POPULAR Computing WEEKLY

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Vol 4 No 34

AMSTRAD 6128 REVIEW INSIDE

# Amstrad beats Atari to 256K

AMSTRAD has announced its second new micro in two weeks.

The machine, called the PCW8256, is a home or office word-processing system, something of a departure for Amstrad.

Based on the technology used in the 6128 the new PCW 8256 offers 256K Ram, a Z80 processor and a sophisticated icon-driven word processing software program in a package which includes a single 3 inch disc drive, high-resolution monochrome monitor and near letter-quality dot-matrix printer. The computer, disc unit and much of the printer software is built into the compact monitor unit to keep the keyboard and printer as light as possible.

The whole system including the micro, monitor, disc and printer is to be priced around £450.

Unlike Amstrad's previous computers the PCW 8256's much expanded version of Basic is not built-in. Instead it is supplied with the machine on disc and must be soft-loaded.

Like the 6128, the micro is CP/M compatible running version 3.0 (CP/M Plus) and is also supplied with Digital Research's GSX graphics extension package.

The micro can also be expanded with an additional 1M 3 inch disc unit, a space for which is provided behind a removable panel on the monitor unit.

Like the 6128 the 8256 was commissioned from Amstrad by Indescomp Inc primarily for the US market.

It will be available shortly in the UK, in the autumn in the rest of Europe, and and launched, according to Jaime Pero, President of Amstrad Computers US, in late 1985/ early 1986 in America.

## New 16-bit micro from Sinclair?

THE IMMEDIATE future of Sinclair Research was being decided this week as top executives from the troubled computer firm met representatives of its major creditors – owed around £15m – to try to agree a short-term extension of the company's credit.

Cash is urgently needed to carry through developments of new 8- and 16-bit machines.

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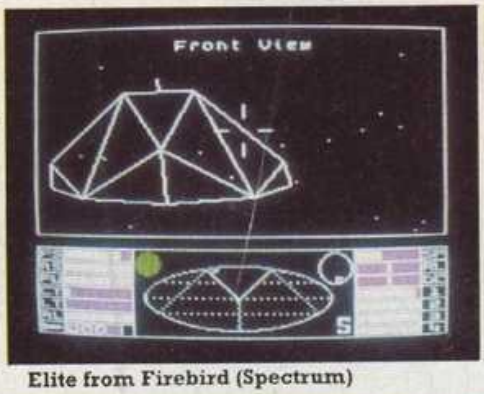
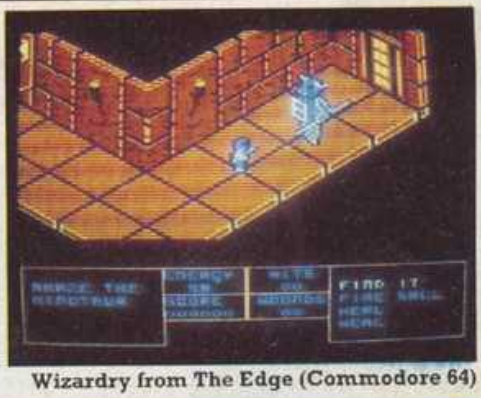
## FIRST LOOK

Warlord from Interceptor (Amstrad)




Elite from Firebird (Spectrum)



Wizardry from The Edge (Commodore 64)

INSIDE ) SETTING FOOT ON LEVEL 9'S RED MOON WIN SUMMER GAMES II )

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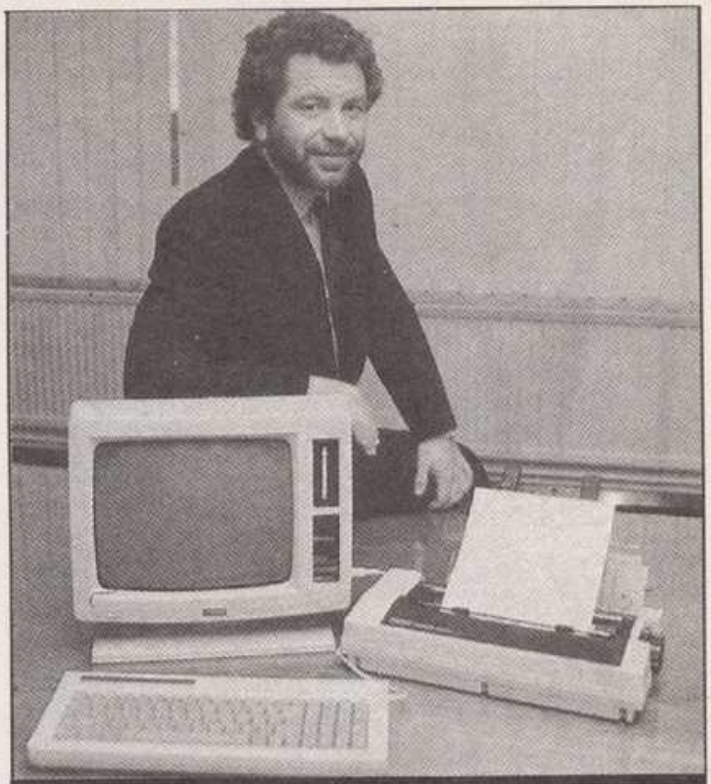

Alan Sugar with Amstrad's PCW8256


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## EDITORIAL

It is difficult to pick up a paper these days without reading some story on 'why the micro bubble burst'. Commentators, who only eighteen months ago championed the micro boom, are now busy banging nails into its coffin: micros 'failed' because they were a product in search of an application.

They are all wrong. Yes, it is true that for the moment the micro's only serious home application is word processing; it is also true that the dreams of armchair shopping or the 'automated' home remain unfilfilled.

But the micro has found its role as an entertainment medium. Anyone familiar with programs like *Elite, Frankie Goes to Hollywood* or *Dun Darach* would be forced to agree the computer game can be a complex and compelling form of entertainment. As valid a leisure pursuit as reading a book, listening to a record or watching a film.

As the music, publishing, film, and now computer, industries continue to move closer together an increasing number of artists and authors are beginning to dabble with micros: the list includes Arthur C Clarke, Douglas Adams, Andy Warhol, George Lucas, Rik Mayall, Pierre Boulez. This week book publisher Hodder and Stoughton launched its version of *The Rats* based on James Herbert's top selling novel. Hutchinson's adaptation of *The Fourth Protocol* is still riding high in the software charts.

With technology still advancing fast the micro offers the intreguing possibility of true interactive fiction—combining elements from a book or film so that the reader/viewer can control by decision-making the development and outcome of the story. Pieces of the jig-saw are already in place; startling graphics like those of Terry Greer used in Interceptor's Amstrad adventures and the sophisticated text detail of the Infocom programs. All that's needed now is more memory.

Even if time eventually shows the interactive novel to be a creative cul-de-sac, the prospect is a fascinating one.

Those who are now ready to write off the micro as a spent force will be proved wrong.

**Editor** David Kelly **News editor** Christina Erskine **Features editor** Graham Taylor **Software editor** John Cook **Staff writer** Martin Croft **Production editor** Lynne Constable **Editorial secretary** Lucinda Lee **Advertisement manager** David Lake **Assistant advertisement manager** Jeremy Kite **Advertisement Executive** Diane Holyoak **Classified executive** David Osen **Administration** Geraldine Smyth **Managing editor** Duncan Scot **Publishing director** Jenny Ireland. **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 © Sunshine Publications Ltd 1985.

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**Computer Trade Association Magazine of the Year**

# First signs of a new QL machine

AS WELL as the much rumoured 128K Spectrum model Sinclair is now known to be working on a new 16-bit machine. The new micro is thought to offer 512K Ram and be based on the technology developed for the QL, yet without microdrives. A disc option may be provided instead.

Both new micros are likely to be shown for the first time at this year's *Personal Computer World* Show in two week's time. Mikro-Gen could be the first company to show software for the new Spectrum the company is already planning a range of titles to launch for its MicroPlus Spectrum Plus expansion system, believed to be compatible with the new micro.

MicroPlus looks rather similar to a joystick interface but provides a Rom expansion giving the Spectrum Plus an increased memory size available for a game, thus giving opportunity for more complex graphics or playing area.

The first title on MicroPlus will be *Shadow of the Unicorn,* and Mikro-Gen is also planning a licensed title, *Battle of the Planets.*

Triptych Publishing, the company which wrote the Brainpower series, is also thought to be writing specifically for the Spectrum 128 and the Pandora portable.

Dixon's, whose £10m order – apparently agreed before the Maxwell take over plan was mooted – was heralded by Sir Clive Sinclair as wiping out the need for a specific rescue deal, has now begun selling its new Spectrum package: Spectrum Plus, joystick and interface, data recorder and ten pieces of software for £139.99 in all Dixon's stores. Its original package — Spectrum Plus, ZX printer and flat screen TV at £199.99 – is still running while stocks last. The discount store Comet is now selling a similar package at £159.99, and discount packages for independent retailers are also expected.

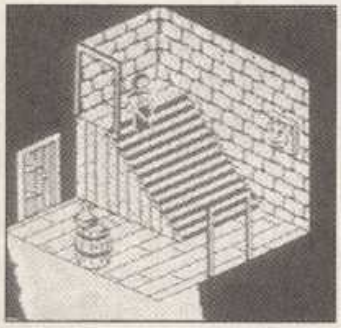
The creditors meeting called on Monday – involving Sinclair and representatives from Thorn EMI, Timex, AB Electronics, Barclays and Citibank – follows the failure of Robert Maxwell's £12m rescue bid three weeks ago.

# Acorn's shares trade again

TRADING in Acorn's shares began again on the Unlisted Securities Market last week. Starting at 2½ pence per share, the price rose at the end of the first day to 6 pence, and currently stand at 14½ pence.

The deal with Olivetti under which Olivetti's stake in Acorn rises to 79.8 per cent is due to be granted shareholders' approval on September 2.

● Acorn's ABC range, which was put in abeyance in February prior to Olivetti's first rescue package, has been incorporated in the newly launched Cambridge work station. This 32-bit scientific processor draws on much of the technology developed for the ABCs, which are still not being produced as machines in their own right.



*TWO new releases from The Edge* – Fairlight *(above) and* Wizardry *(cover) – are both arcade adventures with the emphasis firmly on 3D graphics and animation.*

*For the Spectrum and Commodore 64 respectively, both will be released in early September priced at £9.95.* Wizardry *will also be available for the Commodore 64 on disc at £12.95.*

## Hodder launches horror game

HODDER and Stoughton has now launched *The Rats,* the strategy/adventure game based on James Herbert's blood curdling novel.

The programmers, from Five Ways Software, have deliberately kept in many elements of the horror and spine chilling description that characterised the novel.

*The Rats* will be available in September, priced at £7.95, for both the Spectrum and Commodore 64. An Amstrad version is planned.

## Mighty Oaks available from Acorn's BBC

OAK UNIVERSAL and Acorn have signed a deal for Oak to sell the BBC and BBC Plus as single board computers.

The Oak range offers all permutations of BBC components and peripherals from the basic keyboard and processor board in Oak's own casing at £499 up to the full Oak personal computer, comprising motherboards for BBC and BBC Plus, 65 watt power supply, dual 400K double-sided disc drive, Z80 second processor, CP/M, word processor, spreadsheet, graphics, database, system generator, CIS Cobol, and BBC Basis for £1,325. The keyboard and processor casings only can be bought for £86.95.

## Hollywood's worst in Global deal for micros

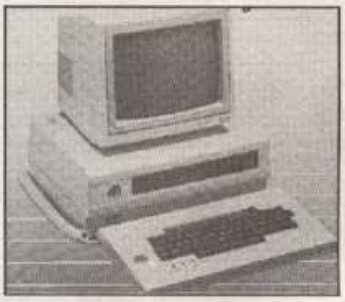
FOLLOWING the licensing of such box office hits as *Rambo – First Blood 2, Alien, Superman* and *Gremlins* comes news of a deal involving the worst films ever.

Global Software, which was formed in March this year by former employees of Argus Press Software, has obtained software rights to films featured in the cult book *The Golden Turkey Awards.*

The book, written by two Calfornians Harry and Michael Medved, awards 'Golden Turkeys' in categories such as The Most Embarrassing Movie Debut of All Time, or The Worst Vegetable Movie of All Time.

The first game in the new series is to be *The Attack of the Mushroom People,* based on The Worst Vegetable Movie of All Time, which is to be released for mid-October for the Spectrum at £6.95 and the Commodore 64 and Amstrad at £7.95. The second game, *Revenge of the Killer Tomatoes,* will follow shortly after.

Global has also released a graphics and text adventure called *The Magician's Ball* which features Mike Oldfield's *Tubular Bells* licensed as backing theme.



Oak has also produced its own modem, which fits internally in the disc drive case, at £135 with software.

Details from Oak Universal, 20 Crofters Green, Green Lane, Idle, Bradford.

**More news on page 6**

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# MUD slinging in Compunet resolved

FOLLOWING an outcry from Compunet MUD players after all Wizard status points were halved last week, the original rankings have now been reinstated.

Players who had attained the powerful Wizard status in the Multi-User Dungeon reacted angrily after MUSE managing director Simon Dally reduced the rankings.

"We had had a lot of complaints from Compunet MUD users saying that those who had made it to Wizard were making the game extremely difficult for others to play," said Simon.

However, the outcry was so violent—some people having spent several hundred pounds reaching the coveted position that MUSE reinstated everyone's previous rankings, including those considered to have attained Wizard status by possibly devious means.

"The problem was really one of supervision of players," commented Simon. "Now that we can access MUD on a Gateway computer rather than needing a Commodore 64 proper supervision should be a lot easier."

*"Can you guarantee there isn't a C5 thrown in as well?"*

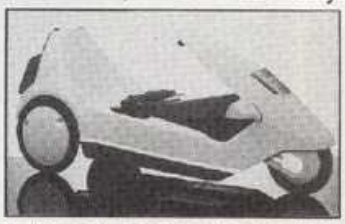
# Hoover halts C5 – price tumbles

SIR CLIVE Sinclair's personal venture, Sinclair Vehicles, sank into even deeper trouble last week when Hoover stopped production of the C5 electric tricycle at its Merthyr Tydfil factory.

"Production has been halted while the £1.5 million writ is still hanging over the company," said a Sinclair Vehicles spokesman. "Hoover did not want to buy new parts when they ran out on behalf of Sinclair Vehicles."

Demand however can be met by stocks currently held by Sinclair – production prior to the stoppage was, however, only 100 per week. The writ, for non-payment of debts, was taken out by Hoover over a month ago, but has still to be served.

The C5, which has only



achieved about a tenth of its predicted sales of 100,000 so far, has already been heavily discounted. Electrical store Comet is selling it at £189, while from Vallance it costs £199, compared with a normal retail price of just over £400.

# Tolkien spoof reaches shops

*BORED of the Rings*, the adventure spoof on J R R Tolkien's *Ring* trilogy, is to be released by Silversoft.

Originally only available by mail order, publisher Delta 4 Software found itself unable to cope with the demand. As part of the Silversoft deal, Silversoft will expand the game adding new locations and graphics.

*Bored of the Rings* will be available by mid-September for the Spectrum and BBC at £7.95. Amstrad and QL versions will follow.

# Letters

## Ram paging

I have an XK modification Spectrum – the system of Ram paging allowing 64K blocks of memory to be built up to a maximum of 4M. I have not seen any programs or news of any products which use this expansion.

I'd be interested in hearing if anyone can help, or from anyone else who has the system.

*K J Turner*
*41 Almond Grove*
*Brentford*
*Middx*

## Thargoid attack

Re Martin Croft's review of *Elite* (June 20 issue). Who says you can't survive a Thargoid attack? If you feel like trying, or just practising, on the BBC version (tape or disc) type *Copy, X, Delete*, and then galactic hyperspace *(Ctrl-H)*, but hold down *Ctrl* until the routine has finished. You will be surrounded by Thargoids in Witch space.

This procedure (known as a back door) has been found to work on BBC (tape and disc). It probably works on the Electron as well.

A useful bug (BBC disc only) is the following. A capital of 1600 credits is necessary. Buy a mining laser (NB *not* lazer) on any view, then buy another mining laser on the same view. The computer will respond with *Laser Present* and your bank account increases in size by 3570.3 credits.

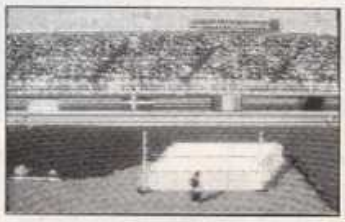
*Peter Bevin*
*62 St Denis Road*
*Selly Oak*
*Birmingham*

**There is also a Witch space routine on the C64 version. The mining laser 'bug' was only present on early BBC versions and has apparently now been corrected.**

# Competition

## Win Summer Games II

This week *Popular Computing Weekly* gives you the chance to win a copy of *Summer Games II* for the Commodore 64. This superb game recreates, with excellent graphics and sound, eight different Olympic events. The game is certain to be a bestseller – this is your chance to get one for nothing. We have 25 copies of the game to give away.



**The Competition**

Below are three questions. If you think you know the answers fill in the coupon below and send it to *Popular Computing Weekly*, Summer Games Competition, 12-13 Little Newport Street, London WC2H 7PP. Closing date is September 13th.

**Questions**

1) How many gold medals did the UK win in the last summer Olympics?
2) Which city is Britain's nomination to hold the 1992 Olympics?
3) Where were the last Winter Olympics held?

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# Surprise package

***Jeff Naylor** evaluates Amstrad's latest surprise – the 128K 6128 machine now in the shops*

Some manufacturers have a reputation for announcing new machines, then trying to get them working, and finally (or sometimes never) releasing them.

Amstrad doesn't work like that. Its new 6128 was available in some shops two weeks *before* being officially announced.

The micro features a Z80A processor, 128K of memory banked in two 64K blocks, a single built-in 3 inch disc drive and either a colour or monochrome monitor. Depending on the choice of monitor the whole package costs either £399 or £299.

The new CPC 6128 is a logical progression in the series of Z80-based Amstrad machines using and expanding on the same technology developed for the 464.

The original 464 provided Resident System Extensions to allow additional commands to be created. These were used to provide extra disc instructions when the DDI-1 disc unit was added to the system.

The 664 replaced the built-in cassette player with a disc unit and added a debugged Rom (no Line Input bug) and offered a slightly extended version of the 464 basic.

## Hardware

Now, only four months after the 664, Amstrad offers the new 6128. It contains an extra 64K of Ram, but the firmware is fully compatible with the 664. Bank switching has always been a feature of the Amstrad as Roms overlay the Ram addresses on the 464, and the 6128 extends the principle to an extra bank of Ram.

The first thing you notice about the 6128 is how neat it looks. It is a lot slimmer than its predecessors, achieved because the disc unit is very compact and also by squeezing the keyboard and function keypad together and reducing the size of some keys. The cursor *Copy* key arrangement has also been altered; *Copy* has moved bottom left alongside a repositioned and enlarged *Control* key, while the cursor keys have been resited at the bottom of the function keypad. It's tempting to quibble about the keyboard changes: I don't like the small *Delete* key (which I'm always using) or the position of the right-hand *Shift*. The latter is sandwiched between *Return* and *Enter*, a duplicity caused by the need to retain the same number of keys as earlier machines. One final moan: all the keys are now the same colour.

Connections to the 6128 offer no surprises: stereo sound, joystick, tape, printer, expansion, power, monitor and disc drive two. Inside the case, a neat circuit-board nestles under the keyboard, but does not extend the full length, despite the extra Ram chips. There is about three inches of space between the board and the disc drive, making the new circuit-board small enough for use in a portable machine. Eight additional 64K Ram chips are used to provide the extra bank of memory. This is enabled through the video gate array in much the same manner as internal Rom selection is achieved. One further cause for speculation is a spare integrated circuit socket which will take a ULA chip . . .

And so to the 65,536 dollar question, asked of all eight-bit computers with more than 64K of Ram. What use is the memory that can't be addressed directly by the CPU?

If programming in Basic, the answer is a complex one, but it boils down to "not a lot". The 6128 uses the same Basic as the 664, so you cannot write bigger programs because the interpreter is unaware of the additional 64K.

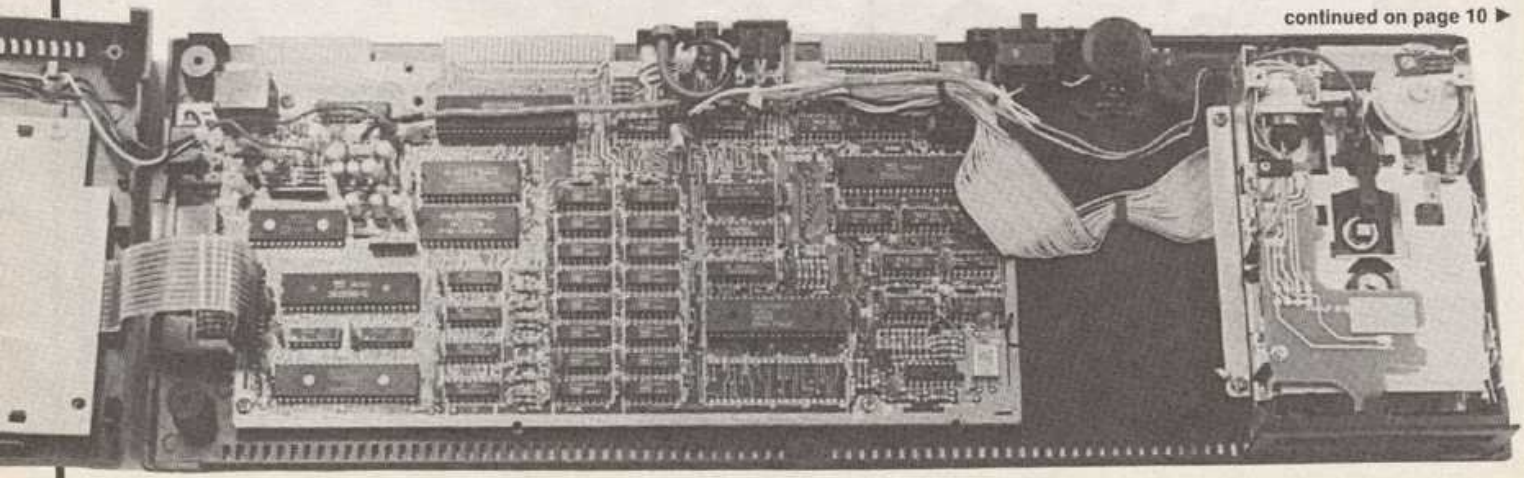
Use of the extra memory is instead facilitated by a suite of RSX routines supplied on one of the system discs. Once these are loaded a number of extension commands become available.

