

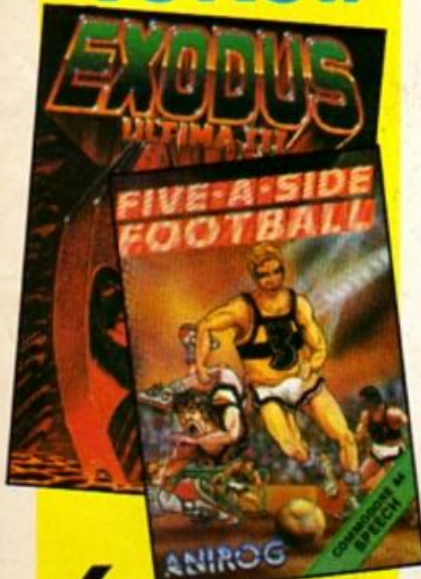
# HOME COMPUTING WEEKLY

AN ARGUS SPECIALIST PUBLICATION

July 16-22 1985 No 121 50p

C16/plus 4  
**TIMESLIP**  
Don't buy another  
C16 game until  
you see TIMESLIP!!  
ENGLISH SOFTWARE  
ENGLISH SOFTWARE  
ENGLISH SOFTWARE  
ENGLISH SOFTWARE

**Under  
review**



**6 pages of  
software p.12**

**Bust  
a Ghost!**



**Win our £1000  
competition from**

**ACTIVISION**  
HOME COMPUTER SOFTWARE

## 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.

**Beginning  
machine  
code for the  
Spectrum p.25**

**Canon's PW1080A  
printer  
reviewed p.27**

**Firefox —  
Amstrad game  
p.28**

**Educational  
software  
for your home  
p.39**

**HCW launch  
a Time  
Capsule p.10**



# WATCH OUT! IT'S



## DYNAMITE DAN

**94%**  
Crash  
Smash

"What makes the game is the graphics – large, witty, bizarre and beautifully animated . . . each screen has something remarkable, and horribly difficult puzzles . . . Dynamite Dan is not just another Miner surrogate and is at least as essential to your collection."

**Popular Computing Weekly.**

**Popular  
Computing  
Weekly  
Pick of the  
Week**

**48K Spectrum/Spectrum + £6.95**

**MIRRORSOFT**

Maxwell House, Worship Street, London EC2A 2EN. Tel 01-377 4600  
Trade orders to: Purnell Book Centre, Paulton, Bristol BS18 5LQ. Tel 0761 413301



# HOME COMPUTING WEEKLY

Editor Dave Carlos  
Assistant Editor Bryan Ralph  
Editorial Assistant Kerry Fowler  
Group Editor Wendy Palmer  
Design Tony Keep  
Production Assistant Sue Couchman  
Ad Manager Dominic Forlizzi  
Classified Advertising David Horne  
Publishing Director Peter Welham  
Chairman Jim Connell

July 16-July 22, 1985 No. 121



## SPECIAL FEATURES

Time Capsule — Wally Week this week .....	10
Canon's PW1080A Printer reviewed .....	27
Buying educational software for the home...	39

### 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**

## SPECTRUM

World Flags — Educational program .....	20
Beginning machine code .....	25
Switchboard — Game program .....	36

## AMSTRAD

Machine code the easy way .....	18
Firefox — Game listing .....	28

## BBC/ELECTRON

Helicopter — Games program .....	33
-------------------------------------	----

## COMMODORE

Scoot — Game .....	24
--------------------	----

## REGULARS

Ghostbusters competition .....	5
News .....	6-9
Software reviews .....	12-17
Gallup Chart — a few surprises .....	41
Your letters .....	42
Classified .....	44
Readers page .....	46

### 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!

Argus Specialist Publications Ltd.  
No. 1 Golden Square, London W1R 3AB. 01-437 0626

Home Computing Weekly is published on Tuesdays. Subscriptions and back issues: Infonet Ltd, 10-13 Times House, 179 Marlowes, Hemel Hempstead, Herts HP1 1BB. 0442 48432. Trade distribution: Argus Press Sales and Distribution Ltd, 12-14 Paul Street, London EC2A 4JS. 01-247 8233. Printed by Alabaster Passmore & Sons, Ltd, of London and Maidstone, Kent. Design and origination: Argus Design Ltd, Circus House, 26 Little Portland Street, London W1N 5AF.



