## Under review

EXODUS ULTIMA III

FIVE·A·SIDE FOOTBALL

ANIROG

## 6 pages of software p.12

## Bust a Ghost!

# Sinclair to risk reliability test?

Choosing a reliable home computer could soon be less of a gamble if an innovative idea from Sinclair is taken up by all the major manufacturers, writes Bryan Ralph.

Up till now no independently assessed figures of faulty micros have been available to the home user. The buyer has been confused by claims from manufacturers and others from retailers that often conflict.

The latest example is a survey by a computer trade newspaper of a small number of retailers to determine return rates of popular home computers.

The survey concluded that the percentage of Sinclair Spectrums returned was 30.6 per cent compared with Sinclairs own estimate of "around 12.15 per cent".

Sinclair, and other manufacturers assessed in the survey, dismissed the findings as unrepresentative.

Computer companies are however concerned by the lack of reliable figures and the effect on confidence in the industry, so Sinclair has made the first move towards rectifying the situation.

A meeting was held between David Chatten, managing director of Sinclair and representatives of the newspaper to discuss ways of producing more credible return figures.

One proposal aired at the meeting was to include a complaint card with a substantial number of Spectrum Pluses. One half would be returned to Sinclair if a fault was found, the other would be sent to the newspaper.

A spokesman for Sinclair said the initiative came about to, "Lay the problem of monitoring computer returns to rest once and for all.

"At this moment we are only in the planning stages and the complaint cards are only one of a number of ideas put forward.

It seems at this stage that Sinclair, at least, will participate in a joint monitoring scheme with an independent assessor. It should be emphasised however that if the complaint card system gets the go-ahead it will only be a monitoring system – the newspaper concerned will not be taking up individual cases with the manufacturers and the speed of repair will not necessarily be shortened.

Hopefully a more accurate method of assessing return rates can stop the bickering over the true figures and leave the companies to concentrate on tightening up quality control. Reliability is used by some companies as a selling point but, at present, for too many manufacturers the very mention of the word produces a shudder of paranoia.
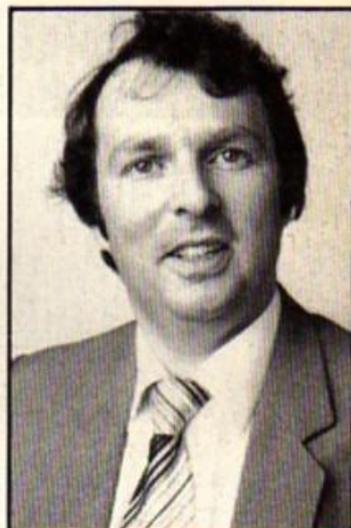
**David Chatten – Sinclair's MD**

## New bill – Old Bill

Let the pirates beware – the Copyright (Computer Software) Amendment Bill is now law and software piracy and theft are now illegal.

Software thieves now face unlimited fines and the possibility of a prison sentence. The maximum fine that can be imposed for copying a single tape is £1,000.

The bill cruised through parliament with virtually no opposition and can be considered a triumph for the Federation Against Software Theft (FAST) formed just a year ago to campaign for a change in the law regarding bootlegged software.

To make the new law stick, FAST have appointed an Enforcement Co-ordinator to collect evidence of violations of copyright. The man chosen to scupper the pirates is Robert Hay, a former Chief Superintendent in the Metropolitan Police who retired last month after over 30 years service.

"My role is to collate evidence against suspected software thieves and build up a data-base on those who are known suspects", said Robert. "If there are clear indications of piracy I will bring it to the notice of the company whose product has been pirated".

"The decision rests with them as to whether they hand the matter to the police, trading standards officers or investigation agencies".

The Enforcement Co-ordinator does not have the power to initiate a prosecution unless a software company has instructed him to take appropriate action on their behalf.

# HOME COMPUTING WEEKLY

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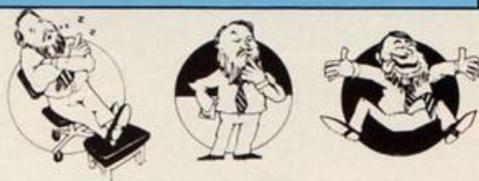
## Soapbox

Summer is a-coming and the days are getting warmer, I would say longer but it's a little late for that!

This is the time of year when the software houses bring out all their summer game packages and we see 400 millimetre hurdles and 19 a-side hockey coming to the small and digital screen.

There is a danger here though. Summer in this country doesn't last too long and I can imagine the few days being spent in front of a computer instead of out in the, vitamin D producing sunshine.

I have a battle to push my son off his machine and whilst I have sympathy for the computer addict, I still don't think that it is healthy. Sunshine and social contacts need time and sitting in front of a VDU screen doesn't help either.

So pick up your HCW, get out the deck chair and read it in the sun. If that's impossible compute with a friend and make this a social rather than an anti-social hobby!   **Dave**

## Coming soon

- The second in our Time Capsule series from James Leavey
- Beginning machine code for the Spectrum
- Clive Gifford continues Music and the Micro
- Plus — news, reviews, and competitions!

## ACTIVISION
### HOME COMPUTER SOFTWARE

# SPOOKY BUSINESS

### Capture a Ghostbusters cassette in our latest brain chilling competition.

There's a chance to get a ghost in your machine this week by entering our competition to win a chartbusting prize.

The Ghostbusters computer game, launched at Christmas, is still in the bestselling software chart and 100 HCW readers have the opportunity to quell the "Marshmallow Man" or get "slimed" if they win a cassette in our £1,000 contest.

Activision's computer version of the film that sent thousands of Americans searching for spectres in their fridges follows the movie's plot closely and includes all the ghoulish adversaries confronted on the big screen.

The action takes place on the streets of New York which is being threatened by an invasion from the netherworld and leads to a grand finale in the temple of Zuul. In the meantime the would-be Ghostbuster has to sharpen his spectre smashing expertise by acquiring the right gizmos — such as Energy Detector, Image Intensifier, Marshmallow Sensor, Ghost Vacuum, Ghost Traps, Ghost Bait and a Laser Confinement system. Tools which no self respecting ghostbuster would be seen dead without.

Of course even capturing phantoms requires capital and your business sense is assessed as you build up your ghostbusting franchise.

When you have been successful and the franchise is won you obtain your very own secret number which you can use next time you play Ghostbusters. Ghostbusters is compatible with C64, Spectrum, Amstrad and MSX. This secret number can be used on any version of Ghostbusters anywhere in the world.

### How to enter

Study the two cartoons — there are a number of differences between them. Circle the differences on cartoon B and seal the cartoon and coupon in an envelope. Write clearly the number of differences you found on the back of the envelope.

Post your entry to Ghost-busting, Home Computing Weekly, No.1 Golden Square, London W1R 3AB. Entries close at first post on Friday 2 August 1985.

**Important:** please follow the guidelines on entering — incomplete coupons and entries in envelopes with no numbers on the back cannot be considered. If you are a winner, the coupon will be used as a label to send your prize so clear writing is essential.

### The rules

• Entries will not be accepted from employees of Activision, Argus Specialist Publications and Alabaster Passmore & Sons. This restriction also applies to employee's families and agents of the companies.
• The How to enter section forms part of the rules.
• The editor's decision is final and no correspondence can be entered into.

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### Activision
### Ghostbusters Competition

#### Entry Coupon

Name _____

Address _____

_____

_____

_____ post      code _____

Number of differences found _____

Machine owned: Spectrum / C64 / Amstrad / MSX

Complete clearly and fully — if you win a prize this coupon will become your address label. Post to: Ghostbusters Competition, Home Computing Weekly, No 1 Golden Square, London W1R 3AB

Closing date: Friday, August 2nd, 1985. Don't forget to follow closely the advice in the How to enter section including writing the number of differences you have found on the back of your envelope.

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## Gissa job

Micronet 800, Modem House and Tandata have announced a new initiative in the home micro communications market.

Modems for leading home micros will be sold with a free three month subscription to Micronet worth £10.

Micronet's marketing manager, Ian Rock said: "With our new range of communications features about to appear on Micronet — Mainframe Chatlines, the Gallery and Jobsearch — a free three month subscription will help more micro users benefit from the convenience and enjoyment of computer communications."

Micronet's new Jobsearch service will feature 50 vacancies every Monday in the fields of management, computing and administration appointments. Micronet users will be able to search dozens of vacancies in minutes and apply immediately via electronic mail.

*Micronet 800, 8 Herbal Hill, London EC1*

## On Your Screens

The UK software house CRL has now entered the home computer peripheral market with its Video Digitiser Module for the C64.

The digitiser allows video signals from any source to be displayed on screen, stored to disc, processed and printed out. It is compatible with video recorders, surveillance cameras and even weather satellite receivers. Once a picture is digitised, an image is produced on screen in four shades of grey (useful for satellite pictures) and the inclusion of a light pen allows integration into user's

## Past and Present unite

The wonders of ancient Italy will be brought to light with the help of Olivetti who is supplying £10,000 worth of hard and software to a Cambridge led team of archaeologists.

The excavations are already under way in the medieval town of Gubbio and the progression of the dig will be speeded and simplified by Olivetti's dot matrix and daisy wheel printers.

One of the teams leaders, Simon Stoddard, is obviously convinced that modern technology plays an essential role in the re-discovery of past cultures. "A computerised database is necessary if effective analysis of such vast amounts of data is to be possible".

*British Olivetti, PO Box 89, 86-/88 Upper Richmond Rd, London SW15 2UR.*

## Dragontorc for the Amstrad

Hewson Consultants, who this year celebrate five years in the games software business, is bringing out a range of new programs in the Autumn headed by the Amstrad conversion of Dragontorc.

Interest in this converted adventure movie is high but as yet we don't have a definite release date, just that it will be around the mid-August mark.

Another interesting release will be Southern Belle for the Spectrum, the first authentic steam engine simulator based on the famous London to Brighton run.

Gribbly's Day Out is to be sequelled with Paradroid for the C64 and Astro-Clone is to be Dragontorc's Spectrum successor — both are expected to appear in early September.

*Hewson Consultants, 56B Milton Trading Est, Milton, Abingdon, Oxford OX14 4RX.*

own programs. It is a sophisticated model, priced at £149.95.

We would like to apologise to CRL and Silversoft for the typographical error which dubbed them "CLR" in HCW issue 120.

*CRL Hse, 9 Kings Yd, Carpenters Rd, London E15 2HD.*

Tim Curry digitised on a C64

A new co-operative venture by two northern software houses means that you too can be a software superstar.

M C Lothlorien and A 'n' F Software are organising the launch of games under a new label in the Autumn and are on the look out for software up to commercial standard.

If you have that arcade game that's unbelievably good, a graphic adventure with teeth or even an, as yet, unprogrammed idea of the super game of the decade then send it along to them at the address below.

They will make an offer for any submissions that they accept and soon you could be reading reviews of your software in HCW.

*M C Lothlorien, 56a Park Lane, Poynton, Cheshire SK12 1AE*
*A 'n' F Software, Unit 8, Canal Side Ind Est, Woodbine St East, Rochdale OL16 5LB*

## Computer Quiz Finals

TV's Michael Rodd is to be question master at the grand finals of the British Computer Society/Commodore Schools computer Quiz which will be held at the University of Reading on the 11th July.

From the original four hundred teams, eight are now preparing to battle it out for the top prize of £1600 worth of Commodore computer and peripheral equipment and a second prize of £700 of Commodore goodies.

To tie in with the quiz, Commodore has developed a loan scheme whereby the schools involved can purchase the equipment at half the recommended price after the loan period is over.

The quiz is becoming increasingly successful and Derek Harding of the BCS is enthusiastic about its future, "with Commodore's help it has now become a major national event bringing the world of computers closer to young people."

*BCS, 13 Mansfield St, London W1M 0BP*

*Commodore UK, 1 Hunters Way, Weldon, Corby, Northants.*

## A world first for Sinclair

Sinclair Research has upheld the tradition of the Great British Invention by producing the world's first commercial wafer scale integrated circuit (WSI).

Metalab, Sinclair's research centre in Cambridge, has managed to come first in the race to produce a cost-effective wafer by making the printed circuit board (PCB) redundant and using switching circuits on the wafer itself.

The previous solution, working with four-inch wafers, was to slice the silicon to separate the rejects from the working chips. With Sinclair's WSI they are rejected by electronic logic.

Although this method of "configuration logic" was invented in 1970, by Ivor Catt, it has taken until now to effectively translate it for mass-production.

It is seen as a major step forward in semiconductor manufacturing and should radically reduce both size and cost.

Sir Clive Sinclair, founder and chairman, sees it as "the next logical development in . . . increasingly complex electronic components." and of immediate importance "in consumer electronics, industrial, medical and defence markets."

## Coming up trumps

Sharp eyed readers of HCW may have noticed the software on a card, first reported in HCW 108, on TV.

Michael Hall of Electronic Software showed the cards on Database. He claimed that the new cards will be the end of software piracy which currently causes the industry so many problems.

The card has a 256 Kilobit capacity (32K byte) but a megabit version is currently under development. He suggested that applications include cashless shopping, typewriters, banking, security, games software and many others.

A firm price is now emerging for the cards. Electric believe that they will be sold at £14.95 initially but that this should fall to around £9.95 within the next six months.

*Electric Software, 91 High St, Longstanton, Cambridge CB4 5BS*



Mr Hind Fletcher receiving his CSX64 from Ariolasoft's Mr Brunger

## Tunnel Vision

Stephen Hind-Fletcher, a London tube-driver, can now indulge his passion for smashing things up without endangering innocent commuters.

Stephen was the lucky winner of Ariolasoft's monthly computer prize and he can now zap things off his SX64 screen to his heart's delight.

Ariolasoft is no doubt pleased to have made London a safer place to live in and 15-hour a week computer addict, Stephen, is also reaping the benefits "it's great therapy after rattling between Watford and Aldgate for eight hours."

*Ariolasoft, Asphalte Hse, Palace St, London SW1*

Macmillan will be launching games for the Spectrum and C64 based on ITV's highly successful children's programme, Orm and Cheep, scheduled to return to the screen in September.

These delightful puppet characters proved so popular last year that they reached the national Top 100 with a viewing audience of over five million.

The well-known voice of Richard Briers, coupled with the enchanting Orm and Cheep obviously captured the imagination of both children and parents alike.

No doubt Macmillan are hoping for a similar response when their computer games are released later this year.

## Aiming High

Compunet, the communications network for C64 users, is expecting 15,000 new subscribers by Christmas 1985.

Having overcome early teething troubles Compunet see its future as a period of active technical and commercial development.

Commodore, who manufacture the Compunet modem, are now offering direct purchasers a package of 1541 disc drive, modem (including a year's Compunet subscription) the Easyscript word processor plus £30 worth of games for £229.

*Compunet, Metford Hse, 15-18 Clipston St, London W1P 7DF*

## Have a T on Tynesoft

Purchasers of Tynesoft's Supergran the Adventure, will be thrilled to hear that they will each receive a t shirt too.

Each cassette will contain a coupon and on sending this to Tynesoft a free Supergran t shirt of the correct size will be despatched.

The company are not claiming that this will give you a free OAP bus pass but it's worth a try!

*Tynesoft, Addison Ind Est, Blaydon upon Tyne, Newcastle*

## Walkies II

Regular readers will recall the item about US Gold's charity walking efforts in HCW 118.

Unfortunately, a typesetting error had the team raising just £100 when the true total was actually £1000. We have sent our apologies, 10 times, to Louise and all the other girls at US Gold and would like to offer our readers the chance to join in the good work.

If you would like to make a donation please send your cheques to the address below and made payable to: BRMB Walkathon.

*Louise Jones, US Gold, Unit 10, Parkway Ind Centre, Henage St, Birmingham B7 4LY.*

## Interstellar towel

Space is big, really big and so is Douglas Adams' towel. Well it needs to be if you're a Galactic hitch hiker.

Adams, the author of the bestselling book — Hitchhikers Guide to the Galaxy, Restaurant at the End of the Universe, Life the Universe and Everything and So long and thanks for all the Fish, has recently written this towel!

For those who haven't heard of Adams and who are wondering what all this has got to do with a computer magazine the following explanations might help: All the books are based around the life of Arthur Dent and could best be described as Science fictional humour. Infocom, the masters of the genre of Interactive Fiction, ie a book in which you can take part, have just released a new game written by Adams and Steve Merketzky which is based upon, but not tied to, the books.

The towel is a galactic hitch hiker's most vital possession and the many lovers of the books will be able to order one, in mulberry or blue, from HH Towels at the address below.

If you want to play the game on your computer then you must have a Commodore or an Atari with a disc drive. We are hoping to feature a full review of the game soon, so keep watching this space!

Towel: *HH Towels, 36-38 Hanway St, London W1P 9DE*
Game: *Beer Davies, 157 Russell Rd, Moseley, Birmingham B13 8RR*



The Hitch Hiker's Guide to the Galaxy has a few things to say on the subject of towels.

A towel, it says, is about the most useful thing an interstellar hitch hiker can have. Partly it has great practical value — you can wrap it around you for warmth as you bound across the cold moons of Jaglan Beta, use it to sail a mini raft, wet it for use in hand to hand combat, wind it off noxious fumes, wave it in emergencies, and of course dry yourself with it.

More importantly a towel has immense psychological value. What any strag (non-hitch hiker) would think is that any man who can hitch the length and breadth of the galaxy, struggle against terrible odds, and still know where his towel is, is clearly a man to be reckoned with.

25

Douglas Adams knows where his towel is!

There are 6 differences.

## Gribbly's mugs

Here it is the full list of winners in our Gribbly Win a mug competition. We have had to send the poor typist home with plenty of plasters for the sore fingers. All you have to do is read the other 149 winners names and perhaps yours will appear at the end of the list.

Rather than tell you the number of differences, here you can see the back of Lee Russell's envelope. I think that should clear up the difficulty.!

Our usual hearty congratulations to the winners. You should receive your mug direct from Hewson within 28 days of reading this issue.

Dave Parish, West Wickham; Pauleen Joyce, Northolt; Mr S S Alg, London; B D Everingham, Romford; B Mawson, Slough; Bryan Steele, West Drayton; G C Smith, Rainham; D E Nicholls, London; Karen Rolph, Tyne and Wear; Barry Griffiths; Lee Russel, London; C M Pearson, Normanton; James Adams, Ashbourne; Brian Lever, Stockport; Jennifer Bailey, Stockton on Tees; Mr S Fowell, Dagenham; Bryn Crowley, Walsall; Scott Thomas, Signal Regiment BFPO 42; Mark Buckley, Huddersfield; M Edwards, Sheperton; David Hall, Co Wicklow; Jill Woffenden, Markyate; L Marsh, Mitcham; D R Dickerson, Huntingdon; Kenneth Taylor, New Rackheath; Omar Ahmad, London; J S Robinson, Stevenage; E V Browning, Cardiff; Paul Bell, Newport; Stuart Edwards, Coventry; Andrew Bird, Ripley; Mr A Hubbard, Leicester; Mr M J Gough, Hersham; Joseph Kin Man Tse, Leeds; Jon Doswall, Wickford; D F Winter, Northwood; Mr K F Hughes, Bristol; Robin Grimwood, Cambridge; Sam Singh, Edinburgh; Vijay Lad, Long Eaton; David Westacott, Cardiff; Paul Hodgkinson, Belfast; Carl Swannick, South Wirral; Martin Alexis, London; Edwin Armstrong, Bedford; Patrick Putnam, London; Chris Crane, Stoke on Trent; Mr M Bromwich, Deeside; Mr D P Pether, Bristol; Miss J Crickmore, Newport; Ka Shing Man, Bushey; R Pilcher, London; C E Smith, Littleport; Richard Webb, Sutton; Patricia Ramsay, Arbroath; Mr M Norris, Coventry; David Blackledge, Bolton; Jonathan Biddle, Leiston; Paul Bousfield, Manchester; Stuart Renfrew, Paisley; S

Chatterton, Hull; L Rudd, Ward End; Paul Smithwhite, Jarrow; Brian Buckley, Shaw; Caroline James, Blackpool; Mr D Dickson, Peterborough; Keith Smith, Faversham; B Morris, Rochdale; D Goodwin, Wallingford; Julian Kendrick, Warley; Andrew Morrison, Alloa; Jonathan Leach, Sidmouth; K Peterson, Liverpool; Andrew McIntryre, Newport; B Bennett, Clevedon; Amy Nisbett, Glen Parva; R Mackenzie, Rochdale; C Trager, Glasgow; Chris Whitehead, Bolton; Richard Gorodecky, Wembley; Colin Neal, Reading; Iain Tanner, Brierfield; Mrs E Haggerty, Blyth; Mr J Henderson, Brixham; Elliot Mason, Hove; Mr D Irissari, Harrow; David Taylor, Huddersfield; B M Hartley, Carleton; Dave Kelly, Shrewsbury; Sarah Cave, Leicester; Brian Christie, Belfast; Mrs E Salisbury, Wirral; W D Mahood, BFPO 39; P F Appleyard, BFPO 110; Dennis Richards, London; Adrian Brain, Harrogate; Alan Campbell, Cheltenham; Attur Rahman, Meadows; Samantha Tricksey, Poole; Harry Sabharwal, Isle of Man; Alan Foster, Heywood; Zamir Hyder, Croydon; S N White, Gillingham; Stephen Marsh, Huddersfield; Nicholas Smith, Burton-on-Trent; F R Puttock, Heathfield; Mrs T M Boverton, S Glamorgan; R McClenaghan, Liverpool; Michael Yates, Peterborough; Robin Ashwell, Theydon Bois; Allan West, Aberdeen; A Watts, North Gosforth; Jack Hughes, Cadishead; D J Blundell, Southampton; Mr P Powley, King's Lynn; Noel Van Der Beek, Belgium; D Lloyd, Sittingbourne; A Kluge, Rugby; A Owen, Caernarvon; M Radley, Fife; W Bell, Bradford; Andrew Raymond, Reigate; Dilesh Patel, London; Clive Viagas, Gibraltar; Nigel Richards, Dyfed; A D Mohammed, Bolton; Richard Moulton, Northam; Peter Halloran, Weymouth; Juliet Roebuck, Lymington; Chun Wanering, London; Rakesh Patel, Portsmouth; David Cummings, Edinburgh; Jason Humphreys, Nottingham; Zamir Hyder, Croydon; A Huck, Plymouth; June Rowe, Launceston; Christopher Shiels, Bolton; Shaun Williamson, Westhoughton; Irfan Butt, Maidenhead; David Porter, Rochford; Ian Johnson, Chelmsford; Arthur Beale, Blandford; Lisa Hadcock, Urmston; Oliver Heaney, Eire; Sidney Reeves, Acocks Green; S J Lee, Huntingdon; S Merrett, Richmond; Matthew Fisher, Lichfield; Marcus Prescott, Burton-on-Trent; M Hicken, Coalville;

## Robot winners

There are 30 Henshin Robots on their way to lucky readers this week.

The machines are prizes in our recent CGL competition and they go to those drawn out of the hat. The cartoons had seven differences as most of you spotted.

Our congratulations to the winners who are:
Mark McIntyre, Newport; Kelly Roche, Poole; Alan McGeachie, Birmingham; Michael Thompson, Dorset; B E Sherry, Laindon; Steven Bell, Dagenham; Nigel Impey, Higham Ferrers; A B Alexander, Boston; Brian Christie, Belfast; Lisa Hadcock, Urmston; T J Gentle, Hitchin; M Suckling, RAF Benson; Arthur Beale, Blandford Forum; Michael Clarke, Consett; Sayeed Rahman; B Mawson, Slough; Charles Goldman, Welwyn; Christopher Jennings, Bushey; Ian Lester, Knutsford; K Axon, Abingdon; Mrs E Haggerty, Blyth; Steven Kinsella, Leigh; Marie McNally, Reading; D Woods, Sutton Leach; Paul Delph, BFPO 29; P Shadmy, BFPO; Keith Mawson, Slough; A F Turner-Howe, Basingstoke; A I Beeston, Cheadle; K Watson, Nelson.

## Chain-gang

The Amateur Programmer's Exchange, the postal user group organised by Nick Godwin, has a new scheme on offer to its members.

Called "Tape-Chain", it enables a programmer to share his or her work with up to five others. The chain consists of up to six Amstrad programmers who send the tape on to each other. On receipt of the cassette each person has four days in which to load all the software found on it and save something for the benefit of the other members.

Participants are encouraged to offer constructive criticism of each others work, and to use their imaginations to develop the potential of the scheme.

The rules of the scheme have been carefully drawn up to avoid mis-use by pirates. Registration on a Tape-Chain costs £1 but each participant is responsible for the cost of posting the package on to other members.

*Nick Godwin, 4 Hurkur Cres, Eyemouth, Berwick, Scotland.*

## Software update

A mixed bag of software this week from which bursts Way of the Exploding Fist, which its publishers Melbourne House claim in "the most authentic martial arts game yet available". For those who get their kicks from oriental combat the game is available for C64 and soon for Amstrad (£9.95) and Spectrum (£8.95).

Mordon's Quest from Melbourne House, which takes place over a time scale of thousands of years, so should keep Spectrum, Commodore and Amstrad users occupied for a while, however the questers task is to save the universe from destruction so coffee breaks should be limited to a century or two.

Pick of the conversions this week are Martech's best selling Eddie Kidd Jump Challenge and Brian Jacks Superstar challenge now available for MSX.

