

# POPULAR NEW COMPUTING

A FOCUS MAGAZINES PUBLICATION

November 19-25 1987 60p WEEKLY

## Ripper opens can of worms



Chambers - not concerned

A STORM of protest has erupted following the release of CRL's *Jack The Ripper* computer game. The game, which features pictures of brutally mutilated women, has re-

cently received an '18' certificate from the British Board Of Film Classification.

Conservative MP Harry Greenway has lashed out at CRL and said, "This game should immediately be confiscated by the police".

Greenway was both appalled and sickened when informed that one scene in the game shows a picture of a near-naked woman lying dead in a pool of blood.

Clement Chambers, 23 year old chairman of CRL, said "People are used to horror and are interested in it. *Jack The Ripper* is something that by having explicit details in it adds a whole new dimension" he continued.

By receiving an '18' certificate, *Jack The Ripper* is subject to certain laws as to who it can be sold to.

Chambers isn't too concerned that under 18's may see the game, however. "I'm not particularly

worried. If you think I stay up all night worrying about it, then no. Dealers know they can't sell to persons under 18 as there is a sticker saying this on the packaging" he said.

Apparently the only warning dealers have about the nature of the game is on the packaging. Electronic Arts, CRL's distributors, didn't realise the game was of a strong nature.

John Forrest, a Director of EA said: "We knew it would be certified, but I thought it was in the same genre as other releases, so we have not really informed dealers in any major way."

According to a spokesman for The Home Office; "any dealer selling the product to under 18's could face legal action and face a fine up to £2,000".

If the product is sold by mail order, then a declaration would have to be signed by the purchaser

stating that they are 18 or over.

Would any police action be taken? "We're not aware of the computer game and cannot comment", a spokesperson for Scotland Yard said.

Ken Penry, Deputy Director of The British Board Of Film Classification said the game received an '18' certificate for two reasons. "There is one particular graphic picture of a woman and also there is a passage in the dialogue which meant the game had to receive an '18' certificate".

Chris Paradine, research assistant for Jo Richardson, the Labour Party Spokesperson on women, said "I would call this pornographic material."

"This is part of a complex syndrome of trivialising and degrading women and perpetuating sexist stereotypes."

Chambers himself said, "This game isn't sexist".

### This Week



Editorial .....	3
News Analysis .....	10
Letters .....	12
Games .....	15-24
C on the Archimedes .....	27
Software contracts .....	30
Sound check in Japan .....	32
Kenn Garroch .....	34
Interfacing .....	37
Listings .....	39-41
Comment .....	54

## Data Protection Act in force

THIS WEEK the final element of the Data Protection Act came into force, giving you the right to see personal data that is held on computer files.

The storing of personal information on computers has always had a 'Big Brother Is Watching You' menace about it.

Among those who receive confidential data are banks' employers and schools, and if the information they have is inaccurate, the subject's life could be seriously affected.

Sarah Spencer, General Secretary for the National Council of Civil Liberties (NCCL) gave a case example. "A former employee of an international oil company was blacklisted because they thought he was a communist. Although he

continued on page 6 ►



Sarah Spencer from the NCCL



# Now the Summer will surely last forever!

The smell of the surf, the sun on your back, the sand between your toes... This isn't California Dreamin' - this is for real! Six of the best West Coast sports designed to set your pulse racing! Now your friends with your incredible flying skateboard skills, or show your cool hacking at the sack.

Slide down the boardwalk, flip the Frisbee® and wheelie the BMX. And then the ultimate test - that King of Californian sports - shooting the curl as you battle with those giant Pacific rollers to decide which surfer truly rules the waves!

You'll be playing for big name sponsors like Pacer Skateboards, Ocean Pacific®, RAD Mag, Frisbee®, Hacky Sack®, Moray Boogie®, Burton®, Snowboards and Bluebird®, and contained in each pack you'll find a fun to enter competition to win quality products made by these companies too!

California Games™ features superb graphics, all the atmosphere of the West Coast, and one to eight

players can take part. All the quality you expect from an Epyx product is here and so much more. We could tell you more but instead let's hear what the critics have to say:

"California Games is quite simply the apex of computer sports gaming. Even in purely technical terms Epyx have somehow managed to surpass their own high standards - the pictures and sounds generated by this program are atmospheric beyond belief."

If you gather up all the superlatives from previous Epyx reviews

and add them together, you just might go halfway towards describing California Games™.

- Zzap 64

"California Games has to be the best release this year so far."

Some of the individual games are almost worth the asking price on their own."

- COMMODORE COMPUTING INTERNATIONAL

Need we say more?

# California GAMES™



CBM 64/128	£9.99 CASSETTE	£11.99 DISK
SPECTRUM	£8.99 CASSETTE	
SPECTRUM+3	£12.99 DISK	
AMSTRAD	£9.99 CASSETTE	£14.99 DISK
MSX	£9.99 CASSETTE	
IBM	£24.99 DISK	
AMIGA	£24.99 DISK	

**PLUS**  
**PRIZES**  
**TO BE WON IN**  
**EVERY PACK!**

Manufactured and distributed under license from Epyx Inc. U.S. Gold Ltd., 2/3 Holborn Way, Holborn, Birmingham B6 7AX. Epyx is a Registered Trademark No 1196270. \*All supplied by Marktrade.

CBM 64

# EPYX®



## NEWS DESK..... 1-8

Furore over *Jack The Ripper* continues... Data Protection Act comes into full effect... Amiga owners plagued by Virus hackers

## NEWS ANALYSIS..... 10, 11

Francis Botto explains the finer implications of the Data Protection Act, and asks who will it protect?

## LETTERS..... 12

## GAMES..... 15-24

Two Games of the Week this week - *Defender of the Crown* on the C64, and *Elite* on the PC. Also *RISK*, *Inspector Gadget*, *Spellbinder*, *Driller*, *Leviathan*, *Travel Game*, *Mean Streak* and *Chuck Yeager's Advanced Flight Simulator*

## SEE C SIGNOR..... 27

David King reviews the new C compiler for the Archimedes

## THE DOTTED LINE SYNDROME..... 30, 31

David Lester offers advice and warnings to any programmers starting to hawk their wares round the software houses

## SOUND CHECK IN JAPAN..... 32

Mark Jenkins reports from Tokyo on Yamaha's 1988 product range

## KENN GARROCH..... 34, 35

## ON THE LATCH..... 37, 38

Kenn Garroch continues his series on interfacing with advice on decoding with the Z80 processor

## LISTINGS..... 39-41

## COMMENT..... 54

Malcolm Arnold on the question of violence

## POPULAR COMPUTING WEEKLY

Vol. 6: No. 46

**Executive Editor** Francis Jago  
**Deputy Editor** John Brissenden  
**Features Editor** Duncan Evans  
**Production Editor** Yvonne Hartland  
**Staff Writer** Nikki Carvey  
**Advertisement Manager** David Osen  
**Advertisement Executive** Athena Peerman  
**Classified Manager** Susannah King

**Classified Executives** Robert Cole, Tim Owen  
**Managing Editor** Brendan Gore  
**Publisher** Trish Phillips  
**Group Publisher** Paul Coster  
**Chief Executive** Richard Hease  
**Financial Director** Brendan McGrath  
**Published by** Focus Magazines, Greencoat House, Francis Street, London SW1P 1DG

**Typeset by** Magazine Typesetters, 6 Parnell Court, East Portway, Andover, Hampshire

**Printed by** McCorquodale Magazines, Andover, Hampshire  
**Distributed by** SM Distribution, London SW9, Telephone: 01-274 8611, Telex 261643  
© Focus Magazines 1987.  
ISSN 0265-0509

ABC

**Popular Computing Weekly.** Tel: 01-834 1717. Fax 01-630 6165

The mystery surrounding the Virus Amiga program looks like being a sad re-run of Commodore's "Crisis? What crisis?" attitude to the A500 grey imports affair during the summer. Then, as now, a situation arose which was affecting large numbers of Amiga owners who had paid good money - for a machine. Then, as now, it appeared that many of them ran into a problem without warning and about which they had no idea what to do. Then, as now, it came to light not through any public statement by Commodore, but from members of the public. And then, as now, Commodore surveyed the situation from a position of majestic inactivity. This is not good enough.

The pages of this magazine have been littered all too often in the past with stories of firms not keeping faith with their customers. All too often the simple truth has had to be restated - computers are not cheap, and customers have a right to expect much greater support from manufacturers in situations such as this.

Of course it may be that, as a Commodore spokesman suggested, that someone is pulling our collective leg, in which case you can expect three lines at the bottom of an inside page in next week's issue by way of grovelling apology.

But what if we are right and Commodore is wrong? Commodore will then be in the unenviable position of not only failing to respond quickly enough to a serious situation, but compounding that failure by dismissing it as a hoax. We are confident that our readers will be the arbiters in this case, as in many others and that they will prove the truth or otherwise of this extraordinary tale. In the event of it being true, we and they shall expect immediate action from Commodore to rectify matters.

Here we go again. CRL's *Jack The Ripper* has got all the Disgusteds from Tunbridge Wells and beyond crawling out of the woodwork. Once again, a software house has won masses of cheap, if not free, publicity by using the oldest trick in the book - shock horror. Once again the press - *Popular Computing Weekly* is no exception - has played along and once again the feminist lobby has found itself in bed, so to speak, with the hang 'em and flog 'em brigade.

There are two ways for the public and the computer industry to eradicate shoxploitation. One is obviously for the public not to buy it and to purchase other titles instead. In the case of games which are in any case good to play, that is maybe too much to expect.

But another way is for the rest of the computer software industry to use a little - pardon the word - inventiveness. What is so difficult about dreaming up other ways of making games attractive to the public, other ways of promoting them, so that software houses won't be tempted to appeal to the lowest common denominator? This kind of thing is, let's face it, more tiresome and boring than actually shocking. If the purveyors of this kind of product won't grow up of their own accord, maybe it's time the rest of us set them an example.



# Amiga plague mystery

MYSTERY last week surrounded a program which is corrupting discs and data held by increasing numbers of Amiga users.

According to Yuri Large, of the Amiga User's Club, the Virus program was initiated by the Scandinavian Cracking Association (SCA) to outdo all the other cracking groups.

SCA created Virus by producing a program which writes itself onto the RAM and then infects every disc which subsequently comes into contact with it. Having put the program on all the games it had cracked, the SCA then passed them to its contacts and so Virus spread.

But Commodore appeared not to be taking the matter seriously. Amanda Cridge, marketing manager for Commodore U.K., dismissed Virus as a hoax saying, "It's like something out of a

science fiction boom".

Large is adamant that it does exist. "It is quite a big thing. We've had a batch of software go down and it's been on the machines in our shops. Now we won't let anyone we don't know put their discs into our machines."

In addition, Alan Hubbard of Dimension Computers, Leicester, informed us that Virus had suddenly appeared on his machines. He had no idea what had caused it.

"I'm completely in the dark about it," he said. "There was suddenly a message on the screen saying, 'Your Amiga is Alive'."

At the moment, Large thinks it is predominantly Amiga pirates who are contracting Virus, retribution for their illicit dealings, one might say.

Sooner or later, legitimate users will be on the receiving end, unless the infection can be eradicated.

Despite the mystery surrounding Virus, Large explained that it was very easy to get rid of. "Turn off the machine for a minute to allow the memory to clear and then use a Virus killer on each of your discs." Virus killer was devised by hackers in the U.S. but is available in Britain for £3.50.

While Large maintains that almost every Amiga user has heard about or seen Virus, Commodore remains unconcerned.

Another Commodore U.K. spokesman stated that Virus was a little too similar to the AIDS epidemic to be taken seriously. He added, "I think someone is pulling your leg".

● Whenever you switch on an Amiga you need to insert a boot disc which contains basic information about the initial set-up - screen colours, stack space and

so forth.

The boot sector is 512 bytes long and loads very quickly. Some striking programs have been written in this sector, including graphics demos, stunning sound tracks - and now Virus.

A system booted with a Virus disc looks like any other, but the program sits there silently waiting for more discs to be inserted and then writes itself to them.

Each time a Virus disc is booted it counts, writing a number back to the boot sector. After a while there is a random delay before the machine crashes. A message appears to say 'Something wonderful has happened - your Amiga is alive'.

The usual three-key reset does not kill Virus. It sits there marking time and corrupting the next disc inserted. The only way to kill it is a full power-off re-set.

## Winter Olympics game to offer holiday in Canada Elite plans

NEXT WEEK Tynesoft is releasing its new winter sports' simulation game, *Winter Olympiad '88*.

As preparations get underway for the Winter Olympics in Calgary, Canada, Tynesoft believe the game will successfully capture the atmosphere of such an event.

Available free with the game is a booklet with an introduction written by David Vine. One of television's leading sports' commentators, Vine has been associated with the Winter Olympic Games for the last twenty years.

In addition, those who buy the game can enter a competition to win a holiday to the Games in February. The closing date for this will be 30th January, 1988.

The game will cost £7.95 on cassette for Spectrum, Amstrad, C16/Plus 4, and £9.95 for Commodore 64, Atari XL/XE, BBC/Electron. On disc, it will retail at £14.95 for BBC/Master Compact, Atari XL/XE and £19.95 for Amiga, Atari ST and IBM.



Winter Olympiad introduction by sports commentator, David Vine

Elite Software last week completed plans for its 1988 product range - involving a 120 per cent increase in programming capacity.

In a statement the company also emphasised moves it has recently taken towards expansion of its software activities, including: MOVING its administration to Lichfield, thereby freeing the whole of its Aldridge offices for use as a software development centre;

APPOINTING George Yapp as software development manager, Niki Penny as brand manager for the Loricels product range, and Geoff Grimes as marketing manager, thus freeing sales manager Bernard Dugdale to spend more time with customers;

STRENGTHENING its software team by adding three additional supervisors to the management, and;

BUYING Durell.



# The cute computer show

By Peter Worlock

WHILE the rest of the world is preoccupied with the burning issues of the day - where is OS/2? is the Amiga better than the ST? should I buy an Amstrad PC or someone else's?, Macintosh owners quietly continue their love affair with the cute computer and Apple continues to rake in the millions.

To say that Apple is doing things its own way is a massive understatement and nowhere was this more evident than at last week's MacUser Show at North London's Business Design Centre.

The Business Design Centre and the Mac might have been made for each other, sharing that "very designer" appearance. Not for the Mac the soulless caverns of Olympia, nor the every day feel of some anonymous city hotel.

Once you had gained entrance to this hallowed ground, the first impression was bewildering to any hardened show-goer. For one thing there was near silence - no throbbing soundtracks booming from neon-lit stands; for another there were no thronging masses barging down crowded aisles. Instead there was a cool, unhurried elegance, like a Palace garden party organised by the marketing department.

But there was new product, and a lot of it. Some was newer than others: Ashton-Tate was showing

*dBase Mac*, a full year after its debut (a sort of *Star Trek* of the business world), but the company insists that the software is ready this time. It is more or less exactly what you'd expect: all the features of *dBase* on the PC, coupled with the Mac's windows, menus and mouse-driven control.

There was a second new contender in Mac databases in the form of 4th Dimension, distributed in the UK by User Power Software. Preliminary reports are good, but at £645 it would have to be good.

Meanwhile, Blyth Software, flying the flag for Britain, was pulling the crowds (using "crowd" in its loosest sense). Its *Omnis 3* program has established a virtual monopoly in the area of serious data management on the Mac and Ashton-Tate may have taken 12 months too long in bringing *dBase* to the Mac market.

Not surprisingly, desktop publishing products abounded with laser printers, scanners and big screens coming at you from all sides. DTP software continues to be a cut-throat race for supremacy. Quark Xpress, a highly praised newcomer, drew a lot of attention, while market-leader Aldus announced *Pagemaker* version 3. This is Aldus' response to *ReadySetGo* version 3, but sneaking up on the blind side, Letraset announced *RSG* version 4.

Apple itself brought two new products to the show *Multifinder* and *Hypercard*. The first is a new Mac operating system which offers limited multitasking but is claimed to be compatible with existing software. *Hypercard* defies de-



The Macintosh Plus - improved speed, storage and peripheral expandability

scription and is really a new category of software: part operating system, part programming language for people who can't program, part freeform database, part graphics paint program, part *Sidekick* lookalike, and some of just about everything else you can think of.

One noted Macintosh observer has said *Hypercard* will be recognised as a milestone in the history of computing. I can't help feeling

it's much more important than that, but you'll have to see it for yourself.

One for the Dear Santa Department: take a Mac II, add Supermac's Spectrum graphics board and its 19-inch colour monitor and you've got a commercial graphics workstation. The system gives you a 68020 processor, megabytes of RAM, 1024 x 768 pixel resolution, and 256 colours from a palette of millions. Not much change from £10,000 though.

On a more accessible scale, there was a Mac version of *BBC Basic*, Borland showed the latest versions of *Sidekick* and *Turbo Pascal*, and like Canute trying to hold back the tide, HSV Computer Services fought for that old computer show feel by flogging discount discs, printer ribbons and boxes of paper.

By any standards the MacUser Show has to rank as a success, not least in the sense that it demonstrated the Mac's victory - against all the odds - in establishing itself as a serious rival to the IBM PC standard.

But I couldn't escape the feeling that in achieving that success, Apple has lost something along the way - a sense of fun, perhaps, or the spirit of adventure. These may not be valuable commercial assets, but I've always thought they were the computer industry at its best.

## Pirate launch

THIS WEEK budget company, Pirate Software, launched their first Spectrum +3 compilation.

The new label is called Pirate 3+3 and is priced at £9.95. Leigh Richards, Pirate Publishing Manager, explained, "Instead of paying for games on separate discs, we are offering the consumer the chance to buy three on one."

The first titles available on Pirate 3+3 are *Call Me Psycho*, *Holiday in Sumaria* and *Smash Out*, all of which were previously available for the Spectrum 48/128K.

## Joint BBC Micronet venture for charity

ON NOVEMBER 27th, the BBC's Children In Need appeal will be broadcast and, with the aid of information technology, you can be part of it.

Micronet, the magazine similar to Oracle, will once again be providing an on line service. With eight computer terminals at the BBC TV Centre, it will enable you to pledge money, talk to celebrities and bid in the auction of computer products. Last year, contributions to the auction included £4500 of Acorn RISC hardware, computers from Atari and Commodore and various modem, peripheral and software donations.

Executive Producer of Children In Need, Mark Patterson said: "The BBC is always interested in using new technology, and we are delighted with the success of the on-line Children In Need appeal organised by Micronet."

Normally only available to its 20,000 subscribers, Micronet will be opening up its systems to Prestel users so that more people can access the appeal. In addition, it has linked up with ITEC, which has 150 information technology centres throughout Britain.

Such a move will allow anyone to take part in the programme if they go to their nearest ITEC



Terry Wogan will present the Children in Need Appeal

centre and log into Micronet. Vic Taylor, a Director of the ITEC's commented: "The ITECs are all about introducing new technology to the public at large, and on-line Children In Need is an ideal way to do that."



# To catch a thief

*THE SPIDER* and *The Fly* is not an exciting new computer game but two alarms designed to protect home and office equipment.

Released by ABA Systems, both alarms are compact and unobtrusive and react to fingertip touch or the slightest movement by emitting a high-pitched 98 decibel scream.

*The Spider* is a central alarm box with four sensorised tentacles which are attached to equipment by double-sided adhesive pads. It is

suitable for clusters of equipment or those consisting of more than one element, such as disc drives and printers. An advantage of this alarm is that normal working use will not activate it. *The Spider* will retail at £39.95, excluding VAT.

*The Fly* is similar in size to *The Spider* but since it does not have any tentacles, it is aimed more at single items. Once set, the alarm will be activated by the slightest movement. *The Fly* is priced at £29.95.



The Spider, anti-theft alarm product from ABA Systems

# Adventure '87

ADVENTURE '87, the Second National Computer Adventurers' Convention will take place next Saturday at the Sutton Civic Centre, Sutton, Surrey.

The event is aimed at all levels of adventurers, from the single user to those interested in multi-

user games (MUG). The latter is a relatively new concept, originating from Essex University. The game enables a number of people to participate in the same adventure, if they have a computer, modem and telephone line. The most recent MUG is 'Shades' on Prestel's Micronet.

The convention will be the launching pad for a new MUG Federation II. There will also be seminars on the technical side of programming and software demonstrations of single-user adventures, some of which are in the play-test stage.

The Convention will start at 10 am and continue all day. Tickets are £2.50 on the door or £2.00 in advance from Mr. D. Wilkins, 21 Village Row, Mulgrave Road, Sutton SM2 6JZ. Sae and cheque payable to Sutton Library Computer Club are required with orders.

# Apology

We owe an apology to Elite. In our last edition it was suggested they were pulling out of computer software.

Clearly our sources of information were inaccurate. We have it directly from Elite themselves that in the financial year to July 1987 their turnover was up 65 per cent and their profits double the previous year to July 1986 (see separate story in News Desk).

# Data Protection Act in force continued

denied this, he has since been unable to get work in any other major company and believes that inaccurate information is held on file about him."

The procedure for accessing your file involves writing to the organisation concerned, stating that you wish to exercise your 'subject access right under the Data Protection Act'.

According to Eric Howe, the Data Protection Registrar, any request must be met within forty days. However, a subject may have to prove his or her identity, provide more information to help locate the data and pay a £10 fee.

After forty days he or she can either apply to the Registrar or to the courts for access. Howe added that there was limited access in certain cases, for example 'where it would be likely to prejudice the prevention or detection of crime'.

Whilst the Act is aimed at helping the public see their files, the NCCL believes the £10 fee will put many off.

Spencer, was also unhappy

about other weaknesses of the Act, particularly its exclusion of manual files and the exemption clause. "Since most schools still keep paper files on pupils, it would mean that many people would still suffer as a result of inaccurate information at this stage. In addition the tax file is exempt, so that people will not have the right to see poll tax information, which is collected from all sorts of sources."

So that the public becomes aware of their rights concerning computerised data, an advertising campaign has been launched and leaflets are available at the local library or Citizen's Advice Bureau. Spencer hopes that people will make use of the Act but indicated that it was below the NCCL's expectations, stating, "We will monitor it carefully and if it proves unsatisfactory, press for it to be extended."

Any further details on the Act is available from: The Office of the Data Protection Registrar, Water Lane, Wilmslow, Cheshire SK9 5AX; tel: (0625) 535777.

# Epson scanner

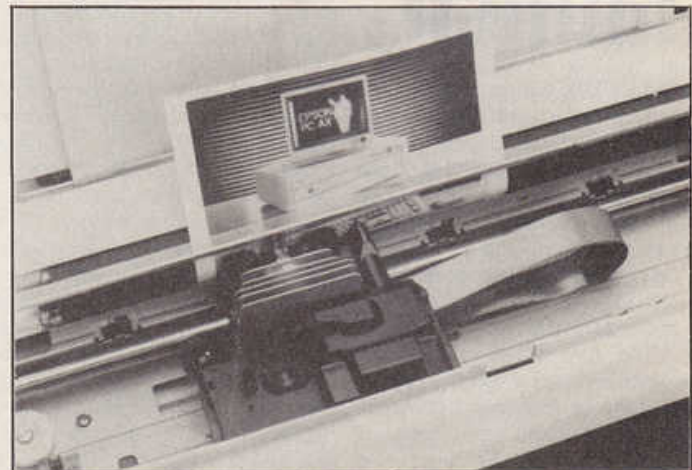
EPSON is about to release an Image Scanner, giving desktop publishers the bonus of digitised bit-mapped graphic versions of images.

The Scanner will be an option on four of Epson's printers EX800/EX1000 (RRP £180 ex-VAT) and LQ2500/LQ2500+ (£195 ex-VAT). On the EX printers, the scanning speeds are 25 inches per second and on the LQs they are 27 inches per second. Maximum read-

able areas are 11" x 8" (horizontal: vertical) on the EX1000 and LQs and 6" x 8" on the EX800.

It comes complete with scanning software and is suitable for all IBM PC-compatible machines. Thus users can integrate scanned graphics with text from any word processing or similar application, without paying a fortune for new software.

For further information, contact Epson (UK) Ltd, 388 High Road, Wembley, Middlesex HA9 6UH.



Scanning on Epson's printer



# A MERRY CHRISTMAS AT THE MICROFAIR



**NEW HORTICULTURAL HALL**  
Saturday 12th December 1987 10 am-6 pm  
Grey coat Street Elverton Street  
(Junction) London SW1  
Admission: £2.00 (Adults)  
£1.50 (Kids under 14 years)

## SIZZLING SINCLAIR BARGAINS ON THE 12th DECEMBER 87

Come along and join in the fun at the Christmas Microfair. It's quite simply the biggest market place in the world for the whole range of Spectrum machines, plus full QL support and bargain prices.

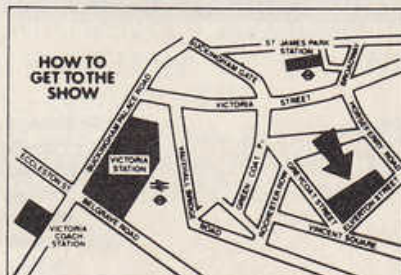
### YOU'LL SEE

- ★ Thousands of games on sale – all the new releases and lots of special discount bargains
- ★ Utilities and serious software
- ★ Full hardware support – printers, tables, monitors, disc drives, light pens and lots of new products
- ★ Full range of books
- ★ Stationery extras – paper, cassettes, discs, labels
- ★ User clubs and expert advice
- ★ Z88 support
- ★ Top magazines
- ★ Special Christmas competitions and prizes
- ★ Restaurant, licensed bar

It's the user-friendly show that has out-lived all the rest because everyone enjoys themselves ... and you can always find a bargain.

Why not send today for cut-priced advanced tickets.

Exhibitors ring Mike or Moira on 01 801 9172 for stand availability.



**Underground:** Nearest stations are Victoria, and St James's Park.

**British Rail:** Victoria Station.

**Bus Routes:** 11, 24, 29, 70, 76 and Red Arrow 507.

**Road:** Signposted (RAC AA) Horticultural Halls.

### SEND NOW FOR REDUCED PRICE ADVANCE TICKETS

Send to Mike Johnston (Organiser), Dept. S.U., ZX MICROFAIRS, 71 Park Lane, London N17 0HG.

Please send me.....advance tickets (Adults @ £1.50)

Please send me.....advance tickets (Child under 14 @ £1.00)

Name \_\_\_\_\_

Address \_\_\_\_\_

**25th**  
ZX MICROFAIR

Please include a stamped, self-addressed envelope and make cheques/POs payable to ZX MICROFAIR.



## DIARY DATES

### NOVEMBER

#### November 21 Wales and West Computer Show

Central Hotel, Cardiff  
Details: Regional computer show of particular interest to Dragon users

Tickets £1 adults, 50p children  
Organiser: R & A J Preston, (0656) 880965

#### November 28 Adventure 87

Europa Gallery of Sutton Civic Centre, Sutton, Surrey. 9.30-4.30  
Details: National Computer Adventurer's Convention,

Seminars and Workshops  
Adults £2.50, £2.00 in advance from Mr D Wilkins, 21 Village Row, Mulgrave Road, Sutton SM2 6JZ

Organiser: Vernon Quaintance, 50 Beafice Avenue, Norbury, London SW16 4ON, evenings 01-764 6556

### DECEMBER

#### December 5 6809 Colour Show

Grand Hall, Connaught Rooms, Gt Queen Street, London

Details: Show for Dragon and Tandy owners  
Tickets £2 adults, £1 children  
Organiser: John Penn, (04203) 5970

December 12

#### Christmas ZX Microfair New Horticultural Hall, London SW1

Details: Latest innovations for Sinclair users

Advanced tickets: £1.50 adults, £1 children

Tickets on the door: £2 adults, £1.50 children

Organiser: Mike Johnson, 01-801 9172

### JANUARY

January 28-30 1988

#### The Amstrad Computer Show

The Great Hall, Alexandra Park, London

Details: Displays and demonstrations of all the latest hardware, software and peripherals for Acorn computers  
Adults £3, Under 16's £2 - £1 off for advance tickets

Organiser: Database Exhibitions, 061-456 8383

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

## CHARTS

### Top Twenty

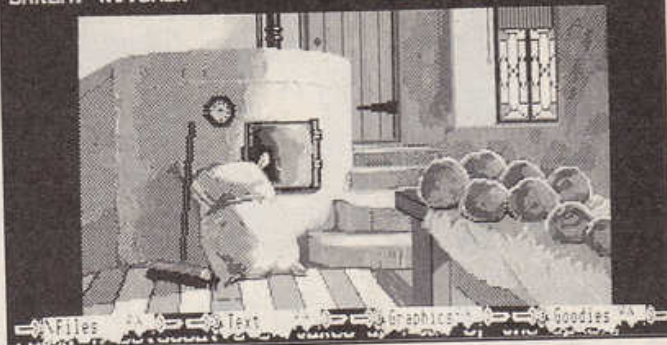
- |    |      |                         |
|----|------|-------------------------|
| 1  | (3)  | Grand Prix Simulator    |
| 2  | (1)  | Joe Blade               |
| 3  | (2)  | Soccer Boss             |
| 4  | (12) | Game Set Match          |
| 5  | (6)  | Renegade                |
| 6  | (5)  | Pro Ski Simulator       |
| 7  | (NE) | California Games        |
| 8  | (11) | World Class Leaderboard |
| 9  | (4)  | Indiana Jones           |
| 10 | (8)  | BMX Simulator           |
| 11 | (9)  | Dizzy                   |
| 12 | (16) | Fruit Machine Simulator |
| 13 | (7)  | Back To The Future      |
| 14 | (10) | Paperboy                |
| 15 | (19) | Comp. Hits 10 Vol. 4    |
| 16 | (13) | Live Ammo               |
| 17 | (18) | ATV Simulator           |
| 18 | (20) | Six Pak 2               |
| 19 | (24) | Barbarian               |
| 20 | (25) | Bubble Bobble           |

- |                |
|----------------|
| Code Masters   |
| Players        |
| Alternative    |
| Ocean          |
| Imagine        |
| Code Masters   |
| US Gold        |
| Access-US Gold |
| US Gold        |
| Code Masters   |
| Code Masters   |
| Code Masters   |
| Firebird       |
| Elite          |
| Beau Jolly     |
| Ocean          |
| Code Masters   |
| Hit Pak        |
| Palace         |
| Firebird       |

All figures compiled by Gallup/Computer Trade Weekly

### BAKERY KITCHEN

0/23



## SOFTWARE HOTLINES

Well with Duncan Evans, our usual Hotlines writer taking a well earned two week holiday in Bermuda, the job of writing this column has, again, landed on my desk.

The first game I managed to get my grubby little hands on this week had something really special going for it; it's free! Programmed by Wordmongers, it is given to all purchasers of 32K blank eproms for the Z88. Using scrolling reminiscent of the ZX81, the game, called *Scrazble*, is amusing, although what it loses in gameplay, it makes up for in price!

On the more serious side, screenshot of the week award goes to *Magnetic Scrolls for Jinxter* (above). I'm sure they're bored with people complimenting their game because of the quality of the graphics, but let's face it, that is a pretty important part of any graphic adventure.

Available on almost every machine you have heard of, the game should be available in the not to distant future.

Konami, the company with the rights to some of the best arcade games ever, are putting the finish-

ing touches to *Salamander* for the Spectrum (below). Based on the fabby (© J. Cook 1985) arcade game, *Salamander* promises to be one of the best shoot-'em ups ever of the Speccy.

As *Salamander* should be ready before Christmas, what I want to know is when they are going to start work on WEC Le Mans!!!

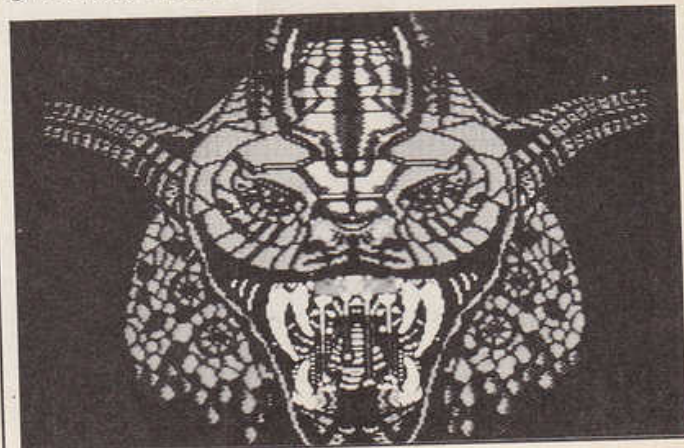
As a cricket fan I, like many others, got up at some ungodly hour to watch England give the World Cup to the Aussies. Whilst drowning my sorrows later, I had a great idea for a game. We've had Peter Shilton's *Handball Maradona*, what about Mike Gatting's reverse sweep giveaway???

You're probably sick of hearing about it, but a screenshot for *Jack the Ripper* just arrived on my desk. I must be honest here, I feel the game has gone a little too far, and that screens of women with their intestines hanging out ought not to be allowed, whether or not they have an 18 certificate.

