

40, Rock Rd. ©

POPULAR
Computing
WEEKLY

Only 50p.

25 September-1 October 1986

Vol 5 No 39

October arrival for Spectrum Plus 2

AMSTRAD PC

Full review

inside

Starts on p17



SOFTWARE

New fast Basic for
the Atari STs

BMX Simulators and
Asterix reviewed

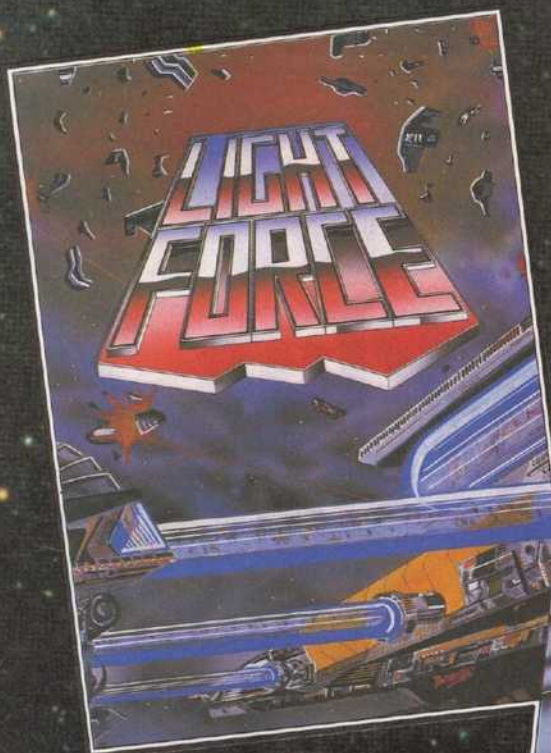
NEWS DESK

The Amstrad threat
to Atari: Tramiel
speaks out - p12

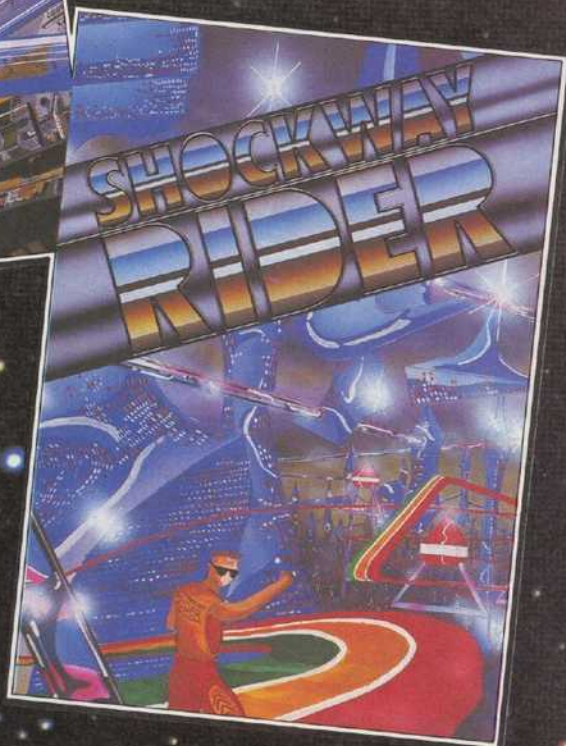
Beyond's Star Trek:
exclusive pictures



"GAMES AT THE SPEED OF LIGHT..."



LIGHTFORCE is for **VENGEANCE**.....
LIGHTFORCE is the Punishment Arm of Galactic Fighter Command.
When a Terran-settled system at the edge of the galaxy is seized by an alien force, revenge comes in the form of a lone **LIGHTFORCE** fighter.
LIGHTFORCE confronts alien in a dazzling battle above the strange landscapes of the Ice-Planet, the Jungle Planet, Alien factories and the impassable Asteroid Belt.
LIGHTFORCE — at the speed of Light - from **FTL**.



SHOCKWAY RIDERS are the pick of the street gangs - **ATHLETIC, AGGRESSIVE & ARROGANT** - as they cruise along the triple-speed moving walkways that circle the great **MEGACITIES** of the 21st Century. **THE ULTIMATE AIM OF EVERY RIDER** is to go "**FULL CIRCLE**" - to do that, he must fight off the Block Boys, the Cops and the Vigilantes - as well as negotiating the Speed Traps and Rider Ramps erected by the angry local residents!
SHOCKWAY RIDER is the most original arcade game of the year - **THE ULTIMATE FUTURE SHOCK!!**

FTL
FASTER THAN LIGHT

LIGHTFORCE AVAILABLE SEPT. '86
SHOCKWAY RIDER AVAILABLE OCT. '86

SPECTRUM £ 7.95
AMSTRAD & COMMODORE £ 8.95

FTL FASTER THAN LIGHT. CARTER FOLLIS GROUP OF COMPANIES.
SEDGLEY ROAD EAST, TIPTON, WEST MIDLANDS DY4 7UJ. Tel: 021-520 2981 (4 lines)

SOFTWARE ▶

15 Fast ST Basic

Computer Concepts' *Fast Basic* provides an alternative to the much criticised Basic bundled with the STs.



16 Blinker 64

How to utilise your subroutines library – a professional software tool for the Commodore 64. Peter Worlock tries out InDev's *Blinker*.

◀ HARDWARE

17 Amstrad PC 1512

Now that the initial ballyhoo has receded somewhat, John Lettice puts Amstrad's much-heralded PC

range through its paces. How does the PC 1512 measure up to the IBM standard, and what improvements has Amstrad made?

GAMES ▶

20 Reviews

More simulations this week, with the Atari ST version of Microprose's *Silent Service*, and *BMX Simulators*, sequel to *BMX Racers*. Plus the long awaited implementation of *Asterix*, and new for the Spectrum, *Conquistador*, a game with a Spanish flavour.

22 Adventure Corner

23 Adventure Helpline

24 Arcade Action

Part one of the complete solution of *Mercenary – Second City*. Plus this week's Gallup Top Twenty.



◀ PROGRAMMING

26 BBC

Keep track of your Roms with this utility from Alan Griffiths.

26 Spectrum

Demonstrating the use of bank-switching on the Spectrum 128 and Plus 2.

27 QL

Give your polygons a new dimension.

29 Amstrad CPC

Continuing Road Toad, our machine code arcade game.

30 Commodore 64

Out and out warfare in Ken Smith's new game.

33 Bytes and Pieces

35 Peek and Poke

REGULARS ▶

4 News Desk

8 Letters, Puzzle

12 News Feature

John Lettice talks to Sam Tramiel, president of Atari, about the threat posed by Amstrad's new PC range.

13 Competition

Part three of our autumn giveaway bonanza.

36 Communications

David Wallin with news of a special offer for multi-player games enthusiasts.

44 New Releases

46 Ziggurat, Hackers

Soundcheck will be back next week. Mark Jenkins is on holiday.

Editor Christina Erskine News editor John Lettice Features editor John Cook Technical editor Duncan Evans Production editor Michelle Beauchamp Supplements editor Christopher Jenkins Supplements designer Barbora Hajek Advertisement and Promotions manager Simon Langston Assistant advertisement manager David Osen Advertisement executive Jon Beales Classified executive Rodney Woodley Editorial secretary Annmarie O'Dwyer Administration Geraldine Smyth Managing editor Peter Worlock Publishing director Jenny Ireland. Published by Sunshine Publications Ltd, 12-13 Little Newport Street, London WC2H 7PP. Tel 01-437 4343 Telex 296275 Fax 01-439 0681 Typeset by Magazine Typesetters, 6 Parnell Court, East Portway, Andover, Hampshire. Printed by McCorquodale Magazines, Andover, Hampshire. Distributed by S M Distribution, London SW9, Tel 01-274 8611, Telex 261643. © Sunshine Publications Ltd 1986. ISSN 0265-0509

Popular Computing Weekly. Tel: 01-437 4343.

How to submit articles Articles which are submitted for publication should not be more than 2000 words long. The articles, and any accompanying programs, should be original. It is breaking the law of copyright to copy programs out of other magazines and submit them here – so please do not be tempted. We cannot guarantee to return your programs – so please do not send your only copy. **Accuracy** Popular Computing Weekly cannot accept any responsibility for any errors in programs we publish, although we will always try our best to make sure programs work.

No Plus 2 till October

THE Spectrum Plus 2 isn't now expected in the shops until mid-October, despite the fact that it was launched at the beginning of this month. At the launch of the machine at the PCW Show Amstrad said that it was "due in the British High Street later this month," but both WH Smith and Amstrad Distribution say it's not expected in the stores for another three weeks.

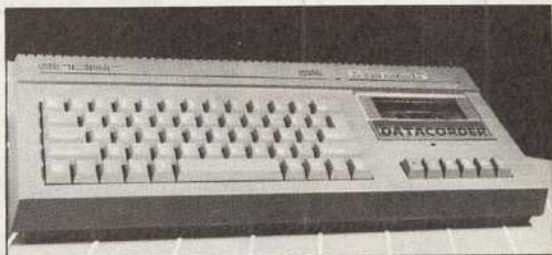
The delay is unusual for Amstrad, which doesn't usually announce machines until they're ready to go into the stores, and it's not clear if there's any problem with the machine.

As it is practically identical

to the Spectrum 128 it's unlikely that there could be a design problem, but it may be that Amstrad is finding to make the machine load both old and new software.

The company will however be spending £2.4 million on advertising the machine this Christmas, and Barry Young, managing director of Amstrad Distribution, is predicting that it will take 40 per cent of the games machine market over the next few months.

The new Amstrad PC is however ruffling feathers among some dealers. Amstrad will only sell the machines through what it



describes as "approved Amstrad dealers," and Amstrad Distribution has sent out a letter detailing the requirements for this.

"Unless you are able to meet the criteria as specified, then please do not waste our time or yours," it reads winningly.

The major requirements are that shops selling the PCs should have a "Business Computer Centre," with two staff trained in the Amstrad range and facilities for individual hands-on demonstrations. The Centre should also

be separated from home computers and games software. These conditions are liable to cause severe space and staffing problems for small dealers, but will also mean that many major multiples will need to reorganise their stores.

From Amstrad's point of view it could however be useful to have smaller dealers ducking out of the PC range and continuing to stock the PCW, as this will avoid the two machines getting into too close competition with each other.

Low-cost hardcard planned for PC

AMSTRAD is now predicting that first shipments of its PC will arrive at the end of this week. It is, however, unlikely that hard disc versions of the machine will be available for some time yet, and third parties are already gearing up to plug the gap.

Foremost among these is distributor Northamber, which has been taken on by Amstrad to supply the PC and which hopes to secure a sup-

ply of hardcards this week.

A hardcard is basically a small Winchester hard disc mounted vertically on a card which is plugged into a PC's expansion slot, and has the advantages of being easy to fit and allowing both floppy drives to continue to be used. Amstrad's hard disc on the other hand fits into the position normally used by one of the floppies.

Northamber is reluctant to

talk about the cards, but it's believed they'll be available in both 10Mb and 20Mb versions. According to spokesman, Eddie Moore, the cost will be comparable to Amstrad-supplied hard disc machines and less than an Amstrad upgrade.

Like the Amstrad hard disc units they will take up one of the machine's three available expansion slots, but because of the width of the card they'll also limit one other slot to a half length card. Because the Amstrad already has most of the Ram and I/O you'll need on board, this, however, is unlikely to be a problem.



A hard act to follow . . .

PCW now stores more

YET another company is to supply a hard disc unit for the Amstrad PCW. The latest upgrade is from ASD Peripherals, and costs £574 for a 10Mb drive and £689 for the 20Mb. The units are external, and include an extension to the PCW's expansion bus so that all existing add-ons can be used at the same time.

The complete setup consists of a controller module which plugs into the expansion socket of the PCW and a combined drive unit and power supply that sits under the PCW itself.

Details from ASD Peripherals, 03224 49235/6.

Amstrad PC user group

A user group for the Amstrad PC has been formed already. The 1512 Independent User Group intends to publish a regular newsletter, run a helpline, offer software discount, hold meetings and run a public domain software library. Membership is £20 a year. Further information is available from Paul Mullen on 0732 450908.

Correction

Those of you who have been following the *Popular vs Colossus* chess game, and are wondering how on earth the bishop managed to move from f1 to c6 in game one, need wonder no longer.

The move should have read 3B f1-c4. The collators will take this into account when deciding the next readers' move.

Sidecar to launch soon?

COMMODORE is thought to be preparing to launch Sidecar, its PC emulator for the Amiga, in the UK shortly. Price isn't yet certain, but according to a source within the company it's to be pitched low to match the price of the Amiga 3, the new entry-level Amiga Commodore intends to announce at the US Comdex show in November.

Commodore UK general manager Chris Kaday is still adamant that there will be no new Amigas in the UK, either announced or in the shops, before Christmas, and although a spokesman confirmed that there would be an announcement from the company this week he categorically denied that it would be Amiga-related.

Kaday however doesn't rule out the possibility of new products being shown elsewhere in the world. Commodore US is currently thought to be working on both the Amiga and the 64 range, with the Ranger, a 68020 machine coming in above the current Amiga and a lower cost development, the Amiga 3, coming in under it.

The 64 range is also thought to be undergoing revision. The recently launched 64c is being viewed by industry sources as a stop-gap machine that will be the subject of development, reducing the chip set to make it cheaper to produce and

easier to upgrade. This of course clashes with the 128, which was originally intended as the upgrade path for the 64, but which is expensive to build and has largely failed to displace the older machine.

Commodore UK denies that it is withdrawing the machine, but of the two models only the 128D, which is too expensive for a mass-market machine, is now readily available in the UK. The company therefore needs to be able to price its 8-bit machines lower if it is to remain in the home market.

Acorn shows up in Manchester

THIS weekend's Electron and BBC Micro User Show will feature Acorn itself, showing its new Master Compact machine. Among the launches expected are a £700 Winchester system, £79 Master console unit and a £16.95 Rom cartridge adaptor from Viglen, while Care Electronics will be showing cheap Master cartridges and an extender to allow old Rom cartridges to work on the new machines.

Among the other companies present will be Norwich Computers, showing a utility Rom for Wordwise Plus, and Advanced Computer products with a new disc interface for the Electron.

First launches £50 PC integrated package

PRICES for integrated software packages for the PC are set to tumble shortly, with the launch of Decision Director, a £49.95 combination spreadsheet and word processor from First Software. As the package will be priced lower than most PC word processors it should provide stiff competition for the reduced price Framework (see separate story) despite the fact

that it doesn't include a database.

First will also be importing a new database, Able, to be priced at £86. This again will be under the predicted price for the PC1512 version of dBase II.

Details from First Software, Unit 20D, Horseshoe Road, Horseshoe Park, Pangbourne, Berks RG8 7SW (07357 5244).

Software Hotlines

Not wishing to repeat the fiasco of their last major licensing deal (*Superman*), **Beyond** is pulling all the stops out for *Star Trek* – as the development versions so far indicate (see below). It's big (1000 stars), complex (255 sub-plots), and looks lovely on the telly (lots of digitised pictures of crew members, etc).

The plot has the Enterprise investigating the mysterious defection of Federation starships within an area of space called 'The Quarantine Zone', centred around the planet Adakiak. Tricky stuff. If they don't run out of memory, it could well be the game of the year... although exactly which year is still uncertain.

It's official – multi-player stand alone arcade games are in, the whole thing started off around a year or so ago in this country with that one to four player fantasy adventure from **Atari**, *Gauntlet*, soon to be emulated in some fashion by **US Gold** (*Gauntlet II* – a two player adaptation – should be hitting the arcades soon). Then came **Sega's** attempt at the multi-player market, *Quartet*. Although placed in a space-age setting, this shoot-'em-up was never as graphically impressive as *Gauntlet*.

This was followed by *Super Sprint*. Again from **Atari**, this is 1-3 player racing game, derived from their mid-seventies game *Sprint*. Possibly the best game in the arcades at the moment, **Electric**



Kirk quarantined

Dreams is in negotiations presently for the home computer rights. But who is going to be the first to go for *Rampage* – the latest multi-player from **Bally-Midway**? This is a 1-3 player game in which you each play a gigantic gorilla taking apart an American city – complete with National Guard sharpshooters and innocent civilians to stomp. Straight out of King Kong, expect one of the big boys to snap this one up pronto.

Here's a heartening tale for any lone programmer. Dominic Robinson started on a BSc Computing course at Bristol University – but decided that they weren't teaching him the kind of things he wanted to know. After leaving he messed around a bit on his Spectrum, came up with a few ideas on how to implement *Unidum* on it... then went to visit Hewson.

Hewson, by coincidence, had already been thinking along the same lines – so the company took him on, and the rest is history. Everyone that saw the demo at the PCW show couldn't fail to be impressed – it'll be out on 28 October. **John Cook**



Enterprise zone

Apple launches new 16-bit IIGS

APPLE'S follow-up to the Apple II, the IIGS, is to go on sale towards the end of the year at an entry-level price of £995. The machine is compatible with the II series - which it will replace - but uses the 65C816 processor, which is the 16-bit version of the 6502 used in the Apple II.

The Basic system consists of 256K Ram, monochrome monitor, mouse and external 3½ inch 800K drive unit. The main system unit has composite and RGB outputs, headphone jack, bus input port, disc interface for both 5¼ inch and 3½ inch drives, twin serial ports, communications chip and joystick port. It also has eight expansion slots, and sports a synthesiser chip. Ram can be expanded to 8Mb and the 128K Rom to 1MB, and resolution is 640 x 200, with seven display modes.



The new Apple

Apple confirms that the Ie and Iic are now dead, and in this country proposes to target the new machine at small businesses and at the II's ex-

isting user base. An upgrade for existing users will be available in the US, but Apple UK is unlikely to bring it into this country.

Horse feathers KBS' nest

KBS Interactive Software considers that its latest idea is a runner. The company claims to have been working on the use of expert and rule-based micro systems for use in everyday applications and, says Cliff Walden-Goodwin, "We decided to apply rule-based theory to what must be every punter's dream - making a profit at the races."

KBS claims a success rate of 80 per cent plus, and is to

launch the system on the open market at the beginning of next year. Punters eager to press money into KBS' hands before then should, however, bear in mind that similar computerised systems were being blamed for last week's spectacular crash on the New York Stock Exchange...

In a separate initiative KBS is also opening a 'software factory' near its Tyne & Wear base. The idea of the factory

is to offer young programmers working space and office facilities for £12.50 a week, and to try to encourage a cross-flow of business between the programmers and KBS. Interested parties should phone 0207 543053.

NLQ extras for Epsoms

THE M&M Technix NLQ Printer Buffer is a buffer and NLQ upgrade for dot matrix printers. The buffer size can be either 8K or 32K, while the NLQ feature, which requires an Epson-compatible printer with quad-density graphics, allows print in four character sizes and a variety of fonts. Three of these are supplied with the buffer, and further versions can be obtained from M&M. The units cost £128 for 8K and £164 for 32K.

Details from M&M Technix, Abindon Business Centre, 346-376 Osmaston Road, Derby DE2 8AG.



M&M Technix's new buffer

Cheap dBase out soon for the PC

A £120 version of *dBase II* should be available for the Amstrad PC later this year. The program is already available in CP/M format for the Amstrad PCW, but like other major software producers publisher Ashton-Tate had until recently set itself against price cuts on its PC software range.

But now, in a spectacular volte face, A-T has bowed to the inevitable and has invited tenders from third party distributors to handle support and marketing for both *dBase II* and a low-cost version of the *Framework* integrated package. The latter will be cut down to avoid damaging the company's existing market for the full version, but *dBase II*, which has to an extent been superseded by *dBase III*, will be practically a full version.

Mailmerge for Locoscript

QMAIL is a mailmerge utility designed to work with *Locoscript*. It supports right justification, tabs and centred text and allows you to select particular people from your list before doing a mailshot. It costs £29.95.

Details from Proteus Computing, 2 Iffley Road, London W6 (01-748 2302).

Real-time clock for the 64

ELECTRONIC and Computer Workshop has produced a battery backed CMOS Ram and real-time clock plug-in module for the Commodore 64. The module's timing facilities aren't affected by the 64's internal timings, which are often interrupted, and it includes 50 bytes of CMOS Ram which can be used to store information such as set-up data even when the machine is switched off. The module costs £36.11 in kit form, or £50.45 ready built.

Details from Electronic and Computer Workshop, 171 Broomfield Road, Chelmsford, Essex CM1 1RY (0245 262149).

New printers from Citizen

CITIZEN has launched three new printers – two in its MSP series and one new high quality model, the HQP 45.

The MSP 10E and 15E are functionally identical, but the 10E is 80 column while the 15E is 136. Draft output speed is 160 cps and near letter quality 40 cps. The machines have 8K buffer, full bit-image graphics, proportional spacing and Epson and IBM compatibility built in. They cost £349 and £449 respectively.

The HQP 45 prints at 1200 cps in draft, 132 cps in correspondence and 66 cps in letter quality. It has 136 column width, Centronics and RS232 interfaces as standard, and optional IBM and Espon emulation. The HQP 45, which costs £935, has a 24K buffer and can take additional plug-in fonts.



Details from Hillingdon Itec, Norland House, Wallingford Road, The Trading Estate, Uxbridge, Middlesex. Tel: 0895 56849, Prestel mailbox 0895 31726 or 0895 59842 for viewdata access.

CD survey published

CD-ROM Standards: The Book is the latest phase in the micro industry's plans to develop a standard volume and file structure for CD-Rom drives. The book puts forward the standard proposal developed by the High Sierra (no relation to the film of the same name) Group, leading participants in which include DEC, Apple and Microsoft. It is described by the publishers, Learned Information and Infotech, as the "definitive guide to CD-Rom standards," and is being sold for £50.

Details from Learned Information, Woodside, Hinksey Hill, Oxford OX1 5AU. Tel: 0865 730275.

Smart switches for Data

CRAFT Data is now importing a range of switch devices, designed by US company Via West, to allow micros to share peripherals. The switches cover IBM, Centronics, RS232 and other common interfaces, and switching between devices can be either manual or through software. They need no external power supply, and start at £30.

Details from Craft Data, 92 Broad Street, Chesham, Bucks HP5 3ED. Tel: 0494 778235.

User group with Flare

FLARE Technology's Ram Music Machine has acquired an official user group just weeks after its launch. Price and benefits of membership had yet to be fixed as *Popular* went to press, but further information is available from organiser Al Straker, 19 Sandringham Road, London NW2 5TP.

Taspro goes onto Amstrad

TASPRO, Seven Stars' *Tasword* utility which allows proportional spacing in justified *Tasword* copy, has now been converted to run with *Tasword 464* or *464-D*. The pro-

gram includes pause control for daisywheels, allowing printwheels to be changed during printing, and handling of alternate mode characters in Epson FX80 proportional mode. It can also justify re-defined characters, and supports a wide range of printers. Price is £7.95.

Details from Seven Stars Publishing, 34 Squirrel Rise, Marlow, Bucks SL7 3PN. Tel: 06284 3445.

ST gains Transputer

KUMA is selling its K-Max parallel Risc processing system for the ST for a cool £1,706. The system consists of a dual processor board containing two Inmos Transputers and two blocks of Ram of 256K each. The system has a potential speed of 15 Mips (million instructions per second).

Technical freaks can get details from Kuma, 12 Horsehoe Park, Pangbourne, Berks RG8 7JW. Tel: 075357 4335.

Correction

In *Popular*, September 11, we inadvertently gave the incorrect number for Memotech Computers, in a reply to a letter.

The correct number is 0993 78691, and Memotech's new address is Unit 24, Station Lane Industrial Estate, Witney, Oxon.

Viewdata for free

THE Middlesex Training Centre has set up a free viewdata service whose subject matter ranges from local Hillingdon information, through computer news, to information about the centre itself. The service includes a wide range of machine specific databases and a mailbox facility, and runs 24 hours a day, 365 days a year.

SEPTEMBER

26-28 September
Electron and BBC Micro User Show

UMIST, Manchester
Details: Software, hardware and peripherals for BBC machines.
Price: £3 adults, £2 children, £1 discount for advance booking.
Organiser: Database Exhibitions, 061-456 8835.

OCTOBER

3-5 October
The Amstrad Computer Show

Novotel, London
Details: Home and business software and hardware for the Amstrad range.

Price: £3 adults, £2 children, £1 discount for advance booking.
Organiser: Database Exhibitions, 061-456 8835.

4 October
2nd Welsh Dragon Computer Show

Cardiff-Wales Airport
Details: Software and hardware for the Dragon.
Price: £1 adults, children and OAPs 50p.
Organiser: John Penn, 04203 5970.

30-31 October
Hampshire Computer Fair
Guildhall, Southampton
Details: Business computers.

Price: Free entry by business registration.
Organiser: Testwood Exhibitions, 0703 31557.

NOVEMBER

7-9 November
Electron and BBC Micro User Show

New Horticultural Hall, Greycoat Street, London SW1
Details: Hardware, software and peripherals for the Electron, BBC micro and Master series.
Prices: £3 adults, £2 children, £1 discount for advance booking.
Organiser: Database Exhibitions, 061-456 8835.

Diary Dates

8 November
UKEUG National Einstein Show

National Motor Cycle Museum, Birmingham
Details: Einstein software and hardware.
Price: Free.
Organiser: UKEUG, 07982 2399.

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

To dump on K-Graph

We appreciated your publication of a review of our business graphics package *K-Graph* for the Atari ST series in last week's edition of *Popular Computing Weekly*.

Unfortunately the reviewer seems to have been unable to print a screen dump and claims it cannot be done, this is incorrect. Up to four windows can be displayed on the screen simultaneously, this would be pointless if the display could not be printed. To obtain a screen dump all the user has to do is pick up the 'Picture Icon' and drop it on the 'Printer Icon', exactly as described on page 55 of the *K-Graph* manual.

An example of the results obtainable by the above method can be seen in our enclosed software leaflet.

All the printing is done by using icons and drop down menus, we were surprised that this is 'too fiddly' for Mr.

Evans, there are certainly several options built in, though none of these could be described as difficult.

Jon Day
Sales Manager
Kuma Software

Xen X2

Looking at the two articles on *Xen-Basic* (*Popular*, September 4/11), may I make two points?

Firstly, the command *!Progen* can be used on CPC 664s and 6128s by changing two numbers in Line 200 - the number 131 in the fourth row of Line 200 becomes 102, and 129 on the fifth row becomes 100. These are the low bytes of the addresses where the end and start of Basic are stored.

Secondly, the description of *!Rompeek* has a mistake - Rom should be 0 to examine the lower Rom.

On a general note, I think it would be better to print the data for machine code programs in hex rather than deci-

Can't Fool an Amsdos

Your reply in *Peek and Poke*, September 4 concerning loading *.Com* files under AMSDOS unfortunately doesn't work. No amount of renaming will fool AMSDOS because it creates headers for each file containing all the information about file name, type, length, etc.

I have had this problem myself as I wanted to use *Devpac* to disassemble *.Com* files.

The solution is first to create a dummy file under AMS-DOS with

```
SAVE "TEST.BIN",b,&2000,length
```

where length is the size of the *.Com* file you wish to transfer. Next boot CP/M and use *DDT* to load the dummy file with

```
DDT TEST.BIN
```

Examine the header with *d100* now if you wish. An

interesting point is that if you have renamed the file the header still contains the original name.

Next overlay your *.Com* file using *DDT* with

```
ITEST.COM and R80
```

80h being the offset required so as not to overwrite the header. Exit *DDT* with *g0* and save the final version of *Test* with

```
SAVE length in pages TEST.BIN
```

The length in pages is the original *.Com* file length plus 80h, the header length, all divided by 256. AMSDOS will now recognise your CP/M *.Com* file. It sounds a bit involved, but works fine. If anyone knows a better way I would like to know.

Alex Aird
Birmingham

mal: 205,90,187 is totally incomprehensible, but CD,5A,BB is instantly recognisable (to Amstrad buffs

at least) as the call to print a character.

Ewen Flint Dumfries
continued on page 10 ▶

Puzzle

Puzzle No 226

There are three boxes on a shelf just about in reach. You cannot look inside, but you can remove the 'coloured' balls contained therein.

On each box is a label, but unfortunately the labels have got mixed up and are on the wrong boxes. Inside each box are two balls in the correct combination, ie, red/red, white/white, red/white.

The object is to determine the minimum number of balls to remove from the boxes in order to discover which balls are in which box.

Solution to Puzzle No 221

Answer

The final arrangement of coins is...

```
H T H T H T H T
H H T H T H T T
H H H T H T T T
H H H H T T T T
H H H H T T T T
H H H T H T T T
H H T H T H T T
H T H T H T H T
```

Solution

The solution utilises a two dimensional array N(N,N) to represent the chess board. Each value in the array is originally set to 1. This represents a coin with heads uppermost. Using conventional X and Y axis each square is taken in the order described in the puzzle.

Lines 70 to 340 'turn' all coins in line either horizontally, vertically or diagonally. This is

exactly the same as the squares attacked by the queen in chess. The coins are 'turned' by multiplying the value in that unit of the array by minus 1, thus +1 becomes -1, and -1 becomes +1. Line 60 'turns' the coin on which the queen stands only if it is heads uppermost.