## Firmware

*Bankopen,n* sets up the second bank of Ram for string storage; the *n* parameter defines the length of all the strings up to 255 characters. To use the space, commands *Bankwrite*, *Bankread* and *Bankfind* are employed. The whole system operates like a Ramdisc. You may read from or write to either the current record or one specified by an optional parameter, or search the memory for a string matching the one you have specified. In all cases a parameter returns the record number or a negative value if the operation fails.

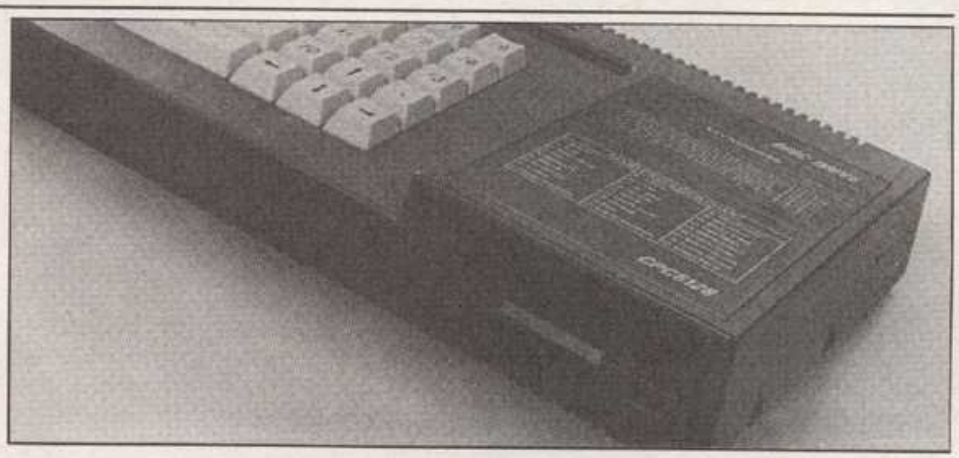
*Screenswap* and *Screencopy* allow the

continued on page 10 ▶



extra Ram to be used for screen storage, but they do not reprogram the video chip to fetch its video information from elsewhere. All that they do is copy 16K blocks of data in and out of the video Ram area. You may store four additional screens, but displaying them can take half a second.

Machine-code programs will find the extra Ram much more useful, with a firmware call at &BD5B allowing access to the second bank, but in the short term it seems unlikely that software houses will write programs that cannot run on the whole range of Amstrad machines.



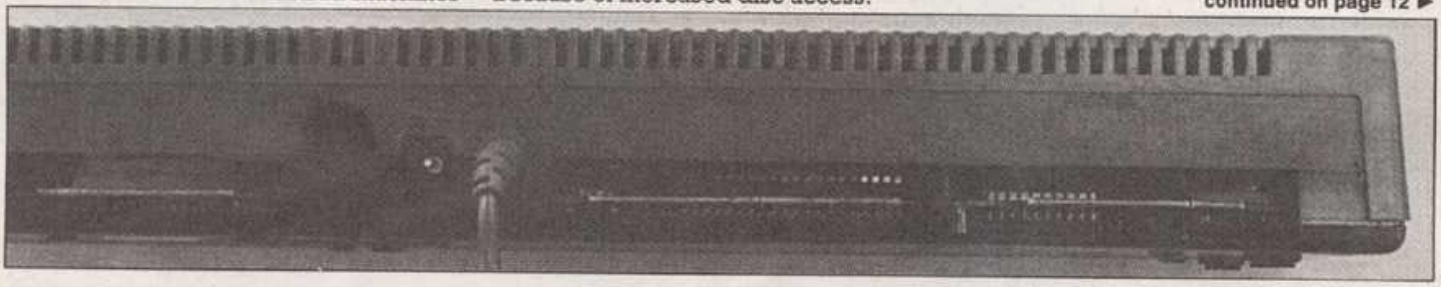
# Software

The main justification for the extra Ram is Digital Research's CP/M version 3.1 (CP/M Plus) Which is supplied as standard with the CPC 6128.

Earlier disc-based Amstrad machines run CP/M 2.2, but the video chip requires 16K of the memory map. Therefore the 464 and 664 have only 39K available for transient programs. Some CP/M programs need rewriting in order to run, and even then may be slow because of increased disc access.

The 6128 has none of these problems. Its version of CP/M exploits the extra Ram, resulting in a transient program area (TPA) of 61K. CP/M Plus includes a number of other improvements. More meaningful error messages are dis-

continued on page 12 ▶

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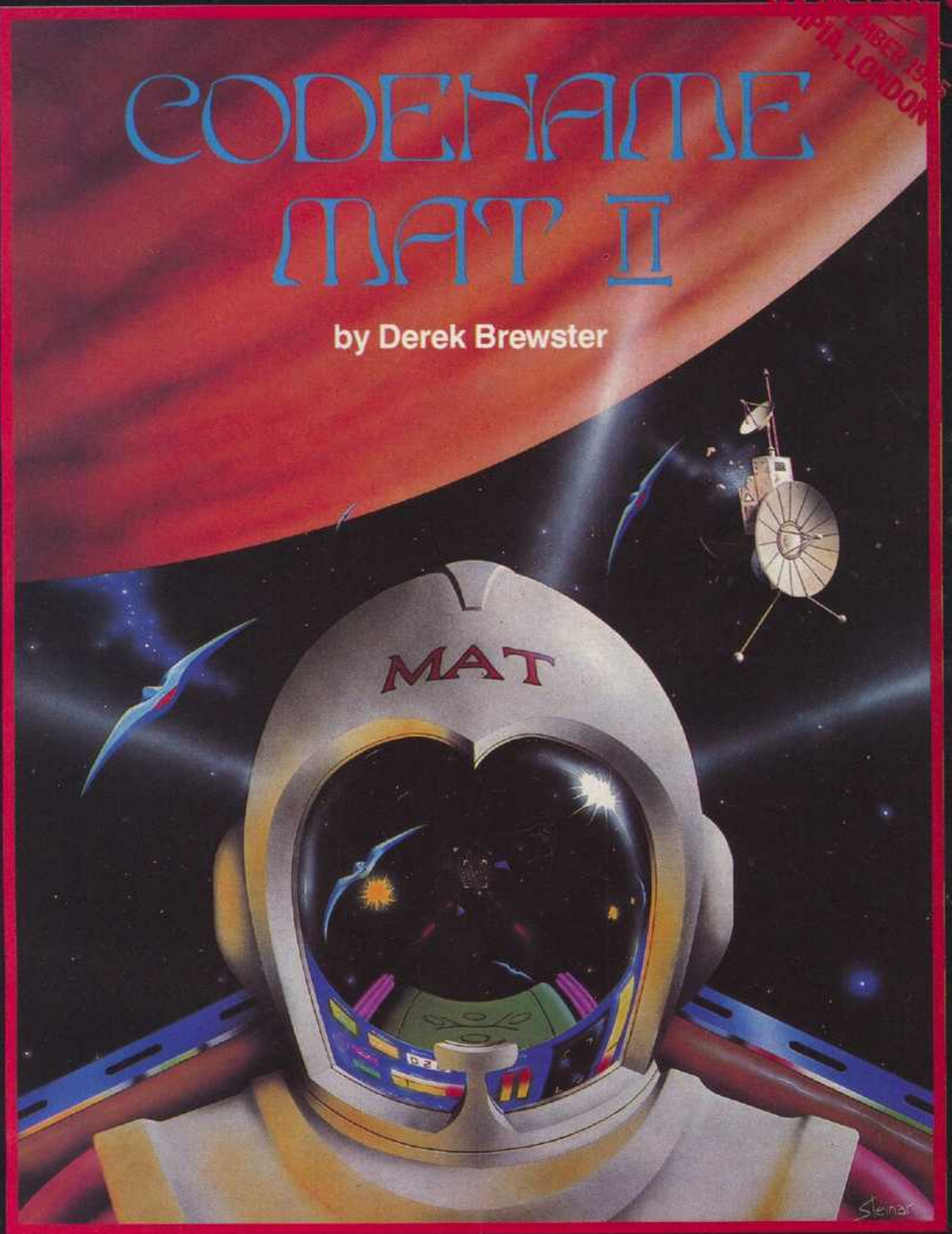
# CODENAME MAT II

by Derek Brewster

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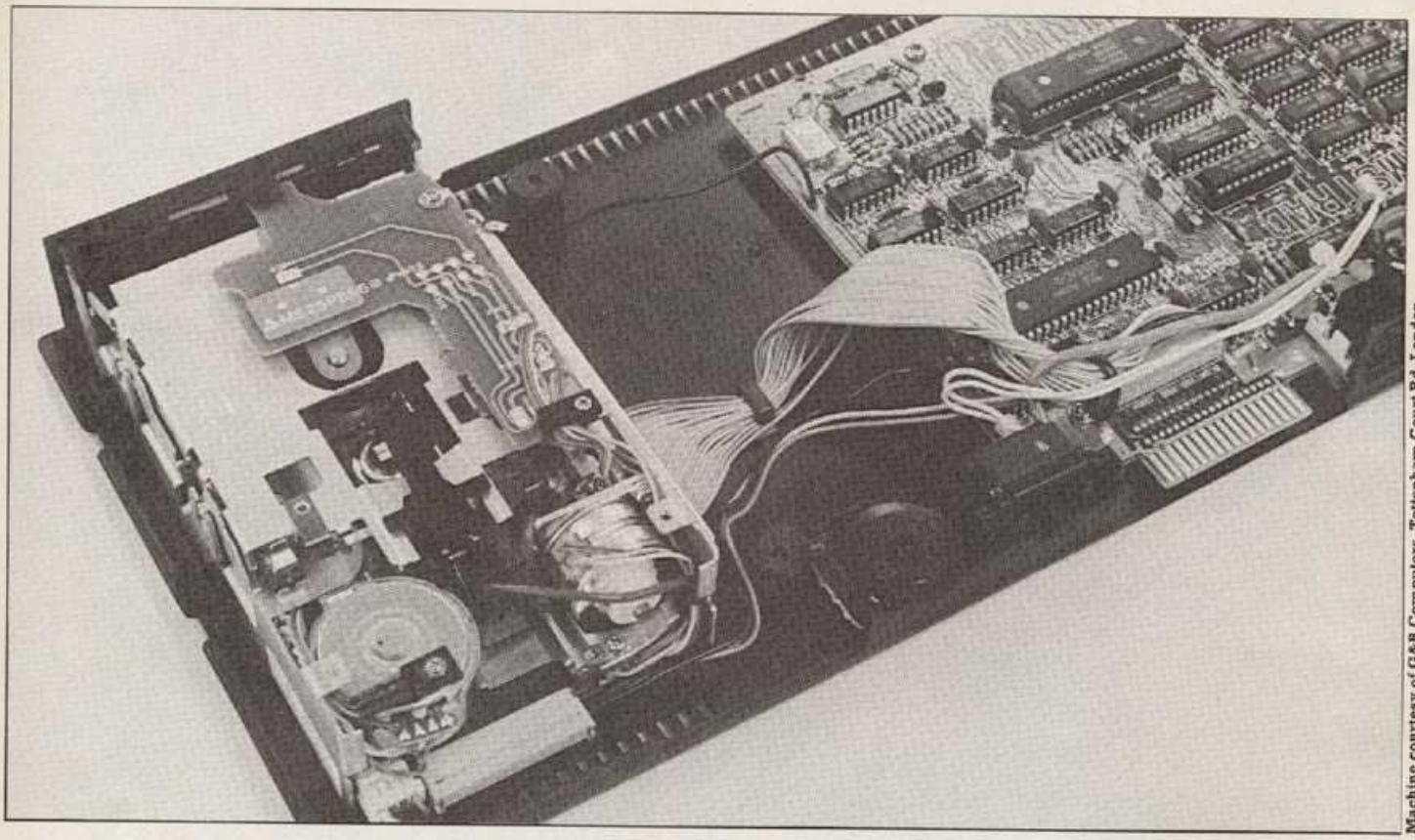


Machine courtesy of G&B Computers, Tottenham Court Rd, London

played as a scrolling banner at the bottom of the screen (if you find this irritating you can disable it). Because more of the operating system is stored in Ram, there is no need to "warm boot" (ie press *Ctrl C*) every time you change discs. Although CP/M Plus is much improved, earlier CP/M software is easily up-graded, so the vast range of software (including the 'freeware' of the CP/M user's group) is now truly accesible.

The CPC 6128 comes with two system discs. In addition to CP/M Plus and the Bank Ram Manager RSXs, a host of other goodies are included. The Digital Research Graphics System Extension (GSX) allows CP/M programs to use graphics. Logo is also supplied, along with some standard utility programs. Some of the machine-code tools though unfortunately assume that your processor is an Intel 8080 chip, so some have limited uses. Amstrad have also included *Disckit3*, a fairly friendly disc formatter and copier, while *Pip* (the file copy program) has been rewritten to work on a single drive system.

Just to be safe, one side of the system disc contains CP/M 2.2, useful if you upgrade from a 664 or 464 plus disc and want to run your old software.

Anything that runs on the other Amstrad disc machines can be used with confidence.

If you wish to transfer files from cassette, then you will need to use the utilities on this disc, which are much the same as those for the 464 disc drive.

## Amstrad CPC 6128 Specification

| | |
|---|---|
| Processor: | **Z80A** |
| Ram: | **128K in two 64K switchable banks** |
| Rom: | **48K including Locomotive Basic (same version as used by the CPC 664)** |
| Disc (built-in): | **Hitachi format 3 inch** |
| Disc operating system: | **CP/M version 3.1 (CP/M Plus) and AmsDOS plus CP/M version 2.2** |
| Disc software included: | **Dr Logo, Graphics System Extension (GSX)** *Disckit3* **disc formatter/copier,** *Pip* **file copier** |
| Monitor: | **Choice of colour or monochrome monitor** |
| Display: | **Max 640 × 200 pixels. 20, 40 or 80 column** |
| Sound: | **3 voice (AY-3-8912 chip)** |
| Connections: | **Stereo sound, joystick, cassette, printer, general expansion and additional disc drive ports** |
| Prices: | **£399 (with colour monitor)**<br>**£299 (with monochrome monitor)** |

## Conclusion

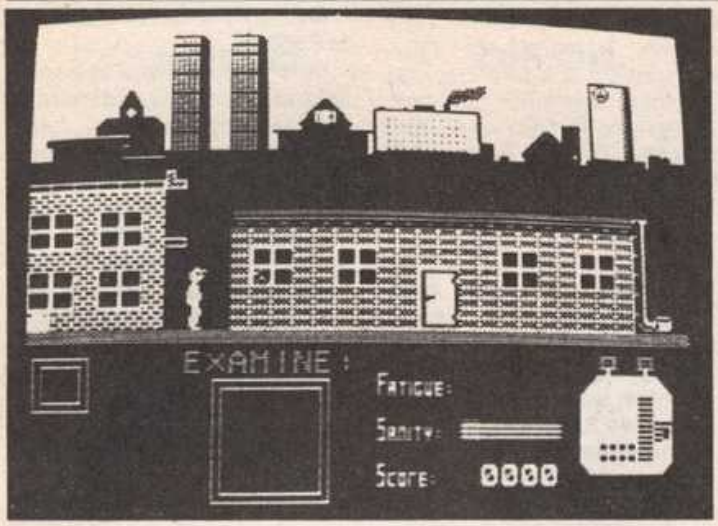
Viewed in isolation from other Amstrad computers, the CPC 6128 is a very well-designed and manufactured piece of hardware. Some of the keyboard features may seem retrograde step to current Amstrad users and the extra memory is not particularly useful to Basic programmers. The 6128 *is* still only a 8-bit machine (a boring Z80 crate, according to one commentator).

But each of these points can be countered – the restyling has resulted in a more attractive machine, the improved CP/M, CP/M Plus, is only possible because of the memory size, and Amstrad must be praised both for the compatibility of their computers and the size of the existing software base.

Which leaves the prices: computer, disc drive and monitor for £399 in colour, £299 for a green screen.

They represent a new step in value-for-money. The green screen version is only £20 more than Commodore's proposed C128 – and that has neither disc nor monitor. As for the BBC B Plus at £499 – no comment.

The 6128 is the most attractive new 8-bit micro so far this year. The only people who may complain will be those who have just bought an Amstrad 664.




## Spirited

**Program** *That's the Spirit* **Micro** Spectrum 48K **Price** £7.95 **Supplier** The Edge, 31 Maiden Lane, Covent Garden, London WC2

In the future all cities won't look like Milton Keynes – they'll look like New York instead. They'll also all be called New York. And spirits will be banned, though thankfully just the ectoplasmic not the alcoholic kind because the game background doesn't make much sense while I'm sober.

Understanding the game itself isn't that easy either. First appearances reveal a pick-things-up-and-find-their-use arcade adventure, but I was stumped until I received a Help sheet.

Once collected you can *Examine* (ie magnify) objects and even *Connect* some of them together to make them work. This is certainly similar to the puzzles that have pleasurably plagued text adventurers, though here there's the added difficulty of actually recognising an artifact from its appearance.

With an operating laser you can start frying the spirits, avoiding contact which will drive you insane. You also need to sleep every so often – tiring work this ghost hunting!

It's a good looking game, in particular in its settings, and there's some nice sound. A multitude of key presses keeps the options open and it's all rather witty – try pressing *Swear* or start up the QL. Whether you call it subtle or merely infuriating will depend on your attitude to the genre.

**John Minson**

## In ore

**Program** *Nick Faldo Plays the Open* **Micro** Spectrum 48K **Price** £9.95 **Supplier** Argus Press Software, Liberty House, 222 Regent Street, London W1R 7DB

Now the boxers have endorsed sports simulations it's the turn of the golfers and first on to the fairway is Nick Faldo.

I'm not sure how much Nick was concerned with game development but he has provided a booklet on playing the Royal St George's course with its treacherous shifting sea winds.

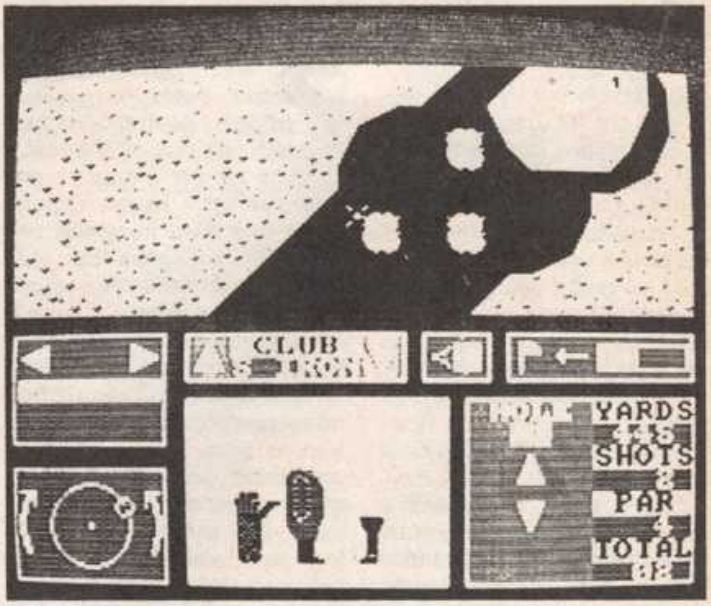
Golf games consist of choosing the correct club and calculating the angle and force of shot. They were among the earliest programs but Argus has dragged them into the present by improving the graphics with a scrolling view of the course, flying golf ball, and icon control.

Actually these icons are more than a flash accessory and many people will prefer a moving bar for power to 'Enter 1-100'. Judging the angle was always difficult enough without having to convert it to degrees. While taking the shot these can both be fine-tuned. There's also a caddy who informs you if you've chosen the wrong club – useful for non-golfers – and comments, most often sarcastically in my case, on your efforts.

It's all most appealing apart from one near fatal flaw. Without any magnification on the green, putting is extremely difficult and impossible when the ball is near the flag.

Not a hole in one, perhaps, better than par for the course.

**John Minson**




## In motion

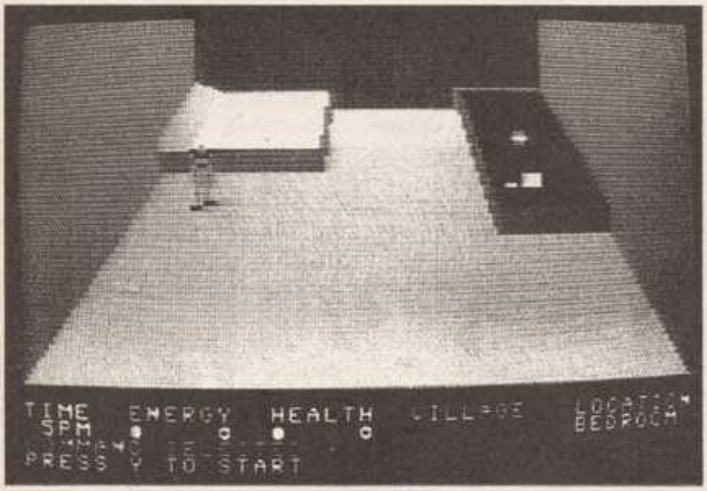
**Program** *Amsprite* **Micro** CPC 464 **Price** £8.95 **Supplier** The Electric Studio, PO Box 96, Luton LU3 2JP

This is the first Sprite graphics package I have seen for the Amstrad computers. It seems to be a reasonable utility, although it has some drawbacks that may make some people want to hang on for the release of something more powerful such as White Lightning. The good points are that the routine takes up very little memory space, up to 40 sprites can be defined at once, the maximum size being 32*46 pixels. The sprites are 'non-destructive' of any information already on screen and you have full control over wraparound, bounce and collision detection. The sprites can be animated in sequence, are smooth and flicker free. The speed of the response is good from Basic as long as you don't have too much happening on screen at once – 40 separate sprites would be ridiculous.