Little has been heard from either Rainbird or Hewson about the Braybrook/Turner dispute, so let's hope that it has been settled amicably, it would be a pity not to get any new games from these two because of the dispute.

Well, that's it for this week, I'll speed to you again next week, and Duncan will be returning the week after that (once he has his handi-cap down to six!!!).

Daniel McGrath







## Ram Electronics (Fleet) Ltd

"MANUFACTURERS OF QUALITY COMPUTER PRODUCTS"

SPECTRUM			AMSTRAD CPC 464/664		
	CODE	SRP (Inc. VAT)		CODE	SRP (Inc. VAT)
RAM MkII Interface	S001	£9.95	Music Machine — Tape	A001	£49.95
RAM Turbo	S002	£12.95	Music Machine — Disk	A002	£59.95
Music Machine	S003	£49.95	Speech Synth — Rom	A003	£39.95
Ramprint	S004	£34.95	Speech Synth — Tape	A004	£29.95
Keyboard	S005	£37.50	Light Pen — Rom	A005	£29.95
Light Pen and Interface	S006	£14.95	Light Pen — Tape	A006	£19.95
Centronics Interface	S007	£29.95	64K Ram	A007	£39.95
56 way Ribbon Cable	S008	£9.95	256K Ram	A008	£75.00
DKT Programmable I/F	S009	£14.95	256K Silicon Disk System	A009	£99.95
3 Channel Sound Synth	S010	£24.95	Printer Cable	A010	£12.95
Speech Synth	S011	£24.95	Real Time Clock	A011	£34.95
DKT Single Port I/F	S012	£9.95	TV Tuner	M006	£69.95
DKT Dual Port I/F	S013	£13.00			
Bus Extender Board	S014	£4.95			

AMSTRAD CPC 6128			AMSTRAD PCW 8000		
	CODE	SRP (Inc. VAT)		CODE	SRP (Inc. VAT)
256K Ram	A101	£75.00	Communicator	A201	£59.95
256K Silicon Disk System	A102	£99.95	Memory Upgrade to 512K	A202	£29.95
Speech Synth — Rom	A103	£39.95	DKT Joystick Interface	A203	£19.95
Light Pen — Rom	A104	£29.95	Music & Sound Synth	A204	£39.95
Printer Cable	A105	£12.95	Real Time Clock	A205	£34.95
Real Time Clock	A106	£34.95			

CBM 16/64/128			SINCLAIR QL		
	CODE	SRP (Inc. VAT)		CODE	SRP (Inc. VAT)
CBM64 Centronics Cable	C001	£17.50	Centronics Interface	Q001	£29.95
CBM64 128 Sprint	C002	£29.95	Serial Cable	Q002	£7.95
CBM16 16K Ram Pack	C003	£29.95			

BBC/ELECTRON			CAMBRIDGE COMPUTERS		
	CODE	SRP (Inc. VAT)		CODE	SRP (Inc. VAT)
BBC Centronics Cable	B001	£12.95	Z88 Centronics I/F	Z001	£29.95
BBC Joystick I/F	B002	£9.95			
Commander 3 I/F	E001	£14.95			

IBM PC			VIC 20		
	CODE	SRP (Inc. VAT)		CODE	SRP (Inc. VAT)
256K Ram Board	P001	£89.95	16K Switchable Ram	V001	£34.95
384/512 Ram Board	P002	£124.95	32K Switchable Ram	V002	£49.95
Parallel Printer I/F	P003	£29.95			
Printer Buffer plus 'Side Print'	P004	£124.95			

APRICOT					
	CODE	SRP (Inc. VAT)		CODE	SRP (Inc. VAT)
128K Fast Card	P101	£110.00			
512K Memory Expansion	P102	£124.95			

### WE ARE ALSO DISTRIBUTORS FOR THE FOLLOWING PRODUCTS

Quickshot 2	M001	£9.95	Quickshot 2 Turbo	M002	£12.95
Moonraker Joystick	M003	£6.99	Moonraker (Amstrad Ver)	M004	£7.99
Spec. Plus 2 J/X Adap	M005	£1.99			

RAM IS NOW ABLE TO OFFER THE WIDEST RANGE OF HOME  
COMPUTER PERIPHERALS CURRENTLY AVAILABLE

ALL RAM PRODUCTS ARE MANUFACTURED IN THE UK AND CARRY  
A FULL 12 MONTHS GUARANTEE

TO PLACE YOUR ORDER JUST SIMPLY FILL IN THE COUPON BELOW AND SEND IT TO:-  
RAM ELECTRONICS, UNIT 16, REDFIELDS INDUSTRIAL PARK, REDFIELD LANE, CHURCH  
CROOKHAM, HAMPSHIRE GU13 0RE OR PHONE US DIRECTLY ON

**0252 850085/31**



If you have an Access/Visa Card you may telephone  
24 hrs on 0252 850085.



NAME \_\_\_\_\_  
ADDRESS \_\_\_\_\_  
TEL NO. \_\_\_\_\_  
CHQ. NO. \_\_\_\_\_  
ACCESS/VISA \_\_\_\_\_

I WOULD LIKE TO ORDER THE FOLLOWING:-

_____	TOTAL
_____	
_____	
_____	
_____	

SIGNATURE \_\_\_\_\_

ALL PRICES ARE INCLUSIVE OF VAT AND PLEASE ALLOW UP TO 28 DAYS FOR DELIVERY.



# The Data Protection Act— will it protect?

Francis Botto outlines the new Data Protection Act and analyses the effect, if any, it will have on accessing and protecting personal information.

**O**n November 11, Eric Howe the Data Protection Registrar truly became the Data Protection Registrar, with powers to prosecute offenders in the criminal courts, and initiate searches of premises if suspicions arise. But just how effective is the Act going to be; will it be a 'white elephant Act' being impossible to enforce?

The Data Protection saga began in July 1984, with the very purpose of eventually governing the conduct and manner of computer bureaux, individuals or establishments utilising computers to store personal information. In other words, the Act is an attempt to keep tabs on data users. As expected, a logical starting point was to catalogue all data users by requesting them to apply for registration. In the brief registration period - November 1985 to May 1 1986 - little more than half of Britain's data users registered. Though this may sound totally discouraging or perhaps disgraceful, we are assured by the Data Protection office that this is in keeping with similar ventures implemented by our European counterparts. According to the Act, data users failing to register are technically offenders, who may subsequently be fined up to £2,000 in the lower courts with unlimited fines in the higher courts.

## Principles

In theory, the Act is quintessentially concerned with protecting the rights of individuals like you and me, by attempting to ensure all collected data is accurate, solely relevant, legitimately acquired, divulged for a particular purpose and perhaps most important the Act seeks to impart personal information with subjects concerned - a right we are presently deprived. Eric Howe has drafted eight easily understood principles that set the Act's purpose in motion.

- The information to be contained in personal data shall be obtained, and personal data shall be processed, fairly and lawfully.

- Personal data shall be held only for specified and lawful purposes.

- Personal data held for any purpose or purposes shall not be used or disclosed in any manner incompatible with that purpose or those purposes.

- Personal data held for any purpose or purposes shall be adequate, relevant and not excessive in relation to that purpose or those purposes.

- Personal data shall be accurate and, where necessary, kept up-to-date.

- Personal data held for any purpose or purposes shall not be kept for longer than is necessary for that purpose or those purposes.

- An individual shall be entitled:
  - at reasonable intervals and without undue delay or expense;
  - to be informed by any Data User whether he holds data of which the individual is a subject; and
  - to access to any such data held by a Data User, and,
  - where appropriate, to have such data corrected or erased.

- Appropriate security measures shall be taken against unauthorised access to, or alteration, disclosure or destruction of, personal data and accidental loss or destruction of personal data.

Arguably, though most of the principles can be comfortably put into practice, the seventh principle seems to be the one

which threatens the Act's over-all effectiveness. For example, if a subject feels a data user possesses inaccurate personal data or is illegally vending information, unless the subject knows of the data user, the subject is helpless, as is the case now.

Also after November 11, data concerning any tax or duty will remain inaccessible as will information likely to hinder the prevention or detection of criminal activities.

Of course I'm not suggesting the Act will be useless, but merely highlighting the problem of pinpointing the not so scrupulous data users. For, many individuals now falling victim to such data users will no doubt continue to do so.

## Who should register?

In many respects the Act is sensibly aimed, so not everyone who uses their home computer to store personal information need register. Here are some examples:

If you store information about members of your family for other than professional purposes.

Personal information relating to members of your computer club or whatever can gain you exemption providing the eight Principles are observed and each and every member of your club approves of his or her personal data being stored.

Certain payroll and accounting operations are also exempt.

If you are not sure whether or not you should register, it is perhaps advisable to contact the Registrar's office for further information, which will be issued to you free of charge. And if ambiguity should occur, and we are informed that it will, then it is perhaps safer to pay the £22 registration fee rather than risking a heavy fine that could cripple your company, organisation, club or whatever.

Professional data users of any kind are most likely obliged to register even if they are data users in a third party sense,





Eric Howe, with microfiche equipment used for viewing the Data Protection Registry

where perhaps their accountant handles personal data - you don't even have to own a computer to be a data user. Once again, if in doubt contact the Registrar's office.

### The register

As would be expected the register is open to scrutiny by the public, with copies of the register and index already available in many of Britain's main libraries. The register, besides containing data users and registration numbers, also conveys the type of data stored and the use to which it is put, and to whom the information is divulged. Additionally, the register is a catalogue of addresses that can be contacted to request copies of your personal data.

However, here is the 'sting in the Act's tail', data users are to be eventually permitted to charge for this service - the price of which will be decided by the Home Office.

You could be forgiven for thinking that the seventh principle infers there will be no charge - in fact it merely implies this notion. But just how contradictory principle 7 is will largely depend on the forthcoming cost of the service.

### The outcome

The outcome of the Act in terms of ability to tame the likes of ruthless data users will largely depend on the effectiveness of complementary detective work in sifting

out offenders. And as for this new openness the Act seeks to achieve, that will largely depend upon the cost of obtaining such information - which will make or break the Act.

In short we shall just have to wait and see, but I for one am sceptical.

For further information contact:

Office of the Data Protection Registrar  
Springfield House  
Water Lane  
Wilmslow  
Cheshire SK9 5AX  
Tel: 0625 535777



\_\_\_\_\_

I note with dismay the absence of any reference whatever to the puzzle in your issue dated 10-13 November. Obviously, you have not been able to agree a fee with Gordon Lee and you have not been able to kid any of your readers to do it cheaper. If the puzzle is phased out, I shall certainly not bother to renew my subscription.

## Puzzle saga continues

I agree with several points in Mr Godman's letter ("Sinister ring"). I too fail to see how you can devise a consistently new format for a written puzzle. Perhaps once or twice you could, for example, write it in "Playfair" cypher, or perhaps as an ordinary crossword; but what then?

To my mind, a written puzzle needs to be no more than just that - a written puzzle.

Being set in print, all that seems to be necessary is that the problem should be clearly and fairly set out (though the problem itself need not be obvious): it should have a unique solution unless otherwise stated;<sup>4</sup> and it should be most conveniently solvable by the invention and use of a program which can be run on the average micro (since it is after all written for a "popular" computer magazine). What else is needed which is not merely a fancy waste of column inches?

But do your allegedly discontented readers really want a true puzzle at all? It is probably uncharitable to suspect that the "overwhelming demand" comes from those who find the puzzle in their existing format too difficult and/or too much trouble; and that what they are really after is an easier crack at the £10.

Perhaps the "overwhelming demand" is in effect for some sort of quiz rather than a true puzzle, with questions like "Who runs Amstrad computers? Tramiel, Sinclair, Sugar or Dr Runcie?"

I suggest that there are too many of these already, and that they are in any case screamingly dull. You might just as well run a straight lottery. Perhaps this is what you will end up with - perish the thought!

Or perhaps an "overwhelming" number of solvers find the puzzles too easy, and are tired of waiting for their names to "come out of a hat"?

Somehow I doubt it. Only you know the true reasons for the "demand", and you haven't speci-

Please may we have our puzzles back as they were? They were usually of just the right standard, and I thought the setter(s?) did an admirable job. Like Mr Godman, I buy PCW mainly for the puzzle, in very narrow preference to other magazines which don't have one.

Incidentally, when can we expect the solutions and winners of puzzles 271 to 275?

We've been pleasantly surprised by the volume of support for Mr Lee and his puzzles – but puzzled by the fact that it's taken the temporary disappearance of the puzzles to provoke it.

The good news is that the puzzle will be returning as before very soon – either next week or the week after.

As for your suspicious mind, Phil Amey, shame on you! You clearly underestimate the respect we have for our readership if you think we would not keep you all fully informed about an issue which is obviously of such interest.

In addition, your idle and mistaken speculation upon the private dealings between us and our puzzle compiler is, shall we say, less than constructive? What about informed contributions like this next one - Ed.

I would like to request, through your magazine, those dynamic and expanding hardware/software dealers that the Zambian computer scene is expanding quickly though still at infancy. Those willing to hear more or those willing to join hands with new distributors are welcome to contact me at the address:

Crispin Lavu  
Infordeal Consultant  
c/o PO Box 30029  
Lusaka, Zambia, Central Africa

I am doing a project on "Alternative Medicines" for my General Studies AO. I obtained your address from research into the book "Healing Without Harm", so I decided to write and see if you would be so good enough to help me in anyway with my research.

As I have said I am doing my General Studies AO, which means I am in the first year of the sixth form (ie starting "A" levels).

I am enjoying doing this project very much, and I have learnt a great deal from doing it, as in the beginning I hardly knew what it was all about. I would be very grateful if you could in any way help me and look forward to hearing from you.

**F**urther to the great debate on the Atari ST v Amiga, I would like to add my views.

Bla, bla, bla, bla, bla, bla, bla.  
bla, bla, bla, bla, bla, bla, bla, bla,  
bla, bla, bla.

Bla, bla, bla, bla, bla, bla, bla,  
bla, bla, bla, bla, bla, bla, bla, bla,  
bla, bla, bla, bla, bla, bla, bla, bla,  
bla, bla.

Bla, bla, bla, bla, bla, bla, bla,  
bla, bla, bla, bla, bla, bla, bla, bla  
(letter edited for length).

Mark Stevens  
Cowley, Oxford

I'm writing regarding the two letters printed in Vol 8 No 44 regarding poor service received from mail order companies.

I have to ask what was the point in printing them at all. Surely the idea behind the writing of such letters is for the author to air his grievances about a particular company and to warn other readers from falling into the same trap. Therefore by not naming the companies concerned you have rendered the letters pointless.

In effect by not naming the two companies concerned you have protected the dishonest at the cost of those who try to give a good service. The net result of all this is that at a time of the year crucial for mail order companies' survival, you have in effect persuaded a

The end result is potentially disastrous for all concerned. If this type of letter continues then we and no doubt several others of your advertisers may well question the wisdom of continuing to spend money on advertising in your magazine whilst we are unnecessarily condemned and - if enough decide this way - the magazine could collapse through lack of revenue.

Anonymous  
Mail-Centa  
Belper, Derby

How wrong you are. By not naming the companies concerned – by agreement with them, by the way – we were avoiding the danger of legal action by them. We tried to contact both companies and printed the letters to show the readers in question that it is worth contacting us if problems are encountered with one of our advertisers.

Surely you would agree that your primary responsibility is to your customers. It is after all their money you spend when you advertise.

Here at *Popular Computing Weekly* we are constantly amazed by the shoddy service customers receive from computer companies, large and small.

We have a responsibility to our advertisers certainly - but we all, press and advertisers alike - have a greater responsibility to our readers and your customers.

It is for that reason that we take up their queries. We accept that companies like yours provide a good service, but until the industry as a whole shapes up, surely you and we must declare open season on companies which fail in that responsibility.

We are in a dilemma. If we name companies which are failing their customers badly, we risk being sued. If we do nothing, we are seen to be in league with disreputable firms. If we investigate, print a letter but do not name the firm in question, other companies cry foul. Surely reputable companies - unnamed or otherwise - have nothing to fear.

We're sorry but *Popular Computing Weekly* cannot guarantee to reply to *all* letters requesting a personal answer. It helps us enormously if readers are prepared to have general queries answered on these pages, so, if possible, please do not send SAs.



## ARE YOU A COMPUTER ENTHUSIAST?

### DO YOU WANT TO STOP PLAYING GAMES WITH YOUR FUTURE?

*You can become a professional programmer in the real commercial world*

We are a rapidly expanding systems software house and are No. 1 in our market. We require at all levels programmers with enthusiasm, drive and the ability to learn.

#### IN RETURN WE CAN OFFER YOU

A professional training with real career and promotion prospects; in addition to all this we can give you a excellent remuneration package according to age, skills and experience.

In the first instance please write with full C.V. and cover note to Brian Livingstone (which will of course be treated in the strictest confidence and an immediate reply)

**TIME MASTER SYSTEMS LTD,**  
Barclay House, 35 Whitworth Street West,  
Manchester N1 5NG. Tel: 061-236 8855

(582)

## The AMIGA Centre Scotland

### SPECIAL OFFERS

DIGI-PAINT ..... £40.00 Deluxe Video 1.2 ..... £60.00

#### AMAZING COMPUTING

★ Shipped directly to us by air ★ All back-issues available ★ Sent by First-Class post ..... £3.50

#### NEW MAGAZINES IN STOCK

★ INFO ..... £3.50  
★ ROBO CITY NEWS ..... £2.50  
★ AMIGA SENTRY ..... £3.00

#### SUBSCRIPTIONS

12 issues for 10 times cost of single issue: includes postage

#### BUTCHER 2

★ 25 IFF Graphics Utilities ★ See full review in YOUR COMMODORE September 1987 ★ New features. Registered Users Upgrade (send original disc) ..... £8.00  
Butcher 2 ..... £27.00

#### EARTHBOUND FONTS

★ Over 90 fonts on three discs ★ Over 80 different point sizes on each disc ★ Utilities to view any font ★ Upgrade Fonts using discs ..... each £13.00  
all three £38.00

#### RAY TRACER

★ 3D Graphics in 4096 colours ★ Disc contains Source Code in C and BASIC ★ Enter our Competition and win a 3D Utility ..... £11.00

#### RAY TRACER NEWSLETTER

★ Issues 1-4 on disc ★ Hints, tips, tutorials, pictures ★ Code to create your own JUGGLER-type movies  
Discs 1 to 3 ..... each £6.00  
Disc 4 ..... £3.00

#### DISKPRO + !

★ Increase free disc space by compressing your files ★ Includes free DIMMER to save your monitor ..... £22.00

#### EXPRESS PAINT

★ Supports PAL and OverScan ★ Uses Half-Bright mode (64 colours in lo-res) ★ "Typeset" newsletters, images, posters, business reports ★ Flow text into areas of any shape (not just boxes) ★ Overlay mode ★ Fast scrollable canvas ★ Link text files from any word processor (inc NotePad) ★ Alter all the icons to customise the program ★ Use any AMIGA screen resolution (up to 752 pixels wide) ★ Supports a canvas size of 8000 (eight thousand) pixels wide by a height only limited by memory ..... £58.00

#### AIRT

★ State of the art icon-driven programming language ★ Over sixty commands ★ Over 5600 instructions possible per program ★ Includes Editor, Compiler, Print Utility, Form Utility ..... £55.00

#### OUTLINE

★ Keep lists of data in a way which used to be the province of the database ★ Compatible with any word processor ★ Use to prepare lists, speeches, papers, books, agendas ..... £36.00

#### SCULPT-3D

★ Eric Graham's new masterpiece ★ 3D Modelling Program ★ THIS IS THE UK PAL VERSION ★ Mouse or keyboard-driven ★ Combine primitive solids to form complex shapes ★ Build shapes by extruding or spinning curves ★ Construct surfaces from contour lines ★ IFF output: previews in less than one minute ..... £69.00  
Demonstration disc ..... £4.00

#### FORMS IN FLIGHT

★ 2D/3D Drawing and Animation ★ View from any perspective or direction ★ Rotate, Pan, Roll, Magnify, Move In/Out ★ Splines, Polygons, Freehand, Snap ★ Complex Object-Nesting and motion ★ Surface extrusions - any angle ★ Efficient hidden line removal ★ Red/Blue stereo images ★ Plotter support ★ Comprehensive manual (Requires 1Mb to run) ..... £60.00

#### COMING SOON

FAC-IT  
MICROFICHE FILER  
RAM and Hard Disc  
expansion

#### DOUG'S MATH AQUARIUM

★ Explore and display functions in 2D/3D ★ Uses recursion to create fractals, Mandelbrot's ★ Wire Frame, Contour Map or Superimpose modes ★ ZOOM in/out and change position ★ Cycle colours and change Sample Rate ★ Teaching/Learning/Research tool ..... £58.00

#### ANIMATOR: APPRENTICE

★ Create solid Disney-style 3D Animations ★ Includes shading in 4096 colours ★ Background mattings ★ Real-time audition (Requires 1Mb to run) ..... £195.00  
ANIMATOR: JUNIOR ..... £52.00  
Demonstration Discs ..... £7.00  
Library Discs ..... £14.00-£25.00  
2-hour demo film on VHS ..... £25.00

Send large S.A.E. for our software and reviews lists. Dealer enquiries welcome.

★ 24 hours VISA Card Service ★

★ All prices include VAT and Postage (UK and BFPO) ★  
★ Callers: Wednesday-Saturday 12 noon to 6.00pm ★

**AMIGA Centre Scotland**

4 Hart Street Lane, Edinburgh EH1 3RN Tel: 031-557 4242 anytime

EIDERSOFT SOFTWARE LTD PRESENTS...

## AN IBM PC ON YOUR ST!

**Special package of PC Ditto and the Triangle 5¼" IBM™ Compatible Disk Drive**

## PC-DITTO

PC Ditto is the superb new IBM PC emulator for the Atari ST which will run over 95% of IBM PC software! Coupled with our Triangle 5¼" Floppy Disk Drive you immediately transform your ST into an IBM PC!

PC Ditto, the official UK version imported by Robtek, is almost fully compatible with the IBM PC. Running in software, it operates in all screen resolutions, offering VGA and CGA graphics capabilities.

## 5¼" IBM DRIVE

Of course, the only way to get IBM software into your Atari ST used to be to transfer the files across the serial ports using appropriate comms software. Not any more! The Triangle 5¼" IBM compatible disk drive allows you to not only read files off an IBM 5¼" disk, but to write them back again. The files can then be read by a proper IBM machine without even having to think about serial ports, baud rates, hand-shaking or Xmodem!

The Triangle 5¼" disk drives also operates as a normal ST disk drive (but with 5¼" disks of course!) and can format to either the ST's normal 720K or, using special software provided, the standard IBM 360K (8 or 9 sectors per track). For IBM mode, the drive is switchable between 40 tracks (IBM) or 80 tracks (ST).

**PC-Ditto and a Triangle 5¼" IBM Compatible Disk Drive costs just £199!**

**EIDERSOFT**  
SOFTWARE LTD

• UNIT 4 STANNHETS • LAMBTON NORTH TRADE CENTRE • BARBLEDON • EBBEX • SS15 6DJ •

**Tel: 0268 541212**

Triangle 5.25" IBM Compatible Disk Drive costs £147.78 if bought separately.

IBM IS THE TRADEMARK OF INTERNATIONAL BUSINESS MACHINES.  
ALL PRICES QUOTED ARE EX-VAT.



# WHAT MORE COULD YOU ASK FROM A JOB?

The opportunity to work with all the latest technology.

Liase with top freelance programmers.

Have the security of working for the longest established independent software house.

**I**f you have a broad knowledge of home computers and extensive experience of machine-code programming then you could be the person we are looking for.

**W**e urgently require a talented programmer, with a special knowledge of turbo-loading and protection techniques, to fill the vacancy of Technical Manager.

**T**he successful applicant will be responsible for a variety of areas of work including mastering of programs, care of company equipment, and dealing with technical queries.

**Y**ou will need to be able to accept responsibility, show initiative, be self-motivated and have a positive outlook; but the rewards are high, and the position, within this progressive company, has great scope for self-improvement.

Help develop major projects as part of a team.

**TECHNICAL MANAGER**  
c.£10,000 p.a.  
+ Royalties

Be our technical expert at exhibitions.



**SUPERIOR  
SOFTWARE**  
Limited



# Fight to the top

After a long wait, the game that launched a thousand Amigas has arrived for the ST, *Defender of the Crown*.

The time is November 1149 and dirty deeds have been perpetrated. The King has copped a one-way ticket to the great tournament in the sky and the kingdom's in a bit of a mess. Saxons and Normans are blaming each other and warfare is about to erupt across the green fields of England.

You play a decent law abiding, pure of heart Saxon lord, with his own castle in the country, and are determined to wipe the scummy Norman filth clean off the map and claim the crown for yourself.

There are three main options available to the man (or woman) who would be king; seek conquest, hold a tournament, or go raiding.

Initially, all territories except those containing castles are unclaimed and contain vassals who are only too willing to join your force. As buying an army, be they soldiers, knights, catapults or small castles, takes up an entire game turn, the best bet to start with is to blitzkrieg the countryside and avoid opposing armies. This way you can gobble up territories, which put varying amounts of gold into the castle coffers, and mop up lots of floating vassals. When you go home

there's a huge pile of swag to spend on building a really big army.

You'll need a large pack of Saxon troops to take on the enemy castles, as even the smallest force can be difficult to extract from behind those stony walls. To attack a castle you should need a catapult, to make a hole in the wall, although you don't have to demolish it completely. However, there is a bug in the early versions which results in the defenders supplying you with a catapult if you haven't bought one!

In addition to reducing the wall to rubble (an undamaged one doubles the defensive strength) you can throw Greek fire into the courtyard to make things even hotter for the residents, or even lob a dead horse over to spread disease.

One of the arcade elements is that you are responsible for firing the catapult, and it's by no means as easy as the Amiga original, which was too easy.

Should you win the day and take someone's home castle, then they are eliminated from the game and you take control of all their lands. A couple of interesting points are that you can be given safe passage through Saxon lands, and that you only have to capture all three Norman castles to win the game.

The other main option is hold-



ing a tournament whereby you can joust for leadership points or land.

Jousting represents the next of the arcade sequences, in that you see your opponent thundering towards you, and you have to point your lance, which bounces up and down wildly, at the very centre of his shield and click the mouse button when you hear a metallic clanging sound.

Your third option is to go raiding, which involves two swordfights, one in the enemy castle's courtyard, and one in the keep.

Although none of the characters would give Errol Flynn a moment's worry, the swordfighting is certainly good fun.

If you win both fights then you get to plunder the castle's treasure room.

The adult entertainment aspect comes into play when a Saxon lady is kidnapped by the Normans. To avoid being called a big girl, and other Saxon insults, by your men you must stage a rescue. This involves repeating the raiding scene but this time the reward is much more satisfying than a few gold pieces. The Saxon doxie shows her gratitude by inviting you into her bedchamber. In a couple of humorous, but pretty tacky, scenes the

obliging wench becomes pledged to you.

This has two side effects. One is that her piccy appears on the map alongside yours and that your men fight better in battle. The second is that whichever Saxon lord was her protector, bows out of the game and hands over his lands to you. Well worth the effort really. Let's talk about the graphics, which after all were the selling point for the original. A couple of superfluous scenes have been cut, but the main ones are still there. I could expend lots of words like fabby, excellent, brilliant, until it became nauseating. And it would all be true. But the most glowing comment must surely be that on the ST, the graphics are virtually the same as on the Amiga original.

*Defender of the Crown* on the ST is a lot more difficult and more challenging than before, and, unless you want to watch endless repeats on the TV, essential entertainment this Christmas.

Duncan Evans



Program *Defender of the Crown* Micro Atari ST Price £24.95 Supplier Mirrorsoft, Athene House, 66-73 Shoe Lane, London EC2.





# YOUR CHANCE £1 OFF SELECTED

All you have to do is obtain  
the Mirror Card



from the Daily Mirror Club: cut out the coupon from Daily Mirror – one coupon each day for 7 days, week commencing 30th November. Take the club card and the coupon in to selected branches of Woolworths and you will be entitled to £1 off the selected game. Each day has a £1 voucher off a different game.



## THUNDERCATS



# TO HAVE D GAMES FROM WOOLWORTHS

in

upon  
for  
1987.

vill

ne.

**MONDAY**

NOW FOR COMPUTER

**720°**

TITLE 720°  
MACHINE Spectrum  
PRICE £8.95

**TUESDAY**

Danger And Suspense Behind Enemy Lines

**AIRBORNE RANGER**

MICRO PROSE

TITLE Airborne Ranger  
MACHINE  
PRICE £14.95

**WEDNESDAY**

SPECTRUM 48-121

FREE! Action demo of game 'Gryphon' included in this pack.

**COMBAT SCHOOL**

Ocean

TITLE Combat School  
MACHINE Spectrum  
PRICE £7.95

**FRIDAY**

Z.I.G.Z.A.G. MIRROR

**Zig Zag**

TITLE Zig Zag  
MACHINE Commodore 64  
PRICE £9.95

**SATURDAY**

Thundercats

**Thundercats**

elite

TITLE Thundercats  
MACHINE Commodore 64, Spec, Amst  
PRICE £9.95, £7.95, £8.95

**SUNDAY**

DARK SCEPTRE

**DARK SCEPTRE**

TITLE Dark Sceptre  
MACHINE Spectrum  
PRICE £7.95

**WOOLWORTHS**  
*is Christmas*



Your complete guide to all the software released this week



## Amstrad CPC

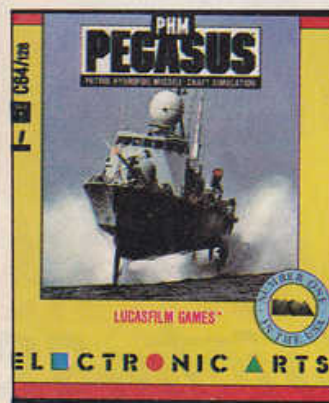
**Program** *Spore Type* Arcade  
**Price** £1.99 **Supplier** Mastertronic,  
8-10 Paul Street, London EC2.

**Program** *Combat Mission Type*  
**Price** £1.99 **Supplier** Mastertronic,  
8-10 Paul Street, London EC2.

**Program** *Agent X2 Type* Arcade  
**Price** £1.99 **Supplier** Mastertronic,  
8-10 Paul Street, London EC2.

**Program** *Grid Iron Type* Simulation  
**Price** £1.99 **Supplier** MIL,  
Chiltern Enterprise Centre, Station  
Road, Theale, Berks RG7 4AA.

**Program** *The Elite Collection* contains  
*Bomb Jack*, *Commando*,  
*Frank Bruno's Boxing*, *Airwolf*,  
*Battleships*, *PaperBoy*, *Ghosts 'N'*  
*Goblins*, *Bomb Jack II* **Price**  
£14.95 (cassette), £19.95 (disc)  
**Supplier** Elite Systems Ltd, East-  
ern Avenue, Lichfield, Staffs  
WS13 6RX.



Oh no, it's back to the dungeons. Why can't people set computer games in interesting places. Like a Ferrari dealer showroom or a Bangkok cat-house. Instead we have to put up with scenarios that sound like the deranged ramblings of a terminal Genesis fan in the last stages of Tolkeins' disease.

With *Spellbinder* we're in a place called the Castle of Lorraine, which sounds like a plug for someone's girlfriend.

The basic plot is like all the other basic plots you've ever heard and contains people with silly names, such as 'Magelord' and 'Eldon the Spellbinder'. Essentially you have to explore the castle to find and collect the ingredients for a powerful spell.

There are all the usual castle-type things, like one-way doors, secret passages and, um, teleports. While you're wandering around, picking things up, examining other things and generally having a cool time you tend to bump into nasty creatures, like Deathmonks, Zombies and Forest Hags. A couple of those can spoil your whole day, though you can cast spells to heal yourself.



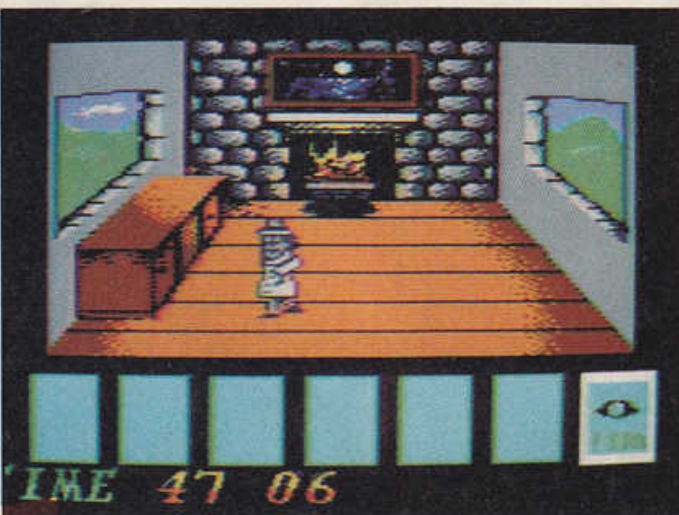
Rising another attack of rheumatism, I started my exploration of the castle. This is a graphic adventure in the Knightlore tradition, and at first sight the graphics are quite pretty. They're monochrome, but come in a range of colours and are detailed, and your character moves smoothly around the screen.

