DISK DRIVES

ST 225	**20mb(65ms)**	**£159.95p***
ST 251-1	**40mb(28ms)**	**£199.95p***
ST125	**20mb(40ms)**	**£189.95p**

*** denotes 5.25" half height drives**

Seagate Disk controllers £34.95p inc cables

Postage per Disk Drive £4.05p

AMSTRAD NETWORKS

The complete package to enable you to link upto 3 PC's together. The package consists of 3 interface cards, Junction boxes, cables, software & full documentation. Based on the "Corvus" design, this package is very powerful & professional. Originally made to sell at £400.00p plus VAT, our special price, while stocks last, is just £149.95p inclusive of VAT & Postage. **£149.95p**

PC Software-To Clear:-

Wordstar 1512 Wordprocessor/ Supercalc 3.1 Spreadsheet & AccountMaster	**£29.95p**
Microsoft WINDOWS 286/386	**£29.95p**

Postage £3.05p

PC HAND SCANNER

Manufactured in Korea. 3 resolution levels, 400/ 300/200/ dpi selectable. Line Art & Halftones. 16 grey levels(ideal for photographs). Ideal for capturing and editing logos, artwork, text, signatures, cartoons, photos etc. Files can be saved in .TIF(for Pagemaker) .PCX (PC PaintBrush) and .MSP (Windows Paint), plus...Superimposition(images can be placed over & alongside other images). The package contains the Handy Scanner, XT bus interface, Acer Scan Studio Program, User Manual & Operator's manual.

£89.95 **postage & packing £3.05p**

MS Windows is required

PC/AT 286-40MB H/D

Made by SAMSUNG. Model MFC 6000/1. Usual selling price around £800.00p plus VAT. Features include 80286 processor @ 10MHz. 1Mb On-Board RAM (Expandable), 6 Expansion Slots, 1.2 Mb 5.25" High Density Floppy Disk Drive, (Room for 2 additional drives), 102 key keyboard, battery back-up, Hercules/Monochrome graphics Card, Serial & Parallel Ports, MS-DOS 3.2 & GW-BASIC. Philips 12" Green Screen Tilt & Swivel Monitor, & 40Mb. Seagate Hard Disk.

£599.95p **This price includes VAT, but please add carriage £15.00p.**

PC/XT FOR UNDER £300

8088 Processor @ 8 MHz, Serial & Parallel Port. 8087 Socket.
1/2 Mb On-Board RAM (Expandable)
1X360k 5.25" FDD (Space for second)
Mono/Colour Graphics Card
2 Conventional Expansion Slots
Space for Internal Hard Disk Drive
MS-DOS 3.3 & GW-BASIC 3.2
102 Key Keyboard made by EPSON
12" Mono Monitor

As Reviewed in PC-PLUS

£299.95p **inc. VAT & Carriage**
Send or phone for other options

BEGINNERS PC/AT 286

640k RAM Expandable to 2MB. on-board, 1.2 Mb 5.25" Hi-Density Floppy disk drive, True IBM Compatible, 1 Parallel & 2 Serial Ports, 5 Empty Disk Drive slots, (for future expansion), & 9 Empty internal expansion slots(8-bit & 16-bit). Also included is a Maths Co-Processor socket, Battery back-up, MS-DOS 3.3 & GW-BASIC 3.2. This price doesn't include a monitor or display card .

£299.95p

inc. VAT (Carriage £15.00 O/N)

Phone for options on graphic cards and monitors. Also we stock Hard Disk Drives at low prices.

HP COMPAT LASER PRINTER

512k RAM expandable to 4.5 Mb.
Centronics interface (optional serial)
HP Laserjet series 11 compatible
6 Resident Fonts & 23 symbol sets
21 Font Cartridges available(& soft fonts)
Ricoh 6000 Laser Engine (Very reliable)
6 Pages per minute
300 x 300 dots per inch.
Portrait & Landscape delivery
150 sheet feed tray (See Free Offer)
Measures only 16" x 16.5" x 8" (17kgs)
On-Site warranty included (extendable)

"Best Buy 1991"

£649.95
inc. VAT & Carriage

FREE **400 Sheet paper tray, value £200**

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VISA/ACCESS orders welcome. Prices subject to change without notice. All transactions are subject to our standard conditions of Sale, available upon request. Personal callers welcome by appointment. All prices include VAT. All goods Brand New unless expressly stated otherwise

VISA

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Unit 22, BSS House
Cheney Manor Ind. Est.
Swindon, Wilts. SN2 2PJ
Tel: (0793) 695034

SO WHO NEEDS WINDOWS 3?

