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POPULAR Computing WEEKLY

29 May-4 June 1986

Vol 5 No 22

# £25 million loss rocks Commodore

- **Commodore reports its biggest losses yet**
- **New 64 planned for launch soon**
- **Super-Amiga to follow this year**

*Full details below and inside*

COMMODORE was last week planning a major push for the 64 in this country, following on its announcement of increased losses worldwide in the first quarter of this year. Chris Kaday of Commodore UK said that plans to "make the 64 more attractive" would be announced "in the next few weeks".

The company is known to be preparing an enhanced version of the 64, redesigned to fit in with the 128, and although Kaday won't talk about the nature of his plans it seems likely that they'll include this. This should give a new lease of life to a machine which, although long in the tooth, continues to be a money-spinner for Commodore.

The financial results themselves are spectacularly bad, with the company showing a pre-tax loss of $36.7 million (£24.7 million) on sales of $182.3 million (£121.5 milion) worldwide.

Commodore claims that Europe is performing strongly, with January to March sales of $98 million (£65 million) up 53 per cent from $64 million (£42.7 million) in the same period last year.

Europe is therefore accounting for more than half of Commodore's sales worldwide, and although the company won't disclose profit figures for Europe, chairman Irving Gould has identified the performance of the US operation as "disap-

**Continued on page 4►**

## COLOUR REVIEWS



- *Shogun – Virgin*
- *Biggles – Mirrorsoft*
- *Conquest – Mastertronic*
- *All in colour – page 16*

## BASIC COMPILERS

*What do compilers do, and do you need one?*

*see page 12*

## THIS WEEK'S NEWS

- *Mastertronic to go public?*
- *Storm breaks over US Gold's World Cup Carnival*
- *MSX 2 arrives – JVC's HC-95*

# LASER GENIUS

## AN EDITOR, ASSEMBLER, MONITOR AND ANALYSER THAT REPRESENTS A NEW APPROACH TO MACHINE CODE DEVELOPMENT.

### THE EDITOR

***Produces tokenised source files which occupy about half the normal space and accelerate assembly to three times the normal speed.***

* Source files can be loaded/saved to and from tape and disc from within the editor. Source files from other popular assemblers can be loaded and tokenised.
* A full screen editor which replaces conventional text handling with a block/paragraph numbering scheme.

### THE ASSEMBLER

***A full two-pass macro assembler (co-resident with the editor) which supports input/output from tape and disc, conditional assembly, intelligent assembly of subroutine libraries and inclusion of named files from tape or disc.***

* Built in calculator with access to symbol table after assembly.
* Symbol table may be saved and loaded for cross reference and selective assembly of subroutine libraries.
* Z80 mnemonics can be freely mixed with Phoenix, a high level compiling language.

### THE MONITOR

***has all the usual features of a relocatable front-panel debugger plus:***

* Disassembly to screen, printer, tape or disc with CALL and JUMP labels automatically generated. Disassembled files can be loaded into the assembler, edited and re-assembled.
* 4 slow running modes with a trace facility that allows the path of a program to be stored so that bugs can be traced back to their source.
* 17 types of breakpoints are available – up to 8 can be set at any one time. Options include "down-count" and control of slow run modes.

### THE ANALYSER

A completely new concept in program debugging. This unique utility allows you to execute up to ten analyser programs that scrutinise your machine code program while it is running. When a particular condition is found the program will break with an option to trace the path taken.

For example, if a program crashes, writing extraneous data to the screen, the analyser can be set to run the program up to the point that a 'write' is made to a particular area of the screen. The path can then be listed to find where the error originated.

ocean

iq

LASER GENIUS, the definitive system for machine code programming, is part of the OCEAN "Innovation and Quality" range, brought to you with the combined skills and resources of OCEAN and OASIS (producer of "White Lightning"). Other easy to use products in this range will include extended BASICs, Compilers, screen designers, music composers and word processors to make your programming more rewarding and exciting.

**SPECTRUM 48K/+/128K £14.95**

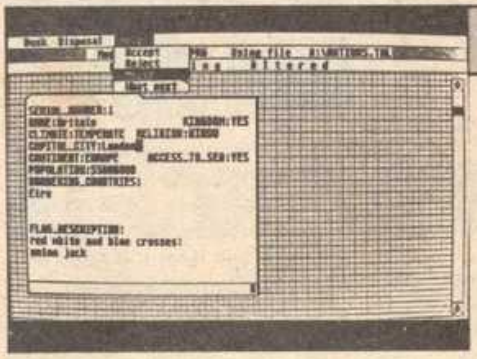
**AMSTRAD CPC 464/664/6128**

**£14.95 TAPE £19.95 DISK**

**COMMODORE 64/128**

**£14.95 TAPE £19.95 DISK**

# Contents



## SOFTWARE

### 14 ST Database
*Trim* cuts no corners – as John Cook discovered when he examined this information management system for the Atari ST

### C64 Spreadsheet
A financial modelling tool designed for Commodore owners at home and in small business. John Lettice puts his account in order

## SPECIAL FEATURES

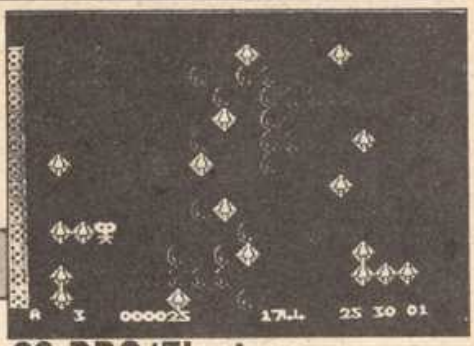
### 12 Compile with me!
What is a compiler? How does it work? Why should you care? David Ridge has the answers to these and other questions




## GAMES

### 16, 17 Reviews
Six new releases undergo trial by combat and we have, as they say, something for all tastes. A bit of empire-building in *Shogun*, adventuring in *Conquest*, aerial combat in *Biggles*, monster-bashing in *The Standing Stones*, potholing with *Return of Rockman*, and some culinary mayhem in *Attack of the Killer Tomatoes*

### 18 Arcade Action
### 20 Adventure Corner
### 21 Adventure Helpline



## PROGRAMMING

### 24 QL
SuperBasic functions allow you to customise the language. Mike O'Donnell gets you started with five useful additions to the QL's string-handling repertoire

### 25 Commodore 64
There are plenty of sprite editors about – but here's a utility with a difference. Catalogue your sprites with this print dump which even gives hard copies of multicolour sprites

### 26 Amstrad
Part II of our handy Address Master program. Useful for small mailing list applications

### 28 Spectrum
Need a screen dump? Stuart Nicholls' machine-code program provides the answer – with extras

### 29 BBC/Electron
Three-dimensional arcade action from Shawn McAvery. Not only good fun, but some useful programming techniques too

### 30 Bytes & Pieces
### 33 Peek & Poke
More questions and answers from our resident expert

## REGULARS

### 4 News Desk
Mastertronic prepares to go public as US Gold face a storm over *World Cup Carnival*

### 8 Letters, Puzzle
### 22 Communications
RS232 is much more than a song from Spitting Image. David Wallin explains the pros and cons of this communicating protocol

### 44 New Releases
### 46 Charts, Hackers

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**Published by** Sunshine Publications Ltd, 12-13 Little Newport Street, London WC2H 7PP. Tel 01-437 4343 Telex 296275 **Typeset by** Publishers Reprographics Services Ltd, 4 Roger Street, London WC1, **Printed by** Greenaway Harrison, Sutton Road, Southend-on-sea, Essex. **Distributed by** S M Distribution, London SW9. Tel 01-274 8611, Telex 261643.
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ABC

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# Amstrad's £445 PC: the full specifications

AMSTRAD's IBM PC compatible machine, due for launch at next month's Amstrad show, is taking shape. It will be supplied initially in three versions. The basic machine will have monochrome monitor, 128K Ram and probably a single disc drive and will cost £399 ex VAT. A colour version with 256K Ram and twin drives will be £499 ex VAT, while the price of the top end model, sporting ten or 20M hard disc and 512K Ram, has yet to be fixed.

It now also seems likely that the Amstrad PCs will incorporate 5¼ inch disc drives and will have full-sized IBM expansion slots. This would allow the machines to run the current range of IBM software and to use the full range of IBM and third party expansion cards.

A full spec PC compatible from Amstrad would up the ante in the clone battle considerably. The cheapest PC clones are currently selling for somewhere between £500-£1,000 depending on specification, and to compete on value as well as marketing Amstrad has to do better than this.



Sugar: £26 million richer

The company, it is suggested, is going to do this by bundling printer and monitor with the machines, and by including an enhanced graphics ability, possibly compatible with the IBM Hercules card. The machine will be fully compatible, but rather than using Microsoft's MSDOS operating system – IBM's PCDOS is a subset of this – will use rival company Digital Research's CP/M 86 or DOS Plus. Versions of the machine may also include Gem and a mouse.

Amstrad boss Alan Sugar meanwhile has converted 5,000,000 of his shares in the company into an estimated £26-28 million. An Amstrad spokesman first observed that normal people could live happily on "one percent of the interest on that", and that Sugar wanted the money "for his own personal use."

Although Amstrad won't say what the money is needed for apart from "investment generally" the share offer – which was considerably oversubscribed – could be a sign that further major expansion is in the offing.

It does, incidentally, value Amstrad at over £500 million, and for the first time brings Sugar's shareholding down below 50 per cent. Other shareholders are institutional.

## First to sell budget dBase II

FIRST Software and Publishing has won the UK rights to Ashton-Tate's *dBase II*, the market leading professional database, and is to sell it for the Atari ST, Amstrad, Commodore, and Tatung for £119. This represents a considerable reduction on the standard price, which can be anything between £250-£500.

According to a First spokesman the rights were won against stiff competition from other publishers, including Amstrad specialist New Star. He predicted brisk sales for the package, which has recently gone down well in both France and Germany. Because of the low price Ashton-Tate won't be handling hot-line support. This will be dealt with by First for an extra £40 per year.

## Watford sets up dealer network

BBC mail order specialist Watford Electronics is attempting to broaden its customer base by setting up a dealer network. According to its managing director Nazir Jessa the company is moving in this direction because it feels many people are reluctant to purchase via mail order, and would therfore be prepared to pay a little extra in order to be able to buy BBC add-ons through their local dealer.

Announcing the move Jessa stressed the company's continuing commitment to the BBC micro, which he said still had "a lot of potential left unexplored."

# Commodore £25m loss

◀Continued from page 1

pointing". It seems likely that he is viewing Europe as the lifeline Commodore needs to achieve its aim to break even in the second quarter of this year.

The company claims strong sales of both the 64 and the Amiga in Europe, with Kaday reporting the first week's UK shipment of 1,000 Amigas already sold out. "The phones are buzzing", he claims. The company will not however be looking to bring the Amiga down towards mass-market status in the foreseeable future.



Amiga: A big brother coming?

The first of the machine's successor, expected later in the year, will be a more, rather than less, powerful version, says Kaday. He won't give details at present, but Commodore is known to have heeded suggestions that the Amiga's blitter chip could usefully be made to handle larger areas of memory than the current 512K of video Ram.

When the machine was first designed this seemed a ludicrously large quantity of memory, but the possible applications for the chip are much wider than simply controlling graphics.

The blitter allows areas of memory to be shifted around in the machine very fast, and therefore each Ram location controlled by it can effectively be viewed as being adjacent to all other locations controlled by it. Future developments of the machine could therefore have applications in vector processing. A further possible addition would be a 68020 processor, the enhanced version of the Amiga's current 68000.

## Amstrad software

SOFTSHOP is now offering Amstrad versions of *DR Graph* and *Draw* at £49.50 each, *Sage Stock* and *Invoicing* at £69.99 and *CP+* and *Brainstorm* at £29.95 and £49.99 respectively.

The programs can be purchased at Softshop's Amstrad Business Software Centre at 66 Tottenham Court Road, London W1, or ordered by telephone on 01-251 0967.

## The Writer

**Our feature on Softek's The Writer word processor for the Spectrum (May 22nd supplement) contained some slight errors on pricing details. To set the record straight, both the 48K and 128K versions come on cassette, and cost £14.95 and £17.95 respectively. Each cassette includes a version of the program which, if you wish, can be customised and transferred to microdrive.**

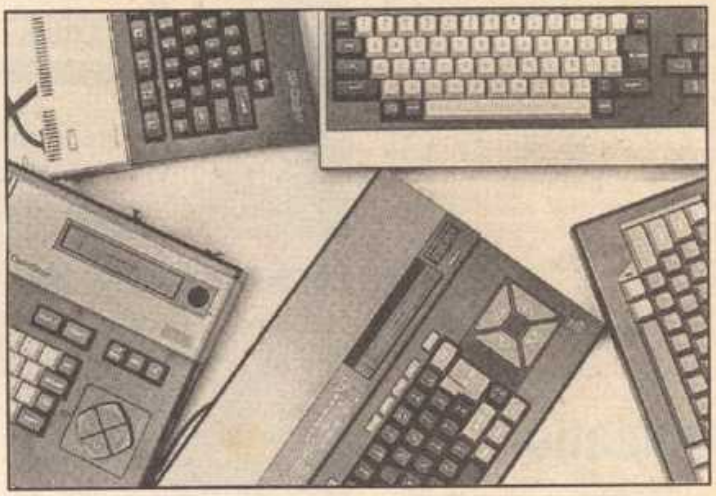
**The 48K and 128K cassettes are available now, and the disc version is forthcoming at a price to be announced.**

# JVC aims £1,000 MSX 2 micro at Commodore Amiga market

JVC's MSX 2 machine, the HC95, is likely to be launched as a £1,000 Amiga killer this Autumn. The company was previewing the machine at a London electrical trade show last week, and according to JVC spokesman Pieter Glas it will be sold bundled with video graabbing software, allowing computer and digitised video images to be mixed freely.

The machine has twin 720K disc drives, cartridge port and twin expansion slots, RS232 and Centronics ports, video in and out and left and right audio. It also incorporates a second processor custom-designed by JVC. This is MSX compatible – although not 100%, it appears – and when switched in allows the machine to run two to four times faster.

It will cost between £1,050 and £1,100, which is significantly less than a comparable Amiga system, and probably cheaper than anything that could be put together for the ST.



**The MSX team – where are they now?**

JVC already sells one other MSX 2 machine, a low-cost variant, in Japan, and is to launch a third mid-range machine there shortly. Glas however doubts that these will appear in the UK in the foreseeable future, his feeling being that the cheapest machine should retail at £250, and that the UK market won't currently support this level.

The company will however continue to sell its MSX 1 machine at £99, and is selling a £169, midi interface which it claims will work with any MSX machine and any keyboard. Glas feels that attacking specialist markets like these is the way forward for MSX at the moment.

The plans of the other MSX companies seem to be considerably less coherent. A Mitsubishi spokesman volunteered the information that the company had "withdrawn from MSX", and when quizzed further said it had "withdrawn from MSX in the UK". The UK side had, he said, considered importing MSX 2, but had decided against this, and was unlikely to do anything else with MSX here unless the machine involved was "pretty dramatic".

Panasonic, whose machines are highly regarded in Japan, is in a similar situation, although less formally. The company currently has no stocks of machines in the UK.

Toshiba, MSX market leader in this country, has virtually sold out of its HX10 machine, and will be selling only its 80K HX22 version at £150 in the near future. A spokesman conceded that it was unlikely that Toshiba would be involved in MSX 2 here before 1987.

# Cup controversy

US GOLD's official World Cup games, *World Cup Carnival*, appears to be raising hackles in the industry. The game is, according to US Gold boss Geoff Brown, an enchancement of Artic's *World Cup Soccer* game.

"We've made it perfectly clear that it is an adaptation with enhancements", he says, "and if they [the customers] have purchased *World Cup Soccer* I don't thing they're going to gain a lot." He does however add that distributors should be making it perfectly clear that this is the case.

One distributor who did not wish to be named did however tell *Popular Computing Weekly* that dealers were returning large quantities of the game on discovering its ancestry.

*Popular Computing Weekly* has also received a number of phone calls from readers who have bought both versions and weren't warned by their dealers.

The message that *World Cup Carnival* is a version of Artic's game therefore doesn't always seem to be getting through, especially as there is no warning on US Gold's extensively revamped *World Cup Carnival* packaging.

# CP/M emulator

ESSEX computer dealer Mike's Computer Store is offering a cleaned up version of Atari's CP/M emulator for the ST at £6.50 including post, packing and VAT. The package, which was produced by former Atari employee Mike Wilding, includes one CP/M emulator disc, a utility disc incorporating public domain software, and a 14 page manual. Wilding points out that the latter overcomes "the usual Atari problem" of having the instructions for using the disc filed as a document – on the disc.

The emulator also has the German documentation supplied by Atari placed in its own folder on the disc, and the English text corrected.

# Unitsoft is sunk

GLASGOW-BASED mail order discount company Unitsoft has ceased trading, leaving a large number of customers with their cheques cashed but with no software.

*Popular Computing Weekly* has already been contacted by a number of readers who are owed money by Unitsoft, and as the company crashed after mounting a heavy advertising campaign in the computer press it's likely that many more people have been caught out.

As Unitsoft was not a limited company, the settlement of debts is the responsibility of the two partners.

Accountant John Hendry and Co is currently going through Unitsoft's books to establish the extent of the liability.

"It looks as though there's about £80,000 owing," said John Hendry himself. "The assets of the individuals involved don't seem too good. But we will be writing to all the creditors."

John Hendry and Co. can be contacted out 3 Lynedoch Street, Glasgow, Scotland.

# News Desk

## Mastertronic plans a share flotation

MASTERTRONIC is planning a share flotation to finance "a major capitalisation programme" next year. A spokesman said it wasn't yet certain whether or not the flotation would take the form of an offer of a minority stake in the company, or whether it would be sold off completely. He did predict, however, that Mastertronic would be "looking at an exceedingly good punt."

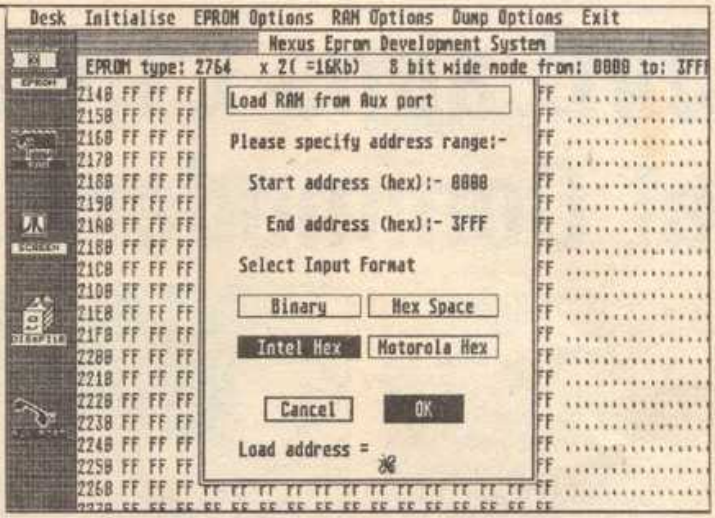
The nature of the expansion the company wishes to finance, and hence the sum of money required, is dependent on the success of its new US operation. This, the spokesman said, was moving steadily, but not astonishingly. The company's expansion plans encompass the computer market, but are also likely to include low price mass marketing of other, non-computer, products.

"Mastertronic came in for a lot of flak when it launched", said the spokesman, "but it has demonstrated spectacularly that, given the right product at the right price, there's a huge market out there."

## OCP goes into liquidation

SOFTWARE publisher Oxford Computer Publishing has gone into liquidation. According to OCP's boss, Bill Richardson, the company suffered badly when French distributor Direco went down, and has experienced further difficulties in obtaining money from a number of outlets on the continent, which accounted for a great deal of its business.

This, coupled with the difficulties it encountered in getting serious software distributed in this country, meant that it couldn't continue without further finance. The creditors' meeting is scheduled for this week, and although Richardson hopes to be able to find a buyer for the company and its stock, no offers have so far been forthcoming.




## Eprom programmer

NEXUS Technical Services has launched an Eprom development system for the Atari ST. The system's hardware plugs into the ST's cartridge port, leaving DMA and serial ports free for expansion, and has two Zip sockets for programming and reading Eproms, an external simulation socket and an expansion socket.

The ST's Gem-based operating system has also been incorporated allowing, for example, data to be transferred from disc to Ram. Internal simulation also allows the ST to run either simulation Ram or Eproms.

Details from Nexus Technical Services, 38 Melrose Avenue, Reading RG6 2BN (0734 664559).