After a while, however, all the locations start to look the same. If you haven't already got well into the game by then you'll probably just give up, as I did. I think I'd rather have a real

adventure game and do without graphics, or have a good fast arcade game. Some people will doubtless love *Spellbinder*, but frankly I am on the side of the Deathmonks.

Steve Mansfield

**Program** *Spellbinder Micro*  
**BBC B Price** £9.95 (cassette),  
£11.95 (5.25in disc), £14.95  
(3.5in disc) **Supplier** Superior  
Software Ltd, Regent House,  
Skinner Lane, Leeds LS7 1AX.



The latest release from Melbourne House puts you in the starring role as cartoon super-sleuth *Inspector Gadget*, chief investigator of the Service. Inspector Gadget has been sent by his boss Chief Quigley to investigate a series of mysterious goings on that have been occurring at the International Circus.

Together with his ever faithful companions, Penny and Brains, his pet dog, Gadget enters the circus. The three of them then started their investigations by entering the Big Top, unfortunately, for Gadget, a loose EXIT

sign swung down and knocked him flat out.

Having recovered from the accident, Gadget awoke and realised that Penny and Brains have gone missing. What Gadget first thought of as being an accident was no more than a devious plot by the wicked MAD organisation to undermine Gadgets investigations.

Now they have got Penny, Gadget must find her and ensure that MAD don't start a world war. Unfortunately for Gadget, as he was lying unconscious all his special gadgets were stolen.

Gadget is unable to get into action until he can find all his essentials. And this is where the 'fun' of the game starts as Gadget visits all the areas of the circus after his gadgets. Without the gadgets, Gadget is unable to arrest the MAD spies. Time is of the essence, the future for Penny rests with Gadget, indeed the future of the world rests with him.

What a brilliant plot for a game, what wonderful atmospheric music is played as you explore the circus, it's a real shame that the actual gameplay and graphics are a slight let down. As a budget game *Inspector Gadget* would be brilliant at £1.99, but at £8.95 it's not too impressive. The movement on the characters are not very smooth and Gadget himself moves in 'block' directions.

Although not one of their best releases, *Inspector Gadget* will appeal to all Gadget fans, and the music is so good, it should be able to sell the game on its own.

Leslie Bunder

**Program** *Inspector Gadget Micro* Commodore 64/128 **Price**  
£8.95 (cassette), £14.95 (disc)  
**Supplier** Melbourne House,  
8-10 Port Street, London EC2.



## SUPERTEC LTD -computer solutions!

Atari computer systems available from stock - ALL MODELS - call for details.

520 STF - 1040 STF - MEGA ST2 & ST4  
HARD DRIVES - MONITORS - PRINTERS  
ATARI PC'S



AMSTRAD PC1512 ALWAYS IN STOCK.

We have a full range of AMSTRAD products available. Ask about the new PPC604 portable.

AKHTER PC'S from £499 (exc VAT) call for details.

We have a wide range of software, this includes:

GAMES - APPLICATIONS - GRAPHICS  
PLEASE CALL AND ASK

SUPERTEC IS A GENUINE ATARI AND AMSTRAD DEALER, NOT JUST A POSTAL ADDRESS. WE SUPPORT OUR CUSTOMERS WITH QUALITY SERVICE AND BACKUP IF REQUIRED. DON'T COMPARE US WITH 'BOX MOVERS'. IF YOU KNOW WHAT YOU WANT, WE WILL SUPPLY ON MAIL OR TELEPHONE ORDERS. ORDER WITH VISA OR ACCESS FOR IMMEDIATE DESPATCH OF STOCK ITEMS.

PRINTERS - PLOTTERS - MODEMS - DISC DRIVES - HARD DRIVES - CABLES - MONITORS and SOFTWARE!

We can supply items from the following manufacturers:  
Pentonic - Micro Peripherals - Epson - Brother - Philips - Mannesmann Tally - Roland - Tandon - Miniscribe - Star Micronics - Amstrad - Akhter - Miracle Technology - Cumana - Eldersoft - and many more. JUST CALL AND ASK!

COME FOR A CHAT ABOUT YOUR NEEDS, YOU WON'T BE GIVEN THE HARD SELL, BUT WE WILL TRY TO HELP.

PC & ATARI ST based DESK TOP PUBLISHING systems from Mirrosoft (FLEET STREET PUBLISHER) - TIMEWORKS DTP - Soft Logik (PUBLISHING PARTNER)

Don't be a DINOSAUR - move to the best and easiest micro's to use. You can easily pay three times (or more) as much, for the so called 'INDUSTRY STANDARD' computers and still not get a system as good.

THIS AD WAS PRODUCED ON AN ATARI LASER!

SUPERTEC LTD  
CORNWALLIS HOUSE  
HOWARD CHASE  
BASILDON  
ESSEX  
SS14 3BB



TEL (0268) 282308

OPEN 9 TO 5 PM MONDAY TO FRIDAY  
PERSONAL CALLERS WELCOME - WE HAVE SYSTEMS ON DEMO FOR YOU TO TRY  
VISA & ACCESS ACCEPTED.

## SPECIAL OFFER POLAROID PALETTE FOR THE B.B.C. MICRO

System includes  
Autoprocessor,  
Cutter Mounter,  
Sample Films.

The simple way to  
instant 35mm  
presentation  
slides, prints  
and overhead  
transparencies.



To take advantage of this limited period offer please send your order to: Robin Cartwright Polaroid (U.K.) Ltd., Ashley Road, St. Albans, Hertfordshire AL1 5PR.

- ☐ Please debit my Polaroid Account No:.....  
☐ Cheque for full order value enclosed (£563.50 inc VAT).....  
☐ Please debit my Access Account No:.....  
Barclaycard Account No:.....

Name..... Address.....  
..... Signature.....

ELECTRIC PROCESSOR/ILLUMINATED CUTTER MOUNTER £50 EXTRA (+ VAT)

**Polaroid**

Polaroid is a registered trademark of Polaroid Corporation, Cambridge, Mass. USA

C.I.

# DON'T MISS..

BOARD  
GAME

THE BEST FOOTBALL

GAMES YOU CAN BUY

COMPUTER  
GAME

## FOOTBALLER OF THE YEAR

Enjoy the world of a Football League Player suffering the pain and winning the glory, starting at the bottom and becoming a legend.... A Footballer of the Year.



## SUPERSTAR SOCCER

The most original computer football game of all time.... Available on CBM64/128 disc and cassette, Amstrad disc and cassette, Spectrum 48/128K cassette, MSX Cassette.

Available  
Now  
£14.99

Gremlin Graphics Software Ltd /  
Gremlin Board Games Ltd.,  
Units 2/3 Holford Way,  
Holford, Birmingham  
B6 7AX

CBM64/128 · AMSTRAD £9.99C · £14.99D  
SPECTRUM · MSX £7.99

Available  
from  
October

### ORDER YOUR GAMES NOW!!

If you would like us to rush one of these great games direct to your home at no extra charge fill in this coupon NOW and post to:-

GREMLIN BOARD GAMES/GREMLIN GRAPHICS SOFTWARE LTD.  
Units 2/3 Holford Way, Holford, Birmingham B6 7AX.

I would like _____ copies of Gary Lineker's Footballer of the Year.		I would like _____ copies of Gary Lineker's Superstar Soccer System.	
(Cheques made payable to Gremlin Board Games)		(Cheques made payable to Gremlin Graphics Software Ltd)	
Name _____		Address _____	
Total Amount Enclosed £ _____		Postcode _____	
Please debit my Access/Visa account		CHEQUE/P.O./OR ACCESS/VISA ONLY	
Signature _____		Date _____	





## ZONEFOUR LTD

All disks now sent 1st class or courier



### MIMIC IN FREE LIBRARY CASES

DS 96 TPI	10s	£7.60
FLIPSIDED	10s	£7.15
DS 48 TPI	10s	£6.80
UNIVERSAL	10s	£7.95

### MIMIC 3.5"

SS	10s in Library Case	£13.55
DS	10s in Library Case	£15.95

### 5.25" BULK UNBRANDED DISKS (LIFETIME GUARANTEE)

FULLY CERTIFIED	SS 48 TPI	SS 96 TPI	DS 48 TPI	DS 96 TPI
Try 10 and see	£4.75	£5.55	£5.55	£6.35
25	£9.60	£10.40	£10.40	£11.20
50	£18.40	£19.20	£19.20	£20.80
100	£33.60	£35.20	£35.20	£36.80
250	£76.00	£77.60	£77.60	£80.00
500	£144.00	£148.00	£148.00	£152.00

AMSOFT CF2 3"	10s	£20.00
MAXELL CF2 3"	10s	£20.00
3" MIMIC CF2DD	10s	£26.40

### ACCESSORIES INC VAT

IBM/Amstrad PC1512 Printer Cable GPR10125 x cent.	£7.15
Disk Notcher/doublers	£3.60
Disk cleaners 3.5"	£3.95
5.25" cleaner	£3.60
Mini Vac for printers and keyboards	£5.55

### 5.25" BULK COLOUR UNBRANDED

FULLY CERTIFIED	SS 48 TPI	SS 96 TPI	DS 48 TPI	DS 96 TPI
10*	£7.15	£7.95	£7.95	£8.75
25	£17.60	£19.20	£19.20	£20.80
50	£32.00	£36.00	£36.00	£38.40
100	£60.00	£64.00	£64.00	£72.00
250	£140.00	£152.00	£152.00	£160.00
500	£272.00	£208.00	£208.00	£300.00

### RED, GREEN, BLUE, YELLOW, WHITE

10 in single colour OR 2 of each please state in large quantities your choice. (If stocks are available) \* in library cases

## NEW CATALOGUE AVAILABLE NOW

### 3.5" BULK UNBRANDED DISKS 135 TRILIFETIME GUARANTEE

	SS	DS
10	£11.95	£13.55
25	£28.00	£32.00
50	£52.00	£64.00
100	£96.00	£120.00
250	£220.00	£280.00
500	£400.00	£520.00

### AMIGA HARDWARE

A500 Amiga	£475.00
Cumana compatible 1 meg disk drive	£140.00
Modulator	£24.95

ALL 5.25" DISKS HAVE REINFORCED HUB RINGS, SLEEVES, LABELS AND WRITE PROTECTS.

ALL DISKS CARRY A LIFETIME GUARANTEE.

ALL DISK PRICES INCLUDE VAT AND P/P.

TO ORDER PLEASE CALL DIRECT DISK LINE: 10AM 6PM

### MIMIC HIGH DENSITY COBALT COATED 1.6 MEG SUITABLE FOR A.T.S.

10	50	100
£14.40	£64.00	£120.00
Verbatim preformatted for use with Kodak 6.6 meg drive or equivalent (5 Pack)		
		£90.00

### DISK BOXES INCLUDING VAT

5.25"	50 capacity £6.95	100 capacity £9.35
3.5"	40 capacity £6.80	80 capacity £9.55
3"/3.5"	80/90 capacity £9.55	
10 x 3.5" or 5.25" (library case)	£1.20	

### SOFTWARE

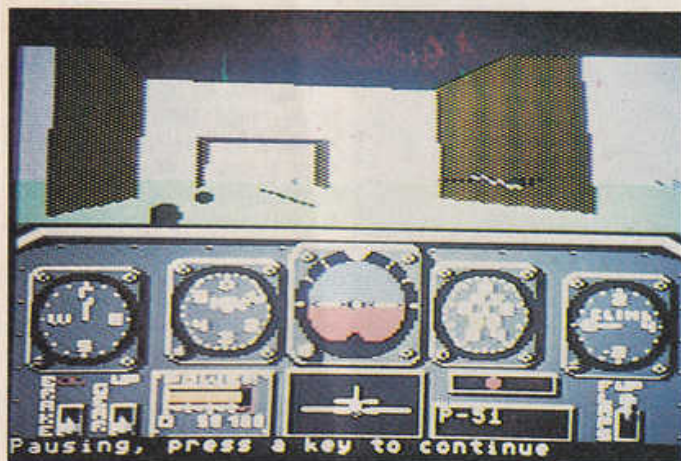
We sell the full range of SAGE POPULAR SOFTWARE	
ABC All in One Business Package	£150.00

**Please Note:** We can now offer you a duplicating service and in-house printing, packaging and most services you require. If you require any of these services, please telephone for a quotation on 0707 331076.

ZONEFOUR, Unit 11, Mundells Court, Welwyn Garden City, Herts. Tel: 0707 334460

Please call for bulk and seasonal prices and a full list of Paper, Labels, etc. etc. and new catalogue





Anyone who watched the fascinating BBC2 television series on test pilots about two months ago will be pleased to hear that there is now a game that can recreate this 'seat-of-the-pants' type of flying; *Chuck Yeager's Advanced Flight Simulator*.

Programmed by Electronic Arts, and released in the UK on a variety of machines - in this case the Commodore 64 - by the European arm of this well respected software house.

As with the rest of EOA's games, this AFS comes with a lengthy and well written manual

which is essential reading for anyone attempting to get the most from the game - especially if you are a flight sim enthusiast.

Graphically, AFS is excellent, although as you would expect of the Commodore 64, the animation is not exactly fast, though by no means unplayably slow.

In play the game allows you to sample the delights of 14 different planes, ranging from Sopwith Camels to 'Top Gun' like F-16 Fighting Falcons. To add to the problems of being a test pilot, there are also three experimental planes.

The most obvious comparison to make is with *Flight Simulator II*, the industry standard simulator from Microsoft. Although AFS is not quite as smooth or relaxed, it more than makes up for this with action and 'thrills'.

The philosophy behind the game is typically American, but thankfully Chuck Yeager seems more endearing than most, and even quite amusing.

"Crash is not a word pilots ever use. I don't really know why, but the word is avoided in describing what happens when several tons of metal ploughs itself and its pilot into the ground. Instead, we might say 'He averted in.' Or, 'He bought the farm!'"

Overall, AFS is a game that will appeal to everyone who has wondered when simulations will start to bridge the gap between arcade games and simulations.

Daniel McGrath

**Program** *Chuck Yeager's Advanced Flight Simulator* Type Simulation Price £9.95 Machine Commodore 64 Supplier Electronic Arts, 11/49 Station Road, Langley, Berks.

*Leviathan* could be the greatest game since *Space Invaders*, but anything that uses a dongle gets top marks in the pain in the backside department. Yes, in this Amiga incarnation, it's wrestling time as you evict a defenceless mouse from its home and replace it with the sawn off end of a joystick plug.

Enough of that though. Now to the plot. Refreshingly, English Software hasn't bothered with one. Just fly your ship, *Leviathan*, over (and into with sickening regularity) three types of landscape, each one being pre-

sented in a couple of different colours, and destroy every enemy ship that you find. All within the time limit. I liked that; completely unpretentious stuff.

As usual your ship is continually running out of diesel so landing on the arrows near the fuel pods in the Cityscape is recommended rather than the take a spare can approach.

On the control panel at the bottom of the screen there's all the regular guys; score, fuel counter, lives indicator, timer, value of BP shares, and a couple of new ideas. One is a snapshot of

the type of enemy coming next while two arrows flash green to point in which direction the enemy is actually lurking.

In play *Leviathan* is a Zaxxon-style game, but much better. The screen scrolls diagonally up and down, and does so very smoothly when you're moving at top speed. The graphics for the landscapes are made up of shades of one particular colour at a time, enabling detailed shadowing and similar effects to be realistically portrayed.

It's nice to see a game that actually looks like it's running on an Amiga rather than an ST, and the Greekscape in particular is delightfully done.

The music on the title page, by the prolific David Whittaker, is up to the mark without being in the jaw dropping class.

Still, this Amiga version of *Leviathan* is easily the best, and one for the Christmas stocking of those who like mindless action games.

Mark Ulliyat

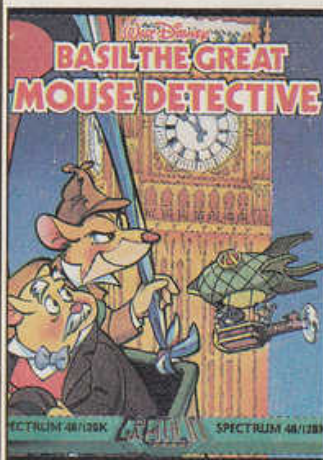
**Program** *Leviathan* Micro Amiga Price £24.95 Supplier English Software, 1 North Parade, Manchester M3 2NH.

## Software guide continued

### Atari ST

**Program** *Talladega Type Simulation* Price £1.99 Supplier MIL, 12 Chiltern Enterprise Centre, Station Road, Theale, Berks RG7 1AA.

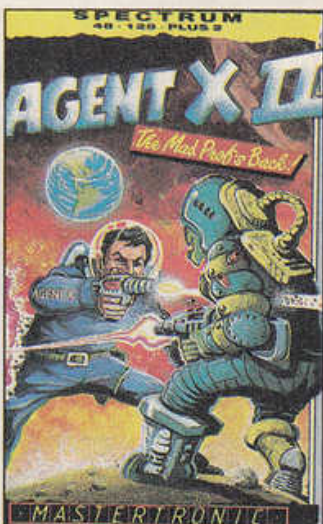
**Program** *The ChessMaster Type Simulation* Price £24.95 Supplier Electronic Arts, Langley Business Centre, Langley, Nr Slough, Berks SL3 8YN.



### Amiga

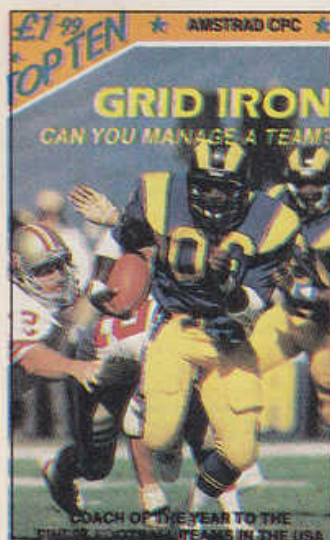
**Program** *Red October Type Combat Simulation* Price £24.95 Supplier Argus Press Software Ltd, Victory House, Leicester Place, London WC2H 7NB.

**Program** *The ChessMaster 2000 Type Simulation* Price £24.95 Supplier Electronic Arts, Langley Business Centre, Langley, Nr Slough, Berks SL3 8YN.





## Software guide continued



### Commodore 64

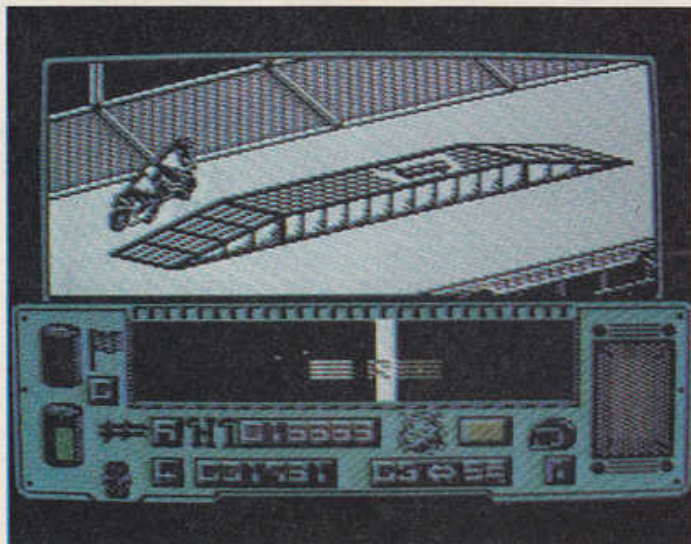
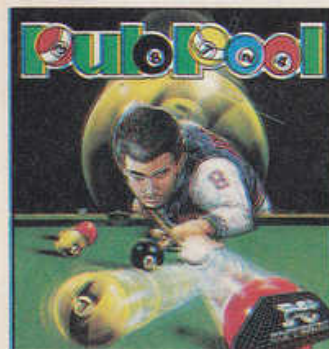
**Program** *Bosconian Type* Arcade  
**Price** £1.99 **Supplier** Mastertronic,  
8-10 Paul Street, London EC2.

**Program** *The Elite Collection* contains *Bomb Jack*, *Commando*, *Frank Bruno's Boxing*, *Airwolf*, *Battleships*, *Paperboy*, *Ghosts 'N' Goblins*, *Bomb Jack II* **Price** £14.95 (cassette), £19.95 (disc)  
**Supplier** Elite Systems Ltd, Eastern Avenue, Lichfield, Staffs WS13 6RX.

**Program** *Tailadega Type* Simulation **Price** £1.99 **Supplier** MIL, Chiltern Enterprise Centre, Station Road, Theale, Berks RG7 4AA.

**Program** *Alice In Videoland Type* Adventure **Price** £2.99 **Supplier** MIL, 12 Chiltern Enterprise Centre, Station Road, Theale, Berks RG7 4AA.

**Program** *Basil The Great Mouse Detective Type* Adventure **Price** £9.99 (cassette), £14.99 (disc) **Supplier** Gremlin Graphics Software Ltd, Units 2/3 Holford Way, Holford Industrial Estate, Birmingham B6 7AX.



While the world waits with an expectant hush for *Super Hang On* to make an appearance on the shelves - Mirrorsoft have sneaked out a motorcycle extravaganza of their own in the form of *Mean Streak* - weighing in on the Spectrum (48K and 128K natch) and Commodore 64 and it's not half bad.

Best played (as with all motorcycle games) with a hair dryer taped to the top of the telly for added effect, Mirrorsoft have shunned the "over the shoulder" perspective usually adopted, and plumped for the more technically demanding (though less trouble on the knees) "sitting in the grandstand" view, with a nicely

done diagonal scrub, as in *Paperboy*. But whereas the latter lacked the gratuitous violence needed for a truly classic work (relying heavily on the teen-age sub-conscious need to exercise the work ethic and several dodgy under-the-counter payments) *Mean Streak* requires the plucky gamester to blow thousands of Outcast Bikers away in a veritable orgy of destruction.

The senario is set a Mad Max-like far future, with your riding round the Battletrack (a disused, rubble strewn motorway circling a capital city), a Rebel, shunning the hedonistic *New Ways* which seem to amount to staying indoors watching reruns of Neigh-

bours... riding your Super Bike, armed with machine guns, rockets and oil.

The aim is to complete the circle round the city (all five levels of it) blowing away everything in your path, watching out for the pin-tacks, picking up extra fuel, avoiding sundry nasties on the track, and generally having a good time. As an extra incentive for hackers, there is a competition attached to the game so that if you complete all the levels, you get a special code - and so get a chance to qualify for a play-off to win a fabby new ultra trendy mountain bike. Cooooo.

There are one and two player versions on both the Speccy and the CBM, which you pit yourself against a biological opponent, and the 128K and 64 versions have the appropriate hip-hip body popping music.

Admittedly buying this game won't gain you automatic admittance to your local HA chapter - but for the true feel of the open road in times to come, wear some funny clothes, load it up, turn on the drier and think of the M25. Fabby.

John Cook

**Program** *Mean Streak Micro* Spectrum 48K/128K, CBM 64  
**Price** £7.95/£8.95 **Supplier** Mirrorsoft, 66-73 Shoe Lane, London EC4, Tel: 01-377 4645.

**The Travel Game** is a game for adults which does not have an X-certificate; nor does Samantha Fox make an appearance.

In fact, the game is charmingly old-fashioned in its appeal, but very modern in the sophistication of its programming: you match your brains against those of a very cunningly-devised program. The idea is to travel round the world, collecting clues at various locations. The prize which awaits you at the end of the journey is the answer to the Endgame; this answer is currently worth 5,000 which increases by 1 each time another copy of the game is sold.

This sounds easy but RuleFormat, the producers, expect that it will take several months before the Endgame is cracked. The problems begin with the fact that you start off with only £500 and you need money to pay for travel by boat, train or plane as well as to buy the souvenirs which lead to your next destination and

your next clue. You must take decisions about how to plan your route to maximise speed and minimise expense; the best strategy is not always obvious.

As you progress the game becomes more difficult and unexpected things happen; your expertise increases as you advance. You must accumulate extra money by answering a set of brain-teasing questions most of which are based on numbers and letters rather than general knowledge. Perhaps the best way of capturing the game's flavour is to say that it has already received the endorsement of Magnus Magnusson.

There are no graphics in the program in order to ensure that the game will run on any PC. The screen is functional and looks more like a business application than a conventional game. A box in the top-left reminds you of your current location; a box top-right records the passage of time. Most of the screen is taken

up with the box where information, questions and help text appear. Your instructions are typed in at the bottom of the screen.

The program is written in C - in other words, it is a classy and sophisticated program with no apparent bugs. If, like me, you enjoy working out puzzles and trying to unravel secrets, then I would recommend the *Travel Game*. How far have I got? Well, I have just spent my second expensive night in a London hotel and, when I resume playing this evening, I will be staring at a large overdraft, desperate to scrape together enough money to continue my journey.

Robert Hollier

**Program** *Travel Game Micro* Adventure **Price** £24.95 + 95p p&p **Machine** Any IBM PC compatible **Supplier** The Travel Game, Freeport, Liverpool L1 8AB, (051) 708 8202.

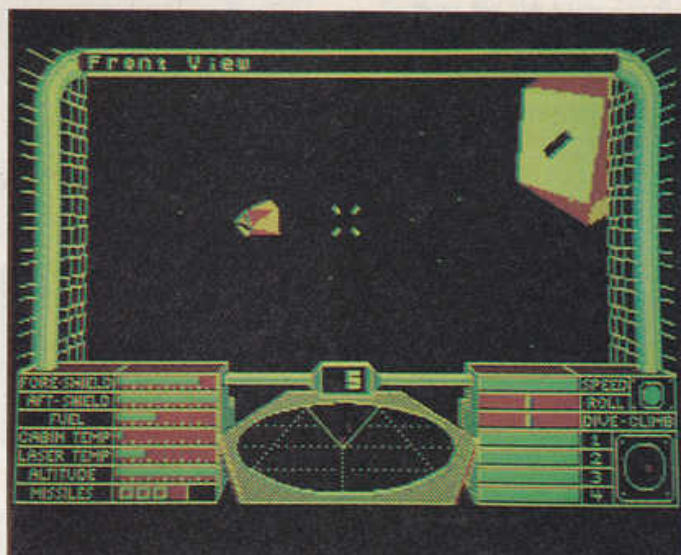


The game that launched a thousand space pilots is now available on the IBM PC and compatibles. Along with *Starglider*, *Elite* must be the most eagerly awaited conversion, and those who glimpsed it at the PCW show will know that this version has something special - a solid 3D option!

For the few who have never heard of *Elite*, it is quite simply the best 3-dimensional space combat game going. You pilot a Cobra Mk. III, a ship well-suited to both combat and trading. Trading is an integral part of the game as you need to increase your credit balance in order to afford all those cute little accessories, such as docking computer, military lasers, fuel scoops and so forth. However, piracy and bounty hunting can also prove profitable. The aim is to increase your rating from 'Harmless' to 'Elite'. However you should be offered your first mission before reaching that coveted status...

When you load the game (the disk is not protected will copy straight to hard disk), you may select either Shaded or Line Elite. Both utilise low res. and four colours, and these are hatched to produce shading variations on the control panel and ships. Firebird recommend an 80286 micro at 6Mhz or higher to appreciate the solid animation, but the PC1512 display is adequately smooth.

Before play starts you are prompted for a word chosen randomly from the enclosed novella.



time to the Blue Danube Waltz. The shaded Cobra looks very impressive, although you might catch the odd screen-swap flicker on a PC1512, it's still remarkably smooth.

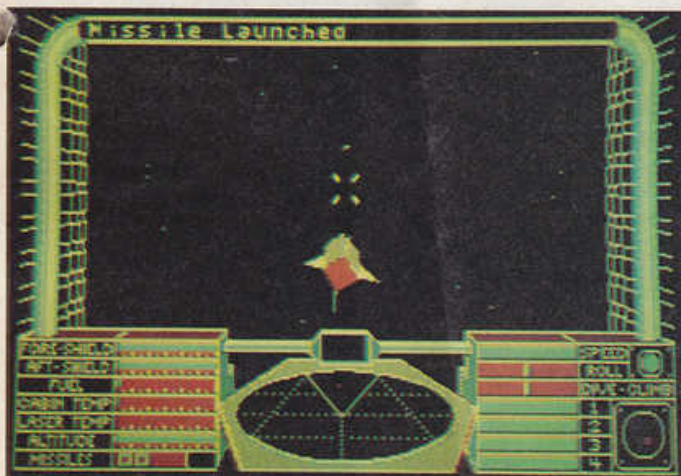
Unable to resist an immediate test flight (and having flown Cobras before on a Beeb!), I promptly hit F1 and launched into the cold void above planet Lave. The PC key layout is easy to adjust to, and I was soon skimming the space station, wondering if it was worth annoying the local police fleet? Common-sense said No, but I opened up on the station anyway. Instantly a stream of police Vipers erupted from the dock opening and commenced to return fire. I counted 10 of them before my career as a Cobra pilot was abruptly curtailed, and the screen displayed

scale of 1-10 (highest), with '8' being the default. Unfortunately this also seems to affect the frequency with which the keyboard is scanned, so while '10' offers the smoothest animation, it loses you accurate steering and your Cobra tends to veer at the lightest touch. On the Amstrad I found the default of '8' was fine for combat, but docking required setting of '1' (at least until I can afford a docking computer!).

There is little doubt that IBM *Elite* is a masterly conversion. The shaded space stations are most impressive to behold as they rotate majestically against a backdrop of drifting stars and distant, blazing sun. Also impressive is the circling attack manoeuvre taken by police Vipers as they dart from dock, fly round the space station in a chain, then pursue you and set up a circling attack formation around you. Very pretty though somewhat lethal to watch. The most pleasing image was that of two incoming missiles on the rear view screen, rapidly gaining ground, but lost just before impact as my Cobra completed count-down and leapt into the colourful display of Hyperspace.

*Elite's* appeal was always long-term: with over 2000 planets to trade with and the elusive rank of *Elite* to be gained, not to mention the occasional mission on behalf of the Space Navy, there is always something to do. It's destined to be the most popular PC game this Christmas, if not this year.

Pete Gintz



This consistently refused to work for me, and I eventually tried the Flight Training Manual instead. Instant success! Firebird will be changing the entry screen to specify the current manual.

The title screen displays your sleek Cobra Mk. III, rotating in

my wreckage spinning away towards Lave.

Because there are any number of IBM clones operating at varying speeds, not to mention the '286 and '386 families, there is an option to increase/decrease the rate of frame display, on a

## Software guide continued

### BBC/Electron

**Program Warehouse Type Arcade**  
Price £2.99 Supplier MIL, 12 Chiltern Enterprise Centre, Station Road, Theale, Berks RG7 4AA.



### Spectrum

**Program Staine Type Adventure**  
Price £8.99 Supplier Martech, Martech House, Bay Terrace, Penvensey Bay, East Sussex BN24 6EE.

**Program Grid Iron Type Simulation**  
Price £1.99 Supplier MIL, 12 Chiltern Enterprise Centre, Station Road, Theale, Berks RG7 4AA.

**Program Agent X II Type Arcade**  
Price £1.99 Supplier Mastertronic, 8-10 Paul Street, London EC2.

**Program Alien 8 Type Adventure**  
Price £1.99 Supplier Mastertronic, 8-10 Paul Street, London EC2.

**Program The Elite Collection** contains *Bomb Jack*, *Commando*, *Frank Bruno's Boxing*, *Airwolf*, *Battleships*, *PaperBoy*, *Ghosts 'N' Goblins*, *Bomb Jack II* Price £14.95 (cassette), £19.95 (disc) Supplier Elite Systems Ltd, Eastern Avenue, Lichfield, Staffs WS13 6RX.