Simon Walsh investigates an alternative to Windows for those who don't have the computing power to run 'the real thing'.

After coming to prominence in the home computing world by creating the two-million-selling *GeoDesk* for the Commodore 64, American company GeoWorks has, for the last three years, been turning its attentions to the PC market.

The result of this switch in markets is Ensemble, an award-winning suite of programs which aims to provide your PC with a WIMP-based front-end. And what a front-end it is! The visual effect is best described as 'soft 3D'; subtle shading defines a combination of sliders, buttons and switches which borrow heavily from Steve Jobs' NeXT machine interface in both appearance and functionality.

Ease of use is the name of the game here, and what is really remarkable about Ensemble is that it will run on any PC with a minimum of just 512K of memory. This, coupled with an open-ended design allowing for the addition of further modules to complement its built-in applications, and excellent print quality, makes the package tremendous value for money.

Essentially, it contains everything the home user or small business with standard AT or XT-type machines needs to manage and present their work.

SETTING UP

Although Ensemble is shipped with 500-plus pages of documentation, it's immediately apparent that, by and large, the manual is not really required. Installation is a simple question of typing 'setup' at the DOS prompt; everything else is taken care of automatically – assuming, of course, that you have the various system requirements on hand: an XT, AT, 386, 486 or PS/2 PC compatible, at least 512K of memory, 3Mbytes of hard disk space, a mouse, DOS 2.0 or higher and an EGA, VGA, MCGA or Hercules card driving your monitor.

Since Ensemble is primarily designed to be a front-end it's perhaps a good idea to modify your autoexec.bat file to autoload Ensemble on booting. This will be no problem if you then want to run a DOS program; on loading, you are presented with three buttons, one of which allows you to directly launch DOS batch files. The other two buttons, labelled Appliances and Professional, let you dispense with the dreary old command line interface forever.

BASIC ESSENTIALS

The manual somewhat simplistically refers to the bundled Appliances as the equivalent of a toaster; small, simple and basic. Although the Planner, GeoDex, Banner, Calculator, Notepad and Solitaire modules accessible from the Appliances section also appear in the Professional workspace, in Appliances mode they don't include additional buttons, scroll bars and pull-down menus. We're talking idiot-proof mini-applications here.

The two Appliances most worthy of note are Geodex, an Address book, and Banner, a large-scale print application; although basic, both show the tremendous ease and flexibility of the system.

GeoDex is more like a Macintosh *HyperCard* stack than a conventional PC program, with small buttons enabling you to quickly create and locate names and addresses and automatically dial corresponding phone numbers (if you have a modem hooked up).

Banner is a simple-to-use printing utility which will output text sideways on to continuous paper at a size of one character per page. Although programs like this have been around for a while now, this one is about the best available – various modifications to the text such as emboldening, italicising and shadowing can all be brought in from a pull-down font menu. And if you assume that the eventual print quality of these embellishments might leave a lot to be desired, you couldn't be more wrong; the output is fantastic, even on a 9-pin dot matrix printer.

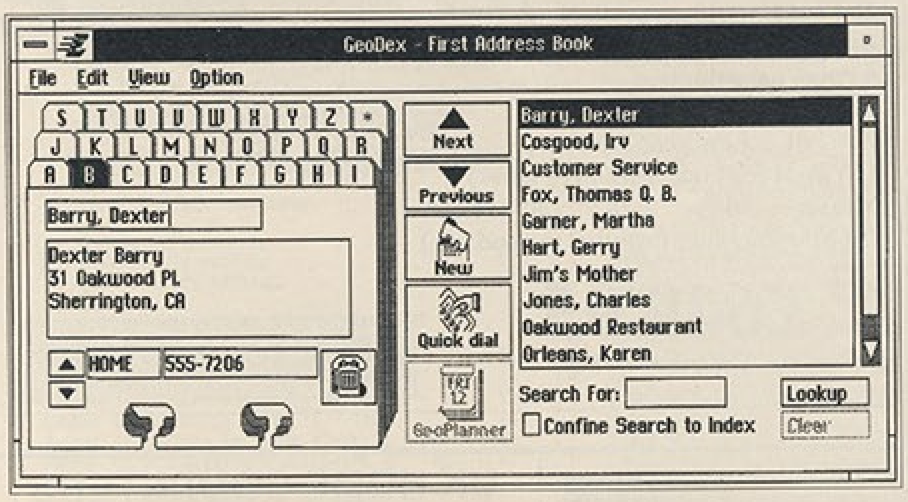
This is because Ensemble uses outline fonts to define the shape of characters both on screen and in print. The result is fast screen updates and extremely precise printed output.

