POPULAR
# Computing
WEEKLY

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Vol 3 No 45

# CBM Mac rival

COMMODORE will now go ahead with its plans to launch a rival for Apple's Macintosh in mid-1985, despite a continuing legal battle with Atari over the ownership of the technology involved.

The Commodore machine is based on the Lorraine — a 256K, 32-bit 68000-based micro — developed by Amiga, a US company which Commodore has been in the process of acquiring for some months. Commodore's purchase of Amiga was completed last week.

The future of the new Commodore machine had been in some doubt since Atari sued Amiga earlier in the year in a dispute over chips — used in the Lorraine — developed by Amiga for Atari. Atari claimed that Amiga did not complete the contract and then offered the chips for sale to third parties.

Now there is confusion over how the sale of Amiga to Commodore will affect the law suit. Steven Greenberg of

continued on page 5▶

# Advance — IBM takes action

COMPUTER giant IBM has taken action regarding the Advance 86a and B IBM-compatible micros.

Discussion between Ferranti, manufacturers of the Advance machines, and IBM have been going on for some time, regarding the Rom chips used in the Advance.

IBM claimed that the Advance Rom is a 90% direct copy of the Rom developed by IBM for its PC range. Now an agreement has been reached between the companies involved. A spokeswoman for IBM said, "IBM has concluded that a program in the Advance's Rom is an unauthorised copy of the basic input/output system on the IBM PC. Having been informed of the infringement, Ferranti, Advance and W H Smith the distributors, have all agreed to cease infringements." It now seems likely Advance will alter the 86 micros' Rom chip.

At £1500, the Advance 86b undercuts the basic IBM-PC by nearly £1000, while the 86a sells for just £399. The Advance's 8086 processor runs up to 40% faster than the PC's 8088 chip.

# Atari plans up-market 800 XL micro

ATARI is to launch a new 128K version of its 800XL computer, as well as new 16- and 32-bit micros, in its renewed assault on the micro market.

"The 800XL, now selling at £169, will be the figurehead of the 8-bit range, and we will also be producing a 128K machine in this series," confirmed Simon Westbrook, Atari Corporation (UK)'s managing director.

**Simon Westbrook**

"Then we will be introducing 16-bit and 32-bit machines, as talked about by Sam Tramiel earlier this year, which will involve much superior technology. Software for these will be both for business and domestic purposes." These up-market machines are expected to be 68000 processor based.

Atari is planning to offer a range of hard disc units with the more sophisticated machines, up to an IBM-compatible level. The company will also continue to support the lower, end of the market.

INSIDE ⟩ Exclusive — win a Sinclair ZX Spectrum + ⟩

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Vol 3 No 45

# View

Last week one amateur Commodore 64 'hacker' succeeded where our government has so far failed. He lifted the exchange rate to $50 to the pound.

Actually what he did was to use his modem to break into the *Financial Times*' reserved pages on the Prestel database and change the information displayed on the system as a joke. He also, while he was at it, gained access to the private mail Prestel area used by Prince Philip.

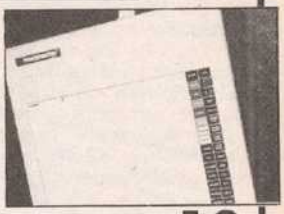
break in — apparently without too much difficulty — is considerably embarrassing for Prestel (and just when Prestel bashing seemed to be going out of style, too), especially as Prestel has recently embarked on a campaign to persuade big companies to take system space on which to store their own confidential business information.

Under this government's controversial Data Protection Act it is the responsibility of each database to ensure that its confidential information on individuals is kept as secure as possible. Anyone whose personal details are wrongfully disclosed can go to court to claim damages against the data provider. Taking action against the 'hacker is not easy, however, under present law.

It must only be a question of time now before here are professional hackers — experts who, for a fee, undertake to pick open data files as directed and pull out financial data, police records or people's credit ratings and political allegiances.

There should be big fines imposed for such 'professional' hacking. And databases carrying private information on individuals should evolve systems to detect if an unauthorised access to the system has been made.

# Presents...



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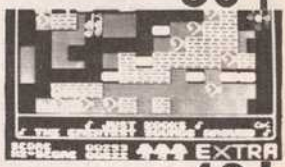


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Data filing program for the Amstrad ... on-screen printing without control characters on the 64

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**Computer Trade Association Magazine of the Year**

Here John did you know

# Pyjamarama

is better than Jet Set Willy?

## Who says so?

**Computer and Video Games**

It would be unfair to compare this game with Jet Set Willy but as people will inevitably do this, I'd like to say I think it is better. Here at C&VG we liked it so much **that we are sticking it in our Hall of Fame.**

**Crash**

Pyjamarama has some of the best animation and realistic graphics I have ever seen. Pyjamarama is unbeatable.

**Personal Computer News**

Pyjamarama has what is probably the most stunning graphics you are likely to see on a Spectrum. Pyjamarama is probably one of the best ever games released for the Spectrum.

**Personal Computer Games**

Game of the Month
It's not just the graphics, although these are outstanding. **The real point about Pyjamarama is that it's the first Arcade Adventure which is a real adventure.** Coupled with the games superb graphics and easy playability means that most people will fall in love with it straight away.

**So now you know don't ya**

Spectrum 48K
Commodore 64K
Amstrad CPC464

Signed *Wally Week*

## Mac rival

continued from page 1

Commodore US commented last week: "All the Atari lawsuit has done is prevent Amiga from licensing its chip technology to any third party — in its sale to Commodore it is not doing that, and the suit makes no difference.

"We will certainly be releasing a machine based on Amiga's micro under the Commodore name. A date has not been announced yet, but it will probably be some time in the second quarter of 1985."

Until Commodore's purchase of Amiga, Atari was hoping that its lawsuit would prevent Commodore from releasing the machine.

## Rocky Horror Picture Show game from CRL

CRL, the company which has recently released games based on *War of the Worlds*, *Terrahawks* and *The Magic Roundabout*, is negotiating for a deal to base a computer game on *The Rocky Horror Show*.

"We still have to finalise the deal, but everything is going very smoothly," said CRL's managing director Clement Chambers. "We'll be basing the game around the strange environments in the stage show, with the emphasis on graphical presentation, rather than on the elements of dubious taste in the show itself.

Clement Chambers

"I'm hoping the game will be out in the middle of next year. We'll definitely be doing Commodore and Spectrum versions, and as many others machines as we can manage."

More news on page 8

# Sinclair portable

SINCLAIR is developing a new portable computer, based on the Spectrum technology.

The machine, which could be available by mid-1985, will be fully software compatable with the existing Spectrum and Spectrum+.

Unlike other portable machines, however, the Spectrum Portable will be battery operated, requiring no external power supply.

"This is one of the many projects in the pipeline, although no definite release date has yet been set," said a Sinclair spokesman.

Research into new types of high-performance batteries is now under way at Sinclair's Mealab development facility. The Metalab team worked with Polaroid on the battery for the Sinclair flat-screen tv and is currently working to design the power unit for the Sinclair Electric Vehicle project.

● Among the developments at Sinclair's Metalab is a solid state drive for the QL. This silicon version of the Winchester hard disc drive will run up to 100 times faster than a conventional device.

## Low-cost modem

UNICOM has announced a full-feature modem costing only £60.

For the price, which includes postage and packing, Unicom is offering a modem, complete with leads, power supply and manuals, which connects to any micro with either an RS232 or RS432 interface. It features auto-answer, and auto-baudrate scan facilities, and operates at a variety of baud rates: 300/300, 1200/1200, 1200/75 and 75/1200. The device also allows one- or two-way simultaneous transmission (full and half-duplex).

**Unicom's low cost modem. Details from Unicom, 20 Orange Street, London WC2**

Software is also available, on Rom at £24, and disc at £12 to give access to a number of networks including Prestel, Micronet and Telecom Gold. It also provides an auto-dial and auto-redial facility, and enables the use of a printer to dump data sent and received.

## Tangerine in troubles

TANGERINE, the company which spawned Tansoft and Oric Products International, has hit trouble.

Teknocron Circuits, an Isle of Wight company, has presented a winding-up petition against the company. The petition has caused some surprise, since Tangerine has been largely dormant since Oric and Tansoft became separate entities, and Tandata was bought by Applied Petroleum.

"The petition concerns an argument which has been going on for the last three years," explained Oric managing director Barry Muncaster. "Teknocron made the circuit boards for Tangerine's Tantel Prestel adaptor. The money it says we owe them is around £4000 of outstanding interest.

continued on page 8 ▶

## Acorn micro music add-on

ACORN is to launch a music synthesiser add-on for the BBC B at the COMPEC show, beginning on November 13.

Manufactured by Hybrid Technology, the synthesiser plugs into the BBC and also connects with a hi-fi system. The user can write and program music on the micro, using a specially developed language, which can then be played back through the hi-fi speakers. The synthesiser can also be interfaced with a music keyboard.

Acorn is aiming the synthesiser at the professional market, and it is expected to sell for just under £200.

Other new Acorn products for the BBC set for launch at COMPEC include the languages *Logo* and *Pascal* — *Logo* on Rom at £69 and *Pascal* on both disc (6502 second processor needed) and Rom. A Winchester hard disc and the long-awaited 32016 second processor option for the BBC will also be announced.

For the Electron, the Plus 3 disc interface will be making its first appearance.

## Prestel to hold inquiry

PRESTEL is conducting a top-level investigation into its security following a bizarre incident in which hackers broke into subscribers' files.

Personal identity codes of subscribers were printed on screen, much to the hackers' delight. They were then able to tamper with the *Financial Times* Stock Exchange news, so that at one point, the pound was displayed as being worth $50 and break into the files of stockbrokers Hoare and Govett. They also perused the personal mail of Prince Philip — the Duke of Edinburgh is a Prestel subscriber.

"We are treating this very seriously indeed," said a British Telecom spokesman. "I can confirm that there was a severe lapse in Prestel security for a short while. Our immediate action was to change all the identity codes of our information providers, but we are carrying out a full investigation as to how it happened."

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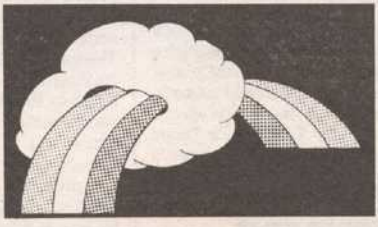

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## Visions of the future

VISIONS Software has shed its marketing operations and is to concentrate solely on program development.

Marketing manager Mike Cowell has left the company and joined CSM (Consolidated Software Marketing) as sales and marketing director. CSM has now gained exclusive marketing rights to all Visions products.

"The amount of money Visions needed to market its own games was way beyond its means," explained Mike Cowell. "Future releases written by Visions may or may not carry the Visions name — that has not yet been decided."

Of those future releases, the next titles to be launched will be four games for the BBC B — *Apple Pie*, *Sim*, *Ultron* and one as yet untitled *Q-Bert* style game. These should be available within a month at between £6 and £8.

## ACT — company of the year

ACT, manufacturers of the Apricot range of business computers, has received the Business Enterprise Award as Company of the Year.

The Business Enterprise Award is sponsored principally by the Institute of Directors, and also by Barclays Bank, Lloyds Bank, the Sunday Telegraph and Henley — the Management College.

## Tangerine

◀ continued from page 5

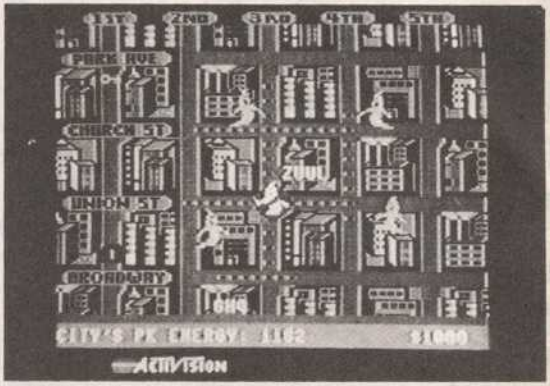
"The action won't mean Tangerine will cease to exist — because it'll pay the money."

● Oric's legal action against its distributors Prism is also due to be heard in court this week (see *Popular Computing Weekly*, October 4). Oric is suing Prism for £4m made up of several smaller claims but has applied for summary judgment on claims totalling £320,000.

"We applied for summary judgment because the £320,000 claim is rock solid and beyond dispute. It concerns product that was taken and not paid for, and product which was not taken," Barry said.

# Game of the film

*GHOSTBUSTERS — The Computer Game* is due out later this month, some three weeks before the film on which it is based goes on general release.




Produced for Activision by *Pitfall* author David Crane, the game plot follows the film fairly closely. The player takes the part of a "ghostbuster", striving to save New York from an invasion of ghosts and evil spirits. The aim is to find, capture and safely store the ghosts out of harm's way. Also making an appearance is the huge marshmallow man, a feature of the movie.

Ghostbusters will be released initially for the Commodore 64 on disc (£19.99) and cassette (£10.99) and for the Spectrum (£9.99). BBC and MSX versions will follow.

# Exclusive competition

## Win a ZX Spectrum +

*Popular Computing Weekly*, in association with Sinclair, offers the chance to win a Spectrum + — Sinclair's new Spectrum software compatible micro — worth £179.95 — complete with its six bundled software packs including *Tasword 2*, *Scrabble*, *Vu-3D*, *Make-a-Chip*, *Chess* and *Chequered Flag*.

All you have to do is look closely at Sinclair's current TV advert for the Spectrum + — being shown on Channel 4 and ITV until December — and name the eight Sinclair software programs which are shown on the screens during the advert.

If you think you know what the eight titles are, fill in the coupon below together with your name and address and send it off to us at: Sinclair Competition, Popular Computing Weekly, 12-13 Little Newport Street, London WC2R 3LD.

Just in case more than one of you get the eight answers correct there is a tie-break. Read the idea for a new Sinclair game and think up a good title for it: *'You are invited to an isolated mansion as a potential heir to a vast fortune. To claim the fortune for yourself you must find and piece together the fragments of a portrait distributed around the cobweb festooned house'.*

The best game title, with the correct eight titles from the TV ad will win the prize.

**The judges decision will be final. Entries must reach us by midday on Friday, December 7.**

**Name** .....

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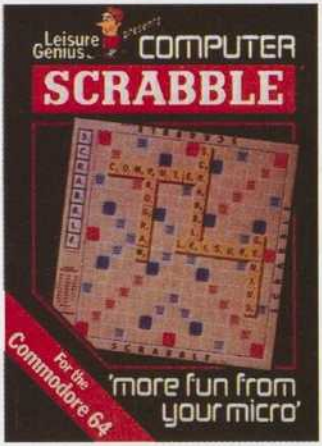
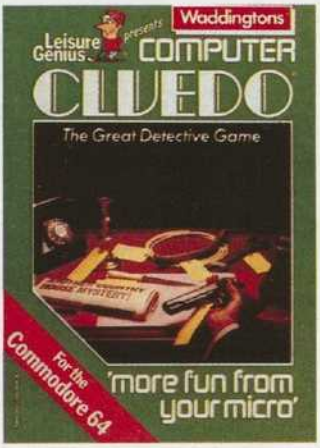
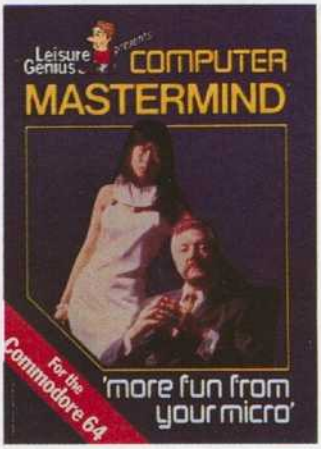
| | | | |
|---|---|---|---|
| 1 THE HOBBIT | 2 MATCHPOINT | 3 | 4 |
| 5 | 6 | 7 | 8 |

**My title for the 'heir to the fortune' game is** .....

# Ingenious...



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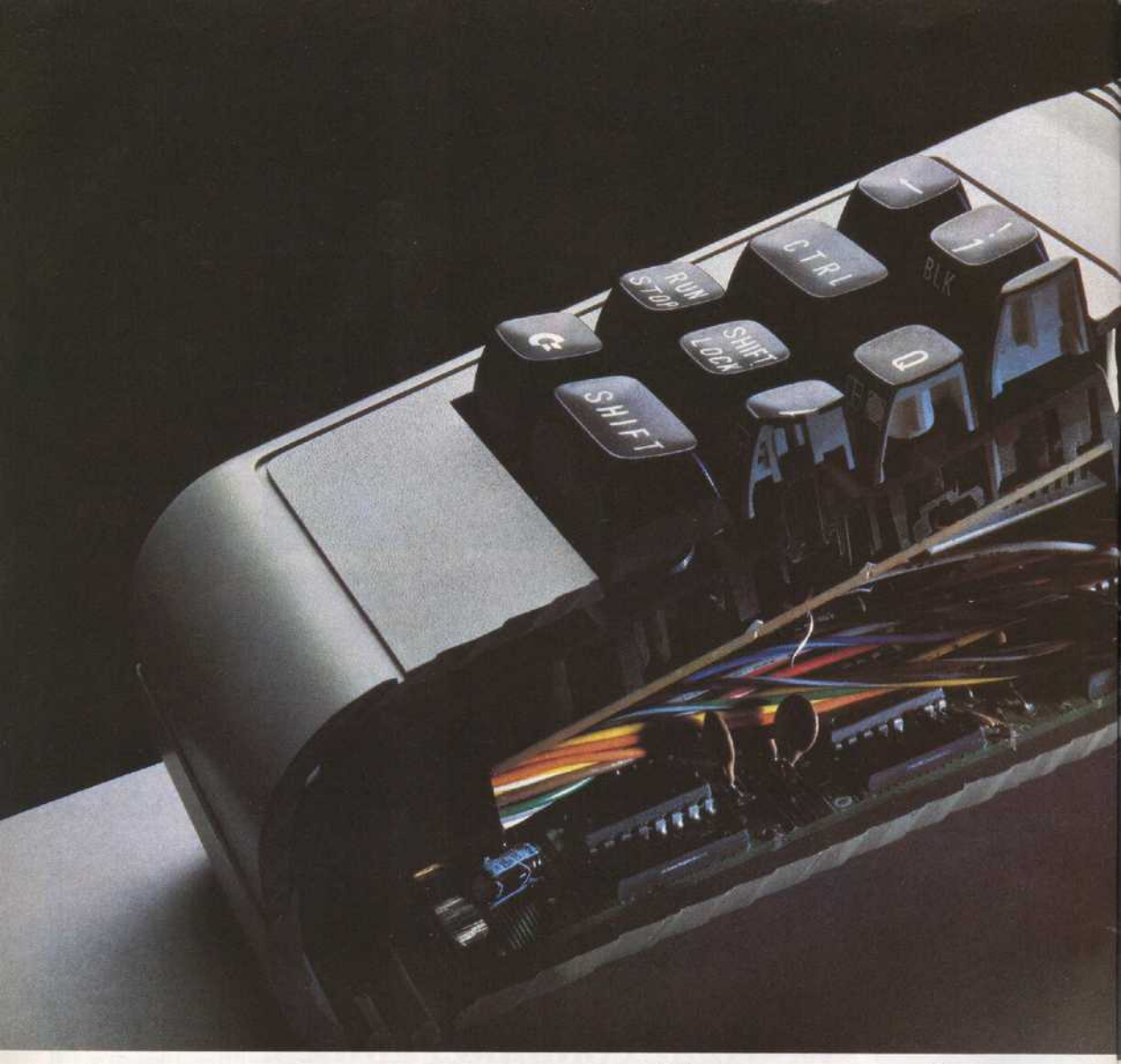



# Are you only using

To only play games on a Commodore computer is like asking Albert Einstein to work out the square root of four.

The computer's brain barely ticks over.

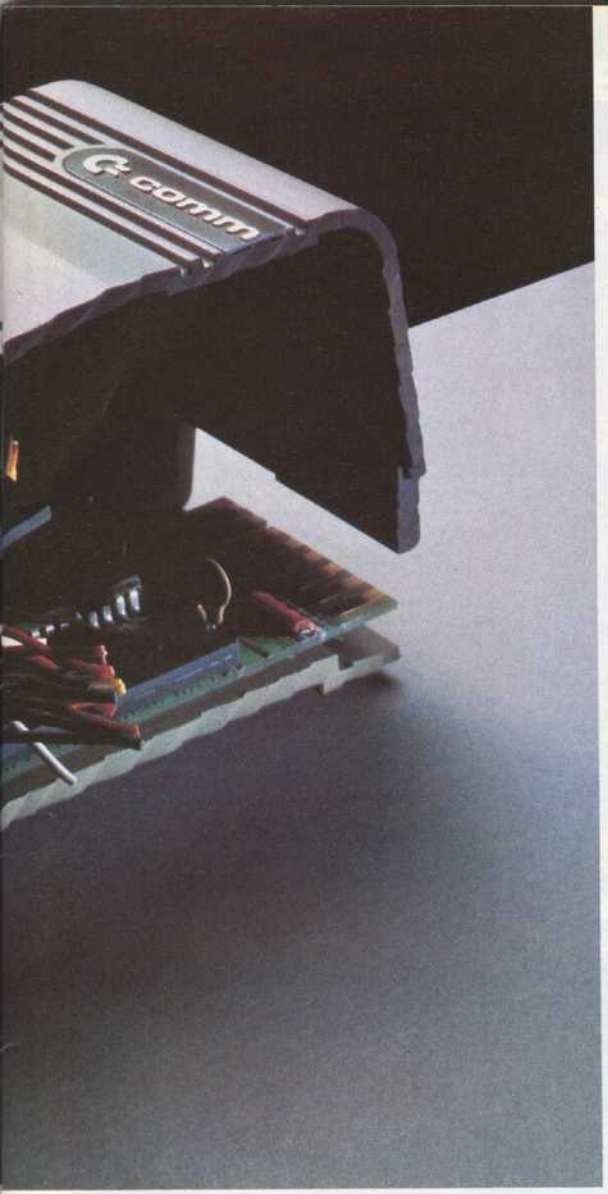
To really stretch it, you need more interesting software programs. For example, record keeping, interactive education, stimulating adventure games or word processing.

And for those you need peripherals.

Like a Commodore disk drive, a really fast storage and retrieval system with a vast memory.

Or a Commodore cassette unit, the inexpensive way of loading and storing programs.

For those who like the idea of text and graphics being more alive and having greater clarity than on a TV, there's the Commodore colour monitor.



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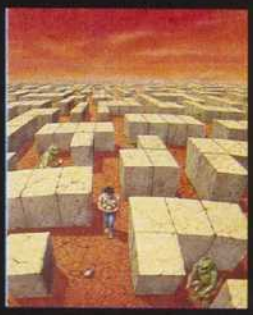
Written by Simon Pick. Denis, fast becoming the best motorcycle stuntman around now faces his most difficult task:- a hazardous ride attempting to avoid numerous obstacles and thus achieve invincibility.



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£6.95 — GALAXY RAIDERS
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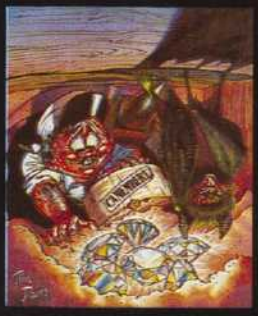
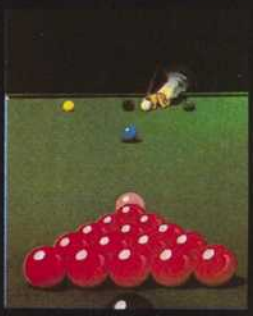
Galaxy Raiders has the feel of an adventure with the nail biting excitement of a Galactic mission. You must think to stay alive.



£9.95 — HENRI ATARI
400/800/1200 with any 16/32K Ram VA 01-16

Written by Adam Billyard. Henri is tunnelling for diamonds, but in his quest for wealth he must fend off killer bats and falling anvils by throwing his deadly camembert cheese.



£8.95 — SNOOKER
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# Letters

## No such animal

Your correspondent John Mawhood (*Letters*, October 25 issue) has indeed spotted a documentation bug: although I'd like to point out there is no such animal as 'The Amstrad'.

Dec$ is not mentioned in the main user guide, and should have been omitted from the technical manual for the Basic, and will be in future editions.

As for the comment: "...ought to be publicised because Amsoft have not officially acknowledged it..." What do you want, low-flying aircraft towing banners?

Late delivery of *Amsword* is a considerable nuisance — but exemplifies several cases where software houses anticipated "just transferring" programs from lesser hardware to the CPC464, but ended up by producing a labour of love inspired to far greater things than originally intended by the power of the hardware and OS.

Mr Mawhood will be receiving a beta copy of *Amsword* today, and he may then appreciate why it isn't a simple clone of the Spectrum product. It is a wolf in sheep's clothing, sir — unlike other products which prompt thoughts of mutton dressed as lamb...

And as for having the Spectrum + dangled in front of us — well, really. And the funny thing is that my spies tell me that many programs using the cursor keys on the original Spectrum seem to be exhibiting some trouble coping with the Plus — even though the Rom is reputedly identical. Nice one!

*William Poel*
*Amsoft*
*Brentwood House*
*169 Kings Road*
*Brentwood*
*Essex*

## Delete alternative

Here's a quick Amstrad CPC464 bug. If you type in 10 *Rem* and then hit *Tab* you end up with the line: 10 *Rem* →.

If this is run you get error messages 'syntax error in 32511' and 'line does not exist in 32511'.

However, things get curiouser. Enter Line 10 → and you get a message 'Line 10 does not exist', so it appears the arrow is ignored.

Now try a small program of ten *Rem* statements. If the first one contains an arrow it deletes all subsequent lines if it is *Run*. *Goto* has no effect.

This then becomes an effective alternative to *Delete*. If you wish to delete the whole program after, say, Line 10000 you can achieve this with 9995 *Rem* →, followed by *Run* 9995. Interesting, eh!

*D R Halliwell*
*4 Heatherdale Close*
*Oxton*
*Birkenhead*

## Right-hook comparison

Perhaps someone can enlighten me? How is it that some writers and reviewers say that the MSX standard is the best thing that ever happened to the Z80, while others claim that it is 'substandard' (sub what standard? To the best of my knowledge there ain't been one up to now).

Some of the most vitriolic statements seem to come from the Spectrum diehards, coming out of the blue corner swinging with a right and a left, and following through with a right-hook comparison. Which machine really does fare better?

**Sound** MSX: 3 voices, 8 octaves, programmable using a macro music sub-language. Spectrum: 1 squeak.

**Keyboard** MSX: Full-travel, typewriter style. Spectrum: Squelch sensitive, travel-sick.

**Cursor keys** MSX: Well placed, easy to use cluster. Spectrum: Errmm...Now...which key, oh sorry!

**Editor** MSX: Full-screen, cursor-controlled. Spectrum: Single line, back to those cursed cursor keys.

**Colour attribute problems** MSX: Two colours per eight pixels (horizontal). Spectrum (and C64 for that matter): Two colours per 64 pixels (chunky, man!).

**Joystick ports** MSX: Two D-ports. Spectrum: What joystick port?

**Sprites** MSX: Thirty-two. Spectrum: ...if you buy *White Lightening*...(Commodore 64: Eight, but who can control them?)

**Real-Time Interupts** MSX: Eight. Spectrum: None.

Need I go on? If MSX is sub-standard, what does that make the Spectrum? If MSX is out-of-date because of the Z80 chip it is based on, what is the Spectrum based on, a 32 bit wonder! It is not.

All I'm saying chaps is that the Japanese have made a good job of their standard. Their machines are easy to use, well made, well laid-out, and use a more than passable version of Basic (OK so the Enterprise's Basic is better, but I think that this venerable machine must have been got-at by those nasty Klingons).

And the Japanese companies have done what we should have done two years ago — they got together! We the punters are the winners, or we will be if we take little notice of the misinformation which is circulating in certain periodicals.

*Mr D A Austin*
*15 Stafford Avenue*
*Clayton*
*Newcatle-U-Lyme*
*Staffs ST5 3BN*

**What you have not mentioned in your evaluation of the MSX system is that, whereas the Spectrum is £129 and the Commodore 64 is £199, the majority of the MSX machines cost over £275, and they all have considerably less memory available to Basic than either the Spectrum or C64.**

## Search in vain

Melbourne House say in the booklet which accompanies their excellent adventure game *Sherlock* 'you will find yourself in strange situations'.

They were right. I had been searching in vain for some time for Major Percival Foulkes when, on returning to Baker Street, I found him in a hansom cab in my hall! I have since tried to remove him and the cab from the hall without success.

A small bug, in an otherwise first-class game.

*P Cowley*
*148 Widney Lane*
*Solihull*
*W Midlands*

## More practice

Jeff Naylor's review of the Spectrum+ in the October 25 issue refers to a 'bug' in the new welcome tape. The keyboard tutor program will tell you that you need more practice even when you score 100% if you have spent insufficient time in any section. At least four correct keystrokes are required to get a pass mark.

As you are allowed to leave any section at any time, we decided that 'you need more practice' was an appropriate message for those who leave a section precipitously. Regard it as a bug if you will, but it is a deliberate one.

Incidentally, both the welcome tape and the new manual were designed for a much younger user than the original Spectrum items. Sinclair have thought that most Spectrum users, who are in the eight to 15 age group, may have found the original manual heavy going. After all, Sinclair did not envisage the Spectrum being used primarily for entertainment when it first appeared. It was thought in the beginning that it would be used by small businesses and in education.

Goldstar Software were specifically required to replace the original items with brighter, more easily understood, and friendlier productions, omitting the more esoteric technicalities, and maybe even some of the less esoteric ones.