Bilbo and Co, the fantasy Tolkein characters from the Lord of the Rings are now to be found in a new improved version of the Hobbit on disc for the BBC. More locations have been added and 50 graphic screens have been included in the BBC version for the first time.

| Title | Machine | Price | Publisher |
|---|---|---|---|
| Lands of Havoc | C64 | £6.95 | Microdeal |
| Red Moon | C64, Amstrad, Atari BBC, MSX, Spectrum, Memotech | £6.95 | Level 9 |
| Mercenary | C64 | £9.95 D£12.95 | Novagen |
| Thing on a Spring | C64 | £7.95 | Gremlin |
| Hobbitt | BBC | D£17.95 | Melbourne. |
| Mordon's Quest | C64, Spectrum, Amstrad | £6.95 | Melbourne |
| The Way of the Exploding Fist | C64 (Amstrad, Spectrum) | £9.95 | Melbourne |
| Word Perfect | C16/Plus 4 | £12.95 D£14.95 | Supersoft |
| Music Master | C16/Plus 4 | £12.95 D£14.95 | Supersoft |
| Eddie Kidd Jump Chllnge | MSX | £7.95 | Martech |
| Brian Jacks Superstar Challenge | MSX | £7.95 | Martech |

Wilma   Tom   Dick   Harry

Herbert
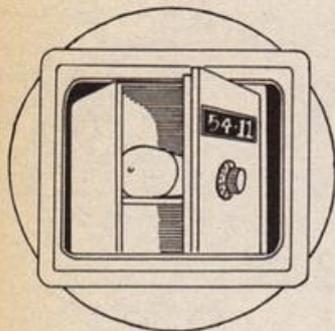
# "Everyone's a Wally"
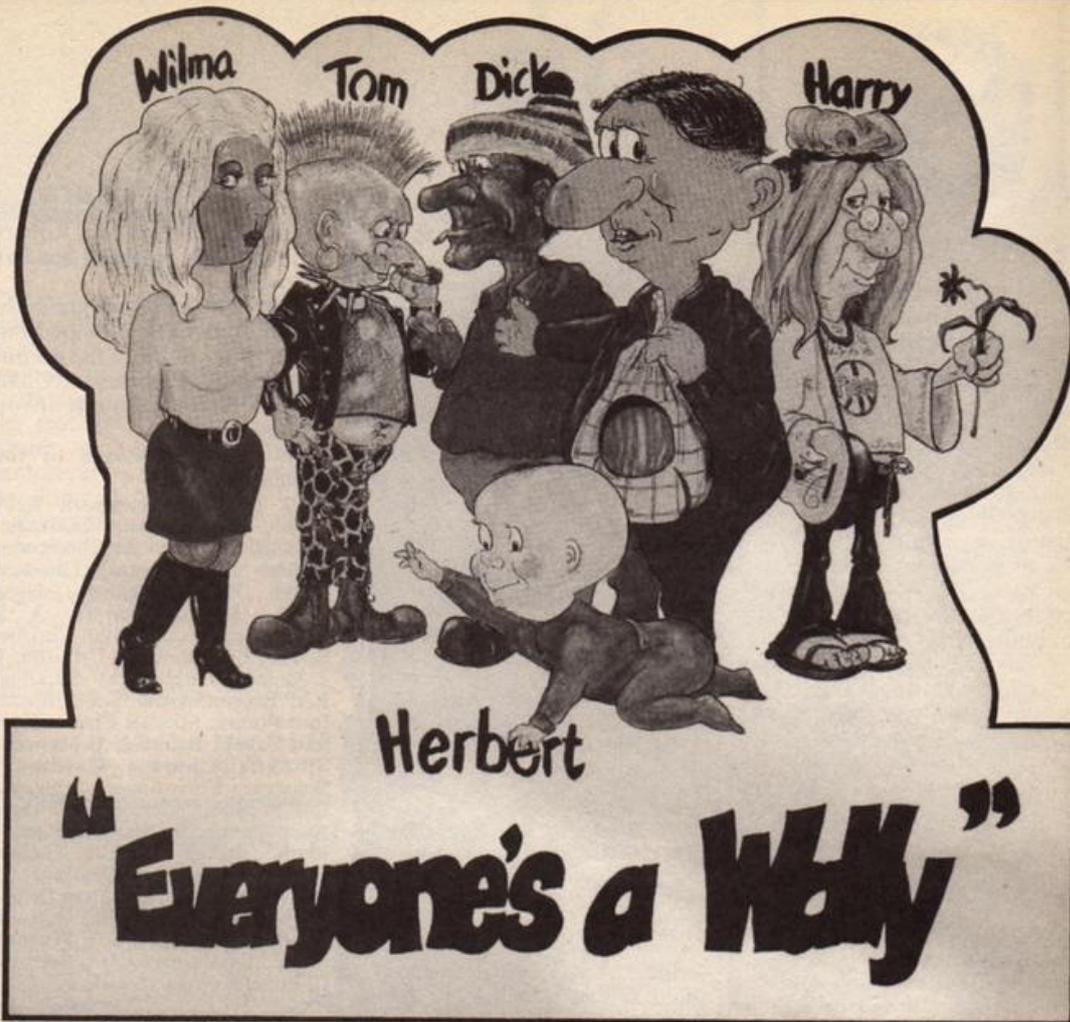
# IT'S WALLY WEEK

**In this first interview of a new regular series we talk to Wally Week, super-star of Pyjamarama, Automania, Everyone's a Wally and Herbert's Dummy Run**

There can be few men who have shot to fame quite so quickly as the (in)-famous Wally Week. The leap from incredible obscurity to complete super-stardom was nothing for a man as skilled as he.

It was with great trepidation therefore that we at HCW approached his management, Mikro-Gen Deals Incorporated, in an effort to persuade him to launch our new series Time Capsule.

In this new and regular series we will interview famous names within the home computer industry and ask them to choose the products that they believe should be preserved for posterity from our current computer age. We will then pack these products into an imaginary time capsule and bury them underneath the statue of Eros in the centre of Piccadilly Circus — out of the office door turn left and walk 250 steps ignoring all traffic and

you're there! — where they will remain until another age sees fit to clean Eros again.

Over the next weeks and months there will be personalities from all parts of the industry entertaining you with their life stories and their selections but for now we had better return to Mr Week who we last saw trying to get three cherries to come up on a parking meter.

Wally Week was born of humble parents in a small town called Walliford in darkest Scotland. His childhood has been a major influence on his entire life and has been described by his biographer as "Simple, and when I say simple I mean **simple**". Wally has always remembered these early years and a tear will often drop from his eye when he hears people describe him in this manner.

He lived in a small crofter's cottage with a turf roof, which, when the family were desperate,

used to be burned in the simple hearth. It meant that the rain dripped in but they at least had a fire to try to dry their clothes.

Wally was born at a very early age on Monday 1 June 1952, just eight days after the Editor but that is another simple story. As Wally developed, over a period of days, years and months, his parents became aware of his unique talents.

As a teenager, Wally was the first person in the British Isles to start a Llama farm. He kept these mild mannered beasts with the split lips for several years but then discovered that they didn't give milk after all and his first business closed with what Wally describes as "only minor success".

His next venture was much more adventurous and involved a great deal of study and thought. Wally became the proud founder of Scotland's first Dinky toy repair facility. This venture was so successful that Wally managed to collect a full tool kit, super economy size, and extensive experience in vehicle repair. This business only closed when Wally ran out of garage space, a tragic occurence for all concerned.

Wally was so dejected at the failure of this concern that he

SENSATIONAL SOFTWARE FROM
## MIKRO·GEN

Herbert's
Dummy Run

COMMODORE 64

decided to leave his native land and cross Hadrian's Wall to find fame and fortune.

His first job south of the border was as a car mechanic for Auto Cross in Bracknell. He wrote his own references and mentioned his vast experience repairing Rolls Royce, Jaguars, Mercedes Benz and a number of other makes of motor vehicle. With this type of background, how could the garage resist a man of his calibre?

You are likely to know the rest of the story. Wally had a terrible problem. He just couldn't get up in the morning and this difficulty meant he got the sack, but by then he was already on his way to stardom.

Most people would have solved their early morning problems with the purchase of an alarm clock but not our Wally. He decided that he needed a wife and that this would end all his difficulties. He married Wilma who he met when servicing her car, a Morris Minor. Wally gave it all his best care and attention and the vehicle was returned to Wilma in a large cardboard box.

just become engaged. They had heard about the marriage services that take place in Wally's native land and pledged their troth over an ice cream cart in bonny Scotland.

It was at this point that Wally decided to sort out his life and asked Wilma to help. The first problem was that "due to

exercise and they started up as building contractors. They looked for maintainance work and soon found that there was more than they could cope with.

It was at this time that Wally met his new friends Tom, Dick and Harry. Work flooded in. It wasn't so much the quality of work that led to this popularity as the fact that no one ever paid for their work. Wally admitted that this was due to "staffing difficulties".

During this time Herbert led a very wayward babyhood. There was never anyone to discipline him and he ended up getting in everyone's way. One of the games that Herbert used to play was hide and seek. This was fine at first but eventually led to his becoming lost in a local department store. Wally and Wilma eventually found him but only after a hard day's slog.

We were lucky to be able to interview Wally at all as the entire Week family are currently on a continental holiday. We arranged this interview by phone and Wally agreed to pay his own day return fare to speak, exclusively, to Home Computing Weekly.

We first asked Wally which piece of computer hardware he felt was the most impressive over the years that he has watched the computer industry. "I think that would have to be the Jupiter Ace. It has to be a good and clever computer because even I couldn't understand it after reading every book on BASIC that I could find."

The software scene has interested the entire Week family for years and their choice for preservation is The Great Space Race from Legend. "This is a truly astounding package as far as we Weeks are concerned. We had hours of fun just trying to find anything worthwhile in the box. We never even got to playing the game."

Wally admits that he has very few computer accessories, he likes to keep things as simple as possible. He did however succumb to buying a disc drive for his C64. "I was fed up with all these turbo loading programs. They never gave me any time to drink my coffee. I solved all that by buying the 1541 disc drive unit. Now I have all the time in the world."

"Although I don't have much time to read there is one series of books that should be preserved as far as I'm concerned. These are the listing books by Tim Hartnell. I have typed in hundreds and he is a very clever fellow. He really teaches you about BASIC. I didn't know that bug hunting could be so much fun. I still haven't got one to work."

It was at this point that the interview was terminated due to the appearance of two large



We have heard Wally's marriage refered to as the ninth Wonder of the World. Its circumstances were certainly strange enough. Wally intended to ask Wilma for a date but his question ended up as a proposal of marriage. Wilma accepted before Wally had finished talking and found that she had

circumstances beyond my control" Herbert arrived. Wally claims to be baffled as to how this happened and is still investigating the circumstances.

Being parents — "a role I take very seriously" says Wally — the Weeks decided that Wally's innovative business background required more



policemen. It appears that when Wally left the country he signed a paper declaring that he would not return "for reasons of national security". The policemen had come to enforce that agreement and Wally was whisked away to rejoin his family and search for another job — abroad.

# SOFTWARE
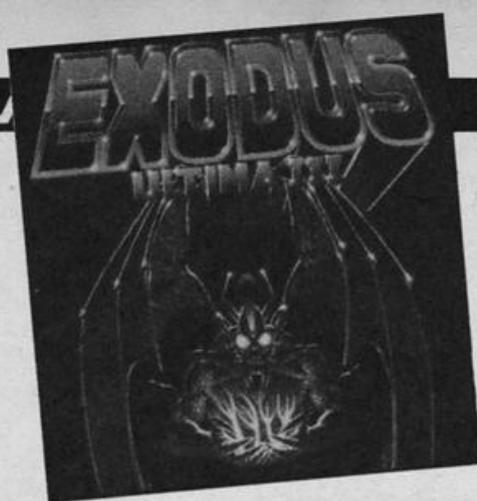
### Exodus Ultima III

Based closely on Dungeons and Dragons, this action adventure places you in the realm of Sosaria which is populated by a host of nasties including thieves, skeletons, demons, giants, orcs and wizards. Before starting the adventure certain rituals must be performed.

The game is disc-based because of all the locations involved in the game. It is necessary to transfer the scenario information onto a disc of your own before you can start your first game. This done, you are ready to embark on the game proper.

First of all you must create at least four characters from the menus given in the manual. Each character has two main attributes: race and profession. Race determines the relative amounts of strength, dexterity, intelligence and wisdom which each character can attain but each attribute can be allotted a certain amount of energy at the beginning of the game.

Profession dictates the weapons and armour which can be used as well as whether the character can use magic or has some other specialisation. The five races are human, elf, dwarf, bobbit and fuzzy, with eleven possible professions such as wizard, cleric, druid or ranger.

With this number of options the variations are virtually limitless but 20 characters can be defined. Character definition also allows you to specify the sex of the character as male, female or other but this has no effect on the game whatsoever. Having thought up at least four names and distributed energy according to type a party can be formed. One niggling thing about the menu selection system is that it rarely permits second-thoughts and once a decision is made it must be adhered to.

During the adventuring phase, commands are given with single key presses and a comprehensive easy reference chart is provided of all the commands available. Each letter used sensibly related to the command, for example, U for unlock or X for exit.

Initially you are placed naked and unarmed on the plains of Sosaria, an island with pirates raiding the shore. You have cloth armour, a dagger each and a quantity of gold so the first task is to dress, arm and then make for the nearest town to buy extra arms and provisions (starving to death is a distinct possibility otherwise!).

On the "surface" you may find yourself attacked by a group of enemies and the scene changes to give a closer view of the battle. Each player in turn has a chance to move or attack. Movement is by keyboard control — it's a pity that this conversion does not take the joystick port into consideration. Attack can be physical assault with a weapon at close quarters or by magic at a distance. The problem with magic is that there are 32 possible spells but no booklet to tell you what they do. This is a serious omission which I hope will be corrected, trial and error can only go so far.

Success in battle means a gold reward in a casket which is often booby trapped and must be opened with care. The gold can be used to buy healing, armour, weapons or food in the nearest town or castle.

When all your men are killed the game ends abruptly and cannot be restarted without reloading the game from scratch.

This is an excellently conceived game which I recommend as the best action adventure available for the 64, despite my reservations that the conversion could have been better thought out.          **E.D.**

**Price:** £19.95 (disc only)

**Publisher:** US Gold

**Address:** Unit 10, Parkway Ind Est, Henage St, Birmingham B7 4LY

### Alex Higgins' World of Snooker

I was quite surprised to receive Alex Higgins' World Snooker from Amsoft as they have already got one snooker game in their collection. I was even more surprised when I loaded the program and found that I was faced with the same game — well almost.

Amsoft have taken their original competent program and spiced it up a little. The game follows all the rules of snooker and can be played with a choice of 6, 10, or 15 red balls. A practice option is also included, the user being allowed to wander round the table potting the balls and amassing phenomenal breaks (ha ha).

The first difference that you will notice is the excellent picture of the Irishman himself which is displayed during loading. The second enhancement can only be taken advantage of by the more affluent amongst you. If you have purchased the Amstrad speech synthesiser, or even the dk'tronics system, then you can enjoy the scores and prompts being called out by an Irish dalek.

The operation of the program itself has also been improved. In the original game the cursor, with which you set the direction of the shot, was represented by a flashing white dot. This was quite difficult to place accurately. In the new game the cursor is a flashing circle which is the same size as the cue ball. Finally you will find that all of the games controls react 100% faster to your commands.

The Higgins' version of the game is a definite improvement over the original program — but I still couldn't make the balls jump off the table like he does!          **J.R.**

**Price:** £8.95

**Publisher:** Amsoft

**Address:** Brentwood Hse, 169 Kings Rd, Brentwood, Essex CM14 4EF

## The Scout Steps Out

I must admit that when I first saw the title of this program I was unsure of what to expect. Would it be a Roland goes bob-a-jobbing I wondered? I was pleasantly suprised to find that the game was quite a little gem.

Before I get started on the game I must insist that you rig up your Amstrad to your Hi-Fi system. The little tune that plays continually whilst the scout is on the opening screen is superb. It is played in stereo with multiple voices and is so catchy that should it be made into a single then it would go straight to number one.

The aim of the game is to wander round a series of ladders and levels type screens collecting various objects. These include the troop missing trophies, flags on flag day, components for the camp radio, and even mushrooms for the troop's tea.

All of the screens and characters are drawn in full colour and great detail. You are not required to complete each screen before going on to the next, just wander off one side of the screen and you will appear somewhere else.

The number of lives that you begin with is determined by the number of cornflakes that you have eaten for breakfast. There is a dishful on the opening screen but even a scout can only eat nine at a time.

The Scout Steps Out is one of the most well written, difficult, and fun games that I have played in a long while.    **J.R.**

**Price:** £8.95

**Publisher:** Amsoft

**Address:** Brentwood Hse, 169 Kings Rd, Brentwood, Essex CM14 4EF

**AMSTRAD**
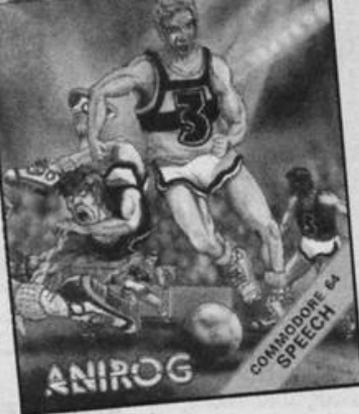
## Five a Side

Commodore's International Soccer has long ruled the Kop as the best football simulation around but this game from Anirog is a worthy challenger for the championship.

The opening menu offers a one or two player game of soccer or penalty competition at any of three skill levels. The penalty game I found to be quite disappointing despite the excellent graphics but the football match itself is great fun.

My complaint about the penalties relates to the way in which the ball sprite is handled. The view of the penalty is from behind the ball looking towards the goal and when the ball is kicked you must move the goalkeeper in the direction the ball is travelling and press the fire button to punch the ball out. Unfortunately the sprite for the ball does not switch from foreground to background priority and it is only when the message appears on the screen that you know if the ball was saved or not. I found these penalties to rely more on luck than judgement and I can't honestly say that I enjoyed this aspect of the game.

Really it's the football game itself by which the game will be judged and on the whole it passes the test. The first surprise is the use of Anirog's excellent Voice Master unit to produce a suitably boorish football chant just before the kick off. From the kick-off the player nearest the ball is controlled by joystick and this is signified by him being high-lighted in a darker colour than the rest of the team. He can dribble by sending him on a collision course for the player in possession of the ball. Alternat-

ively, he can kick the ball with the strength of the kick being determined by the length of time the fire button is held down before being released to effect the kick.

Five-a-side is noted for being a very physical sport and the contact aspect has not been ignored in this simulation. Hard tackles will floor the opponent but too much rough play will result in a penalty kick-off from the centre spot being awarded to the victim's team.

The second surprise comes if you indulge in excessively rough play; a punch up is staged on the pitch. After a few seconds of thumping good entertain-ment, penalties are awarded. Each player in turn has a chance to shoot for goal from the penalty spot. The fight is fun but the penalties... well, you know what I think!

While I'm in a critical mood I'll also have a moan about the goalkeeping during the match. Maybe it's me but I found it very difficult to judge the level of the ball when placing my keeper for the save. Perhaps a little more practice will reveal a few hidden secrets in the art of goalkeeping.

The view of the pitch is treated in the same Match of the Day television camera style which Commodore adopted for their game and the side to side scrolling is just as smooth. Further comparison between the games would not really be fair because the action looks the same in both games. Really it's a case of you pays your money and takes your choice, bearing in mind that this game costs just under £6.

My verdice on Five a Side is that it is a hit with me and as for its addictiveness — "Here we go, here we go, here we go..."    **E.D.**

**Price:** £5.95

**Publisher:** Anirog

**Address:** 8 The High St, Horley Surrey

**C64**

★ ★ ★ ★ ★
**Flipped**

★ ★ ★ ★
**Hooked**

★ ★ ★
**Keen**

★ ★
**Yawning**

★
**Comatose**

## Out On a Limb

Jack the lad in the beanstalk tale is plundering the giant's castle again. Somewhere in the 23 locations of this game there are three hidden treasures. Jack must find the golden egg, the harp and the bag of gold as quickly as possible. To do this he must first climb the overgrown vegetable to the castle.

On the way up the beanstalk our Jack must leap from limb to limb avoiding beetles and ducks until he reaches the clouds. At this point he finds he can actually walk on the clouds up to the castle but the task becomes harder the higher he climbs with little jellybabies blocking the skyways.

Inside the castle the game takes on the appearance of a simplified Jet Set Willy with rogue vacuum cleaners and other little problems to be overcome in a myriad of rooms. Although each screen does not have as many obstacles as Willy, this does not mean that it is any easier to complete. Every new location has a logical series of movements but it takes time to think of them and often means losing all four lives many times before achieving your goal.

Each time all the lives are used up you start a fresh game from the bottom of the beanstalk with the giant's synthesised voice booming out his familiar Fee Fie Fum chant.

The graphics for the game are what I would describe as very pleasant and solid looking, ideal for a fairytale game. Not the best game of this type that I've seen but by no stretch of the imagination is it the worst.
**E.D.**

**Price:** £5.95

**Publisher:** Anirog

**Address:** 8 The High St, Horley Surrey

## The Hobbit

Here it is for the CPC464! Briefly, you play the role of Bilbo Baggins, the Hobbit from Tokien's book. Your task is very simply specified: find the treasure and install it in the chest seen in the opening graphic sequence. Books have now been written as to how to get round the problems you will encounter on your travels in Wilderland. And there are certainly some problems to solve, though the copious documentation supplied assures you that reading the accompanying copy of the novel will help.

Unlike the Spectrum version, from which all the others are derived, this one features a really stunning loading screen, the like of which I haven't seen before on the Amstrad. It features a superbly drawn dragon in myriad colours. When finally loaded, however, the graphics faithfully follow the Spectrum's, with perhaps one or two improvements, though more slowly drawn. Many locations are illustrated this way, following the announcement of your arrival in a text window at the bottom of the screen. Instructions which follow wipe it out, however.

It's hard to remember that this is the program which started the adventure revolution with characters to whom you can talk, who respond to you, and who have their own independent existence, carrying on with their business without you! Not only that, but instead of the usual verb-noun instruction, the input interpreter allows quite complex sentences.

It's very, very good, but rather dated now, as others have followed its lead. If you want the original, you must pay the rather over-the-top price.
**D.M.**

**Price:** £14.95

**Publisher:** Melbourne Hse

**Address:** Castle Yard Hse, Castle Yard, Richmond TW10 6TF

## Bridge Player II

This program gives a simulation of the game of contract bridge. To the uninitiated, bridge is a card game in which you bid with your partner in order to decide on the number of tricks with a specified trump suit which must be collected (a contract).

It should be understood that you won't learn to play the game by simply buying this program. It's really intended to polish up your game.

The display is quite simple and shows the four normal playing positions. At the bottom right hand corner, a window is given showing the current score, current contract and number of tricks won. Since the program is written in machine code, all actions are instantaneous.

At any stage of the action you can get an interpretation of any given bid. This enables you to ensure that your bid matches your hand. The program recognises the standard Acol system but beyond that it's a bit stupid.

It can't, for example, give an interpretation of a pre-emptive bid. The standard of bidding was reasonable although I sensed a certain reluctance to bid above the three level. Occasionally, the bidding was diabolical with the program missing an excellent trump fit. The play of contracts tended to be quite good although the program lead trumps rather too often.

On the whole this is a fun program which plays a passable game and, in small doses, is enjoyable. Strictly for the bridge beginner.
**A.W.**

**Price:** £9.95

**Publisher:** CP Software

**Address:** 2 Glebe Rd, Uxbridge, Middx UB8 2RD

## Maverick

In this poker simulation you play against five others, each with their own characteristic style of play. Such behaviour as boldness, bluffing and timidity are catered for. These are allocated randomly at the start of play and remain constant for the full session. By using your powers of observation you should be able to assess your opponents and gain an advantage.

The play is straight draw poker. After the first round of betting you can change any of your cards. There then follows the final round of betting and the inevitable showdown.

At the beginning you can choose the size of each player's bank rolls. This means that if you want a short game, you can have one. After each hand, you have the option to assess the progress of each player, change the bet limit and, if allowed, have a look at the winner's last hand.

The display is simple, with your cards depicted along the lower part of the screen. Your opponent's names are listed down the upper left hand side. As each hand progresses, messages and actions are printed beside the relevant player. These messages are flashing to emphasise their appearance.

The feel of this game is one of careful and effective programming. The programmer has obviously given thought to the display and the program runs smoothly without bugs. The standard of the opponents game is good giving a challenging game. The instructions are detailed and the price is reasonable. Overall an enjoyable simulation representing good value.
**M.W.**

**Price:** £5.95

**Publisher:** Cases Computer Simulations

**Address:** 14 Langton Way, London SE3 7TL

C64

AMSTRAD

C64

SPECTRUM
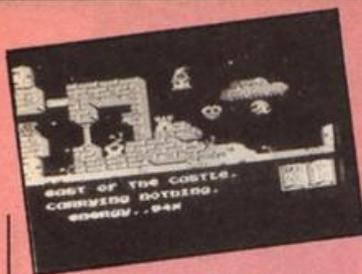
## Sorcery

This is a conversion from the C64. It is an arcade adventure which wouldn't necessarily appeal to the true adventure fan but it certainly is an improvement on the arcade scene.

The star feature just has to be the graphics. The game boasts 50 different screens which are really sensational. You have scenes that show the various parts of the mansion in which a lot of the action takes place and much of the country around. Take a look at some of those on the cassette inlay. All drawn in such incredible detail that I spent a good hour just mindlessly wandering about admiring the view.

But there is more. The game itself places you in the role of a free sorcerer intent on rescuing other sorcerers imprisoned by the evil Necromancer. During your explorations you will come across various objects, some of which will be of use whilst others are a hindrance.

In each scene you will be pestered by annoying sprites — in both senses — which can be destroyed. However they do have the effect of depleting your energy and so you race against time. In fact there are ways of replenishing your lost energy but there is an overall time limit shown by a gradually diminishing spellbook.

Each screen is accompanied by a description of your location and a statement of what you are holding.

You will need to plan carefully and, I suspect, to map your journey if you wish to make serious progress.