PROFESSIONAL WORKSPACE

Although the Appliances are impressive, the heart of Ensemble lies behind the Professional Workspace button. This reveals the GeoManager icon desktop, with its 10 sub-applications. Any of these can be launched by double-clicking on their icons, and can be made to multitask with each other in their own separate windows – which can be resized using scroll bars or moved around by holding down the mouse button while in the title bar area.

Clicking on the icons representing different drives in the information area produces iconic or textual representations of all the folders and files on your entire machine.

Ensemble follows a Mac-style interface, in that any document relating to a program residing elsewhere on disk can be launched directly by simply double-clicking on it – saving you the trouble of finding the program itself and launching that, then opening the relevant document. Moreover, an 'overlapping' icon allows you to view several window directories simultaneously within the larger GeoManager window.



GeoDex - First Address Book

Barry, Dexter

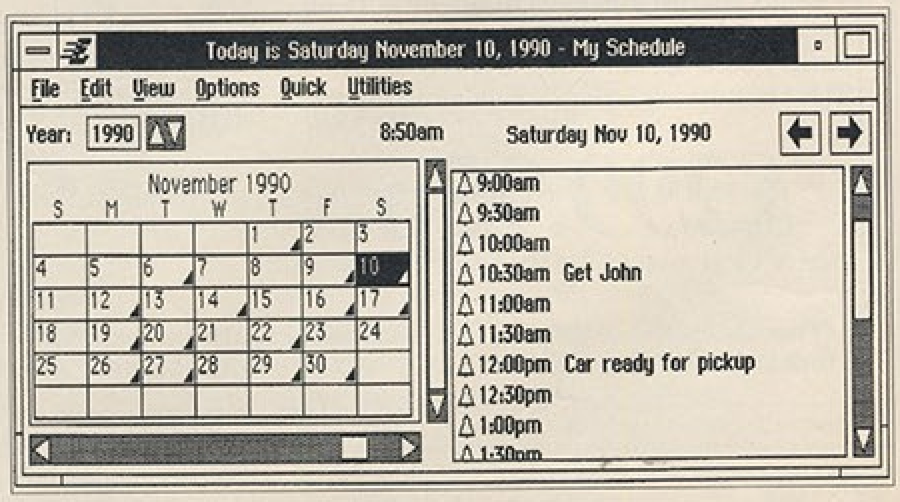
Dexter Barry
31 Oakwood Pl.
Sherrington, CA

HOME 555-7206

Barry, Dexter
Cosgood, Irv
Customer Service
Fox, Thomas Q. B.
Garner, Martha
Hart, Gerry
Jim's Mother
Jones, Charles
Oakwood Restaurant
Orleans, Karen

Search For:
☐ Confine Search to Index

• *Geodex is much better than the Address Book Appliance – it gives you lots of extra features. You can print all the names and addresses in the file on your printer.*