There is also a very-easy-to-use sprite editor which looks like a large copy of those UDG designing grids, but gives you full control over colour pallettes, allows scrolling, mirroring and reversing of images and can read the information to and from tape or memory.

The drawbacks are that you are restricted to working in mode 0, sprites cannot be defined offscreen and moved on, there appears to be no method of relocating the spriter movement code, and control of sprites from Basic is only achieved by poking a series of memory addresses with data. It is a shame no attempt was made to exploit the ability of the machine to add commands to the Basic itself, making the whole thing more user friendly. Thy manual is a classic example of why documentation shouldn't be written only by those who know exactly how the program works. It took me ages to work out some points, and I'm sure programming beginners could easily be baffled. The company also seem to have shied away from any mention of where they stand on copyright when games are produced using this utility.

**Tony Kendle**




## Hyde bound

**Program** *Mad Doctor* **Micro** Commodore 64 **Price** £8.95 **Supplier** Creative Sparks, Thompson House, 296 Farnborough Road, Farnborough, Hants

You know all those classic horror movies where the mad scientist steals bodies intent on building a human being out of spare parts, only to be foiled at the last minute by our hero who saves the village from its dreaded threat?

Haven't you thought like me, that just once, wouldn't it be nice if Christopher Lee turned the tables on Peter Cushing and the monster won?

Here's your chance with a very clever arcade adventure game from Creative Sparks called *Mad Doctor*. You are cast as the evil Dr Blockenspiel, who is intent on carrying out his late uncle's legacy of building the ultimate spare-part human. These ghoulish experiments take place in your castle, which, fortunately for you, overlooks a small sleepy village stocked with many potential victims. Using your joystick, you guide your doctor through six areas of the village ranging from the poor sector, and the village dwellings where the pub is to be found, through to the graveyard and the main centre which houses the hospital, a good place for supplies of needle and thread! The plan is to come upon an unsuspecting villager, bash him or her to death and cart off the body to your lab for a quick once over, select a useful appendage and then bury the remains. Choosing the right victim is important, you don't want your monster running around with a screw loose!

Sooner or later, as a result of your little trips, people become suspicious and chase you as soon as you venture out. Using cunning and strategy, and the odd hidden passage, you can outwit the village and realise your manic ambition, but beware choose the wrong parts and your final creation might just turn against you.

Plenty of locations, good 3-D graphics. And just when I though games were getting really wholesome.

**Andy Moss**

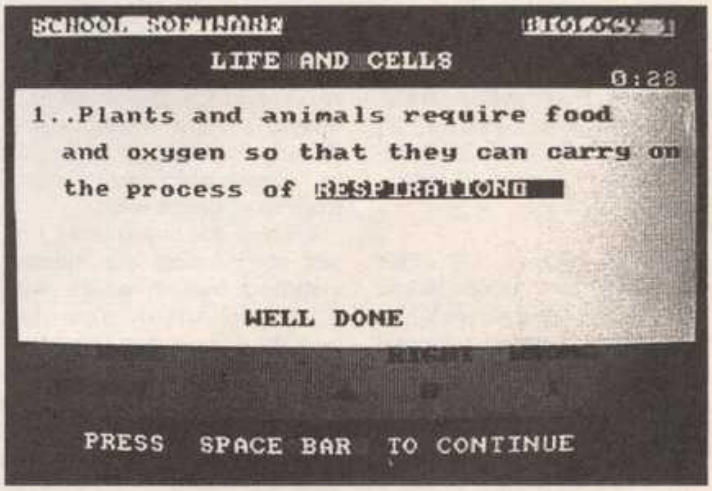
## No aid

**Program** *Biology 1 O-level* **Micro** CPC 464 **Price** £7.95 **Supplier** School Software, Meadowvale, Raheen, Limerick, Ireland

Have you ever wondered why people bother producing programs that simply duplicate the function of a book, but at five times the price?

I suppose that the answer is that using a computer can provide a motivation that a 'boring old book' couldn't do, so I won't play too much on the fact that this program consists of only about 100 text questions that any revision aid book worth its salt will improve upon. However, I will take exception to the fact that the thing has been programmed to carefully exploit all the worst points of a computer – most notably its inability to think. Consider this exchange. "Question: what type of soil is very free draining and low in mineral salts?" – my answer is SAND – "Wrong! The correct answer is SANDY".

In order to get over such infuriating drivel, adventure games programmers have had to learn how to develop some quite sophisticated language parsing routines in just a few K. Isn't it about time that education programmers woke up to the fact that our children deserve something just as good, or better? If nothing else there should be a routine that gives a choice of correct answers, recognises slight misspellings and even corrects them, or searches the response for recognised strings within it. It may not work all the time but it would be better than nothing.




If you want your children to grow up without the ability to provide imaginative responses to questions, to become obsessed with semantic trivialities or to become so frustrated they never want to see another education program again, then this is the tape for you.

**Tony Kendle**

## Head monitor

**Program** *Assembler* **Micro** Commodore 64 **Price** £16.95 **Supplier** McGraw-Hill, Shoppenhangers Road, Maidenhead, Berks

This is a sophisticated utility program designed to translate standard assembler mnemonics into machine code.

For the experienced programmer it is an essential tool, although I cannot recommend it for the novice, due to the lack of any detailed instructions in the accompanying manual. It is only 14 pages long and assumes that the reader is fully conversant with C64 machine-code.

The assembler has a number of interesting features incorporated in the design to give the programmer an easy life. For example, the source file (assembler Mnemonics) is written in normal Basic lines which means that the Commodores' own powerful text and screen editing system can be used. Also, the unassembled source file can be saved to tape or disc.

Another feature is the ability to run your programs with the assembler still in memory, invaluable when developing software. The assembler can be directed to store the assembled code anywhere in memory thus utilising all available memory space. Both disassembler and assembler can reside in memory simultaneously.

An excellent utility which I can thoroughly recommend. The disappointment is the lack of detail for the novice machine-code programmer.

**Andy Moss**

## Drop dead

**Program** *Hangman VI* **Micro** Commodore 64 **Price** £7.95 **Supplier** McGraw Hill, Shoppenhangers Road, Maidenhead, Berks SL6 2QL

Yes, it's back to that old favourite, *Hangman* – this time, disguised as an educational program for 11-13 year olds.

I'm sure all you intellectuals know how to play Hangman, so I won't bore you with the details. Suffice it to say that you only get seven chances to guess the letters before suffering a terrible death on the gallows. There are four levels of play, and the computer holds a bank of 800 words. Plenty to keep you busy, but if this isn't enough, you can also enter and save your own list of words. And if playing the computer becomes boring, you can always find a friend and give him/her a game just as if you were using a pencil and paper.

Hangman VI is certainly a very good program. It's got quite decent graphics and screen layout, and it even plays the odd tune or two. I did manage to crash the program once, though (syntax error line 3766?).

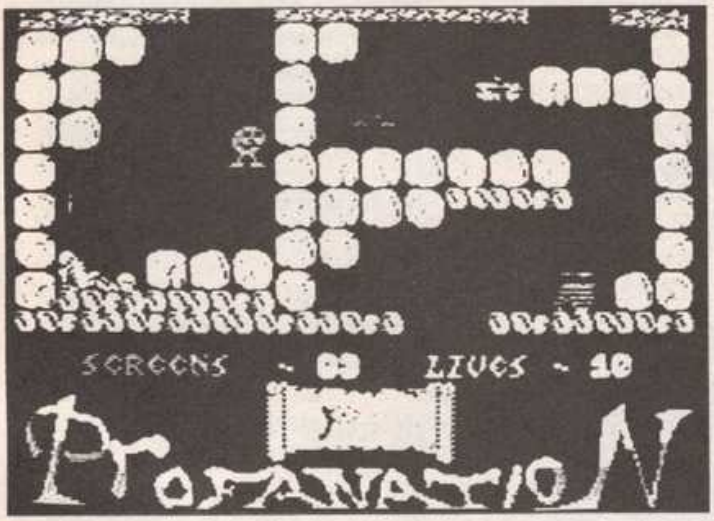
The tape has got plenty of options, I only wish I could get the computer to give me a few clues. If you fancy a *Hangman* program and want to learn something as well, you can't really go wrong.

**Tom Hussey**

## Pyramid pest

**Program** *Abu Simbel Profanation* **Micro** Spectrum 48K **Price** £6.95 **Supplier** Gremlin Graphics Software, Alpha House, 10 Carver Street, Sheffield S1 4FS

Poor old Johnny Jones (from Indianna?) didn't allow for the curses of Ramses II.




A plague of locusts? Worse! The handsome hero and two-fisted explorer was transformed to resemble nothing more than a grape with two legs! Afraid that this would ruin his love life (would you like to be caught kissing a smiling, winking grape, even when it's as well animated as JJ?) he retired into his pyramid.

Luckily old Ramses was s forward-looking pharaoh and had equipped his home with teleports and hidden doors triggered by hi-tech hieroglyphics. Unluckily his attitude to pest control was less advanced and the resting place was quickly overrun with everyday pyramid pests like malevolent mummies, sinister spiders and every day sort of nasty.

This means that once again we're running left and right and jumping to two heights to collect keys and map a path through the game. Basic arcade adventures of this type need some selling point and in this case it's the beautiful, atmospheric backgrounds and the comical hero who reminds me of *Bugaboo*, the Hispanic flea. Coincidentally the *Abu Simbel* title was written for Gremlin by Spanish authors.

Set against the backdrop is the excessively reflex testing timing needed to avoid the nasties. I'd have preferred strength reduction on contact to instant death for this reason but doubtless one reviewer's impossibility is another player's challenge, and you can't say pharaoh than that.

**John Minson**

## Magical moon

**Program** *Red Moon* **Micro** Spectrum 48K **Price** £6.95 **Supplier** Level 9 Computing, PO Box 39, Weston-Super-Mare, Avon BS24 9UR

There have been some excellent *Quilled* adventures, but sadly all too often the ease of this utility has led to feelings of deja vu.

Level 9 uses its own text compression system and, backed up with someone's rich imagination, this has produced a succession of eagerly awaited classics.

From the moment this adventure starts, looking out over a sea of grass, your quest to find the Red Moon Crystal begun, there's a feeling of care with a capital Q for Quality. It's not just the amount of text, nor the optional pictures that head most locations. *Red Moon* is so richly written by David Williamson and Pete Austin that it makes the term 'interactive novel' seem almost credible. Care has also been taken over the internal logic of the Island of Baskalos.

The game is rather more than an exercise in object

gathering and puzzle solving. The *Cast* command allows for magic, though you'll need to find a focus for some spells. Iron prevents magic which is an important factor when choosing what to carry, and you have limited strength for spell casting, none of which makes life easy.

Highly recommended.

**John Minson**

## Solo

**Program** *Chinese Patience* **Micro** Spectrum 48K **Price** £1.99 **Supplier** Atlantis, 19 Prebend Street, London N1 8PF

You don't have to be oriental to play *Chinese Patience*, a successor to the highly praised *Nines* card game from the Atlantis budget range.

For those unacquainted with this patience variation it's played competitively, the winner being the first player to dispose of all the cards.

You do this by placing cards in ascending sequence by suit on one set of piles, or in descending value in alternate colours on another four piles. Strategy comes in the ability to manipulate the second set of piles to open up new runs or, more sadistically, to transfer cards to your opponent's stack under certain circumstances. A turn continues until you can no longer discard cards.

If this all sounds complex on paper it soon becomes obvious in play and the subtleties of shifting cards to your best advantage, and your opponent's disadvantage, soon become clear. You can play sequences of games and I was soon hooked on attempting to beat my Spectrum.

Here lies the game's main problem though. The micro plays rather too well and some will find it dispiriting to be thrashed time after time. But it's a very neat implementation at a ludicrously low price.

**John Minson**

# Pandemonia

**Machine code action on the BBC B from the keyboard of Jeffrey Cooke**

In this game, you must move your character around the screen using *A,Z,?*, and / keys, collecting red objects as they scroll past at lightning speed, avoiding the white crosses. Ten must be collected within the time limit of 20 seconds, or you loose a life.

If you do collect ten, you move onto the next screen (there are 16 in all). On further screens you are pestered by such strange things as wandering fish and stray pixels. Be warned – this one is not easy!

The program is printed in two parts – this week and next, on the BBC page. When run, disc users should first type in *Page= &1100.*

If all that code proves to be too daunting, tape copies of the program can be obtained from the author fro £2.50. Write to Jeffrey Cooke at 152 Galliagh Park, Londonderry, N. Ireland BT48 8DF.

```
   10 REM (C) PANDEMONIA
   20 REM JEFFREY COOKE
   30 REM DEDICATED TO JACQUELINE
   40 ENVELOPE 1,5,10,-5,0,1,0,0,12
7,0,0,-3,126,126
   50 ENVELOPE 2,1,-10,-50,-100,1,1
,1,10,20,-30,50,50,0
   60 ENVELOPE 3,1,0,0,-1,1,2,10,25
,-15,-4,-1,126,126
   70 ENVELOPE 4,1,4,-4,4,10,20,10,
127,0,0,-5,126,126
   80 *FX225,0
   90 !&CFC=RND:?&CFB=&53:?&CF9=&B5
:?&CFA=&76:?&CFB=&65
  100 *FX19
  110 PROCdatset(&6000,&7203,250)
  120 PROCdatset(&7300,&76F0,5000)
  130 PROCdatset(&7700,&79F0,6040)
  135 PROCtrans(&6000,&1900,&1200)
  140 PROCtrans(&7300,&2C00,&3F0)
  145 PROCtrans(&7700,&A00,&2F0)
  147 PRINT"READY"
  150 CALL&1900
  160 DEF PROCdatset(START,FINISH,R
ESET)
  170 RESTORE RESET
  180 FOR X%=START TO FINISH STEP 1
0
  190 READ Z$
  200 FOR Y%=1 TO 19 STEP 2
  210 A$=MID$(Z$,Y%,2):A%=EVAL("&"+
A$)
  220 B%=((Y%-1)/2)+X%:?B%=A%
  230 NEXT:NEXT
  240 ENDPROC
  241 DEF PROCtrans(F%,T%,L%)
  242 FOR X%=0 TO L%
  243 A%=X%+F%:B%=X%+T%
  244 ?B%=?A%:NEXT
  245 ENDPROC
  250DATA 20A127201D1920361920
  260DATA 6319A584F00620581C4C
  270DATA 061920B0194C001960A9
  280DATA 00858C858D858E858FA9
```

```
290DATA 018DF50CA9008DF60CA9
300DATA 03858460A9008580A954
310DATA 8581A900858285838585
320DATA 858785888DF70CA200BD
330DATA 000B9D000CE8E0F0D0F5
340DATA A900B58CA920858D60AD
350DATA F60CC900F01EC901F020
360DATA C902F022C903F024C904
370DATA F026C905F028C906F02A
380DATA 20C31B4CAF1920F7194C
390DATA AF1920331A4CAF192074
400DATA 1A4CAF1920B51A4CAF19
410DATA 20F61A4CAF1920371B4C
420DATA AF19207D1B60A91F20EE
430DATA FFA90620EEFFA90A20EE
440DATA FFA91120EEFFA90320EE
450DATA FFA94720EEFFA94120EE
460DATA FFA94D20EEFFA94529EE
470DATA FFA92020EEFFA94F20EE
480DATA FFA95620EEFFA94520EE
490DATA FFA95220EEFF6020C727
500DATA 20091C20801C20CD1C20
510DATA 4F22208621ADF50CC902
520DATA F006203D234C1F1A2007
530DATA 24204F2220862120E127
540DATA ADF70CF0D9C902F00720
550DATA 5728A584D0C56020C727
560DATA 20091C20801C20CD1C20
570DATA 4F22208621A901209F1F
580DATA ADF50CC902F006203D23
590DATA 4C601A200724204F2220
600DATA 862120E127ADF70CF0D4
610DATA C902F007205728A584D0
620DATA C06020C72720091C2080
630DATA 1C20CD1C204F22208621
640DATA A90120CD1EADF50CC902
650DATA F006203D234CA11A2007
660DATA 24204F2220862120E127
670DATA ADF70CF0D4C902F00720
680DATA 5728A584D0C06020C727
690DATA 20091C20801C20CD1C20
700DATA 4F22208621A902209F1F
710DATA ADF50CC902F006203D23
720DATA 4CE21A200724204F2220
730DATA 862120E127ADF70CF0D4
740DATA C902F007205728A584D0
750DATA C06020C72720091C2080
760DATA 1C20CD1C204F22208621
770DATA A90320CD1EADF50CC902
780DATA F006203D234C231B2007
790DATA 24204F2220862120E127
800DATA ADF70CF0D4C902F00720
810DATA 5728A584D0C06020C727
820DATA 20091C20801C20CD1C20
830DATA 4F22208621A902209F1F
840DATA A90120CD1EADF50CC902
850DATA F006203D234C691B2007
860DATA 24204F2220862120E127
870DATA ADF70CF0CFC902F00720
880DATA 5728A584D0BB6020C727
890DATA 20091C20801C20CD1C20
900DATA 4F22208621A902209F1F
910DATA A90320CD1EADF50CC902
920DATA F006203D234CAF1B2007
930DATA 24204F2220862120E127
940DATA ADF70CF0CFC902F00720
950DATA 5728A584D0BB6020C727
960DATA 20091C20801C20CD1C20
970DATA 4F22208621A902209F1F
980DATA A90520CD1EADF50CC902
990DATA F006203D234CF51B2007
1000DATA 24204F2220862120E127
1010DATA ADF70CF0CFC902F00720
1020DATA 5728A584D0BB60A91F20
1030DATA EEFFA90020EEFFA91D20
1040DATA EEFFA91120EEFFA90620
1050DATA EEFFA95320EEFFA94320
1060DATA EEFFA95220EEFFA94520
1070DATA EEFFA94520EEFFA94E20
1080DATA EEFFA92020EEFFADF50C
1090DATA 18694020EEFFADF60C18
1100DATA 693020EEFF60ADF60CC9
1110DATA 07F006EEF60C4C7C1CA9
1120DATA 008DF60CEEF50CADF50C
1130DATA C903F0034C7C1CA9028D
1140DATA F50C20852960A9108DF3
1150DATA 0CA97B8DF40CA584F03E
1160DATA 8DF20CCEF20CF036ADF3
1170DATA 0C8570ADF40C8571A911
1180DATA 8575A9068576A9008577
1190DATA A92C8578205D25CEF20C
1200DATA F014ADF30C186938DDF3
1210DATA 0CADF40C69008DF40C4C
1220DATA 961C60A9BE207526F00E
1230DATA 20AE1DD00920221D2086
1240DATA 2A4C1E1DA99E207526F0
1250DATA 0E20071ED00920451D20
1260DATA 862A4C1E1DA9B7207526
1270DATA F00E20C91DD009206B1D
1280DATA 20862A4C1E1DA9972075
1290DATA 26F00B20EB1DD006208B
1300DATA 1D20862A20541E60A580
1310DATA 8570A581857120BF25A5
1320DATA 8385722013 26A5708580
1330DATA A5718581A5728583A573
1340DATA 858260A5808570A58185
1350DATA 7120E925A58385722036
1360DATA 26A5708580A571858 1A5
1370DATA 728583A573858260A580
1380DATA 8570A581857120BF25A5
1390DATA 8385722036 26A5708580
1400DATA A5718581A5728583A573
1410DATA 858260A5808570A58185
1420DATA 7120E925A58385722013
1430DATA 26A5708580A571858 1A5
1440DATA 728583A573858260A580
1450DATA 8570A581857120B926A0
1460DATA 00B170C900F005A9FF4C
1470DATA C81DA90060A5808570A5
1480DATA 818571A9078572209026
1490DATA A000B170C900F005A9FF
1500DATA 4CE71DA90060A5808570
1510DATA A5818571A9118572209E
1520DATA 26A000B170C900F005A9
1530DATA FF4C061EA90060A5B085
1540DATA 70A5818571A9118573A9
1550DATA 07857220AE26A000B170
1560DATA C900F005A9FF4C291EA9
1570DATA 0060A9118570A9008571
1580DATA A9028572A900B573A94B
1590DATA 8574A9008575A9018576
1600DATA A9008577A270A000A907
1610DATA 20F1FF60A582F03AA583
1620DATA F01BA5808570A5818571
1630DATA A9118575A907B576A966
1640DATA 8577A92C85784CC91EA5
1650DATA 808570A5818571A91185
1660DATA 75A9068576A9008577A9
1670DATA 2C85784CC91EA583F01B
1680DATA A5808570A5818571A911
1690DATA 8575A9078576A9438577
1700DATA A92D85784CC91EA58085
1710DATA 70A5818571A9118575A9
1720DATA 068576A9DD8577A92C85
1730DATA 78205D2560858BA90085
1740DATA 8AA9008589A48AA689B9
1750DATA 120C957AE8C8E006D0F5
1760DATA 20031FA9008589A48AA6
1770DATA B9B57A99120CE8C8E006
1780DATA D0F5848AC68BD0D160A5
1790DATA 7CF00620351F4C101F20
1800DATA 4C1FA57A857EA57B857F
1810DATA A57CF00620631F4C251F
1820DATA 20771F208B1FA90FA000
1830DATA 917AA900A000917E60A5
1840DATA 7A8570A57B857120BF25
1850DATA A94120C526F004A90085
1860DATA 7C60A57A8570A57B8571
1870DATA 20E925A94120C526F004
1880DATA A901857C60A57A8570A5
1890DATA 7B857120BF25A570857A
1900DATA A571857B60A57A8570A5
1910DATA 7B857120E925A570857A
1920DATA A57185 7B60A57A8570A5
1930DATA 7B8571A90420C526F004
1940DATA A9018585608588A5886A
1950DATA 9033A900858AA9008589
1960DATA A48AA689B9000C957AE8
1970DATA C8E006D0F520DA1FA900
1980DATA 8589A48AA689B57A9900
1990DATA 0CE8C8E006D0F5848AC6
2000DATA 8BD0D160A57DF00D2031
2010DATA 20C901D010209F204CF5
2020DATA 1F206A20C901D003209F
2030DATA 20A57DF006204E204C02
2040DATA 20208320A580C57AA581
2050DATA E57B900620D5204C1520
2060DATA 20AF20200D21A57DF006
2070DATA 20E9204C252020FD20A9
2080DATA 0420C526F004A9018585
2090DATA 60A57A8570A57B8571A9
2100DATA 0A8572A90A8573202827
2110DATA A94420C526F002A90160
2120DATA A57AB570A57B8571A57C
2130DATA 8572203626A570857AA5
2140DATA 71857BA572857C60A57A
2150DATA 8570A57B8571A90A8572
2160DATA 20FA26A94420C526F002
2170DATA A90160A57A8570A57B85
2180DATA 71A57C8572201326A570
2190DATA 857AA571857BA572857C
2200DATA 60A57DF007A900857D4C
2210DATA AE20A901857D60A57A85
2220DATA 70A57B8571208F25A941
2230DATA 20C526D013A57A8570A5
2240DATA 7B857120BF25A570857A
2250DATA A571857B60A57A8570A5
2260DATA 7B857120E925A570857A
2270DATA A571857B60A57A8570A5
2280DATA 7B8571A90A8572A90A85
2290DATA 7320282760A57A8570A5
2300DATA 7B8571A90AB57220FA26
2310DATA 60A57DF03AA57CF01BA5
2320DATA 7A8570A57B8571A90A85
2330DATA 75A90A8576A9D28577A9
2340DATA 2E85784C8221A57A8570
2350DATA A57B8571A90AB575A909
2360DATA 8576A9148577A92E8578
2370DATA 4C8221A57CF01BA57A85
2380DATA 70A57B8571A90A8575A9
2390DATA 0A8576A9BA8577A92D85
2400DATA 784C8221A57A8570A57B
2410DATA 8571A90A8575A9098576
2420DATA A9BA8577A92D8578205D
2430DATA 2560AD300C857AAD310C
2440DATA 857BAD320C857C20A821
2450DATA A57A8D300CA57B8D310C
2460DATA A57C8D320C60A585C901
2470DATA F01DA57CF01320CC21A5
2480DATA 7CF00C20022220102220
2490DATA 2C224CCB2120AE282010
2500DATA 2260A57A8570A57B8571
2510DATA A9058572A90985732028
2520DATA 27A94420C526F00320EA
2530DATA 2160A57A8570A57B8571
2540DATA A9098575A90585762941
2550DATA 27A900857C60A57A1869
2560DATA 08857AA57B6900857B60
2570DATA A57A8570A57B8571A909
2580DATA 8575A9058576A9658577
2590DATA A92F8578205D2560A57A
2600DATA 8570A57B8571A9058572
2610DATA A9098573202827A90420
2620DATA C526F008A9018585A900
2630DATA 857C60AD0C0C857AAD0D
2640DATA 0C857BAD0E0C857C2071
2650DATA 22A57A8D0C0CA57B8D0D
```