# NICK FALDO

PLAYS THE

# Open

£9.99

*Runs on both  
Spectrum 48K  
and CBM64*

Accurate  
900 screen  
scrolling map of the  
Royal St. George's  
Golf Course, venue for the  
Open Championship 1985.

Can you make par on this  
course of Champions? With strong  
winds and deep bunkers you'll need all  
the help your caddy can give you. Full  
animation and live action bring your game to life.

Argus Press Software Ltd., Liberty House,  
222 Regent Street,  
London W1R 7DB  
Telephone 01-439 0666

MIND  
GAMES



Free booklet featuring maps and  
history of the course with a hole by hole  
guide by  
*Nick Faldo*





# 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 Ghostbusting, 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.

## 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.





### 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**

### 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, 86-188 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.**

### On Your Screens

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

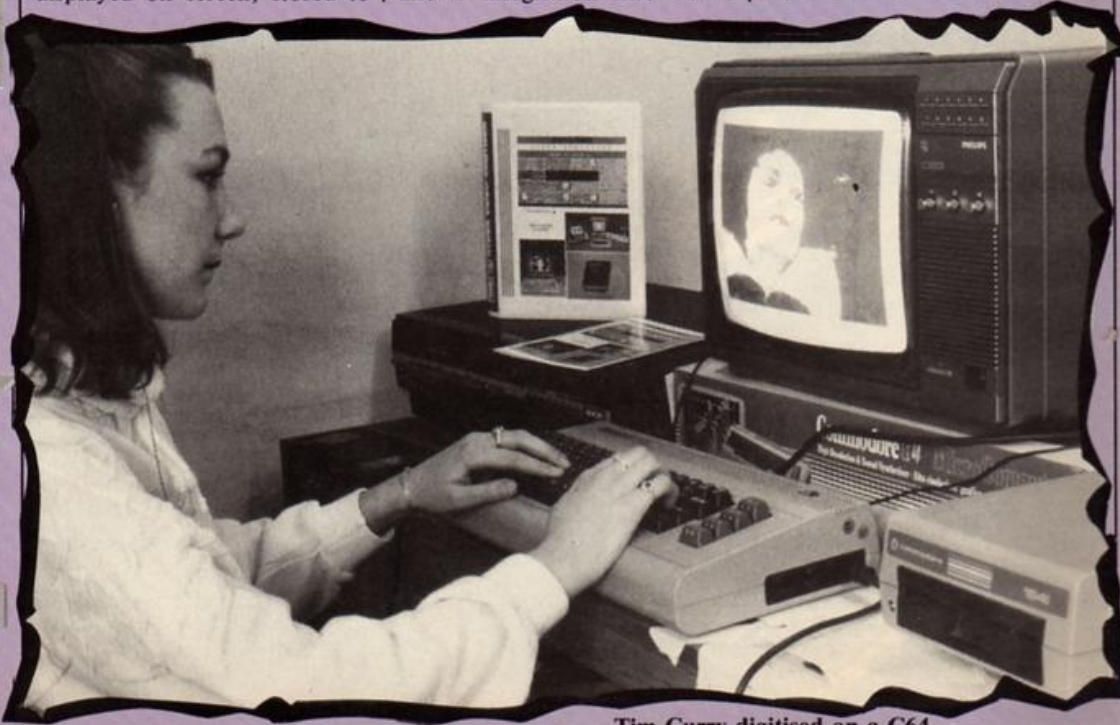
The digitiser allows video signals from any source to be displayed on screen, stored to

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

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.