**Program Elite Type Adventure**  
Price £24.95 Supplier Firebird, 67-76 New Oxford Street, London WC1A 1PS.



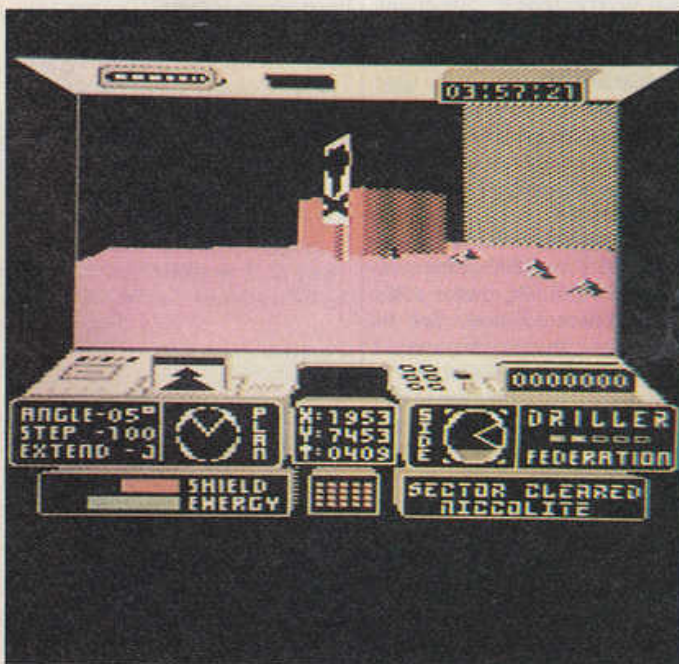
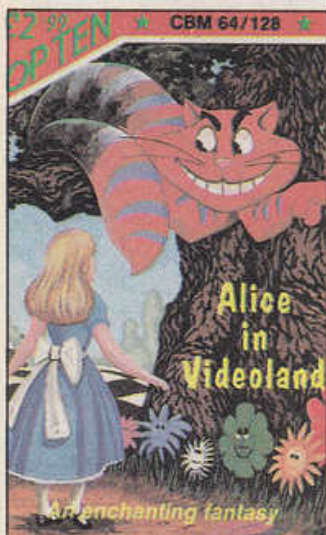
## Software guide continued

### IBM PC

**Program** *The ChessMaster 2000*  
**Type** Simulation **Price** £24.95 **Supplier** Electronic Arts, Langley Business Centre, 11-49 Station Road, Langley, Nr Slough, Berks SL3 8YN.

**Program** *Vegas Casino* **Type** Simulation **Price** £9.95 **Supplier** Mastertronic, 8-10 Paul Street, London EC2.

**Program** *Pub Pool* **Type** Simulation **Price** £9.95 **Supplier** Mastertronic, 8-10 Paul Street, London EC2.



Remember the age old game of *Defender*, where the object of the game was to fly across a planet and rescue humans from aliens who were going to turn them into zombies?

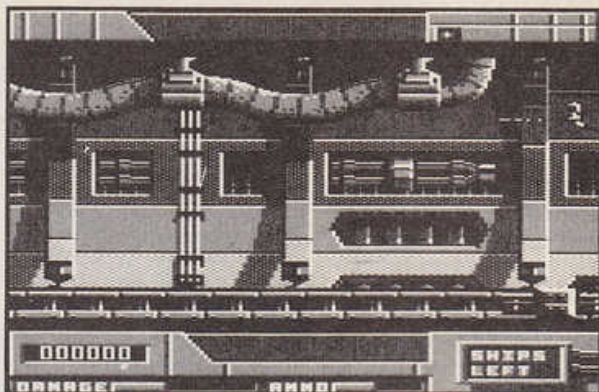
The folks at The Edge seem to remember the game particularly well. Unlike a lot of copies of that all time classic, The Edge have taken *Defender* as a basic plot and expanded on it. *RISK* is primarily a shoot 'em up but it also contains elements of strategy in the actual gameplay as you can equip your spaceship with various objects as you set about customising the ship.

You can add thrusters, boosters, retros infact a whole host of objects that will help you seek out and destroy those offending aliens.

There are several different objects involved in the game. The first is to explore the planet Christon 3 and destroy the aliens who have occupied the planet.

Further objects involve you having to rescue as many scientists as possible from the planet and eventually find the underground complex to get hold of more fighting power and the blueprints of a top secret weapon system that was being researched on Christon 3. Graphics are large and detailed.

Incentive has been talking about its 'Freescape' technique for a while, but at last here's the finished Spectrum version of *Driller*, with CBM64 and Amstrad to follow. Was it worth the wait? Yes, especially if you've



The mountaintain terrain, looks very realistic but it's really no surprise as apparently a lot of work has gone into the writing of the game by brothers Chris and Tony West.

Controlling your spaceship is done a la *Defender* in that you are positioned horizontally and there is a box on the top of the screen showing you where the aliens are coming from and how near they are to you.

The music on *RISK* is very good and is very reminiscent of a theme tune to some top sci-fi adventure film.

It's a real shame that during the actual playing of the game there is no music playing.

The only sound effects are of you shooting at the aliens. It would have been nice if the

authors could have let the music from the introduction run into the game.

What could have been considered as a 'rip off' of an old game has turned out to be a game with added originality.

It's pleasing to see that old ideas can be taken to and brought back in a modern way. Congratulations to The Edge. How about bringing out a new version of *Asteroids* or *Space Invaders*, Edge?

Leslie Bunder

**Program** *Risk* **Micro** Commodore 64/128 **Price** £8.95 (cassette), £12.95 (disc) **Supplier** The Edge, 36-58 Southampton Street, London WC2E 7HE, 01-831 1801.

enjoyed games like *Mercenary* and *Sentinel*. *Driller* gives you a solid 3-D landscape, with objects that you can walk round, walls you can climb on (and fall off) and the ability to look in any direction. Look up as you walk through a passageway and you'll see the roof going by, and if you raise your viewpoint when you come to a wall you can look over into the next playing area.

Control requires most of the keys on the keyboard, though a joystick makes life easier; Kempston, Sinclair and Cursor are supported. Even with a stick you'll still need another 16 keys! These enable you to look up and down, tilt left and right, do a U-turn, rise and fall vertically and teleport drilling rigs.

Drilling rigs? Well there is a game in here as well! It takes place on Mitral, where a build-up of gas beneath the surface needs an experienced driller just like you to explore Mitral's 18 sectors and place the drilling rigs in the right spots to relieve the pressure. You also only have four hours (real-time) before a meteor hits Mitral, and if the gas prob-

lem hasn't been sorted out by then the resulting explosion could mean the end of civilisation as we know it. With a potential playing time of four hours, it's as well there's a SAVE feature.

There are 16 controls around the main viewing screen, so I won't go into all those, but some of the more sensible include the ability to alter your rate of movement and the angle through which you turn round when you look to left or right. *Driller* does take a while to get started, as you try to get used to everything that's going on, but it repays the effort.

*Driller* has lots of amusing touches. Not a fast-action shoot 'em-up, and I've a feeling the Freescape technique will produce even better games than this, but it's a good (if pricey) start.

Mike Gerrard

**Program** *Driller* **Type** Adventure **Micro** Spectrum **Price** £14.95 (tape), £17.95 (disc) **Supplier** 2 Minerva House, Calleva Park, Aldermaston, Berkshire RG7 4QW.



# Computer Music at it's best...

ONLY  
£49.95



Just what the serious or amateur musician has been waiting for.

## MIDI INTERFACE

For ZX SPECTRUM - Compatible with 48/128k/+2

- MIDI DELAY FACILITY • STORES THOUSANDS OF NOTES
- MIDI IN/OUT/THROUGH • FULL MIDI COMPATIBLE ASSIGNMENTS
- CONTROL ANY MIDI COMPATIBLE INSTRUMENT
- FORWARD AND REVERSE SEQUENCE PLAYBACK
- REAL OR STEP TIME INPUT FROM INSTRUMENT OR COMPUTER
- SUITABLE FOR HOME OR PROFESSIONAL USE
- FULL SYNC FACILITY • 8 TRACK MIDI SEQUENCER
- COMPLETE WITH HARDWARE / FULL SOFTWARE
- TRANPOSE FACILITY • MICRODRIVE COMPATIBLE
- COMPREHENSIVE INSTRUCTION MANUAL
- MIDI LEAD INCLUDED
- EXCEPTIONAL VALUE

128k/+2 to Midi Lead  
(BT style plug to 5 pin DIN)  
**ONLY £9.75**  
It is not necessary to purchase this lead  
with the Cheetah MIDI Interface

Extra 5 pin DIN  
to 5 pin DIN Midi Leads  
**ONLY £4.99**

## SOUND SAMPLER

For ZX SPECTRUM - Compatible with 48/128k/+2

- SAMPLE ANY SOUND • SYNC FACILITY • MIXING OF SAMPLES
- SUITABLE FOR HOME OR PROFESSIONAL USE • SIMPLE TO USE
- REPLAY AT VARIOUS PITCHES FORWARDS OR BACKWARDS
- POWERFUL EDITING FACILITY • ECHO, REVERB ETC.
- SAMPLE SOUND EFFECTS INCLUDED • COMPLETE SYSTEM
- EACH SAMPLE SOUND STORED AS FILES IN MEMORY
- BANDWIDTH - AN AMAZING 17.5KHz
- OUTPUT THROUGH MOST HI FI'S • MICRODRIVE COMPATIBLE
- GRAPHICS SAMPLE DISPLAY • PLAYBACK FROM KEYBOARD
- REALTIME PITCH HARMONISER

Dog barking, Glass breaking, Drum beating, Car revving even make your voice sound like Mickey Mouse — it's all possible with this amazing add-on from Cheetah



ONLY  
£44.95



'Peripheral of the Year'  
(Readers polls - PCW  
& Sinclair User)

SPECDRUM  
£29.95

## SPECDRUM / AMDRUM

Digital Drum System for the Spectrum 48K 128K +2  
and Amstrad 464.664.6128

As featured on  
"Micro Live"  
and  
"Saturday  
Superstore"

- 8 DIGITALLY RECORDED REAL DRUM SOUNDS
- SIMPLE TO USE - UP AND RUNNING IN ONLY MINUTES
- A TRUE DIGITAL DRUM MACHINE
- 'REAL TIME' OR ON SCREEN PROGRAMMING
- COMPLETE WITH SOFTWARE
- EXTRA SOUNDS CAN BE LOADED FROM TAPE
- CREATIVE, EDUCATIONAL AND FUN
- THE MOST EXCITING PERIPHERAL EVER DEVELOPED
- DYNAMIC FILING SYSTEM — STORE OVER 1000 PROGRAMMED RHYTHMS
- SONGS CAN BE SAVED ON TAPE
- TAPE SYNC FACILITY
- POLYPHONIC • COMPREHENSIVE MANUAL
- JUST PLUGS IN TO MOST HI FI'S

Prices include VAT, postage & packing. Delivery normally 14 days.  
Export orders at no extra cost. Dealer enquiries welcome.

Cheetah, products available from branches of

Dixons Harveys LARVE

WHSMITH • High St. Stores and all good computer shops  
or direct from Cheetah.

NOW AVAILABLE  
Latin Kit & Editor  
**£3.99**  
Electro Kit & Editor  
**£4.99**  
Afro Kit & Editor  
**£4.99**

128 to Midi Lead  
available  
now at .... **£9.75**

**Cheetah**  
Marketing



CHEETAH MARKETING LTD  
Norbury House, Norbury Road,  
Fairwater, Cardiff CF5 3AS.  
Telephone: Cardiff (0222) 555525  
Telex: 497455 Fax: (0222) 555527



# PROGRAMMERS

Over the last year the ZEN ROOM has produced some of Europe's top games, like TAU CETI, DRACULA, CYBORG, ACADEMY, DEATH OR GLORY, BALLBREAKER and THE ROCKY HORROR SHOW. Now Britain's most innovative software development team are looking for experienced freelance programmers to join them. If you have just written a game or are about to and would like the financial and programming back-up the ZEN ROOM can offer contact Michael Hodges on 01-985 2391 or write to the ZEN ROOM, Unit 7D, Kings Yard, Carpenters Road, London E15.

## THE ZEN ROOM

A DIVISION OF CRL GROUP PLC



# DRIVER

## IN THE NEW DIMENSION

### FREE



Large (100 disk capacity) lockable disk storage box worth £13.95 -

CATALOGUE: Send 50p (or 30p with order). Refundable

HIGH QUALITY

### JAPANESE HIGHGRADE

5.25" DS/DD DISKS  
Large storage case totally FREE with the following quantities of high quality Japanese disks-

25 disks ... £18.75

50 ..... £28.95

100 ..... £49.95

150 ..... £73.95

250 ..... £119.95

All inclusive of Post & VAT

Nebulae, Dept. N.J. FREEPOST, Kilroot Park Industrial Estate, Carrickfergus, Co. Antrim BT38 7BR  
Telephone (09603) 51020 (Monday to Friday 9 to 5)  
7 day delivery and 14 day money back period.

We accept orders from all government bodies, schools, universities, PLC's etc.  
We despatch on receipt of an official purchase order.

ORDER BY PHONE FOR SAME DAY DESPATCH

Tel: (09603) 51020  
FREEPOST YOUR ORDER TODAY - NO STAMP REQUIRED

# THE ULTIMATE SPECTRUM UPGRADE!

## LOAD 48K PROGRAMS IN ONLY 3½ SECS!\*

WITH THE **PLUS D** DISC/PRINTER INTERFACE

- ★ Up to 780K storage with 3.5 or 5.25 discs.
- ★ Instant transfer from cassette or disc with snapshot button - up to 16 48K games or 6 128K games per disc.
- ★ Load/Save in an amazing 3.5 seconds (128K in 10 secs.)
- ★ Print screen at anytime with unique snapshot print. Single or Double size.
- ★ Compatible with a wide range of serious and most games software. Can use Disciple discs.
- ★ From MGT... the designers of the Disciple - Supported by INDUG - The Disciple Users Group.

Add the power and speed of a DISC DRIVE to your SPECTRUM (any model except +3)

**SUPER PRICE ONLY**

**£49.95** INC. VAT

**IDEAL XMAS GIFT**



PACKAGE DEAL  
PLUS D with  
780K 3.5" Drive  
**£129.95**  
(plus postage)

FOR FULL DETAILS BY RETURN POST, PLEASE SEND SAE

MGT, Unit 4, Chesterton Mill,  
French's Road, Cambridge  
CB4 3NP or call 0223-311665

## MGT

Public Français  
et Francophone contactez  
Duchet +44-291 257 80

MILES GORDON TECHNOLOGY

\*Timings are approximate, depending on drive.



# See C Signor

The first C compiler for the Acorn Archimedes has appeared. David King concludes that it is not all that it could have been.

**A**corn currently has two versions of the C language in their software catalogues, and one is 400 times faster than the other! I'm referring to *Acornsoft C* for the BBC Master Series, and also *Acorn C* (notice the lack of 'soft') for the new 'BBC Micro', none other than the Archimedes.

These two products serve to underline just how many worlds apart Acorn's old 8-bit BBC work-horse and the new 32 bit super-micro are. It is not just speed of course; with the 8-bit C language you are restricted to fairly small programs because of memory limitations, and run-time code is not true machine code, but an intermediate interpreted type, which is also non-portable. The Archimedes on the other hand has pretensions to being a full-blown Unix work-station, and so C forms an extremely important part of the new machine's initial repertoire of languages.

## Programming C

If you want to program in C on your Archie, you'll need a 1 megabyte machine - either an A310, or an expanded A305. The version of C we looked at was a pre-production release, and this was openly admitted and warned about in the documentation. Acorn has had ARM (Acorn RISC Machine) C compilers running for well over a year now, and according to details supplied with the version we had, our version was a recent release originally written in C itself. We ran Norcroft release 1.40. Acorn have opted for the ANSI (American National Standard for Information Systems) standard, which should mean good portability across the already crowded spectrum of rival C compilers on other machines.

## Features

The package has all the basic features you would expect from a professional C compiler, a linker is included (an essential part of a C system but often supplied as an 'extra!') - though ours wasn't documented! Nevertheless, there were no surprises here, and users familiar with other commonly available systems shouldn't have any problems getting started.

The Archimedes doesn't currently have any floating point co-processor hardware,

however a floating point emulator is supplied, and you're directed to have this present when using the compiler.

No editor is supplied, though Acorn programmers swear by their in-house developed Twin editor - a multi-tasking version of Edit as supplied on the Master 128. We didn't have this but got by using View under the Archimedes 6502 emulator! There's no debugger either, which could put some professional applications houses off.

The pre-production compiler on sale at present does have some annoying bugs, but these are not too serious and they are

```

%TV.SIEVE

#include <stdio.h>

#define TRUE 1
#define FALSE 0
#define SIZE 8190

char flags[SIZE+1];

main()
{
    int i, prime, k, count, iter;
    printf("10 iterations\n");
    for (iter = 1; iter <= 10; iter++)
    {
        count = 0;
        for (i = 0; i <= SIZE; i++) flags[i] = TRUE;
        for (i = 0; i <= SIZE; i++)
        {
            if (flags[i])
            {
                prime = i + 1;
                for (k = i*prime; k <= SIZE; k += prime)
                    flags[k] = FALSE;
                count++;
            }
        }
        printf("%d primes.\n", count);
    }
}

```

A shot of a typical C program in action

documented. Some limitations are also evident, like the lack of linker documentation, and the lack of flexibility in some features - the stack is fixed at 16K for example - but addendums supplied promise to shore up these weaknesses in later releases.

*Acorn C* has a standard library, once again with nothing basic missing. Extensions to the library include graphics calls - basically links to the extended graphics in the Archimedes' Arthur operating system, plus the ability to use what was referred to as the Arthur WIMP system.

We didn't have time to test this feature but assume this is a reference to the Archimedes Desktop Windows module.

A *Sieve of Eratosthenes* program is supplied, and we used this to find the first 1899 prime numbers.

## Speed

Execution speed of the resulting ARM code was impressive - just 0.58 of second. This compares with over three minutes for the poor old Master 128 running Acornsoft C. For some reason we were unable to get Beebug's C compiler for the BBC to accept the example program. Brasscourt C for the BBC Model B, which compiles true machine code, was much more impressive at 38 seconds, but still over 60 times slower than the Archie. However rather more relevant comparisons disappoint. Running the same Sieve program on both Motorola 68020 based NCR and Intel 80386 based Altos Unix multi-user systems, the same program ran three and five times faster respectively.

This has to be down to the compiler, and perhaps the early 0.20 release of Arthur in our Archimedes. The Archie's ARM is capable of matching, or even exceeding, the performance of either a 68020 or an 80386, so we can only deduce that those machines have better optimised compilers.

However this probably shouldn't be all that surprising. *Acorn C* is currently the only commercially available C compiler for the Archimedes and will probably benefit greatly from further optimisation in later releases. Acorn will send later releases to current users as long as they receive a user-registration coupon supplied with the original package.

## Conclusion

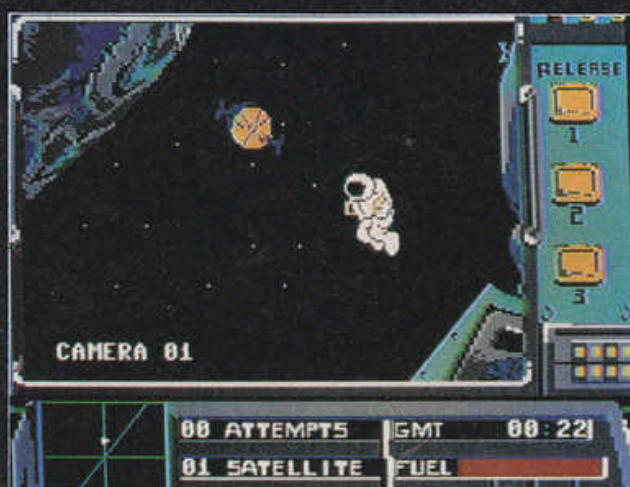
Perhaps this initial release of *Acorn's C* package is a touch disappointing, but it's still good enough to get going with, and certainly very important for Acorn's crusade to get the Archie recognised and installed as a powerful business/utility workstation. □

Acorn ANSI C, \$99 plus VAT  
Acorn Computers Limited  
Cambridge Technopark  
645 Newmarket Road  
Cambridge CB5 8PD

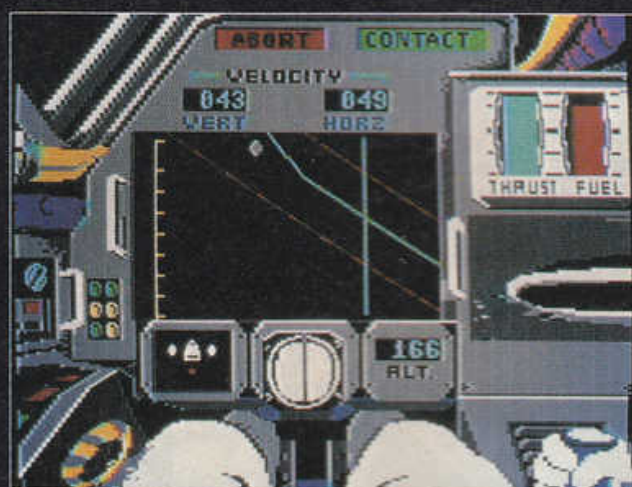


# APOLLO 18 TEST DRIVE

**FIRST.....** TRY TO DECIDE WHETHER APOLLO 18 IS BETTER  
BET YOU CAN'T. THEY BOTH HAVE GREAT ACTION



SPACEWALK TO A CRIPPLED SURVEILLANCE SATELLITE. ZERO GRAVITY AND ZERO MARGIN FOR ERROR!



ARE THEY CRATERS OR BOULDERS BELOW? YOU NEED TO BE COOL TO TAKE MANUAL CONTROL OF THE APOLLO LANDER DURING DESCENT.



THE DETAILED SPEC CHART FOR THE LAMBORGHINI COUNTACH. 173 MPH AND 0-60 IN JUST 5.2 SECONDS!



DRIVE SET ROUTES WITHIN GIVEN TIME LIMITS. LOOK OUT FOR SLOW TRUCKS, OTHER TRAFFIC, MEN AT WORK AND BE CAREFUL TO USE YOUR RADAR DETECTOR TO LOCATE SPEED TRAPS.

**THEN.....** GO OUT AND BUY THEM BOTH. BET YOU WILL.  
BECAUSE THEY'RE THE BEST AROUND.



# VS

# VE

**THAN TEST DRIVE.  
AND FANTASTIC SCREENS.**

## APOLLO 18



Apollo 18 - a brilliant simulation of an actual Apollo moon flight. From lift off to splashdown. Take 'one small step for man, one giant leap for mankind'.

## TEST DRIVE



Lamborghini, Ferrari, Porsche, Lotus and the Corvette. Test Drive five of the world's most exotic cars. Sound, animation and handling like the real thing.

Electronic Arts - available from good software stockists! Where you'll see this sign.

**ELECTRONIC ARTS**  
AUTHORISED DEALER

### AVON

K & K Weston Super Mare 32 Alfred St., Weston Super Mare, Avon. 0934 418324.

### BEDFORDSHIRE

Software Plus The Boulevards, Howard Centre, Bedford. 0734 66508

### BUCKS

Softshop Ltd 55 St Peter's Court, Chalfont St Peter, Bucks. 0753 889010

### CAMBRIDGESHIRE

Cambridge Computer Store 4 Emmanuel Street, Cambridge. 0223 358264

### CLEVELAND

Chips Computer Shop 151/153 Linthorpe Road, Middlesbrough, Cleveland. 0642 219139

### DERBYSHIRE

Gordon Hanwood Computers 69/71 High St., Alfreton, Derby. 0773 836781

### ESSEX

Lan Computer Systems 1063 High Road, Chadwell Heath, Romford, Essex. 01-599 0961

Software Plus 72 North St., Romford, Essex. 0708 765271

Software Plus 336 Charlwell Square, Victoria Circus, Southend. 0702 610784

Software Plus Liberty Shopping Mall, East Square, Basildon, Essex. 0268 27922

Software Plus 15 Kingsway, Colchester. 0206 760977

### HAMPSHIRE

GB Microland 7 Queens Parade, London Road, Waterlooville, Hants. 0705 259811

Software Plus The Boulevard, Wellington Centre, Aldershot, Hants. 0252 29862

### HERTFORDSHIRE

RSC 75 Queen's Road, Watford, Herts. 0923 243301

Y2 Computing 111 St Albans Road, Watford, Herts. 0923 50161

### KENT

Silica Shop 1/4 The Mews, Hatherley Road, Sidcup, Kent. 01-300 3399

Software Plus 35 High Street, Gravesend, Kent. 0474 333162

Software Plus 49 High Street, Gillingham, Kent. 0634 579634

### LANCASHIRE

Castle Computers 5 Frances Passage, Lancaster. 0524 61133

### LEICESTERSHIRE

ABC/Construction Software 135 St Leonard's Road, Leicester. 0533 700190

Cavendish Commodore Centre 56 London Road, Leicester. 0533 550993

### LONDON

Adamsworld of Software 779 High Road, North Finchley, London N12. 01-446 7170

G & B Computer Electronics 13 Tottenham Court Road, London W1. 01-580 3702

Geel Computer Services 45 Boston Road, Hanwell, London W7. 01-579 6133

Gultronics 223 Tottenham Court Road, London W1. 01-323 4612

Hi-Voltage 53/59 High Street, Croydon. 01-886 6362

Micro Anika 220A Tottenham Court Road, London W1. 01-636 2547

Silica Shop Lynn House (1st Floor), 227 Tottenham Court Road, London W1. 01-580 4839

Silica Shop Selfridges (1st Floor), Oxford Street, London W1. 01-629 1234

Tricomputer Software 161/169 Uxbridge Road, Ealing, London W13. 01-874 3418

### MERSEYSIDE

Bits & Bytes Computers 18 Central Station, Ranelagh St., Liverpool. 051-709 4488

### MIDDLESEX

Strategic Plus Software 188 Fulmer Close, Hampton, Middx. 01-979 2987

### WEST MIDLANDS

Comtalia 204 High Street, Dudley, W. Midlands. 0384 239259

Software City 3 Lichfield Passage, Wolverhampton. 0902 25304

Software Express 514/516 Alum Rock Road, Alum Rock, Birmingham. 021-326 3585

### NORFOLK

Computer Plus, Kings Lynn 40 New Conduit Street, Kings Lynn, Norfolk. 0553 774550

One Step Beyond 11a Castle Meadow, Norwich, Norfolk. 0603 863796

### NOTTINGHAM

Byteback Newark 6 Mumby Close, Newark, Nottingham. 0636 79097

Computer Shop Unit 280, Victoria Centre, Nottingham. 0602 410633

MPC Software 72 Julian Road, West Bridgford, Nottingham. 0602 520106

The Computer Shop Unit 25C, Victoria Centre, Nottingham. 0602 410633

### SCOTLAND

Comcal (Scotland) 11 Bath Street, Glasgow. 041 3325147

Comsoft 48 Duke Street, Coldstream, Scotland. 0890 28542979

Megabyte 12 Ethrick Square, Cumbernauld, Scotland. 0236 738398

### STAFFS

Castle Computers 47 Bridge Street, Newcastle, Staffs. 0782 619159

Castle Computers Newcastle Street, Burslem, Stoke on Trent. 0782 575043

Computer World 42 Market Street, London, Stoke on Trent, Staffs. 0782 319144

Micro-Education 30 Town Road, Hanley, Stoke on Trent, Staffs. 0782 287540

Miles Better Software 219/221 Cannock Road, Chaddsmoor, Cannock. 05435 3577

Software Cabin 61A High Street, Burton on Trent, Staffs. 0283 40489

### SUFFOLK

Computer Magic 44 High Street, Ipswich, Suffolk. 0728 830579

Computer Magic 24 Crown Street, Ipswich, Suffolk. 0473 50965

Computer Magic 51 St Andrew's Street South, Bury St Edmunds, Suffolk. 0284 702305

Software Plus 22 St Matthew's Street, Ipswich, Suffolk. 0473 54774

### SURREY

Games Room In-shops, Unit 15, Market Hall, Epsom. 0372 44465

### EAST SUSSEX

Gamer 71 East Street, Brighton, E. Sussex. 0273 728681

### YORKSHIRE

Microbyte 36 County Arcade, Leeds. 0532 480529

Thoughts & Crosses 33 Market Street, Heckmondwike, W. Yorkshire. 0924 402337

Tomorrows World Paragon Street, Hull, E. Yorkshire. 0482 24887

York Computer Centre 9 Davygate Centre, Davygate, York. 0904 641862

### WARWICKSHIRE

Software Express 221 Broad Street, Birmingham, Warwickshire. 021 6439100

### WALES

Cwmbran Computer Centre 3-4 Vestnor Road, Old Cwmbran, Gwent. 06333 60996

Soft Centre The Parade, Cwmbran Town Centre, Cwmbran, Wales. 06333 68131

**ACCOLADE**

**UNLEASH THE POWER OF  
YOUR IMAGINATION**

Electronic Arts software is available on a wide range of home computers including Commodore C64, Commodore Amiga, Atari ST, IBM, Spectrum and Amstrad. Not all titles are available on every machine format.

For a full broadsheet describing the complete range or information on your nearest stockist write to: Electronic Arts, 11-49 Station Rd., Langley, Slough, Berkshire SL3 8YN. Or call our Customer Services Dept. on 0753 46465.

ELECTRONIC ARTS



# The dotted line syndrome

If you are thinking of selling computer games, or already do so, David Lester has some handy advice on signing contracts, how to avoid financial disappointment and how to tackle legal wrangles.

**M**ost programmers are on something of a high when they finally agree on the terms by which MegaBucks Software Ltd. will publish their latest hit. Their eyes fill up with pound signs and unfortunately realism takes something of a back seat.

## Signing a contract

When you negotiate a deal with a software house for it to market your game, they will usually require you to sign a contract. I was staggered recently when the Hewson programming experts left to join Firebird - and it was revealed that there had in fact been no written contract. I would hazard a guess that in the future all software houses will require programmers to sign a contract. They do say one learns by one's mistakes...

But this is not something to be afraid of - but rather, something you should push for as programmers, since the contract is there to protect both parties, and might end up your only means to get what is owed to you. Contracts have been used widely in the industry ever since it began, and they are usually fairly similar. But, as history has shown, you should read anything through very carefully, and be aware of what you are signing before you pen your scrawl on it.

## Unfair Terms Act

The English legal system is such that the contract may not be the be-all and end-all of any agreement. If you sign a contract which later turns sour, you may have some comeback under the Unfair Terms Act - which over-rides any written contract under certain conditions, and may help you. Being under 18 might also help, but don't rely on it, if you can sign something you are happy with, do so.

## Verbal

Another interesting, and little known, point about the law of contract is that a contract need not be in writing, it can be spoken. So if a firm offers you £10,000 for the UK rights to your latest *Jupiter Ace* program over the phone, they can techni-

cally be held to it: the problem, of course, is in proving that they made that offer. For any contract to be valid, there must be an Offer ("I'll give you £1500 for that Spectrum game"), Acceptance ("I accept") - and some sort of consideration (in our example, the £1500 from the software house, and the UK rights to the Spectrum game from the programmer) although it doesn't matter how much - a penny will do.

There is a lot more detail than that, of course, but generally speaking if you have those three elements, then a contract exists which is legally binding. The law is currently changing, or about to, concerning the ability of minors (anyone less than 18, for your information, John, not someone who works underground!) to make contracts, if this is relevant to you, it might be worth your while checking with a solicitor about this.

## Signing a contract

So, what are the main points to watch out for in publishing contracts with software houses? The basis of the contract will explain who both sides are (ie, you and "your agents" and the software house, and their agents; for practical purposes, this

being given for licensing these rights, ie, the royalty arrangement you have negotiated, or the lump-sum payment, or whatever.

## Copyright

Most programmers I have come across like to maintain ownership of the copyright to a title, and simply license the rights to it. This then gives you control over sub-licences, and the rights to any income earned from subsidiary products (such as T-shirts sold with the game name on it, etc). That is, assuming that you do not assign these rights to a publisher, too. You might not think that this is desperately important, but just suppose that your program really hits the big time: there have been instances where board game manufacturers have converted a software game to a board game; and where arcade game firms such as Taito or Sega have bought the rights to a home computer game for conversion into an arcade game (for example, *Star Glider*). While this is pretty rare, you would be none too happy if you saw nothing of the profits of these licences. My advice is therefore to only assign the precise rights your publisher needs.

## Publisher's rights

The other side to this coin is that the publisher will usually make you sign a clause saving that you guarantee that you own all rights to the product, and will protect the publisher from any infringement of them. This just means that if anyone starts producing copies of your title which are a bit too close for comfort, the publisher can make you sue, they cannot sue themselves, since they are not the owners of the copyright. This could get expensive, so the first time I saw this, I felt decidedly worried about signing it. But if you are with a reputable firm then they will probably help you out financially if it comes to this (which is very unlikely anyway). And if you are with a smaller firm, then they will probably be less keen to sue anyway. You can be fairly happy about this simply because the publisher

**"The English legal system is such that the contract may not be the be-all and end-all of any agreement..."**

merely means you and them!). It will then explain what the contract does: usually licensing the rights to manufacture, market and distribute your software title, or the copyright to it; it will then have a section about what "consideration" you are



will be even harder hit than you by any infringement, so it is in its interests to help you sue.

## Royalties

Then comes the royalty or payment clause. It is impossible to say what you can reasonably hope to get. The best thing to do is just to show the game to several publishers, and take the best offer you can get (never just accept the first offer you are made, just in case...; there are less programmers ripped-off now than there were "in the early days", but it still happens from time to time).

For budget software titles, an outright payment of about £1,000 to £1,500 is fair, unless you are dealing with one of the big three firms, who should double that figure. The best thing by far, though, is to obtain an advance on royalties, so that if sales really do take off, you get a piece of the action. I have only come across two firms which refused to offer royalties, so you should be able to negotiate such a deal. On full-price, expect royalties of about 15 to 20% (of the net price, ie, what the software house actually receives from the distributors for the game, and some sort of advance but the market is just so volatile (sounds like the City, doesn't it!) that predicting the size of any advance would be foolhardy.