There is so much to comment on this game that I am sure it will become a classic in its own right and produce lots of comment from both arcade and adventure fanatics. You must buy this one! **M.P.**

**Price:** £8.95

**Publisher:** Virgin Games

**Address:** 2-4 Vernon Yard, Portobello Rd, London W11 2DX

## Darts

I must confess to not having seen any other darts programs for the Spectrum, so I can't make a comparison. This offering features the standard Sinclair character set in a BASIC program with machine code driven graphics. The instructions/practice module load first. A monochrome dart board is drawn over almost the whole of the screen.

A small graphic person appears bottom left with a moving arm. By pushing the space bar, you stop the arm for vertical aim, then repeat the process for horizontal. That being done, a dart appears from the centre of the screen, describes a classy arc, then stops in the board. Your score appears, and your total is revised. Learning to get double top is fairly easy, but in order to finish, you have to be good all round the board, and that takes some practice.

When your aim is good enough,it's time to load the main program, which gives you the opportunity to play championship darts from 501 or 301, round the board, or killer darts. Up to four people can play.

Surprisingly, the computer doesn't play against you, so practice is all you get alone! Graphically, this isn't very sophisticated either; many £1.99 games are better presented. On the other hand, the price is relatively modest, and it's one of the few new releases which will run on a 16K Spectrum too. Overall, worthwhile if you and your friends insist on darts without a dart board. Otherwise, perhaps a shade over-priced. **D.M.**

**Price:** £4.50

**Publisher:** Slogger

**Address:** 215 Beacon Rd, Chatham, Kent

## Minipedes

Here we have a version of that old arcade favourite involving a centipede-type creature plus many other nasties. The scenario is simple and rather bloody. You control a spaceship-type vehicle and can move around the bottom two-thirds of the screen.

The area is scattered with mushrooms which impede your movement, and a centipede moves from the top of the screen down. As it encounters a mushroom it changes direction. You must shoot all the segments of the centipede.

To make life difficult, a wide range of nasties including spiders, beetles, wasps, catapillars, butterflies, fleas etc charge around the screen. Some, such as spiders and wasps, go for you. Others just get in the way. Contact with just about anything means a lost life.

The interesting point of this cassette is that it carries a version for the 64 on one side and versions for the VIC, Plus/4 and C16 on the other. Graphically the game is very good with very well animated nasties. The spiders in the C64 version are particularly effective. Each screen features a different nasty or collection of nasties, each accompanied by accurate sound effects — the buzzing of the wasps and gnats is excellent.

I tried both the C64 and VIC versions, both utilised the respective machine to the full. A practice mode is provided to enable you to get used to things. Whilst this isn't an original game, it's one of the best versions I've seen. It's certainly the most frantic! Good value too. **M.W.**

**Price:** £6.95

**Publisher:** Anirog

**Address:** Unit 10, Victoria Ind Park, Victoria Rd, Dartford, Kent DA1 5AJ

## German is Fun

This is one of a series which offers you the chance of a painless introduction to a language in the privacy of your own home.

The cassette has two distinct elements. Firstly you learn a vocabulary through pictures and words on screen and secondly you can synchronise the other side to hear the words as well. This audio/visual approach gives it an edge on those tape-only courses but the disadvantage is in the relatively small vocabulary it teaches you.

There are six screens, each built up as the words are introduced. One element is usually animated: for example, the beachball bouncing at the seaside. The drawings are very good and colourful with an option to take them singly or one after the other in a demonstration mode. Once you select your picture you may choose to have the German and English text appear as the items are drawn or you may test yourself. Mistakes are noted by a counter but if you get stuck, typing a "?" will give you the next letter.

The pictures involve a house, the countryside, seaside, a cafe, a street and a school. These represent the basic vocabulary needed, as the cassette inlay suggests, for "the student, holiday maker or traveller."

There is a phrases-only mode which helps in making sense of what you have learned. In addition there are sections dealing with numbers and telling the time.

This is a program which is inventive in its approach and versatile enough to cope with the beginner's bewilderment. Recommended as a very simple introduction to the language. **M.P.**

**Price:** £7.95

**Publisher:** CDS

**Address:** Silver Hse, Silver St, Doncaster, S Yorks DN1 1HL

MSX

SPECTRUM

C64 VIC-20

MSX
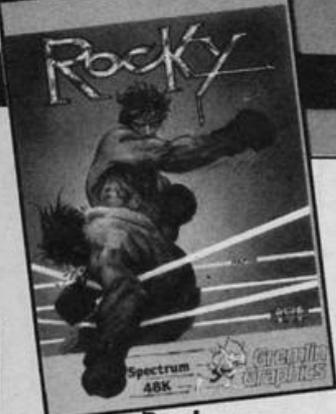
## Rocko

Three boxing games have recently appeared on the Spectrum. This one is written by Spanish software house Dinamic, and has the most obvious title.

The game presents a three dimensional view of the ring, with surrounding crowd. Your opponent faces out of the screen, with your man seen from the back, in large, excellently shaded, black and white graphics. There is a choice of four moves: left and right attack and defence, and hits are always to the mouth, which is not very good sportsmanship. Strength bars underneath indicate who is winning, and when either bar reaches zero, a knockout is achieved. Three knockouts in a round allow you to progress further or the game to finish.

To become world champion you must fight four increasingly tough opponents of various nationalities. These are portrayed in small well-presented cards at the bottom of the screen — but although this graphic changes each round, your opponent stays the same throughout.

Animation is clever, particularly the facial expressions, although sometimes it is unclear whose arms are guarding.

In general, playing this game is monotonous and the sound average. With only four moves, little skill is involved, so the player is reduced to Decathlon-style key bashing, but without the fun. It is also rather easy — pressing the same key, nonstop, will take the player through to the third round. I found it un-addictive, and once the world championship is gained, the lack of scoring means the game becomes boring. It's overpriced, and generally a disappointing game from Gremlin. **P.S.**

**Price:** £7.95

**Publisher:** Gremlin Graphics

**Address:** Alpha House, 10 Carver Street, Sheffield S1 4FS.

**SPECTRUM**
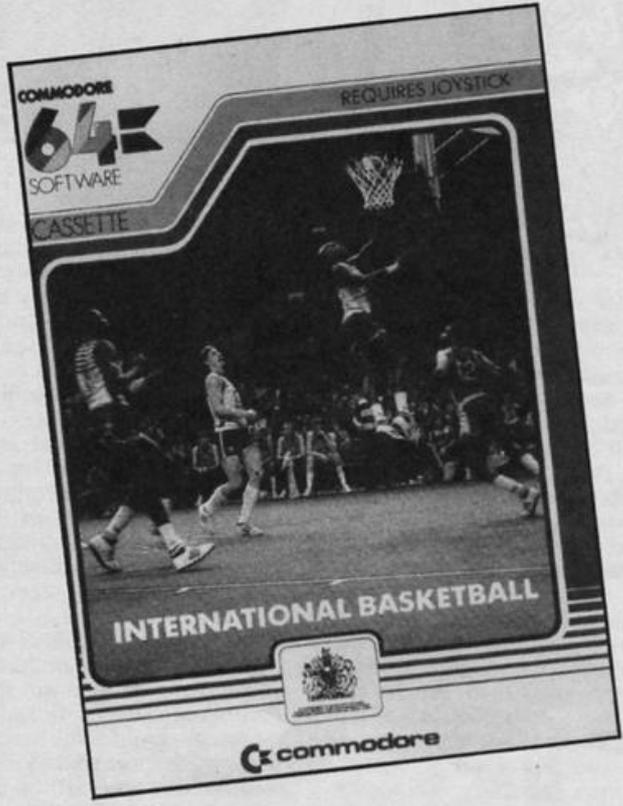


## International Basketball

Commodore had a huge hit with the highly popular International Soccer. This game, I presume, is a sort of follow up. The interesting feature is that it's copyrighted in 1983. Why the delay in its release?

The game is very similar in feel to the soccer game and is similar in format except that you play in a gym — not unsurprisingly. Due to sprite numbers, each side comprises of three players. Your opposition may be either the computer or another human. The computer can play at one of nine skill levels. In addition, you may choose between NBR and NCAA rules. Since I don't play basketball, I haven't a clue what the difference is.

As usual, you can only control a single player at any one time. This player is signified in a different colour. This player can be changed by holding the fire button down. You can pass the ball to other players by a quick stab at the fire button.

The graphics are comparable to its predecessor and are colourful with good attention to detail. The players are well designed and excellently animated. As you dribble up the playing area, the ball is regularly bounced and the opposition move realistically to intercept you. If you score the audience applauds with realistic sound effects. At the end of the game, the teams appear on screen and the victors receive a cup.

At low levels the computer plays an unbelievably poor game but things get more interesting. At level nine, as you would expect, the opposition is quite tough. I don't know if it's simply my naturally aggressive style but rather a lot of fouls were awarded to the opposition, often without an obvious reason. This was about the only poor feature of the game. On the whole an addictive game which is first class value. **A.W.**

**Price:** £5.95

**Publisher:** Commodore Business Machines

**Address:** 1 Hunters Way, Weldon, Corby, Northants, NN17 1QX

**C64**



## Dork's Dilemma

The C16 is such a relative newcomer to the home computer market that the software for it has consisted of old 64 games revamped. Hopefully, Dork's Dilemma heralds the dawn of a new age.

The game consists of two phases, the first being a shoot the aliens game, the second a jigsaw. In the first phase you guide a creature — either a man in a barrel or a tortoise, I'm not sure which — around a maze killing off a specified number of aliens. there are 25 rooms to explore, each one different and with one of a variety of aliens inhabiting it. When you have disposed of the nasties you are given a part of the jigsaw which forms the second part of the game.

The screen is divided into two main sections, the playing area and an information area. In the information area is a diagram showing your position — down to the finest degree — and a grid containing your jigsaw pieces. These pieces are moveable using the joystick — and when you have completed this part of the game you are whisked to the beginning of a new game but with more aliens to destroy.

There is no music included but the sound effects used, especially the bombs exploding as you run for cover, are well done. Overall, this is a delightful game, it's basis may not be completely original but it's implementation is well thought out. This is definitely something for C16 and Plus 4 owners to look at. **M.W.**

**Price:** £6.95

**Publisher:** Gremlin Graphics

**Address:** Unit 10, The Parkway Ind Ctre, Heneage St, Birmingham B7

**C16**

## Hypersports

Licensed from the Kuonami arcade game, Hypersports features swimming, skeet shooting, jumping the horse, archery, triple jump and weight lifting. It's one of those games joystick manufacturrs love — you can easily wreck yours — and different models make for different scores.

As this is the Spectrum version there are no multi-coloured sprites, but they are beautifully animated — smooth, and no flickers. Backgrounds scroll at different rates and sound is provided. In fact the whole thing is very well done, though not perhaps of the highest technical standard. There's no attempt at reality — it's more like a cartoon.

To start swimming you press the fire button at the gun (no cheating) then left and right like fury to move the arms of your swimmer, pressing the fire button when breathing is called for. If you can't meet the qualifying time, you won't get through to shooting, where you use left and right to fire when the target clay is in your cursor. Again, you must reach the target score to go on to jumping. Press the fire button to start running, and then you reach the springboard and the horse. Then spin using left and right. I'd like to tell you about the rest, but I'm not good enough to qualify yet!

My joystick was literally hot, and I wore the skin off a finger swimming — a new world record! Well executed, and for me, highly addictive. But I CAN'T get the hang of the jumping. Still, next time . . .

**D.M.**

**Price:** £7.95

**Publisher:** Imagine

**Address:** 6 Central Street, Manchester

**SPECTRUM**

## Witchswitch

English has definitely come up with a winner here. Your task is to get a magic pouch past various enemies on a wide variety of screens. Eventually you will drop it into the witch's brew and stop the flow of molten lava reaching a village.

In the first screen you must hop between toadstools to get across the swamp safely. As you move, the screen scrolls from right to left.

The second screen has a scenario of a river with a bridge across it. You must hurl stones at the attacking ravens and avoid cats on broomsticks before you may cross the bridge. At this point the magic pouch is passed to an owl.

The acid lake comes your way next. You must dodge the thunder clouds, snakes and jumping fish. If you touch a green tortoise then you are instantly swept on to the next screen.

Spiders, wasps and many voracious insects are in the forest. You must kill them with your hoot before they touch you. This part of the game is very hard, and I haven't got past it yet.

The graphics are quite good — lots of interesting effects are used. The same can also be said of the sound. A variety of different compositions are played throughout the game — you don't just get the same tune over and over again.

The game really falls down when it comes to the dreaded documentation. Your aim is different on each of the screens — but you aren't told anywhere exactly what you should be doing.

**K.I.**

**Price:** £4.95

**Publisher:** English

**Address:** Box 43, Manchester M60 3AD

**C64**
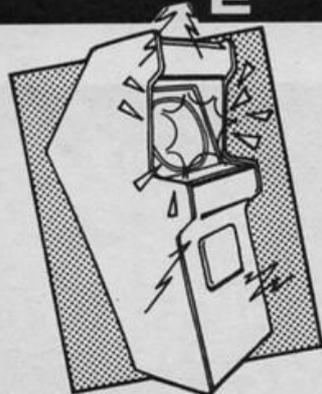
## War Machine

This game is yet another budget-offering aimed at those of us who aren't prepared to shell out too much money on games. After due consideration, I must say that this is the worst game I've ever had the pleasure to play.

According to the cassette insert you have been left at a distant outpost of the empire and are tasked with protecting the remaining deposits of neutronium. In order to achieve this goal, you must shoot the space ships which patrol the skies and avoid wandering land vehicles. With a single prod of the fire button a missile is set both vertically and horizontally. The space ships will bomb you, given half a chance, but the land vehicles simply collide with you.

The screen shot shows a grid of mole hills with paths between them. You may move your vehicle along any of these paths. The land vehicles move at random from side to side down one of the paths. You either shoot them or move to another path. You simply shoot the ships or vehicles and accumulate points. When you score sufficient points, you move onto the next level. Higher levels simply seem to be faster rather than more difficult.

The game seems to be full of oddities. If the space ships collide with each other, for example, they are destroyed and you gain the points. The graphics and sound are just about average but the game play is terrible. It's just a test of endurance rather than skill. Notwithstanding the price, this is a game to avoid. **A.W.**

**Price:** £1.99

**Publisher:** Pocket Money Software

**Address:** 41 Truro Rd, St Austell, Cornwall

**C64**

## Cluedo

I have to confess that I don't like Cluedo as a board game, and find it very boring, however . . .

The basic idea is as follows, you are shown the ground floor plan of a house, and the house are six people and six weapons. At the start of each game a location, a weapon, and a murderer are chosen by the computer. Each player, who can be computer or human controlled, is then given "clue cards" — person, weapon, location — and thus if the clue is in your hand, those things can't have been used for the murder.

The game proceeds by throwing a dice. You then move the appropriate number of squares. When you eventually get into a room, you may make a suggestion as to who did the murder in that room and with which weapon. All the other players must then look at their cards, and the first one to hold one of the suggestions you have made, must show it to you.

Thus by a process of elimination and movement about the house, you can determine who did what to whom, where, and with what. When you are absolutely sure, you can make an accusation. If right, you win. If wrong, you are out of the game which then continues without you.

Not the most suitable game for computer implementation — your opponents can cheat easily — but an adequate technical job. Even though you can turn off the awful sound, it still takes ages to play. But if you like Cluedo . . . . . **D.M.**

**Price:** £9.95

**Publisher:** Leisure Genius

**Address:** 3 Montagu Row, London W1E 1EZ

**SPECTRUM**

# MACHINE CODE — THE EASY WAY
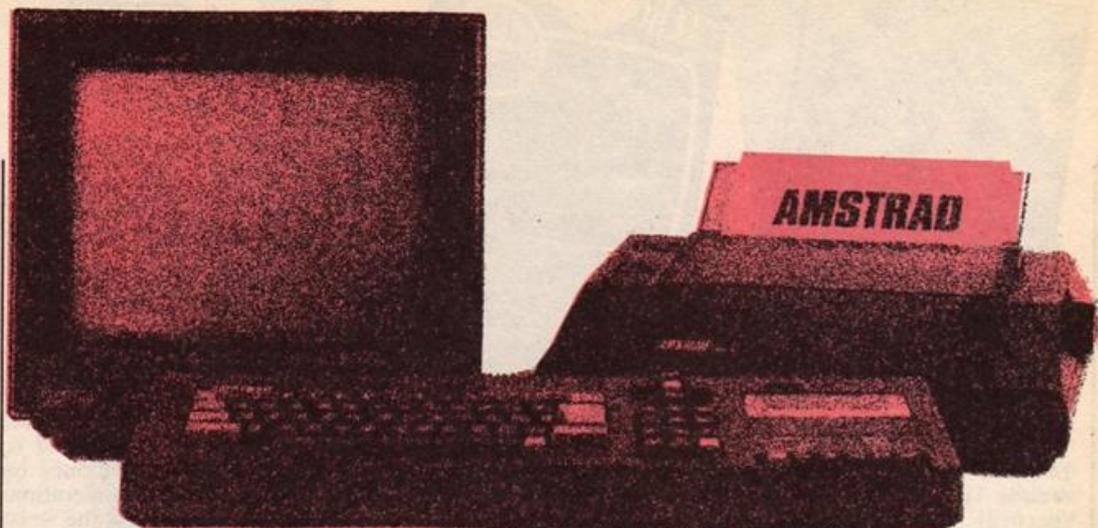
**David Ellis will have you jumping merrily around your machine in this weeks article**

In several of my earlier articles reference has been made to the "jumpblock" on the AMSTRAD without explaining what it actually is.

A jumpblock is a series of jump instructions placed in RAM which call various routines that are used by the firmware. Thus the firmware routines can be easily called from your own machine code routines, or they can be "patched" to jump to your own routines.

Figure 1 shows how the jumpblock works in normal operation. The "main" program here refers to the program that is controlling the running of the computer — the operating system. To access firmware routines a call is made to the jumpblock at the required address, in the example here it is given the name BLOCK 5.

The first instruction at BLOCK 5 is a RST1. This is equivalent to the Z80 instruction RST 8. RST stands for RESTART and is a special kind of jump. On the CPC464 it causes a jump to take place to a routine in the LOWER ROM. The two bytes that follow RST1 contain the address of the routine in ROM. However, bits 14 and 15 are used to signal which ROMs are to be enabled or disabled and the remaining 14 bits contain the actual address to jump too.

For the main jumpblock bits 14 and 15 enable the LOWER ROM, and disable the UPPER ROM. Most of the useful routines are located in this main jumpblock which lies from &BB00 to &BD39. To see the whole list of routines, and what they do, you will need to buy the manual "Complete CPC464

Operating System", available from Amsoft for a little under twenty pounds. Expensive, but invaluable!

Some of the firmware routines can be called directly by issuing a CALL to the jumpblock address. You may like to try some of the following:

| | | |
|---|---|---|
| CALL &BB48 | — | Disables the 'ESC' key. |
| CALL &BB4E | — | Initialise the text VDU. |
| CALL &BB9C | — | Swap pen and paper inks over. |
| CALL &BBBA | — | Initialise the Graphics VDU. |
| CALL &BBDB | — | Clear the Graphics window. |
| CALL &BBFF | — | Initialise the whole screen pack. |
| CALL &BC6E | — | Turn cassette motor ON. |
| CALL &BC71 | — | Turn cassette motor OFF. |
| CALL &BD37 | — | Reset the firmware jumblock. |

Many of the other routines require values to be passed to them. These values and the registers that need to be used are in the Firmware Manual and this is one reason why this manual is essential reading.

Many useful operations can be carried out by merely CALLing these routines from within your own machine code program. For example, &BB15 calls a routine to allocate a buffer for the expansion strings. In normal use this buffer is set at 256 bytes, which as you have no doubt found, will only allow you to set up a limited number of function keys. The routine requires that the DE register holds the address of the buffer to be used,

and that the HL register contains the length of the buffer.

The program shown in listing 1 will set the length of the buffer to 2K and the start of the buffer at &9500. You can either POKE the numbers into memory, starting at &7530, or use the BASIC LOADER program. The DATA will be:

```
100 DATA 17,&00,&95,33,0,8,
    205,&15,&bb,201
```

If you RUN the program and then type CALL 30000 or CALL &7530 then you will now find that you can set up your function keys (using KEY and KEY DEF) with a whole 2K of buffer space to use. Remember that you can use **any** 32 keys on the CPC464 as function keys, although the user manual is not over clear on this point.

Figure 2 shows an example of how the jumpblock could be patched. The three instructions at BLOCK 5 have been replaced by a jump to the machine code routine at &9000. This can either be a "stand alone" routine which replaces the ROM routine completely, or, as in the example that follows, it may be a routine that performs an operation and then jumps to

Jumpblock after patching

Figure 2.

the original ROM routine — as shown by the dotted lines.

Listing 2 shows a simple example of how to "patch" a machine code routine. The routine itself is in the first 4 lines — from &7530 to &7537. This uses the jumpblock routine at &BB5A — **Text Output**. This is the routine that outputs characters (32-255) or control codes (0 to 31) to the text VDU on the currently selected stream. The accumulator holds the character that is being sent. Our short machine code routine checks to see if the character in the accumulator is less than 32. CP32 will subtract 32 from the value in the accumulator. The value in the accumulator is not changed by this operation, but various flags are set depending upon the result. In this case we are testing the Carry flag, which will be set if the result is negative — i.e. if the value in the accumulator is less than 32. If for instance, the accumulator contained 27, then 27 - 32 + -5. The result is negative, so the Carry flag will be set.

The next instruction JR C will therefore jump to MISS if the carry is set. In this case the program will then jump to the original routine (in ROM) that was specified in the jumpblock using the RST1 opcode. Any characters that are less than 32 will therefore not be altered. Characters that are equal or greater than 32 will have their value increased by 1, by the INC A opcode, and then jump to the original routine.

The second part of the listing from &7538 to &7543 is the part that patches the three jumpblock bytes. The three bytes here (207,&00,&84) are replaced by 195,&30,&75 - JP &7530 which, of course, is our own routine.

Enter the two routines using the BASIC loader and the opcodes in the DATA lines 100 and 110 and then RUN the BASIC program. Now that the machine code program is in memory we can patch the jumpblock by CALL &7538. If all is well you will be greeted by the rather strange "Sfbez" message. This is the "Ready" message! Any characters sent to the VDU now will have their ASCII value increased by 1 — except for the control codes. Changing the control codes as well would produce some most unpleasant side effects.

Try changing the 32 at &7531 with 9 and you will see what I mean! Try other values as well. Using 97 would mean that only the lowercase characters get altered. Instead of the JR C opcode try JR NZ which is 32 — poke it in if you like with POKE &7532,32. This time the INC a opcode will only be used if the value in the accumulator is the **same** as the comparison value. So if you were comparing the value 65 (ASCII 'A') only the letter 'A' would be modified to become 'B'.

Note that any characters that you type in are not altered, this is because a different routine is used to print characters to the screen directly from the keyboard.

Also make a note of the order in which the jumpblock is patched. Get your machine code routine (the one at &7530) into memory **before** the patch (at &7538) is called. After all, if you do it the opposite way around, there will be no machine code program in memory to jump to. The jump will still take place and whatever values happen to be at that location will be assumed to be the machine code program. As this will probably be garbage, the end result will usually be disastrous!
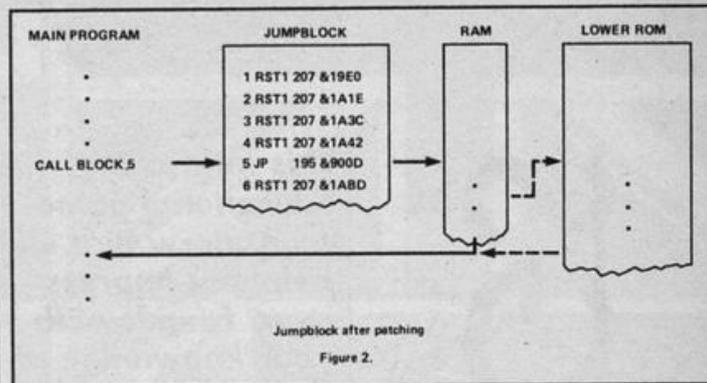
Although the routine given here is of little use, it is a good illustration of how to patch the jumpblock. The next article will use a very similar program to cure those line feed problems on your printer — if you've already cut wire 14 on your printer lead then hard luck!

Finally for this week Listing 3 gives the machine code opcodes in answer to the problem set in the last article.

```
           LISTING 1.   SET BUFFER FOR FUNCTION STRINGS TO 2K.

&7530      LD DE,&9500      17 &00 &95    ;Buffer Address
           LD HL,&0800      33 &00 &08    ;Length of buffer
           CALL  &BB15      205 &15 &bb   ;Set and initialise
           RET                    201     ;Done
```

```
           LISTING 2.   PATCHING A MACHINE CODE PROGRAM.

&7530      CP 32                254 32    ;Subtract 32 from A
           JR NC MISS            56 01    ;Miss next bit if <32.
           INC A                   60    ;Add 1 to character.
MISS       RST1 &9400       207 &00 &94   ;Jump to original routine.

&7538      LD A,195             62 195    ;195 = Z80 opcode for 'JP'.
           LD(&BB5A),A        50 &5A &BB  ;Replace RST1 with a JP.
           LD BC,&7530         1 &30 &75  ;Address of new routine.
           LD(&BB5B),BC     237 67 &5B &BB ;Replace old address.
           RET                    201     ;Done.


100 DATA 254,32,56,1,60,207,&00,&94
110 DATA 62,195,50,&5a,&bb,1,&30,&75,237,67,&5b,&bb,201
```

```
           LISTING 3.   ANSWER TO LAST PROBLEM.


100 DATA 17,&00,&75,6,25,104,38,80,229,205,&75,&bb
110 DATA 205,&60,&bb,18,27,225,37,124,254,0,32,240,16,235
120 DATA 205,&0b,&bc,124,18,27,125,18,201

200 DATA 33,&01,&01,205,&75,&bb,17,&2f,&6d
205 DATA 26,111,19,26,103,19,205,&05,&bc
210 DATA 1,208,7,26,213,197,205,&5d,&bb,193,209,19,11,120,177
220 DATA 32,242,33,&01,&01,205,&75,&bb,201
```



Jumpblock before patching

Figure 1.

