

POPULAR

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# Computing WEEKLY

13 - 19 June 1985

*It's the best selling weekly*

Vol 4 No 24



DOMARK, which launched its *A View To A Kill* game based on stunts used in the new James Bond film of the same name last week (pictured above), is rumoured to be in negotiations to develop a game on *Biggles*, a film due out this Christmas, featuring Captain WE Johns' famous air ace, immortalised in over fifty novels.

Domark's marketing manager Rory Curran however denied that any *Biggles* game was planned.

## Amiga's arrival pressures Atari

COMMODORE looks set to launch its Amiga computer - a rival for Atari's ST and Apple's Macintosh - on July 18, in the US.

The machine includes a built-in monitor and single disc drive, and will sell for \$1995 (around £1540).

Following last week's Consumer Electronics Show in Chicago, more details of the machine's design have emerged. The 68000 processor-based micro offers 256K

Ram expandable with a Ram pack to 512K. A 192K Rom includes a mouse-operated windows/icons operating system which Commodore calls 'intuition' and a disc operating system, Amiga-DOS. The machine also includes three custom chips handling animation (Agnus), graphics (Daphne) and sound (Portia).

Graphics display offers either a 60 or 80 column text display, hardware sprites, up

to 4096 colours, and its 32K screen offers a range of display resolutions (with different numbers of colours possible) from 320 x 200 pixels up to 640 x 400 pixels.

The sound chip gives four sound channels (or twin stereo tracks) over nine octaves. The chip also handles disc and joystick input/output.

As well as the built-in 3½ inch double-sided double-

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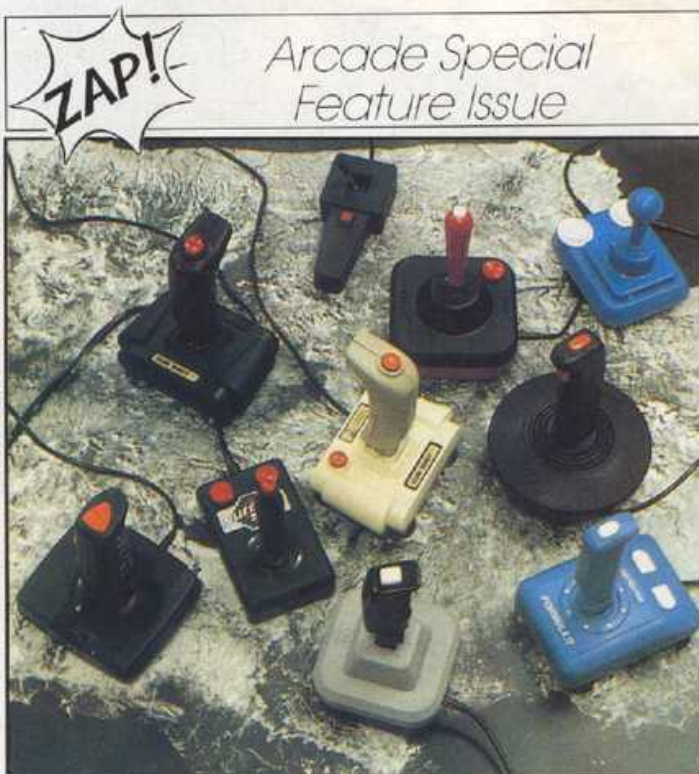
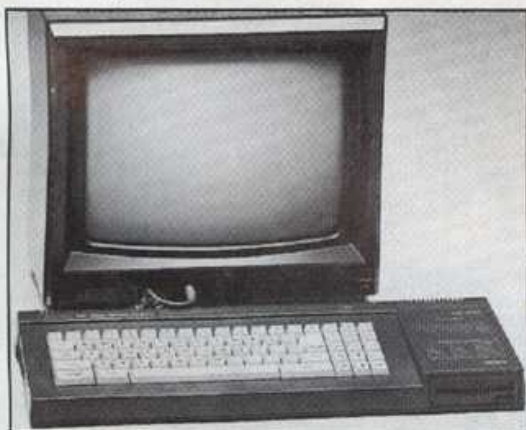
## Amstrad goes for US 128K

AMSTRAD has launched a 128K version of its disc-based CPC 664 at the Summer Consumer Electronics Show held in Chicago last week. The

new model is intended for sale in the US this autumn.

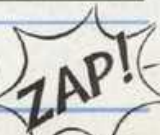
Like both Amstrad's previous machines, the CPC 6128 - as it is called - is being offered together with a choice of either monochrome or colour monitors. The green screen version will cost \$699 (around £540) and the colour version will cost \$799 (around £620).

cont. on page 5 ►



INSIDE

INFINITE GUIDE TO INFINITE LIVES - BEGINS P12





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# View

**S**inclair's troubles continue. Hardly a day goes by without further articles adding fuel to rumours of financial instability at Britain's top micro company.

Considering that Sinclair is currently carrying somewhere around £30m of unsold stock, it is hardly surprising that the strain is beginning to show. Further, with home micro sales significantly reduced across the board, Sinclair still has now to find money to buy the components it will need to manufacture its models to be sold this Christmas.

Now it would be easy - as many have - to write Sinclair off as a spent force. But that would be to seriously underestimate the strength of Sinclair and indeed the strength of Sir Clive.

Despite the unexpectedly vicious down-turn in post-Christmas sales the company is still holding on to its approximately 40 per cent share of the market.

Sinclair is astonishingly good at spotting emerging consumer areas and exploiting them before anyone else. Yet he does so within the constraints of entirely conventional (and so less capital intensive) technologies. Somehow he always manages to find 'windows' of opportunity that others miss.

Some, like the Spectrum, have been wildly successful and so tremendously profitable.

Admittedly others are too risky to be successful, like the C5. Some are brilliantly conceived, but go off half-cocked, like the QL. And some grasp success from the jaws of disaster, like the flat screen TV, which now finally looks like coming good.

Sinclair has always walked a difficult tightrope. But he has proved himself a survivor.

# POPULAR Computing WEEKLY

Vol 4 No 24

## Presents . . .

**News** > More Chicago Show news



**Joystick Review** > A two page summary of the slickest and quickest available



**Arcade Addicts Guide** > Four packed in pages of pokes and tips for virtually any game you've ever played!

**Star Game** > A high speed machine code version of the classic race 'n' chase strategy game

**Software Reviews** > Latest software from the musical mayhem of Ghetto Blaster on the Commodore to the intricacies of ADA

**Spectrum** > Keep track of your shares

**QL Page** > Examine the QL memory with this function key based utility

**Commodore 64** > Create synthesized sound and see it displayed as bar charts with this sophisticated utility

**Amstrad** > A program to let you create programmable function keys on the Amstrad

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## Futures . . .

C128 reviewed. . . check your chess grade on the Commodore 64. . . machine code strategy board game on the Spectrum

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ABC

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Computer Trade Association Magazine of the Year



# Oric bought by French company

ORIC Products International has finally been bought from the receiver by Eureka Informatique, a French distribution company.

Eureka Informatique - which was formerly known as SPID - has acquired all rights to all names, products and current stocks. The company will be restarting production of the Oric Atmos and Stratos machines in its newly purchased factory in Normandy,

France. The offices in Cambridge, previously occupied by Oric, are to be sold off independently.

Before it crashed, Oric was also working on an IBM compatible machine and a portable model. "A substantial part of the technology relating to these machines is available to Eureka," said Cameron MacSween, a consultant who handled the negotiations between Eureka and the receiver,

Dennis Cross of Chater and Myhill. "I do not, know, however, if work will now continue on them - I suspect it is unlikely."

He added that Eureka had no plans to set up a manufacturing facility in the UK, although prior to the purchase, discussions had been held with Barry Muncaster of Oric Products Export, with a regard to making the machines available in this country.

## Amiga hits Atari ST

◀ continued from page 1

density drive - with a formatted capacity of 880K - the machine includes a detachable 89-key keyboard, two-button mouse (configured for one joystick port), twin joystick ports, supplementary disc, Centronics parallel, RS2320C serial and Ram expansion interfaces and stereo audio, domestic TV and RGB monitor outputs.

The machine's sophisticated Intuition operating system offers special facilities for multi-tasking, window handling and animation.

Commodore also plans to offer - to complement the machine - a range of printers, additional disc units (both 3½ inch and 5¼ inch), a 1200 baud modem, hard disc unit (up to 8M), a video controller package including a genlock interface and frame grabber, and a Midi music interface.

Commodore views the Amiga machine as a very significant launch for the company and is aiming it at a broad spectrum of applications in the entertainment, education and home business areas.

It UK launch is expected early next year. "It will not be announced before January," said Commodore UK's general manager Nick Bessey, "But I would put money on an announcement in January."

## Amstrad goes for US 128K

◀ continued from page 1

The machine is Z80-based and the 128K Ram capacity is achieved by bank-switching two 64K Ram blocks. The CPC 6128 includes a built-in 3 inch disc drive and is upwardly software compatible with the CPC 464 and 664.

The machine is being distributed in America by a new Chicago-based distributor, Indescomp Inc, with Amstrad acting purely as manufacturer. Indescomp Inc was set up in January this year by Indescomp SA, Amstrad's Madrid-based Spanish computer distributor.

"Amstrad is not financially involved in the project in any way," said Amstrad's William Poel.

It is not clear whether the CPC 6128 will be launched in the UK "The 6128 is being displayed for the benefit of the US market. We had to launch at CES in order to take machines into the shops in the autumn".

"It has somewhat perverted Amstrad's usual principle of not showing anything until it's ready," William Poel continued.

Alan Sugar, Amstrad's chairman, said that the 6128 was more likely to come to Britain early next year, as there was no need to add to Amstrad's range at the present time.

The CPC 6128 will initially be sold in the US through a deal with retail giant Sears Roebuck.

## Space robots kit crosses Atlantic

TOY MANUFACTURER Milton Bradley has launched a new range of motorised construction kits, which can be made into various vehicles, and which should soon be



capable of being interfaced with a home micro.

The company is stressing the educational potential - schools in Wales have been experimenting interfacing the models with BBC Bs via a control box, using them much in the same way as turtles.

Milton Bradley has no plans to launch its own interface, but is considering applications for licences from a number of UK companies.

There are three major sets at present, plus an expansion set. The price ranges from around £20 for the expansion set, to between £60 and £80 for the largest set.

## Hopes of Sinclair progress hindered by accounts delay

A MEETING of Sinclair's major creditors was held last week, at which a level of support for the troubled company was agreed.

The meeting was held largely because of the action of Sinclair manufacturer Timex, in selling its stock of Spectrums to Zeta Services (see *Popular Computing Weekly*, June 6) in order to recoup some money on Sinclair products.

The main parties at the

meeting were Barclays, Citibank, Thorn Emi, Timex and AB Electronics.

The Bank of England has also undertaken to provide a chairperson from its industrial finance division to chair negotiations between Sinclair and potential investors.

However, serious talks cannot begin until Sinclair's auditors complete last year's accounts. These were due to be ready last week, but have been delayed.

## Acorn boss appointed from Olivetti

ACORN has announced that Alex Ubaldi, a senior director at Olivetti, has been appointed as acting managing director at the Cambridge computer company.

The post had been left vacant after Olivetti rescued the company in February.

Acorn's chairman, Dr. Alexander Reid, had no comment to make on the appointment last week.

Following the rescue Acorn's shares have still failed to make a recovery. After dipping as low as 9p at one point last week, they currently stand at 13p. Before Acorn's troubles the shares stood as high as 114p.



## Receiver called in

PROTEK, developer of the Protek joystick interface, a Spectrum modem, and the Spectrum game *Hunter Killer*, has called in the receiver.

D J Watt of accountants Cork Gully's Edinburgh office, has been appointed to handle the receivership.

● Romik, the software company which crashed in March, had debts totalling over £100,000, a creditors meeting revealed last week.

## Software auction

AN AUCTION of computer software in aid of the Ethiopian Famine Appeal is being held at County Hall, London SE1 on June 15, starting at 11 am.

Lots will include software titles from US Gold, Activision and Quicksilver among others. The auction is being organised by the industry publication *Computer Trade Weekly*.

## First showing of C128 at show

THE highlight of the 6th Commodore Computer Show, held in London between June 7 and June 9, was undoubtedly the first public showing of Commodore's new C128 machine in this country.

Both models, the basic C128 and the C128D - with built-in single 5 $\frac{1}{4}$  inch disc drive - were shown.

Commodore has still not announced a definite release date or price for the C128 machines. The machine is expected to be available in vol-

ume by September, but may be released to some dealers during the summer. "The C128D will be launched around September or October," said Paul Welch, Commodore's UK sales and marketing manager. The price for the basic C128 is expected to be between £300 and £350, while the built-in disc version is likely to be considerably more expensive, probably nearer £500-£600.

The new 1571 disc drive will also be launched at the

same time as the C128. This is fully compatible with the C128, operating as a 1541 in Commodore 64 mode, and as a much faster drive in CP/M and 128 mode.

Also at the show, Commodore previewed a new colour monitor, the 1902. The current 1701 monitor has only a 40-column screen, and so cannot be used with the 128 in CP/M or 128 mode.

Paul Welch also announced one more bundling package for Commodore 64 selling the 1541 disc drive, Commodore modem and *Easy Script* together for £229. The price includes a year's subscription to *Compunet*.

Commodore has already announced three other special packs: a £199 deal to pack the Commodore 64 with cassette player and *International Soccer*, the £449 *Plus/4 Business Pack* (see *Popular Computing Weekly*, June 6) and the £349 pack offering the 1541 disc drive, MPS 801

continued on page 7►



Commodore's new C128 machine

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STREET HAWKS	7.95	5.90	RAID OVER MOSCOW	7.95	5.90
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A VIEW TO KILL	10.99	8.50	CAULDRON	7.99	5.99
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THE FOURTH PROTOCOL	12.95	9.99	BRUCE LEE	7.95	5.90
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## CAN YOU WAIT?



# Letters

## QL command

I don't know if other QL users will find the following of any interest to them, but there is one command on the ZX Spectrum which I would dearly like to have on my QL. That is the use of *Line* when used to auto start a program loading, eg, *Save "name" Line 200* would cause a program, when *Loaded* back, to start from Line 200.

On the QL, however, you have the *LRun* command which causes a program to start from the beginning which would then need *Gotos* *Gosubs* or *Procedure* calls to start from the specified part of the program.

I have found a very simple way around this difficulty and that is to *Open* a file to microdrive and list the program to it, ending with *Print* "Run".

To try it, first have a program in memory then enter as direct commands the following:

```
OPEN 5;MDV1 name : LIST 5 :
PRINT 5;"RUN xxx" &
CHRS(10) : CLOSE 5
```

Now, whenever the program is *Loaded* back by either the *Load Mdv1*, etc, or *LRun Mdv1*, etc, the program will start from the line specified in the print statement above; *Run xxx*, where *xxx* is the number.

D Hayward  
No4 Lane End  
Whelford  
Gloucester



"64K's enough for British Amstrad users - but in America everything's got to be bigger."

## Monolithic

Ref Letters page cartoon  
Vol 4 No 18.

I entered the listing that was on the Monolith and then typed *Run* and for some reason my monitor became 12 feet tall and its weight increased to five tons.

I might have misread some of the hieroglyphics.

W G Gillett  
74 Castleway South  
Leasowe  
Wirral  
Merseyside L46 1PB

## Out of stock

It seems a shame now that even chain stores can decide if a computer sells or not. I am of course talking about the events concerning Commodore that happened recently.

When the chain stores find themselves out of stock they also find they cannot buy new stock at a cheaper price and so discontinue the computer. The manufacturer finds it is now unable to sell the

computer.

If they wanted to, the chain stores could end the computer industry in about a month's time.

J M Shearing  
Ivy Mill Lane  
Godstone  
Surrey  
RH9 8NB

## Minor bug

During abusive treatment of my Bank Account program I have found a minor bug.

Statement of Account: It has been found that if the option "EXAMINE/DELETE ENTRIES" is selected before any Data has been entered for the month in question, the program will stop with an error report.

This will be eliminated by adding the following line:  
6045 IF  $s(1,z) = 0$  THEN  
GOSUB 420: RETURN

D G Shedden  
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## NAPOLEON'S SANDWICHES



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# Chicago Show dominated by Activision and Epyx

NEW software at the Consumer Electronics Show, held in Chicago between June 2-5, was greatly reduced from last year in the games and educational areas, although Activision, Epyx and Broderbund introduced major new titles.

Broderbund, one of the largest US software companies, concentrated its new releases on the Apple II range.

One of the software highlights of the show was the preview of Epyx's *Summer Games II* and *Winter Games*.

*Winter Games* follows the

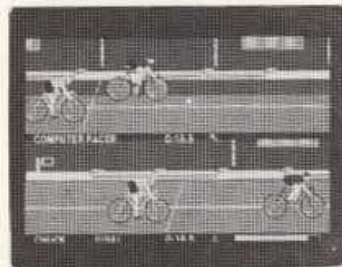


same format of sophisticated graphics and complex animation as the original *Summer Games*. The earlier game has now sold over 200,000 copies in the US alone according to Epyx. *Winter Games* features

six winter sports: skiing, the ski jump, a ski biathlon, figure skating, freestyle skating and bobsledding.

*Summer Games II* adds eight new sports to the original title - rowing, triple jump, javelin, high jump, fencing, cycling, kayak canoeing and show jumping.

While *Summer Games II* will be available in the US this summer, *Winter Games* will not be released until the autumn.



Following on from Epyx's deal with Lucasfilms which produced *Ballblazer* and *Rescue on Fractalus*, the company has announced it will be publishing two more Lucasfilm games, *The Eidolon* and *Koronis Rift*.

*The Eidolon* is an arcade adventure set around the Eidolon, a 19th century time machine, which transports the player to a land of caverns, trolls and dragons. The task is to track down the missing inventor of the Eidolon.

In *Koronis Rift*, the player must try to recover weapons used by ancient civilisations, destroying the base held by hostile guardians of the ancients' weapons.

While the new Epyx games should reach the UK through licensing deals, it will not be from CBS, since the contract between the two has been terminated. US Gold is strongly rumoured to be taking over the Epyx licence.

Activision's new titles, which should be released in this country through Activision UK, showed a greater emphasis on simulation games, and surreal scenarios. *Ghostbusters* author David Crane's latest effort is *There's Someone Living Inside My Computer*. The screens show a diagrammatic representation of a house, with your computer dweller

inside, with whom you can converse via the keyboard.

*Hacker* from Activision is an adventure with a plotline similar to *System 18000* in this country - the computer plays the part of a computer, with the player as a hacker, trying to discover what you have hacked into.

*Fast Tracks* is a computer 'slot-car' construction kit, while the idea of *The Great American Cross Country Road Race* is self-explanatory.

Activision announced that it has signed a deal with Lucasfilm, to publish its titles outside North America. *Ballblazer* and *Rescue on Fractalus* should be available in Europe and Australia this summer.

Simon and Schuster announced a text adventure based on *Star Trek*, called *Star Trek: The Kobayashi Alternative*. The player takes the part of Captain Kirk, and must use the Enterprise crew and resources to solve an intergalactic mystery. A Commodore 64 version of the game will be available in the States in October.

Mindscape announced two licensed titles, one based on a Stephen King novel *The Mist*, the other, interestingly enough, based on *A View to a Kill*. Mindscape's version, however, is a text adventure covering all the action of the film rather than three separate segments.

Mindscape also showed a graphic adventure for the Macintosh, called *Deja Vu*,



designed specifically to use the Mac's hi-res graphics, windowing capabilities and different fonts.

Of the British software houses, only Mastertronic was prominent. Its budget Commodore 64 discs, which sell for \$9.99, have done remarkably well since they were launched in the US. Mastertronic launched *Spooks*, *The Captives*, *Finders Keepers* and *Wrath of Magra* for the first time in the US.

## Commodore Show

◀ continued from page 5

printer with *Easy Script*.

Anyone purchasing the £199 Commodore 64 package or C16 starter pack can also take advantage of a Commodore holiday offer - three nights accommodation for two at a range of 300 hotels in Europe.

Commodore also showed its willingness to move towards 3½ inch discs - which are fast becoming an industry standard - by showing the 1561, a single-sided 170K capacity 3½ inch disc drive 1541-compatible.

"There is no specific launch date for this model, but if 3½ inch discs become the standard, we have the 1561 ready to launch quickly," said Commodore's John Baxter.

A number of new software packages were launched at the Show. Melbourne House's karate simulation *Way of the Exploding Fist*, due for release next week for the Commodore 64 at £9.95, took up all of the company's stand.

Audiogenic used test cricketer Graham Gooch to promote its new cricket simulation, *Graham Gooch's Test Cricket*, to be released this month at £9.95.

Continuing with sports simulations, Commodore itself launched *International Tennis*, the latest in the series which includes *International Soccer* and *International Bas-*

*ketball*. *Tennis* will be in the shops this month at £5.99.

Commodore also announced the addition of *Sound Studio* and *Sampler* to its music series. Like *Music Maker* and the *Playalong* album series, the two new packages were developed by Music Sales. *Sound Studio* turns the C64 into a music synthesiser and multi-track sequencer; *Sampler* enables the user to record any sound and then alter it and play it back over a 10-octave range.

*Sound Studio* will be available by the end of the month at £14.95, *Sampler* is intended to be a Christmas release at £69.99.



Test cricketer Graham Gooch

Also on the musical side, Island Logic's *Music System* has been converted to the C64 and was on show.

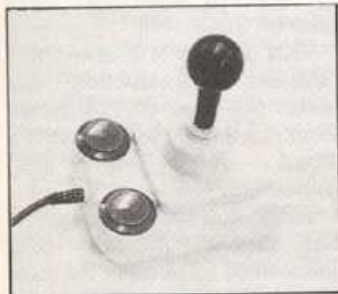
Precision launched a new C64 word processor, *Superscript*, an enhanced version of *Easyscript*, a low cost version of its acclaimed *Superbase*, called *Superbase Starter*, and *Supertype*, a typing tutor. *Superscript* costs £69.99, *Superbase Starter* £39.95, and *Supertype* £19.95.



# Joysticks Survey

Thirteen of the best, compared. In our first Arcade games special feature, issue, *Graham Taylor* gets to grips with a selection of the top joysticks available for micro

**BBC Pro Joystick**  
**Price £17.95**  
**Supplier Kempston**



**T**he BBC Pro Joystick is beautifully designed. You need no additional software and the whole thing can be plugged straight into the analogue port with no need for cumbersome interfaces. It also uses eight-way micro switches to register movement which means it's very sensitive - maybe too much for some games.

The design is sturdy with a metal shaft, fire buttons are large, although the action was maybe a little sloppy - they didn't quite 'feel' like they registered your press. Extensive testing on Acornsoft's *Revs* revealed no major design flaws - the simple ball shaped tip provided a positive non slip grip.

In short an excellent joystick for BBC owners. Quite expensive but, remember, many alternatives also need an interface.

**Kempston Formula 1 Joystick**  
**Price £16.95**  
**Supplier Kempston**



**T**his is a deluxe version of the Kempston Formula 2.

The main difference is the use of micro switches which makes for better response and greater longevity (they

apparently don't break so easily).

The basic design is the same as the BBC Pro Joystick - strong metal shaft, left and right fire buttons, firm ball grip. As with the BBC there may be some minor doubt about the fire button response - it's not all that firm.

One point that hasn't been skimped - the length of the connecting lead - it's long at five feet and that can be useful. Short leads can get easily twisted up in two-player games and force players to stand close together. £16.95 is not cheap but I don't think it'll need replacing too often.

**Kempston Formula 2 Joystick**  
**Price £11.95**  
**Supplier Kempston**



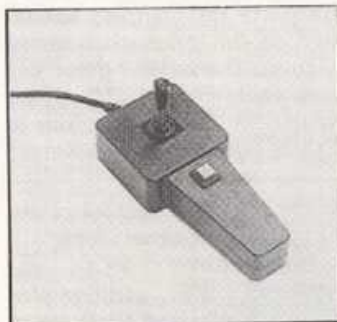
**T**he Formula 2 Joystick is Kempston's bottom range item and at £11.95 it's one of the cheapest joysticks around.

It uses leaf switches which have a number of problems associated with them. For one thing the action is very sluggish. To move left you have to shove the whole shaft firmly and far to the left - it takes a noticeable amount of time and on our test program (*Dynamite Dan*) definitely caused valuable lives to be lost. There is a longer term question of reliability. The leaf system works a bit like those metal plate battery connectors, there is a danger that because of oxidation the electrical connection could fail to be made.

Although unlike the Formula 1, you get a top-of-shaft fire button generally the other aspects of design seem cheaper. The shaft is some kind of

nylon-like material rather than metal and the grip, although more like a motorbike throttle, is not necessarily easier to use. As Kempston joysticks go, I'd certainly rather pay the extra five pounds for the Formula 2.

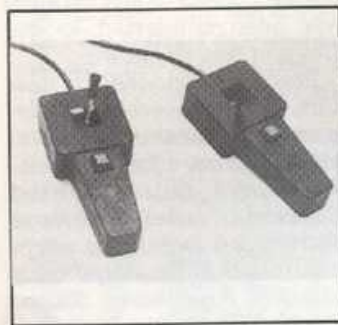
**Flightlink Switch Joystick**  
**Price £11.45**  
**Supplier Flight Link**



**F**light Link has a range of similarly styled joysticks designed for a range of machines. The basic model has an Atari connector and costs £11.45 - less than the average for switch-type joysticks.

The actual switching is excellent, very responsive indeed and with a reassuring 'click' that sounds like it isn't going to wear out quickly. The fire button also sounds and feels like it could take a lot of strain. What you lose over cheaper joysticks is in design - the shaft is a short metal pipe, topped off with a short piece of plastic. It works perfectly well but isn't elegant. If you don't care about looks, this is one of the best switch-type joysticks available.

**Flightlink BBC Joystick (pair)**  
**Price £17.95**  
**Supplier Flight Link**



**T**hese joysticks are the same overall design as the Flightlink switch-type joystick but use an analogue system and come as a pair both connected to one BBC analogue port connector.

At £17.95 for a pair of joysticks these are obviously very cheap, although I wonder how many games on the BBC have facilities built-in for two joysticks - not many I think.

Analogue systems tend to be unreliable but this one feels good and is surprisingly responsive, although it doesn't re-centre itself automatically.

In fact it's fair to say you could easily believe it was a micro-switch system - Flight Link give it a 300,000 cycles track and wiper life which translated means they expect it to last a long time. Very good value if you need two joysticks (a single analogue joystick costs £9.95).

**Vulcan Gunshot Joystick 1**  
**Price £8.95**  
**Supplier Vulcan Electronics**



**A** very cheap analogue joystick that looks pretty good, has a reasonable grip and a pretty good response. The doubts come with long term reliability. We've had one in the *Popular* office for around six months or so and it's broken - the amount of use it got was too much for it and the switch mechanism gave in.

However, it had to work hard in that time and maybe it was just a dodgy one from the factory.

If you're limited in cash they don't come much cheaper.



# Joystick Survey

**Vulcan Gunshot Joystick II**  
**Price** £11.95  
**Supplier** Vulcan Electronics



**T**he only difference between this joystick and the Gunshot I is the fact that it's black and that it has an auto-fire switch.

Setting auto-fire to on is the same as holding down the fire button continuously. This is fine for your basic blast-'em-up game but not that useful in *Manic Miner*-style games where all that happens is that you bounce around everywhere.

If you are absolutely addicted to games which need lots of laser destruction you might think the extra £3 for the fire switch is worth it. Most people probably won't need it.