This is the clause to check, recheck, and check again. Simply make sure it says what you agreed with the publisher, and nothing else. Note how often the royalties are paid, too, some firms only pay them once a quarter (every three months) which means that you won't see anything for a long time after you have finished the game. If you possibly can, negotiate this down to monthly payments; while you should still get the same sum, if your firm goes bust after two months, at least you will have had two months' payments rather than none! (not to mention any interest earned on the cash).

## Conversions

You should make sure that the contract is clear about arrangements for conversions of your game to other formats (assuming that you are providing it on only one or two yourself). This can be an extra source of income which might make you more money even than the original, so don't sign away your rights to money here. One publisher I have come across claims that its contracts, don't actually entitle the original programmer to any of the proceeds from conversions - if so, don't sign it.

If you think about how many formats some games are available on (with 8 and 16 bit, there must be at least 9 relatively common ones) that is a lot of sales. As copyright holder, you should be entitled to at least 25% of what the converter gets for

the new versions. Talk this over with your software house, they should be quite happy with this arrangement, and you can then include it in the contract. You should also take into account whether or not you keep the right to license out conversions to other software houses - for example if the publisher of the original version doesn't publish on the Spectrum or Commodore, would you be allowed, under the terms of the contract, to license a second firm to publish the Spectrum or Commodore version, respectively, of the game. If not, you stand to lose out.

## Overseas sale

Similarly, make sure you are happy with any arrangements for overseas sales. This is clearly crucial if your game is likely to be a hit somewhere like the United States, but if it is a small-time UK-only game, it probably won't matter so much. But for any arcade game, and most good strategy, adventure, or simulation games, there could well be large markets overseas or your program. There is usually an extra clause dealing with this, which usually drones on about sub-licences. I would reserve the right to veto any sub-licence

**"The main point is to avoid at all costs signing any sort of exclusive agreement..."**

with which I was not happy (unlikely, but you never know) and negotiate a fairly high proportion of sales revenue for these sales. After all, there is not much work involved at that stage - the artwork and packaging has all been done, and the costs of actually producing the tape or disc are extremely low. It's just a case of using your own judgement about what is either fair, or the fairest deal you can get (not always the same, unfortunately).

## Sub-licensing

This sub-licensing is more important now than it used to be, since so many titles are released at first on their own, then later as either budget titles, or on compilations, or both. Of course, when you first sign up a contract, you have no idea whether this will happen or not, and if so how much revenue will be generated by it. So I would suggest having a clause which lets you re-negotiate the terms of any such deals yourself, as and when they arise.

That way, you might have a better idea of the likely success of the budget title or compilation, and be able to get a better deal for yourself. The software houses might not be too keen on this, though, since it is a very lucrative sideline for them, but stick up for your rights; it is, after all, your talent (and that of their other programmers) which earns their living for them.

There are two other clauses to note, one you should try to include, the other you should try even harder to exclude! Firstly, you should incorporate a term of the contract about what happens if they go bust, or are taken over. If they get taken over by someone who doesn't like your game, sales could literally stop dead, and with them, your income! You need to specify the different types of possibility here in some depth as people have been caught out before by excluding one or other of the categories. Allow for "ceasing to trade, going into liquidation or receivership, bankruptcy or being acquired by a third party"; should any of these events happen, you then automatically own any rights assigned under the contract once again, and as such are free to go and resell them to a new firm, if you can find one interested.

The main point is to avoid at all costs signing any sort of exclusive agreement, whereby you agree to (and are legally bound to) offer the publisher of your current title first refusal on all subsequent programs for the life of the contract. Under an exclusive agreement, the software house can get away with paying you very little for your new titles, since you cannot legally offer them anywhere else. One to avoid.

## Protect your interests

There are no easy answers to protecting your interests, and none which will guarantee anything. If in doubt, go elsewhere, or at least get as much as possible in up-front money. One way out is to use an agent, who then fights for you and arranges contracts on your behalf... for a small fee; two such firms I know of are Marjacq and Black Knight Computers Ltd.; the latter usually take a commission of about 10%, and report an increasing level of interest from programmers who have worked for major firms, most of whom have a story to tell concerning their own brand of shark.

A tight contract will only help you if there is someone you can sue, and so long as that someone, or firm, has enough ready to pay your debt and costs. Otherwise, even the law won't be able to help. So why bother? Because without a decent contract which protects your interests, you are definitely sunk. It's a great world, isn't it...!



# Eastern Delights

Mark Jenkins with computer news from the heart of it all . . .

Thanks to the Yamaha Corporation Of Europe, which has recently been set-up to co-ordinate Yamaha's activities in the UK, France, Germany, Spain, Italy and elsewhere, we recently got a chance to fly over to Japan to check out next year's new products. As far as Yamaha are concerned, the main line in computer music is the CX5 series, which as you'll probably know is in a state of flux in the UK. However, thanks to Yamaha's "X-Day 6", a trip to their retail store in the Shibuya area of Tokyo, and various other exhibitions, we have managed to gather quite a lot of information about the state of computing in general, and music computing in particular. In the land that does all that sort of thing best . . .

First, the CX5 series. Users who have been frustrated by the apparent deletion of the line due to the failure of the MSX standard in the UK will be pleased (or more frustrated) to know that it is going strong in Japan, Spain and Germany still take large numbers of MSX computers - and the home market is healthy, so much so that two expanded models - the CX5HII/128 and the CX11 - are currently available. These are, of course in addition to all the other MSX machines from Sony, Canon, Toshiba, Mitsubishi and many others, which can be used as music computers now that Yamaha have made their SFG-05 FM synthesizer cartridge available separately.

A music computer is only as good as its software, and currently Yamaha Japan offers a long line of options. The full list runs as follows.

- *Computer Music Workshop*; Keyboard Chord Master, Keyboard Chord Progressions, Guitar Chord Master
- *FM Auto Arranger*; FM Auto Arranger Utilities
- *Graphic artist*; Graphic Artist Utilities
- *FM Voice Data*; Vols 1, 2, 3
- *DX100/DX27 Voice Data*; Vols. 1, 2
- *DX 21 Voice Data*; Vols. 1, 2, 3
- *RX15 Rhythm Data*; Rock Vol. 1, Vol. 2, Swing/Shuffle
- *RX11 Rhythm Data*; Rock Vol. 1, Vol. 2, Swing/Shuffle
- *RX21 Rhythm Data*; Rock Vol. 1, Vol. 2
- *Music Pad*, Music Pad Accessories

The last of these, the Music Pad, is a chunk of hardware similar to a flatbed plotter which allows you to enter music, arrange pieces and create new sounds using a plotter pen to control the computer. Yamaha also make a word processor available for their MSX machines, and use the CX11 to run automatic testing routines at their DX synthesizer factory in Toyooka.



The Japanese FM77AV40 and Fujitsu monitor

The most popular MSX line in Japan seems to be the Sony Hit Bit, which can be built up into a complete business system. If you don't want to use a keyboard, this can be run from a tiny numeric control pad with just 0-9, cursor, and function keys, and you can clip on a 300/1200 bps MODEM to communicate with music networks such as PAN, IMC and ES1 Street. Similarly, Panasonic's 32k MSX computer has an optional clip-on "MSX-Audio" cartridge called FS-CA1 which gives it polyphonic synth voices for use with packages such as the standard "MSX-Music".

If you really want to integrate your music, hi-fi, computing and TV interests, the Fujitsu FM77 AV/AV20/AV40 is the one for you. It's described as an Audio-Visual Computer and comes with a powerful polyphonic sound-chip, two disc-drives, TV, keyboard and hi-fi sound outputs. A MIDI interface, the FM77-40 is optional, as

are various boards to add SCSI (hard disc) interfacing, e-mail, and what looks to be a voice-activated control system, or perhaps just a sound sampler.

The FM77 is shown being used for computer-aided design, MIDI control of Yamaha, Korg and Roland synths and effects (using a package called *FM Music World* created by Fujitsu and Music Plan) running an FM Music Editor, creating abstract graphics, doing word processing and accounting tasks, and generally being a bit of a jack-of-all-trades.

Of course, it's hard to give an idea of the cost of the machine since so many options are available. Prices in Tokyo are high now due to the strong Yen, but to give you some idea, the Apple Mac and SE are about the same price in Tokyo as in the UK, so you won't in fact make any enormous savings on electronics by shopping in Japan nowadays.

However, if you're after equipment which isn't available at all in the UK, Japan is still the place to be. The country's leading computer graphics and music magazine, *Epsilon*, covers MIDI basics, digital mixers, photographic equipment, professional video equipment, computers from manufacturers such as NEC, Sharp and Panasonic, computer graphic tips with BASIC listings, drum machines, scanners, CAD packages, films, books records, and shows.

*Epsilon* is largely in Japanese, but it is good to look at and contains tempting pictures of lots of items not yet available in the West. The publishers would no doubt be pleased to hear from you if you'd like to subscribe. Write to them in (straightforward) English c/o Studio Somewhere, 1-29-1 Gohongi, Meguro-ku, Tokyo 153, Japan, Tel: Japan 03 793 0655 (9 hours ahead).

Incidentally, non-Atari owners will be pleased to hear that the ST is very little in evidence in Japan, and that Yamaha seems to have no intention of flooding the world with ST-based software. However, one still suspects that the Japanese professional musicians are stealthily using Steinberg's Pro-24 and other MIDI music packages familiar in the West rather than more obscure packages for NEC or other micros. More Far Eastern stuff next week! □



# NEW LOW PRICE ST!



## ONLY FROM SILICA

Finally, there's a personal computer that not only solves problems like other computers, but also solves the one problem that other computers have created: Affordability. Silica Shop are pleased to present the ST range of personal/business computers from Atari. The ST was designed utilizing the most recent breakthroughs in semiconductor technology, producing a personal computer that performs tasks with fewer parts. Which means it costs less to make. And less to buy. The latest ST computers now include built-in power supplies and built-in disk drives. The TOS operating system and GEM window environment are now on ROM chips which are already installed in the ST keyboard. This enables automatic instant booting when you switch on. Silica Shop are pleased to offer the complete Atari ST range. Our mail order department is situated in Sidcup and we have 3 retail outlets at Sidcup, Lion House (Tottenham Court Rd) and Selfridges (Oxford Street). We have eight years' experience of Atari products, longer than any other UK company, and are well established as the UK's No.1 Atari specialist. With a group turnover of over £5 million and in excess of 80 staff, we offer you unbeatable service and support. We provide several facilities which you will find invaluable during your Atari computing life and most of these facilities are available **ONLY FROM SILICA**. We suggest that you read through what we have to offer, before you decide where to purchase your Atari ST.

### FREE STARTER KIT - Only From Silica

When you purchase any Atari ST keyboard, you will not only receive the best value for money computer on the market, but you will also receive the following from Atari Corporation as part of the package:

\* BASIC Language Disk \* BASIC Manual \* ST Owners Manual \* TOS/GEM on ROM  
If you buy your ST from Silica Shop, you will also receive:  
\* NEOchrome Sampler - colour graphics program \* 1st Word - Word Processor  
In addition, we at Silica would like to see you get off to a flying start with your new computer, so we have put together a special **ST STARTER KIT** worth over £100, which we are giving away **FREE OF CHARGE** with every ST computer purchased at our normal retail prices. This kit is available **ONLY FROM SILICA** and is aimed at providing users with a valuable introduction to the world of computing. We are continually upgrading the ST Starter Kit, which contains public domain and other licensed software, as well as books, magazines and accessories all relevant to ST computing. Return the coupon below for full details.

### DEDICATED SERVICING - Only From Silica

At Silica Shop, we have a dedicated service department of seven full time Atari trained technical staff. This team is totally dedicated to servicing Atari computer products. Their accumulated knowledge, skill and experience makes them second to none in their field. You can be sure that any work carried out by them is of the highest standard. A standard of servicing which we believe you will find **ONLY FROM SILICA**. In addition to providing full servicing facilities for Atari ST computers (both in and out of warranty), our team is also able to offer memory and modulator upgrades to ST computers.

**1Mb RAM UPGRADE:** Our upgrade on the standard Atari 520ST-FM or 520ST-FM keyboard will increase the memory from 512K to a massive 1024K. It has a full 1 year warranty and is available from Silica at an additional retail price of only £29.95 (+VAT = £35.94).

**TV MODULATOR UPGRADE:** Silica can upgrade the 1040ST-F to include a TV modulator so that you can then use it with your TV set. This is an internal upgrade and does not involve any untidy external boxes. A cable to connect your ST to any domestic TV is included in the price of the upgrade which is only £49 (inc VAT). The upgrade is also available for early 520ST computers at the same price.

### THE FULL STOCK RANGE - Only From Silica

We aim to keep stocks of all Atari related products and our warehouse carries a stock of over £15 million. We import many computer titles direct from the USA and you will find that we have new releases in advance of many of our competitors. Unlike dealers who may only stock selected titles, we have the full range. In addition, we carry a complete line of all books which have been written about the Atari ST. A range as wide as ours is something you will find is available **ONLY FROM SILICA**.

### AFTER SALES SUPPORT - Only From Silica

Rest assured that when you buy your ST from Silica Shop, you will be fully supported. Our free mailings give news of releases and developments. This will help to keep you up to date with new software releases as well as what's happening in the Atari market. And in addition, our sales staff are at the end of a telephone line to service all of your Atari requirements. If you purchase an ST from Silica and would like any technical advice, we have a full time technical support team to help you get the best from your computer. Because we have both the staff and the systems specifically dedicated to providing after sales service on Atari ST computers, we are confident that our users enjoy an exceptionally high level of support. This can be received **ONLY FROM SILICA**.

### FREE CATALOGUES - Only From Silica

At Silica Shop, we recognise that serious users require an in-depth information service, which is why we mail free newsletters and price lists to our ST owners. These are up to 48 pages long and are crammed with technical details as well as special offers and product descriptions. If you have already purchased an ST and would like to have your name added to our mailing list, please complete the coupon & return it to us. This information service is available **ONLY FROM SILICA**.

### FREE OVERNIGHT DELIVERY - From Silica

Most orders are processed through our computer within 24 hours of receiving them. Most hardware orders are sent by the overnight GROUP 4 courier service **FREE OF CHARGE** to customers within the UK. This method helps to ensure minimum delay and maximum protection.

### PRICE MATCH - Only From Silica

We hope that the combination of our low prices, FREE UK delivery service, FREE Starter Kit and FREE after sales support, will be enough to make you buy your Atari equipment from Silica Shop. If however, there is something you wish to purchase, and you find one of our competitors offering it at a lower price, then please contact our sales department, providing us with our competitor's name, address and telephone number. If our competitor has the goods in stock, we will normally match the offer (on a 'same product - same price' basis) and still provide you with our normal free delivery. We realise that we are not the only company who will match a competitor's price. However, if you come to us for a price match, you will also be entitled to our after sales service, including free newsletters and technical support. This makes our price match promise rather special, something you will receive **ONLY FROM SILICA**. We don't want you to go anywhere else for your Atari products. So shop at Silica, the UK's No.1 Atari Specialist.

**SIDCUP (& Mail Order)** 01-309 1111  
1-4 The Mews, Hatherley Road, Sidcup, Kent, DA14 4DX

**LONDON** 01-580 4839  
Lion House (1st floor), 227 Tottenham Court Rd, London, W1P 0HX

**LONDON** 01-629 1234 ext 3914  
Selfridges (1st floor), Oxford Street, London, W1A 1AB

# £260

+VAT=£299

## SO MUCH FOR SO LITTLE!

There is nothing that can compare with the incredible value for money offered by Atari's 520ST-FM. For only £260 (+VAT=£299), you can purchase a powerful 512K RAM computer, with a 95 key keyboard (including numeric keypad), MIDI interface, GEM, a palette of 512 colours, mouse controller, and a 512K built-in disk drive. The 520ST-FM has a TV modulator built-in, and comes with a lead to allow you to plug it straight into any domestic colour television set. The mains transformer is also built-in to the keyboard, so there are no messy external boxes. You couldn't wish for a more compact, powerful and stylish unit. Atari ST computers are now firmly established in the UK, there are nearly 500 software titles already available for a wide variety of applications and the list is growing all the time. And that's not all. When you buy your new 520ST-FM (or any Atari ST computer) from Silica Shop, you will get a lot more, including a **FREE Silica ST Starter Kit** worth over £100. Read the **ONLY FROM SILICA** section on the left, to see why you should buy your new high power, low price 520ST-FM from Silica Shop, the UK's No.1 Atari Specialists. For further details of the range of Atari ST computers and the **FREE Silica ST Starter Kit**, complete and return the reply coupon below.

**ATARI 520ST-FM NOW ONLY £260 (+VAT=£299)**  
520ST-FM with 512K RAM & mono monitor £399 (inc VAT) Upgrade from 512K RAM to 1024K RAM £100 (inc VAT)

### ATARI 1040ST-F - NEW PRICE

We are pleased to announce a new reduced price point on the 1040ST-F, which is now available for only £499 (inc VAT). The 1040 is a powerful computer with 1Mb of RAM and also includes a built-in 1Mb double sided 3 1/2" disk drive. The 1040 has been designed for use on business and professional applications most of which require a high resolution monochrome or colour monitor. It does not therefore have an RF modulator for use with a domestic TV set. Modulators can be fitted for £49 (inc VAT).

1040ST-F Keyboard Without Monitor £499 (inc VAT)  
1040ST-F Keyboard + High Res SM125 Mono Monitor £599 (inc VAT)  
If you would like further details of the 1040ST-F, return the coupon below.

### MEGA ST's NOW IN STOCK

For the user who requires even more RAM than the 520 or 1040 ST's offer, the new MEGA ST computers are now available. There are two MEGA ST's, one with 2Mb of RAM and the other with a massive 4Mb. Both new computers are fully compatible with existing ST's and run currently available ST software. The MEGA ST's are styled as an expandable Central Processing Unit with open architecture and a detachable keyboard. They are supplied with GEM, a free mouse controller and all extras as with the 520 or 1040. Prices are as follows.

MEGA ST 2Mb Keyboard + CPU £299 (inc VAT)  
MEGA ST 2Mb Keyboard + CPU + SM125 Mono Monitor £399 (inc VAT)  
MEGA ST 4Mb Keyboard + CPU £1199 (inc VAT)  
MEGA ST 4Mb Keyboard + CPU + SM125 Mono Monitor £1299 (inc VAT)  
If you would like further details of the MEGA ST's, return the coupon below.

# ATARI ST

To: Silica Shop Ltd, Dept PCWK 1087, 1-4 The Mews, Hatherley Road, Sidcup, Kent, DA14 4DX

**PLEASE SEND ME FREE LITERATURE ON THE ATARI ST**

Mr/Mrs/Ms: ..... Initials: ..... Surname: .....

Address: .....

Postcode: .....

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







## A bit dense

G A Sansom, of Orpington, Kent, writes:

**Q** I have read in your column a couple of times about discs and the different densities and formats. However, most of what you say seems to go right over my head. Could you explain in very simple terms the various aspects of discs - with pictures if possible?

**A** Starting from basics, a disc is a round piece of plastic coated on each side with a layer of magnetic material (Fig. 1). This material is very similar to that used on magnetic tapes and if it is magnetised in one direction, stays that way until it is changed to another direction. At its simplest level, the direction in which the material is magnetised can be taken as a one or a zero and can be read back from the disc by a coil of wire which senses the direction. This makes them easily written to and read as well as giving a pretty reliable system.

To store as much information as possible on the disc, its area is split up into tracks which are then split into sectors (Fig. 2). Each sector holds a series of ones and offs according to the information stored. This sectioning of the disc is known as its format and is purely magnetic ie, the physical aspect of the disc is not changed by it - allowing the same disc to be used under different formats.

A common format is to split one side of the disc into 40 tracks, each having 10 sectors and each sector holding 256 bytes of information. The whole disc can therefore hold up to 102400 or 100k bytes of data. To find the first track, the index hole is usually used. This is a physical hole in the disc whose position can be detected by means of a light beam shining through it. Sector zero can then be found by

allowing a certain amount of time to elapse before reading or writing - since the speed at which the disc is spinning is known.

To read or write the tracks, an arm holding the read/write head is positioned over the disc and can be moved in and out in precise steps (Fig. 1) one for each track. To find track zero - usually the outermost - the arm is pulled back as far as it can go until it hits a stopper. This position defines track zero, and all other track positions are based on offsets from this.

Before a blank disc can be used, it must be formatted and this operation is performed by taking the two positions described above ie, track, zero and sector zero, and then writing information to each track that splits it up into the correct sectors. Once this is done, a couple of tracks are set aside to hold the directory information ie, what files start where and how long they are. This directory info varies quite a lot from system to system and is usually the reason why discs that may be incompatible at first sight, can often be read by a system if the format is known.

There are a couple of ways of getting more information on a disc, the most obvious of which is to use both sides in this situation, there is a read/write head positioned on each side of the disc giving twice the number of tracks. The other way is to increase the number of tracks, usually doubling them ie, from 40 to 80. An 80 track (or double density) double sided disc with the sector format described before would hold 409600 or 400k bytes (1k is 1024 or  $2^{10}$ ). It is also possible to have quadruple density but this is quite rare since it puts great demands on the quality of the magnetic material and the drive mechanism. To get 80 tracks the read/write arm must move exactly half as far for each track as before - obviously things are getting a little delicate when it is moving half as far again.

Floppy discs come in four main sizes, 3", 3.5", 5.25" and 8" with the 3.5" and the 5.25" being by far the most common (Fig. 3). The formatting of these is pretty much as before and the number of tracks, sectors and bytes per sector varies from system to system. You'll have noticed that 5.25" and 8" discs have notches in their cases. This is for the write protect and if the notch is there, the drive is able to write to it. If, however, the notch is covered with a write protect tab (a piece of sticky foil), the hardware in the disc drive stops any information being written protecting the disc from harm.

When discs are manufactured, they are coated on both sides and then tested to see how well they hold the information. If both sides work well then the disc is sold as double sided double density. If one side has faults then it may be sold as single sided, and if both sides have minor faults then it will be single density. Since the disc is always coated on both sides, it can be used in a double sided double density system, but is not guaranteed to retain its data. I have a number of discs that I have used without any problems in this way - both 5.25" and 3.5", however, it is

not recommended. You should always buy the correct density and sides specified by the computer system manual, since most discs are guaranteed for life (I'm not sure whose but then I'm not Methuselah - yet) you will have no trouble.

One final thing is that Commodore disc drives don't use the index hole and so can be turned over allowing both sides to be used in a single sided system. You do have to buy special discs, or cut an extra write protect notch in the other side of the disc to make them work however.

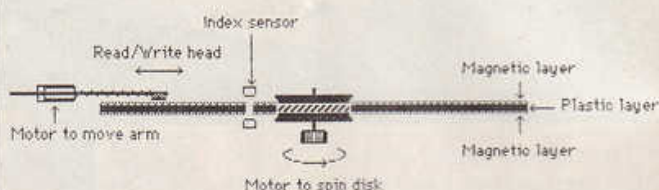


Fig 1 - the main components of a disk and drive seen edge on.

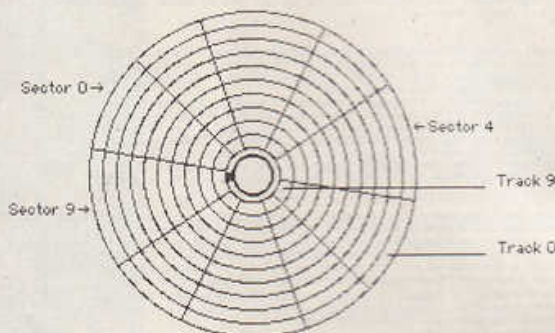


Fig 2 - the sectors and tracks (only ten shown) of a floppy disk.

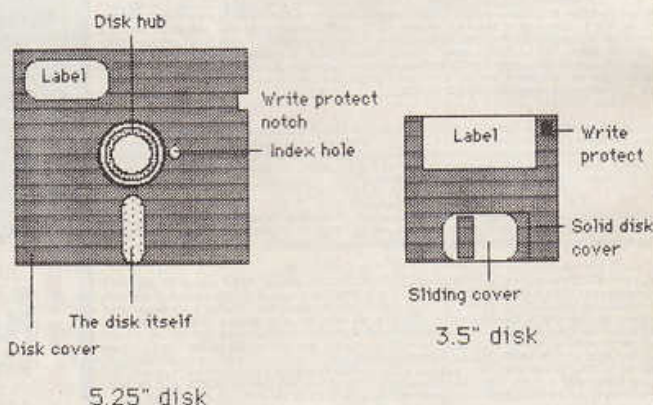


Fig 3 - the commonest disk types.



## Testing time

C Wooley, of Pelsall, W Midlands, writes:

**Q** I use three Amstrad computers, the PC1512, CPC6128 and the PCW8256, and find the Basic on two of them quite good. However, I have hit on a problem with Locomotive Basic 2 in that the TEST and FLOOD commands do not operate. For me this is a serious problem in that I have persuaded my company to purchase a PC1512 so that I could write the required programs.

I have been in touch with Amstrad, Locomotive Software, and Digital Research and, although they were very helpful, there seems to be no solution to the problem.

It turns out that Basic 2 was written for use with the original GEM environment which was not complete. What I find strange is that when DR needed these commands for GEM Paint, they included them. Locomotive, however, didn't, but left the commands there anyway ie, they are in the manual but don't actually work.

Could you please identify a Basic which is compatible with the Amstrad PC machine and which will support the graphics commands that I need. I would also like to know if other Basic 2 users have encountered other problems and ways of resolving them.

**A** I think that Microsoft's GWBasic is the one you want, although I am not 100% certain. Other possibilities are Borland's Turbo Basic and Quick Basic (MS). Since I don't use PC's very often, I am not really an expert on the software available. The best thing would be to ring a couple of reputable dealers and ask their advice - possibly our reader's know for sure?

## Sound Out

T F McCabe, of Walton, Liverpool, writes:

**Q** What I want to do is use my 520 STFM with an Amstrad colour monitor that I used to use with my CPC464. Thanks to you, the video connection is fine, the problem is the sound output. I know which pins to use but I am a bit worried about what to connect it to. Could you clarify the situation please?

**A** The manuals for the ST state that the sound output is 1 Volt peak to peak but I cannot find the impedance which I "assume" to be around 1K $\Omega$ . In plain English, this means that it more or less matches the common 'phono' input of most modern amplifiers.

It also more or less matches most modern (Walkman type) headphones. This leaves you with three choices, a pair of headphones with the two channels connected to the single output for the ST, straight connection to an amplifier - the CD input is suitable otherwise one of the tape inputs will do.

The final, and by far the most difficult is to obtain an amplifier especially for the system. I haven't got space here to detail this but basically it should have 1k $\Omega$  1V p-p input, and be able to drive an 8 $\Omega$  speaker at about 10 Watts.

Personally, I prefer the headphones since they cause no disturbance to anyone else, and they can be quite loud.

## Coded

Philip E Jones, of Anfield, Liverpool, writes:

**Q** I wonder if you can help me? I am at University and studying a computing course, the system is using Algol 68, but so far I have only learned, Basic, Pascal and some Z80 machine code. I know that Algol 68 and Pascal are similar and that a Pascal compiler can be bought. But, I would like to know if there is such a thing as an Algol 68 compiler, and if so how much will it cost? If there is more than one, which is best? I own a Spectrum 128K (the one Sir Clive brought out).

**A** As far as I know, you are completely out of luck when it comes to Algol 68 compilers, especially for the Spectrum. There may be an IBM PC (small c stands for clone) version but I think that this is rather unlikely as well.

The problem is that Algol 68 was designed well before the age of the micro-computer, in 1968 in fact. This means that any compilers for it will be written for elephantine machines such as the ICL 1900 series, at least, that is the only computer I have ever used it on.

I think that the best thing to do would be to stick with Pascal and maybe c as these are the closest to Algol. If you can get to grips with

Pascal, converting to Algol should be fairly easy.

Perhaps some of our readers know of an Algol implementation for micro-computers? If so then please let me know.

## Driving force

R Stevenson, of Islington, London, writes:

**Q** I plan to buy an ST but need advice in order to decide between the following options:

- 1) Buy a 1040 STF
- 2) Buy a 520 STFM with 1 Meg upgrade and a Cumana 1 Meg drive.

The second option would seem to give the equivalent of a 1040 and a second drive, for not much extra cost. But would it?

Is a 520 STFM with RAM upgrade really the equivalent to the 1040 (except for the drive) or would there still be some differences?

What about the drive? Would the external drive be able to do all that the 1 Meg internal drive does on the 1040 eg, when booting?

## Giving the boot

A Bradshaw, of Chorley, Lancs, writes:

**Q** I've read a couple of times in your mag, people asking how to use auto running programs on 1 Meg disks when their STFM's always boot up on the built in  $\frac{1}{2}$  Meg drive.

Pins 19 and 20 on the YM2149 sound-chip control the drives, switching these over, switches the boot drive. I have enclosed a drawing showing how to put a switch in, this allows either drive to be drive A.

Fitting the switch means desoldering the two pins, and cold

**A** As far as I can see, the 520 STFM plus memory upgrade plus 1M Cumana drive would come to approximately \$477 (I didn't look for the cheapest prices around) whereas the 1040 STF is \$480 and including a Cumana drive this would come to \$619. So it looks as though you are right about the price advantage.

As far as I know, the 520 with a RAM upgrade should behave exactly like a 1040 since the operating system takes care of the additional RAM when the machine boots up.

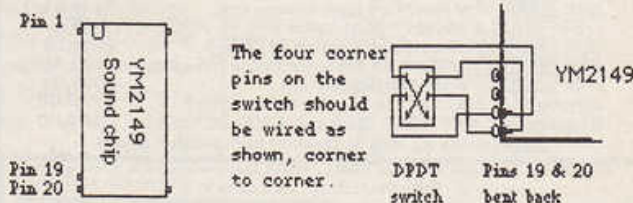
Also, since pretty well all ST software comes on single density discs, it should all run from the internal drive. The only drawback with the system you propose is that you will not be able to boot from the external drive unless you either fit the switch shown in P&P a couple of weeks back, or fit a double density disk drive (also in P&P a while back).

As I have said before, my answers are all 'as far as I know' and I have been known to be wrong (ablet rarely) I would think that your best bet would be the 520 + upgrade + external drive since it seems a far better deal than the 1040 + external drive.

soldering four wires, one wire to each of the pins, and a wire to each of the holes where the pins came from. These four wires are then taken out of the ST via the mouse/joystick port and attached to a DPDT (Double Pole Double Throw) switch.

Anyone who wants the switch fitted but has little experience of soldering should get someone who is capable to do it for them.

**A** Thanks for the tip, it is pretty obvious when you think about it, the only drawback is that the warranty will be invalidated - but this is usually not too great a problem.





ALL PRICES INCLUDE  
VAT & DELIVERY

NEXT DAY DELIVERY  
£5.00 EXTRA

# Prices Crushed

**520 STFM NEW LOW PRICE**  
**Only £279.00**  
ATARI *Back in stock* ATARI

520STFM with 1MEG memory upgrade installed £338.00  
1040 STF £469.00 SM125 M.monitor £134.00  
MEGA ST 2 £899.00 MEGA ST 4 £1199.00

All ST prices include: mouse etc. PLUS 5 disks full of s'ware including demos, utility, wordpro & game

Philips CM8833 Hi-res colour monitor c/w ST cable £279.00  
(ONLY £269.00 if bought with an ST)

Atari SC1224 Hi-res colour monitor £299.00

Atari SMM804 Printer (Special, few only) £149.00

1MEG MEMORY UPGRADE (STFM ONLY) £59.00

(Requires soldering, free fitting if you buy a new ST from us)

**3.5" disks** 10..... £11.95 in 10 cap plastic case £13.95  
25..... £27.95 in 40 cap plastic case £34.95  
Fully guaranteed double sided media.