Today is Saturday November 10, 1990 - My Schedule

Year: 1990

8:50am

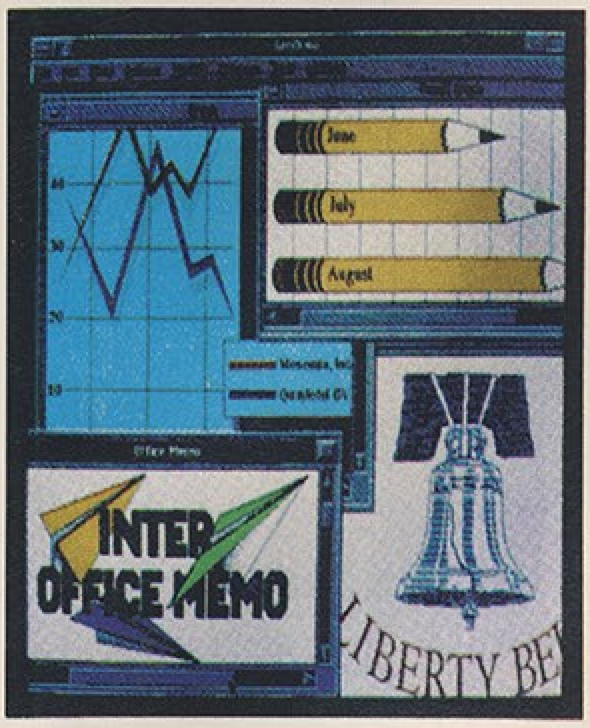
Saturday Nov 10, 1990

November 1990

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	

9:00am
9:30am
10:00am
10:30am Get John
11:00am
11:30am
12:00pm Car ready for pickup
12:30pm
1:00pm
1:30pm

• *GeoPlanner is a combination of desk calendar and appointment book. It's a good place to write things you don't want to forget.*



• *GeoDraw in action - it can import scanned images too*

The upper area of the screen contains buttons to open, close and expand windows to full screen size and to call up the Express Menu – an essential shortcut which lets you switch from one application to another, start a new application, return to the Welcome screen or return to DOS. Also up top are the pull-down menus – File, Tree, View, Options, Disk and Window.

These file management and viewing functions are probably the areas where Ensemble is most likely to be compared to Windows 3 – and there's no escaping the fact that there are remarkable similarities. The difference lies in the added value supplied by Ensemble's bundled Appliances and the consistent menu iteming they share.

These consistent menus are present throughout all the sub-applications included in Ensemble, although individual items within menu ladders will alter depending on the parent program. It is certainly the case that consistent key combinations and positioning of items makes the interface begin to seem to be pretty intuitive after a few hours' use.

As any Mac user will tell you, the fact that all Mac programs have a consistent orthodoxy in the way they behave and are presented makes that machine one of the most enjoyable to work on. With Ensemble, Geoworks has set out to do just the same.

THE PROGRAM SUITE

The main programs available in Ensemble are the *GeoWrite* word processor and *GeoDraw* paint package, together with *GeoComm*, a fully-functioning telecommunications package with auto-dialling and sequencing scripts. But smaller applications are also present; functional utilities existing as memory resident programs or desktop accessories which can be called up at any time.

The calculator, notepad, scrapbook and planner can all be used to store diverse information which can then be transferred into the other applications. Thus, for instance, it's possible to quickly paste name and address information from *GeoDex* into *GeoWrite*, or exchange pictures between *GeoDraw* and *GeoWrite* via the scrapbook.

Another useful utility is called Preferences, which offers the user options to alter screen, mouse and printer device options. A spreadsheet and database are in the pipeline and should be available later this year.

Aside from the well-designed front-end and the useful memory-resident utilities, each of which in themselves make Ensemble worth having, are the main packages on offer; *GeoWrite* and *GeoDraw*.

First of all, it's important to say that the two applications are extremely similar in terms of menu design and one can easily cut and paste material between the two. While *GeoWrite* is primarily intended to offer text editing facilities, it also supports many design and layout functions within the package. Similarly *GeoDraw*, while primarily intended to offer design and layout features, also offers text editing functions.

With 20 fonts and several different typestyles, *GeoWrite* is obviously more than a standard text editor. Instead it's more of a word processor along the lines of, say, Microsoft *Word* for the Mac, where all a user has to do is highlight text with the mouse before selecting the size, font and type style required; the results are immediately displayed on-screen. The screen can also be expanded or contracted in size to suit your own viewing needs.

Besides this, though, the module also offers a number of features normally only found in DTP packages. Facilities, for example, to produce white-on-black reversed-out type, custom design borders surrounding text, background, border and text halftones and multi-column formatting are all present in the package.

Perhaps the most innovative feature of *GeoWrite* is its colour support, however; text and border areas can be set to one of 16 preset colours or one of 255 individual RGB settings. Finally, graphic elements can be imported from *GeoDraw*.

The *GeoDraw* module is also a very advanced piece of software, with object-oriented graphic elements allowing accurate changes of size and proportion with no loss in resolution or definition. Graduated fills and halftones can be added to discrete objects, whether they be polygons, lines or text characters.