**The Boss**  
**Price** £25.00  
**Supplier** Computer Games



**T**his joystick uses six-way leaf switches rather than micro switches but it responds well.

There may be a few doubts about long-term reliability, partly due to the mechanics of the leaf system and partly because of the construction – the joystick shaft seems to be mainly plastic.

Visually the joystick is neat – smart black and grey colour scheme with a moulded grip. One complaint here, the grip is short and the fire button is mounted on the top. This

means that to operate the fire button the thumb has to be pressed down in a slightly uncomfortable way.

A reasonable mid-range analogue joystick.

**Bat Handle Joystick**  
**Price** £25.00  
**Supplier** Computer Games



**A** very high quality joystick using a specially developed left system to register joystick movement.

The Wico leaf system does appear to give the kind of response you'd expect from a micro switch system and is apparently as reliable.

This joystick has a thick metal shaft which recentres automatically and twin fire buttons. One is top-mounted the other in the base – a switch selects which is in operation.

The design is plain; square base and tapered plastic grip. It looks like it might cause you to slip but in practice it never gave any problems.

A very nice joystick but £25 is a lot compared to a Kempston Micro Switch at £16.

**Super Three Way Command Control**  
**Price** £27.00  
**Supplier** Computer Games



**T**his is basically the Bat Handle Joystick with a choice of grips – a round handle, a tapered plain grip and your standard ribbed motorcycle-style handle. Changing between grips is simple and each handle fitted firmly. I can't believe that people really need three handles but I suppose the First Division addict may have a use for them.

**Super Champ**  
**Price** £12.95  
**Supplier** Dean Electronics



**S**heer amount of plastic makes this one good value. It's probably the largest joystick available. That and the matt black colour have given it such macho appeal that it's been the most successful joystick in the US for a while. Although not micro switched it has a tough but flexible ring of plastic between shaft and base that prevents you breaking it easily.

The grip is firm with a fire button mounted both on the top for thumb action and another just below that for first finger – it's very easy to use.

All in all unless you want the extra sensitivity of micro switches this could be the joystick to go for.

**CGL Champion**  
**Price** £11.99  
**Supplier** Computer Games



**T**his is a budget-price joystick which nevertheless includes stick and base-mounted fire buttons and an auto-fire switch.

The saving is made in the switch design. This uses some sort of leaf system with an action that feels a little doubtful. I can imagine that it might not last very well, but is still good value.

**QL Sure Shot**  
**Price** £25.95  
**Supplier** Eidersoft



**A** very high quality device which plugs straight into the QL's serial port.

It uses a very high quality micro switches with a reassuring click when contact is made. It has a plain design with flat rectangular base and a taper-style grip. Fire buttons are mounted left and right on the base and on the top and all have a very good and decisive response.

The shaft is thick metal for durability and generally this looks like a joystick that will last. Highly recommended.

**Dean Electronics**, Glendale Park, Fernbank Road, Ascot, Berks.

**Computer Games Ltd**, CGL House, Goldings Hill, Loughton, Essex.

**Vulcan Electronics**, 200 Brent Street, London.

**Flight Link**, Unit 12 The Maltings, Turk Street, Alton, Hants.

**Kempston Micro Electronics**, Singer Way, Woburn Road, Industrial Estate, Kempston Beds MK42 7AF.

**Eidersoft**, The Office Hall Farm, North Ockenden, Upminster RM14 3QH.



# OUT OF A SEA OF SOFTWARE...



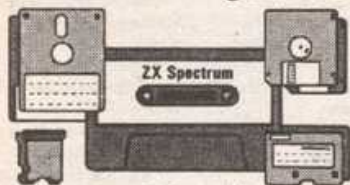


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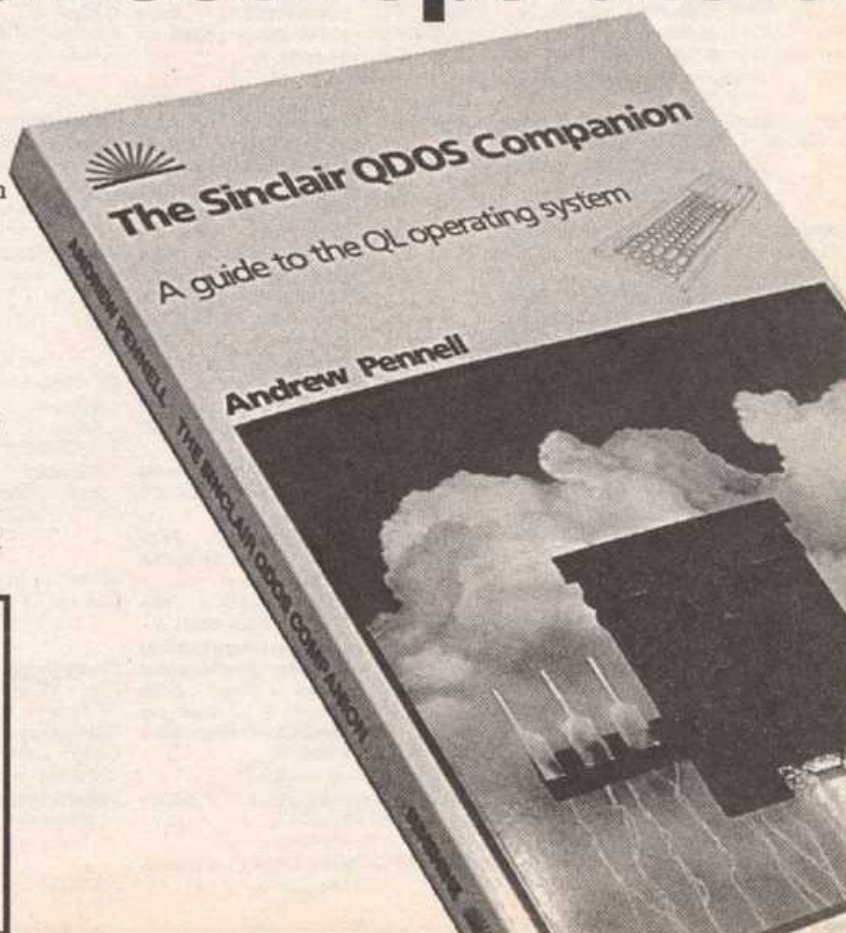
# QDOS — for smooth operators

If you have a Sinclair QL and you want to program effectively in machine code, then Andrew Pennell's latest book is for you.

The Sinclair QDOS Companion is a complete guide to the working of the QL operating system. It begins with an introduction and a chapter on multi-tasking, before going on to cover the 8049 second processor, input/output, device drivers, exceptions, interrupts and the Job Scheduler, and QDOS utilities. The final chapters show you how both to extend SuperBASIC and make use of external ROMS.

The book is definitely not just a rehash of the QDOS manual, but extends the basic information to give you a broader understanding of how best to make use of QDOS. The QDOS traps are described not in numerical order but in a more logical order based on their use.

Andrew Pennell is an experienced Sinclair author. Practical Computing described his previous book Assembly Language Programming on the Sinclair QL as: 'An excellent introduction ... eminently readable'.



Please send me \_\_\_\_\_ copies of The Sinclair QDOS Companion at £6.95 plus 60p p&p each.

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# Complete Arcade

## SPECTRUM

**Knight Lore** 10 Clear 24831: Restore  
: Gosub 60: Gosub 60:  
Poke 62000,61: Poke  
62178,0: Poke 62258,201  
: Poke 62410,251: Poke  
62411,201: Randomise  
USR 62374  
20 Poke your routines  
here eg Poke 53567,0 is  
infinite lives.  
30 Print USR 24832  
40 Data 23296, 23306,  
221, 33, 64, 156, 17, 14, 4,  
62, 255, 55, 205, 86, 8,  
201  
50 Data 41012, 41021, 33,  
113, 158, 17, 48, 242, 1,  
172, 1, 175  
60 Read a,z: For p=a to  
z: Read d: Poke p,d:  
Next p: Randomise USR  
a: Return  
Just type in the above  
and play your original  
from just past the initial  
header.  
Poke 50064,201 stops  
metamorphosis  
Poke 50206,0 gives infi-  
nite days  
Poke 49759,n n is num-  
ber of objects needed to  
collect.

**Underworld** Use the *Knight Lore* Pro-  
gram but make these  
changes:  
Line 50 change 41012 to  
41008 and 41021 to  
41017  
Line 30 change to Print  
USR 28610  
Line 20 is Poke 59376,0  
for endless lives or  
Poke 48019,201 re-  
moves moving sprites.

**Mutant Monty** Poke 54800,0: Poke  
54867,0: Poke 54893,0:  
Poke 55321,0 These  
give infinite lives.

**Project Future** Poke 27682,0 removes  
aliens

**Cookie** Poke 28695,62: Poke  
28696,5: Poke 28697,0:  
Poke 28698,0 endless  
lives

**Pyjamarama** To get past the  
hyperloader type in this  
routine. It will load the  
game and then stop it  
from auto starting:  
10 Clear 29999: Restore  
20 For a=1 to 14  
30 read b:  
Poke(a+b\*29999),b  
40 next a  
50 Print "insert game  
and press play"  
60 Randomise USR  
30000  
70 Poke 32844,207:  
Poke 32845,26  
80 Poke 32828,251:  
Poke 32829,201  
90 Poke 32789,243:  
Poke 32921,0  
100 Randomise USR  
32789  
120 Stop

### Fall Guy

130 Data 221, 33, 59, 127,  
17, 216, 1, 62, 255, 55,  
205, 86, 8, 201  
Once the game has  
loaded you can enter  
your pokes. Poke  
43883,x x is number of  
lives. To start the game  
Randomise USR 64649.

Type in the following  
for infinite lives:  
10 Clear 24100  
11 Load "" code  
12 Randomise USR  
65100  
13 Load "" code  
14 Poke 44204,0  
15 Randomise USR  
41200

### Sky Ranger

(Level) Code: (1) enter;  
(2) magic; (3) pilot; (4)  
stomp; (5) pairs; (6)  
event; (7) recap; (8)  
alibi.

### Horace and the Spiders

Poke 25142,0 - no hills  
on Level 1.  
Poke 28773,0 - no spi-  
ders on Level 1.  
Poke 29626,0 - ropes  
are pulled in fast.  
Poke 28720,0 - jump  
onto next rope when  
you like.  
Poke 30070,0 - all spi-  
ders die on Level 3  
instantly.  
Poke 25215,0 - hills and  
more hills, for  
masochists.  
Poke 29910,0 - slow spi-  
ders on Level 3.  
Poke 30116,0 - infinite  
spiders on Level 3.  
Poke 29626,52 - stops  
ropes being pulled up  
on Level 3.

### Stop the Express

before entering the  
Pokes do the following:  
Type MERGE "", then  
press Enter, and press  
play on your original  
tape. Type Clear  
25999: Load "" code,  
then press Enter, and  
press play on your origi-  
nal. Step the tape, then  
type Poke 48111,201:  
Randomise USR 48098,  
then press Enter. You  
can now enter your  
pokes. To run the code  
type Randomise USR  
32768.  
Poke 34464,183: Poke  
34928,183: Poke 35257,0  
- endless lives.  
Poke 35780,0: Poke  
39549,0 - unlimited  
time.  
Poke 40673,0: Poke  
40674,0: Poke 49261,N -  
start at carriage number  
'N'. (Be careful some  
values may crash  
game). If it does not  
work then add: Poke  
40075,4.

### Freeze Bees

Poke 34610,0 - infinite  
lives.

### Pi-Ballad

Poke 44416,x - x is num-  
ber of lives.

### Psytron

Poke 28625,0: Poke  
28626,0 - endless fuel.  
Poke 41098,17: Poke  
41099,32: Poke 41100,1:  
Poke 41101,0 - endless  
men.  
Poke 26142,62: Poke  
26143,255: Poke 26144,0  
- endless oxygen.

### Frank 'n' Stein

Poke 28277,x - where x  
is the number of lives.

### Ah diddums

Poke 24942,x - where x  
is the number of lives.

### Pyramid

Poke 44685,0 - limitless  
energy.

### Arcadia

Poke 25776,0 - infinite  
lives.

### Zip Zap

Poke 53751,0: Poke  
53752,0: Poke 53753,0:  
Poke 54141,0: Poke  
54142,0: Poke 54143,0:  
Poke 54144,0 - infinite  
energy.

### Wild West Hero

Poke 23821,x - where x  
is number of lives (32  
max).

### Mr Wimpy

Poke 33693,0 - infinite  
lives.  
Poke 33809,x - where x  
is number of lives.  
Poke 43105,0 - infinite  
peppers.  
Poke 33721,x - where x  
is number of peppers.  
Poke 33501,0 - skip first  
stage.

### Maze Death Race

Poke 26730,0: Poke  
26731,0: Poke 26659,0:  
Poke 26690,0: Poke  
26771,0: Poke 26772,0 -  
works with interface 1

### Kosmic Kanga

Poke 35136,x - where x  
is the height to jump.  
Poke 23994,x - where x  
is the number of lives.  
36212,0 - infinite lives.

### Monty Mole

Poke 38004,0 - endless  
lives.  
Poke 36301,201 - no  
crushers.  
35874,255 - lets you fall  
a great height.

### Eskimo Eddie

Poke 24686,24: Poke  
24687,76 - infinite lives.

### Kokotoni Will

Poke 43742,0 - infinite  
lives.  
Poke 42214,x - where x  
is the number of lives.  
Poke 42177,2 - changes  
some of the sprites to  
red, so they don't kill  
Will.

### Lazy Jones

Poke 56693,0 - infinite  
lives.

### Spectacle

Password: "Everyone's  
a nervous wreck"

### Scuba Dive

Poke 55711,x - where x  
is the number of lives.  
Poke 45696,0 - makes  
player two's claws open  
less frequently.

### Android

Poke 52249,24: Poke  
52250,32: Poke 53897,0  
- infinite lives.

### Mutant Monty

Poke 54933,0 - gives 256  
lives.

### River Rescue

Poke 33420,0 - infinite  
lives Player 1.  
Poke 33482,0 - infinite  
lives Player 2.

### Zaxxon (Star Zone)

Poke 48825,x - where x  
is the number of lives.

### Son of Blagger

Merger the loader and  
delete Lines 70, 80, 81,  
82, 90. Insert Line 45:  
Poke 27278,0. The  
above Poke will give  
you a hacker menu (All  
routines).

### Gilligans Gold

Poke 52882,0: Poke  
52881,0: Poke 52882,0:  
Poke 52883,0 - unlimit-  
ed lives.

### Finders Keepers

Poke 34252,0 - infinite  
lives.  
Poke 30394,x - where x  
is the number of lives.

### Fred

First type LOAD ""  
CODE 26384, press En-  
ter then press play on  
your original. When  
loaded enter, SAVE  
"FRED" CODE 34500,  
22650. Press Enter and  
save this on a blank  
tape. Rewind your tape,  
then type LOAD ""  
CODE 24500, Press en-  
ter, and play on your  
new tape. Enter your  
pokes, then to run the  
code enter, RANDOM-  
IZE VSR 30285.  
Poke 31175,0 - this will  
make the last unit of  
power last forever.  
Poke 30418,X: Poke  
31592,X: Poke 44696,X -  
where X is the number  
of power units (max 240)

### Sir Lancelot

10 Input "no. of lives":X  
20 For A = 50000 to  
50024  
30 Read B = Poke A,B  
40 Next A  
50 DATA 49, 125, 91,  
221, 33, 128, 91, 17, 128,  
36, 62, 103, 55, 205, 86, 5,  
243, 62, X, 50, 38, 92,  
195, 8, 92  
60 CLS  
70 Print "Load Main  
Headerless Block"  
80 RANDOMIZE USR  
50000  
Forward your tape until  
the main headerless  
block, then run the  
above program, when  
you see the message,  
press play on the tape,  
this will give you X  
lives.

### Chuckie Egg

First type: MERGE ""  
Poke 24501,195: Goto 1  
Then press play on your  
original, the game will  
load normally, but when  
loaded you will see the



# Addicts Guide

OK message. You can now add your own routines, and to run the machine code type: RANDOMIZE USR 42000

Poke 42837,0 This will give you infinite lives. Poke 39151,0 This will give you a never decreasing bonus.

The following program will convert *Chuckie Egg* to work with a Kempston joystick.

10 DATA 39277,103,39321,71,40311,71,40893,71,39341,79,40254,79,40850,79,40855,95,40713,87

20 RESTORE

30 FOR I = 1 to 9

40 READ A,B

50 Poke I, 219: Poke A+1, 253: Poke QA+2,0: Poke A+3,0: Poke A+4, 203: Poke A+5,B

60 NEXT I

The screens are 672 bytes long, and held at address 46000 onwards.

The values in the addresses are as follows:

0-Blank Space 170

1-Right side of the ladder 171

2-Left side of the ladder 172

3-Egg 173

4-Food 174

5-Floor & walls 175

168-Top ring of the cage 176

169-Top ring of the cage 177

178

179

180

181

The cage itself

There are 3 sections of the cage, each of 4 characters

The following program will fill in all of gaps at the bottom of the screen:

10 FOR F=46000 to 51375 step 672

20 FOR G=0 to 31

30 IF Peek (F+G)=0 Then Poke (F+G),4

40 NEXT G

50 NEXT F

The food can be changed to eggs, so to make the game easier change the 4 to 5 in Line 30.

Some of the Characters are at addresses

(poke 23675,x : Poke 23676,y)

x=248 : y=132 ladder, eggs, food, floor, words

x=248 : y=133 enlarged characters

x=248 : y=135 thick characters

x=48 : y=138 cage

x=160 : y=138 words

*Jetset Willy* Save screen by pressing S at any time (but start the tape first because no start tape message will appear).

Poke 35538,191 : Poke 35600,1A : Poke 35601,254 : Poke 34997,0 : Poke 34998,0 : Poke 34999,0

For I = 35547 to 35590 : Read A = Poke I,A:Next I

For I = 65500 to 65516 : Read A = Poke I,A:Next I

Data 253, 229, 221, 229, 221, 33, 220, 255, 17, 17, 0, 175, 205, 194, 4, 6, 50, 118, 16, 253, 17, 0, 27, 62, 255, 221, 33, 0, 64, 205, 194, 4, 203, 221, 225,253,225,14, 254, 14, 254, 14, 254, 0, 0, 0, 0, 0, 0, Data 3, 83, 67, 82, 69, 69, 78, 36, 32, 32, 32, 0, 27, 0, 64, 0, 27

To jump rooms: Go to landing and get to lowest level then type in the letters WRITETYPYR - don't go up ladder. You can now jump to any room by pressing a sequence of numbers 1-6 and then press 9 at the same time. Eg, for Off Licence just press 9. To go to Bathroom press 1,6,9 all together.

*Android 2* In the first clearing kill yourself 4 times then go over a mine at the same time as a monster, you will then lose another 2 lives but due to a bug you will now have infinite lives and infinite time.

*Ghostbusters Accounts:*

Name Ghostbusters Account 00166605 (\$100,000)

Name S Account 20203002 (\$24,000)

Name Tang Billy Account 15570011 (\$112,100)

*Crypt* Level coders: 1) Carnell 2) Software 3) beats 4) all 5) the 6) others

*Cavelon* Press all the keys on rows QWERTY and ASDF when it says Hi Chris what do you want? Press a number from 1 to 6 to start at that level. Alternatively, move man into maze and type JS WILLY

*Wheelie* Enter codes: 1)ENTER

2) WITTY 3) SHARK 4) BEBOD 5) XENON 6) ZX83B 7)2MOL3 8) HRME2.

*Tir Na Nog*

If touched by a sidhe, press symbol shift 6 at once to restart game from your current position (may need to repeat)

*Knight Lore*

If you prop an object in the wizard's room the spell doesn't appear, enabling you to pass through the room more easily

*Zoom*

For infinite lives: Poke 24743,0

*Pi-in'ere*

For infinite lives: Merge "" the loader then insert Poke 38151,0 before the let 1 = USR 24576 statement

*Manic Miner*

For infinite lives: Poke 35136,0 after Basic loader between 30 and 40

*Gissa Kiss*

1) Merge Basic Loader 2) Edit after the Load lines Poke 25386,255 (255 lives) 3) Change USR to 25005 4) Run program and restart Tape

*Chiller*

Poke 34025,0 = no energy loss  
Poke 39791,0:Poke 40062,0:Poke 40333,0 = stops moving sprites  
Poke 41165,0 top men vanish

*Sabre Wulf*

Poke 43575,255 for infinite lives (works on series 2 Spectrum with Interface 1)

*Tir Na Nog*

Poke 34202,200 (no sidhe)

*Manic Miner*

To change screens, (Bug Byte version type on keyboard when game is running 6031769. When boot appears use combination of key 6 plus one or more other numbers to change screen, eg, press 6 and 5 for the warehouse.

""for Software Projects version Type TYPEWRITER

*Moon Alert*

Poke 39754,0 - endless lives  
Poke 42404,n - n is number of lives  
Poke 42654,195 - Immortality  
Poke 37035,201 - no enemies in air

*Tornado Low* Edit these lines in header for infinite lives: 20

DATA55,62,255,221,33,0,64,17,156,191,205,88,5,62,0,50,190,136,50,15132,201,50 For n=65423 to 65444 3000 Randomise USR 65423

Early ULTIMATE games use Poke 23756,1 to allow the header to be edited

*Lunar Jetman*

Poke 36965,0 or Poke 36966,224: Poke 36945,3 for endless lives

*Select Level*

Poke 43082,x-1 where x is level 99

*Trans Am*

Break game after main block has loaded. Type Poke 25446,0 : CONTINUE

*Pi-Balled*

Poke 46441,0 for endless lives

*Jet Set Willy*

Endless lives: Merge header. Enter line 35

Poke 35899,0

Poke 34778,255 - Maria disappears

Poke 41983,255 - Makes number of objects to collect only one

Poke 36477,1 - Fall from any height

Poke 34795,n - Change start room number

Poke 36635,239 - Allows interface two to remain connected

Poke 59900,255 - Removes Attic Bug

Poke 60231,0 : Poke 42183,11 : Poke 59901,82 : Poke 56876,4 - Removes Banyan tree bug that makes game impossible

Poke 50552,170 : Poke 50553,170 - Blocks off Hades

Poke 50512,168: Poke 50520,168 : Poke 50528,170 - Puts ledge in 'Security Guards' so you can get under drive avoiding 'Forgotten Abbey'

Poke 56342,0 : Poke 56350,0 : Poke 56357,170 - Puts invisible object in a place where it is easily collected on first landing

Poke 37874,0 - Collects objects on entering a room

Poke 38123,0 - Disables anything that moves

Poke 36353,60 - Higher jumping

Poke 37982,0 : Poke 37994,0 - Walk through monsters

*Finders Keepers*

Poke 30394,255

*Tutankhamun*

Poke 34953,57 : Poke 34970,58 - to change start room

Poke 27279,x where x 10 - Extra lives

Poke 27783,0 - Immortality

The Screen address.

Screen	Addresses
1	46000-46671
2	46672-47343
3	47344-48015
4	48016-48687
5	48688-49359
6	49360-50031
7	50032-50703
8	50704-51375



# Complete Arcade

**Hunchback** Poke 24760,255 for endless lives or try Poke 26888,0

**Mugsy** Poke 43013,0 : Poke 42906,0

**Zzoom** Poke 24743,0 : Poke 32892,0 - infinite lives

**Ground Attack** Poke 36212,0 - endless lives

**Horace Goes Skiing** Poke 30027,0 : Poke 30644,0 - no ski charge  
Poke 29009,0 : Poke 29045,0 - No cars on 'frogger' stage  
Poke 30762,0 - No ambulance fee

**Jack & Beanstalk** Poke 56110,0

**Giant's Revenge** 10 Clear 24249 : Poke 23806,115 : Poke 23807,246  
20 Load "" Screen\$: Load "" Code  
25 Poke 24504,0  
30 Randomise USR 24480

**Sabre Wulf** Merge header. Type Poke 23756,1 : Clear 65535. Edit the line and delete the Print USR 23424. Add line 10 that includes your pokes. Add line 20 Print USR 23424.  
Poke 43575,255 - 1 player infinite lives  
Poke 45520,255 - 2 player infinite lives  
Poke 45509,x - Number of lives  
Poke 41725,255 - No limit on gained lives  
Poke 44929,0 - ; disable baddies, so they only appear when the fire button is being pressed. To get an object stand on it and press fire  
Poke 44786,0 - indestructible Sabreman  
Poke 45001,0 41011,0 : Poke 31602,0 : 48560,0 - stay blue, super fast and no monsters  
Poke 39702,30 - gets rid of materialising monsters  
Poke 44685,186 : 44676,255 : 44677,80 - permanently cyan

**Lunar Jetman** Poke 36964,244 : 36965,3 - infinite lives  
Poke 43117,x - where x is no. of lives  
Poke 37999,201 - no enemy  
Poke 43092,x-1 - where x is level (x < 99)

**Trans Am** Poke 25446,0 - infinite lives

**Backpackers Guide to the Universe** To make a print-out of the guide on ZX or Alphacom printer  
1 Clear 65535: Load "" Screen\$  
2 Paper 0:Ink0  
3 Print at 10,0;  
4 Load "" Code  
5 For x is 29182 to 29198: Read a: Poke x,a: Next x  
6 Poke 29180,21  
7 Data 82, 127, 219, 254, 230, 1, 194, 215, 113, 205, 172, 14, 196, 215, 113  
8 Randomise USR 29126  
Now load guide. Press Space for a copy

**Boulderdash** On cave E go all round perimeter then under gem boxes, wait until firefly is going up, then follow, wait at top until both fireflies are gone, then get gems and retreat

**Hunchback** Poke 26888,0 - infinite lives  
Poke 24760,x - where x is number of lives

**Moon Alert** Poke 42654,195 - infinite lives  
Poke 42249,24 - stops time decreasing  
Poke 42585,2:52595,2 - keeps scrolling fast (whole screen)  
Poke 42404,x - where x is the number of lives (14 max)  
Poke 39754,0 - endless lives  
Poke 37035,201 - no enemies  
Poke 35113,255 - move left at 100 mph  
Poke 28371-28607 - hi score table

**Defenda** Poke 37531,0 - infinite  
Poke 34163,0 - infinite smart bombs  
Poke 35730,x - where x is the number of lives

**Tutankhamun** Poke 27783,0 - infinite lives

**Zzoom** Poke 24743,0 - infinite lives  
Poke 25131,x - where x is the number of lives

**Atic Atac** Poke 36819,0 - infinite lives  
Poke 36353,0: Poke 36362,0 - stops energy drains  
Poke 36871,0: Poke 39092,0 -  
Poke 37229,175: Poke 37280,175 - makes doors open more frequently

26373,x - where x is the number of lives  
Poke 28075,0 - allows your rocket to take off with only one fuel block  
Poke 25020,0 - infinite lives

**Pass** Poke 24984,0 - infinite lives

## COMMODORE 64

**Bounty Bob Strikes Back** On level 1 after getting coffee pot type 8 and press F7 to go to level 8 after getting flower pot type 1 and press F7 to go to level 4 on level 10 after getting pitchfork type, and hit F7 to go to level 14

**Super Gridder** To make grid invisible until run over: When loaded press Run/Stop + Restore then type SYS 4624

**Tir Na Nog** Poke 34202,200 makes complete game easier

**Booby** Hold down keys K,E,V,I,N all at the same time for chat mode with unlimited lives

**Manic Miner** For infinite lives: Poke 16571,234

**Falcon Patrol** For infinite lives: Poke 16784,234

**Bruce Lee** Get two joysticks sellotape the fire button down which controls the Yammo and move him out of the way. You get more lives and only have to worry about the Ninja.