*Iolo Davidson*
*Goldstar Software*
*1-2 Henrietta Street*
*London WC2*

# DARK STAR

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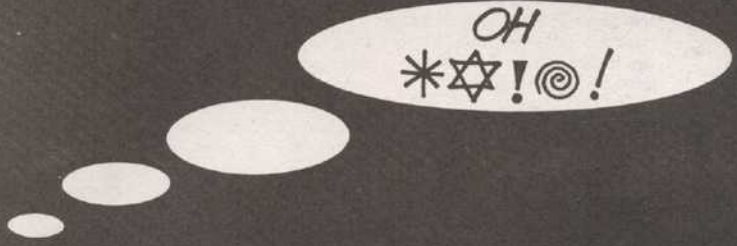


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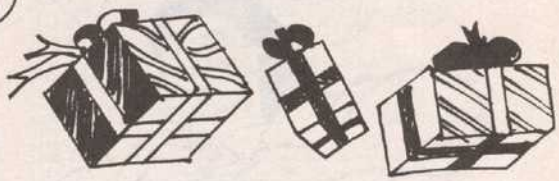

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# Dragon Slayer

**Rid the land of ferocious dragrons armed with only a sturdy bow, in this arcade game by Richard Snowdon for the QL**

Many years ago, when dragons roamed the forests, a typical day's work may have involved ridding the land of herds of ferocious dragons. But this is no easy task, as the dragons are devious, and powerful and will soon defeat you if you lack concentration.

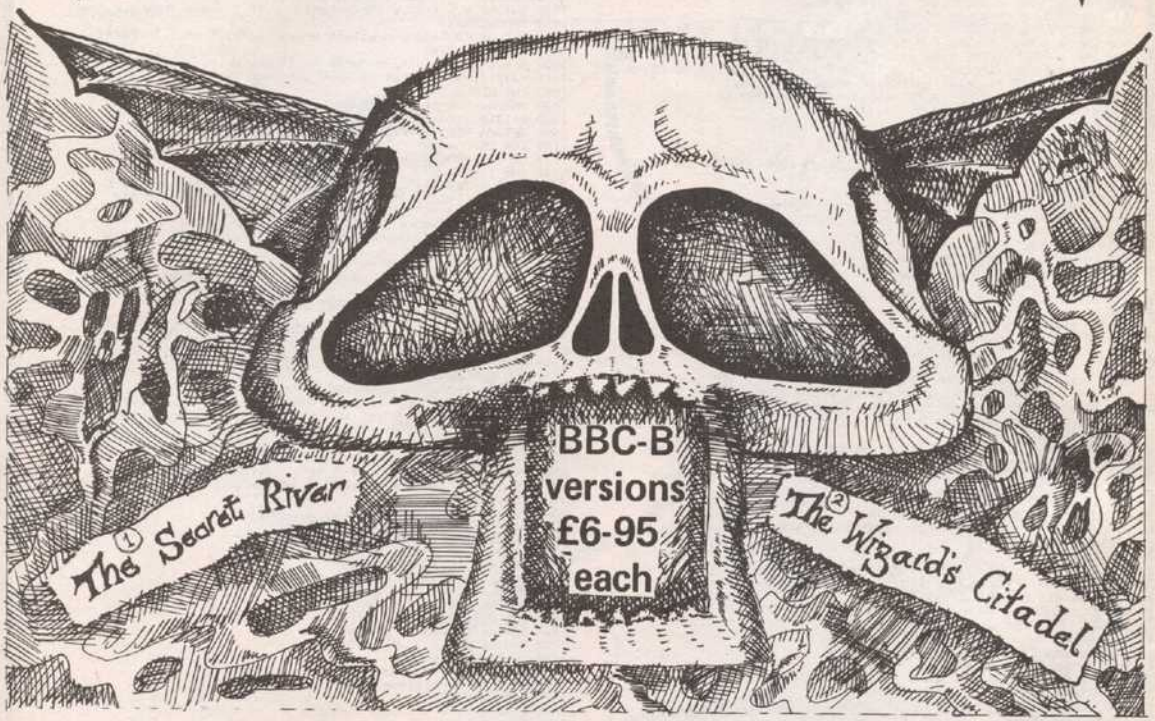
Here, the QL becomes your own personal hunting trainer to tune up your reflexes. A direct hit is required to destroy a dragon, but plan your attacks well, as you have only six arrows. Once this stock is depleted, you must venture across the river and enter the castle to re-stock.

Use the cursor keys to move, and the *ALT* key to fire. To enter the castle, stand just in front of the castle door and step inside when it opens.

```
10 REMark    Dragon Slayer
20 REMark       *SnowSoft*
30 REMark  Richard Snowdon
120   moveset
130   readchars
140   castle 280,166
150   door 280,166.5
160   lake
170   init
180   play
190 STOP
200 DEFine PROCedure castle(x,y)
210 WINDOW #1,465,210,32,2:WINDOW #0,465,46,32,210:BEEP
220 FOR i=0 TO 2:BORDER #i,0,0:SCALE #i,256,0,0:INK
#i,7:PAPER #i,0:CLS #i:OVER #i,0
230 MODE 8
240 LINE x,y:INK 2:FILL 1:LINE_R 50,0 TO 0,40 TO -50,0 TO 0,-40
250 INK 2,3:FILL 1:LINE_R 0,40 TO 10,5 TO 50,0 TO -10,-5
260 INK 2,0:FILL 1:LINE_R TO 10,5 TO 0,-40 TO -10,-5 TO 0,40
270 INK 0:FILL 1:LINE x,y
280 LINE_R 3,10 TO 0,20 TO 3,5 TO 3,-5 TO 0,-20 TO -6,0
290 FILL 1:LINE x+38,y:LINE_R 3,10 TO 0,20
TO 3,5 TO 3,-5 TO 0,-20 TO -6,0
300 INK 3:FILL 1:LINE x,y:LINE_R 0,40 TO 5,10 TO 5,-10 TO -10,0
310 INK 3,0:FILL 1:LINE_R 5,10 TO 10,5 TO 5,-10 TO -10,-5 TO -5,10
320 INK 3:FILL 1:LINE x+38,y:LINE_R 0,40 TO 5,10 TO 5,-10 TO -10,0
330 INK 3,0:FILL 1:LINE_R 5,10 TO 10,5 TO 5,-10 TO -10,-5 TO -5,10
340 FILL 0:OVER -1:CSIZE 3,1:CSIZE #0,0,1:OVER #0,1
350 FOR i=10 TO 0 STEP -2:INK #0,1+6*(i=0):CURSOR #0,
1,(10-i):PRINT #0,"OL Dragon Slayer"
360 OVER #0,0:END DEFine
370 DEFine PROCedure door(x,y,colour)
380 LINE x+25,y:OVER 0:INK colour:FILL 1
390 LINE_R -10,0 TO 0,30 TO 10,5 TO 10,-5 TO 0,-30 TO -10,0:OVER -1
400 END DEFine
410 DEFine PROCedure init
420 x=20:y=150:dirn=33:fx=330:fy=50:lives=4:dras=-1
430 dx=270:dy=80:po=37:fire=0:arr=6:inc=0
440 END DEFine
450 DEFine PROCedure play
460 knight x,y:dra dx,dy,po:arrow
fx,fy:arrowsleft:livesleft:dragleft
470 REPeat loop
480 k1=KEYROW(1)
490 IF k1&2 :IF x>8 THEN knight x,y:x=x-8:dirn=35:knight x,y
500 IF k1&16 :IF x<420 THEN knight x,y:x=x+8:dirn=33:knight x,y
510 IF k1&4 :IF y>8 THEN knight x,y:y=y-8:knight x,y
520 IF k1&128 :IF y<180 THEN knight x,y:y=y+8:knight x,y
530 IF KEYROW(7)&4 :IF arr>0 :IF NOT fire THEN fire=1:
fx=x:fy=y:fp=10*(dirn=33)-10*(dirn=35):in
c=dirn=33:arr=arr-1:arrowsleft:arrow fx,fy:BEEP 0.10,-2,100,-2,100
540 IF fire :IF fx<10 OR fx>420 THEN fire=0:arrow fx,fy:fx=330:fy
=50:BEEP:ELSE arrow fx,fy:fx=fx
+fp:arrow fx,fy
550 IF fx<dx+50 :IF fx>dx :IF fy>dy-10 :IF fy<dy+10 THEN bump
dx,dy,4:dragleft
560 IF arr=0 :IF y<80 :IF x>326 AND x<334 :IF y>40 THEN door
280,166,0
570 IF arr=0 :IF y<72 :IF y>60 :IF x>326 AND x<334 THEN arr=6:
knight x,y:x=20:y=150:door 280,166
,5:knight x,y:arrowsleft:FOR s=255 TO 10 STEP -1:BEEP 16000,s,
-255,500,-255,500
580 r=dot(x,y)
590 IF r THEN bump x,y,1:livesleft
600 IF fire :IF dy>y-10 :IF dy<y+10 THEN dra dx,dy,po:dy=(dy+2)*
(dy<170):dra dx,dy,po
610 IF RND(40)<5 THEN
620 IF fire THEN arrow fx,fy
630 breath dx,dy:dra dx,dy,po
640 IF dx>x THEN po=37:dx=dx-8
650 IF dx<x THEN po=42:dx=dx+8*(dx<366)
660 IF dy>y :IF dy>10 THEN dy=dy-8:IF dot(dx+
(po=42)*40,dy) THEN dy=80
670 IF dy<y THEN dy=dy+8:IF dot(dx+(po=42)*40,dy) THEN dy=130
680 dra dx,dy,po
690 IF fire THEN arrow fx,fy
700 END IF
710 END REPeat loop
720 END DEFine
730 DEFine PROCedure arrow(x,y)
740 INK 3:CURSOR x,y:PRINT CHR$(188+inc)
750 END DEFine
760 DEFine PROCedure arrowsleft:AT #0,0,20:PRINT #0,"Arrows:
";:FOR i=1 TO arr:PRINT #0,CHR$(189)
770 CLS #0,4:END DEFine
780 DEFine PROCedure breath(bx,by)
790 LOCal w,p
800 BEEP 16000,255,-200,20,-200,20,9,0
810 IF po=37 :p=RND(40):p=p*(p<bx):w=bx-p :ELSE p=bx+50:w=RND
(320 TO 440)-p:IF w<p THEN w=440-p
820 IF by>20 :IF by<72 :IF bx<320 :IF po<>37
THEN w=300-p:w=w*(p<290)
830 BLOCK w,40,p,by-10,2,0
840 IF x>p :IF x<p+w :IF y>by-30 :IF y<by+30
THEN bump x,y,2:livesleft
850 BLOCK w,40,p,by-10,2,0
860 IF fire THEN BEEP 0.10,-2,100,-2,100
870 END DEFine
880 DEFine PROCedure dra(x,y,d)
890 INK 4
900 CURSOR x,y:PRINT CHR$(d):CURSOR x+10,y:PRINT CHR$(d+1)
:CURSOR x+20,y:PRINT CHR$(d+2):CURSOR
x+30,y:PRINT CHR$(d+3)
910 END DEFine
920 DEFine PROCedure bump(cx,cy,colour)
930 LOCal p,r,f
940 BEEP 0,2,50,50,50,50,7,7:INK colour
950 LINE cx/440*420,(190-cy)/190*256:FILL 0
960 FOR p=1 TO 2
970 FOR r=1 TO 50 STEP 5:CIRCLE_R 0,0,r
980 FOR r=50 TO 1 STEP -5:CIRCLE_R 0,0,r
990 NEXT p:BEEP
1000 END DEFine
1010 DEFine PROCedure livesleft:lives=lives-1:AT #0,1,16:PRINT #0,
"Lives:";:FOR i=1 TO lives:PRI
NT #0,CHR$(134);:NEXT i:PRINT #0," "
1020 knight x,y:x=20:y=150:knight x,y:IF lives=0 THEN gameover
1030 END DEFine
1040 DEFine PROCedure dragsleft:dras=dras+1:AT #0,1,26:PRINT
#0,"Dragons:";dras;
1050 dra dx,dy,po:dx=270:dy=80:po=37:dra dx,dy,po:fire=0:arrow fx,
fy:fx=330:fy=50:IF dras=10 THEN gameover
1060 END DEFine
1070 DEFine FuNction dot(dx,dy)
1080 p=131072+(dx+32)*.2530612+(dy+2)*128
1090 RETurn PEEK(p)+PEEK(p+1)+PEEK(p+2560)+PEEK(p+2561)
1100 END DEFine
1110 DEFine PROCedure lake
1120 INK 1:FILL 1
1130 LINE 0,150 TO 52,150 TO 43,130 TO 0,130 TO 0,150:FILL 1
1140 LINE 75,145 TO 390,110 TO 390,80 TO 64,125 TO 75,150
1150 END DEFine
1160 DEFine PROCedure screen
1170 OVER -1:CSIZE 0,0:BEEP 0,255,-60,100,-25,100
1180 FOR t=1 TO 2
1190 FOR p=10 TO 0 STEP -1
1200 AT p,p+1:FOR x=p TO 36-p:INK (x MOD 7)+1:PRINT CHR$(41);
1210 FOR y=p TO 19-p:AT y,37-p:INK ((y+3) MOD 6)+1:PRINT CHR$(41)
1220 FOR x=37-p TO p STEP -1:AT 20-p,x:INK
(x MOD 7)+1:PRINT CHR$(41);
1230 FOR y=20-p TO p STEP -1:AT y,p:INK ((y
+3) MOD 6)+1:PRINT CHR$(41)
1240 NEXT p:BEEP 0,0,-200,200,-200,200:NEXT t:BEEP
1250 END DEFine
1260 DEFine PROCedure gameover
1270 AT #0,0,0:CSIZE #0,1,1:CLS #0:BEEP 0,255,-60,-70,-25,100
1280 IF dras=10 THEN PRINT #0,"The Knight won":PAUSE 50:PRINT
#0," this time":ELSE PRINT #0,"Th
e Dragon won";:PAUSE 50:PRINT #0," as per usual"
1290 PAUSE 50:CSIZE #0,3,1
1300 PRINT #0,"Another game (Y/N) ";:i$=INKEY$(8000)
1310 IF i$=="Y" THEN RUN 140:ELSE screen:STOP
1320 END DEFine
1330 DEFine PROCedure moveset
1340 set=167722
1350 oldbase=PEEK_L(set)
1360 newbase=RESPR(375)
1370 FOR m=0 TO 375 STEP 4
1380 POKE_L newbase+m,PEEK_L(oldbase+m)
1390 NEXT m
1400 POKE_L set,newbase
1410 END DEFine
1420 DEFine PROCedure readchars
1430 RESTORE
1440 numberofchars=13
1450 FOR char=1 TO numberofchars
1460 READ c:charbase=newbase+10+(c-32)*9
1470 FOR dat=1 TO 9
1480 READ d:POKE charbase+dat,d
1490 NEXT dat
1500 NEXT char
1510 END DEFine
1520 REMark characters in mode 8 need size 3 when defining.
1530 DATA 33,24,24,16,52,92,20,24,36,72
1540 DATA 34,24,24,16,52,92,52,24,40,68
1550 DATA 35,48,48,16,88,116,80,56,72,36
1560 DATA 36,48,48,16,88,116,88,48,40,68
1570 DATA 37,0,16,96,16,104,4,4,0,0
1580 DATA 38,0,0,4,24,48,64,64,48,12
1590 DATA 39,0,40,84,0,0,0,0,0,124
1600 DATA 40,0,0,68,44,60,56,32,32,64
1610 DATA 41,124,68,84,84,84,84,84,68,124
1620 DATA 42,0,0,68,72,104,120,120,8,4
1630 DATA 43,0,40,84,0,0,0,0,0,124
1640 DATA 44,0,0,112,8,4,4,8,48,64
1650 DATA 45,0,16,12,16,28,96,64,0,0
1660 DEFine PROCedure knight(x,y)
1670 INK 7:CURSOR x,y:PRINT CHR$(dirn+x/8 MOD 2)
1680 END DEFine
```

# RUNEMAGIC

## ADVENTURE SERIES

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# Quest for discs

***Christina Erskine** talks to Paul Bygrave from Quest*

The idea of the Sinclair QL as a small business machine has been given a shot of extra credibility with the recent launch of a wide range of business-style add-ons for the machine from Quest International Computer Technology.

The Quest QL Executive series (Newsdesk, November 1 issue) includes five floppy disk drives ranging in price from £249 to £599 — single 200K, 400K and 800K and dual 400 and 800K models — a 7.5Mb Winchester hard disc drive at £995, four memory expansion boards from 64K to 512K, microdrive and disc versions of CP/M (£49.50 and £79.50), and Tally, a comprehensive accounts package.

Quest's main field of interest, until now, has been in operating systems and Winchester discs for micros in the IBM/Sirius/Apricot range, making their move 'down' to the QL all the more interesting. Very much like Sinclair, Quest operates solely on a research and development basis — all manufacturing is sub-contracted.

Paul Bygrave, Quest's technical director, explained why the QL had caught the company's attention: "Initially we were interested because the QL used the Motorola 68000 processor — we had been aware of the chip's development in the US for some time and its possibilities. The QL's specification made it look like a good machine, and good for items such as Winchesters to run on. We also had the experience to do memory expansions — we felt there was room for an alternative operating system to QDOS, and gradually we progressed to a complete set of packages. Judging from Sinclair's record, we felt the machine would be a volume seller.

"To me, the QL looks like a starter machine with considerable business potential. Perhaps it has been treated with some caution so far because it's not easy to define its market — we're hoping our range will help define one end of it."

Paul joined Quest in March 1984. Previously he and Ralph Warren, now Quest's general manager, headed a company named Raw Computers. Raw was sold to Quest Automation and re-emerged as Quest International Computer Technology, part of the Quest group.

The decision to implement Digital Research's CP/M-68K operating system on QL arose from a feeling that CP/M — apart from its large established software base — was more suited to business applications than QDOS.

Quest is currently working on a few refinements to the Executive series for the near future; one such is a utility to enable data file transfer from QDOS to CP/M: "We want our CP/M system on the QL to be able to co-exist with QDOS — to enable people to go directly from the QL to the type of machine they have in the office," Paul continued. "One sector of the market we do envisage using our system on the QL is people working on business at home. They will be able to take their data on disc from the QL and feed it straight into their office micro."

Other work in progress includes the facility to allow the floppy disc drives to run 3½ inch and 8inch discs — at the moment they run 5¼ inch only. "We chose 5¼ inch to start with because it's the one most people are familiar with — and although we will release a controller board for 8inch, I don't really see it as a heavyweight market."

Quest has been working on the Executive Series since the QL's launch, and have had Sinclair's full support throughout since, as one Sinclair executive put it, Sinclair has neither the time nor inclination to manufacture QL peripherals itself.

"Sinclair provided all the necessary documentation, and notified us immediately when the new SuperBasic versions came out. We also worked closely with Psion on our *Tally* software packages — we wanted the *Tally* accounts programs to integrate fully with Psion's bundled software. As a result, you can take data from *Tally*, load *Easel*, and have your data represented in graphic form without any re-input needed."

Paul is quick to stress that in bringing out a range of floppy disc drives, Quest is not suggesting any inadequacy on the part of the QL's in-built microdrives. "I think the microdrives serve a definite purpose, and the Psion packages are very good indeed, but some people will find they simply need the extra space and speed that conventional discs can offer.

"Obviously we're aware of the arguments against microdrives, and, yes, we did have some problems with them, but with our range, people can build up slowly to the level they want."

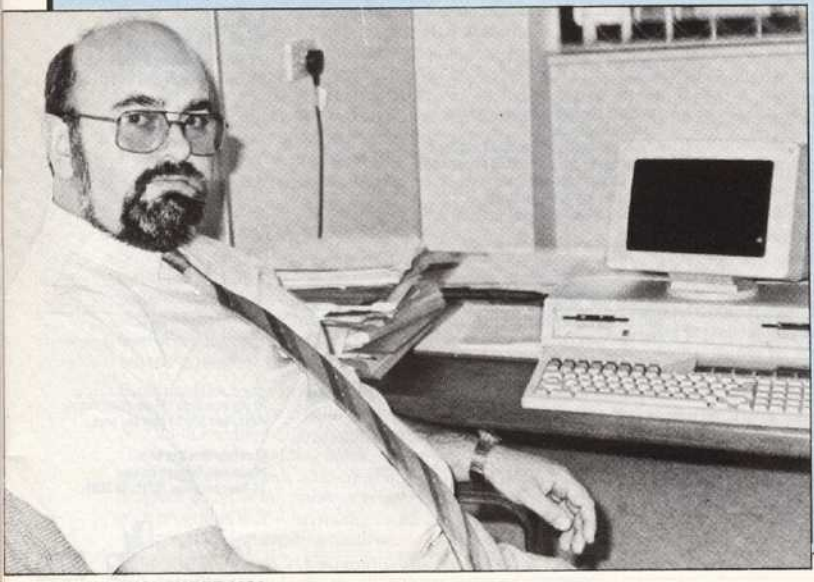
Quest's Executive series will also be made available in its entirety in the US when the QL is launched there early next year. "I can see the QL being very successful in the States — they'll see the machine as very much a home micro, but at a fantastic price — much cheaper than an Apple, for example. I also don't think the Americans will be quite so critical of microdrives, surprisingly enough. I think they'll see them as an exciting novelty — which may not be so good for our floppy discs!"

In the long-term, Quest is looking at possibilities for networking and multi-user multi-tasking on the QL. "We have an option on Digital Research's concurrent disc operating system, which is a system emulating MS-DOS for multi-tasking, but this is really looking quite far into the future.

"It takes a very long time to test the system — the writing doesn't take nearly so long, but I can't see anything happening before the second half of next year."

Meanwhile, Quest is still working on its Firefly Winchester disc range for the 'heavyweight' micros — adding the Apricot F1 to the list of machines to carry Firefly and looking at its possibilities on the IBM AT.

The QL Executive series, however, will form the major focus point of Quest's stand at Compec, the business computer exhibition at Olympia later this month when the series will go on show for the first time to the public.



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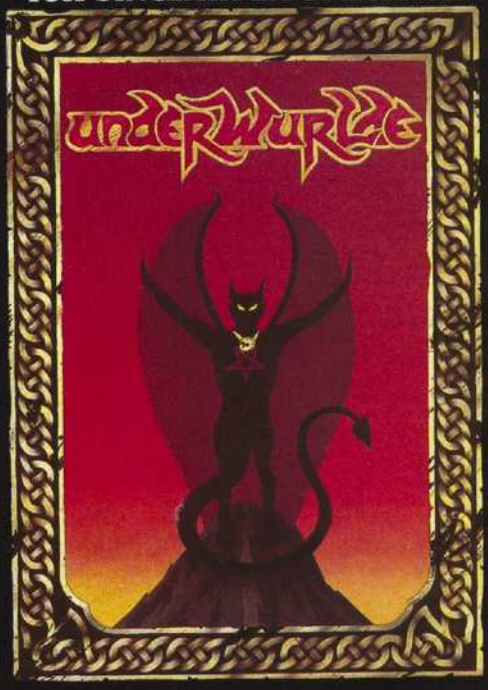


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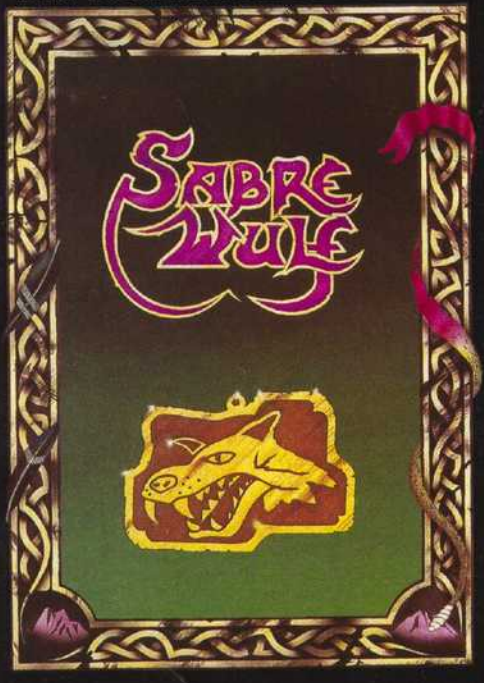


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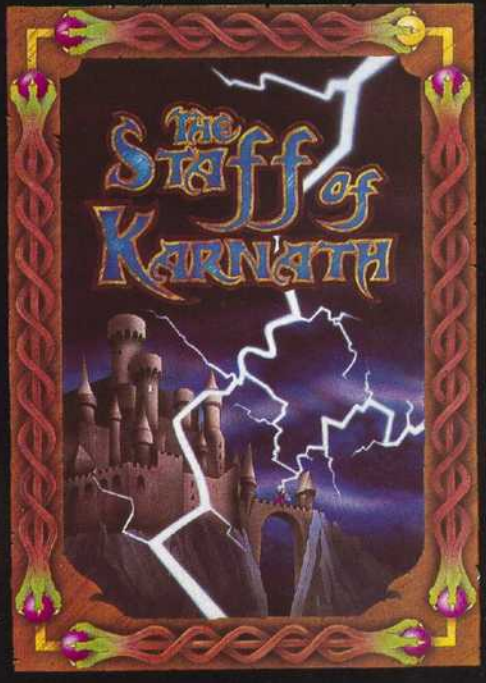


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## Demo mode

**Program** *Kensington* **Price** £12.95 **Micro** Commodore 64 **Supplier** Leisure Genius, 3 Montague Row, London W1H 1AB.

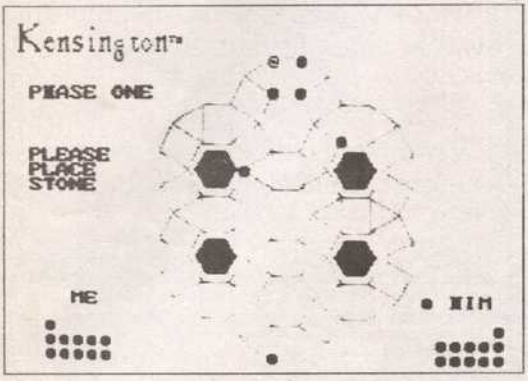
*Kensington* forms part of Leisure Genius's series of micro vesions of well-known board games.

*Kensington* can be used in a number of different modes. The most useful of which enables a solo player to pit his wits against the program, which can play at three skill levels — novice, intermediate and expert. At the expert level, it proves quite a formidable opponent. The program can also be used by two players using the board displayed on the screen in place of a real one — which seems fairly pointless. Alternatively, both players can be played by the computer giving a demo mode.

There are several other options, for example, you can control the speed at which the computer makes its moves, ranging from too fast to follow, to paralysingly slow. You can also watch the program trying out its moves before it selects the best one.

This is a good presentation of an already enjoyable board game, and makes for a handy way for one person to enjoy a game of *Kensington*. The only complaint is that it would have been nice to have been able to use a joystick for control.

**Richard Corfield**




## Overlay

**Program** *Grasp* **Micro** Amstrad CPC 464 **Price** £8.50 **Supplier** Camel Micros, 33a Commercial Road, Weymouth, Dorset.

*Grasp* is a graph dawing package which will produce variations about three main types of graph: bar, line and pie.

Before you can draw a graph, it is necessary to have the correct data. This data is stored in four 100 element files and can easily be edited. If you want to draw a line graph you must enter the *x*-axis data into one file and the *y*-axis data into another. This can be done using the editor, or, if the data is linked by a mathematical formula, simply by entering the equation.

A graph of your data is drawn by pressing a single key depending on the graph format to be used. Other junctions allow graphs to be overlaid on the screen, tests to be added, and display to be dumped to a printer.

To define your own graph format you have to specify the type, colour, size, position, scaling etc. If you require it, auto scaling can be used.

Overall, *Grasp* is a very good program with extensive facilities which are clearly described in the comprehensive manual. With practice, complex graph formats can be described.

**Greg Pearson**

## Key press

**Program** *Zedis* **Micro** Amstrad CPC 464 **Price** £6.95 **Supplier** Pride Utilities, 7 Charlton Heights, Charlton, Luton LU4 9UF.

*Zedis* is a machine code editor and disassembler for the Amstrad CPC 464. It uses the 80 column display, 40 columns being used for the disassembly, the rest showing the options available and your previous commands.

The commands are limited to those that change the start address of the disassembly, insert a character string or hex digits into memory, move a block of memory, or search memory for a specified 16 bit word.

The disassembly is displayed as a series of pages, each consisting of 24 lines forward or 80 bytes back. The disassembly on the screen can be copied to a printer by pressing the *Copy* key. This means printing a lot of code requires an equal finger numbing amount of key pressing.

As the program is written in Basic, it can't be relocated in memory, and use with another Basic routine will require merging of the programs.

If you only require a very simple disassembler/editor then *Zedis* may be sufficient, more than that and it probably won't be good enough.

**Greg Pearson**

## Dumb-bell

**Program** *Boxer* **Price** £9.95 **Micro** BBC B **Supplier** Acornsoft Limited, 4a Market Hill, Cambridge CB2 3NJ.

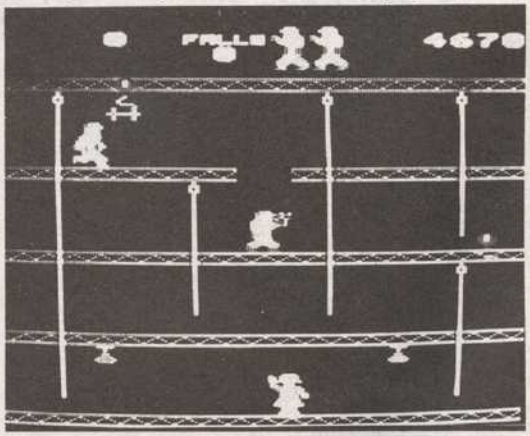
Fast moving action is required to win the heart of the blonde heroine. The scenario is that he-man you and your micro-macho rival are in a gym vying for the attention of a girl by catching the balloons she keeps releasing from the floor. You can catch them only when they lodge in the rafters or beams at various levels. This means you must shin up and down ropes, run to and fro, jump to the balloons — and avoid moving ones as they knock you over.

As if that weren't tough enough, you also have to avoid boxing gloves, hammers and dumb-bells that come flying across the screen — not to mention odd things your rival drops on you.