Again, the full palette of colours is available (although the actual range of colours depends on your graphics card). Text manipulation is also straightforward and extremely fast, given the system's employment of outline fonts. As such, text can be rotated and flipped very quickly.

Used in combination, *GeoWrite* and *GeoDraw* provide immense possibilities; even the humblest XT with 512K of memory is capable of handling graphics and text as if it were a 386 with several Megs of RAM.

WORTHY OF INVESTIGATION?

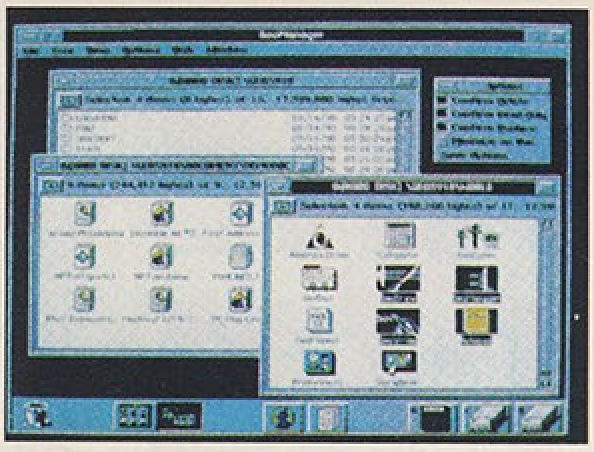
So, is Ensemble worth a look? As far as I'm concerned, the answer is a resounding yes. GeoWorks has spent three years working on the package and, after looking hard at the Macintosh, Windows, NeXT and OS/2 interfaces, the company thinks it has come up with something rather special. To all intents and purposes it has – Windows 3 notwithstanding.

Perhaps Ensemble's only flaw is its bad timing; had the product made it to the market a year earlier, then perhaps we would now see it as the central player in the new generation of PC user-friendliness. As it is, the ground has been stolen, Microsoft is firmly entrenched and, despite the package's credible advantages, one can't help but feel that in the long run, it's doomed.

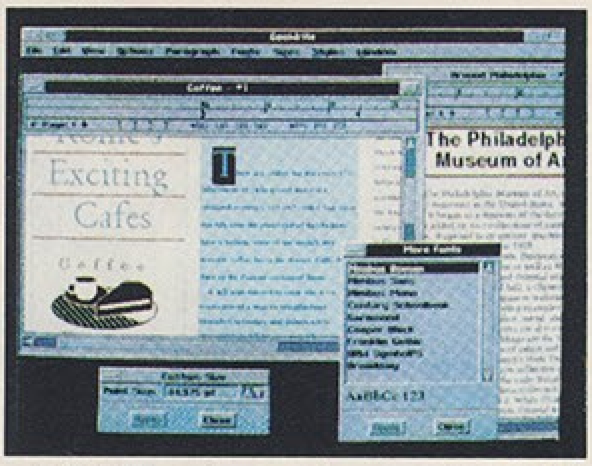
But then, 80 per cent of the PC market consists of 086 and 286 machines with 640K of memory and nothing more. Flashy 386 boxes with extended memory are in the minority, so GeoWorks is, rightly, aiming its product at the majority of PC users.

With Ensemble, you don't need Windows and you certainly don't need to upgrade just so you can draw on the benefits of using a graphical interface. If you want all that a WIMP interface can offer and more besides, take a long, hard look at Ensemble; you may well find that it fits the bill. ■

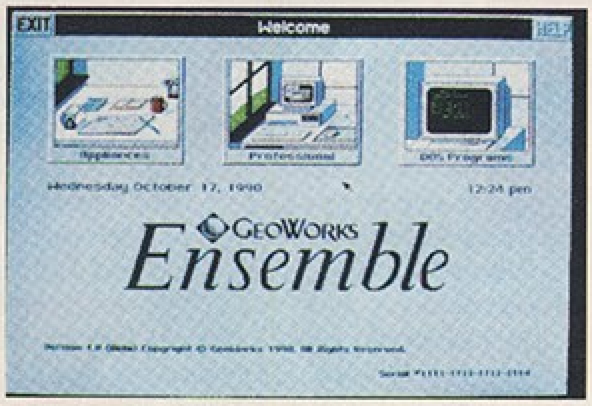
GeoWorks' Ensemble is available for £149 from GSI Republishing on 081-995 4500.