**Airwolf** When route is blocked by spinning ball when you rescue third scientist move it by shooting two switches at cave bottom - shoot it before it floats to the ground.

**Entombed** Try whipping anything that blocks an exit.

**Spy vs Spy** On one player game, wait in airport room, booby trap doors, when the computer has objects he will be killed getting to the airport - get objects and leave.

**Zaxxon** To make ship indestructible simply type Red before starting the game.

**Attack of the Mutant Camels** Load first part without running it (type Verify and then Return) Load second part by typing Load "",1,1 and enter Poke 11639,255 SYS 4096 you now have unlimited lives.

**Hexpert** Poke 21875,173 : Poke 21872,1173 (infinite lives)  
Poke 20400,169 : Poke 20401,0 : Poke 20402,234 disables collision detection

**Gridrunner** Poke 35869,173 = infinite lives

**Hover Bover** Poke 35680,96 = infinite lives

**Ancipital** Poke 22743,57 : Poke 22744,57 Sys 16384 to start.

**Matrix** Poke 38485,234 : Poke 38486,234 ditto

**Arcadia** Poke 10930,234, Poke 10915,234 ditto

**Rollerball** Poke 29000,173 : Poke 28921,173 ditto

**Armageddon** Poke 4088,1

**Skramble (anirog)** Poke 8609,173 infinite lives  
Poke 3806,169 : Poke 3809,0 : Poke 3810,234 no collision detection

**Blogger** After loading tap space bar - lives should change to 5. Then pressing CTRL + alphabet keys changes screen.

**Manic Miner** Verify "" Return  
When loaded type Load "",1,1 Return when load error appears  
Poke 16419,x x is screen number 0-19  
Poke 16424,x x is lives (not too many)  
Sys 16384 to begin

**China Miner** Verify "" Return  
Load "",1,1:load "",1,1 Return  
When loaded type Poke 32776,0 or Poke 33320,x x is the screen to start 0-29  
Sys 33127  
Every time after this you run/stop restore type Sys 84738 and type the pokes in again.

**Entombed** To get rid of Mummies: Break into program - you'll need a reset board which won't corrupt the code - then use following pokes: Poke 27658,169: Poke 27659,20: Poke 27660,234 then SYS 2128 then fire button then F1 key then fire button you can then play (this only works in the corridor). Also: in the room of pools stand in the white pool then in the red pool then walk to the wall and stand to the right of the yellow pool then jump left so you land in the centre of the yellow pool

Due to the number of pokes/tips we received it is impossible to ensure that every one works; we have done our best to check as many as possible but cannot guarantee the results.



# Addicts Guide

then push forward the joystick - this jump technique if used at other blocked doors will get you through.

## VIC 20

**Perils of Willy** Load game. Press CTRL Q and RESTORE Lives = Poke 111373,200 No chars disappearing - Poke 11260,234 : Poke 11365,234 Start screen Poke 11378,x (x = 0 to 31) Restart game with SYS 12269

## AMSTRAD

**Pyjamarama** 10 Memory 8191 20 Load "" 30 Poke 16087,0 50 Call 8192 Replace the header with this to get infinite lives

**Roland Goes Digging** 10 Memory 17000 20 Load "" 17800 30 Poke 17978,0 40 Call 18658

**Defend Or Die** 10 &3ff 20 Load "Defend or Die" 30 Poke &64e4,&99 : Rem lives 40 Poke &64e9,&99 : Rem smart bombs 100 Call &4025

**Karl's Treasure Hunt** 10 Memory 12288 20 for f=1 to 3: Load "" : next 30 Poke 38102, lives 40 Call 36864

**Roland in the caves** Press CTRL G to exit a level at any time. Shift + A goes to next screen with 100000 pts.

**Blagger** Poke 32518,x, x is lives less than 240 Poke 31938,0 : Poke 31940,0 together disable the conveyors so that they act like dry land. Poke 32579,0 : Poke 32580,0 drop from any height In demo mode find the start screen you want and press "ADGJL" simultaneously - now start as normal and you will begin on your chosen screen.

**Roland In Time** Type Memory 4999 : Load "Rovertime", 5000 When loaded Poke 6850,167 (endless lives) To run it Call 5000

**Electro Freddy** 10 Memory 10000 20 Load "A1": Load "" : Load "" : Load "" : Load ""

**Punchy**

30 Poke 39356,255 40 Call 38323

**Roland on the Ropes**

10 Memory &1FFF 20 Load "code" 30 Poke &20A9,255 40 Call &2000

**Manic Miner**

10 Memory 4800 20 Load "Roland.d" 30 Load "Roland.c" 40 Poke -25804,0 : Poke -25862,0 (minus addresses) 50 Call 41100

**Football Manager**

Poke &6F8D,x x is lives Poke &6FA9,0 endless lives poke 77401,24 switch screens by pressing 'ESC' Poke &713E,0 drop from any height Poke &7311,0 stops air running out

**Jetset Willy**

10 mode 1 20 memory &7fed 30 Load "" 40 For n=170 to 244 50 Read a\$ 60 Poke n, val("&" + a\$) 70 Next 80 cls 90 call 170 100 Data 3E,C9,32,80,81, 21,00,80,11,01,80,01,08, 00,36,00,ED,BO,CD,EE, 7F,01,00,15,21,20,20, 22,78,AF,C5,21,5D,AF 110 Data CD,S3,AF,78, 58,87,87,87,47,7B,C6,05, 16,08,AF,05,F2,C8,00, 3E,7F,32,F0,81,C3,4A, AC

**Hunchback**

10 Border 0: ink 0,0: ink 1,18: ink 2,5: ink 3,25 20 Ent 1,100,2,2 30 Ent 2,90,-8,2 40 Env 12,10,-2,10 50 Pen 2 60 Memory &3BFF 70 Load "Hun 3", &4C00 80 Poke &61F8,1 90 Poke &61F9,1 100 Poke &61F8 + 18,1 110 Poke &61F8 + 19,1 120 Poke &61F8 + 26,1 130 Poke &61F8 + 27,1 140 Poke 20782,0 150 Call &5431

**Android 1**

Infinite lives: Poke &6391, &837A, &939F and &93A0

## BBC

**Mr EE**

After the page has loaded, press Break, type \*Load "MREE" L900 << Return >> ?&1ECB = &EA << RETURN >> Then type CASS&4300 << RETURN >> (Infinite

**O Bert**

Let the whole game load, then press "CTRL + Break" then type PAGE = &1700 << RETURN >> : OLD << RETURN >> : << RETURN >> : << RETURN >> : Change MEN% from 2 to the number of lives you want

**Castle Quest**

To get out of jail, take the stool, jump and throw it at the torch, take the stool and torch and get to the top of the door, throw torch on bed and jump past guard when he rushes in

**Cylon Attack**

Speed up game with ?&FE45 = 21: ?&FE46 = 21 (CR) - this also works for Chuckie Egg

**Snapper**

For extra lives: Chain "" Snapper as usual but when "snap2" has finished loaded press Escape and enter 45?&FDD = &7F and then Run

**Elite**

To make a lot of cash: trade computers from rich industrial planets to poor agricultural. If attacked by a few ships follow one slowly. His pattern of evasive manoeuvres will save you

**Frak**

\*Load the last part of the game then type ?&305B = &F for infinite lives or ?&304DD = 1 so that the escape key changes levels Call &468A to start game

## ATARI

**Diamonds**

Poke 8,0:Poke 744,16 x = usr(40960) Now enter and run this 10 restore 1000 : for x=0 to 25 : read ins : poke 180 + x, ins : next x 1000 data 169,96,141,39, 8,32,8,8,169,76,141,80, 21,169,88,141,81,21,169, 21,141,82,21,76,96,10 2000 end Now put diamonds in the tape recorder, type x = usr(62404) and press return. press r after the bleep and start tape. when the title page appears you have 1.5 seconds to press the system reset. Now type x = sure(1280) the rest of the game will load. If you don't have a disc system don't load the dos before using this routine.

## QL

**Invaders**

Add shooting sound: 100 For n = 0 to 36 Step w 110 If n > 30 Then R = 240: Else R = N + 2 120 BEEP 1500,N,R,15,2,0,1

## ELECTRON

**Zalaga**

Load the first program with LOAD "Zalaga" and type PROCpugwash. The Electron will play the Pugwash theme tune with two voices.

## DRAGON

**Hungry Horace**

To get high scores get to bell and stay there till it stops ringing.

**Ninja Warrior**

Load game as normal but before typing EXEC type Poke 9489,n n is lives 1 to 255

**Planet Invasion**

As above but Poke 7438,n n is 1 to 14 - larger values cause a crash.

**Skramble**

Skipf"" Poke 32761,&H8E Poke 32762,&H04 Poke 32763,&H00 Poke 32764,&HBD Poke 32765,&HB7 Poke 32766,&H5B Poke 32767,&H39 Exec 32761 Poke &H1C7E, (player 1 lives) Poke &H1C84, (player 2 lives) Exec 4096

**Whirley Bird Run**

Poke &H2078, lives Poke &H2073, stage

**Lunar Rover Patrol**

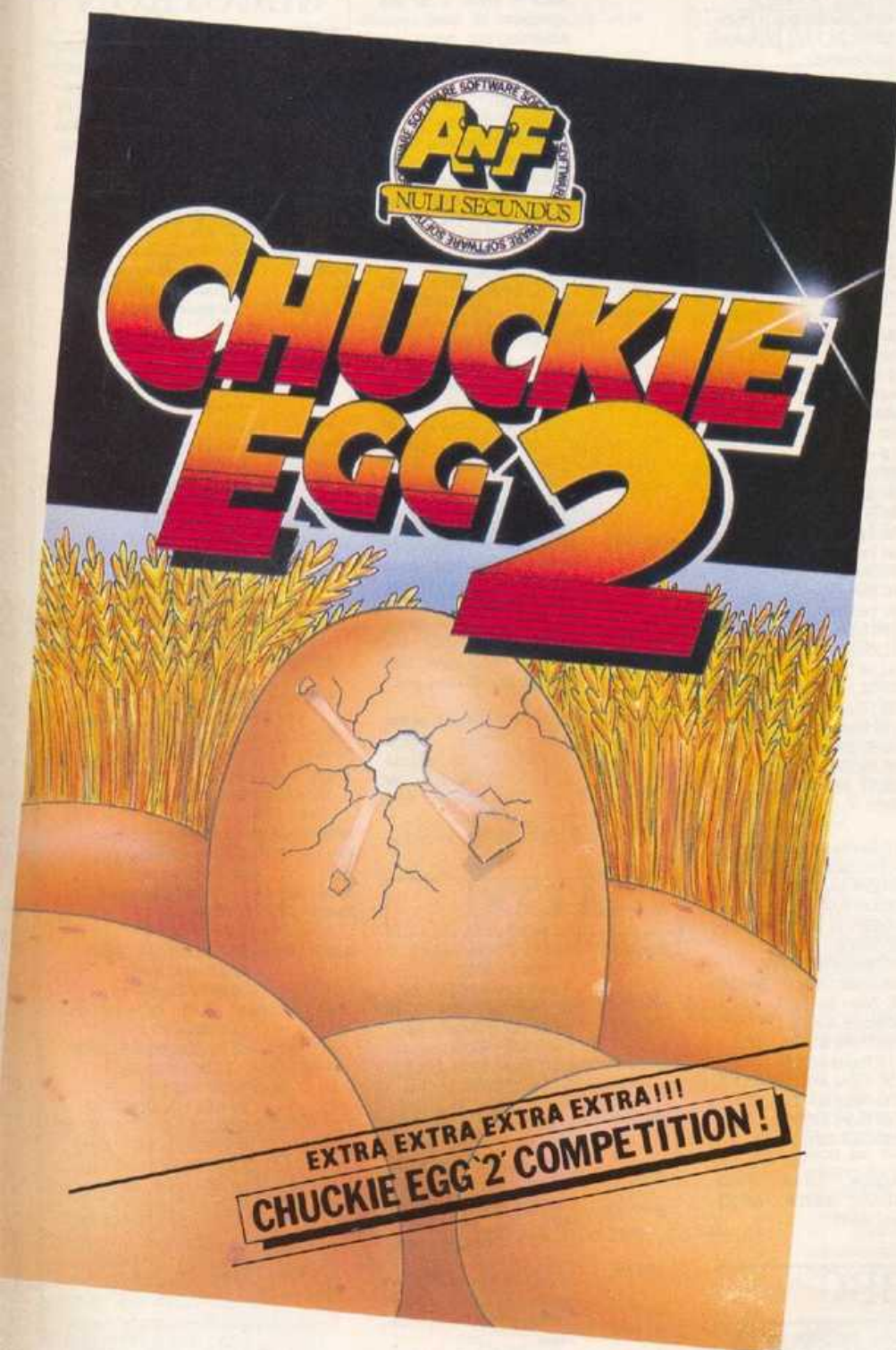
Poke &H8728, lives

**Manic Miner**

10 CLEAR 200,32599 20 ST = 32600 30 INPUT A\$ 40 FOR A = 1 TO LEN(A\$) 50 POKE ST, VAL("&H" + MID\$(A\$,A,2)) 60 ST = ST + 1 70 NEXT A:GOTO 30 Enter this CCB3FFD380A884E B7380C8609B73817 8E0600A684A789FB 4330018C7E8A26F3 39 Then press break and csave using CSAVEM"MINAL", 32800,32640,32600 Then NEW the basic and load manic miner with CLOADM"" 1213 Then enter EXEC 32600 To select a screen, press enter as normal then press a key from A to V (in upper case) To alter the number of lives, poke 32612 in MINAL.



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Not only does Harry have to collect the ingredients to mix the eggs, but he will also have to collect the parts for the toys that go inside the eggs.

As if all these problems were not enough there are a number of other items that Harry will need to find and use to be able to complete the task. Things like ladders, bits of girders, keys and many more.

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# Laser Cycles

For our Arcade issue, what better than a machine code implementation of the classic game *Light Cycle* on the BBC B by Jeremy Thornton?

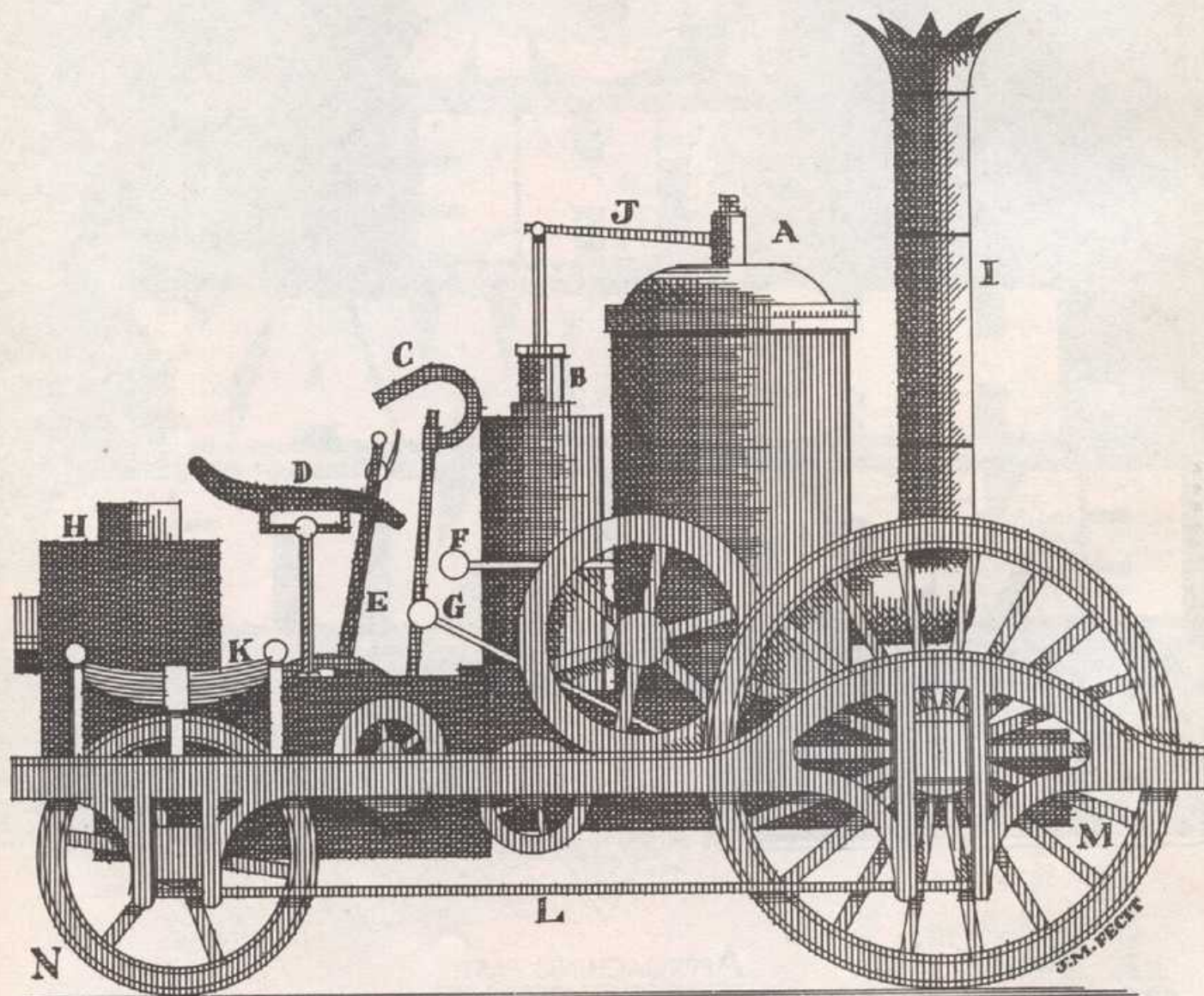
**T**he object of the game is to guide your laser cycle around the screen and to box in your opponent with the trail that you leave behind. Colliding with either your trail, your opponents trail or the wall will cause your destruction! It is either a two player game or you can challenge the computer.

The game itself was written in assembly language with the user interaction at the beginning and end being handled by the Basic. The machine code itself occupies less than half a K, in fact only 440 bytes. It is located just below the model screen between &2CDO and &2E88.

The small piece of code at the beginning, between &0CO9 and &0C1E is an

interrupt routine which intercepts the operating systems and if a key has been pressed stores it before returning it to the O.S. routine at &DC93.

When a key is pressed its specific code is stored in &EC, the previous number being pushed into &ED. In this way the keys used can be changed by altering the data at Line 2990.



THE PATENTED LASER CYCLE



```

10REMark Laser
Cycles by Jeremy
S. Thornton
20FORpassX=0TO
2STEP2:PX=&C09
30OPTpassX
40PHA
50TXA
60PHA
70TYA
80PHA
90LDA&EC
100STA&8E
110LDA&ED
120STA&8F
130PLA
140TAY
150PLA
160TAX
170PLA
180JMP&DC93
190RTS:JNEXT
200osword=&FFF1
toswrch=&FFEE
210FORpassX=0TO
2STEP2:PX=&2CE0
220OPTpassX
230.output
240LDY#0:.loop
1
250LDA(&70).Y
260JSRswrch
270INY
280CPY#9
290BNEloop1
300LDA&99
310BEQfast
320JSRdelay
330.fast
340LDA&79
350BNEdead
360BEQalive
370.dead:RTS
380.alive
390LDA&7F
400BNEcomopp
410JSRinput
420JMPoutput
430.comopp
440JSRplayer
450JMPoutput
460.player
470LDA&7C
480BNElogic
490JMPinput
500.logic
510LDA&D06
520STA&89
530LDA&D07
540STA&8A
550LDA&D08
560STA&8B
570LDA&D09
580STA&8C
590LDY&7D
600STY&7E
610LDA(&72).Y
620JSRkeys
630LDA&79
640BNEch1
650JSRlim
660LDA&75
670BEQokay
680.ch1
690LDA&89
700STA&D06
710LDA&8A
720STA&D07
730LDA&8B
740STA&D08
750LDA&8C
760STA&D09
770LDY&7E
780LDA&BFF.Y
790STA&7D
800TAY
810LDA(&72).Y
820JSRkeys
830LDA&79
840BNEch2
850JSRlim
860LDA&75
870BEQokay
880.ch2
890LDA&89
900STA&D06
910LDA&8A
920STA&D07
930LDA&8B
940STA&D08
950LDA&8C
960STA&D09
970LDY&7E
980LDA&C03.Y
990STA&7D
1000TAY
1010LDA(&72).Y
1020JSRkeys
1030.okay
1040JSRsound
1050JSRnext
1060RTS
1070.input
1080LDX#2:.loop
1090LDA&8D.X
1100LDY#4:.loop
2
1110CMP(&72).Y
1120BEQout
1130DEY
1140BNEloop2
1150DEX:BNEloop
1160BEQover
1170.out
1180LDX&7C
1190STA&74.X
1200.over
1210LDX&7C
1220LDA&74.X
1230JSRkeys
1240JSRsound
1250JSRnext
1260RTS
1270.next
1280LDA&7C
1290EOR#1
1300STA&7C
1310LDA&70
1320EOR#10
1330STA&70
1340LDA&72
1350EOR#60
1360STA&72
1370LDA&77
1380EOR#22
1390STA&77
1400LDA&7A
1410EOR#9
1420STA&7A
1430RTS
1440.keys
1450.a:LDY#4
1460CMP(&72).Y
1470BNEb
1480LDY#0
1490JSRaddition
1500.b:DEY
1510CMP(&72).Y
1520BNEc
1530LDY#0
1540JSRsubtract
ion
1550.c:DEY
1560CMP(&72).Y
1570BNEd
1580LDY#2
1590JSRaddition
1600.d:DEY
1610CMP(&72).Y
1620BNEfin
1630LDY#2
1640JSRsubtract
ion
1650.fin
1660RTS
1670.addition
1680LDA(&77).Y
1690CLC
1700ADC#4
1710STA(&77).Y
1720INY
1730LDA(&77).Y
1740ADC#0
1750STA(&77).Y
1760JSRcheck
1770RTS
1780.subtraction
1790LDA(&77).Y
1800SEC
1810SBC#4
1820STA(&77).Y
1830INY
1840LDA(&77).Y
1850SBC#0
1860STA(&77).Y
1870JSRcheck
1880RTS
1890.sound
1900LDX&7A
1910LDY&7B
1920LDA#7
1930JSRswrch
1940LDY#4
1950LDA(&7A).Y
1960LDY#8
1970EOR(&7A).Y
1980LDY#4
1990STA(&7A).Y
2000RTS
2010.check
2020LDX&77
2030LDY&78
2040LDA#9
2050JSRswrch
2060LDY#4
2070LDA(&77).Y
2080STA&79
2090RTS
2100.lim
2110LDA#0
2120STA&75
2130LDA&D07
2140CMP#81
2150BNEbr1
2160LDA&D06
2170CMP#80
2180BNEbr1
2190INC&75
2200RTS
2210.br1
2220LDA&D07
2230CMP#85
2240BNEbr2
2250LDA&D06
2260CMP#84
2270BNEbr2
2280INC&75
2290RTS
2300.br2
2310LDA&D09
2320CMP#83
2330BNEbr3
2340LDA&D08
2350CMP#82
2360BNEbr3
2370INC&75
2380RTS
2390.br3
2400LDA&D09
2410CMP#87
2420BNEbr4
2430LDA&D08
2440CMP#86
2450BNEbr4
2460INC&75
2470.br4
2480RTS
2490.delay
2500LDX&99
2510.dloop1
2520LDY#128
2530.dloop2
2540NOP
2550DEY
2560BNEdloop2
2570DEX
2580BNEdloop1
2590RTS
2600RTS:JNEXT
2610?&204=?&2
05=&C
2620ENVELOPE1,3,0,0,0,0,0,0,121,-10,-5,
-2,120,120:fx=0
2630MODE7:VDU141:PRINTSPC(10)"LASER CY
CLES":VDU141:PRINTSPC(10)"LASER CYCLES"
2640PRINTTAB(4,3)"Will you challenge t
he computer(1) or another human(2)
?"
2650REPEAT:g%=GET:IFg%=49 OR g%=50 UNTI
L1 ELSE UNTILO
2660IFg%=50 ?&7F=0:PRINT"Red bike:UP=1
DOWN=Q LEFT=Z RIGHT=X":PRINT"Blue
bike:UP=I DOWN=J LEFT=> RIGHT=?"
2670IFg%=49 ?&7F=1:PRINT"Blue bike:UP=
I DOWN=J LEFT=> RIGHT=?":REPEAT:INPUT
""Enter difficulty factor 1-10 easy-ha
rd "fx:IF fx>10 OR fx<1 UNTILO
2675fx=10-fx:fx=fx*4
2690REPEAT:INPUT"Enter speed factor 1-
10 slow-fast "sx:IF sx<1 OR sx>
10 UNTILO
2700UNTIL1:?&99=10-sx
2710PRINT""SPC(10)Press SPACE":REPEA
TUNTILGET=32
2720r%=0:b%=0:REPEAT:MODE1
2730PROCinit
2740VDU19,0,7,0,0,0,0,19,2,4,0,0,0,19,3,5
,0,0,0
2750GCOLOR,3:FORy%=0TO1024STEP20:MOVE10,
Y%-20:DRAW10,Y%:DRAW0,Y%:MOVE1270,Y%-20:
DRAW1270,Y%:DRAW1280,Y%:MOVE10,Y%:NEXT
2760FORx%=0TO1280STEP20:MOVEX%-20,10:DR
AWX%,10:DRAWX%,0:MOVEX%-20,1000:DRAWX%,1
000:DRAWX%,1020:MOVEX%,10:NEXT
2770CALL&2CE0
2780SOUND0,1,5,100:FORix%=0TO15:VDU19,0,
ix,0,0,0:NEXT:VDU19,0,7,0,0,0
2790IF?&70=1COLOUR1:PRINTTAB(8,10)"Red
warrior is the victor":r%=r%+1:ELSECOLOR
R2:PRINTTAB(8,10)"Blue warrior is the vi
ctor":b%=b%+1
2800COLOUR1:PRINT""SPC(8)"RED=":r%:COLOR
UR2:PRINTSPC(8)"BLUE=":b%
2810TIME=0:REPEATUNTILTIME>200
2820COLOUR3:PRINTSPC(4)"Another contest
?":*FX15,1
2830G=GET
2840IFG<>78 PROCinit:UNTILO
2850IFr%>b% COLOUR1:PRINT" Red warri
or is triumphant!"
2860IFr%<b% COLOUR2:PRINT" Blue warri
or is triumphant!"
2870IFr%=b% PRINTSPC(9)"Contest is a dr
aw"
2880END
2890DEFPROCinit
2900RESTORE2980
2910FORix%=0TO19:READ?(&D01+ix):NEXT
2920FORix%=0TO7:READ?(&D20+ix):NEXT
2930FORix%=0TO17:READ?(&D30+ix):NEXT
2940FORix%=0TO14:READ?(&70+ix):NEXT
2950FORix%=0TO7:READ?(&C00+ix):NEXT
2960FORix%=0TO7:READ?(&80+ix):NEXT
2970?&7D=RND(4):?&80=?&80+fx:?&82=?&82+
fx:?&84=?&84-fx:?&86=?&86-fx
2980DATA18,0,1,25,69,127,2,128,1,0,18,0
,2,25,69,128,2,128,2,0
2990DATA144,176,225,194,184,248,231,232
3000DATA0,0,&F8,&FF,4,0,0,0,1,0,0,&F8,&
FF,5,0,0,0,1
3010DATA&0B,&0D,&23,&0D,248,194,0,&10,&
0D,0,&39,&0D,0,3,3
3020DATA3,4,2,1,4,3,1,2
3030DATA11,0,8,0,227,4,232,3
3040ENDPROC

```



## First ADA

**Program** *The ADA Training Course* Price £49.99 Micro Commodore 64 (+Disc Drive) **Supplier** First Software, Unit 20B, Horseshoe Road, Pangbourne, Berks.