SPECTRUM PROGRAM
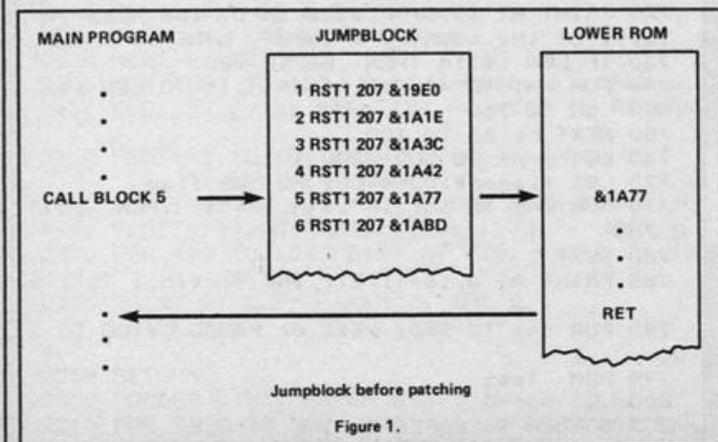
# WORLD FLAGS

**This interesting educational game by Andrew Bird will help you impress your friends with your knowledge of flags of the world**

This program is a fun educational game and the theme is flags of the world.

You have three playing options. The first demonstrates all 40 flags in the computer's memory, one at a time and you may look at each as long as you like so as to memorise them.

The second option allows you to input a country and draw its flag without going through the whole list.

The third option tests how much you have learned and corrects you if you're wrong.

### How it works
**1-70** initialise graphics, variables and country names
**100-170** main menu
**500-640** demonstration
**700-790** flag of your choice
**800-995** test on selected flags
**1000-2340** subroutines for drawing flags
**9000-9100** graphics

### Variables
**GB** positions vertical band on flag
**OS** continue or quit message
**DIM CS** countries
**DIM B** background colour
**g** demonstration loop
**l** determines length of country name
**iS** your input
**n** search for country loop
**flag** subroutine to jump to
**cor** correct answers
**test** number to be tested
**DIM t** checks countries used in test
**w** test loop
**fl** random country
**aS** correct answer
**x,y** co-ordinates for star or crescent position
**s** size of star or crescent
**tilt** tilt of crescent
**p** paper colour
**z** loops used to
**d** delay loop
**f** general purpose loops

```
   1 REM   FLAGS OF THE WORLD
   2 REM   By   Andrew Bird
   3 CLS : GO SUB 9000
   4 LET GB=0
   5 POKE 23658,8: POKE 23609,20
   7 RANDOMIZE
  10 LET o$="CONTINUE  OR  QUIT"
  20 DIM c$(40,15)
  30 RESTORE 40: FOR f=1 TO 40: READ z$: LET
c$(f)=z$: NEXT f
  40 DATA "ARGENTINA*","AUSTRALIA*","AUSTRIA*
","BELGIUM*","BRAZIL*","BULGARIA*","CANADA*",
"CHILE*","CHINA*","COLOMBIA*","CZECHOSLOVAKIA
*","DENMARK*","EGYPT*","FINLAND*"
  42 DATA "FRANCE*","GERMANY*","GREAT BRITAIN
*","HUNGARY*","ICELAND*","INDIA*","IRISH REP*
","ITALY*","JAPAN*","NETHERLANDS*","NEW ZEALA
ND*","NORWAY*","PAKISTAN*","PERU*"
  44 DATA "POLAND*","PORTUGAL*","ROMANIA*","S
PAIN*","SWEDEN*","SWITZERLAND*","TURKEY*","U.
S.A.*","U.S.S.R.*","URUGUAY*","VENEZUELA*","Y
UGOSLAVIA*"
  50 DIM b(40)
  60 RESTORE 70: FOR f=1 TO 40: READ a: LET b
(f)=a: NEXT f
  70 DATA 1,5,1,1,1,5,1,5,1,5,5,1,5,5,5,1,5,1
,5,5,5,1,1,5,5,5,1,5,5,1,5,5,1,5,1,5,1,5,5,5
  99 REM   Menu
 100 BORDER 7: PAPER 7: INK 1: CLS
 110 PRINT AT 0,0; INVERSE 1;"  WORLD FLAGS
By Andrew Bird  "
 120 PRINT AT 6,2; INK 2;"1  Demonstration of
flags";AT 8,2;"2  Draw flag of your choice";
AT 10,2;"3  Test on selection of flags"
 130 PRINT AT 15,7; INK 3;"Press  1, 2, or 3"
 140 IF INKEY$="1" THEN   GO TO 500
 150 IF INKEY$="2" THEN   GO TO 700
 160 IF INKEY$="3" THEN   GO TO 800
 170 GO TO 140
 499 REM   Show
 500 FOR g=1 TO 40
 510 GO SUB 2300
 550 GO SUB 4900+g*100
 560 PRINT AT 0,7; INK 9;"This is the flag of
"
 565 FOR l=1 TO 15: IF c$(g,1)="*" THEN   GO T
O 575
 570 NEXT l
 575 PRINT AT 21,16-(l/2); INK 9;c$(g,1 TO l-
1)
 580 FOR f=1 TO 18
 585 IF o$(f)="C" OR o$(f)="Q" THEN   PRINT AT
f+1,31; INK 9; FLASH 1;o$(f): NEXT f
 590 PRINT AT f+1,31; INK 9;o$(f): NEXT f
 600 FOR d=1 TO 150: NEXT d
 610 IF INKEY$="Q" THEN   GO TO 100
 620 IF INKEY$="C" THEN   GO TO 640
 630 GO TO 610
 640 NEXT g: GO TO 100
 699 REM   Locate
 700 BORDER 6: PAPER 6: INK 0: CLS
 720 PRINT AT 10,5;"Please INPUT the name";AT
12,9;"of the country": INPUT LINE i$
 730 IF LEN i$>14 THEN   GO TO 720
 740 FOR n=1 TO 40: IF i$=c$(n)(1 TO LEN i$)
THEN   GO TO 760
 750 NEXT n: GO TO 100
 760 LET g=n: GO SUB 2300
 770 LET flag=n*100+4900: GO SUB flag
 775 FOR l=1 TO 15: IF c$(n,1)="*" THEN   GO T
O 785
 780 NEXT l
 785 PRINT AT 0,16-(l/2); INK 9;c$(n,1 TO l-1
)
 790 FOR d=1 TO 150: NEXT d: PAUSE 0: GO TO 1
00
 799 REM   Test
 800 LET cor=0
 805 BORDER 3: PAPER 3: INK 7: CLS
```

```
 810 PRINT AT 7,2;"HOW MANY FLAGS DO YOU WISH
";AT 9,2;"TO BE TESTED ON ( 1 - 40 )"
 820 INPUT test
 825 IF test>40 THEN  GO TO 820
 830 DIM t(40)
 840 FOR w=1 TO test
 850 LET fl=INT (RND*40)+1
 860 IF t(fl)=1 THEN  GO TO 850
 870 LET t(fl)=1
 880 LET g=fl: GO SUB 2300
 890 GO SUB fl*100+4900
 900 PRINT AT 0,5; INK 9;"THIS IS THE FLAG OF
...."
 910 INPUT "          "; LINE i$
 920 IF LEN i$>14 THEN  GO TO 910
 930 FOR l=1 TO 15: IF c$(fl,1)="*" THEN  GO
TO 950
 940 NEXT l
 950 LET a$=c$(fl)(1 TO l-1)
 960 IF i$=a$ THEN  PRINT AT 21,8; INK 9; FLA
SH 1;" C O R R E C T ": FOR f=1 TO 50: BEEP .
05,f: NEXT f: LET cor=cor+1
 970 IF i$<>a$ THEN  PRINT AT 21,5; INK 9; FL
ASH 1;" N O ": FLASH 0;"  ";a$: BEEP 3,-40: N
EXT f
 975 NEXT w
 980 BORDER 6: PAPER 6: INK 0: CLS
 990 PRINT AT 5,6;"AT THE END OF YOUR";AT 8,5
;"TEST YOU HAVE MANAGED";AT 11,5;"TO SCORE ";
cor;" OUT OF ";test
 995 PRINT AT 21,0; PAPER 5;"    Press any key
 to continue.   ": PAUSE 0: GO TO 100
 999 REM  Subroutines
1000 FOR f=2 TO 19: PRINT AT f,4; PAPER p;"
           ": NEXT f: RETURN
1100 FOR f=2 TO 10: PRINT AT f,4; PAPER p;"
           ": NEXT f: RETURN
1200 FOR f=2 TO 7: PRINT AT f,4; PAPER p;"
           ": NEXT f: RETURN
1300 FOR f=8 TO 13: PRINT AT f,4; PAPER p;"
           ": NEXT f: RETURN
1400 FOR f=14 TO 19: PRINT AT f,4; PAPER p;"
           ": NEXT f: RETURN
1500 FOR f=2 TO 19: PRINT AT f,4; PAPER p;"
    ": NEXT f: RETURN
1600 FOR f=2 TO 19: PRINT AT f,12; PAPER p;"
   ": NEXT f: RETURN
1700 FOR f=2 TO 19: PRINT AT f,20; PAPER p;"
    ": NEXT f: RETURN
1800 FOR f=2 TO 19: PRINT AT f,11+GB; PAPER p
;"   ": NEXT f
1810 FOR f=9 TO 12: PRINT AT f,4; PAPER p;"
           ": NEXT f: RETURN
1900 FOR f=-s/3 TO s/3: PLOT x,y+s: DRAW f,-s
: NEXT f
1910 FOR f=-s TO s: PLOT x,y-s/3: DRAW f,s*(2
/3): NEXT f
1920 FOR f=s/4 TO s/1.2: PLOT x-s/1.8,y-s/1.1
: DRAW f,s/1.2
1930 PLOT x+s/1.8,y-s/1.1: DRAW -f,s/1.2
1950 NEXT f: RETURN
2000 FOR f=2.7 TO 3.5 STEP .05
2010 PLOT x,y: DRAW tilt,s,-f
2020 NEXT f: RETURN
2100 FOR f=80 TO 127: PLOT f+GB*8,16: DRAW 0,
143: PLOT 32,f-16: DRAW 191,0: NEXT f: RETURN

2200 FOR f=2 TO 10: PRINT AT f,4; PAPER 1;"
       ": NEXT f
2210 FOR f=32 TO 40: PLOT f,88: DRAW 128-f,10
4-f: PLOT 87+f,88: DRAW -(56+f),32+f: NEXT f
2220 FOR f=2 TO 10: PRINT AT f,8; PAPER 7; IN
K 2;"      ": NEXT f
2230 PRINT AT 5,4; PAPER 7; INK 2;"
    ";AT 6,4;"           ";AT 7,
4;"                "
2250 RETURN
2300 BORDER b(g): PAPER b(g): INK 7: CLS
2310 FOR f=18 TO 26: PLOT f,0: DRAW 0,164: NE
```

```
XT f
2320 FOR f=167 TO 171: PLOT 14,f: DRAW 16,0:
NEXT f
2330 PLOT 31,15: DRAW 193,0: DRAW 0,145: DRAW
 -193,0: DRAW 0,-145
2340 RETURN
4999 REM  Flags
5000 REM  Argentina
5010 LET p=7: GO SUB 1000
5020 LET p=5: GO SUB 1200: GO SUB 1400
5030 PLOT 112,84: DRAW  INK 6;20,20,821
5050 RETURN
5099 REM  Australia
5100 LET p=1: GO SUB 1000
5110 GO SUB 2200
5120 LET x=80: LET y=52: LET s=18: GO SUB 190
0
5125 LET s=12: RESTORE 5130: FOR z=1 TO 4: RE
AD x,y: GO SUB 1900: NEXT z
5130 DATA 176,130,154,96,198,96,176,40
5140 LET x=182: LET y=72: LET s=5: GO SUB 190
0
5150 RETURN
5199 REM  Austria
5200 LET p=7: GO SUB 1000
5210 LET p=2: BRIGHT 1: GO SUB 1200: GO SUB 1
400: BRIGHT 0
5250 RETURN
5299 REM  Belgium
5300 LET p=0: GO SUB 1500
5310 LET p=6: GO SUB 1600
5320 LET p=2: GO SUB 1700
5350 RETURN
5399 REM  Brazil
5400 LET p=4: GO SUB 1000
5410 INK 6: FOR f=24 TO 88
5420 PLOT 160-f/.7272,f: DRAW (f-24)*2.727,0
5430 PLOT 160-f/.7272,176-f: DRAW (f-24)*2.72
7,0: NEXT f
5440 FOR f=7 TO 14: PRINT AT f,12; PAPER 6;"
       ": NEXT f
5450 INK 1: FOR f=1 TO 20 STEP .5: CIRCLE 128
,88,f: NEXT f: INK 7
5460 RETURN
5499 REM  Bulgaria
5500 LET p=7: GO SUB 1200
5510 LET p=4: GO SUB 1300
5520 LET p=2: GO SUB 1400
5550 RETURN
5599 REM  Canada
5600 LET p=7: GO SUB 1000
5610 FOR f=32 TO 79: INK 2
5620 PLOT f,16: DRAW 0,143: PLOT f+144,16: DR
AW 0,143: NEXT f
5630 FOR f=-12 TO 12: PLOT 128,72: DRAW f,36+
(ABS f/3): NEXT f
5640 FOR f=0 TO 15 STEP .25: PLOT 128-f/2,64+
f: DRAW 25,16: PLOT 128+f/2,64+f: DRAW -25,16
: NEXT f
5650 FOR f=-16 TO 16: PLOT 128,120: DRAW f,-6
0-(ABS f/4): NEXT f
5660 FOR f=-14 TO -6: PLOT 100,94: DRAW 12,f:
 PLOT 156,94: DRAW -12,f: PLOT 129+f/6,44: DR
AW 0,20: NEXT f
5690 INK 7: RETURN
5699 REM  Chile
5700 LET p=2: GO SUB 1000
5710 LET p=7:1100
5720 FOR f=2 TO 10: PRINT AT f,4; PAPER 1;"
      ": NEXT f
5730 LET x=70: LET y=124: LET s=25: GO SUB 19
00
5750 RETURN
5799 REM  China
5800 LET p=2: GO SUB 1000
5810 LET s=22: LET x=66: LET y=128: INK 6: GO
 SUB 1900
5820 LET s=8
5830 RESTORE 5840: FOR z=1 TO 4: READ x,y: GO
```

```
  SB 1900: NEXT z: INK 7
5840 DATA 70,90,90,101,96,121,98,144
5850 RETURN
5899 REM   Colombia
5900 LET p=1: GO SUB 1000
5910 LET p=6: GO SUB 1100
5920 FOR f=17 TO 52: PLOT  INK 2;32,f: DRAW
 INK 2;191,0: NEXT f
5950 RETURN
5999 REM   Czechoslovakia
6000 LET p=2: GO SUB 1000
6010 LET p=7: GO SUB 1100
6020 INK 1
6030 FOR f=16 TO 87: PLOT 32,f: DRAW (f-16)*1
.2,0: PLOT 32,175-f: DRAW (f-16)*1.2,0: NEXT
f
6050 INK 7: RETURN
6099 REM   Denmark
6100 LET p=2: GO SUB 1000
6110 LET GB=0: LET p=7: GO SUB 1800
6150 RETURN
6199 REM   Egypt
6200 LET p=2: GO SUB 1200
6210 LET p=7: GO SUB 1300
6220 LET p=0: GO SUB 1400
6230 INK 4: LET s=18
6240 LET x=104: LET y=88: GO SUB 1900
6250 LET x=152: GO SUB 1900: INK 7
6260 RETURN
6299 REM   Finland
630 LET p=7: GO SUB 1000
6310 LET GB=0: LET p=1: BRIGHT 1: GO SUB 1800
: BRIGHT 0
6320 FOR f=9 TO 12: PRINT AT f,11; PAPER 7;"
  ": NEXT f
6330 FOR f=75 TO 100: PLOT 90,f: DRAW  INK 2;
27,0: NEXT f
6350 RETURN
6399 REM   France
6400 LET p=1: GO SUB 1500
6410 LET p=7: GO SUB 1600
6420 LET p=2: GO SUB 1700
6450 RETURN
6499 REM   West Germany
6500 LET p=0: GO SUB 1200
6510 FOR f=8 TO 13: PRINT AT f,4; PAPER 6; IN
K 2;"
   ": NEXT f
6530 LET p=6: GO SUB 1400
6550 RETURN
6599 REM   Great Britain
6600 LET p=2: GO SUB 1000
6605 FOR f=24 TO 36: PLOT 32,f: DRAW 208-f,16
0-f
6610 PLOT f+16,16: DRAW 208-f,160-f
6620 PLOT f+16,159: DRAW 208-f,-(160-f)
6625 NEXT f
6630 INVERSE 1
6635 FOR f=-70 TO 74 STEP 4
6640 PLOT  PAPER 1;127,108: DRAW  PAPER 1;f,5
0
6645 PLOT  PAPER 1;127,68: DRAW  PAPER 1;f,-5
0
6650 PLOT  PAPER 1;104,88: DRAW  PAPER 1;-70,
f*.68
6655 PLOT  PAPER 1;152,88: DRAW  PAPER 1;70,f
*.68
6660 NEXT f: INVERSE 0
6670 LET GB=3: GO SUB 2100
6680 LET p=2: GO SUB 1800
6690 RETURN
6699 REM   Hungary
6700 LET p=2: GO SUB 1200
6710 LET p=7: GO SUB 1300
6720 LET p=4: GO SUB 1400
6750 RETURN
6799 REM   Iceland
6800 LET p=1: GO SUB 1000
6810 LET GB=0: GO SUB 2100
```

```
6820 LET p=2: GO SUB 1800
6850 RETURN
6899 REM   India
6900 LET p=7: GO SUB 1300
6910 LET p=4: GO SUB 1400
6920 FOR f=2 TO 7: PRINT AT f,4; BRIGHT 1; PA
PER 6; INK 2;"
          ": NEXT f
6950 RETURN
6999 REM   Irish Rep
7000 LET p=4: GO SUB 1500
7010 LET p=7: GO SUB 1600
7020 FOR f=2 TO 19: PRINT AT f,20; BRIGHT 1;
PAPER 6; INK 2;"          ": NEXT f
7050 RETURN
7099 REM   Italy
7100 LET p=4: GO SUB 1500
7110 LET p=7: GO SUB 1600
7120 LET p=2: GO SUB 1700
7150 RETURN
7199 REM   Japan
7200 LET p=7: GO SUB 1000
7210 FOR f=1 TO 25 STEP .5: CIRCLE  INK 2;128
,88,f: NEXT f
7250 RETURN
7299 REM   Netherlands
7300 LET p=2: GO SUB 1200
7310 LET p=7: GO SUB 1300
7320 LET p=1: GO SUB 1400
7330 RETURN
7399 REM   New Zealand
7400 LET p=1: GO SUB 1000
7410 GO SUB 2200: LET s=14
7420 INK 2: RESTORE 7430: FOR z=1 TO 4: READ
x,y: GO SUB 1900: NEXT z: INK 7
7430 DATA 176,130,154,96,198,96,176,40
7450 RETURN
7499 REM   Norway
7500 FOR f=2 TO 19: PRINT AT f,4; PAPER 6; IN
K 2;"
    ": NEXT f
7510 GO SUB 2100
7520 LET p=1: GO SUB 1800
7550 RETURN
7599 EM   Pakistan
7600 LET p=4: GO SUB 1000
7610 LET p=7: GO SUB 1500
7620 LET x=184: LET y=56
7630 LET s=70: LET tilt=-(s/2)
7640 GO SUB 2000
7650 LET x=184: LET y=102: LET s=10: GO SUB 1
900
7660 RETURN
7699 REM   Peru
7700 LET p=7: GO SUB 1000
7710 LET p=2: GO SUB 1500: GO SUB 1700
7750 RETURN
7799 REM   Poland
7800 LET p=2: GO SUB 1000
7810 LET p=7: GO SUB 1100
7850 RETURN
7899 REM   Portugal
7900 LET p=2: GO SUB 1000
7910 FOR f=32 TO 105: PLOT  INK 4;f,16: DRAW
 INK 4;0,143: NEXT f
7950 RETURN
7999 REM   Romania
8000 LET p=1: GO SUB 1500
8010 LET p=6: GO SUB 1600
8020 LET p=2: GO SUB 1700
8050 RETURN
8099 REM   Spain
8100 LET p=6: GO SUB 1000
8110 LET p=2: GO SUB 1200: GO SUB 1400
8150 RETURN
8199 REM   Sweden
8200 LET p=5: GO SUB 1000
8210 LET p=6: GO SUB 1800
8250 RETURN
```

```
8100 LET p=6: GO SUB 1000
8110 LET p=2: GO SUB 1200: GO SUB 1400
8150 RETURN
8199 REM    Sweden
8200 LET p=5: GO SUB 1000
8210 LET p=6: GO SUB 1800
8250 RETURN
8299 REM    Switzerland
8300 LET p=2: GO SUB 1000
8310 FOR f=112 TO 144: PLOT f,24: DRAW 0,128:
 PLOT 64,216-f: DRAW 128,0: NEXT f
8350 RETURN
8399 REM    Turkey
8400 LET p=2: GO SUB 1000
8410 LET x=120: LET y=40: LET s=96: LET tilt=
0: GO SUB 2000
8420 LET x=152: LET y=92: LET s=16: GO SUB 19
00
8450 RETURN
8499 REM    U.S.A.
8500 LET p=7: GO SUB 1000
8510 FOR f=16 TO 28
8520 INK 2: PLOT 32,f: DRAW 191,0: PLOT 32,f+
24: DRAW 191,0
8530 PLOT 32,f+48: DRAW 191,0: PLOT 32,f+72:
DRAW 191,0: PLOT 32,f+96: DRAW 191,0
8540 PLOT 32,f+120: DRAW 191,0
8550 NEXT f: INK 7
8560 FOR f=2 TO 10: PRINT AT f,4; PAPER 1;"
          ": NEXT f
8570 FOR y=152 TO 96 STEP -11: FOR x=41 TO 11
1 STEP 10
8580 LET s=3: GO SUB 1900
8590 NEXT x: NEXT y: RETURN
8599 REM    U.S.S.R.
8600 LET p=2: GO SUB 1000
8610 LET x=62: LET y=144: LET s=5: INK 6: GO
SUB 1900: INK 7
8620 PRINT AT 5,7; PAPER 2; INK 6;;"   ";AT
6,6;"   "
8650 RETURN
8699 REM    Uruguay
8700 LET p=7: GO SUB 1000
8710 FOR f=4 TO 16 STEP 4
8720 PRINT AT f,4; PAPER 1;"
         ";AT f+1,4;"                      ":
 NEXT f
8730 FOR f=2 TO 9: PRINT AT f,4; PAPER 7;"
      ": NEXT f
8740 PLOT 45,113: DRAW  INK 6;25,25,821
8750 RETURN
8799 REM    Venezuela
8800 LET p=6: GO SUB 1200
8810 LET p=1: GO SUB 1300
8820 LET p=2: GO SUB 1400
8830 LET s=3
8840 RESTORE 8850: FOR z=1 TO 7: READ x,y: GO
 SUB 1900: NEXT z
8850 DATA 96,76,102,88,114,98,128,100,141,98,
154,88,160,76
8890 RETURN
8899 REM    Yugoslavia
8900 LET p=1: GO SUB 1200
8910 LET p=7: GO SUB 1300
8920 LET p=2: GO SUB 1400
8930 INK 2: LET x=128: LET y=88: LET s=22: GO
 SUB 1900: INK 7
8950 RETURN
8999 REM    Graphics
9000 RESTORE 9010: FOR f=USR "a" TO USR "f"+7
: READ a: POKE f,a: NEXT f
9010 DATA 85,170,85,170,85,170,85,170
9020 DATA 0,6,1,0,62,126,252,248,0,0,128,64,9
6,32,48,48,0,0,0,1,1,1,3,3
9030 DATA 247,99,1,128,193,255,62,0,48,176,20
8,224,56,156,14,4
9100 RETURN
9999 SAVE "WorldFlags" LINE 1
```

CANADA

This is the flag of

AUSTRALIA

## C64 PROGRAM
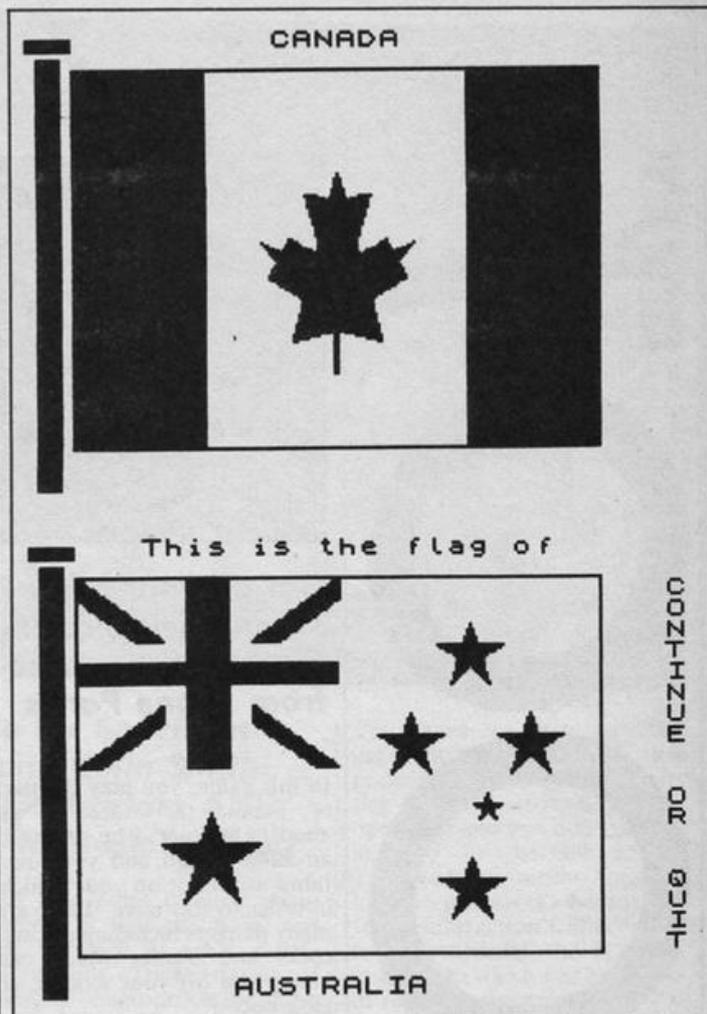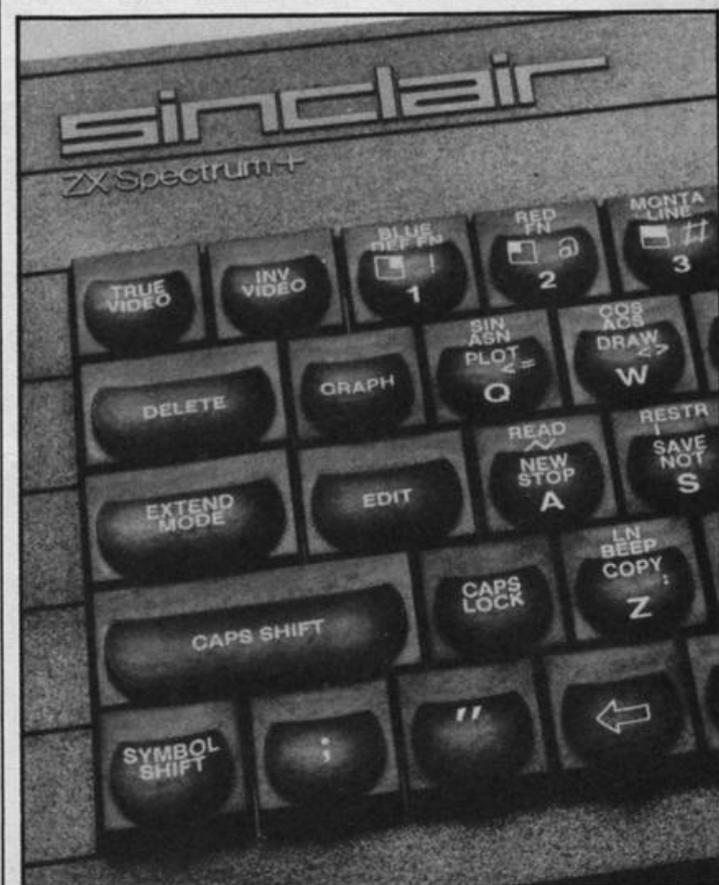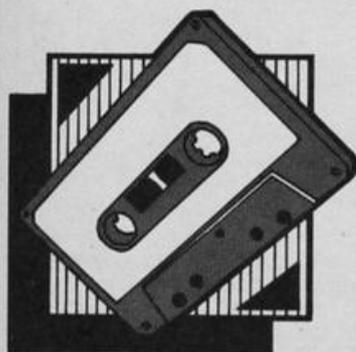
# SCOOT

### Get on your bike on an alien planet in this great game from Shane Parris

In this game, you play the part of Scoot, the rider of an amazing scooter. The setting is an alien terrain and you must jump around it on your vehicle in order to stay alive. There are many dangers including arrows, rocks and bushes which can knock you off your scooter, so look out.