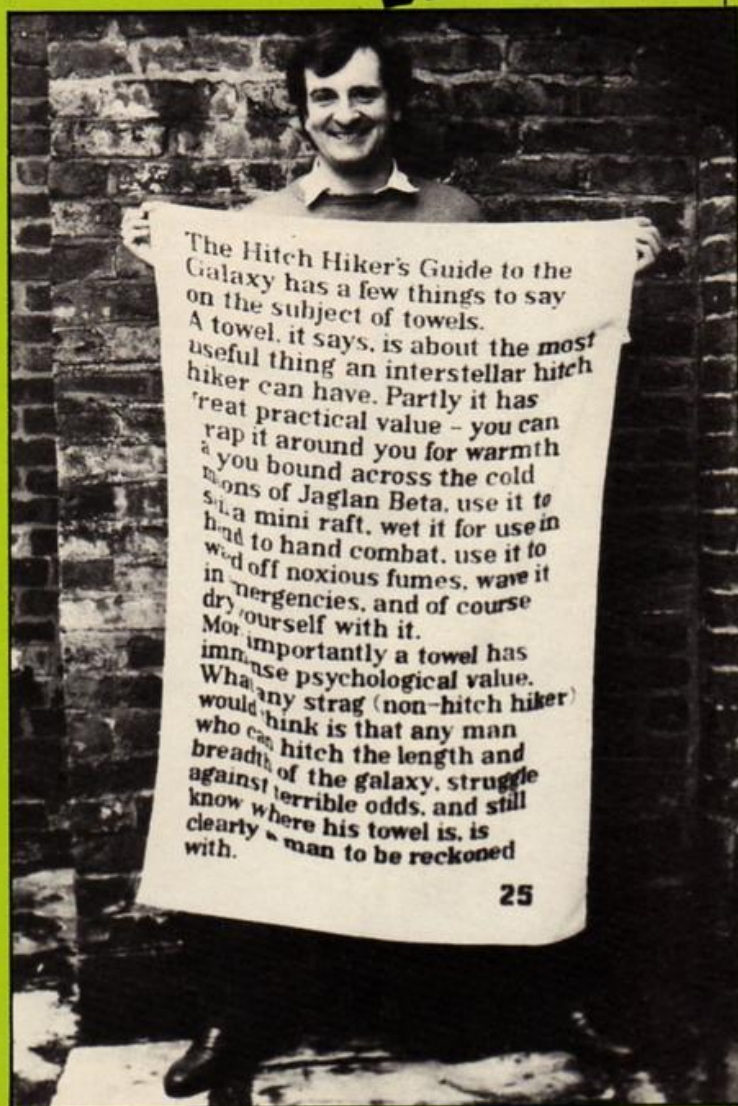
Adams, the author of the bestselling book — Hitchhikers Guide to the Galaxy, Restaurant at the End of the Universe, Life the Universe and Everything and So long and thanks for all the Fish, has recently written this towel!

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 Meretzky 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**



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; Paulene 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 Russell, London; C M Pearson, Normanston; 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, Hershaw; 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 McIntyre, 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 Haddock, Urnston; 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;

W

S

## 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 Haddock, Urnston; 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

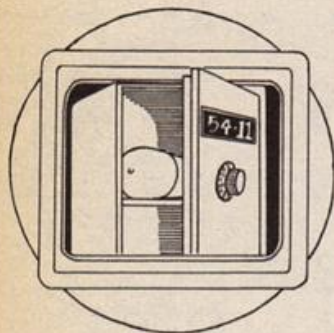
task is to save the universe from destruction so coffee breaks should be limited to a century or two.