## Amstrad languages

PROSPERO Software, which recently released its *Pro Pascal* and *Pro Fortran* compilers on the Atari ST, has transferred the two to the Amstrad PCW 8256. The two products cost £75 each. They are now available on Z80, 8086 and 68000 based micros.

Details from Prospero Software, 190 Castlenau, London SW13 9DH (01-741 8531).

# Diary Dates

### MAY

31 May
**Dragon Computer Show**
Ossett Town Hall, Yorkshire
**Details:** Hardware and software support for the Dragon.
**Organiser:** John Penn, 04203 5970.

### JUNE

10-12 June
**Comdex International in Europe**
Nice, France
**Details:** Business exhibition covering computers, printers, peripherals and software. Trade only.
**Organiser:** Interface Group, 01-734 7282.

13-15 June
**The Amstrad Computer Show**
Novotel, London
**Details:** Hardware, software and peripherals for Amstrad micros.
**Price:** £3 adults, £2 children, £1 discount for advance sales.
**Organiser:** Database Publications, 061-456 8383.

24-26 June
**Computer '86**
G-Mex Exhibition Centre, Manchester.
**Details:** Business and industry computer show, formerly known as the Northern Computer Show.
**Price:** Free entry by business registration.
**Organiser:** Reed Exhibitions, 01-643 8040.

### JULY

16-18 July
**PC User Show**
Olympia, London
**Details:** Hardware and software for IBM machines and their compatibles.
**Organiser:** EMAP, 01-608 1161.

24-27 July
**Acorn User Exhibition**
Barbican Centre, London
**Details:** Hardware, software and peripherals for the Electron, BBC micro and Master machines. Trade only 10am-1pm on 24 July.
**Price:** £3 adults, £2 children, £1 discount for advance sales.
**Organiser:** Editionscheme, 01-349 4667.

### SEPTEMBER

3-7 September
**Personal Computer World Show**
Olympia, London
**Details:** Software and hardware for home, educational and business computer users.
**Price:** £2.
**Organiser:** Montbuild, 01-487 5831.

13-14 September
**Commodore Horizons Show**
UMIST, Manchester
**Details:** Commodore hardware, software and peripherals.
**Price:** £3 adults, £2 children, £1 discount for advance booking.
**Organiser:** Database Publications, 061-456 8383.

26-28 September
**Electron and BBC Micro User Show**
**Details:** Software, hardware and peripherals for the Electron, BBC micro and Master machines.
**Price:** £3 adults, £2 children, £1 discount for advance booking.
**Organiser:** Database Publications, 061-456 8383.

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

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# Letters

## Popular buggy

A friend of mine told me that some time ago you printed an article on computer buggies. As I have only recently been introduced to computing, I missed this article and would like to know if you or any of your readers can help me. I own a Commodore 64.

I have another query. How do you take a photo of a television screen? I have had a few attempts at taking screen shots of my favourite games, but without success.

*Asmat Ullah*
*5 Napiershall St*
*Glasgow*

**This article was printed in the March 14-20, 1985 issue. Back numbers of *Popular* are available from the address and phone number at the front of the magazine.**

**Taking screen shots: turn all the lights off in the room (best to take pictures in the evening), use a tripod, set the exposure to one eighth of a second, put the aperture to between f4 and f6, take the picture and keep your fingers crossed . . .**

## Clever feature

In response to your news item regarding the 'virtual standstill' of 128K Spectrum software, I was disappointed, but not surprised, to hear this. 128K only software seems to be limited so far to the excellent *Knight Tyme* from Mastertronic. However, there is still some good things to look forward to.

Ocean's *Batman* contains a very clever feature which detects which machine it's being loaded on and produces the relevant sound effects. Whilst this obviously does not warrant buying a 128K, it is an idea which more software houses should include as standard, saving them from having to produce a separate 128K version.

It was obvious that stories of gloom and doom might follow the Amstrad take-over, but speaking personally the option between versions of a game is something 48K owners do not have a choice over.

*Richard Hewison*
*Lower Woodside*
*Luton*
*Beds*

## Dinky footwork

In answer to all those who took exception to my comments about *Movie* (Letters, March 13), let me go on to talk about *Batman*.

The graphics in *Batman* appear to be based on the same technology, but this time they add so much to the game, by allowing *Batman* to manipulate the furniture to some purpose.

The atmosphere in *Batman* is delightful, and the graphics so clear that the game is eminently replayable.

Suffice to say *Batman* is terrific and I find that I do not even mind his footsteps. They are so much in character with his dinky footwork.

*Hugh T Walker*
*Burpham*
*Surrey*

Star Letter

## Toolbox routines

I liked the recent series of toolbox routines for the Spectrum, written by Paul Murray, but I felt these utilities had one disadvantage; the output from the *Trace* and *Dump* routines could only be sent to the screen or a ZX printer, not to a 'full-size' printer.

These routines can be 'modified' to send output to the printer, or any other output device quite simply.

The *Dump* routine is the easier, and it does not require any Pokes, ie, the machine code is not changed.

First of all type

OPEN #2, channel

where 'channel' is the name of the output device. For example, if you wanted to send output to a printer through the interface one RS232 port, you would use *Open #2, "T"*.

Once finished, the command

OPEN #2, "S"

returns the screen to normal use. This method can also be used to redirect output from the 'header' routine.

The *Trace* routine is more difficult. This is because the channel attached to stream 2 cannot be altered, without the program doing some weird things. Therefore a new stream must be used. The command

OPEN # stream, channel

can be used, where stream is the output (4-16), and channel the name of the output device. The value of stream would be poked into address 62387. Now when the *Trace* routine is run it will send output to the specified device, eg, an 80-column printer.

*Chester Gillon*
*Colchester*

**A year's supply of Popular binders goes to Chester Gillon**

## Balanced view

We were intrigued by Peter Worlock's review of our *Pascal80* product for the Amstrad disc-based machines (May 15) as it contains a number of factual errors and some highly contentious statements.

Firstly, the product is called *Pascal80* and it runs on *any* Amstrad machine with a disc drive (ie, the CPC464 with DDI-1, the CPC664, CPC6128, PCW8256 and PCW8512). It requires CP/M 2.2 *or* CP/M Plus with a minimum TPA size of 30K.

The GSX library routines are supplied free of charge so that owners of Amstrad machines which are supplied with GSX can write programs which access this graphics interface; GSX is supplied by Amstrad on its CPC6128, PCW8256 and PCW8512 machines. For own-

**continued on page 10 ►**

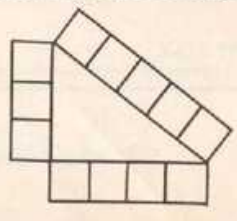
# Puzzle

**Puzzle No 210**

My nephew has a number of identical cubical toy building blocks which he keeps in a larger plywood box which is exactly cubical. When full, this box will house all but one of the blocks.

The other day he was laying out right-angled triangles such as the one shown below.

As you can see, this uses just 12 of the blocks as the triangle has sides of three, four, and five units. Curiously, if he were to use all of his blocks he would have just enough to build a much larger triangle.



What is the smallest number of blocks that he could have in his collection which would allow him to do this?

**Solution to Puzzle 205**

The amount that Luigi withdrew each week was 10,799 lire. Each day for seven days an amount equal to 8/365000ths of the amount in the account at that time is added to the total sum. At the end of this time a cash withdrawal is made. This is repeated 52 times, after which the amount in the account amounts to 500,010 lire.

In order to find the amount which has to be withdrawn each week, an approximate value (R) is introduced into the program at line 10. The necessary yearly computations are then carried out using this value and the resulting residue is compared with the 'target' figure of 500010. Depending on this result, the original value of

```
 10 R=1000
 20 CAP=1000000
 30 FOR WEEK=1 TO 52
 40 FOR DAY=1 TO 7
 50 CAP=CAP+(CAP*8/365000)
 60 CAP=INT(CAP*.5)
 70 NEXT DAY
 80 CAP=CAP-R
 90 NEXT WEEK
100 PRINT CAP,R
110 IF CAP=500010 THEN STOP
120 R=INT(R*(CAP/500010))
130 GOTO 20
```

'R' is adjusted by an appropriate proportion in line 120. Each successive approximation is printed out until the required value is arrived at when execution of the program stops.

**Winner of Puzzle No 205**

This week, no one managed to arrive at the correct answers, so there is no winner.

**Rules**

The closing date for puzzle 210 is 24 June.

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# Letters

◄ continued from page 8

ers of Amstrad CP/M 2.2 machines, graphics support is provided through a turtle graphics package using *firmware* calls. A turtle graphics package using GSX calls also is provided for those machines supporting GSX. The turtle graphics packages are supplied as Pascal source programs containing procedures, functions and declarations, enabling programmers to create turtle graphics applications in compiled Pascal – it is *not* a turtle graphics interpreter.

The documentation provided with *Pascal80* contains a complete definition of the language syntax accepted by the compiler, using syntax diagrams to make it easy to follow. A number of example programs are provided on the disc (*Dis.Pas* is a semi-intelligent Z80 disassembler, for example and *Birthday.Pas* demonstrates the use of random-access filing techniques) and in the manual, so we feel that the documentation is more than adequate.

For those who know nothing of Pascal or similar block-structured high-level languages then yes, a tutorial book will be required. We mention a few suitable ones in the bibliography in the manual.

We would like to question Peter's assertion that Digital Research's Pascal/MT+ is 'the natural choice for computing students' as it is not an ISO-standard compiler. Prospero Pascal, which Peter didn't mention, *is* an ISO compiler, is nearly as fast as our *Pascal80* and is not that much more expensive on the Amstrad.




*"Is this an action replay of Artic's World Cup?"*

Although we would agree that Borland's Turbo Pascal is fast, it is not as fast as *Pascal80* and we disagree that it is 'the one for real language buffs' as even Borland admits that it is far from being ISO-standard.

We would like to point out, with deference to Peter, that HiSoft's *Pascal80* does seem really to have the edge over the other Pascal compilers on both performance and code size. On price, of course, we are unbeatable.

As Peter's review seems to us unbalanced, we think that publishing this letter in your magazine would help to redress the balance.

*Hi-Soft*
*Dunstable*
*Beds*

**Peter Worlock replies: The name Pascal 180 was a printers' error: I said it ran on any Amstrad machine; I said it supported GSX; I said there were demo programs; we agree a tutorial may be needed.**

**The turtle graphics business was my mistake, for which I apologise. As to the various implementations, I think this is a matter of opinion. I wasn't aware that Prospero's *Pro Pascal* was available for the Amstrads; of the packages I mentioned none is ISO-standard and I wasn't able to benchtest them. I will take your word that *Pascal80* is the fastest, but I stick by recommendation of *Turbo Pascal* on the strength of the number of support packages available and the enormous user-base.**

## Star letters

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# Compilers – an overview

*Professional programmer David Ridge reveals all about Basic compilers, their advantages and limitations, with particular reference to the Spectrum*

Picture the scene: friends are enthralled as you explain the dazzling details of your latest program. You're telling them about the climactic ending where mutant teddy bears, armed with wooden spatulas, overthrow the Thatcher government, when someone asks, "What's it written in?" Noticeably shaken and with a quiver in your voice, you mutter almost inaudibly, "Basic." Your friends begin to look at you with that special gaze they usually reserve for an unrecognisable plate of food.

Is this scene familiar? For most people who dabble in programming the Spectrum, Basic is the most common medium used. However, after some programming most people find themselves using a few creative adverbs when describing the slow execution speed of Spectrum Basic.

In the last year or so, there has been a proliferation of Basic compilers. *A* Basic compiler, in the most general terms, will turn a Basic program into machine code. More accurately, most Basic compilers create a strange brew of calls to run-time routines interwoven with proper machine code. Clear as mud, isn't it?

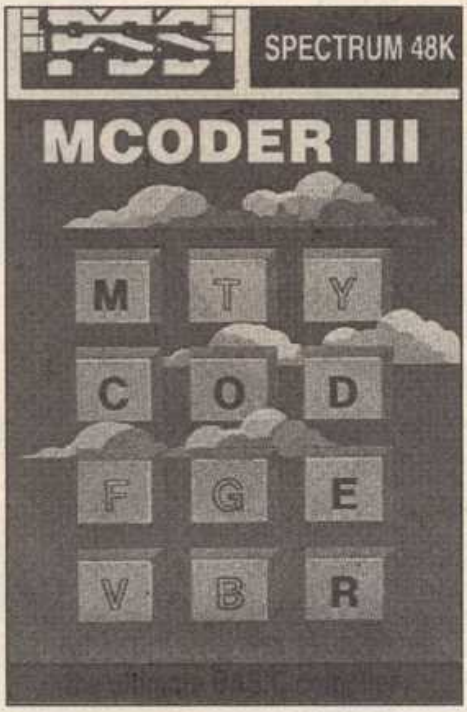
The Spectrum, like most computers, has a built-in set of instructions on the Rom chip. These Rom instructions are the brain of the computer, enabling it to know what to do when you push a key or enter a command. The Rom is made up of many individual routines which can be called to do their thing. Machine code programs generally contains many such Rom calls.

## Mixture of calls

Compilers tend to do things a little differently. Most compilers have a number of built-in routines, usually referred to as the "Run-time package". These run-time routines are instructions which are called by the compiled code instead of the Rom routines. The code produced by some compilers will be a mixture of calls to Rom routines and run-time routines. Other compilers may use either their own run-time routines or the Rom exclusively.

You may well ask why the compiler doesn't call only Rom routines, since, after all, the Rom routines are in machine code. The answer is that run-time routines are generally used to increase execution speed. A good example is the *Circle* routine in the Spectrum Rom; it is painfully slow. If the Rom was used, there would be no increase in drawing speed because the Rom routine is already in machine code!

It's not that Sinclair doesn't know how to make a fast circle routine. Due to memory restraints, compact code is a higher priority than execution speed. That's why for example, *MCoder III*, one of the more




recent Basic compilers, draws a circle many times faster than the Rom. It is using its own run-time routine.

So what about the compilers that use the Rom exclusively? How do they give a speed increase? The main reason Basic runs slowly is because it is an "interpreted language". The computer doesn't understand Basic; it only understands the binary bliss of ones and zeros known as machine code. So when you run a Basic program, the interpreter is constantly changing the Basic into machine code at run-time; a very slow process! The compiler eliminates this step by changing the Basic into machine code before it is executed.

So you can see that even if a compiler uses the Rom routines exclusively, tremendous increases in speed can still be achieved because the interpreter is bypassed. These concepts are generally true for all compilers, whether you are compiling Basic, Pascal, C or whatever.

## Speed increase

In that case, it seems a bother to learn machine code when a Basic compiler will do it for you, but the two main reasons are the tremendous bulk of the compiled code and the resulting slower execution speed. A computer can't be expected to create machine code as efficiently, elegantly and logically as an expert.

The most often asked question about Basic compilers is "How much of a speed increase can be expected?" That depends on whether you use a "floating point" compiler or an "integer" compiler. The floating point compiler will compile Basic containing any floating point operations such as *Sin, Cos* or any operation using real (decimal) numbers. The integer compiler will not.

The code produced by a floating point Basic compiler will always run much slower than that produced by an integer compiler. But even so, in a case where you want to compile some Basic containing some floating point operations, the fastest integer compiler in the world won't help you at all!

## General rules

Usually, the advertisements for these compilers will not mention whether the compiler in question is of the floating point or the integer variety. A good general rule is, if the advertisement says that the compiler will handle *all* Basic commands, then it is a floating point compiler.

The speed increase you can expect will vary wildly depending on the compiler you are using, the Basic operations you are compiling, and the structure of the Basic. However, I would offer these estimates: a floating point compiler will generally yield a speed increase of one to 10 times that of Basic, with an average increase of approximately four times. An integer compiler will usually yield an increase of 20 to 120 times that of Basic, with an average increase of approximately 50 times.

Now, don't let these fantastic quotes for integer compilers sway you too much. Because integer compilers don't handle all of the Basic your Spectrum can produce, there are many restrictions involved with their use. These restrictions will vary from one compiler to another, but generally they will not handle *any* operation using real numbers, any complicated string manipulation or multi-dimensioned arrays. You may find that for some programs, the restrictions imposed by the integer compiler make it useless. On the other hand, you may find the relatively poor speed increases yielded by the floating point compilers make them worthless!

BUT! There are many situations where a speed increase of four or five times can mean the difference between an irritating, jerking screen display and a smooth, fast and professional looking result. If you're can get away with using an integer compiler, the results can be spectacular! You can't really appreciate what it means to speed a program up by 40 to 50 times until you've seen it with your own eyes.

It is possible to use a Basic compiler as a professional development tool on the Spectrum, although one very serious drawback of Basic compilers is the size of the code they produce. I would estimate

programmer.

Further, these compilers either append a large portion of code to the compiled code or they must have the compiler present for the compiled code to run. Most Basic compilers take up between 4K and 6K of Ram. Suppose you're compiling a 1K Basic program. Typically, the compiled code will be around the same size as the Basic code, about 1K in this case. Now add the 4K to 6K for the compiler and your 1K of Basic has grown to 7K at run-time. It becomes less of a concern with larger programs. Another 4K on the end of 25K of code doesn't sound so bad.

As a professional programmer concerned with rapid development time, I am very interested in the potential of a good Basic compiler. To this end I have purchased and experimented with a number of Basic compilers. I would say that the speed achieved is perfectly acceptable for commercial program development, but the size of the code is not.

## Which compiler?

Which compiler to buy? A very tough question to answer. I have extensive experience with the following floating point compilers: *MCoder III* by PSS, and *FP Compiler* (which has just been relaunched) by Softek, and for integer compilers: *Colt* by Hisoft, and *MCoder II* by PSS.

If you want to be prepared for all possible situations, you will need both a floating point and an integer compiler. I should point out that an advanced Basic programmer will be able to find many ways around the restrictions of an integer compiler. A novice may have to settle for the ease of use and meagre speed increases offered by the floating point variety.

My experience indicates that Basic compilers which handle the *least* number of Spectrum Basic commands, yield the fastest and most compact results. I know it's dangerous to come up with sweeping, general statements, but here goes: *the more work required to get the compiler to compile, the faster and more compact the compiled code is likely to be.*

If you use a floating point compiler, chances are you won't have to change your Basic listing at all and the results can be a little disappointing. If you can use an integer compiler, you may end up modifying your original Basic listing a great deal, but the results will be worth it.

As for which one to buy, they all have advantages and disadvantages. I should point out that *Colt* by Hisoft is an enhanced version of *MCoder II* so if you're considering an integer compiler you might just as well choose *Colt*. *MCoder III*, however, is a whole new ball game.

It's difficult to make a recommendation in the floating point category. I found *MCoder III* to be simple to use and compatible with nearly all Spectrum Basic commands, but it lacks the kind of documentation that a programmer needs. I'm not saying that it has poor documentation. It virtually has none at all, and needs none because it's so easy to use. The problem is that there is no information given about the size of the compiled code or even its location. The insert doesn't even say how large a program you can compile!

The *FP Compiler* by Softek doesn't handle as many Basic commands as *MCoder III*, but it does give all the necessary information a programmer would want and the documentation is fair by Spectrum standards. I compiled many small test programs using both *MCoder III* and *FP Compiler*. The programs compiled using *MCoder III* ran consistently faster than those using *FP Compiler*. The difference was generally in the area of 10% to 30%. On the other hand, the *FP Compiler* can be easily transferred to, and used from, microdrive. *MCoder III* cannot be used from microdrive, but the compiled code can be saved to microdrive.

***MCoder II* (£9.95) and *MCoder III* (£12.95) are available from PSS, at 452 Stoney Stanton Road, Coventry CV6 5DG, *FP Compiler* (£9.95) from Softek at 12-14 Henrietta Street, London WC2, *Colt* (£12.95) from Hi-Soft, 180 High Street, Dunstable, Beds, and *Laser Basic Compiler* (£19.95) from Ocean IQ, 6 Central Street, Manchester.**


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# Money planner

*Office Mate* from Gemini is new on the Commodore 64, although other versions have been around for a while. The package, on tape or disc, offers a database, home accounts, Mailist and word processor. Not bad for £12-£15.

The title is rather misleading in some respects. The accounts program, for instance, is strictly for domestic finances, more a Home Mate than an Office Mate.

The database is a simple, and quite flexible little program. You can design your records pretty much from scratch, with up to 20 fields in each and 78 characters per filed, so you don't have to use easily forgettable abbreviations. Fundamental search and sort facilities are there, plus printer dump and calculating options on your collected data.