Instructions are included in the program which will work with Currah Micro Speech 64, but this unit is optional.

### Variables

**SP%,INIT,SAY** standard variables for Currah speech unit
**SS** random speech selection
**A$,B$,C$,D$** cursor positions
**K$** keyboard
**VO,WA,AT,HI,I,H** sound variables
**Z** sprite positions
**P** random number
**V** video chip
**C** collision variable
**LI** lives
**SC** score

### How it works

#### Program 1

0-1 message
2-7 machine code
8-20 sprite loader and data
21-24 auto load for program 2

#### Program

0-15 variables
20-60 initialise sprite characters
70-100 main loop
1000-1120 jump routine
2000-2020 collision routine
3000-3022 update routine
4000-4019 title screen
4020-5001 instructions
6000-6005 speech data for Currah speech unit

```
0 CLR:PRINTCHR$(8):POKE53280,5:POKE53281,0:GOSUB6000
1 PRINT"J":SP%=-10:IFSP%=1THENINIT
2 GOSUB4000:A$="L                                 "
3 B$="U                                           "
4 FORT=0TO20:PRINT"                                 "INEXT
5 Z=195:VO=54296:WA=54276:AT=54277:HI=54273:H=40:I=1:LI=3:SC=0
6 PRINT"                            ":A$:B$
7 D$="                             "
8 C$="                                             "
10 V=53248
15 C=PEEK(V+31)
20 POKE2040,130:POKE2041,129:POKE2042,128
30 POKEV+39,5:POKEV+40,1:POKEV+41,7
40 POKEV+21,7
50 POKEV,80:POKEV+1,195
60 POKEV+4,79:POKEV+5,200
70 GETK$
72 P=INT(RND(0)*3)+1
73 SC=SC+1
74 SYS50000
75 IFINT(RND(0)*100)+1>87THENPRINT"U":D$:C$:MID$("++*+",P,1)
76 PRINT"U":D$:LEFT$("____",P)
77 PRINT"        ":SC
80 IFK$="J"THENGOSUB1000
81 IFPEEK(V+31)=4THENGOSUB2000
90 SYS50000
100 GOTO70
1000 REM ***** JUMP ROUTINE *****
1001 POKEVO,15:POKEWA,129:POKEAT,15
1002 SS=INT(RND(1)*5)+1:POKE53280,SS
1003 IFSP%=1THENSAYS$(SS)
1010 FORT=200TO175STEP-5:I=I+1
1012 SYS50000
1020 Z=Z-5
1030 POKEHI,I
1040 POKEV+5,T:POKEV+1,Z
1050 NEXT
1060 FORT=175TO200STEP5
1062 I=I-1
1064 POKEHI,I
1070 Z=Z+5
1080 SYS50000
1090 POKEV+5,T:POKEV+1,Z
1100 NEXT
1110 POKEWA,0:POKEAT,0:I=1
1120 RETURN
2000 REM ***** HIT OBJECT *****
2001 POKEVO,15:POKEWA,17:POKEAT,15
2002 FORT=79TO200STEP2
2003 POKEHI,T
2004 POKEV,T:NEXTT
2005 POKEV+2,215:POKEV+3,185:IFSP%=1THENSAY"DRAT"
2006 FORT=0TO500:NEXTT
2007 POKEWA,0:POKEAT,0
2008 POKEV+2,0:POKEV+3,0:FORT=0TO500:NEXTT
2009 POKEV+1,200
2010 POKEV,80:POKEV+1,195
2011 LI=LI-1:IFLI=<0THENGOSUB3000
2012 PRINT"                            ":LI
2020 RETURN
3000 REM ***** UPDATE *****
3010 :
3012 POKEV+21,0
3015 PRINT"                        ANOTHER GAME (Y/N)"
3016 FORT=0TO1500:NEXTT
3017 IFSP%=1THENSAY"ANOTHER GAME   YES OR NO"
3018 GETK$
3019 IFK$="Y"THENGOTO0
3020 IFK$="N"THENGOTO5000
3021 GOTO3018
3022 :
4000 REM ***** INSTRUCTIONS *****
4001 IFSP%=1THENSAY"SCOOTT,, BY S PARRIS   9TEEN BEE 5"
4010 PRINT"                                           "
4011 PRINT"                                          "
4012 PRINT"                                          "
4013 PRINT"                                          "
4014 PRINT"                                          "
4015 PRINT"                                          "
4016 PRINT"                            PRESS ANY KEY"
4019 GETK$:SYS50000:IFK$=""THEN4019
4020 IFSP%=1THENSAY0"INSTRUCSHUNZ "
4021 PRINT"                  INSTRUCTIONS"
4022 PRINT"     GUIDE SCOOT ACROSS THE ROUGH ALIEN"
4023 PRINT"  TERRAIN FOR AS LONG AS POSSIBLE"
4024 PRINT"  AVOIDING ROCKS & ARROWS BY JUMPING"
4025 PRINT"  OVER THEM."
4026 PRINT"  CONTROLS:-"
4028 PRINT"            J = JUMP"
4029 PRINT"                     PRESS ANY KEY"
4030 GETK$:IFK$=""THEN4030
4031 PRINT"J"
4032 PRINT"  SCORE:        SCOOTS: 3"
4040 RETURN
5000 PRINT"J":POKEV+21,0:CLR:END
5001 :
6000 S$(1)="JERON IMO"
6001 S$(2)="LOOK OUT BELOW"
6002 S$(3)="HOME COMPUTING WEEKLEE IZ GRAYTE"
6003 S$(4)="FEW [<OTH)]AT WAZ CLOSE"
6004 S$(5)="[<GG)]OOD [<GG)]REEF"
6005 RETURN
```

# BEGINNING MACHINE CODE

*This weeks episode for Spectrum owners has Diana and Colin Smith explaining the logical operators AND, OR, EOR and starting to Stack it all up*

In our last article, we covered 8-bit or single byte arithmetic and IF/THEN constructions. We are now going to extend that to 16-bit or two byte numbers. In doing so, we will cover the logical operators AND, OR and XOR, together with the machine code STACK instructions.

Just as the A register was used to Accumulate the Answers in 8-bit arithmetic, the HL register pair is used in 16-bit arithmetic. The 16-bit instructions work in the same way as their 8-bit counterparts described in the last article. Instructions for the register pairs covered by this series are summarised in Table 1 together with their codes.

### Table 1    16-bit Arithmetic Instructions

| Instruction | Code |
|---|---|
| ADD HL, HL | 41 |
| ADD HL, BC | 9 |
| ADD HL, DE | 25 |
| ADC HL, HL | 237 106 |
| ADC HL, BC | 237 74 |
| ADC HL, DE | 237 90 |
| INC HL | 35 |
| INC BC | 3 |
| INC DE | 19 |
| DEC HL | 43 |
| DEC BC | 11 |
| DEC DE | 27 |
| SBC H, HL | 237 98 |
| SBC HL, BC | 237 66 |
| SBC HL, DE | 237 82 |

The first point to note about Table 1 is that the ADC and SBC instructions are two-byte instructions. The designers of the Z80 microprocessor have managed to cram a quart into a pint pot by using two (or more) bytes to specify an instruction. If they hadn't done this, there would only be 256 machine code instructions available!

You will find the ADC HL, HL instruction listed in Appendix A of the Spectrum Manual under code 106 — after ED. ED is the hexadecimal (base 16 numbers) equivalent of 237 decimal. We are not going to complicate this series with hexadecimal numbers as a beginner can manage quite well without them. If you want to know more, then read Appendix E of the Spectrum Manual. In Appendix A you will also see the "— after CB" column. CB is hexadecimal for 203 decimal.

Note that the INC instruction for increasing the value of a 16-bit number may affect one or both bytes, depending on whether or not the low byte is initially equal to 255. If it is, the high byte will go up by one and the low byte becomes zero.

The DEC instruction operates on 16-bit numbers in a similar manner when decreasing their value by one. Both instructions operate modulus 65536, so INCreasing 65535 equals 0.

You will also note from Table 1 that there are no 16-bit instructions for SUB or CP.

You have to use an SBC instruction instead. This can present a problem if the carry flag has been set by a previous operation and you don't want it included in the subtraction. This leads us nicely onto the logical operators because a 16-bit subtraction will normally be preceded by the AND A instruction which has the effect of resetting the carry flag.

Use an assembler or the decimal loader given in the first article of this series to enter the code of Listing 1. Run the code with PRINT USR 3000 and you should get an answer of 500. Delete the AND A instruction from the assembler or DATA statement and load the code again. After running, you will get an answer of 499.

To understand the logical operators, we need to look at the bits within the bytes. Suppose we have a section of code

```
LD  B, 174
LD  A, 55
AND B
```

Each bit of the A and B registers is compared in turn. If **both** bits are set (1), the A register bit remains set. Otherwise it is reset (0). This becomes clearer when we look at the numbers in binary.

$$
\begin{array}{c c c}
\text{A} & & 0\,0\,1\,1\,0\,1\,1\,1 \\
& \text{AND} & \\
\text{B} & & 1\,0\,1\,0\,1\,1\,1\,0 \\
\hline
\text{A} & & 0\,0\,1\,0\,0\,1\,1\,0
\end{array}
$$

You could try applying what you have learned so far in the series to print out the CHR$ of the value left in the A register. It should be the "&" character.

Another use of the AND instruction is to limit the range of numbers. Suppose you need to calculate the column position of a character on the screen. You need to limit the value to the range 0 to 31.

```
Value  AND  00100011  35
Mask        00011111  31

Result      00000011   3
```

If you AND the calculated position with a mask value of 31, you will get the column position within the correct range.

You can AND the A register with a number, one of the eight bit registers or with (HL). Because only the A register can be used in this way and because A stores the result, it is not specified in the mnemonic (e.g. A AND C is written AND C). The remaining two logical operators, OR and XOR operate in a similar manner.

The OR instruction leaves the A register bit set if **either** of the bits being compared are set. Otherwise the bit is reset.

```
A  OR  00110111
B      10101110

A      10111111
```

A much used special case of this instruction is if both registers are zero. If this is the case, the zero flag is set by the OR instruction. It is used in the equivalent of FOR/NEXT loops if the number of repetitions is greater than 256 where you can't use the 8-bit DJNZ, dis instruction. We will put this to good use later.

The XOR instruction — "exclusive or" is used less commonly. The A register bit is set if **only** one of the bits being compared is set.

```
A  XOR  00110111
B       10101110

A       10011001
```

If you are feeling very miserly with your computer's memory, XOR A will do the same for you as LD A, 0 but do it in one rather than two bytes.

Load the code given in Listing 2. This is a short routine which works through the attributes area of the screen memory. It manipulates the attribute bytes, changing the PAPER colour but leaving the INK colour and the FLASH and BRIGHTNESS states un-

changed. Delete the loader, then enter and RUN these lines of BASIC:

10 PRINT INK 7; FLASH 1; "Spectrum";
20 RAND USR 30000

Now insert the extra line

15 POKE 30001,1

and RUN it again. Its rather quicker than the BASIC:

FOR n = 0 TO 767: PRINT OVER 1; PAPER 5; CHR$ 32;:NEXT n

Finally, let's mention the machine stack. This is a section of memory where you can temporarily store 16-bit numbers. It is well compared to the spiked board on which bills, etc. are speared. The last piece of paper PUSHed onto the spike has to be POPped off to get at the paper underneath.

The machine stack operates in just the same way. The last 16-bit number PUSHed onto the stack is always the first to be POPped off. The microprocessor keeps track of the memory locations for you, so you don't need to know exactly where the numbers have been saved in memory.

The AF,BC,DE and HL registers can all be PUSHed and POPped. Because there are so few 16-bit "variables" (register pairs) available, these stack instructions are often used to free a register pair temporarily while it is used for another number. The original number is then POPped back.

Another use is to transfer a number from one register pair to another. This use is demonstrated in Listing 3 which is an example of multiplication of numbers, Load the code and run it with

PRINT USR 30000

The answer is initially held in the HL register pair. By moving it to the BC pair, we can use the PRINT method of running the code to print out the answer.

PRINT USR XXX runs a machine code routine at address XXX and prints the value held in BC on return to BASIC.

In the next article we will look at the block move instructions and the instructions for reading the keyboard and making sounds.

**Listing 1.**

```
30000          LD    A,200      62
                                200
30002          ADD   A,A        135
30003          LD    HL,1000     33
                                232
                                  3
30006          LD    DE,500      17
                                244
                                  1
30009          AND   A          167
30010          SBC   HL,DE      237
                                 82
30012          LD    B,H         68
30013          LD    C,L         77
30014          RET              201
```

**Listing 2.**

```
30000          LD    A,5         62
                                  5
30002          ADD   A,A        135
30003          ADD   A,A        135
30004          ADD   A,A        135
30005          LD    D,A         87
30006          LD    HL,23296    33
                                  0
                                 91
30009          LD    BC,768       1
                                  0
                                  3
30012  L1      DEC   HL          43
30013          DEC   BC          11
30014          LD    A,(HL)     126
30015          AND   199        230
                                199
30017          ADD   A,D        130
30018          LD    (HL),A     119
30019          LD    A,B        120
30020          OR    C          177
30021          JR    NZ,L2       32
                                245
30023          RET              201
```

**Listing 3.**

```
30000          LD    HL,0        33
                                  0
                                  0
30003          LD    DE,50       17
                                 50
                                  0
30006          LD    BC,30        1
                                 30
                                  0
30009  L1      DEC   BC          11
30010    ¦     ADD   HL,DE       25
30011          LD    A,B        120
30012          OR    C          177
30013          JR    NZ,L1       32
                                250
30015          PUSH  HL         229
30016          POP   BC         193
30017          RET              201
```
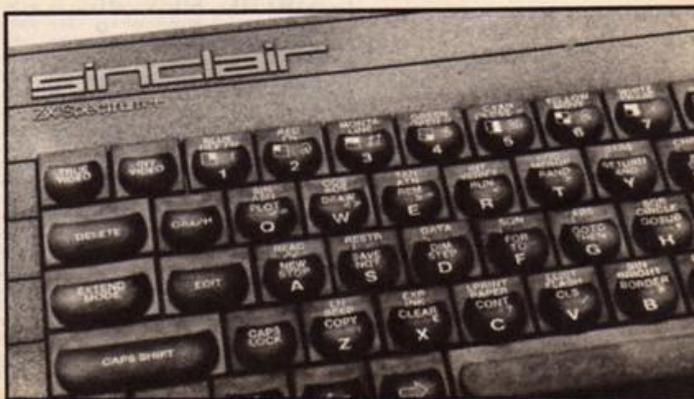
# PERIPHERAL

**Canon's PW-1080A is one of the new breed of dot matrix printers that have several fonts and a very low price — Clive Gifford finds out if it's worthwhile**

The dot-matrix printer market is becoming an overcrowded one with models seemingly being released every week. Canon, despite their relative inexperience in the low-cost printer field, look very likely to succeed with this model and the wider 15 inch carriage, PW-1156A printer.

This printer is well-packaged, as most printers seem to be, and takes but a few minutes to set up. This is in part due to the better-than-average manual which is supplied with the machine. It is thankfully devoid of any 'Japanese-English' which has become the norm with printer manuals from the Orient. Unfortunately it lets itself down by plunging into the complex technical data straight after the clearly written and illustrated setting-up chapter. The user should really have had a simple explanation of how to obtain some of the more common control codes such as obtaining underlined printing and a slashed zero (∅) as opposed to 0.

The PW-1080A is a stylish-looking machine, very neatly designed and with the minimum of protrusions. The front of the machine sports the three membrane switches used for switching the machine on and off line and for line or form-feeding the paper. The on/off switch and the paper feed knob are situated on the right hand side of the printer while the Centronics (or RS232) interface is positioned at the back.

The printer has a print density selector which can be switched to between 1 and 5 (2 is suggested for most paper types and conditions). The DIP switches are numerous and allow you to control various printing parameters such as characters per line and so on. These switches and their capabilities are well detailed in the manual but unfortunately are situated within the machine so altering them entails unscrewing the top cover to get inside.

As is the case with most dot-matrix printers, both roll or tractor fed paper can be used. Roll paper must be placed in the printer housing and this limits the diameter of the paper rolls that can be used to a maximum of 70mm. My old paper rolls are far larger than that but I found that if placed behind, on a roll stand (from my old Star DP520) and fed through the back of the printer housing, I could use any size roll. In addition one can use single sheets of paper which is very useful for writing letters. Alignment of paper takes a little while but is just a matter of getting used to the controls for paper setting.

The printer has two print modes, normal and Near Letter Quality (NLQ). Let's deal with each in turn. The normal mode is rather like the basic Epson mode utilising a standard 11 by 9 dot matrix. It prints at a rapid 160 characters per second bi-directionally and can print condensed, emphasised, subscript and elite styles. Another very useful feature is the ability to print proportionately which can add a look of professionalism to your textual output.

The NLQ mode is far slower at 27 characters per second but the result is, frankly, superb for a dot-matrix printer of this price. Figure 1 is a sample of both modes in action and as you can see, the NLQ gives the budget daisywheels a good run for their money. An additional advantage of this printer is that it is far quieter and quicker than most of the daisywheels currently on offer at under £500 plus it already has a tractor-feed unit which you will find is an optional extra with daisywheels.

In addition to these two basic print modes, the Canon PW-1080A also offers 16 dot graphic bit-image printing and a 3K input buffer which releases your computer earlier from the printing task. Another rather handy feature particularly for budding machine code enthusiasts is the printer's ability to print out all data and program listings sent to the printer in hexadecimal.

Optional features include a PCG RAM which allows you to design and store up to 8K of user-designed characters and a number of different font ROMS. The font ROMS simply give the printer a new character set to print out. This is similar to changing the daisywheel or golfball on other printers and typewriters. At present four different fonts are available, the most useful, in my opinion, being the italic font. The PCG RAM is priced at £49.94 while the fonts are individually priced at £27.50.

I've given this printer a real bashing in the time that I've been reviewing it, but I knew that I wouldn't be changing ribbons very quickly. Each ribbon costs £9.50 but will last for 3 million characters, one thirtieth of the life of the print head, approximately. The printer is very solid and will last anybody a long, long time. If you want to do more than just print out program listings and were seriously considering a daisywheel, then I suggest that you think again and have a look at the Canon PW-1080A.

**Price:** £349.95 (shop around though)

**Manufacturer:** Canon UK Ltd

**Address:** Canon House, Major Road, Wallington, Surrey SM6 0AJ

**Figure 1**

```
The Canon  PW-1080-A  features  both  normal  print
mode  at a speed of  160  cps  and  a  special  Near
Letter Quality (NLQ) mode that prints at 27 cps.

The above was printed in the normal mode. This
is printed in the NLQ mode, almost as good as a
budget daisywheel printer and slightly faster.
```

AMSTRAD GAME

# FIREFOX
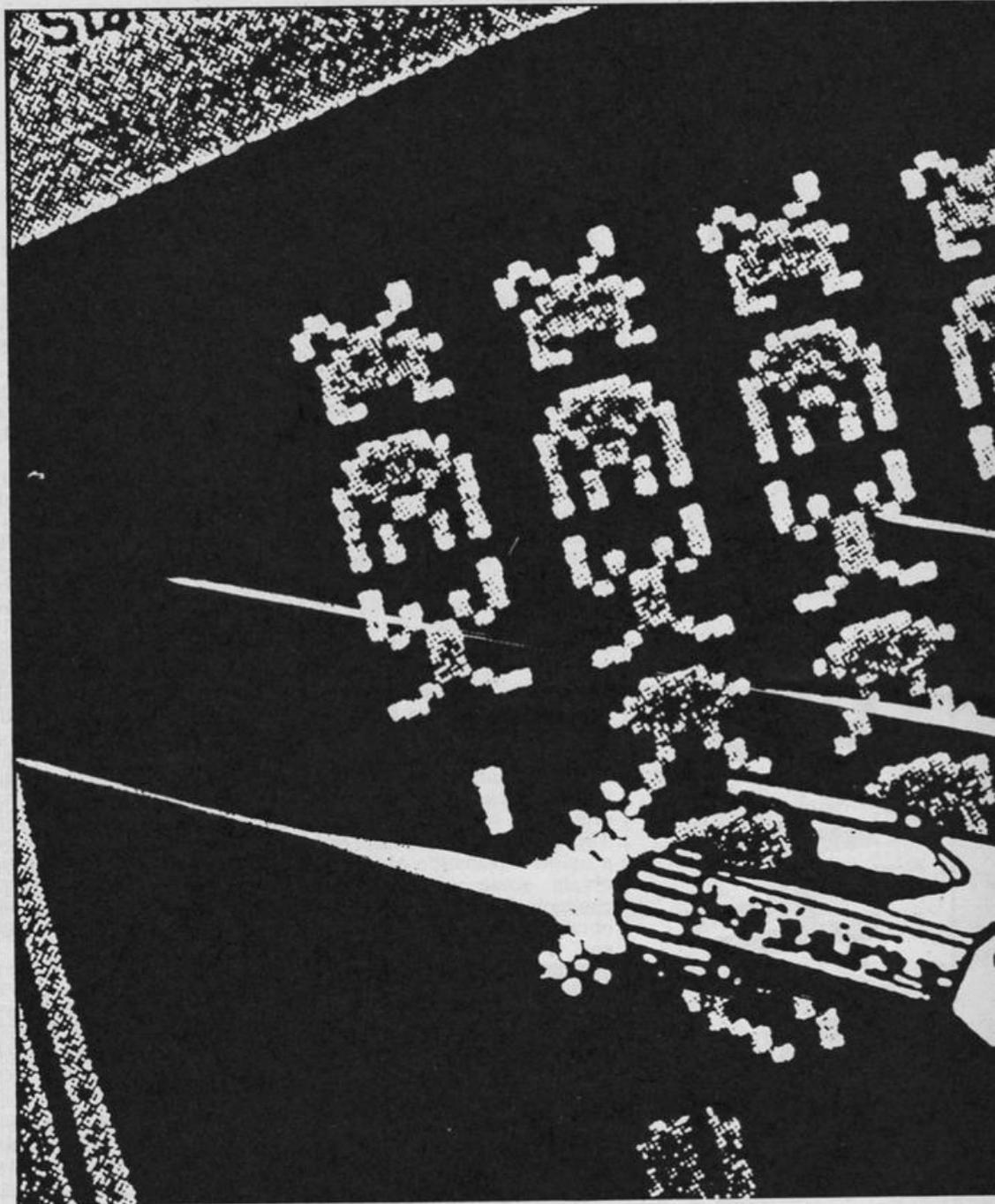


## Shoot the aliens in this exciting Amstrad game from Mark Anglin

The object of this Defender style game is to shoot up the aliens and get the highest score.