You can punch hammers and gloves if you are fast enough but have to jump dumb-bells. You get points for balloons caught, items punched or jumped. But your opponent gains points if balloons get past you to the top and he is also steadily scoring points himself!

Action is by keys or joysticks with fast, smooth animation but curiously little sound. By no means the most original or compelling arcade game based on an overworked 'sense' theme.

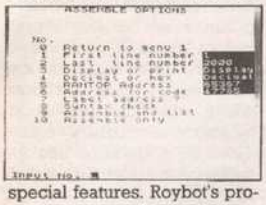
**Dave Watterson**



## Slow trace

**Program** *Assembler and Debugger* **Micro** 48K Spectrum **Price** £9.95 **Supplier** Roybot.

The market for Spectrum Assemblers has become a tough one, and programs have to compete in the areas of testing facilities and




special features. Roybot's program scores well on both these counts, and makes up for a slightly non standard line entry and label procedure.

The instructions are entered as Basic *Rem* lines: not an approach I would prefer, but easy to get used to. Labels are not used as such, instead you refer to the line number of the routine to *Call* or *Jump* to. This rules out using a meaningful name for a label, and is something that many programmers will miss. However, the program is easy to use, and different subroutines can be merged together allowing the build up of a library of different subroutines.

The best part of this program is its test facilities. It allows single step or slow trace, showing all registers, plus various memory locations. Also included is a fast trace and the use of 'Non Stop Calls', a sort of Express Coach of machine code to use with bits of the program you are sure work properly. The program also maintains a history of the last ten instructions to be executed, allowing some insight into how you got in that endless loop! Also provided are breakpoint, direct entry of instructions, and many more, all easy to use.

The only literature provided is the small cassette box insert, but as the program is menu driven this is not an important omission. Roybot's *Assembler* won't be everyone's best buy, but is good enough for most home machine code programmers.

Along with a suitable introductory book, it will give a low cost way in to this more advanced programming language.

**Simon Springett**

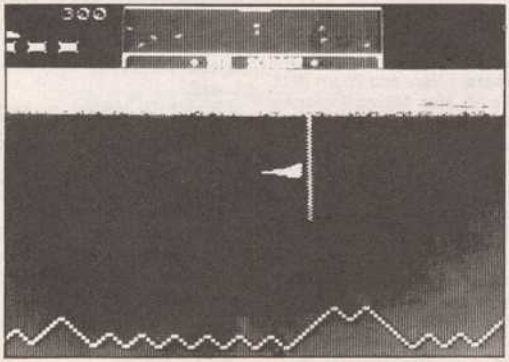
## Frenzied

**Program** *Scuba Attack* **Micro** Spectrum **Price** £6.95 **Supplier** Century Software, Portland House, 12-13 Greek Street, London W1.

It can't be easy thinking of new shoot-'em-ups, but this one contains enough that is novel to make it interesting for those with itchy trigger fingers.

Actually fingers are its major failing — six controls are needed and almost all at the same time. Play can become a tangle of digits.

Meanwhile, on the screen, your submarine defends divers from 'frenzied jellyfish' (frenzied jellyfish — is this for real?). Your laser fires forwards and three sonic bombs can destroy




everything in the area; a long range scan completes your equipment.

This results in a fast-moving game — not highly sophisticated in sound or graphics but both are passable — I particularly liked the wobbling whirl of the aforementioned jellyfish.

One hitch is that fresh attackers sometimes appear too close to the submarine, destroying it instantly — survival calls for quick reactions at the best of times.

While there is still a market for a basic run-and-shoot game this could sell steadily, though at the moment it is overpriced. A twin-fire programmable joystick would improve the play considerably.

**John Minson**

## Big bug

**Program** *Pi'-'in'-ere* **Micro** Spectrum **Price** £6.00 **Supplier** Automata UK, 27 Highland Road, Portsmouth, Hants.

Arcade freaks watch out for this program in the series featuring Burt, the large nosed cult-figure from Automata.

In this game he is inserted into a computer's innards to search out various bugs, and eventually the elusive (well, I didn't find it) Big Bug.

The graphics are very cleverly done — particularly the way the central character turns — and the game uses colour and sound well. The snag is that, even with a joystick (all the usual options are available), the response is far from quick: the little creature takes so long to turn round that the bugs are on him before he can get around to moving away. The game feels impossible at first but you will quickly develop strategies to clear each of the 61 screens — that is if you haven't found anything more interesting to do, like listening to *Today in Parliament*.

You see, the truth is that I found this game boring. The sound track on the cassette flip side is quite fun, but totally unsurprising. And I feel the same about the game — it works very neatly but the ideas have all been used many times before.

**Simon Springett**

## Minimal

**Program** *The Horselord* **Price** £12.95 **Micro** BBC B **Supplier** Century Publishing Co. Ltd., Portland House, 12-13 Greek Street, London W1V 5LE.

Century bring us a combination novel and arcade game package built round Peter Morwood's sword-and-sorcery book *The Horselord*. The novel is not striking but quite fun with all the standard features of young man making good in a world where all seems set against him. The game is designed by Jonathan Griffiths of *Snapper* and *Rocket Raid* fame. I wish it were even as good as the book.

In fact the action is based on a four page section of the 250 page book. The hero, Aldric, takes part in an obstacle

course for horse soldiers. Like a joust it has dummy swords and dyes to indicate strikes rather than blood. The scenario is that as a messenger he must beat the opponents and deliver vital news to the castle. In the book something unexpected happens ... but not in the game.

You see the plan view of a course like the @ symbol. Riding up to an obstacle the screen changes to give you a closer view. It may be a water jump or more often an ambushing enemy to be destroyed. You may swing at opponents with sword or let loose one of the arrows in your stock. It takes five strikes or one arrow to down an enemy swordsman. You play against the clock.

You can use joystick or keys but your actions are limited to turning left or right, accelerating and jump/strike or fire arrow. The movements are fast but jerky, the graphics chunky, the sound minimal.

In short it is boring and a poor way to spend £12.95

**Dave Watterson**

## Unnamed

**Program** *Shuttle Shock* **Micro** Spectrum **Price** £2.99 **Supplier** Software Supersavers, Bear Brand Complex, Allerton Road, Woolton, Liverpool.

For this, their bargain priced label, Software Projects have stripped packaging to a basic minimum. Gone too are fancy loading screens and elaborate graphics. Indeed *Shuttle Shock* resembles a primitive *Manic Miner*.

Your character (unnamed — I said this was stripped down) walks left, right or teleports at 45° around a series of platforms. Lifts provide some help but accurately judging the teleport leaps is most important.

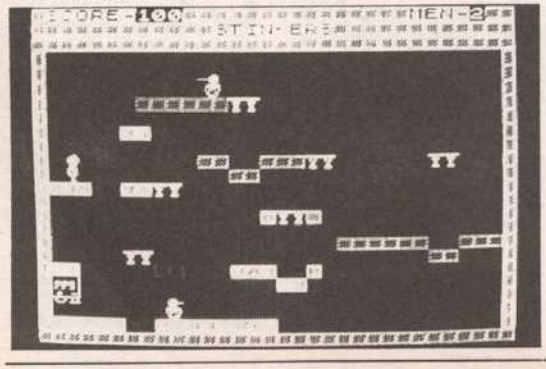
Inevitably, deadly beasties roam the place on set courses, so timing is vital if you're to reach the exit to the next screen. There is also continuous, infuriating music (although it can be turned off) and the traditional humourous screen titles.

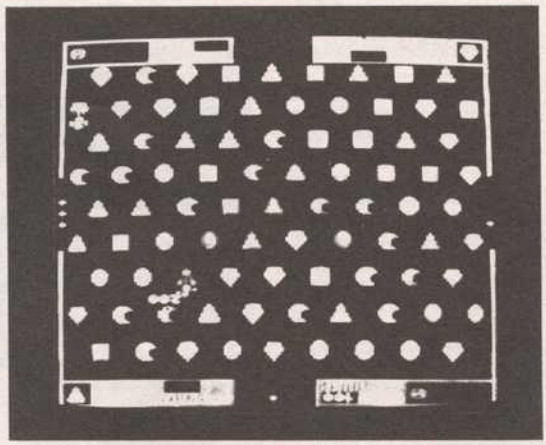
As with all games of this type, the fun lies in seeing what comes next, the addictivity in that you only learn what to do by playing.

However, I did notice one point in Screen Two, which is rather too harsh in taking a life.

The game looks bargain-priced but performs well and is a clever, not too difficult addition to the platform-maze game family that should suit newcomers. Recommended at the price.

**John Minson**





## Mean streak

**Program** *Drogna* **Price** £9.95 **Micro** BBC B **Supplier** Acornsoft Limited, 4a Market Hill, Cambridge CB2 3NJ.

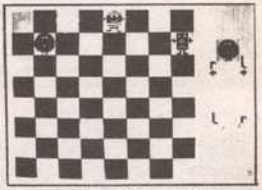
Based on part of TV's 'Adventure Game' *Drogna* offers the fascination of a game where the rules change as you play. What's more it is one of those rare micro games for two people. Strategy, lateral thinking and a mean streak all make a contribution to the winner's skill.

You play on a screen composed of five different shapes each of which may appear in five different colours. You are given a base shape and colour which allows you to move onto any colour in your base shape, or onto any shape in your base colour. Think about it! The fun really starts when you learn that on each turn the base shape and colour may change! This system means a colour TV or monitor is essential.

The purpose of your action is to steal diamonds from two stores and transport them to your lair. But your larcenous opponent may steal your gems — even the topmost one in your lair ... and you can do the same to him or her. Strategy is involved in planning your routes, deciding where to park the loot temporarily if you can't move where you want, and in attacking your opponent so as to make them dissolve into the walls and re-materialise at their lair. The first to win 900 points worth of diamonds wins.

Play is by keys or joystick and as fast as you expect from Acornsoft, though the sound effects are limited. As a game it rates far below *Elite* but should entertain younger members of the household and has the advantage of allowing two to play at once.

**Dave Watterson**



## Directions

**Program** *Here and There With The Mr Men* **Micro** Spectrum 48K **Price** £7.95 **Supplier** Mirrorsoft, Holborn Circus, London EC1.

Mr Reviewer has an educational program featuring his friends, the Mr Men. It contains four games to teach four to eight year olds directions. Whoopee!

Mr Reviewer's mental age is five. Also, Mr Reviewer could never tell his left from his right. But there you go. Here he has to guide things from his own and the Mr Men's point of view.

The first jigsaw game is a bit boring, but making Mr Tickle tickle Mr Grumpy is much more fun. Then a big worm has to be sent up a tree to knock apples into Mr Lazy's mouth. Finally four Mr Men gang up against Mr Tickle on a chess board.

Roger Hargreaves' cartoons transfer well to the micro, as those nice Mr Men at Mirrorsoft have shown before. A colour television is advised for these games though.

Mr Reviewer thinks that this program should suit the age-group suggested, but youngsters will need guidance.

**John Minson**

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# Communicator

**Hardware** *Touchmaster Pad (plus Multiprint program)* **Micros** Spectrum, Commodore 64, Vic 20, BBC, Dragon 32 and 64 **Price** £149.95 **Supplier** Touchmaster, Kenfig Industrial Estate, Margam, nr Port Talbot.

For those of you who are not able to type, or who dislike doing so, there are many alternative ways in which you can communicate with a computer.

Joysticks, light-pens, touch-screens and mice are some of the more common ways of keeping your fingers away from the keyboard.

Now, Touchmaster, the company which has sprung out of the collapsed Dragon Data, provides yet another way.

It has produced what it claims is 'a revolutionary' touch-sensitive pad that sits next to the computer. This device (from which the company takes its name) consists of a wedge-shaped plastic case about 15in long and 12in deep, rising from half an inch in height at the front to about two inches high at the back.

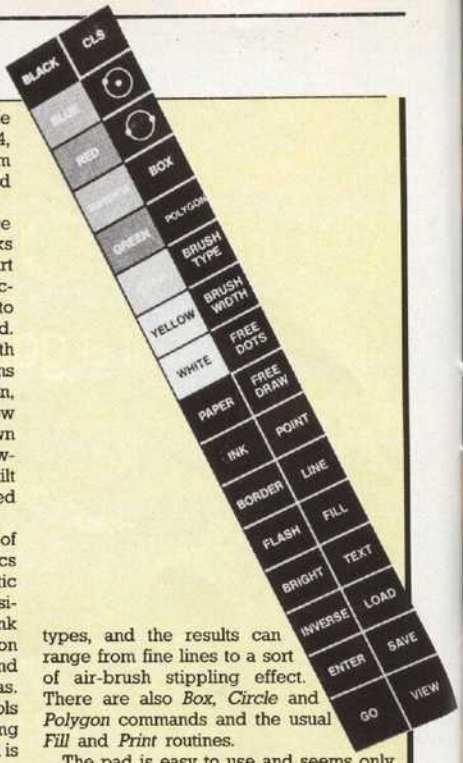
Most of the upper surface of the Touchmaster is taken up by an A4-size rubber pad, which forms the communication surface itself.

This pad has a touch resolution of 256 x 256 points, and information about which points have been touched — using a stylus like a ball-point pen which is supplied with the package — can be transmitted in serial or parallel form to the host computer via a Din connection at the back. The company so far, is producing versions for the BBC, Spectrum, C64, Vic 20 and Dragon 32 and 64. Versions for the Amstrad and MSX are also under development. Micros that already possess a suitable interface, such as the BBC, need only a cable; those like the C64, the Vic20, the Dragon and the Spectrum need an extra interface (which is included in the price).

The Spectrum version has the interface contained in a black plastic box that looks just like a Dragon games cartridge. Apart from the standard connector to the Spectrum, there is a ribbon cable that plugs into the parallel port on the Touchmaster pad. The power comes from a power supply with an integral mains plug and the connections are shown clearly in the documentation, which also includes short routines to allow the Touchmaster to be used in your own programs. The proof of the pudding however, lies in using some of the purpose-built software for the device — the so-called 'Touchware'.

Included in the pack is a copy of *Multipaint*, a fairly complex graphics package. As with all Touchware, a plastic overlay is included that fits over the sensitive pad on the Touchmaster. This is blank on most of the surface except for a section about an inch wide down the right-hand edge that is divided into 40 small areas. Pressing these with the stylus controls colour, brush type and width, drawing mode and so on, while the rest of the pad is used as the drawing area.

The software on the Spectrum loads in about two minutes to display a blue screen with a small information area along the base to remind you of the ink/paper colour, drawing mode, etc. A large cross acts as the drawing cursor, and once the brush type and width have been selected, drawing can commence. It takes some time to get used to the fact that your hand is moving in one place, while the results are appearing somewhere else, but once you get over that conceptual hurdle, the effects can be quite good. There are brush widths from one pixel up to 32, as well as five different stroke




types, and the results can range from fine lines to a sort of air-brush stippling effect. There are also *Box*, *Circle* and *Polygon* commands and the usual *Fill* and *Print* routines.

The pad is easy to use and seems only limited by your own graphic ability and of course, the Spectrum's restrictions on colours in the same character square, which produces chunky edges if you aren't careful. My only complaint with the Touchmaster in use lies in finding where you are on the screen, as there is no record of your progress on the pad.

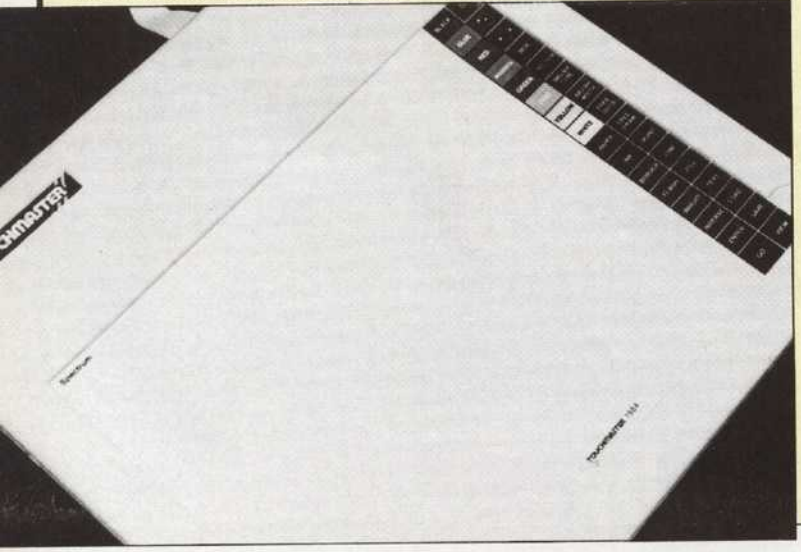
The BBC version of the pad will clearly produce better detail, and if a QL model were to be produced we could look forward to something approaching the electronic paint-box system used by TV companies.

There is also now, a range of software titles available for the Touchmaster pad, including board games, adventures and learning packages. The scope for a device like the Touchmaster in early education or with the handicapped must be enormous, as software can be written that does not involve reading or complex muscular skills, merely the recognition of shapes or colours and the ability to touch the pad.

My overall impressions are very favourable, and the Touchmaster would be a very useful peripheral for any computer. However, I don't think it will sell particularly well as long as it keeps its present price. If it cost £60, it would be expensive but worth having. At £145, it is considerably more than you would have to pay for a Spectrum, an Atmos, a Dragon or a Vic 20 or C16.

Much as I like the concept, at the moment you'd get better value from a light-pen, and you'd also know where you were on the screen.

**John Scriven**



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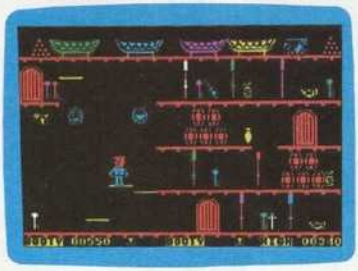

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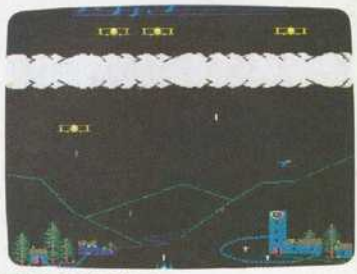

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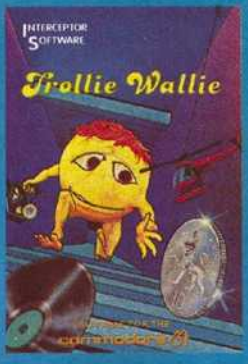


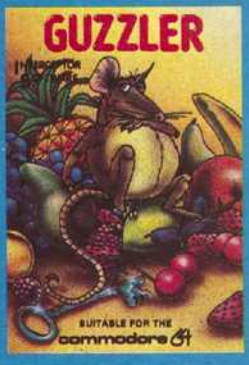


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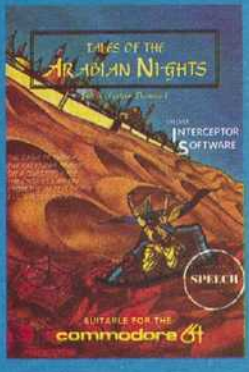


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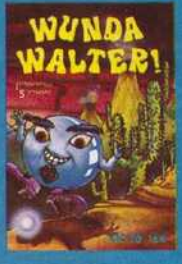


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## Elegant

**Hardware** *Spectrum On-off power switch* **Micro** Spectrum **Price** £4.95 **Supplier** TEC, 24 Victoria Road, Bromsgrove, Worcs.

Peripheral manufacturers have made a good living out of the Spectrum's budget-conscious design. Supplementary keyboards, joystick interfaces and sound boxes by the dozen are available, and it's only with the introduction of the Spectrum Plus and Sinclair's own interfaces that business seems likely to die down.

Meanwhile, TEC's Spectrum Switch remedies an abiding problem, by allowing you to switch off or reset your old-style Spectrum without pulling out the mains connector and risking wear on the socket.

The Switch costs £4.95, is designed with breathtaking elegance and simplicity, and adheres to the back of the Spectrum with stick-on self-adhesive pad. It clips over the power socket, and has a follow-on socket on the back.

It's unlikely to fit on any add-on keyboard, but some of these have built-in reset switches anyway.

The switch itself seems sturdy and reliable, and if you don't have the ability or patience to solder together your own reset switch, you would do well to request Santa to leave one of these in the toe of your stocking.

**Chris Jenkins**

## In storage

**Hardware** Microdrive storage box **Price** £5.95 **Micro** Spectrum & QL **Supplier** Transform Ltd, Swatlands, Lucks Lane, Paddock Wood, Kent

No, contrary to first impressions, this is not a box to store microdrives themselves, but a neat holder for the actual cartridges, used on the Spectrum and the QL.

It consists of a black plastic box with internal divisions for holding up to 20 cartridges, and a hinged lid to cover them all. Inside there is also a small gap that can be used for anything, such as the sticky labels supplied with the cartridges, or up to four more cartridges.

When your bank manager lets you buy more than 20 cartridges, you can get an additional box, as they cleverly interlock with one another. The cost is reasonable, being not much more than a single cartridge.

The world (well, me mainly) has been crying out for a method of storing the little blighters, and Transform have come up with a neat and cheap way of doing it.

**Andrew Pennell**

# Top 50

# Spectru

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# Sinclair speaks

*Let your Spectrum do the talking with* ***John de Rivaz***

This program was developed so that CB users could get their Spectrums to say repetitive messages. The messages are listed in statement lines 390 to 430.

After you have found a blank channel, press '!' and enter the channel number. Then tune your CB to channel 14 and hold the microphone near your Spectrum's speech speaker and press *One* and the microphone key. The Spectrum will say 'One four for a copy.'

When another breaker (ie, CB user) answers, usually with 'Break a window' (ie, pick an empty channel), press *Three* and your microphone key, and the Spectrum will say 'Breaker for a copy go to', followed by your chosen channel number. You can press *Four* to get the Spectrum to 'Crank your handle' (ask your contact his CB name), and *Two* to give a count (used to test a link). When you want to talk to your contact, *Five* gives a suitable message.

**Program notes**

| | |
|---|---|
| 10-120 | Creates the speech strings, which are checksummed by the program. Data line 50 is "oh", "zero", "zero", etc. |
| 130 | Sets the port number to that of your speech unit, which should use the SP025 chip |
| 150-180 | Checksumming routine for the speech strings |
| 190-240 | Subroutine that says a string *XS* |
| 250-340 | Subroutine that says a channel number between 1 and 99 (the program won't *Input* numbers over 40) |
| 380-550 | The main loop |

```
  10 CLS : PRINT "CB TALKER (C) RTL 7 JUNE 1984": PRINT : PRINT "Please wait, I'
m thinking."
  20 REM CB Talker was made using RTL's Speechwriter, which accepts English Text
 and converts it to allophone strings after asking the user some simple quest-
ions.
  30 REM This program (and Speechwriter) is for all speech units using the
SP0256 chip.
  40 DATA "R;/(L^('L^(8(N<-O($",1090
  50 DATA "OOOKY(R;/(1C(L27(L^(L$L([O&M[([+G+/(8&1(\$/($",2588
  60 DATA "cK8MW'L^&8&N<-O&aY&1:($",1411
  70 DATA ",K>/M&=^&?>/9b$",899
  80 DATA "$&>4&8&[99-+N1K;4'&N<4-U1X(&$&ROQ&\D&->[&=U&1:&4$&Y/X($",3068
  90 RESTORE 40: FOR n=1 TO 5: READ x$,TEST: GO SUB 150: IF a<>TEST THEN  PRINT
"Error in data line ";30+n*10;".": STOP
 100 NEXT n
 110 RESTORE 40: READ a$,f,b$,f,c$,f,d$,f,e$
 120 LET cn=1: REM Default channel number
 130 LET PORT=159: REM Set this to your port number.
 140 GO TO 370
 150 REM SUBROUTINE TO TEST STRING
 160 REM ═══════════════════
 170 LET A=0: FOR F=1 TO LEN X$: LET A=A+CODE X$(F): NEXT F
 180 RETURN
 190 REM SUBROUTINE TO SAY X$
 200 REM ═══════════════════
 210 FOR N=1 TO LEN X$
 220 IF IN PORT>127 THEN  GO TO 220
 230 OUT PORT,(CODE X$(N)-36)
 240 NEXT N: RETURN
 250 REM subroutine to say channel number
 260 REM ═══════════════════
 270 LET n$=STR$ cn: IF LEN n$=1 THEN  LET n$="0"+n$
 280 FOR f=1 TO 2: LET n=VAL n$(f)
 290 LET k=0: FOR j=0 TO n-1
 300 LET k=k+1: IF b$(k)<>"(" THEN  GO TO 300
 310 NEXT j
 320 LET x$=""
 330 LET k=k+1: LET x$=x$+b$(k): IF b$(k)<>"(" THEN  GO TO 330
 340 GO SUB 210: NEXT f: RETURN
 350 REM Main Loop
 360 REM ═══════════
 370 CLS : PRINT "CB TALKER (C) RTL 7 JUNE 1984": PRINT
 380 PRINT "Press to say"
 390 PRINT "1.     One Four for a copy"
 400 PRINT "2.     Zero to nine count"
 410 PRINT "3.     Breaker for a copy goto ";cn
 420 PRINT "4.     Crank your handle"
 430 PRINT "5.     I am a Spectrum Computer.        I will now pass you to my
 owner"
 440 PRINT : PRINT "!      to set channel number"
 450 LET x$=INKEY$: IF x$="" THEN  GO TO 450
 460 IF x$<>"!" THEN  GO TO 490
 470 INPUT "Channel Number ";cn: IF cn<1 OR cn>40 THEN  GO TO 470
 480 GO TO 370
 490 IF x$<"1" OR x$>"5" THEN  GO TO 450
 500 IF x$="1" THEN  LET x$=a$
 510 IF x$="2" THEN  LET x$=b$
 520 IF x$="3" THEN  LET x$=c$: GO SUB 210: GO SUB 250: GO TO 450
 530 IF x$="4" THEN  LET x$=d$
 540 IF x$="5" THEN  LET x$=e$
 550 GO SUB 210: GO TO 450
```

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# Printing prettier

*Take the strain out of listing with Pretty Prints by* ***B G Merrick***

SuperBasic is a powerful language designed for ease of programming. Hence it is perhaps surprising that no facility exists for indenting sections of a program when listed to show its structure, especially considering that this function is provided automatically in the database programming languague provided in Archive.

This routine overcomes this deficiency by reading a program file from microdrive (or any other source) and copying it to another device (or back to the same file), formatting it by indenting all multi-line *RE*Peat loops, *FOR* loops, *SEL*ect switches, *PROC*edures, *FUN*ctions and *IF* statements as it goes.

In order to use this program, first save the code to be formatted. Then load and run this program. The program prompts for a source and a destination file. The full name including the device should be entered, for example, *'mdv1-pretty'* as this provides consistency with SuperBasic commands and allows a file to be formatted to a printer. However, if just *Enter* is pressed in response to the destination file prompt, and the file is on microdrive, this program will just copy the file to a temporary file as the source, delete the original file and use this as the destination file. At the end of the program the temporary file is deleted.

**Main Routine**

This initially prompts the user to determine the file names to use and if required copies the original file *(Source$)* to a temporary file and deletes the old version.

After opening the files (Lines 240 and 250) the routine enters a loop which terminates when the end of the source file is reached. Within the loop the program reads a line at a time, calling *Num* to strip any leading spaces from the line, and print the line number to the destination file. The variable *Spc* holds the number of spaces to be placed between the line number and the first command of a line. The amount this is to be altered before and after printing the line is held in Before and After respectively. The procedure *Spaces* determines the values of these variables for the line. Line 340 ensures that an error will not occur if a program with incorrect syntax is passed through this program. Line 350 actually prints the line using *Fill$* to provide a string of spaces.

On exit from the loop, the channels are closed and if used the temporary file is deleted.

**Procedure Num**

This routine consists of three parts. The first, Lines 460 to 490 simply removes any leading spaces from the line. The second, Lines 500 to 550 gets the line number and prints this right justified in a space of 5 characters (Line 550).

The final part (Lines 560 to 600) is identi cal to the first part except that it removes spaces from after the line number.

**Procedure Spaces**

This section of the program compares the start of a program line with the statements listed in Lines 930 and 940 as data. If a match is found the *For* loop terminates with a value of 1 to 9 in *N*, representing the commands in the *Data* statements. If no match is found *N* contains the value 10, hence the dummy command '*' at the end of Line 940 preventing an error on the tenth *Read*.

*Colon* is then set to a truth value representing whether the line contains more than one statement by first testing for the presence of a colon and ensuring that this is not the end of the line.

This can then be used to determine whether or not a structure exists in its single or multi-line form.

The routine then switches on the value of *N* to determine the change in spacing for different statements. The only points to note here are that as a multi-line structure can start on the same line as an ON= or =switch. *Spaces* is called recursively, with the remainder of the line being passed as its parameter. A test for *Then* statement is made in the part that deals with *If*.