# Twain meets twain

*Use Spectrum screen pictures on your Amstrad with this program by* ***J Keneally***

Creating screen pictures can be very time-consuming even with a good graphics designer. This program allows any Spectrum screen dump to be read into the Amstrad and developed onto the screen in the same colours. There are a wealth of excellent Spectrum screen pictures around which can be used as a starting point for your own Amstrad screens.

Alternatively the program can be used to speed up title screen loading. Even on fast load, the 16K Amstrad screen takes along time to load. It is much quicker to create the screen on a Spectrum, dump it, and use that instead. It also makes life more difficult for the pirates!

To transfer between the Spectrum and CPC464 screens we must scan through each Spectrum screen pixel, then for each pixel check whether it is on or off, and decode the corresponding colour from the Attribute block. Now encode the colour into CPC464 (*Mode 0*) format and write the encoded colour to the screen.

The process is slightly complicated by the mis-match of the number of horizontal pixels per line. On the Spectrum there are 256, on the CPC464 (*Mode 0*) only 160. We must either compress three Spectrum pixels into two on the CPC464 (covering 240 pixels on the Spectrum and losing the other 16), or 'frame out' any 160 pixels on the Spectrum without compression. Both these options are available in the program.

Of course, the Spectrum screen dump must be read into the CPC464 first. This is read into locations 32768 onwards, using a special reader routine. This routine will in fact read in *any* Spectrum memory dump.

Typing in should be straightforward, though it is easy to make errors when entering the Data statements in Lines 670 onwards. For this reason, each of these lines has a checksum incorporated. If you make a mistake you will get an error message when the program is run.

After running the program, you will be asked to load the Spectrum screen dump, and press a key to start loading it. On completion, you will have a blank screen with the legend:– F, W, I or S shown. These are the command keys as follows:–

F = display the Full compressed picture

W = display a Window of 160 pixels. You select the window by entering a horizontal offset. A zero value means start from the extreme left of the picture. The code for this has been written mainly in Basic so that you can more easily follow how it works. It therefore runs much slower than the more complicated code for the 'F' command, which is in machine-code.

I = change the colour of a particular ink. This allows you to instantaneously alter the colour of all parts painted in that ink.

S = Save the screen to tape.

**Program Notes**

**Variables**

| | |
|---|---|
| ldscreen | address of Spectrum dump loader |
| attr | routine to decode Spectrum colours |
| fullsc | routine to create compressed picture |
| xcoord,ycoord | pixel coords for Spectrum |
| amdad | Amstrad display address |
| spdad | Spectrum screen address |
| pixel%, pap%,nink%, | pixel on/off, paper, and ink colours from Spectrum |

| **Line No** | |
|---|---|
| 80-160 | Initialisation |
| 170 | Load Spectrum dump |
| 180-210 | Set ink colours |
| 220-269 | Select command |
| 270-320 | Dump Amstrad screen |
| 330-350 | Change ink colour |
| 360-370 | Do compressed picture |
| 380-490 | Do 'framed' picture |
| 500-660 | Routine to create machiner-code routines |
| 670-840 | Code for Spectrum dump loader |
| 850-1100 | Code for transfers. |

```
 80 REM Screen transfer utility, S
pectrum to CPC464
90 REM Copyright J. Keneally
100 BORDER 0:MEMORY 18000:CALL &BBF
F:CALL &BB4E:REM reset screen
110 ldscreen=39755:attr=40003:fulls
c=&9CE3
120 xcoord=40000:ycoord=40002:REM x
 & y for code routines.
130 GOSUB 500: REM Load code
140 amdad=&C000:spdad=32768:REM CPC
464 and Spectrum screen addresses.
150 INK 1,13:INK 0,1:PAPER 0:PEN 1:
CLS:PRINT"Load SPECTRUM screen dump
, press a key"
160 IF INKEY$="" THEN 160
170 CALL ldscreen,spdad
180 ON ERROR GOTO 1110:MODE 0:WINDO
W #1,1,20,25,25:PEN#1,7:PAPER#1,0
190 RESTORE 200:FOR i%=0 TO 15:READ
 j%:INK i%,j%:NEXT:REM Set up inks
0 to 15
200 DATA 0,1,9,10,3,4,12,13,0,2,18,
20,6,8,24,26
210 PRINT#1,"F,W,I, or S";:REM Remi
nd user of commands.
220 a$=INKEY$:IF a$="" THEN 220
230 a$=UPPER$(a$):IF a$="F" THEN 36
0
240 IF a$="W" THEN 380
250 IF a$="I" THEN 330
260 IF a$<>"S" THEN 220
270 REM ****Screen Save Segment****
280 CLS#1:PRINT#1,"Load tape, hit k
ey";
290 IF INKEY$<>"" THEN 290
300 IF INKEY$="" THEN 300
310 CLS#1:PRINT#1,"Saving...";:
320 SAVE"!pict",b,amdad,16384:CLS#1
:GOTO 210
330 REM ***** Change inks segment**
***
340 CLS#1:INPUT#1,"Ink no. ";nink%:
CLS#1
350 INPUT#1,"Colour no. ";col%:CLS#
1:INK nink%,col%:GOTO 210
360 REM ****Compress Spectrum onto
CPC464*****
370 CALL fullsc:GOTO 220:REM All do
ne in machine-code
380 REM *****Frame out part of Spec
trum screen****
390 CLS#1:INPUT#1,"Offset? 0-96";of
fset:screenbase=amdad:screenadr=scr
eenbase:CLS#1
400 IF (offset<0) OR (offset>96) TH
EN 390
410 FOR y%=191 TO 0 STEP -1:POKE xc
oord,offset:POKE ycoord,y%
420 FOR x%=offset TO offset+159 STE
P 2
430 IF INKEY$=" " THEN ERROR 17: RE
M if SPACE pressed, abort
440 pap%=0:nink%=0:pixel%=0:CALL at
tr,@pixel%,@pap%,@nink%:col%=pap%:I
F pixel%<>0 THEN col%=nink%
450 CALL attr,@pixel%,@pap%,@nink%:
col2%=pap%:IF pixel%<>0 THEN col2%=
nink%
460 POKE screenadr,2*col%+col2%:scr
eenadr=screenadr+1:NEXT
470 IF (y% MOD 8)=0 THEN screenbase
=screenbase+80:screenadr=screenbase
:GOTO 490
480 screenadr=screenadr+2048-80
490 NEXT:CLS#1:GOTO 210
500 REM Load machine-code segments.
510 REM First the code to read SPEC
TRUM
520 REM format dumps into the CPC46
4.
```

```
530 REM This is used by doing:-
540 REM CALL 39755,address (where a
ddress
550 REM is the required load addres
s)
560 REM See for example Basic line
20
570 REM ANY Spectrum code dump can
be read,
580 REM not just screen dumps.
590 RESTORE 670:address=39750:GOSUB
 620
600 REM Now the code for decoding t
he Spectrum screen
610 RESTORE 850:address=40000:GOSUB
 620:RETURN
620 REM Load code with checks
630 code=0:checksum=0
640 WHILE code)=0:READ code:POKE ad
dress,ABS(code):address=address+1:c
hecksum=checksum+code:WEND
650 IF code=-2 THEN READ check,lno:
IF check<>checksum THEN CLS:PRINT"E
rror in line ";lno:STOP: ELSE addre
ss=address-1:GOTO 630
660 RETURN
670 DATA 0,0,0,0,0,-2,-2,1500
680 DATA 205,110,188,243,221,126,0,
50,70,155,221,126,1,50,-2,1764,1510
690 DATA 71,155,217,197,1,0,245,217
,8,245,8,62,0,50,74,155,-2,1703,152
0
700 DATA 221,42,70,155,17,17,0,62,0
,205,154,155,48,28,221,42,-2,1435,1
530
710 DATA 70,155,221,94,11,221,86,12
,62,255,205,154,155,48,11,8,241,-2,
2007,1540
720 DATA 8,217,193,217,205,113,188,
251,201,62,1,50,74,155,24,238,20,8,
21,-2,2244,1550
730 DATA 62,0,31,31,230,32,79,191,0
,205,33,156,48,250,33,21,-2,1400,15
60
740 DATA 4,16,254,43,124,181,32,249
,205,29,156,48,235,6,142,-2,1722,15
70
750 DATA 205,29,156,48,228,62,190,1
84,48,224,36,32,241,6,194,-2,1881,1
580
760 DATA 205,33,156,48,213,120,254,
206,48,244,205,33,156,208,-2,2127,1
590
770 DATA 121,230,255,79,38,0,6,165,
24,31,8,32,7,0,0,221,117,-2,1332,16
00
780 DATA 0,24,15,203,17,173,192,121
,31,79,19,24,7,221,126,0,173,-2,142
3,1610
790 DATA 192,221,35,27,8,6,167,46,1
,205,29,156,208,62,196,184,-2,1741,
1620
800 DATA 203,21,6,165,210,4,156,124
,173,103,122,179,32,202,-2,1698,163
0
810 DATA 124,254,1,201,205,33,156,2
08,62,25,61,32,253,167,-2,1780,1640
820 DATA 4,200,217,237,120,217,31,3
1,169,230,32,40,243,121,47,-2,1937,
1650
830 DATA 79,230,7,246,8,55,201,-2,8
24,1660
840 DATA -1
850 REM Code for screen transfer.
860 DATA 0,0,0,58,66,156,71,62,191,
144,230,248,-2,1224,1802
870 DATA 111,38,0,84,41,41,58,64,15
6,60,50,64,-2,765,1804
880 DATA 156,61,31,31,31,230,31,95,
25,17,0,152,-2,858,1806
890 DATA 25,126,230,7,79,126,31,31,
31,230,7,71,-2,992,1808
900 DATA 203,118,40,8,62,8,129,79,6
2,8,128,71,-2,914,1810
910 DATA 121,205,203,156,120,221,35
,221,35,205,203,156,-2,1879,1812
920 DATA 33,66,156,62,191,150,79,23
0,7,87,121,31,-2,1211,1814
930 DATA 31,31,230,31,71,230,24,130
,87,120,230,7,-2,1220,1816
940 DATA 23,23,23,23,23,95,43,43,12
6,61,71,31,-2,583,1818
950 DATA 31,31,230,31,131,95,120,23
0,7,60,71,33,-2,1068,1820
960 DATA 0,128,25,126,23,5,32,252,6
2,0,143,221,-2,1015,1822
970 DATA 110,2,221,102,3,119,201,14
,0,30,4,31,-2,835,1824
980 DATA 203,17,167,203,17,29,32,24
7,167,203,25,221,-2,1529,1826
990 DATA 110,0,221,102,1,113,201,33
,0,192,93,84,-2,1148,1828
1000 DATA 62,191,50,66,156,175,50,6
4,156,221,33,58,-2,1280,1830
1010 DATA 157,229,213,205,67,156,20
5,68,157,135,221,119,-2,1930,1832
1020 DATA 6,205,67,156,205,68,157,2
21,134,6,33,64,-2,1320,1834
1030 DATA 156,52,209,225,18,19,58,6
4,156,254,238,56,-2,1503,1836
1040 DATA 216,58,66,156,230,7,40,18
,235,1,176,7,-2,1208,1838
1050 DATA 9,235,1,66,156,10,214,1,2
,210,237,156,-2,1295,1840
1060 DATA 251,201,1,80,0,9,93,84,24
,236,65,157,-2,1199,1842
1070 DATA 66,157,67,157,0,0,0,0,221
,33,65,157,-2,921,1844
1080 DATA 221,78,0,221,70,1,221,126
,2,167,40,1,-2,1146,1846
1090 DATA 65,120,221,33,58,157,201,
-2,853,1848
1100 DATA -1,0,0
1110 RESUME 210
```

British Telecommunications plc.

# Joining up the dots

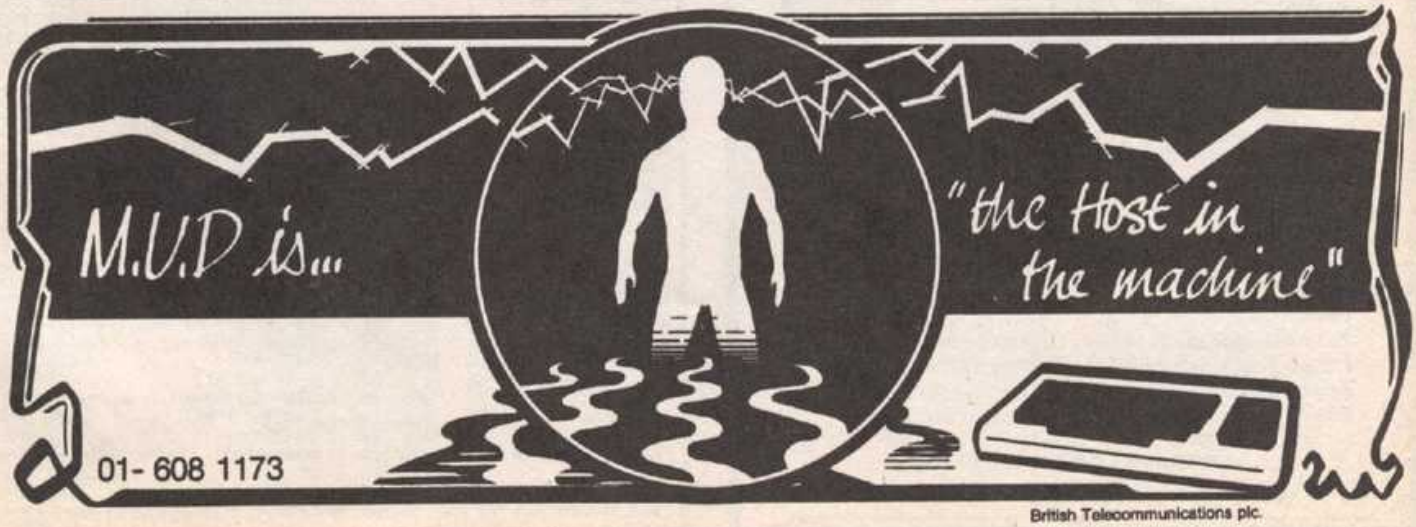
*Part One of a general purpose plotting routine*
*by **John Cochrane***

When I am wearing my technical consultant's hat I often have to deal with collections of numbers of one sort or another. Staring at a jumble of numbers on a piece of paper is a mind-dulling experience and I will usually want to plot the whole lot out onto a sheet of graph paper as quickly as possible in order to begin to make sense of the data. This is where the QL should start making itself useful by quickly plotting my data for me. *Easel* is, unfortunately from my point of view, intended primarily for plotting financial data and falls down rather badly when it comes to dealing with most other forms of data. The following program will fit a least-squares curve to a set of data and, after automatically scaling the graph, will plot out the data points and the curve.

In fact I have a number of versions of the program running on different machines and providing different facilities. The program has been written with this flexibility in mind and I have thus kept the thing as general as possible. As presented below, the program will plot up to three sets of data on a single graph. A least-squares polynomial of order one to four can be fitted to each data set, or straight lines can be used to "join the dots". Up to 20 data points can be included in each data set. This number can readily be increased but the screen display can get crowded and the program takes longer to run. All the data is set up in *Data* statements, although here again modification to allow keyboard input would be quite simple. Another not quite so simple extension which I have working in one version is to get the thing to plot several separate graphs on the screen at one time, but the screen resolution means that the graph annotation has to be simplified if the graph size is reduced too far. Program notes and the rest of the listing next week.

```
100 REMark ************* PLOT ****************************
110 REMark This program plots up to 3 lines.
120 REMark Up to 20 points per line.
130 REMark Scaling and curve-fitting is automatic.
140 REMark ***********************************************
150 START_UP
160 READ_DATA
170 FIND_SCALE
180 DRAW_GRAPH
190 FOR n_line=1 TO number of lines
200   FIND_FIT
210   PLOT_DATA
220   PRINT_KEY
230 END FOR n_line
240 WINDOW #1,477,12,23,12:BORDER #1,1,7
250 WINDOW #1,460,12,30,242:BORDER #1,1,2
260 WAIT$=INKEY$(-1)
270 WINDOW #1,477,244,23,12:CLS #1
280 WINDOW #1,477,212,23,12:BORDER #1,1,7:CLS #1
290 STOP
300 :
310 DEFine PROCedure START_UP
320   REMark Dimension variables, etc.
330   DIM x(3,20),y(3,20),A(20,20),B(19)
340   DIM data_points(3),key$(3,12),line_type(3)
350   MODE 512
360   WINDOW #1,512,256,0,0:BORDER #1,100,0:CLS #1
370   WINDOW #1,477,244,23,12:BORDER #1,1,7
380   INK #1,7:PAPER #1,0:CLS #1
390   AT 8,30:PRINT #1,"THINKING....."
400   SCALE #1,242,-30,-36
410   x_axis_length=305:y_axis_length=185
420   tick_x=1.5:tick_y=2
430 END DEFine START_UP
440 :
450 DEFine PROCedure READ_DATA
460   REMark Read in the plot-data.
470   RESTORE
480   READ title$
490   READ x_title$,y_title$
500   READ number_of_lines
510   FOR n_line=1 TO number_of_lines
520     READ key$(n_line)
530     READ line_type(n_line)
540     READ data_points(n_line)
550     FOR n_data=1 TO data_points(n_line)
560       READ x(n_line,n_data),y(n_line,n_data)
570     END FOR n_data
580   END FOR n_line
590 END DEFine READ_DATA
600 :
610 REMark DATA
620 :
630 REMark MAIN TITLE
640 DATA "Test Graph; 3-Line Plot."
650 REMark AXIS TITLES
660 DATA "X Axis title","Y Axis Title"
670 REMark NUMBER OF LINES ON PLOT
680 DATA 3
690 REMark DATA FOR 1ST LINE
700 REMark KEY-COMMENT
710 DATA "Cubic-Fit"
720 REMark TYPE OF LINE-FIT
730 DATA 3
740 REMark NO OF DATA POINTS
750 DATA 15
760 REMark DATA POINTS FOR LINE 1 (X,Y)
770 DATA -60,-10,-35,-8,-2,-5,3,-4,6,-1,10,3,12,1,20,10
780 DATA 28,18,32,22,51,38,60,49,67,60,92,70,115,45
790 REMark OTHER DATA SETS
800 DATA "Linear-Fit",1,5
810 DATA -50,-10,12,0,28,3,110,30,110,25
820 DATA "Join-Dots",6,4
830 DATA 70,-10,75,-5,80,-10,90,-10
840 :
850 DEFine PROCedure FIND_FIT
860   REMark Fit a curve to the data.
870   type_of_line=line_type(n_line)
880   SELect ON type_of_line
890    =1 TO 4
900     REMark -------- LEAST-SQUARES FIT -----------
910     FOR K=1 TO 6:B(K)=0
920     REMark Simultaneous eqns.....
930     order_plus_one=type_of_line+1
940     IF order_plus_one>data_points(n_line) THEN
```

```
950       order_plus_one=data_points(n_line)
960     END IF
970     FOR L=1 TO order_plus_one
980       FOR M=1 TO order_plus_one
990         sum_1=0:sum_2=0
1000        FOR K=1 TO data_points(n_line)
1010          sum_1=sum_1+x(n_line,K)^(L+M-2)
1020          sum_2=sum_2+y(n_line,K)*x(n_line,K)^(L-1)
1030        END FOR K
1040        A(L,M)=sum_1
1050        A(L,order_plus_one+1)=sum_2
1060      END FOR M
1070    END FOR L
1080    REMark Solve system of eqns.....
1090    rows=order_plus_one:cols=order_plus_one+1
1100    FOR K=1 TO rows
1110      pivot=A(K,K):K_or_L=K
1120      FOR L=K+1 TO rows
1130        IF ABS(A(L,K))>=ABS(pivot) THEN
1140          pivot=A(L,K):K_or_L=L
1150        END IF
1160      END FOR L
1170      IF K_or_L<>K THEN
1180        FOR L=1 TO cols
1190          temp_1=A(K,L)
1200          A(K,L)=A(K_or_L,L)
1210          A(K_or_L,L)=temp_1
1220        END FOR L
1230      END IF
1240    END FOR K
1250    FOR L=2 TO cols
1260      A(1,L)=A(1,L)/A(1,1)
1270    END FOR L
1280    FOR L=2 TO rows
1290      FOR K=L TO rows
1300        sum_1=0
1310        FOR M=1 TO L-1
1320          sum_1=sum_1+A(K,M)*A(M,L)
1330        END FOR M
1340        A(K,L)=A(K,L)-sum_1
1350      END FOR K
1360      FOR K=L+1 TO cols
1370        sum_1=0
1380        FOR M=1 TO L-1
1390          sum_1=sum_1+A(L,M)*A(M,K)
1400        END FOR M
1410        A(L,K)=(A(L,K)-sum_1)/A(L,L)
1420      END FOR K
1430    END FOR L
1440    B(rows)=A(rows,cols)
1450    FOR L=1 TO rows-1
1460      temp_1=rows-L:sum_1=0
1470      FOR K=temp_1+1 TO rows
1480        sum_1=sum_1+A(temp_1,K)*B(K)
1490      END FOR K
1500      B(temp_1)=A(temp_1,cols)-sum_1
1510    END FOR L
1520    =5
1530    REMark -------- JOIN THE DOTS ETC -------------
1540  END SELect
1550 END DEFine FIND_FIT
1560 :
1570 DEFine PROCedure FIND_SCALE
1580   REMark Sort data, find max., min., then scale.
1590   x_min=x(1,1):y_min=y(1,1):x_max=x_min:y_max=y_min
1600   FOR n_line=1 TO number_of_lines
1610     FOR N=1 TO data_points(n_line)-1
1620       temp_1=0
1630       FOR K=1 TO data_points(n_line)-1
1640         IF x(n_line,K)>x(n_line,K+1) THEN
1650           temp_1=1
1660           temp_2=x(n_line,K)
1670           x(n_line,K)=x(n_line,K+1)
1680           x(n_line,K+1)=temp_2
1690           temp_2=y(n_line,K)
1700           y(n_line,K)=y(n_line,K+1)
1710           y(n_line,K+1)=temp_2
1720         END IF
```