Every five sheets, you will have to refuel your ship, but this is not easy to do. If you manage to dock you will get 10,000 extra points. If you crash you will lose one of your ships.

There is a full set of instructions included in the program.

### How it works

| | |
|---|---|
| **10-60** | set up screen mode and colours |
| **70-210** | place ship on screen, check for key presses |
| **220-330** | check which alien has been hit by missile |
| **340-940** | control alien movements |
| **950-1150** | control alien fire |
| **1160-1480** | ship explosion routine |
| **1490-1690** | set up UDGs |
| **1700-1880** | set up screen display and variables |
| **1890-1980** | game over routine |
| **1990-2070** | attack wave routine (sheets cleared) |
| **2080-2670** | refueling stage routine |

### Variables

**SX,SY** ship co-ordinates
**PX,PY** pod co-ordinates
**WX,WY,LX** cosma mutant co-ordinates
**LX,LY** clone co-ordinates
**LZX,LZY** beta co-ordinates
**SX,SL** ship last position
**EX,EY** cosma mutant last position
**CY,CX** clone last position
**CZX,CZY** beta last position
**C3X,C3Y** magnum last position
**PDX,PDY** pod last position
**BX,DY,BX,BY** ship explosion co-ordinates
**MX,MY** missile co-ordinates
**SH** amount of ships
**PE,LE LZE,L3E,WE** amount of aliens shot
**HI** highest score
**EM** extra men
**Bonus** bonus points
**RF** refuel stage
**X,S,R** random number count
**U** movement of characters in game introduction
**SHE** sheet counter

```
150 IF LE<>1 THEN GOSUB 340
160 IF INKEY(0)=0 AND SY<320 THEN SY=SY+16
170 IF L2E<>1 THEN GOSUB 690
180 IF INKEY(72)=0 AND SY<320 THEN SY=SY+16
190 IF L3E<>1 THEN GOSUB 820
200 SL=SY
210 GOTO 80
220 MX=80:MY=SY
230 PLOT MX-16,MY:PRINT" ";:PLOT MX,MY,2:PRINT CHR
$(243);
240 IF MX=624 THEN PLOT MX,MY:PRINT" ":RETURN
250 T=TEST(MX+20,MY-10)
260 IF T=1 THEN PLOT MX,MY:PRINT" ";:SOUND 1,0,15,
15,0,0,7:PLOT MX+16,MY:PRINT CHR$(238);:SC=SC+200:
PE=PE+1:GOSUB 1760:PLOT PDX,PDY:PRINT" ";:PX=38*16
:RETURN
270 IF T=2 AND C=247 THEN PLOT MX,MY:PRINT" ";:SOU
ND 2,0,15,15,0,0,7:PLOT MX+16,MY:PRINT CHR$(238);:
SC=SC+150:WE=WE+1:GOSUB 1760:PLOT EX,EY:PRINT" ";:
WX=39*16:RETURN
280 IF T=2 AND C=254 THEN PLOT MX,MY:PRINT" ";:SOU
ND 2,0,15,15,0,0,7:PLOT MX+16,MY:PRINT CHR$(238);:
SC=SC+250:WE=WE+1:GOSUB 1760:PLOT EX,EY:PRINT" ";:
WX=39*16:RETURN
290 IF T=3 AND LY=MY THEN PLOT MX,MY:PRINT" ";:SOU
ND 4,0,15,15,0,0,7:PLOT MX+16,MY:PRINT CHR$(238);:
SC=SC+75:LE=LE+1:GOSUB 1760:PLOT CX,CY:PRINT" ";:L
X=37*16:RETURN
300 IF T=3 AND L2Y=MY THEN PLOT MX,MY:PRINT" ";:SO
UND 4,0,15,15,0,0,7:PLOT MX+16,MY:PRINT CHR$(238);
:SC=SC+110:L2E=L2E+1:L2X=37*16:GOSUB 1760:PLOT C2X
,C2Y:PRINT" ";:RETURN
310 IF T=3 AND L3Y=MY THEN PLOT MX,MY:PRINT" ";:SO
UND 4,0,15,15,0,0,7:PLOT MX+16,MY:PRINT CHR$(238);
:SC=SC+100:L3E=L3E+1:L3X=37*16:GOSUB 1760:PLOT C3X
,C3Y:PRINT" ";:RETURN
320 MX=MX+16
330 GOTO 230
340 LY=INT(RND*25)*16
350 IF LY<64 OR LY>320 OR LY=L2Y OR LY=L3Y THEN GO
TO 340
360 LMX=LX-32:LMY=LY
370 X=INT(RND*10)
380 PLOT CX,CY:PRINT" ";
390 CX=LX:CY=LY
400 TF=TEST(LX-4,LY-12):TT=TEST(LX+8,LY+4)
410 PLOT LX,LY,3:PRINT CHR$(244);
420 LX=LX-16
430 IF LX=0 THEN PLOT LX,LY:PRINT" ";:LX=37*16:RET
URN
440 IF X=5 AND LX>48 THEN GOSUB 950
450 IF TF=2 OR TT=2 OR LX<48 AND LY=SL THEN PLOT S
X,SL:PRINT CHR$(238);CHR$(238);:PLOT LX,LY:PRINT"
";:LX=37*16:FOR N=7 TO 1 STEP -1:SOUND 7,0,15,N,0,
0,7:NEXT:SH=SH-1:PLOT SX,SL:PRINT"    ";:GOSUB 1170:
GOSUB 1740:GOTO 70
460 RETURN
470 PY=INT(RND*25)*16
480 IF PY<64 OR PY>320 THEN GOTO 470
490 PLOT PDX,PDY:PRINT" ";
500 PDX=PX:PDY=PY
510 PF=TEST(PX-4,PY-12):PT=TEST(PX+8,PY+4):PB=TEST
(PX+8,PY-8)
520 PLOT PX,PY,1:PRINT CHR$(245);
530 PX=PX-16
540 IF PX=0 THEN PLOT PX,PY:PRINT" ";:PX=38*16:RET
URN
550 IF PF=2 OR PT=2 OR PB=2 AND PX<64 THEN PLOT SX
,SL:PRINT CHR$(238);CHR$(238);:PLOT PX,PY:PRINT" "
;:PX=38*16:FOR N=7 TO 1 STEP -1:SOUND 7,0,15,N,0,0
,7:NEXT:SH=SH-1:PLOT SX,SL:PRINT"    ";:GOSUB 1170:G
OSUB 1740:GOTO 70
560 RETURN
570 IF WE=1 THEN C=254
580 IF WE=0 THEN C=247
590 WY=INT(RND*25)*16
600 IF WY<64 OR WY>320 THEN GOTO 590
610 PLOT EX,EY:PRINT" ";
620 EX=WX:EY=WY
630 WF=TEST(WX-4,WY-12):WT=TEST(WX+8,WY+4):WB=TEST
(WX+8,WY-8)
640 PLOT WX,WY,2:PRINT CHR$(C);
650 WX=WX-16
660 IF WX=0 THEN PLOT WX,WY:PRINT" ";:WX=39*16:RET
URN
670 IF WF=2 OR WT=2 OR WB=2 AND WX<=64 THEN PLOT S
X,SL:PRINT CHR$(238);CHR$(238);:PLOT WX,WY:PRINT"
";:WX=39*16:FOR N=7 TO 1 STEP -1:SOUND 7,0,15,N,0,
```

```
5 REM MARK ANGLIN
10 MODE 1
20 GOSUB 1490
30 INK 0,0:BORDER 0:PAPER 0
40 GOSUB 2690
50 INK 0,0:INK 1,6:INK 2,24:INK 3,18:PAPER 0:BORDE
R 0
60 GOSUB 1700
70 PLOT SX,SL:PRINT"    ";
80 PLOT 0,16,2:PRINT C$;:C$=MID$(C$,2)+LEFT$(C$,1)
90 PLOT SX,SY-16:PRINT"  ";:PLOT SX,SY,2:PRINT CHR
$(251);CHR$(252);:PLOT SX,SY+16:PRINT"   ";
100 IF INKEY(47)=0 OR INKEY(76)=0 THEN FS=FS-1:GOS
UB 220:GOSUB 1760
110 IF PE<>1 THEN GOSUB 470
120 IF INKEY(2)=0 AND SY>64 THEN SY=SY-16
130 IF WE<>2 THEN GOSUB 570
140 IF INKEY(73)=0 AND SY>64 THEN SY=SY-16
```

```
0,7:NEXT:SH=SH-1:PLOT SX,SL:PRINT" ";:GOSUB 1170:
GOSUB 1740:GOTO 70
680 RETURN
690 L2Y=INT(RND*25)*16
700 IF L2Y<64 OR L2Y>320 OR L2Y=LY OR L2Y=L3Y THEN
 GOTO 690
710 L2MX=L2X-32:L2MY=L2Y
720 X=INT(RND*15)
730 PLOT C2X,C2Y:PRINT" ";
740 C2X=L2X:C2Y=L2Y
750 T2F=TEST(L2X-4,L2Y-12):T2B=TEST(L2X+8,L2Y-8)
760 PLOT L2X,L2Y,3:PRINT CHR$(246);
770 L2X=L2X-16
780 IF L2X=0 THEN PLOT L2X,L2Y:PRINT" ";:L2X=37*16
:RETURN
790 IF X=5 AND L2X>48 THEN GOSUB 1020
800 IF T2F=2 OR T2B=2 OR L2X<48 AND L2Y=SL THEN PL
OT SX,SL:PRINT CHR$(238);CHR$(238);:PLOT L2X,L2Y:P
RINT" ";:L2X=37*16:FOR N=7 TO 1 STEP -1:SOUND 7,0,
15,N,0,0,15:NEXT:SH=SH-1:PLOT SX,SL:PRINT" ";:GOS
UB 1170:GOSUB 1740:GOTO 70
810 RETURN
820 L3Y=INT(RND*25)*16
830 IF L3Y<64 OR L3Y>320 OR L3Y=LY OR L3Y=L2Y THEN
 GOTO 820
840 L3MX=L3X-32:L3MY=L3Y
850 X=INT(RND*20)
860 PLOT C3X,C3Y:PRINT" ";
870 C3X=L3X:C3Y=L3Y
880 T3F=TEST(L3X-4,L3Y-12):T3B=TEST(L3X+8,L3Y-8)
890 PLOT L3X,L3Y,3:PRINT CHR$(248);
900 L3X=L3X-16
910 IF L3X=0 THEN PLOT L3X,L3Y:PRINT" ";:L3X=37*16
:RETURN
920 IF X=5 AND L3X>48 THEN GOSUB 1090
930 IF T3F=2 OR T3B=2 OR L3X<48 AND L3Y=SL THEN PL
OT SX,SL:PRINT CHR$(238);CHR$(238);:PLOT L3X,L3Y:P
RINT" ";:L3X=37*16:FOR N=7 TO 1 STEP -1:SOUND 7,0,
15,N,0,0,15:NEXT:SH=SH-1:PLOT SX,SL:PRINT" ";:GOS
UB 1170:GOSUB 1740:GOTO 70
940 RETURN
950 IF LMY=PY OR LMY=L2Y OR LMY=L3Y OR LMY=WY THEN
 RETURN
960 PLOT LMX+16,LMY:PRINT" ";:PLOT LMX,LMY:PRINT C
HR$(144);
970 TM=TEST(LMX-4,LMY-10)
980 IF TM=2 AND LMY=SL THEN PLOT SX,SL:PRINT CHR$(
238);CHR$(238);:PLOT LMX,LMY:PRINT" ";:LMX=LX-32:F
OR N=7 TO 1 STEP -1:SOUND 7,0,15,N,0,0,15:NEXT:SH=
SH-1:PLOT SX,SL:PRINT" ";:GOSUB 1170:GOSUB 1740:G
OTO 70
990 IF LMX=0 THEN PLOT LMX,LMY:PRINT" ";:RETURN
1000 LMX=LMX-16
1010 GOTO 950
1020 IF L2MY=LY OR L2MY=PY OR L2MY=L3Y OR L2MY=WY
THEN RETURN
1030 PLOT L2MX+16,L2MY:PRINT" ";:PLOT L2MX,L2MY:PR
INT CHR$(144);
1040 T2M=TEST(L2MX-4,L2MY-10)
1050 IF T2M=2 AND L2MY=SL THEN PLOT SX,SL:PRINT CH
R$(238);CHR$(238);:PLOT L2MX,L2MY:PRINT" ";:L2MX=L
2X-32:FOR N=7 TO 1 STEP -1:SOUND 7,0,15,N,0,0,15:N
EXT:SH=SH-1:PLOT SX,SL:PRINT" ";:GOSUB 1170:GOSUB
1740:GOTO 70
1060 IF L2MX=0 THEN PLOT L2MX,L2MY:PRINT" ";:RETUR
N
1070 L2MX=L2MX-16
1080 GOTO 1020
1090 IF L3MY=LY OR L3MY=L2Y OR L3MY=PY OR L3MY=WY
THEN RETURN
1100 PLOT L3MX+16,L3MY:PRINT" ";:PLOT L3MX,L3MY:PR
INT CHR$(144);
1110 T3M=TEST(L3MX-4,L3MY-10)
1120 IF T3M=2 AND L3MY=SL THEN PLOT SX,SL:PRINT CH
R$(238);CHR$(238);:PLOT L3MX,L3MY:PRINT" ";:L3MX=L
3X-32:FOR N=7 TO 1 STEP -1:SOUND 7,0,15,N,0,0,15:N
EXT:SH=SH-1:PLOT SX,SL:PRINT" ";:GOSUB 1170:GOSUB
1740:GOTO 70
1130 IF L3MX=0 THEN PLOT L3MX,L3MY:PRINT" ";:RETUR
N
1140 L3MX=L3MX-16
1150 GOTO 1090
1160 BX=SX:GOTO 1180
1170 BY=SL+16:DY=SL-16:BX=0
1180 BY=SL+16:DY=SL-16
1190 IF DY>32 THEN PLOT BX,DY,2:PRINT" ...";
1200 IF BY<348 THEN PLOT BX,BY,2:PRINT" ...";
1210 DY=DY-16:BY=BY+16
1220 IF DY>32 THEN PLOT BX,DY,2:PRINT". . . .";
1230 IF BY<348 THEN PLOT BX,BY,2:PRINT". . . .";
1240 DY=DY-16:BY=BY+16
1250 IF DY>32 THEN PLOT BX,DY,2:PRINT" . .";
1260 IF BY<348 THEN PLOT BX,BY,2:PRINT" . .";
1270 DY=DY-16:BY=BY+16
1280 IF DY>32 THEN PLOT BX,DY,2:PRINT". . .";
1290 IF BY<348 THEN PLOT BX,BY,2:PRINT". . . .";
1300 DY=DY-16:BY=BY+16
1310 IF DY>32 THEN PLOT BX,DY,2:PRINT" . .";
1320 IF BY<348 THEN PLOT BX,BY,2:PRINT" . . .";
1330 BY=SL+16:DY=SL-16:BX=0
1340 IF DY>32 THEN PLOT BX,DY,2:PRINT"    ";
1350 IF BY<348 THEN PLOT BX,BY,2:PRINT"    ";
1360 DY=DY-16:BY=BY+16
1370 IF DY>32 THEN PLOT BX,DY,2:PRINT"    ";
1380 IF BY<348 THEN PLOT BX,BY,2:PRINT"    ";
1390 DY=DY-16:BY=BY+16
1400 IF DY>32 THEN PLOT BX,DY,2:PRINT"    ";
1410 IF BY<348 THEN PLOT BX,BY,2:PRINT"    ";
1420 DY=DY-16:BY=BY+16
1430 IF DY>32 THEN PLOT BX,DY,2:PRINT"    ";
1440 IF BY<348 THEN PLOT BX,BY,2:PRINT"    ";
1450 DY=DY-16:BY=BY+16
1460 IF DY>32 THEN PLOT BX,DY,2:PRINT"    ";
1470 IF BY<348 THEN PLOT BX,BY,2:PRINT"    ";
1480 RETURN
1490 SYMBOL AFTER 101
1500 SYMBOL 103,16,24,60,126,255,255,255,255
1510 SYMBOL 102,0,0,0,0,255,255,255,255
1520 SYMBOL 104,0,0,0,129,195,231,255
1530 SYMBOL 208,255,0,0,0,0,0,0,0
1540 SYMBOL 241,0,96,120,127,127,127,127,32
1550 SYMBOL 251,0,96,120,127,127,127,127,0
1560 SYMBOL 242,0,0,0,240,204,255,248,16
1570 SYMBOL 252,0,0,0,240,204,255,248,0
1580 SYMBOL 243,0,0,0,0,0,255,0,0
1590 SYMBOL 244,0,24,60,102,126,126,126,82
1600 SYMBOL 245,137,74,60,255,28,42,74,137
1610 SYMBOL 246,0,24,36,66,129,255,255,36
1620 SYMBOL 247,28,62,107,62,73,34,73,34
1630 SYMBOL 248,24,36,66,153,153,253,66,60
1640 SYMBOL 250,255,255,255,255,255,255,255,255
1650 SYMBOL 249,255,255,85,170,85,170,85,170
1660 SYMBOL 122,255,255,255,255,255,255,255,255
1670 SYMBOL 254,249,43,29,15,252,170,201,143
1680 SYMBOL 238,0,102,102,0,24,24,198,0
1690 RETURN
1700 CLS
1710 HI=0
1720 SH=4:SC=0:PE=0:LE=0:L2E=0:L3E=0:WE=0:EM=5000:
BONUS=100:SHE=0:RF=5:FS=150
1730 C$="fgfgfghghghfgfggfhgfhfgfgfghhgfghfhgfggfg"
1740 SX=2*16:SY=12*16:LX=37*16:L2X=37*16:L3X=37*16
:PX=38*16:WX=39*16
1750 INK 1,6:INK 2,24:INK 3,18
1760 SC2=SC:HI2=HI
1770 IF SC>HI THEN HI=SC
1780 IF SC>=EM THEN FOR N=70 TO 5 STEP -5:SOUND 7,
N,2,7:NEXT:EM=EM+10000:SH=SH+1
1790 TAGOFF
1800 IF (PE+WE+LE+L2E+L3E)=6 THEN SHE=SHE+1:GOTO 1
990
1810 IF SHE=RF THEN RF=RF+5:GOTO 2080
1820 IF FS=0 THEN SH=SH-1:FS=FS+100
1830 PEN 2:LOCATE 12,2:PRINT"SHIPS":LOCATE 13,3:PR
INT;SH:LOCATE 3,2:PRINT"SCORE":LOCATE 2,3:PRINT;SC
:LOCATE 29,2:PRINT"HI SCORE":LOCATE 28,3:PRINT;HI
1840 LOCATE 21,2:PEN 2:PRINT"FUEL":LOCATE 20,3:PRI
NT;FS
1850 IF SH=0 THEN GOTO 1890
1860 TAG
1870 MOVE 0,348:DRAW 639,348,1:DRAW 639,399:DRAW 0
,399:DRAW 0,348
1880 RETURN
1890 MODE 0
1900 LOCATE 5,12:PEN 2:PRINT"GAME OVER"
1910 FOR T=1 TO 3000:NEXT
1920 MODE 1
1930 LOCATE 1,12:PRINT"DO YOU WANT ANTHER GAME ?(Y
,N)"
1940 D$=INKEY$
1950 IF D$="Y" OR D$="y" THEN CLS:GOSUB 1720:GOTO
70
1960 IF D$="N" OR D$="n" THEN GOTO 1980
1970 GOTO 1930
1980 END
```

```
1990 CLS
2000 LOCATE 13,9:PRINT"ATTACK WAVE";SHE
2010 LOCATE 14,10:PRINT"COMPLETED"
2020 LOCATE 12,12:PRINT"BONUS";SHE;"X 100=";SHE*BO
NUS
2030 FOR N=125 TO 100 STEP -1:SOUND 4,N,5,7:NEXT:F
OR T=1 TO 5:FOR S=10 TO 100 STEP 10:SOUND 4,S,2,7:
NEXT:NEXT
2040 SC=SC+(SHE*BONUS)
2050 PE=0:WE=0:LE=0:L2E=0:L3E=0
2060 INK 0,0:INK 1,6:INK 2,24:INK 3,18:PAPER 0:BOR
DER 0
2070 CLS:GOSUB 1740:GOTO 70
2080 MODE 0
2090 LOCATE 3,12:INK 1,6,26:PEN 1:PRINT"REFEULING
STAGE"
2100 FOR T=1 TO 3000:NEXT
2110 INK 1,6
2120 MODE 1
2130 TAG
2140 PLOT 288,48,3:PRINT STRING$(4,249);
2150 PLOT 288,32,2:PRINT STRING$(4,203);
2160 PLOT 0,16,2:PRINT STRING$(40,206);
2170 INK 1,15:PLOT 560,80,3:PRINT CHR$(150);CHR$(1
58);CHR$(158);CHR$(158);CHR$(158);
2180 PLOT 560,32,2:PRINT STRING$(5,250);
2190 PLOT 560,48,2:PRINT CHR$(143);CHR$(207);CHR$(
207);CHR$(207);CHR$(143);
2200 PLOT 560,64,2:PRINT CHR$(143);CHR$(212);CHR$(
208);CHR$(213);CHR$(143);
2210 PLOT 544,32,2:PRINT CHR$(150);
2220 TAG:SX=2*16:SY=25*16
2230 PLOT SX,SY,2:PRINT CHR$(241);CHR$(242);
2240 TBA=TEST(SX,SY-18):TBA2=TEST(SX+30,SY-18)
2250 IF INKEY(1)=0 AND SX<608 THEN SX=SX+16:PLOT S
X-16,SY:PRINT"  ";
2260 IF INKEY(75)=0 AND SX<608 THEN SX=SX+16:PLOT
SX-16,SY:PRINT"  ";
2270 IF INKEY(8)=0 AND SX>0 THEN SX=SX-16:PLOT SX+
16,SY:PRINT"  ";
2280 IF INKEY(74)=0 AND SX>0 THEN SX=SX-16:PLOT SX
+16,SY:PRINT"  ";
2290 SL=SY
2300 X=INT(RND*8)
2310 S=INT(RND*8)
2320 R=INT(RND*8)
2330 IF TBA=3 AND TBA2=3 THEN PLOT SX,64,2:PRINT C
HR$(241);CHR$(242);:SOUND 7,45,10,7:SC=SC+1000:GOS
UB 2410:CLG:GOSUB 1740:GOTO 70
2340 IF TBA=3 OR TBA2=3 THEN PLOT SX,SY:PRINT CHR$
(238);:FOR N=7 TO 1 STEP -1:SOUND 7,0,15
,N,0,0,7:NEXT:SH=SH-1:PLOT SX,SY:PRINT"  ";:GOSUB
1160:CLG:GOSUB 1740:GOTO 70
2350 IF TBA=2 OR TBA2=2 THEN PLOT SX,SY:PRINT CHR$
(238);:FOR N=7 TO 1 STEP -1:SOUND 7,0,15
,N,0,0,7:NEXT:SH=SH-1:PLOT SX,SY:PRINT"  ";:GOSUB
1160:CLG:GOSUB 1740:GOTO 70
2360 IF S=6 AND SX>0 THEN SX=SX-16:PLOT SX+16,SY:P
RINT"  ";
2370 IF R=6 AND SX<608 THEN SX=SX-16:PLOT SX+16,SY
:PRINT"  ";
2380 IF X=5 THEN SY=SY-16:PLOT SX,SY+16:PRINT"  ";
2390 IF SH=0 THEN GOTO 1890
2400 GOTO 2230
2410 TAGOFF
2420 LOCATE 11,14:PEN 1:PRINT"BONUS 1000 POINTS"
2430 LOCATE 8,12:PEN 1:PRINT"YOU LANDED SUCESSFULL
Y !"
2440 FOR T=1 TO 3000:NEXT
2450 LOCATE 8,12:PRINT"                   ";:
LOCATE 11,14:PRINT"                  "
2460 INK 1,6,26
2470 LOCATE 16,12:PEN 1:PRINT"REFEULING !"
2480 FOR F=558 TO 200 STEP-1:PLOT F,54,1
2490 TF=TEST(F-2,54)
2500 IF TF=2 THEN SOUND 7,45,10,7 ELSE NEXT
2510 INK 1,26
2520 TAGOFF
2530 FS=0
2540 LOCATE 18,2:PEN 2:PRINT"FEUL":LOCATE 17,3:PRI
NT;FS
2550 SOUND 4,300,1,7
2560 IF FS=150 THEN GOTO 2580 ELSE FS=FS+3
2570 GOTO 2540
2580 LOCATE 16,12:PRINT"            "
2590 LOCATE 16,12:PEN 1:PRINT"REFEULING"
2600 LOCATE 16,13:PEN 1:PRINT"COMPLETED"
2610 INK 1,6,26
2620 FOR R=F TO 556:PLOT R,54,0
2630 FOR T=1 TO 8:NEXT T
2640 NEXT
2650 INK 1,6
2660 FOR T=1 TO 2000:NEXT
2670 TAG
2680 RETURN
2690 CLS:C$="fgfgfghgghfgfgffggfhfgfgfghhgfghfhgfg
gfg"
2700 INK 1,0:INK 2,0:INK 3,0
2710 SPEED INK 10,10
2720 LOCATE 1,9:PEN 1:PRINT"zzzzzzzzzzzzzzzzzzzzzzz
zzzzzzzz"
2730 LOCATE 1,10:PEN 2:PRINT"z
  z"
2740 LOCATE 1,11:PEN 3:PRINT"z       z
  z"
2750 LOCATE 1,12:PEN 1:PRINT"z
  z"
2760 LOCATE 1,13:PEN 2:PRINT"zzzzzzzzzzzzzzzzzzzzz
  zzzzzzzzzzzz   zz"
2770 LOCATE 1,14:PEN 3:PRINT"z        z    z   z
  z   z zz    z z"
2780 LOCATE 1,15:PEN 1:PRINT"z     z    zzzz    zzz
  z    z    z"
2790 LOCATE 1,16:PEN 2:PRINT"z      z     z z    z
  z    zz    z z"
2800 LOCATE 1,17:PEN 3:PRINT"z       z    z   z   zzzz
  z     zz   zz"
2810 LOCATE 5,24:PRINT"** (C) MARK.A.ANGLIN 4.2.85
**"
2820 FOR C=0 TO 26:INK 1,C:INK 2,C:INK 3,C:SOUND 7
,C*10,3,7:NEXT
2830 FOR T=1 TO 26:FOR N=1 TO 200:NEXT:INK 1,26,T:
INK 2,6,T:INK 3,15,T:NEXT
2840 FOR C=26 TO 0 STEP -1:INK 1,C:INK 2,C:INK 3,C
:SOUND 7,C*10,3,7:NEXT
2850 CLS
2860 INK 0,0:INK 1,6:INK 2,24:INK 3,18:BORDER 0:PA
PER 0
2870 LOCATE 16,1:PEN 2:PRINT"SCORING"
2880 TAG
2890 PLOT 32,320,2:PRINT CHR$(251);CHR$(252);
2900 PLOT 0,16,2:PRINT C$;
2910 U=48
2920 PLOT 624,U,3:PRINT CHR$(248);:GOTO 3090
2930 PLOT 128,224,3:PRINT CHR$(248);:PLOT 80,208,2
:PRINT"MAGNUM";:PLOT 48,176,2:PRINT"100 POINTS";:U
=48
2940 PLOT 624,U,3:PRINT CHR$(246);:GOTO 3100
2950 PLOT 320,224,3:PRINT CHR$(246);:PLOT 288,208,
2:PRINT"BETA";:PLOT 256,176,2:PRINT"110 POINTS";:U
=48
2960 PLOT 624,U,3:PRINT CHR$(244);:GOTO 3110
2970 PLOT 512,224,3:PRINT CHR$(244);:PLOT 480,208,
2:PRINT"CLONE";:PLOT 464,176,2:PRINT"75 POINTS";:U
=48
2980 PLOT 624,U,1:PRINT CHR$(245);:GOTO 3120
2990 PLOT 128,144,1:PRINT CHR$(245);:PLOT 112,128,
2:PRINT"POD";:PLOT 48,96,2:PRINT"200 POINTS";:U=48
3000 PLOT 624,U,2:PRINT CHR$(254);:GOTO 3130
3010 PLOT 320,144,2:PRINT CHR$(254);:PLOT 288,128,
2:PRINT"COSMA";:PLOT 256,96,2:PRINT"250 POINTS";:U
=48
3020 PLOT 624,U,2:PRINT CHR$(247);:GOTO 3140
3030 PLOT 512,144,2:PRINT CHR$(247);:PLOT 480,128,
3:PRINT"MUTANT";:PLOT 448,96,2:PRINT"150 POINTS";:
U=48
3040 FOR T=1 TO 10
3050 FOR N=1 TO 26
3060 INK 1,N:INK 2,N:INK 3,N:FOR S=1 TO 20:NEXT:NE
XT
3070 NEXT
3080 GOTO 3240
3090 IF U=320 THEN PLOT 624,U-16:PRINT"  ";:GOSUB 3
150:GOTO 2930 ELSE U=U+16:PLOT 624,U-32:PRINT"  ";:
FOR T=1 TO 50:NEXT:GOTO 2920
3100 IF U=320 THEN PLOT 624,U-16:PRINT"  ";:GOSUB 3
150:GOTO 2950 ELSE U=U+16:PLOT 624,U-32:PRINT"  ";:
FOR T=1 TO 50:NEXT:GOTO 2940
3110 IF U=320 THEN PLOT 624,U-16:PRINT"  ";:GOSUB 3
150:GOTO 2970   ELSE U=U+16:PLOT 624,U-32:PRINT"  ";
:FOR T=1 TO 50:NEXT:GOTO 2960
3120 IF U=320 THEN PLOT 624,U-16:PRINT"  ";:GOSUB 3
150:GOTO 2990 ELSE U=U+16:PLOT 624,U-32:PRINT"  ";:
FOR T=1 TO 50:NEXT:GOTO 2980
3130 IF U=320 THEN PLOT 624,U-16:PRINT"  ";:GOSUB 3
150:GOTO 3010 ELSE U=U+16:PLOT 624,U-32:PRINT"  ";:
```

```
-FOR T=1 TO 50:NEXT:GOTO 3000
3140 IF U=320 THEN PLOT 624,U-16:PRINT" ";:GOSUB 3
150:GOTO 3030 ELSE U=U+16:PLOT 624,U-32:PRINT" ";:
FOR T=1 TO 50:NEXT:GOTO 3020
3150 MX=80:MY=20*16
3160 PLOT MX-16,MY:PRINT" ";:PLOT MX,MY,2:PRINT CH
R$(243);
3170 IF MX=639 THEN PLOT MX,MY:PRINT" ":RETURN
3180 T=TEST(MX+20,MY-10)
3190 IF T=1 THEN PLOT MX,MY:PRINT" ";:SOUND 1,0,15
,15,0,0,7:PLOT MX+16,MY:PRINT CHR$(238);:PLOT MX+1
6,MY:PRINT" ";:RETURN
3200 IF T=3 THEN PLOT MX,MY:PRINT" ";:SOUND 2,0,15
,15,0,0,7:PLOT MX+16,MY:PRINT CHR$(238);:PLOT MX+1
6,MY::PRINT" ";:RETURN
3210 IF T=2 THEN PLOT MX,MY:PRINT" ";:SOUND 4,0,15
,15,0,0,7:PLOT MX+16,MY:PRINT CHR$(238);:PLOT MX+1
6,MY:PRINT" ";:RETURN
3220 MX=MX+16
3230 GOTO 3160
3240 CLG:TAGOFF
3250 INK 1,14:INK 2,14,26
3260 PEN 1:PRINT"YOUR HERE TO DEFEND THE EARTH FRO
M "
3270 PRINT"DESTRUCTION !.YOU HAVE TO FIGHT ALIENS
"
3280 PRINT"WHO HAVE NO MERCY."
3290 PRINT
3300 PRINT"THE MAGNUMS & BETA MAY BECOME RESISTANT
"
3310 PRINT"TO YOUR MISSILES AND HAVE TO BE HIT "
3320 PRINT"2 OR 3 TIMES TO DESTROY THEM."
3330 PRINT
3340 PRINT"  BE CAREFUL HOW YOU USE YOUR MISSILES"
3350 PRINT"BECAUSE YOU HAVE A LIMITED AMOUNT."
3360 PRINT
3370 PRINT" EVERY FIFTH  SHEET YOU GET A "
3380 PRINT"CHANCE TO REFUEL YOUR SHIP BUT BEWARE !
"
3390 PRINT"YOU HAVE VERY LIMITED CONTROL OVER YOUR
"
3400 PRINT"SHIP.SO YOU NEED TO BE VERY SKILLFUL.IF
"
3410 PRINT"YOU MANAGE TO DOCK YOU GET A BONUS OF"
3420 PRINT"1000 POINTS.WHEN YOU REACH 5000 POINTS"
3430 PRINT"YOU GET AN EXTRA SHIP BUT AFTER THAT"
3440 PRINT"IT IS EVERY 10000 POINTS."
3450 PRINT"         GOOD LUCK !"
3460 PRINT
3470 PRINT
3480 TAGOFF
3490 LOCATE 10,24:PEN 2:PRINT" PRESS C FOR CONTROL
S"
3500 B$=INKEY$
3510 IF B$="C" OR B$="c" THEN GOTO 3530
3520 GOTO 3500
3530 CLS:INK 2,14:PEN 2
3540 PRINT"1. USE CUSOR KEYS FOR UP AND DOWN."
3550 PRINT"2. USE THE SPACE BAR FOR FIRE."
3560 PRINT"YOU CAN ALSO USE A JOYSTICK TO CONTROL"
3570 PRINT"THE SHIP."
3580 LOCATE 12,24:INK 1,14,26:PEN 1:PRINT" PRESS S
 TO START"
3590 B$=INKEY$
3600 IF B$="S" OR B$="s" THEN RETURN
3610 GOTO 3590
```