## AMSTRAD 1512/1640

ALL PRICES VAT & DELIVERY INCLUSIVE

Select an Amstrad PC from our wide range

We have a full range of models including the highly popular Evesham upgraded models. Our single floppy 21/32 MEG models are professional internal installations leaving maximum expansion room. The twin floppy versions use a hardcard. 1512 models can be supplied with 640K RAM upgrade installed for £20.00 extra. Prices in light type are ex VAT

**STOP PRESS FREE with 1512... Migent Ability & 4 games**  
(former retail value over £200.00)

	SD	DD	AMS 20MEG	SD 21MEG	DD 21MEG	SD 32MEG	DD 32MEG
MONO 1512	381.74 439.00	477.39 549.00	N/A N/A	598.26 688.00	693.91 798.00	841.74 938.00	737.39 848.00
COLOUR 1512	520.87 599.00	616.52 709.00	N/A N/A	737.39 848.00	833.04 958.00	780.87 898.00	676.52 1008.00
MONO 1640	494.78 569.00	581.74 669.00	868.70 999.00	818.00	711.30 918.00	798.26 868.00	754.78 968.00
CGA (colour) 1640	625.22 719.00	712.17 819.00	912.17 1049.00	841.74 968.00	928.69 1068.00	885.22 1018.00	972.17 1118.00
ECD (EGA) 1640	755.65 869.00	842.61 969.00	1129.57 1299.00	972.17 1118.00	1059.13 1218.00	1015.65 1168.00	1102.61 1268.00

**32MEG HARDCARD...** Western Digital Filecard, supplied with XTREE file management software **FREE** (Normally £50.00)  
Supplied ready configured..... **NOW ONLY** ..... £299.00

**21MEG HARDCARD** Tandon Business card, top quality at a low price. Supplied fully configured .. **NOW ONLY** ... £249.00

## Commodore

64C computer only £149.95 Connoisseurs pack £199.95  
C128 computer only £199.95 C128 starter pack £239.95  
1541C D.drive £189.95 Music exp. pack £75.00  
Excelsator+ CBM compat. disk drive (inc. GEOS) £159.95  
Excelsator+ as above c/w Freeze Machine cart. £179.95

**SCOOP purchase** Complete brand new '64 circuit boards. Use for repair, spare or upgrade a VIC-20. Limited qty. **only £45.00**

**AMIGA** A great offer on the fabulous new 500 model. Includes TV modulator, Deluxe Paint, Silent Service & 5 disks of public domain s'ware. PLUS one of either Skyfox, One on One or similar. Price includes voucher allowance. **only £469.00**

Philips CM8833 hi-res colour monitor, STEREO sound, inc cable £279.00  
(ONLY £269.00 if bought with an AMIGA)

## PRINTERS PRICES INCLUDE VAT, DELIVERY & CABLE

We use and recommend Star printers, they offer the best combination of features, print quality, reliability and value for money. Sheet feeders in stock.

Star NL-10 New low price (state cartridge type) £219.00

..SPECIAL: 2 spare ribbons value £13.90 **FREE** with NL-10..

Star NX-15 Wide carriage version of NL-10 £319.00

Star NB24-10 Brilliant 24 pin printer 216cps 72cps NLO £479.00

Star NB24-15 Wide carriage 24 pin £599.00

Amstrad LQ-3500 24 pin printer, now in stock £379.00

PANASONIC KXP-1081. Best sub £200.00 model £179.00

Many other models in stock at competitive prices

All prices include VAT/delivery. Next day delivery £5.00 extra.

### How to order

Send cheque, P.O. or ACCESS/VISA details  
By phone with ACCESS/VISA details  
Govt., Educational or PLC orders accepted  
Same day despatch whenever possible  
Callers welcome, open 6 days 9.30-5.30  
All goods subject to availability E.&O.E.  
TELEX: 333294 FAX: 0386 765354  
Also at: 1756 Pershore Rd., Cotteridge, Birmingham B30 3BH Tel: 021 458 4564

**Evesham Micros**  
63 BRIDGE STREET  
EVESHAM  
WORCS WR11 4SF  
Tel: 0386 765500

# AMAZING OFFERS!

Brand New

## SPECTRUM PLUS's 48k

A scoop purchase for Christmas at

only **£79.95**

With power supply, User Guide, introductory cass, TV aerial & 90 day warranty

## ELECTRON COMPUTERS

Superb value — only **£59.95**

## ELECTRON PLUS 1's

only **£43.95**

with View & Viewsheets — only **£65.95**

Please add 95p for P. & P.  
Cheques, P.O or quote Access or Visa



0532 687735  
SAE for latest product offers  
Please state which machine

SOFTWARE BARGAINS  
DEPT. PCW  
8/8A REGENT STREET  
LEEDS  
LS7 4PE

TRADE OR EXPORT ENQUIRIES WELCOME

WE WANT YOU!



THE PLAYERS TEAM ARE OUT LOOKING FOR YOU!

CAN YOU WRITE COMMERCIAL QUALITY GAMES IN MACHINE CODE?

Write in Strictest Confidence to:  
RICHARD PAUL JONES  
PLAYERS SOFTWARE, CALLEVA PARK  
ALDERMASTON  
BERKS. RG7 4QW

or phone: (07356) 77421 (5 lines)



# On the latch

Kenn Garroch continues, in the second part of his series on interfacing, to deal with aspects of decoding on the Z80.

Last week, I looked at the two basic input output (i/o) systems to use on home microcomputers, the 6502 and Z80 types. This week I'll look at how to decode the address and data buses on the Z80 (8080 etc) to bring it up to a similar state as systems using w.i.m. chips.

There are six main signals that have to be decoded to specify an i/o access, the address bus which tells the hardware which part to use, the data bus where the information is read in or written out, the read and write lines which define the

byte of data on it ie, physically setting the 8 lines to different states is not allowed as it would interfere with the rest of the system.

To get around this a system known as Tri-State is used for any signals to be placed on the bus. All chips designed to be interfaced directly to a data bus have tri-state outputs, and when they are in tri-state mode, are effectively invisible to the data bus as though they were physically switched off, not set high or low.

When the processor is ready to receive

tant. Since the data is only available on the microprocessor's bus at the time it is written, the 8218 needs to store it so that any external circuitry can read it at any time.

## Latches

For instance, when using the computer to control a set of lights (up to 8 Light Emitting Diodes or LEDs), each data line on the bus defines one of them. Setting bit 0 to 1 (5V) turns the light on, and setting it to zero (0V) turns it off.

Since the data bus is being used for a number of other things like reading and writing memory, reading the keyboard, etc, simply attaching the light to one of its bits will cause it to flash. To sustain the output sent with the OUT command, the byte that was sent out on the data bus has to be held in the 8212 until it is changed by the computer. The latches perform this function. Each of the C inputs is a clock that takes the state of D and passes it along to Q where it remains until another clock pulse is sent, or the latches can be cleared with a pulse on R.

## Device select

There are two device select lines, DS1 and DS2 and to disable the tri-state, DS1 is set

continued on page 38 ►

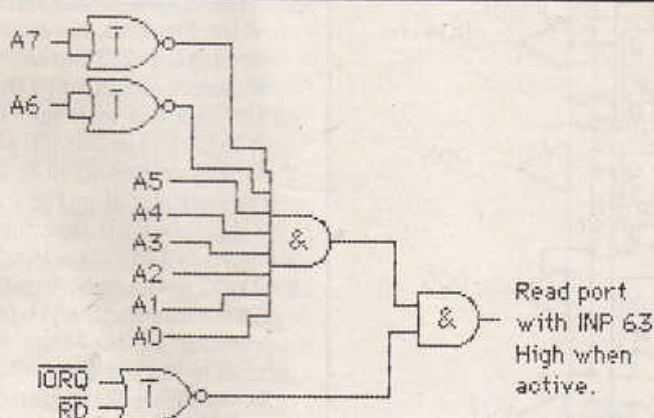


Fig 1 - Port 63 read select logic for Z80 (actually for Spectrum)

direction and the memory and iorq selects to separate memory from i/o. When an input or output instruction is come across by the processor the port number is placed on the data bus, the memory request is sent high ie, deselect, the i/o request is set low and for an in, the read is set low and write high. For a write, the read and write signals are swapped and the data bus has the data to be written placed on it.

## Simple logic

Some simple logic is needed to decode all of these signals into a single signal that foils the external hardware to become active. Because the data bus is constantly in use for memory access, simply placing a

input, the tri-state can be disabled (also known as chip/device select) allowing the processor to read the information placed on the data bus.

## Decoding

The logic circuit shown in Fig 1 is one way of decoding the various signals to give a signal that is used to disable the tri-state when the microprocessor is ready. To form a simple read/write port, the 8212 chip (Figs 2 and 3) can be used. This is simply an octal (8 lines) buffer that has tri-state and latching capabilities. It can be used for either input or output depending on how it is wired up. When it is used as an output port, the latching facility becomes impor-

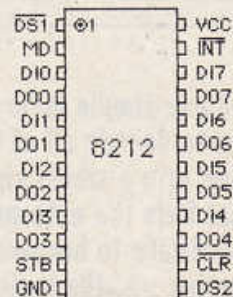


Fig 2 - 8212 pinout



◀ continued from page 37

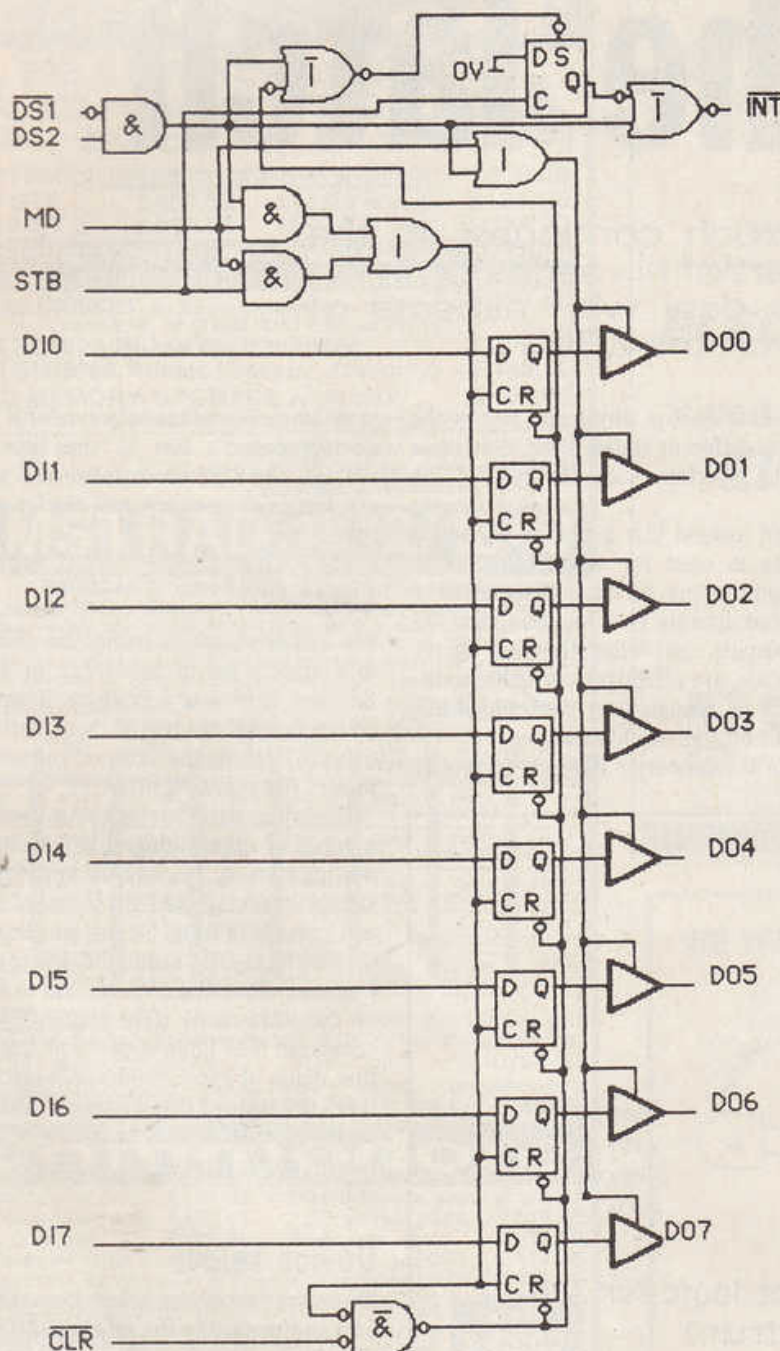


Fig 3 - 8212 internal logic

low, and DS2 high. For an output, they will always be in this position for an input (to the processor), they are only set when needed.

The advantage of having two select lines is that either a high select or low select can be used simply by setting the other line to its active state.

The circuit in Fig 1 can be used to make the 8212 into an input port by taking the output of the last AND gate ie, select, and using it to control DS2. DS1 is attached to 0V so that the output from the chip is placed on the data bus when DS2 goes high. At other times it is in tri-state mode.

## Inputs

The inputs to the 8212 work according to the table in Fig 4, SEL is used to denote the DS lines in selected state ie, DS1=0 & DS2=1 is SEL=1 and any other state is SEL=0.

There are other lines on the 8212 and examination of Fig 3 in conjunction with the truth tables shown last week should show the functions.

Forming the 8212 into an output port is a little more complicated as the data placed on the data bus with the OUT command must be latched so that it is available when the processor goes off to do other things.

The logic circuit in Fig 1 is changed so that write (WR) is used instead of read, MD is set to 0 and the select from the logic goes to STB. As can be seen from the table in Fig 4, a transition of STB from 1 to 0 sets the output of the chip from straight through to latched data.

So, when port 63 is selected with the out command STB goes high and the data on the data bus goes straight through.

After the command, STB goes low, and the data is latched so that it appears at the cursors until more is sent out. Obviously, the 8212 is changed around so that the D1 lines come from the data bus, and the D0 lines are the output. □

**“Some simple logic is needed to decode all of these signals into a single signal that foils the external hardware to become active . . . the logic circuit is one way of decoding that.”**

STB	MD	SEL	Data out is:	
0	0	0	Tri-state	unseen by processor data bus
1	0	0	Tri-state	
0	1	0	Data latch	This is data that was latched in
1	1	0	Data latch	
0	0	1	Data latch	Data input straight through to output
1	0	1	Data in	
0	1	1	Data in	
1	1	1	Data in	

Fig 4 - truth table for 8212



## Spectrum Various

J Collins

The following routines were sent in as a series by J Collins of London. They all use the same loader and so you will have to include lines 10-50 of the first one with them all.

The first is Music which allows dual channel sound to be played. The syntax is:

INPUT USR 60300,duration,note 1,note 2.

Where the duration varies from 0-255. The routine starts at 60300 and is 45 bytes long. The loader is included in this listing to show how it works.

The second routine is Bases and is used to convert and print decimal numbers into the bases of 16 (hexadecimal), 2 (binary), and 8 (octal). To convert the 8 bit number (0-255) to one of these bases, use RANDOMISE n where n is the number. To print the number use LET xx=USR 6140Y the last digit (Y) depends on which base you want. Y=0 is hexadecimal, Y=3 for binary, and Y=6 for octal. Use lines 10-50 from the Music listing for the loader.

The third routine is Fade and is used to fade out any graphics on screen. The utility is called with RANDOMISE USR 61600.

The fourth utility (POKE\$) allows strings to be poked into memory. The syntax for the routine is INPUT USR 61700,addr,string where addr is where the string will start and the string is a normal string ie, "This is OK" or p\$ or p\$(2 TO 4) etc.

Finally, Passord also involves string but this time in the guise of a password system that locks the Spectrum up until the correct password is entered. The syntax is: INPUT USR 61000,pass\$ where pass\$ is any form of string as described for POKE\$. Short of turning the computer off, there is no way out.

### Music

```

5 LET x=60200: LET y=60245: LET s=8
10 CLS : PRINT "Setting up code
  -please wait"
15 FOR n=x TO y STEP s: LET tot=0
20 FOR m=0 TO s-1: READ a
25 POKE n+m,a: LET tot=tot+a
30 PRINT AT 2,0;n+m: NEXT m: READ tot1
35 IF tot<>tot1 THEN PRINT AT 2,0:
  "Data error in line ": GO TO 50
40 NEXT n: PRINT AT 2,0;"Code created":
  STOP
50 PRINT 1000+(((n-60000)/8)*5): STOP
1000 DATA 205,121,28,205,129,28,205,148,1069
1005 DATA 30,245,205,148,30,245,205,148,1256
1010 DATA 30,71,241,103,241,111,243,229,1269
1015 DATA 209,37,32,5,238,16,211,254,1002
1020 DATA 98,45,32,245,238,16,211,254,1139
1025 DATA 107,16,238,251,201,0,0,0,813
  
```

### Bases

5 LET x=61400: LET y=61530: LET s=8

```

1000 DATA 195,225,239,195,8,240,195,44,1341
1005 DATA 240,58,118,92,245,31,31,31,846
1010 DATA 31,205,237,239,241,230,15,254,1452
1015 DATA 10,56,2,198,7,198,48,42,561
1020 DATA 81,92,229,245,62,2,205,1,917
1025 DATA 22,241,215,225,34,81,92,201,1111
1030 DATA 42,81,92,229,62,2,205,1,714
1035 DATA 22,58,118,92,103,6,8,203,610
1040 DATA 124,32,5,62,48,215,24,3,513
1045 DATA 62,49,215,203,36,16,240,225,1046
1050 DATA 34,81,92,201,42,81,92,229,852
1055 DATA 62,2,205,1,22,58,118,92,560
1060 DATA 245,203,7,203,7,230,3,198,1096
1065 DATA 48,215,241,245,203,63,203,63,1281
1070 DATA 203,63,230,7,198,48,215,241,1205
1075 DATA 230,7,198,48,215,225,34,81,1038
1080 DATA 92,201,0,0,0,0,0,0,293
  
```

### Fade

5 LET x=61600: LET y=61650: LET s=8

```

1000 DATA 1,0,24,33,0,64,54,0,176
1005 DATA 205,203,240,17,7,0,25,124,821
1010 DATA 254,88,32,2,38,64,11,120,609
1015 DATA 177,32,235,33,0,88,17,1,583
1020 DATA 88,1,255,2,58,141,92,119,756
1025 DATA 237,176,201,197,6,30,16,254,1117
1030 DATA 193,201,0,0,0,0,0,0,394
  
```

### Poke \$

5 LET x=61000: LET y=61053: LET s=8

```

1000 DATA 231,205,140,28,205,241,43,120,1213
1005 DATA 254,0,32,8,121,50,104,238,807
1010 DATA 254,0,32,2,207,11,33,125,664
1015 DATA 238,235,237,176,33,125,238,6,1288
1020 DATA 3,253,203,1,110,40,250,253,1113
1025 DATA 203,1,174,58,8,92,190,32,758
1030 DATA 235,35,16,237,201,97,97,97,1015
  
```

### Password

5 LET x=61700: LET y=61722: LET s=8

```

1000 DATA 205,129,28,231,205,140,28,205,1171
1005 DATA 241,43,213,197,205,153,30,197,1279
1010 DATA 209,193,225,237,176,201,0,0,1241
  
```



## UFO 2

Steven Pattullo

This week is the second part of the arcade game *UFO 2*. Last week's section should be named - in the order they were printed - RECON, SPRITE and CHARSET.

The two sections in this week's and next week's issues should be typed in and named ALPHA CHARS, M CODE and UFO 2.

Full loading and playing instructions will be in next week's issue.

READY.

```
10 I=51200
20 READ A: IF A=256 THEN END
30 POKE I,A: I=I+1: GOTO 20
51200 DATA 255,255,195,195,195,195,255,255
51208 DATA 248,252,254,239,255,255,231,231
51216 DATA 248,252,254,239,254,231,255,254
51224 DATA 120,252,254,239,224,227,255,126
51232 DATA 248,252,254,239,231,231,255,254
51240 DATA 248,252,254,231,240,224,255,254
51248 DATA 248,252,254,231,240,224,224,224
51256 DATA 120,252,254,224,239,231,255,127
51264 DATA 224,228,230,231,255,231,231,231
51272 DATA 56,28,28,28,28,28,28,62
51280 DATA 120,124,30,31,28,220,252,120
51288 DATA 224,228,230,239,252,238,231,231
51296 DATA 224,224,224,224,224,224,255,255
51304 DATA 64,236,254,223,215,215,215,215
51312 DATA 128,196,230,247,255,255,239,231
51320 DATA 120,252,254,239,231,231,255,126
51328 DATA 248,252,254,239,255,254,224,224
51336 DATA 120,252,254,239,231,239,254,127
51344 DATA 248,252,254,239,255,254,238,231
51352 DATA 120,252,254,240,126,15,255,126
51360 DATA 248,252,254,31,28,28,28,28
51368 DATA 224,228,230,231,231,231,255,126
51376 DATA 224,228,230,239,238,252,248,240
51384 DATA 192,196,214,215,215,255,255,110
51392 DATA 128,196,238,254,124,126,255,231
51400 DATA 224,228,230,255,126,30,252,120
51408 DATA 120,252,254,206,28,14,15,126
51416 DATA 24,24,24,255,255,256
```

READY.

READY.

```
10 I=49152
20 READ A: IF A=256 THEN END
30 POKE I,A: I=I+1: GOTO 20
49152 DATA 169,147,32,210,255,169,0,141
49160 DATA 32,208,141,33,208,120,169,127
49168 DATA 141,13,220,169,64,141,20,3
49176 DATA 169,192,141,21,3,169,1,141
49184 DATA 26,208,141,25,208,169,255,141
49192 DATA 18,208,173,17,208,41,127,141
49200 DATA 17,208,88,96,0,0,0,0
49208 DATA 0,0,0,0,0,0,0,0
49216 DATA 173,25,208,41,1,208,3,76
49224 DATA 49,234,141,25,208,173,18,208
49232 DATA 201,255,240,0,169,255,141,18
```

```
49240 DATA 208,162,0,160,0,169,1,141
49248 DATA 132,3,189,60,3,201,1,208
49256 DATA 3,76,183,193,201,2,208,3
49264 DATA 76,196,193,201,3,208,3,76
49272 DATA 224,193,201,4,208,3,76,242
49280 DATA 193,201,5,208,3,76,14,134
49288 DATA 201,6,208,3,76,27,194,201
49296 DATA 7,208,3,76,55,194,201,8
49304 DATA 208,3,76,73,194,200,200,24
49312 DATA 46,132,3,232,224,8,208,186
49320 DATA 169,0,141,187,3,173,30,208
49328 DATA 41,1,201,1,208,5,169,1
49336 DATA 141,187,3,173,182,3,201,1
49344 DATA 208,118,173,0,220,201,126,240
49352 DATA 30,201,125,240,39,201,119,240
49360 DATA 48,201,123,240,62,201,118,240
49368 DATA 69,201,117,240,78,201,111,208
49376 DATA 87,76,201,194,76,56,193,169
49384 DATA 1,141,60,3,169,2,141,69
49392 DATA 3,76,56,193,169,5,141,60
49400 DATA 3,169,2,141,69,3,76,56
49408 DATA 193,169,3,141,60,3,173,69
49416 DATA 3,201,2,240,43,238,69,3
49424 DATA 76,56,193,173,69,3,240,32
49432 DATA 206,69,3,76,56,193,169,2
49440 DATA 141,60,3,169,2,141,69,3
49448 DATA 76,56,193,169,4,141,60,3
49456 DATA 169,2,141,69,3,76,56,193
49464 DATA 173,63,3,201,1,208,13,162
49472 DATA 1,173,82,3,157,249,199,232
49480 DATA 224,3,208,248,173,16,208,41
49488 DATA 32,201,32,208,8,173,21,208
49496 DATA 41,223,141,21,208,173,16,208
49504 DATA 41,128,201,128,208,8,173,21
49512 DATA 208,41,127,141,21,208,169,0
49520 DATA 141,30,208,173,30,208,41,132
49528 DATA 201,132,208,8,173,21,208,41
49536 DATA 123,141,21,208,173,30,208,41
49544 DATA 136,201,136,208,8,173,21,208
49552 DATA 41,119,141,21,208,173,30,208
49560 DATA 41,144,201,144,208,8,173,21
49568 DATA 208,41,111,141,21,208,173,30
49576 DATA 208,41,1,201,1,208,5,169
49584 DATA 1,141,187,3,76,49,234,185
49592 DATA 1,208,56,253,69,3,153,1
49600 DATA 208,76,157,192,185,1,208,56
49608 DATA 253,69,3,153,1,208,185,0
49616 DATA 208,24,125,69,3,144,3,32
49624 DATA 101,194,153,0,208,76,157,192
49632 DATA 185,0,208,24,125,69,3,144
49640 DATA 3,32,101,194,153,0,208,76
49648 DATA 157,192,185,0,208,24,125,69
49656 DATA 3,144,3,32,101,194,153,0
49664 DATA 208,185,1,208,24,125,69,3
49672 DATA 153,1,208,76,157,192,185,1
49680 DATA 208,24,125,69,3,153,1,208
49688 DATA 76,157,192,185,1,208,24,125
49696 DATA 69,3,153,1,208,185,0,208
49704 DATA 56,253,69,3,176,3,32,113
49712 DATA 194,153,0,208,76,157,192,185
49720 DATA 0,208,56,253,69,3,176,3
49728 DATA 32,113,194,153,0,208,76,157
49736 DATA 192,185,1,208,56,253,69,3
49744 DATA 153,1,208,185,0,208,56,253
49752 DATA 69,3,176,3,32,113,194,153
49760 DATA 0,208,76,157,192,173,16,208
49768 DATA 77,132,3,141,16,208,169,0
49776 DATA 96,173,16,208,77,132,3,141
49784 DATA 16,208,173,16,208,45,132,3
49792 DATA 205,132,3,208,5,169,95,76
49800 DATA 140,194,169,255,96,234,234,234
```



```

493008 DATA 173,16,208,41,32,201,32,208
49816 DATA 8,173,16,208,73,32,141,16
49824 DATA 208,173,21,208,9,32,141,21
49832 DATA 208,169,7,141,65,3,173,16
49840 DATA 208,41,4,201,4,240,17,173
49848 DATA 4,208,233,29,141,10,208,173
49856 DATA 5,208,141,11,206,32,17,195
49864 DATA 96,173,84,3,201,1,208,62
49872 DATA 169,144,141,255,199,173,16,208
49880 DATA 41,128,201,128,208,8,173,16
49888 DATA 208,73,128,141,16,208,169,3
49896 DATA 141,67,3,169,7,141,76,3
49904 DATA 173,0,208,105,30,141,14,208
49912 DATA 173,1,208,141,15,208,173,21
49920 DATA 208,9,128,141,21,208,32,73
49928 DATA 195,169,0,141,84,3,76,56
49936 DATA 193,162,24,169,0,157,0,212
49944 DATA 202,208,250,169,15,141,24,212
49952 DATA 169,50,141,5,212,169,130,141
49960 DATA 6,212,169,129,141,4,212,160
49968 DATA 0,162,0,140,1,212,140,0
49976 DATA 212,232,224,100,208,245,200,192
49984 DATA 65,208,238,169,0,141,24,212
49992 DATA 96,162,24,169,0,157,0,212
50000 DATA 202,208,250,169,15,141,24,212
50008 DATA 169,10,141,5,212,169,130,141
50016 DATA 6,212,169,17,141,4,212,160
50024 DATA 65,162,0,140,1,212,140,0
50032 DATA 212,232,224,100,208,245,136,208
50040 DATA 240,169,0,141,24,212,96,256

```

READY.

READY.

```

0 REM IF SIMON FROM DEVON READS THIS THEN
  CONTACT STE CAUSE IVE LOST YOUR ADDRESS
1 DIM A$(5):DIM Z(5):A$(1)="STEVEN
  PATTULLO":A$(2)="OUR SNOOKER MOB"
2 A$(3)="KEY OX":A$(4)="KENT MURRAY":
  A$(5)="GAZZA JONES":POKE 49873,143
3 SC=0

```

```

4 FOR N=1 TO 5:Z(N)=500:NEXT
5 POKE 839,3:POKE 840,3
8 POKE 53270,24:PRINT "■":POKE 53282,14:
  POKE 53283,6:POKE 43873,144
9 GOSUB 10000:SC=0
10 POKE V+21,0:POKE 51193,146:FORN=704 TO
  719:POKE N,0:NEXT:POKE 51192,143
11 POKE V+27,0
20 FOR N=39 TO 46:POKE V+N,7:NEXT:POKE
  V+37,8
21 GOTO 100
25 IF (PEEK(V+30)AND132)=132 THEN POKE
  V+21,PEEK(V+21)-4
26 IF (PEEK(V+31)AND1)=0 THEN 62000
27 IF (355)=1 THEN 62000
28 RETURN
30 FOR N=837 TO 844:POKE N,2:
  NEXT:POKE 842,6

```

```
100 PRINT "7"  
399 PRINT "XXXXXXXX":X=0:POKE 652,1:POKE  
51192,144:POKE 51197,139
```

```
1000 PRINT"                ?$$$$$$$$$|?$$  
    $$$|?$$$|"
```

```
1002 PRINT "      &+ + _ * | + + + + ' & + +  
      + + + ' & + + + ' "
```

```
1004 PRINT"          &+ + >X0++++' &- .  
      . . /' &+ + + /"
```

[illegible]

continued on page 42 ►



## PROGRAMMING: C64

◀ continued from page 41

```

2030 POKE V,20:POKE V+2,30:POKE V+16,28:POKE 852,1
2040 POKE V+21,29:X=0:POKE 841,2
2050 POKE 839,2:POKE 840,2
2060 POKE V+5,150:POKE V+4,100
2090 POKE V+7,150:POKE V+6,100
2100 POKE V+9,150:POKE V+8,100
2110 FOR N=1 TO 500:NEXT
2120 POKE 831,8:POKE 840,5
2130 POKE 832,6:POKE 841,5:POKE 839,4
2145 IF (PEEK(V+16)AND1)=1 AND PEEK(V)>80 THEN GOTO 3000
2146 GOSUB 25
2147 X=X+1:IF X=10 THEN SYS 43808:X=0
2148 IF (PEEK(V+30)AND132)=132 THEN POKE V+21,PEEK(V+21)-4
2149 IF PEEK(955)=1 THEN 62000
2150 GOTO 2145
2160 IF (PEEK(V+30)AND132)=132 THEN POKE V+21,PEEK(V+21)-4
3000 PRINT "":FOR N=51194 TO 51196:POKE N,142:NEXT:SC=SC+100:POKE 852,1
3002 PRINT "  \"
3004 PRINT "    II                      ?$$$$$$$\"
3006 PRINT "      $$$|                      ?++++++\"
3008 PRINT "        ?+++++|  \"/\  ?$$$$$$$$$$$$$$$$$$$$++++++\"
3010 PRINT "$$$+$$$$$$$/$$$$/?+++##$%#$%#$%#$%#$/++++++\"
3012 PRINT \"+++##$%+$/+/+++++\")*(*)*(*)*+\"
3014 PRINT \"+++&+/'+++++##$%#$%#$%#$%#$/+++++\"
3016 PRINT \"+++&+/'++/\+++++)\")*(*)*(*)*+\"
3018 PRINT \"+++(\")*++++)\")/+###$%#$%#$%#$%#$/+++++\"
3020 PRINT \")))++++++ )/+---+(\")*(*)*(*)*+\"
3022 PRINT \"   ++++++ -)))))))))))+\"
3024 PRINT \"   -)) )+-----\"
3026 PRINT \"       -----\"
3028 PRINT \"       -\"
3030 POKE V+16,252:POKE V,20:POKE V+2,30
3040 X=0:Y=0:POKE 830,7:FOR N=839 TO 841:POKE N,2:NEXT:POKE V+21,253
3050 POKE 831,7:YX=0
3060 POKE 832,7
3070 POKE V+5,100:POKE V+4,130
3080 POKE V+7,150:POKE V+6,90
3090 POKE V+9,200:POKE V+8,130
3100 IF Y=0 THEN POKE 830,6:POKE 832,8:POKE 840,1
3101 GOSUB 25
3109 IF PEEK(955)=1 THEN 62000
3110 IF Y=1 THEN POKE 830,8:POKE 832,6:POKE 840,2
3120 IF X=5 OR X=15 OR X=25 OR X=35 OR X=45 OR X=55 THEN Y=0
3130 IF X=0 OR X=10 OR X=20 OR X=30 OR X=40 OR X=50 THEN Y=1
3137 IF (PEEK(V+16)AND1)=1AND PEEK(V)>70 THEN GOTO 4000
3140 X=X+1-

```

## PROGRAMMING: ST

## Film Show

D Eaton

This is the continuation and end of last week's GFA Basic program - a Degas picture show utility. ☐

```

Procedure Rd_buff
  Fi%=Fi%+1
  F$=Mid$(Buf$,31,Instr(31,Buf$,Chr$(0))-31)
  D$(Fi%)=F$
Return
,
Procedure Get_pic
  Sget A$

```

```
A$=A$+Left$(A$,34)
Bload D$(P%),Varptr(A$)
Colr$=Mid$(A$,3,32)
Return
,
Procedure Col
Void Xbios(6,L:Varptr(Colr$))
Return
,
Procedure Fixit
On Error Gosub Fixit
T%=Fatel
If T%=-1
Resume Start

Endif
Run
Return
```



# MICRO-FILE

FOR SALE

## MICROWARE COMPUTER SERVICES

### AMIGA HARDWARE

Amiga 500 inc. Deluxe Paint modulator & Starter Pack.....	£449
Amiga 500 inc. Deluxe Paint modulator & Starter Pack & 1081 Colour Medium res monitor.....	£739
Amiga 500 inc. Deluxe Paint modulator & Starter Pack + NEC 3 1/2" Disc Drive.....	£559
Amiga 500 inc. Deluxe Paint modulator & Starter Pack + 1081 Monitor & NEC disc.....	£849

### PERIPHERALS

1081 medium res. colour monitor.....	£329
Philips ATH43 med. res. colour monitor stereo.....	£279
Philips 8852 med/hi res. colour monitor stereo.....	£319
NEC 3 1/2" 880K disc drive.....	£129
512K RAM expansion with clock.....	£99
Diggi view II with A500.....	£189
Easy drawing tablets for A500.....	£289
20Mb hard disc for A1000.....	£669
2Mb RAM expansion for A1000.....	£410

### ATARI HARDWARE

Atari STM with 1/2 Mb disc drive, mouse and software.....	£279
Atari STM as above + mono monitor.....	£369
1040 STF 1Mb drive mono monitor 24K RAM.....	£499
Atari XE and computer games consul with joystick.....	£79
Spectrum Plus 2.....	£129

### 8 BIT HARDWARE

Commodore 64 package includes Computer data recorder joystick, 11 top games.....	£159
Commodore 64 + 1541C disc drive + joystick & 11 games.....	£299
1541C disc drive.....	£159
Commodore music expansion system.....	£99
Commodore Sound sampler.....	£69
Atari XE computer games consul, with game and joystick.....	£79

THIS IS ONLY A VERY SMALL SELECTION OF OVER 250 PRODUCTS.  
PLEASE PHONE FOR CHRISTMAS SPECIAL OFFERS.