Finally lines 1000 to 1030 print out the final array, plus 1 indicating 'heads', minus 1 indicating 'tails'.

Winner of Puzzle No 221

The winner this week is M J Fecher of Maidenhead, Berks, who will be receiving £10.

Rules

The closing date for Puzzle No 266 is October 13.

```
10 N=8
20 DIM N(N,N)
30 FOR X=1 TO N:FOR Y=1 TO N
40 N(X,Y)=1:NEXT:Y
50 FOR Y=1 TO N:FOR X=1 TO N
60 IF N(X,Y)=1 THEN N(X,Y)=N(X,Y)*-1
70 X1=X:Y1=Y
80 X1=X1-1
90 IF X1<0 THEN N(X1,Y1)=N(X1,Y1)*-1:GOTO 80
100 X1=X:Y1=Y
110 X1=X1+1
120 IF X1>N+1 THEN N(X1,Y1)=N(X1,Y1)*-1:GOTO 110
130 X1=X:Y1=Y
140 Y1=Y1-1
150 IF Y1<0 THEN N(X1,Y1)=N(X1,Y1)*-1:GOTO 140
160 X1=X:Y1=Y
170 Y1=Y1+1
180 IF Y1>N+1 THEN N(X1,Y1)=N(X1,Y1)*-1:GOTO 170
190 X1=X:Y1=Y
200 X1=X1+1:Y1=Y1+1
```

```
210 IF X1=N+1 OR Y1=N+1 THEN 230
220 N(X1,Y1)=N(X1,Y1)*-1:GOTO 200
230 X1=X:Y1=Y
240 X1=X1+1:Y1=Y1-1
250 IF X1=N+1 OR Y1=0 THEN 270
260 N(X1,Y1)=N(X1,Y1)*-1:GOTO 240
270 X1=X:Y1=Y
280 X1=X1-1:Y1=Y1+1
290 IF X1=0 OR Y1=N+1 THEN 310
300 N(X1,Y1)=N(X1,Y1)*-1:GOTO 280
310 X1=X:Y1=Y
320 X1=X1-1:Y1=Y1-1
330 IF X1=0 OR Y1=0 THEN 350
340 N(X1,Y1)=N(X1,Y1)*-1:GOTO 320
350 NEXT X
360 NEXT Y
1000 CLS:FOR Y=1 TO N:FOR X=1 TO N
1010 IF N(X,Y)=1 THEN PRINT;"H";
1020 IF N(X,Y)=-1 THEN PRINT;"T";
1030 NEXT X:PRINT:NEXT Y
```


MIRRORSOFT

ZYTHUM

Unknown perils lurk in the search for the elixir of Zythum.
Can you outwit them and claim the secret of eternal life?



Out now on
SPECTRUM £7.95

MIRRORSOFT

Maxwell House,
74 Worship Street,
London EC2A 2EN.
Tel: 01-377 4644/5
Telex: 886048 BPCC G
Fax: 01-377 0022

Eiderdown price list

I am writing concerning a serious misprint in the *PCW* show report in *Popular Computing Weekly*, September 11. The misprint concerns our software titles for the Atari ST, *ST Karate*, *Space Station*, *ST Protector*, *Fireblaster* and *War Zone*.

The programs were criticised as being a little on the expensive side. I agree. The reporter gave incorrect prices! *Space Station* and *Karate* are £24.95 (not £29.95), while the others are only £19.95 each (not £24.95).

Reference is also made to an unknown game with rather colourful graphics, but small sprites. This game, *Haunted House*, is part of our super demo disc, which includes this game, a slide show and some desktops.

What's more, it's absolutely free of charge (save the cost of the disc) and can be obtained either by sending a disc to us with an S.A.E., or from most Atari dealers. Readers may like to know that the games can be recognised in the shops by their distinctive triangular packaging.

Eidersoft Software

Beginners be warned!

A warning to beginners like myself! It was not until I saw my letter in *Popular*, 28 August) headed *DirEdit debugged* that I realised that my recently bought printer CP 80 Type 1, prints out lowercase *g* very similar to lowercase *q*. Thus it was no fault of your typesetters that my reference to line 140 was printed to include *qa\$(16),qb\$(16)*. In other words (and trying to type with my fingers crossed), this portion should have read *ga\$(16),gb\$(16)*.

By way of atonement, here is a little tip for program listers: when you finish typing a stage, use line one *Remmed* to record your last line number. When you recommence, load and *List 1* to find your starting place. If you update the number at the end of each period it will keep the lead in your pencil!

Joseph G Berry
Northants

A new command

With regard to Simon Goodwin's RSX program - 32 new commands for the Amstrad CPCs, *Popular*, September 4 - he deserves top marks.

However, I found a small mistake with one of the commands. The command *RScreen* should be *RScroll* - this is given in the *Help* command.

Also here's a little addition to save space and loading time:

Replace line 50 in the main program with

```
50 SAVE "XEN.BIN",b,41000,1445
```

Then, to load, just

```
MEMORY 40999  
LOAD "XEN.BIN",41000:CALL  
41000
```

Kim Foksett
Market Harborough



Questions...

With reference to the article on pages 12 to 13 of *Popular Computing Weekly* 11-17 September 1986 that explained how to expand the Amstrad DMP-2000's buffer to 8K. The article mentioned that a suitable 8K Ram chip could be obtained from RS (ref 301-870), but did not give an address for this company. I would be grateful if you would publish the address.

One further point, on my printer the three pads marked J3 have a link wire going from the middle pad to the right hand pad on the top of the circuit board (looking at the board in the same orientation as in figure 2 in the article) and not as stated in the article a PCB track on the underside. Hence it is necessary to cut or remove this link wire and then to connect the left hand pad

to the middle pad. This may be of help to those readers with particular interest in this article who may be experiencing some confusion over this point.

A Fisher
Prestwick, Ayrshire

The Ram chip in question (see letter below) is the 6264. RS (Radio Spares) can be contacted at Lamas Road, Weldon Industrial Estate, Corby, Northants NN17 9RS (0536 201201).

And answers...

Having read with interest the article on the expansion of the Amstrad DMP2000 printer buffer. *Popular* September 11, I have the following comments to make. I have been doing this modification to the printer for some time now and I am afraid that Mr Race has a lot of his facts wrong. The most important thing that I think readers should know is that just by taking the case off the printer and removing the chip, will invalidate the Amstrad warranty. However, this is not the most important part of the problem.

Point number one. The 8K Ram chip to use is not a 6164 but a 6264 and it is a 28 pin chip, which can be purchased from any good electronics store for less than £3.

Point number two. There is no need for the PCB to be removed from the casing as the link J3 should have a removable top, which when taken off can be changed to the other side, ie, like in the drawing but without the need of any tools except a small pair of pliers.

I hope that this will clear up a few of the problems that might occur when people without too much electrical knowledge try to use a soldering iron. I might add that this modification to the DMP2000 is a very simple job for anyone to tackle. It seems to me that it was the intention of Amstrad to put an 8K Buffer in, but changed their minds at the last minute.

I hope that this has cleared up one or two points on this matter.

J B Palmer
Warblington
Havant

Dave Race replies: Indeed the 6264 CMOS 8K by 8-bit Ram chip is the one you want. My own DMP printer's J3 link does not have a removable top, but I can well believe that some models do.

To put it in black and white

May I clarify the situation regarding the "monochrome" option for the Amstrad PC1512. In common with the CPC464, the PC1512 is fundamentally a colour computer, the "monochrome" monitor converting each individual colour to a different shade of grey.

Thus the assertion by John Lettice in *Popular*, September 18, that PC games will not run on a monochrome Amstrad PC is incorrect. I suspect he is confusing our "monochrome" implementation with the IBM/Hercules monochrome standard (which you can of course fit, with a suitable monitor, in one of our expansion slots).

As suggested in his review on page 15, games software houses are converting their games to use the Amstrad 16 colour standard and mouse. At the *PCW* show we have already demonstrated *Cyrus Chess* and *Alex Higgins Snooker*, both of which use the Amstrad 16 colour mode and mouse (and are available from Amsoft).

R Perry
Technical Manager

Amstrad Consumer Electronics John Lettice replies: Mr Perry is quite correct, and my apparent assertion that "if you have a monochrome monitor none of the games will run" is actually a load of old codswallop. The text as published didn't, however, reflect what I originally wrote. My point initially was that you can't buy a bottom of the range, non-Amstrad PC compatible with mono monitor and expect games software to run, because they don't in general have a graphics adaptor. The Amstrad, as Mr Perry so lucidly points out, doesn't have this problem.

SOFTWARE CREATIONS

are looking for
PROGRAMMERS

Have you the ability and commitment to make a career in the computer industry?

Have you written any high calibre games or utilities for your home computer and would like to receive top royalties or outright payment?

For immediate evaluation contact:

Software Creations

6 Parklands, Whitefield, Manchester M25 7WY.

Telephone: 061-766 5053

COMPUTEC

MUSIC UK - (0902) 405100

HARDWARE

Prophet 5 to MIDI interface £100 inc VAT
Chroma to MIDI interface £299 inc VAT
DX Voice Vault
Decillionix The Box
DX7 ROMs from Skyslip and Rittor
Shadow GTM6 guitar to MIDI

SOFTWARE

Steinberg Syntech Passport C.Lab Joreth
Microvoz Treasoft DHCP Lemi MIDI soft
XRI Systems Icon Cheetah Roland Etc.
Roland JX8P Editor for the Commodore
Prophet 2000 Editor for the Commodore

Overseas Customers Welcome
UK Send Cheque or PO for £1, Overseas send £2
International Money Order, for facts pack and price list.
Refund on purchase
* The only music-software specialists in the country *

24 HIGH ST., BROCKMOOR, BRIERLEY HILL,
WEST MIDLANDS DY5 3JA

Evesham Micros PRINTER OFFERS

Check out these offers on top quality dot matrix printers. All the models offered are substantially reduced from the normal high street prices. Prices are fully inclusive of VAT, delivery and lead to suit any computer with centronics parallel printer port, eg. Amstrad, B.R.C., Einstein, Atari ST, Oric, Dragon, Memotech or MSX. For the CBM 64/128 we supply a user port centronics cable. For Spectrum or QL owners an appropriate interface is supplied for an extra £20.00, for Atari models other than the ST an extra £30.00. Delivery is by insured receipted delivery and orders are despatched the next working day after receipt, provided we have stock.

Micro P. MP165

The best NLQ of any printer in the price range? Many people think so. This particular printer has been very popular recently and should win even more friends at this price. Very highly featured with 165 cps draft speed and a switch selectable NLQ mode at 70 cps. (Manufacturer's figures).

Standard features include friction and tractor feed, 2K buffer, Epson compatibility, quiet operation, and full graphics capability. This printer must offer the highest specification available for the price. Look at these unretouched, actual size print samples.

Superb near letter quality print and high draft speed make the MP165 an outstanding buy at this price. *Italics and good underlining* along with many other print modes confirms the **FACT**.

THIS MUST BE THE BEST PRINTER OFFER IN THE COUNTRY
ONLY £219.95

Price includes printer lead to suit your micro.
Or to suit Spectrum £239.95 including Centronics "E" interface

PANASONIC KX P1080

Now available at a really competitive price. This printer has a R.R.P. of £245 + VAT. Features are: 100cps; Friction and tractor feed; easy access "dip switches"; easy change long life ribbon and superb switch selectable NLQ mode.

A sample of the impressive N.L.Q. from the Panasonic KX P1080 N.L.Q. available in Elite (12cpi) and italic modes.

Superb value from Evesham Micros
High quality from Panasonic
Two names you can trust

ONLY £199.95

Price includes Centronics lead to suit your micro.
Or to suit Spectrum with Kempston "E" Interface £219.95

STAR NL10

New high specification printer just released. All the usual features PLUS easy front panel selection of most modes, semi automatic single sheet feed AND plug in interface cartridges. Choose between standard centronics parallel, IBM, or Commodore. Ideal for Commodore owners who want the convenience of a CBM ready printer but may wish to change later, just buy a new interface cartridge for £39.00.

OUR PRICE: ONLY £269.00
(state which cartridge required)

ATARI 1040ST mono	£799.00	ATARI 1040ST colour	£999.00		
(these prices INCLUDE VAT)					
ATARI 520STM c/w SF354	Disk Drive	£449.00			
FREE "THE PAWN" WITH ALL ATARI'S					
CBM 1526 printer	£149.95	SS/DD	£12.95	DS/DD	£15.95
CBM MCS 801 colour printer	£199.95	3" 3M DISCS (packs of ten)			
CBM 1541C Disk drive, latest model	£189.95	SS/DD	£29.95	DS/DD	£39.95
5" 3M DISCS (packs of ten)		3" DISCS (suit Amstrad)			
SS/DD	£11.95	DS/DD	£14.95	BOX OF TEN	£39.00
or in plastic library case		All offers subject to availability			

All prices include P&P and VAT. Send cheque, Postal Order or Credit Card No. Credit Card order accepted by phone. Callers welcome. Wide range of goods stocked. Trade enquiries welcome. European orders send price as advertised. Outside Europe £2.00 for airmail. Mail order to Evesham Shop please.

EVESHAM MICROS
BRIDGE STREET, EVESHAM,
WORCS., WR11 4RY.
Tel: 0386 41989

MICRO CENTRE
1756 PERSHORE ROAD,
COTTERIDGE, BIRMINGHAM.
Tel: 021-458 4564

Atari versus Amstrad

John Lettice talks to Atari president Sam Tramiel about the newest Atari computers

If the recent PCW show proved anything it was that the micro market is diverging into two main strands.

Amstrad launched its PC in the week of the show, and the machine, although an excellent implementation of the IBM standard, is in no means new. Like Amstrad's other micros it is essentially a well-executed package of tried and tested products, and technically breaks no new ground.

The other strand is currently represented by Atari, which although clearly out-ballyhooed by Amstrad at the show, was extolling the virtues of high tech and deploring the vices of packaging to everyone who'd listen.

There's generally at least one Tramiel holding court to the press at each major show, and this time, although Jack was absent, sons Sam and Leonard were filling the slot admirably. In the company's home US market Amstrad hasn't made an impact, and won't do until it launches its PC there next spring, so it's curious that Atari president Sam Tramiel already talks of the British company as a major competitor.

The US is currently pretty well overrun with cheap PC clones, and although 68000-based machines like the ST, Macintosh and Amiga have managed to carve out a niche for themselves, they've in no sense achieved mass market status.

Considering the conditions it would seem logical for companies like Atari to batten down the hatches and wait for the PC storm to blow over.

Sam Tramiel, however, doesn't accept this, seeing the PC standard as something Atari should be in head-on competition with. Asked how he'll do this he waves his hand airily towards the corner of the room. "With that," he says.

The 'that' in question was, at the time of the PCW show, a mock-up of a new PC-style package of system unit, de-

"The Atari ST will be available in a new housing, so you'll either get it as a complete package or à la carte"

— Sam Tramiel on the new Atari machines

tached keyboard and monitor based on the ST. According to Tramiel the machine is already in prototype form, and will be launched directly against Amstrad and the clones.

"It'll mean the ST will be also available

under Amstrad, it will be either the same price or slightly over," the argument being that the ST is vastly superior to the PC technically, and can therefore sustain some price disadvantage.

But if it's to compete with Amstrad on price Atari has a problem. Amstrad now has an entry level, single drive machine with bundled mono monitor for £459, and even if Atari were to produce a bundled version of the 520ST to compete here — which clearly wasn't what Tramiel was talking about — it would have to drop the machine's price by around £100, with similar implications for the rest of the range.

Launch date is also equivocal, as Tramiel would clearly like to get the new version STs out this November, while general manager Max Bambridge guarantees "no more new machines before Hanover" (next year's Hanover Fair), then undercuts himself by saying that

because the micro market changes so fast, that statement only holds good for two weeks.

Bambridge also categorically denies that Atari will be launching a £459 Amstrad-basher, and changes the subject when it's suggested Atari might currently be split over whether to go for Amstrad or not.

As far as Sam Tramiel is concerned, it's more a case of 'how' than 'whether'.

Clearly he wants the ST to supplant the PC as a world

standard, and clearly he wants to begin to make this happen, but he's still looking at market conditions — British market conditions in particular. The question — which he's not too proud to ask people — is whether the ST can compete on a combination of power and price, or whether it can only face Amstrad by competing on price.

If the answer is price, then the next question Atari must ask itself is whether it can afford it. If it decides it can we might just see some interesting new launches a lot earlier than Hanover.



in a new housing, so you'll get it either as a complete package, or à la carte." The mock-up bore the legend "2080ST", but Atari isn't saying what it will eventually be called.

Tramiel claimed to be unsure whether the base machine will have 2Mb or 4Mb of Ram as standard, but it seems likely that first models will be 68000-based, with 68020 versions to follow.

Pressed on price, Tramiel first says it will be priced "competitively", then elaborates.

"There's no reason for it to be priced

Have you entered our Autumn Competition?

We've reached the halfway point in our autumn bonanza now, and here are two more science fiction movie stills for you to identify.

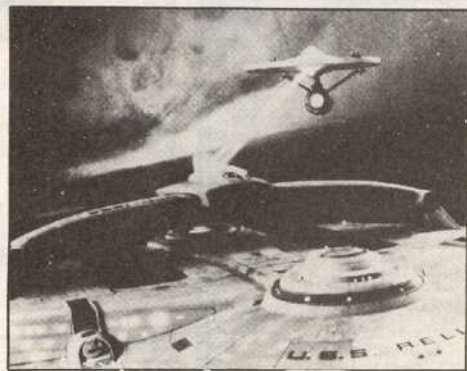
Remember — don't send anything in yet. There are two more films to be identified next week, and after that, we'll print the entry form, and maybe drop a hint or two.

The prizes

Up for grabs are some pretty classy prizes. Five brand new Spectrum Plus 2s will go to the first five winners; then we've got ten Star Macronix printers to give to the next winners. And last but not least, the next 50 winners will receive a Mastertonic Magnum joystick. So don't lose this page — with prizes like these on offer, you can't afford not to enter.



Picture 5 (above): Which film featured these weirdos?



Picture 6 (left): Not so difficult perhaps, but which movie in the series does this still come from?

**Home users...
business users...
educational users...
this is YOUR show!**

Champagne Suite & Exhibition Centre

**NOVOTEL
HAMMERSMITH
LONDON W6**

The 5th official

**AMSTRAD
COMPUTER
SHOW**

Organized by
Database Exhibitions

Friday, October 3, 10am-6pm
Saturday, October 4, 10am-6pm
Sunday, October 5, 10am-4pm

Confirmed bookings from:

Amstrad	Computer Manuals	Loadplan	SageSoft
Amstrad Computer User	Computing with the	MicroLink	Sandpaper Software
Amstrad Professional	Amstrad	Manostat 800	Saxon Software
Computing	Connect Systems	Minerva	Selanta
Advanced Memory Systems	Comix	Miniature Tool Co	Shekhana
AK Marketing	EG Computer Graphics	MML Systems	Seven Software
Amtec	Fireground	Nectar Software	Software Plus
Bernard Bahrin	Garwood Software	Overbase	Sumshine Books
Bourne Educational	GEM Distribution	Quest International	Teamware Software
Software	Guitronics	Pace Microtechnology	The Electric Studio
Cambridge Software Works	HISOL Computer Services	PCS	Timote
Caston Software	Intellock Services	Prison Software	Transform
CDS Software	RDS Electronics	Probe Utilities	Videx Case Co
Curcom	LCL Educational Software	Professional Data Services	Willenty
Compact Software	Load and Run	Robert Edwards & Co	

Advance ticket order

Please supply

Adult tickets at £2 (save £1) £ _____

Under 16s tickets at £1 (save £1) £ _____

TOTAL £ _____

Cheque enclosed made payable to Database Publications Ltd

Please debit my credit card account

Address _____

City _____

Postcode _____

Admission at door: £3 (adults) £2 (under 16s)

POST TO: Amstrad Show Tickets, Europa House,
68 Chester Road, Hazel Grove, Stockport SK7 5NY.

**AMSTRAD
COMPUTER
SHOW**

Champagne Suite & Exhibition
Centre, Novotel, Hammersmith, W6
October 3-5, 1986

PHONE ORDERS: Show Hotline: 061-456 8835

PRESTEL ORDERS: KEY '89, THEN 614568383

MICROLINK ORDERS: MAILBOX 72 MAG001

Please quote credit card number and full address - Ref: Pop 3

**Avoid the
queues!**

**Get your
ticket in
advance
and...**

**SAVE £1
A HEAD!**

LOGIC'S SUMMER SALE

SPECTRUM TITLES	
Lords of Time	4.95
Showball	4.95
Colossal Adventure	4.95
Emerald Isle	3.99
Adventure Guest	4.95
Ashkeron	1.99
Bizzcom	2.95
Physchedelia	1.99
Highway Encounter	3.95
Alien Highway	3.99
Knockout	3.99
Match Fishing	2.99
J. S. W.	2.99
American Football	4.25
Now Games Compilation	3.99
Matchpoint	3.95
Eureka	1.99
Blockbusters	3.99
Nightlife II	1.99
Lord of the Rings	6.95
Train Game	2.99
Gremkins	2.99
Pinball Wizard	3.95
Superchess 3-5	3.95
Juggernaut	2.99
Talos	2.99
Beamrider	2.99
Phantasia Diamond	2.99

Sold a Million	
inc Decathlon	4.99
Sabre Wolf	4.99
J. S. W.	4.99
Beachhead	4.99
Dark Star	2.50
Availon	2.99
Lazy Jones	2.50
Confusion	1.99
Moon Alert	2.95
Gilt from Gods	1.99

Arcade Hall of Fame	
inc Raid!!	4.99
Blue Max	4.99
Rocco	4.99
Flak	4.99
Hunchback!!	4.99
Mini Office	3.50
BC's Quest for Tires	3.95
Moon Cresta	3.50
Robot Messiah	2.50
Technician Ted	1.99
Astro-clone	2.99
Monty Mole	3.99
Beachhead II	3.99
Bluper Lee	3.99
Never Ending Story	4.99
Bounty Bob	3.99
Sabre Wolf	2.99
Underworld	3.99
Twin Kingdom Valley	2.99
Wizards Lair	2.99
Wheeler	2.99
Everyone's a Wally	2.99

PERIPHERALS 48K	
Currah Micro-Slots	2.95
5 Rolls of Alphacom Paper	8.95
Timex 20/40 Thermal Printers	34.95

COMMODORE 64 TITLES	
Cascade 50	2.95
Beachhead	2.95
Greegs Revenge	3.95
Tallegda	3.95
Combat Leader	3.50
Doughboy	1.99
Ancipital	1.50
M.L.B.A.T.E.T.	1.50
Arc of Yesod	3.50
Crazy Cornets	1.99
Dummy Run	1.99
Automania	1.99
BC's Quest for Tires	2.99
Manic Miner	2.95
J. S. W.	2.95
Who Dares Wins II	2.95
Outlaws	3.99
Hover Bover	1.50
Colossal Adventure	4.95
Lords of Time	4.95
Pastfinder	2.99
Causes of Chaos	2.99
Wed Dimension	2.99
Space Shuttle	2.99
Beamrider	2.99
Rock 'N' Bolt	2.99
Fighting Warrior	2.99
Rocky Horror Show	2.99
Blade Runner	2.99
Drebs	2.99

COMMODORE 64 DISCS	
Zork I	3.99
Zork II	3.99
Zork III	3.99
Starcross	3.99
Deadline	3.99
Suspended	3.99
6 Games Disc (inc Sooper Fruit, Depth Charge, Stellar Wars, Labyrinth, The Quest, Patience, Spirit Stones, Bozo's Night Out, Jammin')	1.99
Whispering Gears Rhymeland	1.99
Hover Bover	2.99
Sheep in Space	2.99
Revenge Mutant Camels	2.99
Exodus Ultima III	4.99
Super Zaxxon	3.99
Monty of the Run	3.99

64 UTILITIES	
Dr Watson 64 Ass Lang. Course Disc	9.95
Touch Type (cass)	2.95
Commodore Modems	49.95
Easy File (disc)	9.95
Programmer's Ref. Guides	3.99
Easy Stock (disc)	9.95
Easy Script (disc)	9.95
Future Finance (disc)	9.95
Easy Spell (disc)	9.95
Assembler Tutor (disc)	9.95
1501 Disc drives for +4 and C16	79.95
C2H Databases	24.99
Commodore Joysticks	4.99
Commodore 128 Music Maker Keyboard	9.95
Facem (Assembler/Disassembler)	2.99
Programmers Utilities (Disc)	7.95
Simons Basic Extension (cassette or disc)	4.99

Bargain Books from 1st Publishing
 8 Books for just £9.95 + £2.50 p&p
 Normally over £50.00 RRP
 64 Cassette Book
 Anatomy of a Commodore 64
 Graphic Book C64
 Peekes & Pokes C64
 Tricks & Tips C64
 Advanced Machine Language Book C64
 Ideas Book C64
 Machine Language Book C64

1st Publishing Programs on Disc for C64
 All just £10.95 each.
 At least £20.00 off RRP!!
 Firstbase (word proc)
 Firstbase (database)
 Basic 64C
 Pascal (language)
 A.D.A. Training Course (language)
 Power Plan (calc prog)
 Assembler Monitor (compiler)

Postage and packing 75p all orders
OVERSEAS £1.00 per tape

LOGIC SALES LTD.
 6 MIDGATE, PETERBOROUGH,
 CAMBS PE1 1TN
 24 hour ordering on 0733 313870

ANCIENT & MODERN

Unit 111 (Rear), Washington Road, West Wilts Trading Estate, Westbury, Wilts					
SPECTRUM	inc AM	COMMODORE 64	inc AM		
Paperboy	7.95	4.90	Paperboy	6.90	10.50
Dan Dare	8.95	6.95	Astoria	6.90	10.50
Dragon's Lair	7.95	4.90	Dan Dare	6.90	N/A
Graphic Arts Creator	22.95	14.99	Dragon's Lair	6.90	N/A
Ghost 'N' Goblins	7.95	4.95	Sazer Cycle	2.90	N/A
Heartbeat	9.95	5.90	W.A.R.	6.90	N/A
Adriatic Challenge	7.95	5.25	Go for Gold	2.90	4.25
Laser Game	14.95	9.90	Tune Tunnel	4.90	8.80
Inc. Jinx	7.50	3.90	Handball	4.90	8.90
Back to the Future	9.99	3.99	Other US Gold	6.99	9.99
Arc of Yesod	7.95	2.90	Comic Bakery	4.90	N/A
Zaxxon	7.95	3.99	Que Pasa	2.99	N/A
Any Freshed Silver	1.99	1.80	Snowboard	4.99	N/A
Scrabble	14.95	4.90	Yin Yr Kung Fu	6.90	9.99
Killer Tomatoes	7.95	2.99	Bombjack	6.90	8.99
Adventure Hall of Fame	5.95	4.99	Bounder	3.99	6.99
Top Cat	9.95	2.99	Fighting Warrior	4.99	9.99
I of the Mask	9.99	3.99	Graphic Arts Creator	14.95	15.99
Foremost Adventures	7.95	3.99	Gyrfalcon	6.90	8.99
Rock 'N' Wrestle	9.95	4.95	Ghost 'N' Goblins	6.90	9.90
Amazon Women	7.95	3.99	Graphic Arts Creator	14.95	15.99
Perchon	9.95	2.99	V	5.99	N/A
Shabwaf	9.95	2.99	Max Headroom	3.99	N/A
P2 Warner	9.95	2.99	30 Games	4.99	N/A
Winter Games	7.95	4.99	Uddrum	7.99	9.99
Dynaste Dan II	7.95	4.99	Rock 'N' Wrestle Edition	5.90	9.99

All prices include P & P. Overseas add 75p per tape please. Thousands of titles in stock. Please send SAE for full list stating machine. Lists also available for C16, Dragon, Electron, BBC, Vic 20.
 *Cheques/POs payable to AMTEN Ltd.

Unit 111 (Rear), Washington Road, West Wilts Trading Estate, Westbury, Wilts.

YOUR NAME IN THIS SPACE!

**CALL SIMON LANGSTON
01-437 4343**



Once Bytten

31 BOWNESS ROAD
LONDON SE6 2DG

Phone Orders: 01-698 2911
(Callers by Appointment Only)

IT'S THE WAY WE SELL 'EM!
 THAT MAKES ONCE BYTTEN DISC THE BEST BUY. TOP
 QUALITY FLOPPIES FROM TOP FLIGHT MANUFACTURERS.
 100% ERROR FREE - LIFETIME GUARANTEE AND NO HIDDEN
 EXTRAS... WHAT YOU SEE IS WHAT YOU PAY.

SPECIAL OFFERS FOR AUTUMNAL EVENINGS IN FRONT OF YOUR MICRO!!!