# HELICOPTER

## Hold tight — the choppers are out in force in this action packed game from Alan Brack

The city is being attacked by evil alien forces — it's up to you to stop them. The only way of warding them off is by reaching the next difficulty level. So get your trigger finger ready, hold on to your hat and off you go!

Although designed for the Acorn Electron, Helicopter works perfectly on the BBC.

### How it works

**10-150** sets up UDGs
**270-490** main program loop
**PROCIntro** introduction
**PROCCity** draw city
**PROCAliens** print random aliens
**PROCFire/FireLeft** fire left and right
**PROCLand** land aliens
**PROCZap** laser sound
**PROCPat** draw random pattern

Difficulty level may be altered in lines 370 to 410.

```
   4REM**************************
   5REM***  By Alan Brack  ***
   6REM**************************
  10VDU23,224,0,0,31,0,0,128,241,127
  20VDU23,225,0,0,255,64,64,240,136,134
  30VDU23,226,15,7,1,0,8,7,0,0
  40VDU23,227,131,254,248,144,145,254,0,0
  50VDU23,228,0,0,0,0,0,128,241,127
  60VDU23,229,0,0,0,64,64,240,136,134
  70VDU23,230,0,0,255,2,2,15,17,97
  80VDU23,231,0,0,248,0,0,1,143,254
  90VDU23,232,193,127,31,9,137,127,0,0
 100VDU23,234,240,224,128,0,16,224,0,0
 110VDU23,235,0,0,0,2,2,15,17,97
 120VDU23,236,0,0,0,0,0,1,143,254
 130VDU23,237,255,255,255,187,187,187,255,25
5
 140VDU23,238,24,126,219,126,36,36,102,0
 150VDU23,240,66,126,219,219,126,66,66,231
 160MODE1
 170PROCINTRO
 180MODE5
 190VDU23,1,0;0;0;0;
 200SC=0:LVS=3:LVL=1:R1=30
 210A1=0
 220X=0:Y=15:D=0:I%=224:J%=225:K%=226:L%=227
:M%=228:N%=229
 230IFLVS=0THEN1220
 240COLOUR131:CLS:VDU19,3,132,0,0,0
 250PROCCITY
 260PROCALIENS
 270COLOUR1
 280VDU31,X,Y,M%,N%,10,8,8,K%,L%
```

```
290R=R+1:IFR=(R1)THENPROCALIENS:R=0
300IFINKEY(-99)ANDD=1THENPROCFIRELFT
310IFINKEY(-99)ANDD=0THENPROCFIRE
320COLOUR2
330VDU30:PRINTTAB(0,0)"SCORE"
340PRINTTAB(7,0)"LIVES     LEVEL"
350PRINTTAB(1,1);SC:PRINTTAB(9,1);LVS:PRINT
TAB(17,1);LVL
360SOUND0,-15,5,1
370IFSC>=250ANDSC<290THEN1470
380IFSC>=600ANDSC<640THEN1470
390IFSC>=900ANDSC<940THEN1470
400IFSC>=1100ANDSC<1140THEN1470
410IFSC>=1250ANDSC<1290THEN1470
420COLOUR1
430VDU31,X,Y,I%,J%,10,8,8,K%,L%
440*FX15,0
450IFINKEY(-98)THENI%=230:J%=231:K%=232:L%=
234:M%=235:N%=236:D=1:B%=FNC(X-1,Y):C%=FNC(X-
1,Y+1):GOSUB500:X=X-1:IFB%>32ORC%>32THEN1170:
GOTO270
460IFINKEY(-105)THENO%=FNC(X+1,Y+2):P%=FNC(
X,Y+2):GOSUB500:Y=Y+1:IFO%>32ORP%>32THEN1170:
GOTO270
470IFINKEY(-67)THENI%=224:J%=225:K%=226:L%=
227:M%=228:N%=229:D=0:F%=FNC(X+2,Y):G%=FNC(X+
2,Y+1):GOSUB500:X=X+1:IFF%>32ORG%>32THEN1170:
GOTO270
480IFINKEY(-73)THEND%=FNC(X,Y-1):E%=FNC(X+1
,Y-1):GOSUB500:Y=Y-1:IFD%>32ORE%>32THEN1170
490GOTO270
500VDU31,X,Y,32,32,10,8,8,32,32
510IFX>17THENX=17
520IFX<1THENX=1
530IFY<1THENY=1
540IFY>28THENY=28
550SOUND0,-15,5,1
560RETURN
570DEFPROCFIRE
580PROCZAP
590FORL=2TO6
600IFX+L>19THEN650
610FG=FNC(X+L,Y)
620IFFG=142ORFG=144THENSC=SC+10:SOUND1,-15,
212,2
630COLOUR1
640VDU31,X+L,Y,95
650NEXTL
660FORL1=2TO6
670VDU31,X+L1,Y,32
680NEXTL1
690ENDPROC
700DEFPROCFIRELFT
710PROCZAP
720FORL2=-1TO-5STEP-1
730IFX+L2<0THEN780
740FG=FNC(X+L2,Y)
750IFFG=142ORFG=144THENSC=SC+10:SOUND1,-15,
212,2
760COLOUR1
770VDU31,X+L2,Y,95
780NEXTL2
790FORL3=-1TO-5STEP-1
800IFX+L3<0THEN820
810VDU31,X+L3,Y,32
820NEXTL3
830ENDPROC
840DEFPROCZAP
850ENVELOPE1,129,-15,-8,-3,10,10,10,126,0,0
,-126,126,126
860SOUND&11,1,255,5
870FORT=1TO20:NEXT
880ENDPROC
890DEFPROCALIENS
900A1=A1+1:W=0
910FORL=1TO3
920A=RND(19):B=RND(15)+A1:CO=RND(3)
930A2=RND(2)
940IFA2=1THENA2=238
```

```
950IFA2=2THENA2=240
960IFCO=3THENCO=0
970COLOURCO
980IFA1>=8THENB=RND(17)+A1
990PRINTTAB(A,B);CHR$A2
1000IFB>=27THENW=1
1010NEXTL
1020IFW=1THENPROCLAND
1030ENDPROC
1040DEFFNC(V,O)
1050PRINTTAB(V,O);
1060A%=135
1070=(USR(&FFF4) AND &FF00)/&100
1080DEFPROCCITY
1090COLOUR0
1100VDU31,0,27,237,237,10,8,8,237,237,10,8,8
,237,237,10,8,8,237,237,10,8,8,237,237,237,23
7,237,237,237,237,237
1110VDU31,2,30,237,237,237,237,237,237
1120VDU31,6,27,237,237,10,8,8,237,237,10,8,8
,237,237
1130VDU31,10,27,237,237,10,8,8,237,237,10,8,
8,237,237,10,8,8,237,237,10,8,8,237,237
1140VDU31,13,27,237,237,10,8,8,237,237,10,8,
8,237,237,10,8,8,237,237,10,8,8,237,237,237,2
37,237,237
1150VDU31,18,27,237,10,8,237,10,8,237,10,8,2
37
1160ENDPROC
1170FORSE=220TO10STEP-1
1180SOUND1,-15,SE,0
1190NEXTSE
1200LVS=LVS-1
1210GOTO220:END
1220COLOUR130:CLS
1230COLOUR1
1240PRINTTAB(5,2)"WELL DONE!"
1250PRINTTAB(3,6)"Score...";SC
1260PRINTTAB(3,10)"Level...";LVL
1270IFSC>H%THENH%=SC
1280PRINTTAB(3,14)"Hi score ...";H%
1290COLOUR0
1300PRINTTAB(2,20)"Another go Y/N."
1310*FX15,0
1320IFINKEY(-69)THENRUN
1330IFINKEY(-86)THENEND
1340GOTO1310
1350DEFPROCLAND
1360FORT=1TO50:NEXT
1370COLOUR2:CLS
1380VDU19,3,9,0,0,0
1390FORLA=1TO12
1400PROCZAP
1410PRINTTAB(4,15)"THEY LANDED"
1420FORT=1TO280:NEXT
1430NEXTLA
1440PROCPAT
1450GOTO1220
1460ENDPROC
1470LVL=LVL+1
1480SC=SC+100
1490FORT=1TO80:NEXT
1500COLOUR0:CLS
1510VDU19,3,11,0,0,0
1520FORLA=1TO12
1530PROCZAP
1540PRINTTAB(5,15)"LEVEL   ";LVL
1550PRINTTAB(1,20)"(100 bonus points)"
1560FORT=1TO250:NEXT
1570NEXTLA
1580R1=R1-7
1590IFR1<=2THENR1=4
1600R=0
1610GOTO210
1620END
1630DEFPROCINTRO
1640VDU23,1,0;0;0;0;
1650COLOUR131:CLS
1660COLOUR1
```

```
1670COLOUR1
1680PRINTTAB(8,2)"***** HELICOPTER *****"
1690PRINTTAB(6,5)"The city is being attacked
            by aliens....."
1700PRINTTAB(6,9)"Your helicopter is our onl
y        hope....."
1710PRINTTAB(6,13)"The only way to stop them
is           to reach the next difficulty
            level....."
1720COLOUR2
1730PRINTTAB(15,18)"USE KEYS"
1740PRINTTAB(10,20)"Z=left        X=right"
1750PRINTTAB(10,22)":=up          /=down"

1760PRINTTAB(11,24)"space bar = fire"
1770COLOUR0
1780B%=0
1790FORFA=1TO25
1800FORNT=B%TOB%+12
1810SOUND&11,-15,NT,1
1820NEXTNT
1830B%=B%+7
1840NEXTFA
1850PRINTTAB(6,29)"PRESS SPACE BAR TO CONTIN
UE"
1860*FX15,0
1870IFINKEY(-99)THEN1890
1880GOTO1860
1890ENDPROC
1900DEFPROCPAT
1910GCOL0,2
1920FORL=1TO120
1950DRAWRND(1280),RND(1024)
1955SOUND1,-15,RND(200),1
1960NEXT
2000ENDPROC
```

SPECTRUM PROGRAM

# SWITCHBOARD

**In this game you take the part of a harassed switchboard operator trying to connect hundreds of callers to the right extensions. By Andrew Bird**

If you've never worked in a busy office then this nightmare of a game may not be familiar to you, but it's still worth trying.

The idea is to unravel the lines of a switchboard before you become inundated with phone calls. This is achieved by pressing the letters at either end of a line, thus connecting them.

### How it works

| | |
|---|---|
| 10-190 | set up arrays |
| 200-390 | draw game |
| 500-510 | ask for skill level |
| 800-990 | print letters |
| 1000-1260 | check for key pressed |
| 1500-1690 | check for matching letter of pair |
| 6500-6700 | telephone ringing routine |
| 7000-7090 | end of game (win) |
| 8000-8090 | end of game (fail) |
| 9000-9060 | instructions |

### Variables

**DIM x, DIM y** letters
**mix** mixes letters up into pairs
**sk** skill level
**ls, le** draw a line between letters
**top, bot** check for part of switchboard pressed first
**co** counts lines untangled
**pc** phone calls during game
**phone** used to trigger phone call routine
**key** CODE of key pressed
**s** search for letter loop
**f,n** general purpose loops
**d** delay loop

```
  1 REM  SWITCHBOARD 1985
  2 REM  By  Andrew Bird
  3 GO SUB 9000
  5 CLS : PRINT AT 10,10;"PLEASE WAIT"
  7 RANDOMIZE
  8 POKE 23609,30: POKE 23658,8
  9 REM  Set up Arrays
 10 DIM x(13,3): DIM y(13,3)
 20 FOR f=1 TO 13
 30 LET x(f,1)=INT (RND*13)+65
 40 FOR n=1 TO f-1
 50 IF x(f,1)=x(n,1) THEN  GO TO 30
 60 NEXT n: NEXT f
 70 FOR f=1 TO 13
 80 LET y(f,1)=INT (RND*13)+78
 90 FOR n=1 TO f-1
100 IF y(f,1)=y(n,1) THEN  GO TO 80
110 NEXT n: NEXT f
120 FOR f=1 TO 13
130 LET mix=INT (RND*13)+1
140 FOR n=1 TO f-1: IF x(n,2)=mix THEN  GO T
O 130
145 NEXT n
150 LET x(f,2)=mix
160 NEXT f
170 FOR f=1 TO 13
180 LET y(x(f,2),2)=f
190 NEXT f
199 REM  Screen & Skill level
200 BORDER 6: PAPER 6: INK 0: CLS
210 FOR f=169 TO 175: PLOT f-153,f: DRAW 457
-f*2,0: NEXT f
220 FOR f=1 TO 15: PRINT AT f,2; PAPER 0;"
           ": NEXT f
230 FOR f=33 TO 46: PLOT f-32,f: DRAW 215-f*
2,0: NEXT f
240 FOR f=18 TO 21: PRINT AT f,0; PAPER 0;"
           ": NEXT f
250 PLOT 192,48: DRAW 16,18,1: DRAW -16,-18,
1: DRAW 16,18,3.5
260 PLOT 232,94: DRAW 16,18,1: DRAW -16,-18,
1: DAW 16,18,3.5
270 PLOT 213,48: DRAW 40,48,1.2
280 PLOT 214,56: DRAW 30,34,1
290 PLOT 197,44: DRAW  INK 9;-64,-24,-2: PLO
T 198,43: DRAW  INK 9;-64,-24,-2
300 PRINT AT 0,20;"SWITCHBOARD";AT 2,20;"By
A.G.Bird"
310 INK 7: CIRCLE 133,20,3
320 CIRCLE 36,16,2: CIRCLE 36,16,14
330 FOR f=1 TO 12
340 IF f=6 OR f=7 OR f=8 THEN  NEXT f
350 CIRCLE 36-9*COS (f/6*PI),16+9*SIN (f/6*P
I),2.2
360 NEXT f
370 PLOT 46,6: DRAW -6,5: DRAW 2,3: DRAW 6,-
5
390 INK 0
500 INPUT " SKILL LEVEL 1 - 3   ";sk
510 IF sk>3 OR sk<1 THEN  GO TO 500
799 REM  Print lettrs
800 FOR f=1 TO 13
810 IF INT (f/2)=f/2 THEN  PAPER 5: GO TO 85
0
820 PAPER 4
850 PRINT AT 2,f+2;CHR$ (x(f,1))
860 PRINT AT 14,f+2;CHR$ (y(f,1))
890 NEXT f: PAPER 6
900 FOR f=1 TO 13
910 LET ls=8*f+20
920 PLOT  INK 7; OVER 1;ls,151
930 LET le=8*(x(f,2)-f)
940 DRAW  INK 7; OVER 1;le,-86
950 NEXT f
960 POKE 23560,0
970 LET top=0: LET bot=0
980 LET co=0: LET pc=0
```

```
  990 LET phone=100
  999 REM  Keypress
 1000 LET key=PEEK 23560
 1010 IF key>64 AND key<78 THEN  GO TO 1100
 1020 IF key>77 AND key<91 THEN  GO TO 1200
 1030 LET phone=phone-(sk+pc/4)
 1040 IF phone<0 THEN  LET phone=100: GO SUB 6
500
 1050 GO TO 1000
 1100 IF top=1 THEN  GO TO 1030
 1105 IF bot=1 THEN  GO TO 1500
 1110 FOR s=1 TO 13
 1120 IF x(s,1)=key THEN  GO TO 1140
 1130 NEXT s: GO TO 1030
 1140 IF x(s,3)=1 THEN  GO TO 1030
 1150 LET x(s,3)=1: PRINT AT 2,s+2; PAPER 0; I
NK 6;".": BEEP .01,20
 1160 LET top=1
 1170 GO TO 1030
 1200 IF bot=1 THEN  GO TO 1030
 1205 IF top=1 THEN  GO TO 1600
 1210 FOR s=1 TO 13
 1220 IF y(s,1)=key THEN  GO TO 1240
 1230 NEXT s: GO TO 1030
 1240 IF y(s,3)=1 THEN  GO TO 1030
 1250 LET y(s,3)=1: PRINT AT 14,s+2; PAPER 0;
INK 6;".": BEEP .01,20
 1260 LET bot=1
 1270 GO TO 1030
 1499 REM  Matching letter
 1500 IF x(y(s,2),1)<>key THEN  GO TO 1030
 1510 PRINT AT 2,y(s,2)+2; PAPER 0; INK 6;".":
 BEEP .01,20
 1520 LET x(y(s,2),3)=1
 1530 LET top=0: LET bot=0
 1550 LET ls=8*y(s,2)+20
 1560 LET le=8*(x(y(s,2),2)-y(s,2))
 1570 PLOT  INK 7; OVER 1;ls,151: DRAW  INK 7;
 OVER 1;le,-86
 1580 LET co=co+1: IF co=13 THEN  GO TO 7000
 1590 POKE 23560,0: GO TO 1030
 1600 IF y(x(s,2),1)<>key THEN  GO TO 1030
 1610 PRINT AT 14,x(s,2)+2; PAPER 0; INK 6;"."
: BEEP .01,20
 1620 LET y(x(s,2),3)=1
 1630 LET top=0: LET bot=0
 1650 LET ls=8*s+20
 1660 LET le=8*(x(s,2)-s)
 1670 PLOT  INK 7; OVER 1;ls,151: DRAW  INK 7;
 OVER 1;le,-86
 1680 LET co=co+1: IF co=13 THEN  GO TO 7000
 1690 POKE 23560,0: GO TO 1030
 6499 REM  Phone ringing
 6500 GO SUB 6600
 6510 FOR n=1 TO 2
 6520 FOR f=1 TO 10
 6530 BEEP .01,40: OUT 254,f: OUT 254,200-f: N
EXT f
 6540 FOR d=1 TO 10: NEXT d: NEXT n
 6550 GO SUB 6600
 6560 PRINT AT 6,20;"       "
 6570 LET pc=pc+1: IF pc=12 THEN  GO TO 8000
 6580 POKE 23560,0: RETURN
 6600 OVER 1: PLOT 228,110: DRAW -18,12: DRAW
3,-11: DRAW -56,5: DRAW -2,20: DRAW 46,-5: DR
AW 0,8: DRAW 18,-16: DRAW 2,8: DRAW 7,-20
 6610 OVER 0: IF RND>.5 THEN  PRINT AT 6,20;"H
URRY!": RETURN
 6620 PRINT AT 6,20;"QUICK!": RETURN
 6700 RETURN
 6999 REM  Win
 7000 PAPER 6: CLS
 7010 FOR f=5 TO 9: PRINT AT f,0; PAPER 7;"
                 ": NEXT f
 7020 PRINT AT 6,1; PAPER 7;"WELL DONE ! YOU'V
E PROVED YOUR";AT 8,5;"WORTH AS A TELEPHONIST
"
 7050 FOR f=1 TO 50: BEEP .02,f: BEEP .01,f+10
: NEXT f
 7060 FOR n=1 TO 2: FOR f=1 TO 10: BEEP .01,10
: NEXT f: FOR d=1 TO 10: NEX d: NEXT n
 7070 PRINT AT 20,8; OVER 1;"Press any key"
 7080 IF INKEY$="" THEN  PAUSE 40: GO TO 7060
 7090 CLS : GO TO 5
 7999 REM  Fail
 8000 BORDER 4: PAPER 4: CLS
 8010 FOR f=5 TO 9: PRINT AT f,0; PAPER 7;"
              ": NEXT f
 8020 PRINT AT 6,2; PAPER 7;"OH DEAR... YOU'VE
 JUST BEEN";AT 8,8;"GIVEN THE SACK."
 8030 BEEP 1,-40: FOR d=1 TO 250: NEXT d
 8060 BEEP .01,-10: IF INKEY$<>"" THEN  CLS :
GO TO 5
 8070 PRINT AT 20,8; OVER 1;"Press any key"
 8090 GO TO 8060
 8999 REM  Instructions
 9000 BORDER 5: PAPER 5: INK 0: CLS
 9010 PRINT  PAPER 6;"  SWITCHBOARD   BY  ANDRE
W BIRD  "
 9020 PRINT AT 4,0;"You have just been put in
charge"'''"of a large switchboard with all"'''"
of its linestangled up."
 9030 PRINT '"Your job is to untangle them by"
'''"typing in the letters at each"'''"end. Howe
ver you must act fast"'''"as the incoming call
s begin to"
 9040 PRINT '"mount up.       Good luck !"
 9050 PRINT AT 21,8; PAPER 6;" Press any key "
 9060 FOR d=1 TO 200: NEXT d: PAUSE 0: RETURN
 9999 SAVE "switchb/d" LINE 1
```



SWITCHBOARD By A.G.Bird

..FEMLH.D.KAB

HURRY!