I am always a little wary of home accounts packages. If you're meticulous, you probably keep pretty good accounts filed on paper. If you're lazy about financial planning, then you're likely to be lazy about loading up an accounts program and updating it regularly. Luckily this one doesn't expect you to key in every Mars Bar you buy; it's essentially a month-by-month planner and budgeteer. It's clearly laid out, with easy to follow menus, and not too many confusing sub-menus.

The Mailist is also simple, and quite strictly defined in its names and addresses format.

The word processor is basic but functional – something to do a club newsletter on, rather than a professional report. As ever, there are the usual ingenious fudges to get around the Commodore's 40-column display and the printer's 80-column output; in this case, each single line on the print-out appears in a different colour on-screen. Word wrap, right justification option, block delete, word counts, etc, are included on separate menus.

As a package, its simplicity and ease of use are applaudable, particularly for the price, and the accompanying manuals are also extremely clearly written. The essential features are all there, but don't expect any mind-blowingly sophisticated features . . . and I still think it should have been called Home Mate – Gemini's companion package *Office Master* deals further with business-style utilities.

**Christina Erskine**

**Program** *Office Mate* **Micro** Commodore 64 **Price** £12 (tape) £15 (disc) **Supplier** Gemini Marketing, Gemini House, Dinan Way Trading Estate, Exmouth EX8 4RS

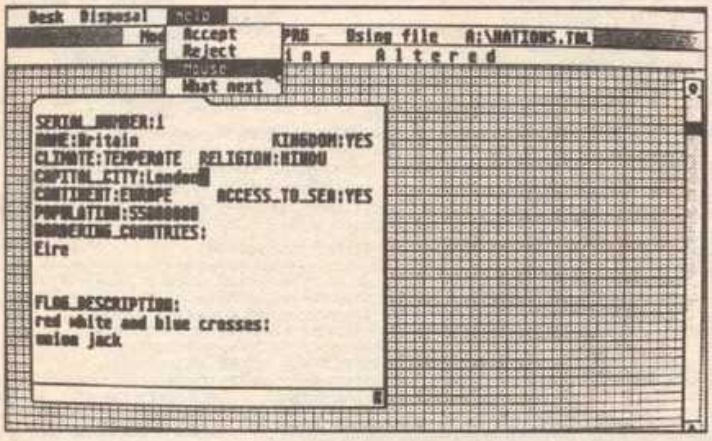
# A quality product

In the beginning, databases for home micros were little better than simple card files. Still, as the power of the machines has increased, so has, in general, the usefulness and quality of the product – enter please *TRIM* on the ST from Talent.

You'd expect a disc-based system running under Gem to be good, but there's more to *TRIM* than nice graphics and mouse control.

about *TRIM* is the way you can question the database, and extract information from it in the form of reports. The report generation turns the database into an intelligent mail merge of considerable potential power.

Like most good things, I suspect you would have to put in a fair amount of thought to get the most out of this program – but its comprehensive handbook and user-friendliness should guide you well.




For starters, the documentation takes you through file creation and data entry step by step – you set up various fields (Talent calls these variables) and define field types and lengths, but unlike other, less flexible databases, these can be altered after data entry has started.

However, the best point

**John Cook**

**Program** *TRIM (Talent Relational Information Management)* **Micro** Atari ST **Price** £89.95 **Supplier** Talent Computer Systems, Curran Building, 101 St James Road, Glasgow G4 0NS.

# Business users

Generic terms, as Ariolasoft and Batteries Included seem to have found, aren't always the best way to sell a product. One of the latest efforts from the duo (produced by the latter, published by the former), *Cal-Kit*, is billed as "the complete problem solving software package".

No more messy bank statements, income tax returns and so on – it sounds like a dream, but it doesn't sound like what it is. Yes, that's right, it's a spreadsheet.

The publisher's reticence as regards the dreaded word – extending to references to "worksheet" throughout – is understandable. Spreadsheets can certainly be configured so that they do sterling service vis a vis bank statements et al, but this all too often means the user has to commit a considerable amount of time and effort to producing models. The spreadsheet therefore tends to have unfavourable associations for home users.

But fortunately, there's more to *Cal-Kit* than just a name change. As I've said, the effort involved in designing models is one of the major problems of spreadsheets, and Batteries Included has taken the obvious step of including a series of ready built models with *Cal-Kit*. There are a considerable number of these, ranging from the fairly obvious *Home budget* to the decidedly esoteric *Canning calc*.

The latter is a product of the fevered imagination of the forms designers round at Batteries Included, and you will find it "extremely convenient" if you do "your own canning and freezing." Ho hum . . .

Nevertheless, the likes of this can no doubt be modified to apply to non tuna-related practices, and several of the other models should be right up the street of the home user with a bent to business, dealing as they do with electricity and installment payments, bank statements, heating and – nice touch this – business start-up.

The program itself is fairly easy to use, and, of course, allows you to design your own forms. The spreadsheet (sorry, worksheet) handles 99 rows by 26 columns, and includes a help-screen and a range of logical maths functions.

Personally, I'm not as convinced as the software houses are that there's a real demand for "home productivity" software, but as there's no profit for them in selling pencils and backs of old envelopes you've got to give them credit for trying. And *Cal-Kit* in this sense is a fine effort. It's neat, effective, easy to understand, and good value for money. It should do well with small business users, and if you want to get that home canning business going it could be just what you need.

**John Lettice**

**Program** *Cal-Kit* **Micro** Commodore 64/128 **Price** £39.95 (disc) **Supplier** Ariolasoft, Long Acre, London WC2.

# DO YOU WANT TO BE A HERO?




The result of unique co-operation between three ace software developers and the Biggles film production company, Biggles – The Untold Story will knock you right out of the air! It's a multi-part arcade strategy game in which each part must be completed to reach your final goal.

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| **Coming in June** | Amstrad CPC | £9.95 tape, £14.95 disk |

MIRRORSOFT

Purnell Book Centre, Paulton, Bristol BS18 5LQ

# Tebbit goes east

Remember Shogun? The mega TV epic of a year or so ago? The one where Richard Chamberlain was washed up in mediaeval Japan and the locals wandered about saying incomprehensible things?

Well, Virgin has now created *Shogun* the computer game. In this version, the locals wander about doing incomprehensible things.

It has to be said that the game is only loosely based on the book/TV series. You take the part of any of 40 or so characters with the aim of becoming Shogun – a sort of oriental Norman Tebbit.

To succeed you must pursuade 20 of the other characters that you're the one for the job. You do this by befriending/bribing/threatening people you meet, and if all that fails you can try to kill them.

All of this sounds like the makings of a first-class strategy game, but sadly Virgin has rather blown it in the execution. *Shogun* plays too much like *Sorcery*, with (admittedly nice) graphic characters wandering about the screen. when you meet someone, you can take a number of icon-driven actions including the said bribery/befriending etc.

One catch is that it's all too abstract. Apparently, levitation was commonplace in ancient Japan – if you need to get to the top of the mountain you simply levitate straight up for half a dozen screens. Sometimes you can walk through walls, other times you need to fly over the house.

The other major drawback is that for most of the time you haven't a clue what's going on. All of the other characters wander about doing their own thing, and your only means of keeping track of the action is a single-line newspaper that informs you of events like "Toranaga orders Kiku" and "Pine takes a helmet near the village".

You're told only how many followers you have and you'll find yourself watching the display in bemusement as your band increases and decreases, apparently at random. Some kind of information screen, showing the state of your major rivals, etc, would have helped enormously.

It's not that *Shogun* is a bad game, because it isn't. The graphics are well done, and the soundtrack sets the scene perfectly. It's rather that it could have been one of the all-time classic strategy games and ends up being an average arcade offering.

Check it out for yourselves – some of you will love it, but I suspect that many will share my disappointment.

**Peter Worlock**

**Program** *Shogun* **Micro** Amstrad CPC, Commodore 64 **Price** £9.95 **Supplier** Virgin Games, 2 Vernon Yard, Portobello Road, London W11.



# Ghoul infestation

Derek Brewster is well known as the adventure columnist of a monthly magazine so it should be no surprise that when he writes an arcade game it has heavy adventure overtones.

Our pre-production copy of *Conquest* was so hot off the press it was also pre-inlay, so I can't tell you much about the plot, except that it sets your tiny hero the task of running round a vast, multi-room castle which is infested by as ugly a collection of ghouls as ever howled in the night!

The first thing to find is the axe, which returns boomerang style when thrown and seems to be efficient against 99% of all known nasties.

Let a snake sink his fangs into you and you'd better get a suitable potion quickly or it's fangs for the memory.

The game uses a rather odd control system. The four joystick directions control movement but there are two other pairs of keys to select one of five objects carried and to select an action icon.



Graphically the game is somewhat spartan looking with its high vantage point 3D rooms. It's a clever idea but I couldn't help feeling it was more suited to the standard range than competing with MAD games.

**John Minson**

**Program** *Conquest* **Micro** Spectrum 48K **Price** £2.99 **Supplier** Mastertronic MAD Games

# Looping the loop

I've always thought Biggles had great computer game potential – Sopwith Camel flight simulation, text adventures (Go north. Say to Von Stalhein "You cad", then stiffen upper lip), arcade action in the shoot-outs or aerial dogfights.

Now it's happened, and there is, of course, a catch. The game is based on the film, not the books, and since the film is a travesty of everything true Biggles fans hold dear, Mirrorsoft has a tough job.

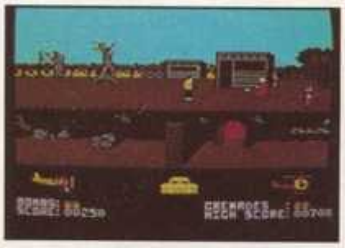
*Biggles* is actually two games – *Timewarp* and *The Sound Weapon* on either side of the tape. Completing the second is easier if you have already completed the first, but not impossible.

*Timewarp* is a fairly straightforward arcade game, with a nice touch which links it to the film. There are three scenarios: flying through the air shooting everything; moving through the battlefield shooting everything and chasing around the rooftops dodging everything. The first two are set in 1917 during the war, the third is set in 1986.

As in the film you are transported from one year to another with very little warning – just a thunderflash appearing on screen to tell you that the time warp is taking effect.

Having completed *Timewarp* (or not, as the case might be), you can move on to *Sound Weapon*, where the emphasis is partly on flight simulation (in a helicopter with your time travel companion, thoroughly modern Jim) and partly on a more conventional arcade adventure scenario.

As a flight simulator, it's not going to give anyone at Sublogic sleepless nights, but



that's not the point and it is quite fun. But the thought of Biggles travelling through time in a helicopter is giving me sleepless nights and Captain W E Johns and Biggles himself will be looping the loop in their graves.

**Christina Erskine**

**Program** *Biggles* **Micro** Commodore 64 **Price** £9.95 **Supplier** Mirrorsoft, Maxwell House, Worship Street, London EC2.

# The holiness of an atheist . . .

The meaning of Stonehenge has puzzled some of the world's finest minds. But now we have the solution – it was built to provide a scenario for Ariolasoft's latest game.

*The Standing Stones*, written by Electronic Arts, actually takes place beneath Stonehenge in a sort of Arthurian setting. The ultimate goal of your quest is the Holy Grail, although you should keep an eye open for Excalibur and some charmed armour along the way.

So, taketh up thy sword and prepareth to entereth the bowelth of earth.

The documentation is written in thith sort of style, and it's very funny in places. Of a sample character it says: "He hath the holiness of an atheist and though he be fleet of foot, he clearly suffereth from advanced leprosy . . . Choose thou not such a loser!"

You start by creating a knight, preferably with reasonable strength in all departments. Intelligence and holiness govern spellcasting ability; strength, agility and hit points determine how well you will perform in combat.

Then, down in the dungeon something stirreth . . . In you go, treading the maze depicted in 3D perspective graphics. On the way you'll encounter monsters, a few of whom are friendly but most of whom will attempt to rip out your throat.

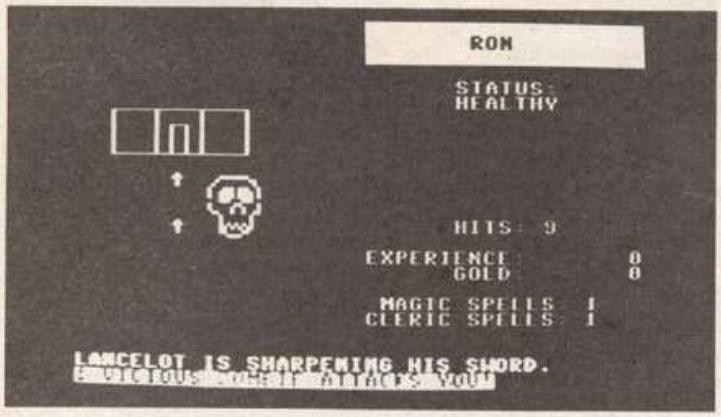
Sirtech's *Wizardry* is the classic of this genre and comparisons are inevitable. In the early stages, it must be said, *The Standing Stones* does not quite reach the elevated levels of *Wizardry* but the documentation hints at better things on the lower levels. I lacked the nerve (and the hit points) to venture down that far.

One of the delights in store is leisure time at the oasis where you can trade, buy food, bet on the cockroach races, and leave messages for friendly characters.

At £14.95 for a disc-based game, it's not overpriced and you're guaranteed hours, if not weeks, of play. Well worth trying if you're a fan of the genre.

**Peter Worlock**

**Program** *The Standing Stones* **Machine** Commodore 64 (128 compatible) **price** £14.95 disc only **Supplier** Ariolasoft, 68 Long Acre, London WC2E 9JH.




# Bureaucratic tasks

Strategy and combat specialists Black Knight are back on the warpath with a tale of land management and mis-management in medieval times. The King has allocated a remote territory to you, which as a job is second only to cleaner of the royal piranha's teeth!

Not that you're being rushed. You have all of 200 years to raise 1,000 groats and placate his majesty. In this case I think I'd rather get the Abbey Habit and go for long term investment. Apparently that option's not open to medieval nobles, though, so it's gather your knights together to exploit the peasantry.

Actually *Sword and Shield* is a considerable advance on the old-style land management game when you just had to allocate resources. There's a wargame element to this which has totally avoided using a grid. Instead you issue orders to your troops, sending them off at a specified speed in one of eight directions.

When one of your knights comes into contact with the enemy the inevitable battle ensues unless you decide discretion is the better part of valour. There are also castles to be plundered, and at the end of every year you can alter taxes, buy troops and deal with all the other bureaucratic tasks that test a hard-pressed duke.

The control system is rather novel with a large cursor to steer over the knight in question. The problem is that once your troops begin to space out around the playing area, it becomes increasingly difficult to keep track of them and to update any commands that were altered when their course met an obstacle.

I found the game quickly became repetitive and I suspect that even hardened wargamers will find too few variables here to make those two centuries of command worthwhile.

**John Minson**

**Program** *Sword and Shield* **Micro** Spectrum 48K **Price** £5.95 **Supplier** Black Kight Computers, PO Box 132, Chislehurst, Kent BR7 6LJ.

# Caverns of rocks

Once upon a time there was a home computer game called *Boulderdash*. It involved a little critter called Rockford, represented in appealingly low-tech 2D, making his way through caverns of rocks in search of diamonds. Such was the success of *Boulderdash* that it sprouted a sequel, *Rockford's Riot*, which was vaguely similar but flopped because it was sold in a silly box. So it goes . . .

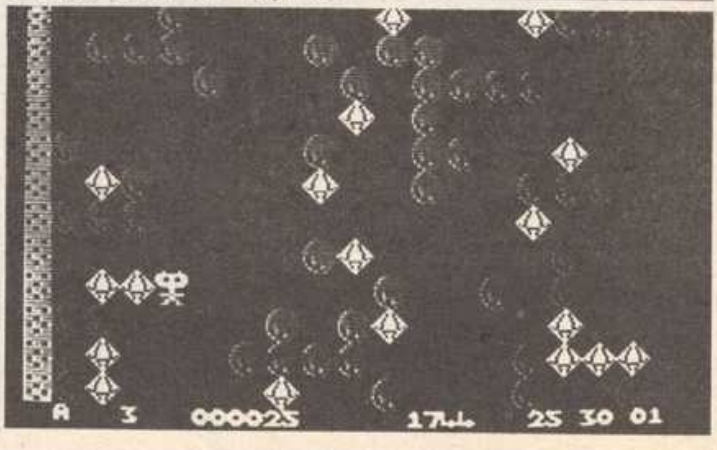
What, I hear you ask, does this have to do with Mastertronic's *Return of Rockman?* Well, the original *Rockman* was fairly similar to *Boulderdash*, and the sequel is even more similar. You have to guide Rockman through ten caverns full of earth, boulders which can sometimes be shoved out of the way, diamonds which are your goal, and radioactive waste which is best avoided. There are a couple of variations on the original scenario; deadly bows become valuable sources of diamonds if waste falls on them (a new principle of physics I believe).

It would all be jolly good fun if it were as fast and smooth as the original CBM 64 or Spectrum versions, but *The Return of Rockman* is slow, lacking in polish and devoid of interesting sound effects.

Maybe our C16 was having an off day, but really, this is not one of the best Mastertronic efforts.

**Chris Jenkins**

**Program** *The Return of Rockman* **Micro** C16-Plus **Price** £1.99 **Supplier** Mastertronic, 8-10 Paul Street, London EC2A 4HJ.





# Highest common factors

*Tony Kendle wades through Gargoyle's excruciating puns and completes the Marsport solution*

Amstrad owners will no doubt be pleased to know that I have heard again from John Lyndon Smith and friends, who form Hacker's Unlimited. They have sent some more useful pokes that we will be printing in a week or two.

In the meantime, however, they have pointed out that the pokes given for the tape version of *Sorcery* apparently do not work on all Amstrad machines (as a result of some unguessable internal changes in the Rom I suppose) and they promise that they are on top of the problem and will be providing the necessary modifications in the near future.

Whilst on the subject of pokes, can anyone come up with something for infinite lives for Hewson's superb *Uridium* on the Commodore?

## Alien items

Now for the rest of our complete *Marsport* solution. We left John Marsh having discovered the secret of the antidote and ready to tackle the problems of the vidtex clues.

As mentioned last week there are five very hard clues in all that point towards the factoring of certain pairs of items. However, before you can find and solve all five clues you must deal with the sept warlords (at last!) to make the rest of the complex accessible. If you use the valium from the chemists to get past the nerve gas on level B, you will find a peculiar item called a topee.

When you carry this item around you will soon see that the normally innocent herald robots start to behave like the evil warders – as soon as you see one shoot it or run.

This behaviour is the explanation of the clue, 'Heralds know all that is alien', in short the heralds have detected that you are carrying an item that is 'alien' and have decided to attack you. It is helpful then to put the topee somewhere safe, both so that it is easier to survive and also so that you will able to tell when you pick up something else that is alien.

In fact the next alien item is found by taking the kettle from Farr level in the key slot of the boiler room. In here you will find a decidedly dodgy helmet.

Factor the helmet and the topee and you will find you have the starlord's power booster. Combine this with your gun and you will be endowed with a hypergun that can turn the warlords into a smudge on the wall.

The first clue to solve can be found on laxa level 'One is easy and full of aplomb'. Not an easy one to solve though. The thing that is easy is the cakes (as in a piece of. . .) and the term PLOMB relates to the old fashioned term for lead, ie, you have to collect all the items for another cake and then all the items for another lead suit and finally combine the two. You will end up with something known as the 'R token'.

There is a clue on Daly level 'one draws near and throws away'. The thing that throws away is reasonably obviously a projector. The thing that 'draws' is a piece of charcoal (don't blame me, I didn't write it).

On level C you will find 'one monkey says why the other two can't'. This obviously relates to the story of the three wise monkeys and you want to find something that stops you from seeing evil (you must construct some more sunglasses) and something that stops you from hearing evil (the earmuffs).

On Elis level there is 'One says nothing, the other says it all'. The thing that says nothing is the mute from the music room. The thing that says it all is a manifesto from the oratory.

## A mixed bag

The last clue, and one that had me stumped for days and groaning when I solved it is on level B. 'One is holy with skill after church'. The holy thing is obvious – the strainer from the bar. The skill after church is more complicated because it refers to the 'chart' of the sunchart. The church is the abbreviation 'ch.' and the skill is of course the 'art'.

Once you have factored all the above pairs of items you will find yourself in possession of five tokens, E,N,T,E,R, and Y. It doesn't take a genius to realise that this spells something and if you factor all five together you will be supplied with the key that will get you through the sanctum.