PO Box 2, Skegness, Lincolnshire PE25 2QL. Tel: 0754 610217

Order instructions: write name, address, postcode and phone number. Write order out clearly stating quantity, description and price, make cheques or POs payable to Microware Computer Services and send to above address. All prices are fully inclusive. Prices subject to change without notice on availability. E. & O.E. (575)



At last, a high speed version of the classic game is available for the Amstrad PC!

Available at good software retailers or send cheque/PO made payable to ILLIMITABLE, 14 Clausentum Road, Portswood, Southampton SO2 0RZ.  
Dealer Enquiries Welcome.

## STORT SOFT OFFER

If you have an ATARI 8-bit system, why not part exchange your hardware/original software for an exciting new ST system from STORT SOFT.

Ring with full details or just drop us a line

Write for more information. Cheques etc. payable to STORT SOFT (International orders remit in pounds Sterling by bank draft or international money order and send amount quoted which will be exclusive of VAT but include additional postage. Write for quote in any other currency)

ACCESS/MASTERCARD/EUROCARD/VISA accepted  
CREDIT CARD ORDER LINE - 0279 89509

24 HOURS A DAY, 7 DAYS A WEEK - VAT & P.P. INC. NO HIDDEN EXTRAS -  
WHAT YOU SEE IS WHAT YOU PAY

18 CROWN CLOSE, SHEERING, BISHOP'S STORTFORD  
HERTS CM22 7NX (560)

## MICRODRIVE AND INTERFACE OFFERS

Express Service - order by phone. Free C.O.D. service over £20 in U.K.

### STARTER PACK 1

Microdrive unit, Interface 1 (to connect RS232, network and Microdrives to your Spectrum) plus a demonstration cartridge. Delivered for only £57.50

### STARTER PACK 2

Two Microdrive units, Interface 1 plus a demonstration cartridge. Delivered for only £83.50

### EXTENSION PACK

Second (or third or fourth ...) Microdrive unit(s). Delivered for only £27.50

### CARTRIDGE PACK

Five blank cartridges. Delivered for only £9 each

Make cheques payable to Applied Technology.

Export orders outside Europe: add £4 for Australia and countries bordering Pacific Ocean, elsewhere add £2. Where insured parcel service is not available goods are sent at customers' risk.

Delivery ex-stock at time of going to print, all units carry manufacturers' 1987 serial number.

AT APPLIED TECHNOLOGY

64 Tannery Drift, Royston, Herts SG8 5DE

Tel: 0763 41754 (572)

## ADVERTISING RATES FOR MICRO-FILE

Semi Display  
Lineage

£8 per single column centimetre (+VAT)  
35p per word (+VAT)

CALL SUSANNAH KING, ROBERT COLE or TIM OWEN on  
01-834 1717 FOR SEMI DISPLAY ADVERTISING



## CRIBBAGE

The popular pub game six card cribbage is now available for the Spectrum 48K/128K

Features include:

**IMPRESSIVE FULL COLOUR  
PLAYING CARD GRAPHICS  
100% MACHINE CODE  
TWO LEVELS OF PLAY  
AUTOMATIC SCORING  
HELP OPTION FOR BEGINNERS**

Six card cribbage is suitable for both beginners and experienced crib players and comes with full instructions and rules of the game.

★ ★ ★ ★ MONEY BACK GUARANTEE ★ ★ ★ ★

If you are not delighted with six card cribbage then simply return the tape within 5 days and your cash will be refunded.

★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★

Send cheque or postal order for £6.95 to

### ESEM SOFTWARE

95 Rodway Road, Patchway, Bristol BS12 5PH  
Tel: 0272 236064

(490)

### KENT BARGAINS

**Generous discount on  
ATARI ST and COMMODORE software**

SPECIALISTS IN BBC, AMIGA AND AMSTRAD

**Master Compact..... SAVE £300**  
— BUSINESS OFFER

**Amstrad PC1512..... SAVE £100**  
— BUSINESS PACK

**BUY A PRINTER AND  
WE PAY THE**

**V.A.T.**

EDUCATIONAL SOFTWARE A SPECIALITY

**Lighthouse Computer Service**  
4 Park Avenue, Deal. Tel: (0304) 362049

(537)

### QL JOYSTICK — £7.99

Plugs directly into CTRL 1/2.2 Firing Buttons.  
"Probably the best I have seen" QL World 2/87

### QL HOUSEWIFE — £5.99

"A general planner for shopping and meal control... interesting and useful" QL World 2/87

### INVESTMENT MONITOR — £19.99

The ideal method for controlling all your investments

Come and see us on Stand 30 at the ZX Microfair, December 12th

For further details send S.A.E. for DJW News  
Order direct from:

### DJW SOFTWARE

(PCW), 11 Pound Close, Bramley, Hants RG26 5BL  
or phone 0256 81701  
Overseas orders please add £2

(587)

## YOUR LAST CHANCE TO BUY!!

### \* SPECTRUM

48K + ..... £54.95      128K..... £74.95  
RECONDITIONED, TESTED, AS NEW.

\* **ALPHACOM 32 PRINTERS**..... £42.00

\* **EXPANSION PACKS**..... £59.95  
INCLUDES MICRODRIVE, 1/FACE 1, BOOKLET, NETWORK LEAD, INSTRUCTION CARTRIDGE AND FLEX.

\* **MICRODRIVES** WITH SOLID CONNECTOR..... £24.95

\* **SUPADrive UTILITY**..... £7.95  
FORMATS TO LOOK, FINDS FILES ETC.

### \* ACCESSORIES

MICRODRIVE FLEX CONNECTOR..... £3.50  
MICRODRIVE SOLID CONNECTOR..... £3.50  
NETWORK LEAD..... £3.50  
DEMO-INTRO CARTRIDGE..... £5.50  
CARTRIDGE BLANKS (10)..... £16.00  
CARTRIDGE SINGLE..... £1.75

### \* POWER SUPPLIES

SPECTRUM AND SP+ (1400mA)..... £8.95  
128K (1850mA)..... £9.95

\* **RS 232 PRINTER LEADS**..... £12.95

MINIMUM ORDER £10, UNDER £35 ADD £2 P.&P. OVERSEAS  
ADD £4. TERMS C.W.O. OR VISA.

**ORDERS TO EEC LTD, 18-21 MISBOURNE HOUSE,  
CHILTERN HILL, CHALFONT-ST-PETER,  
BUCKS SL9 9UE. Tel: 0753 888866.**

(552)

## CROWN COMPUTERS!!!

ANY PRICE AND WE WILL MATCH IT!!!

**In Stock now**

Atari 520 STFM..... 269.95  
Amiga 500 Sports Bundle..... 519.00

**NEW**

PC 1640 Mono Single Drive..... 539.95  
PC 1640 Colour Single Drive..... 699.95  
PWV 95 12 Mono/M Daisy Printer + Software..... 539.95  
PC 1512 Mono Single Drive..... 445.45  
PC 1512 Colour Single Drive..... 599.00

Commodore, Amstrad, Spec 10% off RRP

**6 High Street,  
Boston, Lincs.  
Tel: (0205) 53611**

Phone now for orders!

(528)

## MAKE YOUR MICRO EARN!

Yes, making money becomes incidental when you know how. Your micro is, if only you knew it, a gold mine. The size and make is irrelevant. Make the initial effort **NOW** by starting your own **HOME BASED BUSINESS**

**REMEMBER:** You'll never get rich by digging someone else's "ditch". It's more rewarding than playing games. The benefits are many and varied. Full or part time. For **FREE** details send S.A.E. to:

### HOME BASED BUSINESS

**97 PILTON PLACE (PCW 8)  
KING AND QUEEN STREET  
WALWORTH  
LONDON SE17 1DR**

(574)



**DJW**  
SOFTWARE







# A NEW GENERATION AID TO dBASE PROGRAM WRITING

## QUANTUM

If you use any version of dBase, Clipper or dBase language look-alike, you need QUANTUM. QUANTUM is a new generation professional utility for use with all versions of the dBase programming language. It is completely menu-driven with context-sensitive help a mere keystroke away. The power of QUANTUM will:

### 1. PRODUCE PROFESSIONAL QUALITY SYSTEM DOCUMENTATION

A vital area but one which consistently gives developers their biggest headaches. Now with QUANTUM you can maintain up-to-the-second system documentation. This makes working on a system, even if written by someone else, less of a bit and miss affair. QUANTUM will document code at whichever level you choose - from a single program throughout an entire system hierarchy - automatically. Options include "drawing" a graphical representation of your system, analysing database and index relationships as well as listing all databases - including their fields - within a system.

QUANTUM	VER 1.0	GENERATE SYSTEM DOCUMENTATION
CHOICES:		
F1 HELP		
F2 DRAWS SYSTEM STRUCTURE CHART		
F3 ANALYSE DATABASES AND INDEXES		
F4 DATABASE AND INDEX MATCHING		
F5 ANALYSE SYSTEM HIERARCHY		
(ESC) MAIN MENU		

### 2. PROPERLY INDENT CODE

Sloppy coding is probably the main reason why bugs can end up crawling into your programs. QUANTUM will automatically indent programs in your system whilst checking for software bugs. Output in the form of an error report will highlight "suspect" programs.

QUANTUM	VER 1.0	QUANTUM MENU CHOICES
CHOICES:		
F1 HELP		
F2 DOCUMENT A SYSTEM		
F3 PRINT OUT A SYSTEM		
F4 INDENT CODE AND CHECK FOR LOGIC BUGS		
F5 QUICK CHECK FOR LOGIC BUGS		
F6 GLOBAL SEARCH/CHANGE/DELETE		
F7 VIEW TEXT FILES - QUANTUM OUTPUT		
F8 BUILD A PROCEDURE FILE		
(ESC) EXIT		

### 3. PRINTOUT PROGRAMS

Ever tried to print out all the programs in a system? QUANTUM makes it easy and automatic - you only need give the name of the top level program.

### 4. QUICK SCAN FOR LOGIC BUGS

Selecting this option will make QUANTUM search through your system and detect logic problems with electronic speed.

### 5. PROCEDURE FILE BUILDING

QUANTUM will automatically develop a procedure file of your entire system - this will greatly improve management of large, cumbersome programs.

### 6. GLOBAL SEARCH/CHANGE

An innovative wordprocessor-like feature which can make your coding a real pleasure. Especially useful when converting from dBase to Clipper or onto a multi-user environment, this option will literally save you hours of tedium.

### EASY-TO-READ DOCUMENTATION

QUANTUM comes complete with easy-to-read documentation on disc which is so user-friendly, it's downright cuddly. Also included are helpful tips and hints to make your programming that much more productive. So, if you're really serious about getting it right first time, without the hassle or the tears, get the power of QUANTUM.

QUANTUM	VER 1.0	GLOBAL SEARCH/CHANGE
INPUT DRIVE AND DIRECTORY (C:/QUANTUM)		
(S)SEARCH, (R)EPLACE OR (D)ELETE (S)		
OPERATE (L)INE OR (W)ORD (W)		
AUDIT TRAIL ON (N) OR OFF (F) (N)		
IGNORE UPPER/LOWER CASE Y/N (Y)		
WHOLE WORDS ONLY Y/N (Y)		
(C)ONFIRM OR (A)UTOMATIC (C)		
PROCESS ALL SUB PROGRAMS Y/N (Y)		
QUANTUM REPORT FILE (QUANTUM MSG)		
SEARCH FOR ( )		
REPLACE WITH ( )		

### SYSTEM REQUIREMENTS

IBM PC/XT/AT/3270 PC/Personal System/Hewlett Packard Vectra/HP 150 and 100% compatibles with at least 384 Kb RAM and 2" Floppy Disc Drives. A Hard Disc Drive is recommended.

### UPDATE POLICY:

Updates for licensed users of QUANTUM are free of charge within the first six months of purchase, providing that you send your original disc back to Brigitte Neese & Associates. If you purchased any version of QUANTUM from a dealer please contact him for updates. You will be notified as and when updates become available. Please send in your user registration card!

### EXCHANGE/REFUND POLICY:

If for any reason you feel that QUANTUM does not entirely meet your requirements, return the original disc along with a note confirming that you have destroyed all copies of the program to receive a full refund. This refund policy is effective within 14 days of purchase.

### CUSTOMER LIAISON POLICY:

We like to keep in touch with our customer base and welcome any suggestions which could improve our product. Customers are regularly kept up to date with product developments and programming tips and hints.

### SITE LICENCE POLICY:

Brigitte Neese & Associates can make unlimited copy site licensing agreements available for QUANTUM if your company qualifies and requires more than three copies of QUANTUM, please contact our Corporate Marketing Department.

## IF YOU UNDERSTAND THIS, THIS PRODUCT IS A MUST! QUANTUM

**Brief description:** 1. Produces pro/system documentation. 2. Highlights possible system bugs. 3. Simple to use menu driven format with on-line help. 4. Works with either single or entire hierarchy. 5. Automatic user controlled indentation. 6. Use with dos/2.XX or line. 7. Not copy protected.

Contact: Virginia Flagg, Brigitte Neese & Associates any time, for more info on this exciting new product.

53 OSBORNE TERRACE, STACKSTEADS, BACUP OL13 8JY. TEL: 0706 876072

(568)

## STORT SOFT

### ATARI MAIL ORDER SPECIALISTS

### INCREDIBLE LOW PRICES!

ALL DISKS CARRY A NO QUIBBLE REPLACEMENT GUARANTEE ARE CERTIFIED 100% ERROR FREE AND COME WITH LABELS, 5 1/4" ALSO HAVE SLEEVES AND WRITE PROTECTS. FLIP SIDED DISCS HAVE TWO INDEX HOLES AND TWO NOTCHES.

#### SPECIAL OFFER !!

25 SS 48TPI 5.25" DISCS & 100 CAP LOCKING DISC BOX	£16.00
50 SS 48TPI 5.25" DISCS & 100 CAP LOCKING DISC BOX	£25.00
100 SS 48TPI 5.25" DISCS & 100 CAP LOCKING DISC BOX	£39.95
25 DS 48TPI 5.25" DISCS & 100 CAP LOCKING DISC BOX	£17.00
50 DS 48TPI 5.25" DISCS & 100 CAP LOCKING DISC BOX	£26.50
100 DS 48TPI 5.25" DISCS & 100 CAP LOCKING DISC BOX	£42.00

5 1/4" DISCS FROM AS LITTLE AS 33 PENCE

#### BLANK 5 1/4" DISKS

DISK NOTCHER FREE WITH EACH 100 DISKS PURCHASED

UNBRANDED	TRIAL 10	25	50	100	10 in a plastic lib. case
SS48 TPI	£4.50	£9.00	£17.00	£33.00	£5.50
DS48 TPI	£5.50	£11.00	£19.00	£35.00	£6.50
DS96 TPI	£6.50	£13.00	£21.00	£37.00	£7.50
DS96 TPI FLIP SIDED	£7.00	£14.00	£22.00	£38.00	£8.00
MIMIC FLIP SIDED DS96 TPI	£8.95	£20.00	£38.00	£70.00	£9.95
MIMIC HIGH DENSITY 1.6meg	£23.00	£52.00	£100.00	£180.00	£24.00

#### LOCKING DISK BOXES

5 1/4" HOLDS 50	£7.95	5 1/4" HOLDS 100	£9.95
3 1/2" HOLDS 40	£7.95	60/90 (HOLDS 60 3" or 90 3 1/2")	£9.95

#### 3.5" SPECIAL OFFERS

25 SS/DD 135 TPI(MF1DD) & 80 or 60/90 locking disc box	£35.00
50 SS/DD 135 TPI(MF1DD) & 80 or 60/90 locking disc box	£59.95
25 DS/DD 135 TPI(MF2DD) & 80 or 60/90 locking disc box	£39.95
50 DS/DD 135 TPI(MF2DD) & 80 or 60/90 locking disc box	£65.00

135tpi unbranded	10	25	50	100	500	10 into case
SS/DD (MF1DD)	11.95	29.00	57.00	98.00	—	12.95
DS/DD (MF2DD)	13.95	33.00	62.00	110.00	—	14.95

#### CUMANA DRIVES

ATARI ST 1 MEGABYTE	£139.00
AMIGA 1 MEGABYTE	£129.00

#### ATARI HARDWARE - BARGAIN PRICES

520 STFM £279.95

520 STM, SF354 (1/2 meg drive)	£279.95
520 STM, SF314 (1 meg drive)	£339.95
520 STM, SF354 & SM125 mono monitor	£374.95
520 STM, SF314 & SM 125	£434.95
1040 STF & SM125 mono monitor	£570.00
Mega ST (2 megabyte RAM & 1 meg drive)	£845.00
Mega ST (2 megabyte RAM & 1 meg drive) & SM125	£935.00
Mega ST (4 megabyte RAM & 1 meg drive)	£1095.00
Mega ST (4 megabyte RAM & 1 meg drive) & SM125	£1190.00

All Hardware comes with free dust covers!! All STs come with 5 public domain disks including CPM emulator and the arcade game Megaroids, 5 blank discs to get you going or choose 5 additional discs from our public domain library. Basic language disk and manuals.

520 STM ONLY comes with 1st Word word processor and spelling checker.

#### COMPUTER ACCESSORIES

5 1/4" DISK NOTCHER (Double your disk capacity on a single sided drive)	£3.95
DISK CLEANING KITS Liquid non-abrasive type - protect your valuable software	
5 1/4" DCK	£3.95
3 1/2" DCK	
ST/IBM/AMSTRAD 1512 TO CENTRONICS PRINTER LEAD (2 metres)	£8.95
ST TO RS232 MODEM LEAD (2 metres)	£8.95
BATTERY POWERED MINI-VAC - for keyboards, printers etc.	£9.95

Just write for more information. Cheques etc. payable to STORT SOFT (International orders remit in pounds Sterling by bank draft or international money order and send amount quoted which will be exclusive of VAT but include additional postage. Write for quote in any other currency)

ACCESS/MASTERCARD/EUROCARD/VISA accepted. CREDIT CARD ORDER LINE - 0279 89509

24 HOURS A DAY, 7 DAYS A WEEK - VAT & P.P. INC. NO HIDDEN EXTRAS - WHAT YOU SEE IS WHAT YOU PAY

18 CROWN CLOSE, SHEERING, BISHOP'S STORTFORD, HERTS CM22 7NX

(548)



## Z88 FROM SECTOR SOFTWARE

Z88 computer .....	£287
QL Z88 file transfer .....	£23
Mains adaptor .....	£10
32K RAM pack .....	£20
128K RAM pack .....	£80
32K Eprom .....	£20
128K Eprom .....	£50
PC Z88 link .....	£25
Eprom eraser with in built in timer .....	£40
RS 232 printer lead .....	£10
Parallel printer interface .....	£30
BBC to Z88 link .....	£25
4 rechargeable batteries .....	£8
Battery charger .....	£10
Diconix 150 portable printer .....	£400
Portable battery powered printer ....	£400

39 Wray Crescent,  
Ulmes, Walton, Leyland, Lancs. PR5 3NA  
0772 454328



(571)

## SOFTWARE CITY BARGAINS SOFTWARE CITY BARGAINS NEW AND USED BARGAINS

**WANTED ALL TYPES OF HOME COMPUTER  
EQUIPMENT**

**TOP PRICES PAID**

**WE ESPECIALLY REQUIRE THE FOLLOWING:**

Commodore 64  
Commodore Plus 4  
Spectrum 48K  
Spectrum 128K  
MPS 801 Printer  
CBM 1541 Disc Drive

**WORKING OR NOT**

**FOR IMMEDIATE QUOTE TELEPHONE  
0602 410 493**

**NO TIME WASTERS**

**SOFTWARE CITY (PCW)**  
173 Mansfield Rd  
Nottingham NG1 3FR  
Tel: (0602) 410493

(553)

## CORRESPONDENCE

Learn 'C', the modern computer language. From 'what is a computer?' to 'pointers to dynamic structures', you will learn how to write commercial quality software at your own pace, and in easy stages.

You will have a personal tutor to answer your queries and solve your problems.

This friendly course comes in ten parts, and is offered at the

**SPECIAL XMAS PRICE ..... £99.50**

(579)

**STONE SOFTWARE, FREEPOST, LONDON SE7 7YZ**

## Phone for the best price

5 1/4" DS/DD	3 1/2" DS/DD
10..... £4.75	10..... £9.50
25..... £12.50	25..... £23.50
50..... £19.95	50..... £45.00
3" MIMIC CF2 (10).....	£20.00
80 capacity 5 1/4" LSB.....	£8.00
100 capacity 5 1/4" LSB.....	£11.00
3 1/2" / 5 1/4" library cases.....	95p
40 capacity 3 1/2" LSB.....	£7.95
Spectrum 128+.....	£99.00
Citizen 2 col. dot matrix printer.....	£28.95
Datex Microstick joystick.....	£8.99
C2N data recorder.....	£25.99

All prices include VAT and postage.  
ALL TRADE ENQUIRIES WELCOME.

## M.D.S. Computer Supplies

11 Church Street, Banbridge BT32 4AA

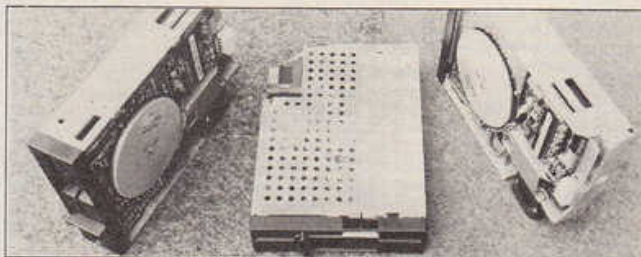
24-hour Credit Card Hotline  
08206 23477

Enquiries - Tel: 08206 23399  
A Division of Brooklis Enterprises Ltd.



(468)

## 80 TRACK / DS DD 5 1/4" HALF HEIGHT DISC DRIVES



Uncased bare drive .....	£60
Drives in cream metal cases .....	£70
Cased drive with connecting leads to suit BBC micro.....	£74.95

## Special Offers on IBM compatible add-ons

Few only:

Olivetti plug in 20 megabyte hard card .....	£199
Racal CP2123 plug in modem card .....	£99
Teac 40 track DS/DD bare drives, black fronted.....	£60
AT and T CDC Wren 1 36mb hard disc drives (45µS) (uncased) .....	£335

Money back if not satisfied and returned undamaged within 7 days. Callers welcome Mon-Fri 9-5.

## Pinboard Computers Ltd,

Unit 9, Bondor Business Centre,  
London Rd, Baldock,  
Herts SG7 6NG  
Tel: (0462) 894410

Prices include VAT, packing  
and parcel post.



(477)



## AMIGA A500 NOW IN STOCK FOR ONLY £429



**AMIGA PACK 1 INCLUDES**  
Amiga A500 ★ Deluxe Paint ★ Workbench  
1.2 ★ Very First Steps Tutorial  
**£429.95**

**AMIGA PACK 2 INCLUDES**  
Amiga A500 + 1901 Colour Monitor ★  
Deluxe Paint ★ Workbench 1.2 ★ Very  
First Steps Tutorial  
**£679.95**

**MORE PACKS AVAILABLE, PHONE FOR  
DETAILS.**

### AMIGA HARDWARE

	RRP	OUR
Commodore PC .....	—	£499.00
Amiga 2000 .....	£1259.25	£995.00
XT Bridge Card (Amiga 2000) .....	£573.85	£449.95
Internal 1 Meg Disc Drive (Amiga 2000) .....	£228.85	£199.95
1010 External Disc Drive .....	£286.85	£259.95
Amiga Internal 1 Meg Upgrade .....	£113.85	£99.95
Triangle 1 Meg Disc Drive .....	—	£139.95
Cumana 1 Meg Disc Drive .....	—	£139.95
Amiga (2000) 2 Meg RAM expansion .....	£458.85	£359.95
Commodore 64 C pack .....	—	£159.00

Now in stock SEGA Master Systems £99, + software now in stock

### AMIGA SOFTWARE

King's Quest (3 pack) .....	£24.95	Area/Bratticus .....	£29.95
Barbarian .....	£18.75	Diablo .....	£14.95
Gold Runner .....	£18.75	Alien Strike .....	£11.50
Terrapods .....	£18.75	Mouse Trap .....	£11.50
Ogre .....	£18.75	Plutos .....	£11.50
Archon/toni .....	£17.95	Road War 2000 .....	£18.75
Flight Sim II .....	£37.95	Portal .....	£29.95
Deluxe Paint II .....	£57.95	Hunt For Red October .....	£18.75
Marble Madness .....	£14.95	Skyfighter .....	£12.95
Instant Music .....	£18.75	Dr. Fruit .....	£8.95
Sinbad .....	£29.95	Invaders .....	£8.95
Super Huey .....	£14.95	Pseud .....	£8.95
Bards Tale .....	£18.75	Space Ranger .....	£8.95
Chess Master 2000 .....	£18.75	The Final Trip .....	£8.95
Earl Weaver Baseball .....	£18.75	Grand Slam Tennis .....	£18.75
Seven Cities of Gold .....	£11.50	King's Quest Triple Pack .....	£19.95
Mean 18 Golf .....	£18.75	King's Quest 1/2/3 .....	£8.95
Deep Space .....	£19.95		

### BUSINESS SOFTWARE

Word Perfect .....	£239.95
Super Base .....	£79.95

More Software than we can show please ring.

**We are a Commodore appointed dealer**  
**All trade enquiries welcome**

### BLANK DISCS

10	20	50	100
£10.95	£21.50	£49.95	£97.00

Trade enquiries welcome

**Lockable disc boxes 3.5" holds 80 .....£9.95**

**Spend over £50 on Software and get a Free Calculator**



**SOUND N VISION**



**11 Silk St, Leigh, Lancs WN7 1AW.**  
**Phone now for details - Tel: (0942) 673689**

Cheques and P/Orders payable to: Sound N Vision P.&P./VAT INCLUDED  
Visitors welcome in showroom. Send S.A.E. for price list.

(534)

## LEARN CHESS

Sinclair Spectrum 48K + 128K + 2

2 massive programs, using approximately 80K of memory, teach everything that the beginner needs to know to play the fascinating game of chess at club level.

"... Very comprehensive ..." (Sinclair User).

"... An excellent implementation ..." (Ocean).

RRP: £9.95

Mail order: £6.95 from:

## COXSOFT

31 Fullwell Avenue, Barkingside, Ilford, Essex IG6 2HB  
Tel 01-505 3822

Please allow 28 days for delivery.  
Trade enquiries welcome.



(511)

## HARDSOFT · INTERNATIONAL

1A The Square, Sawbridgeworth, Herts. 0279 726488/726406

**Office automation at a price that is affordable.**  
**Lease an Amstrad PC1640 DD-MD + Epson printer + wordprocessor + spreadsheet, for under £7.00 per week.**

As an approved dealer for Amstrad, Epson, Seikosha, Star, Olivetti etc., we offer free unbiased advice on various machines and software.

Our sales team can demonstrate any machine anywhere in Britain and will advise you on which of our eight different leases will suit your needs best. **CONTACT US TODAY FOR A FREE QUOTATION**

**NATIONWIDE NEXT DAY DELIVERY ★ CONSUMABLES ★ FREE TAX & FINANCIAL GUIDANCE ★ CONTINUOUS STATIONERY ★ 24 hr MAINTENANCE CONTRACTS ★**

**PCW 9512 in stock £499 + VAT (including FREE maintenance)**

**SPECIAL OFFER - ATARI STFM £274.00**

**AMIGA A500 £439.00 inc. VAT & P.P. modulator + software** (460)

## JACKPOT 1

**The ultimate pools development program  
for the ATARI ST**

Analyses every team's past performance and forecasts the results. Three tuning levels. Not only draws but home and away wins. Create your own league tables with teams from any country. You can develop your own plans with any number of selections from the pools coupon and you will know what the percentage of you winning will be, if a predefined amount of draws by you, come. Thousands of plans are possible. They can be used for pools, correct score permutations and anything that requires you to forecast results from any number of selections up to 991. Also keeps a file of every week's score draws for useful manipulation. B/W and colour.

**ONLY £24.95 (inc. VAT & P.&P.)**

Send cheques or postal order to:

### FUTURESOFT

11 Meath Close, Hayling Island  
Hants PO11 9QN

(593)

## Athene Consultants

33 Holly Grove, Fareham, Hants PO16 7UP. Tel: 0329 282083

**ALL DISCS SUPPLIED WITH LABELS AND LIFETIME GUARANTEE**

Disc manufacturer Memorex

Description	Price
3-5 DS/DD 10 discs .....	£11.50 inc.
3-5 SS/DD 10 discs .....	£10.95 inc.
Storage Box (holds 10 discs) .....	£1.30 inc.

Popular Computing Weekly Special Offer only

1 free 3 1/2 disc box worth £1.30 with ten discs

Quantity Discount starts at 50 discs

3-5 DS/DD 50 discs .....	ONLY £52.90 inc. (92p each + VAT)
3-5 SS/DD 50 discs .....	ONLY £49.90 inc. (87p each + VAT)
3-5 DD 100 discs £100; 3-5 SS/DD 100 £94.30	

Despatch by 1st class post

Remember prices include VAT, postage and labels. All discs by top manufacturers with a Lifetime Guarantee. PLUS a 14 Day Money Back Guarantee.

QL Turboquill described as "Absolutely Essential" by QL World now has even faster version, QL Turboquill + for expanded memories QIs only. QL Turboquill + only £13.50 please state mdv or 3-5 inch disc & quill version.

To take advantage of these very low prices, send cheque/P.O. to:

### Athene Consultants

Dept (POP), 33 Holly Grove, Fareham, Hants PO16 7UP. Tel: 0329 282083 Prestel MBX 329282083  
CALL FOR THE LOWEST PRICES FOR QUANTITY IN U.K. (489)



(489)



SPECIAL OFFERS

★ EXCEPTIONAL VALUE

25 x 5.25" DS-DD DISCS  
PLUS  
100 CAPACITY LOCKABLE DISC BOX  
FOR

ONLY £17.60

OR  
50 x 5.25" DS-DD DISCS  
PLUS  
100 CAPACITY LOCKABLE DISC BOX  
FOR

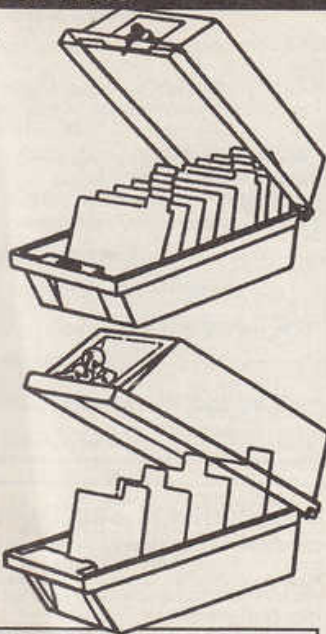
ONLY £27.10

20 x 3.5" DS-DD DISCS  
PLUS  
40 CAPACITY LOCKABLE BOX  
FOR

ONLY £29.50

OR  
50 x 3.5" DS-DD DISCS  
PLUS  
90 CAPACITY LOCKABLE BOX  
FOR

ONLY £68.20



REMEMBER THE PRICE YOU SEE IS ALL  
YOU PAY. (U.K. ONLY)  
THEY INCLUDE VAT AND CARRIAGE

Cheque or Postal Order to:



**Manor Court Supplies Ltd**

Dept YC10, Glen Celyn House, Penybont,  
Llandrindod Wells, Powys LD1 5SY.  
Telephone: 0597 87784 or 0597 87792

Orders accepted from educational and government depts.  
Dealer enquiries invited. (510)

**SPECTRUM**  
MICRO DRIVE OWNERS

# OUTLET

The new electronic maga-  
zine. For a copy send £1.00  
and a blank cartridge.

S.A.E. for details or log onto Micronet

**Chevron Software**

605 Loughborough Road,  
Birstall, Leics LE4 4NJ

(504)

**AMIGA A500 NOW IN STOCK FOR ONLY £439.95**



Light the candles!