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PD586

# A gentleman's excuse me

*Interrupt driven music on the 64 from the keyboard of* ***Gareth Thomas***

Although the 64 has a powerful graphics and sound capabilities that are renowned throughout the computing world, to achieve a mixture of both these mediums in Basic is a slow and difficult process. This is where Machine Code comes in to help, in this case with the sound.

If you've ever wanted to play a little tune while juggling with your sprites and hires graphics (well nigh impossible in Basic) now's your chance. With this routine in operation you can play any tune you decide while your basic program can be left to do other things.

The program makes use of the Hardware Interrupt. This takes place every 60th of a second, during which time the processor drops what it's doing and jumps to a routine pointed to by the Interrupt ReQuest vector (IRQ) at $0314 & $0315 when it scans the keyboard, flashes the cursor, updates the system clock, etc. All this of course goes on unnoticed since it happens in a fraction of a second.

All my routine does is to alter the *IRQ* vector to point to my routine which is then executed before the process continues as normal.

**Program Notes**

There are a number of memory locations which are used by the routine.

251 (low byte), 252 (high byte) – pointer-start of music.

253 (low byte), 254 (high byte) – pointer-repeat music.

828 – countdown to next note

829 – waveform (*Poke* without gate set, ie pulse = 64 *not* 65)

830 – *Flag* – play music

831 – *Flag* – repeat music

As you can see 251,252 point to the start of the music. The music will be played from this address onwards until a value of 0 is encountered for duration, when unless the repeat flag is set, play will stop. If the repeat flag is set play will continue from the address pointed to in 253,254.

The data to be *Poked* for the music must be in the form; *Hi,Lo,Duration,Hi,Lo,Duration etc . . .* The values for Hi and Lo can be found in the manual page 161. The duration is in 60ths of a second (ie, to play a note for one second the duration must be 60), the maximum duration being 255 which is 4½ seconds. Rests can be achieved by setting Hi and Lo both to 0 and then the duration to the length of the rest.

The parameters controlling the sound, such as the ADSR and waveform, can be changed at any time even when the routine is running without crashing the computer.

Finally the *IRQ* driver also disables the *Run Stop/Restore* keys which if pressed would reset the *IRQ* which would stop the music. To set this to normal type *Sys 51859*, but if *Poke 830,0* is typed the keys will still be disabled and only the music will stop.

```
0 REM  INTERRUPT DRIVEN MUSIC ROUTINE
1 REM            FOR P.C.W
2 REM     (C) BY GARETH THOMAS 1985
10 FORT=832TO885:READA:POKET,A:NEXT
11 R=51858:T=0
12 R=R+1:READA:IFA=-1THEN14
13 POKER,A:T=T+A:GOTO12
14 IFT<>17654THENPRINT"DATA ERROR":STOP
15 :
16 SYS 51882:REM INITIALISE IRQ DRIVER
17 :
20 SD=54272:REM ADDRESS OF SID
25 FOR CL=SDTOSD+24:POKE CL,0:NEXT:REM CLEAR SID
30 POKE SD+5,45:  REM ATTACK/DECAY
40 POKE SD+6,69:  REM SUSTAIN/RELEASE
45 POKE SD+2,255:REM PULSE WIDTH
50 POKE SD+24,15:REM VOLUME
55 :
60 REM SET MAIN & REPEAT POINTERS
70 POKE 251,64:POKE 252,3
80 POKE 253,64:POKE 254,3
90 :
100 REM PULSE WAVEFORM
110 POKE 829,64
120 :
130 REM SET FOR PLAY AND REPEAT
140 POKE 830,1:POKE831,1
150 :
160 REM NOTE DATA
170 :
1000 DATA 25,177,30,28,214,30
1010 DATA 25,177,30,25,177,30
1020 DATA 25,177,15,28,214,15
1030 DATA 32,94,90,25,177,30
1040 DATA 28,214,30,19,63,30
1050 DATA 19,63,30,19,63,30
1060 DATA 21,154,7,24,63,7
1070 DATA 25,177,30,24,63,15
1080 DATA 19,63,60,0,0,0
2000 :
2010 REM M/C DATA
2020 :
2030 DATA 120, 169, 71, 141, 24, 3, 169, 254, 141,
     25, 3
2040 DATA 169, 49, 141, 20, 3, 169, 234, 141, 21, 3
2050 DATA 88, 96, 120, 169, 193, 141, 24, 3, 169, 202
2060 DATA 141, 25, 3, 169, 206, 141, 20, 3, 169, 202
2070 DATA 141, 21, 3, 88, 96, 72, 138, 72, 152, 72
2080 DATA 169, 127, 141, 13, 221, 76, 114, 254,
     173, 62
2090 DATA 3, 240, 8, 173, 60, 3, 240, 6, 206, 60
2100 DATA 3, 76, 49, 234, 173, 61, 3, 141, 4, 212
2110 DATA 160, 0, 177, 251, 141, 1, 212, 32, 33, 203
2120 DATA 177, 251, 141, 0, 212, 32, 33, 203, 177, 251
2130 DATA 240, 17, 141, 60, 3, 32, 33, 203, 173, 61
2140 DATA 3, 105, 1, 141, 4, 212, 76, 49, 234, 173
2150 DATA 63, 3, 141, 62, 3, 208, 3, 76, 49, 234
2160 DATA 165, 253, 133, 251, 165, 254, 133, 252,
     76, 49
2170 DATA 234, 230, 251, 165, 251, 208, 2, 230, 252,
     96, -1
```

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Save the whole of Part Two as, *Save "part two" Code 5904,5464*, after Part One. Once verified, both can be loaded back into your Spectrum, and run using *Print Usr 62777*.

You can now work through each of the instructions checking each one of them functions correctly. If any problems occur, check your code using the Hexdump program (with *Goto 10*).

Should all the typing be more than you can stand, tape copies can be obtained from me for £3.00. Write to 82 Lays Drive, Keynsham, Bristol BS18 2LE.

Keep your eyes peeled for a comprehensive demo program in Vol 4 No 36.

```
F868 E6 1F 4F 3E 1F 91 C6 02 = 0A
F870 4F 7C D6 18 30 FC 28 02 = 0F
F878 C6 18 47 3E 18 90 47 C3 = 15
F880 D9 0D 79 3D 3D E6 07 3C = 02
F888 57 C3 D0 0A CD 92 F8 C3 = 0E
F890 DC 0A FE 80 38 23 FE 90 = 4D
F898 30 0C 47 CD 38 0B CD 03 = 63
F8A0 0D 11 92 5C 18 2D D6 A5 = CA
F8A8 30 09 C6 15 C5 ED 4B 7B = 8C
F8B0 5C 18 0B CD 10 0C C3 03 = 2E
F8B8 0B C5 ED 4B 36 5C EB 21 = A6
F8C0 38 5C CB 86 FE 20 20 02 = 28
F8C8 CB C6 26 00 6F 29 29 29 = A1
F8D0 09 C1 EB 79 3D 3E 21 28 = EA
F8D8 02 05 4F B9 D5 CC EF F8 = 97
F8E0 D1 C5 E5 3A 91 5C 06 FF = A7
F8E8 1F 38 01 04 C3 A4 0B 11 = DF
F8F0 D9 0D D5 78 A7 C0 21 20 = DB
F8F8 40 06 08 E5 0E 03 C5 EB = F4
F900 21 E0 FF 19 EB 01 20 00 = 25
F908 ED B0 7D A7 20 F1 21 20 = 13
F910 07 19 C1 0D C5 20 EE AF = 70
F918 06 20 12 13 10 FC C1 E1 = F9
F920 24 10 D8 21 20 58 11 00 = B6
F928 58 01 E0 02 ED B0 3A 8D = 9F
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F950 3E 19 B8 20 03 05 0E 21 = 66
F958 C3 D9 0D 3A 91 5C F5 FD = C2
F960 36 57 01 3E 20 CD B9 F8 = 6A
F968 F1 32 91 5C C3 DC 0A CD = 86
F970 6B 0D C3 F9 17 F3 21 00 = 5F
F978 40 11 01 40 36 00 01 FF = C8
F980 17 ED B0 23 13 01 FF 02 = EC
F988 3A 8D 5C 77 ED B0 21 21 = 79
F990 18 22 88 5C 21 00 40 22 = A1
F998 84 5C FB C9 DF FE 2C C2 = 6F
F9A0 0A 1C E7 CD 02 1C CD EE = B3
F9A8 1B CD 02 F7 DA 62 FB A7 = BF
F9B0 CA 68 FB F5 CD F5 F6 F1 = CB
F9B8 CB 7A C2 F9 24 CB 7B C2 = 2C
F9C0 F9 24 ED 43 7D 5C ED 43 = 56
F9C8 7C FB FE 01 20 06 CD E2 = 4B
F9D0 F6 C3 4D 0D 47 3E 64 90 = 8C
F9D8 DA F9 24 21 98 FA 22 74 = 40
F9E0 FB 05 78 23 23 10 FC 22 = EC
F9E8 76 FB 23 23 01 02 00 11 = CB
F9F0 78 FB ED B0 32 7A FB AF = 66
F9F8 32 7B FB 2A 7C FB ED 5B = 91
FA00 7A FB 7C 82 38 2C 47 7D = 9B
FA08 83 38 04 4F CD 6C FB 7C = BE
FA10 83 38 14 47 7D 92 38 04 = 51
FA18 4F CD 6C FB 7C 93 47 7D = 46
FA20 92 38 0F 4F CD 6C FB 7C = D8
FA28 82 47 7D 93 38 05 4F CD = 32
FA30 6C FB 7C 92 38 2E 47 7D = 9F
FA38 93 38 04 4F CD 6C FB 7C = CE
FA40 93 38 16 47 7D 92 38 04 = 73
FA48 4F CD 6C FB 7C 93 38 09 = D3
FA50 47 7D 82 38 0F 4F CD 6C = 15
FA58 FB 7C 92 47 7D 83 38 04 = 8C
FA60 4F CD 6C FB 21 7B FB 34 = 4E
FA68 7E 2B 96 D2 4D 0D 2A 74 = 09
FA70 FB 23 23 22 74 FB 5E 23 = 53
FA78 56 2A 76 FB 4E 23 46 2A = D2
FA80 78 FB EB 09 ED 52 DA FB = 7B
FA88 F9 21 7A FB 35 2A 76 FB = 5F
FA90 2B 2B 22 76 FB C3 FB F9 = A0
FA98 00 00 01 00 04 00 09 00 = 0E
FAA0 10 00 19 00 24 00 31 00 = 7E
FAA8 40 00 51 00 64 00 84 00 = 79
FAB0 90 00 A9 00 C4 00 E1 00 = DE
FAB8 00 01 21 01 44 01 69 01 = D2
FAC0 90 01 B9 01 E4 01 11 02 = 43
FAC8 40 02 71 02 A4 02 D9 02 = 36
FAD0 10 03 49 03 84 03 C1 03 = AA
FAD8 00 04 41 04 84 04 C9 04 = 9E
FAE0 10 05 59 05 A4 05 F1 05 = 12
FAE8 40 06 91 06 E4 06 39 07 = 07
FAF0 90 07 E9 07 44 08 A1 08 = 7C
FAF8 00 09 61 09 C4 09 29 0A = 73
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FB18 00 10 81 10 04 11 89 11 = 50
FB20 10 12 99 12 24 13 B1 13 = C8
FB28 40 14 D1 14 64 15 F9 15 = C0
FB30 90 16 29 17 C4 17 61 18 = 3A
FB38 00 19 A1 19 44 1A E9 1A = 34
FB40 90 1B 39 1C E4 1C 91 1D = AE
FB48 40 1E F1 1E A4 1F 59 20 = A9
FB50 10 21 C9 21 84 22 41 23 = 25
FB58 00 24 C1 24 84 25 49 26 = 21
FB60 10 27 CD F5 F6 C3 F9 24 = CF
FB68 CD F5 F6 C9 D5 E5 CD E2 = EA
FB70 F6 E1 D1 C9 C2 FA C2 FA = E9
FB78 84 83 15 16 7F 5B CD F5 = 4B
FB80 F6 CD 09 FC 78 FE 04 D2 = 14
FB88 F9 24 79 FE 02 D2 F9 24 = 85
FB90 ED 43 5D FC CD F5 F6 CD = 0E
FB98 09 FC 78 FE C1 D2 F9 24 = 2B
FBA0 FE 02 DA F9 24 79 FE 21 = 8F
FBA8 D2 F9 24 A7 CA F9 24 ED = 6A
FBB0 43 5B FC CD F5 F6 CD 09 = 28
FBB8 FC 78 FE C0 D2 F9 24 79 = 9A
FBC0 FE 20 D2 F9 24 ED 43 59 = 96
FBC8 FC 3A 59 FC 21 5B FC 86 = 89
FBD0 FE 01 DA F9 24 FE 21 D2 = E7
FBD8 F9 24 ED 4B 5D FC 79 CB = F2
FBE0 27 CB 27 80 A7 CA 5F FD = 66
FBE8 FE 01 CA 51 FD FE 02 CA = E1
FBF0 35 FD FE 03 CA 43 FD FE = 3B
FBF8 04 CA 89 FD FE 05 CA E3 = 84
FC00 FC FE 06 CA 61 FC C3 9C = 86
FC08 FC CB 7A C2 F9 24 CB 7B = 66
FC10 C2 F9 24 C9 79 07 07 07 = 36
FC18 A8 E6 C7 A8 07 07 6F 78 = F2
FC20 A7 1F 37 1F A7 1F A8 E6 = 70
FC28 F8 A8 67 C9 25 7C E6 07 = 5E
FC30 FE 07 C0 7D D6 20 6F 38 = DF
FC38 04 7C C6 09 67 3E 3F 94 = C6
FC40 C0 26 57 C9 24 7C E6 07 = 93
FC48 C0 7D C6 20 6F 3F 9F E6 = 56
FC50 F8 84 67 FE 58 C0 26 40 = 5F
FC58 C9 00 00 00 00 00 00 00 = C9
FC60 00 ED 4B 59 FC CB 21 CB = 44
FC68 21 CB 21 CD 14 FC 22 5F = 6B
FC70 FC 3A 5B FC 47 7E F5 2C = 73
FC78 10 FB ED 4B 5B FC 2A 5F = 23
FC80 FC 05 E5 CD 44 FC D1 E5 = A9
FC88 C5 06 00 ED B0 C1 E1 10 = 1A
FC90 F1 79 85 3D 6F 41 F1 77 = 44
FC98 2D 10 FB C9 ED 4B 59 FC = 0E
FCA0 3A 5C FC 80 3D FE C0 38 = 45
FCA8 02 D6 C0 47 CB 21 CB 21 = B7
FCB0 CB 21 CD 14 FC 22 5F FC = 46
FCB8 3A 5B FC 47 7E F5 2C 10 = 87
FCC0 FB ED 4B 5B FC 2A 5F FC = 0F
FCC8 05 E5 CD 2C FC D1 E5 C5 = 5A
FCD0 06 00 ED B0 C1 E1 10 F1 = 46
FCD8 79 85 3D 6F 41 F1 77 2D = 80
FCE0 10 FB C9 ED 4B 59 FC CB = 2C
FCE8 21 CB 21 CB 21 CD 14 FC = D6
FCF0 ED 4B 5B FC E5 C5 A7 CB = AB
FCF8 1E 2C 0D 20 FA C1 E1 30 = 43
FD00 02 CB FE CD 44 FC 10 EC = D4
FD08 C9 ED 4B 59 FC 3A 5B FC = E7
FD10 81 3D 4F CB 21 CB 21 CB = B0
FD18 21 CD 14 FC ED 4B 5B FC = 0D
FD20 E5 C5 A7 CB 16 2D 0D 20 = 8C
FD28 FA C1 E1 30 02 CB C6 CD = 2C
FD30 44 FC 10 EC C9 3E AF 32 = 24
FD38 75 FC CD 61 FC 3E 7E 32 = 09
FD40 75 FC C9 3E AF 32 BC FC = 11
FD48 CD 9C FC 3E 7E 32 BC FC = 0B
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FD58 FC 3E 30 32 FF FC C9 3E = 9E
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FD88 60 CD B1 FD 38 07 3E 00 = D8
FD90 90 4F 06 00 C9 ED 4B 50 = 36
FD98 FF 2A 7B 5C CD 6D FD 06 = 3D
FDA0 15 CD B1 FD 38 07 3E A5 = B2
FDA8 90 4F 06 00 C9 01 00 00 = AF
FDB0 C9 C5 D5 E5 1A AE 28 04 = 3C
FDB8 3C 20 12 3D 4F 06 07 14 = 1B
FDC0 23 1A AE A9 20 07 10 F7 = C2
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FDD0 00 19 D1 C1 10 DB 37 C9 = 96
FDD8 ED 4B 52 FF 3E BF 90 38 = 4E
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FE38 FE 5B C8 7E B9 20 01 78 = E9
FE40 23 18 F4 CD D5 2D DA F9 = D1
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FE68 F1 79 A7 CA F9 24 FE 11 = 87
FE70 D2 F9 24 C9 11 00 00 19 = EA
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FF20 00 ED B0 C9 00 00 00 00 = 66
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FF30 FF E9 A7 ED 42 30 0A 21 = 19
FF38 FF ED A7 ED 42 38 02 02 = FE
FF40 C9 CF 19 0E 00 47 C0 57 = 1D
FF48 71 0E F3 0D 21 17 C6 1E = 9B
FF50 2F F2 76 1B 03 13 00 3E = 06
```

# Wally mania

Can I please ask for *no more* solutions to *Pyjamarama*, or *Sorcery* – the former was printed in entirety ages ago, and the latter we are not going to print because of the games wizard competition. I Grainger of 33 Wellfield Road, Wingate, Co Durham TS28 5LA has finished the latter with 98,000 and kindly offers help to anyone who sends him/her a large SAE. He/she has also scored 12550 on level 11 of *Blagger* and 91,840 on *Roland in the Caves* after escaping four times. We are also given this tip for *Steve Davis Snooker*: "When there is only the black ball left on the table abort the game. You should get a higher break than Steve (my real high break is 34 points)."

## On the edge

Here's a letter that I have been very slow in printing from George White of Bury, concerning help for The Edge's *Quo Vadis* for the C64. "The original question was how to deal with the 'snakes' and the 'heads' or 'faces' and before I could answer I would have to know which ones!

"Some reports have it that you should shoot everything on the way down, to make the return trip easier, but because of 'one-way' traps you aren't coming back the same way. If an energy chest is in the room it may pay to clear the monsters, but the one-way system even stops you getting to some of the chests and to get to them again you have to return at a different level.

"Shooting nasties is comparatively easy firing from left to right – if you do it the other way you have to jump more to get out of the way. Firing up and down into chambers is hardest (I find it best to outrun them if possible).