The final problem you will now face, indeed the problem that makes up all of the last section of the game, is how to take the plans and get out of Marsport before the time limit runs out and your are blown to pieces.

As you travel around the various levels you will have found several peculiar items known as codexes which up till now have had no obvious purpose.

The last clue that you will find, and the one that provides the solution to this last problem, is on Joly and reads '7 from 10 makes you a bighead'. As long as you have mapped the game carefully you will find that there are strangely enough 10 of these codexes and that one occurs on each of the levels A to J. If you take the items from each of the levels in turn that spell *BIG-HEAD* you will receive the message *HD6 GUNW*.

What this means when deciphered is that you should go to the corridor reference HD6 and fire at the west wall with your gun.

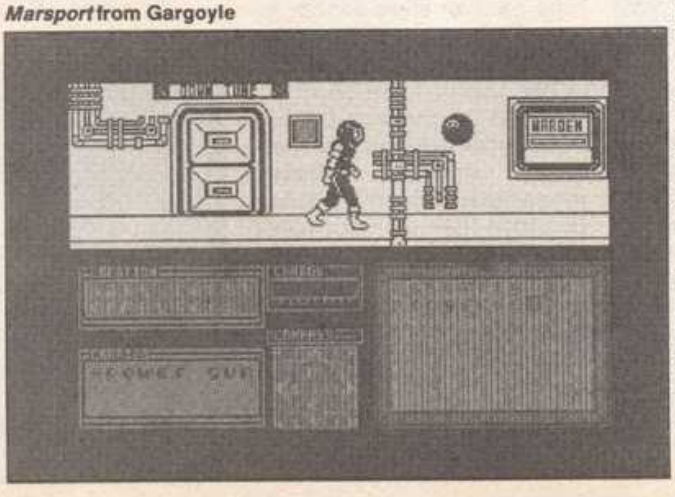
The screen should flash and you will fund that a new up tube has appeared which is near enough to the plans to let you collect them and escape from the spacefield door with relative ease.

That is of course the end of our *Marsport* solutions, possibly to the relief of some of you who have been stuck on the last stages of the game.

Next week we will be back to a more mixed bag. It's always difficult to try to classify Gargoyle games as either arcade or adventure and in the absence of a more rational solution, Tony Bridge and I seem to be taking them in turns. I have therefore reluctantlysacrificed all interest in *Heavy On The Magick* and would request that all tips for this masterly game should go to him.

See you next week.

***Marsport* from Gargoyle**



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# Real English

*This week Tony Bridge offers some help to adventurers having trouble with their real English*

It's been a long time since I gave any Help to fellow adventurers: that's mostly because there are so many new programs to look at and tell you about, but also because even four pages a month are not enough to fit everything in, and I think that the excellent help services provided by clubs like Roger Garrett's *Guiding Light*, and Henry Mueller's *Adventurer's Club Ltd* are all that the avid adventurer could ask for.

Mr T G Toon is getting in a bit of a tizzy about Interceptor: "I have just started playing *Forest at World's End*, and it is, to my mind, the most stupid, awkward game yet devised by these so-called computer wizards. Can you enlighten me as to the "real English" that this game is supposed to understand? At the start, for example, an elf attacks you. You cannot *Fight Elf, Kill Elf, Use Bow, Fire Bow On Arrow* and so on. Please tell me what "real English" is, in computer terms! *Message from Andromeda* is exactly the same – unless you can help me, I will *never* buy an Interceptor game again."

Now that the Interceptor catalogue is down to a bargain £1.99, I'd hate you to miss out on the other Interceptor adventures, Mr Toon. They can indeed be frustrating in their use of language, and I agree with you – adventures shouldn't be mere word-matching exercises.

As to the Elf, just try 45 (or 7) 36,24,50. Very soon, now, you'll have to 16,42,9,46 and later, 58,23,33. So you see that the computer *does* seem to recognise "real" English, where many other programs would require you to say something like 54,33 or 18,33: that seems to me to be rather more of an artificial and forced construction than Interceptor's.

Other questions that I've been asked about this adventure in particular, are: How do I get past the Dragon (66,45) and How do I get the Key (just 47,8 before entering the Witches Hovel). The key, incidentally, is needed to unlock the chest, and the rope to enter the crater (when standing on the overhanging rock 51,63,19,6 and then 58,25,63). The coin and the food are not of any value, though you can of course *Eat* the food.

*Warlord* is another Interceptor adventure which is highly thought of by Bernard Henderson amongst several others ("simply magic!"): he offers his help to anyone who wants it. His address is 25 North Wallington, Fareham, Hants PO16 8SN.

Ivor Williams, whose name has been linked with Interceptor adventures many times in The Corner, says that after 13 hours of hard work, he has finally finished the adventure, which he reckons is "the most difficult yet from Interceptor, most enjoyable and highly recommended."

## Highly recommended

To get started, 54,4,27,35,43,12,4,4,48,20, 52,38,20,19,39,48,29,7,29. The items not needed are the 10,53,30, and 50. The Amulet is the hardest item to get, but when you first meet the Druid, who has the Amulet, read the Scroll carefully to gain a clue as to what he wants. If help is needed on any Interceptor adventure, I'll be glad to help, and my address is Sgt I Williams, 26 Engr Regt, Wksps REME, BFPO 24."

John Wilson, an old friend of The Corner, has sent me a long list of solutions to *Warlord* problems: To get the helmet, go to the cavern on the beach and 58,23,5 then 4,52,58,62,13,5. To get the sword, wear the helmet, cross the causeway, then 52,4,52 and 57. To get the shield 38,17,28,17,64.

## Organised breakdown

From Dennis Goodwin comes several letters regarding adventures that he is currently working on, complete with maps and sheets of very organised breakdowns of vocabulary, locations and objects along with the solutions to puzzles. His favourite appears to be *Mordon's Quest*.

And here are some of his hints: To get the diamond 14,3,55. To get across the quicksand 41,17,31. To kill the pigmy 41,17,11. To bribe the carniverous plant 41,17,61,53,67. To get past the waterfall 41,17,56,1,17,34,60,17,37. In the barn 41,17,32,49,19,48,26. To activate the Droid 44,26,23,2. The answer to Tarzan's question is 15. Although trying to use the cigar is usually met with the Man with No Name theme, it *will* be useful in the Arena. The password for the Admantium barrier is 22. You can write to him (including SAE of course) at: 18 Norman Way, Wallingford, Oxon OX10 0SS.

| | | | |
|---|---|---|---|
| 1 | AND | 33 | BOAT |
| 2 | DROID | 34 | DAGGER |
| 3 | IRON | 35 | HARE |
| 4 | EAST | 36 | ELF |
| 5 | POOL | 37 | TEMPLE |
| 6 | ROCK | 38 | GIVE |
| 7 | KILL | 39 | RAVEN |
| 8 | RING | 40 | WEAR |
| 9 | ACROSS | 41 | USE |
| 10 | SKULL | 42 | LOG |
| 11 | BLOWPIPE | 43 | WEST |
| 12 | UP | 44 | INSERT |
| 13 | OF | 45 | SHOOT |
| 14 | BREAK | 46 | CHASM |
| 15 | FROG | 47 | WEAR |
| 16 | LAY | 48 | GET |
| 17 | THE | 49 | COUNTER |
| 18 | ENTER | 50 | BOW |
| 19 | TO | 51 | TIE |
| 20 | ACORN | 52 | NORTH |
| 21 | AND | 53 | PIG |
| 22 | PERSEVERE | 54 | GO |
| 23 | INTO | 55 | PYRITE |
| 24 | WITH | 56 | FROG |
| 25 | DOWN | 57 | SLEEP |
| 26 | BATTERY | 58 | CLIMB |
| 27 | FREE | 59 | VASE |
| 28 | GUARD | 60 | AT |
| 29 | TORC | 61 | DEAD |
| 30 | SILVER | 62 | OUT |
| 31 | BLANKET | 63 | ROPE |
| 32 | GEIGER | 64 | SALT |
| | | 65 | HORN |
| | | 66 | BLOW |
| | | 67 | MY |

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# ADVENTURE HELPLINE

**Sherlock on C64.** How can I find the Old Mill Road near Leatherhead? N Barfod, Fagotvej 88, 2730 Herlev, Denmark.

**Fourth Protocol on Spectrum.** Of the seven questions which need answers to give you a keyword, I'm stuck on the last three: 1) What proof do you have? 2) Where did it happen? 3) How was the traitor recruited? Please help me. Steven Hill, 6 Penlan Road, Loughor, Swansea, West Glamorgan SA4 2QG.

**Murder at the Maon on Spectrum.** I can't find the rifle to shoot the lock on the manor gates open, although I do have the bullet. Anne Crossland, Aurrida House, Finstown, Orkney KW17 2ES.

**Spiderman on C16.** How do you defeat the ring master? Mr S Fry, 49 Lealholm road, Benton, Newcastle upon Tyne NE7 7NN.

**The Neverending Story on C64.** How do you save your position? Clive Tomes, 19 Pre des Chenes, St John, Jersey, CI.

**Mordon's Quest on QL.** How do I defeat the gladiator? Where is the pump for the aqualung? Nick Pretzel, 150 Chiswick Village, London W4 3DG.

**Hitchhikers Guide to the Galaxy on Atari ST.** How do I show the door in the heart of gold that I am intelligent? Mike Morris, 332 Banbury Road, Oxford OX2 7ED.

**Ship of Doom on Spectrum.** How do I press the switch in the control room without being ejected into space? Gareth Edwards, 6 Broc Clare, Tall Trees Estate, Penkridge, Staffs.

**Spiderman on Spectrum.** How do I beat Electro? I can help with Hobbit, Hulk, Sub Sunk, Espionage island, Inca Curse, Fourth Protocol (part 1), Mindshadow 1, voyage into the Unknown and Legend, Gareth Edwards, 6 Broc Clare, Tall Trees Estate, Penkridge, Staffs.

**Spellbreaker on C64.** How do I cross to the outsropping? G M Phillips, 8 Poolsford Road, London NW9 6HP.

**Fourth Protocol part 1 on Spectrum.** I think I have 'gone' everwhere, but I cannot complete the final question. James Wheatley, 33 Whkeham close, Blaby, Leicester LE8 3HT.

**Ground Zero on Spectrum.** Where do I build my shelter to survive nuclear attack? Mr N Jones, RNEC, Manadon, Plymouth PL5 3AQ.

**Subsunk on Spectrum.** How do you unblock the sink? How do you get the pills out ofthe bottle? What do I do with the yoghurt? How do I use the vacuum? Any help please. Caroline James, 19 Burnside Avenue, Blackpool, Lancs.

**Robin of Sherlock on Spectrum.** I can't get into the castle. What do you do on the mystic hill? What do I do anyway? Caroline James, 19 Burnside Avenue, blackpool, Lancs.

**Gremlins on Spectrum.** I do not know where to go after obtaining the camera from Dorrys. Chris Moore, 58 Ledbury Road, Priory Road, Hull HU5 5SJ.





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# Half, full and Simplex

*David Wallin explains duplex and takes a look at the RS232 interface*

This week I'll be looking at the RS232 interface. But first a full explanation of duplex is required.

For full information on the use of each pin of the RS 232c, see *Hotline – a personal guide to computer communcations* by Ben Knox. (Century Communications, £6.95. ISBN 0-09-160931-3). This book was an information source for this week's article.

## Duplex

Transmission and reception of data may be in one of three 'duplexes' or modes, they are: Full Duplex, Half Duplex and Simplex.

*Simplex* – This mode of operation allows data to either be sent or received, but not both. Simplex Data Transmission means that data may be transmitted, but not received. Similarly, Simplex Data Reception means that data may be received, but not transmitted. A normal radio receiver is a received, but not transmitted. A normal radio receiver is a simlex device, you pick up sound transmitted from a studio, but you can't talk back.

*Half Duplex* – Half duplex allows data to be sent or received but not at the same time. When transmitting data, you cannot receive anything, and when receiving, you can't transmit. 'Walkie-Talkies' and CBs are half duplex devices. On a computer-modem link the TxD and RxD pin are required. Also the protective ground should be wired up.

*Full Duplex* – Full duplex allows you to receive and transmit at the same time. A telephone is a full duplex device, you can hear and talk at the same time. Most home micros will work with full duplex modems, but are not capable of doing two things at once, (ie, transmitting and receiving) and so they operate in half duplex. Micros like the Amiga which can multi-task would be able to receive and transmit at one time. Full duplex is expensive and usually requires four lines, TxD, RxD, protective ground and signal ground (pin 9).

The most common duplex is half and, unless stated otherwise, the information in this article applies to half duplex operation.

## How RS 232 began

Over 20 years ago, the Electronics Industries Association of Washington DC, decided that they needed a standard for connecting any computer (be it micro, mini or mainframe) to any serial device (ie modem, printer or robot). A standard was set and this was known as 'Agreement RS232'. The most common RS standard used today, the V24 version, is agreement RS 232c which was introduced in 1969.

Many home micros (including the BBC) have an RS 423 interface port. This is a budget version of the full 232c. As most data links (connection of micro and device) require usse of only five of the 25 pints, the RS 423 was designed as a five pin serial port. Also many micros that claim to have an RS 232 or an RS 232c, in fact have a cut down version; very few use all of the 25 pins.

## The RS 423

As mentioned above RS 423 has only five pins. This is because most of the other pins are not required, and those that are can be 'created' by combining the available pins. The five pins used are:

| Name | Abbreviation | Pin number |
|---|---|---|
| Protective ground | (Gnd) | 1 |
| Transmit data | (TxD) | 2 |
| Received data | (RxD) | 3 |
| Request to send | (RTS) | 4 |
| Clear to send | (CTS) | 5 |

Some modems have the inputs and outputs (TxD and RxD) labelled differently, so check the manual for proper wiring up details. In fact, only three pins are essential as the CTS and RTS lines are hardly ever used these days. This is because their job can be done by a buffer, an area of Ram (about 128 bytes, ($\frac{1}{8}$K) in which data waits as if in a kind of queue.

## CTS and RTS

The purpose of CTS and RTS are to prevent *data collisions*. This is when data is going in both directions, on a half duplex line and there is literally a crash as the two collide. This results in loss of and damage to data. To prevent this CTS and RTS are available.

If the computer wishes to send data, it *raises* or *take high* the RTS line (it requests permission from the modem to send some data). In plain English, it applies to voltage to it. When the modem is ready and able to send data, it raises the CTS line (telling the computer it is clear to send). The data is then sent. After it has all been sent, RTS and CTS are lowered, the voltage is dropped.

Full duplex has no need for the CTS and RTS as Txed (transmitted) data and Rxed (received) data travel along different wires.

## RS 232c link

It is useful to know what all the pins on an RS 232c are for, so here's a list.

| Pin No. | Description | Abbreviation |
|---|---|---|
| 1 | Protective ground | Gnd |
| 2 | Transmitted data | TxD |
| 3 | Received data | RxD |
| 4 | Request to send | RTS |
| 5 | Clear to send | CTS |
| 6 | Data set ready | DSR |
| 7 | Signal ground | Gnd |
| 8 | Received line signal detector | |
| 9 | Reserved | |
| 10 | Reserved | |
| 11 | Unassigned | |
| 12 | Secondary received line signal detector | |
| 13 | Secondary clear to send | 2nd TxD |
| 14 | Secondary transmitted data | 2nd TxD |
| 15 | Transmitter signal element timing | DCE source |
| 16 | Secondary received data | 2ndRxD |
| 17 | Receiver signal element timing | DCE source |
| 18 | Unassigned | |
| 19 | Secondary request to send | 2ndRTS |
| 20 | Data terminal ready | DTR |
| 21 | Signal quality detector | |
| 22 | Ring indicator | RI |
| 23 | Data signal rate selector | |
| 24 | Transmit signal element timing | DTE source |
| 25 | Unassigned | |

Unassigned means that the pin has no use, the two unassigned pins take the number of pins up to 25, a standard connector size. Reserved means that the pin is there for the manufacturers to do what they like with. They are not subject to either RS 232 or CCITTT regulations and may be used for testing, etc. They usually perform functions which only that device has.

## The connectors

The two common connectors are:

1) The standard 25 way RS 232 'D' socket. An elongated 'D' shape. The female is usually found on the computer and the male on the modem/device. The pin numbers correspond to the RS 232 pin number.

2) The five pin RS 423, as found on the BBC and many other cheaper home micros. The computer usually has the female connector.

If you have any queries, tips or comments to make about any aspect of micro communications, David Wallin would love to hear from you.

Write to him at *Popular Computing Weekly*, 12-13 Little Newport Street, London WC2H 7PP.

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# FUNCTIONS

by Mike O'Donnell

One of the beauties of QL SuperBasic is the way that procedures and functions are used to 'expand' the Basic. They are then used as the usual Basic commands are, rather than being 'called', as in other Basics. For example, on most machines a function to return the cube root of a number would be executed by something like; *Print FNcu (n)*. More often than not you are limited to a two character name. On the QL the *FN* or *Proc* part is omitted, resulting in; *Print Cube-Root (n)*. The function name can be any length.

This brings us to the listing. A useful feature that the Amstrad has is the ability to change a string to upper or lower case with the *Uppers* and *Lowers* functions. My first two functions do the same. (Once the listing has been entered, you can use any of them – there is no need to type Run.)

To change a string's case, try something like, *Print Uppers ("HellO ThERe")*. It will return *"Hello There"*. Or you could try, *a$ = "FrEDd":a$ = Lowers (a$) :Print a$*. This will return *"fred"*. Only the relevant characters are altered, so numeric characters, punctuation, etc, are left alone.

The three remaining functions are fairly obvious: they give the string handling commands found on most other machines. Once you are used to it, Sinclair string splitting is (I think) more advanced than that found on other machines, but beginners may find my functions useful whilst getting used to other aspects of the QL. They may also be handy for those interested in converting programs to the QL from other machines, without spending too much time altering things.

They are used as the same functions would be in other Basics, eg, *Print Lefts (a$,4)* will return the four leftmost characters of a$, while *Print Mids (a$,3,5)* will give five characters from *a$*, starting at character number 3. *Print Rights (a$,3)* will give the last three characters of *a$*.

I have added some simple error trapping; if you ask for more characters than there are in a string, you will get only what is there, and an empty string will return nothing.

A peculiarity of SuperBasic is that function, procedure, and variable names are stored as soon as they are entered. If you like your commands to be in upper case, typing them so just once ensures that they appear that way each time you enter them into a program line.

The reason for the line numbers starting at 30000 is that I find it useful to save procedures and functions to microdrive, numbered from 30000 upwards. They can then be merged into a program, and the whole thing renumbered to allow further merges.

```
30000 REMark   SuperBasic Functions
30010 REMark  by Mike O'Donnell
30020 :
30030 :
30040 DEFine FuNction LOWER$(a$)
30050 IF a$="" THEN RETurn a$
30060 FOR n=1 TO LEN(a$)
30070   IF CODE(a$(n))>64 AND CODE
      (a$(n))<91 THEN
30080     a$(n)=CHR$(CODE(a$
      (n)) || 32)
30090     END IF
30100   END FOR n
30110 RETurn a$
30120 END DEFine LOWER$
30130 :
30140 :
30150 DEFine FuNction UPPER$(a$)
30160 IF a$="" THEN RETurn a$
30170 FOR n=1 TO LEN(a$)
30180   IF CODE(a$(n))>96 AND CODE
      (a$(n))<123 THEN
30190     a$(n)=CHR$(CODE(a$(n))
      && 223)
30200     END IF
30210   END FOR n
30220 RETurn a$
30230 END DEFine UPPER$
30240 :
30250 :
30260 DEFine FuNction LEFT$(a$,n)
30270 IF a$="" THEN RETurn a$
30280 IF n>LEN(a$) THEN n=LEN(a$)
30290 IF n<1 THEN RETurn ""
30300 RETurn a$(1 TO n)
30310 END DEFine LEFT$
30320 :
30330 :
30340 DEFine FuNction RIGHT$(a$,n)
30350 IF a$="" THEN RETurn a$
30360 IF n<1 THEN n=1
30370 IF n>LEN(a$) THEN RETurn a$
30380 RETurn a$((LEN(a$)-n)+1
      TO LEN(a$))
30390 END DEFine RIGHT$
30400 :
30410 :
30420 DEFine FuNction MID$(a$,n,m)
30430 IF a$="" THEN RETurn a$
30440 IF n<1 THEN n=1
30450 IF n+m>LEN(a$) THEN RETurn a$
      (n TO LEN(a$))
30460 RETurn a$(n TO n+m-1)
30470 END DEFine MID$
```



# SPRITE PRINTER

*by Frank Bingley*

A useful utility for any CBM64 programmer is a sprite editor. These excellent programs make easy work of creating sprites, so much so that it doesn't take long to accumulate quite a collection.