**Procedure Diff**

This procedure simply updates the values of *Before* and *After* by adding its parameters to them.

```
100 REMark  PRETTY PRINT ROUTINE
110 REMark       BY B.G.MERRICK
120 REMark          (c)1984
130 REMark
140 INPUT#0,"Source file
? ";Source$\"Destination file ? ";Dest$
150 IF (Dest$=''OR Dest$=Source$)AND Source$(1 TO 3)=="MDV"
160   Dest$=Source$
170   Source$=Source$&'_tmp'
180   COPY Dest$ TO Source$
190   DELETE Dest$
200   temp=1
210 ELSE
220   temp=0
230 END IF
240 OPEN_IN#3,Source$
250 OPEN_NEW#4,Dest$
260 Spc=1
270 REPeat Loop
280   IF EOF(#3) THEN EXIT Loop
290   INPUT#3,line$
300   Num line$
310   Before=0:After=0
320   Spaces line$
330   Spc=Spc-Before
340   IF Spc<0:Spc=0
350   PRINT#4,FILL$(' ',Spc);line$
360   Spc=Spc+After
370 END REPeat Loop
380 CLOSE#3
390 CLOSE#4
400 IF temp THEN DELETE Source$
410 STOP
420 :
430 DEFine PROCedure Num(a$)
440   LOCal n$,i
450   n$='':i=1
460   REPeat loop2
470     IF a$(i)<>' ' THEN EXIT loop2
480     i=i+1
490   END REPeat loop2
500   REPeat Loop3
510     IF a$(i)<'0'OR a$(i)>'9' THEN EXIT Loop3
520     n$=n$ & a$(i)
530     i=i+1
540   END REPeat Loop3
550   PRINT#4,FILL$(' ',5-LEN(n$));n$;
560   REPeat loop4
570     IF a$(i)<>' 'THEN EXIT loop4
580     i=i+1
590   END REPeat loop4
600   a$=a$(i TO)
610 END DEFine
620 :
630 DEFine PROCedure Spaces(l$)
640   LOCal N,Colon,thenin,Stmt$
650   RESTORE
660   FOR N=1 TO 10
670     READ Stmt$
680     IF l$(1 TO LEN(Stmt$))=Stmt$ THEN EXIT N
690   END FOR N
700   Colon=':'INSTR l$
710   IF Colon=LEN(l$) THEN Colon=0
720   SELect ON N
730    =1,2
740     Diff 1,1
750     IF Colon THEN Spaces l$(':'INSTR l$+1 TO)
760    =3 TO 6
770     IF NOT Colon THEN Diff 0,2
780    =7
790     thenin='THEN'INSTR l$
800     IF thenin THEN thenin=LEN(l$)>thenin+4
810     IF NOT(Colon OR thenin) THEN Diff 0,2
820    =8:Diff 2,2
840    =9:Diff 2,0
850   END SELect
860 END DEFine
870 :
880 DEFine PROCedure Diff(a,b)
890   Before=Before+a
900   After=After+b
910 END DEFine
920 :
930 DATA '=','ON','REPeat','FOR','DEFine'
940 DATA 'SELect','IF','ELSE','END','*'
```

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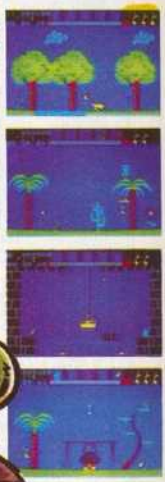

BY
DEREK
BREWSTER

22 screens of stunning cartoon animation. Swinging through the trees collect, drop and use the objects scattered around. Speed of reaction is one thing. In Jasper you must also think fast and plan accurately. Can you handle it?

# Noises off . . . .

*Try using these sound effects to give that professional touch to your programs, from* **Mark Gornall**

This program demonstrates seven different sound effects using the *SID* chip. You may look upon them as an example of Commodore 64 sound or you may prefer to use them in your own programs, expanding and improving a particular sound to your own taste.

The program is menu driven, and lets you choose a particular sound or you can play all seven sounds one after the other. You can change the wave form being used, but it should be noted that some sounds may play better in one wave form than another. Here is a short description of each routine.

*Sound One* plays two notes in a *For/Next* loop, but one note is always much higher than the other, giving the effect a rough musical scale. *Sound Two* uses ring modulation of voices one and three to produce a strange sound. *Sound Three* plays random notes, but the Sustain/Release is set to give a pleasant effect. *Sound Four* plays two notes in the chosen wave form and two notes of white noise all the way up the scale, using voices one and two. It sounds best in saw tooth wave form. *Sound Five* imitates multiple explosions using all three voices. It sounds best in white noise wave form. *Sound Six* plays two musical scales, one starting at the bottom, playing up, and one starting at the top, playing down, using voices one and two. *Sound Seven* is my favourite. It plays a small echo using voice one and sounds great in all wave forms. You may like to try changing Line 228 to *For i=0T040.*

I can never make up my mind which sounds best.

**Program Notes**

| | |
|---|---|
| Line 2 | Set up screen |
| Line 4 | Initialise variables |
| Lines 6-28 | Print menu, check key press |
| Lines 30-56 | Change wave form |
| Lines 60-238 | Sound routines |
| Line 244 | Clear SID chip |
| Line 248 | Set volume and pulse width |
| S | Voice 1 |
| S1 | Voice 2 |
| S2 | Voice 3 |
| WV | Waveform |
| (CLR) | Shift Clr/Home |
| (CUD) | Cursor down |
| (CUL) | Cursor left |

```
0 REM *** SOUND EFFECTS-MARK
G,1984 ***
2 POKE53280,11:POKE53281,11:POKE646,0
4 S=54272:S1=54279:S2=54286:WV=33
6 C=0:PRINT"[CLR]"TAB(12)
"SOUND EFFECTS"
8 PRINT"[CUD][CUD][CUD]1.
PLAY A SOUND"
10 PRINT"[CUD]2. PLAY ALL SOUNDS"
12 PRINT"[CUD]3. CHANGE WAVEFORM"
14 PRINT"[CUD]4. END"
16 POKE198,0
18 GETA$:IFA$=""THEN18
20 IFA$="1"THEN30
22 IFA$="2"THENC=1:GOTO60
24 IFA$="3"THEN36
26 IFA$="4"THENPRINT"[CLR]":END
28 GOTO18
30 INPUT"[CLR]ENTER SOUND (1-7)
.[CUL][CUL][CUL]";N
32 IFN<1ORN>7THEN30
34 ONNGOTO62,86,110,136,162,192,218
36 PRINT"[CLR]WAVE FORMS"
38 PRINT"[CUD][CUD]1. TRIANGLE"
40 PRINT"[CUD]2. SAW TOOTH"
42 PRINT"[CUD]3. PULSE"
44 PRINT"[CUD]4. WHITE NOISE"
46 GETA$:IFA$=""THEN46
48 IFA$="1"THENWV=17:GOTO6
50 IFA$="2"THENWV=33:GOTO6
52 IFA$="3"THENWV=65:GOTO6
54 IFA$="4"THENWV=129:GOTO6
56 GOTO46
58 :
60 REM **** SOUND 1 ****
62 GOSUB244
64 POKES+5,88:POKES+6,88
68 POKES+4,WV
70 FORI=0TO200STEP0.5
72 POKES+1,I:POKES+1,I+55
74 NEXTI
76 POKES+4,WV-1
78 IFC=1THEN86
80 GOTO6
82 :
84 REM **** SOUND 2 ****
86 GOSUB244
88 POKES+1,130
90 POKES+5,204
92 POKES+15,30
96 FORI=1TO300:POKES+4,21
98 POKES+4,WV
100 NEXTI
102 IFC=1THEN110
104 GOTO6
106 :
108 REM **** SOUND 3 ****
110 GOSUB244
112 POKES+5,9:POKES+6,5
114 FORI=1TO200
116 HF=INT(RND(1)*100)
118 LF=INT(RND(1)*100)
120 POKES+1,HF:POKES+1,LF
122 POKES+4,WV
124 POKES+4,WV-1
126 NEXTI
128 IFC=1THEN136
130 GOTO6
132 :
134 REM **** SOUND 4 ****
136 GOSUB244
138 POKES+5,8:POKES+6,204
140 POKES1+5,8:POKES1+6,204
142 FORI=1TO100
144 POKES+1,I:POKES1+1,I
146 POKES+4,WV:POKES1+4,129
148 FORJ=1TO5:NEXTJ
150 POKES+4,WV-1:POKES1+4,128
152 NEXTI
154 IFC=1THEN162
156 GOTO6
158 :
160 REM **** SOUND 5 ****
162 GOSUB244
164 POKES+5,255:POKES+6,204
166 POKES1+5,64:POKES1+6,234
168 POKES2+5,0:POKES2+6,204
170 POKES+1,2:POKES,24
172 POKES1+1,8:POKES,97
174 POKES2+1,67:POKES2,15
176 POKES+4,WV
178 FORI=1TO3000:NEXT::POKES1+4,WV
180 FORI=1TO2000:NEXT:POKES2+4,WV
182 FORI=1TO2500:NEXT:POKES2+4,WV-1
:POKES1+4,WV-1:POKES+4,WV-1
184 IFC=1THEN192
186 GOTO6
188 :
190 REM **** SOUND 6 ****
192 GOSUB244
194 POKES+5,9:POKES+6,0
196 POKES1+5,9:POKES1+6,0
198 FORI=1TO150
200 POKES+1,I:POKES+1,I+1
202 POKES1+1,151-I:POKES1+1,152-I
204 POKES+4,WV:POKES1+4,WV
206 POKES+4,WV-1:POKES1+4,WV-1
208 NEXTI
210 IFC=1THEN218
212 GOTO6
214 :
216 REM **** SOUND 7 ****
218 GOSUB244
222 POKES+5,88:POKES+6,204
224 POKES+4,WV
226 FORI=1TO15
228 FORJ=40TO0STEP-1
230 POKES+1,J
232 NEXTJ
234 POKES+4,WV-1
236 NEXTI
238 GOTO6
240 :
242 REM *** CLR SOUND CHIP ***
244 FORI=0TO24:POKES+I,0:NEXTI
246 REM *** SET VOL,PULSE WIDTH ***
248 POKES+24,15:POKES+3,8:POKES+2,0
250 RETURN
```

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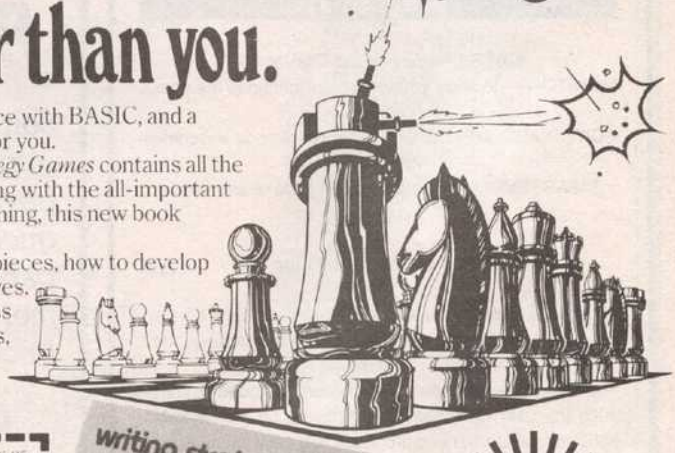

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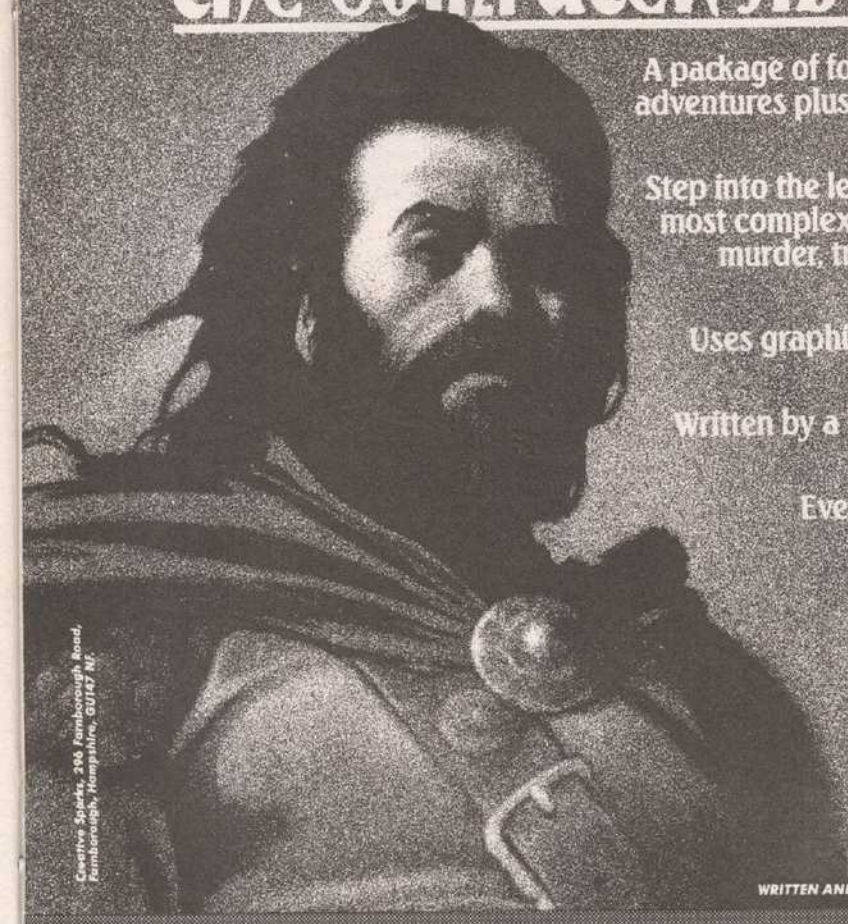

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# Rates of interest

*Clear up a few of your financial problems on the BBC B with the help of* ***Neil McGlynn***

This program's purpose is to solve problems concerned with social arithmetic ... the everyday mundane financial calculations that we all have to make.

It has five functions: simple interest, compound interest, depreciation, rates and Vat.

When the program is executed, the user is confronted with a menu, and is asked to choose which service is required.

The program is well strucutured and easy to follow, with Rem statements detailing the workings of each procedure.

**Program Notes**

| | |
|---|---|
| *Procinitialise* | Disables *Escape* and *Break* keys |
| *Procmenu* | Prints menu on screen |
| *Procscreen* | Draws border around menu |
| *Procsimple* | Calculates simple interst |
| *Proccompound* | Calculates compound interest |
| *Procdepreciation* | Calculates depreciation |
| *Procvat* | Calculates Vat |
| *Procrates* | Calculates local rates |
| *Procend* | Ends program |
| *Procagain* | Asks for another calculation |

The program could be easily developed further to form part of a comprehensive domestic financial program.

```
  10REM ************************
  20REM ***    CALCULATOR    ***
  30REM *** BY NEIL McGLYNN  ***
  40REM *** BBC BASIC        ***
  50REM *** 1984             ***
  60REM ************************
  70REM The main loop of the program changes
 the mode to a graphics mode and ca
lls three procedures.
  80REPEAT
  90MODE2
 100PROCinitialise
 110PROCmenu
 120PROCagain
 130UNTILagain$="N"
 140END
 150REM PROCinitialise sets the decimal
 place to 2 places and disables the ESCA
PE and the BREAK keys.
 160DEFPROCinitialise
 170*FX229,2
 180*KEY10OLD|MRUN|M
 190@%=&020200
 200ENDPROC
 210REM PROCmenu removes the cursor from the
 menu and calls PROCscreen which dr
aws a border around the menu.
 220DEFPROCmenu
 230VDU23;8202;0;0;0;
 240PRINTTAB(2,3);"CALCULATOR MENU"
 250PRINTTAB(2,4);"_______________"
 260PRINTTAB(2,8);"SELECT NUMBER"
 270PRINTTAB(0,11);" 1 SIMPLE INTEREST"
 280PRINTTAB(0,14);" 2 COMPOUND INTEREST"
 290PRINTTAB(0,17);" 3 DEPRECIATION"
 300PRINTTAB(0,20);" 4 VAT"
 310PRINTTAB(0,23);" 5 LOCAL RATES"
 320PRINTTAB(0,26);" 6 END PROGRAM"
 330PROCscreen
 340REPEAT
 350answer=GET-48
 360UNTILanswer<7 AND answer>0
 370IFanswer=1THENPROCsimple
 380IFanswer=2THENPROCcompound
 390IFanswer=3THENPROCdepreciation
 400IFanswer=4THENPROCvat
 410IFanswer=5THENPROCrates
 420IFanswer=6THENPROCend
 430ENDPROC
 440REM PROCscreen draws a border
 around the menu.
 450DEFPROCscreen
 460GCOL0,1
 470DRAW1279,0
 480DRAW1279,1023
 490DRAW0,1023
 500DRAW0,0
 510ENDPROC
 520REM All procedures called from the menu
 have the commands VDU22,7 and CHR$1
41. VDU22,7 changes the mode to the teletext
 mode(MODE 7)and CHR$141 prints the
 character in double height.
 530REM PROCsimple calculates
Simple Interest.
 540DEFPROCsimple
 550VDU22,7
 560PRINTCHR$141;"           SIMPLE INTEREST"
 570PRINTCHR$141;"           SIMPLE INTEREST"
 580PRINT
 590PRINT
 600PRINT
 610INPUT"INPUT PRINCIPAL        "principal
 620PRINT
 630INPUT"INPUT INTEREST RATE    "rate
 640PRINT
 650INPUT"INPUT NUMBER OF YEARS "years
 660interest=(rate/100)*principal*years
 670amount=principal+interest
 680CLS
 690PRINTCHR$141;"           SIMPLE INTEREST"
 700PRINTCHR$141;"           SIMPLE INTEREST"
 710PRINTTAB(3,7);"PRINCIPAL
=  "principal
 720PRINTTAB(3,9);"INTEREST
RATE = ";rate;"%"
 730PRINTTAB(3,11);"YEARS
      = "years
 740PRINTTAB(3,13);"INTEREST
=  "interest
 750PRINTTAB(3,15);"AMOUNT
=  "amount
 760PRINTTAB(3,23);"ANY KEY TO RETURN"
 770next$=GET$
 780ENDPROC
 790REM PROCcompound calculates
Compound Interest.
800DEFPROCcompound
810VDU22,7
 820PRINTCHR$141;"
COMPOUND INTEREST"
 830PRINTCHR$141;"
COMPOUND INTEREST"
 840PRINT
 850PRINT
 860PRINT
 870INPUT"INPUT PRINCIPAL        "principal
 880PRINT
 890INPUT"INPUT NUMBER OF YEARS "years
 900PRINT
 910INPUT"INPUT INTEREST RATE    "rate
 920amount=principal
 930FORtime=1TOyears
 940amount=amount+(amount*(rate/100))
```

```
950NEXTtime
960interest=amount-principal
970CLS
980PRINTCHR$141:"
COMPOUND INTEREST"
990PRINTCHR$141:"
COMPOUND INTEREST"
1000PRINTTAB(3,7):"PRINCIPAL
= "principal
1010PRINTTAB(3,9):"YEARS          = "years
1020PRINTTAB(3,11):"INTEREST RATE =
":rate;"%"
1030PRINTTAB(3,13):"AMOUNT        = "amount
1040PRINTTAB(3,15):"INTEREST
= "interest
1050PRINTTAB(3,23):"ANY KEY TO RETURN"
1060next$=GET$
1070ENDPROC
1080REM PROCdepreciation calculates the
number of years it takes an article to be
worthless and worth half its original value.
1090DEFPROCdepreciation
1100REPEAT
1110VDU22,7
1120PRINTCHR$141:"          DEPRECIATION"
1130PRINTCHR$141:"          DEPRECIATION"
1140PRINT
1150PRINT
1160PRINT
1170INPUT"INPUT VALUE OF ARTICLE "sum
1180PRINT
1190INPUT"INPUT % DEPRECIATION   "percent
1200UNTILsum>0ANDpercent>0
1210variable=sum
1220variable2=sum
1230years=0
1240years2=0
1250REPEAT
1260variable=variable-((percent/100)
*variable)
1270years=years+1
1280UNTILvariable<1
1290REPEAT
1300variable2=variable2-((percent/100)
*variable2)
1310years2=years2+1
1320UNTILvariable2<sum/2
1330CLS
1340PRINTCHR$141:"          DEPRECIATION"
1350PRINTCHR$141:"          DEPRECIATION"
1360PRINTTAB(3,5):"ORIGINAL VALUE  = "sum
1370PRINTTAB(3,7):"% DEPRECIATION
= "percent;"%"
1380PRINTTAB(3,9):"NUMBER OF YEARS
FOR ARTICLE'S
VALUE TO BE WORTHLESS       = "y
ears;" YEARS"
1390PRINTTAB(3,14):"NUMBER OF YEARS
FOR ARTICLE'S
VALUE TO BE HALVED          = "
years2;" YEARS"
1400PRINTTAB(3,23):"ANY KEY TO RETURN"
1410next$=GET$
1420ENDPROC
1430REM PROCvat calculates the VAT to be
1440DEFPROCvat
1450VDU22,7
1460PRINTCHR$141:"          VAT"
1470PRINTCHR$141:"          VAT"
1480PRINT
1490PRINT
1500PRINT
paid on an article.
1510INPUT"INPUT THE VALUE OF VAT       "vat
1520PRINT
1530INPUT"INPUT THE VALUE OF
THE ARTICLE   "article
1540output=article*(vat/100)
1550CLS
1560PRINTCHR$141:"          VAT"
1570PRINTCHR$141:"          VAT"
1580PRINTTAB(3,7):" VAT
= ":vat;"%"
1590PRINTTAB(3,9):" ARTICLE PRICE
=  ":article
1600PRINTTAB(3,11):" THE VAT ON
THE ARTICLE  = ":output
1610PRINTTAB(4,23):"ANY KEY TO RETURN"
1620next$=GET$
1630ENDPROC
1640REM PROCrates calculates the
Local Rates to be paid.
1650DEFPROCrates
1660VDU22,7
1670PRINTCHR$141:"          LOCAL RATES"
1680PRINTCHR$141:"          LOCAL RATES"
1690PRINT
1700PRINT
1710INPUT"INPUT RATEABLE VALUE    "rateable
1720PRINT
1730INPUT"INPUT RATE PER          "pound
1740rate=rateable*pound
1750CLS
1760PRINTCHR$141:"          LOCAL RATES"
1770PRINTCHR$141:"          LOCAL RATES"
1780PRINTTAB(3,7):"RATEABLE VALUE =
"rateable
1790PRINTTAB(3,9):"RATE PER POUND =  "pound
1800PRINTTAB(3,11):"YOU WILL HAVE
1810PRINTTAB(3,23):"ANY KEY TO RETURN"
1820next$=GET$
1830ENDPROC
1840REM PROCend ends the program.
1850DEFPROCend
1860CLS
1870END
1880ENDPROC
1890REM PROCagain asks the user if he/she
would like another calculation to be
1900DEFPROCagain
1910VDU22,7
1920CLS
1930PRINTTAB(3,14):"ANOTHER
CALCULATION (Y OR N)"
1940again$=GET$
1950ENDPROC
```

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# The dread beast scrolls

*The first of three machine-code routines for the Dragon 32 by* **Roger Walton**

The Dragon has a poor reputation for lack of quality in its games software. This has often been due to the use of *PMode 4* graphics displays. Although these provide maximum resolution, the user is limited to a two colour display. More recently, programs have appeared using *PMode 3* graphics which are visually more appealing. With careful programming, excellent display becomes possible.

The purpose of this series is to provide a number of machine-code utilities which may be incorporated into programs using *PMode 3*.

*PMode 3* requires four pages of graphics memory to display a full screen. The memory set aside for graphics by the Dragon 32 is reserved by the *PClear* command. *PClear 4* is the default value. In normal use, memory addresses *&H0600* to *&H1DFF*, a total of 6144 bytes of Ram, are used by *PMode 3*.

Each point displayed on the screen consists of two bits of memory. This means that each byte will display four points on the screen, giving $4 \times 32 = 128$ points per row. There are 192 rows down the screen so the display is $128 \times 192$ in *PMode 3*.

The bit patterns within a byte determine the colour which is displayed. The following table shows how this works:

| bit pattern | colour displayed | |
|---|---|---|
| | Screen1,0 | Screen 1,1 |
| 00 | green | buff |
| 01 | yellow | cyan |
| 10 | blue | magenta |
| 11 | red | orange |

In the first program a routine is provided which will scroll a section of the screen to the left, two bits at a time. 'Wrap-around' has is to stop should be *Poked* into *&H7f69* (see Basic listing one).
the screen as it disappears from the left. The full width of the screen is scrolled but the vertical height of the section scrolling can be set by the user. This is done by *Poking* the appropriate y-coordinates before *Execing* the routine. The y-coordinate at which the scroll should start needs to be *Poked* into *&H7F68*. The address at which the scroll is to stop should be *Poked* into &H7f69, (see *Basic* listing one).

An example of a use for this program would be to scroll a set of options across the bottom of the screen, as in the excellent *Chuckie Egg* game. A later article will provide a character set for this purpose.

The assembler listing is provided so that you can see how the routine works. The next article will show how to scroll the screen to the right and upwards.

```
10 '  LISTING 1
20 '****************************************
30 ' SCROLL PROGRAM, R. Walton, July '84   *
40 '****************************************
50 '
60 ' This program scrolls PMODE 3 graphics left
70 ' across the screen, with
wrap-around built in
80 ' The section of the screen to be scrolled
90 ' is defined by it's X and Y coordinates
which should
100 ' be POKED into &H7F68 and &H7F69 before
EXECing the machine code
110 CLEAR 100,&H7F60
120 FOR LOC=&H7F61 TO &H7FEF
130 READ P$
140 P$="&H"+P$
150 P=VAL(P$)
160 T=T+P
170 POKE LOC,P
180 NEXT
190 IF T<>14274 THEN CLS:PRINT"DATA ERROR":STOP
200 CLS:PRINT"CODE LOADED."
210 PRINT"EXEC &H7F61 TO"
220 PRINT"CALL LEFT-SCROLL"
230 DATA 16,00,0B,06,00,1D,FF,00
240 DATA BF,00,00,00,00,00,86,20
250 DATA F6,7F,68,3D,C3,06,00,FD
260 DATA 7F,64,86,20,F6,7F,69,3D
270 DATA C3,06,1F,FD,7F,66,BE,7F
280 DATA 64,7F,7F,6A,31,88,1F,10
290 DATA BF,7F,6D,7F,7F,6B,A6,B4
300 DATA 85,80,26,27,85,40,26,2E
310 DATA 68,B4,68,B4,1C,FE,30,01
320 DATA BC,7F,6D,2E,05,17,00,23
330 DATA 20,F2,A6,1F,BA,7F,6A,BA
340 DATA 7F,6B,A7,1F,BC,7F,66,25
350 DATA C8,20,2B,34,02,86,02,B7
360 DATA 7F,6A,35,02,20,CE,7C,7F
370 DATA 6B,20,CD,C6,02,F7,7F,6C
380 DATA 1C,FE,68,B4,25,07,7A,7F
390 DATA 6C,5A,26,F4,39,A6,1F,BA
400 DATA 7F,6C,A7,1F,20,F0,39
```

Continued over the page

```
7F61                    1015     PRT $0C
7F61                    1020 ******************************************

7F61                    1030 *                                        *

7F61                    1040 *    LEFT SCROLL FOR PMODE 3             *

7F61                    1050 *    ROGER WALTON, JULY :'84             *

7F61                    1060 *                                        *

7F61                    1070 ******************************************

7F61 16000B             1080 @START LBRA @IN
7F64                    1090 *****Reserve storage************************

7F64                    1100 @SCRST RMB 2       ;lower scroll address
7F66                    1110 @SCREND RMB 2      ;higher scroll address
7F68                    1120 @YIN RMB 1         ;lower Y-coordinate
7F69                    1130 @YOUT RMB 1        ;higher Y-coordinate
7F6A                    1140 @CARRY RMB 3       ;used for wrap-around
7F6D                    1150 @LINEND RMB 2
7F6F                    1160 *****Calculate screen addresses*************

7F6F                    1170 @IN EQU *
7F6F 8620               1180     LDA #32        ;32 bytes/line
7F71 F67F68             1190     LDB @YIN       ;y-coordinate on entry
7F74 3D                 1200     MUL
7F75 C30600             1210     ADDD #$600     ;get screen address
7F78 FD7F64             1220     STD @SCRST     ;scroll starts here
7F7B 8620               1230     LDA #32
7F7D F67F69             1240     LDB @YOUT
7F80 3D                 1250     MUL
7F81 C3061F             1260     ADDD #$61F
7F84 FD7F66             1270     STD @SCREND    ;scroll ends here
7F87                    1280 ******************************************

7F87 BE7F64             1290     LDX @SCRST
7F8A 7F7F6A             1300 @GOON CLR @CARRY  ;keep track of bits
7F8D 31881F             1310     LEAY 31,X     ;transferred between bytes

7F90 10BF7F6D           1320     STY @LINEND
7F94 7F7F6B             1330     CLR @CARRY+1
7F97 A684               1340     LDA ,X
7F99 8580               1350     BITA #$80     ;save bit 7
7F9B 2627               1360     BNE @SET
7F9D 8540               1370 @TEST BITA #$40   ;save bit 6
7F9F 262E               1380     BNE @SET1
7FA1 6884               1390 @CONT1 ASL ,X     ;scroll one bit
7FA3 6884               1400     ASL ,X        ;and another
7FA5 1CFE               1410 @CONT ANDCC #$FE  ;clear carry
7FA7 3001               1420     LEAX 1,X      ;point to next byte
7FA9 BC7F6D             1430     CMPX @LINEND  ;if at line end
7FAC 2E05               1440     BGT @WRAP     ;wrap around screen
7FAE 170023             1450     LBSR @SCROLL  ;else keep on scrolling
7FB1 20F2               1460     BRA @CONT     ;do next bit
7FB3                    1470 ******************************************

7FB3 A61F               1480 @WRAP LDA -1,X    ;point to last byte
7FB5 BA7F6A             1490     ORA @CARRY    ;in line, setting bits
7FB8 BA7F6B             1500     ORA @CARRY+1  ;if necessary
7FBB A71F               1510     STA -1,X
7FBD BC7F66             1520     CMPX @SCREND  ;is screen done
7FC0 25C8               1530     BLO @GOON     ;if not, continue
7FC2 202B               1540     BRA @OUT      ;else return to BASIC
7FC4                    1550 ******************************************
```

```
7FC4 3402          1560 @SET PSHS A
7FC6 B602          1570      LDA #2
7FC8 B77F6A        1580      STA @CARRY   ;used to set bit 2 if neede
d
7FCB 3502          1590      PULS A
7FCD 20CE          1600      BRA @TEST
7FCF 7C7F6B        1610 @SET1 INC @CARRY+1;used to set bit 1 if need
ed
7FD2 20CD          1620      BRA @CONT1
7FD4               1630 ***********************************************

7FD4 C602          1640 @SCROLL LDB #2
7FD6 F77F6C        1650      STB @CARRY+2
7FD9 1CFE          1660 @SHIFT ANDCC #$FE ;clear carry flag
7FDB 6884          1670      ASL ,X
7FDD 2507          1680      BCS @COPY    ;copy bit
7FDF 7A7F6C        1690 @BACK DEC @CARRY+2
7FE2 5A            1700      DECB
7FE3 26F4          1710      BNE @SHIFT
7FE5 39            1720      RTS
7FE6               1730 ***********************************************

7FE6 A61F          1740 @COPY LDA -1,X    ;take care of
7FE8 BA7F6C        1750      ORA @CARRY+2 ;transfer of bits
7FEB A71F          1760      STA -1,X     ;between bytes
7FED 20F0          1770      BRA @BACK
7FEF               1780 ***********************************************

7FEF 39            1790 @OUT RTS
7FF0               1800      END @START
```


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## Spider Attack

### on Spectrum

The object of this game for the 48K Spectrum is to make your way through six levels of a multi-storey maze, collecting boxes of treasure on your way, and finally reaching a magic treasure chest.