"I won't give away the position of the riddles as that would remove most of the adventure part, but here they are: *A thousand added to everything loses fifty; losing the Dutch one, Royalty appears before me; Touro' force using only a knife, to eat an A1 solution; binary indecisions between silent beginnings and quiet terminations* (a cruel one this as you kill yourself getting it); *be sweet and be quick to go backward.*

## Money's worth

"I would point out that there are two rooms I have not got into, but I have found the sceptre and my high score is 526,000."

Sounds like you got your money's worth out of that game, George. He very kindly says that if anyone sends him an SAE and 20p to cover photocopying costs, he will send a copy of a map of the game. Write to him at 44 Tenterden St., Bury, Lancs,

Once the game is finished and you get back the rope, you get the last riddle: *"When you think you are there, you really are not, you will have to return, for what you least forgot"*. George would like help with this riddle and Phil Walker of Skelmersdale writes that the message means you must press *Return* and it simply goes back to the title page.

Phil's goes on to say "My best buys for the Commodore are 1) *Quo Vadis* 2) *Raid over Moscow* 3) *Eureka* 4) *World series baseball* 5) *GoGo the Ghost*. My five worst re 1) *Arcadia 64* 2) *The Great Space Race* 3) *Gateway to Apshai* 4) *Stellar Wars* 5) *Gilligan's Gold*. If anyone would like help with any of the games above, I'm at Skelmersdale 22938."

Mike Williams of Guisborough in Cleveland has sent in a superb letter full of pokes and tips for the Spectrum. Let's begin with the complete solution to *Everyone's A Wally*. "Get monkey nut to get into zoo. Dick takes plunger and monkey wrench to mend fountain. Gasmask to get in cave. Wilma takes rubber stamp and parcel to get stamped at post office.

"Fill bucket by walking past fountain. Wally takes full bucket and sand to get cement. Walk past wall with cement and trowel and wall will be built. When you are in the cave and want to get out without being savaged by the shark, wait until another character enters the sewer and do a character swap.

"Wilma has to take books 1,2, and 3 back to the library to receive jump leads, bunsen burner and letters B respectively. Kill a certain amount of aliens to lead electricity pylon nasties astray.

***Everyone's a Wally***

Tom can get the flat car battery from the fork lift truck. Harry must walk over the blown fuse in the butchers with the pliers and fusewire and it will become rewired.

"Harry – take a good insulator and screwdriver to mend pylon. This sends power to the battery in BP. Harry takes the flat battery and jump leads to BP to recharge it.

Tom – put recharged battery back in truck. Wally go from truck on to wall to get letter K. Tom – oil can moves trolley in supermarket (it doesn't have to be full). Harry – jump on trolley and then freezer for letter A. Wally – get superglue and hook will be fixed. Put the hook back in the docks. Wilma swap stamped parcel with the letter E. Dick – gas pipe and chewing gum: drop the pipe on workbench and get the patch with the chewing gum. Walk under the leaking pipe and it will mend. Replace the pipe in the pipe in the cave."

Phew! What a marathon that was.

## Free Monty

Mike has also given some diagramatic tips for *Monty is Innocent*, which we can't easily reproduce here – so I will explain them. On the screen with all the keys number them 1 to 8, working from left to right and top to bottom. These keys then open these doors. On the screen with a long ladder on the left, and a short one on the right, the door on the left is key 1, the door on the right is key 5. On the adjacent screen with one long ladder on the right the door is key 2. On the long corridor screen, the doors on the left from front to back are 8,7,6. On the right from front to back, 4,3.

**Tony Kendle**

## We are searching for the top UK computer games player – the best there is!

The very best of Britain's game players will get to fight it out on a number of top secret new games – scheduled for release in the autumn.

**Here's how it works**

Study the table below and look at the column for the machine you have – these are the games you'll need to master. Send your high scores in on the form below, making sure that your scores are authenticated by a responsible individual signing the form. Any score achieved using technical short-cuts – such as infinite lives Pokes – will not be accepted.

Between now and September Tony Kendle will be keeping you up to date on the *Arcade Avenue* page with just who has the scores to beat. Then, in September, the top three scorers on each machine will battle it out for a place in the final and the chance to be the first to play our 'top secret' games.

| | Commodore | BBC | Spectrum | Amstrad |
|---|---|---|---|---|
| Game 1 | Suicide Express | Elite | Technician Ted | Sorcery |
| Game 2 | Beach Head | Jet Pac | 3D Star Strike | Splat! |
| Game 3 | Shoot the Rapids | Chuckie Egg | Cyclone | Manic Miner |

***Game Wizard Entry Form***

Micro .....

Game 1 score: .....

Game 2 score: .....

Game 3 score: .....

Name .....

Address .....

.....

.....

Your signature .....

Witness's signature .....

.....

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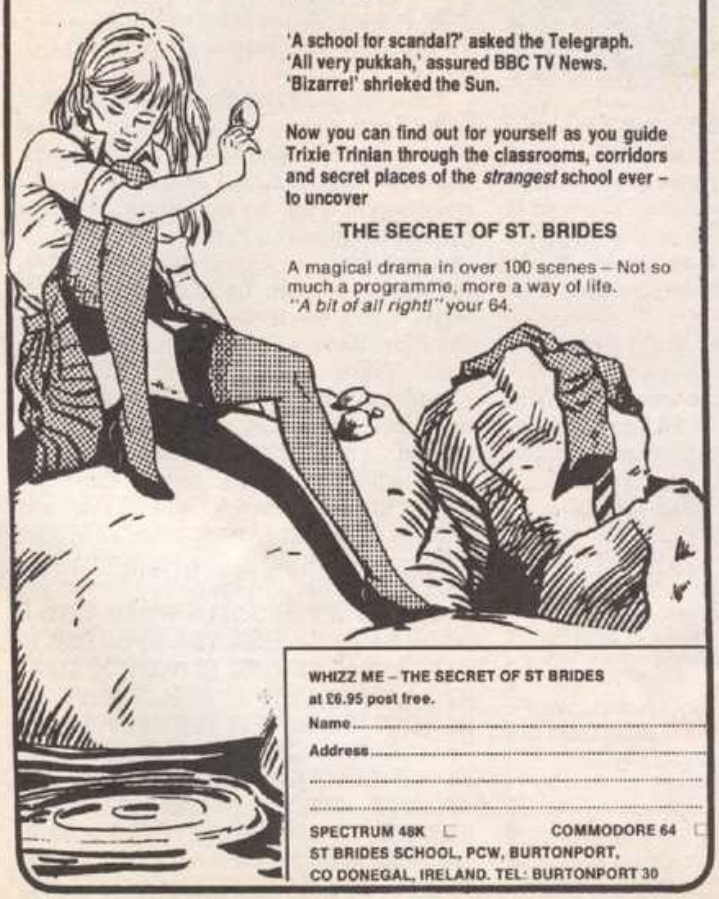

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# Tony Bridge's Adventure Corner

## Earth-shattering

The release of a new Level 9 adventure is, as we so rightly say, an earth-shattering experience (well a flag-day, anyway, for all aspiring adventurers!). *Red Moon* is no exception – in fact, I'm prepared to say that this is the most enjoyable of the Level 9 series since *Dungeon Adventure*. The new adventure is available on the Spectrum, Commodore 64, BBC and Amstrad.

You'll know by now that the game involves magic. The story goes that for aeons of time, the Moon glowed as bright as the sun, the colour of Magic. Its power bathed the Earth, and spells were widely and easily used. After constant battles with its rival, the Sun, the Moon eventually dwindled to what we know today, a pale shadow of its former glory. The magicians gathered to find a solution, and thus was the Red Moon Crystal made, a thousand-fold weaker than the original moon, but enough to keep an oasis of magic alive in the Moon Tower of Baskalos. Then the Moon Crystal was stolen. It is your task to recover the crystal.

Pretty standard stuff, but Level 9 have fashioned an extremely accessible adventure while retaining their customary verve and style. All the usual conventions are recognised, with the addition of magic spells which can be used by the player. Unlike other adventures which require lengthy processes in order to gain the experience required to wield spells, *Red Moon* provides each spell with a 'focus' object – find the Dulcimer, for example, and you can immediately use the *Escape* spell. This is particularly useful, allowing the player to jump right back to the starting location and back again (thus easily storing treasures and so on); of course, without the Dulcimer, you're stymied. Other useful spells include the *Snoop* spell, which allows you to look into an adjoining room (to check for monsters), the *Shield*, which wards off attacks for a while, and *Zap* which of course attacks an enemy magically. One of the most useful is *Find*, which locates a given subject – simply by typing in the standard sort of treasure such as Rings, helmets and so on will give you an awful lot of information, not only on whether particular objects are present in the adventure, but also where they are, and the corollary of this is that you will find locations that you haven't yet stumbled across.

These spells are really useful and ensure that a lot of thought has to be given to the correct order in which tasks are undertaken. An ambitious detail of spell-casting, however, namely that spells can't be cast when in the presence of iron, occasionally comes adrift. For example, *Save* and *Restore* for some reason are spells, and so, if you are carrying the Horseshoe, you can't Save your position.

How many locations? The cassette in-

**Red Moon**

lay mentions "over 200", but I've only come across just over half, and several of these were "tiny passages", all the same, in the grand tradition. I know of at least three more that I haven't yet found, and presumably there are many more inter-connecting locations (see the *Find* spell).

While the mechanics of the game are rather different from other Level 9s, the location descriptions are written with the usual attention to detail and atmosphere. I was, however, disappointed that the description of a very early location contained no less than two spelling mistakes – unforgiveable in a full-price adventure!

No sooner had I got fairly well into *Red Moon* (and let me tell you that this is a very addictive game, being very easily mapped – until the player can no longer juggle all the objects and has to stop to work out the problems – and very astmospheric), than a list of hints came through from Mr M Kerr of Newcastle. Refer to the list of words at the end of *The Corner:*

To Drain The Lake; 8, 17, 30, 12, 19, 17
To Get Through The Tiny Door; 23, 2
To Get Past The Watchdog; 8, 21, 30, 36
To Get The Sword From The Forge; 3, 38
To Swim Underwater; 3, 31, 13, 16, 35, 1
To Get Into The Metal Room; 3, 18
To Be Safe On The Precarious Platform; 13, 10

Mr Kerr also needs help in opening the safe, getting the Iron Coins and also wonders what to do with the grid in the Metal Room. You need to Dial Safe, but I can't help you with the other questions. If you know better, write to him at 27 Eddrington Grove, Chapel House Estate, Newcastle upon Tyne NE5 1JG.

### Quicksand

Mr Kerr also offers help in *Mordon's Quest*, which is from Melbourne House. I haven't seen this one myself, but I can pass on his help to others, hoping that it all makes some sense:

To Cross The Quicksand; 5, 29, 34
To Get Past The Pigmy; 9, 32, 7, 14, 33, 6, 39, 33, 15, 24
To Get Past Carniverous Plant; 9, 24, 20
Who Is King Of The Jungle; 37
To Cross The Waterfall; 26, 37, 30, 11, 4, 28

Time for *Subsunk* from Firebird. Paul and Glenn Gilney would like to know where is the battery for the vacuum, where is the acid, and also how do you get the pills from the bottle without them getting lost on the floor. They would also like any clues for *Eye of Bain*, in particular, how to pass the Beast down the Well. Here, you'll need the Ruby – then type Say Fire. Now, Enter Hole and progress from there. They have completed *Colditz* and *Valkyrie 17*, both with a little help from their dad ('are we the youngest at 13 and 10?' I haven't the faintest idea, lads!). If you need help in those (as well as the venerable *Hobbit*, or can help them in *Subsunk*, write to them at: 9, The Hollies, Woodburn, Carrickfergus, Co Antrim, Northern Ireland.

1 FLASK 2 MUSHROOM 3 WEAR 4 GO 5 DROP 6 MAKE 7 BERRIES 8 PUT 9 USE 10 BRACERS 11 TEMPLE 12 HOLE 13 CARRY 14 THORNS 15 KILL 16 TUBING 17 HANDLE 18 BOOTS 19 TURN 20 BODY 21 PILLS 22 HI! 23 EAT 24 PIGMY 25 PUT 26 SACRIFICE 27 JILLY! 28 NORTH 29 THE 30 IN 31 GASMASK 32 BAMBOO 33 TO 34 BLANKET 35 AND 36 MEAT 37 FROG 38 GLOVES 39 BLOWPIPE.

## Adventure Helpline

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

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# ATARI ST

## 520ST

## POWER WITHOUT THE PRICE

### THE NEW ATARI 520ST

Under the new leadership of Jack Tramiel (former boss and founder of Commodore Business Machines), Atari Corporation have marked their entry into the world of business/personal computers with a machine which leaves the competition standing. Tramiel's slogan 'Power Without the Price' has been implemented in the manufacture of the new 512K Atari 520ST colour computer which offers the user amazingly high performance at an incredibly low price. Launched as a work-station, this new system incorporates seven software packages as well as the 520ST computer with 512K RAM, mouse controller, high resolution monochrome monitor (640x400), 95 key keyboard (with 18 key numeric keypad), MIDI interface, GEM and a 500K 3½ inch disk drive, all for the package price of only £651.30 (+VAT = £749). Dubbed the 'Mac beater' and the 'Jackintosh' (after Atari's Chief, Jack Tramiel), Atari's new machine has been directly compared with the Apple Macintosh RRP £2595 (+VAT = £2985) which offers similar features and capabilities but at a much higher price. Favourably reviewed by the UK's highly critical specialist computer press, the 520ST is likely to make a great impact in this country as a sophisticated alternative to an IBM PC, APRICOT or APPLE MACINTOSH. Unlike its overpriced competitors, the Atari 520ST can be linked up to a colour monitor to unleash a choice of up to 512 colours. The addition of colour brings out the full potential of graphics packages such as GEM.

### USER FRIENDLY GEM OPERATING SYSTEM

The power of the ST is harnessed and made user friendly by the new operating system 'GEM' from Digital Research. GEM stands for Graphics Environment Manager and allows a user friendly colour or B/W graphics interface which closely resembles that of the Macintosh. This similarity extends to the use of moveable resizeable windows, icons to represent objects such as disks and disk drives, and the use of pull down menus and a mouse. The advantage of all this is that the computer becomes extremely easy to use. GEM has now been implemented for the Acorn, ACT, Atari, IBM, ICL, and Olivetti. Software written for GEM on one computer should also run under GEM on another computer. This will enable the market to quickly produce a large library of standard interchangeable software.

### FREE SOFTWARE AND FUTURE EXPANSION

The Atari 520ST comes supplied with seven free software packages as listed below: 1) TOS +Tramiel Operating System based on CPM 68K. 2) GEM Graphics Environment Manager by Digital Research (DR) giving a WIMP (Window, Icon, Mouse, Pull down menu) environment. 3) DR GEM Paint for creating graphics masterpieces. 4) DR GEM Write for word processing. 5) Logo learning language to enable you to write your own programs easily using turtle graphics. 6) DR Personal Basic a powerful user friendly version of the Basic programming language. 7) BDS operating system giving you access to dozens of business applications packages already available on the market. Designed with future expansion in mind, the ST also features a host of different interfaces to the outside world and an impressive list of accessories is planned. Atari will soon be releasing a 1000K (1MB) 3½ inch disk drive, and a 15MB hard disk storage system as well as a mass storage compact disk (CD) player capable of storing an entire 20 volume encyclopaedia on one disk. A full range of inexpensive printers are planned including dot matrix, daisywheel and thermal colour printers. With its unbeatable graphics, speed and software at a price which is far below that of any comparable personal computer currently on the market, the ST is all set to do battle with the competition. To receive further details of the ST from Silica Shop, just fill in the coupon below with your name and address details and post it to us.

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## ATARI 520ST SPECIFICATION

**MEMORY**
512K RAM (524,288 bytes)
16K ROM expandable to 320K
Port for addn 128K plug-in ROM cartridges
200K TOS operating system

**GRAPHICS**
Individually addressable 32K bit-mapped screen with 3 screen graphics modes:
320x200 pixels in 16 colours (low resolution)
640x200 pixels in 4 colours (med resolution)
640x400 pixels in monochrome (high res)
16 shades of grey in low res mode
512 colours available in low/medium res
8 levels of each in red, green and blue

**ARCHITECTURE**
4 custom designed chips:
GLUE Chip - MMU Memory Mngemt Unit
DMA Controller - Graphics Processing Unit
16/32 bit Motorola 68000 processor at 8MHz
eight 32 bit data registers
eight 32 bit address registers
16 bit data bus/24 bit address bus
7 levels of interrupts/56 instructions
14 addressing modes/5 data types

**DATA STORAGE**
High speed hard disk interface
Direct memory access 1.35 Mbytes per second
CD (Compact Disc) interface
Built in cartridge access
Dedicated floppy disk controller

**DISK DRIVE**
500K (unformatted) sided 3½" floppy disk drive
348K (formatted) storage capacity

**SOUND AND MUSIC**
Sound Generator
Frequency control from 30Hz to above audible
3 voices (channels) in wave shaping sound in addition to a noise generator
Separate frequency and volume controls
Dynamic envelope controls
ADSR (Attack, Decay, Sustain, Release)
Noise generator
MIDI interface for external music synthesizers

**KEYBOARD**
Separate keyboard microprocessor
Standard QWERTY typewriter styling
Ergonomic angle and height
95 keys including 10 function keys
Numeric keypad — 18 keys including ENTER
One touch cursor control keypad

**MONITOR**
12" screen - high res monochrome monitor
640x400 monochrome resolution

**VIDEO PORTS**
Display - Low Resolution - 40 columns
Med/High Res - 40/80 plus cols
Medium res RGB (Red/Green/Blue) output
High resolution monochrome (Black & White)

**COMMUNICATIONS**
Bidirectional centronics parallel interface for printers, or modems capable of input/output
RS232C serial modem/printer interface
VT52 Terminal Emulation Software
Maximum Baud Rate up to 19,200
High speed hard disk interface
Floppy disk controller (Western Digital)
2 joystick ports (one for 2 button mouse)
MIDI interface for external music synthesizers

**GEM WIMP ENVIRONMENT**
WIMP - Window Icon Mouse Pop-down menus
Two button mouse controller
Icons/Pull down menus/Windows
GEM VDI - Virtual Device Interface
GEM AES - Application Environment Services
GEM DRT - Bit Block Transfer
Real time clock & calendar

**SOFTWARE**
GEM environment
with user friendly Macintosh style operation
TOS - Tramiel Operating System
*Atari's own system based on CP/M 68K with hierarchical directory & file structure plus a host of MS DOS & UNIX command structures*
BDS - Business Operating System
*to run any standard BDS business programs*
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*with GEM PAINT graphics mgmt system and GEM WRITE word processor*
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Dimensions: 470mmx240mmx60mm
Rackmountable external power supplies
Expansion: 3½" Noisy disk drives 300K/1,000K (two drives can be connected)
3½" 15MB hard disk
CD (compact laser disc)
Dot matrix & daisywheel printers (Diablo)
Thermal dot matrix (colour)
RGB & monochrome monitors

**LANGUAGES**
BASIC & LOGO supplied
Many others will soon be available, including:
Assembler, BCPL, C, Cobol, Compiled Basic
Lisp, Modula-2 and Pascal

Note: Some of the above specifications are pre-release and may therefore be subject to change.