What with sprites for one program or another, some stored as Basic loaders, some as 'Boot Files', it can become quite a tricky business remembering what you have, where it is stored, or what part of memory holds the sprite data!

Having been in this position myself, it didn't take long for me to realise that it would be handy to have some sort of catalogue with a computer print-out of each sprite and where it is sorted, etc. This prompted me to write the following utility called Sprite Printer.

Written in Basic, this short program is not a sprite editor, but is designed to be used in conjunction with one, especially if you have a machine code editor which resides from $C000 upwards. It is then possible to have both programs in memory at once, switching between each utility as necessary. For those of you with basic sprite editors, it would be best to design your sprites first, then load 'Sprite Printer' whilst the sprite data is still in place, to get printed records.

When run, the program will present a table of options along with a sprite on the right-hand side of the screen.

**Option (m)** will display the sprite in multicolour mode.

**Option (o)** will display the sprite in hi-res mode.

**Option (+)** and **Option (-)** is a fast search facility which can be used to find known or unknown sprites. These two options simply increment or decrement the sprite pointer to the desired location. It will wrap-around at each end of the table.

**Option (e)** will end the program.

**Option (p)** will give a printed representation of the current sprite shown on the screen. This will produce one of four different results, according to what other flags are set in the program.

If the sprite on screen is in hi-res mode then a hi-res replica will be produced. The numbers at the top of the grid represent the bit numbers. On the other hand, if the sprite on screen is in multi-colour mode, then a multi-colour picture will be printed. (The colours represented by shades of grey.)

To get a true bit pattern for multi-colour sprites, it will be necessary to press option (o) before printing the sprite. Finally, with the sprite pointer pointing to block number #0, a blank grid will be drawn. This is useful for designing sprites without the computer or editor or where a sequence of sprites are needed for animation purposes, where only slight pixel differences are required. (The sprite pointer is set at this position by default.)

It should be pointed out at this stage, that if some sprite data is stored very low

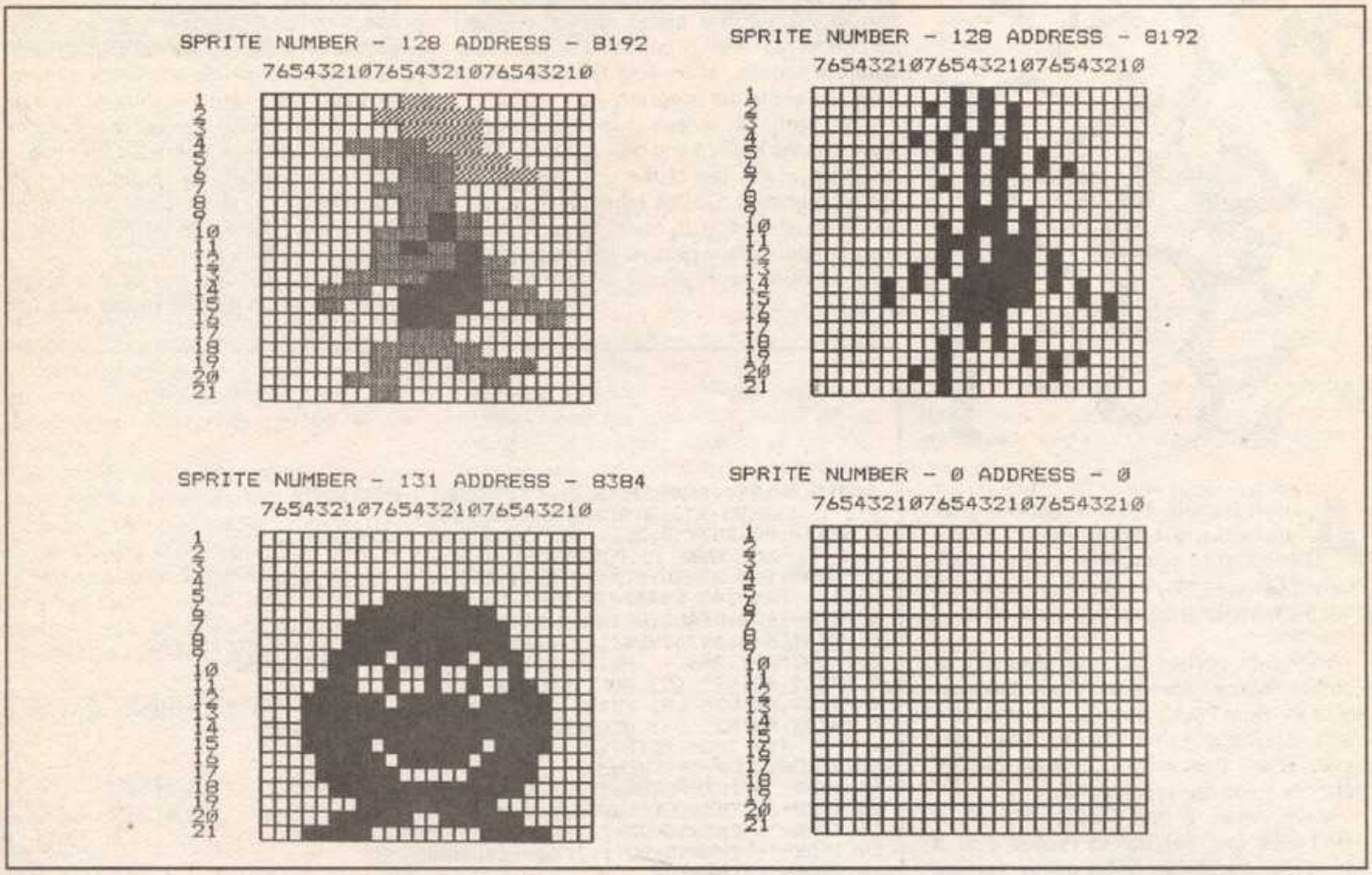
```
1 DIM SP(64):POKE53285,6:POKE53286,5:POKE53287,
     1:FORA=1TO13:SP$=SP$+CHR$(32)
2 NEXTA:POKE53248,255:POKE53249,166:POKE53269,1
    :POKE53280,10:POKE53281,0:DD=0
3 FORA=1TO8:READD:S(A)=D:NEXT:OPEN4,4:OPEN6,4,6
    :PRINT#6,CHR$(23):POKE650,255
4 FORA=1TO8:READD:S2(A)=D:NEXTA:V=0:POKE53276,0
5 PRINTCHR$(147)CHR$(150)CHR$(18)SP$;"SPRITE PRINTER";SP$
6 PRINT"OPTIONS -":PRINT:PRINT" (M) MULTICOLOUR ON"
7 PRINT:PRINT" (O) MULTICOLOUR OFF"
8 PRINT:PRINT" (P) PRINT SPRITE":PRINT:PRINT" (+) INCREMENT SPRITE"
9 PRINT:PRINT" (-) DECREMENT SPRITE":PRINT:PRINT"
     (E) END":PRINT:PRINT
10 GET0$:IF0$="P"THEN25
11 IF0$="M"THENPOKE53276,1:V=1
12 IF0$="O"THENPOKE53276,0:V=0
13 IF0$="+"THENDD=DD+1:IFDD=256THENDD=0
14 IF0$="-"THENDD=DD-1:IFDD=-1THENDD=255
15 IF0$="E"THEN200
16 POKE2040,DD:PRINTCHR$(145);"CURRENT SPRITE BLOCK
     NO.";DD;CHR$(157)"  "
17 GOTO10
25 AD=DD*64:P$=""
26 IFDD=0THENFORA=1TO64:SP(A)=0:NEXT:GOTO36
30 FORA=1TO64:SP(A)=PEEK(AD-1+A):NEXT
36 PRINT:PRINT"ADDRESS -"AD
37 PRINT#4,"SPRITE NUMBER -"DD"ADDRESS -"AD:PRINT#4,
38 PRINT#4,SPC(6)"76543210765432107654321076543210"CHR$(13)
39 IFV=1THEN300
40 A=1:FORB=1TO21:PRINT#4,B;SPC(4-(LEN(STR$(B))));CHR$(167);:
     FORC=1TO3:FORF=1TO8
50 IFSP(A)=>S(F)THENGOSUB100:SP(A)=SP(A)-S(F):GOTO65
60 P$=P$+CHR$(112)
65 NEXTF:A=A+1:PRINT#4,P$;:P$="":NEXTC:PRINT#4,:NEXTB
75 PRINT#4,SPC(6);:FORA=1TO24:PRINT#4,CHR$(163);:NEXTA:PRINT#4,
90 GOTO5
100 P$=P$+CHR$(18)+CHR$(32)+CHR$(146):RETURN
200 PRINT#4,:CLOSE4,6:POKE53269,0:END
300 A=1:FORB=1TO21:PRINT#4,B;SPC(4-(LEN(STR$(B))));CHR$(167);
310 FORC=1TO3:FORF=1TO4:X=SP(A)ANDS2(F)
320 IFX=S2(F)THENP$=P$+CHR$(18)+CHR$(32)+CHR$(32)+CHR$(146):GOTO360
330 IFX=0THENP$=P$+CHR$(112)+CHR$(112):GOTO360
340 IFX=S2(F+4)THENP$=P$+CHR$(166)+CHR$(166):GOTO360
350 P$=P$+CHR$(17)+CHR$(169)+CHR$(169)+CHR$(145)
360 NEXTF:A=A+1:PRINT#4,P$;:P$="":NEXTC:PRINT#4,:NEXTB
370 GOTO75
500 DATA 128,64,32,16,8,4,2,1
510 DATA 192,48,12,3,64,16,4,1
```

# Programming: C64

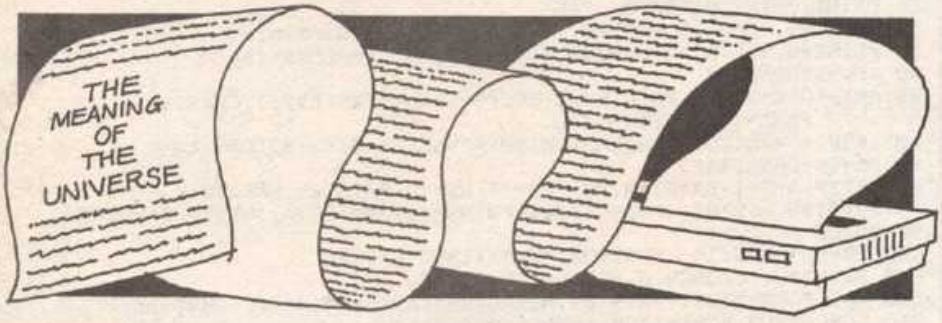
down in memory, then it may clash with where this program is stored. Equally so, due to the way the computer handles strings, prolonged use of Sprite Printer may overwrite some sprite data, but this is seldom the case.

**Program Notes**

| | |
|---|---|
| 1-2 | Set up array to hold sprite data. |
| | Initialise sprite colours and positions, screens colours. |
| 3-4 | Fill arrays with bit data, open channels to printer. |
| 5-9 | Screen display |
| 10-17 | Analyse input |
| 25 | Fill sprite data array with zeros if sprite pointer at zero. |
| 30 | Fill sprite data array. |
| 36-90 | Work out bit values and print hi-res sprite. |
| 100 | Subroutine to print reverse space. |
| 200 | Close printer channels, turn off sprite and end program. |
| 300-370 | Work out multicolour bit values and print multicolour sprite. |
| 500-510 | Data for bit values. |
| 520-560 | Credits. |




# Programming: Amstrad




## DATA BASE

*by B Baxter*

This utility program (printed over two weeks) was generated simply out of need and the fact that at the time I could find nothing similar at a realistic price.

My requirements were for a simple data base of names and addresses which I could access either as a group or individually and then print-out either to labels or a list. The Search and Delete routines were added as a means of quickly locating a particular file which needed to be amended or deleted without fuss whilst the Alphabetical Sort was added to tidy up the list. I now keep all my names and addresses on this data base and intend to elaborate still further with telephone numbers, etc.

At least it is a package which didn't cost me an arm and a leg and which I find was well worth the trouble to generate.

The print-out to labels was designed for the 'single' label roll as I found these convenient, but little modification is required for the multiple labels rolls. Printer output was to an Epson printer MX 82F/T although for the purpose of this article I did not include an instruction to cancel the 'Step over Perforation' which can be obtained by the integral switches on this machine. My own copy has this built in the label option routine and will be obvious by the make of printer used.

For individual addressing of envelopes by the printer, a simple TAB instruction is used to position the print head as required.

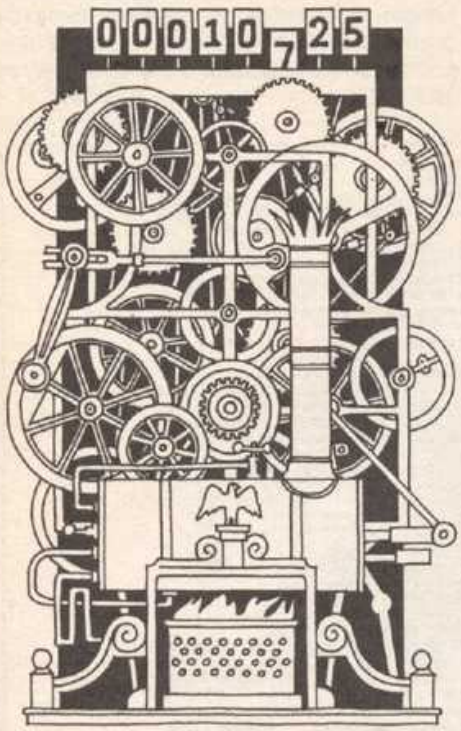
I included a variable *X* for my own use which could be set to tabulate for any envelope size.

Note that the variable *M* has been set for 100 entries but this may be altered to suit.

Also, the cassette has been used as a storage medium but disc storage may be used as required with slight modification to the output stream.

Next week, the rest of the listing, plus a few brief program notes. In the meantime, for the impatient, tape copies of the program are available, at a cost of £2.50. Write to PO Box 17, Burnham on Sea, Somerset TA8 1DT.

```
30 REM ********************
40 REM * ADDRESS MASTER *
50 REM *                *
60 REM *   B.BAXTER     *
70 REM ********************
80 REM
90 SC=FRE(""): REM GARBAGE COLLECTION
100 M=100: REM ALTER TO SUIT
110 E$=CHR$(93): REM E$=] END OF LIST MA
RKER
120 REM N$=NAMES:A1$=ADDRESS1:A2$=ADDRES
S2:A3$=ADDRESS3:A4$=ADDRESS4
130 REM C=LIST COUNTER:A$=ANSWER$
140 DIM N$(M),A1$(M),A2$(M),A3$(M),A4$(M
): REM SET UP ARRAYS
150 N$(C)=E$: REM SET END OF LIST MARKER
160 WHILE OPT<11: REM SET LOOP
170 MODE 1:PRINT"* MENU *":PRINT:PRINT
180 PRINT" 0. Rules of Engagement.":PRIN
T
190 PRINT" 1. Create New List.":PRINT
200 PRINT" 2. Alpha Sort.":PRINT
210 PRINT" 3. Add New Name & Address.":P
RINT
220 PRINT" 4. Delete Name & Address.":PR
INT
230 PRINT" 5. Search for Name & Address.
":PRINT
240 PRINT" 6. Output to Printer.":PRINT
250 PRINT" 7. Save the List.":PRINT
260 PRINT" 8. Load the List.":PRINT
270 PRINT" 9. End of Program.":PRINT
280 PRINT:PRINT"Select Option...."
290 A$=INKEY$:IF A$="" THEN 290
300 IF ASC(A$)<48 OR ASC(A$)>57 THEN 160
310 OPT=ASC(A$)-47
320 ON OPT GOSUB 360,840,1220,1440,1580,
1760,2140,2310,2490,2700
330 WEND
340 REM
350 REM ***************************
360 REM * 0. Rules of Engagement *
370 REM ***************************
380 REM
390 CLS:PRINT"* RULES OF ENGAGEMENT *":P
RINT:PRINT
400 PRINT"* 1. Create New List..":PRINT
410 PRINT"* 3. Add N. & A. to List..":PR
INT:PRINT
420 PRINT"Address Master is designed to
store and retrieve " M " names addresses
.":PRINT
430 PRINT"All entries are restricted to
a maxieum of five lines of data. This in
cludes anyCounty, Country or Postal Code
s, Tel No.etc.. Enter 'CR' for Blank li
nes.":PRINT
440 PRINT"The layout of the entry is res
tricted bythe size of Label used for pos
ting. The actual address may be altered
to suit a label size.":PRINT
450 PRINT"An entry is numbered and a cou
nt kept asan indicator to the size of th
e list..":PRINT
460 LOCATE 3,25:PRINT"Press Space Bar to
 Turn Page.."
470 A$=INKEY$:IF A$="" THEN 470
480 IF A$<>" " THEN 470
490 CLS:PRINT"Example...":PRINT:PRINT
500 PRINT"Name..      B. Baxter"
510 PRINT"Address..   P.O. Box 17"
520 PRINT"Address..   Burnhaa on Sea"
530 PRINT"Address..   Somerset"
540 PRINT"Address..   TA8 1DT"
550 PRINT:PRINT"A List is terminated wit
h a code:-":PRINT
560 PRINT"      ']'":PRINT
570 PRINT"The terminator ']' is entered
 into the  'Name position following the l
ast entry.":PRINT
580 PRINT"The terminator is used as an a
nd of listmarker and will return control
 to the   Menu.":PRINT
590 PRINT"These rules apply to the 3rd o
ption of  'Add New Name & Address..'"
600 LOCATE 3,25:PRINT"Press Space Bar to
 Turn Page.."
610 A$=INKEY$:IF A$="" THEN 610
620 IF A$<>" " THEN 610
630 CLS:PRINT:PRINT
640 PRINT"* 2. Alphabetical Sort..":PRIN
T
650 PRINT"As its name implies, 'Alpha So
rt' sorts the list of N.& A. into an alp
habetical order.  This commences with th
e first  character of the Name. and is
sequentialthroughout the entry i.e B. Ba
xter wouldprecede C. Baxter etc..":PRINT
660 PRINT"It is advisable to invoke an A
lpha Sort  at the completion of any list
...":PRINT
670 PRINT:PRINT"* 4. Delete Name & Addre
ss..":PRINT
680 PRINT"To Delete any N.& A. the entry
 must be  the same as that already store
d in the  list.  CAUTION.. When in use..
":PRINT"Spaces & Dots are Legal!.."
690 LOCATE 3,25:PRINT"Press Space Bar to
 Turn Page.."
700 A$=INKEY$:IF A$="" THEN 700
710 IF A$<>" " THEN 700
720 CLS
730 PRINT:PRINT"* 5. Search for Name & A
ddress..":PRINT
740 PRINT"This routine will Search for a
 N.& A. asrequested. Again, the requeste
d name    should be exactly as stored in
 the list.":PRINT
750 PRINT"The result is displayed and an
 option tooutput to a line printer is gi
ven.  The search will continue for anoth
er name inthe list, and if not found, wi
ll return control to the Menu.":PRINT
760 PRINT:PRINT"* Output to Printer..":P
RINT
770 PRINT"Two options are given. 'Output
 List willprintout contents in Horizonta
l format. 'Output to labels will printou
t contentsin Vertical format.  Some adju
stment maybe needed to facilitate the Us
ers needs.":PRINT
780 LOCATE 3,25:PRINT"Press Space Bar to
 Turn Page.."
790 A$=INKEY$:IF A$="" THEN 790
800 IF A$<>" " THEN 790
810 RETURN
820 REM
830 REM ************************
840 REM * 1. Create New List *
850 REM ************************
860 REM
870 C=1: REM START COUNT
880 CLS:PRINT"* CREATE NEW LIST *":PRINT
890 PRINT"ENTRY ";C;" of "M
900 PRINT:PRINT"Name       ";:GOSUB 1100
910 N$(C)=P$:PRINT
920 IF N$(C)=E$ THEN RETURN
930 PRINT:PRINT"Address    ";:GOSUB 1100
940 A1$(C)=P$:PRINT
950 PRINT:PRINT"Address    ";:GOSUB 1100
960 A2$(C)=P$:PRINT
970 PRINT:PRINT"Address    ";:GOSUB 1100
980 A3$(C)=P$:PRINT
990 PRINT:PRINT"Address    ";:GOSUB 1100
1000 A4$(C)=P$:PRINT
1010 PRINT:PRINT: PRINT:PRINT"Correct..
?  (Y/N)"
1020 A$=INKEY$:IF A$="" THEN 1020
1030 IF A$="N" THEN 880
1040 IF A$<>"Y" THEN 1020
1050 C=C+1: REM INCREMENT COUNT
1060 IF C=M THEN LOCATE 1,25:PRINT"List
Complete..":FOR T=0 TO 1250:NEXT T:GOTO
160
1070 CLS:GOTO 890: REM RETURN FOR ANOTHE
R
1080 REM
1090 REM ***************************
1100 REM * Keyboard Input Routine *
1110 REM ***************************
1120 REM
1130 P$=""
1140 K$=INKEY$:IF K$="" THEN 1140
1150 IF ASC(K$)=13 THEN RETURN
1160 IF ASC(K$)=127 AND LEN(P$)=0 THEN 1
140
1170 IF ASC(K$)=127 THEN P$=LEFT$(P$,LEN
(P$)-1):PRINT CHR$(8) CHR$(16);:GOTO 114
0
1180 PRINT K$;
1190 P$=P$+K$:GOTO 1140
1200 REM
1210 REM ************************
1220 REM * 2. Alphabetical Sort *
1230 REM ************************
1240 REM
1250 CLS:PRINT"* ALPHABETICAL SORT *":PR
INT
1260 IF C=0 THEN PRINT"List Empty...":FO
R T=0 TO 1200:NEXT T:RETURN
1270 PRINT:PRINT"Alphabetical Sort in pr
ogress... Please wait.."
1280 C=1: REM SET COUNTER
1290 IF N$(C)=E$ THEN N=C-1:GOTO 1310
1300 C=C+1:GOTO 1290: REM INCREMENT COUN
TER AND RETURN
1310 FOR Q=1 TO N-1
1320 FOR R=Q+1 TO N
1330 IF N$(R)>=N$(Q) THEN 1390
1340 S$=N$(R):N$(R)=N$(Q):N$(Q)=S$
1350 S$=A1$(R):A1$(R)=A1$(Q):A1$(Q)=S$
1360 S$=A2$(R):A2$(R)=A2$(Q):A2$(Q)=S$
1370 S$=A3$(R):A3$(R)=A3$(Q):A3$(Q)=S$
1380 S$=A4$(R):A4$(R)=A4$(Q):A4$(Q)=S$
1390 NEXT R
1400 NEXT Q
1410 RETURN
1420 REM
1430 REM ******************************
1440 REM * 3. Add New Name & Address *
1450 REM ******************************
1460 REM
1470 CLS:PRINT"* ADD NEW NAME & ADDRESS
*":PRINT
1480 IF C=0 THEN PRINT"List Empty...":FO
R T=0 TO 1200:NEXT T:RETURN
1490 C=1: REM SET COUNTER
1500 IF N$(C)=E$ THEN 1520
1510 C=C+1:GOTO 1500
1520 IF C=M THEN PRINT"*  LIST COMPLETE
  *":FOR T=1250:NEXT T:RETURN
1530 N$(C+1)=E$
1540 GOSUB 890
1550 RETURN
1560 REM
```