There are said to be people who have never heard of ADA. There are also said to be people who wished that they never had.

ADA is the language officially adopted by NATO for use on all real-time systems for the 1990s and beyond, such as command and control systems, communications, and automatic defence.

One of the major problems with ADA is that although most of it has been defined on paper the language is very difficult to implement on existing hardware. In fact the only full implementations of the vital ADA compiler are test versions on very powerful and very secret mainframes.

So, an ADA compiler on the Commodore 64 was not the sort of package I ever expected to see. Who would even think of writing a compiler for a 64K micro when the big boys are having trouble getting it on a mainframe? Volker Sasse of Data Becker (West Germany), that's who... and he's done a good job too.

The software consists of an editor to write the ADA programs, a three-stage compiler (actually two programs) which converts the ADA into assembler language, an assembler for final conversion of the program into machine code, and a disassembler. Both the assembler and disassembler are stand-alone utilities which you can also use for your non-ADA efforts.

As an introduction to the language part of ADA the package works very well. The manual is written clearly, in the main, and takes you step by step through the use of the ADA editor and compiler whilst also guiding you on your first steps into the intricacies of ADA itself. However, although ADA is potentially a very powerful language it is also very complex and the ADA Training Course (translated from the original Ger-

```
10 with TEXT_IO; use TEXT_IO; -- Chain with I/O routines
20 with CBM_64; use CBM_64; -- and special CBM fnctns
30 procedure ADA is
40   NUMBER : FLOAT; -- Declare variables to be
50   N_CALC : FLOAT; -- used in program
60   TMP_1, TMP_2, TMP_3, TMP_4 : FLOAT;
70 begin
80   SCREEN_CLR; -- Clear screen
90   for N in 1..1000 loop -- Start loop
100    NUMBER := FLOAT ( N ); -- Transfer integer to real
110    if N < 500 then -- Perform calculation
120      TMP_1 := NUMBER + 0;
130    else
140      TMP_1 := 500;
150    end if;
160    TMP_2 := NUMBER * TMP_1; -- N_CALC:=INT(TMP_1*
170    TMP_3 := LOG ( NUMBER ); -- NUMBER*LOG(NUMBER) )
180    TMP_4 := TMP_2 * TMP_3;
190    N_CALC := INT ( TMP_4 );
200    NEW_LINE; -- Print NUMBER and N_CALC
210    PUT ( N );
220    PUT ( " " );
230    PUT ( N_CALC );
240   end loop REPT; -- End of loop
250   SCREEN_CLR;
260   PUT ( "FINISHED!" );
270 end ADA; -- End
```

man by First Software) falls short of explaining many of the principles of ADA. It tends to concentrate on the workings of the compiler itself. You would be well advised to get hold of an ADA text book as well.

Listed here is an example ADA program which goes round a loop 1000 times and performs one of two simple calculations each time round, printing as it goes.

Note that the individual expressions used are very simple, the compiler cannot even multiply three numbers together in one go. Also note the rather weird form required for line 120. The final compiled program runs rather a little more quickly than a comparable Basic one, though. It is not a particularly good improvement for what is in effect a machine-code program, especially when the Basic program can be optimised to perform the same function in around 95 seconds.

To be fair on ADA though it

is the printing to screen which takes time and the compiler has to call the C64 Kernal for the maths routines and thus produces inefficient code.

To sum up, the ADA Training Course gives a low-level introduction to ADA and provides a very cheap means of gaining vital hands-on experience. The compiler provided offers only a very stripped-down version of the language but is interesting none the less. A lot of disc operations are required to compile a single program, which makes the compiler slow to use, and prone to the usual Commodore disc-loading malaise of hanging up from time to time.

Also, it seems to be very easy for beginners to make mistakes which can appear anywhere.

Interesting but probably for experienced programmers only.

John Cochrane



## Joust a minute

**Program** *Sir Lancelot Micro* CPC 464 Price £6.95 **Supplier** Melbourne House, Castle Yard House, Castle Yard, Richmond TW10 6TF.

The biggest thing *Sir Lancelot* had going for it on the Spectrum was that it ran in 16K, which was great news for the people who hadn't been driven to upgrade by a dearth of software. It was also very well done, even if the sheer num-

ber of platform games tended to make you cringe at the thought of another.

On the CPC the question of memory is irrelevant, but the fact that it is still well programmed isn't. There is not, as yet, the mind-numbing quantity of such games released for the Amstrad machines and *Lancelot* is one of the most enjoyable I have played.

The movement and animation are extremely fast and smooth and, despite being in 16 colour mode the graphics avoid looking crude and chunky. All your extra lives

are seen dancing at the bottom of the screen, as in *Manic Miner*, but as each of these is killed off the speed of the remaining sprites increases dramatically, so that by the last life everything on screen is going positively berserk, a bit like old *Space Invaders* games.

There are 24 screens, each of which can be reached directly from screen 1, which will be a very welcome feature for those who are not adept at such games. The only drawback is that, whilst attractive on the colour monitor, it is unplayable on the green screen because of invisible objects, colour clashing etc. This forces you to try and get some time using the TV - a nightmare I'm sure all Amstrad owners are very glad to have left behind.

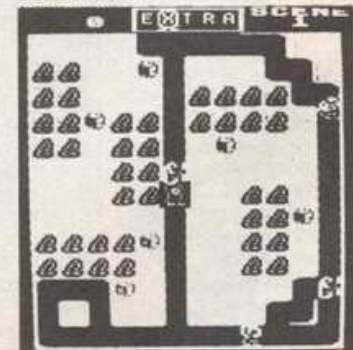
Tony Kendle



## Ee ba gum!

**Program** *Mr EE* Price £6.95 **Micro** BBC B **Supplier** Micro Power Ltd., Sheepscar House, Sheepscar Street South, Leeds LS7 1AD.

Micro Power have another hit game on their hands - why? Because it's an arcade game that's neither impossible to learn nor so easy you leave the cat to play after the first ten minutes - and it has decent music!



True it seems tricky when you read the instructions, but in fact you have to run your character around the screen to eat cherries while avoiding the bad guys or arranging for apples to fall on their heads. (There's nothing dramatically new in the game - *PacMan*'s offspring are everywhere.) You can develop simple, ef-



fective strategies after a few plays. There are – they tell us – ten screens and you can choose to play for a high score or to zip through all the screens at high speed. Sadly there's no hall of fame to allow you to battle with other scores or other people.

You can use keys or joy-

sticks, the sound can be turned off if it drives everyone mad and you can pause to answer the phone. All in all good fun, good value and just the thing to work off energy after the exams.

Dave Watson



## Heads win

**Program** *Operation Caretaker* **Price** £9.95 **Micro** Spectrum/Amstrad **Supplier** Global Software, 33 Shelgate Road, London SW11 1BA.

**A**zimuth adjustment – altering the tape-head alignment to improve leading – seems to be the thing at the moment.

Following *Interceptor's* release for the Amstrad a short while ago is this package released by Global.

In the package you get an azimuth adjustment tape, a screwdriver and a head cleaning tape. Unlike the *Interceptor* product there is no free game with the package.

Whilst the logic of the package for Amstrad owners is obvious, indeed essential, I immediately snickered at the idea of a package being released for other machines since they do not have standard tapes and there was no guarantee that the screwdriver would fit at all.

However, I was more impressed when I found that it fitted all five recorders I have access to.

Even if you are unlucky and have to find a screwdriver that fits your deck yourself the software is worth having. The system it uses seems more straightforward than *Interceptor's*. Instead of having pointers laid out over the tape deck which tell you the extreme angles of the tolerance of the head, Global's package produces a bar chart on screen that tells you when the reading is good or poor. They do admit, though, that for that final 5% accuracy some sort of pointer should be used as well.

The most important point is that I was absolutely stunned by the improvement it produced – almost all the blasted turbo loaders I couldn't get to work went in first time – and as an added bonus, your hi-fi will never sound better.

I regard it as an essential purchase.

Tony Kendle



## Barrels

**Program** *Gatecrasher* **Micro** CPC 464 **Price** £8.95 **Supplier** Amsoft, Brentwood House, 169 Kings Road, Brentwood, Essex, CM14 4EF.

**T**his is a conversion of a game released by Quicksilver for almost every machine that was around at the time. It is more of a logic testing game than one requiring quick reflexes.



The object is to roll barrels down various holes in the

ground so that they follow the ledges and gates and arrive in containers at the bottom.

The idea is to fill the nine boxes with one barrel each, although the objectives get more complex as the game progresses. The game therefore relies on you choosing the correct hole to let your barrel off.

As it hits one of the gates the gate spins to face in a different direction, causing subsequent barrels to rebound in different ways. You can scroll the ledges in an attempt to make things connect in the way you want, or if things are really hopeless you can cause an earthquake that can disturb all the gates.

It's an easier game to play, or at least to get into, than it is to describe. It becomes very much a 'just one more go' or 'I'll just finish this screen' ses-

## Dancin!

**Program** *Ghetto Blaster* **Price** £8.95 **Micro** Commodore 64 **Supplier** Virgin Games Ltd., 2-4 Vernon Yard, 119 Portobello Road, London W11 2DX.

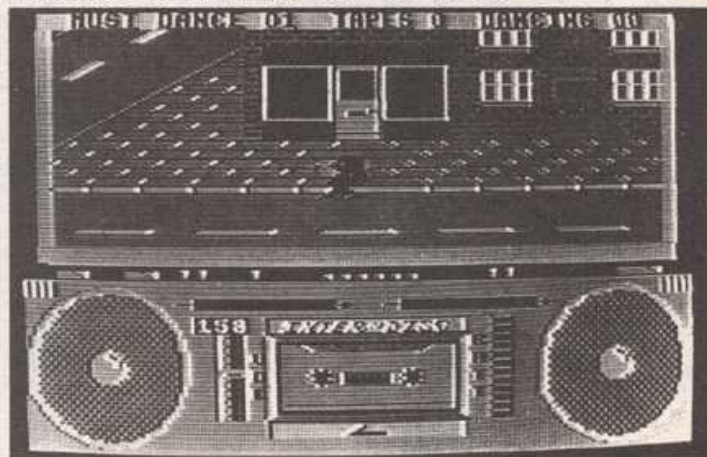
**V**irgin's latest release, *Ghetto Blaster*, is just what you would expect from one of the country's leading record companies – a game based on music.

All the action revolves around Rockin Rodney and his "powerful playback" ghetto blaster. He has got himself a job as messenger for the record company Interdisc. On this particular day, he has to collect ten demo-tapes from around the town and deliver them to Interdisc's main office on

Funky Street. It's also part of Rodney's job to "turn the locals on" to his sounds and get them dancing. There's a map included with the instructions showing all the streets in Funkytown and believe me, it comes in very useful. While Rodney patrols the streets he has to avoid some pretty mean dudes like the tone-deaf walkers and the gangsters of the groove.

The main feature of this program is the funky soundtrack with its twelve separate tunes, which is certainly very good. The thing that caught my eye was the layout and presentation of the game. Both were excellent. However, I'm no so sure about the 'stability' of *Ghetto Blaster*. Still, it's an original idea for a game.

Tom Hussey



sion and you could easily sit up until the small hours with it. A refreshingly original game.

Tony Kendle



## Assassin

**Program** *Assassin* **Price** £9.95 cassette, £11.95 disc – 40 or 80 track. **Micro** BBC **Supplier** Robico Software, 3 Fairland Close, Llantrisant, Mid-Glamorgan CF7 8QH.

**H**ow good it is to find an adventure game with style and quality. Robico produce some nifty numbers and *Assassin* is first rate.

It is a text adventure in which you play Nick Hanson, special agent, and your first task is to discover your task!

As you travel through a beautifully described landscape starting in a decaying railway station, you receive instructions in a variety of ways. You're always in danger of being bumped off yourself – so it pays to be careful and quick.

The text compression system is efficient and the game understands quite tricky commands. You can combine two commands in one sentence – an advance most adventurers will appreciate. Sensible options include coloured text or b/w, a chance to save the game and a helpful command list.

Best of all there's no sense of being cheated... unlike other adventures where random chances and downright perversity often rule.

Jan Watterson





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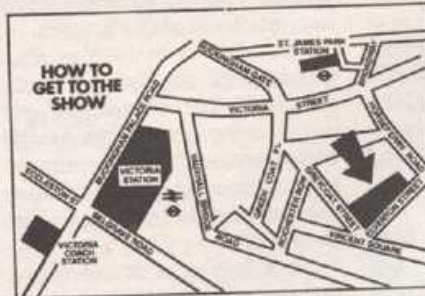
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POPULAR COMPUTING WEEKLY



# Play the market

Just in case you haven't sold those BT shares yet, try this microdrive based program by **Peter Shaw**

**T**his *Share Portfolio* was primarily designed for those people who, like myself, purchased British Telecom shares and wanted to record and subsequently display graphically how they were doing in the Stock Market. However, it can be used to retain information of up to 15 other shares, if required.

A description of the various Menu Options is as follows: *Option One* captures basic information regarding the share, ie, Name of share (limited to 15 characters). Purchase price. Date when purchased. "High" and "Low" price with associated dates. Number of shares purchased and a share reference to be subsequently used for loading and saving share detail. *Option Two* is a Data Entry Module, where you are requested to answer questions: Share Price and Date of Share Price. If the share price is either higher or lower than either of the ones previously recorded, the display will be updated and the new "High/Low" values with their associated dates will be recorded. In order to see how your shares are faring, it will also display the current Gross Profit/Loss, after entry of the price.

*Option Three* displays the share graph. You will be requested to enter a "Pause" factor. The value (50=1 second) determines the speed at which the share price data will be plotted. Upon entering the value, a base line will be drawn, which is mid-point to the screen, from which all subsequent plotting will be performed. Before plotting commences, you have the option of moving the base line either up or down the screen, just in case your share rockets up or plummets down. If you move the base line, the final position will not have to be subsequently repositioned next time the graph is displayed, as the value of the position will have been recorded. Whilst you view the graph being plotted, your attention will be drawn if and when a new "High/Low" value is achieved. It will also display the current price with associated dates.

*Option Six* will display your portfolio. Use this option when you want a quick look at the current situation of your share/s. It will display, amongst other details, the current price together with whatever associated profit of loss.

*Options Four and Five* - saving and loading share prices - are fully explained on screen.

Finally *Option Seven* is a facility to use if you only want a quick look at your Portfolio or perhaps determine a Share Reference for subsequent loading of a share.

If you are using *Share Portfolio* for the

first time you must use Option 1 as this sets up the initial Share Portfolio. Answer "Y(es)" to the initial question "is it first time to set up any Share". After using Option 1, go to Option 2 and enter share price details. After entering share details go to Option 4 (Save Share Prices).

You are now set up for all subsequent updating and creating, if desired, new share details. Should the program for some unforeseen reason stop, type in "GOTO 10" and the program will be restored and will return you to Menu.

## Program Notes

The maximum number of share prices you can retain within a Share file is 80, as

each "plot" or a price is 3 pixels. When you come to enter the 80th price, the program will warn you of this, and give the necessary instructions (Line 2010), of what course of action to take.

If you want to only view your Portfolio (Option 6) you must use Option 7 (Load Portfolio File) first.

When you "Save" your first share file, three Data files are created, each bearing the same "Share Reference", but suffixed with the letters "A", "B" & "C" ie, if File Ref was "BTT" first file would be "BTTA" etc. Each of these three files is to hold the data stored in the N\$, P and Q\$ arrays.