Unfortunately your task is hampered by two man-eating spiders which patrol the maze. You carry a gun, but this can only stun them, and firing the gun uses up precious oxygen.

To escape from one level to the next you must simply make your way to the bottom right hand corner of the screen.

The controls are:

1 = move left
2 = move right
7 = shoot left
8 = shoot right
9 = jump left
0 = jump right

```
  10 FOR n=USR "a" TO USR "h"+7:
 READ m: POKE n,m: NEXT n
  20 DATA 60,126,255,m,m,m,126,6
0
  30 DATA 67,167,157,189,39,35,3
4,4,194,229,185,189,228,196,68,3
2
  40 DATA 60,66,129,165,129,66,6
0,66,129,m,m,m,126,102,231,m,31,
35,69,249,137,138,140,248
  50 DATA 15,16,32,63,32,m,63,0,
248,20,28,244,20,24,240,0
  60 LET a$="AAA AAA AA AAAAAAAAA
A   AA AA   AAAAA  A  AAAAAA AAA
A  AAAA AAAAA  AAAA  AAA AA AAAA
AAA AAAA  AAAAAAA  AAA AAA  AAAA
A  AAA  AAAAAA AAAA  A AAA AAA A
AAA   A AAA  AAAAA AA AAAA A AAA
AA AAA A AA  AAA     AAAAAA AAAAA
 AAAAA AAAAAA AA"
  70 DIM b$(6,704): FOR m=1 TO 6
: FOR n=3 TO 21 STEP 3: LET a=IN
T (RND*190)+1: LET b$(m,n*32+1 T
O (n+1)*32)=a$(a TO a+31): NEXT
n: NEXT m
  80 PAPER 6: INK 1: BORDER 1: C
LS : LET ii=3: LET ll=1: LET s$=
0: LET am=20: LET ai=20: LET x=
3: LET y=0: LET s=3: LET ss=3: L
ET s1=22: LET s2=27
  90 PRINT b$(ii);AT 21,0;"AAAAA
AAAAAAAAAAAAAAAAAAAAAAAAAA";AT
0,0;"AIR: ";AT 0,8;"LEVEL: ";AT 0,
18;"SCORE: ": FOR n=1 TO 12: PRIN
T AT INT (RND*16)+3,INT (RND*32)
; BRIGHT 1;"F": NEXT n
 100 PRINT AT x,y;" ";AT x-1,y;"
": LET y=y+(INKEY$="2" AND y<31
)-(INKEY$="1" AND y>0): IF SCREE
N$ (x+1,y)=" " OR ATTR (x+1,y)=1
13 THEN GO SUB 500
 102 IF ATTR (x,y)=113 OR ATTR (
x-1,y)=113 THEN LET s$=s$+10
 104 PRINT AT x,y;"E";AT x-1,y;"
D";AT 0,4; FLASH (INT ai/=2);IN
T ai/; FLASH 0;"  ";AT 0,14;ll;A
T 0,24;s$;AT 0,29;"DDD"( TO ll)
;"  ";AT ss,s2
 106 PRINT AT s,s1;"  ";AT ss,s2
;"  "
 108 IF INKEY$="0" OR INKEY$="9"
 THEN GO SUB 1000
 110 LET ai=ai-.05: LET s1=s1+
(RND>.5)+(RND>.5)-(RND>.5)-(RND>
.5)-(RND>.75): LET s2=s2+(RND>.5
)+(RND>.5)-(RND>.5)-(RND>.5): IF
 s1>30 THEN LET s1=30
 120 IF s1<0 THEN LET s1=0
 130 IF s2>30 THEN LET s2=30
 135 IF INKEY$="7" OR INKEY$="8"
 THEN GO SUB 4000
 140 IF s2<0 THEN LET s2=0
 150 IF SCREEN$ (s+1,s1)="  " THE
N GO SUB 600
 160 IF SCREEN$ (ss+1,s2)="  " TH
EN GO SUB 700
 165 IF ll=6 THEN PRINT AT 20,30
; BRIGHT 1; FLASH 1;"GH"
 167 IF (x=s AND (y=s1 OR y+1=s1
)) OR (x=ss AND (y=s2 OR y+1=s2)
) THEN BEEP .6,-20: GO TO 7900
 170 PRINT AT s,s1;"BC";AT ss,s2
;"BC"
```

# Baud Walk

## Price war

The price war on modems — predicted in Baud Walk on several occasions — is now showing signs of hotting up with the arrival of the cheapest yet approved 300/300 unit and some price slashing going on in the multi-standard modem arena.

Enter Answercall, best known for their business activities in telecommunications — their *Minimo* modem shipped in from off-shore costs just £75.

The modem is very compact it's about half the size of a Spectrum — and comes with a power pack too. It has LCD to show when the line has been grabbed or dropped and all in all is a very neat package.

The drawback is that Answercall do not offer any software or recommend any software in the enclosed instructions. I would have thought this would have been a natural thing to do given that it's aimed at the home/hobbyist market as well as office automation uses — ie, hooked up to a word processor for telex.

In the multi-standard modem arena, Pace is currently offering its all-singing, all-dancing Nightingale for £136.85, the cheapest yet.

Nothing much appears to be stirring on the bulletin board front, but I know of at least one modem company which is planning to bring out bulletin board software to encourage growth of those types of dial-up databases.

About to break in a couple of weeks time is a Channel 4 advertising campaign from Micronet 800 who have been busily arranging demonstration centres so people can see the database before deciding to buy a modem and subscribe to the service.

I understand many Boots stores and some John Lewis and Spectrum Group stores will be offering this facility. If you already have a 1200/75 modem with viewdata software you could contact Freephone Prestel and arrange to see a demonstration database from the comfort of your armchair, so to speak.

And just a little snippet to keep you hanging on ... a major publishing company is about to announce an education network service offering electronic mail and data file exchange possibilities. I'm sure *PCW*'s intrepid reporting team will be at the official launch.

**Robin Wilkinson**

**Baud Walk** is a new weekly column with news on networking, databases, reviews of modems and software and points of contact for information.

Any readers with experience of networking are asked to send their experiences or news of services to Robin Wilkinson, Baud Walk *Popular Computing Weekly*, 12-13 Little Newport Street, London WC2R 3LD.

He can also be contacted on Prestel mailbox 019993727.

# QUARTERBACK

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# Open Forum

```
 180 IF x=20 AND y>29 THEN GO TO
 5000
 190 IF INT air=0 THEN GO TO 900
0
 200 GO TO 100
 501 LET t=30
 505 IF ATTR (x+1,y)=113 THEN LE
T sc=sc+10
 510 BEEP .1,t: LET x=x+1: PRINT
 AT x,y;"E";AT x-1,y;"D";AT x-2,
y;" ": IF SCREEN$ (x+1,y)=" " TH
EN LET t=t-5: IF t=-10 THEN LET
x$="YOU JUMPED TOO FAR": GO TO 8
000
 515 IF SCREEN$ (x+1,y)=" " THEN
 GO TO 510
 520 PRINT AT x-1,y;" ": RETURN
 600 LET s=s+1: IF SCREEN$ (s+1,
s1)=" " THEN GO TO 600
 610 RETURN
 700 LET ss=ss+1: IF SCREEN$ (ss
+1,s2)=" " THEN GO TO 700
 710 RETURN
1000 IF x=2 THEN RETURN
1002 LET d=1: IF INKEY$="9" THEN
 LET d=-1
1005 IF (d=1 AND y=31) OR (d=-1
AND y=0) THEN RETURN
1010 PRINT AT x,y;" ";AT x-1,y;"
": LET x=x-3: LET y=y+d: FOR n=
0 TO 40 STEP 2: BEEP .03,n: NEXT
 n
1020 IF d=1 AND y<30 THEN LET y=
y+1
1030 IF d=-1 AND y>0 THEN LET y=
y-1
1040 RETURN
4000 LET air=air-1: IF INKEY$="7
" THEN GO TO 4100
4005 PRINT AT s,s1;"BC";AT ss,s2
;"BC"
4010 FOR n=y+1 TO y+10: PRINT AT
 x,n;"-": IF (x=s AND n=s1) OR (
x=ss AND n=s2) THEN FOR j=30 TO
0 STEP -1: BEEP .002,j: NEXT j:
PRINT AT s,s1;"  ";AT ss,s2;"
  ": LET sc=sc+50: LET s=3: LET ss=
3: LET s1=30: LET s2=27: GO TO 4
200
4020 IF n=30 THEN GO TO 4200
4030 NEXT n: BEEP .5,-25: GO TO
4200
4100 FOR n=y-1 TO y-10 STEP -1:
PRINT AT x,n;"-": IF (x=s AND n=
s1) OR (x=ss AND n=s2) THEN FOR
j=30 TO 0 STEP -1: BEEP .002,j:
NEXT j: LET sc=sc+50: PRINT AT s
,s1;"  ";AT ss,s2;"  ": LET s=3:
 LET ss=3: LET s1=30: LET s2=27:
 GO TO 4200
4110 IF n=0 THEN GO TO 4200
4120 GO TO 4030
4200 PRINT AT x,0;"
                  ": RETURN :
REM 32 spaces
5000 LET s=3: LET ss=3: LET s1=3
0: LET s2=27: LET x=3: LET y=0:
CLS : PRINT AT 10,10; FLASH 1; B
RIGHT 1;"LEVEL:" AND (l<>6;STR$
(l+1) AND (l<>6: FOR n=1 TO 3:
FOR m=-20 TO 40 STEP 2: BEEP .00
9,m: NEXT m: NEXT n: LET l=l+1
: CLS : IF l<>7 THEN GO TO 90
5005 BEEP .3,24: BEEP .6,20: BEE
P .2,21: BEEP .2,23: BEEP .2,24:
 BEEP .5,30: BEEP .5,30: BEEP 1,
26
5010 PRINT AT 10,11; BRIGHT 1; F
LASH 1;"BONUS:";(INT air)*100;AT
 12,2; FLASH 0;"PRESS ANY KEY TO
 PLAY AGAIN";AT 14,8;"YOUR SCORE
:";sc+((INT air)*100): PAUSE 0:
PAUSE 0: RUN
7900 LET x$="GOT BY THE SPIDERS"
: OVER 1: PRINT AT x,y;"BC": OVE
R 0
8000 FOR n=0 TO 7: BEEP .1,n+5:
PRINT AT x,y; INK n;"E";AT x-1,y
;"D": NEXT n: LET x=3: LET y=0:
LET li=li-1: IF li=0 THEN GO TO
9000
8010 CLS : GO TO 90
9000 IF INT air=0 THEN LET x$="Y
OUR AIR SUPPLY RAN OUT"
9010 BEEP .5,10: PAUSE 3: BEEP .
3,10: PAUSE 1: BEEP .2,10: PAUSE
 1: BEEP .3,10: PAUSE 4: BEEP .3
,13: PAUSE 1: BEEP .15,12: PAUSE
 1: BEEP .3,12: PAUSE 1: BEEP .1
5,10: PAUSE 1: BEEP .3,10: PAUSE
 1: BEEP .2,9: PAUSE 1: BEEP 1,1
0: PRINT AT 10,0; BRIGHT 1;"YOU
ARE DEAD-PRESS A KEY TO PLAY";AT
 8,3; BRIGHT 0;x$: PAUSE 0: RUN
```

**Spider Attack**
*by S Inger*

# Arcade Avenue

## Infinite lives

By the time you read this *Jetset Willy* will be making its, no doubt considerable, impact on the Commodore charts. I understand that it is also being transfered onto the Amstrad. Versions of *Manic Miner* are similarly being prepared for the BBC, Amstrad, Dragon and MSX which must be a huge relief for the non-Spectrum owning readers of this column that are wondering what all the fuss is about Miner Willy every few weeks. Even the Vic has its own 16K version of the *Perils of Willy*. Infinite lives pokes will be eligible once the games have been around for a while if you're happier hacking than playing games. (Incidentally I hope all you hackers are rushing to buy System 15000.)

Meanwhile amongst all this flurry of activity from Software Projects, Commodore owners should try to catch a glimpse of the game they licensed from American company Sierra Online — BC's *Quest For Tires*.

From what I've seen it has a disappointingly simple jump, dodge, rescue the helpless maiden plot, but the graphics are wonderful in that they capture almost exactly the nuances of the pictures of cartoonist Johnny Hart (no relation to Tony Hart) who writes the BC comic strip. His cartoons are packed full of inventiveness, humour and rich imagery and I am all for them being drawn upon to improve computer games.

Now on to the first couple of letters I have had about Ocean's *Decathlon*. From James Cockings of Sheffield comes this tip.

"I started to play this super game in reverse by trying to get the lowest distance I could on the discus. The man did a quarter turn and I threw the discus up at 36 degrees. The discus went up and up till it landed in the crowd and I got 186.86m." (I think you should have got 20 years!) "When I finished the game it restarted again where I left off with three athletes left — infinite lives!"

Still with Daley Thompson from Port Glasgow comes what appears to be a syndicate of athlete games players headed by J. J. Smith.

"My personal best for decathlon is 100 metres, 8.74s; long jump, 10.08m; shot put, 33.15m; high jump 2.38m; 400 metres, 27.42m; 110 metres hurdles 9.38s; pole vault, 5.04m; discus, 75.90m; javelin, 132.4m; 1500 metres, 268.11s. Total decathlon score was 716,690 with 493,465 scored on day two.

"On *Micro Olympics* by Database Publications our record scores are 100 metres, 8.04 — self; 200 metres, 16.12 — A. McIntyre and self; Javelin 102.48 m — G. Wilkinson and self; long jump, 9.5 — A. McIntyre, G. Wilkinson and self; high jump, 2.40 — self.

"My other high scores are *Halls of the Things* 726; *Invasion of the Body Snatchers* 4650; *Splat!* 14,855; *Penetrator* 78,430; *3D Ant Attack* 40,844; *Sabre Wulf* 179,000; *Chuckie Egg* 221,000; *Winged Warlords* 14,000 (which caused it to crash); *Full Throttle* 1st place."

Imagine the muscles that guy must have in his fingers!

**Tony Kendle**

The Arcade Corner is a new section for anyone who enjoys playing arcade games. If you have any comments, from playing tips on difficult games or programs you'd particularly like to praise (or blame!) then write to: Tony Kendle, Arcade Avenue, *Popular Computing Weekly*, 12-13 Little Newport Street, London WC2R 3LD.

# Open Forum

## Words

on BBC

This is a simple word processor using the mode 7 screen. It is quite easy to operate, you just type what ever you want until you reach the end of the page.
Press shift & to get : which prints the screen to a Epson printer
Press shift & to get ~ which saves the screen to tape or disk
Press shift & [ to get { which loads a save screen from tape or disk

```
 10 REM ************************
 20 REM * MACHINE CODE / BASIC *
 30 REM * WORD PROCESSOR V.1.0 *
 40 REM * BY S.C.PITHERS       *
 50 REM * (C) JUNE 1984        *
 60 REM ************************
 70 REM
 80 CLS
 90 DIM S% 300
100 FOR O=0 TO 1
110   P%=S%
120   [OPT O
130   .word%
140   LDA &22:JSR &FFEE                    \ SETTING MODE7
150   LDA &7:JSR &FFEE                     \ ------------
160   LDA &200:LDX &1:LDY &0:JSR &FFF4     \ DISABLE ESCAPE
170   LDA &12:JSR &FFEE                    \ CLS
180   LDX &0
190   .L
200   LDA DA,X
210   CMP &ASC"*":BEQ BW                   \ PRINT TITLES
220   JSR &FFEE:INX:BNE L
230   .BW LDA &13:JSR &FFEE                \ LABLE WITH CARRIAGE RETURN
240   .BG JSR &FFE0:STA &76                \ WAIT FOR INPUT
250     .R  CMP &13:BEQ RT                   \ COMPARE WITH 13, BRANCH IF =
260     LDA &76
270     CMP &ASC"!":BEQ pr
280     CMP &ASC"~":BEQ sa                   \ 3 CMP TO CHOOSE WEATHER TO LOAD
290     CMP &ASC"{":BEQ lo                   \ SAVE OR PRINT TO A PRINTER
300     .BB
310     JSR &FFEE
320     JMP BG
330     .pr                                  \ PRINTER PROCEDURE
340     LDA &2:JSR &FFEE:LDA &1:JSR &FFEE
350     LDA &27:JSR &FFEE:LDA &1:JSR &FFEE
```

# Microradio

**GW6JJN**

## Spot check

Since computers have been around in amateur radio, they have mostly been put to use for logging and calculation purposes, as well as for transceiving existing modes of communications such as Morse or RTTY. Many people, myself included, have long argued that this was a waste of the available technology. What is needed is a new and more efficient mode or modes that use computer technology to provide faster, efficient and more comprehensive communication. This has been achieved in two ways. Firstly with *AMTOR* and secondly with the packet radio systems.

This week I shall concentrate on *AMTOR* and a new program for the Dragon which brings it within the range of the ordinary amateur. *AMTOR*, to put it very simply, is a highly sophisticated form of Radio Teletype which has handshaking protocols and extensive error checking. One of the great problems with RTTY in difficult conditions is whether the message has actually arrived at its destination. With *AMTOR*s error checking ability, this problem is solved.

*AMTOR* is an amateur version of an existing system which is used on marine frequencies for weather reports known as *NAVTEXT* and for commercial transmissions known as *TOR/SITOR*. Until now, it was quite difficult and expensive to get on the air with *AMTOR*. Thanks to the prolific radio software house Grosvenor Software, it is now possible to use *AMTOR* on the Dragon. If you have a conventional RTTY interface then only a 1KHz clock circuit is required in addition to the software. The clock and/or a full unit is available from PNP.

*AMTOR* on the Dragon supports three modes of communication, FEC which is like RTTY with less errors, ARQ which is the full *AMTOR* with handshaking and error detection/ corrction, and a mode called LISTEN which is a monitor mode. As usual with Grosvenors software there is full split screen operation, type ahead facility, ten user memories and the contact review facility.

A status line continuously displays vital mode and error information and there is a USOS (unshift on space) facility which means that the program always transmits the correct shift after spaces. As usual there is the 24 hour real time clock display which is instantly transmittable.

Dragon *AMTOR* is available on cassette for £39, on disc (Dragon DOS) for £44 and best of all, on *om* cartridge for £49. For people who wish only to listen in on *AMTOR* traffic, there is a receive only cassette at £24.

What I find fascinating is that Grosvenor are producing their programs on cartridge which means instant and safe use. They are now offering combinations of their programs in this form as follows: *AMTOR* + RTTY or *AMTOR* + Morse at £59 and *AMTOR* + RTTY + Morse at £69.

When you consider that the Grosvenor programs are probably the ultimate in amateur radio software and remember that the Dragon is retailing around £100 nowadays, then it is beginning to make sense to get a Dragon to use as a dedicated amateur terminal. The total cost with all the interfaces/terminal unit hardware involved is still under £200. Such a possibility was only a dream a year or two ago.

**Ray Berry GW6JJN**

This series of articles is designed for radio and microcomputer enthusiasts alike. If you have any queries that you want answered, hints and tips to share, or topics that you would like to see covered, write to: Ray Berry, Microradio, *Popular Computing Weekly*, 12-13 Little Newport Street, London WC2R 3LD.

```
360     LDA £51:JSR &FFEE:LDA £1:JSR &FFEE
370     LDA £45:JSR &FFEE
380     LDA £00:STA &70:LDA £&7C:STA &71
390     .AA
400     LDY £00
410     .BB
420     LDA £1:JSR &FFEE
430     LDA (&70),Y:JSR &FFEE
440     INY:BNE BB
450     INC &71:LDA &71:CMP £&80
460     BNE AA:LDA £3:JSR &FFEE
470     JMP BB                          \ END OF PRINTER PROCEDURE
480     .sa LDA£1:STA&75:RTS            \ SAVING PROCEDURE
490     .lo LDA£2:STA&75:RTS            \ LOADING PROCEDURE
500     .RT JSR&FFEE:LDA£10
510     JSR &FFEE:JMP BB
520     .DA
530     EQUS "      "
540     EQUS "Simons M/C Word Processor*"  \ DATA FOR TITLE
550     RTS1
560     NEXT
570   CALL Word%
580   IF ?&75=1 PROCSAVE:CALL BB
590   IF ?&75=2 PROCLOAD:CALL BB
600   CALL BB
610   END
620
630
640   DEF PROCSAVE
650   *SAVE "SCREEN" 7C00 7FFF
660   AX=00
670   ENDPROC
680
690
700   DEF PROCLOAD
710   *LOAD "SCREEN" 7C00
720   AX=00
730   ENDPROC
```

Words
*by S Pithers*

# The Music Box

## Sound synthesis

New products ready for the expected Christmas boom seem to be flooding in mercilessly. Don't worry if you haven't seen any of the goodies yet — this is the computer market, after all, and the practice of early announcement and late delivery has become a tradition.

Perhaps top of anybody's shopping list has to be the Yamaha CX5M. Don't be deceived — this isn't just any old MSX micro. The CX5M is an MSX micro plus what is effectively an entire digital synthesiser complete with keyboard, MIDI interface and Yamaha's DX7/9 hardware and software.

The DX7 and DX9 synths (which retail at around £1500 and £800 respectively) use a new form of sound synthesis based on frequency modulation. Previous systems have either attempted to reconstruct a sound wave numerically (direct synthesis) or have used analogue or digital oscillators, filters and envelope generators to produce a basic sound wave and then process it. FM synthesis uses the fact — long known — that when you combine two different sound waves by frequency modulation, the result will be a whole range of sound waves with different frequencies.

The technical details are elaborate, but the system is similar to the one by which VHF radio and the video part of television pictures are transmitted. Since the process is complicated, nobody thought to do it before Yamaha developed their YM2151 chip. The nearest thing to FM synthesis was the production of vibrato — the effect obtained when the frequency of a note varies slightly and rapidly. (It's worth experimenting with vibrato on your micro to see how some interesting effects can be obtained — all you have to do is rapidly change the frequency or pitch of a note in a regular fashion while it's playing.) Digital techniques have allowed Yamaha to develop a set of algorithms for FM which can be relatively simply understood by the non-expert.

The CX5M comes complete with an FM voicing program allowing you to control the YM2151 chip which is contained in a bolted-on unit under the main computer. You get a mini-keyboard too but it is very small and the CX5M MIDI doesn't allow you to run the computer from any MIDI keyboard, which is a great pity, especially since cheap MIDI keyboards are now becoming available (the £449 MK900 from Siel, to take a notable example).

Also unavailable is the Music Macro program which, like other CX5M software comes on cartridge (there's no disc-drive at present), and allows you to use the FM system from Basic. For those of us stuck in Basic without FM, the CX5M offers an AY-3-8910 standard MSX programmable sound generator, which is hardly compensation.

Still, at around £600 for the package, Yamaha seem to have come up with a winner.

**Gary Herman**

**The Music Box** is a new weekly column with news, reviews and readers comments on all aspects of micros and music.

Any readers with experience of computer music making or companies with new product news are invited to write to: drop a line explaining what they're doing to: Gary Herman, The Music Box, 12-13 Little Newport Street, London WC2R 3LD.

# Open Forum

## Days

### on Spectrum

The Spectrum manual, on page 163, gives a program which converts a date to the right day of the week. This program, however only works for dates of the 20th century. The program below works for any date including other centuries. This is based on the formula V = A mod 7, where A = (2.6m − 0.2) + d + y (y/4) + (c/4) − 2c. *m* is the number of the month (Jan = 11 of the previous year, Feb = 12 of the previous year, Mar = 1, Apr = 2 and so on), *d* = day, *y* = year and *c* = (century − 1). By *A mod 7* we mean the remainder of A/7 which, in turn can be found by the formula A mod 7 = A − (7*(A/7)) where (A/7) is the integer part of A/7.

**Program Notes**

| | |
|---|---|
| 20-50 | Set the introduction |
| 60 | Prompts input of date |
| 70-150 | Find value for Y(ear), M(onth), D(ay) and C(entury) |
| 160 | Sets value for A |
| 170 | Introduces formula |
| 180-250 | Finds and prints the right day of the week |
| 260-270 | Prompts for another try |
| 280 | Stop |

```
  10 REM **********************
  11 REM *** DAY OF THE WEEK ***
  12 REM ********* BY *********
  13 REM *** CHARLES BAJADA ****
  14 REM **** 17th MAY 1984 ****
  15 REM **********************
  20 CLS : PRINT AT 0,9;"DAY OF
THE WEEK";AT 0,9; OVER 1;"
  30 PRINT AT 2,0;"   This progr
amme gives you the day of the we
ek of any date you may enter. Gi
ve the correct dataand let the C
omputer do the restFor FULL DATE
 enter date in the form 03/04/19
45."
  40 PRINT AT 20,4; FLASH 1;"PRE
SS ANY KEY TO CONTINUE"
  50 PAUSE 0: IF INKEY$="" THEN
GO TO 60
  60 CLS : INPUT "FULL DATE:";D$
: PRINT AT 0,12;D$
  70 LET m=VAL D$(4 TO 5)-2: IF
m=-1 THEN LET m=11
  80 IF m=0 THEN LET m=12
  90 IF m=11 OR m=12 THEN GO TO
110
 100 GO TO 120
 110 LET x=VAL D$(7 TO 10): LET
x=x-1
 120 LET d=VAL D$(1 TO 2)
 130 LET c=VAL D$(7 TO 8)
 140 LET y=VAL D$(9 TO 10)
 150 IF m=11 OR m=12 THEN LET y=
y-1
 160 LET a=(2.6*m-0.2)+d+y+(INT
(y/4))+(INT (c/4))-2*c
 170 LET day=a-(7*(INT (a/7)))
 180 PRINT AT 5,0;D$;" was/is a
";
 190 IF day>=0 AND day<1 THEN PR
INT AT 5,21;"SUNDAY"
 200 IF day>=1 AND day<2 THEN PR
INT AT 5,21;"MONDAY"
 210 IF day>=2 AND day<3 THEN PR
INT AT 5,21;"TUESDAY"
 220 IF day>=3 AND day<4 THEN PR
INT AT 5,21;"WEDNESDAY"
 230 IF day>=4 AND day<5 THEN PR
INT AT 5,21;"THURSDAY"
 240 IF day>=5 AND day<6 THEN PR
INT AT 5,21;"FRIDAY"
 250 IF day>=6 THEN PRINT AT 5,2
1;"SATURDAY"
 260 INPUT ;"ANOTHER DATE ?";x$
 270 IF x$="y" THEN GO TO 60
 280 STOP
```

**Days**
*by C Bayada*

# Book Ends

**Book** Gateway to Computing Book 1 **Price** £4.95 **Micro** Commodore 64 (Spectrum, BBC, Dragon 32, Electron also available) **Supplier** Shiva Publishing Limited, 64 Welsh Row, Nantwich, Cheshire CW5 5ES

Ian Stewart's book is aimed at the young, absolute beginner and is one of three available in versions for a variety of micros.

This first volume introduces many of the major Basic commands, it emphasises the need for careful punctuation and other practicalities, and takes a quick look at the workings of the computer, all in a humorous, informal style.

It uses cartoons, diagrams and many small tests and examples to avoid being dry or daunting. It should provide a firm base for any youngster interested in doing more than zapping aliens; however, buying all three parts will prove a costly investment. Recommended, though.

**John Minson**

**Book** Commodore 64 Machine Code **Price** £6.95 **Micro** Commodore 64 **Supplier** Shiva Publishing Limited, 64 Welsh Row, Nantwich, Cheshire CW5 5ES

To fully exploit the potential of any computer you need machine code, but sadly it is a subject that can make even dedicated programmers quail.

Now Commodore 64 users have Ian Stewart and Robin Jones's excellent introduction to the subject. By breaking it down into byte-sized nibbles (sorry!) they have tamed most of its terrors.

Machine code is primarily concerned with careful manipulation of simple processes, and the authors illuminate the logic of these through many practical examples. Moving from binary and hex numbers to hi-res graphics, and including several hand-assembly aids, the book provides a painless grounding for anybody interested in communicating directly with their 64's CPU.

**John Minson**

**Book** *The Electron Puzzle Book* **Micro** Electron **Price** £6.95 **Supplier** Sigma Technical Press, 5 Alton Road, Wilmslow, Cheshire SK9 5DY

Written principally with the Electron in mind, this book nevertheless assumes a minimum working knowledge of BBC Basic. Through posing problems and offering alternative solutions, the book aims to develop the serious computer user's ability to solve puzzles and problems in a logical manner. New information is reinforced through a series of graded problems — each concerned with making words, numbers, sounds and graphics.

The book is written in a somewhat 'chatty' style. There are four chapters containing 50 problems with their solutions. All the puzzles require you to produce some result on the TV screen — simple words, random words and numbers, etc. Once these have been solved, the problems are made more complex when they are developed further with graphics and sounds. Not a book for beginners, but good for more serious programmers wanting to learn how to apply programming skills in an interesting and logical way.