## MACINTOSH v F1ø v 520ST

"Imagine a Fat Mac - the 512K Apple Macintosh - but with a bigger screen; a far bigger keyboard with numeric keypad, cursor and function keys, and colour. That gives you some idea of what the Atari 520ST is like; except for two important things. First the Atari seems faster. Second the Atari system is about one third of the price."
June 1985 - Jack Schofield - **PRACTICAL COMPUTING**

| FEATURES OF BASIC SYSTEM | APPLE MACINTOSH | APRICOT F1a | ATARI 520ST |
|---|---|---|---|
| Price Includes B/W Monitor | YES | NO - extra £200 | YES |
| Keyboard size mm (LxDxH) | 300x147x50 | 450x187x28 | 470x240x60 |
| Keyboard size ins (LxDxH) | 12x5¾x2 | 17¾x8½x1 | 18½x9½x2½ |
| 3½" Dr/Drive (Unformatted) | 600K | 500K | 500K |
| 3½" Dr/Drive (Formatted) | 399K | 315K | 349K |
| WIMP (window, Icon, Mouse ...) | Apple | ACT - Activity | GEM |
| Real-time Clock | YES | YES | YES |
| Polyphonic Sound Generator | YES | NO | YES |
| Atoda Serial Port | YES | YES | YES |
| Centronics Parallel Printer Port | NO | YES | YES |
| Dedicated Floppy Disk Controller | NO | YES | YES |
| Hard Disk DMA Interface | NO | YES | YES |
| Full stroke keyboard | YES | YES | YES |
| Number of keys on keyboard | 58 | 82 | 95 |
| Numeric Keypad | NO | YES (16 Keys) | YES (18 keys) |
| Cursor Control Keypad | NO | YES | YES |
| Function keys | NO | 10 | 10 |
| 16-bit processor | 68000 | Intel 8086 | 68000 |
| Processor running speed | 8MHz | 4.77MHz | 8MHz |
| RAM size | 512K | 256K | 512K |
| Number of graphics modes | 1 | 4 | 3 |
| Number of colours | Monochrome | 16 | 512 |
| Max Screen Resolution (pixels) | 512 x 342 | 640 x 256 | 640 x 400 |
| Mouse included | Single Button | NO - extra £95 | Two Button |
| Replaceable External Power Pack | NO | NO | YES |
| Cartridge Socket | NO | NO | YES |
| Joystick Ports | NO | NO | YES (two) |
| MIDI Synthesiser Interface | NO | NO | YES |
| Monitor Size | 9" | 9" - extra £200 | 12" |
| RGB Video Output | NO | YES | YES |

**System Cost with: Mouse - Monochrome Monitor - 512K RAM - 500K Disk Drive**

| | | | |
|---|---|---|---|
| Price of basic system (exc VAT) | £2595+VAT | £595+VAT | £652+VAT |
| + Mouse | Included | £95+VAT | Included |
| + Monochrome Monitor | Included | £200+VAT | Included |
| + Expansion to 512K RAM | Included | £295+VAT | Included |
| Price of complete system (exc VAT) | £2595+VAT | £1185+VAT | £652+VAT |
| **PRICE** rounded down including VAT | **£2,984** | **£1,362** | **£749** |

## PRESS COMMENT

"Atari's new corporate image as an aggressive low cost computer maker is likely to mirror that of Commodore where Mr. Tramiel established the maxim that 'Business is war'."
August 21st 1984 - **FINANCIAL TIMES**

"This is the only personal computer I know of that comes with a Midi interface as standard."
Peter Bright - March 1985 - **PERSONAL COMPUTER WORLD**

"The (GEM) version running on the Atari 68000 machines will have the additional advantage of leaving the PC version standing."
April 6th 1985 - **PERSONAL COMPUTER NEWS**

"It would seem that GEM offers the ideal operating system."
March 7th 1985 - **POPULAR COMPUTING WEEKLY**

"I found it (GEM) extremely easy to use and was very impressed with the way in which it disguises the unfriendly hardware and operating systems lurking under the surface."
Peter Bright - Feb 1985 - **PERSONAL COMPUTER WORLD**

"The electronics in the machine are a work of art ... The heart of the 520ST is a Motorola 68000, one of the most powerful 16-bit processors around and in many respects it is close to being a 32-bit chip ... when the machine appears in the shops, I'll be at the front end of the queue to buy one."
Peter Bright - June 1985 - **PERSONAL COMPUTER WORLD**

"This machine is significantly more powerful than an IBM PC ... if it's possible to design a sure-fire winning machine, this is it."
May 11th 1985 - **PERSONAL COMPUTER NEWS**

"... the use of GEM makes the new range of Atari computers so similar to the Macintosh (with the added attraction of colour), that they are already being called 'Jackintoshes'."
May 2nd 1985 - **COMPUTING**

"The new Atari ST computers truly represent to the consumer what Jack Tramiel is saying — easy-to-use computing power without the price."
March 1985 - **ANALOG COMPUTING**

"It (the ST) uses the most modern technology that is affordable, in a package that gives a professional impression."
May 23rd 1985 - **POPULAR COMPUTING WEEKLY**

"The Atari ST is one of the most elegant designs I have seen ... Atari has used an original and elegant method of memory management which should make the ST faster than any other PC on the market - in any price bracket ... The 64K dollar question is would I go out and spend money for one? To which the only answer is 'Try and stop me!' "
John Lambert - July 1985 - **ELECTRONICS & COMPUTING**

"The 520ST is technically excellent ... The 520ST hardware is the new standard by which others will be judged."
July 1985 - **YOUR COMPUTER**

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| Event | Dates | Venue | Admission | Organisers |
|---|---|---|---|---|
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| Computer Show | August 31<br>10.30am-5.00pm | Co-op Hall<br>East Street<br>Swindon<br>Wiltshire | 50p | CJS/Northleach<br>04516 609 |
| Personal Computer World Show | September 4-8 | Olympia<br>London | £2.00 | Montbuild<br>01-486 1951 |
| Electron and BBC Micro User Show | September 27-28<br>10.00am-6.00pm<br>September 29<br>10.00am-4.00pm | UMIST<br>Manchester | £2.00 adults<br>£1.50 children | Database Publications<br>061-456 8383 |
| Amstrad User Exhibition | October 5-6<br>10.00am-6.00pm | Novotel<br>Hammersmith | £2.00 adults<br>£1.00 children<br>(in advance) | Computer Marketplace<br>01-930 1612 |

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**BARGAIN** 48K Spectrum, cassette recorder, 50 top games, all good condition, worth £600, sell for £160 ono. Tel: Notts 514766.

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## ADVENTURE HELPLINE

**Urban Upstart on Commodore 64.** How do I pass the building site without getting stuck? How do I carry all the objects found? Leslie Austin, 25 Royal Avenue West, Onchan, Isle of Man.

**Fantasia Diamond on the Spectrum.** I have explored the house and the pixies cave and I have tried to cross the river. What now? Karl Butcher, 4 Greenleas, Thundersley, Benfleet, Essex.

**Project Volcano on the Amstrad.** How do I get past the lift service droid? C. Tinsley, 23 Liverpool Road, Page Moss, Liverpool L14 9PG.

**Return to Eden on Amstrad.** How do I get into the bank? I have 11,250 credits and I have the ID card. John Walker, 32/5 Shandon Crescent, Haldane, Alexandria, Dunbartonshire G83 8EX.

**Jewels of Babylon on Amstrad.** Can't get past the lion and crocodile. How does the slab move? Where are weapons? Andrew Pearce, 11 West Park, South Molton, Devon EX36 4HJ.

**The Hobbit on Spectrum.** How do you get into the Goblins cave? Simon Pickup, 54 Crouch Hall Road, London N8 8HG.

**Brawn Free/Smugglers Cove on the Amstrad.** How do I get past the wooden door(BF)? How do I use spade, get past pirate, cat, mermaid? D. Carr, Thornlea, Oak Road, Mottram Saint Andrew, Macclesfield, Cheshire SK10 4RA.

**Wizardry 2 on Apple 2.** Can't work out how to get to the down stairs on level 1. Can't work out the riddle in the labyrinth. M. Meredith, 48 Merton Road, Wandsworth, London SW16.

**Fourth Protocol on Spectrum.** I need help with Warburton, Faulkner and Pasternak. Scott Macfarlane, 2 Boomside Terrace, Corstorphine, Edinburgh EH12 7LZ.

**Quest on Spectrum.** How do I get an object, and how do I say hello to a dwarf? James Alleiv, 4 Barling Drive, Ilkeston, Derbyshire DE7 9JA.

**Valkyrie 17 on Commodore 64.** How do you get money to leave hotel? Peter Hurley, Support Troop C Sqn, 13/18 RH(QMO), BFPO 15.

**Fantasia Diamond on Amstrad.** Don't know what to do with silver statue. Clive Roberst Woodings, 7 Booth Street, Alvaston, Derby.

**Jewels of Babylon on Amstrad.** How do you kill the lion and the crocodile? Where is the gun? Will swap hints for forest at World's End. Natasha Silva, 6 Goldhanger Close, Rayleigh, Essex.

**Fantasia Diamond on Amstrad.** Does anyone have a full solution? David Carr, 'Thornlea' Oak Road, Mottram Saint Andrew, Macclesfield, Cheshire.

**Williamsburg Adventure on C16.** How do I get past the gravestone and what do I do with it? D. W. Ironside, 59 Melville Heath, South Woodham, Ferrers, Chelmsford.

**Ashkeron on Spectrum.** How do you get out of the dungeon? John Harris, 31 Braunstone Avenue, Leicester.

**Lords of Time on Amstrad.** How do I get past the brontosaurus on level 3 after it's lifted me out of the pit? Leslie Moss, 34 Wakehams Hill, Pinner, Middx (01-868 3973).

**Erik the Viking on Spectrum.** Please help with directions at sea—I'm lost! David Blackledge, 7 Greenway Close, Bolton.

**Catacombs on Commodore 64.** I can't even open the first door! Any information will be very welcome. I. Benjelloun, 69 Oakdale, Wellwyn Garden City, Herts.

**Emerald Isle on BBC.** How do I get out of the mole hole and where do I go from here? R. Dawson, 41 Union Court, Otley, W. Yorks.

**Jewels of Babylon on Amstrad.** Where is the key and how do I get it? Also, what is the plank for? W. Learoyd, 105 Wellstone Avenue, Bramley, Leeds.

**Eureka on Commodore 64.** I have only achieved 50% on the prehistoric part. Can someone please help me? I can offer help on Nos 2, 3 and 4. Kevin Blake, 41 Sycamore Grove, Braintree, Essex.

**Adventureland on Commodore 64.** Any help please—I'm new to adventures but enjoying them! J. Hammond, 4 Maidstone Avenue, Romford, Essex.

**The Final Mission on Spectrum.** How do I kill the slime monster? How do I get through the second door? A. Hughes, 22 Tyddyn To, Menai Bridge, Gwynedd.

**Eureka 2 on Commodore 64.** I have the chicken but I can't find the soothsayer to give it to. Richard Katte, 160 Station Road, Leigh-on-Sea, Essex.

**Castle Quest on BBC.** I have got the wand and 60 score points but I don't know how to finish. Steve Johnstone, 25 Bristol Road, Colchester, Essex.

**Aztec Tomb on Commodore 64.** I'm stuck at the harbour and I don't know how to go anywhere on the boat. I have been to the island. Any help please? J. Hammond, 4 Maidstone Avenue, Romford, Essex.

**System 15000 on Spectrum.** What is the second bank code? Martyn Cheyney, 12 Greenock Street, Armley, Leeds 12.

**Fantasia Diamond on Amstrad.** How do I get the conductor to play music to open the musical door? What do you do with the statue? D. P. Watts, 9 Railway Terrace, Rogiet, Gwent NP6 3JG.

**Fantasia Diamond on Amstrad.** How do you get across the river and how do you open the manhole?

**Forest at World's End on Amstrad.** When you are in the volcano how do you open the treasure chest? Jason Stonway, 26 Newpool Road, Knypersley, Biddulph, Stoke-on-Trent.

**Valkyrie 17 on Spectrum.** How do I get out of town and get money for the telescope? M. Winstone, 11 Burnet Close, Ingleby Barwick, Cleveland.

**Escape from Pulsar 7 on Commodore 64.** What does the white button do and how do you open the grill in the wrecked cabin?

**Feasibility Experiment on Commodore 64.** Where is the wick for the oil lamp? Edward Coult, 41 Volta Street, Selby, Yorks (Selby 706343).

# Charts

## Amstrad

| | | | | |
|---|---|---|---|---|
| 1 | (1) | Way of the Exploding Fist | (Melbourne House) | £9.95 |
| 2 | (2) | Red Moon | (Level 9) | £6.95 |
| 3 | (3) | Dun Darach | (Gargoyle) | £9.95 |
| 4 | (4) | Beach-head | (Access/US Gold) | £9.95 |
| 5 | (10) | Finders Keepers | (Mastertronic) | £1.99 |
| 6 | (–) | Chiller | (Mastertronic) | £1.99 |
| 7 | (6) | Alien 8 | (Ultimate) | £9.95 |
| 8 | (5) | Nonterraueous | (Mastertronic) | £1.99 |
| 9 | (7) | Red Arrows | (Database) | £8.95 |
| 10 | (8) | Knight Lore | (Ultimate) | £9.95 |

**Bubbling Under:**

| | | |
|---|---|---|
| Sorcery | (Virgin) | £9.95 |
| Rocky Horror Show | (CRL) | £8.95 |

## Atari

| | | | | |
|---|---|---|---|---|
| 1 | (1) | Bounty Bob Strikes Back | (US Gold) | £9.95 |
| 2 | (5) | Mig-Alley Ace | (Microprose/US Gold) | £9.95 |
| 3 | (3) | Hard Hat Mack | (Ariolasoft) | £9.95 |
| 4 | (2) | Airwolf | (Elite) | £6.95 |
| 5 | (4) | Drop Zone | (Microprose/US Gold) | £9.95 |
| 6 | (7) | Bruce Lee | (Datasoft/US Gold) | £7.95 |
| 7 | (9) | Kissin Cousins | (English Software) | £6.95 |
| 8 | (6) | Archon | (Ariolasoft) | £11.99 |
| 9 | (8) | Miner 2049'er | (Big 5) | £9.95 |
| 10 | (–) | Mule | (Ariolasoft) | £14.99 |

**Bubbling Under:**

| | | |
|---|---|---|
| Ghostbusters | (Activision) | £14.99 |
| Colourspace | (Llamasoft) | £7.50 |

## BBC

| | | | | |
|---|---|---|---|---|
| 1 | (2) | Beach-head | (Access/US Gold) | £9.95 |
| 2 | (1) | Revs | (Acornsoft) | £14.95 |
| 3 | (5) | Red Moon | (Level 9) | £6.99 |
| 4 | (3) | Alien 8 | (Ultimate) | £9.95 |
| 5 | (7) | Contraption | (Icon) | £8.95 |
| 6 | (4) | Elite | (Acornsoft) | £12.95 |
| 7 | (6) | Atic Atac | (Ultimate) | £7.95 |
| 8 | (10) | Bobby Charlton's Soccer | (Stack) | £11.95 |
| 9 | (8) | Repton | (Superior) | £9.95 |
| 10 | (–) | Knightlore | (Ultimate) | £9.95 |

**Bubbling Under:**

| | | |
|---|---|---|
| Magic Mushrooms | (Acornsoft) | £12.95 |
| Combat Lynx | (Durrell) | £8.95 |

## Commodore 64

| | | | | |
|---|---|---|---|---|
| 1 | (1) | Way of the Exploding Fist | (Melbourne House) | £9.95 |
| 2 | (4) | Frankie goes to Hollywood | (Ocean) | £9.95 |
| 3 | (2) | Hypersports | (Imagine) | £7.95 |
| 4 | (3) | Elite | (Firebird/Acornsoft) | £14.95 |
| 5 | (–) | Tour de France | (Activision) | £9.99 |
| 6 | (7) | Mr Do | (Datasoft/US Gold) | £9.95 |
| 7 | (–) | Nick Faldo Plays the Open | (Mind Games) | £9.99 |
| 8 | (5) | Rockford's Riot/Boulderdash | (Monolith) | £9.95 |
| 9 | (6) | Fourth Protocol | (Hutchinson) | £12.95 |
| 10 | (9) | Soft Aid | (Various Artists) | £4.99 |

**Bubbling Under:**

| | | |
|---|---|---|
| Pitstop II | (Epyx/US Gold) | £9.95 |
| Great American Road Race | (Activision) | £9.99 |

## Spectrum

| | | | | |
|---|---|---|---|---|
| 1 | (1) | Frank Bruno's Boxing | (Elite) | £6.95 |
| 2 | (2) | Hypersports | (Imagine) | £7.95 |
| 3 | (3) | Highway Encounter | (Vortex) | £7.95 |
| 4 | (–) | Frankie goes to Hollywood | (Ocean) | £9.95 |
| 5 | (4) | Dynamite Dan | (Mirrorsoft) | £6.95 |
| 6 | (6) | Glass | (Quicksilva) | £7.99 |
| 7 | (5) | Soft Aid | (Various Artists) | £4.99 |
| 8 | (7) | Nick Faldo Plays the Open | (Mind Games) | £9.99 |
| 9 | (–) | Dambusters | (Sydney/US Gold) | £9.95 |
| 10 | (–) | Spy vs Spy | (Beyond) | £9.95 |

**Bubbling Under:**

| | | |
|---|---|---|
| Fourth Protocol | (Hutchinson) | £12.95 |
| Rocco | (Gremlin) | £7.95 |

**All figures compiled by Ram/C**

# Top Twenty

| | | | |
|---|---|---|---|
| 1 | (1) | Hypersports *(Spectrum/C64)* | **Imagine** |
| 2 | (3) | Frank Bruno's Boxing *(Spectrum)* | **Elite** |
| 3 | (2) | Way of the Exploding Fist *(C64)* | **Melbourne House** |
| 4 | (4) | Frankie Goes to Hollywood *(Spectrum/C64)* | **Ocean** |
| 5 | (7) | Nick Faldo Plays the Open *(Spectrum/C64)* | **Mind Games** |
| 6 | (6) | Soft Aid *(Spectrum/C64)* | **Various Artists** |
| 7 | (18) | Highway Encounter *(Spectrum)* | **Vortex** |
| 8 | (14) | Dynamite Dan *(Spectrum)* | **Mirrorsoft** |
| 9 | (5) | Elite *(C64/BBC/Electron)* | **Firebird/Acornsoft** |
| 10 | (8) | Fourth Protocol *(Spectrum/C64)* | **Hutchinson** |
| 11 | (–) | Tour de France *(C64)* | **Activision** |
| 12 | (9) | Red Moon *(Spectrum/C64/BBC/Electron/Amstrad)* | **Level 9** |
| 13 | (15) | Glass *(Spectrum)* | **Quicksilva** |
| 14 | (17) | Mr Do *(Spectrum/Atari)* | **Datasoft/US Gold** |
| 15 | (–) | Dambusters *(Spectrum/C64)* | **Sydney/US Gold** |
| 16 | (13) | Rockford's Riot/Boulderdash *(C64)* | **Monolith** |
| 17 | (19) | Spy vs Spy *(Spectrum/C64)* | **Beyond** |
| 18 | (–) | Beach-head *(Spectrum/C64/BBC/Amstrad/Atari)* | **Access/US Gold** |
| 19 | (11) | Dun Darach *(Spectrum/Amstrad)* | **Gargoyle** |
| 20 | (–) | Great American Road Race *(C64)* | **Activision** |

**Figures compiled by Ram/C**

# Readers' Chart No 38

| | | | |
|---|---|---|---|
| 1 | (4) | Soft Aid (Spectrum/C64) | **Various Artists** |
| 2 | (1) | Elite (C64/BBC/Electron) | **Firebird/Acornsoft** |
| 3 | (2) | Hypersports (Spectrum) | **Imagine** |
| 4 | (3) | Way of the Exploding Fist (C64) | **Melbourne House** |
| 5 | (5) | Dun Darach (Spectrum/Amstrad) | **Gargoyle** |
| 6 | (6) | Shadowfire (Spectrum/C64) | **Beyond** |
| 7 | (–) | Frank Bruno's Boxing (Spectrum) | **Elite** |
| 8 | (9) | Spy vs Spy (Spectrum/C64) | **Beyond** |
| 9 = | (7) | Revs (BBC) | **Acornsoft** |
| 9 = | (–) | Dynamite Dan (Spectrum) | **Mirrorsoft** |

**Winning phrase No 38: "Acorn due at hades" from David Blackledge, of Bolton, who receives £25. Runners up: "Rail station chef dead" from John Brownsill of Milton Keynes and "Dial 'D' for death" from R Robertson of Mossend, Lanarkshire.**

# Now voting on week 40 – £25 to win

Each week *Popular* is compiling its own special software top ten chart – compiled by YOU.

And each week we will send £25 to the person who sends in, with their chart votes, the most original (witty, neat or clever – but never rude) phrase or sentence made up from the letters (you don't have to use them all) in the titles of the top three programs in this week's chart, published above.

You can still vote in the chart without making up a slogan – but you won't be in with a chance of winning the prize.

All you have to do is fill in the form below (or copy it out if you don't want to damage your magazine) and send it off to: Top 10, *Popular Computing Weekly*, 12-13 Little Newport Street, London WC2H 7PP.

**Voting for Week 40 closes at 2pm on Wednesday August 28 1985. Entries received after that time will not be eligible for inclusion in that week's voting. The judges decision is final. Only one entry per individual per week will be allowed.**

**Name** .....

**Address** .....

.....

.....

**My top 3: Voting Week 40**

**1**.....

**2**.....

**3**.....

**My phrase is:** .....

# New Releases

## CHOCS AWAY

*Dam Busters* on the Spectrum is a surprisingly good impersonation of the game originally released on the Commodore.

The game simulates the attack on the Moehne, Eder and Scorp dams by a flight of Lancasters carrying the most Monty Pythonesque weapon of war ever invented, the bouncing bomb.

The challenge consists not only of piloting the plane using an icon-like system to adjust levels of throttles, power boost, flaps, etc, but manning every other key site on the plane where appropriate – the bomb bay, rear gunner and front gunner.

The full mission consists of successfully taking off from RAF Scampton, through flak, avoiding baddie planes and eventually blowing the dam to bits.

All the controls are presented in close-up as separate screens which adds to the realism but does mean shunting around a lot. For me the balance between blasting and flying is about right – the Lancaster isn't horrendously difficult to fly but neither is it a bland up-down-left-right arcade zap. The landscape graphics are nothing too special but are good enough for a sense of atmosphere to be maintained.

One of the better flying efforts.

**Program** *The Dam Busters*
**Price** *£9.95*
**Micro** *Spectrum*
**Supplier** *US Gold*
*Unit 10*
*Parkway Industrial*
*Estate*
*Birmingham*
*B7 4LY*

## RIPPING YARN

Here's weird. In Ireland there really exists a school especially designed for women who want to pretend to be schoolgirls. Schoolgirls of the type found in all the best *Girls Own* annuals.

It involves much dressing up and having a ripping time being terribly naughty and having midnight feasts in the dorm.

People pay money for a week or so of this, and I suppose it's no stranger than, say, pretending to be a wizard or elf on an adventure weekend.

Anyway the ethos of the school has been captured in a graphics adventure written with the *Quill* and *Illustrator*. You play Trixie Trinian and along with your friends Fiona and Cynthia investigate the strange goings on at St Brides School. Yes, there are strange goings on (other than merely the fact that grown women pretend to be schoolgirls) – there is a mystery.

Of the nature of the mystery and the way you solve it I can say little, except that it helps if you can convince the teachers you are one of them.

Though slow to be drawn, the relatively simple graphics are effective and add to the atmosphere – all musty school rooms and endless hallways. The descriptions seem good too and I found myself well hooked.

However, whilst getting on reasonably well with the absolutely whizzo adventure of the secret of St Brides, I now discover that the ultimate task is to find an ámulet which lurks in locations that I, as a wet-behind-the-ears new chap, stand absolutely no chance with.

Nothing technically clever about the game given that it's all *Quilled*, obviously, but it seems very entertaining; it has a lot of tongue in cheek humour, I can also think of a lot of macho Orc-slaying adventures who could do a lot worse than playing this game.

**Program** *The Secret of St Brides*
**Price** *£5.95*
**Micro** *Spectrum/C64*
**Supplier** *St Brides School*
*Burtonport*
*County Donegal*
*Ireland*

## BURN UP

*Speed King* is one of the more interesting bike race games I've seen in a long while. Its strength is that, whilst there is a level of authenticity about its presentation of 10 world famous circuits on a Suzuki, it is easy to get going and a lot of fun to play.

All controls are through the joystick and fire button, including gear changes, acceleration and leaning left and

right around the corners (watch the way the rider puts his foot out). There are plenty of other riders on the track, although it was a long time before I saw much of them after the start of the race.