In addition to these three files, two other files are automatically created, which are called "Portfolio" and "Portfolioa". These files contain the data, as the name suggests, for the Portfolio file and are contained within the Data Arrays P\$ and R.

```

1 REM *****
2 REM *WHEN PROGRAM ENTERED *
3 REM * SAVE BY *
4 REM * "SAVE" "M"; "I"; "NAME" *
5 REM * LINE 10 *
6 REM *****
10 PAPER 7: INK 0: FLASH 0: BORDER 7: CLS
11 BORDER 1
15 PRINT AT 2,8: BRIGHT 1: INVERSE 1: "SHARE PORT
FOLIO"
20 PRINT: PRINT AT 4,8: "1 SET UP NEW SHARE": AT
5,8: "2 ENTER SHARE PRICES": AT 6,8: "3 DISPLAY SHARE
GRAPH": AT 7,8: "4 SAVE SHARE PRICES": AT 8,8: "5 LOA
D SHARE DATA": AT 9,8: "6 DISPLAY PORTFOLIO": AT 10,8
: "7 LOAD PORTFOLIO FILE": AT 11,8: "8 STOP PROGRAM"
30 PRINT AT 19,3: OVER 1: PAPER 6: "PRESS NUMBER
OF YOUR CHOICE": PAUSE 25: IF INKEY="" THEN GO T
O 30
33 LET Z=INKEY
34 LET Z=VAL Z
35 IF Z<1 OR Z>8 THEN BEEP .1-.30: GO TO 30
40 IF Z=8 THEN STOP
50 GO TO Z*1000
1000 CLS: PRINT AT 10,0: "IS THIS FIRST TIME TO S
ET UP ANY SHARE?"
1002 INPUT "PLEASE ENTER Y/N": Z
1004 IF Z="" THEN GO TO 1002
1006 IF Z="Y" OR Z="y" THEN DIM P$(60,15): DIM
R$(1): REM *****SET UP FOR PORTFOLIO*****
1010 CLS: DIM R(1): DIM N$(90,6): DIM P(90): DIM
Q$(1,15): LET RC=0: LET N$(8)="90": BORDER 1
1012 PRINT BRIGHT 1: AT 19,0: "
"
1014 PRINT BRIGHT 1: AT 20,0: "
"
1016 PRINT BRIGHT 1: OVER 1: AT 21,10: "SHARE PROFI
LE"
1018 INPUT AT 22,0: AT 7,2: "NAME": LINE Q$(
1): AT 8,2: "PURCH PRICE": P(1): AT 9,2: "DATE DOWN":
LINE N$(1): AT 10,2: "HI": PRICE: P(2): AT 11,
2: "LO": PRICE: P(3): AT 12,2: "NO OF SHARES": P(4
): AT 13,2: "SHARE REF": LINE N$(2): AT 19,2: "IS T
HIS CORRECT Y/N": LINE Z
1020 IF Z="Y" OR Z="y" THEN GO TO 1000
1070 GO TO 10
1180 STOP
1977 REM *****
1998 REM ** SHARE PRICE ENTRY **
1999 REM *****
2000 CLS
2005 GO SUB 8010
2010 IF RC=89 THEN CLS: PRINT AT 0,8: INVERSE 1
: "IMPORTANT NOTICE": INVERSE 0: AT 6,0: "NO MORE REC
ORDS CAN BE STORED": "UNDER FILE REF": FLASH 1: N$(
2): "FLASH 0: 'SAVE THIS FILE'": FLASH 1: "AFTER YOU
HAVE PRESSED ANY KEY": "YOU WILL BE RETURNED TO ME
NU": "CREATE A NEW FILE (OPTION 1)": "I.E": "IF ORIGI
NAL FILE WAS BT1 MAKE": "NEW FILE BT2": PAUSE 45:
GO TO 10
2020 BORDER 1
2070 FOR J=1 TO 15
2072 IF Q$(1,J) TO J+1="" * THEN LET length=J: GO
TO 2095
2074 NEXT J
2085 PRINT AT 3,16: INT (length/2): PAPER 2: INK 7:
Q$(1,1 TO length)
2090 PLOT 4,4: DRAW 0,167: DRAW 247,-0: DRAW 0,-16
7: DRAW -247,0
2091 PLOT 12,92: DRAW 0,40: DRAW 112,-0: DRAW 0,-4
0: DRAW -112,0
2092 PLOT 132,92: DRAW 0,40: DRAW 112,-0: DRAW 0,-
40: DRAW -112,0
2093 PLOT 12,44: DRAW 0,46: DRAW 112,-0: DRAW 0,-4
6: DRAW -112,0
2096 PLOT 132,38: DRAW 0,52: DRAW 112,-0: DRAW 0,-
52: DRAW -112,0
2097 PLOT 4,33: DRAW 247,-0
2098 PLOT 76,4: DRAW 0,28: PLOT 132,4: DRAW 0,28
2100 PRINT AT 1,7: "DATA ENTRY MODULE"
2110 PRINT AT 6,2: "HIGH": AT 6,10: "DATE": AT 6,18: "L
OW": AT 6,25: "DATE"
2120 PRINT AT 7,2: "PRICE": AT 7,8: "DOWN": AT 7,17
: "PRICE": AT 7,23: "DOWN"
2125 PRINT AT 11,3: "LAST UPDATE": AT 11,17: "ENTRY D
ETAIL": AT 12,5: "DOWN"
2135 FOR I=12 TO 16: PRINT PAPER 1: BRIGHT 1: AT I
,17: TAB 30: NEXT I
2140 PRINT AT 13,23: "DOWN": AT 14,6: "PRICE": AT 1
4,17: "DATE": AT 16,17: "PRICE"
2150 PRINT AT 18,1: "PURCHASE": AT 18,11: "NO OF": AT 1
8,18: "CURRENT GAIN"
2160 PRINT AT 19,2: "PRICE": AT 19,10: "SHARES": AT 19
,20: "OR LOSS": AT 20,20: "
"
2170 IF RC=1 THEN GO SUB 2600
2180 IF RC=1 THEN GO SUB 2500
2300 FOR J=RC TO 90
2305 IF RC=89 THEN GO TO 2010
2310 INPUT "Date DOWN or Menu": LINE Y$
2315 IF LEN Y$<6 AND CODE Y$(1)<77 AND CODE Y$(1
)<109 THEN STOP: GO TO 2310
2320 IF CODE Y$(1)=77 OR CODE Y$(1)=109 THEN GO T
O 10
2322 IF CODE Y$(1)<48 OR CODE Y$(1)>51 THEN GO TO
2310: REM ERROR
2323 IF CODE Y$(2)<48 OR CODE Y$(2)>57 THEN GO TO
2310: REM ERROR
2324 IF VAL Y$(3)<0 OR VAL Y$(3)>1 OR VAL Y$(4)>9
THEN GO TO 2310: REM ERROR
2330 LET N$(J)=Y$
2332 LET N$(7)=N$(3)
2334 LET Z=VAL N$(3,3 TO 4)
2335 PRINT PAPER 1: INK 9: AT 13,5: N$(J,1 TO 2): N$
(1,2)&3-3 TO 2)&3: N$(J,5 TO 6): AT 14,23: N$(J,1 TO
2): N$(1,2)&3-3 TO 2)&3: N$(J,5 TO 6)
2338 INPUT "Enter share price": LINE Y$
2340 IF CODE Y$(4) OR CODE Y$(5) THEN GO TO 2310
2341 LET P(J)=VAL Y$
2342 PRINT PAPER 1: INK 7: AT 15,7: P(J): " * ( TO 3
-LEN STR$ P(J))
2343 PRINT PAPER 1: INK 7: AT 16,24: P(J): " * ( TO

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3-LEN STR$ p(j))
2344 INPUT "IS THIS CORRECT (Y/N)? ";z
2346 IF z$="" THEN GO TO 2310
2347 IF z$="N" OR z$="n" THEN PRINT AT 14,23; PAP
ER 1; " "AT 16,24; " " GO TO 2310; REM ERR
OR
2357 PRINT AT 16,24; PAPER 1; INK 7;p(j)); " ( TO
3-LEN STR$ p(j))
2358 LET P(8)=P(3)
2360 IF p(j)>high THEN LET high=p(j); LET Z=VAL N
9(1,3 TO 4); LET P(5)=P(3); LET N9(5)=N9(3); BEEP
.8-.30; PRINT AT 9,3; INVERSE 1; BRIGHT 1; PAPER 7
;high; " ( TO 3-LEN STR$ high); AT 9,8; INVERSE 1;
BRIGHT 1; PAPER 7;n9(1 TO 2);N9(1,Z+3+1-3 TO Z+
3);N9(3,5 TO 6); PAUSE 100
2370 IF p(j)<low THEN LET low=p(j); LET Z=VAL N9(
1,3 TO 4); LET P(6)=P(3); LET N9(6)=N9(3); BEEP .8
-.30; PRINT AT 9,3; INVERSE 1; BRIGHT 1; PAPER 7;at 9,19;
BRIGHT 1; PAPER 7;low;at 9,23;n9(1 TO 2);N9(1,Z
+3+1-3 TO Z+3);N9(3,5 TO 6); PAUSE 100
2374 LET PL=INT ((P(3)-P(1))+P(4))/100)
2375 PRINT INVERSE 1; BRIGHT 1;at 20,21;PL; " (
TO 3-LEN STR$ PL)
2400 LET RC=RC+1
2410 LET P(7)=RC
2450 NEXT J
2460 STOP
2499 REM *****
2500 REM ** 1ST ENTRY **
2501 REM *****
2510 LET Z=VAL N9(1,3 TO 4); PRINT AT 9,3;P(2);AT
9,8;N9(1,1 TO 2);N9(1,Z+3+1-3 TO Z+3);N9(1,5 TO 6)
;at 9,19;P(3);at 9,23;N9(1,1 TO 2);N9(1,Z+3+1-3 TO
Z+3);N9(1,5 TO 6);AT 13,6; FLASH 1;"FIRST";AT 15,
6;"ENTRY"; LET P(6)=P(3); LET P(5)=P(2); LET HIGH=
P(2); LET LOW=P(3)
2520 PRINT AT 20,3;P(1);AT 20,12;P(4);AT 20,20;" "
; PAUSE 200; PRINT AT 13,6; " "AT 15,6; " "
2525 LET RC=10
2530 RETURN
2532 STOP
2600 REM *****
2601 REM * 2ND & SUBSEQUENT *
2602 REM * ENTRIES *
2603 REM *****
2610 IF P(5)=P(2) OR P(5)=P(2) THEN LET Z=VAL N9(
1,3 TO 4); PRINT AT 9,3;P(2);AT 9,8;N9(1,1 TO 2);N
9(1,Z+3+1-3 TO Z+3);N9(1,5 TO 6); LET HIGH=P(2)
2620 IF P(5)=P(2) THEN LET Z=VAL N9(5,3 TO 4); PR
INT AT 9,3;P(5);AT 9,8;N9(5,1 TO 2);N9(1,Z+3+1-3 T
O Z+3);N9(5,5 TO 6); LET HIGH=P(5)
2630 IF P(6)=P(3) THEN LET Z=VAL N9(6,3 TO 4); PR
INT AT 9,19;P(6);AT 9,23;N9(6,1 TO 2);N9(1,Z+3+1-3
TO Z+3);N9(6,5 TO 6); LET LOW=P(6)
2640 IF P(6)=P(3) THEN LET Z=VAL N9(1,3 TO 4); PR
INT AT 9,19;P(3);AT 9,23;N9(1,1 TO 2);N9(1,Z+3+1-3
TO Z+3);N9(1,5 TO 6); LET LOW=P(3)
2645 LET Z=VAL N9(7,3 TO 4); PRINT AT 13,5;N9(7,1
TO 2);N9(1,Z+3+1-3 TO Z+3);N9(7,5 TO 6);AT 15,7;P(
RC-1)
2650 PRINT AT 20,3;P(1);AT 20,12;P(4);AT 20,20;" "
;AT 20,21;INT ((P(RC-1)-P(1))+P(4))/100)
2680 RETURN
2997 REM *****
2998 REM * DISPLAY SHARE GRAPH *
2999 REM *****
3000 PAPER 7; BORDER 7; CLS
3002 BORDER 1
3010 LET HIGH=P(2); LET LOW=P(3)
3050 FOR J=1 TO 18
3055 IF q(1,J TO J+1)="" * THEN LET length=j; GO
TO 3130
3060 NEXT J
3130 PRINT TAB 16-INT (length/2); PAPER 2; INK 7;0
9(1,1 TO length)
3135 LET p(9)=0; LET entries=0
3140 PRINT INVERSE 1; BRIGHT 1; PAPER 7;at 0,0;"S
P "p(1);AT 1,0;"B "p(4);AT 0,26;"HI "p(2);AT 1
,26;"LO "p(3)
3145 INPUT "Enter pause factor for plotting
";delay
3147 PAUSE 50
3150 GO SUB 3500
3160 FOR J=10 TO RC-1
3165 LET Z=VAL N9(1,3 TO 4)
3170 PRINT AT 1,10; PAPER 1; INK 7;p(j)); " ( TO 3
-LEN STR$ p(j));AT 1,16; PAPER 1; INK 7;N9(1,1 TO
2);N9(1,Z+3+1-3 TO Z+3);N9(1,5 TO 6)
3190 LET endp(j)
3200 LET startp(j-1)
3210 IF p(j)>high THEN LET highp(j); BEEP .3-.30
; PRINT AT 0,29; BRIGHT 1; PAPER 7;high; " ( TO 3

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-LEN STR$ high); PRINT AT 0,29; BRIGHT 1; PAPER 7;
high
3220 IF p(j)<low THEN LET lowp(j); BEEP .8-.30;
PRINT INVERSE 1; BRIGHT 1; PAPER 7;at 1,29;low; "
( TO 3-LEN STR$ low); PRINT AT 1,29; BRIGHT 1; PAP
ER 7;low
3230 LET q=(end-start)
3240 IF entries<1 THEN GO SUB 3400
3250 IF entries>1 THEN DRAW INK 1;3,0; PAUSE de
lay
3260 LET entries=entries+1
3280 NEXT J
3290 PRINT @1; PAPER 2; INK 7;" End of entries-Pr
ess any key " ; PAUSE 4e4; GO TO 10
3400 IF entries<1 AND p(j)=p(1) THEN LET q=0; DRA
W INK 1;3,0; PAUSE 100; RETURN
3410 IF entries<1 AND p(j)=p(1) THEN LET emp(j)=p
(1); PAUSE 100; DRAW INK 1;3,0; RETURN
3420 IF entries<1 AND p(j)=p(1) THEN LET emp(j)=p
(1); PAUSE 100; DRAW INK 1;3,0; RETURN
3477 REM *****
3498 REM ** ADJUST BASE LINE **
3499 REM *****
3510 LET z=VAL N9(8)
3515 PLOT 0,X; DRAW 255,0; PLOT 0,X
3520 PRINT @1;" KEYS 7(U) 6 (DOWN) ANY OTHER N
UMERIC KEY TO RETURN TO PLOT"
3530 LET a$=INKEY$
3540 IF a$="" THEN GO TO 3530
3550 IF VAL a$=7 THEN DRAW OVER 1;255,0; PLOT 0
VER 1;0,x; PLOT 0,x+2; DRAW INK 1;255,0; LET z=z+
2; PLOT 0,z; GO TO 3530
3560 IF VAL a$=6 THEN DRAW OVER 1;255,0; PLOT 0
VER 1;0,x; PLOT 0,x-2; DRAW INK 1;255,0; LET z=z-
2; PLOT 0,z; GO TO 3530
3570 LET N9(8)=STR$ Z
3590 RETURN
3997 REM *****
3998 REM ** SAVE DATA **
3999 REM *****
4001 GO SUB 4700
4003 CLS : PRINT AT 0,7; PAPER 2; INK 7;"DATA SAVI
NG MODULE";AT 10,1;"IS THIS FIRST TIME FOR "; INK
8; PAPER 7; FLASH 1;N9(2);AT 12,6; PAPER 2; INK 7;
FLASH 0;"TO BE SAVED ? (Y/N)"
4004 PRINT @1;"PLEASE PRESS Y OR N " ; PAUSE 4E4
4005 LET Z=INKEY$
4006 IF Z=CHR$ 89 OR Z=CHR$ 121 THEN GO TO 4020
4007 CLS : PRINT AT 10,3; FLASH 1;"NOW ERASING OLD
DATA FILES"
4009 ERASE "M";1;N9(2)+A"; ERASE "M";1;N9(2)+B";
ERASE "M";1;N9(2)+C"
4019 PRINT AT 18,5; INVERSE 1;"OLD FILES NOW DELET
ED"; PAUSE 200
4020 CLS : PRINT AT 4,8; FLASH 1;"NOW SAVING DATA"
4030 PRINT AT 6,5; FLASH 1;"DATA ARRAY N9(1) ";N9(2
)
4040 SAVE "M";1;N9(2)+A" DATA N9(1)
4045 PRINT AT 6,5; FLASH 0;"DATA ARRAY N9(1) ";N9(2
)
4050 PRINT AT 8,5; FLASH 1;"DATA ARRAY P(1) ";N9(2
)
4060 SAVE "M";1;N9(2)+B" DATA P(1)
4065 PRINT AT 8,5; FLASH 0;"DATA ARRAY P(1) ";N9(2
)
4070 PRINT AT 10,5; FLASH 1;"DATA ARRAY Q(1) ";N9(
2)
4080 SAVE "M";1;N9(2)+C" DATA Q(1)
4085 PRINT AT 10,5; FLASH 0;"DATA ARRAY Q(1) ";N9(
2)
4190 PRINT AT 21,9; FLASH 1; PAPER 2; INK 7;"ALL D
ATA SAVED"; PAUSE 200
4200 CLS : INPUT "IS THIS THE 1ST TIME PORTFOLIO
IS TO BE SAVED Y/N? ";z$
4220 IF z$="" THEN GO TO 4200
4230 LET Y$=z$(1)
4240 IF Y$="Y" OR Y$="y" THEN PRINT AT 10,0;"SAVI
NG PORTFOLIO FILES"; SAVE "A";1;"PORTFOLIO" DATA
P9(1); SAVE "M";1;"PORTFOLIO" DATA R(1); PRINT AT
10,0;"PORTFOLIO FILES SAVED UNDER FILE NAMES";
AT 12,13; INVERSE 1;"PORTFOLIO";AT 13,13;"PORTFOLI
O A"; STOP
4250 PRINT AT 10,0;"GOING TO ERASE OLD PORTFOLIO A
ND THEN GOING TO SAVE NEW DATA"; ERASE "M";1;"PORT
FOLIO"; ERASE "M";1;"PORTFOLIO"
4260 PRINT AT 13,15; FLASH 1;"FILES ERASED"; PAUSE
200
4270 SAVE "M";1;"PORTFOLIO" DATA P9(1); SAVE "M";
1;"PORTFOLIO" DATA R(1)
4280 PRINT AT 13,15; FLASH 0; INK 2; PAPER 7;"FILE
S SAVED "; PAUSE 250; GO TO 10
4700 REM *****

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4701 REM ** SAVE PORTFOLIO DET *
4702 REM *****
4703 CLS : PRINT AT 1,6; PAPER 2; INK 7;"SAVE PORT
FOLIO MODULE"
4715 INPUT "ENTER TOTAL NUMBER OF FILES IN
PORTFOLIO ";c
4718 LET R(1)=C*5
4720 INPUT "ENTER WHAT NUMBER IS THIS SHARE WITHIN
YOUR PORTFOLIO ";COUNT
4725 LET CNT=COUNT*5+1-5
4730 LET P9(CNT)=N9(2)
4750 LET P9(CNT+1)=Q9(1)
4770 LET P9(CNT+2)=STR$ P(4)
4790 LET P9(CNT+3)=STR$ P(1)
4810 LET P9(CNT+4)=STR$ P(8)
4900 RETURN
4999 REM *****
5000 REM ** LOAD DATA **
5001 REM *****
5010 CLS
5020 PRINT AT 10,0;"PLEASE ENTER NAME OF SHARE FIL
E REFERENCE - IF REFERENCE IS LESS THAN 6 CHAR
ACTERS THEN ENTER SPACES TO MAKE UP 6 CH
ARACTERS"
5030 INPUT "ENTER FILE REF ";F$
5035 IF LEN F$<6 THEN GO TO 5030
5040 PRINT AT 16,13; INVERSE 1;F$
5050 INPUT "IS THIS CORRECT Y/N ? ";Z$
5060 IF Z$="N" OR Z$="n" THEN GO TO 5030
5070 CLS
5075 GO SUB 8000
5080 PRINT AT 4,8; FLASH 1;"NOW LOADING FILES"
5090 PRINT AT 6,8; FLASH 1;"DATA FILE ";F$+A"
5100 LOAD "M";1;F$+A" DATA N9(1)
5105 PRINT AT 6,8; FLASH 0;"DATA FILE ";F$+A"
5110 PRINT AT 8,8; FLASH 1;"DATA FILE ";F$+B"
5120 LOAD "M";1;F$+B" DATA P(1)
5125 PRINT AT 8,8; FLASH 0;"DATA FILE ";F$+B"
5130 PRINT AT 10,8; FLASH 1;"DATA FILE ";F$+C"
5140 LOAD "M";1;F$+C" DATA Q(1)
5142 PRINT AT 10,8; FLASH 0;"DATA FILE ";F$+C"
5145 LET RC=P(7)
5146 LET P(8)=P(RC-1)
5150 DIM P9(60,15); DIM R(1)
5160 PRINT AT 12,8; FLASH 1;"DATA FOLIO FILES"
5170 LOAD "M";1;"PORTFOLIO" DATA P9(1); LOAD "M";
1;"PORTFOLIO" DATA R(1)
5250 PRINT AT 18,8; FLASH 1; INK 2; PAPER 7;"FILES
ALL LOADED";AT 20,6;"NOW GOING TO MENU"; PAUSE
200; GO TO 10
5997 REM *****
5998 REM ** DISPLAY PORTFOLIO *
5999 REM *****
6000 CLS : PRINT AT 0,9; PAPER 2; INK 7;"SHARE POR
TFOLIO"
6010 PRINT INVERSE 1;AT 1,0;"REF";AT 1,7;"NAME";A
T 1,21;"B";AT 1,25;"FP";AT 1,29;"CP"
6016 LET N=1
6020 FOR J=N TO R(1)
6030 PRINT TAB 0;P9(N,1 TO 3);TAB 7;P9(N,1,1 TO 13
);TAB 21;P9(N,2,1 TO 3);TAB 25;P9(N,3,1 TO 3);TAB
29;P9(N,4,1 TO 3)
6032 PRINT TAB 16; INVERSE 1;"PROFIT/LOSS "; PAPER
7; INK 1;INT ((VAL P9(N,4)-VAL P9(N,3))*VAL P9(N
+2))/100)
6035 LET N=N+5
6036 IF N>R(1) THEN GO TO 6100
6040 NEXT J
6100 PRINT @1; PAPER 2; INK 7;" PRESS ANY KEY TO
GO TO MENU " ; PAUSE 4E4
6105 GO TO 10
6990 REM *****
6998 REM ** LOAD PORTFOLIO **
6999 REM *****
7000 REM *****
7005 DIM P9(60,15); DIM R(1)
7010 CLS : PRINT AT 10,2;"LOADING PORTFOLIO DATA F
ILES"
7020 LOAD "M";1;"PORTFOLIO" DATA P9(1); LOAD "M";
1;"PORTFOLIO" DATA R(1)
7030 PRINT AT 10,1; FLASH 1;"PORTFOLIO DATA FILES
NOW LOADED"; PAUSE 200
7040 GO TO 10
8001 REM *****
8002 REM ** DIMENSIONING ARRAYS*
8003 REM *****
8005 DIM N9(90,6); DIM P9(90); DIM Q9(1,15); LET LE
NTH=0
8010 DIM N9(1,36)
8020 LET N9(1)=JANFEBMARAPRMAJUNJULAUSEPCTNOVDE
C"
8040 RETURN

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## Memory breakdown

Check your memory on the QL with this multi-tasking utility written by **John Lawlor**

**T**his is a multitasking job for the QL called *Systat*. The job gives a complete memory usage breakdown with a couple of novel features – use of the function keys to activate/deactivate the output and the restoration of the original screen contents upon deactivation, which considerably enhances the QL's windowing ability.

Information output includes Resident Procedure Area, Transient Program Area, Superbasic Area, Channels/Heaps Area, Resource Management/System Variables Area, Immediate Free Space, Total Memory Usage, Largest Available Transient Program Area and Largest Available Heap Space.

The first seven of these are calculable from Basic but the last two are only accessible via system traps and hence need machine code. Use of the program provides a useful insight into how QDOS executes memory management and is extremely useful when those 'Out of Memory' messages appear when trying to load multitasking programs which require Heap space.

The loader is fairly self-explanatory and, due to the large amount of Data statements, includes comprehensive error checking after every 16 bytes. A very important point which is not documented anywhere is that the minimum data space you should allocate to a multitasking job appears to be about 256 bytes (line 1078). I first imagined that QDOS would require only enough room

to save the registers, say 128 bytes. However, if you try altering the 256 to, say, 128 bytes, then *Systat* will apparently run perfectly – now do a *New* and after a few operations the QL will crash, sometimes giving an unstoppable ASCII dump of the Rom from address 0! The extra Data space must be for channel ID's etc, while a *New* is occurring.

After a successful loading a small window is opened in the top left hand corner of the screen containing the message 'F1 to Activate'. At this stage the program is running at the lowest possible priority – 1/127. Upon pressing function key 'F1' three things happen:

- 1) The priority is increased to 64/127.
- 2) The contents of the screen where the main window will be opened are copied into a Heap area for eventual restoration. This enhances the windowing features of the QL by leaving the screen intact after the job has been deactivated. If there is insufficient Heap space available then a warning message to this effect will be printed in the main screen window.
- 3) The main screen output window is opened.

Output now commences with the Resident Procedure Area, the Transient Program Area, the Basic area, the channels/heaps area (any area allocated for the screen save will be deducted as this is released upon deactivation), the resource management/system variable area, the immediate free space (SV-BASIC-SV-FREE) and the total memory used

including the screen but ignoring the temporary screen save area. The next statement is the largest available Transient Program area (MT-FREE, TRAP#1, DO=6) – note that this space is not necessarily there at the moment. The last parameter, the largest available heap area, uses MT-ALCHP – Trap#1, DO=18 and attempts to obtain a heap area progressing from 592K (for those with the full 640K memory) in 1K steps until no error occurs. At this point *Systat* decides if the area allocated is larger than the screen save area – if a screen save occurred, and also whether they are contiguous before deciding the largest available area. The heap space is then removed.

Finally, the message 'F5 to Deactivate' appears; upon deactivation *Systat* restores the screen contents (if they were saved) releasing the Heap area used, restores its own priority to 1/127 and returns to waiting for F1 to be pressed.

*Systat* as listed works in monitor Mode 4 but will also work in Mode 8 if you use <CTRL>F5 to control screen scrolling. If you wish to patch the loader for TV mode, ie, move the output windows away from the origin 0,0 then answer 'Y' to the patch prompt and follow the instructions.

Once you start using *Systat* you will notice that QDOS lets the memory fill right up before doing any pruning. For instance, load and then remove a Transient Program and note that the space is still allocated, ie, it isn't released as microdrive buffer storage! Memory reorganisation only occurs when something drastic happens such as a *New*, reset or memory overflow – and even then it will still sometimes persist with *Out of Memory* messages when you know better!

```

1000 REMark Systat Loader
1002 a=RESPR(1296)
1004 RESTORE 1211
1006 offset=0
1008 FOR n=11 TO 67
1010   chksum=0
1012   FOR m=1 TO 16
1014     READ byte
1016     POKE a+offset,byte
1018     offset=offset+1
1020     chksum=chksum+byte
1022   END FOR m
1024   READ chk
1026   IF chk<>chksum THEN PRINT "**** ERROR - Data Line 12
";n:STOP
1028 END FOR n
1030 FOR n=1 TO 12
1032   READ byte
1034   POKE a+offset,byte
1036   offset=offset+1
1038 END FOR n
1040 FOR n=1 TO 12
1042   READ length
1044   POKE_W a+offset,length
1046   offset=offset+2
1048   READ message$
1050   FOR m=1 TO length
1052     POKE a+offset,CODE(message$(m))
1054     offset=offset+1
1056   END FOR m
1058 END FOR n
1060 chksum=0
1062 FOR n=1 TO 64
1064   READ byte
1066   chksum=chksum+byte
1068   POKE a+offset,byte
1070   offset=offset+1
1072 END FOR n
1074 READ chk
1076 IF chk<>chksum THEN PRINT "**** ERROR in final data st
atements":STOP
1077 patch
1078 SEXEC mdvl_systat,a,1296,256
1080 EXEC mdvl_systat
1211 DATA 96,14,0,0,0,74,251,0,6,83,89,83,84,65,84,929
1212 DATA 114,255,116,1,112,11,78,65,67,250,3,52,52,120,0,2
00,1496
1213 DATA 78,146,67,250,3,54,52,120,0,208,78,146,71,250,4,2
16,1743
1214 DATA 38,188,9,1,0,0,18,60,0,0,66,107,0,4,23,65,579
1215 DATA 0,6,23,124,0,2,0,7,112,17,78,65,12,1,0,2,449
1216 DATA 102,218,114,255,116,64,112,11,78,65,116,255,34,60
,0,0,1600
1217 DATA 35,48,112,24,78,65,67,250,4,104,74,128,103,6,18,1
88,1304
1218 DATA 0,0,96,42,18,188,0,1,73,250,3,30,40,136,36,124,10
37
1219 DATA 0,2,0,0,52,60,0,139,54,60,0,15,32,210,88,138,850
1220 DATA 81,203,255,250,213,252,0,0,0,64,81,202,255,236,67
,250,2409
1221 DATA 2,236,52,120,0,200,78,146,47,8,67,250,4,36,12,17,
1275
1222 DATA 0,1,103,14,52,120,0,208,67,250,2,226,78,146,97,0,
1364
1223 DATA 2,40,67,250,2,234,52,120,0,208,78,146,157,206,34,
57,1653
1224 DATA 0,2,128,32,146,185,0,2,128,28,44,65,97,0,2,20,879
1225 DATA 32,87,97,0,1,240,67,250,2,226,52,120,0,208,78,146
,1606
1226 DATA 34,57,0,2,128,28,146,185,0,2,128,20,221,193,97,0,
1241
1227 DATA 1,242,97,0,1,208,67,250,2,222,52,120,0,208,78,146
1694
1228 DATA 34,57,0,2,128,20,146,185,0,2,128,16,221,193,97,0,
1229

```



```

1229 DATA 1.210,97.0,1.176,67.250,2.218,52.120,0.208,78.146
1626
1230 DATA 34.57,0.2,128.12,146.185,0.2,128.4,67.250,3.146,1
164
1231 DATA 74.17,103.6,146.188,0.0,32.48,221.193,97.0,1.164.
1290
1232 DATA 97.0,1.130,67.250,2.200,52.120,0.208,78.146,34.57
1442
1233 DATA 0.2,128.4,146.188,0.2,128.0,221.193,97.0,1.132,12
42
1234 DATA 97.0,1.98,67.250,2.228,52.120,0.208,78.146,34.14,
1395
1235 DATA 6.129,0.0,128.0,97.0,1.106,97.0,1.72,97.0,734
1236 DATA 1.88,67.250,2.166,52.120,0.208,78.146,34.57,0.2,1
271
1237 DATA 128.16,146.185,0.2,128.12,67.250,3.38,74.17,103.6,
1175
1238 DATA 210.188,0.0,32.48,97.0,1.58,97.0,1.24,67.250,1073
1239 DATA 2.182,52.120,0.208,78.146,47.8,112.6,78.65,32.95,1
231
1240 DATA 97.0,1.32,97.0,0.254,67.250,2.188,52.120,0.208,13
68
1241 DATA 78.146,47.8,34.60,0.9,64.0,116.255,112.24,78.65,1
096
1242 DATA 74.128,103.36,12.129,0.0,4.0,103.8,4.129,0.0,790
1243 DATA 4.0,96.230,67.250,2.202,74.17,103.8,34.60,0.0,1147
1244 DATA 35.48,96.64,66.129,96.60,67.250,2.182,74.17,103.4
4.1333
1245 DATA 73.250,1.118,42.84,219.252,0.0,35.64,177.205,102,
8.1630
1246 DATA 6.129,0.0,35.64,96.20,12.129,0.0,35.48,98.12,684
1247 DATA 112.25,78.65,34.60,0.0,35.48,96.8,47.1,112.25,746
1248 DATA 78.65,34.31,32.95,97.0,0.154,97.0,0.120,97.0,900
1249 DATA 0.136,67.250,2.82,52.120,0.208,78.146,114.255,116
.1,1627
1250 DATA 112.11,78.65,71.250,2.144,38.188,9.1,0.0,18.60,10
47
1251 DATA 0.0,66.107,0.4,23.65,0.6,23.124,0.2,0.7,427
1252 DATA 112.17,78.65,12.1,0.32,102.218,67.250,2.52,74.17,
1099
1253 DATA 103.0,253.138,73.250,0.242,32.84,96.124,0.2,0.0,1
337
1254 DATA 52.60,0.139,54.60,0.15,36.152,88.138,81.203,255.2
50.1583
1255 DATA 213.252,0.0,0.64,81.202,255.236,32.84,112.25,78.6
5.1699
1256 DATA 96.0,253.90,67.250,2.36,52.120,0.208,78.146,52.12
0.1570
1257 DATA 0.208,67.250,1.228,78.146,114.10,118.255,112.5,78
.67,1737
1258 DATA 78.117,66.128,66.130,66.131,67.250,1.216,211.252,

```

```

0.0,1779
1259 DATA 0.36,69.250,1.248,75.250,1.242,74.129,102.10,58,1
88,1733
1260 DATA 0.1,20.188,0.48,78.117,66.132,146.145,101.4,82.4,
1132
1261 DATA 96.248,210.145,147.252,0.0,0.4,82.0,74.4,102.10,1
374
1262 DATA 74.3,102.6,12.0,0.10,102.10,6.4,0.48,82.66,525
1263 DATA 118.1,20.196,12.0,0.10,102.206,58.130,78.117,7.1,
1056
1264 DATA 18.7,0.105,0.35,0.0,0.0,0.48,127.32,74.32,478
1265 DATA 76.65,87.76,79.82,32.32,49.57,56.52,32.32,83,89,9
79
1266 DATA 83.84,65.84,32.76,79.65,68.69,68,32,32,70,49,32,9
68
1267 DATA 84.79,32.65,67.84,73.86,65.84,69,32,7.1,18,7,853
1268 DATA 1.0,0.140,0.0,0.0,0.0,0.0
1269 DATA 16,"Screen not saved"
1270 DATA 26,"Resident Procedure Area = "
1271 DATA 26,"Transient Program Area = "
1272 DATA 26,"Allocated Basic Area = "
1273 DATA 26,"Channels / Heaps = "
1274 DATA 26,"Res_Man / Sys_Var Area = "
1275 DATA 30,"Immediate Free Space = "
1276 DATA 26,"Total Memory Used = "
1277 DATA 30,"Largest Free TRNS_PRG Area = "
1278 DATA 30,"Largest Available HEAP Area = "
1279 DATA 16,"F5 to Deactivate"
1280 DATA 6," Bytes"
1281 DATA 0.0,0.0,0.1,0.0,0.10,0.0,0.100,0.0
1282 DATA 3.232,0.0,39.16,0.1,134.160,0.15,66.64,0.152
1283 DATA 150.128,5.245,225.0,59.154,202.0,0.0,0.0,0.0
1284 DATA 0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,2161
1300 DEFINE PROCEDURE patch
1310 INPUT#0,"Do you wish to alter screen x-origin from 0
? ";ans$
1320 IF ans$<"y" AND ans$<"Y" THEN RETURN
1330 REPEAT loop
1340 INPUT "Enter x-coordinate (a multiple of 16) e.g.
16,32,48 max 256 - ";X_coord
1350 IF NOT X_coord MOD 16 AND X_coord<257
1360 EXIT loop
1370 ELSE
1380 PRINT "WRONG !!! Try again"
1390 END IF
1400 END REPEAT loop
1410 POKE_W (a+854),X_coord:POKE_W (a+916),X_coord
1420 POKE_L (a+128),(131072-(X_coord/4))
1430 POKE_L (a+684),(131072-(X_coord/4))
1440 END DEFINE

```

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## Graphic notes

*Experiment with sound for your games using this utility by* **Andrew Esmond**

**T**he Commodore 64 has, in its SID chip, one of the best sound chips available on a home computer. However, due to the wisdom of Commodore, the SID can only be accessed by the *Poke* command, needing at least six commands to bleep, let alone perform some of its more complicated functions. Using these *Pokes* once an effect has been worked out is tolerable; however, for experimenting, this system is almost impossible.

The program listed here takes some of the effort out of experimenting by allowing the various envelops values to be graphically displayed and altered using a couple of keystrokes.

When the program is initially *Run*, a bar chart is displayed which illustrates the attack, decay, sustain and release values for all three voices: attack in green, decay in red, sustain in yellow and release in blue. Below this the type of waveform, note frequency and pulse frequency (for the pulse waveform) are displayed. The volume is shown at the top of the screen below the status line which shows which voice is being played or used.

The *Play* section is very simple. On pressing *P* for play, you are asked which voice you wish to play: press 1, 2, 3 or A.

(all). The voice is then played. The *Alter* section is slightly more complicated. The initials presented stand for: A-attack; D-decay; S-sustain; R-release; F-frequency; P-pulse frequency; W-waveform; V-volume; X-exit to main program. The A,D,S and R alterations are carried out by pressing + or - to increment or decrement the respective value(s). X exits to the alteration choice menu.

The frequency and pulse frequencies are input using the Basic input statement. Take care not to hit *Return* without entering a number as this will upset the display. The range of values for frequency are 0-65535 and 0-4095 for pulse frequency (Hz). The volume is altered in the same way, values for 0-15 are allowed. The wave form is altered by pressing the initial letter of the waveform you want, the abbreviations are *Trian*-triangular waveform, *Swath*-sawtooth waveform, *Pulse*-pulse waveform. The frequency for the pulses can be altered to any value between 0-4095. *Noise* is the white noise waveform.

### Program Notes

100-230

Initialises the main variables and sets the screen colours.

900-960

Sets up a trial set of

[illegible]

values to test the display routine, delete this when you are sure it is working.

Displays the values and draw the graph.

Choice selection and execution.

This is the routine to play an effect.

The various alteration routines are called from here.

This is the routine to alter the attack. Part of this routine (3280-3290) is used to alter the on-screen graph and is called by the other routines.

This alters the decay.

This alters the sustain.

This alters the release.

This section inputs and checks a new value for the frequency.

This section inputs and checks a new value for the pulse frequency.

This routine is used for changing the waveform.

Inputs and checks the new volume level.

A message used for the  
adrs alter routine.

This just clears the bottom two screen lines.

This clears the sound registers.







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## Private function

Program your own function keys on the Amstrad with this routine from **John Hurst**

One of the many clever features of the Amstrad is its ability to support Function Keys. The keys in question are those on the numeric pad, to the right of the main keyboard. By using the "Key Def" command (as described in Chapter 8, p23 of the Manual), one can re-assign these keys, so as to make them carry out quite complicated manoeuvres. This can be particularly useful when writing a Basic program: there are a lot of commands, which get used over and over again, and it is a tremendous convenience to be able to carry them out with a single key-stroke, rather than to type them in individually in full.

Of course, everyone has his, or her own list of pet functions, but the list given here is the result of some considerable time spent programming on the 464. I keep the program which Loads them on a cassette of its own, and Load this before every session, so that the keypad is always primed with the special functions.

The list of functions is given in Fig 1, which shows their distribution on the key-pad. Fig 2 is the Basic program listing to implement them. Here's a breakdown of what they are each designed to do:

"ENTER" is left alone and not re-programmed. It does "ENTER" when used normally and a "LOAD & RUN", when used with CTRL.

"." give *Cls:List*. You are always needing to *List* a program under construction, when it has been changed, or had a line added. This particular setting does not allow a line to be specified, as the "Chr\$(13)" in the function ensures that the new function executes itself.

"0" gives *Run*. Another obvious must. These last two commands, I find, are the most commonly used, which is why they are assigned to the two keys next to enter.

"7" gives *Chr\$( -* but obviously doesn't execute. The idea is to use it in combination with *Key 8* (giving ")"), so that one can insert *Chr\$(xx)*, with the minimum fuss.

"9" gives *,&*. This is used when compiling *Data* lists - if, like me, you tend to use Hex notation when preparing User Defined characters, with the help of *Symbol* (Ch.8 p46 of the Manual). This key setting makes it very easy to write: *&00,&FF,&F0,&0F* etc, etc.

"4" gives *,"*. Also used for *Data* lists, this time for strings - as in, "Peter", "Ann", "David". The Function has to be written using *Chr\$(34)*, as the double quote otherwise gets the Basic in a muddle.

"5" gives *-*, and for the reason in the paragraph above, this is chosen to give a printed double quote.

"1" gives *Auto*. It is not allowed to execute, as you usually want to specify the line number - almost invariably the next line number of the program. Somewhere in the Basic must be hidden the value of the existing last line of the program, so that one ought to be able to get the Function to discover its own "next Line" number.

"2" gives *Edit*. Again, this is an obvious function to have on the pad, when writing a program. Like *Auto*: the function incorporates a space at the end, so that it is possible to type in directly the

Line number you want to edit.

Two further lines are added to the *Key Def* program. At Line 100 *Width 32* which is only useful if you have a printer, as it sets the line length used. I have a roll of 3½ inch cash register paper permanently fed into my Brother M-1009 for scratch print-outs, and this setting just fits the roll. The paper is held in an adapted toilet roll holder, but this is not meant to be a reflection on the value of the software.

Finally, the last line of the program is *New*. This effectively clears the decks for another Basic program, but leaves all the newly defined Functions in place. Obviously, the selection given here doesn't end the possibilities for the Function keys. Two keys have not yet been assigned; you may want to add some more commands, or change the ones I have suggested. But having your own cassette for Loading before you do any programming, is a very worthwhile investment.

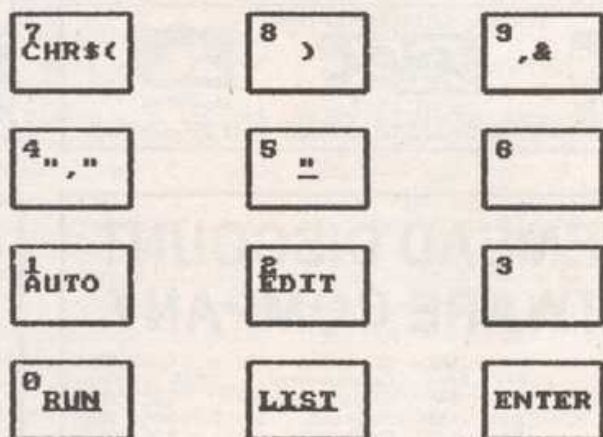


Fig. 1

### "KEY DEF" LISTING