10 x 5 1/4" SSDD Discs in Library Case with sleeves, labels, write-protects and hub-ringed	£8.95
5 Boxes (50 Discs) for only	£39.95
10 Boxes (100 discs) for only	£75.00
10 x 5 1/4" DSDD Discs in Library Case with sleeves, labels, write-protects and hub-ringed	£8.00
5 Boxes (50 Discs) for only	£45.00
10 x 3 1/2" SSDD Discs in Library Case with labels	£18.95
5 Boxes (50 Discs) for only	£89.95
10 x 3 1/2" DSDD Discs in Library Case with labels	£24.95
5 Boxes (50 Discs) for only	£117.50
10 x 3" Amsoft Discs	£34.95

Bulk Unbranded Discs with sleeves
 (Without boxes or labels, but same high quality discs)

5 1/4" SSDD 96tpi	25 £16.95	5 1/4" DSDD 96tpi	25 £18.95
	50 £29.95		50 £34.95
	100 £55.00		100 £65.00
3 1/2" SSDD 135tpi	25 £39.95	3 1/2" DSDD 135tpi	25 £49.95

Please ring for quotations on larger quantities.
 Trade, Government and Company orders welcomed.
 Quickshot II "The World's favourite joystick" £7.95 inc. P&P

ALPHACOM 32 PRINTERS

High quality thermal printer for all Spectrums at a give-away price only £19.95 (p&p insurance £3.00)

DISC BOXES
 5 1/4" 10 Capacity 1 + £1.50 10 + £1.25
 5 1/4" 100 Capacity Locking 11 + £11.95
 12 + £10.00
 5 1/4" 10 Capacity 1 + £1.50 10 + £1.25

EXTRA ENVELOPES 5 1/4"
 10 + 9p 50 + 8p 100 + 7p
 500 + 6p 1000 + 5p

LABELS
 5 1/4" Label Sets (for 10 discs) inc. write-protects 1 + 35p 20 + 25p
 3 1/2" Label Sets (for 10 discs) 1 + 25p 20 + 20p

IMPORTANT Notice:— Any order including 10 or more discs is POST FREE, otherwise please add £1.00.

Cheques or Postal Orders payable to AMTEN Limited, please. Cash should only be sent by REGISTERED MAIL. You may pay by VISA or ACCESS card by mail or phone.
 HOTLINE FOR PHONE ORDERS 01-698 2911 37P010

The basic alternative for the ST

A new Basic is something that the ST is in need of. On paper there's nothing actually wrong with *ST Basic*, but a combination of bugs, the random destruction of the contents of string variables probably being the worst, and the awful editor makes programming a high on impossible chore.

So, if you can't be bothered waiting for Atari to replace it sometime in the distant future and you want to do some programming then an alternative is worth considering.

Fast ST Basic is one such alternative, from Computer Concepts, well known for their BBC software. Indeed, there is a certain BBC Basic flavour to some of the commands available. Not only that, but a number of word processing features have been included as well.

If you're going to call a product *Fast ST Basic* then to retain credibility it should knock along at decent pace. In fact it does more than that, it positively flies. Below are the results when the Basic undertook the PCW benchmarks, beating everything in sight from all eight bit machines (including the Amstrad PC alone) to 68000 based computers like the QL and Macintosh.

Benchtest No.	Speed (seconds)
1	0.145
2	0.58
3	1.305
4	1.455
5	1.51
6	2.58
7	4.105
8	2.73

Average: 1.801 seconds

The first thing to note about *Fast ST Basic* is that unlike the official language, it is supplied on a 128k cartridge which takes up no user memory. After a couple of clicks on the relevant icons, the two main windows of *Fast Basic* appear almost instantaneously.

These are the edit and output windows. All program output is shown in the output window, naturally, but using some of the available commands it's quite easy to print

outside it; anywhere on the screen in fact.

The edit window allows the inputting of program lines as well as correcting and editing facilities. Amongst the editing options are the facilities to cut, copy, paste and clear chunks of a program listing. The word processing theme continues with a search and replace feature and the fact that you can have ten different programs in memory (in segments which are allocated 32k when something is put into them) at the same time, although they won't run concurrently.

The other window available is the immediate window which is basically used for testing what a particular command will do without having to run a program.

Students of structured programming will be well pleased, because as well as offering *Def Proc... Endproc*, *Repeat... Until*, *If... Then... Else, Endif*, and *While... Wend* constructs, line numbers are completely optional in the program. If used, line numbers are simply utilised as labels and so are not automatically sorted as in other Basics. A program numbered 20, 30, 10, 5 will run in exactly that order, not the usual numerical order.

The ST is renowned for its quality graphics so it's nice to see 64 graphics related commands. It's possible to set the various patterns and colours used by the commands that draw lines, circles, pie charts, arcs, elliptical versions of the preceding commands, boxes, polygons, rectangles with rounded edges, fills and plot points.

A useful feature is the ability to print text, in various styles, at any graphics location on the screen, providing that the location is inside the user defined graphics area (which can be outside the output window!). Once there, text can be scrolled in any direction for any distance, one pixel at a time, and believe me, it does it very quickly, with just one command. Text can also be justified on a pixel rather than character square basis.

Most impressive of all is the



A famous smile for fast ST Basic

Blit command, a software blitter. Once an area of the screen has been defined, it can be moved around at will, although with nine parameters required it's certainly no doddle.

With the *Palette* command available, any of the ST's 512 possible colours can be displayed, something else that *ST Basic* could not manage to do.

An interesting pseudo variable is *Physbase* which can be read or written and determines which part of memory is used as the screen display. So, various picture screens could be loaded in and then displayed instantly by changing the value of *Physbase* to point to them. *Logbase* is a related pseudo variable which points to where in memory all screen output will end up. So, it's quite feasible to set an entirely new display area, free from the constraints of the output window, the size of which cannot be defined from within a program anyway.

File handling, serial and random access, is covered fairly comprehensively, the commands allowing the creation of directories and files and the reading and writing of characters, or blocks of characters, within them.

Perhaps the most staggering advantage of *Fast ST Basic* over the official lingo concerns using the various facilities offered by GEM. Atari *ST Basic* has such no commands, whereas *Fast ST Basic* is incredibly comprehensive, providing the means to do virtually anything. Mouse control, drop-down menus, dialogue

and alert boxes, windows and the like are all available. However, it has to be said that for the more advanced commands a thorough knowledge of the subject is required before attempting to use them.

And finally, there is an assembler built-in which enables Basic and assembly language commands to be used together, in BBC micro style. Unfortunately there are only a scant 11 pages of the manual devoted to the assembler which can hardly be said to be enough.

Fast ST Basic is not perfect, program lines can be larger than the edit window causing the left hand side of the line to vanish as window scrolls everything along (it means you can't see all of the program line at once). There's no command to change screen mode and the sound commands are few (three) and somewhat crude.

One other problem - the manual is inadequate in places; there again how could it hope to cover everything in detail without being so large as to add pounds to the selling price of the whole package?

But any way you look at the thing, it's a vast improvement on Atari *ST Basic* in virtually all departments, very fast and definitely worth considering.

Duncan Evans

Program *Fast ST Basic*
Micro Atari **ST Price**
 £89.95 **Supplier** Computer Concepts, Gaddesden Place, Hemel Hempstead, Hertfordshire HP2 6EX.

Exploring the cave of the Word Wizard

Educational software has very seldom been 100% satisfactory. Either it is very good educationally but poorly programmed, lacking motivation and ease of use, or very well programmed but totally useless as far as teaching is concerned.

A new product from Time-works UK, the distributors of

various business software, for the C128 brings a fresh approach to educational software, with *Cave of the Word Wizard*, a spelling game with a built-in speech facility.

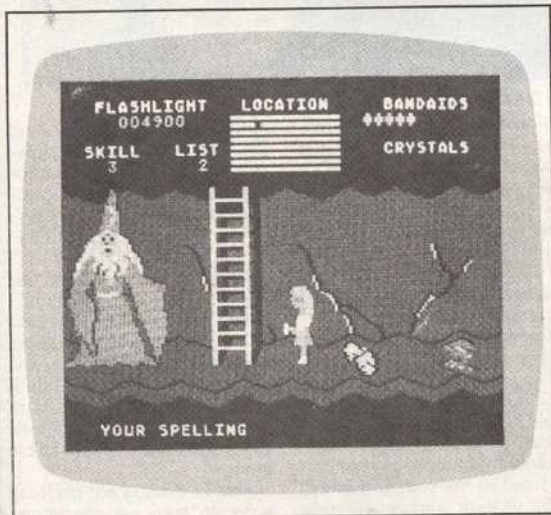
The program comes on a disc where Side a contains the main program, and Side b contains additional word libraries. The game is similar in play to *Impossible Mission*:

you are in the Wizard's Cave, and you must find four crystals to escape.

There are eight levels in the cave (which are reached via ladders and holes), and of course there are nasties, namely rocks, spiders, puddles which will require a plas-

The whole thing is very well presented, and is a lot of fun to play even for a grown-up, with several libraries of words that should take care of the more advanced player. A nice touch is the facility to choose between being a little boy or a little girl.

"The whole thing is very well presented, and is a lot of fun to play even for a grown-up, with several libraries of words to take care of the advanced player"



From the *Cave of the Word Wizard*

ter when bumped into.

As you proceed with your quest, the batteries of your torch weaken, and the wizard appears at regular intervals to ask the spelling of a word. It is fair to say that the speech is excellent, the only snag being a hint of American accent. If you spell the spoken word correctly, you are rewarded with extra batteries or plasters, otherwise you lose some light. You lose if you run out of light or have encountered too many nasties.

The acid test came when young children played the game. The results speak for themselves: children will play it for hours. I would definitely class this game as one of the best educational programs ever published.

Eric Deghaye

Program Cave of the Word Wizard Micro Commodore 64/128 Price £19.95 (disc only) Supplier Timeworks UK, PO Box 453, Maidenhead, Berks SL6 1ST.

The Rolls-Royce of merger programs

No matter how good the hardware, or the operating system, or the programming language, no manufacturer has yet released the perfect programming system.

Which is good news for hackers who like to write their own utilities. And better news for software companies who like to sell utilities to those of us not up to writing our own.

Companies like Indev, which has recently released *Blinker* for the Commodore 64.

Blinker is a Basic linker, somewhat like the merge utilities often included in programmer's toolkits, or printed in magazines like *Popular*.

However, *Blinker* is to merge utilities what a Rolls-Royce is to a Citroen 2CV.

What *Blinker* does is to allow you to create libraries of oft-used routines, and incorporate them into new programs with consummate ease. More to the point, it's a rock-solid piece of software which tells you what's happening as it happens, what's just happened, whether anything went wrong, and what the state of play is after it's done all these things.

Error messages are clear and helpful, and the documentation is excellent with full examples, memory maps and so on.

Suppose you want to write a simple database (or even a complicated one). Break it down into a number of routines; add a record, find a record, delete a record, sort a file, load a file, save a file, etc.

Now, clever chap that you

are, you already have a sort routine, and save, load and print routines, and all sorts of other useful stuff.

Instead of writing it all over again, you simply load *Blinker*, write the master routine to control all the other bits, then type in: BLINK, "SORT", "SAVE", "LOAD", "PRINT", etc.

Now *Blinker* will pull in all these routines from disc, tag them onto the end of your main module, renumber everything, and leave the whole job neat and tidy.

It also tells you how much program memory is being consumed, how much variable memory is available, and will intelligently look for routines that would create an "Out of Memory" error, or illegal line numbers.

There are lots of other pos-

sibilities too, but what it boils down to is that *Blinker* makes serious program writing a hell of a lot easier.

And there's the rub, as Shakespeare would put it. Who does that much serious programming in 64 Basic? There's also the question of price: *Blinker* will cost you £29.90, which to my mind is precisely £14.95 too much.

So, wonderful as *Blinker* undoubtedly is, I don't see much of a market for it. Pity really, but then I almost never use the Rolls to drop off the laundry either.

Peter Worlock

Program Blinker-64 Micro Commodore 64 with disc drive Price £29.90 Supplier Indev, 24 Deerings Road, Reigate, Surrey RH2 0PN

The clone of contention

The new Amstrad machine, says John Lettice, is up and running

Amstrad has traditionally made larger and larger piles of money not by stating the obvious so much as by doing it. Obviously there was big money to be made in the home computer market, so the CPC464 was launched. Obviously serious users wanted a complete system that they could use rather than puzzle over, hence the PCW8256 and 8512.

The latest move, the launch of the PC1512 series, is probably the most obvious of the lot. IBM has dominated the business market for the last five years and has sold stacks and stacks of its PCs simply by virtue of the fact that it is IBM. Other business manufacturers have followed the IBM standard, and until recently, when a lot of small companies decided they could put together IBM clones, sell them for half the price of an IBM PC, and still make a profit, the bigger companies were all doing very well for themselves.

Now the obvious bit here is that it needn't actually cost any more to produce a business machine than it does to

make any other machine, and that if a company were to produce a PC clone in volume it could sell it at a price low enough to make the business manufacturers lose interest in the PC standard fairly rapidly. That's what Amstrad has done with its PC, and the initial intention is to carve out a large slice of the world market. On first impressions the new machines might just be neat enough and cheap enough to do it.

"The monitor is neatly designed and mounted on a tilt and swivel stand on the top plate"

The machine is simple in construction. It's smaller and lighter than the IBM PC, but the need for 5 1/2 inch disc drives and IBM standard expansion slots has kept its desktop footprint up to around 15 x 15 inches.

The entry-level machine has a single drive plus monochrome monitor, and the series goes up to single drive plus 20Mb

hard disc and colour monitor. The review machine's twin floppy drives took up the whole of the front plate of the machine, and being substantial metal-sheathed beasts extended back across half of the machine's base unit.

I/O ports are on the left hand side and around the back. On the left beside the volume control (zero to horrible racket) is the keyboard plug and mouse port. I take it the latter's placing was dictated by circuit board layout, but while I'm happy to meet my first left-handed mouse I'm not sure how the majority of users, who are I believe right-handed, will take to it.

Parallel and serial ports are at the rear, with video output and power input (like other Amstrad machines the power supply goes through the monitor) just along from them.

On most PC compatibles the expansion slots are accessed by unscrewing the casing, generally a fiddly task on a crowded desk, but the Amstrad PC uses a hatch to the rear of the top of the casing plus one on the side for access to

continued on page 18 ▶

NOBLES COMPUTER REPAIRS

- * Repairs carried out by our own engineers
- * All repairs carry a 4-MONTH GUARANTEE

For estimates phone or send your computer to NOBLES Spectrum Plus..... **£16.95** inc parts

Commodore 64/Vic 20 from **£9.95** plus post and pack parts

Amstrad..... from **£18.95** plus parts

Also repair specialists for MSX computers

NO HIDDEN CHARGES

★ SPECIAL OFFER

5 FREE GAMES WORTH £25

with each Spectrum repair - Trade/School and Club discounts arranged

* For free, no obligation estimates phone or send your computer to **NOBLES** for the fastest, cheapest repairs in ESSEX.

NOBLES

14-17 Eastern Esplanade

Southend-on-Sea

Essex

0702 63377/8

63336/7/8/9

7 days a week, 24-hour Answering Service

HARDWARE

	RRP	WAVE
PCW 8256	£458.85	£409.00 (a)
PCW 8512	£573.85	£513.00 (a)
CPC 6128 green	£299.00	£267.00 (a)
CPC 6128 colour	£399.00	£361.00 (a)
CPC 464 green	£199.00	£178.00 (a)
CPC 464 colour	£299.00	£267.00 (a)
DMP 2000 Printer inc. free cable	£159.00	£139.00 (a)
DD1 Disk Drive CPC 464	£159.95	£143.00 (b)
2nd 3" Drive ONLY - PCW	£182.85	£136.00 (b)
2nd 3" Drive + 256K Ram upgrade	£232.85	£162.00 (b)
Gemini Intergem Interpace - PCW	£98.95	£69.00 (c)
PSD 3 Pace 5 1/2" Drive par Intergem	£143.75	£123.00 (b)
CP5 8256 Cent. - RS232 Interpace	£68.94	£60.00 (c)
Brother HR15 Daisywheel printer I-F	£449.00	£399.00 (a)

SOFTWARE databases

A. Tate Dbase II - PCW	£119.00	£87.00 (d)
Sage retrieve - 6128/PCW	£69.99	£44.00 (d)
Caxton condor 1 6128 twin/PCW	£99.99	£73.00 (d)
Camssoft Cambase PCW	£49.95	£30.00 (c)
Compact Nucleus - PCW	£99.99	£68.00 (d)
Compsoft delta 6128 twin/PCW	£99.99	£70.00 (d)
Rat. Sol. At last 1 6128/PCW	£49.95	£33.00 (d)
Gemini datagem PCW	£39.95	£26.50 (d)
M.P.S. Kwikfile CPC	—	£10.00 (e)
C.F.2.3" Blank discs (box of 10)	£45.00	£35.00 (d)

All prices include VAT. Please add carriage indicated as follows: (a) £5.00 (b) £4.00 (c) £3.00 (d) £2.00 (e) £1.00 despatched by return of post.

W.A.V.E. (mail order)

Walney Audio Video & Electrical

53 Shearwater Crescent, Barrow-in-Furness, Cumbria LA14 3JP. Telephone: 0229 44753

Hardware Feature

the cards' interfaces. Both these are easily snapped in and out.

The monitor is again neatly designed, and is mounted on a tilt and swivel stand that fits into a well on the top plate. Unlike standard IBMs the monochrome and colour versions use the same video output, with the mono simply showing shades of grey instead of colour.

IBMs also have severe limitations on the number of colours that can be displayed at once – which is why PC games generally have odd colour combinations – but the Amstrad can handle 16 in 80 column mode. It's also compatible with two of the modes available on IBM's EGA (Enhanced Graphics Adaptor), which is more than you can say for most software packages...

Screen quality is quite good, although not superb, and this leads on to a major disadvantage. Because the power supply is in the monitor you can't fit third party monitors to the machine without fitting a new power supply or running two monitors. You'd also better be sure of the monitor you want when you buy the machine, because if you upgrade from Amstrad mono to Amstrad colour you'll wind up with a useless mono monitor.

The machine's keyboard is basically IBM format, although there's a separate *Enter* key on the numeric keypad (operation being similar to the one on the PCW), and the *Alt*, *Control*, *Caps lock* and *PrtSc* (print screen) keys have been moved to slightly more sensible locations.

The feel of the keys is fine, although I've seen better on machines four or five times the price of the Amstrads. The keyboard also includes a joystick socket, but this apparently emulates the cursor keys rather than being compatible with

the standard IBM joystick, so games software will need some amendment.

If you look inside the machine you see what Amstrad really does best. The original IBM machines have sprawling circuit boards populated by large quantities of low-tech chips. The Amstrad on the other hand has its chip set boiled right down, and rather than being socketed (which is cheaper for small runs, but costs more for volume production) most of the chips are surface mounted.

The board takes up around two thirds of the machine's base. The 512K Ram is made up of 256K chips, while the 128K upgrade will consist of 64K chips fitted into sockets alongside. These extend right under drive A, which would have to be removed to gain access to them. What price field upgrades?

The 8086 processor is fairly central, with a socket for the 8087 maths co-processor alongside it, other major points of interest being several custom chips labelled Amstrad. Developing these will have a cost a packet, but when economies of scale take over they'll make Amstrad's production costs difficult to match.

Operation

Amstrad claims that the machine is spectacularly fast, outrunning all but the Pinnacle, a little-known PC compatible machine. The claims are true, as far as running Basic programs are concerned, but don't really hold water for normal operation. Disc access for a standard *Wordstar* document is marginally faster on the Amstrad than the Bondwell PC, but then again as the Amstrad has the superior 0006 chip running at 8MHz, and the Bondwell has an 8088 running at 4.7MHz, it ought to be a lot faster. The

point here is that the basic mechanics of I/O flatten out performance considerably.

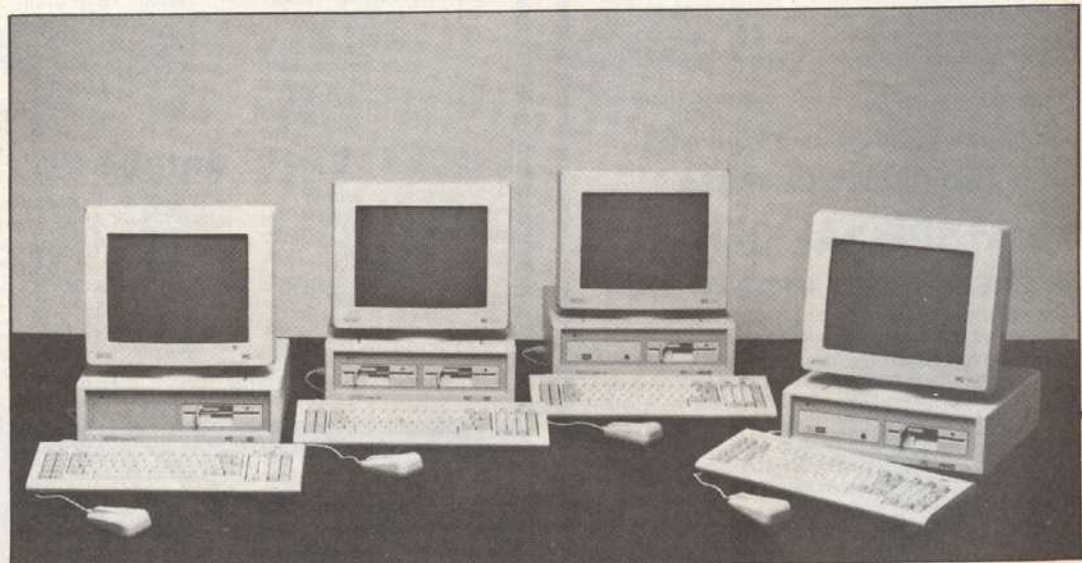
Screen handling is also an impediment to the Amstrad's speed. As far as text display is concerned it's faster than the IBM, but seems lower than the Olivetti M24, which also runs an 8086 at 8MHz. Graphic screens are more significantly slower. The test used here, which I hereby patent, involves *F15 Strike Eagle* software (see last week's issue for review) and time taken to run out of fuel. With afterburners engaged the Amstrad took just under three minutes, while the Olivetti turned into a brick at just over two.

The Amstrad, however, is probably still faster than the IBM in terms of graphics. The spectacular differences in Basic speeds (over twice the speed of the M24) can incidentally be ascribed in part to Locomotive's Basic 2, which is very fast indeed. It also runs under Gem, and together Gem and Basic 2 suck up over 470K of the machine's 512K Ram, but that's another story.

System software

This is probably the most valuable, and unnerving, area of the whole machine. The standard IBM operating system is Microsoft's MSDOS, and this is included. It is, however, also possible to use the machine with a second system, Digital Research's Dos Plus, which is also bundled, and finally it can be run under Gem, DR's windowing front end for the PC. Gem isn't strictly an operating system, but has been pre-installed on a third disc which also includes Dos Plus.

Working out which you'll use is problem enough, but the confusion is heightened by various bits and pieces that



squirt out of the discs as you chug along. Dos Plus allows a measure of multi-tasking, and the disc includes a couple of little programs, including an alarm and background printing utility, that take advantage of this. These, however, can only be accessed through Dos Plus, not through MSDOS or Gem. Considering DR wrote both Dos Plus and Gem I'm sure there must be a way to put the two together, but initial phone calls didn't enlighten me.

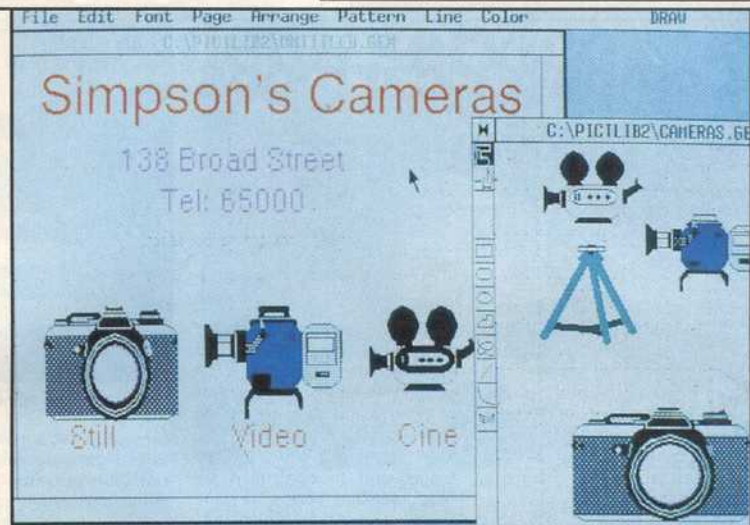
Dos Plus and Gem in fact, although worthwhile independently, don't seem to add up to more than the sum of their parts. Exit to Dos from Gem and you can't get back to Gem Desktop. Instead you've got to put the Gem Startup disc back into A, type *autoexec* or *gem* (although the latter appears not to work if you've run a program in the meantime) then reload the Desktop disc. It seems to me that DR ought to be able to make the two systems a lot more integrated than this.

Compatibility

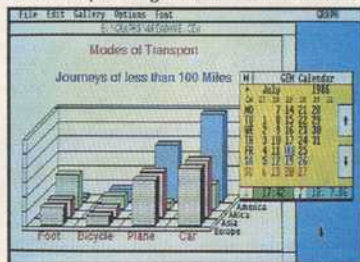
The way to make a machine totally compatible is to make it as slow and horrible as the original IBM. Amstrad to its credit hasn't done this, but the machine is still almost 100 per cent compatible. *Lotus 1-2-3*, *dBase*, *Flight Simulator* and *Open Access* all run, and I had no trouble with a fairly wide range of other programs, apart from *Sargon 3* chess, which seemed reluctant to return to a text screen after going to a graphics display. The latter also, however, gives trouble on the Olivetti, where it crashes whenever it seems to be losing...

Hardware compatibility is more difficult to judge, but the machine is likely to be able to take most IBM expansion cards, with a few exceptions.

It won't take an EGA because it can't



patch out its own graphics, and extra serial and parallel cards may cause problems depending on which areas of



memory they use. The advice here is try before you buy.

Verdict

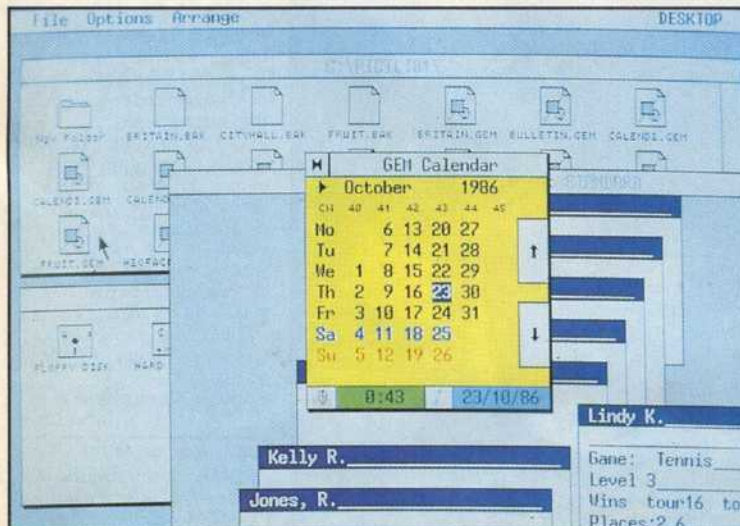
There are a few disadvantages to the Amstrad machines in absolute terms,

but as a total package of software and hardware they're well up in the front runners among PC clones. Take price into account and they have no competition there. Their competition elsewhere really depends on what you want a machine for.

If you want a fast, non-compromise machine at the cutting edge of technology you'd probably look elsewhere, but the Amstrads make no pretence to being this kind of machine.

What they are is cheap, relatively fast machines that run more different software packages than any other micro. At the moment this software is mainly business, but as the support market goes crazy it's inevitable that software of all kinds will be launched for the PC.

So the message is, if you want it for business it's a good buy now (although bear in mind you'll have to buy extra applications software and a printer) while if you are an enthusiast it may be worth your while waiting until the support starts coming through. Either way, at the price it's hard to go wrong.



All three photos above: the uses of a rare Gem

Machine Amstrad PC1512 Supplier
Amstrad, Brentwood House, 169 King's Road, Brentwood, Essex CM14 4EF

Prices (all including VAT)

512K machine plus:
 Single 360K drive and mono monitor £469
 Single drive and colour monitor £649
 Twin drives and mono monitor £587
 Twin drives and colour monitor £764
 Single drive, 10Mb hard disc, mono £822
 Single drive, 10Mb hard disc, colour £999
 Single drive, 20Mb hard disc, mono £940
 Single drive, 20Mb hard disc, colour £1,116

Computer cartoons for the younger generation

Asterix is the most successful attempt yet to create a "cartoon-style" computer game. The graphics are faithful to the spirit of the popular Asterix comic books, and the action is a combination of arcade challenge and simple entertainment.

Asterix, hero of the last Gaulish village still resisting the Roman invaders, must search the countryside for the missing pieces of the Magic Cauldron.

Without these, the village wise-man Getafix cannot brew the magic potion which gives Asterix his irresistible

strength.