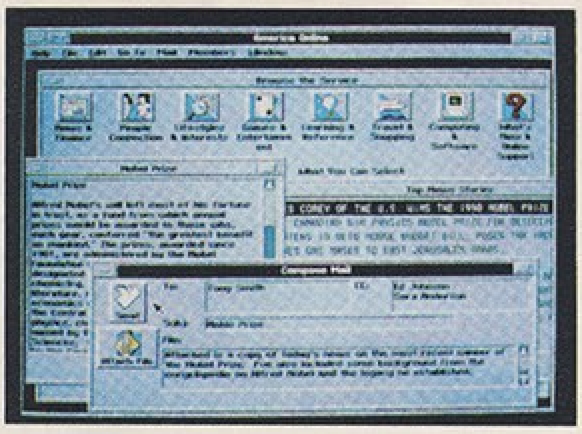
• *GeoManager's icon driven front-end makes for easy file management.*



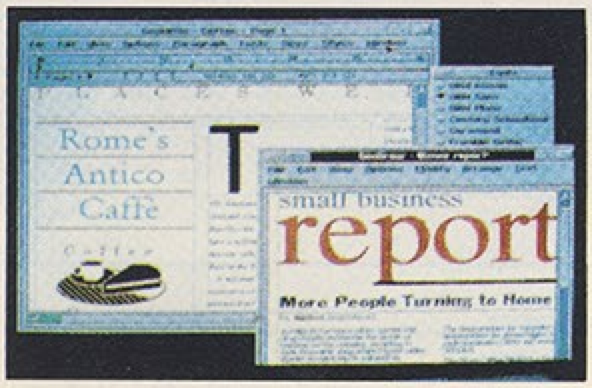
• *The GeoWrite word processor also supports pictures and DTP elements.*



• *Ensemble's Welcome screen.*



• *The built-in comms package also supports multi-windowing.*



• *With outline fonts it's possible to quickly resize text*

ARE YOU A £50,000 WINNER?

Not if you entered a compo in *Express*, but in the last six months or so we've never given away a prize worth less than £400 and we even gave a £2,000 laser printer to some lucky soul. To see if you've joined in the £20,000 *Express* giveway read on:

Some one had to win, didn't they? We've cranked up the steam tombola and drawn winners for some of *Express'* recent competitions. There were so many entries that the tombola cracked in the middle when we turned the handle too fast. There' are loads more to draw yet and we'll be listing those within the next few weeks.

All of the prizes in the competitions we run come direct from the distribution companies themselves. If you haven't received your prize within a month of the cover date of this issue, yell at them, not us.

So who wanted a QL? Loads and loads of you. But the exceptionally lucky winner is Rick Mitford and he gets a QL, monitor and printer from EEC Ltd on 0753 888866.

There were 40 **Dial Code Breakers** to win from Sector Software (0772 452414). We've drawn the first 20 (the other 20 will be announced in a few weeks) and they are: Brian Ross, R Beaconwell, S Stinson, P Wallace, E R Burns, Paul Boocock, Jim Comrie, S R Fincham, Ally Hill, R P Sharman, Edward Mc Laughlan, A Hylton, Steve Pepper, Eugene Morgan, J Wilson, Colin Mackay, N Prescott, KW Birks, Roger Philips, RF Gay.

Next came a couple of copies of the delightful Amiga DTP package, ***Pagestream 2***. These are available from Silica Shop on 081-309 1111 and will be winging their way to the Amigas of M Jones and AH Foster.

Show me the way to go home, we said and with ten copies of ***Autoroute*** from NextBase on 0784 460582, here are ten Express readers who can do just that: Robert Gill, Bryn Stevenson, Peter Kempley, M Campeann, David North, NA Crooks, EA Cook, Neil wakeford, Garth Barnes, Terrence Simpson.

Last, but not least the Down to Earth with a Bang Compo offered copies of ***Air Traffic Control Simulator Tower FRA*** to 20 of you: Michael Barton, Maynard Wilson, Graham Dobson, Stephen Wakefield, TS Whaite, Steve Carter, Nick Taylor, Allan Ogilvie, I Timson, Peter Gunning, MJ Humphrey, D Winder, Dave Brown, MJ Bull, Andrew More, Mrs S Matheson, Simon Taylor, Trevor Cobbe, W Stones-Clare, Philllip Capstick.