**ATARI 520 STFM NOW IN STOCK FOR  
NEW PRICE ONLY £289.95**

Includes mouse controller, manual, language disc and starter pack

And let's all  
as children



be as happy  
this Christmas!!!

Buy from Sound N Vision this Christmas.

SEE HALF PAGE FOR BEST PRICES ON HARDWARE/SOFTWARE ETC.



**SOUND N VISION**

11 Silk St, Leigh, Lancs WN7 1AW.  
Phone now for details - Tel: (0942) 673689

Cheques and P/Orders payable to: Sound N Vision P.&P./VAT INCLUDED  
Visitors welcome in showroom. Send S.A.E. for price list. (534)

## IBM PC and AMSTRAD PC1512/1640 SHAREWARE/PUBLIC DOMAIN SOFTWARE

**WATCH OUT!** There are *SHAREWARE SHARKS* about, and they're after your money!!!

Why pay them £5 to £10 per disc when you can have a larger choice plus the latest releases from us, at only £3 per disc (less for quantity, Starter pack at only £2/disc!). Send SAE for a free catalogue.

**NEW!!!** Modula-2 compiler, 3D Chess, Bridgepal, Com-  
poser, UK General Ledger, plus many more.

**PC-STAR**

P.O. Box 164, Cardiff CF5 3YB

(573)

## DIGIPIX Disk Price Special 3.5" DS/DD DISKS



	10	25	50	100
Unbranded DS/DD 135tpi (MF2DD) inc labels & p&p	9.95	24.00	46.00	90.00
Mimic DS/DD 135tpi (MF2DD) cases labels p&p	14.95	36.50	70.00	130.00

All Disks Fully Guaranteed

Disk customers may also purchase any amount of the following  
with their order. (Available only with Disk orders.)

Mouse Mat £3.50 ★ 40 capacity, locking 3.5" Disk Box £5.75  
80 capacity, locking 3.5" Disk Box £7.00 ★ 100 3.5" Disk Labels £1.50

Send Cheque or P.O. to:

**DIGIPIX**

(494)

1 Brasher Close, Bishopstoke, Hants. SO5 6PY

Please note that the price for 50 DS/DD discs in last issue should have been £48 not £45 as stated

Central Media shop now open at address below

## CENTRAL MEDIA

WE SELL  
ATARI ST  
HARDWARE  
Ring for  
details

520 STFM  
£273

3.5 INCH DISCS  
TO UNBRANDED DS/DD 135 tpi £9.89

AMIGA 500  
ONLY £449!!!  
All ATARI ST come with Mouse & S&D disk & Basic

520 STM + 1/2 meg drive  
ONLY £273  
1040 ONLY £389

TRADE ENQUIRIES WELCOME

We sell  
the AMIGA  
Genlock  
computerised  
video system,  
a ring for  
details you  
will not be  
disappointed

ALL CHEQUES & PO's PAYABLE TO  
CENTRAL MEDIA

101 SPRING BANK, HULL HU3 1BH TEL: (0482) 26581 (493)

Central Media shop now open at address below

## CENTRAL MEDIA

WE SELL  
ATARI ST  
HARDWARE  
Ring for  
details

520 STFM  
£273

3.5 INCH DISCS  
TO UNBRANDED DS/DD 135 tpi £9.89

AMIGA 500  
ONLY £449!!!  
All ATARI ST come with Mouse & S&D disk & Basic

520 STM + 1/2 meg drive  
ONLY £273  
1040 ONLY £389

TRADE ENQUIRIES WELCOME

We sell  
the AMIGA  
Genlock  
computerised  
video system,  
a ring for  
details you  
will not be  
disappointed

ALL CHEQUES & PO's PAYABLE TO  
CENTRAL MEDIA

101 SPRING BANK, HULL HU3 1BH TEL: (0482) 26581 (493)



# CHEER UP! we've got you covered



£8.75  
incl.

## SEAL'n TYPE™

A protective keyboard cover through which you can type freely and easily.

## SEAL'n TYPE™

Accidents can happen! Protect against spills, dust, ash and grime; any of which could ruin your keyboard. Stop erosion of your key lettering.

## SEAL'n TYPE™

Made of clear, flexible plastic moulded to fit over every key. Removable, Washable, Reusable.

For Amstrad PCW/PC, BBC, AB/B+

# ...straightened FEED'n PRINT™

A Paper Guide for the PCW 8256/8512 which fits simply onto your printer. Now you can easily 'feed' in paper and have precisely aligned margins every time.

## FEED'n PRINT™

Includes markers to centre A4 and inch scales in pitches 10 & 12 matching screen layout.

£6.50  
incl.

# and re-inked!

PROLONG PRINTER RIBBON LIFE

Ring 0784 252662 for FREE transporter SAs.

Same day service

£1.90 per ribbon

Make cheques  
Payable to  
KADOR

Visit us:  
Amstrad Show  
10-12 July  
Stand A5

Send to:  
KADOR  
PO Box 20  
Ashford  
Middlesex  
TW15 3QE

kador

# AMAZING

This is the verdict from all our customers who purchased a copy of "The Gamerster". This is a truly unique utility that allows the user to gain infinite lives on most types of games, and includes the brilliant "Slomo" device, to slow down most programs to your desired speed. Win all those top prizes with "The Gamerster".

"Well worth buying . . ." CRASH

"Very easy to use . . ." A.S.D. Mid-Glamorgan

"Absolutely brilliant, now I play all those impossible games and easily gain high scores." R.D. Manchester

Spectrum 48/+128/+2/+3

Compatible with Multiface 1/Multiface 128/Snapshot

R.R.P. £9.99 ..... MAIL ORDER £5

Cheques/POs to:

S.U., 155 Wash Lane, Yardley, Birmingham B25 8PX

SAME DAY DESPATCH

(540)

## Kobraisoft Spectrum 48K/128K Utilities

504 ADVANCED TAPE TO M/D UTILITY: Transfer even the latest programs - e.g. Death Wish 3, Gunrunner - also the latest Pulsed Leader programs e.g. Arkanoid. FULL Manual, PLUS Disassembler, PLUS FREE Header Reader. Price: £6.95 (inc. P.&P.). On Microdrive Cartridge: £8.95 (inc. P.&P.).

504 TAPE TO OPUS DRIVE UTILITY: As for 504 - but transfers to Opus Drive - similar superb value. Price: £6.95 (inc. P.&P.).

SHARPSHOOTER: A 100% Machine Code multiscreen Arcade Game with superb graphics and sound. Many advanced features, multiple skill levels, uses keyboard, Kempston or ZX interface, 2 joysticks. Incredibly addictive. Price: £7.95 (inc. P.&P.).

KOBRAISOFT SPECTRUM Z80 MACHINE CODE COURSE: A 12 month course from Beginner to Advanced level. Suitable for anyone. Applies to all current Spectrum models. Price: £15.

SL4 ADVANCED SPEEDLOADER: Converts most programs to Fast Loaders with a choice of SIX loading speeds. Multi-coloured and various other loading borders - converts even the latest programs. FULL Manual, PLUS FREE Header Reader, FREE Disassembler. Price: £6.95 (inc. P.&P.).

SUPER INTERFACE FL1: A superb interface which converts almost ANY program to reload at any one of FIVE speeds as a Fast Loader - AUTOMATICALLY! Programs reload independently of FL1. Price: £29.95 (inc. P.&P.).

SUPER INTERFACE MD1: This interface converts programs to microdrive fully AUTOMATICALLY. COMPACT code - gives TWO LONG programs per cartridge! Programs reload independently of MD1. Price: £29.95 (inc. P.&P.).

SUPER INTERFACE OD1: As for MD1, BUT converts programs to your Opus drive AUTOMATICALLY! Similar specification to MD1. Price £29.95 (inc. P.&P.).

Send Cheque/PO to:

Kobraisoft, 'Pleasant View', Hulme Lane, Hulme, Longton, Stoke-on-Trent, Staffs ST3 5BH.

Overseas: Europe add £1 P.&P. PER ITEM, others £2. Send for FREE DETAILED Catalogue of ALL our products - please mark envelope 'ENQUIRY'.

(576)

# SPECTRUM REPAIRS

ONLY ONE COMPANY OFFERS YOU:

An honest 6 month guarantee. We repair any fault within 6 months, you do not have to prove that the same fault has reoccurred as with other companies.

Full overhaul and up-date with each repair to identify and repair all faults ensuring continuing reliability.

Over 17 years computer maintenance experience on all types of systems from main frames to micro's. Probably ten years more than our nearest competitor.

Fast efficient service. Most units are despatched fully insured by first class post within 24 hours of receipt.

No "free" games tape - we could offer you £50 worth of games with each repair, but instead we use top quality components, sophisticated test equipment and professional engineers.

All inclusive price of £17.50 regardless of number of faults.

BBC, Commodore, Amstrad. Free estimates. Normal repair costs £25.00.

Educational Authority orders welcome.

We also service a wide range of peripherals, including disc drives and printers.

# M.P.C. ELECTRONICS

The Laurels, Wendling, Dereham, Norfolk NR19 2LZ. Tel: 036 287 327



## FOR SALE

### BLANK CASSETTES

WITH LIBRARY CASES

	C10	C15	C20	C30
20	7.50	7.70	7.90	8.70
50	16.00	16.20	16.90	18.50
100	29.00	30.00	31.00	35.00

Fully Inclusive (C.O.D. £1 extra)

### DISKS

10 5 1/2 DS/DD  
£6.00 inc. case

10 3 1/2 SS/DD  
£11 inc. case

10 MAXELL 3" CF2  
£20

### MEMOTECH COMPUTERS AND ACCESSORIES

MTX 512 COMPUTER	£43.00
DMX 80 PRINTER	£150.00
RS232	£30.00
PASCAL ROM	£30.00
SPECULATOR ROM	£30.00
1 mb. DISK DRIVE & INTERFACE	£160
1 mb. DISK DRIVE & INTERFACE	£160

All the above prices are fully inclusive. We stock the entire Memotech Range. Order/Enquiries to:

**UK HOME COMPUTERS**  
82 CHURCHWARD AVE, SWINDON,  
WILTS SN2 1NH  
24-hr Phone Service 0793 695034

### DISCIPLE DISC MANAGER

A must for all Disciple users. 3 programmes: Configurer, Catalogue and Autoloader offers powerful file handling in a disc drive environment. Menu driven!

Name and number discs... and use this data to automatically create a master catalogue of all the contents of all your discs. No typing in! Search, update etc.

Multiple rename or erase + much more! Easy to use - Great graphics - Only £12.95 S.A.E. for details and leaflet.

#### BETTERBYTES

10 Spital Terrace, Gosforth  
Newcastle upon Tyne NE3 1UT (558)

**MEGA MAG DISK** The Magazine on disk for the Amiga, and coming soon for Commodore 64.

Price £5.00 monthly

Send cheques/POs, made payable to: **Mega Mag Disks** or write for info to:

Izy Farm, Fox Hole, Saxlingham,  
Nethergate, Norwich, Norfolk NR15 1UG

(547)

### QUALITY DISCS DD/DS BOXES OF 10

5 1/4"	£7.90
3 1/2"	£12
3"	£20

Victoria Telecom, 199 Gloucester Road,  
Bishopston, Bristol BS7 80J. Access/Visa  
Tel: 0272 47632/428381 (665)

**COMMODORE 64**, C2N, 2 joysticks, over £350 of software and games, £275 o.n.o. Tel: Antony 01-908 3019.

**WANT THE BEST ST DEAL?** I did. Send £5 for my product choice decision and phone survey of 13 suppliers. ??? ???? ????.

**ATARI 1040 STF**, SC1224 12" colour monitor, SMM 804 Atari dot matrix printer and lots of software (all brand new with 1 year's guarantee). Only £825. Tel: 05827 64152.

**GRAPHIC DESIGNER** is selling his Amstrad 464 colour with disc, AMX mouse, 256K Ram pack, 2 light pens + games, £350 o.n.o. Tel: (Leicester) 0533 392185.

**AMIGA 500**, Ram/clock expansion, TV mod. Deluxe Paint 2, Fareytale, Starglider and others. Under guarantee. £450. Tel: 08832 5259.

### ATARI ST PUBLIC DOMAIN

Why reinvent the wheel? We have a large selection of languages, demo's, utilities, comm's and games etc., available. A stamp for our list will save you hours of frustration.

Discs from £2.50

#### MCSOFT

9 Abingdon Gardens, Bath,  
Avon BA2 2UY (178)

### ALADDINK

FABRIC RIBBON CASSETTE RE-INKING

Trial offer: £1 per ribbon

Post used cassettes with payment to:

**ALADDINK (Dept PC)**,  
4 Hurkur Crescent, Eyemouth,  
Berwickshire TD14 5AP  
Tel: 08907 50965 (338)

### FLOPPY SHOP ST USER GROUP AND PUBLIC DOMAIN LIBRARY

You'll be amazed at our large selection of games, utilities, languages and demos. Our new membership is only £5.00. Full user support provided through our own magazine, (FREE to members) Send large S.A.E. for further details to:

Floppy Shop ST

50 Stewart Crescent, Northfield, Aberdeen AB2 5SR (513)

### KELSOFT specialising in FICTIONEERING

Gerald T. Kellett B.Sc. Trading as KELSOFT

PAW Text Adventure with SFX:

ESCAPE INTO SPACE £3.50

PAW Adventure METEORITE STRIKE, due out January

Enhancements for PAW, Quill and GAC

Send S.A.E. for details to:

#### KELSOFT

28 Queen Street, Stamford, Lincs PE9 1QS

Telephone: (0780) 56119 (564)

### M.D.S. Computer Supplies

5 1/2 DS/DD ..... 10 for £4.75

#### Amazing savings

11 Church Street  
Banbridge BT32 4AA

**HOTLINE**  
08206 23477 (578)

### AMIGA

CUMANA DISC DRIVES/JUMPDISK  
CHRISTMAS PACK

Using only the internal disc drives becomes tedious and frustrating. The Cumana disc drive for the Amiga is the answer. It is quite compact and highly reliable - we test each drive prior to the search and there is a 12 month guarantee. We include with all orders the Christmas issue JUMPDISK, the top two PD selling discs and a special software surprise. Immediately available for only £129 inc. VAT & p&p

George Thompson Services Ltd.

Dippen Lodge, Dippen, Brodick, Arran,  
Scotland KA27 8RN. Tel: 077082 234 (291)

**NEW SPECCY CLUB.** For details send S.A.E. to: ZXSC, 18 Poplar Close, Biggleswade, Beds.

## SERVICES

### EAST LONDON MICRO SERVICE CENTRE

Spectrum, Commodore, Amstrad, Atari, MSX plus peripherals.

Turnaround typical of 2-5 days. Three months warranty guaranteed. Computer ICs Eproms 74LS series.

Linear ICs components sold. Diskettes Branded

10 5 1/2 ..... £8.50  
10 3 1/2 ..... £13.00

Power supplies C64 ..... £25.00  
Spectrum ..... £9.95

Accessories sold. Mail order trade enquiries welcome.

Open 9am-8pm Mon.-Sat

#### SAN ELECTRONICS

63 Plashet Grove, East Ham  
London E6 1AD

Tel: 01-472 4871

Four minutes walk from Upton Park Tube Station, (358)

## SERVICES

### COMPUTER REPAIRS

Fixed Super Low Prices!

Inclusive of parts, labour and VAT



FIRST AID  
FOR  
TECHNOLOGY

1 week turnaround

Free collections/delivery available for local area

### ★ AUTUMN OFFERS ★

SPECTRUMS	£14 inc. + Free Game
C64	£22 inc. + Free Game
C16	£18 inc.
VIC20, C+4	£22 inc.
BBC	£32 inc.
ELECTRON	£19 inc.
AMSTRAD 464	£32 inc. + Free Game
SPECTRUM 128	£16 inc.
C64 P.S.U. FOR SALE	£20 inc.

Please enclose payment with item - 3 month warranty on repair

Please enclose advert with repair

### W.T.S. ELECTRONICS

5-9 Portland Road, Luton, Beds LU4 8AT. Tel: 0582 458375. Telex: 265871 (182)

## COMPUTER REPAIR SERVICE

Have your computer repaired for Christmas

### ★ Special Christmas Offers ★

Amstrad CPC 464 .....	£25	Amstrad PCW 8256 .....	£30
Sinclair Spectrum + .....	£18	Atari 130 XE .....	£20
Acorn BBC B .....	£27	Atari 520 ST .....	£27
Commodore 64 .....	£20	CBM disc drive .....	£25

All prices include parts and labour

Come along or post with payment. Please phone before posting

### WYNTER ELECTRONICS

Unit 30F Atlas Village

Oxgate Lane

Staples Corner

London NW2 7HU

Tel: 01-452 5660

We also upgrade units - please phone for details (588)

## T.M. COMPUTER SERVICES

### FAST COMPUTER REPAIRS

Spectrum Plus .....	£15.95
Commodore 64 .....	£22.00
Vic 20 .....	£22.00
C16 .....	£20.00
Plus 4 .....	£22.00
Amstrad 464 .....	£32.00

FREE collection and delivery in Leeds, Bradford and Huddersfield areas.

Phone Heckmondwike 0924 402715 day or night!

Computers direct to:

**Mr. T. Marshall**  
21 FOURELL STREET, HECKMONDWIKE,  
W. YORKS WF16 0EA

enclosing cheque and brief description of fault (580)



M

CRO  
SLE

## 3 SCOTLAND

## GLASGOW

SPECIAL  
OFFERS

Atari 520 STFM .....	£279.95
Monitor 12" mono .....	£59.95
Telemod modem .....	£24.95
Fantastik joystick .....	£4.95
CBM power supply .....	£22.50
Spectrum power supply .....	£9.95

## PRINTERS

Star NL10 .....	£219.95
Citizen 120D .....	£179.95
Olivetti, spark jet .....	£69.95
5 1/4" discs (box of 10) .....	£4.99
3 1/2" discs (box of 10) .....	£12.90

## COMPUTER DEPOT

205 Buchanan Street  
Glasgow G1 2JZ

Telephone: 041-332 3944

(569)

## GLASGOW

MEGABYTE  
SCOTLANDS PREMIER COMPUTER CENTRE

## PROUDLY PRESENT

A line up of computer and peripheral products to suit the taste and budget of all enthusiasts from all over the United Kingdom. We pride ourselves in attempting to satisfy the needs of all your computing interests. Call us on 0236 738398 or better still come up and see us some time.

ATARI 520STFM .....	299.00
ATARI 1040 STF .....	499.00
ATARI MEGA ST2 .....	999.00
ATARI MEGA ST4 .....	1299.00
ATARI 130XE PACK .....	129.95
ATARI 85XE CONSOLE .....	119.95
ATARI 2600 CONSOLE .....	49.95

All Atari computers and games consoles come with free software. Phone or S.A.E. for details.

## Commodore 64 Sports pack

C2N cassette, 6 games, joystick, sports bag

★ £169.95 ★

## Commodore AMIGA A500

★ £499.00 ★

Includes: Deluxe Paint, Modulator and Skyfox

The fabulous SEGA games machine, unbelievable graphics on a TV	
SEGA Games console .....	99.00
Phaser gun .....	45.00

The astounding NINTENDO games machine with controllers, light gun and R.O.B. the robot with two games to wet your appetite 159.00

NINTENDO games unit .....

159.00

Sinclair Plus 2 .....

139.95

Sinclair Plus 3 .....

199.95

One with cassette drive, one with disc drive, the choice is yours. Both come with masses of free software. Call for details.

For the man who has everything. The husband or the father, always a problem at Christmas.

THE PSION ORGANISER

Model CM .....

99.00

Model XP .....

135.00

Lots of add-ons and software always in stock. Send for details and price list.

All our computer and games machines come with free software. Check out the freebies you get with the list below.

## Atari ST's:

5 Discs, 5 Public Domain discs, Neochrome, 1st Word, DB Master and Mouse Mat.  
OR a 3 Game Entertainment Pack (titles may vary).

## Sinclair +2 and +3:

6 Games and Joystick.

## SEGA:

"Hang on" and controllers.

## NINTENDO:

Mario Bros, Gyromite, Duck Shoot (depends on pack).

Atari 2600: Free Warlord and Breakout

Atari 85XE: Free Flight Sim II and Bug Hunt

MEGABYTE IS ONE STOP  
COMPUTER SHOPPING

12 Ettrick Square, Town Centre, Cumbernauld G67 1ND  
Telephone: (0236) 738398



(585)

## DEALERS!

You can reach 40,000 readers for as little as £25 a week!  
For more details phone Susannah on 01-834 1717



## 3 SCOTLAND

### EDINBURGH

#### The AMIGA CENTRE SCOTLAND

Commodore Business Centre  
Amiga Specialists since 1985  
Amiga A500 and A2000 now available.  
Technical and software support to our customers. Full range of AMIGA software and peripherals.

Send S.A.E. for our software catalogue

4 Hart Street Lane  
Edinburgh EH1 3RN  
Tel: 031-557 4242 (24 hrs.)

(379)

### GLASGOW

#### GLASGOW COMPUTER CENTRE

Atari appointed dealer  
and Service Centre  
Specialists in Atari ST Computers

WE'VE MOVED TO:  
122 WEST MAIL STREET  
GLASGOW G1 2QZ  
TEL: 041-552 1522

(138)

## 1 THE SOUTH EAST

### EALING

#### EALING COMPUTER CENTRE

19 Queens Parade, Ealing, London W5. Tel: 01-991 0928

West London's newest and best computer showroom

Special opening offers - VAT inc. (limited stock)

ATARI 1040 STF £399.99 1040 STF + SM125 £499.99  
STAR NL10 £199.99 OPUS PCIII TF £699.99

All models on display. 100s of titles for Atari, IBM

Authorised dealer

ATARI  
Power Without the Price™

Opus  
PC COMPUTERS

THE STAR  
PRINTERS FOR BUSINESS

(584)

### SWAFFHAM

#### GRAPHIX

Of Norfolk

Serious computer application based around the Amiga computer, video packages, gen-lock devices, titling packages, digitisers, cameras, monitors etc. Graphics packages, drawing tablets, input devices, all graphic software supplied.

Design, animation, cartooning, home desk-top publishing.

A500, A2000, disc drives, Ram packs and all major software titles supplied.

Phone 0760 24947 (9am to 9pm)

Monday to Saturday for prices on any of the above

(544)

## 2 NORTHERN ENGLAND

### ASHBY DE LA ZOUCH

#### ASHCOM

##### Atari hardware

520 STF, keyboard/mouse/0.5 meg drive £259.95  
1040 STF keyboard/mouse/1 meg drive £439.95  
1040 STF plus colour monitor £799.95  
SF 314 1 meg drive £169.95

##### Commodore Amiga range

A500 + Offer Pack + modulator £435.00  
A1010 disc-drive £249.95  
3.5 inch discs DD/DS guaranteed (packed in 10s) £12.00  
25 bulk packed 3.5 inch discs DS/DD guaranteed £25.00  
Free public domain software on request with discs. All products fully guaranteed

Amazing prices on peripherals and all software. All prices include VAT at 15% and P&P on UK mainland. For more information call us on (0530) 411485 or send SAE for full price list. To order send cheques/PO or Visa/Access details to the address below or phone with credit card.

#### ASHCOM

10 The Green, Ashby de la Zouch, Leicestershire LE6 5JU

(437)

### MANCHESTER/HINCKLEY

#### COMPLEX

##### NEVER BEATEN ON PRICE

Amstrad 1640 20Mb Tandon £949 + 10 discs of public domain software  
Complex floppy discs DS/DD £7 per box of 10 + 50p P&P.

##### AMSTRAD PC

100 Mono £379  
200 Mono £479  
100 Colour £519  
200 Colour £519  
1640 20 meg ECD £1089  
1640 DDEC £839  
1640 EDC £749  
Tandon PCA20 £1299  
Mini Scribe 30 Meg card £275  
Tandon 20 Meg upgrade £199  
Tandon 20 Meg business card £199  
20Mb Upgrade for Amstrad PC (fitted if required) £245

##### PRINTERS

New NEC 2200 £299  
Epson LX800 £189  
Star NL10 £195 inc. interface  
Citizen 1200 £135

For further lists of printers and machines see PCW

NEVER BEATEN ON PRICE

##### ATARI

1040STF £399  
1040STF + mono monitor £525  
1040STF + Philips colour 8833 £624

##### COMMODORE

Amiga 500 £439  
Amiga 500 modulator £25  
Amiga I £949  
Amiga II £1049  
Amiga 2000 1Mb £1116

GOVERNMENT AND EDUCATIONAL ORDERS WELCOME,  
EXPORT ENQUIRIES WELCOME

STANDARD DELIVERY £7.50 AND NEXT DAY £9.50 - ADD 15% TO ORDER TOTAL

Complex House, 28 Bradgate Road, Hinckley LE10 1LA  
(0455) 635583. Manchester 061-976 3763

(342)

### SOUTHEND-ON-SEA

#### ESTUARY PERSONAL COMPUTERS

Amiga A500 + Deluxe Paint + 100 PD Discs

(Value of extras over £180)

+ Mouse Mat + Book + Game £499 inc.

520 STF + First Word + 5 PD Discs

+ 3 Games (extras value £115) £299 inc.

Victoria Circus Shopping Centre

Up escalator from Rail Station

SOUTHEND ON SEA, ESSEX

(0702) 614131

(561)

### LEIGH-ON-SEA

#### A.S. and T. Ltd.

Largest Atari St dealer in Essex

Tel: 0702 510151  
Unit 32/33  
Rutherford Close  
Eastwood Industrial Estate  
Leigh-on-Sea  
Essex

(Progress Road/A127)

(388)

### LONDON

#### DIGITAL SHADES LTD

★ Atari ST Special Offer!

Atari 520 STF plus starter kit

Now ONLY £260.00

Amiga 500 - £499.00

Mail order hotline

(01) 471 7969

9 Selsdon Road, Upton Park

London E13 9BY

(357)

### LOUGHBOROUGH

#### CHARWOOD COMPUTERS

Specialists in:

- ★ Atari
- ★ Commodore
- ★ Compact discs
- ★ Casio keyboards
- ★ TV Hi-fi

Tel: 0509 239892

85 Nottingham Road  
Loughborough  
Leicestershire

(594)

### BIRMINGHAM

#### SPECIAL CHRISTMAS BARGAINS

Due to so many people requesting  
mail order ALLEN JAMES will  
supply on demand:

ATARI 520 STF £279  
AMIGA A500 £459  
AMSTRAD PCW £299  
COMMODORE 64 £159

Please phone for best prices and amazing  
savings on all your computer needs

ALLEN JAMES

Stratford Road, Birmingham B11 4DA

(591)



# What are we playing at?

"Is this just a game or is it real?" asks the boy at the keyboard

"What's the difference?" answers the voice synthesiser of the computer.

This is the chilling moment in the film *War Games* when the young hero realises that by hacking into someone else's mainframe he may have gone just a little too far. This particular mainframe - you will recall - turns out to be the artificial intelligence running the whole of NATO's nuclear arsenal! And playing 'Global Tactical Thermonuclear War' with this baby is definitely not recommended for light entertainment.

Instead, maybe our hero should have got stuck into *High Frontier* the Strategic Defence Initiative simulation from Activision. At least then he would have known that any harm he could wreak would stop at his monitor - or in the realms of his imagination. Just good clean fun.

No room here for informed discussion, questioning the practicalities and desirability of SDI in the world arena. *High Frontier's* promo blurb makes sure you know whose side you're on right from the start: "4,000 Soviet nuclear warheads are targeted at the North American mainland... You are the project leader committing staff and funds to make SDI a reality. You must make the decisions that could save the American mainland..." Oh good. Because, let's face it, if the whole world were teetering on the edge of oblivion we'd all want to be reassured that the good ol' U.S. of A. was going to be ok. Sod the rest, and especially those Ruskies with their awful 'Evil Empire'.

Activision are by no means alone in their very definite approach to who the

good guys are. A number of battle simulation games do away with the niceties of any pretence of attempting to remain apolitical. Why waste time and trouble inventing imaginary enemies when we all know what the public want? Micro Prose's *F15 Strike Eagle* provides us with all the hi-tech weaponry we need to blast those nasty MiG fighters, and to cheerfully bomb Egypt, Libya, Haiphong, Hanoi, the Persian Gulf, Iraq, or Syria. Gung ho ho ho!

Are these games too warlike - too violent? Is this what I'm driving at? No. SDI at least involves, as far as I can gather, shooting down missiles, not people; and any war game or battle simulation will inevitably involve a degree of sanitised violence, as will any kind of fictional adventure from *Hansel and Gretel* to *Raiders of the Lost Ark*. What is worrying here is not so cut and dried as the anti-violence lobby would probably see it. I am certainly less concerned than the German government seem to be about the odd decapitation in fantasy games such as Palace Software's *Barbarian*, which they have just banned. I personally don't believe that the graphics in such a game could possibly produce images of violence so realistic as to cause offence, or that violence itself in a game necessarily incites violent behaviour.

Fantasy as a fictional genre is generally regarded as useful because it allows great moral questions to be pondered in symbolic form. A great deal of hack and slay or zapping with futuristic weapons goes on in the tussle between the forces of light and darkness. Look at Tolkien as a prime example, or *Dr. Who!* The problem I perceive is not the action itself in computer

games, but rather the values and rationale which underpin the action. *High Frontier* and *Strike Eagle* have more worrying qualities than the more overtly 'shocking' *Barbarian*.

They are set very firmly in the real world, and they propose a definite set of political preconceptions for gameplay, which qualify the action whilst inadvertently reinforcing an insidious and reactionary 'us and them' mentality.

Though I have said that I dispute that the portrayal of violence in games in itself incites violent behaviour, I can see a problem where violence is portrayed against a 'realistic' backdrop, and is seen as nothing short of desirable. Where the violence becomes the main focus of the game and is merely gratuitous.

The software companies know how important the scenario is. How else do you explain the inclusion of a 48 page novella in Firebird's classic *Elite*? Outside the simple maze or platform format, computer games are after all role play. And the more satisfying the scenario, the more satisfying the playing of the role. But what values are we willing to take on board in the process - or to compromise?

The software companies should realise this, and take careful responsibility in future games design concepts.

With echoes of *War Games*, the *High Frontier* promo concludes that it's "... hopefully as near as you'll ever get to the real thing... or is it?"

"Is this just a game or is it real?" The action is just a game, but what's underneath the action - and what does playing it say about me?

MALCOLM ARNOLD

## HACKERS





# The answer to the Spectrum-users prayer the **disciple**



## the **disciple**

the ultimate disk, printer, joystick and network controller for the Spectrum **£89.95** (inc VAT)  
Designed by Miles Gordon Technology for Rockfort Products (a trading division of Vignesh Ltd)

### ★ **DISK INTERFACE**

- ★ Allows up to 1.6 Mb of storage on 2 drives
- ★ Loads a full 48K program in 3.5 seconds
- ★ Simple Basic Syntax
- ★ Compatible with any standard drive – single or double density single/double sided, 40/80 track, 3", 3½", 5¼".

### ★ **SNAPSHOT BUTTON**

- ★ Saves any program instantly – at any point you wish and as often as you like.

### ★ **PRINTER INTERFACE**

- ★ Compatible with the whole range of Centronics Parallel printers.
- ★ Uses normal Sinclair Commands – LLIST, L PRINT, COPY
- ★ Permits user defined and screen graphics.

### ★ **DUAL JOYSTICK PORTS**

- ★ Sinclair and Kempston compatible.

### ★ **NETWORKING**

- ★ Operating system allows Disciple to act as file server; shared access to printer and disc drive for up to 64 Spectrums
- ★ Interface 1 Compatible

**AVAILABLE NOW!**  
the all purpose interface to take  
your Spectrum to the limit

Use the disciple with any Spectrum – even the new Plus Two model.

**WRITE OR CALL US ON**  
01-203-0191

### **FOR FURTHER DETAILS OF:**

- ★ Disciple + 780K drive at £199.95
  - ★ Disciple + dual drive/printer packages
  - ★ Special Disciple software titles
  - ★ User Club + Magazine – format
- The Disciple means that upgrading Spectrum owners do have a choice other than selling their machines and buying a Plus Three.

(Popular Computer Weekly)

To: Rockfort Products, 81 Church Road, London NW4 4DP

Please send me POST FREE ..... (Quantity) DISCIPLE Interfaces  
@ £89.95 each, including VAT & P&P.

I enclose CHEQUE/POSTAL ORDER for £ .....

OR debit by ACCESS ☐ or VISA ☐ (tick as appropriate)

CARD NO .....

EXPIRY DATE .....

SIGNATURE .....

NAME (Block Capitals) .....

ADDRESS .....

Postcode .....

Overseas order and trade enquiries welcome. Telex 933740 GANESH G.

YC12



# Garfield

"BIG, FAT, HAIRY DEAL"



JIM DAVIS

SPECTRUM  
£8.99

AMSTRAD  
COMMODORE  
£9.99

DISC - £14.99

AMIGA  
ATARI ST  
£19.99