```

10 KEY 128,"run"+CHR$(13)
20 KEY 129,"auto "
30 KEY 130,"edit "
40 KEY 132,CHR$(34)+CHR$(44)+CHR$(34)
50 KEY 133,CHR$(34)+"; chr$(34); "+CHR$(34)
60 KEY 135,"chr$("
70 KEY 136,")"
80 KEY 137,",&"
90 KEY 138,"cls:list"+CHR$(13)
100 WIDTH 32
110 NEW
    
```

Fig. 2



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# Tony Bridge's Adventure Corner



## Faithful following

**A**rrow of Death, from Adventure International seems to have had a very faithful following over the last few months, and I'm not surprised, as it has quite a lot of atmosphere, despite the usual syntax problems that Brian Howarth programs display – the players spends much of the time searching for the right combination of words, and to me that's daft. The *Daily Telegraph* or *Times* both have better crosswords if that's what you're after!

However, *Arrow*, as I've said, does keep the interest alive, and most of the problems holding people up are to do with getting into the Giant's Building, without being killed (well, you didn't think that this was going to be easy, did you?). Of course, before going into the Castle, wouldn't it be best to nobble the Giants? To do this, take the Toadstools from the Clearing and add them to the Broth in the Cookhouse Cauldron – just type "Poison (or Drug) Broth". This will put the Giants to sleep and allow you to proceed unhindered. The problem of the Guardians by the Sacred Willow is solved by throwing the Medallion – you should then cut the branch.

In pursuit of Trivia No. 1: Go West is, as you'll know, a phrase which adventurers will have used many times – it's also, of course, now better known to the world at large as the name of one of the latest successful groups. One of the two guys who make up the band, Richard Cox and Peter Drummie (I'm not sure which), is a keen Beeb user and adventurer – when a name for the group had to be found, what else could it be? Go West, young man!

Now back to the most enduring adven-

ture of them all, *Colossal Adventure* to give it just one of the names by which it is known. It is, whatever the name, the original and classic game as implemented on the huge mainframes of several years ago. It is classic, not only because it was the first and probably best-known, but also because the problems contained therein display a neat simplicity that has remained unsurpassed.

There are several versions for home micros, probably the best, for us British adventurers, that from Level 9, boasting as it does a lengthy end-game not featured in the original. The problems in the first part are, in most respects, the same as the original, and most of the versions available are much the same as each other, differing only in the wording needed to solve the problems. A major difference, however, is found in the Abersoft version, now marketed by Melbourne House as *Classic Adventure*. The first problem in the adventure is how to get past the snake – the solution has been revealed about 54 times in various places, so I will not be giving anything away by saying that you must first get the Bird (how? Well, that is another sticky problem, but let's say that birds in this cave system are rather tame except when they see Black Rods!), and then release it in the presence of the old snake, which takes fright and slithers off. Abersoft, rather humourlessly, think that the snake will eat the bird.

As evidence that the problems are as tough as ever, I still get many letters regarding *Classic Adventure*, whatever the version is called. "I can get across the fissure, but the only place I can get to from there is where Batteries are for sale. Please help!" So says G S Kewin of The Isle of Man. The vending machine is in the Different Maze, and, as you have found, contains batteries for your lamp, and you'll need a coin to feed into the machine. To get out of the Maze from the Vending machine, go North and Up. You should be back in the West end of the Long Passage. Now go East, then North, North and Up – this will bring you to the Slab Room, and from there quite a few locations will become open to you. Of course, you can go to other places from the Maze – nearby is another Maze, this one being of rooms all the same, which contains the Pirate's Chest. Bill from Knottingley was encouraged to try *Co-*

*lossal Adventure* and has done quite well – up to a point. "What do I do with the Gazette, where is the Pirate's Maze, how do I get my treasure back when he pinches it?" You should know the answer to most of your questions now, Bill – the Gazette, which is found not far from the Slab Room mentioned before, can of course be read, but can also be left at the next location (Witt's End) for extra points. But beware, it's not easy to leave once in there, though repeatedly typing South should do the trick.

In his recent letter, Dave Chapman of Timperley also mentions *Colossal Adventure*: "On writing to Level 9 for a free clue, which together with help from The Corner enabled me to complete the game, I commented that I thought having four mazes in one game was a bit much, and also wondered why one should have to go back to the start of the first part when failing the second – Level 9 wrote back to say 'are you playing *Colossal*?' Overall, though, I thought that *Colossal* was good, and I look forward to trying Level 9's next tape."

I agree that four mazes is pouring on the agony a little, and I'm not a fan of mazes anyway – but there are many adventurers who revel in the challenge. As for going back to the very start – well, it shows you the importance of saving your position before any drastic decision. Dave goes on to say: "I must mention *Knight's Quest*, one of your favourites. I have arrived at the point where the Eagle attacks you after rescuing the Princess, but have been unable to get any further – the game now gathers dust, but I would still rate this as one of the best adventures for the Spectrum. Can you help me with CCS's *The Prince*? The game loads properly, but the problem is that only Ferrordo of the main characters will carry out his specific duties."

I have never had the pleasure of seeing this game, though it appeared as a listing in an issue of *Sinclair User* some months ago. Try writing to them for a back issue, and you might then be able to alter the code. But of course, you should not be expected to do CCS's work for them. Dave also says that he has completed *Planet of Death* and *Urban Upstart*, both of which he liked. The eagle problem in *Knight's Quest* is rather complex – but the outcome of the attack depends on which weapon you use to defend yourself. If you use the Sword, you will be taken to the eagle's eyrie, which is actually no bad thing. If you have found the Diamond spear in the Castle of Clouds, then you have a dead eagle.

In pursuit of Trivia, No. 2: passing an off-licence the other day (a momentous event in itself), the Grand Elf was amazed to see a bottle of wine displayed, with the label bearing the proud legend "Thorin"! For a mere £2.50 or so, that's good value for a wine that will sing to you about Gold.

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## On the market

David Fox of Sheffield, writes:

**Q** How do I go about selling my own programs? I have a computer and I have made some of my own games which I feel wouldn't do too bad if marketed under my name. What do I do?

**A** Firstly, you will have to sell by mail order. You are unlikely to attract any of the large retailers, at least until you have established some sort of reputation. Secondly, you will have to obtain some means of duplicating your software (some form of tape copier would be best). It is probably not worth your while getting tape insets or labels produced, owing to the small quantities that you are likely to need (at least initially).

Lastly, you will need to advertise in magazines, so that the world can be told of your products. Your prices should be realistic... don't price your games as high as the retail products - people won't buy.

## Freezed computer

Angus Ross, of Norwich, writes:

**Q** One of the more irritating habits of my QL, which I use principally for word processing with Quill, is its habit of freezing occasionally for no apparent reason. One of the sources of unreliability with Quill is certainly the microdrive, but they do not seem to be the culprit here. Could the problem be spikes in the mains supply? QL User

magazine recently carried a story about a device from Power International that claimed to eliminate the problem. Is there any reason to believe the QL to be more sensitive to spikes in the mains than any other home computers? I have never had this problem with my Vic 20.

**A** A 'freezing' computer... this symptom is usually caused by one of three things: (a) a bug in the software, (b) a faulty machine, (c) a sudden peak or low in the power supply.

I find the last one harder to believe in your case than the first two.

As you say you always use Quill, do you never have this problem when using other software on the QL? The power supply would seem to be OK, because, as you say, you have never experienced problems with your other computer.

One thing you do not mention is how long after switching on it is before you get your problem. A common problem with home computers is their uncanny knack of suddenly going 'dead' after about an hour of trouble free use.

My advice would be to try other software on the QL and see if the problem still occurs. If it does not then I suggest that you contact the shop/dealer who sold you the machine and arrange for it to be repaired.

## Spectrum recorder

J Maffey of Kings Lynn, writes:

**Q** I am going to buy a Spectrum + and want to know if there is any cassette recorder recommended to be used with it. If so are there any special leads required?

**A** Any cassette recorder with 2.5mm earphone and microphone sockets should work with the Spectrum +. Ordinary mono recorders tend to give better results than stereo ones. A tape counter is an extremely useful feature to have, so that you can locate programs on a long tape.

There are a number of so called 'computer compatible' recorders on the market which do indeed give good results. The best advice is to shop around and get the best deal you can.

You will not need to get any special leads as the Spectrum comes complete with the necessary connections, etc.

## Slow disc drive

K Ebberley of Manchester, writes:

**Q** I have a Commodore 64 and am extremely happy with it except for one thing, the disc drive is extremely slow. Is there any way of speeding the thing up?

**A** Ah... you've noticed then that the manufacturer who brought you the elephant that never forgets, also brought you the disc drive that reads just about as fast as one!

In defence of Commodore, however, it is fair to say that their disc drives are comparatively cheap, and as is always the case, you pay your money and you take your choice.

There is unfortunately nothing that can really be done to speed them up; they are just built that way.

## Forth alternative?

D Rise of Bournemouth, writes:

**Q** I have a Sinclair Spectrum, and am very interested in programming. I have learned and mastered Basic, and want to move on to something more demanding. A friend suggested Forth as an alternative to machine code. Do you think that this is a good idea and can you recommend a good package?

**A** As far as recommending a good package is concerned, I need go no further than Abersoft Forth, which is widely accepted as about the best, cheap (£15.00) version available. As to whether I think that using Forth is a good idea, it depends.

If your purpose is to experiment with programming techniques, and to build up your own programs for purely personal use, then Forth is a good idea. If however you want to write programs for sale, then I would suggest machine code. I say that not because Forth is an inferior language, but because it usually requires the interpreter software to be in memory when it loads. This would, of course, bring copyright problems.

## Unlimited lives

Nicola Laurenson of Newtoll-Willows, Merseyside, writes:

**Q** For Christmas I received a CBM 64, I also received a tape called Manic Miner. So far I haven't got farther than Room 1. While reading a back issue of Popular, I saw a set of Pokes compatible with the Spectrum version. Is there a set of codes on the CBM that will enable me to get into any room I like? I'm desperate!

**A** In Vol 4 No 1 Tonly Kendle (Arcade Avenue) printed just the things you need to know. As I know the feeling well of trying to get past that stupid creature and those silly flowers... here are the Pokes! Type, Verify (return), Load "", 1,1 (return and play), Poke 16573,234 (return), Poke 16572,234 (return), Poke 16571,234 (return), Sys 16384 (return).

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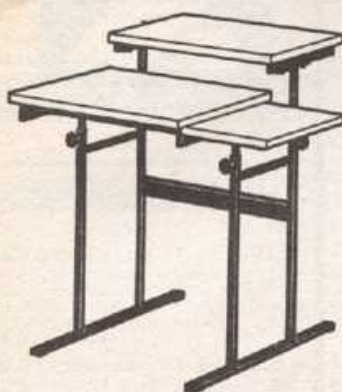
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**BBC model B 1.2** O/S with disc filing  
system double or single density also a  
few original density also a few original  
games on cassette £300. Tel: 021-558  
4591.

**BBC B**, colour monitor £395. Epson  
QX10 computer £1400. Tel: South Hamp-  
ton 32808.

**BBC B** with dual DS discs 32K solidisk  
sideways Ram, sideways Rom socket,  
joystick, data recorder, 40 Diskettes  
with extensive software £750. Tel: High  
Wycombe (0494) 451103.

**ACORN** Electron complete with b/w  
monitor, as new £135. Colin, Tel: Leeds  
(0532) 678334.

**ACORN** Electron with Plus 1, Sanyo  
cassette recorder, pair of joysticks,  
books, software, with all leads. Cost  
over £270 with accept £150. Tel: Sunder-  
land 670451 after 5pm.

**ELECTRON** data recorder, joystick in-  
terface, Quickshot II, magazines, books,  
£130 software, worth £325 sell for £160.  
Quick sale wanted. 13 Sutton Avenue,  
Culcheth, Warrington, Cheshire. Tel:  
Culcheth (09256) 4480 after 4pm.

**BBC/LVL** 100k + 100K dual disc drive for  
sale £150 cash ono. Good condition plus  
manual and several discs. (Takes power  
from BBC). Tel: Penn 4179 after 7pm.

**ACORN BBC B** plus leads and manual,  
used twice only. £260. Tel: 052 785 2831.  
**BBC**, DFS, 400K disc drive, Microvite  
monitor. Brand new. £600. Tel: 01-650  
6052.

**BBC expanded model A** with Acorn DFS,  
100K Teac disc drive, disc doctor, cha-  
meleon colour palette (4096 colours),  
joysticks (Acorn + Atari). Also over  
£1000 software on disc £450 ono. Tel:  
021 308 2467.

**BBC B** computer with disc drive, all  
necessary leads, cassettes, discs,  
books, manuals and over 150 programs  
on cassette or disc. Quickshot joystick  
also included, all for £500. Tel: 01-570  
3131.

**BBC** Electronic book DIY program one  
for use with Tandy produced book £50  
ono. Tel: Antrim 65345.

**ACORN** Electron plus £65 worth soft-  
ware plus books, magazines and cas-  
sette lead. Still under guarantee £90  
ono. Hugh. Tel: 01-834 3665.

**ACORN ZX80** processor and software,  
hardly used £280 LVLDDFS £50. Brother  
EP22 thermal printer typewriter £50. QL  
Centronics interface £20. Russell Clark.  
Tel: 0981 250496.

**BBC B** £235. Lots of mags, s/w, joystick  
interface. Tel: 01-542 7848.

**ACORN** Electron, s/w inc Mini Office,  
Twin Kingdom Valley and mags £93. Tel:  
Street 46172.

**BBC B 1.2** o/s Acorn DFS. Hardly used,  
mint condition. Cassette recorder and  
games (original only) £320 ono. Tel: 01-  
841 2061 (Ruislip).

**BBC UDM** double density interface. Ver-  
sion II £55. Tel: 0272 22850.

## Ataris for Sale

**ATARI 800**, data recorder, software, joys-  
ticks, magazines. All in excellent con-  
dition £120 ono. Tel: Mold (0352) 58941.

**ATARI 600 XL**, data recorder and s/w  
£79 ono. Tel: 01-590 2226.

**ATARI 600 XL** and Atari cartridge £80.  
Tel: Newark 0636 706326.

**ATARI** Visicalc (disc) £12 brand new.  
Tel: 0923 770601, Mr Archer.

**ATARI 800**, 2 Atari 810 disc drives £360  
the lot, will separate. Alan, Tel: 01-300  
2455 after 6pm.

## Commodores for Sale

**CBM 64** complete with cassette record-  
er, as new £145. Tel: 0532 678334.

**COMMODORE** Vic 20 starter pack, £600  
of s/w £300 ono. Commodore 16 starter  
pack and games £100 ono. Tel: Alex 01-  
242 4433 ext 5208.

**COMMODORE** Easy script word pro-  
cessing and 6 games for sale. For CBM  
64 with disc, never used. Gift with Vic 20.  
Any offers Tel: Stanford-le-Hope (0375)  
676919.

**COMMODORE** 64, disc drive 1541,  
Commodore tape deck, Commodore  
carrying case, 10 games on tape and 10  
discs £450. Or will swap for BBC. Tel:  
Bury St Edmunds 60680.

**CBM 64**, disc drive, MBS 801 printer,  
tape recorder, cassette recorder,  
speech synthesiser, books, s/w (Busi-  
ness). Cost £1100, want £600 or swap for  
equivalent BBC or QL. Tel: 061-775 5198.

**CBM** MPS 801 printer 1000 sheets of  
paper, word processor £150. Cassette  
player, £300 or original s/w, mags £110.  
Tel: 01-223 1550.

**VIC 20**, C2N c/recorder, 16K switchable  
Ram pack, joystick, Boxed and new, lots  
of s/w, books and games £100 ono. Tel:  
0704 31704.

**CBM 64** and cassette unit £300 recent  
original s/w. Impossible Mission and  
Pitstock 2. Offers £250. Tel: 01-997 8724.

**VIC 20**, data recorder, 3K, 16K expan-  
sion Intro-basic 1 and 2, 19 games (11 on  
cartridge) mags and books £100. Best  
offer. Tel: 01-449 1362 after 6pm.

**CBM 64** for sale. Cassette interface,  
joysticks, Football Manager and Mutant  
Camels games, manuals and leads  
£170. Tel: 01-977 0860.

**CBM 64**, data recorder and joystick £130  
or s/w (original) inc Super Basic and  
books inc reference guide £200. Tel: 01-  
391 2238.

**CBM 64**, unwanted gift £100. Brand new.  
Tel: 01-890 2254 9am-1pm.

**CBM 64**, cassette unit, joystick £200 of  
original s/w. Reset switch books and  
mags £220. 1520 or printer plotter £60 or  
all at £275. Tel: Reigate 43905 after 5pm.

**CASSETTE** recorder for Commodore 64,  
Brand new unused (unwanted gift) £25.  
Also few games for sale Rocketball,  
Breakdance, Cricket etc. Cheap. Tel: 01-  
470 0861 (East London).

**C64** books for sale including The Work-  
ing 64 and Basic 64 and many more and  
white lighting cost £140 + £80 ovno. Tel:  
James on 05363 63700.

**C64**, + C2N cassette unit, excellent  
condition, under guarantee and boxed  
plus over £170 of s/w and two joysticks.  
£280 ovno. Tel: James on 05363 63700.

**COMMODORE** Vic 20. Complete starter  
pack, including joystick and magazines  
plus over £100 of games. Sell for £65  
ono or swap for ZX Spectrum. Tel:  
Sheffield 374788 after 6pm.

**VIC 20** super expander Arlon expansion  
16K expansion cover m/c monitors, 8  
cartridges 75 sheet programs, 88 tape  
programs, recorder intro basic 2, rev-  
sion packs, joysticks, worth £1200 sell  
£350 ono. Tel: 0273 556139 Chris.

**COMMODORE C16** starter pack and  
home office. Database and Wordpro  
£10. Will sell for £70. Tel: 01-723 9855.

**CBM 64**, C2N, 1520 printer, dust cover,  
B+W monitor, approx £200 of original s/  
w Q/S joystick, manuals £300. Tel: 01-  
670 1971.

**VIC 20**, C2N data recorder, s/w, Intro to  
Basic Part I, manuals, still in box, good  
condition, will accept £80. Mark. Tel:  
061-643 6009.

**CBM64**, data cassette unit, 2 Quickshot,  
joystick, over £250 of s/w, US Gold titles.  
Dust cover, boxed £500. Sell £200 ono.  
Kevin. Tel: Redhill 67353 day.

**CBM64** C2N, £160 of original s/w, books  
£159 ono. CBM1541 drive and s/w £139  
ono. Both for £290. MPS801 matrix prin-  
ter, unopened £129 ono. All for £399. Tel:  
01-863 5113.

**CBM64**, cassette unit, 2 joysticks £120,  
original s/w £190. Justin. Tel: 01-723  
2808.

**COMMODORE** Vic 1520 colour printer/  
plotter only 2 months old £70 ono +  
£7.50 p/p. Interface for ZX printer for Vic  
20 or Commodore 64. Instructions etc, in  
perfect condition £10 inc. Tel: 0851  
870868 after 5pm.

**COMMODORE** Vic 20 plus 16K switch-  
able Ram pack, C2N cassette recorder  
intro to basic parts 1 and 2, games  
cartridge and software and books, all for  
£80. Tel: Bourne End (08285) 20091.

**VIC 20**, recorder, cover, 86 tapes, pro-  
grams, Arlon expansion, 16K expan-  
sion, super expander, 8 cartridges, intro  
Basic 2, 75 sheet programs, suitable  
beginner, school, advanced, family us-  
ers, revision packs, 2 m/c monitor,  
worth £1200 sell £300 ono. Tel: 0273  
556139.

**FOR SALE**, Vic 20 £40, tape deck £20,  
software £30, 16K Ram pack £15. Many  
magazines (HCW) £20. Tel: Reigate  
(07372) 22136.

**CBM 1541** disc drive for sale £150 ono.  
Tel: Leigh 673627.

**CBM 1541** disc drive, cassette, joystick  
and some software £380 ono. Tel: 01-361  
9591.

## Dragon

**DRAGON 32**, Recorder, 3 Joystick +  
utilities ESO. Ideal for first time user.  
CSP 115 £100 ono. Games programs  
extra. Tel: 01-363 6523 for details (even-  
ings) ask for Andrew.

**DRAGON 32** + Joystick + mags £50 of  
s/w. Tape deck as new £80 or swap for  
any other Popular Computer. Tel: 0707  
51481.

**DRAGON 32** TV, desk, recorder, two  
joysticks, books, magazines and £300  
software. All for £120. Also Brother HR-5  
printer and lead, both new £100. Tel:  
0942 813895.

**Dragon 32** cassette recorder, two joys-  
ticks, lightpen, 9 games, turtle graph-  
ics, leads. Swap for R/C car outfit or sell  
for £90. Tel: Lingfield 834868.

## For Sale

**AMSTRAD** user wishes to find a pen-  
friend, home or abroad. Please write to  
Mark Walmsley, 34 Bank Lane, Intack,  
Blackburn, Lancashire, England BB1  
2AX.



**ORIC Atmos 48K** less than one month old but I'm now emigrating to USA and it won't work over there hence bargain price, £59. Phone Greg, Brighton (0273) 600070.

**AMSTRAD CPC 464** colour complete with joystick software and books. Excellent condition, £280. Tel: Ashford (Middlex) 534688.

**PRISM VTX 5000** Modem (for Spectrum) complete with connector, etc. Hardly used, £40. Tel: 01-806 4044.

**ZX Printer** + 4 roms, £15.00; DK-Tronics Character Board (ZX81) £12.50; Zon-X Programmable Sound Generator (Amp/Spkr) 81-Spec £12.50; Glamire Realtime Clock-Cal I/O Board ZX-81 £15; Microtutor 6502 PSU, TV/Cass leads, £40. McKenzie, Preston 864599.

**ORIC Atmos 48k** under makers guarantee with technical software including unique five equation curve fitting, transient vibrations, spreadsheet, analysis, etc. Also books £85 ono. Tel: 0785 52189 evenings.

**AMSTRAD**, colour monitor, 2 joysticks, several books, mags, £400 or original s/w. Swap for BBC or CBM 64 with disc drive. Tel: 0900 65614, Kieth (daytime).

**MODEMS**, prisms 75/1200, Acoustic, £15. Maplin 30/300 direct connect. Built into phone £30. BBC joysticks £5. Tel: 01-958 6228, Peter Knight.

**CBM 64 801** Printer with paper, £125. Tel: 01-837 0987.

**NEWBRAIN** Ad, 40/80 columns with latest Rom. This excellent micro for sale at only £125. O/S software manual £15. Tel: Farnborough (0252) 540633.

**SONY MSX** computer with 4 game cartridges won in local radio competition, £200 ono. Tel: Wrexham 753238.

**PAIR** of self centering BBC joysticks and seven discs, three of which have games on them, Meteors, Planetoids and Arcadians. Sell separately or the lot for £25. Tel: 051 327 2155.

**EPSON MX82** printer with stack Centronics and software for Comm 64 £125 ono. Tel: 051 933 3988 anytime ask for Dave. Can deliver (free box of paper).

**KEMPSTON** joystick and interface for sale, only £17.50. Cambridge joystick, tape and interface, only £22.75. Tel: 01-348 3924 and ask for Graham.

**BROTHER EP-22** printer/typewriter, RS-232 battery or mains (adaptor inc), Thermal or ordinary paper, £80. Tel: Blackpool (0253) 38395, carriage extra.

**STONECHIP** programmable joystick interface to sell for £15 or will swap for ZX printer + paper. Tel: 0287 32561 (after 3.30pm on weekdays).

**BROTHER HR5** printer (RS232), 8 months old, power supply and manual £100. Tel: 01-221 7972.

**FOR SALE** Rotronics Wafadrive with 3 Waifas + Word Processor £80 or swap for A4 width printer, must be in good condition. Tel: Wigan 36284 or write Tommy, 127 Spring Street, Wigan.

**AMSTRAD CPC464**, 3 months old, little used, includes colour monitor. Quick sale £300 ono. Tel: 902 2788, after 9pm, Mon to Fri. Ask for Amrat.

## ZX81s for Sale

**ZX81** s/w £1.50 all originals. Various titles inc: Assembler/Dissassembler, plus games. Ring Mark 0524 52920 after 7pm.

**16K** Ram pack for ZX81. Maded by Memotech, boxed, v.g.c. £20 o.n.o. Tel: 01-937 5764 after 4pm.

**ZX81** 16k, very good condition, inc. all leads and power supply, 2 manuals, loads of mags, many games inc: Rocket Man. Tel: Ripley 810039.

**ZX81** software for sale. Eight original cassettes: Pimania, Catacombs, Damsel and Beast, Defender, Krakit, Asteroids, Dragon-Maze, Nightmare Park. Accept £22.50 o.n.o. the lot or will split. (0244) 675717.

**FULL** size printer for ZX81. ASR33 teletype. Very cheap to run. No special

paper or ribbon. With interface and software. Ready to run. Buyer collects £45. Phone Chippenham 653682.

**ZX PRINTER**, vgc, £20. ZX81 s/w for sale, originals only. Tel: 03526 3033, after 4pm.

**COMPUTER** package ZX81 16K, 7 games, approx 90 computer mags, all leads, manual, carrying case, just £48. Good beginner, with boxes. Tel: Ashford, Middlesex 41669.

**ZX81** £12. Arron. Tel: Quorn 412554 anytime after 7pm.

## Spectrum for Sale

**SPECTRUM 48K** with Kempston joystick and over £160 of S/W and books. All in perfect condition, £150. Tel: Guildford (0483) 65128 eves.

**FOR SALE:** Spectrum software including Daley Thompson's Decathlon, USA Baseball, 1984 Pool, Urban Upstart, Ghostbusters and Black Crystal. Thirteen games in all worth £90 but I want £15, will split. Tel: Sheerness 664009.

**SPECTRUM SOFTWARE:** Hobbit, Hurg, White Lightning, £7.50 ea. Doomdarks Revenge, £5.50. Dark Star, £4.50; Jet-Pac, Galaxians, Missile Defence, £3.50 ea; Night Gunner, £4. Mr Davis 177 Downs Rd, Belmont, Sutton, Surrey SM2 5QD.

**KEMPSON INTERFACE 'E'** Spectrum to Centronics all instructions in Rom, £35. Tel: 0733 232580 evenings.

**ZX SPECTRUM 48K**, £75. Computer tape recorder, £12; Interface 2 £9; Kempston, £5; light pen, £10. Also 31 tapes £15. Hobbit and Treasure Island £10. E. Shuttis, 76, Archer Ave, Southend-on-Sea, Essex SS2 4QT.

**SPECTRUM SOFTWARE:** Raid Over Moscow, Wrath of Magma, Return to Eden, L.O.M., Tower of Despair, Classic Adventure, Bunny, Phasor Chase, Hulk: the lot for £40. R. Martindale, 28 McMinnis Ave St. Henens, Merseyside WA9 2PN.

**SPECTRUM LO-PROFILE** professional keyboard, as new, £25. Also many best-selling titles all at ridiculously low prices. Please send list for details, 12 Middlefield Lane, Hinckley, Leics. Tel: 0455 635416.

**SPECTRUM SOFTWARE.** Six pack, £15 ono, boxed. G700 Philips video Pac, 2 cartridges, £20 ono or swap for ZX printer and paper. Mark. Tel: 907-5396.

**SPECTRUM ORIGINALS** for sale. Bear George, Aquarius, Megapede, Cassette 50 and Planetoids. Only £3.50 each or all five for £12. Write to Julia Chambers, 22 Bedford Avenue, Shaw OL2 7DW.

**SPECTRUM SOFTWARE FOR SALE.** All originals, include Baseball, Bruce Lee, Buggy Blast, Designers Pencil, 3 Level 9, Out of the Shadows, etc. Tel: (0298) 77641 and ask for Rob.

**SPECTRUM** + games + joystick interface + mags + books + manual. Under guarantee. Swap for CBM 64 + C2N. Write with Phone number. Gary Sanger 30 Station Ave, Wickford, Essex SS11 7AS.

**SPECTRUM 16K.** Some software, £55 ono or exchange Brother EP22. Tel: 01-978 5047.

**SPECTRUM POWER PACK**, £2.50. Both manuals for £4. Cassette leads, £1; Horizons tape, £1; JSW, £2.50; Penetrator, £2.50; Kong, £2.50. SAE to G. Edwards, 19, The Maltings, Hunton Bridge, Kings Langley, Herts. Tel: Kings Langley 66501.

**48K SPECTRUM**, excellent condition, printer + 4 rolls of paper, cassette recorder, £700. software, sell lot for £200. Tel: Xchurch (0202) 486727.

**SPECTRUM SOFTWARE:** Volcano, 3D Lunar Crabs, £3 each. Spawn of Evil, Voyage into the Unknown, £1.50 each; Booty, £2; also Tro Jan, Light pen, £16; Beep amplifier £10 or sell for £32. Steven Holms. Tel: Swansea 3655.

**BOXED SPECTRUM** + with guarantee and turbo interface, Quickshot 2 and 12 games. Titles include Death Star, Inter-

ceptor, Moon Cresta, Air Wolf and many more. Total £239, but for quick sale £165. Tel: 452 5259 4pm-8pm.

**SPECTRUM 48K** fitted in fuller FDS keyboard, power pack, manual, working order, £90 posted £80 if collected. Tel: Rainham 04027 20252 (Essex).

**48K SPECTRUM**, joystick interface, light pen, software mags, Quickshot II joystick. Cost £279, sell £180 or swap for Atari 800XL, tape deck + games. Tel: Glasgow (041) 771 4715.

**48K SPECTRUM** with nearly £200 or original software including White Lightning, Ghostbusters, Jet-Set Willy etc; plus joystick interface, all boxed, as new in excellent condition. Only £100. Tel: Horley 771876.

**SPECTRUM ORIGINAL SOFTWARE SALE:** Forth, Assembler, Knight Lore, £5; Backgammon, Chess, Reversi, Caesar The Cat, Omnicalc, £3. Bryan. Tel: 01-692 4690.

**48K SPECTRUM**, Currah Speech unit, Cassette recorder, plugs and leads, manuals, books and magazines, £200 or software. Worth £450 sell for £200 ono. Tel: (0539) 21450 ask for Dave.

**SPECTRUM SOFTWARE FOR SALE:** Worth over £75, sell for £35 ono all originals including Daley's Decathlon, TLL, Micro Olymp, Omega Run, Chequered Flag and eight other quick sale. Tel: 0349 882708 after 5pm.

**ORIGINAL SPECTRUM SOFTWARE:** Cyrus Chess, Supercode III, flight simulation, Vu-Calc, Arcturus, 3D Strategy etc. All boxed, mint condition, £15 the lot. Tel: 01-527 5493.

**SPECTRUM (16K/48K)** tapes worth £70: Transam, Cookie, Magic Meanies, CDS Pool, Bug-Byte Pool, Star Warrior, Airliner, Molar-Maul, Meteor Storm, Digger-Dan, Roman Empire, Rifle-Range, Monsters in Hell, Spacewalk. £30 ono. Tel: Clacton 427538.

**SPECTRUM 48K**, Interface, joystick, over 100 quality games inc: Match Day, Starstrike, Decathlon etc. Many magazines and books. Still boxed. Worth £575, sell for £160 ono. Tel: 0329 287684.

**SPECTRUM SOFTWARE** for sale £30 worth of games will sell for only £15 inc p&p. Will not split. Tel: Leeds 824856.

**SPECTRUM 48K**, Microspeech, Turbo joystick interface tape, recorder, Over £300 of software inc Doomdarks Revenge, Lords of Midnight, Quill, Match Point, Valhalla, Cyclone, Knight Lore, Worth £550, sell for £245. Tel: Toddington 3265.

**SPECTRUM** plus Tandy cassette recorder and Currah Microspeech, £90 the lot! Large collection spectrum software, £40. Interface one with two microdrives and ten cartridges, £90. Accept £200. Whole system. Tel: 0844 52426.

**48K SPECTRUM**, DK Tronics, built in sound Rotronics wafadrive, seven cartridges, Alphacom 32 printer, plus books, software, lead, PSU etc. Good sensible offers, £200. Tel: Abingdon 834613.

**SPECTRUM** games offers all originals and in good condition. Just send an SAE to 10 Estcourt Drive, Widmer End, High Wycombe, Bucks HP15 6AH or Tel: High Wycombe 713899.

**SPECTRUM SOFTWARE FOR SALE.** All originals. All half price or less. Titles include Alien 8, Doomdarks Revenge, Fantastic Voyage, Boulder Dash and over 75 other titles. Tel: (0602) 26946 and ask for Stephen.

**48K SPECTRUM** software, books and 140+ mags, worth £420, going for £180 ono. Tel: Amesbury (0980) 22589.

**SINCLAIR QL**, as new, with all cartridges and RS232 cable included plus some books, £320 ono. Tel: 0509 214810. Am prepared to travel large distances to deliver computer.

**48K SPECTRUM**, low profile keyboard, tape deck, tapes, books, plus all leads, 2 manuals, lots of magazines, £90. Tel: Blanford 54161, after 6pm.

**SPECTRUM** software pack (all originals), Cyrus Chess, Supercode III, Psion Flight Simulation, Vu-Calc, Arcturus, 3D Strategy etc. £15 ono the lot. Tel: 527 5493.

**48K SPECTRUM** professional keyboard, programmable interface, Kempston joystick, all in excellent condition plus over £500 of software plus tape recorder all at a bargain price of £400. Tel: Andy 01-858 9964.

**SPECTRUM** software for sale, Games Designer £4.95, Pogo £2.95, Kong £1.95, the lot for £8. Tel: 0732 865197 after 6pm. (Originals only).

**SPECTRUM** for sale, 48k complete with leads, instruction manuals and tape recorder, only £90. Telephone 01-348 3924 and ask for Graham. First offer secures.

**48K SPECTRUM**, tape recorder, interface I, 2 microdrives, 2 joysticks, music synthesiser, speech synthesis, £300. Tel: 01-992 7210.

**48K SPECTRUM** Interspec Interface, light pen, printer, 6 rolls of paper, tape recorder, books, s/w, £200 the lot. Sell sep! Tel: Brecker 2579.

**ZX SPECTRUM 48K**, Microspeech, Sound Synthesiser joystick + Interface + £250 of s/w all for £200. Tel: 01-809 2841 after 4pm.

**ONE ORIGINAL** Spectrum keyboard mint condition £10. Tel: (0493) 603965.

**48K SPECTRUM**, under guarantee, VGC. New programmable comcon joystick Interface. £100 + of software. New cassette recorder. All worth £250+ but for £130 ono. Phone 01-953 5565 evenings only.

**UNUSED SINCLAIR QL**, computer, quill easel etc. plus 8 microdrive cartridges, RS232 lead. Bargain £299. 51-652 1106 (9-5pm).

**48K SPECTRUM** + tape recorder, books, games and lightpen (fully boxed). Will sell for £100 ono. Tel: 01-883 5950.

**SINCLAIR QL** plus manual, extra tapes. Mint condition very little useage any trial £250. Tel: Windsor 63949.

**QL** with manuals + leads £250. Contact Dave Brunton, 68 Station Road, Reddish, Stockport, Cheshire.

**SPECTRUM 48K PLUS**, Protex switchable Interface, Quickshot 2 joysticks, lightpen, 3 program books. Over £100 of s/w (Original) Price £150. Tel: Newquay 06373 77658.

## Tandys for Sale

**TANDY 100**, 32K Computer + additional S/W, 1/2 of original price £350, excellent working condition. Tel: 0532 439431.

**APPLE 2** compatible, 64K, 80 colour, £280 printer card. £140. 2 clones £180. £180 Green Monitor 9" £30 Teac Dot matrix printer 120 CPS £220. Andrew Wong, Room 5, John Adern Hall, 15/23 Emsleigh Street WC1H.

**TANDY THERMAL** printer model FTP-10 as new cost £80. Unwanted gift including interface cable for TRS-80 computer, paper, plug etc. Stillboxed accept first £37.50 ono will post. Tel: 0244 675717.

**TANDY TRS 80** colour extended 16K joystick manuals game perfect condition £70. Tel: Newcastle-upon-Tyne 324608 evenings.

## Wanted

**WANTED** Spectrum 'Micro-Command' (up to £30). Swap Currah Speech (VGC) for Cheetaah 'Sweet-Talker' (sell £20). Also poly-synth (Siel MK900 etc)/casio keyboard wanted (up to £300). Tel: Neil 0249 712662.

**WANTED** Sinclair printer for Spectrum, must be in v. good working order, will pay £25 plus some software write to Jeff, 28, Harry Price House, Hartlebury Road, Oldbury, Warley B69 1EQ.