So if you didn't win, keep on trying. We're giving away thousands of pounds worth of prizes starting with the Commodore *Express* £5,000 giveaway!

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Door to Door
Yes it's that program!
Is it really as bad as everyone says?

GT ST
Adimens' GT relational database for the ST
- better than SuperBase?

Goldstar's PC
Express's office PC taken to pieces

AND
News of a cracking Commodore compo !!!

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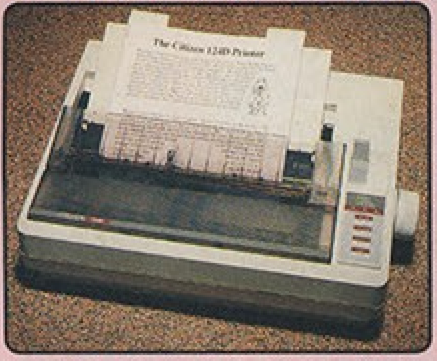

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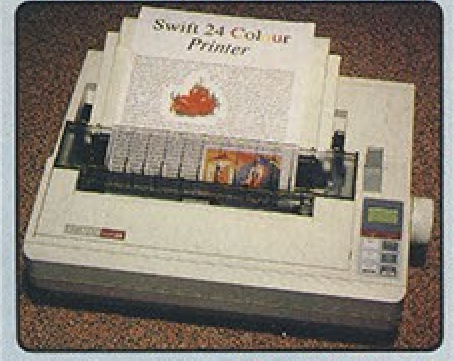

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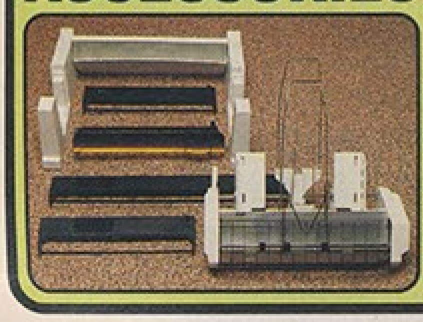

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MiG-29™

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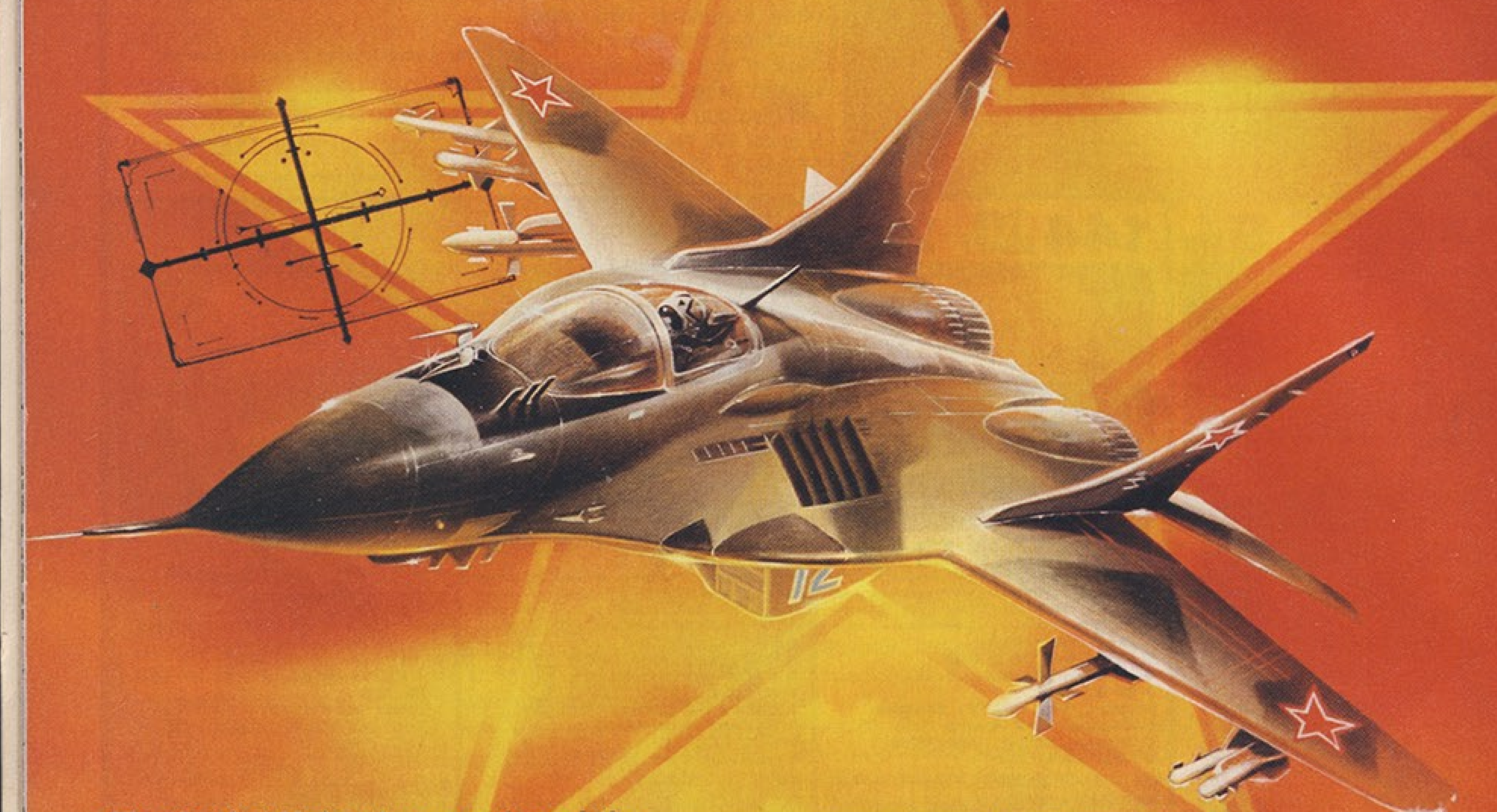