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

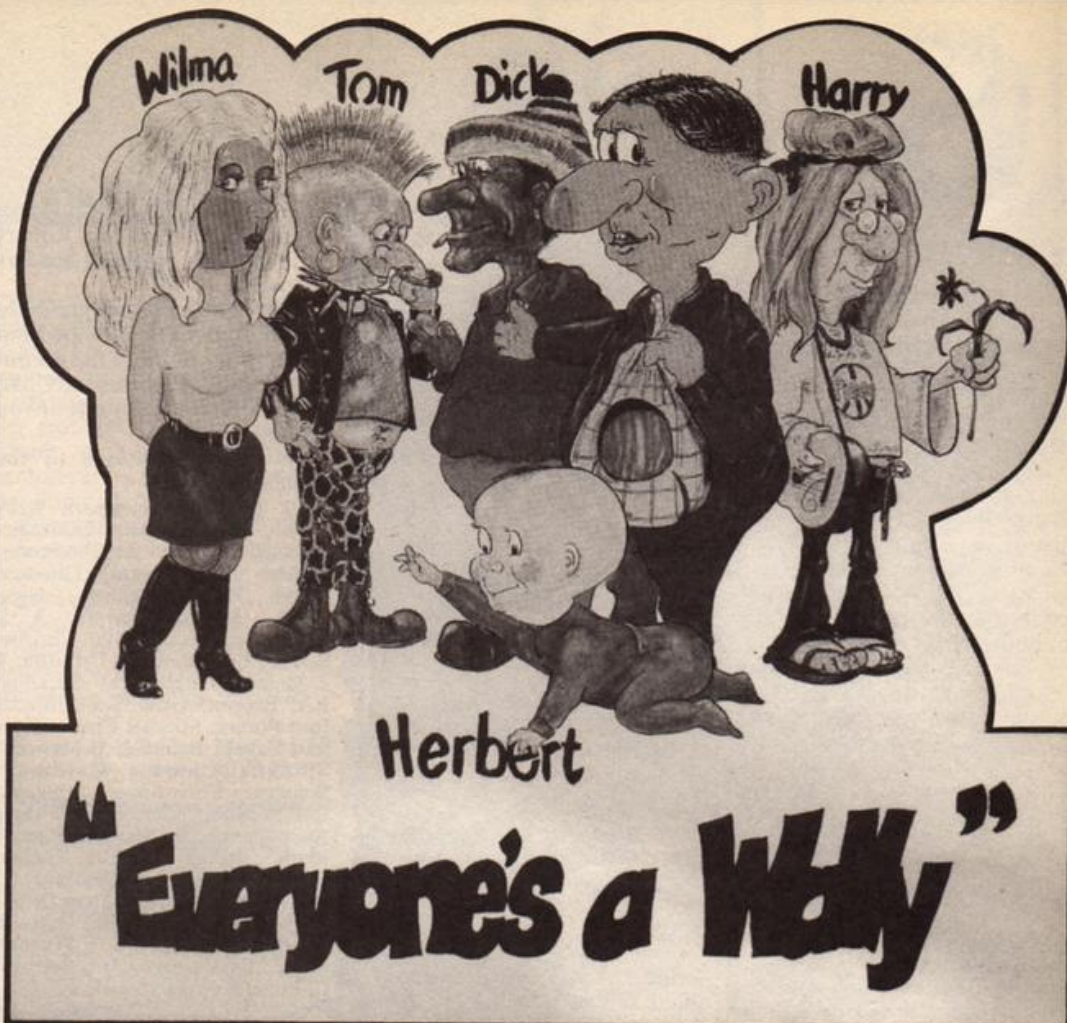
Bilbo and Co, the fantasy Tolkein characters from the Lord of the Rings are now to be found in a new improved version of the Hobbit on disc for the BBC. More locations have been added and 50 graphic screens have been included in the BBC version for the first time.

Title	Machine	Price	Publisher
Lands of Havoc	C64	£6.95	Microdeal
Red Moon	C64, Amstrad, Atari	£6.95	Level 9
Mercenary	BBC, MSX, Spectrum, Memotech	£9.95	Novagen
	C64	DE12.95	
Thing on a Spring	C64	£7.95	Gremlin
Hobbitt	BBC	DE17.95	Melbourne
Mordon's Quest	C64, Spectrum, Amstrad	£6.95	Melbourne
The Way of the Exploding Fist	C64 (Amstrad, Spectrum)	£9.95	Melbourne
	C16/Plus 4	£12.95	Supersoft
Word Perfect		DE14.95	
Music Master	C16/Plus 4	£12.95	Supersoft
		DE14.95	
Eddie Kidd Jump Chllnge	MSX	£7.95	Martech
Brian Jacks Superstar Challenge	MSX	£7.95	Martech





# 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**

**T**here 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 occurrence for all concerned.

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



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 maintenance 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."

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

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

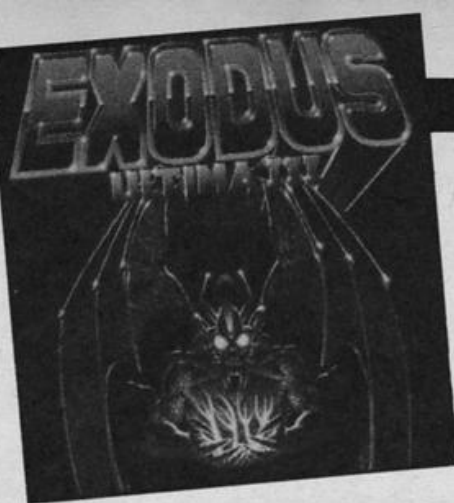


We have heard Wally's marriage referred to as the ninth Wonder of the World. Its circumstances were certainly strange enough. Wally intended to ask Wilma for a date but his question ended up as a proposal of marriage. Wilma accepted before Wally had finished talking and found that she had



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.