**WANTED.** Interface one and microdrive, will swap for VTX5000 Modem plus books. Tel: Andrew on Neath 750 952 or write to 1, Heol-y-graig, Crynant, Neath SA10 8TF.



**EXCHANGE** Spectrum 16K complete on/off reset switches for Brother EP22 typewriter/printer or sell £55 ono. Chris 01-979 5047 (9-5).

**MEMOTECH** Pascal Rom-chip wanted also Memotech RS232 communications board wanted. Telephone David on (0278) 862181 after 5.30.

**WANTED** CBM 64 or BBC will exchange classical guitar Alhambra 9C value £250 plus carrying case and foot stool. Phone Enfield 01-363 3363.

**WANTED** Atari 400 48K Ram board. Willing to swap 2 to 6 Roms depending on condition (working board or not), or £20. Telephone Steve 061-766 2159 after 7pm.

**SWAP** Prism VTX5000 + software for ZX printer + paper. Perfect condition. Keven Ashbridge, 29 Queen Crescent, Frizington, Cumbria.

**WANTED** Oric 1 keyboard and case. Did you keep it when upgrading to Atmos? I will give you £10 for it! Write to Mr Norton, 138 Newlands Road, Stirling, B'ham B30 2RH.

**WANTED** to buy Amstrad hardware & software (local area preferred). Mr Gerry, 3 Upper Ham Road, Ham, Richmond, Surrey.

**WANTED** Acorn Sof Veiushi for BBC micro. Tel: Radlett 2632. Wanted Z80 processor.

**EXCHANGE** Sinclair QL for Apple III plus accessories. Write: B. Jamieson, 9 Hartford Crescent, Ashington, Northumberland NE63 0CD.

**WANTED** cheap printer software utilities etc for Spectrum. Also other cheap computer working or not for college studies. Write: Nigel Richardson, Flat 15, 22 Thicket Road, Sutton, Surrey SM1 4PS.

**SWAP** camera equipment for modern computer + printer. Olympus OM2N outfit worth £800. Tel: 0708 857968 (Essex).

**WANTED** Atari 800 or 400 48K. Tel: South Shields 558990.

**SWAP** Currah Microspeech (Spectrum) for working ZX81 or broken Spectrum. Please phone (0707) 42065 evenings & weekends.

**SWAP** Currah Microspeech + s/w tape for Spectrum. Printer + paper for sale. £20. Tel: Niel (0249) 712862.

**WANTED** Spectrum s/w, new titles. Offers to Raellette 2673.

**WANTED** 48K Spectrum for spares. Pay up to £30. Can not collect. Tel: 707001 Farnworth.

**WANTED** TI 99ER magazines and extended basic module fair price paid. 32 Glenshesk Park, Dunmurry, Belfast BT17 9BA. Telephone 0232 623001.

**WILL** swap Stonechip programmable joystick interface, Quickshot II and Cambridge joystick. All working perfectly for Alphacom 32 printer. Phone (0555) 71911 after 5pm Mon-Fri and ask for Stuart.

**WANTED** Arari 410 cassette recorder and non-working Aquarius S.A.B. 108 Kingsway, Wellingborough, Northants NN8 2EN.

**SWAP** my Tokai Strat guitar and Marshall 30W Amp for your 1541 disc drive or £285 of your cash. Tel: (0245) 670264 after 5pm.

**SWAP** Amstrad CPC 464 with colour monitor, joystick, cassette for Casio C2101 or synthesiser. Write to D. Scot 26 Harden Place, Hawick, Scotland.

**WANTED** ZX printer or Alphacom 32 with rolls will pay up to £15 (not inc. paper). Write to Brian O'Connor, 5 Almeida Tce, Kilmainham, Dublin 8. Also wanted Spectrum s/w.

**WILL** swap Stonechip programmable joystick interface, Quickshot II and Cambridge joystick. All in v.g.c. for Alphacom 32 or microdrive + interface. Phone (0555) 71911 after 6 o'clock Mon-Fri and ask for Stuart.

**Now** a poor unemployed Spectrum owner requires your unwanted microdrive or wafadrive. Must be very, very, very cheap or even free. Phone (0555) 71911 after 6 Mon-Fri. Ask for Stuart.

**WANTED** 1 Dragon Premier, 5 1/2 Disc User for exchange of hints/tips/disc. Tel: Staines 58707 after 6pm.

**WANTED** Basic for Sharp MZ80K plus any other software or books including owners handbook. Tel: Mr Reeves 0923 31287.

**WANTED** Vic 20 16K expansion and Bongo. Will buy or swap for 2 cars and Wacky Waiters tape for unexpanded Vic. Need urgently. Tel: 0926 316 346.

**ZX PRINTER** (working) wanted: Up to £30 paid. Tel: 0562 740 720, after 6pm.

**EXCHANGE** Textfile Word Processor & Colossus Chess, both on disk, for Basic compiler on disk for Commodore 64 or light pen. Tel: 01-478 7868, after 6pm.

**WANTED** Atari 810 disc drive. Any reasonable offer considered. Write G. Yendall, 1 Eastley, Basildon, Essex SS16 5TQ.

**SWAP** my CBM16, C3N, Intro to Basic, £100 games, mags and books for your Atari 800 XL, with tape unit, joystick and games. Tel: 0703 731472. I also have joystick.

**WANTED** ZX80 computer. Must be in good condition with leads, manual, etc, and very cheap! ZX81, Vic 20, Jupiter Ace, Aquarius, etc also wanted. Must be cheap. Phone 0763 61392.

**SWAP** Currah Speech for ZX printer or Kempson joystick. Tel or write to Chris now, 985 6279.

**QL** wanted, QL monitor, Lisp, Toolkit, Integrated Accounts, cash trader, for sale QL Pascal. Tel: 021-742 1969.

**WANTED** Oric and Atmos software. Must be originals. Also any ZX81 software and Dragon software. Cash paid for quality items. Tel: 0788 812940 (after 7pm).

**SWAP** Spectrum 48k upgraded to Plus Kemston Triple Joystick Interface software and £50 for CBM 64 with C2N cassette deck. Eales, 33 Lower Ellacombe Church Road, Torquay, Devon.

**SWAP** Dragon 64, 2 joysticks, 6 games, 3 books and mags for Spectrum Plus or

Electron or sell £140 ono. Tel: Nottingham (0602) 639882.

**WANTED** Dragon 32/64. Edinburgh area. Will collect. Any peripherals considered. Tel: 0506 55231.

**WANTED** ZX81 s/w. Good price paid for good s/w (originals only). Tel: 01-573 7591.

**SWAP** Spectrum Plus, still under guarantee + books + mags + joystick interface + lot of software for DBM 64 + C2N or sell £160. Write Gary Sanger, 30 Station Avenue, Wickford, Essex.

**COMMODORE** 1541 Disc drive plus 8 discs offers or exchange Spectrum 48K plus cash also Compunet Modem and Membership. Ask for Tony. Tel: 0482 838111 (anytime).

**WANTED** to Buy - Interface & disc drive. Tel: Sunderland 40858 anytime.

**WANTED** Hewlett Packard HP 86 Computer, disc drive etc, will buy for cash or part exchange for professional camera outfit, Mamiya RB67 plus lenses. Tel: Wolverhampton 751678.

**BBC-B** wanted preferable with disk drive and game willing to pay up to £400. Tel: Luton 37968 after 5pm.

**SHERLOCK** on CBM64. General tips wanted. Write to Allan Cooper, 22 The Crossways, Old Coulsden, Surrey or phone Downland 55122.

**WANTED** Dot matrix printer RS232 only, or with interface for Spectrum. Must be under £100. Also wanted Teletype-style printer (RS232) cheap but working. Tel: Bookham 56327.

**WANTED** 4040 Commodore dual disk drive. Tel: 0795 668173.

**AMSTRAD** Penpal wanted. Write to Mark Lee, 3 Leopardstown Court, Stillorgan, Co Dublin, Ireland.

**WANTED** Hint sheets for Lords of Time, Adventure Quest, Dungeon Adventure. Tel: 0973 770607. Mr Arthur.

**AMSTRAD** colour monitor, 2 joysticks, several books, mags, £400 of original s/w. Swap for BBC or CBM64 with disc drive. Tel: (0900) 65614 Keith (day).

**WANTED** new Spectrum s/w. Very good price. No copies. D. Snell. Tel: Radlett 2673.

**WANTED** Jupiter Ace, working condition. Tel: 01-330 3837 evenings.

**COMMODORE USERS!!** I desperately require the following articles: "Inside CBM Dos" from Prentice Hall, "Anatomy of the 1541 Disk Drive" from Adamsoft/First Publishing. Phone me now! Mike 0558 822509.

## ADVENTURE HELPLINE

**Colditz on Spectrum.** How do you stop the floor boards from creaking when gitting the wire cutters? How do you get off the window ledge? Mark Howlett, 88 Byngs, Harlow, Essex.

**Denis Through the Drinking Glass on Spectrum.** How do you get a drink and get out of number 10? R Wilson, 8 Westfield Terrace, Loftus, Saltburn, Cleveland.

**Claymore Castle on Commodore 64.** How do I climb the fountain without dying? How do I open the stone door? How do I get the can? Steve Huckvale, 47 Finham Green Road, Finham, Coventry (0203 418809).

**Tomb of Xeiops on Commodore 64.** I cannot get the majestic painting, miniature pyramid or 100 grinning skulls. What use is the fruit cake? Leslie Austin, 25 Royal Avenue, West Onchan, Isle of Man.

**Fantasia Diamond on Amstrad.** I can't open the trapdoor or musical door because the conductor stays there. Is there something missing? Mohamed Lakhi, 52 Cardinals Way, London N19.

**The Tracer Sanction on Commodore 64.** Where do I find Sols on Darton to reach Valkyron? Marco van Slageren, Langswater 299, 1069 EC Amsterdam, holland.

**Spiderman on Commodore 64.** How do I reach the mysterious cloud? How do I start the presses? J H Dyson, Bryn Tirion, Vaynol Park, Bangor, Gwynedd.

**Sherlock on Spectrum.** How do you get into Basil Phipps' and Tricia Fender's London homes. Sarah Young, 40a Carnarvon Road, South Woodford, London E18.

**Tower of Despair on Spectrum.** How do I get past the Demonkin? Roel Castelein, Ullenshofstratt 13, 2080 Merksem, Belgium.

**Return to Eden on Spectrum.** How do I start? I keep getting zapped! Dave Edwards, 45 Riverdale Court, Higher Blackley, Manchester.

**Mission 1: Project Volcano on Amstrad.** Please send out a plea of help. I have got past the lift droid and up to the second level, but I can't get any further without being gassed. Tony Goodman, 87 Crescent Road, Ramsgate, Kent (0843 595304).

**Empire of Karn on Commodore 64.** How do you kill the snake and how do you get the key from the widow Nazill? Gillian Dadson, 73 Amethyst Road, Christchurch, Dorset.

**Jewels of Babylon on Amstrad.** Where is the key for the door and how does the slab move? Ms B J Fox, 354 Moat Road, Oldbury.

THE  
FUZION  
OF MIND  
AND MACHINE  
CONFUZION

## COMPUTER SWAP

Computer Swap entries are limited to 30 words. Either fill in the accompanying form and send to Computer Swap, *Popular Computing Weekly*, 12-13 Little Newport Street, London WC2H 7PP or telephone 01-437 4343.

All software offered through computer swap must be in original condition and for private sale only.

It cannot be swapped.  
**Warning:** It is illegal to advertise pirated software.

## COMPUTER SWAP

Please write your copy in capital letters on the lines below.


Name .....

Address .....

Telephone .....



## Amstrad

1	(1)	Knightlore	(Ultimate)	£9.95
2	(5)	Alien 8	(Ultimate)	£9.95
3	(3)	Ghostbusters	(Activision)	£10.99
4	(3)	Sorcery	(Virgin)	£9.95
5	(8)	Tankbusters	(Design Design)	£7.95
6	(-)	Combat Lynx	(Martech)	£6.95
7	(10)	Super Pipeline 2	(Taskset)	£8.90
8	(9)	3D Star Strike	(Real Time)	£6.95
9	(4)	Daley's Decathlon	(Ocean)	£8.95
10	(6)	Minder	(DK'Tronics)	£9.95

### Bubblers:

Hunchback	(Ocean)	£6.90
Jet Set Willy	(Software Projects)	£8.95

## Atari

1	(1)	Bruce Lee	(US Gold)	£7.95
2	(4)	F15 Strike Eagle	(US Gold)	£14.95
3	(6)	Pole Position	(Atarisoft/US Gold)	£9.95
4	(-)	Fort Apocalypse	(US Gold)	£9.95
5	(2)	Ghostbusters	(Activision)	£10.99
6	(-)	Drehs	(US Gold)	£9.95
7	(9)	Smash Hits 3	(English Software)	£14.95
8	(7)	Mr Do	(US Gold)	£9.95
9	(5)	Decathlon	(Activision)	£9.99
10	(8)	Beachhead	(US Gold)	£14.95

### Bubblers:

Zaxxon	(US Gold)	£14.95
Smash Hits 2	(English)	£14.95

## BBC

1	(1)	Knightlore	(Ultimate)	£9.95
2	(2)	Alien 8	(Ultimate)	£9.95
3	(3)	Revs	(Acornsoft)	£14.95
4	(4)	Atac Atac	(Ultimate)	£7.95
5	(7)	Elite	(Acornsoft)	£14.95
6	(8)	Brian Jacks Superstar	(Durell)	£7.95
7	(5)	Wizardore	(Imagine)	£7.95
8	(-)	Cremains	(Adventure International)	£9.95
9	(-)	Castle Quest	(Micropower)	£6.95
10	(9)	Hampstead	(Melbourne House)	£6.95

### Bubblers:

Magic Mushrooms	(Acornsoft)	£12.95
Combat Lynx	(Durell)	£8.95

## Commodore 64

1	(1)	Dambusters	(Sydney/US Gold)	£9.95
2	(2)	Softaid	(Softaid)	£4.99
3	(3)	Pitstop II	(CBS/Epyx)	£9.95
4	(5)	International Basketball	(Commodore)	£5.99
5	(7)	Theatre Europe	(PSS)	£9.95
6	(4)	Shadowfire	(Beyond)	£9.95
7	(-)	Herbert's Dummy Run	(Micro-Gen)	£9.95
8	(6)	Impossible Mission	(CBS/Epyx)	£7.95
9	(10)	Spitfire 40	(Mirrorsoft)	£9.95
10	(-)	Grog's Revenge	(Sydney/US Gold)	£9.95

### Bubblers:

Bounty Bob Strikes Back	(Big S/US Gold)	£9.95
Strangeloop	(Virgin)	£8.95

## Spectrum

1	(1)	Softaid	(Softaid)	£4.99
2	(3)	Shadowfire	(Beyond)	£9.95
3	(4)	Spy Hunter	(Sega/US Gold)	£7.95
4	(8)	Tapper	(Sega/US Gold)	£7.95
5	(2)	Starion	(Melbourne House)	£7.95
6	(10)	Herbert's Dummy Run	(Mikro-Gen)	£9.95
7	(6)	Rocky Horror Show	(CRL)	£8.95
8	(-)	Falcon Patrol 2	(Virgin)	£6.95
9	(-)	Minder	(DK'Tronics)	£9.95
10	(-)	Give My Regards to Brdst	(Mindgames)	£7.95

### Bubblers:

Chuckie Egg 2	(A 'n' F)	£6.90
Gyron	(Firebird)	£9.95

All figures compiled by Ram/C

1	(1)	Soft Aid (Spectrum/C64)
2	(3)	Dambusters (C64)
3	(2)	Knight Lore (Spectrum/BBC/Amstrad)
4	(4)	Pitstop II (C64)
5	(8)	Alien 8 (Spectrum/Amstrad)
6	(12)	Herbert's Dummy Run (Spectrum/C64)
7	(10)	International Basketball (C64)
8	(14)	Theatre Europe (C64)
9	(-)	Revs (BBC)
10	(7)	Shadowfire (Spectrum/C64)
11	(6)	Spy Hunter (Spectrum/C64)
12	(-)	Tapper (Spectrum/C64)
13	(5)	Starion (Spectrum)
14	(15)	Rocky Horror Show (Spectrum/C64)
15	(-)	Atic Atac (Spectrum/BBC)
16	(13)	Impossible Mission (C64)
17	(16)	Ghostbusters (Spectrum/C64/Amstrad/Atari)
18	(-)	Spitfire 40 (C64)
19	(19)	Jonah Barrington's Squash (Spectrum/C64)
20	(11)	Minder (Spectrum/Amstrad)

Figures compiled by Ram/C

Various Artists
Sydney/US Gold
Ultimate
Epyx/CBS
Ultimate
Mikro-Gen
Commodore
PSS
Acornsoft
Beyond
Sega/US Gold
Sega/US Gold
Melbourne House
CRL
Ultimate
Epyx/CBS
Activision
Mirrorsoft
New Generation
DK'Tronics

# Readers' Chart No 28

1	(1)	Soft Aid (Spectrum, C64)
2	(3)	Knight Lore (Spectrum, BBC, Amstrad)
3	(2)	Everyone's a Wally (Spectrum, C64)
4	(4)	Alien 8 (Spectrum)
5	(5)	Confuzion (Spectrum, Amstrad)
6	(-)	Elite (BBC/Electron)
7	(6)	Bruce Lee (Spectrum, C64)
8	(7)	Gyron (Spectrum)
9	(10)	Finders Keepers (Spectrum)
10	(8)	Match Day (Spectrum)

Various Artists
Ultimate
Mikro-Gen
Ultimate
Incentive
Acornsoft
US Gold
Firebird
Mastertronic
Ocean

Winning phrase No 28: "Keen hairstyler follows yeti" from D J Bradbury of Aylward Road, Wimbledon, London SW20, who receives £25. Honourable mentions go to Neil Bond of Llanedeyrn, Cardiff, for "Harold Wilson's eaten a live Tory", T Burdis of London SW14, for "Ashes for Gower? Not likely" and A Hyland of Gravesend, for "Eeeeaak, what is it?"

# Now voting on week 30 - £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 30 closes at 2pm on Wednesday June 19 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 .....	My top 3: Voting Week 30
Address .....	1 .....
.....	2 .....
.....	3 .....
My phrase is: .....	



# New Releases

## DEMONS

*Fiona Rides Out* is a new release for the Commodore 64 very much in the style of *Cauldron* and *Sorcery*. For some reason arcade games which let you collect and use things using joystick controls and generally have some sort of adventure element are always connected with magic witches. Wonder why?



Anyway *Fiona Rides Out* has you helping Fiona, foul witch, to regain her power - this involves retrieving her spell book found on the 12th screen. To get there she needs to collect various tools and spells. To get spells she has to blast at flying ingredients. If Fiona fails she gets sent to Hell where all is burning rocks and demons.

Graphically it's a reasonable though not staggering game and the music - gothic Bachian type stuff - is a bit reminiscent of other games. Still, there are a few original ideas and you get a free game, *Daredevil Dennis*, on the other side of the tape

**Program** *Fiona Rides Out*  
**Price** £7.95  
**Micro** Commodore 64  
**Supplier** Viper  
Eardley House  
182/184 Campden  
Hill Road  
London W8

## BUDGET

It's always difficult to see why the average person would want to keep their bank account on a micro.

People seem to forget that whilst a computer can tell you

all sorts of clever things about current totals, standing orders, you do have to remember to type things in.

Can you really imagine having a regular time when you sit at your computer and input all the cheques you've written, to whom, and when?

If you can then *QL Bank Account* is very good. Microdrives mean that, at least, compared to tape, the program loads quickly, as do file records. The design is simple to use, there are 17 budget headings under which outgoings may be filed, and once you enter the basic details of a standing order the computer will include it in each month's balance automatically.

You can dump statement details to Epson printers, but there is an ominous warning that should you start the print out process with no printer attached, the program will hang up and you have to restart the program with all the current information in the computer being completely lost.

This is not Cenprime Software's fault but Sinclair's. I mention it because it is these kind of annoying hiccups that have plagued the QL since its introduction.

**Program** *QL Bank Account*  
**Price** £19.95  
**Micro** QL  
**Supplier** Cenprime Software  
10 Castle Street  
Rugby  
CV21 2TP

## ILL-DEFINED

*C5 Clive* is a cheapie £1.99 game from Scorpio Software.



Really the only noteworthy feature of the game is that it features a C5. But since this is, in fact, a tiny little user-defined graphic that could equally well be a piece of cheese that element is hardly crucial.

The game is a standard dodge the baddies game mixed with a sort of bike jump-type game. You move the C5 up and down past odd objects collecting batteries (God knows, you need them) and then leap over things like people and buses.

Objects are, without exception, blobby and ill-defined, and whilst it's cheap I think this one is below the average level of, say, a Mastertronic game.

**Program** *C5 Clive*  
**Price** £1.99  
**Micro** Spectrum  
**Supplier** Scorpio  
Gamesworld  
307-313 Corn  
Exchange Building  
Cathedral Street  
Manchester 4

## RECREATION

Yes, it's the one Commodore 64 game players have been waiting for - *Elite* on the C64. Written by Ian Bell and David Braben, who wrote the BBC version, it is a faithful recreation of the original, with a few extra features included.

The colours on the various displays have been greatly enhanced - now you have four colours for the view screen and eight for the status panels. This means that you can actually have glorious orange explosions as your missiles tear through the fragile skin of your target.

What it really means, of course, is that the displays are far clearer, much easier to understand, and somehow crisper. It all adds to the illusion of being in the cockpit of your Cobra Mark III.

The C64 *Elite* also has music - but only for the docking sequences. And guess what it is - that's right, da-da-da-da, du-du, du-du, etc - the Blue Danube.

In addition to the command that turns the music on/off, you can also remove the lines that you see on the planets - this speeds up the whole



game There are also a lot of extra features that aren't mentioned in the instruction book - this is deliberate, so I shan't spoil them for you.

Bell and Braben have done an excellent job converting their game for the Commodore, it plays superbly and it seems to be as fast as the BBC version.

**Program** *Elite*  
**Price** £17.95  
**Micro** Commodore 64  
**Supplier** Firebird Software  
Wellington House  
Upper St Martin's  
Lane  
London WC2H 9DL

## TRUMPED

*Bridge* for the Amstrad from Kuma is one of the first versions on this machine of this classic card game. The difficulty of implementing *Bridge* on the computer, I reckon is programming the computer to play the cards convincingly after the bidding.

Kuma's *Bridge*, after testing, was declared by those in the office who know, to be a sound but overly cautious bidder, which probably means it would be good for practising with.

Graphically the game is very impressive - the high resolution Amstrad screen is well suited to clearly displaying fine detail and there is much use made of it in this program. Hands are very clearly depicted and bidding, score, tricks and cards are all displayed on screen.

**Program** *Bridge*  
**Price** £8.95  
**Micro** Amstrad  
**Supplier** Kuma Computers  
12 Horseshoe Park  
Pangbourne  
RG8 7JW



# New Releases

## DIVIDED

*Danger Mouse in Double Trouble* is now available on the Amstrad. Graphically it's marvellous – the design for the main characters is taken straight from the original sketches for the cartoon. As a game I'm not so sure.

I always think it's a bad sign if a game is divided into sections – separate games are too often bodged together with no real attempt to unify them. The idea is that three inferior games, not good enough to stand up on their own, may produce an acceptable end result if you put them together. It doesn't work.

Not that *Danger Mouse* is the worst example of this syndrome, the effort that has gone into the graphics prevent that. It's more a question, I think, of not really having a good idea for the game – what you get instead are three OK ideas.

The sections are these: *Danger Mouse* is first seen with Penfold flying in his aerocar. At different height

levels they are confronted by different baddies and must launch the correct repellent. Stage two is a jungle game-jump over the swamp avoiding the crocodile and then climb the tree using the swinging monkeys. Part three is a form of *Mastermind* with an excellent *Danger Mouse* animated sprite trying to match a coloured pattern.

If you like *Danger Mouse* and great graphics you may love this, but for pure game alone I can't recommend it.

**Program** *Danger Mouse in Double Trouble*

**Price** £7.95

**Micro** Amstrad

**Supplier** Creative Sparks  
Thompson Houses  
296 Farnborough Road  
Farnborough  
Hants GU14 7NF

## BLOCKAGE

*Pipeline* by Taskset on the Commodore was one of the more inventive games on the machine, the basic idea being to keep the water flowing through a pipe by constantly repairing the blockages that appear in it. This means moving a little workman figure around – there are the compulsory nasty objects zooming around to make things tough. A simple basic idea that worked.

The game has been produced for the Spectrum by Viper. In the admirable intention of doing a sophisticated job the programmer has, I feel, somewhat spoilt it. Basic game plan is the same – move your workman around the pipe taking him to each new blockage.

## Pick of the week

## HARD LUCK

Whatever you believe someone or something somewhere is going to prove you wrong and so it is with gritted teeth that I own up to finding a *Manic Miner* derived game with an alternative title utterly wonderful.

The game is *Dynamite Dan* and it has a main character who looks incredibly like Sebastian Flyte and appears to loll about as though surveying the dreaming spires. Let's dismiss the plot quickly – collect the sticks of dynamite, blow up the safe, collect the papers and escape. The usual, in other words.

What makes the game is the graphics – large, witty, bizarre and beautifully animated and not a colour resolution problem in sight (well, very very few, anyway). Visually the game looks a little like the recent *Mikro Gen Wally*.

The game is packed with screens and, more significantly none of them are

throwaways, each has something remarkable, and horribly difficult puzzles in the left-right-jump tradition; as ever, timing is all.

Aside from the expected vast collection of assorted bouncing sprites the game features elevators, transporters, a river that runs along the bottom of several screens with a boat that is very difficult to catch and appears very rarely, and the oddest hard luck screen I've seen – you are executed by a funny man in a spaceship who then turns to face you, grinning madly.

*Dynamite Dan* is not just another *Miner* surrogate and is at least as essential to your collection as the original. It's a pity about that name, though.

**Program** *Dynamite Dan*

**Price** £6.95

**Micro** Spectrum

**Supplier** Mirrorsoft  
Holborn Circus  
London EC1P 1DQ

But *Viper* has produced large sprites for the workman and 'you' (a sort of foreman figure) in the *Wally* vein, which would be fine except that they have become difficult to move using the most sensitive joystick we have. It proved hard to move them smoothly around the maze of pipes.

Even if you argue that it's just something you have to get used to, it doesn't alter the fact that the big sprites look wrong for the game and I

found it surprisingly off putting.

A contentious one then, not dross but not much fun to play either. You may react differently.

**Program** *Pipeline*

**Price** £6.95

**Micro** Spectrum

**Supplier** Consolidated  
Software  
Marketing  
182/184 Campden  
Hill Road  
London W8 7AS



## This Week

Program	Type	Micro	Price	Supplier	Rhythm + Pitch	Ed	Commodore 64	£9.99	Chalksoft
Smuggler's Cave	Ad	Amstrad	£5.95	CRL	QL Bank Account	Ut	QL	£19.95	Cenprime
Danger Mouse Db, Trb	Arc	Amstrad	£7.95	Creative Sparks	A View To A Kill	Arc	Spectrum	£10.99	Domark
Timebomb	Arc	Amstrad	£6.50	Black Knight	Ancient Quests	Arc	Spectrum	£7.95	Mirrorsoft
Bridge	S	Amstrad	£8.95	Kuma	C5 Clive	Arc	Spectrum	£1.99	Scorpio
Handicap Golf	S	Amstrad	£6.95	CRL	Dynamite Dan	Arc	Spectrum	£6.95	Mirrorsoft
Hack Attack	Ut	Amstrad	£5.95	Ash Byproducts	Happy Hour	Arc	Spectrum	£1.99	Scorpio
Mastercalc	Ut	Amstrad	£19.95	Amsoft	Phineas Frog	Arc	Spectrum	£7.95	Mirrorsoft
Mr Frosty + Penguins	Arc	Commodore	£1.99	Scorpio	Pipeline	Arc	Spectrum	£6.95	Viper
A View To A Kill	Arc	Commodore 64	£10.99	Domark	Planet Attack	Arc	Spectrum	£1.99	Scorpio
Fiona Rides Out	Arc	Commodore 64	£7.95	Viper	Turntaking	Ed	Spectrum	£5.95	Learning Proces
Jet Set Willy II	Arc	Commodore 64	£7.95	Soft. Projects	<b>Key:</b> Ad – adventure. S – strategy-simulation Arc – arcade. Ut – Utility Ed – education.				
Way Exploding Fist	Arc	Commodore 64	£9.95	Melbourne House					



## SNEAKY

*Jet Set Willy II* is not alas, the legendary Willy and the taxman but is the deluxe souped-up version of the original *Jet Set Willy*. Souped



rooms means finding a spaceship and activating it – a neat way of fitting in the rooms without upsetting the layout of Willy's Mansion. There's nothing dramatically new about the game, of course, but the new rooms are, in many cases, inventive and fiendish. The milling hoards of *Jet Set Willy* addicts should be delighted.

**Program** *Jet Set Willy II*  
**Price** £7.95  
**Micro** Commodore 64  
**Supplier** Software Projects  
 Bearbrand Complex  
 Allerton Road  
 Woolton  
 Liverpool L25 7SF

## WAR GAMES

*Battlefields* is a two game package for the BBC B, published by the BBC itself. Both games are wargames – one is the Battle of Waterloo, the other the American Civil War.

The screen display on both games is rather uninspiring, but no doubt this is due to the limitations on the good old Beeb.

*Waterloo* has a dark blue background with a few trees and little huts scattered around, representing forests and towns.

The players take it in turns, first the Allies, then the French. Each side has ten units, with a mixture of cavalry, infantry and artillery. Cavalry units can move two squares, infantry units one.

More care should have been taken with the program; it refuses to recognise lower

case input for the movement orders.

On the plus side, this is one of the few two player games I have seen that makes any use of the computer to generate a realistic feel.

Enemy forces are not shown unless one of your units is next to them, in which case you get a sighting report.

*Civil War*, although it covers a far larger area, is very similar. Again each side has ten units, but each unit can move up to eight squares.

The objective is to score points by occupying enemy territory – each square conquered scores one point.

I can't help feeling that both games are rather too simplistic, both in terms of presentation and actual play.

The usual drawbacks to two player computer wargames are to some extent ameliorated, but I would have preferred a computer opponent.

**Program** *Battlefields*  
**Price** £9.95  
**Micro** BBC B  
**Supplier** BBC  
 35 Marylebone  
 High Street  
 London W1M 4AA

## REVISION

Sphere, the book publisher, has just issued a range of educational titles for O level students. They are easy to summarise and simple in scope – each one consists of dozens of revision questions on each subject presented in the form of a multiple choice exam.

That's it really, the programs have no other function

beyond helping O level student test themselves – if you get something wrong the right answer is given but no explanation is offered. Although questions are divided up into subject areas revision can be confined to particular – you can take a general test on all subjects if you wish.

So, if revision aids are what you need, then at present the range covers Biology, Mathematics, Physics and Chemistry. It won't actually teach you anything, though.



**Program** *Biology*  
**Price** £5.95  
**Micro** Spectrum  
**Supplier** Sphere  
 30-32 Gray's Inn  
 Road  
 London WC1X 8JL

Compiled by Graham Taylor

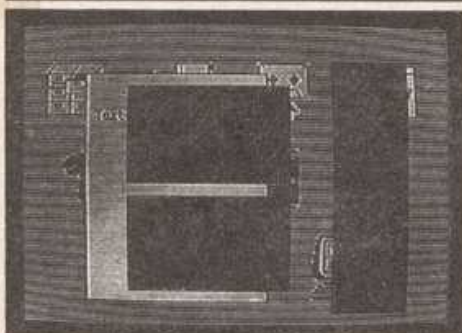
New Releases is designed to let people know what software is coming on the market. If you have a new game or utility which you are about to release send a copy and accompanying details to: New Releases, Popular Computing Weekly, 12-13 Little Newport Street, London WC2R 3LD.

## This Week

**Amsoft**, Brentwood House, 169 Kings Road, Brentwood, Essex. 0277 230222. **Ash Byproducts**, 183 Bristol Road, Edgbaston, Birmingham B5 7UB. **Black Knight**, 60 Slades Drive, Chislehurst, Kent BR7 6JX. 01-467 7451. **CRL** CRL House, 9 Kings Yard, Carpenter's Road, London E15 2HD. 01-533 2918. **Cenprime**, 933 Foleshill Road, Coventry CV6 5HN. 0203 686162. **Chalksoft**, 37 Willowsea Road, Worcester WR3 7QP. 0905 55192. **Creative Sparks**, Thompson House, 296 Farnborough Rd, Farnborough, Hants. 0252 543333. **Domark**, 204 Worple Road, London SW20 8PN. 01-947 5624. **Kuma**, Kuma Computers, 12 Horseshoe Park,

Pangbourne RB8 7JW. 07357 4335. **Learning Process**, 38 Homedale House, 3 Brunswick Road, Sutton SM1 4DG. **Melbourne House**, 39 Milton Trading Estate, Abingdon, Oxon OX14 4TD. 0235 835001. **Mirrorsoft**, Mirror Group, Holborn Circus, London EC1P 1DQ. 01-353 0246. **Scorpio**, 307-313 Corn Exchange Building, Cathedral Street, Manchester 4. 061 834 2292. **Soft Projects**, Bear Brand Complex, Allerton Road, Woolton, Liverpool L25 7SF. 051 428 7990. **Viper**, Eardley House, 182/184 Campden Hill Road, London W8 7AS. 01-221 3592.





## Written word

Every so often good ideas do emerge from the collective endeavours of those in the computing field. And more often than not they appear briefly, and then sink without trace.

Take icons for example. An increasingly strong band of manufacturers now believe that icons with either mice or touch screens are the way for the future.

I'm not so sure. The idea behind icon thinking is to develop a system to use a computer with a kind of prompting with pictures. Yes, it is true that it is simpler to indicate a disc icon with a mouse pointer than to type 'Save B:filename', but even so, in ordinary use still the main body of work with the computer involves typing in alpha-numeric information using a keyboard.

Most information given to the computer must still be in a written format and is stored in that form. This is inefficient. The less adept the typist is, the slower the information is entered into the machine. How can the author be freed from the tyranny of the keyboard? Icons certainly don't go far enough.

Instead of using symbols to represent the words, the user could actually use the words themselves - ie, dictate to the computer.

It is, perhaps surprisingly, the telecommunication companies which are at the moment concentrating on developing speech recognition/generation systems. The computer companies do seem to see the possibilities in doing away with the keyboard altogether, and are investing their money in the idea of icons *et al*. Even so, within another ten years we should have an adequate speech interpreter. NEC's general manager has claimed "We're 10 or 20 years off a speaker-independ-

dent, large vocabulary, connected speech recognition system."

Speech generation - the other side of the communication gap - is now so far advanced that even home micros costing under £100 can be fitted with £30 speech generators.

So, by the turn of the century or before, all computers could well be dealing with the outside world using the spoken word. Everything - from international businesses' mainframes to the local village shop's stock-taking micro - will be able to speak to their user and listen to the reply. The system would be cheap enough to be implemented even on home micros.

One immediate effect will be in publishing. The cost of publishing a book will be measured by how much memory it takes up - and given the way prices are falling at the moment, coupled with the enormous market for memory chips once 'home publishing' becomes feasible, even specialist books should not cost over £5.

With artificial intelligence, then the computers would no longer merely be able to respond to our orders, they would be able to explain difficult passages. Further, there would no longer be any language barriers. Already the EEC is using a system called Syrstran - for analysing and translating written language.

Next year a much more powerful machine, Eurotra, is to be brought into service, which will deal with all the 42 different European languages and their variations.

Suddenly, the keyboard will no longer be needed to communicate with computers, all one need do is speak to them. As soon as this happens, popular books will speedily be put on the systems. If the language analysis programs pattern recognition systems are sophisticated enough it will merely be a matter of letting a computer scan each page of a book - possibly a ten minute operation - and at the same time the computer will be able to assimilate any pictures or graphics for it to display on screen.

Fifty years from now written language could have all but disappeared. The most permanent form documents would take would be as digital codes stored in the computer's memory.

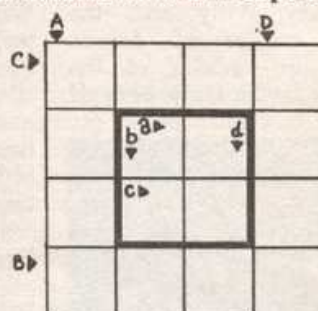
Who will need to read or write then?

Andrew Mulholland

## Number puzzle

### Puzzle No 162

Here is an unusual crossnumber puzzle:



In the grid, a, b, c and d are four two-digit numbers which interlock in the centre four squares (a and c are numbers across, and b and d are numbers down).

The squares of these numbers are represented by the capitals A, B, C, and D which fit in the perimeter squares. Can you find their values?

### Solution to Puzzle 157

The only way of reaching the maximum score without being eliminated is if the first dart lands on the '13'.