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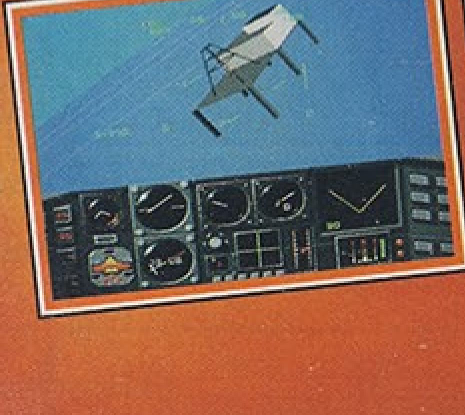

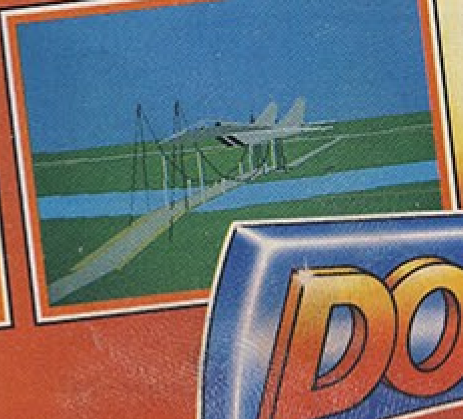

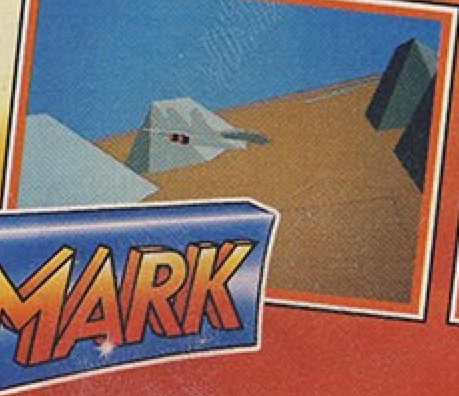

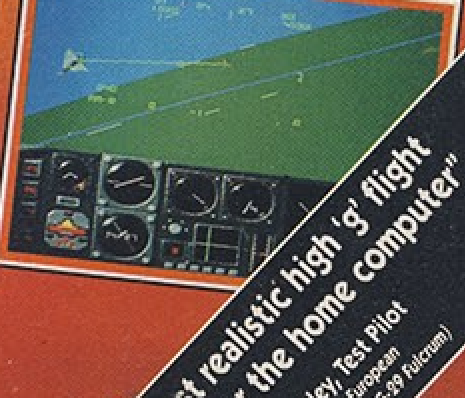

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