NQ.XV.YT.Z.RS



ZX Spectrum

**Programs** are always supplied on cassette and are accompanied by full details of the program variables, how the program works and any hints on conversion you can offer. Please type these details double spaced. Listings are helpful but not essential. What is vital is that the programs should be completely error free, so please double check.

**Always** use a coupon firmly fixed to the back of your envelope, and fully complete and enclose the cassette inlay card.

We are particularly interested in programs with less than 100 actual lines of BASIC. All submissions are acknowledged.

# Send your programs to HCW!

Use this cassette inlay card for your program

Name _____

Address_____

_____

_____

_____

_____

Expansion needed _____

Special loading instructions _____

_____

Program title

Machine

**HOME COMPUTING WEEKLY**

Program submission

Complete this coupon and stick it firmly on the back of your envelope

Name _____

Address_____

_____

Program title _____    Machine _____
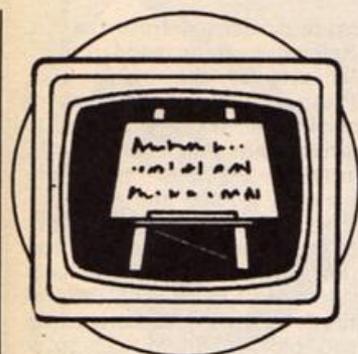
# EDUCATION

**Home Sweet Home is John Henderson's theme this week — Is home software worth buying and does it help or hinder?**

Life after school — how can the home computer help children with their learning? There is only really one answer — by using quality software along the lines used by the schools themselves. Talking to teachers will, however, present parents with a wide range of differing ideas. This week it is time for an examination — no, not the things that everyone hates. An examination of educational software produced for the BBC computer at home, guaranteed not to upset even hayfever sufferers! The basic question — is home educational software all it seems?

As most homes still rely on cassette loading, lets look at an intro package. **Using your computer** is published by the BBC no less and incorporates real jargonese. The technique used in this package is *Computer Synchronised Audio* (CSA). In laymans terms — after all it is a complete introduction to what computers are capable of — CSA enables children to understand what is happening on the computer screen by following instructions given to them on an audio cassette. Yes, you do need to own two cassette recorders.

Cassettes are contained in an open-out card pack, with voice tapes and software tapes clearly labelled and colour-coded. There's even a supply of sticky labels to label each cassette player according to its function. A 48 page instruction booklet contains the main aims of each set of programs, together with a transcript of each voice programme. The four programs cover a general introduction to computer graphics and screen positions; a look at the tasks performed by computers; an introduction to BASIC functions; and a history of computing.

Full and clear instructions are provided to transfer this software to disc. The package will run on BASIC1 and BASIC2 machines. The packaging is substantial enough to live up to life at home and cassettes are easily removed from their plastic tray — no need for the usual jemmy treatment at all.
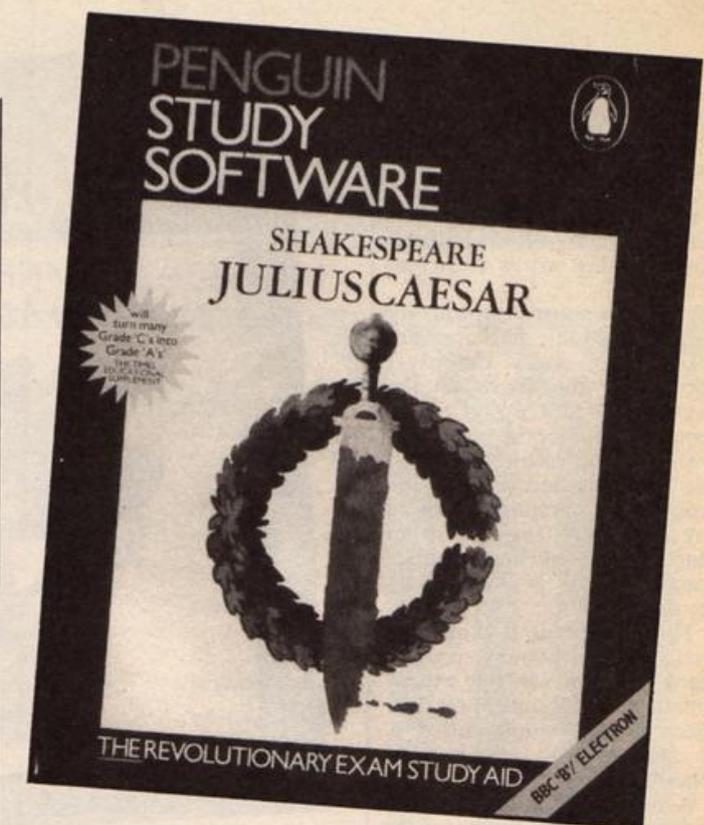
On the face of it, a good introductory package to complement the Welcome tape supplied with the BBC computer. Strange that so much emphasis is placed on BASIC as a programming language. In the best primary schools, the audience to which this is aimed, learning BASIC forms no part of computer work. The effects of time also hinder this pack — the lunar landing situation aims to show how computers can be used, when really it is part of the history.

This set of programs were originally available as part of regular broadcasts to schools, at a cost of £12. Why then has the price doubled for the home market? Yes the voice tapes are included but this is inflation at its worst. A new set of radio programmes in this series are due to be broadcast to schools later this year. They may eventually appear on the home front — if you can afford them.

Another camouflaged package is **Picture Logic** from Addison-Wesley Homesoft. This originally came to schools as Logo Challenge. I prefer the new title as this is not a logo im-plementation but a screen graphics package. It has one thing in common with Using the Computer — a price increase, this time to £32.10. Supplied on disc or cassette, Picture Logic allows children to explore a picture world by using some of the commands to overcome the exercises and challenges detailed in the documentation. Full instructions are provided in a well presented 40 page challenge book and the 16 page user manual.

Such a pity that so much looks like a typical textbook instead of a new adventure with shape. An answer file is also supplied to perpetuate the right/wrong answers. Graphic packs to be marked out of ten in red ink!

Pictures are drawn with yellow lines on a blue background. Quite sophisticated designs are possible using REPEAT loops. Children are already using similar software in the classroom, so why buy this for home? Well the potential for further learning sometimes relates to familiarity with the resource. Time spent at home with Picture Logic can continue the learning. There are however, some disadvantages.

Some commands are given different names to those used on packages most popular in schools eg. DEFINE for building procedures. A major problem, especially for younger

users, is the orientation of the drawing arrow. Most start with the arrow pointing North, in Picture Logic the arrow faces to the East. This may seem trivial, but children are often confused when relating words to actual direction.

Features not commonly found in graphic packages are WHERE, to map the exact position of the arrow on the screen, and SETX and SETY coordinates to set the pen in any position. The editor presents a line by line account of the procedures complete with a screen display showing what function each line has. A screen dump program is available on the disc.

This is a useful, if expensive, package that could provide many hours of valuable experience. Parents should, however, check to see if similar software is available for children in school.

Acornsoft Home Education series would seem to be just the thing for parents to look at.

One package in this category is **Spooky Manor**, the old haunted house and missing treasure syndrome, but an adventure with a difference. In an attempt to consider future developments, this program allows the choice of keyboard or microwriter input. Following the title page and a short burst of spooky music to help set the scene, a menu page allows the user a choice of input device and a sound on/off option. Access to this menu is via the escape key at all times. Users may return to the menu during a game, when the options are to start afresh or to continue.

A game for up to 4 players, Spooky Manor deals in real interaction between the players. Screens for this program are split into four parts, one for each player showing their positions in the house and current score (maximum 600). On entering their own numbers, players can insert commands to explore the house, picking up clues as they go. If you require the help of another player nothing could be simpler, call them. Messages then change in each players window and the path the cooperative planning opens up. If you feel close to solving the mystery there is nothing to prevent you having more than one go at a time.

The game starts close to nightfall — players are kindly
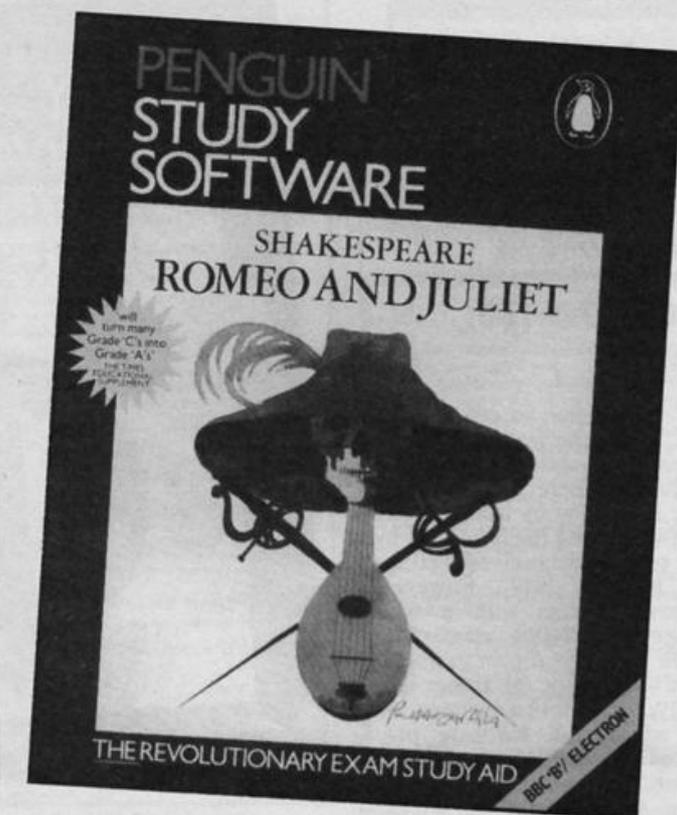
provided with torches, but start in different rooms. Thus a plan of the house needs to be built up as players explore (a plan is available in the handbook for cheats). The object is to collect as much treasure as possible before escaping, but beware of things that go bump in the night. In fact the ghosts only scare you — no senseless killing or maiming in this abode.

Although the packaging is poor, the booklet accompanying Spooky Manor is very well written, listing some of the simple every-adventure type of commands and emphasising the real educational value of this communal learning environment. There's even the text of a sample game to read if you have problems. An excellent introduction to friendly adventuring for all the family. Worth waiting the 6 minutes loading time on the cassette version for

the hours of fun to follow.

Now to move on to thinking of exams — yes, this is the time to think about the options available for next year. Some students taking English Literature papers will already know the names of the books they will have to study. Revision is always difficult, but half the battle is a sensible approach to learning the material. Look no further than the PENGUIN STUDY SOFTWARE series of cassettes. With titles considering plays by Shakespeare this software is amongst the best around.

After loading the screen presents the user with a list of characters, scenes and themes. Use the arrow keys to move around the selection of choices. Pressing one key (P for PICK) enables a character or theme to be chosen for a search of the file. Several choices can be

made or deleted from the list. Reference can be made to specific acts or the whole play. Pressing s initiates the search and further text is presented to direct thoughts towards the answer. Discover the links between Romeo and the Sycamore tree and even the passions of the nurse. There's also a section entitled "for further consideration" to help fix the plot firmly in the mind. Both adults and older children will enjoy using these packages and a real appreciation of Shakespeare begins to emerge.

An introduction to computing, an adventure game, a graphics pack and a revision aid. The programs discussed look at four very different areas of computers in education. What patterns have emerged? Well, there's the rip-off, where software increases in price for the home market, balanced by exciting activities that show the computer in the role it fits best, as a motivator of children. The choice is up to individuals. Parents should ask in local schools to see what is being used successfully. There are so many steps over which to fall that in the next article will be a series of hints of features to look for when choosing educational software.

# TOP 20

# SOFTWARE

## Fortnight Ending July 12, 1985

### Up and coming

Last week's chart was obviously the lull before the storm. This week shows a number of changes, throughout the chart.

A new Number One is always a celebration although in this case it means that Soft Aid is starting to fall. Elite must be selling in vast numbers for the Commodore as BBC sales can hardly be contributing to the total.

The new Melbourne House game, Fist, seems to have made a real impact too. It makes me wonder why Bruce Lee didn't make a bigger impression when it was released.

The real surprise is the rise of Jet Set Willy the second. I know that there are huge numbers of loyal fans but I didn't expect them to all rush out and buy number two. Well it just shows how wrong you can be!

| LAST WEEK | MOVE | THIS WEEK | TITLE | PUBLISHER | SPECTRUM | CBM 64 | BBC | ELECTRON | VIC 20 | AMSTRAD | ATARI | OTHERS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 36 | ▲ | 1 | Elite | Acornsoft/Firebird | | • | • | • | | | | |
| NE | ▲ | 2 | Way of the Exploding Fist | Melbourne Hse | | • | | | | | | |
| 1 | ▼ | 3 | Soft Aid | Various | • | • | | | | | | |
| NE | ▲ | 4 | View to a Kill | Domark | • | • | | | | | | |
| 23 | ▲ | 5 | Cauldron | Palace | • | • | | | | | | |
| 2 | ▼ | 6 | Spy Hunter | US Gold | • | • | | | | | | |
| 3 | ▼ | 7 | Shadowfire | Beyond | • | • | | | | | | |
| NE | ▲ | 8 | Jet Set Willy 2 | Software Projects | • | • | | | | | | |
| 11 | ▲ | 9 | Rocky Horror Show | CRL | • | • | | | | | • | |
| 7 | ▼ | 10 | Alien 8 | Ultimate | • | | | | | • | • | |
| 42 | ▲ | 11 | Dun Darach | Gargoyle | • | • | | | | | | |
| 6 | ▼ | 12 | Combat Lynx | Durell | • | | • | • | • | • | | |
| 5 | ▼ | 13 | Knightlore | Ultimate | • | | | | | • | • | |
| NE | ▲ | 14 | Hypersports | Imagine | • | | | | | | | |
| 4 | ▼ | 15 | World Series Baseball | Imagine | • | • | | | | | | |
| 16 | ● | 16 | Pitstop 2 | US Gold | | • | | | | | | |
| 8 | ▼ | 17 | Bruce Lee | US Gold | • | • | | | | | | • |
| RE | ▲ | 18 | Spy vs Spy | Beyond | • | • | | | | | | |
| 30 | ▲ | 19 | Revs | Acornsoft | | | • | | | | | |
| NE | ▲ | 20 | Drop Zone | US Gold | | • | | | | | | • |

### SPECTRUM Top Ten

1. **Soft Aid** — Various
2. **Spy Hunter** — US Gold
3. **Cauldron** — Palace
4. **Dun Darach** — Gargoyle
5. **Jet Set Willy 2** — Software Projects
6. **View to a Kill** — Domark
7. **Hypersports** — Imagine
8. **Shadowfire** — Beyond
9. **Spy vs Spy** — Beyond
10. **Starion** — Melbourne House

### BBC Top Ten

1. **Revs** — Acornsoft
2. **Alien 8** — Ultimate
3. **Knightlore** — Ultimate
4. **Combat Lynx** — Durell
5. **Elite** — Acornsoft
6. **Attic Attac** — Ultimate
7. **Castle Quest** — Micro Power
8. **Repton** — Superior
9. **Mini Office** — Database
10. **Football Manager** — Addictive

### COMMODORE Top Ten

1. **Elite** — Firebird
2. **Way of the Exploding Fist** — Melbourne House
3. **Soft Aid** — Various
4. **Pitstop 2** — US Gold
5. **View to a Kill** — Domark
6. **Dam Busters** — US Gold
7. **Drop Zone** — US Gold
8. **Kik Start** — Mastertronic
9. **International Basketball** — Commodore
10. **Cauldron** — Palace

I am writing this letter to you because I had problems when I typed in your Cookie Monster program in HCW 115.

After I had typed the game in, it wouldn't run. There was a problem. Print statements in lines 210, 220, 230 and 240 kept appearing in the maze and, when the little man walked into them, the program stopped and I got a message about incorrect statements in 930.

To solve this I took out the offending lines and now the program works great.

All HCW listings for the TI are great and I would give 10 out of 10 for each one.

**Alan Boyle, Airdrie**

FOR EVERY
**A PRIZE**
LETTER PRINTED

### Question of balance

I felt I had to write in answer to S G Young, Glasgow, in edition 117, in which he stated that your magazine should be altered.

I feel the magazine as it stands is first class and deals fairly with all types of computers. I own an Amstrad 464 and his suggestion that the games listings are a waste of editorial space quite frankly appalled me. I am a learner and it is only by typing in all the listings that I find I can understand how the games and utilities work.

I have four grandchildren and although he states that the listings are "at best average" they have been delighted with every game I have managed to type and been successful in running.

I am no longer fit to work and listings help pass many a pleasurable hour and at the same time make four children very happy. It would be impossible for me to supply them with bought software because of the price the manufacturers are asking.

His suggestion to replace the listings with a "Cheats Page" is, to say the least, ridiculous — to go to the expense of purchasing a manufactured game and then purchase a magazine to assist you in beating it — defeats the object of buying it in the first place.

Please keep your magazine as well balanced as it is as I believe you do try to cater for everyone.

**R McCleneaghan, Liverpool**

Home Computing Weekly,
Nº 1 Golden Square,
London WIR 3AB.

### Leave the lists alone

I was very unhappy to read S G Young's comment in HCW 117 that in his opinion the biggest drawback with HCW is the games listings and he sees the games listings as a waste of precious editorial space, "as they pale completely in comparison with most of the commercially available programs."

Please don't, for I am a chap who gets enjoyment from your games listings although there are not that many. I am not complaining because your mag is worth double the price. I am a 60-year-old disabled person with an Amstrad who really gets a very great deal of pleasure from doing your listings of games and my nieces and nephews also enjoy playing them.

So why doesn't S G Young RUN, PEEK or GOTO at another items and let me and hundreds like me still get great happiness from reading your mag exactly as it is. So please keep it up and many thanks for a first class mag with a third class price.

**Stan Fowell, Dagenham**

*It rather looks as though Mr Young is outnumbered. We had a number of other letters about the inclusion of games listings too, and all wanted them to stay.*

*We are always looking for good quality games and utility listings and use a huge number of readers programs each year. Please keep sending them in. We have to reject a number but that is to keep the quality up to HCW's high standard.*

*P.S. We even pay for those we publish!*

### Time for a trade-in?

With computers now owned by a great deal of homes there obviously comes a time when your machine falls behind and a better version appears on the market.

My own C64 is lined up for an upgrade to a C128 and to do so I will have to sell my 64 — most likely through the ads in a computer magazine or the local paper.

In the same way, Spectrum, BBC and other computer owners may feel the need to upgrade, whether to a better version of their old computer or to a completely different make. The problem is that, if you had a video, hi-fi or TV, you could most likely get a trade-in at a shop.

Unfortunately as yet widespread facilities for computer trade-ins are unavailable and it seems such a pity in a market which has always been so fast moving.

Maybe one day Woolies, Smiths, Dixons and all the others will see the need for a service. Let us hope that it won't be a long time coming.

**A Clarke, Warwicks**

### More Amstrad modems — please

I own a CPC464 and am very, very pleased with it. Now that I am becoming interested in modems I have been looking through all the magazines to see if there are any which have been reviewed, but I could only find two modems being sold in packages. One is from Database Publications and the other is from KDS Electronics in Norfolk.

Please could you review these two packages. I'm sure there are a lot of Amstrad owners who want to buy a modem but are just waiting to see a couple of them reviewed. Please don't disappoint us Amstrad users!

**D Bennett, Colliers Wood, London**

*Thanks for the idea, we will contact the companies concerned and see what we can do.*

*We are planning a feature on modems for the future so look out for that too.*

# LETTERS PAGE

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269 Field End Road, Eastcote, Ruislip,
Middx HA4 9LS   Tel: 01-429 2446**

## Amstrad
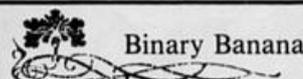
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## Libraries

**BBC B/Electron/Dragon** software
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heim Walk, Corby, Northants.

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cent, Peterborough. Tel: Peter-
borough 312120.

## Software

### WD Software
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**WD Utilities (3rd ed) (base £5.50)**
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**WD Utilities for CST Q-Discs (base £8)**
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CHECK on Screen or Printer (or speech for Spectrum with Currah MicroSpeech). Also own
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**Tradewind (base £4)**
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**Jersey Quest (base £4)**
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QL or Spectrum Microdrives — £2.00/cartridge plus base price
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Two or more programs on one medium — pay medium + base. e.g. WD Utilities and
RefQL for £10.50, but IMPOSSIBLE to mix QL/BBC/Spectrum programs on one medium.
Send YOUR cartridge and pay base price but FORMATted it FIRST in your DRIVE 1
compatibility.

**WD Software, Hilltop, St Mary, Jersey.  Tel (0534) 81392**

**MSX Speech Synthesiser program.**
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listing. Firefly Software, 8 Pools-
ford Road, London NW9 6HP

## Software Libraries

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## Reader's hi-score table

| Name | Game | Machine | Score |
|------|------|---------|-------|
| Jonathan Dale | Skramble | VIC-20 | 35,485 |
| | Quasimodo | VIC-20 | 1,007,426 |
| | The Pit | VIC-20 | 5,600 |
| | Metamorphosis | VIC-20 | 17,600 |

### Whatever next

Three rather strange looking collections of numbers but there is a sensible answer in each case to our question — whatever next?

All three, by the way, are linked by a common theme.

| 61 | 21 | 82 | 43 | 03 | 64 | ? |

| $\frac{7}{1}$ | $\frac{4}{2}$ | $\frac{1}{2}$ | $\frac{8}{3}$ | $\frac{5}{4}$ | $\frac{2}{4}$ | $\frac{9}{5}$ | $\frac{6}{6}$ | ? |

| 61 | 42 | 23 | 04 | 84 | 65 | 46 | ? |

### Solution to last weeks puzzle

1. BRACES 2. BUNION 3. INSERT 4. CURARE 5. UPROAR 6. TRAILS.

### Dragon tales

Jan Van Sivis has sent in these games tips for Dragon 32.

In Dungeon Raid, if you press 'C' after a go then you start where you left off. For Manic Miner on any screen press 'P' and the game will pause. Type penguins and a boot will appear on the bottom right of the screen. Press BREAK and the game will pause, then hit 'A' for the central cavern and 'B' for the cold room.

Jan would like a computer pen friend so write to him at 51 Forge Rd, Little Sutton, South Wirral L66 35G

### Staff alert

Here are a few tips from Ian Longdon on the Staff of Karnath for the C64.

In the dungeons there is a red skull in the wall. This has a piece of the pentacle behind it. To get it, go into the small room where there are two ghosts. Touch the wall between the two middle coffins and hurry back to the red skull which should be up in the air, but hurry because it doesn't stay up for long.

To get the piece of the pentacle in the laundry room go into the upper guard room where there is a witch. Shoot the shield in the middle with the Throbin spell and, when there is a tinging sound, press a key twice and shoot with that spell. A cross will fall off onto the floor. Collect it and you may get into the laundry room.

In the great hall shoot the flames with the Aelvs spell and quickly pick up the piece.



"WHAT WAS THE LAST BATSMAN'S SCORE?"

# READERS PAGE