Asterix and his giant companion Obelix move through some nicely coloured landscapes of trees, villages, Roman forts and deep forests in search of the lost pot.

Movement is three-dimensional and is controlled by joystick, and icons display your position, supplies, amount of magic potion available and so on.

Obelix needs a constant supply of hams, so Asterix must battle wild boar and there are always Roman legionaries must also be fought.

Battles take place in a



Camp Totorum from Asterix

blown-up section of screen in which the opponents slug it out with punches and kicks, again under joystick control, in a sort of mini-Exploding Fist scenario.

The music is nice, the graphics are fun, and the game must be quite difficult (since I couldn't get very far with it). However, the scenery takes an annoyingly long time to draw every time Asterix and chums wander from one

scene to another and this along with the lack of complex challenges will probably mean that *Asterix* will appeal more to younger players.

Popular Appeal ♦♦♦♦
Chris Jenkins

Program Asterix **Micro**
CBM 64 Price £9.95
Supplier Melbourne House, High Street, Hampton Wick, Kingston Upon Thames.

BMX Simulator to go platinum

The budget software market, with some justification, has often been compared to the singles record market - but whether that's true or not, *BMX Simu-*

lator (one of the first releases from the new budget software house, Code Masters) possesses many of the virtues a good 45 should have.

It's bright, loud, catchy and

it's cheap. In short, everything a budget game should be.

Sequel to that huge seller, *BMX Racers*, this one is an overhead view of various

BMX tracks (seven in all) which you race around, challenging either a friend or the computer.

You manoeuvre your bike round the track using joystick or keyboard. The controls are a doddle - left/right, pressing fire to accelerate, finger off the fire button to brake.

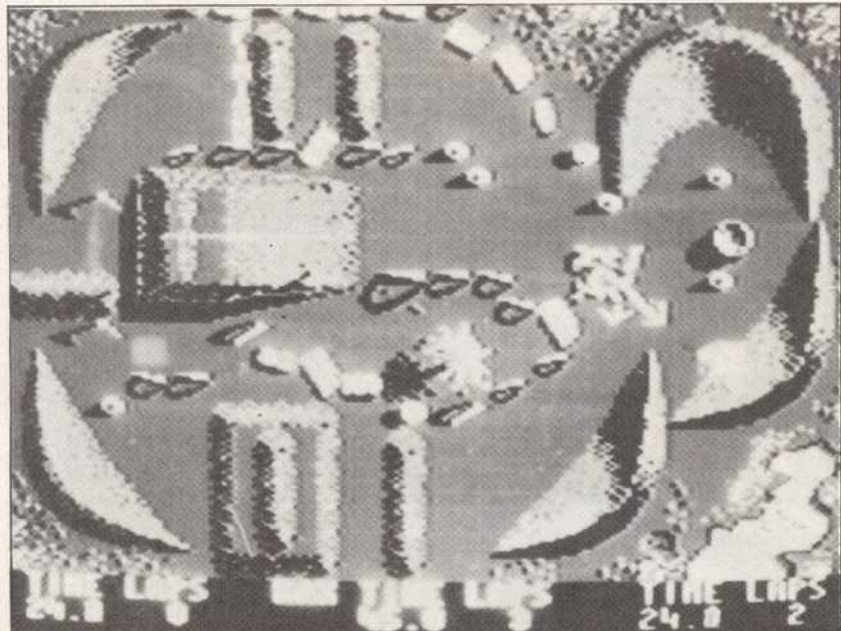
The tracks start off fairly simple with quite a generous time limit, but get much more difficult as time goes on. You soon find yourself having to use the banked corners to get that extra speed.

The actual sound effect produced as you crank the pedals is a bit peculiar; a cross between a steam engine and someone clapping slowly in the middle of the Albert Hall but the finger-clicking music between races makes up for that.

Great fun, especially as a two player game, I'd say it'll go platinum.

Popular Appeal ♦♦♦♦
John Cook

Program BMX Simulator
Micro Commodore 64
Price £1.99 **Supplier**
Code Masters.



The much too silent service

Pling! Pling! The sonar gave its monotonous warning of the destroyers relentless advance overhead on a nauseatingly clear afternoon in 1944.

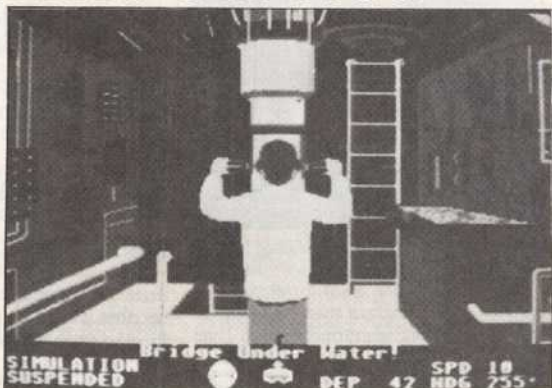
The chase had lasted three hours, had seen our deck gun blown to pieces, bow torpedo tubes exhausted, engines and hull damaged. Speaking of the hull, that creaked ominously as we hovered perilously close to our maximum test depth.

The dull boom of the depth charges exploding reverberated in our ears as the submarine shook from end to

end from the shock waves. With a tortured howl rivets and plates buckled and collapsed beneath the awful pressure of being 400 feet underneath the Pacific. Time to surface. Blowing the emergency tanks, we clawed our way upwards.

Unfortunately the cruiser was waiting and no sooner had the conning tower emerged sparking into the sunlight, than it was blown off.

Thankfully this was the USS PCW undergoing its trials and tribulations in *Silent*



Service, the ST conversion, from Micro Prose, so it lived to fight another day.

Graphically, this version scores over the C64 original, all the screens, bar the maps, being more detailed, some substantially more. The gameplay is exactly the same but this has a couple of extra missions to take your submarine on.

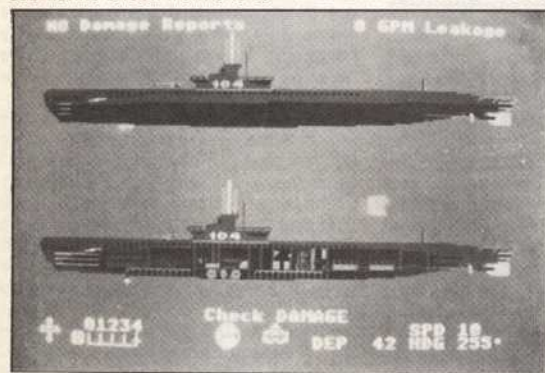
All is not perfect though. For instance, when on the surface it's impossible to quickly scan around, and if you try looking around, once you get below decks again you'll find the periscope has

moved to the direction you last looked in from the tower.

Despite some shortcomings with non-existent sound effects (creaks and damage from depth charges) *Silent Service* is a pretty good game even if it's not quite Das Boot.

Popular Appeal ♦♦♦♦
Duncan Evans

Program *Silent Service*
Micro Atari ST **Price**
£24.95 **Supplier** US
Gold, Unit 2-3 Holford
Way, Holford, Birmingham
B6 7AX.



One of the silent screens from the silent service

Droids and robots, arcade and adventure from Anglosoft for your Commodore

It's always good to see a new games software house emerging; Anglosoft isn't a new name, but previous releases have been in the MSX and CBM utilities field.

Droids is a nicely-produced arcade adventure with elements of Hewson's *Paradroid* and Epyx's *Impossible Mission*. The graphics are big and colourful and the programming is pleasantly fast and smooth.

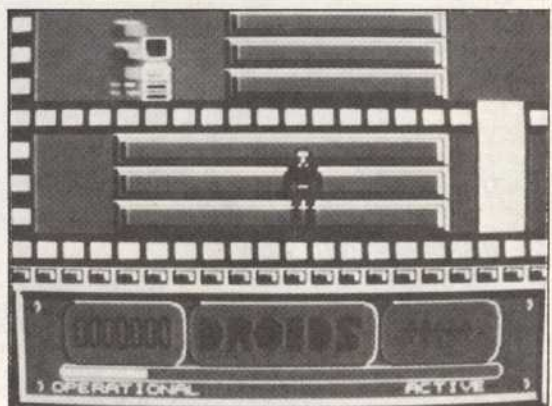
You control a space commando attempting to disable a rogue battlecruiser. The screen shows two levels of

deck, plus your score, lives remaining and energy level. Energy pods allow you to replenish lost power.

Scattered around the decks are escalators to allow you to change level, hatches to the next deck and terminals to log on to.

Guard robots have to be zapped or ducked, and once they're all destroyed you can access a terminal, enter the correct code and shut down that deck.

Teleporters enable you to jump from one deck to another, though it can be a shock to find that the guard



robots get more and more vicious on later decks.

Plans of the deck, both side views and top, can be called up from the terminals, and there's a challenging little reaction-test involving moving an indicator through moving barriers in order to shut down each deck.

Good fun though not hugely original - worth checking out

if you want to encourage a worthy new games software house.

Popular Appeal ♦♦♦♦
Chris Jenkins

Program *Droids* **Micro**
CBM 64 **Price** £8.95
Supplier Anglosoft, PO
Box 60, Coventry CV1
5SX.



An adventurer's guide to the Hitchhiker's Guide to the Galaxy

The omnipotent Tony Bridge brings you the secret of the Babel fish and more...

We looked some weeks ago at the problem of the intelligence screening door in *Hitchhiker's Guide to the Galaxy*, but there is an earlier puzzle that gets everyone tearing their hair out; the getting of the Babel fish!

If you haven't solved this one yet, then you may not know that you need the fish to be able to understand what all that garbage is coming over the intercom (although you will know, if you have consulted the guide, that the Babel fish will allow you to hear any alien language in perfect English).

As you'll know by examining the dispensing machine, there is a source of Babel fish in the vagon hold (by the way, just getting to see in the hold is quite a trick - when you first find yourself in this predicament, just input any old rubbish and watch the responses very carefully, particularly counting the number of senses unavailable to you; it's not the only time that this trick works, so keep it in mind for future use).

"Infocom and Douglas Adams are more devious than to allow you a prized object as easily as merely pushing a button! The Babel fish comes out... only to disappear from view through a tiny hole in the opposite wall!"

Back to the fish, and you'll naturally press the button on the dispensing machine. But Infocom and Douglas Adams are more devious than to allow you a prized object as easily as merely pushing a button! The fish comes out all right, but sails across the room at knee level to disappear from view through a tiny hole in the opposite wall. Oh dear.

But there is a hook just above the hole, so maybe you could hang something on this hook, thus covering the hole. Ford's towel doesn't, unfortunately, want to stay on the hook, so something else must be tried. At last the trusty dressing

gown will come in handy!

So now the hole is covered up, try again. The Babel fish isn't going to give up that easily, however - although it slides down the sleeve of the gown, it then falls to the floor, to disappear through a previously unseen drain. You'll find that the towel is quite large enough to cover the drain (you're right, the dressing gown *isn't*).

But, but... As the fish lies there, a tiny cleaning robot whizzes across the floor and, pausing only to grab the fish, disappears through a panel in another wall. Is this fish *ever* going to give up?

Applying what we've learnt so far, we can safely assume that this panel can be covered up too. What else can we use? How about Ford's satchel? He's asleep now, so he won't mind if you prop it against the panel; and this works fine, except that now, wouldn't you just know it, a *second* robot zips in to gracefully catch the fish as it bounces off the satchel!



The Hitchhiker's Guide...

Something else is called for here - if you read that last description about the second robot, there's a germ of an idea there. Now, you *did* bring the junk mail with you, didn't you? I hope so, because that is what we need now - just place it on top of the satchel, press the button one more time, and watch what happens.

At last the Babel fish is yours; but what a marvellous problem, and what a marvellous feeling for the adventurer when finally solved. This kind of thing is what makes Infocom stand head and shoulders above other software houses. Meanwhile, however, don't think that the vagon hold has given up all its secrets...

While we're in space, let's take a look at *Rebel Planet* and the peculiar problems

that the game from Adventure Soft UK has been posing to players. As you may have gathered from my recent Corners, I find this story quite a refreshing program, and promising for the future of this company.

Although a lot of exploring may be done at the start, the first priority is to get the access card from the galactic travel valet. This is accomplished by talking to it, when the card will be revealed along with the analgesic ampoule and two tickets to Troho.

You'll know from the blurb on the cassette inlay that you must beware of showing weapons to the police or customs. A good way of hiding such things as the laser sword is to use the lite kube. Just *Drop* the object *into Kube* and when needed, *Get* object *from Kube*. Incidentally, the kube will also allow you to carry more objects at one time than would be possible otherwise.

To get through the customs, ensure that all weapons and doubtful objects like the alloy strip etc., are carried in the lite kube. Once you meet the officers (which may take some doing, I can tell you!), you'll need the card at least. Now you'll come across a pair of angry Arcadians who aren't too impressed that you seem to have parked your stupid spaceship right in their parking space! Giving the ticket to them will get rid of them and will also yield up a nice object for you!

Let's finish with a bit more Infocom help. *Wishbringer* is described by the authors as being an adventure for beginners, but as you'd imagine, that doesn't mean that it is in any way a walkover! I haven't got space to go into great detail, but a couple of problems might be giving you a headache if you've just started.

First, don't bother trying to get the chocolate in the police station. Although it is the focus for a spell, you won't actually need that spell during the course of the game. Next, don't get caught by the boot patrol, or you'll land up in jail - the way to avoid them is to simply run in the opposite direction.

You *will* need to get into the jail at a later stage, but this is accomplished by opening the tree stump on Lookout Hill. Once in the jail, you must get the blanket which you must then use to keep the grue captive. Finally, when in the cinema, look under the seat for something spectacular!

Adventure Helpline

Dungeon Adventure on Spectrum. A severe lack of progress. Any help at all would be appreciated. How do I use those zarking collars? Are there any other light sources apart from the resinous burning wood, and where are they – please! Simon Amos, 22 Albert Road, Tonbridge, Kent TN4 2SR.

The Fantastic Four, part one on BBC B. How does the thing pass the fire in the cavern, and how does the torch move the boulder? Paul Tang, 21 Main Street, Branston, Burton-on-Trent, Staffs DE14 3EY.

Robin of Sherwood on Amstrad CPC 464. I have got one touchstone, but I don't know how to get the others. Gavin Lennon, 10 Earlsvale Road, Cavan, Co Cavan, Eire.

Hampstead on Spectrum. How do you get a job? What do you do with the credit card? What do you do with the lathe bracket? Martyn Cheney, 12 Greenock Street, Armley, Leeds LS12 3JH.

Heroes of Karn on C64. I can't get past the bear. Andrew Lancaster, 16 Anne Close, Christchurch, Dorset BH23 2NW.

Bored of the Rings on Spectrum. How do I get the debugger that is used to kill the kremlins? After climbing down the

rope, how do I get it back? Simon Amos, 22 Albert Road, Tonbridge, Kent TN4 2SR.

Crystal Quest on Spectrum. How do I fix the engine malfunction and move the lift on sentinel delta? What next after getting blowpipe? Tony Fox, 15 Spenser Street, Bootle, Merseyside L20 4LN (051-933 6652).

Knight Tyme on MSX. How do I get my photo on to the ID card, having got camera, film, glue, etc? Matthew Palmer, 21 Beaumont Close, Maidenhead, Berkshire SL6 3XN.

The Hobbit on Spectrum. After carrying Bard to the dragon's sleeping place, what should he do to kill the dragon? How does he kill the dragon with

bow and arrow? I would be obliged if anyone can come forward with a solution to this problem. G M Petkar, c/o John Harris Assoc, PO Box 214, Muscat, Sultanate of Oman.

The Boggit on Spectrum. How do I get out of the tunnel-like hall? J Haslam, 6 Sittingbourne Avenue, Bush Hill Park, Enfield, Middlesex EN1 2Da.

Questprobe: Torch/Thing on Spectrum. I can't get thing out of the tar-pit, or get into Doctor Doom's castle. Help! Philip May, 73 Fidas Road, Llanishen, Cardiff, S Glamorgan, Wales CF4 5LX.

Twin Kingdom Valley on Spectrum. How do I kill the witch in the castle of the desert king? Simon Amos, 22 Albert Road, Tonbridge, Kent TN4 2SR.

Adventure Helpline

Going bananas? If you are stuck in an Adventure with nowhere to turn, do not despair – help is at hand.

Fill in the coupon, explaining your prob-

lem, send it to us, and a fellow adventurer may be able to help.

Remember – the system only works if those adventurers who have solved the puzzles get in touch. Every week is Save An Adventurer Today (SAAT) week!

Adventure Problem on (Micro)
 Name
 Address

AMSTRAD 8256/8512

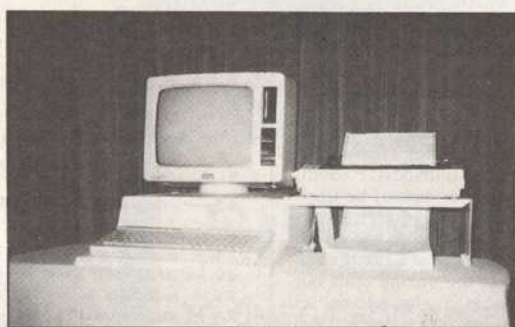
Mobile Computer and Printer Stand



- ROTATABLE THROUGH 360 DEGREES
- HEIGHT IS ADJUSTABLE (32"–42")
- STURDY CONSTRUCTION
- EXTREMELY STABLE
- HEAVY DUTY CASTORS
- COMPLETELY MOBILE
- COMPLETE WITH PRINTER STAND
- A SUPERB PIECE OF FURNITURE
- SOLD DIRECT FROM FACTORY

£99.95 + P&P £7.50

Desk Console and Desk Printer Stand



- TRANSFORMS YOUR PCW
- RELIEVES NECK/BACK ACHE
- ANGLED KEYBOARD
- RAISES VDU TO EYE LEVEL
- WHITE LEATHER GRAIN FINISH
- PRINTER LEVEL WITH CONSOLE
- PRINTER STAND DETACHABLE
- DUST COVERS AVAILABLE FOR BOTH UNITS

Purchase both console and printer stand for **£39.95**, SAVE £4, plus P&P £2.50

As separate items: Console **£29.95**, Printer **£12.95**, plus P&P £2.50

FINEGROUND LTD.

Computer Hardware Div., Unit 3D, Herald Industrial Estate, Hedge End, Southampton
 TEL: 04892/88175



All products copyright April 1986



Please allow 28 days for delivery

Trade enquires welcome



Mercenary's Second City - the final solution

Tony Kendle begins the first of a series of articles with maps on solving Novagen's classic

This week we start a special treat for *Mercenary* fans - the complete solution and map to the second city, sent in by Christopher Hester, who wrote such an excellent piece on the first game.

Second City is notable as being "the first data set that ever reached the software charts" and it is a testament to the lasting quality of the original game that it was so popular and in no way dated. The forthcoming Amstrad/Spectrum *Mercenary* releases will be the first city but hopefully these games will have provision for the second city releases. The awesome ST version will be a compendium of both cities together with a Targ survival kit of maps and hints. This compendium will also be ready in 8-bit Atari, Commodore 64 and Plus/4 versions.

On with the game. Christopher writes, "The second city is much harder than the original, there are all kinds of traps for you. New features include a cheat room, accessible through any triangular door; there's only one problem - no key!

"There are permanently dark rooms which even a photon emitter cannot light up. These appear orange.

"A lot of rooms appear dark but you could see in them with a photon emitter, but guess what, it's hard to get at the emitter and seemingly impossible to remove it. It lies in a room accessible only by a one way transporter room. Once in the transporter cannot be used again. Are you stuck? The room features two other doors, one of which has a skull and crossbones over it! If you go through that you fall out of the colony craft but fear not, that is what you have to do.

"First you need the antigrav which will let you pick up your ship and when you fall to the ground you simply drop it and off you go again.

"An alternative is to cheat - drop to the ground and drop all your objects. Press *Ctrl-Q* to quit and you get a new ship with all objects still nearby.

"The abundance of darkened rooms means that, unlike before, you can't avoid them to get through. In one of them a key is hidden.

"Another, in the hanger complex 3.04, features six doors, each a different shape. The following tips have been of help here.

"In a lit room if you face a wall and turn about twenty degrees to one side, then

move over to the wall, you can force your way along it until you hit a door, which you will go through if it isn't locked. After practising, you'll find any invisible doors if you do the same in a dark room. A wall that has several doors along it is unfortunately a difficult challenge, and you are never sure when you have reached the end of the wall so

going right round a dark room is tricky. "Not all traps are marked by a skull and crossbones - you just have to try each door to see.

"There is a room where only the lines of the floor are visible, which is one of the three prisons."

More on *Mercenary: Second City*, and more maps next week.

- 1 - ANTIGRAV
- 2 - ANTI-TIME BOMB
- 3 - CATERING PROVISIONS
- 4 - LARGE BOX
- 5 - USEFUL ARMAMENT
- 6 - CHEESE (TABLE)
- 7 - COFFIN
- 8 - POWERAMP
- 9 - KEY ▲
- 10 - KEY ◆
- 11 - KEY ▼
- 12 - KEY ▲
- 13 - KEY ◆
- 14 - KEY ▲
- 15 - MECHANOID
- 16 - WINCHESTER
- 17 - PASS
- 18 - MEDICAL SUPPLIES
- 19 - ENERGY CRYSTAL
- 20 - SIGHTS
- 21 - NOVADRIVE
- 22 - INTERSTELLAR CRAFT
- 23 - CHEESE
- 24 - METAL DETECTOR
- 25 - KITCHEN SINK
- 26 - ANTENNA
- 27 - ESSENTIAL 12939 SUPPLY
- 28 - PHOTON EMITTER
- 29 - PLYAR DIAMOND SHIP
- 30 - LAND BART
- 31 - JET BART
- 32 - CAR
- 33 - GOLD (?)

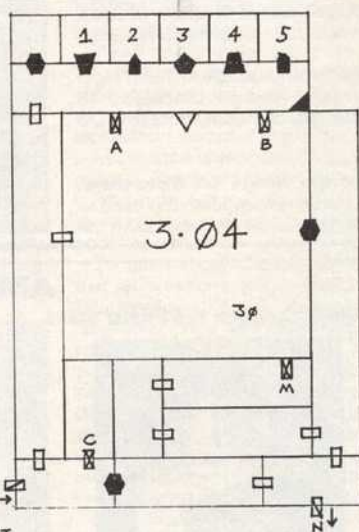
DRAWN BY CHRISTOPHER HESTER

ORANGE WALL-LESS ROOM

DARK ROOM

△ - ENTRY POINT
TO AUTHOR'S CHEAT ROOM (NO KEY AVAILABLE)

MERCENARY: THE SECOND CITY.

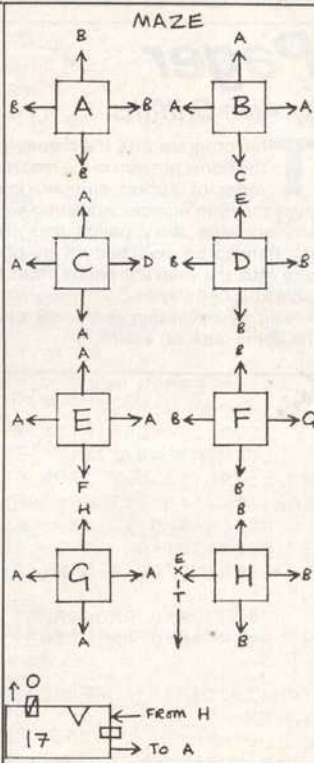
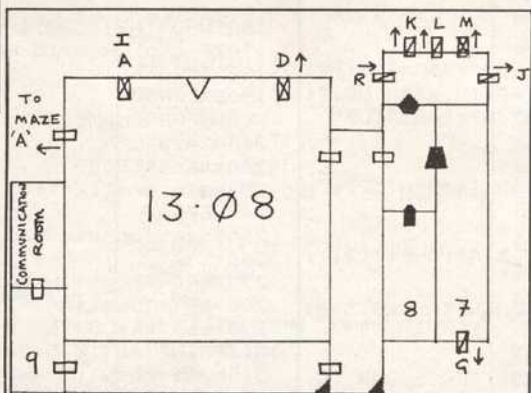
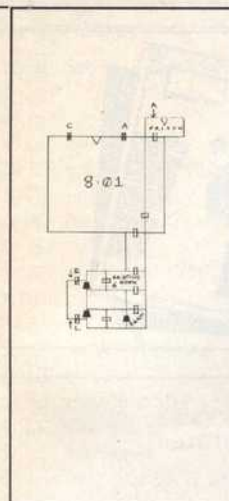


HANGARS AT LOCATIONS:-

LOC.	COLOUR
3.04	BROWN
5.13	GREY
13.08	GREEN
14.15	CYAN
8.**	CYAN
**08	BROWN
COLONY CRAFT	BLUE

OBJECTS OUTSIDE CITY:-

LOC.	NAME
8.69	SHIP?
8.96	PYRAMID



"THE ADVENTURERS HANDBOOK"

The monthly book no self-confessed adventurer should be without.

"Stunning value" - Tony Bridge, PCW, issue 11 available now!

44 pages of adventure help and news for just £1

FOR EVEN BETTER VALUE
TAKE ADVANTAGE OF OUR SUBSCRIPTION RATES

3 issues for £2.75

6 issues for £5.00

12 issues for £9.00

Issues 1 to 10 are still available and cover hints, maps and solutions to over 175 adventures (issues 1-6 for £5, issues 7, 8, 9 and 10, £1 each).

ARCADE PLAYERS

If you enjoy arcade games why not take a look at our other handbooks - £1 each - back copies and subscriptions as for Adventurer.

Spectrum Arcade Handbook - issue 11

Commodore Arcade Handbook - issue 10

Amstrad Handbook (including adventures) - issue 10

BBC Handbook (including adventures) - issue 10

C16/Plus 4 Handbook (including adventures) - issue 4

Send cheque or PO to:

H&D SERVICES (PCW)
1338 Ashton Old Road
Higher Openshaw
Manchester M11 1JG
Tel: 061-370 5666

100 NEW TITLES REQUIRED IN 1986

PROGRAMMERS REQUIRED

**TO SEND YOUR BEST
GAMES PROGRAM**

**TO OMEGA FOR IMMEDIATE
ASSESSMENT, OUTRIGHT
PURCHASE OR ROYALTY
ARRANGEMENTS FOR
ALL MACHINES**



Omega Software

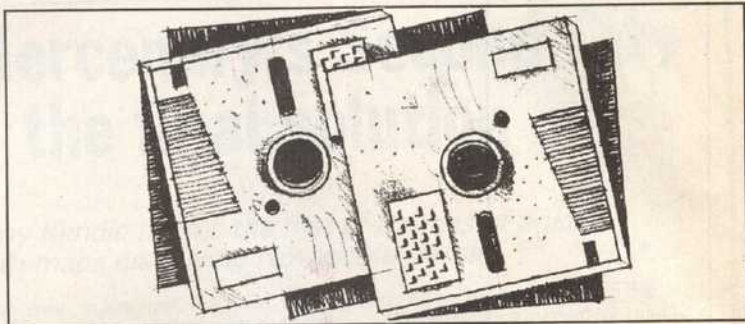
9 King's Yard Carpenter's Road
London E15 2HD
Tel: 01-985 6877

Pager

by Alan Griffiths

This program lists the names of all the Roms present in the machine in order of socket number. It also gives the Rom number indicating service and language entry points and allows any Rom to be switched off by poking zero into the relevant paged Rom type table at &2A1.

Note that pressing *Break* will turn all the Roms back on again.



```
100N ERROR MODE 7:END
20MODE 7:K=16
25VDU23;8202;0;0;0;
30PRINTTAB(1,1);" SOCKET";TAB(3,2);"
NO. ";TAB(10,1);" ROM ";TAB(10,2);" NO. ";
TAB(15,2);" TITLE";TAB(27,2);" STATUS"
40FOR A=0 TO 15
50B=&2A1+A
60PRINTTAB(4,5+A);A;TAB(11,5+A);?B;"
"
70IF ?B>0 PROCNAME
80IF ?B=0 PRINTTAB(15,5+A);CHR$(131);
TAB(29,5+A);" OFF" ELSE PRINTTAB(29,5+A)
;" ON"
90 NEXT
100PRINTTAB(1,22);"PRESS SPACE BAR TO
ALTER STATUS"
110PRINTTAB(12,23);"ESC TO END"
120REPEAT;UNTIL INKEY=99:PROCSTATUS:GO
TO30
130END
140DEFPROCSTATUS
150PRINTTAB(1,22);"
```

```
"
160INPUTTAB(1,22);"SOCKET",C
170IF C<0 OR C>15 GOTO160
180?(&2A1+C)=0
190ENDPROC
200DEFPROCNAME
210@X=10
220start=&8009
230pointer=0;X=16
240REPEAT
250location=start+pointer
260YX=A
270?&F6=location MOD 256
280?&F7=location DIV 256
290resultX=USR(&FFB9)
300PRINTTAB(15,5+A);CHR$(130)
310byte=resultX AND 255
320IF byte>31 AND byte<128 PRINTTAB(X,
5+A);CHR$(byte)
330pointer=pointer+1
340X=X+1
350UNTIL pointer=12 OR byte=0
355IF X<20 PRINTTAB(X,5+A);"AND ROM"
360ENDPROC
```

Programming: Spectrum 128

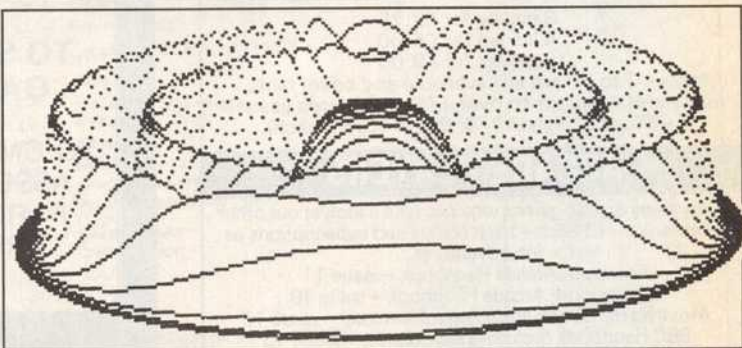
Wobbling Jellies

by M D Lancaster

The following program for the 128K Spectrum will produce fast and complex animation routines.