**Ian Waltham**

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# Tony Bridge's Adventure Corner

## Games without frontiers

One of the more amusing pastimes to which I treat myself occasionally, is reading the adverts in the Computer Press (without which . . .) — the prerequisite nowadays for a game to sell well would seem to be either the reward of a disgustingly huge cash prize, or the endorsement of some disgustingly healthy athlete (who has probably never been within five miles of a home computer!). If not one of these two, then the program is "The Official" version of some boring TV soap opera or horror film. Because of all this, software houses feel it natural to charge rather more than what used to be the norm for computer games. A price of £5 or so is, I think, not too steep — after that, beware! Programs such as *The Hobbit*, and *Elite* (the new spacezap-management-strategy-adventure for the BBC) are exceptions.

It comes as a nice surprise, then, to see a small band of software writers clinging to the pioneering spirit of a couple of years ago (remember when Bug-Byte and Quicksilva occupied little trestle tables and sold their software from cardboard shoe boxes?). When Gilsoft released *The Quill* a few months ago, I expressed the hope that programs written with it would stay in the lower price bracket — after all, the hard work has been done by Gilsoft.

The name of 8th Day Software cropped up not long ago in the Corner, and I am pleased to say that they have recently released a suite of six adventures, all written with the aid of *The Quill*, and all costing an incredible £1.75 each.

Like Scott Adams programs, the 8th Day products, which, incidentally, go under the collective name of Games without Frontiers, are graded in terms of difficulty. Thus, *Ice Station Zero* is a Beginners Game, *Cuddles, Quann Tulla* and *In Search of Angels* are moderately difficult, while only advanced adventurers should tackle *Four Minutes to Midnight* and *Faerie*.

As I've said before, titles are very important in attracting interest in an adventure, and these are guaranteed to grab the attention. The beginner's game *Ice Station Zero* is of the standard "get-everything-you-can-and-expore-as-much-as-possible" variety, in which you, the player, have to cross the Polar ice-cap in search of Stirling, an international terrorist. *Quann Tulla* places you in the shattered hull of a spaceship deep in space. Eventually, battling against robots and highly advanced computer systems, you are pitted against the might of an evil, corrupt Empire.

*In Search of Angles* is another James Bond-like romp, while *Cuddles* pitches you straight into the horrors of the nursery, from which you have to escape (lots of chances, here, to throw dishes of sloppy baby food around the place!). *Four Minutes to Midnight* is set in the devastation caused by a bacteriological disaster. Intriguingly, the player has to recruit five other characters to help in our eventual success. The other "Advanced" adventure in this collection is *Faerie*, which is a Midsummer Night's fantasy on the Spectrum, with all kinds of weird creatures, and hoards of fairy gold.

There are no fancy screen layouts, or redesigned character sets here — all the adventures are pretty workmanlike in their execution; all excellent value and guaranteed to give the keen adventurer, as well as the beginner, lots to think about. Each game starts off with an artfully-drawn title page to set the atmosphere (for example, *Quann Tulla* opens with a James Blish *City in Flight*) — unfortunately, the old spectre of The Spelling Mistake raises its head every so often. It beats me why, even in inexpensive software, someone isn't made responsible for checking *every* word.

*Quann Tulla*, as well as some of the others, displays one of the odd quirks which *The Quill* may be found guilty of, and which the lazy programmer falls foul of — the limited-move syndrome. In many *Quill'd* adventures, this takes the form of "so-many-moves-before-the-player-dies-of-hunger/thirst". This is fair enough, of course, but the anomaly comes after the player has solved this particular problem — it invariably doesn't arise again! Now, this has always struck me as rather silly — after all, if ten (or whatever) moves without food/water is enough to kill you off, why, after satisfying that hunger/thirst, should you then appear invulnerable during the rest of the adventure?

Anyway, the present adventure presents this problem as a requirement for the adventurer to discover how to survive in an airless environment — a certain number of moves are allowed before you die of oxygen starvation, and the same number of moves are required to discover the gas mask and put it on. As this little sequence is at the beginning of the game, you can very quickly start again, and gradually eliminate all the wrong moves.

*Ice Station Zero* is conducted in a similar way — once out of the tent at the start, you are shadowed by a pack of hungry wolves. Make the wrong move, and you are instantly set upon and killed off. The rest of the adventure, though, seems pretty logical (for example, you may take your gloves off when warm, but you must don them again once outside). A good beginner's game, with lots of atmosphere.

The others in the series are also pretty competent. *Faerie*, one of the Advanced games, is nicely laid-out, with little coloured hearts framing the location descriptions, and rather hard puzzles, too.

Overall, the series of Games Without Frontiers is well worth investigating, even though Eddie Waring himself doesn't get a mention, and despite the fact that the frequent spelling mistakes sometimes lead to the player having to actually mis-spell to make the program understand (as in "GET THE BROACH"!). The price excuses this sort of unfortunate lapse, and the atmosphere and logical puzzles in all the adventures makes up for any bad layout — after all, the whole series is still cheaper than some individual programs. And 8th Day provide a complete back-up service, with hint sheets and clues. (8th Day Software, 18 Flaxhill, Moreton, Wirral, Merseyside L46 7UH.)

## Adventure Helpline

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

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**Problem** .....
.....
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## Legal advice

*P West of Scarborough, writes:*

**Q I am writing to ask you for legal advice. I am 15 years of age and my friend is almost 16. We have written several adventure games and are trying to sell them by buying cassettes, recording the tapes ourselves etc. However, we do not know how we stand legally to avoid other people copying our games and what licences or other things we would need to obtain. Could you help us?**

A There are no real legal steps that you can take to protect your software. The law as it stands offers little protection. My advice would be to put copyright notices on any loading screens, and also to place copyright notices within your program code. Unless you can prove that someone has actually copied your code, there is no action you can take.

## Screen in motion

*Craig Lambie of Paisley, writes:*

**Q I own a Vic 20 and I was wondering why the whole screen moves when I type 9*16 ↑ 3,8+8.**

**Also, is there is a chess program available for the unexpanded Vic?**

A Are you sure you did not type in *Poke*, etc? Location 36864 (9*16 ↑ 3) is one of the Vic screen pointers, so that is why the screen moves when you set it to 16 (8+8).

There does not appear to be a chess program for the unexpanded Vic at the moment, although I'm sure that some wide-awake software house will immediately set about writing one now.

## Ace stockists

*Paul Dunlop of Horsley, Glos., writes:*

**Q I am very interested in buying a Jupiter Ace and I have a few questions to ask.**

**Do any retailers still stock the Ace, if so how much?**

**How many Aces were made before Cantab went bust? What modifications meed to be made to a Sinclair 16K Ram pack to make it Ace compatible?**

A Very few retailers still stock the Ace; you would find it much easier to buy one direct from Boldfield Electronics who now market the Ace. A 16K Ace will cost you around £50.

Sales figures are difficult to come by, but at least 20,000 must have been sold. The low cost of Ace add-ons makes it unprofitable to try and adapt existing Sinclair, or other bits and pieces.

## Just a myth?

*Lap Ki Kan of London, writes:*

**Q In one of your earlier issues, you revealed to us a device to allow CBM 64 users to run Spectrum programs. Please can you give me more information on it and its cost?**

A The mysterious Spectrum emulator has not yet emerged into the sight of an eagerly waiting world and rumours abound as to whether it is just a myth.

From a technical standpoint the idea of being able to fit a Z80 emulator as *well* as a commercial Spectrum program into the Commodore 64 seems highly unlikely.

Just hype, I would suggest. Don't hold your breath.

## Basic problem

*William McCulloch of Bonnyrigg, Midlothian writes:*

**Q I have a Vic20 computer and have been programming in Basic for some time. When I use the Ram area at the top of the 16K expansion, user defined graphics characters do not work. I would be obliged if you could give me some advice on this matter.**

A As I don't know what you are doing, or how you are trying to create your user defined characters, I can only suggest what might be going wrong. It seems most likely that you have forgotten to relocate the screen in Ram or to have moved the character set. Both these actions are performed by the following code:

```
POKE 648,30:POKE 642,32:
POKE 36869,240:POKE
36866,150:POKE 0,108:POKE 1,0:
POKE 2,192:SYS(0)
POKE 52,28:POKE 56,28:CLR
FOR i=7168 TO
7679:POKEi,PEEK(i+25600(:NEXTi
POKE 36869,255
```

If this does not cure your problem then write to me again with full details of what you are doing.

## Cobol compiler

*Geoff Haydock of Salford, writes:*

**Q I hope to be joining a course in Computer Studies shortly, during which I will be learning COBOL. I would like to purchase a COBOL compiler for my CBM 64, but have been unable to find one. I would be grateful if you could supply information of any available programs, together with the appropriate addresses and prices.**

A COBOL for the CBM 64 . . . no problem . . . except the cost. You will need to run CP/M on your machine before you can run COBOL. This in itself is not that cheap. CIS COBOL is distributed by Microfocus, who can be contacted on Swindon 695891.

However, there is yet more bad news. You will need discs, of course, and a printer, but the worst news is that CIS COBOL costs £488.75. Bad news, eh? Unfortunately, that is the cheapest version available for the CP/M CBM 64.

## On/off power

*Ian Adey of Halifax, West Yorkshire, writes:*

**Q I would be grateful if you could tell me the *Poke* address which switches on/off power to the CN2 cassette on the Commodore 64.**

A Memory location 1 is the I/O Port address byte and Bit 5 of this is the cassette motor control bit. If it is set on, the motor is turned off, if this bit is off the motor is turned on. Obvious really, isn't it?

The other bits in this byte are used for very important purposes, so they are best left untouched. So, to turn the motor on you could write (in Basic) *Poke 1, (Peek 1 and 251).*

To turn the motor off you would have to save the contents of address 1 and *Poke* the saved value back when you had finished with the cassette.

## Price restriction

*Paul Tang of Burton-on-Trent writes:*

**Q I am considering buying a modem, but am unsure as to which one to get. I am restricted to the ones under £100. Could you suggest one please? Could I get one in kit form for my BBC B?**

A In the under £100 range, the Maplin Modem is probably your best bet. It comes in two forms: ready-made or as a kit — the choice is yours. You can contact Maplin on 0702-552941. Although the Maplin modem does not offer the same range of facilities as the more expensive varieties at £40 or so, it offers very good value for money to those just entering the world of computer communications.

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**48K SPECTRUM** in mint condition. Loads of quality s/w + over £80 worth of mags. Recently serviced. Total cost over £250. Offers over £125.

**48K SPECTRUM — 3 MONTHS** guarantee left still boxed all leads and manuals supplied and lots of software sell for £180 ono or swap for CBM-64 Tel: (0274) 305518 after 6pm.

**SPECTRUM SOFTWARE,** Travels Trashman, Kokoton I Will, Pole Position, Monty Mole, Frank N Stein, Gissa Kiss, Micro Olympics, Flippit, Kenttua, Braxx Bluff, Zenji, Phone Steve (0703) 767580 after 4pm weekdays only.

**48K SPECTRUM,** Interiaeone, microdrive, six cartridges, joystick, Kempston I/F, printer, paper, sixty tapes including Sherluck Holmes, Matchpoint, Lords Of Midnight and Fighter Pilot, £3.50 ono or swap for QL. Bargain. Phone (0908) 56465.

**SPECTRUM S/W FOR SALE** + Kempston joystick. Originals only. Tel: Gary 091 271 2937 after 5pm.

**48K SPECTRUM WITH** manual and all leads + Kempston interface with Quickshot + Atari joystick £100 of s/w. All original. £150. Tel: 01-403 2234.

**LOOK GOOD AS NEW** 48k Spectrum. CBM 64 interface 2, microdrive 1541 disk, Kempston joystick, 16k Spectrum, 1525 printer. Easy script, private sale. Ridiculously cheap. 0753-653331.

**SINCLAIR 16K-ZX81, MANY** games + mags. Swap or sell. Any offers? Tel: Eckington 433563 after 6pm or weekends any time.

**SPECTRUM GAMES TO SELL** including Hobbit, Valhalla, Jetpack, Cookie, Pssst, Stonkers. Will swap any combination of the above for joystick interface. Phone Piers after 6 on 0900 823604.

**48K SPECTRUM + CURRAH** speech + light pen + £150 cased quality original software + 2 books + magazine series. New worth £365. Bargain at only £185. Tel: 0833 50511.

**SPECTRUM ORIGINAL SOFTWARE** Velnor's Lair, Knight's Guest, Horace And Spiders, Twelve more worth £80. Will take £50 ono for all. Phone (0702) 528670 ask for Darren.

**SPECTRUM PROGRAMMABLE** interface as new for either Kempston or switchable interface or sell for £15.00 phone Hinckley 614597 evenings.

**SPECTRUM, STACK LIGHT** Rifle interface 2, £100 of software, cassette recorder, posters, mags, will swap for CBM 64 with recorder or sell for £170. Tel: 0705-26-3076.

**SPECTRUM SOFTWARE FOR SALE:** Doomsday Castle £3.50, Valhalla £8.00, Avenger £2.50, Braxx Bluff, £4.50, 3-D Combat Zone, £3.00 or all for £20 (ono). R. Alberici, 5 Wentworth Close, Finchley, London N.3.

**SPECTRUM GAMES.** Gnasher £1, Mrs Mopp £1, 30 Tank £2.50, JP Jacker £2.50, BD Seidda B Attack £3, Race Fun £3, Glug Glug £4, all originals. Ring Jason 4.30pm 01-291 3672.

**SPECTRUM 48K** & joystick, interface, mags, software (original), £200+, b/w TV, leads, etc... Quick sale £210 ovno. May deliver. Write John Bell, 22 Petherton Road, Highbury N5 for details etc.

**SPECTRUM GAMES,** Arcadia, T.L.L., Jetpac, Hunchback, Atic Atac, Zzoom, Manic Miner, Sabre Wulf, Alchemist. Worth £59. Also Mcoder 2 worth £10. Sell the lot for £40. Tel: Wells 72423 after 6pm.

**48K SPECTRUM** issue 3 + sound amplifier, heat reducer + save/load/on/off switches + over £100 worth original software including Deathchase, Cyrus Chess, Trashman, Atic Atak, World Cup, Level 9, Ant Attack etc. £160. Ring (East Grinstead) 0342 27072.

**SPECTRUM 32K** Ram, upgrade kit, (East London Robotics) for issue 3 Spectrum, v.g.c. £13. Kempston joystick interface £6, software: Hawstead £5, Beachhead £4, Rapscallion, Baxx bluff, Dangermouse £3.50. Phone Michael 01-3402 630.

**48K SPECTRUM** + tape recorder, s/w, mags, case. £300. Sell for £225 or swap for CBM64 + C2N tape recorder. Tel: 01 800 3691.

**SPECTRUM 48K** boxed, Kempston joystick. £300. Original s/w mags, cassette recorder. £240 ono. Tel: Loughborough 231392 eves.

**SPECTRUM 48K** + cassette recorder, s/w, mags. £160. Or swap for CBM + C2N. Tel: 0533 660585.

**48K SPECTRUM** + £40 worth of books & magazines, over £200 worth of s/w (original). Colwyn Bay 31783.

**48K SPECTRUM.** 20 months old, hardly used, several tapes, magazines. £100 ovno, 554 5645 after 4pm.

**48K SPECTRUM,** quickshot joystick, programmable interface (downsway). ZX printer (4 rolls), books, mags, s/w, electronic games, mint condition, worth £350. Sell £175. Tel: 01 647 5092 (Croydon) after 4pm.

**48K SPECTRUM.** Over 200 games. Original 50 mags. Quickshot joystick + Kempston interface. Dust cover. Excellent condition. £350. Sell £175 ono. High Wycombe. 26681.

**SPECTRUM 48K** plus software for £150. Phone Andrew 051 430 7608 — or swap for 1541 disk drive for Commodore 64.

**SPECTRUM 16K.** Perfect condition, including leads, power supply, plus good selection of software. Delivery can be arranged at cost. £65. Telephone 041 638 3343 and ask for Garrey.

**SPECTRUM SOFTWARE** many good titles include Jetpac, Snooker, Atic Atac, Mugsy and Mr Wimpy, worth over £170. Will sell for £100 ono. Will not split. Telephone Silverstone 857628 after 7pm.

**48K SPECTRUM,** Interface I, micro-One, ZX printer, DTCtronics joystick interface. Over £85 of original s/w. 4 microdrives, cartridges, Quickshot joystick, mags and books, all worth £470. Sell £230. Tel: 01-593 6480.

**SPECTRUM S/W,** Ultimate, Imagine, Quicksilva, etc. All originals. Offers. Andrew 01-743 6968.

**SPECTRUM 48K** joystick interface £100. S/w original £130. Tel: Garston 673030.

**SPECTRUM 48K** 11 months old, recently serviced, over 100 games, original only. £223 ono. Tel: Jason 01-866 0438 after 4.45.

**48K SPECTRUM** & joystick interface, many games all originals inc Atic Atac, Jetpack, Psytron, Montey Mole and many more. £160 only. Tel: 01-359 3828.

**SPECTRUM SOFTWARE** OCP, editor-assembler, Apocalypse, Caesar The Cat. All perfect, half-price. Phone 0963 62544. Originals only.

**SPECTRUM 48K** + microdrive + interface I + printer + 14 rolls printer paper + currah microspeech + synthesiser + Kempston joystick + CCR80 cassette unit + software + well over 100 magazines. Best offer secures. Worth £500+. Phone Hornchurch 57487.

**48K SPECTRUM** cassette, all leads, interface I, microdrive, 1 cartridge, DK Troniks, keyboard Mark 2, sound amp, games + some utility programs. Bargain at £160. Plus Desk. Might split. Write N Eagles, 20 Wheatley Street, W Bromwich B70 9TY.

**SPECTRUM 48K** + Fuller FDS keyboard + Sinclair interface 2 + Kempston interface + joystick, cassette recorder and lots of software £170 or swap for CBM 64. Tel: 0244 (Chester) 547167 after 6pm.

**BOXED 48K** Spectrum, AGF programmable board, interface, joystick, 30 games, originals only. Magazines, tape recorder. Offers over £200. Slough (0753) 29888.

**SPECTRUM SOFTWARE** Lords, Midnight, Hobbit, Pyramid, Flight Simulation, Penetrator, Jet-pac, collectors pack from £2 to £8.50+. Offers! Tel: Cambridge 313501 between 5-6pm.

**SPECTRUM SOFTWARE** for sale — dungeon builder (graphic adventure writer), brand new. £6, Stonkers £2.50. Tel: 0532-657038 and ask for Andy.

**SPECTRUM SOFTWARE** for sale, large selection, also want text adventures for Spectrum. Your list for mine. Saulter, 45 The Marles, Exmouth, Devon, Ex8 4NE. Phone 0395 273243 evenings only.

**FOR SALE:** Spectrum software at much less than half price. All originals including Manic Miner, W.T.H.A.S. and many more. SAE for list to: Chris Hall, 51 Clevely Park, Belfast BT8 4NB.

**SPECTRUM SOFTWARE** selling up (computer beyond repair). Over 120 titles, only £2 each. Phone Southend (0702) 617608 after 6pm.

**SPECTRUM S/W.** All originals, Great Britain Ltd £2, Battle of Britain £2, Trader Triology £6. Or trade for interface 2 or similar with Ram slot. G Fleming, 15 St Leonards Road, Stockport SK4 2RD.

**48K 2X** Spectrum with full size keyboard, joystick interface and joystick 1. Lots of software and books £120. Tel: 021-748 3578. Also stack light rifle with games £20.

**ZX SPECTRUM** software for sale: TLL, Psion Flight Simulator, Pimania, Aspect Editor/Assembler, Molar Maul, Meteor Storm. Worth over £50. The lot for £30 ono. Phone Chris (0532) 783334. Leeds area.

**48K SPECTRUM** + Kempston joystick, DK light pen, 20 s/w titles, original Arcade Adventure, FDrH, word processor. £130 the lot. Tel: Chris 0222 733 484.

**48K SPECTRUM** and Sinclair printer. Also £100 worth of top software including 3D Ant Attack and Chequered Flag. Will sell for £200 inclusive ono. Tel: Burgess Hill 2760 after 6pm.

**SPECTRUM BRAND** new 32K Ram upgrade kit from East London Robotics £13. Software for sale: Hampstead £5, Beachwood £4, Rapscallion, Coderave Mat, Dangermouse, Pyjamarama, Braxx Bluff £3.50. Phone Michael 01-340 2630.

**48K SPECTRUM,** interface one, two microdrives, twelve cartridge, ZX printer, software and books. All half price of less. Phone (0442) 46030. Will sell separately and deliver if required.

**48K SPECTRUM,** DK Tronics keyboard, sound amplifyer, Kempston interface, champion joystick. Will split. Games all originals. Going cheap 2-35 each. All reasonable offers considered. Ring Ali on 01-274 2982 after 6pm.

**ORIGINAL SPECTRUM** software for sale, under half price including top titles, Sabre Wulf, Lords of Midnight, Valmalla etc. Craddock 40851 evenings.

**48K SPECTRUM,** Alpacom printer, £40 worth of software, worth £240. Sell for only £170. All boxed and in good condition. 143 Cat Hill, Cockfosters, Herts. Tel: 01-449 1571.

**48K SPECTRUM.** £60 of software, Protek joystick interface, Spectrum Books, games writers pack. All in good condition. Worth over £200. Sell for £80. Tel: Birmingham 475-3464 Paul. Not Saturday mornings.

**SPECTRUM SOFTWARE** for sale including Fred, Ant Attack, Jetpac, Tranzan, Rommel's Revenge, Horace Games, Galaxians, and many more (all originals) £2.50 each or sell collectively. Phone Steve 01-660 3542 weekends only.

**48K SPECTRUM,** Centronics interface, ZX printer, joystick etc for sale. Also original software and books. SAE for list. Quarton 15 Letter Daill, Cairnbaan, Lochgilphead, Argyll, Scotland.

**48K SPECTRUM** plus FDS keyboard £75. Two microdrives plus interface 1 £75, Alphcom 32 printer £25, Currah Mspeech £12, Stonechip Echo, amplifier £7, tape recorder (compatable) £10. Plus tons of software. Grays Thurrock (0375) 30869.

**48K SPECTRUM** + interface 1 + microdrive + Cambridge joystick + micro speech + DK keyboard + cassette recorder + lots of recent software. Total package worth over £450. Will sell for £290. Tel: Ruislip 08956 38204 evenings.

**48K SPECTRUM** and joystick interface for sale, £100 ono. Brand new unwanted gift. Tel: Dartford 331597 or write: H Coe, 24 Craydene Road, Slade Green, Kent DA8 2HR.

**48K SPECTRUM,** cassette recorder, £50 worth software + books and mags. Only £95 ono or swap for Atari peripherals. 021 357 8026.

**48K SPECTRUM,** Kempston interface and over 100 games for sale including Kokotono Wilf, Monty Mole, for £129. Still under guarantee. Ian Vatcher 0202 721010, 49 Belmont Road, Park Stone, Poole, Dorset.

**LOOK £850** worth of Spectrum software for sale. Includes games, adventures, utilities, educational software. Over 140 tapes, all original. First £200 secures the lot. Ring (0325) 321907 before it's too late!

**SPECTRUM 48K** 9 30 software games and program manuals. £100. Tel: Slough 23062.

**SPECTRUM S/W,** White Lightning £12, Quicksilva, Fares Designer £10, Protex Hunter Killer £4. Will send post free. Tel: (0622) 26657 after 6pm.

**16K SPECTRUM,** hardly used, perfect working condition. Leads, manual, original packaging £60. Tel: 01-956 4676.

**SPECTRUM 48K,** sound chip by computer sound £100. Also s/w, Atic Atac, Trans Am, Lunar Jet Man, Cookie, Jet Pac, all originals. £2.75 e. Tel: Stanford (0780) 544921.

**48K SPECTRUM.** Over £150 s/w, originals only. Tape recorder, Cambridge Intelligent joystick, interface + quickshot joystick. £210 the lot. Tel: 01 749 3976.

**48K SPECTRUM,** keyboard, tape recorder, joystick interface, telesound module, over £250 of softare and books. £210 ono. Phone 0753 889988 (office hours) and ask for Nik.

**SPECTRUM SOFTWARE** Daley's Decathlon, Pimania, Piromania, Olympimania, Kosmic, Kanga, Spectipede (originals), any offers? Wanted, any Automata, Dark Star, Kokotoni Wilf, Black Hawk, Frank N Stein, Tir Nanog, Block Buster. 0763 61392.

**FOR SALE** 48K Spectrum, sound expander, printer, comcon, joystick, lots of software, reader. Buyer must collect. £200. Phone Rosin England 3654 (STD) or Write Emurch on Way Churchill Ro Thetford.

**SPECTRUM 48K,** tape recorder, amplifier, joystick interface, £50+ software, worth £260 except £150 ono. Genuine reason for sale. All v.g.c. Tel: Rayleigh (0268) 781244 after 6.00 pm.

**SPECTRUM 48K** programs £2 mad Martha, chess player, football manager, Starship Enterprise, Test Match, Spartrex Munchman, 007 spy, All originals. Gordon 0222 751550.

**FOR SALE** Spectrum s/w hobbit £8, Arcadia, stonkerd, lunar jetman, atic atac @ £3. Flight simulation, hunter killer @ £4.50, full throtle chequered flag @ £4.50, many more, originals ask for Spencer 051 924 8832.

**48K SPEC** £200 s/w tape recorder + sprint 4X Faster loadings unit Int2 dust cover + mags igc worth £430 sell for £280 ono. Phone (0933) 317858.

**SPECTRUM 48K,** Printer (both boxed), ten rolls paper, tape recorder, joystick (no interface), executive case, manuals, books, £200+ of original software. Value £500+ new, sell for £325 ono. Phone Stevenage 351465.

**48K SPECTRUM,** plus Kempston, Sinclair II interfaces + joystick. Also ZX printer with paper. All leads manuals supplied. + Rom's software includes Hobbit sabrewolf valhalla jet pac ant attack bugaBoo. Quick sale £180 ono. Tel: Lincoln (0427) 88689.

**SPECTRUM 48K** with fuller FD42 keyboard + b/w t.v. worth over £200.00 sell for £194.99 + software (free) Tel: (051) 207 3149.

**48K SPECTRUM** with joystick interface, joystick, £100 of software, boxed with 6 months guarantee plus 100% reliable tape recorder, mags etc. Hardly used £130 Ring 01-863 5113. Ask for Deepak.

**25 SPECTRUM** originals including avalon, pyramid, magra etc. Worth over £150 sell for £50. No swaps. No offers. Quick sale wanted. Phone Richard, Peterborough 235175.

**48K SPECTRUM** for sale, £85. Also ZX printer £25. Phone Clitheroe (0200) 22721 or Write 7 Hereford Drive, Clitheroe, Lancs BB7 1JP.

**48K SPECTRUM** for sale, ZX thermal printer + 3 rolls of paper, 18 software cassettes, 25+ magazines, worth over £300. will sell for £190. Tel: 061 439 2769 after 4 pm.

**ZX SPECTRUM 48K** + Quickshot 2 joystick and interface + over £200 worth of software, books and magazines. Asking only £200 will deliver if local. Ring Warrington (0925) 816405 after 4 pm. (very good condition)

**48K SPECTRUM,** £50 fuller keyboard, over £350 of top software, quickshots I + II, 16K ZX81 Klick keys, magazines + books. Swap for QL, for details, Andrj De Silva, 59, Sunninghill Avenue, Hove 4, Sussex.

**SPECTRUM 48K** with cassette player. Offer! Ashstead 77824.

**SPECTRUM** s/w, all originals £2.50. Titles inc: Trans Am, Hungry Horace, Pool, Vetpac, many more. Tel: Hartfield 812.

**48K SPECTRUM** + kempston joystick lots of s/w eg. lunar jetmen, manic minos etc. Tel: Ascot 21160. Sell £110.

**SPECTRUM** Software. Time trap adventure 48K, £2.00 + cassette, £2.50 without cassette. Also adventure quest and American football £6.00 each. Both 48K Neville Blenkinsopp, 14 Rush Park, Bishop Auckland, Co. Durham.

**SPECTRUM 48K,** In fairly good condition + tape recorder, joystick interface, quickshot 2 and 135 games. Also book, magazines and all leads. And manuals. Only £140. Tel: Blackburn 61967.

## Commodores for Sale

**CBM 4032** computer. Excellent condition perfect order. Looks new! Also books and software (games, business, utilities etc). Accept £225 ono cash or P/exch. For BBC. (0244) 675717.

**VIC-20** (unexpanded) + C2N cassette unit + manuals + book of games + 3 games cassettes £75 (Tyneside) 091-2852003.

**VIC 20** + starter pack + 32K ram + boss joystick + C2N + centronics interface + £165 (original) software £20 of books + mags All worth over £400, will accept £180. Phone 01-807 1724.

**PET/CBM** software for sale. Complete collection business, games, utilities, educational etc. Over £250 worth. Accept £55 ono the lot! Also some pet spares. soundbox, keyboard, crt roms etc. (0244) 675717.

**COMMODORE 64,** tape deck, joystick, 20 games, physics + chemistry O'level revision, instruction to basic, spare leads, slide boxed. Under guarantee. Worth over £400. Accept £230. Tel: 01-853 4416 after 5.30.

**VIC 20** + cassette deck + joystick + £150 of original s/ware, magazines v.g.c. suit beginner only £95. Tel: 01-892 6575.

**VIC 20** + cassette + 16K suitcharge ram pack + quick shot joystick + games programmers reference guide will sell for £120 ono Tel: 0429 870 685 after 6 pm.

**CBM 64** software for sale. Twin kingdom valley, the hulk, £5 each. HGS assembler package £10. (cost £210). Tel: 0703 556022 after 5 pm, ask for Andy. original S/W only.