```
10 DATA 20,5,12,9,14,11,8,15,7,19,3,17,2,15,10,
5,13,4,18,1,20,5,12,9,14,11,8,15,7,19,3,17,2,15,
10,6,13,4,18,1
20 FOR START=1 TO 20
30 RESTORE
40 READ Q:IF Q<>START THEN GOTO 40
50 LET T=START
60 FOR N=1 TO 19
70 READ R
80 LET T=T+R
90 IF T/START=INT(T/START) THEN GOTO 120
100 NEXT N
110 PRINT START
120 NEXT START
```

In the program the scores for each of the segments of the segments of the board (taken in an anti-clockwise direction) are stored in the Data statement. These are repeated to allow a full run of 20 scores from any start position. The program tests each start score in turn and sums up the totals for each by reading from the Data line.

### Winner of Puzzle No 157

The winner is M. W. Peters, of Spetisbury, nr Blandford, Dorset, who receives £10.

### Rules

The closing date of Puzzle No 162 is July 10.

## The Hackers





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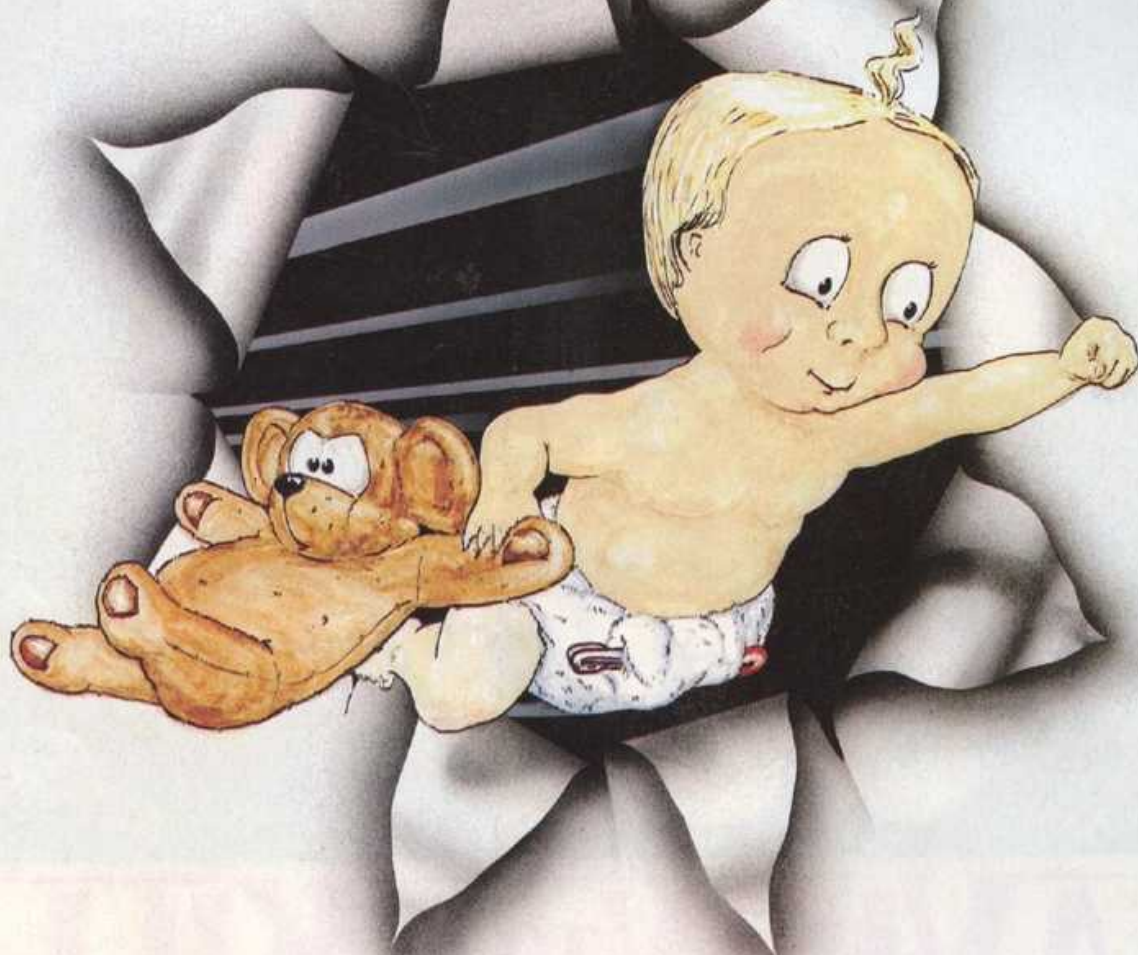


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