This is done by storing the screen display as frames in the Ram disc and then using *Load!* to replay them in sequence.

If the program is *Run* it will generate the plots and save them to *Ram* before giving the option of saving the frames to cassette or microdrive. However, since the function used is a complex one the



demonstration will take two hours to be generated.

This idea of using the *Ram* disc to store clean frames in can be applied in various ways to create fast animation.

The above illustration is an example of the "wobbly jelly". The listing for this program begins on the following page.

10 REM 20 REM Set up initial variables and loop ps. 30 REM 40 LET c=0 50 FOR t = 0.1 TO 7 STEP (7/13) 60 REM 70 REM Function to be plotted. 80 REM 90 DEF FN a(x,y)=t*EXP (2*COS ((x*x+y*y)*.001)) 100 FOR x=0 TO 127 110 LET y=90R (16/29-x*x) 120 LET m=-ie9 130 FOR z=-y TO y STEP 4 140 LET k=FN a(x,z) 150 LET p=k+z/4+88 160 IF p<=m THEN GO TO 190 170 LET m=p 180 PLOT 128+x,p: PLOT 128-x,p 190 NEXT z 200 NEXT x 210 REM 220 REM Save screen to ram disc. 230 REM 240 SAVE !CHR# (65+c)CODE 16384,6144 250 CLS 260 LET c=c+1 270 NEXT h 280 GO TO 630 290 REM 300 REM Display sequence of 12 frames.	310 REM 320 CLS 330 FOR f = 65 TO 76 340 LOAD !CHR# (f)CODE 350 NEXT f 360 FOR f = 75 TO 66 STEP -1 370 LOAD !CHR# (f)CODE 380 NEXT f 390 GO TO 330 400 REM 410 REM Routine to load frames from ram disc and save to microdrive. 420 REM 430 CLS : PRINT AT 5,3;"Insert a cartridge with";AT 7,3;"at least 90K of free space." 440 PRINT AT 9,3;"Press any key when ready" 450 PAUSE 0 460 FOR f = 65 TO 76 470 LOAD !CHR# (f)CODE 480 SAVE *"m";!;CHR# (f)CODE 16384,6144 490 NEXT f 500 SAVE *"m";!;"function" LINE 550 510 GO TO 290 520 REM 530 REM Load frames from microdrive and save to ram disc. 540 REM 550 FOR f = 65 TO 76 560 LOAD *"m";!;CHR# (f)CODE 570 SAVE !CHR# (f)CODE 16384,6144	580 NEXT f 590 GO TO 290 600 REM 610 REM Frames now generated prompt for storage media. 620 REM 630 PRINT AT 5,3;"Save to <M>microdrive." " 640 PRINT AT 7,3;" or <T>ape." 650 INPUT a\$ 660 IF a\$="m" OR a\$="M" THEN GO TO 400 670 IF a\$("<t") AND a\$("<T") THEN GO TO 650 680 REM 690 REM save to tape 700 REM 710 SAVE "function" LINE 800 720 FOR f = 65 TO 76 730 LOAD !CHR# (f)CODE 740 SAVE CHR# (f)CODE 16384,6144 750 NEXT f 760 GO TO 290 770 REM 780 REM load frames from tape and save to ram disc. 790 REM 800 FOR f = 65 TO 76 810 LOAD CHR# (f)CODE 820 SAVE !CHR# (f)CODE 16384,6144 830 NEXT f 840 GO TO 290
--	--	--

Programming: QL

Multi Sided Shapes

by Stephen Salmon

This program runs on a non-expanded QL using a monitor, although line 180 can be changed to

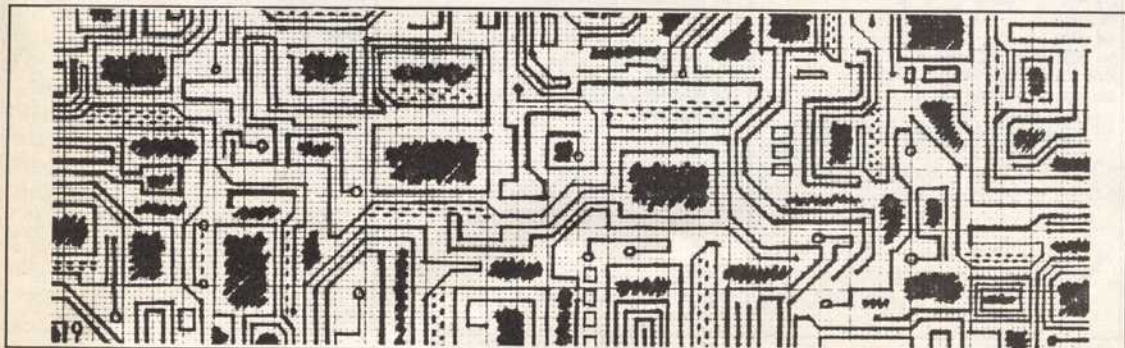
Mode 8 to suit a TV.

When the program is first run an opening demonstration screen is drawn showing the three options available. These are displayed in the menu in the bottom right hand corner of the screen.

Multi Sided Shapes is made up of three procedures which can be incorporated into your own programs. These are *Shapes*, *Prisms* and *Plains*.

Shapes will draw polygons, the pattern

of which can be altered by changing the value of *Step* in line 1530. The *Prisms* procedure draws them with both ends open. The patterns can be altered by introducing a *Step* command into line 1770. The pattern produced by the *Plains* procedure can also be altered by changing the *Step* value in line 1990. The positions of the displays can be altered by using the *X-Centre* and *Y-Centre* values.




```

170 WINDOW#0,512,10,0,246
180 MODE 4
190 PAPER 254
200 CLS
210 LET LIMIT=50
220 LET NUMBER_OF_SIDES = 5
230 WINDOW#1,256,123,0,0
240 MULTI_SIDED_SHAPES
250 CSIZE 2,0
260 CURSOR #1,0,80
270 PRINT"SHAPES"
280 CURSOR #1,0,0
290 PRINT "|||"
300 WINDOW#1,256,123,256,0
310 LIMIT = 40
320 DEPTH = 70
330 NUMBER_OF_SIDES=7
340 PRISM
350 INK 0
360 PRINT "|||"
370 CURSOR #1,0,85
380 PRINT "PRISMS"
390 WINDOW #1,256,123,0,123
400 NUMBER_OF_PLAINS = 4
410 PLAINS
420 INK 0
430 CURSOR #1,0,0
440 PRINT "|||"
450 CURSOR #1,0,90
460 PRINT "PLAINS"
470 MENU
510 DEFINE PROCEDURE MENU
520 WINDOW #1,256,123,256,123
540 CLS:PAPER #1,7,2:CLS
560 INK #1,0
570 CSIZE 3,1
580 PRINT"  MENU"
590 CSIZE 2,0
600 PRINT
610 PRINT" ||| SHAPES"
620 PRINT" ||| PRISMS"
630 PRINT" ||| PLAINS"
640 PRINT
650 UNDER 1
660 PRINT" PRESS KEY FOR  PROGRAM ....."
670 UNDER 0
680 IF INKEY#="1" THEN MULTIN
690 IF INKEY#="2" THEN PRISM
700 IF INKEY#="3" THEN PLAIN
710 GO TO 680
720 END DEFINE MENU
740 DEFINE PROCEDURE MULTIN
750 CLS
760 CSIZE 3,1
770 PRINT " SHAPES "
780 PRINT
790 CSIZE 2,0
800 PRINT" INPUT THE NUMBER OF
SIDES YOU WISH YOUR SHAPE TO HAVE"
805 PRINT"IN THE RANGE 3 TO 20"
810 INPUT NUMBER_OF_SIDES
820 IF NUMBER_OF_SIDES<3 OR NUMBER_OF_SIDES>20

```

```

THEN GO TO 810
830 PRINT "INPUT THE SIZE 10-50"
840 INPUT LIMIT
850 IF LIMIT<10 OR LIMIT>50 THEN GO TO 840
860 CLS
870 WINDOW#1,512,246,0,0
880 MULTI_SIDED_SHAPES
890 CSIZE 3,1
900 CURSOR #1,0,0
910 INK 0
920 PRINT NUMBER_OF_SIDES;" SIDES"
930 CURSOR#1,0,180
940 CSIZE 2,1
950 PRINT"PRESS ANY KEY"
960 PAUSE 99999
970 MENU
980 END DEFINE MULTIN
1000 DEFINE PROCEDURE PRISM
1020 CLS:INK 0
1030 CSIZE 3,1
1040 PRINT" PRISMS"
1050 CSIZE 2,0
1060 PRINT
1070 PRINT"INPUT THE NUMBER OF"
1075 PRINT"SIDES YOU WANT TO YOUR OPEN ENDED"
1078 PRINT"PRISM 4-15"
1080 INPUT NUMBER_OF_SIDES
1090 IF NUMBER_OF_SIDES<4 OR NUMBER_OF_SIDES>15
THEN GO TO 1080
1100 PRINT "INPUT DEPTH 10-90"
1110 INPUT DEPTH
1120 IF DEPTH<10 OR DEPTH>90 THEN GO TO 1110
1130 PRINT "INPUT SIZE 10-50"
1140 INPUT LIMIT
1150 IF LIMIT<10 OR LIMIT>50 THEN GO TO 1140
1170 CLS:WINDOW#1,512,246,0,0
1180 PRISM
1190 CSIZE 3,0
1200 CURSOR #1,0,215
1210 INK 0
1220 PRINT "PRESS ANY KEY"
1230 PAUSE 99999
1240 MENU
1250 END DEFINE PRISM
1270 DEFINE PROCEDURE PLAIN
1290 CLS:CSIZE 3,1
1300 PRINT" PLAINS"
1310 PRINT
1320 CSIZE 2,0
1330 PRINT"INPUT THE THE NUMBER OF PLAINS YOU"
1336 PRINT"WANT ON THE SCREEN IN THE RANGE 3-25"
1340 INPUT NUMBER_OF_PLAINS
1350 IF NUMBER_OF_PLAINS<3 OR NUMBER_OF
PLAINS>25 THEN GO TO 1340
1370 CLS:WINDOW#1,512,246,0,0
1380 PLAINS
1390 INK 0
1400 CURSOR#1,0,0
1410 CSIZE 3,1
1420 PRINT"PRESS ANY KEY"
1430 PAUSE 99999
1440 MENU

```

```

1450 END DEFINE PLAIN
1490 DEFINE PROCEDURE MULTI_SIDED_SHAPES
1510 CLS:BORDER 15,30
1520 PAPER 254
1530 FOR OUTLINE = 0 TO LIMIT STEP .5
1540 X CENTRE = 95
1550 Y CENTRE = 50
1560 HORIZONTAL = X CENTRE - OUTLINE
1570 VERTICAL = Y CENTRE
1580 FOR P=0 TO 361 STEP 360/NUMBER_OF_SIDES
1590 LET HORIZONTAL_2 = X CENTRE - OUTLINE + COS
(P*PI/180)
1600 LET VERTICAL_2 = Y CENTRE + OUTLINE + SIN
(P*PI/180)
1610 INK P/NUMBER_OF_SIDES
1620 LINE HORIZONTAL,VERTICAL TO HORIZONTAL_2,
VERTICAL_2
1630 HORIZONTAL = HORIZONTAL_2
1640 VERTICAL = VERTICAL_2
1650 END FOR P
1660 END FOR OUTLINE
1670 END DEFINE MULTI_SIDED_SHAPES
1710 DEFINE PROCEDURE PRISM
1720 Y CENTRE = 50
1730 X CENTRE = 110
1750 CLS:PAPER 254
1760 BORDER #1,10,55
1770 FOR PRISM_LOOP = 1 TO DEPTH
1780 HORIZONTAL=X CENTRE-LIMIT
1790 VERTICAL=Y CENTRE
1800 FOR P=0 TO 361 STEP 360/NUMBER_OF_SIDES
1810 HORIZONTAL_2 = X CENTRE - LIMIT
+ COS(P*PI / 180)
1820 VERTICAL_2 = Y CENTRE + LIMIT * SIN(P*PI / 180)
1830 INK P/NUMBER_OF_SIDES
1840 LINE HORIZONTAL,VERTICAL TO HORIZONTAL_2,
VERTICAL_2
1850 HORIZONTAL = HORIZONTAL_2
1860 VERTICAL = VERTICAL_2
1870 END FOR P
1880 LET X CENTRE = X CENTRE -.5
1890 LET Y CENTRE = Y CENTRE
1900 END FOR PRISM_LOOP
1910 END DEFINE PRISM
1950 DEFINE PROCEDURE PLAINS
1960 PAPER 254
1970 BORDER #1,10,33
1990 CLS:FOR a=30 TO 90 STEP .75
2000 LET X CENTRE=130:LET Y CENTRE=90
2010 LET HORIZONTAL=X CENTRE - a
2020 LET VERTICAL = Y CENTRE
2030 FOR B=0 TO 361 STEP 360/(NUMBER_OF_PLAINS-1)
2040 LET HORIZONTAL_2=X CENTRE - a*COS (B*PI/180)
2050 LET VERTICAL_2=Y CENTRE + a*SIN (B*PI/180)
2060 INK B/NUMBER_OF_PLAINS/2
2070 LINE HORIZONTAL,VERTICAL TO HORIZONTAL_2 -
HORIZONTAL,VERTICAL_2 - VERTICAL
2080 LET HORIZONTAL = HORIZONTAL_2
2090 LET VERTICAL = VERTICAL_2
2110 NEXT B:NEXT a
2120 END DEFINE PLAINS
2140 SAVE MDV1_BOOT

```


Road Toad

by Graham Tyson

On we go with part two of Road Toad. The line numbers must remain exactly as printed or the

error checking routine will report a fault in the wrong place.

If you can't be bothered with the

typing then send £2 (no cheques) to 39 York House, Idlethorp-Way, Thorpe Edge, Bradford BD10 9ES.



233 DATA 61,7F,06,10,47,3A,60,7F,FE,10,3 0,10,3C,32,60,7F,CD,26,BC,3A,5E, 2040	252 DATA 9B,CB,7F,20,02,E6,77,B1,77,13,2 3,DD,23,10,BE,C1,E1,CD,26,BC,10, 2577	271 DATA 82,21,EB,83,11,44,C0,06,01,CD,5 0,82,C9,2A,9B,7E,EB,21,6B,85,06, 2279
234 DATA 7F,3D,32,5E,7F,18,27,B8,30,96,3 C,32,60,7F,18,1E,3E,10,80,47,3A, 2482	253 DATA B3,C9,00,00,00,00,00,00,00,0 0,00,00,00,00,00,00,00,00,00, 380	272 DATA 01,CD,5D,82,2A,9B,7E,11,04,00,1 9,EB,21,29,85,06,01,CD,5D,82,2A, 1719
235 DATA 60,7F,88,30,10,3C,32,60,7F,CD,2 9,BC,3A,5E,7F,3C,32,5E,7F,18,04, 1876	254 DATA 00,00,00,00,00,00,00,00,00,0 0,00,00,00,00,00,00,00,00,00, 0	273 DATA 9B,7E,11,08,00,19,EB,21,EB,84,0 6,01,CD,5D,82,C9,21,2B,96,11,FE, 2083
236 DATA AF,32,60,7F,22,9B,7E,11,9D,7E,3 P,06,10,C5,01,0A,00,ED,B0,01,F6, 2188	255 DATA 00,00,00,00,00,00,00,00,00,0 0,00,00,00,00,00,00,00,00,00, 0	274 DATA C0,06,01,CD,5D,82,21,EB,85,11,0 2,C1,06,01,CD,5D,82,21,AB,85,11, 2029
237 DATA 07,EB,09,3E,BF,BC,38,04,01,50,C 0,09,EB,C1,10,EB,C9,00,00,00,00, 1911	256 DATA 00,00,00,00,00,00,00,00,00,0 0,00,00,00,00,00,00,00,00,00, 0	275 DATA 06,C1,06,01,CD,5D,82,C9,21,A3,8 7,11,1C,C1,06,01,CD,5D,82,21,63, 1971
238 DATA 00,00,00,00,00,00,00,00,00,0 0,00,00,00,00,00,00,00,00,00, 0	257 DATA 00,00,00,00,00,00,00,00,00,0 0,00,00,00,00,00,00,00,00,00, 0	276 DATA 87,11,20,C1,06,01,CD,5D,82,21,2 3,87,11,24,C1,06,05,CD,5D,82,21, 1733
239 DATA 00,00,00,00,00,00,00,00,00,0 0,00,00,00,00,00,00,00,00,00, 0	258 DATA 00,00,00,00,00,00,00,00,00,0 0,00,00,00,00,00,00,00,00,00, 0	277 DATA E3,86,11,38,01,06,01,CD,5D,82,2 1,6B,86,11,27,E1,06,08,C5,05,01, 2042
240 DATA 00,00,00,00,00,00,00,00,00,0 0,00,00,00,00,00,00,00,00,00, 0	259 DATA 00,00,00,00,00,00,00,00,00,0 0,00,00,00,00,00,00,00,00,00, 0	278 DATA 0F,00,ED,B0,D1,EB,CD,26,BC,EB,C 1,10,F0,C9,11,64,C4,06,09,CD,2E, 2767
241 DATA 00,00,00,00,00,00,00,00,00,0 0,00,00,00,00,00,00,00,00,00, 0	260 DATA 00,00,00,00,00,00,00,00,00,0 0,00,00,00,00,00,00,00,00,00, 0	279 DATA 82,11,92,C4,06,04,CD,2E,82,11,8 2,C5,06,05,CD,2E,82,11,6E,C5,06, 1946
242 DATA 00,00,00,00,00,00,00,00,00,0 0,00,00,00,00,00,00,00,00,00, 0	261 DATA 00,00,00,00,00,00,00,00,00,0 0,00,00,00,00,00,00,00,00,00, 0	280 DATA 03,CD,2E,82,11,56,C5,06,04,CD,2 E,82,11,56,C6,06,07,CD,2E,82,11, 1787
243 DATA 00,00,00,00,00,00,00,00,00,0 0,00,00,00,00,00,00,00,00,00, 0	262 DATA 00,00,00,00,00,06,10,C5,ES,D1,1 B,1A,01,47,00,ES,F5,ED,B0,F1,12, 1928	281 DATA 7C,06,06,03,CD,2E,82,C9,C5,05,2 1,63,88,06,01,CD,5D,82,E1,11,04, 2272
244 DATA 00,00,00,00,00,00,00,00,00,0 0,00,00,00,00,00,00,00,00,00, 0	263 DATA E1,01,00,08,09,3E,BF,BC,38,04,0 1,50,C0,09,C1,10,E1,09,06,10,C5, 1880	282 DATA 00,19,EB,21,23,88,C1,05,C5,05,0 5,CD,5D,82,E1,C1,48,06,00,C8,21, 2237
245 DATA 00,00,00,00,00,00,00,00,00,0 0,11,94,00,21,15,00,CD,C0,BB,21, 836	264 DATA ES,D1,13,1A,F5,01,47,00,ES,ED,B 8,E1,F1,12,01,00,08,09,3E,BF,BC, 2390	283 DATA CB,21,09,EB,21,E3,87,06,01,CD,5 D,82,C9,C5,ES,05,06,10,C5,01,04, 2374
246 DATA 59,7F,06,05,3E,F6,86,C5,ES,CD,F C,BB,E1,23,C1,10,F3,C9,00,00,00, 2652	265 DATA 38,04,01,50,C0,09,C1,10,E1,C9,0 6,10,C5,ES,D1,1B,1A,47,1B,1A,4F, 1890	284 DATA 00,D5,ED,B0,D1,EB,CD,26,BC,EB,C 1,10,F0,E1,11,04,00,19,EB,E1,C1, 3109
247 DATA 00,00,00,00,00,00,00,00,00,0 0,00,00,00,00,00,00,00,00,00, 0	266 DATA C5,C1,46,00,ES,ED,B0,E1,01,00,0 8,09,3E,BF,BC,38,04,01,50,C0,09, 1936	285 DATA 10,E1,C9,11,00,00,CD,C8,82,11,7 0,C3,CD,C8,82,11,30,C7,CD,C8,82, 2844
248 DATA 00,00,00,00,00,00,00,00,00,0 3,43,4F,52,45,4C,45,56,45,4C,1D, 977	267 DATA C1,79,12,13,78,12,C1,10,D9,C9,0 6,10,C5,ES,D1,13,1A,47,13,1A,4F, 2010	286 DATA 21,08,C0,06,04,C5,ES,11,10,04,0 E,00,CD,47,BC,E1,01,14,00,09,C1, 1632
249 DATA 21,AB,83,06,10,11,DC,7F,ES,C5,0 6,04,E7,12,4F,DD,7E,00,FE,00,28, 2126	268 DATA C5,C1,46,00,ES,ED,B0,E1,01,00,0 8,09,3E,BF,BC,38,04,01,50,C0,09, 1944	287 DATA 10,EE,21,A9,DB,11,0B,16,0E,00,0 D,47,BC,21,31,DF,11,0B,10,0E,00, 1578
250 DATA 32,CB,47,20,02,E6,EE,CB,4F,20,0 2,E6,DD,CB,57,20,02,E6,BB,CB,5F, 2632	269 DATA C1,79,12,78,1B,12,C1,10,D9,C9,2 1,AB,84,11,08,C0,06,01,CD,5D,82, 2112	288 DATA CD,47,BC,23,71,DB,11,0B,16,0E,0 0,CD,47,BC,09,06,0A,C5,05,21,A3, 2190
251 DATA 20,02,E6,77,BC,67,20,02,E6,EE,0 B,6F,20,02,E6,DD,CB,77,20,02,E6, 2576	270 DATA 21,6B,84,11,10,C0,06,01,CD,5D,8 2,21,2B,84,11,30,C0,06,01,CD,5D, 1714	

continued on page 30 ▶

Programming: Amstrad 464

```

289 DATA 88,06,10,C5,01,08,00,D5,ED,B0,D
1,EB,CD,26,8C,EB,C1,10,F0,E1,11, 2791
290 DATA 08,00,19,EB,C1,10,E0,C9,00,01,0
2,00,00,09,30,00,10,00,0C,79,C1, 1487
291 DATA 06,40,E0,60,20,14,80,30,05,90,2
0,80,18,20,01,00,90,02,10,81,10, 1275
292 DATA 40,0C,06,50,07,18,82,08,03,0
8,30,80,14,81,30,E0,00,00,40,41, 1196
293 DATA 14,81,40,18,81,0C,81,20,18,40,0
0,00,01,00,00,00,10,40,77,77,44, 1006
294 DATA 77,77,22,20,20,44,55,45,55,22,2
2,40,30,77,77,45,77,22,28,81,18, 1478
295 DATA 11,44,44,55,22,00,40,20,77,44,7
7,55,22,22,20,40,08,01,00,00,01, 933
296 DATA 00,28,81,00,81,20,02,80,60,10,8
0,00,40,40,02,70,80,14,82,05,30, 1283
297 DATA 81,0F,30,02,18,80,04,38,00,08,5
0,01,14,40,08,40,80,10,82,82,20, 1087
298 DATA 40,00,82,70,80,02,40,40,30,F0,0
2,02,00,04,30,80,08,02,04,04,0E, 1164
299 DATA 04,08,02,04,08,04,02,00,08,04,0
1,00,00,00,00,88,11,88,11,88,33, 538
300 DATA 0C,11,0C,77,EE,33,66,77,EE,66,7
7,9F,9F,EE,33,0F,8F,0C,11,FF,FF, 3265
301 DATA 88,11,AA,EE,88,11,FF,88,88,FF,5
5,FF,FF,FF,FF,55,FF,0C,DD,FF,33, 3729
302 DATA 0C,77,EE,33,88,00,00,11,88,00,0
0,11,00,07,00,00,02,01,00,04,04, 948
303 DATA 00,06,02,02,01,00,04,09,01,01,0
9,02,00,50,04,18,20,90,01,08,00, 743
304 DATA 90,01,10,20,90,07,18,20,90,01,0
A,0C,60,05,01,01,01,08,02,01,00, 874
305 DATA 04,04,00,06,02,02,01,00,04,00,0
7,0C,60,00,00,00,00,44,77,EE,22, 514
306 DATA 22,88,11,44,11,33,0C,88,22,00,0
0,44,AA,08,06,55,AA,08,09,55,AA, 1476
307 DATA 08,09,55,AA,0A,09,55,AA,0E,09,5
5,AA,02,06,55,22,00,00,44,11,33, 1087
308 DATA 0C,88,22,88,11,44,44,77,EE,22,0
0,00,00,00,00,00,00,0F,0F,0F, 1099
309 DATA 0F,08,00,00,01,08,08,01,00,0A,0
0,00,05,0A,44,66,85,08,AA,99,01, 389
310 DATA 08,22,99,01,08,44,99,01,08,88,9
9,01,0A,EE,66,05,0A,00,00,05,08, 1105
311 DATA 08,01,0D,08,00,00,01,0F,0F,0F,0
F,00,00,00,00,00,00,80,80,00,F0, 507
312 DATA 40,40,10,00,90,20,10,60,80,A0,2
0,00,90,20,40,44,66,20,A0,00,99, 1711

```

```

313 DATA 40,90,44,99,20,40,44,99,10,30,4
4,99,50,40,EE,66,10,90,10,00,90, 1835
314 DATA A0,10,26,60,80,A0,80,80,40,20,7
0,03,30,C0,00,00,00,00,00,00, 1296
315 DATA 00,00,00,00,00,00,00,00,00,0
0,00,00,00,00,00,00,00,00,00, 0
316 DATA 00,00,00,00,00,00,00,00,00,00,F
0,E0,00,00,F0,F0,00,00,F0,E0,00, 1408
317 DATA 00,00,00,00,00,00,00,00,00,00,0
0,00,00,00,00,00,00,00,00,00, 432
318 DATA 96,F0,00,00,D2,F0,80,00,D2,F0,8
0,00,D2,F0,80,00,D2,F0,80,20,96, 2884
319 DATA F0,00,30,F0,C0,C0,10,4B,00,77,D
C,4B,1F,FF,FE,4B,1F,FF,FE,4B,1F, 2490
320 DATA FF,FE,4B,0C,77,DC,00,00,00,10,0
0,00,00,30,00,00,00,20,00,00,70, 1143
321 DATA F0,00,00,F0,F0,00,00,F0,F0,00,0
0,F0,F0,00,00,F0,F0,00,00,F0,F0, 2640
322 DATA 00,00,F0,F0,00,00,70,F0,00,00,0
0,0F,00,F0,E1,0F,10,F0,E1,0F,00, 1923
323 DATA F0,E1,0F,00,00,00,0F,00,00,00,0
0,00,00,00,00,00,00,00,07,0F, 517
324 DATA 0F,08,0F,0F,0F,0C,16,F0,F0,0C,0
7,0F,1E,2C,07,0F,1E,2C,07,0F,1E, 838
325 DATA 2C,07,0F,1E,2C,07,0F,1E,0C,07,0
F,1E,0C,07,0F,1E,2C,07,0F,1E,2C, 460
326 DATA 07,0F,1E,2C,07,0F,1E,2C,16,F0,F
0,0C,0F,0F,0F,0C,07,0F,0F,08,0F, 823
327 DATA 0F,0F,00,00,01,00,00,0F,0F,0F,0
F,0F,0F,0F,0F,0F,0F,0F,0F,0F, 256
328 DATA 0F,0F,0F,0F,0F,0F,0F,0F,0F,0F,0
F,0F,0F,0F,0F,0F,0F,0F,0F, 315
329 DATA 0F,0F,0F,0F,0F,0F,0F,0F,0F,0F,0
F,0F,0F,00,01,00,00,0F,0F,0F, 256
330 DATA 03,0F,0F,0C,07,0F,0F,0B,07,0F,0
F,08,87,0F,0F,08,87,0F,0F,08,87, 619
331 DATA 0F,0F,08,07,0F,0F,08,16,F0,E1,0
8,16,F0,E1,08,07,0F,0F,08,87,0F, 1268
332 DATA 0F,08,87,0F,0F,08,87,0F,0F,08,0
7,0F,0F,08,07,0F,0F,0B,03,0F,0F, 495
333 DATA 0C,0F,C3,C3,87,78,0F,1E,87,69,1
E,0F,0F,87,0F,3C,96,E1,78,3C,30, 1707
334 DATA 96,C3,C3,F0,3C,E1,78,C3,F0,B4,9
6,E1,69,78,96,96,C3,C3,F0,3C,E1, 3615
335 DATA 78,C3,D2,F0,96,E1,69,78,96,96,C
3,C3,C3,78,E1,78,C3,1E,F0,C3,0F, 3390
336 DATA E1,78,96,87,1E,C3,0F,F0,E1,78,C
3,1E,F0,F0,3C,E1,78,96,96,3C,C3, 3120