# SCREEN COPIES

*by Stuart Nicholls*

Most Centronics printer interfaces include a routine that allows high resolution screen copies to be produced. However, in many cases these copies are too small to see all the detail. This is the case with my Shinwa printer and Kempston interface. To correct this I have written my own routines to produce 2× size as well as 1× size copies of all 24 screen lines.

This is not as straightforward as it first appears. An Epson RX80 printer, for example, only allows 480 bit images per line in single bit image mode. This is the mode that gives the correct height/width combinations for a screen copy, and, as there are 256 pixels across the Spectrum display file, when producing 2× size copies one needs 512 bit images per line. Another problem occurs when trying to 'point' the Edit lines to find the state of eight vertical pixels.

These two problems fortunately have the same answer, namely to rotate the copy 90 degrees clockwise to put the short side of the copy across the paper instead of down the paper.

We now require only 192 × 2 = 384 bit images per line, and, what is more useful, it allows us to use display file addresses directly to find the state of eight vertical pixels.

If we look at a routine for single size copies you will see that we can start at the bottom of the left hand column. *Peek* the byte value and transmit it directly to the printer as eight pixels, thus requiring no juggling of values associated with horizontal copying. We can move up the column one byte at a time until we reach the top then advance the paper by 8/72 spacing and continue on to the next column. This process is fast enough to write a program in Basic to demonstrate the principle (see List 1). This program is slow but still usable.

You will notice that this Basic program has its own printer interface routine *(Gosub 20)* and does not use *Lprint*. This is because values above 127 when *Lprinted* are modified by my Kempston software into keywords thus corrupting the data.

The 2× size copy routine is based on the same principle but this time each column is scanned twice. The first time to print bits 7 to 4 (as 77665544), the second time to print the bits 3 to 0 (as 33221100).

To enter the machine code for these routines use List 2 which will also save the code as *"Copy" Code 64000,299*. Remember, before reloading the code, enter *CLEAR 63999*.

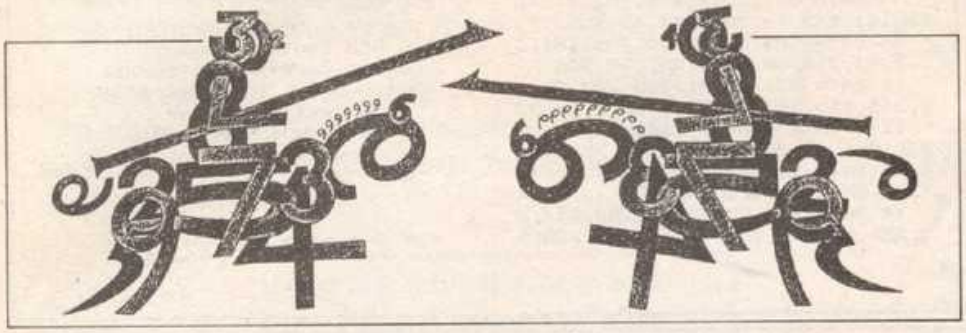
To produce 1× size copies use *Randomize Usr 64222* and for 2× size copies use *Randomize Usr 64000*. A *Break* routine is included in the code, but is only active at the end of a screen line. This has been done to avoid problems with partial bit image data being sent to the printer. If *Break* is used in the Basic program then the printer will probably require switching off to re-initialise.

Finally, these routines may need slight modification for other printer/interface combinations.

```
 10 REM * MACHINE CODE LOADER PROGRAM *
 20 CLEAR 63999
 30 LET LINE=1000
 40 FOR A=64000 TO 64303 STEP 8
 50 RESTORE LINE: LET Z=0
 60 FOR B=A TO A+7
 70 READ C: IF C>255 THEN  GO TO 500
 80 POKE B,C: LET Z=Z+C
 90 NEXT B
100 READ TOTAL: IF TOTAL<>Z THEN  GO TO 500
110 LET LINE=LINE+10
120 NEXT A
130 PRINT "O.K.  NOW SAVE M/CODE"
140 SAVE "COPY"CODE 64000,299
150 STOP
500 BEEP 1,1: PRINT "INCORRECT DATA IN LINE ";LINE
510 PRINT "PLEASE EDIT LINE THEN RE RUN"
520 PAUSE 100: LIST LINE
530 STOP
1000 DATA 205,134,250,205,155,250,33,224,1456
1010 DATA 87,229,205,171,250,14,8,229,1193
1020 DATA 126,87,95,6,4,203,18,23,562
1030 DATA 203,19,23,16,248,205,192,250,1156
1040 DATA 205,192,250,124,37,230,7,32,1077
1050 DATA 231,225,125,214,32,111,13,32,983
1060 DATA 222,124,214,8,103,254,63,32,1020
1070 DATA 212,62,10,205,192,250,225,205,1361
1080 DATA 84,31,210,0,13,229,205,171,943
1090 DATA 250,14,8,229,126,87,95,6,815
1100 DATA 4,203,26,31,203,27,31,16,541
1110 DATA 248,205,192,250,205,192,250,124,1666
1120 DATA 37,230,7,32,231,225,125,214,1101
1130 DATA 32,111,13,32,222,124,214,8,756
1140 DATA 103,254,63,32,212,62,10,205,941
1150 DATA 192,250,225,205,84,31,210,0,1197
1160 DATA 13,44,194,9,250,201,1,191,903
1170 DATA 227,33,154,250,203,70,192,62,1191
1180 DATA 129,237,121,62,15,237,121,203,1125
1190 DATA 198,201,0,62,27,205,192,250,1135
1200 DATA 62,65,205,192,250,62,8,205,1049
1210 DATA 192,250,201,62,27,205,192,250,1379
1220 DATA 62,75,205,192,250,62,128,205,1179
1230 DATA 192,250,62,1,205,192,250,201,1353
1240 DATA 229,197,1,191,227,30,14,197,1086
1250 DATA 5,237,80,203,58,56,250,243,1132
1260 DATA 5,5,237,121,193,237,89,28,915
1270 DATA 237,89,251,193,225,201,205,134,1535
1280 DATA 250,205,155,250,33,224,87,229,1433
1290 DATA 205,23,251,6,8,229,126,205,1053
1300 DATA 192,250,124,37,230,7,32,246,1118
1310 DATA 225,125,214,32,111,16,238,124,1085
1320 DATA 214,8,103,254,63,32,228,62,964
1330 DATA 10,205,192,250,205,84,31,210,1187
1340 DATA 0,13,225,44,32,209,201,62,786
1350 DATA 27,205,192,250,62,75,205,192,1208
1360 DATA 250,62,192,205,192,250,175,205,1531
1370 DATA 192,250,201,0,0,0,0,0,643
```

```
10 GOTO 50
20 REM * PRINTER INTERFACE SUBROUTINE *
30 LET X=IN 50047: IF INT(X/2)<>X/2 THEN GOTO 20
40 OUT 57353,Z: OUT 58303,14: OUT 58303,15: RETURN
50 REM * START PROGRAM BY LOADING SCREEN TO BE COPIED$
60 PRINT AT 11,2;"LOAD_SCREEN_TO_BE_COPIED_NOW"
70 LOAD SCREEN$
80 REM * INITIALISE KEMPSTON INTERFACE *
90 OUT 58303,129: OUT 58303,15
100 RESTORE 290
110 REM * SET PRINTER TO 8/72 SPACING *
120 FOR A=1 TO 3: READ Z: GOSUB 20: NEXT A
130 FOR A=22496 TO 22527
140  LET B=A: RESTORE 300: REM * SET BIT IMAGE MODE *
150  FOR G=1 TO 4: READ Z: GOSUB 20: NEXT G
160   FOR F=1 TO 3        : REM * THREE SCREEN SECTIONS *
170    FOR D=1 TO 8       : REM * 8 CHARS PER SCREEN THIRD *
180     LET E=B
190      FOR C=1 TO 8     : REM * 8 BYTES PER CHAR. *
200       LET Z=PEEK B: GOSUB 20: LET B=B-256
210      NEXT C
220     LET B=E-32
230    NEXT D
240   LET B=B-1792
250  NEXT F
260  LET Z=10: GOSUB 20  : REM * PRINT A LINE FEED *
270 NEXT A
280 PAUSE 0              : REM * HOLD SCREEN PICTURE *
290 DATA 27,65,8         : REM * CODES FOR 8/72 LINE SPACING *
300 DATA 27,75,192,0     : REM * CODES FOR 192 BIT IMAGES/LINE *
```





# MARBLE MANIA

*by Shawn McAvery*

This is a game for both the BBC B and Electron, called *Marble Mania*. It involves you guiding a marble across a three dimensional landscape, to the goal at the bottom of the screen.

The display will then scroll up to reveal the second half of the level – in all there are 12 screens, making a total of six levels to complete.

First, type in the loader program (printed in full this week) and save it to tape. Now start typing in the main program, which we'll be finishing off next week. This should be saved directly after the loader on the tape. Chaining the loader should load and run the main program automatically. For use on the Electron, line 1220 should be altered to read: *DEFPROCslow:ENDPROC*.

Anyone who doesn't want to type the program in can obtain tape copies from the author, at a cost of £3.00. Write to Shawn McAvery at 83 Tipner Road, Stamshaw, Portsmouth, Hants PO2 8QP.

```
10 REM **********************
20 REM ****   LOADER    ****
30 REM **********************
40 REM **** B. MCAVERY ****
50 REM ****  (c) 1986  ****
60 REM **********************
70 MODE 1
80 FORN=0TO640STEP32
90 GCOL 1,1
100 MOVE N,N:DRAW 640-N,0:MOVE 1280-N,N:DRAW 640
+N,0
110 GCOL 1,2
120 MOVE N,N:DRAW (N/3),N:DRAW (N/2),(N/2)
130 MOVE 1280-N,N:DRAW 1280-(N/3),N:DRAW 1280-(N
/2),(N/2)
140 NEXT
150 PRINTTAB(19,18)"BY";TAB(13,21)"SHAWN  MCAVER
Y"
160 PRINTTAB(8,10)"M A R B L E    M A N I A"
170 PRINTTAB(9,13)"Z=LEFT"TAB(9,15)"X=RIGHT"
180 PRINTTAB(27,13)"UP=:"TAB(25,15)"DOWN=/"
185 PRINTTAB(14,24)"PLEASE WAIT"
190 VDU 28,13,29,26,26
200 PROCgrafix
210 CHAIN""
220 END
230 DEF PROCgrafix
240 VDU 23,224,&AACC;&AACC;&AACC;&AACC;
250 VDU 23,225,&E799;&7E99;&E799;&7E99;
260 VDU 23,226,&A699;&AAC9;&AACC;&AACC;
270 VDU 23,227,&A719;&A491;&A799;&AAC9;
280 VDU 23,228,&E298;&2689;&E498;&4484;
290 VDU 23,229,&A498;&4484;&4444;&4444;
300 VDU 23,230,&E799;&7898;&EF9A;&558B;
310 VDU 23,231,&E598;&F54A;&6D3A;&F5BA;
320 VDU 23,232,&4484;&5A44;&54AB;&55AA;
330 VDU 23,233,&D5AA;&B5EA;&ADDA;&ABCE;
340 VDU 23,234,&50BD;&57BC;&47AA;&7E99;
350 VDU 23,235,&E7A9;&1E59;&E719;&7E99;
360 VDU 23,236,&4348;&4F47;&3F5F;&FF7F;
370 VDU 23,237,&E799;&FFFE;&F0FC;&FFFD;
380 VDU 23,238,&E799;&1E19;&F759;&FEF9;
390 VDU 23,239,&E79F;&789A;&E798;&7E99;
400 VDU 23,240,&CFBF;&FF3F;&E77F;&7E99;
410 VDU 23,241,&FEFF;&F8FC;&E4F4;&84C4;
420 VDU 23,242,&4444;&4444;&4641;&7E19;
430 VDU 23,243,&4741;&6419;&4791;&7E19;
440 VDU 23,244,&E484;&2698;&E289;&7E98;
450 VDU 23,245,&4444;&4444;&6484;&7E98;
460 VDU 23,246,&A7C9;&6499;&4791;&7E19;
470 VDU 23,247,&AACC;&AACC;&A6C9;&7E99;
480 VDU 23,248,&E28C;&2698;&E289;&7E98;
490 VDU 23,249,&AACC;&2ACC;&628C;&7E98;
500 VDU 23,250,&55AA;&55AA;&55AA;&55AA;
510 VDU 23,251,&4A8C;&52AC;&54AB;&55AA;
520 VDU 23,252,&FFFF;&FFFF;&FFFF;&FFFF;
530 VDU 23,253,&ABCD;&AFC7;&BFDF;&FF7F;
540 VDU 23,254,&3800;&5C4C;&387C;&0000;
550 VDU 23,255,&4444;&4444;&4444;&4444;
560 ENDPROC
```

```
10 REM ***************************
20 REM ***    MARBLE MANIA     ***
30 REM *** (c) S.MCAVERY 1986 ***
40 REM ***************************
50 MODE1
60 VDU 23,1;0;0;0;0;
70 PRINTTAB(13,15)"PLEASE WAIT"
80 GOSUB 600
90 CLS:VDU4,20,19,3,6;0;
100 *FX15
110 B=1:FORN=128 TO 2556STEP16:B=B+1:SOUND1,-9,N+
B,1:NEXT
120 COLOUR5
130 PRINTTAB(5,5)CHR$254;" M A R B L E    M A N I
A ";CHR$254
140 PRINTTAB(5,4)STRING$(27,CHR$254)
150 PRINTTAB(5,6)STRING$(27,CHR$254)
160 PRINTTAB(1,26)"SPACE - TO PRACTICE MOVEMENT
OF BALL"
170 PRINTTAB(0,28)"RETURN - TO PRACTICE MOVEMENT
OF BALL"
180 COLOUR2
190 PRINTTAB(10,10)CHR$254;" HIGH  ROLLERS ";CHR
$254
200 FORN=1TO4:PRINTTAB(7,12+N*2);H$(N);TAB(26,12
+N*2);H(N):NEXT
210 COLOUR1:PRINTTAB(0,23)"PRESS..":COLOUR2
220 SOUND1,-7,140,3:SOUND1,-7,150,2
230 IF INKEY(-99) THEN GOTO 260
240 IF INKEY(-74) THEN GOTO 930
250 GOTO 230
260 FORN=0TO30:PRINTTAB(0,N)STRING$(40,CHR$255);
:NEXT
270 VDU 19,2,7;0;19,1,7;0;
280 SOUND1,-11,255,1
290 GOSUB 620
300 GOSUB 630
310 COLOUR1:PRINTTAB(15,15)"GET READY"TAB(14,17)
"FOR LEVEL ";(LEV-1230)/330+1
320 GOSUB 660
330 FORN=50TO150STEP20:SOUND1,-9,N,2:NEXT
340 VDU 19,3,COL,0,0,0
350 VDU4:COLOUR3:FORN=1TO17:FORM=1TO18:PRINTTAB(
10+M,N+6);M$(M,N):NEXT,
360 COLOUR3:PRINTTAB(4,2)" SCORE        TIME
  LIVES "
370 PRINTTAB(4,4)"
"
380 FORN=1TOL:PRINTTAB(29+N,4);CHR$254;" ":NEXT
390 PRINTTAB(7,26)STRING$(26,CHR$250)
400 PRINTTAB(7,27)CHR$250;" M A R B L E   M A N I
A "CHR$250
410 PRINTTAB(7,28)STRING$(26,CHR$250)
420 COLOUR1
430 FORN=1TOL:PRINTTAB(29+N,4);CHR$254;" ":NEXT

440 PRINTTAB(12,24)"*GOAL*GOAL*GOAL*"
450 GCOL3,1
460 VDU5:MOVE8X,Y:VDU254
470 VDU4:PRINTTAB(18,4)" ";TM;" ";TAB(5,4);INTBC
:VDU5:TM=TM-1
480 SC=SC+.25
490 MOVEX,Y:VDU254:X=X+A:Y=Y+B:MOVEX,Y:VDU254
500 A=A+(INKEY(-98) AND A>-12)-(INKEY(-67) AND A
<12)
510 B=B+(INKEY(-105) AND B>-12)-(INKEY(-73) AND
B<12)
520 A$=M$(X/32+.5-10,(1024-Y)/32+.5-6)
530 IF A$=CHR$224 OR A$=CHR$226 OR A$=CHR$229 OR
A$=CHR$242 OR A$=CHR$245 OR A$=CHR$247 OR A$=CHR$
249 OR A$=CHR$254 OR A$=CHR$255 THEN GOTO 670
540 IF A$=CHR$230 OR A$=CHR$231 OR A$=CHR$234 OR
A$=CHR$235 OR A$=CHR$250 THEN A=A+.5:B=B-.25
550 IF A$=CHR$236 OR A$=CHR$237 OR A$=CHR$239 OR
A$=CHR$240 OR A$=CHR$252 THEN A=A-.5:B=B-.25
560 IF Y<288 THEN GOTO 760
570 PROCslow
580 IF TM>0 THEN GOTO 470
590 PROCtime
600 DIM M$(18,18):FORN=1TO18:FORM=1TO18:M$(M,N)=C
HR$(254):NEXT,
610 DIMH$(5):DIMH(5):H$(1)="MARBLE MUTT":H$(2)="
ROLLING RING":H$(3)="SKINNY HEAD ":H$(4)="WIZZY WH
ISK":FORN=1TO4:H(N)=3000-(N*500):NEXT
620 SC=0:L=5:LEV=1230:RETURN
630 P=1:TM=300:RESTORE LEV:READSX,COL:IF COL=0 T
HEN LEV=1230:GOTO630 ELSE GOTO 650
640 RESTORE LEV
650 FORN=2TO17:READR$:FORM=1TO16:A=ASC(MID$(R$,M,
1)):M$(M+1,N)=CHR$(159+A):NEXT,:RETURN
660 A=0:B=0:X=8X:Y=(752 AND P=1)+(784 AND P=2):R
ETURN
670 F=100
680 GCOL3,1:MOVEX,Y:PRINTCHR$254
690 FORN=Y TO 0 STEP-64:GCOL3,1:MOVEX,N:PRINTCHR
$254
700 F=F-2:SOUND1,-11,F,3
710 PROCslow
720 GCOL3,1:MOVEX,N:PRINTCHR$254:NEXT
730 VDU4:L=L-1:IF L<1 THEN PRINTTAB(14,16)" GAME
OVER ":GOTO1080
740 FORN=1TOL:PRINTTAB(29+N,4);CHR$254;" ":NEXT:
VDU5
750 GOSUB 660:GOTO 450
760 GCOL3,1:MOVEX,Y:PRINTCHR$254:VDU4
770 IF P=1 THEN FORN=50TO255STEP-5:SOUND1,-11,N*2
,1:SOUND1,-9,N,1:NEXT
780 IF P=1 THEN P=2:LEV=LEV+170:SC=SC+100:GOSUB
640:GOSUB 840:SX=X:Y=784:COLOUR3:PRINTTAB(12,7)STR
ING$(16,CHR$254):COLOUR1:GOTO 440
790 VDU 19,2,3;0;
800 COLOUR3:PRINTTAB(12,24)"*GOAL*GOAL*GOAL*"

810 FORN=50TO150STEP20:SOUND1,-10,N*2-N*3,2:NEXT

820 VDU 19,2,7;0;
830 SC=SC+500:LEV=LEV+160:GOTO 300
840 VDU 28,11,24,28,7
```

# UDG Editor on Spectrum

*by Geoffrey Wearmouth*

UDG Editors – you've got plenty – but this one is so tiny it will fit in the printer buffer. That means you don't have to alter Ramtop before loading and you won't corrupt the program you wish to modify.