**VIC 20** starter pack inc. £80 of s/w. Bargain at £100. Tel: 01-203 1282.

**CBM 64,** Boxed and still under guarantee, C2N cassette unit, reference guide, books, listings and software, £220 ono. Phone Jason on (01, if outside London) 949 5086 after 5pm.

**VIC 20,** C2N 8K Ram pack, intro to Basic 1 + j/stick. £55 worth of s/w, books + mags. All cost £260. Sell £100. Tel: Cowbridge, St Gtaim 04463 3551.

**CBM 64** + C2N + 2 joysticks and a few tapes, v.g.c., all boxed, £150 no offers. Buyer collects. Tel: after 7pm or weekends Walton-on-Thames 222489.

**VIC 20 C2N** cassette deck plus a few games for sale, good condition, £80 o.v.n.o. Phone Brighton (0273) 410430.

**VIC 20,** cassette unit, 16K switchable Rampack, lots of games including Rom game, joystick, dust cover. £120 ono. Tel: (0922) Blox. 403924 after 5pm.

**VIC 20** starter pack plus 16K Ram pack plus £70 worth of software and joystick in excellent condition. £110 ono. Tel: Stevenage 359579.

**COMMODORE 64,** easy script word processor, brand new, never used, only £30. Worth £65. Phone Harpenden (05827) 5232. Ask for Ian, after 5pm.

**VIC 20** + cassette deck + joystick + 16K switchable Ram pack + approx 300 games + 24 weekly computer course + 2 Vic books + amount of magazines excellent condition (boxed). Nice xmas present for £170 ono. Alic Seagrane, 34 Allendale St. Colne, Lancs, BB8.

**WANTED 16K** Spectrum tape recorder, manuals, software etc. Phone (02774) 54406 after 5.30pm or 32 Little Norsey Rd, Billericay, Essex, England CM11 1BL ask for steven McNally.

**CBM, VIC 20,** C2N, 3K Ram, Quickshot j/s, dust cover, 10 original games, Chesmistry, Revision, 2 cartridges, £130. Tel: 0632 573081.

**VIC 20** + cassette, joystick, 3 cartridges, Chess, monsters, music composer + books. £100 — 01 221 0046.

**VIC 20** + tape recorder + 16K expansion, Quickshot joystick, s/w inc: Matrix, Jet Pac, completely boxed as new. £100 ono. Tel: Jason 0952 811258, 7pm.

**CBM 8250** dual disk drive with JCL interface, £490 or will swap for a compact disc music system. Tel: 021-440-2124.

**VIC 20,** C2N cassette recorder, 20K Ram (switchable) ZX printer + interface + paper, speech synth, Vickit II, joystick + reference guides + manuals + over £50 software. Worth £350, sell £180 ono. Tel: Stoke-on-Trent (0782) 314666.

**COMMODORE 64,** original software, Scramble, Cuburt, Revenge, Hobbit Frogger, Kong, Token of Ghall. Must be a bargain at £12 for the lot. Telephone 0493 661024.

**VIC 20,** 32K, C2N, 30 top games, Intro to Basic, worth £300, sell for £130 ono. Tel Mayfield 872041 during day. Under 1 year old, send to Gorsedene, Crowborough, E Sussex.

**VIC 20** + cassette deck, Basic Put I 16K Ram. Kempston joystick, 50 original games, mags. £130. Tel: Stevenage (0438) 1913.

**VIC 20,** C2N, 16K switchable Ram, five cartridges, £180 (of) software inc. Skyhawk, Trader + Intro Basic Pt 1, joystick, mags, books, all v.g.c., colour TV game, 5 cartridges, adaptor, boxed. All for £245, 0292 45477.

**VIC 20** plus C2N recorder, both in mint condition. Plus super expander, two games cartridges, ten games cassettes, programmers guide. Worth £250, sell for £90. Phone birmingham 475-3464 ask for Paul.

**VIC 20,** C2N cassette, two cartridges, joystick, lots of software mags, books etc. £150 ono, plus Intro Basic 1. Tel: Canvey 684825.

**VIC 20** for sale, C2N cassette + introduction to Basic Part 1 + over £200 worth of games + mags. Still boxed under guarantee. £90 ono. Bellshill 745962.

**VIC 20** and C64 owners!! For sale: "Easyfile" only £35, "Intro to Basic Part 1" £7, "Mission Impossible" £3, or swap for original "Raid on Fort Knox". Phone now¡¡ 0558 822509 (quick!!).

**VIC 20** with C2N tape deck, 8K stack store board with Vic Kit II, s/w, magazines, separate, any offers. 051 722 13735.

## Acorns for sale

**ACORN ELECTRON** for sale, very good condition, complete with leads and introduction books. £400 worth of software — many originals. Only for £200. Phone (05827) 5232. Ask for Ian, after 5pm.

**ACORN ELECTRON** first byte joystick interface for sale, only £10, includes tape and instructions and box. Phone Harrenden (05827) 5232 after 5pm. Ask for Ian.

**ACORN 0.90** disc interface. £65. Ring 863-57113 (London).

**ACORN ELECTRON** BBC Date Recorder, Quickshot II, Joystick, original s/w, all leads + all boxed, 3 month old, hardly used, £250. Books & mags included. Tel: Percival on 01-902 5036 anytime.

**ACORN ELECTRON** cassette lead, suitable for all cassette recorders with ear and mic sockets, only £1. David Roberts, 25 Oxwich Road, Mochdre, Colwyn Bay, Clwyd.

**BBC B** large range of accessories, s/w etc, all latest specifications. V.g.c. £325. Tel: Orpington (0689) 71211.

**BBC B 1.2 O/S** Cumana 100K disk drive plus 132K solidisk sideways Rom. Fitted 5 months old, little used, £575 (Basingstoke) 251623.

**BBC B,** brand new unwanted present, fill in your own guarantee, yours for £360. Tel: Long Eaton (0602) 735065 after 5.30pm.

**BBC PRISM** acoustic modem + Rom software for sale, £35 ono. Phone Giuseppe on 01-672-4212.

**BBC B 1.2 O/S.** Official monochrome monitors + cassette player, 8 months old, lots of s/w + mags. All superb condition, hardly used. £450. Tel: 01 444 8349 eves.

**BBC S/W** (original) brand new trak, planetoid, magic garden, smarsh grab, cubemaster etc. Tel: 01-892 6575 (£5-£7).

**BBC 'B'** v.g.c. original packaging instruction manual – welcome tape. Corsham 714426 (eves.)

**BBC** Disk drive, 200K 80 track £85. Tel: 01-699 3426 eves. or 01-480 5811 (X 6535).

**ACORN ELECTRON.** BBC data recorder. Books, mags. programs include, chess, guardian, blagger, flight simulater, twin kingdom valley, draw + many more + dust cover. Cost £326. Sell £225. Tel: 061-225 3063.

**BBC SOFTWARE** micro olympics, cylon attack, birdie barrage, spinx adventure, space invaders £3.50 each or lot for £15. All originals. Tel: 0323 870794.

**CASTLE** of riddles by Acornsoft for the BBC'B' computer. brand new and unused. Worth £9.95, only £4.00. David Roberts, 25, Oxwich Road, Mochdre, Colwyn Bay, Clwyd.

**FOR SALE:** BBC 'B', DFS, disc doctor, look disc drive, 10 discs, cassette lead, manual, books, + software, £400 no offers. Tel: 0446 711372 after six and ask for Dennis.

**BBC B** + Disk interface + disk drive (200k) 40-80 track. Switchetle books, mags. v.g.c. £550. Tel: Mike 01-602 0277.

**BBC 2,** ZX printer interface £10.00. Tel: Bournemouth (0202) 518345. after 5pm. Gary.

**ORIGINAL** Roms. graphics, gremlin, disk doctor, caretaker, all £20 each. wordwise £30. Quill £9, for Spectrum (0923) 54466. Mike (Graphic pad £85).

**BBC SOFTWARE** for sale. £4 each. Blagger, Son of Blagger, Intruders, Space Shuttle, Air Traffic Control Simulator, Vortex, Vision's Snooker, Gemini Missile Control. Tel: Darlington (0325) 55410 after 4pm.

**BBC-B,** 40 track, double sided disk drive, double density disk interface, cassette recorder, joystick, 10 disks, advanced user guide, £520+ of software. Worth £1300+, offers around £700. Telephone Robert, (0255) 507717.

**BBC 'B',** disk interface, single disk drive, star printer, S/W Ram, Roms, light pen, joysticks, software, books and cables. Worth over £1000 will sell for £800 ono. Tel: John, Durham 62913.

**BBC ROM WORDWISE** (original) including Manual for £26, includes P & P. Tel: Blandford (0258) 53742 (anytime).

**ACORN ELECTRON** + recorder & games (Aviator & Chuckey Egg), + 2 books, many mags. £320. Boxed. Offers: Peter, Tel: 551049 Billingham.

**BBC MICRO** £330 twin 40 track disk drive, power supply. Tel: Mike 01-949 0120, after 7pm.

**BBC ACORN DSS** for sale. Offers. Tel: Tim on 42642 (Hornchurch).

**ACORN ELECTRON CASSETTE LEAD.** Suitable for cassette recorders with ear and mic sockets. Only £2.00. David Roberts, 25 Oxwich Road, Mochdre, Colwyn Bay, Clwyd.

**BBC 'B' SOFTWARE** for sale. Cosmic Cruiser, Hunchback, Gunsmoke, Intruders, all originals. £3.00 each. Write to Justin Lewis, 166 King Street, Brynmalor, Gwent, South Wales.

**ACORN ELECTRON SOFTWARE,** Escape from Moonbase Alpha, Pettigrews Diary. All originals, £3.00 each. David Roberts, 25 Oxwich Road, Mochdre, Colwyn Bay, Clwyd.

## Dragons for sale

**DRAGON 32** v.g.c. with £80 of s/w (original), all leads plus books, mags and 2 joysticks. Will sell for £80 the lot. Ring after 4pm 061 724947 S Hilton.

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**DRAGON 32** boxed as new. Cassette Recorder, 2 joysticks, dust cover, 46 latest games original. Dragon, User mags, books, quick sale, mint condition — £700. Sell £175. 44866 Hornchurch.

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**DRAGON 32** for sale, 2 joysticks, £150 of software, dust cover, magazines etc, v.g.c. all for £130 ono. Phone Byfleet (0932 41506 after 4pm.

**DRAGON SOFTWARE** for sale — Jurviors Revenge, Kriegspiel, Ugh!, Chucky Egg, 8 Ball Pool, just £4 each or £18 for the lot. Please ring Rams. (070682) 2025 and ask for Richard.

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# COMPUTER SWAP

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It cannot be swapped.

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## Wanted

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**SWAP T1 99/4A** adventure cassette software, Adventureland, Mission Impossible, Mystery Funhouse, Pyramid, Voodoo, Odyseey, for extended Basic or mini memory or sell £3.50 each. 32 Glenshesk Park, Dunmurry, Belfast BT17 9BA

**WANTED JUPITER** ace or ZX printer, will pay £15 or swap Spectrum software including Hurg, Football Manager, Maniacs and more. Contact Steve, 29A Artillery Terrace, Guildford, Surrey.

**WANTED BBC B** with disk drive, will exchange Dewalt 125 Radial Arm Saw with sturdy stand, extended table and extra 80 tooth CTC blade for cabinet work. 0423 74386.

**SWAP VIC 20** with no sound complete with game, joystick and manual for a good condition ZX printer or £20. Telephone (0924) 443557 after 7pm.

**WANTED SINCLAIR** 48K or 16K (Mark 1 or 2) Spectrum + power pack, must be v.g.c. No peripherals necessary. South England only. Southampton 332285.

**WANTED ALPHA** Can 8125 printer + TC Interface cable for T1/994A. Tel: Staines 54366 eves.

**RS232 LEAD** for use with interface one to go to standard RS232 compatible printer. Swap for any recent software for ZX Spectrum. Must be original. Ring Paul 08864-588 (Worcester).

**WANTED BBC B OS 1.2** Basic II. Also DFS and other extras considered (up to £450 available) can travel to view. Please phone John 0642 484785 (Redcar) after 5pm or weekends.

**WANTED MODEM** for CBM 64 + s/w. Tel: 051 722 3735.

**WANTED SPECTRUM** hardware inc: Interface 1 + Microdrive and any other add ons. Also s/w to buy. Tel: Les 01-928 5151. Ext 3775.

**SWAP AMSTRAD** concise Firm Ware manual for Amstrad Concise Basic manual. Tel: Norwich 402089.

**SWAP CBM 64** + C2N + £160 of software for Electron with similar (or BBC B) or sell for £240. Swap 1541 disk drive for colour monitor (0904) 707699.

**PURCHASED A** Commodore 64 but wishing you had bought a 48K Spectrum + books + magazines + over 60 strategy, arcade + simulation software + tape recorder. Swap for Commodore 64 or sell for £170 ono. 02509 61566.

**WANTED SPECTRUM** 48K or 16K cheapish. In the Anglia area. Phone (0604) 45658 ask for Mr Robert Haynes.

**WANTED:- ANY** information or software for the ZX80, especially required 16K Ram pack. Also for Vic-20, Thorn/EMI's "Pharoah's Curse", Terminal's "Rescue from Castle Dread" and Atarisoft's "Defender". (Urgent). 0558 822509.

**SWAP COMMODORE 64,** C2N, joystick, 7 books, 4 cartridges and 18 tapes for £450. Cost about £600. Tel: 0790 53161 after 4pm and ask for Jason.

**SWAP MY** Vic-20 + cash for CBM 64, plus joystick. Must be reasonable condition. Phone Phil 01-577-2083.

**WANTED BBC** model B with all lead Q s/w, £250 cash available. Tel: 01 504 5214.

**WANTED CBM 3032** and 3040. Must be in good condition. Tel: Romford 46948.

**WANTED ZX** printer in good condition, pay up to £20. Tel: Mr Allen. 01-590 8301 after 6pm.

**CBM 64** Q C2N + joystick + s/w, swap for BBC. Tel: (0249) 659866.

**WANTED FELLOW** MZ700 enthusiasts in North London to exchange ideas and give mutual help/advice. Phone 01-889 1090 evenings.

**WANTED VERY** poor unemployed Spectrum owner needs your unwanted ZX printer. Must be incredibly cheap (or free?!). Tel: (0752) 893121. Someone out there must be feeling generous today!

**48K SPECTRUM** Q s/w to swap for Atari 800. Tel: 0744 815076.

## ADVENTURE HELPLINE

**The Hulk on Spectrum.** How do I get out of the dome? How can I reemove the ring and still stay as The Hulk? Stephen Douglas, 10 Hillside Close, Abotts Langley, Watford, Herts.

**Knights Quest on Spectrum.** How do I get past the vines in the forrest? Segn Devaney, 19 Gilbridge Road, Whalley Range, Mer 16.

**McKenzie on Spectrum.** How do I repair the jet-pack and the android? How do I get thej power pack? P M Brannigan, 11 Morningside View, West Derby, Liverpool.

**Hobbit on Spectrum.** I cannot get out of the elvin kings cellar. Daved Guthrie Jr, 4 County Houses, Easter Kintrae, Elgin Moray, Scotland.

**Valhalla on Spectrum.** How do I get Ofnir? Stuart Jones, 20 Diane Drive, Rhyl, Clwyd, N Wales.

**Hobbit on Spectrum.** I cannot get through the magic door, or kill the dragon, How do you get back home once you've killed it? Neil Putson, 16 Parkside, Ladgate Lane, Middlesborough, Cleveland.

**Madniss and the Minotaur on Dragon.** I can't find the mushrooms, on level 1 so I can't access the magic spells. Richard Iveson, the Cottage, Patrington, N Humberside.

**Feasibility Experiment jon Commodore 64.** Where is the wick for the lamp? What should I do with the dragon? Richard Blythe, 4Meriden Avenue, Garforth, Leeds, W Yorks.

224System 15000 on Commodore 64. I can't get started. I don't know what to do when the screen displays 'please instruct'. Set Cane, 39 Hy Regt RA, BFPO 16, W Germany.

**Hobbit on Spectrum.** I meed some help with getting past the bulbour eyes on the way back. Stephen Jeffries, 14 Preston House, Paddock, Walsall, W Midlands.

**Twin Kingsom Valley on BBC.** How do you get the master key off the dragon in the north tower? Bruce Robertson, c/o Sgt Robertson, J 189, 31 PC Sqn RE, BFPO 35.

**Snowball on Spectrum.** Can anyone tell me how to use the lift and get somewhere? Please! Conn Iggulden, 50 Elmj Avenue, Eastcote, Ruislip, Middx.

**Mounatins of Ket on Spectrum.** How do you crossd the stream? How do you form a stable relationship with the horse?? Brian Diggie, 12 West Park Avenue, Leeds LS8.

**Hobbit on Oric.** Afdter escaping from the govlins dungeon, how do I avoid being recaptured and where is the ring? David Wain, 38 Coleraine Road, Great Barr, Birmingham B42.

224Knights Quest on Spectrum. How do I rescue the dwarf and then get iast the dragon? Help! Conn Iggulden, 50 Elm jJAvenue, EAstcote, Ruislip, Middx.

**Twin Kingdom valley on Commodore 64.** How do I get through the crackj on the sand slope near watersmeet? Marin Hodges, 52 Granville Drive, Kingswinford, West Midlands.

**Twin Kingdom Valley on BBC.** When you get the uniform jout of the guard's room, what use is it to you? Can yor get into the armoury? If so, how? Glen Sugden, 25 Tredegar Road, Emmer Green, Reading, Berks.

**Espionage Island on Spectrum.** What use are the jlanding lights? How do you get past the tand? J Gaffney, 57 Portland Crescent, Barrow-in-Furmess, Cumbria.

**Gems of Stradus on Amstrad.** How do you get over the jpit? How do you pass the guard? A Byrne, 190 North Gower Street, London NW1.

**Urban Upstart on Soectrum.** How do I get past the football fan? What jis the noise at the back of the fish shop? Where is the plane? Adam Buckle, 188 Barnsley Road, Cudworth, nr Barnsley, s Yorks.

**Ring of Power on Commodore 64.** How do I pass the pirate? How do I read the notes in the milk bottle? Mrs P A Taylor, 167 Uplands Road, West Moors, Wimborne, Dorset.

**Quest Adventure on Commodore 64.** How do I get the jewel encrusted sword and mace? Mrs P A Taylor, Uplands Road, West Moors, Wimbourne, Dorset.

**Espionage Island on Spectrum.** Can anyone helpjme find the combination for the safe? Stephen Howard, 69 Cranbourne Road, Northwood, Middx.

**Hobbit on Commodore 64.** How do I get across the black river in the wooden boat? Nigel Davies, 19 Parc Lane, Groes-Faen, nr Pontyclun, Mid-Glam, Wales.

**Ship of Doom on Spectrum.** How do I get the key from the glass? Andrew Gibson, 18 King's Meadow Road, Colchester, Essex.

**Fantasia Diamond on Spectrum.** I have got into the fortress via the broken window and I cannot get any further because of the guardian, E Dubro, 43 Adelaide Drive, Colchester, Essex.

**Voodoo Castle on Vic20.** How do I remove the animal heads? And how do I remove the boards in the chimney? Charles Wade, 93 Mayfield Avenue, Grove, Wantage, Oxon.

**Adventureland on vic20.** Where do I find the container to put the gas in? How do you kill the dragon without waking it? John Irvine, 51 Alma Road, Enfield, Middx.

**Ship of Doom on Spectrum.** How do you take the cover off the key? Stephen stupple, 65 Douglas Buildings, Marshalsea Road, London SE1.

**Feasibility Experiment on Spectrum.** I have five treanres and a working lamp. How do I get past the display caninet guard? Can I do anythinbg withe the dragon/lion/emperor and gladiator except kill them? How do I open the door down the mine? Marcus Groan, 15 Cuofton Street, Rusholme, Manchester. PS I can help anyone having problems with Snowball.

# Top 10

**Spectrum**

| | | | |
|---|---|---|---|
| 1 | (2) | Daley Thompson's Decathlon | (Ocean) |
| 2 | (3) | Beachead | (US Gold) |
| 3 | (1) | Tornado Low Level | (Vortex) |
| 4 | (5) | Kokotoni Wilf | (Elite) |
| 5 | (8) | Sherlock Holmes | (Melbourne House) |
| 6 | (9) | Avalon | (Hewson) |
| 7 | (4) | Delta Wing | (Creative Sparks) |
| 8 | (6) | Full Throttle | (Micromega) |
| 9 | (—) | Danger Mouse in Trouble | (Creative Sparks) |
| 10 | (—) | Lords of Midnight | (Beyond) |

(Figures compiled by WH Smith)

**BBC B**

| | | | |
|---|---|---|---|
| 1 | (1) | Elite | (Acornsoft) |
| 2 | (—) | Mr Ee | (Micropower) |
| 3 | (2) | Frak! | (Aadvark) |
| 4 | (8) | Erik the Viking | (Mosiac) |
| 5 | (7) | Smash & Grab | (Superior) |
| 6 | (6) | Wallaby | (Superior) |
| 7 | (—) | Jet Pac | (Ultimate) |
| 8 | (10) | Aviator | (Acornsoft) |
| 9 | (4) | Micro-Olympics | (Data Base) |
| 10 | (3) | Football Manager | (Addictive) |

(Figures compiled by WH Smith)

**Vic 20**

| | | | |
|---|---|---|---|
| 1 | (3) | Flight 015 | (Craig Communications) |
| 2 | (—) | Perils of Willy | (Software Projects) |
| 3 | (2) | Duck Shoot | (Mastertronic) |
| 4 | (—) | Computer War | (Creative Sparks) |
| | (4) | Max | (Anirog) |
| 6 | (—) | Wizard & the Princess | (Melbourne House) |
| 7 | (8) | Phantom Attack | (Mastertronic) |
| 8 | (9) | Jet Pac | (Ultimate) |
| 9 | (5) | Snooker | (Visions) |
| 10 | (—) | Bewitched | (Beau Jolly) |

(Two titles tie for 4th position)
(Figures compiled by Boots/Websters)

**Books**

| | | | |
|---|---|---|---|
| 1 | (5) | Weird Computer Games | (Usborne) |
| | (1) | Commodore 64 Programmers Reference Guide | (Pitman) |
| 3 | (6) | Mystery of Silver Mountain | (Usborne) |
| 4 | (8) | Sinclair User Book of Games & Programs | (Penguin) |
| 5 | (—) | Very Basic, Basic on the Spectrum | (Century) |
| | (—) | Beginners Micro Guide | (Granada) |
| 7 | (—) | Basic Made Easy on the Spectrum | (Arrow) |
| 8 | (4) | Computer Spy Games | (Usborne) |
| 9 | (—) | Complete Commodore 64 | (Granada) |
| 10 | (2) | 100 Programs for the Spectrum | (Prentice-Hall) |

(Figures supplied by Boots/Websters)

**Commodore 64**

| | | | |
|---|---|---|---|
| 1 | (—) | Football Manager | (Addictive Games) |
| 2 | (—) | Flight Path 737 | (Anirog) |
| 3 | (—) | Trollie Wallie | (Interceptor Micro) |
| 4 | (—) | Kensington | (Leisure Genius) |
| 5 | (—) | Pystron | (Beyond) |
| 6 | (1) | Sherlock | (Melbourne House) |
| 7 | (—) | Cluedo | (Leisure Genius) |
| 8 | (—) | International Soccer | (Commodore) |
| 9 | (—) | Fort Apocalypse | (US Gold) |
| 10 | (—) | Spitfire Ace | (US Gold) |

(Figures compiled by Boots/Websters)

**Dragon 32**

| | | | |
|---|---|---|---|
| 1 | (1) | Hunchback | (Ocean) |
| 2 | (2) | Skramble | (Microdeal) |
| | (4) | Mr Dig | (Microdeal) |
| 4 | (8) | Chuckie Egg | (A & F) |
| 5 | (3) | Cuthbert in Space | (Microdeal) |
| 6 | (5) | Kriegspiel | (Beyond) |
| 7 | (—) | Dragon Chess | (Oasis Software) |
| 8 | (7) | Ring of Darkness | (Wintersoft) |
| 9 | (—) | Sprite Magic | (Knight) |
| | (9) | Sprint | (Oasis) |

(Two titles tie for 2nd and 9th positions)
(Figures supplied by Boots/Websters)

**Atari**

| | | | |
|---|---|---|---|
| 1 | (1) | Solo Flight | (A & F) |
| 2 | (3) | Zaxxon | (Centresoft) |
| 3 | (—) | Captain Stickys Gold | (English) |
| 4 | (5) | Tank Commander | (Creative Sparks) |
| 5 | (—) | Sub Commander | (Creative Sparks) |
| | (—) | Airstrike II | (English) |
| 7 | (6) | Slinky | (Centresoft) |
| 8 | (4) | Cybernome | (L & B) |
| 9 | (8) | Leggit | (Imagine) |
| | (7) | Computer War | (Thorn EMI) |
| | (9) | Carnival Massacre | (Thorn EMI) |

(Two titles tie for 8th position, three for 9th position)
(Figures compiled by Boots/Websters)

# Diary

| Event | Dates | Venue | Admission | Organisers |
|---|---|---|---|---|
| **Home Computer Show** | Nov 8-10 12.00pm-9.00pm Nov 11 12.00pm-6.00pm | Royal Dublin Society (Main Hall) Ballsbridge Dublin 4 | £2.00 adults £1.00 children | SDL Exhibitions Dublin 904171 |
| **Buxton Home Computer Fair** | Nov 10 10.00am-5.00pm | Paxton Suite Pavilion Gardens Buxton | £1.00 adults 50p children | Technical Promotions 0298 6174 |
| **Home Computer Exhibition** | Nov 10 10.00am-6.00pm | David Davies Gallery Newtown Powys Wales | 20p | Newtown and District Computer Club 0686 28715 |
| **Microelectronics Applications** | Nov 10 10.00am-4.00pm | Barden High School Burnley Lancs | 50p | Barden High School 0282 36324 |
| **London Micro Market** | Nov 10 10.00am-6.00pm Nov 11 10.00am-4.00pm | Wembley Exhibition Centre | £1.50 adults 75p children | ECC Publications 01-389 3535 |
| **Compec 84** | Nov 13-15 10.00am-6.00pm Nov 16 10.00am-4.30pm | Olympia | £3.00 | Reed Exhibitions 01-643 8040 |
| **6809 Colour Show for Dragon and Tandy Users** | Nov 17-18 10.00am-6.00pm | Royal Horticultural Halls London SW1 | £2.00 adults £1.00 children | Computer Marketplace 01-930 1612 |
| **Christmas ZX Microfair** | Nov 17 10.00am-6.00pm Nov 18 10.00am-5.00pm | Alexandra Palace London N22 | £1.50 adults £1.00 children | Mike Johnston 01-801 9172 |
| **Humberside Computer Fair** | Nov 18 11.00am-5.30pm | Winter Gardens Cleethorpes | 50p (accompanied children 25p) | Grimsby Computer Club 0472 694047 |
| **Computer Auction** | Nov 28 6.00pm | Bonnington Hotel Southampton Row London WC2 | Free | Crocker Computer Auctions 01-387 5836 |
| **Electron and BBC Micro User Show** | Dec 6-9 | New Horticultural Halls London SW1 | £3.00 adults £2.00 children | Database Publications 061-456 8383 |

# New Releases

## NO FRILLS

*Drelbs* is the latest American import to be launched on the discerning Great British Public by US Gold, who so recently brought us the official version of *Zaxxon*.

Originally produced by Synapse — one of the top US houses — it is an excellent little game, drawing on, but not plagiarising, several arcade themes.

It consists of two main screens. The first is a swivelling maze, as in *Ladybug*, in which you, a drelb, must create squares whilst being pursued by two different sorts of nasty. This is fun. The squares change colour, and are now solid.

When you have made all the squares you can, they start changing into nasty faces . . . all except one, which is a door into the next screen. Here you rescue all your frozen Drelb brethren by tagging them, avoiding being zapped by new nasties. Success takes you back to the first screen, but harder. Few frills, just pretty good.

So why is US Gold's other Synapse title *Fort Apocalypse* so utterly abysmal?

| | |
|---|---|
| **Program** | *Drelbs* |
| **Price** | *£8.95(C) £12.95(D)* |
| **Micro** | *CBM 64 & Atari 32K* |
| **Supplier** | *US Gold*<br>*Unit 10*<br>*Parkway Ind Centre*<br>*Heneage Street*<br>*Birmingham B7* |

## STRAY DNA

As we all know, being the last surviving member of your race is something of a trial. For a start, there's never anyone around to drive you home after a heavy session down the pub. It also takes a hell of a long time to get served.

Still, as far as I am concerned, it is no excuse to go wandering around a 4096-room complex collecting orbs and stray bits of DNA, dressed in a one-piece yellow jump-suit. Is this the reason that apparitions (formed from pure energy) are out to get you? Nevertheless Xavior has been set the task of resurrecting the human race.

Well implemented and designed this PSS game may be, but it does seem to owe something (well quite a lot, really) to that well known hit — *Atic Atac*.

I shall carry on waiting for *Swords and Sorcery*.

| | |
|---|---|
| **Program** | *Xavior* |
| **Price** | *£5.95* |
| **Micro** | *Spectrum 48K* |
| **Supplier** | *PSS*<br>*482 Stoney Stanton Rd*<br>*Coventry*<br>*CV6 5DG* |

## DISPLAYED

*The Soft Sell* is a programming utility which enables you to construct advertising sequences and announcements to run on a Dragon. A total of 17 graphic displays can be sequenced together to create the kind of display used in window fronts, etc.

There is an extensive manual with the program which even covers things like plugging in the computer. Actually creating the text and designs is a matter of using cursor keys to trace an outline and other keys to add colour and copy one part of the screen to another.