```

```

337 DATA C3,78,E1,78,C3,D2,F0,F0,3C,F0,3
C,3C,96,96,C3,F0,3C,E1,78,C3,F0, 3540
338 DATA 84,E1,1E,F0,87,78,0F,87,87,69,1
E,0F,0F,87,0F,3C,F0,00,00,00,F0, 2070
339 DATA 80,00,00,FE,80,00,00,F6,80,00,0
0,F6,80,00,00,F6,80,00,00,F6,80, 2006
340 DATA 00,00,F6,80,00,00,F6,80,00,00,F
5,80,00,00,F6,80,00,00,F6,80,00, 1870
341 DATA 00,F6,80,00,00,FE,80,00,00,F0,8
0,00,00,F0,00,00,00,F0,F0,F0,F0, 2324
342 DATA F0,F0,F0,F0,FF,FF,FF,FF,F0,F0,F
0,F0,F0,F0,F0,F0,F0,F0,F0,F0, 5100
343 DATA F0,F0,F0,F0,F0,F0,F0,F0,F0,F0,F
0,F0,F0,F0,F0,F0,F0,F0,F0,F0, 5040
344 DATA F0,F0,F0,F0,F0,F0,FF,FF,FF,FF,F
0,F0,F0,F0,F0,F0,F0,F0,00,00,00, 4380
345 DATA F0,0E,00,10,F0,1E,00,10,F7,1E,F
F,FE,F4,1E,FF,FE,F4,1E,00,10,F4, 2659
346 DATA 1E,00,10,F4,1E,05,14,F4,1E,0A,1
A,F4,1E,00,10,F4,1E,00,10,F4,1E, 1509
347 DATA FF,FE,F4,1E,FF,FE,F4,1E,00,10,F
7,0E,00,10,F0,00,00,00,F0,00,00, 2339
348 DATA 00,00,00,00,01,0F,00,03,0F,0F,3
0,F0,C3,0F,71,FF,CB,0F,F2,F0,C3, 1810
349 DATA 0F,F4,F0,C3,0F,F4,F0,C3,0F,F4,F
0,C3,0F,F4,F0,C3,0F,F2,F0,C3,0F, 3493
350 DATA 71,FF,CB,0F,30,F0,C3,0F,00,03,0
F,0F,00,00,01,0F,00,00,00,00,00, 1133
351 DATA 00,00,00,0F,0F,0F,08,0F,0F,F0,0
C,00,01,F7,86,0F,01,F7,CA,0F,0F, 1212
352 DATA F7,CB,F0,F0,F7,ED,FE,FF,FF,ED,F
E,FF,FF,ED,F0,F0,F7,ED,0F,0F,F7, 4657
353 DATA CB,0F,01,F7,CA,00,01,F7,86,0F,0
F,F0,0C,0F,0F,0F,08,00,00,00,00, 1385
354 DATA 00,00,00,00,0F,0E,07,0F,0F,0F,0
F,0F,00,00,00,00,0F,0F,0F,0F, 136
355 DATA 0F,0F,0F,F0,F0,F0,F0,FF,FF,FF,F
B,F0,FF,FF,FB,F0,F0,F0,F0,0F,0F, 4023
356 DATA 0F,0F,0F,0F,0F,0F,00,00,00,00,0
F,0F,0F,0F,0F,0E,07,0F,00,00,00, 201
357 DATA 00,00,00,00,00,01,0F,0F,0F,03,F
0,0F,0F,16,FE,08,00,35,FE,08,0F, 930
358 DATA 3D,FE,0F,0F,7B,FE,F0,F0,7B,FF,F
F,F7,7B,FF,FF,F7,7B,FE,F0,F0,3D, 3880
359 DATA FE,0F,0F,35,FE,08,0F,16,FE,08,0
0,03,F0,0F,0F,01,0F,0F,0F,00,00, 1217
360 DATA 00,00,30,60,10,00,10,00,30,60,F
0,F0,30,C0,70,C0,F0,F0,F0,F0, 2544

```

Programming: C64

Minz
by Ken Smith

The object of Minz is to destroy the targets in nine locations whilst avoiding, or shooting, the rocket,

balloon and helicopter. Also to be avoided are the mines which appear at the start of a screen before becoming invisible. Full instructions are given in the program.

The listing is quite long and will be presented over three weeks, so if you don't want to type it in send £2 to Ken Smith, 73 Wakefield Street, East Ham, London E6 1NR for a copy on cassette.

VDU

by Alastair Scott

This program, for any Amstrad CPC, provides a VDU command like on the BBC micro. The syntax is *VDU,a,b,c...* Up to 64 parameters can be passed.

For example, *VDU,4,1,15,3,65* sets Mode 1, Pen 3 and prints 'A'.

```

100 REM VDU by Alastair Scott
110 MODE 1:MEMORY &A63F
120 FOR a=&A640 TO &A674
130 READ b#:POKE a,VAL("&"+b#)
140 NEXT:CALL &A640:PRINT"VDU command OK."
150 DATA 01,49,A6,21,75,A6,C3,D1,BC,4E
160 DATA A6,C3,52,A6,56,44,D5,00,FE,00
170 DATA C8,FE,01,28,16,47,05,DD,23,DD
180 DATA 23,10,FA,47,DD,7E,00,CD,5A,BB
190 DATA DD,2B,DD,2B,10,F4,C9,DD,7E,00
200 DATA C3,5A,BB
  
```

Money Maker

by D G Evans

This program for any Spectrum will generate money. £10 notes to be specific. Just type it in, and it can be easily converted to other machines, run the program and you'll see what I mean. A little effort on your part and you could soon be rolling in the brown notes.

```

10 REM Money Maker
20 CLS : PRINT INK 6; PAPER 2;" M
oney Maker Utility "
30 PRINT : FLASH 1: FOR f=1 TO 85
40 READ b
50 PRINT CHR$( b);
60 NEXT f
70 DATA 87,104,121,32,110,111,116,32,1
15,101,110,100,32,105,110,32,121,111,117
,114,32
80 DATA 115,104,111,114,116,32,112,114
,111,103,114,97,109,115,32,102,111,114,3
2,66,121,116,101,115,32,97,110,100,32,80
,105,101,99
90 DATA 101,115,32,97,110,100,32,101,9
7,114,110,32,121,111,117,114,115,101,108
,102,32,97,32,116,101,110,110,101,114,32
,63
  
```

Status

by Alastair Scott

After typing in and correcting any errors, this program for any Amstrad CPC should be called by entering *IS*.

Three five digit numbers are now produced. They are as follows:

1. Length of the Basic program in memory.
2. Length of the variable area.
3. Free memory.

```

100 ' Status
110 ' by Alastair Scott
120 cs=0:MODE 2:MEMORY &9FFF
130 FOR addr=&A000 TO &A099
140 READ byte#:POKE addr,VAL("&"+byte#)
150 cs=cs+PEEK(addr)
160 NEXT
170 IF cs<>18108 THEN PRINT CHR$(7)"DATA
ERROR!":END
180 CALL &A000:PRINT"IS command OK.":END
190 DATA 01,18,A0,21,99,A0,CD,D1,BC,CD
200 DATA 00,B9,F5,3A,02,C0,A7,CC,7A,A0
210 DATA F1,C3,0C,B9,1D,A0,C3,1F,A0,D3
220 DATA 00,2A,66,AE,ED,5B,64,AE,ED,52
230 DATA CD,44,A0,2A,6C,AE,ED,5B,66,AE
240 DATA ED,52,CD,44,A0,2A,5E,AE,ED,5B
250 DATA 6C,AE,ED,52,CD,44,A0,C9,11,10
260 DATA 27,CD,67,A0,11,E8,03,CD,67,A0
270 DATA 11,64,00,CD,67,A0,11,0A,00,CD
280 DATA 67,A0,11,01,00,CD,67,A0,3E,20
290 DATA C3,5A,BB,AF,37,3F,ED,52,38,03
300 DATA 3C,18,F7,19,C6,30,E5,CD,5A,BB
310 DATA E1,C9,21,83,AE,22,20,A0,22,30
320 DATA A0,21,81,AE,22,24,A0,21,89,AE
330 DATA 22,2C,A0,22,3C,A0,21,7B,AE,22
340 DATA 38,A0,C9,00,00,00,00,00,00
  
```


TROJAN CAD-MASTER™

THE ULTIMATE IN GRAPHICS TOOLS

SUPERB GRAPHICS SOFTWARE PLUS

CBM 64

A TOP QUALITY LIGHT PEN

SPECTRUM

Discover the exciting world of creating your own graphics on screen.

- **FREEHAND DRAW** - 5 pen thicknesses inc. Quills
- **PAINT BRUSH** - for the artistic touch
- **FILL ANY SHAPE** - use 16 colours and 11 patterns.
- **GEOMETRIC SHAPES** - circles, boxes, triangles, lines & banding.
- **DYNAMIC RUBBER BANDING** on all geometric options.
- **PIN-POINT FUNCTION** - for pixel accuracy on all functions.

Plus many more too numerous to mention in this ad. All these features in the Program + a top quality Light Pen and an Instruction booklet in one reasonably priced package. Easy to use for creating colourful pictures or technical drawings. Ideal for use by all ages of micro users. Full back-up service from manufacturers. Available at good dealers or direct from Trojan Products.

Please state which Micro.

ONLY £19.95 per pack.



TROJAN

Micro Computer Software & Accessories
Send cheque/P.O. to:
TROJAN PRODUCTS (PCW1)
166, Derwyn, Dunvant, Swansea SA2 7PF
Tel: (0792) 205491
TRADE ENQUIRIES WELCOMED

SENTIENT SOFTWARE LTD

SPECIALIST CONVERSION AND CONCEPT PROGRAMMERS HAVE IMMEDIATE VACANCIES FOR EXPERIENCED PROGRAMMERS WITH FULL KNOWLEDGE OF AT LEAST ONE OF THESE PROCESSORS, Z80, 6502, 8086, 68000.

A CAPABILITY WITH MUSIC AND/OR GRAPHICS WOULD BE AN ADVANTAGE.

CONTACT . . .
TONY FAGELMAN
BRANCH HOUSE
18 BRANCH ROAD
ARMLEY
LEEDS LS12 3AQ.
TEL: 0532 791136

FREE GAME

when you subscribe to

POPULAR Computing WEEKLY

Your choice of any one of the games listed below is free when you subscribe to Popular Computing Weekly

Please enter my annual subscription to Popular Computing Weekly at £25.00 U.K. (£39.95 Overseas), and send my free game as marked below.

Commodore 64

- Willow Pattern
 Chicken Chase

Amstrad

- Don't Panic
 Chimera

Spectrum

- Willow Pattern
 Chicken Chase

BBC Micro B

- Fat Man Sam
 Microcosm

I enclose a cheque made payable to Sunshine Publications Ltd.

Please charge my Visa/Access card No:

Expiry Date:

Name: Address:

Computers owned: Age:

Return this form together with your payment to: **PCW Subs**, 12-13 Little Newport St., London WC2H 7PP (Allow 28 days for delivery).



With Kenn Garroch

The Amsdos hex

Alastair Scott, of Grange-mouth, in Stirlingshire, writes:

Q I would be grateful if you could help me with the AMSDOS disc format.

On examining the directory entry with a disc sector editor, I get a display such as:

```
00 45 4E 56 45 4C 4F 50
45 42 41 53 00 00 00 4A
20 69 79 7H 7B TE 80 83
84 85 00 00 00 00 00 00
```

I realise that the highlighted hex digits refer to the track sector that the file (in this case *Envelope.Bas*) is stored at. How can you convert these digits into track and sector numbers?

A CP/M disc (for this is what it is) is not set out in the way you might think. The file is split into portions that will fit into the available places on the disc. The directory tells the operating system where the various pieces are. The directory entry is read as follows.

Byte	Contents	Meaning
0	00	Set to 0 if file is valid, E5 if erased
1	E	
2	N	
3	V	Eight
4	E	byte
5	L	filename
6	0	
7	P	
8	E	
9	B	Three byte
10	A	file
11	S	extension
12	00	Extent
13	00	s1
14	00	s2
15	4A	Number of records in this extent

16	26	The
17	69	rest
18	79	are
19	7A	allocation
20	7B	units
21	7E	which
22	80	are
23	83	set
24	84	to
25	85	zero
26	00	if
27	00	they
28	00	are
29	00	unused
30	00	
31	00	

These 32 bytes tell the operating system all of the information it needs to know about the file. The filename and extension are obvious. Files are stored on disc as records of 128 bytes, each allocation unit represents 8 records, and there is space in one directory entry for 16 allocation units, hence $16 \times 8 \times 128 = 16384$ bytes.

The extent entry is used when the file exceeds 16K. If this happens, another extent is opened up creating a new directory entry with the same filename and type but with the extent number set to one (or more if the file is really big, calling for more directory entries).

The allocation units are stored in the directory entry from byte 16 to 31 (16 entries as above) and each refers to a block of eight sectors each sector being 128 bytes long. The blocks are numbered sequentially from track 0 sector 0 through the last track and sector (depending on the density).

So to find where a file is stored on disc, look at the allocation units, and then read the eight consecutive sectors that each one points to. In your example, the first block is stored in block 26 (38 decimal) or sector 304 (38×8); just divide by the number of sectors per track to get the track number, the remainder is the sector on this track where the file starts. At the end of this block, use the next allocation number to work out the position of the next block.

When you get to the last block, it may not be full, the remainder of the 'number of records' entry divided by 8 will tell you how many records are used.

The numbers s1 and s2 are

used by the system for something but I don't know what, the number of records in the extent is exactly that on single density system (such as the 6128) but is a little more convoluted on double density systems.

Go to Print

P M Rainford Jnr, of Llanbedr, in Clwyd, writes:

Q Please could you tell me what is happening in this short program on the Commodore 64?

```
10 PRINT " TIME
20 GOTO 10
```

A The Commodore 64 has a built-in clock that starts counting from zero when the machine is turned on. This 'Jiffy clock', as it is known, counts up at 60 times a second (even on British machines where the mains frequency is 50Hz) and is held in three bytes of

memory, 160, 161, 162, where 162 changes the fastest. $Print\ 65536 * Peek(160) + 256 * Peek(161) + Peek(162)$ is the same as $Print\ Ti$. The Commodore 64 only recognises the first two characters of any variable name so $Print\ Time$ or $Print\ Tide$ are the same as $Print\ Ti$, the Me or De being irrelevant to the machine.

The internal clock is fairly accurate but is somewhat dependent on whether any input/output operations are going on. Both the tape and disc will stop the clock when they are being used leading to inaccuracies.

Ti is also what is known as a system variable, ie, it is reserved for system use and updated by the system. Other system variables are $Ti\$$, which can be used to set the jiffy clock to read the time of day.

$Ti\$ = "083031"$ sets the clock to 8.30 and 31 seconds making $Ti = 1837860\ (((18 * 60 * 60) + (30 * 60) + 31) * 60\ jiffy's)$.

Charts

Top Twenty

1	(5)	Go for Gold	Americana
2	(3)	Dragon's Lair	Software Projects
3	(1)	Super Cycle	US Gold
4	(4)	Speed King	Mastertronic
5	(6)	Thrust	Firebird
6	(12)	Ninja	Mastertronic
7	(-)	Trivial Pursuit	Domark
8	(2)	Dan Dare	Virgin
9	(8)	Ghosts and Goblins	Elite
10	(10)	ACE	Cascade
11	(11)	Ninja Master	Firebird
12	(7)	Kane	Mastertronic
13	(-)	Formula One Simulator	Mastertronic
14	(17)	Warhawk	Firebird
15	(-)	Parallax	Ocean
16	(9)	Knight Rider	Ocean
17	(20)	Green Beret	Imagine
18	(-)	Leaderboard	US Gold
19	(16)	Kick Start	Mastertronic
20	(18)	Nightmare Rally	Ocean

Figures compiled by Gallup/Microscope



In the lap of the Gods

David Wallin has news of multi-user game *Gods*, with a special offer for *Popular* readers

A while back we looked at a couple of BB multi-user games, including *Gods*. This week we have a special *Gods* offer for readers of this column, so it's time to look at the game in more detail. There is a personal bias in this, I must admit; *Gods* is my favourite multi-player adventure, despite its joining-on fee of £23.

Accessing Gods

Gods can be accessed by any 300/300 or 1200/75 terminal, although I find that 1200/75 works a lot better than 300/300. The number is 01-994 9119 and the protocol 8-bits, no parity and one stop bit (standard BB protocol).

Free demo mode

To see if you like *Gods* (and you probably will), you can log on as a guest. From the first menu you go to the Play option and enter guest when asked to, and then follow any on-screen instructions.

Most of the other people I have met on *Gods* are friendly and generally peaceable. There is, though, one thing that can turn even the most friendly people to murder, that is an annoying guest.

Guests have a habit of trying to kill other people, as there are plenty of weapons about for the violent people out there to find and kill with, but most other players are peaceful and don't kill unless forced to.

Other players are also helpful to the beginner. When I first started, many others offered to give me guided tours of the area, totally free, to help me. They also offered tips when you are stuck which is useful. It was the other players who taught me about 'valuing' items (see below). Offering items to the *Gods* (also see below), performing the 'ritual' in Blob's temple and other things that had at first baffled me.

Treasure

When you find treasure, you can value it to find what it's worth. When you type *Value (items)*, a little character appears, looks at it and tells you its worth in both magic points and gold.

Treasure can be offered to a God in his temple. Having asked the guard to take you there, you can type *Offer (item)* to

give the item to the God. What happens next depends on the value of the item. If when valuing it you were told that the Gods would give you zero for it then the Gods will be cross with you. If, however, the item is valued above zero, you will be given its value in magic points (called magical reserves).

The more items you offer, the better your rank will be. You start as Scum, proceed to Salt-Of-The-Earth, then to Second Class Citizen, eventually, through Monk and Priest, to finally become a God. There are many ranks, and the above are just examples. At the time of writing I am a Second Class Citizen, under the persona of Communicator.

The 'ritual' mentioned above is a method of getting a lot of points, even though you may not have much treasure yourself. To find out more you'll have to play *Gods*.

All good adventures have a maze, and *Gods* is no exception. In *Gods* the maze is the Kashab, and it's easy as anything to get lost in it. If you do get lost in the Kashab, then keep typing *Out*. Also there is a forest, where you can get lost, but it is quite a bit easier to find your way out of the forest than the Kashab.

At present, there are only two spells available; *Where* and *Summon*. They do exactly what you would expect. *Where* tells you where an object/person is. *Summon* will bring a person to you. More spells are on their way. Other commands include *Fight, Use, Kill, Get, Value, Offer, Kiss, Bug, Cry, Say, Shout, Help, Mount, Ring Bell, Guard, Out* and many, many, more. The command *Who* will tell you who is currently playing the game.

The Bulletin Board

Running alongside *Gods* is a multi-user Bulletin Board. At present this is a very crude messaging system, where you can leave other players messages, but *Gods* is now running on a new computer and an upgraded BB is promised.

Gods - the background

Gods is run by three people, Tiger, Major Malfunckion (The Major) and Lucy. They form LOTG (Lap Of The Gods). Tiger, who wrote the software, built the hardware, etc, does most of the running.

Until recently, *Gods* was running on a

68000 Xenix machine, now it has been upgraded to Uniplus, on a 'home-made' computer, consisting of bought-in boards. The *Gods* software (and hardware) is available for sale to budding MUG sysops, but don't expect it to come cheap! Also LOTG will write custom games to your own requirements and sell a multi-user Bulletin Board system.

The charges on *Gods* are likely to change soon and an hourly playing charge be implemented when the game is finished, so you'd better join soon and make the most of the 'free' access time available.

Joining Gods

To register you send your £23 to LOTG with some information about your computer and modem. What you must do to register can be found out by Typing *H* at the first menu.

Special Offer

As a reader of *Popular Computing Weekly's* Communications feature, you are entitled to a discount of £6 when joining *Gods*. The cost for a *Popular* reader to join *Gods* is only £19.95 (including Vat).

You have three months to apply to join *Gods* at this special discount price. After then, you will be required to pay the full price.

To be entitled to this offer, you must quote the following on application:

- 1) My Telecom Gold mailbox number (printed regularly on this page).
- 2) The reference dis/PCW/001.
- 3) The volume and issue numbers of this copy of the magazine.

You must include with your £17, your name, address, signature, date and make/model of computer and modem. You then should leave a message on the BB, to Tiger, with your name, address and cheque number (if applicable). You will be notified through the board of your account number and password as soon as your registration fee is received.

The address to send off to for a discounted membership to *Gods* is: Discount Offer, Department PCW, Lap Of The Gods Ltd, 166 Portobello Road, London W11 2EB.

CALL RODNEY WOODLEY on 01-437 4343 FOR SEMI/DISPLAY ADVERTISING

FOR SALE

WANTED books "De re Atari" and "Tech. ref. notes" both for Atari 800XL. Tel: 06845 4968.

SOME FABRIC RIBBON RE-INKING PRICES

Printer	Price £ p	Printer	Price £ p
Amstrad GMP1 & 2000	2.00	Amstrad PCW9250	1.80
Brother M1000	1.35	Canon 1400	1.80
Commodore 4023	1.75	Epson FX30	2.05
Epson LX30	1.30	Kaga Titan KP610	1.80
Schickel SP200	2.05	Shivley 4023	1.75
Silver Reed L344	1.95	Smith Corona D200	2.15

If your used fabric printer ribbon is not on this list, send it with £2.00 and we'll re-ink it and quote future prices.

ALADDINK, (Dept PC), 4 Harker Crescent, Eyemouth, Berwickshire TD14 5AP (28C)

WANT SUPERB QUALITY PRINT from your Amstrad CPC and Epson compatible printer? QFont includes m/c program which adds 4 new commands, 2 fonts, superb font designer, ASCII file printer, and graphic screen-dump, for only £5.95 (tape) or £9.95 (disc)! DW Software, 62 Lascelles Avenue, Withernsea, N. Humberston HU19 2EB.

AMSTRAD tape to disc transfer from £1 per game. Send S.A.E. for details to R. M. Productions, 40 The Brow Brecks, Rotherham S65 3HP.

ATTENTION ATARI USERS. For details about joining "Atari Watch", the national and the best Atari news service, send S.A.E. to: P. Carlin, 8 Tith Croft, Heathtown, Wolverhampton, West Midlands WV10 0HT.

PRINTER/MONITOR STAND

(18" width, white)

ONLY £7.50

21" width also available **£7.99** (BBC-B, Master, will slide under)

In beige 18" **£7.99**, 21" **£8.50**

All prices plus just £1.50 p&p (any quantity)

Send cheque or PO to:

MORRISON COMPUTER SUPPLIES
PO BOX 101, LEAMINGTON
SPA CV32 5SJ (46)

TWO MIRACLE WS2000 MODEMS. Each with Spectrum interface and software. 1200/75, 75/1200, 300/300, 600 half, 1200 half available. Professional Modems, hardly used. Cost £200 each. Will accept £100 each. Tel: Stuart 0438 369706.

STOP PLAYING GAMES

Use your computer to make money. Turn your hobby into a home-based income. Full and part time opportunities to cash in on this tremendous market. High earnings easily possible. Open to any amateur micro user and gamer. Write for free details.

Westlink Promotions
48 Great King Street
Edinburgh EH3 6QY (37)

AMSTRAD SOFTWARE: Maxam ROM unused, £33. Elite disc unused, £13. 464 whole memory guide, £5. Also Memotech MTX 500, 32K RAM assembler, etc., £50. Tel: Richard 01-263 9907 evenings/weekend.

SPECIAL OFFERS!

Commodore Compendium 64	139.99	Cub Monitor 1431 MZ3	180.00
Commodore Plus 4 Disk Drive 1551	129.99	Cub Monitor 1431 DZ2	140.00
Amstrad DMP 2000 Printer	145.00	Sanyo Monitor DM2112 (video out)	45.00
Amstrad Disk Drive + interface (used)	130.00	Silver Reed D/Wheel printer (parallel)	175.00
Opus Discovery (Spectrum)	59.99		
Opus 5 1/2 s/s Drive (BBC)	49.99	★ Spectrum 125K ONLY	95.00
Opus 5 1/2 D/Drive (BBC)	99.99	★ Spectrum Plus 48K only	69.99

Computers & unwanted computer stock wanted for cash.

Now open! 'Computer Repair Dept':

Faster & cheaper than the average (90 day warranty). (20)

THEBURY COMPUTERS

26-28 Bowsfield Lane, Stockton,
Cleveland TS18 3ER Tel: (0642) 604768

C16 + PLUS 4 OWNERS "20 USER" NEW

The only Magazine dedicated to Commodore C16 and Plus 4 Users is "20 USER" (C16 Plus 4 = 20), the official magazine of the C16 & Plus 4 Users Club. For too long now C16 and Plus 4 Users have been treated badly by the majority of the Computer Press, now with the advent of this club, C16/Plus 4 owners can get the most out of their computers.

"20 USER" is a monthly magazine which features all the latest C16 and Plus 4 news, reviews of the latest hardware and software, features, articles, program listings, readers' letters, competitions, special offers, advertisements from trade advertisers and much much more!

To receive a years' subscription to "20 USER" you have to join the C16 & Plus 4 Users Club, one years' membership costs just £10 and this entitles you to 12 issues of "20 USER", a membership card, free classified advertising and various club mailings throughout the year.

If you would like to subscribe to "20 USER" then please send Cheque/Postal Order International Money Order for £10 (UK Membership) or £15 (Foreign Membership) made payable to Micro Media to the following address.

C16 & PLUS 4 USER CLUB (20 USER),
C/O MICRO MEDIA,
42 MOUNT STEWART STREET,
CARLUKE,
LANARKSHIRE,
ML8 5EB

SOFTWARE HOUSES!!!!!!
ARE YOUR PRODUCTS
REVIEWED IN "20 USER" ? IF
NOT THEN YOU ARE MISSING
OUT. SEND YOUR LATEST
PRODUCTS FOR REVIEW IN OUR
NEXT ISSUE!

SUBSCRIBE TO

POPULAR
Computing
WEEKLY

and we will send you free of charge a **Popular Computing Weekly** binder complete with logo and holding 13 (3 months worth) of your favourite computer weekly.

Please enter my annual subscription to Popular Computing Weekly at £19.95 U.K. (£37.40 overseas), and send my free Popular Computing Weekly Binder.

I enclose a cheque made payable to Sunshine Publications Ltd.

Please charge my Visa/Access card

No:

Expiry Date:

Name: Address:

Which computer do you use?

Return this form together with your payment to: PCW Subs., 12/13 Little Newport St., London WC2H 7PP (Please allow 21 days for delivery).

SUMMER PRICES HELD UNTIL OCT. 31st**AMSTRAD PCW8256/8512**

Hardware		
256K RAM expansion quality tested components only.....		£25.00
Quality soft PVC Dust Cover Set only.....		£7.98
Printer ribbon.....	£5.60	2 Ribbons..... £10.95
2nd Disk drive.....	£145.25	HARD DISK. PHONE FOR DETAILS
CF2 Disks..... each £3.90	CF2 Disks box of 10..... £36.25	RS232/Centronics..... £56.95

Software

Powerful	dBASE 11.....	£99.95
Versatile	DELTA.....	£91.00
Comprehensive	CAMBASE 2.....	£40.44

PLEASE PHONE FOR ADVICE ON THE RIGHT DATABASE FOR YOU

MAP Integrated Accounts.....	£125.50	CAMSOFT Integrated System.....	£136.45
Cracker 2.....	£42.88	Scratchpad Plus.....	£58.25
Pocket Wordstar.....	£42.20	Newword 2 & Word +.....	£60.38
Prospell.....	£24.99	Typing Tutors: Touch 'N' Go & IANKEY.....	£21.80
Brainstorm.....	£44.95	Smartkey.....	£44.95
DR CBASIC, DR PASCAL, DR DRAW, DR GRAPH.....		CHIT CHAT Combo.....	£87.99
		3D Clock Chess.....	£12.94

Quantity discounts available with 2 or more software packages**SINCLAIR QL**

Super Q Board 512K NOW WITH THE EXCELLENT TOOLKIT 2.....		£239.00
Super Q Board 512K with dual 3 1/2" NEC Drives.....		£444.00
512K Expanderam.....	£115.00	10 x 3 1/2" DS/DD disks..... £25.00
		Serial cable..... £6.75

NEW ITEMS FOR PCW

Music & Sound Generator.....	£34.99	Joystick Interface.....	£12.49
Electric Studio Light Pen.....	£69.99	Printer Extension.....	£11.95

We now stock quality software and hardware for the BBC and IBM PC. *Send S.A.E. for details*

**Prices include VAT & POSTAGE
PHONE FOR FURTHER DETAILS**

All products are offered subject to availability

PERIPHERY

117 GAINSBOROUGH AVENUE, OLDHAM OL3 1AJ.

TELEPHONE: 061-626 5802

(38)

POSH LIST SPECTRUM 16/48K

Whatever the reason for including multi-statement lines in a BASIC program it may be a hindrance to debugging and reading. With POSH LIST you have the best of both worlds since each statement enjoys a separate line. POSH LIST is 100% machine code, fully relocatable and "transforms" old BASIC into neatly tabulated work of art. - Sinclair User August 1986.