The graphics are excellent with the sense of distance being achieved far more realistically than in most similar games – the way you start to approach the other bikes is extremely smooth.

It feels fast and beats hands down most of the *Pole Position* variants that are around.

**Program** *Speed King*
**Price** *£8.95*
**Micro** *Commodore 64*
**Supplier** *Digital*
*Integration*
*Watchmoor Centre*
*Watchmoor Road*
*Camberley*
*Surrey GU15 3AJ*

# This Week

| *Program* | *Type* | *Micro* | *Price* | *Supplier* |
|---|---|---|---|---|
| **Warlord** | Ad | Amstrad | **£7.95** | Interceptor |
| **Everyone's a Wally** | Arc | Amstrad | **£9.95** | Micro Gen |
| **Scrabble** | S | Amstrad | **£9.95** | Leisure Genius |
| **Steve Davies Snooker** | S | Amstrad | **12.95** | CDS |
| **English Word Usage** | Ed | BBC | **£3.95** | Kosmos |
| **Steve Davies Snooker** | S | C16 | **£7.95** | CDS |
| **Cylu** | Arc | Commodore 64 | **£2.50** | Firebird |
| **Natural History** | Ed | Commodore 64 | **£3.95** | Kosmos |
| **Steve Davies Snooker** | S | Commodore 64 | **£8.95** | CDS |
| **Elidon** | Ad | MSX | **£4.95** | Orpheus |
| **Murder in the Manor** | Ad | MSX | **£0.95** | P Morgan |
| **Treasure Isle** | Ad | MSX | **£0.95** | P Morgan |
| **Alpha Blaster** | Arc* | MSX | **£8.95** | ML |
| **Board Games I** | Arc | MSX | **£4.95** | Orpheus |
| **Board Games II** | Arc | MSX | **£4.95** | Orpheus |
| **Jet Fighter** | Arc | MSX | **£14.95** | P Morgan |
| **Scramble** | Arc | MSX | **£8.95** | ML |
| **Space Busters** | Arc | MSX | **£8.95** | ML |
| **Question of Sport** | Ed | MSX | **£0.95** | P Morgan |
| **Maths** | S | MSX | **£0.95** | P Morgan |
| **Software Manager** | S | MSX | **£0.95** | P Morgan |
| **Super League** | S | MSX | **£0.95** | P Morgan |
| **Music Maker** | Ut | MSX | **£0.95** | P Morgan |
| **Elidon** | Ad | Spectrum | **£8.95** | Orpheus |
| **London Adventure** | Ad | Spectrum | **£2.50** | Firebird |

Pick of the week

## DOCTOR IN CHARGE

According to Sinclair the QL microdrives are absolutely fine, wonderful and a big step forward over floppy discs – this is true if you accept the concept that saving and loading data is not actually the point of microdrives. The point of microdrives is only to be very very small.

Having just lost 850 words of an article I had foolishly typed on *Quill* and saved to microdrive, I was in a desperate but appropriate condition to examine *Cartridge Doctor* from Talent Computer Systems. Probably the most vital utility non-disc drive owning QL users could buy.

It's that blank *bad or changed medium* that rankles – it's so smug: 'well you certainly don't expect me to try and load anything from that, do you,' it seems to say. And what does *changed medium* mean? I always have visions of some sneaky QL-hater taking bits of tape out of microdrives and replacing it with some strange unexpected material like sticky tape or elastoplast.

Anyway *Cartridge Doctor* managed to recover nearly half of my lost article, not such that I could load it back into *Quill*, but at least so that I could read it on screen. It's extremely easy to use – most processes are automatic and most options have defaults for the most common choices.

It works like this. You load the *Doctor* into the QL then choose microdrives for the source microdrive and destination microdrive (if it's to make a new file).

The most common option is *Autoclone* which reads all the files on the microdrive assessing their condition.

Some may be pronounced 'good' which means they can be completely recovered and transferred to a new tape. Others may be found to have one or more doubtful blocks of information.

Files with doubtful blocks may then be patched, a process where each block is loaded up on to screen, where it may be corrected manually, rather like wordprocessing – you move a cursor around deleting characters, etc.

It doesn't seem to be one hundred per cent reliable, though. Some blocks of my *Quill* data proved to be screens full of question marks (maybe I was drunk when I wrote it) but basically my conclusion is simple. QL owners must buy this program.

**Program** *Cartridge Doctor*
**Price** *£14.95*
**Micro** *QL*
**Supplier** *Talent Computer Systems, Curran Building, 101 St James Road, Glasgow G5 0NS*

## WORD PLAY

Some Spectrum owners and not a few Commodore fans would vote, finally, for *Scrabble* as their favourite game on their computer.

It's something to do with the seeming artificial intelligence involved, with the sense that you are challenging the machine with what humans are supposed to be best at, ie, word skills. It helps, of course, that even as a board game it's superbly addictive.

Good news for Amstrad owners then that *Scrabble* is at last available on the machines. It's a fine implementation and, because of the Amstrad monitor, it's the clearest of all the versions.

The vocabulary of 11,000 words gives you a difficult game at the harder levels. I think a reasonably committed *Scrabble* player should win more often than not, but never easily.

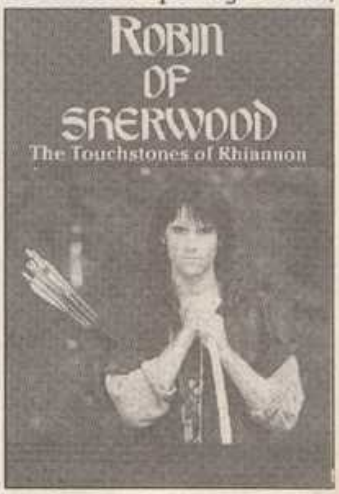
Computer *Scrabble* has one major additional virtue for kids – if anything is going to persuade your parents to buy a computer this game is it – drag them into a shop and make them play it.

**Program** *Scrabble*
**Price** *£9.95*
**Micro** *Amstrad*
**Supplier** *Leisure Genius, 3 Montagu Row, London W1E 1EZ*

## SWASHBUCKLING

*Robin of Sherwood* features some of the slickest graphics I've ever seen in a game of this kind.

If you persevere through the difficult opening section,




there is an absolutely stunning screen of a waterfall.

But first you must release Robin and friends, trapped in a cell awaiting a stiff talking to for venison highjacking. Getting out of the cell is very complex indeed (although to be fair it's exactly how it would happen in a swashbuckling film).

The actual myth of Robin seems to need little embellishment to turn it into the classic adventuring saga – and I found this the most gripping adventure I've seen for ages.

**Program** *Robin of Sherwood*
**Price** *£9.95*
**Micro** *Spectrum*
**Supplier** *Adventure Int. 85 New Summer Street, Birmingham*

# This Week

| | | | | |
|---|---|---|---|---|
| **Robin of Sherwood** | Ad | Spectrum | **£9.95** | Adventure Int |
| **Arithmetic** | Ed | Spectrum | **£3.95** | Kosmos |
| **Astrolab** | Ed | Spectrum | **£6.95** | Eclipse |
| **Chemical Formulae** | Ed | Spectrum | **£9.95** | Eclipse |
| **Halley's Comet II** | Ed | Spectrum | **£6.95** | Eclipse |
| **Stars and Planets** | Ed | Spectrum | **£7.95** | Eclipse |
| **Cylu** | Arc | Spectrum | **£2.50** | Firebird |

**Key: Ad** – adventure **S** – strategy-simulation
**Arc** – arcade **Ut** – Utility
**Ed** – education

**Adventure Int,** 119 John Bright Street, Birmingham B1 1BE, 021 643 5102. **CDS,** Silver St, Doncaster. **Eclipse,** 79 Ardrossen Gardens, Worcester Park, Surrey KT4 7AX. 01 330 3116. **Firebird,** Wellington House, Upper St Martin's Lane, London WC2H 9DL, 01 379 6755. **Interceptor,** Interceptor Micro's, Lindon House, The Green, Tadley Hampshire, 07536 7145. **Kosmos,** 1 Pilgrims Close, Harlington, Dunstable, Bedfordshire LU5 6LX. **Leisure Genius,** 3 Montagu Row, London W1H 1AB, 01 935 4622. **ML,** ML Services, 33 Shelgate Road, London SW11 1BA, England, 01 228 6730. **Micro Gen,** 44 The Broadway, Bracknell, Berks, 0344 427317. **Orpheus,** The Smithy, Unit 1, Church Farm, Hatley St George, Nr Sandy, Beds SG19 3UP, 0767 5481. **P Morgan,** 230 Dunvant Road, Dunvant, Swansea, W Glam SA2 7SR.

## Survival plan

An article published recently on the evolution of fifth generation computers explained how these machines will probably be able to do more or less anything we ask them to.

How many times have you read something similar? Yet somewhere under the words, a rather bizarre confusion of ideas seems to be lurking.

On the one hand there is the metaphor of evolution and everything that suggests in the way of raw Darwinian struggle, blood-stained teeth, the triumph of those best suited to survive, and so on. The tough and ugly face of Nature at its nastiest, as the generations of creatures pit themselves against the brutality of the real world that their creator – or blind chance – condemned them to live in.

Yet for some reason – maybe not unlinked to the desire to sound portentous – this word has become applied to the development by thoughtful, caring humans of willingly servile computers, happy apparently to obey our every whim. The fantasy is given classic form by science-fiction writer Isaac Asimov and his silly-solemn Laws of Robotics – the first and greatest of which is that no robot may ever harm a human being. (And can you really see the military supremos of either superpower keeping to that kind of rule?)

What a contrast between the two ideas.

Can you imagine any species struggling to evolve into a race of servile fools? Even the most docile herbivores, even the blindest and most wretched among liver-flukes, have more independence. Their existence may not be particularly dignified, but at least they retain some small area of self to call their own. The lamb may trot obediently to the slaughter, but at least it can choose whether to bleat when it sees the knife.

A computer, though, is always the prisoner of its program, and in turn the program of its author. Even the most open-ended of flexible expert systems, though capable perhaps of many nifty tricks, and of deductions unsuspected by its designer, cannot go beyond its brief – cannot turn away from its set purpose to do something more interesting, or something more important, or even something utterly vital to its survival.

For a species actually to evolve in any real sense of the word, surely it needs at least this degree of independence? Plus a capacity to protect itself (whether by teeth or camouflage), a talent for adaptation, and the ability to breed. How many of these has your Spectrum Plus got?

But of course it would be rather fascinating to see machines genuinely evolving. And by no means beyond the scope of possibility. All you'll need to arrange would be a robot with a good sized computer for memory, an easily available and re-chargeable power source, sensors so that it could decipher its environment, motor ability, and enough manual dexterity to assemble others of its kind. It would also need to have, programmed deep into its hardware, at the same fundamental level that modern machines are compelled to follow the paths of strictest logic, a will towards an effective independence of Man, (though it would need to be symbiotic with him). Useful talents might include the ability to forage for materials, to think creatively, handle a sawn-off shotgun, locate unprotected sub-post-offices, evade the police, hide out in the Welsh hills, etc.

Just a few generations of these beasts, and we'd see some genuine evolution. The results would undoubtedly be fascinating.

Mind you, there could be disadvantages . . .

**George Simmers**

## Down on the farm

**Puzzle No 171**

When old farmer Jorkins died he left his entire estate to be divided equally between his two sons. This was done quite satisfactorily except for just one rectangular field. This was a bit of a curiosity as the old man specified that the field was to be divided in half diagonally, from corner to corner.

However, there was a method in the madness. If the field was divided in this way, each piece of land would have sides that were all an exact number of yards in length. Further, both sons would each receive 666,666 square yards in area. Can you find the dimensions of the field?

**Solution to puzzle No 166a**

Of the 5040 possible combinations that can be formed with the seven cards, 576 of them are divisible by eleven. This reduces to 4 chances in 35 – slightly better odds than the 1 in 11 chance anticipated.

```
10 LET YES=0:LET NO=0
20 FOR A=1 TO 7
25 PRINT:A
30 FOR B=1 TO 7
40 IF A=B THEN GOTO 220
50 FOR C=1 TO 7
60 IF A=C OR B=C THEN GOTO 210
70 FOR D=1 TO 7
80 IF A=D OR B=D OR C=D THEN GOTO 200
90 FOR E=1 TO 7
100 IF A=E OR B=E OR C=E OR D=E THEN GOTO 190
110 FOR F=1 TO 7
120 IF A=F OR B=F OR C=F OR D=F OR E=F THEN GOTO 180
130 FOR G=1 TO 7
140 IF A=G OR B=G OR C=G OR D=G OR E=G OR F=G THEN
    GOTO 170
150 LET N=A*1000000+B*100000+C*10000+D*1000+E*100+
    F*10+G
160 IF N/11=INT(N/11)THEN LET YES=YES+1 ELSE NO=NO+1
170 NEXT G
180 NEXT F
190 NEXT E
200 NEXT D
210 NEXT C
220 NEXT B
230 NEXT A
240 CLS:PRINT "YES=";YES,"NO=";NO
```

The program generates all possible combinations of the seven digits, 1 to 7, with no digit repeated, and checks each to determine if it is an exact multiple of eleven.

**Winner of Puzzle 166**

The winner is Sam Nash of Leeds, West Yorkshire, who receives a prize of £10.

**Rules**

The closing date for Puzzle 171 is September 18.

## The Hackers

# Spectrum + OCP

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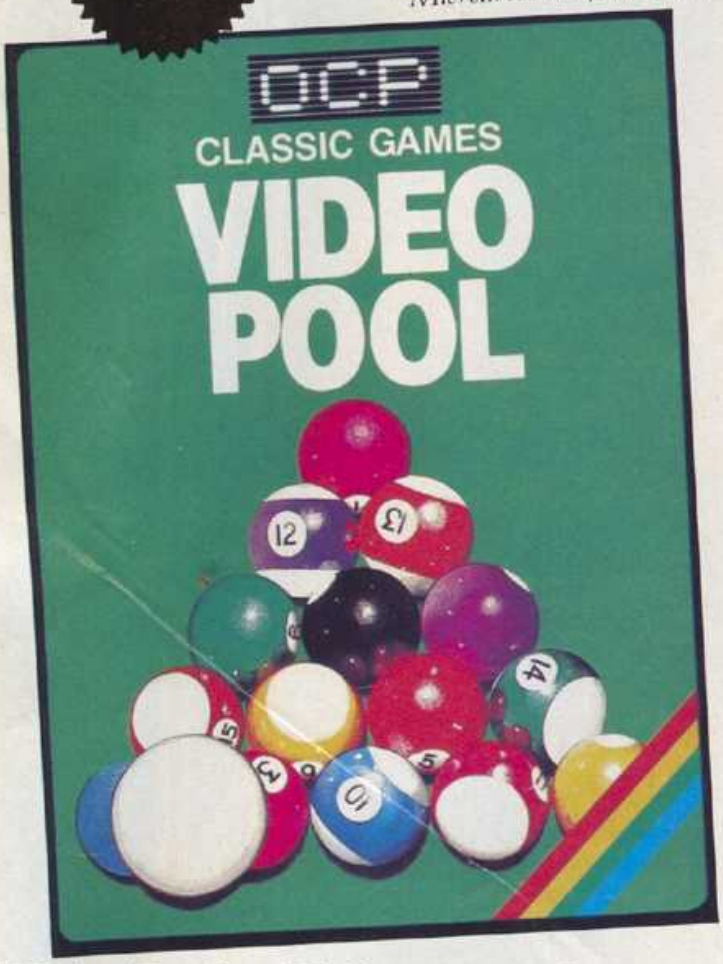


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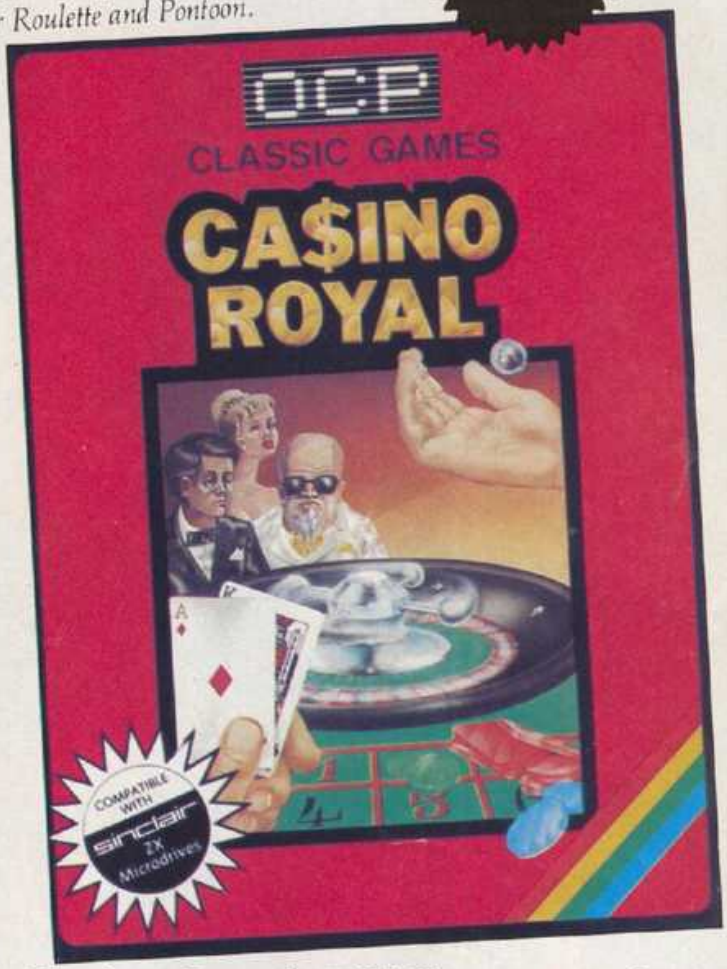


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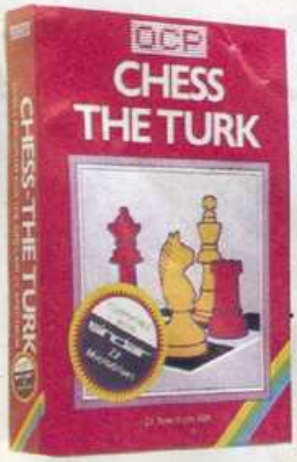


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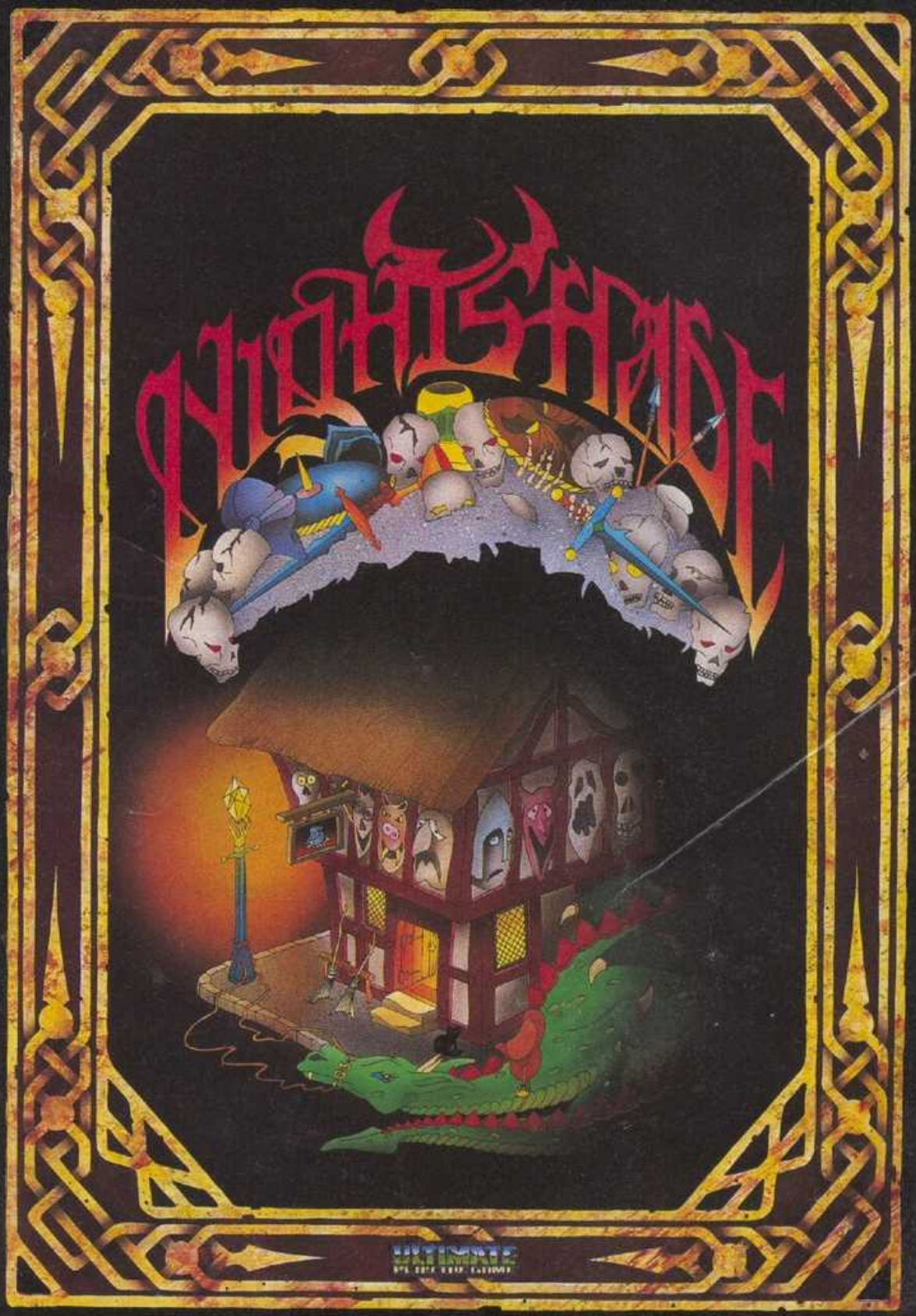


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