### 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, bobbitt 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

C64



AMSTRAD







### 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 boba-jobbing I wondered? I was pleasantly surprised 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

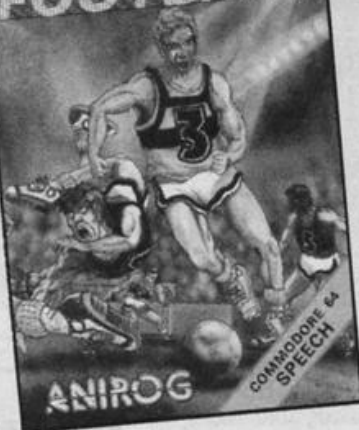
**Publisher:** Amsoft

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

**AMSTRAD**



## FIVE-A-SIDE FOOTBALL



### 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 highlighted 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 entertainment, 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 verdict 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

C64



### The Hobbit

Here it is for the CPC464! Briefly, you play the role of Bilbo Baggins, the Hobbit from Tolkien'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

AMSTRAD



### 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

C64



### 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

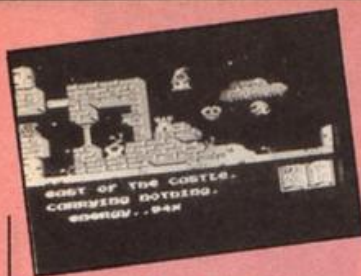
Publisher: Cases Computer Simulations

Address: 14 Langton Way, London SE3 7TL

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

MSX



## 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, Chat-ham, Kent

SPECTRUM



## 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 space-ship-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, caterpillars, 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

C64

VIC-20



## 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







## 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, non-stop, 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.

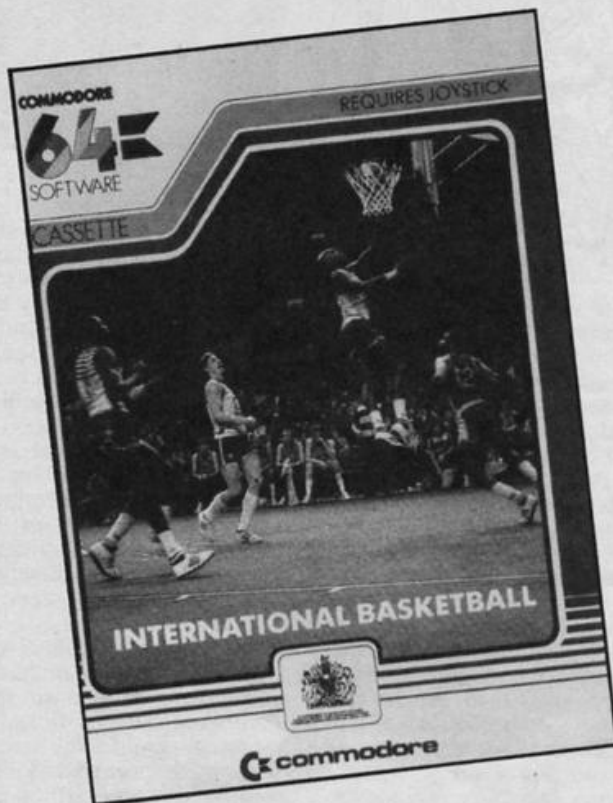
P.S.

**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 manufacturers 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