In addition to the normal LIST LIST header, sections may be listed down to a single line! At the end of each listing a byte count is given with or without the inclusion of REM statements, which may be expanded to REMARK in source video. POSH LIST incorporates a REM statement delete facility with a unique provision to protect selected REMs. Included is an option to insert 32 column text between BASIC lines. Easy to work with, it's a budget bargain - "superb little utility" - Sinclair User August 1986. AT £2.95 for cassettes, manual and plug, we feel sure that you will agree with Sinclair User.

Send your cheque or postal order to:
DELTA80 SOFTWARE, 12 Lowerdale Road, Lewisham, London SE13 6JD. (38)

QL BACKUP SUITE V5.3

Corrupted masters? What are they? Byte for byte mdy duplicator is keys for all known mdy software in as little as 1 min. 10, inc. format. Detect invisible files, file, etc. file len. Swap strings in file. Use relocatable EPROM's from mdy. v. "Fancy" window editor. 100K+. £9.95 to Steve Jones, ZITASOFT, 93 FOXBOURNE ROAD, LONDON SW17 8EN. P.S. Advise update prior V5.0. (43)

HOME ACCOUNTS

Put your house in order! Probably the best home use for your computer! Comprehensive coverage of bank accounts, credit cards, HP, standing orders etc. Inbuilt accuracy check for all transactions. Cashflow projection. For all Amstrads, Commodores and Spectrums. £9.95 or FREE details from:

DISCUS,
FREEPOST,
ILFORD IG1 1BR
Tel: 01-514 4141
(24 hours 'live') (15)

NEW HORIZONS SOFTWARE

Four Weeks, 30 Day-Lite Register, Manual, Screen 801 Soft (Chapters of software for SINCLAIR RESEARCH Ltd) present for the SINCLAIR QL.
The largest range of software for the SINCLAIR QL is offered by any software house in the world - over 70 PROGRAMS: words, strategy, adventures, collections, educational, utilities. Send S.A.E. for catalogue.

★ SPECIAL OFFER ★
CHOMPER A version of the popular arcade game PACMAN with 8000 power pills, etc. £9.00
GOLF A full simulation (not only) of an 18-hole course with ballistics, club selection, water, etc. £8.00
SNOOKER A full simulation of snooker. £8.00

★ STRANDED (+QUEST) You are stranded on a hostile planet. Can you escape? Can you survive in your search for all that is precious in the desolate wastes? £5.00
★ Any 2 for £7.50, any 3 for £8.00, all 4 for £10.00! ★

Level realisation courses in the following subjects: French, Mathematics, Physical Chemistry, Biology. £10.00
NEW RELEASE - WORDSEARCH CREATOR A utility to allow you to create and store in cartridge wordsearches as well as copy to print. £10.00

VALUE FOR MONEY - FANTASIA ADVENTURE Your role is to act as spy and commander in a foreign land - over 1000 objects to find, the reconstruction of the enemy and enemy Master. £10.00
REMEMBER - OVERSEAS CUSTOMERS ADD £1 PER PROGRAM FOR POSTAGE! If you have written a program send it to us for evaluation, if you'd enough you would receive a considerable sum. (Rejected programs returned immediately!) £5

GAP SOFTWARE

DESIGNER - Version 2.2 of the graphics utility now available. Even easier to use, still points up to 52 screen lines. For business cards, leaflets, basic PCB design etc. Still only £8.95. Character Designer - Now with 14 character sets. Still only £4.50.

DUNGY (Bradley Software) - ScreenDump Designer - For Spines, Catalogues, supports 13 popular interfaces. Many height/width options. Still only £7.50.

OR BUY ALL THREE FOR £18.95!
All are compact, interactive, and easy to use, compatible and fully menu-driven. All a double to use! Designer and Character Designer have an automatic back-up. Also printer ribbons, eg. 8000 £4.25, M1000 £5.00. Ring for other prices. (38)

CONSOFT for QL

ODRIVE Microdrive recovery utility £9.95. Multitasking, Menu driven, with instructions. Automatic recovery of dir., files, deletions. File rebuild from sectors. Full Sector editor. View sorted map, dir., sectors and headers. String search, output to any device etc. Note Change of address. Cheque/P.O. to
CONSOFT, 31 Penarley Rd., Rainham, Essex RM13 9HF. (49)

FOR SALE

YAMAHA CX5M owners, get 96 new voices! Various bass, sax, effects, synths/organ sounds for £4.50. PO. Put PCW on envelope. Paul Brown, 19 Wran Road, Sidcup, Kent DA14 4LY.

ATMOS/ORIC 148K Goldmine. Collect gold bars from 35 different mines only £3.50. David Yip, 77 Great North Road, Gosforth, Newcastle NE3 2DD.

CMB 64, 1541, C2N, Modem, sound sampler, Quickdisc, freeze-frame joysticks, £1000 software. Mainly top games but also utilities, e.g., White Lightning, Laser, Compiler, Easyscript and more. £520 o.n.o. Tel: Slough 41211.

SPECTRUM 128K plus £100 software, £100 o.n.o. Opus Discovery disc drive (128), 4 months old, £80 o.n.o. Tel: 021-360 0189.

COMMODORE 64, C2N, 2 books, joystick, £110. 25 originals for C64, £40. Spectrum + and tape recorder £35. RAM Turbo joystick and cartridge interface + 9 ROM cartridges for use with any Spectrum, £22. Tel: 0272 644770.

WANTED COMMODORE 128 or 128D. Cash waiting. J. D. Hamon, 160 Church Hill Road, Cheam, Surrey SM3 8NF. Tel: 01-644 5393.

SERIAL 8056 PRINTER (Dixons) - unused apart from testing - complete with QL connector cable, £30. Tel: Harrogate (0423) 864209 evenings and weekend.

SPECTRUM +, microdrive, centronics interface, brother HR-5 printer, microdrive backup unit, tape deck, joystick, some games. £220 the lot. Will separate. Serial 8056 printer £30. Tel: 051 423 3391 between 6-7 pm.

BLANK CASSETTES**WITH LIBRARY CASES**

	C10	C15	C20	C30
10	3.80	4.00	4.15	4.60
20	7.00	7.20	7.40	8.20
50	15.00	15.20	15.50	17.50
100	27.00	28.00	29.00	33.00

Fully Inclusive (COB 65p extra)

Superior Tapes. Don't Settle for Less!

DISKS

10 5 1/2" DS/DD £8
inc. plastic case
10 3 1/2" SS/DD £17

MEMOTECH COMPUTERS AND ACCESSORIES

MTX 512 COMPUTER	£75.00
DMK 50 PRINTER	£150.00
RS232	£35.00
PASCAL ROM	£38.00
SPECULATOR ROM	£36.00
3 mb. DISK DRIVE & INTERFACE	£150.00
1 mb. DISK DRIVE & INTERFACE	£210.00

All the above prices are fully inclusive. We stock the entire Memotech Range. Orders/Enquiries to:

UK HOME COMPUTERS
82 CHICHESTER AVE. DUNFORD
WILT. BA12 7JH
24-hr Phone Service 0793 895034 31PL27

SOFTWARE

GOLDMARK SYSTEMS

UTILITIES FOR THE AMSTRAD

LORD OF THE RINGS

Side 1 of our conversion cassette will AUTOMATICALLY transfer the three games to disc including the screen. Side 2 is for NON-DISC owners and will reduce the loading time of around 15 mins. to just under 3 mins.

cassette £4.00

SPEED-TRANS

SPEED-TRANS is specifically designed to transfer many programs that have been protected with the SPEEDLOCK protection system. Contains full instructions to convert to disc.

cassette £5.50

TRANSIT

The utility by Pride will copy individual files up to 42K in length from drive A-A, A-B, B-B and B-A. IT DOES NOT REQUIRE THE USE OF CPM and is a necessity for those with a 5 1/4 second drive. It is menu-driven and is easy to use. It is TRANSMATable to disc.

cassette £4.00

VIEWTEXT

This utility by Pride will allow you to see the text in a BINARY file. It is particularly useful for games that require passwords (eg Hacker and other adventure games). It is TRANSMATable to disc.

cassette £3.00

WHY WAIT AGES FOR YOUR PROGRAMS TO LOAD - Let us help you to convert them to disc. We have over 140 conversion routines, most using TRANSMAT by Pride Utilities. Phone or send for more information.

UK prices shown. EUROPE add £1.00 per title, REST OF WORLD add £1.50 per title. We accept EUROCHEQUES (Sterling please).

GOLDMARK SYSTEMS, 51 COMET ROAD, HATFIELD, HERTS, ENGLAND. Tel: 07072 71529 ANYTIME. (14)

WE ARE GIVING AWAY

£1000

AMSTRAD CPC & SPECTRUM OWNERS
DO YOU ENJOY PLAYING GAMES?
CAN YOU SOLVE SIMPLE RIDDLES?
THEN YOU COULD WIN YOURSELF £1000

THE GAME OF THE CENTURY

ONLY £7.95 (add £1 overseas)

DISPLAY GRAFIX LTD

Unit B57, Northbridge Centre, Elm Street, Burnley, Lancs

AMSTRAD DISC USERS: Tape-Disc, Disc-Disc, Disc-Tape, plus much, much more all on one disc for only £10.95 (add £1 overseas) (28D)

400/800 NOW
XL/XE ATARI OWNERS ST

LOOK

Are you having difficulty finding suitable software. If so, then look no further. We have available for both hire and purchase one of the largest selections of both UK and American titles to choose from. Games and Utilities for all ages. Hardware and add-on utilities at discount prices and special deals regularly being offered. If you would like further information please send a large A4 A10 to:

CLARENWOOD PRODUCTS AND GAMES
306 Warwick Avenue, Queens, Leamington
Leamington CV32 9BB
Tel: 0592 412804

SOFTWARE CLUB. Up to 55% off software. Any micro. Free Software. Send for details to: Best-Bite, 104 Elmshurst Gardens, Tonbridge TN10 3OZ.

AMSTRAD SOFTWARE HIRE

Lowest Rates... Fast Service

OUR MEMBERS SAY... WE ARE THE BEST

LATEST RELEASES... HUNDREDS OF TITLES

FREE MEMBERSHIP - JOIN NOW

Details from:

X & M COMPUTER CLUB, Software Library,

40 Fairstead, Birch Green, Shelmersdale, (45)

Lancs WB5 8SD

AMSTRAD Genealogical database (disc). £35. Full details of 1000 people (10 marriages, 19 children) per file. Search (names, places, occupation, special comments etc.). Construct descent lines. Details: Tel: 061-439 4841.

FOR SALE

COMPUTER HIRE

TO HIRE A COMPUTER AND/OR PERIPHERALS BY THE WEEK OR MONTH RING 01-607 0157 or 01-997 6457 WE SPECIALISE IN BBC AND ALSO HAVE A RANGE OF AMSTRAD COMPUTERS FOR HIRE

COMPUTER HIRE SERVICES
294A CALEDONIAN ROAD
LONDON N1 1BA (9)

COMMODORE 64 1541 drive, colour monitor, joystick. Some books, some software, £475. Tel: Drummond Winslow 3078. Anytime during the day.

AMSTRAD SYSTEM: CPC464 colour machine with Disc Drive, DK Tronics 256k Silicon Disc, 256k RAM pack, selection of games and utilities including Tasword.

ATARI CASSETTE DUPLICATOR. Make back-ups of your tapes easily. Only £2.95 each. Send cheque/P.O. to: S. Murray, 26 Edgell Gardens, Potterton, Aberdeen AB4 0ZE.

ADVENTURES FOR 48K Spectrum. Frankenstein only £2. Nightboat only £3. Side B included! Karl Crawford, 90 Westfield Avenue, Redcar, Cleveland TS10 1HG.

YOUR PERSONAL CENTRONICS PRINTER



- DRAFT DOT MATRIX
- NEAR LETTER QUALITY
- SUBSCRIPT SUPERScript
- CONDENSE EMPHASIZE
- 96 KHZ +48 EURO +16 MATHS
- EPSON/IBM GRAPHICS
- OPTIONAL TRACTOR

ROCK HALL LIMITED
128 STATION RD. GLENFIELD,
LEICESTER LE13 8RR
TEL: 0533 313531
TELEX: 341100.

5 1/4" DISKS

SS/DD HIGH QUALITY 96DPI
(inclusive of hubring, envelopes, labels, etc.)

PACK OF 3 £3.50
PACK OF 10 £9.00
PACK OF 100 £65.00

3 1/2" MICRO DISKS

PACK OF 5 (PLUS LABELS) £11.00
PACK OF 10 (PLUS LABELS) £20.00

5 1/4/3 1/2" DISK CASES

LIBRARY CASE (HOLDS 10) £8.50
DESK ARCHIVE (HOLDS 25) £14.50
5 1/4" LOCKABLE (HOLDS 100) £13.50

5 1/4" DISK SLEEVES

DURABLE REPLACEMENT SLEEVES IN 6 BRIGHT GLOSS COLOURS. PRICE:

£1.50 PER 10
£6.00 PER 50

COLOURS: RED, MARGOLD, GREEN (2), BLUE & PURPLE

ALL DISKS CARRY A LIFETIME REPLACEMENT GUARANTEE. ALL PRICES INCLUDE POSTAGE & PACKING. CHEQUES & POSTAL ORDERS TO:

SIERRA VICTOR SOFTWARE
43 GREEDONRISE, SILEBY
LEICESTER LE12 7TE

SERVICES

DUPLICATION

The 1st choice
**EXPRESS SPECTRUM, BBC
and COMMODORE REPAIRS!**

SOFTWARE
RRP £24.00 FREE WITH
EVERY REPAIR*

**WHY PAY HIGH
'FIXED'
PRICES**

Spectrum
repairs between
£9 and £20

BBC repairs
between
£14 and £45

Commodore
repairs between
£14 and £35

*Spectrums only

(We do not charge you for our fancy premises by charging high 'fixed' prices)

Reputations take time to build, we have been repairing ZX 81's, Spectrums, QL's, Apples and BBC's professionally, for 2 1/2 years - who is coming second?

In all U.K. with 'While-u-Wait' repairs with INTERNATIONAL repair service

To charge LOW PRICES for the smaller repairs! (e.g. £9 for keyboard faults)

FOR LOW PRICES - My computer blew recently, I took it to MANCOMP, who fixed it in 8 minutes and for less than £10! They are local, 'closed up' and 'blindingly efficient' & HEATONS DIGEST.

FOR PROFESSIONALISM - 'Of all the repair companies Sinclair User' spoke to, MANCOMP seemed the MOST 'PROFESSIONAL' when it came to advice and a helpful attitude' ALG BS.

FOR HONESTY - We let you watch your computer being repaired and if there is nothing wrong with it, we will tell you!

FOR REPUTATION & HELPFULNESS - 'I have come across a firm that will be more than willing to advise you as to how to remedy your problems. They are called MANCOMP and as well as repairing faulty computers, are also quite willing to discuss your problems with you and offer reasonably cheap and more importantly CORRECT CURES' Phil Rogers POPULAR COMPUTING WEEKLY JAN 85.

FOR SPEED - 'One firm at least can effect any necessary repairs over the counter in 45 minutes. Based in Manchester, MANCOMP can offer what is arguably the FASTEST turnaround in the business to personal customers' CRASH Magazine JUNE 1985.

THIS IS WHY Spectrum users from London, Cornwall, Scotland, Birmingham, Liverpool, Coventry, Leicester, Glossop, L.O.M. etc. AUSTRALIA, AUSTRIA, BELGIUM, EGYPT, EIRE, GERMANY, HOLLAND, NORWAY, NORWAY, POLAND, RUSSIA

NEW GUINEA, SAUDI ARABIA, SWEDEN, SWITZERLAND and ZIMBABWE - send their Spectrums to MANCOMP for repair!
24 HR. TURNAROUND NO-QUEBEC GUARANTEE. NO HIDDEN COSTS.

Because we repair hundreds of computers every week, we are able to pass on our 'component buying discount' to YOU in lower prices... Z80A cpu £1.50, 4116 50p, Upgrade fitted £18.95

- We bring down the prices for repairs and components! (We may refuse to revive computers suffering from attempted D.I.Y. repairs)

Every parcel sent by Royal Mail Receipted Post and insured for return journey! (For next day delivery include £1.50 extra)

(Security by prior arrangement). On-site maintenance for Apples, IBM's and most makes of printers also available

Guaranteed 4hr response
WHY DELAY - OUR ESTIMATES ARE FREE AND WITHOUT OBLIGATION IF

YOU DO NOT LIKE OUR ESTIMATE WE WILL RETURN THE COMPUTER AND REFUND THE POSTAGE INCURRED

MANCOMP LTD
(Dept PCW26)

Printworks Lane, Levenshulme, Manchester M19 3LP
Phone 061-224 1888.
OR 061-224 9888.
OPEN MON - SAT 9am to 7pm



What we do today... others do tomorrow!

CASSETTE COPIES

50 C10's FOR ONLY £240 INC. P + P
FROM YOUR CASSETTE MASTER
IN REAL TIME. PLEASE PACK
IN FOIL AND SEND CHEQUE TO:-
SOUNDS GOOD
CLEAR CROFT, BOTTOM LAKE,
SEER GREEN, BUCKS HP9 2UH.
TEL: (04946) 5900

2SP/03

FAST reliable service of DATA DUPLICATION for most computers. Comprehensive facilities include insurance/re-ordering bank direct debits, bank or printed labels/reverses. COMPETITIVE PRICE-LIST form.

SIMON STABLE PROMOTIONS
CASSETTE DUPLICATION

The Knowledge Studios, 1 World Flat
Luton, Beds LU1 3DF Tel: 0563 25 2611
Fax: 0563 22 7277

CHILTERN COMPUTER SERVICE

FOR FAST RELIABLE REPAIR SERVICE
SPECTRUM, inc VAT & P&P £16.00
(inc parts, VAT, P&P)

WE ALSO REPAIR CEM 64 & BBC, VIC 20, ORIC, AMSTRAD, PRINTERS AND DISC DRIVES

Overseas enquiries welcome!
We give 3 months warranty on replaced parts.
Send computer with details of fault and cheque made out to:
CHILTERN COMPUTER CENTRE (10)
99/100 HIGH TOWN ROAD,
LUTON, BEDFORDSHIRE LU2 5SS

FAULTY SPECTRUM?

As you are probably aware from press reports Sinclair Computers no longer have a repair department.

Our computer repair workshop has been an OFFICIAL Sinclair Repair Depot for the past six years and we are pleased to announce that we will continue to do your out of guarantee repairs as in the past.

Send your faulty computer DIRECT

SPECTRUM.....	£18.75 inc parts
ZX81.....	£11.50 inc parts
16K RAM.....	£9.95 inc parts
MICRODRIVE.....	£15.95 inc parts
INTERFACE 1-11.....	£18.75 inc parts

CALL OR SEND WITH CHEQUE OR P.O.

T.V. SERVICES OF CAMBRIDGE LTD
FRENCH'S ROAD, CAMBRIDGE CB4 3NP
Tel: 0223 311371

28TV

FOR SALE

DISCS

AMSOFT	3"	C2	£29.90 per 10
AMSOFT	3"	CF20D	£59.90 per 10
ATHANA	5.25"	DS0D 48tp	£10.90 per 10
MAXELL	5.25"	DS0D 48tp	£17.90 per 10
MAXELL	5.25"	DS0D 96tp	£22.90 per 10
LVL	5.25"	SS0D	£15.90 per 10
SONY D3440	3.5"	SS0D	£19.90 per 10
SONY D4440	3.5"	DS0D	£29.90 per 10
AMSTRAD	PCW 2nd Drive		£125.00 each
AMSTRAD	CPC 2nd Drive		£86.00 each
AMSTRAD	CPC8128 Green		£242.82 each
AMSTRAD	PCW8256		£378.00 each
AMSTRAD	PCW8512		£478.00 each
CI MANA			
40/80	8BC D/DRIVE		£127.80 each
AMSTRAD	CP83256 I/FACE		£57.95 each

Carriage inc. Please add 15% VAT (2)

RUGBY MICRO SPARES
30 OXFORD ST, RUGBY
CV21 3NF (0788) 71643
Callers welcome by App.

BARGAINS

SANYO 555-2 256K RAM, 2D/S D/D Drives, plus Basic, Wordstar, Spelstar, Mail Star, Calc Star, Infostar, Data Star and Report Star software (value £300 plus).

555-2 only £349 plus VAT

555-2 plus M/RES. Col. Mon., £449 plus VAT

555-2 plus H/RES. Col. Mon., £549 plus VAT

SILICONE SERVICES

Tel: 0642 226945 (44)

HELP eliminate V.D.U. users headache, loss of concentration, with a desk top negative ion generator. Special offer £37.95. Saving £2. Fully guaranteed. S.A.E. to: Ionisers, 1 Hammond Hill, Chatham, Kent.

PRICEBUSTERS COMP SERVICES

The ONLY way to buy software and hardware for your home computer!

LOOK AT THIS WEEK'S AMAZING OFFERS

SPECTRUM	RRP	OURS	COMMODORE 64	RRP	OURS	AMSTRAD	RRP	OURS
Stardisk 512k	8.95	6.50	Green Bee	8.95	6.40†	Knight Games	8.95	6.30
High	8.95	6.50	Fox Call	8.95	6.80†	Sharky	8.95	6.25
Green Heart	7.95	4.75	Older Water	8.95	6.32	Quasmode	8.95	2.89
King Fish	8.95	6.50	Barbedent	8.95	6.42	Black & Goldies	8.95	6.22
Yang Foo Meiter	7.95	4.75	Shark & Islands	8.95	6.50	Knicker '80	8.95	6.78
Ace	9.95	6.00	Dragon Games	8.95	6.82	Pen Test	8.95	6.51
Diast & Gubbins	7.95	4.75	Shark & Islands	8.95	6.82	Worm 10	8.95	6.89†
Engine Force	9.95	2.99	Knight's Lair	8.95	6.50†	Travel Permit	14.95	10.00†
Costa Capers	7.95	2.99	Mercurius	14.95	10.00†	Frankie Dies Highway	3.95	4.00
Rick & Wessale	8.95	2.99	Seaside City	3.95	4.40†	Redbus	8.95	2.99
Motor Vehicle	8.95	2.99	Mercurius	14.95	10.00†	Redbus	8.95	2.99
30 Vectras	7.95	2.99	Rock & Whistle	3.95	2.99	Rick & Wessale	8.95	2.99
Soft Personalities	7.95	5.50	Backstreet	8.95	2.99	Stardisk 512k	8.95	2.90
South Jack	7.95	5.50	Land of the Raags	10.95	4.95	There are a Sarnig	8.95	2.90
Dragon's Lair	7.95	4.75	Great Escape	8.95	6.32	Commodore	8.95	6.90
Travel Pursuit	7.95	4.75	Mighty's Revenge	8.95	6.95	Alan Highway	8.95	2.99
Knights Lair	7.95	4.75	Storm Force Blaster	8.95	5.99	Paperboy	8.95	5.80
Tennis	3.95	2.99	Storm Force	8.95	5.81	Carp Day	8.95	6.80
Paperboy	7.95	4.75	Protein	8.95	9.95	AMSTRAD 8256/8512		
Head Coach	8.95	6.50	Art Studio	14.95	10.00†	Garman	14.95	10.95
Business High	7.95	2.99	Engine Force	10.95	2.99	Garman Coach	14.95	10.95
Spider Rider	8.95	5.95	Quake Messy Dra	3.95	2.99	After Shock	17.95	12.00†
Jack The Ripper	7.95	2.99	Alter Ego (D) M/T	24.95	18.95	Tenabank	18.95	13.95
Sky Fox	8.95	2.95	Alter Ego	9.95	6.50†	MSX		
Heartbeat	10.95	6.50	Estrovia Gate	8.95	2.99	Solar	14.95	7.99
Yess Car	9.95	3.90	Paperboy	9.95	5.50	Hypertown	8.95	6.99
Scott Escape	7.95	5.50	Sea Drive	8.95	4.50	Van Coo	8.95	6.99
Snake Force Hunter	8.95	6.99	C-18	8.95	4.50	Nightshade	8.95	4.30
Military	8.95	6.80	Shen Jack	7.95	5.50	Track & Field	14.95	2.99
Saint City	8.95	4.40†	Frank Bruno	7.95	5.00	Jet Set	7.95	5.50
Overse in Europe	14.95	10.00†	Conway	49.95	30.00	Snapper	7.95	5.50
Beethoven	8.95	7.50†	Arnold	5.95	3.90	Knighr Line	8.95	6.90
Flecks Gate	8.95	2.90	Daryl Doo	8.95	3.90	Way of the Tiger	8.95	6.30
ATARI 5 DISCS			14 ONLY			Miss	8.95	8.50
Patrols	34.99	24.99	Shen Jack	8.95	2.25	BBQ	8.95	2.99
Magic Shell	34.99	24.99	Second City	8.95	4.90	Expanding Fat	8.95	2.99
The Tween	34.99	18.99	Aut (848, Weston)	8.95	2.25†	Pyramid	8.95	5.99
			(1 Disc available at £3.00 extra)			Trail Permit	14.95	8.00†

HARDWARE

SPECTRUM DK-TRONICS	RRP	OURS	AMSTRAD DK-TRONICS	RRP	OURS
Joystick Interface	2.95	5.95	Light Speech Synthesiser	20.95	25.95
Dual Joystick Interface	5.95	7.95	Light Pen	19.95	24.95
Games Printer Interface	12.95	7.95	JOYSTICKS		
Three Channel Sound	18.95	18.95	Koaxic Speed King	12.99	9.99
Speech Synthesizer	24.95	18.95	Knighr Line	8.95	5.99
Light Pen	18.95	13.95	Canohat 2	11.95	8.95

* SPECIAL OFFER
PRISM VTX 8000 MODEM
ONLY £39.95

WHY IT PAYS TO USE PRICEBUSTERS

- * Excellent service and an established network which covers the world.
- * Price promise. If you find any place selling the software or hardware you wish to purchase cheaper than PRICEBUSTERS then send us proof and we will undercut them.
- * We have 1000's of titles in stock if you can not see the software or hardware you require, please send us a letter and we will quote you a price. Send S.A.E. for special offers.
- * All orders over £45 deduct an extra 5% off of your order.
- * All prices are inclusive of P & P and V.A.T.
- * Overseas orders (anywhere in the world) add only 65p to each item to cover excess postage.
- * Why waste time and money buying for a shop? When you can order the easy way!
- * Make your Cheque/Postal order payable to PRICEBUSTERS and send to:

PRICEBUSTERS COMP SERVICES
21 ABBOT ROAD
TITCHFIELD COMMON
FAREHAM
HANTS PO14 4LY

(51)

SINCLAIR COMPUTER REPAIRS

★ SPECTRUM/PLUS COMPUTER REPAIRS £12.00
(Special Offer)

★ SPECTRUM (RUBBER KEYBOARD) REPAIR..... £8.50
(Special Offer)

★ SPECTRUM PLUS KEYBOARD REPAIR..... £12.00
(Special Offer)

SPECTRUM 16K/48K & KEYBOARD REPAIR £20.00

SPECTRUM PLUS & KEYBOARD REPAIR £23.00

INTERFACE ONE REPAIR £17.00

INTERFACE TWO REPAIR £17.00

MICRODRIVE REPAIR £17.00

SPECTRUM/PLUS POWER PACK..... £11.75
(with new replacement)

COMMODORE C64, C16/PLUS 4 VIC 20 Price on
application

All prices are fully inclusive of labour, parts, postage and packing, and VAT. Send cheques or postal orders with computer only, unless power pack suspected.

CALLERS MOST WELCOME. OPEN 9.00 AM-6.00 PM MONDAY-FRIDAY

I. T. WESTERN ELECTRONICS

UNIT F2A & F3, AVONSIDE ENTERPRISE PARK,
NEWBROUGHTON ROAD, MELKSHAM, WILTS. TEL: (0225) 705017

24 HOUR

COMPUTER REPAIR CENTRE

The only **AMSTRAD SPECIALISTS** recommended by Amstrad

Repairs also undertaken for all the following computers:
SPECTRUM, COMMODORE, ATARI, BBC, IBM

NO HIGH FIXED PRICE REPAIR!