Such a program should not define characters in Data statements, but start by loading the character codes. Similarly, it should have a routine that saves the character codes after the basic program.

To add this utility to your toolkit, just type in the listing and run. If you get the OK message, save the contents of the printer buffer with *Save "udg" Code 23296,256.*

To use the editor enter – *Randomise Usr 23296.* The control keys are shown in the listing.

If you have a rubber keyboard then the following pokes remove the need to press Shift with the cursor keys and use 0 for plotting. *Poke 23543,53 : Poke 23545,56 : Poke 23547,54 : Poke 23549,5 : Poke 23541,58.*

```
  1 REM G.Wearmouth. 1985.

    udg Editor.

  2 REM any Spectrum

  3 DATA 0,205,175,13,253,119,4
8,62,128,33,244,71,30,32,6,65
  4 DATA 25,119,16,252,45,53,15
,48,251,30,64,33,37,64,205,148
  5 DATA 91,175,0,50,53,91,205,
220,91,30,143,33,101,64,205,148
  6 DATA 91,33,101,88,17,0,0,25
,54,120,33,143,87,30,20,1
  7 DATA 1,1,253,112,87,123,214
,40,95,22,80,203,6,159,246,128
  8 DATA 21,18,203,1,48,250,159
,18,28,203,0,48,236,37,203,100
  9 DATA 32,227,1,120,15,197,4,
62,141,145,79,205,217,13,253,94
  10 DATA 255,33,200,0,205,181,3
,62,43,215,50,8,92,253,78,206
  11 DATA 33,233,91,205,220,22,4
8,245,110,193,58,53,91,205,21,23
  12 DATA 40,168,24,143,76,205,2
32,10,6,21,28,123,215,16,251,201
  13 DATA 225,42,123,92,245,7,7,
7,95,25,17,143,80,6,8,26
  14 DATA 119,20,35,16,250,241,6
0,254,21,201,205,161,91,61,200,6
1
  15 DATA 28,201,5,5,4,203,88,24
,5,13,13,12,203,89,200,237
  16 DATA 67,99,91,175,201,195,2
29,34,22,3,159,20,198,144,253,11
4
  17 DATA 87,33,143,80,205,236,1
0,215,201,113,160,105,218,110,16
1,99
  18 DATA 216,103,220,98,186,32,
213,8,201,9,203,10,194,11,196,0
 100 PRINT " Just Checking"
 200 LET s=0: LET a=23296
 210 READ b: POKE a,b: LET s=s+b
: LET a=a+1: IF a<23552 THEN  GO
TO 210
 220 IF s<>26628 THEN  PRINT "Ch
ecksum Error": STOP
 230 CLS

1000 REM Control keys
  Cursor keys - grid cursor
  Space Bar   - plot/unplot
  "n" - next character
  "b" - back one character
  "q" - quit
  "c" - clear grid
  "i" - inverse design

 n,b & q save current design.
```

# Dotted Lines on QL

*by D G Neville*

A very basic requirement of any graphics design toolkit is the ability to draw dotted lines between two points. The procedure given opposite will do this for the Sinclair QL.

Firstly we can identify the inputs to the procedure:

*x1, y1* and *x2, y2* are the start and end of the required line.

*l* is the length of the dots and *w* the width.

To determine the number of dots *(nl)* and the start of each separate line to be drawn *(x3, y3)* we first determine the length of the line using Pythagoras *(d)* and the step size in both the *x* and *y (x0* and *y0).*

The procedure can be fairly easily amended to print dots and spaces between dots of different size, lines of dots.

```
150 DEFine PROCedure Dotted_Line(x1,y1,x2,y2,w,l)
160 LOCal x3,y3,d,nl,a,b,xo,yo
170 d  = ((x2-x1)^2 + (y2-y1)^2) ^ .5
180 nl = d / l
190 xo = (x2-x1) / nl / 2
200 yo = (y2-y1) / nl / 2
210 FOR a = 1 TO nl*2 STEP 2
220     FOR b = -w/2 TO w/2
230         x3 = x1 + a * xo - b * yo / l / 4
240         y3 = y1 + a * yo + b * xo / l / 4
250         LINE x3,y3 TO x3+xo,y3+yo
260     END FOR b
270 END FOR a
280 END DEFine Dotted_Line
290 REMark ****************************************
1000 CLS
1010 SCALE £1,100,0,0
1020 Dotted_Line 120,10,10,60,20,10
1030 Dotted_Line 10,100,130,60,10,20
1040 Dotted_Line 130,50,30,10,3,2
1050 Dotted_Line 80,90,70,10,10,2
1060 Dotted_Line 20,50,100,50,6,20
1070 Dotted_Line 30,100,70,10,15,1
1080 Dotted_Line 90,100,10,10,70,10
1090 STOP
```

# Smooth Scrolling on Atari

*by R Parkes*

This short routine was written on an Atari 130XE but should also work on any of the XL series. It allows the Graphics 0 text screen to be smooth scrolled so is useful for printing out pages of text to a Graphics 0 screen, giving a much more professional look.

The routine works by poking location 622 with a 1 which sets up a smooth scroll every time the screen is scrolled up a logical line, then all that needs to be done is to alter the display list so as to carry out the smooth scroll, this is done in line 30.

```
8 REM SMOOTH SCROLLING
9 REM
10 POKE 622,1:GRAPHICS 0
20 DL=PEEK(560)+256*PEEK(561)
30 POKE DL+3,98:FOR J=6 TO 28:POKE DL+J,
34:NEXT J
35 REM END OF SMOOTH SCROLLING SETUP
36 REM
37 REM EXAMPLE
38 REM TYPE UNDERLINED CHARACTERS IN
INVERSE
39 REM
40 ? CHR$(127);"Popular Computing Weekly
"
50 ? CHR$(127);"POPULAR COMPUTING WEEKLY
"
60 GOTO 40
```

*The 4th official*

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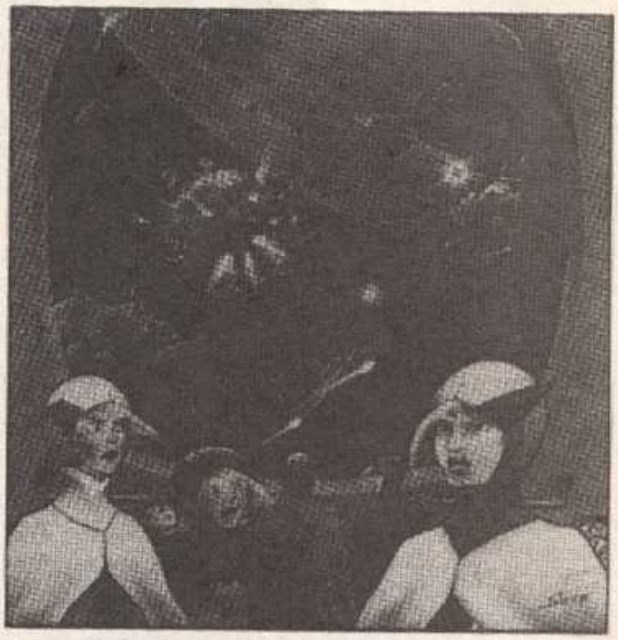
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## Random numbers

*G Costello, of London NW3, writes:*

**Q I would like to buy a computer that can generate random numbers in sets of 10 from a range of 1-60, and store them. I need about 1,000 sets. I then want to list on screen the three most common numbers. What computer could do this for the least cost?**

A Since you'll be handling about 10,000 numbers, plus memory overhead for the program, you need a computer with at least 16K of free memory. This includes just about every computer on the market, with the exception of the C16, and one or two others.

So you have no problem in finding a machine, although I confess to being intrigued as to why you want to do this. In any case, the problem is not a difficult one – simply an exercise in loops and array-handling.

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To check for the most common numbers, use a second, one-dimensional, array –CHECK(60) – then increment each element as you find each number from 1 to 60.

## Atari 520 ST specifications

*Roland Givan, of Brentwood, Essex, writes:*

**Q I am intending to buy an Atari 520STM and I would be grateful if you could clarify some of the specifications. As far as I can tell, the 520STM only displays low-res graphics. If this is so, can GEM be run on it without a separate monitor?**

**Who exactly will be my local dealer? If Atari means the shop which sells me my machine this could be difficult because I intend to buy mail order.**

A The 520STM will display its lowest graphics resolution through the TV modulator, giving 320 × 200 pixels and 16 colours. Gem will work perfectly in this mode, so you have no worries there.

Neither need you fret about support. You should get full co-operation from your nearest dealer, regardless of where you actually buy your machine.

## Copyright procedure

*David Fox, of Sheffield, writes:*

**Q I would like to feature a well-known piece of music in one of my games. Do I have to get copyright permission?**

A If the music is still in copyright – that is, if it's not a traditional piece, such as Greensleeves – then they will probably have had to obtain permission to use it. In your case, it depends on whether you want to have your programs published. If you do, then obtain a copy of the score and write to the publishers requesting permission. The best thing to do is to use pieces that are out of copyright. These usually have the word TRAD at the top of the music. Or write an original piece.

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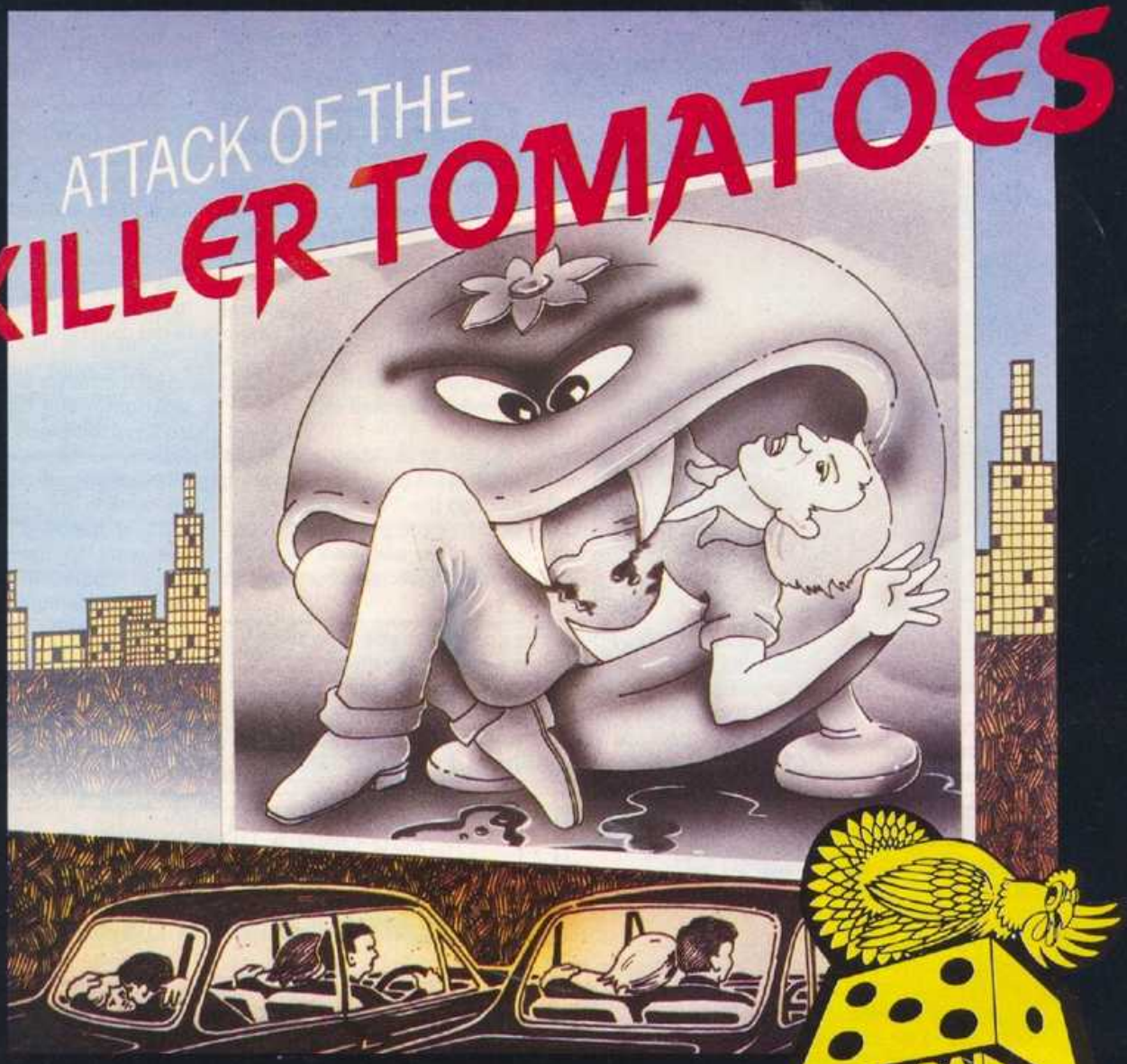
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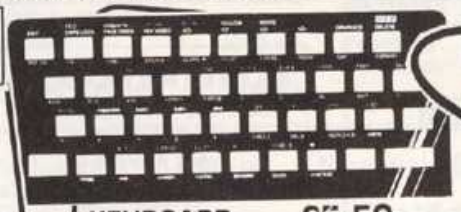
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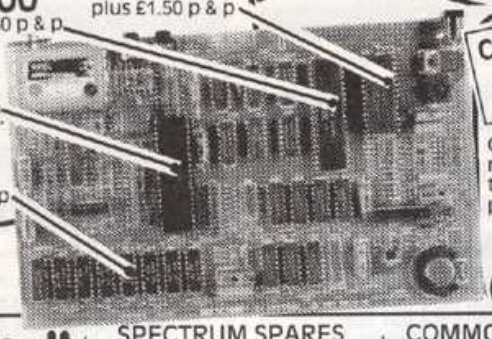
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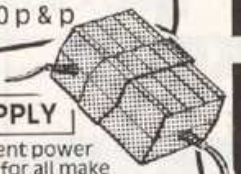
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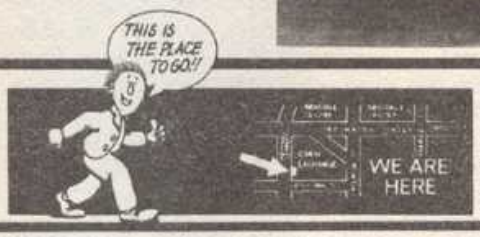
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# New Releases

***John Cook looks through this week's new arrivals***

## Amstrad

**Program** *Dr Who and the Mines of Terror* **Type** Arcade Adventure **Micro** Amstrad **Price** £11.95 (tape) £15.95 (disc) **Supplier** Micropower, Northwood House, North St, Leeds, LS7 2AA.

**Program** *Turbo Esprit* **Type** Arcade **Micro** Amstrad **Price** £8.95 **Supplier** Durell, Castle Lodge, Castle Green, Taunton, Somerset, TA1 4AB.

**Program** *The Price of Magik* **Type** Adventure **Micro** Amstrad **Price** £9.95 **Supplier** Level 9 Computing, PO Box 39, Weston Super Mare, Avon, BS24 9UR.

**Program** *Shadowfire* **Type** Adventure **Micro** Amstrad **Price** £9.95 **Supplier** Beyond, Wellington House, 6-9 Upper St Martins Lane, London WC2.

It's almost a year since *Shadowfire* was released for the Commodore, then the Spectrum soon afterwards; so obviously someone's been taking their time doing this Amstrad conversion.

Never mind, though – for Amstrad strategy addicts who have been straining at the leash waiting for this release, it was worth the wait.



For those with short memories, the scenario is a futuristic *Mission Impossible*, with you controlling a team of five renegades who are sent on a suicide rescue job, on board the sky fortress Zoff V.

Fairly average space opera you might say, but what makes the game special is the way you control the team, in fact, the whole game – via a series of icons. The whole thing has been faithfully recreated, together with the thumping soundrack.

In short, better than the Spectrum version, only slightly inferior to the original, plays like a dream; what more do you want?

**Program** *Toadrunner* **Type** Acrcade Adventure **Micro** Amstrad **Price** £8.95 **Supplier** Ariolasoft UK, Long Acre, London WC2.

**Program** *World Cup Carnival* **Type** Arcade **Micro** Amstrad **Price** £6.95 (tape) £14.95 (disc) **Supplier** US Gold, Unit 10, The Parkway Industrial Centre, Henage St, Birmingham B7.

**Program** *Blackstar* **Type** Adventure **Micro** PCW 8256 **Price** £14.95 **Supplier** CRL, Kings Yd, Carpenter's Rd, London E15.

**Program** SAS Raid **Type** Adventure **Micro** PCW 8256 **Price** £14.95 **Supplier** CRL, 9 Kings Yard, Carpenter's Rd, London E15.

## BBC

**Program** *The Price of Magik* **Type** Adventure **Micro** BBC **Price** 9.95 **Supplier** Level 9 Computing, PO Box 39, Weston Super Mare, Avon, BS24 9UR.

## Commodore 16

**Program** *Super Hits* **Type** Compilation **Micro** C16/Plus 4 **Price** £6.95 **Supplier** US Gold, Unit 10, The Parkway Industrial Centre, Henage St, Birmingham B7.

## Commodore 64

**Program** *HMS Atlantis* **Type** Adventure **Micro** Commodore 64 **Price** £1.99 **Supplier** Macmillan Software, 4 Little Essex Street, London WC2.

**Program** *Speedipen* **Type** Utility **Micro** Commodore 64 **Price** £17.50 (disc) **Supplier** JCL Software, 1, Sheffield Road, Southbrorough, Tunbridge Wells, Kent.

**Program** *Saboteur* **Type** Arcade **Micro** Commodore 64 **Price** £8.95 **Supplier** Durell, Castle Lodge, Castle Green, Taunton, Somerset TA1 4AB.

Thwunk! Your knife hits a guard in the neck. Thwack! You drop-kick another guard and the computer master plan is yours. Just set the bomb, defeat the other hundred guards, avoid betting savaged by the vicious dobermanns, clamber across the roof, into your helicopter and away before the time runs out.

Another successful mission for *Saboteur*, Durell's conversion for the 64 of it's Spectrum hit. Yes, it's violent but jolly good fun too – where so many games tried and failed, *Saboteur* delivers the goods. Buy it!