It's pretty easy to use and I suppose may be a boon to shopkeepers everywhere. I can't help wondering why it's for the Dragon which has amongst the worst graphics of any home micro. It's also pretty expensive at £17.25.

| | |
|---|---|
| **Program** | *The Soft Sell* |
| **Price** | *£17.25* |
| **Micro** | *Dragon* |
| **Supplier** | *Micro Sign*<br>*P.O. Box 60*<br>*Woking*<br>*Surrey* |

## VOCAB TEST

Kosmos have been issuing language teaching programs for a while now and is one of the few companies that has a Spanish

tutorial program. *The Spanish Tutor* has recently been released for the Commodore 64.

All the programs use a simple tutorial program to teach basic keyboard familiarity and have facilities for you to add your own grammar and vocabulary. Pre-recorded lessons include basic vocab, verb conjunctions, prepositions and complete phrases. The language can also be tested in a variety of ways. The course is divided over two tapes which have an awfully silly Spanish man on the cassette cover.

| | |
|---|---|
| **Program** | *The Spanish Tutor* |
| **Price** | *£8.95* |
| **Micro** | *Spectrum* |
| **Supplier** | *Kosmos*<br>*1 Pilgrims Close*<br>*Harlington*<br>*Dunstable*<br>*Beds* |

# This Week

| Program | Type | Micro | Price | Supplier |
|---|---|---|---|---|
| **Return to Eden** | Ad | Amstrad CPC424 | **£9.95** | Level 9 |
| **Football Manager** | S | Amstrad CPC424 | **£7.95** | Addictive Games |
| **Horse Lord** | Arc | BBC B | **£6.95** | Century |
| **PCW Games Collection** | Arc | BBC B | **£4.95** | Century |
| **Project Planner** | Bus | BBC B | **£24.95** | Triptych |
| **Micro Utilities** | Ut | BBC B | **£6.95** | Shiva Software |
| **Eureka** | Ad | Commodore 64 | **£14.95** | Domark |
| **Cliffhanger** | Arc | Commodore 64 | **£7.95** | New Generation |
| **Di's Baby** | Arc | Commodore 64 | **£6.95** | Microdeal |
| **Drelbs** | Arc | Commodore 64 | **£9.95** | US Gold |
| **Fort Apocalypse** | Arc | Commodore 64 | **£9.95** | US Gold |
| **Gun Dogs** | Arc | Commodore 64 | **£7.95** | Hill MacGibbon |
| **Guzzler** | Arc | Commodore 64 | **£7.00** | Interceptor |
| **Psi-Warrior** | Arc | Commodore 64 | **£9.95** | Beyond |
| **Quango** | Arc | Commodore 64 | **£7.00** | Interceptor |
| **Thrusta** | Arc | Commodore 64 | **£7.45** | Software Projects |
| **Entrepreneur** | Ut | Commodore 64 | **£24.95** | Tryptic |
| **Magpie Database** | Ut | Commodore 64 | **£39.95** | Audiogenic |
| **Swift Spreadsheet** | Ut | Commodore 64 | **£19.95** | Audiogenic |
| **Wordcraft** | Ut | Commodore 64 | **£24.95** | Audiogenic |
| **PCW Games Collection** | Arc | Electron | **£4.95** | Century |
| **Shapes & Colours** | Ed | QL | **£12.50** | Key Software |

# New Releases

## FLAGSHIP

With one exception, support for the Oric/Atmos would seem to have dried up. The exception is a French company called No Man's Land whose products are now available in this

country. *Tyrann* is probably the flagship of its range — it's an adventure with graphics in the Dungeons and Dragons style.

To begin you choose your character — Warrior, Thief, Druid or Magician — each has its own strengths and weaknesses. You then move around the village of Golanaur which is displayed in line drawn pictures with simple perspective.

You may trade, be forced to fight, use some objects and save games and characters for later use. You get a nice manual and at £8.95 the program is not overpriced by Oric standards. Good news for drought hit Oric/Atmos owners.

| | |
|---|---|
| **Program** | *Tyrann* |
| **Price** | *£8.95* |
| **Micro** | *Oric/Atmos* |
| **Supplier** | *No Man's Land*<br>*High Tech Units*<br>*1 and 2 Conlon*<br>*Developments*<br>*Water Lane*<br>*Darwen*<br>*Lancs* |

## UNDERGROUND

Interceptor produce well written, fun games that really only ever have one major failing — they are never original. The latest Commodore release is a case in point. *Quango* is a game in which you burrow around underground chased by robots as you try to encourage your mushrooms to grow. Kill the robots by digging the ground from underneath stones which then fall on them — remind you of something? Yes, it's *Dig Dug* in a new guise.

Not that it's a bad game, unlike *Manic Miner* there aren't that many versions of *Dig Dug* around. Consequently as a game it hasn't become that wearisome. Angus (you) dodges robots and strange weeds whilst making his way towards the centre of each cavern.

There are various caves, as you get deeper and deeper so underground streams slowly flood the passages, making it more difficult for Angus to harvest his crop of mushrooms. Quite fun if unspectacular.

| | |
|---|---|
| **Program** | *Quango* |
| **Price** | *£7.00* |
| **Micro** | *Commodore 64* |
| **Supplier** | *Interceptor Micros*<br>*Lindon House*<br>*The Green*<br>*Tadley*<br>*Hants* |

## SKYSCRAPER

*Plummet* is one of a growing range of Spectrum games from Interceptor and it's actually pretty good. The idea is to rescue the mayor who is stuck in a lift. Why a mayor? I know not.

His salvation comes when you — Orson — collect enough ropes to tie the line securely to its supporting chain. The game is played over three screens forming a giant skyscraper. Orson collects ropes scattered about the screen, dodges a variety of irrelevant objects and makes his way to the lift.

There is a Zombie Doorman who appears and disappears and whom you can stun with a tranquiliser dart — the game may be basically only dodge and grab, but there's enough different about it to make it interesting for at least a couple of minutes. The graphics are large and sprite-like, but they suffer from the inevitable co-

lour change when they pass one another.

| | |
|---|---|
| **Program** | *Plummet* |
| **Price** | *£7* |
| **Micro** | *Spectrum* |
| **Supplier** | *Interceptor Micros*<br>*Lindon House*<br>*The Green*<br>*Tadley*<br>*Hants* |

## NEW COMMANDS

The Commodore 64 has terrible Basic. This is a fact accepted through the great passages of time as immutable and certain. To improve this situation, there have been a great number of extensions to Basic beginning with Simon's Basic and continuing every other month with another one from someone else.

Possibly the definitive extension to Basic will prove to be *Breden's Basic* written by Visions and marketed by CSM. It is beautifully packaged in a fold-out wallet, one side containing the cassette and disc and the other contains the large, Spectrum manual type book which explains how to use the new commands.

Obviously the bulk of the new commands are concerned with sound and graphics; eg, EMOB to turn on a sprite, Envelope simplifies the sound command.

It doesn't end there, though, you get useful structured basic commands like While . . . Do . . . Else and Repeat . . . Until and commands like CBit to clear a specific bit. If you are into programming, own a Commodore 64 and have a spare £39.95, then this is for you.

# This Week

| *Program* | *Type* | *Micro* | *Price* | *Supplier* |
|---|---|---|---|---|
| **Barrow Quest** | Ad | Spectrum | **£5.95** | CCS |
| **Eureka** | Ad | Spectrum | **£14.95** | Domark |
| **Jewels of Babylon** | Ad | Spectrum | **£5.50** | Interceptor |
| **Astronut** | Arc | Spectrum | **£6.95** | Software Projects |
| **BMX Trials** | Arc | Spectrum | **£6.95** | Llainlan |
| **Fahrenheit 3000** | Arc | Spectrum | **£5.95** | Softstore |
| **Magic Roundabout** | Arc | Spectrum | **£6.95** | CRL |
| **Trio** | Arc | Spectrum | **£5.95** | Addictive Games |
| **Warlords** | Arc | Spectrum | **£6.95** | Century |
| **Xavior** | Arc | Spectrum | **£5.95** | PSS |

| *Program* | *Type* | *Micro* | *Price* | *Supplier* |
|---|---|---|---|---|
| **American Football** | S | Spectrum | **£6.95** | Softstore |
| **Falklands Crisis** | S | Spectrum | **£9.95** | Llainlan |
| **Grand Prix Manager** | S | Spectrum | **£6.95** | Addictive Games |
| **Punch Line** | S | Spectrum | **£6.95** | Llainlan |
| **Superpower** | S | Spectrum | **£5.95** | CCS |
| **Sound Effects** | U | Spectrum | **£6.95** | Llainlan |
| **Run Your Own League** | Ut | Spectrum | **£6.95** | Addictive Games |
| **Fatty Henery** | Arc | Vic 20 | **£6.95** | Software Projects |

**Program** *Breden's Basic*
**Price** *£39.95*
**Micro** *Commodore 64*
**Supplier** *CSM*
*Strand House*
*Great West Road*
*Brentford*
*Middlesex*

## NO MISTAKE

*Gener 80* is a sophisticated editor-assembler for the Spectrum which does amazing things.

The source code is processed immediately so that syntax mistakes are immediately spotted — the program can assemble 3000 lines in under 10 seconds.

You can edit anywhere on screen, use block move and delete, use all standard Z80 mnemonics and even use Sinclair system variable names as labels. All code can be saved either to tape or microdrive — *Gener 80* itself can also be saved to microdrive from the original cassette.

Obviously not intended for beginners, the program nevertheless comes with a 32-page manual which is pretty good and quite helpful, even for the novice.

**Program** *Gener 80*
**Price** *£7.95*
**Micro** *Spectrum*
**Supplier** *Seven Stars*
*15 Gloucester Avenue*
*London NW1 7AU*

## PULSATING

*Skyline Attack* from Century Software is pretty much your classic blam blam stuff which only has a reason for its existence if you don't already have

something similar.

Basically, it's *Defender* as you move your highly manoeuvrable jet back and forth across scrolling screens and blast everything in sight, except canisters of medical supplies that occasionally drop from the sky.

It's all reactions, screen fulls of pulsating aliens — the only new feature is that it takes place over a number of recognisable skylines like Paris and London. If you've just bought your Commodore and don't have anything to kill yet, then this is for you. If not, forget it.

**Program** *Skyline Attack*
**Price** *£7.95*
**Micro** *Commodore 64*
**Supplier** *Century Publishing*
*Portland House*
*12-13 Greek Street*
*London W1V 5LE*

## RETRIEVED

A potentially useful utility from a company called Lost n Found Software is *Get it Back*, a disc-based program that can retrieve lost files.

What this and similar systems allow is the retrieval of information on disc which appeared to have been lost through disc damage and have resulted in error messages when you attempted to load them.

Obviously you can't get everything back if you have completely wiped information from a disc and put something new on it — rather it's intended for those cases where you know that the stuff is still there, but just can't seem to get to it.

How the program works I know not — probably it just searches through the disc, loading up what data it can find and ignoring errors. Seems like it's a program worth having anyway. It's easy to use too.

**Program** *Get it Back*
**Price** *£6.99*
**Micro** *Commodore 64*
**Supplier** *Lost n Found*
*17 Pitfield Street*
*London N1*

## FULL HOUSE

Fancy playing *Bingo* on your micro? No, I don't either. Still, if you feel you've been missing out by being too old to subscribe to the *Sun* and you've lost your *Times* Portfolio card, you could at least win REAL MONEY on *Bingo* from Tynesoft.

Up to four people can play the computer and beyond saying that it plays Bingo, there's not much comment I can make. However, every time someone wins the last four numbers called are compared with four 'lucky numbers' at the bottom of the screen. If the numbers match then you go into the draw for £100. You prove this by saving it to tape.

If you have a Currah speech synthesizer then the program will actually shout the numbers out.

Personally, I don't like *Bingo* and will be putting my X in the box for no publicity.

**Program** *Bingo*
**Price** *£5.95*
**Micro** *Spectrum*
**Supplier** *Tynesoft*
*Addison Industrial Estate*
*Blaydon upon Tyne*
*Tyne and Wear*
*NE21 42E*

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.



**Addresses**
**Addictive Games,** 71 Richmond Hill, Bournemouth BH2 6HE **Audiogenic,** PO Box 88, 39 Sutton Industrial Park, London Road, Reading, Berks RG6 1AZ **CCS,** 14 Langton Way, London SE3 **Century Software,** 12-13 Greek Street, London W1 **CRL,** 9 King's Yard, Carpenter Road, London E15 **Domark,** 228 Munster Road, London SW6 **Hill McGibbon,** St Bartholomew House, 92 Fleet Street, London EC4 **Interceptor,** Lindon House, The Green, Tadley, Hants **Key Software,** Newlands, Durley Brook Road, Southampton **Level 9,** 229 Hughenden Road, High Wycombe, Bucks HP13 5PG **Llainlan,** Pontyberem, Llanelli, Dyfed **Microdeal,** 41 Truro Road, St Austell, Cornwall PL25 5JE **New Generation,** The Brooklands, 15 Sunnybank, Lyncombe Vale, Bath BA2 4ND **PSS,** 452 Stoney Stanton Road, Coventry CV6 5DG **Shiva,** Software, The Hawthorns, 64 Welsh Row, Nantwich, Cheshire **Softstore,** Suite 1, 39c Paddington Street, London W1 **Software Projects,** Bear Brand Complex, Allerton Road, Woolton, Liverpool **Triptych,** TBL Book Service, Freepost, Camberley, Surrey GU15 3BR **US Gold,** Centresoft, Unit 10, The Parkway Industrial Estate Centre, Heneage Street, Birmingham B7 4LY.

**Key: Ad** — adventure/**Arc** — arcade/**Ed** — education/
**S** — strategy-simulation/**Ut** — utility

This Week is a new section that covers all the new software coming on to the home micro market each week. All suppliers should send details of their new programs to: This Week, *Popular Computing Weekly*, 12-13 Little Newport Street, London WC2R 3LD.

# Grown-up's MSX

The latest news is that the CP/M disc operating system is to be implemented on the QL. Not only that but Amstrad will be providing it as an integral part of their disc system. Even the ever-receding Enterprise offers amongst its specifications CP/M compatability.

Further confirmation that home micros are rapidly crossing the divide into the heady world of small business systems and 'serious software'. If you can control your feverish excitement for a second let's stop and think about what CP/M is, and what is can do — I believe that for 95% of people it is going to be an overblown waste of time.

The idea of CP/M came about as an attempt by Digital Research to overcome the continuing problems of non-compatability between different hardware systems, and avoid prolonged and unnecessary duplication of effort in software development. In short, it is a sort of grown-up's MSX.

Despite its undoubted success I feel there are several prevalent misconceptions about what CP/M can offer that need clearing up.

The most commonly quoted justification for it's existence is that it allows software compatability between different computers and gives access to a back-catalogue of over 3000 programs. Unfortunately this is only true up to a point. Whilst the major headaches of software redesign and debugging that accompany a conversion from say the Spectrum to the CBM 64 can be avoided, you will not be able to go out and buy any old CP/M program and run it on your micro. No machines can be completely software compatible without the rigid internal architecture and Rom constraints that characterise the MSX machines or the more 'highly compatible' IBM clones.

What this means is that you will only have access to the fraction of the 3000 CP/M titles that Amstrad, Enterprise or anyone else decide to convert, unless you fancy doing the job yourself. Only the mainstream big-selling programs are likely to make an appearance.

The other by question about CP/M is, how many of the fraction of the 3,000 programs which are converted will you actually want? The biggest barrier I can see for most people is the price. For instance the *Wordstar*, word processing package which must be the single biggest seller for CP/M still changes hands at the whopping price of £250 — more than most home hardware systems cost!

When you consider how many people make do with their versions of *Tasword*, or *Easiscript*, is it really worth paying ten to twenty times as much for something that, after extensive use, I can assure you is still a fairly average word processor?

As I understand it, some professional business software writers regard CP/M as having been a positive hindrance to the development of quality software by encouraging a lowest common denominator approach.

In particular 16 and 32-bit 'wonder micros' have been forced to develop a pseudo CP/M standard of their own to satisfy business users who are keen to keep the software they are familiar with and want to avoid the probelms of re-entering data files etc.

CP/M is becoming a bottom-line standard perpetuating old technology in a way that many fear MSX will do.

In contrast, the chaotic non-standard home computer scene has seen the arrival of software that has squeezed the very last drop out of the capabilities of the hardware — just look at some of the Spectrum programs comming out now.

People who are forced to run CP/M on their QL because of a shortage of software should feel cheated — the evolution to 16-bit (or is it 32?) has been phenomenally fast so why slam the brakes on now and start getting involved with an 8-bit standard?

As CP/M begins to look more and more arthritic to business users, Digital Research will no doubt be delighted to see a new market opening up for in the low-end home computer sector.

Nevertheless, from Amstrad's point of view CP/M probably didn't look like such a bad idea.

After all, if you can find everything you need for your work on popular CP/M discs, why not run them on the best value hardware you can find? Besides which, it plays games as well.

**Tony Kendle**



## Leaf it out

**Puzzle No 132**

As is my usual practice when packing for the summer holidays, I always include an ample supply of reading matter in case of wet weather. There were a number of books that I had put ready, and these are listed below (the figures in brackets after each title indicate the number of pages in the edition that I had).

1) The Rubaiyat of Omar Khyaam ..... (64)
2) Twelfth Night by William Shakespeare .... (89)
3) The Shorter Poems of Wordsworth ..... (107)
4) Tom Brown's Schooldays by Thomas Hughes ..... (111)
5) Pygmalion by G. B. Shaw ..... (147)
6) Wuthering Heights by Emily Bronte ..... (168)
7) Sleeping Murder by Agatha Christie ..... (175)
8) The Pickwick Papers by Charles Dickens ..... (192)
9) 1984 by George Orwell ..... (204)
10) War and Peace by Leo Tolstoy ..... (241)

I am bound to say that this was the cause of some disagreement between my wife and I, who felt that ten books was somewhat excessive. As a compromise, I chose just five of the books, but even so, these provided me with a total of 800 pages.

Which books did I take?

**Solution to Puzzle No 127**

The total distance ran was 290582 paces.

The program examines each integer from 1 to 1000 to see if it is a multiple of seven or 13 or to see if it contains any of the digits seven, one or three. Only if neither of these conditions apply is twice this distance added to the total (to account for the return journey).

```
10 LET DISTANCE = 20 FOR N = 1 TO 1000 30 IF N/7 = INT(N/7) OR N/13 = INT (N/13) THEN GOTO 100 40 N$ = STR$(N) 50 FOR F = 2 TO LEN (N$) 60 Z$ = MID$(N$,F,1) 70 IF Z$ = "7" OR Z$ = "1" OR Z$ = "3" THEN GOTO 100 80 NEXT F 90 DISTANCE = DISTANCE +(N*2) 100 NEXT N 110 PRINT DISTANCE
```

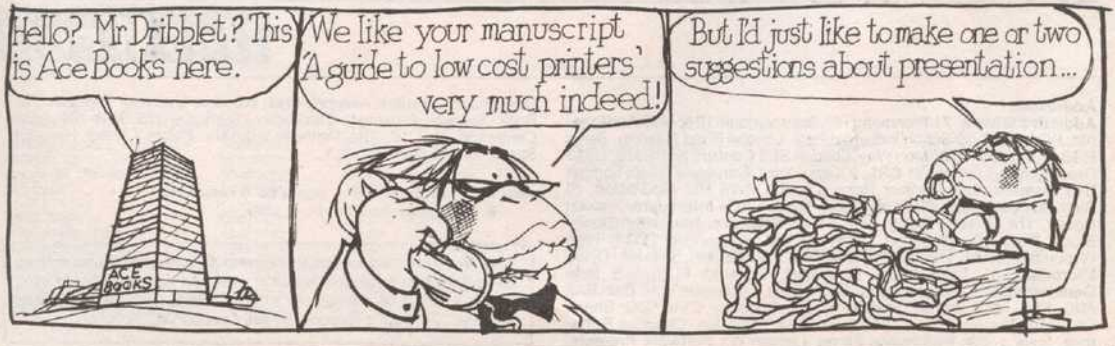
**Winner of Puzzle No 127**

The winner is B. A. Kidd of Holsworthy, Devon, who receives £10.

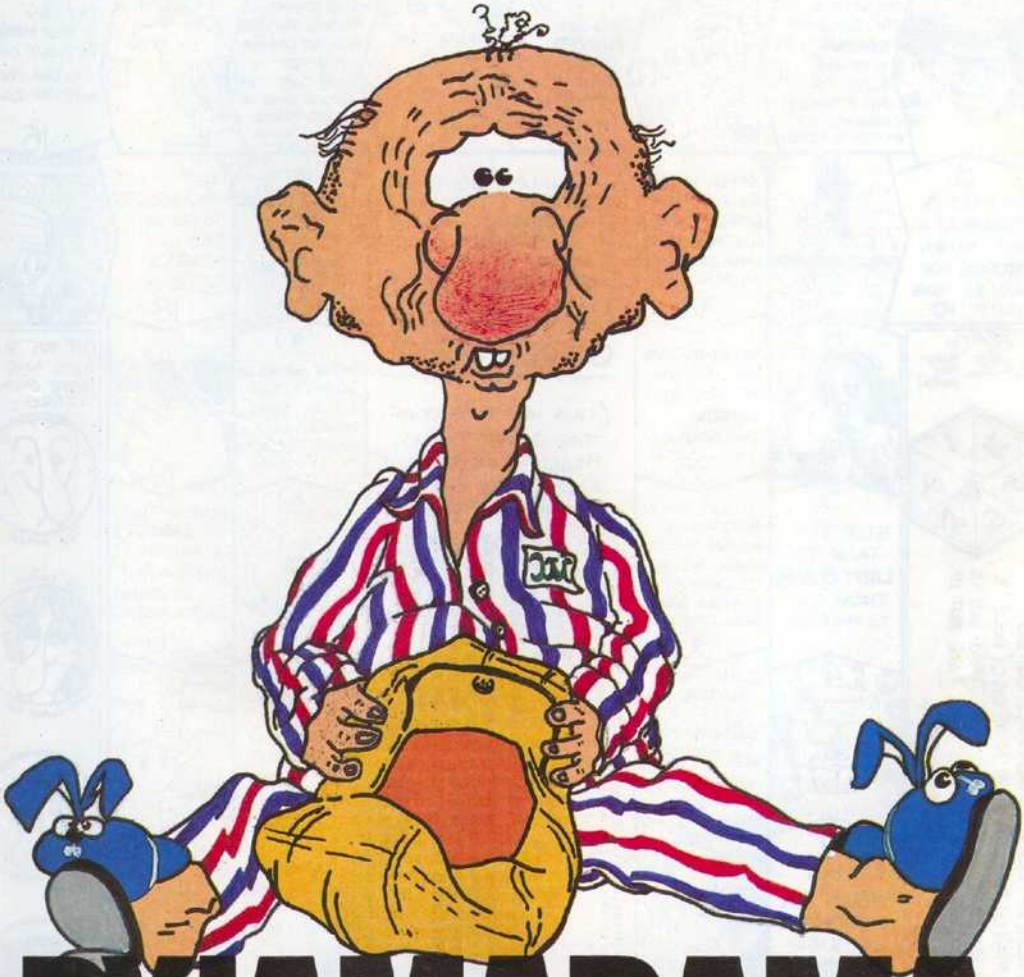
**Rules**

If the puzzle prize can be sensibly solved using a computer, then the winner will have included a listing of the program used to find the correct answer. The closing date for entries to Puzzle No 132 is November 23.

## The Hackers



# You'll never dream a program could be this good!!!



# PYJAMARAMA

## Join Wally in his nightmare

Sensational Software from

*Commodore 64 – £7.95* **MIKRO-GEN** *Spectrum 48K – £6.95*

44 The Broadway, Bracknell. Tel: (0344) 427317

Available for Commodore 64 and Spectrum 48K

# AUTOMATA UK PRESENTS

# THE PI is CAST

SIMPLE-MINDED FUN FOR JADED, MIDDLE-AGED POLTROONS, DEVISED BY PIMAN. GRAPHICS AND OFFENSIVE ADDITIONAL TEXT BY GREMLIN EVANS. ALL CHARACTERS © 1984 AUTOMATA UK LTD.

1 — NO... IT CAN'T BE...

2 — GEDDIM! I'M SPOSED TO BE ON THIS BIT!

3 — YOU BUY DEUS EX MACHINA FOR £15. MOVE DIRECTLY TO 8!!!

4 — (IT MIGHT NOT WORK)

5 — STOP TO TALK TO LADY CLAIR. THROW A 6 TO MOVE ON.

6 — 6

7 — YOU MEET A PIMAN AT A FAIR. YOU BUY CRUSOE FOR ONLY £6. MOVE ON TO 10.

8 — 8

9 — YOU LOCATE THE GOLDEN SUNDIAL OF PI IN PIMANIA. £6000 FOR ONLY A TENNER! CONGULATIONS!! ON Y'GO TO 12 ⇨

10 — 10

11 — 11

12 — YOU GET PI-EYED ON £6 + HIC! = STAGGER ON TO SHILSHTEEN... (16)

13 — UNLUCKY FOR SOME - BUT NOT FOR YOU, COOKIE! DROP ONTO 32 ↓

14 — YOU'RE CAUGHT PIRATING SOFTWARE AND GET CHUCKED OUT OF THE GAME. HOP THROUGH HOUSE ON ONE LEG BEFORE STARTING AGAIN ON THROW OF SIX.

15 — SHITHEC!

16 — PAY £6 TO HELP MORRIS GET OUT OF THE CAR PARK. MOVE TO 20...

17 — TUNICIP... VROOM

18 — GET WHOLESALERS TO PAY UP FRONT.... ADVANCE TO 31 ⇦

19 — 19

20 — DOUBLE TOP IN DARTZ - A WINNER FOR 5 QUID! GO STRAIGHT TO SQUARE 24!

21 — 21

22 — PI-DAY. π MOVE BACK TO 7, PORKY!

23 — YAKZEE! BRESS YOU! ONRY £5. YOUR DISC ARE ROADED - ON TO SQUARE 28! AH-SO!

24 — BUY AUTOMATA SOFTWARE ON 24HR ANSWERING SERVICE. 0705 735242! SPEED YOUR ORDER TO SQUARE 31.

25 — 25

26 — 26

27 — YOU UPSET LURCH, THE OFFICE PARROT. WELL, WE THINK HE'S A PARROT AND HE CHASES YOU BACK 8 SQUARES

28 — YOU'RE BOWLED OVER WITH PI-BALLED AT ONLY £6. ROLL ON TO SQUARE 30.

29 — SPOTS 6

30 — NEW WHEELS JOHN? ONLY A FIVER, JOHN. DRIVES YOU ROUND THE BEND TO 32, JOHN.

31 — 31

32 — GO TO JAIL ... PAY £6 AND MOVE DIRECTLY TO 35.

33 — TURN UP ON THE WRONG DATE TO WIN THE GOLDEN SUNDIAL. GO BACK TO 11, MATE

34 — OFFER WHOLESALE CREDIT... SUFFER CASH-FLOW PROBLEMS. BANK SAYS GO BACK TO 7 ⇦

35 — YOU PI-IN-'ERE MAIL-ORDER SERVICE. £6. AWARDED TWO SQUARES.

36 — START OWN SOFTWARE HOUSE. THROW AGAIN AND GO TO SQUARE NUMBER SHOWN (TOUGH LUCK, KID)

37 — JUMP FROM BLAZING BUILDING IN PIROMANIA. £6 HOSPITAL FEE, BUT LAND ON SQUARE 40.

38 — 38

39 — TELEPHONE-SALES PERSON TRYING TO SELL YOU ADVERTISING. MAKES YOU LANE. MISS A TURN.

40 — THE TOP PIMANS GREATEST HITS, VOLS 1&2, IN, MAY NOT BE. BUT THEY'RE ONLY £5 EACH. YOU'VE WON THE GAME, SMARTY-KNICKERS!

NUMBER 1 — THAT'S AUTOMATA'S PLACE... SO MOVE ON 3 SQUARES, ALREADY!

## ORDER FORM

(THIS ISN'T PART OF THE GAME! THIS IS REALITY! ORDER YOUR UNMISSABLE GOODIES HERE, FOLKS!!

| | | |
|---|---|---|
| CRUSOE | 48K Spec £6 | ☐ |
| PI-EYED | 48K Spec £6 | ☐ |
| PIROMANIA | 48K Spec £6 | ☐ |
| PI-IN'ERE | 48K Spec £6 | ☐ |
| YAKZEE... Dragon/48K Spec £5 | | ☐ |
| 'BACKCHAT' Speech Synth. CBM64 with Software & Programming Book | | £25 ☐ |
| PIMANIACS CLUB for 20% off all products, etc. Annual Subscription UK £5 ☐ Overseas £7 ☐ | | |
| DEUS EX MACHINA | 48K Spec £15 | ☐ |
| GO TO JAIL | 48K Spec £6 | ☐ |
| MORRIS MEETS THE BIKERS.. | Any Spec | £6 ☐ |
| PIMANIAC T-SHIRTS (state size) | Price | £5 ☐ |
| PIMANIA | 48K Spec | £10 ☐ |
| OLYMPIMANIA | 48K Spec | £8 ☐ |
| PI-BALLED | 48K Spec | £6 ☐ |
| DARTZ | 48K Spec | £5 ☐ |
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HOW TO PLAY 'THE PI IS CAST': FIRST, IF PERMITTED SCISSORS, CUT OUT COUNTERS & DIE DISC. INSERT DUD MATCH THROUGH HOLE 'A' OF DISC (HOLE 'B' FOR 'LOADED' VERSION). PASTE THE LOT ONTO THIN CARD. NOTE THAT DIE IS UNUSUAL IN NUMBERING. FOR 'π' SYMBOL, SUBSTITUTE OWN AGE, BUT IF YOU GO PAST '40', CONTINUE COUNTING FROM SQUARE ONE.

CUT OUT THE DISCS AND PASTE ONTO CARD.

THE PIMAN

THE LOVELY LADY CLAIR SPYLINE

UNCLE ARNOLD

RASTAPIMAN

SWETTIBITZ

IF EGOCENTRIC, USE SMALL ROUND PHOTO OF SELF.