FREE SOFTWARE WORTH £35 WITH EVERY SPECTRUM REPAIR

The established company with a proven reputation

Over the years we have built up an enviable reputation in the UK for computer repairs, which is second to none. This is based on many years experience in repairing Spectrum, Commodore, BBC and other leading makes – and we were the first AMSTRAD repair centre anywhere. This is why we have customers all over the world.

We are the best, forget the rest, look what we offer

DON'T DELAY – ACT TODAY
It's as easy as **ABC!**

- No high fixed price – you only pay what the repair actually costs.
- While-U-Wait Service – spare parts for all leading computers – available over the counter.
- State of the art test equipment to provide comprehensive test report and locate faults.
- Repairs to all leading makes of computer.
- Amstrad specialist.
- Spectrum rubber keyboards repaired for only £8.95.
- Commodore 64's, Vic 20's, Atari, Commodore 16's and Plus 4's repaired.
- Discounts for colleges, schools etc.
- Every computer repaired by us is completely overhauled and tested before return.
- All computers returned carriage paid and covered by insurance.
- Three months guarantee included.
- Free Software worth £35 with every Spectrum repair.

A Simply send your computer securely packed, together with a cheque or postal order for the maximum fee to the address below. Your computer will be repaired and returned to you within 24 hours together with the balance of the fee and your FREE £35 worth of software.

B Or if you prefer a written quotation just send £2.50 to cover post & packing.

C Alternatively just quote your Access or Visa card number.

DISCOUNT COMPONENTS
e.g. Power Transformers



Commodore £29.00 + £1.50 p.p.



Spectrum £9.95 + £1.50 p.p.

AMSTRAD REPAIRS from **£9 to £35**

BBC REPAIRS from **£12 to £35**

SPECTRUM REPAIRS from **£7 to £19.90**

COMMODORE REPAIRS from **£12 to £35**

SPECIALIST COMPUTER REPAIR CENTRE

Dept. 6, 28 College Street, WORCESTER WR1 2LS
Telephone: 0905-611072/613023

Trade orders welcome



WE SET THE STANDARD BY WHICH EVERYONE ELSE IS JUDGED

There's a Dealer near you . . .

ESSEX

ESTUARY PERSONAL COMPUTERS

318 CHARTWELL NORTH
VICTORIA CIRCUS SHOPPING CENTRE
SOUTHEND ON SEA
Tel: (0702) 614131

PL484

NOBLES

14-17 EASTERN
ESPLANADE
SOUTHEND-ON-SEA,
ESSEX
Tel: (0702) 63377/8

PL586

GLASGOW

THE COMPUTER DEPOT
205 BUCHANAN STREET
GLASGOW G1 2JZ
Tel: (041) 332 3944

PL708

MEGABYTE

12 ETRICK SQUARE
CUMBERNAULD
067 1ND
0236 738398

29PL1

INTERCHIP

3 MILLER STREET
GLASGOW
Tel: 041-248 6667
*Dealers for Amstrad/Atari
and PC clones* (29D)

KENT

ANIROG COMPUTERS
29 West Hill
Dartford
Kent
Tel: (0322) 91649

PL484

MICROWAY COMPUTERS

39 HIGH STREET
RAINHAM, KENT
Tel: (0634) 376702

PL812

LEEDS

MICROPOWER

NORTHWOOD HOUSE
NORTH STREET
LEEDS LS7 2AA
Tel: (0532) 458800

PL583

LONDON

GALLERY SOFTWARE
1st FLOOR
THE ARNDALE CENT,
WANDSWORTH,
LONDON SW18
Tel: 01-870 4941

27PL29

GAMES WORLD

129 KING STREET
HAMMERSMITH
LONDON W6
Tel: 01-741 4467

PL518

LIVERPOOL

NABITCHI
COMPUTING
SPECIALISTS IN AMSTRAD
PCW8256 - PCW8512
SOFTWARE & HARDWARE
MERSEYSIDE INNOVATION CENTRE
131 MOUNT PLEASANT
LIVERPOOL L3 5TF
051-709 0123/708 8775
Software Design Service Available

29PL1

Microbyte

We talk business, not bits & bytes
NO. 1 ON MERSEYSIDE FOR
ATARI AND AMSTRAD
71 SEAVIEW ROAD, WALLASEY,
MERSEYSIDE L45 4QW
(051) 630 6933/638 1420
10 am - 6 pm
MAIL ORDER
SERVICE AVAILABLE
G10



NORFOLK

TETFORD MICROS
SPECIALISTS -
COMPUTER REPAIRS
21 GUILDHALL STREET
TETFORD
NORFOLK
(0842) 61645

PL812A

HEREFORDSHIRE

HONEYSETT COMPUTERS
17 UNION STREET
HEREFORD HR1 2BT
Tel: (0432) 279404
ASK ABOUT
CLUNKER SALE

PL884

SURREY

ULTIMA
UNIT 28

WHITE LION WALK
GUILDFORD
(0483) 506939

26PL802A

POSITRON COMPUTING
15 CENTRAL PRECINCT

LLANELLI
SAE15 1YE
0554 759624

AMSTRAD 8256
UPGRADE

24PL20

SUSSEX

GATWICK COMPUTERS
62 THE BOULEVARD
CRAWLEY, SUSSEX
Tel: (0293) 26240/37842

PL812

COMPSWAP

ATARI 520 STM with SF354 disk drive as new, lattice C computer. Also games and spare disks worth over £800. Sell for £350. Tel: Richard Dunstable 61694. Must collect.

AMSTRAD 6128 colour screen, perfect condition, hardly used - £300, with Hitchhikers Guide and over £200 of original software + discs etc. Tel: 08832 2461 evenings and weekends. **WANTED:** Commodore 1520 printer/plotter. Will pay up to £30. Write to Martyr Symonds, Delta Cottage, Ley Lane, Minsterworth, Glos. GL2 8JU.

BBC-B OSI.2 basic 2 plus software, magazines and joystick. £250. Tel: Doncaster (0302) 531815.

TASSPELL, Tasprint + Tascopy. Cost £1,000, yours for £500 o.n.o. Tel: John, 01-211 3301 (office hours).

HELP eliminate V.D.U. users headache, loss of concentration. With a desk top negative ion generator, special offer £37.95. Saving £2. C.O.D. 0634 45734.

ACORN ELECTRON with tape recorder, joystick and interface. Loads of software. Perfect condition - £70. Ring Ware (0920) 822740 evenings.

AMSTRAD CPC 464 with colour monitor, disk drive, disk wizard and two joysticks. Loads of business & games. Software on tape & disk. £320. Ring Ware (0920) 822740 evenings.

COMMODORE 64 computer 1541 disk drive. Hitachi colour 14" colour T.V. Commodore modem, MPS801 printer. Lots of software, books, magazines - £450. Tel: 01-642 9574.

QL, DISC interface, parallel printer interface, two joystick adaptors, software including Assembler-Editor. New green monitor. Advanced user guide, Sinclair technical guide, magazines. Offers about £290. Details Tel. Leeds 743060.

COMMODORE 64 + disk drive 1541 + printer mPS801 + table + 6 branch socket. All boxed. Just out of guarantee. Word processor + 8 games. £300. Tel. 0273-27637 evenings.

BBC B 1205 DFS 'Word' Rom. Zenith green screen monitor, Cumana twin DS 40/80 track drive, Canon N1Q printer, £575 o.n.o. Tel: 01-541 9818 or Godalming 5079 evenings.

CBM MPS803 dot matrix printer, few months old, excellent condition - genuine reason for sale (sold CBM 64). Printer paper included. Bargain at £80. (Would cost £150 new.) Tel: Julian 0852 34557 daytime.

GAC PROBLEMS? Free help from experienced writers, just send details of difficulties plus large S.A.E. Also Writer's Magazine, Player's Magazine, £1.00 each, monthly. Adventure. Contact: 13 Hollington Way, Wigan WN3 6LS.

FOR SALE! Memotech MTX512, Sidewinder, Mig-Alley, Ace (Atari discs), Spy v Spy, Nightshade, Knight-lore, Aliens, Underworld, White Lightning, Sherlock (Spectrum), Sidekick (IBM PC and Clones). Tel: 01-733 3256.

SINCLAIR Interface One, £25; Micro drive, £25. Mint condition. Both in boxes, unused. Instructions. Write to Paul Rowe, 15 Townsend Close, Treton, Rotherham, South Yorkshire.

AMSTRAD 6128 green screen little used. Protex, Baumword, some games, joystick, 8-bit KAS, £190. Tel: Kingswinford 279687.

AST ONE MET DISK DRIVE for Atari ST 3 1/2 in. also MSX and 2 cart-ridges, both as new for sale. Offers: Tel: West Wratting (Cams) 022 029 830.



John Cook looks through this week's new arrivals

Amiga

Program Instant Music Type Utility **Micro Amiga Price** £29.95 **Supplier** Ariolasoft, 68 Long Acre, London WC2E 9JH.

Program Archon II Type Arcade/Strategy **Micro Amiga Price** £29.95 **Supplier** Ariolasoft, 68 Long Acre, London WC2E 9JH.

Program Adventure Construction Set Type Utility **Micro Amiga Price** £29.95 **Supplier** Ariolasoft, 68 Long Acre, London WC2E 9JH.

Program Skyfox Type Arcade **Micro Amiga Price** £29.95 **Supplier** Ariolasoft, 68 Long Acre, London WC2E 9JH.

Program Arctic Fox Type Arcade **Micro Amiga Price** £29.95 **Supplier** Ariolasoft, 68 Long Acre, London WC2E 9JH.

Amstrad CPC

Program The Inheritance (Panic in Las Vegas) Type Adventure **Micro Amstrad CPC Price** £9.95 (tape) £14.95 (disc) **Supplier** Info-grammes, Mitre House, Abbey Road, Enfield, Middx EN1 2RQ.

Program Questor Type Arcade Adventure **Micro Amstrad CPC Price** £8.95 (tape) £13.95 (disc) **Supplier** Cascade Games, Harrogate, North Yorkshire.

Program Nemesis Adventures Type Adventure **Micro Amstrad CPC Price** £13.95 (disc only) **Supplier** Advantage, 33 Malyns Close, Chinnor, Oxon OX9 4EW.

Program Advantage C Type Language Compiler **Micro Amstrad CPC Price** £39.95 (disc only) **Supplier** Advantage, 33 Malyns Close, Chinnor, Oxon OX9 4EW.

Program Virgin Atlantic Challenge Type Arcade **Micro Amstrad CPC Price** £8.95 **Supplier** Virgin Games, 2/4 Vernon Yard, Portobello Road, London W11 2DX.

Amstrad PCW

Program Advantage C Type Language Compiler **Micro Amstrad PCW Price** £39.50 **Supplier** Advantage, 33 Malyns Close, Chinnor, Oxon OX9 4EW.

Atari

Program Raid Over Moscow Type Arcade **Micro Atari XL/XE Price** £9.99 (tape) £14.99 (disc) **Supplier** US Gold, Unit 2/3, Holford Way, Holford, Birmingham B6 7AX.



Commodore 64

Program Asterix and the Magic Cauldron Type Arcade **Micro Commodore 64 Price** £9.95 (tape) £14.95 (disc) **Supplier** Melbourne House, 60 High Street, Hampton Wick, Kingston Upon Thames, Surrey KT1 4DB.

Program Orpheus in the Underworld Type Arcade **Micro Commodore 64 Price** £1.99 **Supplier** Alpha-Omega, CRL Group, 9 Kings Yard, Carpenters Road, London E15 2HD.

Program Robobolt Type Arcade **Micro Commodore 64 Price** £1.99 **Supplier** Alpha-Omega, CRL Group, 9 Kings Yard, Carpenters Road, London E15 2HD.

Deus ex Machina

Program Deus ex Machina Type Weird Arcade **Micro Amstrad CPC Price** £8.95 **Supplier** Nu Wave, CRL House, 9 Kings Yard, Carpenters Road, London E15 2HD.

You have to hand it to the guys at Automata – they have their moments.

I still miss Christian Penfolds displaying his manhood in that baggy pink jogging suit every Microfair – thinly disguised as the Pi-man.

But Automata's creative tool, the man with his feet firmly on the artistic and ideological tiller was always Mel Croucher.

A man of many opinions, whose documented thoughts start at 'semi-visionary' move hastily through 'well observed' and, more often than not, don't stop 'till they get to

'crass' – love him or hate him, the guy has imagination. And as far as computer software goes, that imagination reached its pinnacle with *Deus ex Machina*.

More like a concept album than a compilation, *Deus* is a collection of fairly original, but simple arcade games linked together by their abstract futurist setting. This alone would be of interest, but the action proceeds along with a synchronised soundtrack of words (credits include Jon Pertwee and Frankie Howerd) and music (Croucher).

The result had our office full of amazed people at one time – but commercially, it was a flop.

Who knows why, but it's out now on Amstrad CPC and MSX formats, marketed by CRL's Nu Wave label. At this price a bargain, go out and grab yourself a piece of computing history.

Program Warhawk Type Arcade **Micro Commodore 64 Price** £1.99 **Supplier** Firebird, 64-67 New Oxford Street, London WC1 1PS.

Program Dante's Inferno Type Arcade/Adventure **Micro Commodore 64 Price** £9.95 **Supplier** Beyond, 64-67 New Oxford Street, London WC1.

I had no idea that mediaeval scholars used PCW 8256s. But here we are, at the beginning of an epic and terrifying journey through the nine circles of Hell, and where do we start? Limbo.

Well, obviously Dante



knew a thing or two, and his classic work *Inferno* has now received the ultimate accolade

the 20th century can give a literary masterpiece – along with such exalted company as *Adrian Mole* and the *Fourth Protocol* for instance – in that it has become the subject of a computer game.

Programmed by Denton Designs (now minus founder members Cain and Everett), *Inferno* has you controlling 'pilgrim' (dressed, as all good pilgrims are, in raggedly cut hessian) through the nine circles of Hell to reach Purgatory on the other side – which is where some would say Beyond have been for quite some time.

The game is really a series of mazes and puzzles, each maze inhabited by different creatures and hazards, with problems to solve at almost every step.

The graphics are well designed and the renaissance type sound track is refreshingly different – however, the unkind soul that shouted, "It's like Sabre Wulf with knobs on," from the back of the office, had a point.

No, well presented and atmospheric though this particular arcade adventure is, it is not the program to pull Beyond out of the doldrums. But just wait 'till you see *Infodroid* and *Star Trek*.

Dragon

Program Tanglewood Type Adventure **Micro** Dragon/Tandy CoCo 32K **Price** £5.96 **Supplier** Microdeal, PO Box 68, St Austell, Cornwall PL25 4YB.



Program Wizards Quest Type Arcade **Micro** Dragon/Tandy CoCo 32K **Price** £5.95 **Supplier** Microdeal, PO Box 68, St Austell, Cornwall PL25 4YB.

Program Cuthbert and the Golden Chalice Type Arcade **Micro** Dragon/Tandy CoCo 32K **Price** £5.95 **Supplier** Microdeal, PO Box 68, St Austell, Cornwall PL25 4YB.

Program The Thirteenth Task Type Adventure **Micro** Dragon 32/64 **Price** £3.00 (incl p&p) **Supplier** Arc Software, 272 Mearns Road, Newton Mearns, Glasgow G77 5LY.

MSX

Program Deus ex Machina Type Weird Arcade **Micro** MSX **Price** £8.95 **Supplier** Nu Wave, CRL House, 9 Kings Yard, Carpenters Road, London E15 2HD.

QL

Program War in the East (Scenario 1: Barbarossa) Type Strategy **Micro** QL **Price** £19.95 **Supplier** TK Computerware, Stone Street, Stanford, Ashford, Kent TN25 6DF.

Program War in the East (Scenario 2: Stalingrad) Type Strategy **Micro** QL **Price** £19.95 **Supplier** TK Computerware, Stone Street, Stanford, Ashford, Kent TN25 6DF.

Program War in the East (Scenario 3: Destruction of Army Group Centre) Type Strategy **Micro** QL **Price** £19.95 **Supplier** TK Computerware, Stone Street, Stanford, Ashford, Kent TN25 6DF.

Program War in the East (Scenarios 1-3) Type Strategy **Micro** QL **Price** £39.95 **Supplier** TK Computerware, Stone Street, Stanford, Ashford, Kent TN25 6DF.

Spectrum

Program 3D Game Maker Type Utility **Micro** Spectrum **Price** £8.95 **Supplier** CRL Group, 9 Kings Yard, Carpenters Road, London E15 2HD.

Program Oblivion Type Arcade **Micro** Spectrum **Price** £1.99 **Supplier** Alpha-Omega, CRL Group, 9 Kings Yard, Carpenters Road, London E15 2HD.

Program Xeno Type Adventure **Micro** Spectrum **Price** £1.99 **Supplier** Alpha-Omega, CRL Group, 9 Kings Yard, Carpenters Road, London E15 2HD.

Program Adventure Builder Type Utility **Micro** Spectrum **Price** £4.95 **Supplier** Alpha, CRL Group, 9 Kings Yard, Carpenters Road, London E15 2HD.

Program Bombscare Type Arcade/Adventure **Micro** Spectrum **Price** £1.99 **Supplier** Firebird, 64-67 New Oxford Street, London WC1A 1PS.

Program The Happiest Days of Your Life Type Arcade/Adventure **Micro** Spectrum **Price** £1.99 **Supplier** Firebird, 64-67 New Oxford Street, London WC1A 1PS.

Program Dr What Type Adventure **Micro** Spectrum **Price** £7.95 **Supplier** CRL, 9 Kings Yard, Carpenters Road, London E15 2HD.

Program 3D Starstrike Type Arcade **Micro** Spectrum **Price** £2.99 **Supplier** £2.99 Classics, Elite, Anchor House, Anchor Road, Aldridge, Walsall WS9 8PW.

Program Thrust Type Arcade **Micro** Spectrum **Price** £1.99 **Supplier** Firebird, 64-67 New Oxford Street, London WC1A 1PS.



Not quite a classic in its own right, but still worth getting.

Program Prodigy Type Arcade/Adventure **Micro** Spectrum **Price** £7.99 **Supplier** Electric Dreams, 31 Carlton Crescent, Southampton SO1 2EN.

Prodigy is its name. "A game which demands compassion, guts and intelligence in ways no other game does." You bet, since your tasks include cleaning, feeding and generally protecting a human baby, with you (Solo - a synthetic man... and no, it doesn't mean you wear a lot of polyester) attempting to lead the kid through the laboratories of the machine sorcerer Wardlock. Seeing as it is infested with sundry genetic horrors, it's no doddle.

With a very nice 3D scrolling display and some well animated meenies (at least one lot inspired by those eyes from *Highway Encounter*) one thing you can't call this game is stereotypical.

As you wander around the playing area, your human charge follows you unerringly, just like a smaller brother or sister tends to do when you want to go off and do something illicit.

Certainly conceptually out of the ordinary and technically well done, the only question is, lads, can your gender identity take it?

Here it is at last - the Spectrum conversion of that number one top selling second cousin of *Asteroids* and *Gravitar* we were all going crazy about earlier in the year - *Thrust*.

The graphics are similar rather than identical, but the basic layout of each cavern level has been retained. Not bad so far, but how does it play?

The original version of *Thrust* on the Commodore (and that excellent clone on the BBC) relied heavily on playability, and you'll be pleased to learn that the Spectrum version does capture some of that, although if you have tried the others, you'll notice that the feel of the ship as you traverse the caverns is slightly inferior. Extras include definable keys and a message on-screen telling you when the limpet guns are deactivated.

The selling game

What's the difference between a budget game and a full price game? Okay, I'll run that one past you again - what's the difference between a budget game and a full price game, apart from seven or eight quid?

I see this is confusing you; let's try it another way. Was the last full price game you bought five times better than the last budget game you bought? That's one way of looking at it, yet my pet marketing expert tells me the real difference between full price and budget is actually where the product is sold.

When something as crazy as that may well have several grains of truth in it, maybe it's time to examine what's going on.

When the games market started, no-one had much idea about anything and the concept of 'price points' for computer software was still a twinkle in the eyes of as yet unappointed marketing managers.

Experienced business people had yet to take home computers seriously, and the wacky entrepreneurial/programmer types just cranked the stuff out for what they thought would sell. Looking at some 3½ year old *Populars*, that opinion seemed to vary from £4 to £10.

However, things started to change when glossy ads and full colour cassette inlays were invented - games were suddenly a youth culture in-

dustry. Enter the professionals.

Professionals know that for each kind of product there is a price which the consumer likes. Not too expensive - as you need to maximise your profit without losing too many sales. But there again, not too cheap, or the consumer will believe the product to be worthless. This is known as a price point.

For software, this appeared to be around £9 for Spectrum games and £10 for Commodore 64/Amstrad CPC (after all, they paid more for their machines, didn't they?).

As the industry boomed, everyone who programmed for the right machines prospered and was happy. Then in 1984 came budget software, pioneered by Mastertronic. The professionals laughed.

In 1986, one in five games sold is a Mastertronic game, four out of 10 games sold is a budget title and this time next year it'll be at least six out of 10. So what's gone wrong with the status quo?

What Mastertronic realised first - and others are realising now - is that what was considered the industry, price point is just too high. The punters (that's you and me) are reluctant to pay out large sums of money for a product of indeterminate quality.

High prices do not guarantee high quality (eg, *The Great Space Race*), so why bother? At least if a £1.99 game is a dud, you haven't blown a month's pocket money.

Now that budget software has developed so that it consistently overlaps with 'full price' in terms of quality, there are even more problems.

An 'industry figure' I was talking to recently was mystified. "They seem to be selling a full price product at budget prices." I would put it the other way around. As the quality of budget software increases, it is harder for other companies to justify the 'traditional' price tag of a tenner.

Computers are no longer 'whoosh goes the rocket' gadgets - they are simply everyday consumer items, and twice the price of an LP is too much for a single computer game, unless the quality is considerably above that of budget level - and that is seldom the case (adventures and complex strategy games may be an exception here).

"But if we sold our products cheaper, we would go out of business," I hear the cry.

Well, I don't see Mastertronic rapidly going down the tubes. The fact is that lower prices would mean increased sales, less copying and more interest in the hobby.

There will always be the *Elites* of this world - well worth the money - but as far as the run-of-the-mill releases are concerned, the average price should be lower. How about it, then? Never mind the profit margin, just feel that turnover.

John Cook

NEXT WEEK

Special Supplement Micros and Music

The music supplement is packed with reviews of the latest products - the Spectrum Midi synthesiser/sampler/drum machine from Ram Electronics, Cheeta's sound sampler, Kuma's *K-Minstrel* music editor, and the Amstrad *Advanced Music System*. Plus news from the States of all the forthcoming Commodore and Atari music packages.

Hardware

The reviews of Comx's PL80 printer/plotter and the Fantastick 2 joystick, which had to be omitted from this issue due to lack of space, will be appearing in the October 2 issue. The Comx PL80 is both Commodore and PC compatible, while the joystick can be used with a wide range of micros.

Star Glider

At long last, Rainbird's *Star Glider* is finished and ready for release. We bring you a full review.

Competition

The last science fiction movie stills for you to identify in our great autumn giveaway.

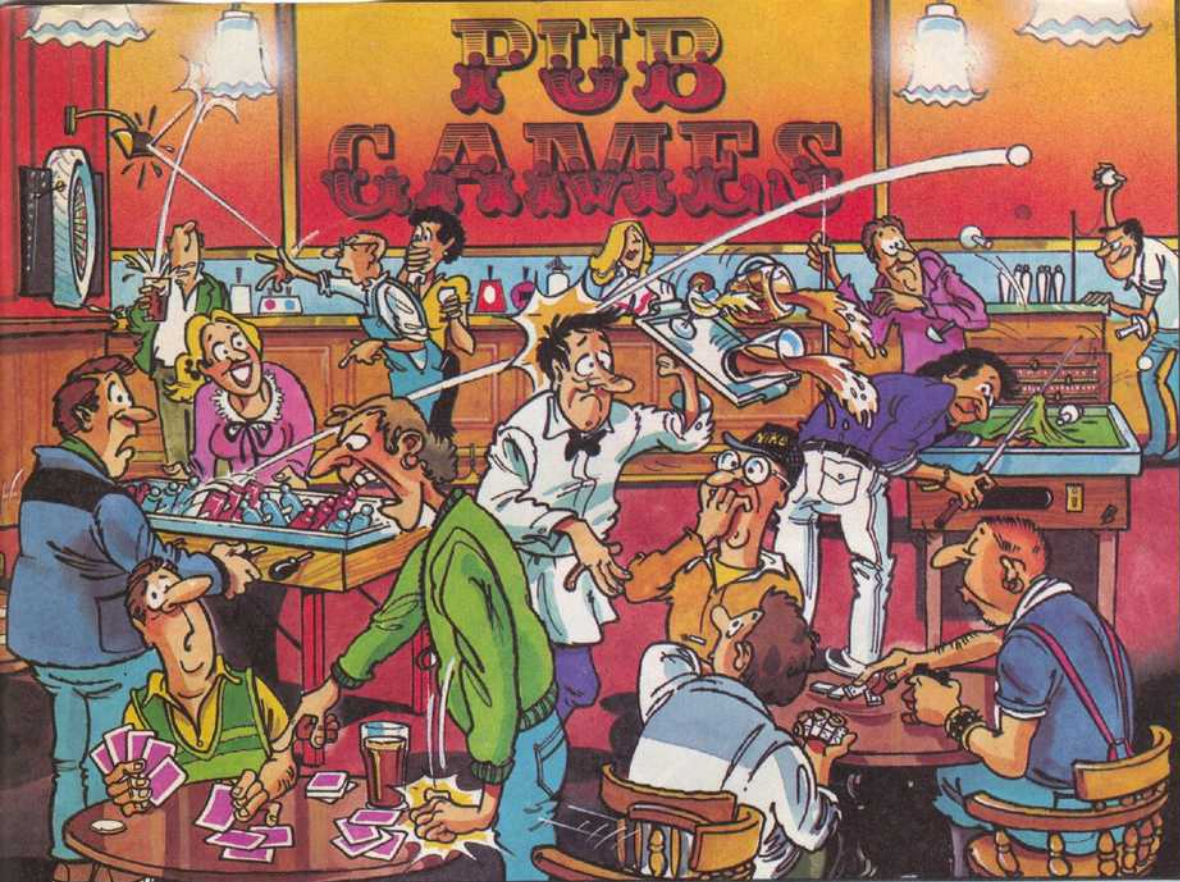
Hackers

& I will conclude my speech by reiterating, that, in any computer system, the hardware is the easy part...

the real cleverness is in the software. Thank you.

(Get him off!) (Take him out & string him up!)
Lynch him!
Boo! Hiss!
Don't let him leave the building alive!





AND THEY CALL THEMSELVES
ADULTS!!!

The times they've left you at home because 'you're not grown up' or 'not old enough to come to the pub' and look what they get up to when they get there! Here's your chance to find out what it's really like in those smoke filled haunts of adulthood. The opportunity to see how good you are at these ADULT?? games. Why let the mums and dads have all the fun. Pub Games can be a laugh for everyone.



PUB GAMES

a compilation of
**BAR BILLIARDS · DOMINGOS
 DARTS · TABLE FOOTBALL
 POKER & PONTOON
 BAR SKITTLES**

£9.95

available on
 Commodore 64/128 · Spectrum 48K · Amstrad
 Available soon BBC · MSX

Alligata Software Ltd., 1 Orange Street,
 Sheffield S1 4DW.
 Tel: (0742) 755796

OUT NOW!



C64 VERSION
 ZZAPI 64
'FLIGHT SIMULATOR OF THE YEAR'
OUT NOW — £9.95
 SPECTRUM VERSION £12.95
 (FULL 64K PLUS1A VERSION)
C64 PLUS1A DISK VERSION
FREE POSTER WITH EVERY COPY

ACE



"AT LAST YOU CAN REALLY FLY!"

"I JUST COULDN'T BELIEVE HOW MUCH THERE WAS IN IT" ZZAPI 64
 "ACE IS ONE OF THE BEST SIMULATORS I HAVE EVER PLAYED" CCI
 "THERE ARE FLIGHT SIMULATORS AND THERE ARE FLIGHT SIMULATORS — AND THEN THERE'S ACE"

RAF PILOT



CASCADE GAMES LTD,
 HARROGATE, HG1 5BG,
 ENGLAND
 TEL: (0423) 504663

COMPUTER AND VIDEO GAMES

Screen shots are taken from the C64 version

Available from all good software suppliers or direct from
 Cascade 24-hour ordering service on (0423) 504663
 Versions available for: SPECTRUM 128
 COMMODORE C64/128 C16 VIC20 PLUS1A
CASSETTE £9.95
DISK £12.95
 (C64/128, Plus1A)