**Program** *World Cup Carnival* **Type** Arcade **Micro** Commodore 64 **Price** £9.95 (tape) £14.95 (disc) **Supplier** US Gold, Unit 10, Parkway Industrial Centre, Heneage St, Birmingham B7.

All the signs are there. The panic buying of lager, potato munchies and caffeine tablets. David Coleman has just gone in for his 1,400 day service. People are humming *Land of Hope and Glory* on the Fenchurch St line. It can only mean one thing. It's World Cup time again.

And to make it official, *World Cup Carnival* has just arrived in the office.

This is an impressive package – glossy full colour 'World Cup facts' poster, glossy full colour World Cup league table, together with adhesive World Cup flags. World Cup supporters badge and a free competition to win games or a compact disc. Phew!

Oh . . . and there's this com-

Pick of the week

## Splitting Images

**Program** *Splitting Images* **Type** Arcade Strategy **Machine** Spectrum **Price** £7.95 **Supplier** Domark, 204 Worple Road, Wimbledon, London SW20 8PN.

One day, the man that brought 'the jigsaw into the computer age' (that's what it says on the press release, believe me) will be hailed as a far-sighted visionary of a new era. One day the leaders of East and West will hold hands, skip round the White House lawns, make daisy chains and proclaim war is a bad thing, I thought as I read said release.

Until that time arrives, I will continue to treat any new Domark release with tredipation. What will they think of next, eh?

I'll tell you what – it's called *Splitting Images* – you know, after that wacky TV program *Spitting Images*. Wizard prang. The kids will love it.

Yes, Domark has released a game very loosely connected with the series that has just come off air.

All will be forgiven if the game is any good. And it is . . . possibly one of the best I've played this year so far. The Dutch programming team, Ernisoft, has come up with one hell of a brainstormer.

Essentially, it's just solving a sliding block puzzle against time, but there are some great touches. You must solve a 5 by 4 puzzle on a 5 by 5 grid. You start off with an empty frame, and release pieces one by one from a hidden stack on the top right (all movement is under multi-colour cursor control). But not all pieces released are puzzle pieces – and by clever manipulation of these strange objects, vast bonuses can be gained; like colliding a dripping tap with a bomb . . . but if you don't get the bomb off screen within a few seconds you're in trouble.

The *Spitting Images* connection is that the completed screen images comprise famous figures: Ronnie, Maggie, Sir Clive, etc.

Forget the hype and don't think twice about the price – this one really is worth it.

puter game as well. Remember Artic's *World Cup*? It has to be said that *World Cup Carnival* is not going to be anything new to you if you already have the Artic version. A few frills have been added, but the gamesplay is the same, as are the major graphics and sprites. A good enough game in its time, but it does look a bit dated now.

If you are football mad, already seething with sporting patriotism, like stickers and desperately want to play computer games during half time,




then this would be a good purchase. I'll stick to making the tea.

## MSX

**Program** *The Price of Magik* **Type** Adventure **Micro** MSX **Price** £9.95 **Supplier** Level 9 Computing, PO Boc 39, Weston Super Mare, Avon BS24 9UR.




## PCW 8256

**Program** *Blackstar* **Type** Adventure **Micro** PCW 8256 **Price** 14.95 **Supplier** CRL, 9 Kings Yard, Carpenter's Rd, London E15.

**Program** *SAS Raid* **Type** Adventure **Micro** PCW 8256 **Price** £14.95 **Supplier** CRL, 9 Kings Yard, Carpenter's Rd, London E15.

## Spectrum

**Program** *World Cup Carnival* **Type** Arcade **Micro** Spectrum **Price** £9.95 **Supplier** US Gold, Unit 10, The Parkway Industrial Centre, Henage St, Birmingham B7.

**Program** *Outworld* **Type** Strategy **Micro** Spectrum **Price** £1.99 **Supplier** Durome Software, Victoria House, 6 Vicarage Rd, Bradwell Village, Milton Keynes Bucks, MK13 9AQ.

**Program** *Podder* **Type** Arcade **Micro** Spectrum **Price** £1.99 **Supplier** Central Solutions, 500 Chesham House, 150 Regent St, London W1.

**Program** *A Trick of the Tale* **Type** Arcade **Micro** Spectrum **Price** £1.99 **Supplier** Central Solutions, 500 Chesham House, 150 Regent St, London W1.

**Program** *Toadrunner* **Type** Arcade/Adventure **Micro** Spectrum **Price** £7.95 **Supplier** Ariolasoft UK, Long Acre, London WC2.

I've got to admit that *Toadrunner* is a pretty good name for a game – almost in the same league as *Attack of the Killer Tomatoes* in fact – but if you're expecting a souped up version of *Frogger*, then you'd be in for a surprise, as *Toadrunner* is a new arcade adventure from Ariolasoft.

No American import this, but a thoroughly home grown product, written by David Harper who, those with a good memory will remember, wrote *Riddlers Den*, which also featured an amphibian in the starring role.

Here, your task is to hop around the 60-odd screens, discover the Stone Heart, destroy it, then get a kiss from a princess which will transform you into a prince. (Haven't I heard all this somewhere before?)

Both the Amstrad and Spectrum versions are really quite good. The maze like plan-view graphics are distinctive and give the whole thing something of a fairytale atmosphere.

The puzzles vary in difficulty from simple logic (magnets attract metal objects) to the more lateral thinking types (to get past the Gorgon for instance will require some mythological background knowledge, plus a sharp nose for puns, while other problems simply require a eye for detail.

Fans of this type of game are unlikely to be disappointed, apart from the price tag. Every game of this sort must be compared to *Spellbound* – that excellent Mastertronic title. That was £2.99, this one is considerably more.

Not the best value in town then, but if you're an arcade adventurer with royal aspirations, webbed feet and eight quid or so to spend, this one's for you.

**Program** *The Price of Magik* **Type** Adventure **Micro** Spectrum **Price** £9.95 **Supplier** Level 9 Computing, PO Box 39, Weston Super Mare, Avon, BS24 9UR.




**Program** *Laser Basic* **Type** Utility **Micro** Spectrum **Price** £14.95 **Supplier** Ocean IQ, 6 Central St, Manchester, M2.
**Program** *Laser Compiler* **Type** Utility **Micro** Spectrum **Price** £9.95 **Supplier** Ocean IQ, 6 Central St, Manchester, M2.

**Program** *World Cup Carnival* **Type** Arcade **Micro** Spectrum **Price** £9.95 **Supplier** US Gold, Unit 10, The Parkway Industrial Centre, Henage St, Birmingham B7.

**Program** *International Match Day* **Type** Arcade **Micro** Spectrum 128 **Price** £9.95 **Supplier** Ocean Software, 6 Central Street, Manchester M2 5NS.

More football – this time from those software giants Ocean – and it's for the Spectrum 128 too.

Not surprisingly, *International Match Day* is a revamped




version of that well known program *Match Day*, but there are some new features mainly in the shape of an extra option, that of an international knockout tournament. As before, you can directly control one player at a time, with the rest of your team pottering around under computer control. You can tell which player is activated because the socks change colour.

The action isn't exactly fast and furious, but it plays well and the 3-D perspective is effective enough.

What the game goes have is a host of options – would that Bobby Robson had this many.

Colours can be changed, team names can be changed (alas, Crystal Palace blew out to Spain 7-0), controls can be changed, handicaps can be set, difficulty altered. No shortage of variety here, Brian.

General opinion has it that this is the best of its type for the Spectrum, so if you feel the need for a football game on your 128, then look no further.




**Program** *Adventure Game Pack Vol 2* **Type** Adventure **Micro** Spectrum **Price** £6.95 **Supplier** Central Solutions, 500 Chesham House, 150 Regent St, London W1.

# Charts

## Top Twenty

| | | | |
|---|---|---|---|
| 1 | (1) | Thrust *(C64)* | Firebird |
| 2 | (5) | Formula One Simulator *(Various)* | Mastertronic |
| 3 | (6) | Kik Start *(Spectrum, C64, C16)* | Mastertronic |
| 4 | (7) | Commando *(Various)* | Elite |
| 5 | (11) | Batman *(Spectrum, Amstrad)* | Ocean |
| 6 | (2) | Spindizzy *(Spectrum, C64, Amstrad)* | Electric Dreams |
| 7 | (4) | International Karate *(Spectrum, C64,)* | System 3 |
| 8 | (–) | Rock 'n' Wrestle *(Sp, C64, Ams)* | Melbourne House |
| 9 | (10) | Bomb Jack *(Spectrum, C64, Amstrad)* | Elite |
| 10 | (11) | Spellbound *(Spectrum, C64, Amstrad)* | Mastertronic |



Thrust stays at no 1



Kik Start up to no 3

| | | | |
|---|---|---|---|
| 11 | (8) | They Sold (2) *(Spectrum, C64, Amstrad)* | Mastertronic |
| 12 | (13) | Way of the Tiger *(Spectrum, Amstrad, MSX)* | Gremlin |
| 13 | (–) | Comp. Hits 10 Vol 2 *(Various)* | Beau Jolly |
| 14 | (9) | Vegas Jackpot *(Various)* | Mastertronic |
| 15 | (–) | Saboteur *(Spectrum, C64, Amstrad)* | Durell |
| 16 | (20) | Last V8 *(C64, Amstrad, Atari)* | Mastertronic |
| 17 | (16) | Bounder *(Spectrum, C64, Amstrad, Atari)* | Gremlin |
| 18 | (18) | V *(Spectrum, C64)* | Ocean |
| 19 | (–) | Action Biker *(Spectrum, C64, C16, Atari)* | Mastertronic |
| 20 | (17) | Turbo Esprit *(Spectrum, Amstrad)* | Durell |

## Top Tens




All figures compiled by Gallup/Microscope

### Amstrad

| | | | |
|---|---|---|---|
| 1 | (1) | Get Dexter | (PSS) |
| 2 | (–) | Winter Games | (Epyx/US Gold) |
| 3 | (5) | Commando | (Elite) |
| 4 | (10) | Last V8 | (Mastertronic) |
| 5 | (6) | They Sold (2) | (Hit Squad) |
| 6 | (2) | Spindizzy | (Electric Dreams) |
| 7 | (3) | Batman | (Ocean) |
| 8 | (–) | Way of the Tiger | (Gremlin) |
| 9 | (–) | Comp. Hits 10 (10) | (Beau Jolly) |
| 10 | (9) | Into Oblivion | (Mastertronic) |

### Commodore 64

| | | | |
|---|---|---|---|
| 1 | (–) | Thrust | (Firebird) |
| 2 | (2) | Int Karate | (System 3) |
| 3 | (3) | Spindizzy | (Electric Dreams) |
| 4 | (5) | Spellbound | (Mastertronic) |
| 5 | (8) | PSI-5 T'ding Company | (Us Gold) |
| 6 | (–) | Biggles | (Mirrorsoft) |
| 7 | (4) | F1 Simulator | (Mastertronic) |
| 8 | (–) | Rock 'n' Wrestle | (Melbourne Hse) |
| 9 | (–) | Saboteur | (Durell) |
| 10 | (–) | Golf | (Ariolasoft) |

### Atari

| | | | |
|---|---|---|---|
| 1 | (1) | Vegas Jackpot | (Mastertronic) |
| 2 | (7) | Action Biker | (Mastertronic) |
| 3 | (4) | Last V8 | (Mastertronic) |
| 4 | (2) | New York City | (Americana) |
| 5 | (6) | Ollies Follies | (Americana) |
| 6 | (8) | Fighter Pilot | (Digital) |
| 7 | (9) | Sharnus | (Americana) |
| 8 | (5) | One Man | (Mastertronic) |
| 9 | (3) | Scooter | (Americana) |
| 10 | (–) | Arcade Classics | (Datasoft) |

### BBC

| | | | |
|---|---|---|---|
| 1 | (1) | Commando | (Elite) |
| 2 | (2) | Winter Olympics | (Tynesoft) |
| 3 | (4) | Tennis | (Bugbyte) |
| 4 | (8) | Karate Combat | (Superior) |
| 5 | (–) | Phantom Combat | (Doctor Soft) |
| 6 | (–) | Citadel | (Superior) |
| 7 | (3) | Bruce Lee | (US Gold) |
| 8 | (–) | Jack Attack | (Bugbyte) |
| 9 | (–) | Repton 2 | (Superior) |
| 10 | (–) | Combat Lynx | (Durell) |

### Spectrum

| | | | |
|---|---|---|---|
| 1 | (–) | Batman | (Ocean) |
| 2 | (5) | Starstrike 2 | (Realtime) |
| 3 | (–) | Rock 'n' Wrestle | (Melbourne Hse) |
| 4 | (2) | Green Beret | (Imagine) |
| 5 | (7) | Way Of The Tiger | (Gremlin) |
| 6 | (8) | Fireman | (Mastertronic) |
| 7 | (6) | Hvy On The Magik | (Gargoyle) |
| 8 | (–) | Turbo Esprit | (Durell) |
| 9 | (5) | Bomb Jack | (Elite) |
| 10 | (–) | V | (Ocean) |

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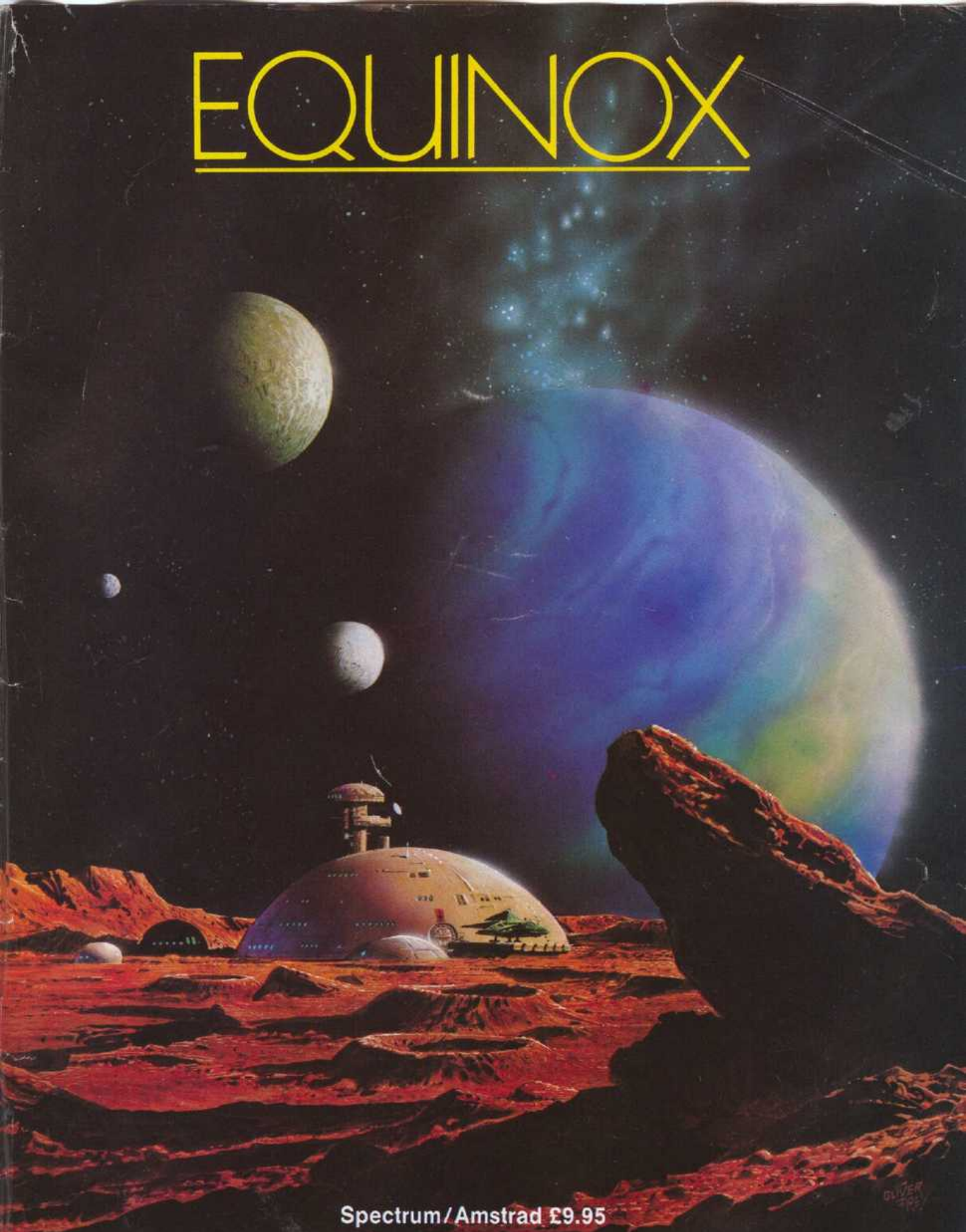
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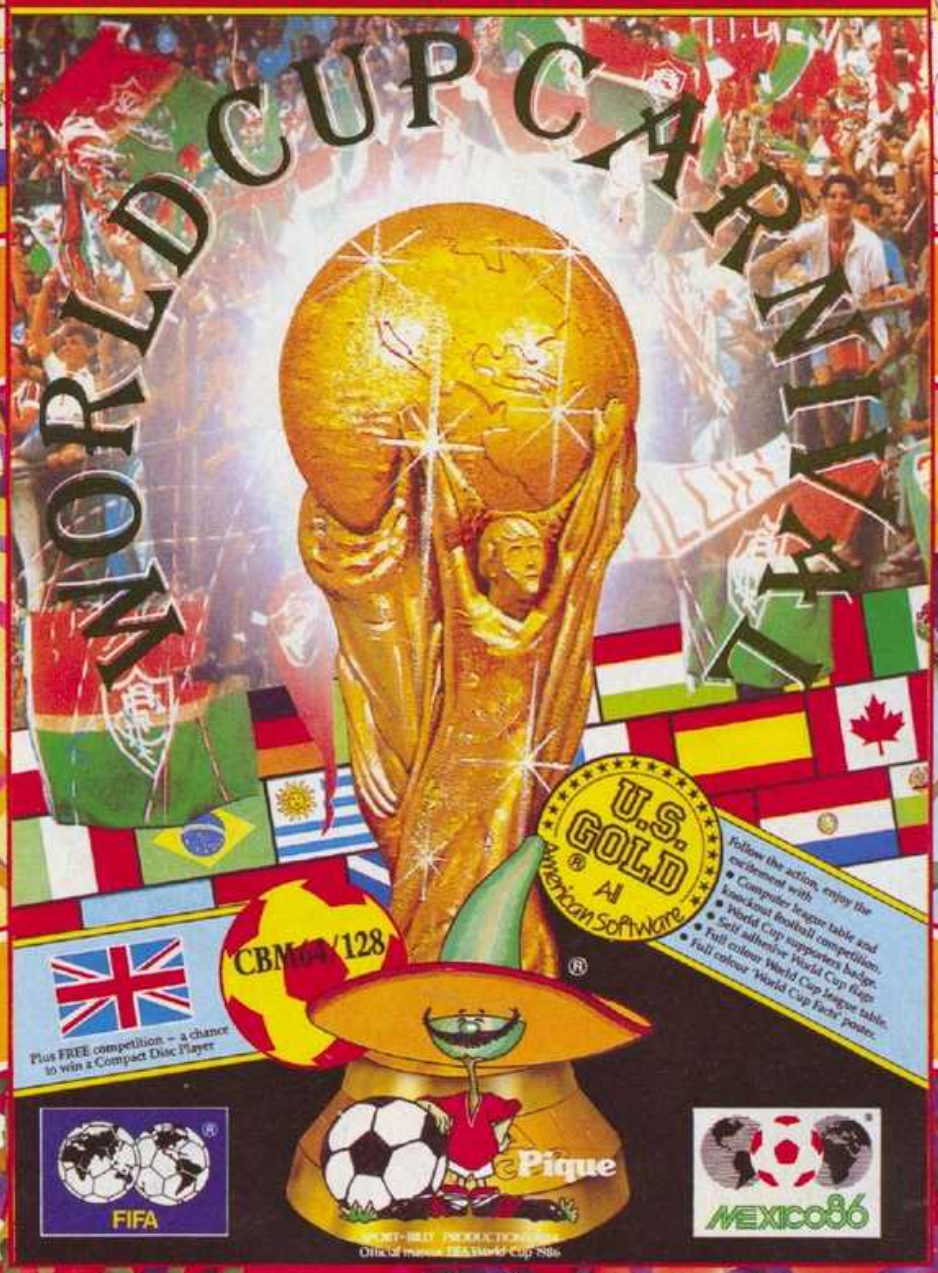
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