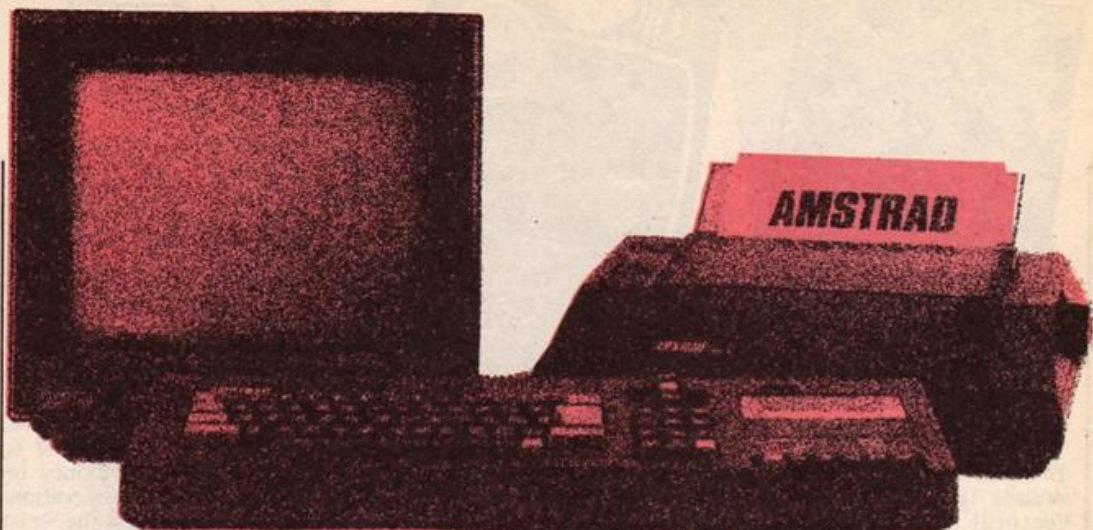
Publisher: Leisure Genius

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 jumpblock.

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



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

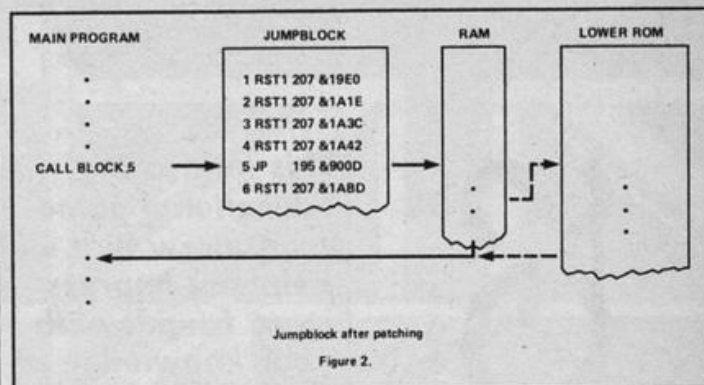


Figure 2.

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
```

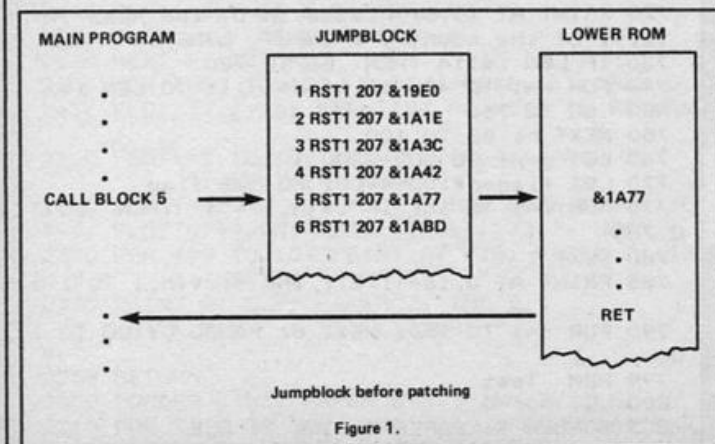


Figure 1.





## 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  
a\$ 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$: NEXT f
40 DATA "ARGENTINA*","AUSTRALIA*","AUSTRIA*
","BELGIUM*","BRAZIL*","BULGARIA*","CANADA*","
"CHILE*","CHINA*","COLOMBIA*","CZECHOSLOVAKIA
*","DENMARK*","EGYPT*","FINLAND*"
42 DATA "FRANCE*","GERMANY*","GREAT BRITAIN
*","HUNGARY*","ICELAND*","INDIA*","IRISH REP*
","ITALY*","JAPAN*","NETHERLANDS*","NEW ZEALA
ND*","NORWAY*","PAKISTAN*","PERU*"
44 DATA "POLAND*","PORTUGAL*","ROMANIA*","S
PAIN*","SWEDEN*","SWITZERLAND*","TURKEY*","U.
S.A.*","U.S.S.R.*","URUGUAY*","VENEZUELA*","Y
UGOSLAVIA*"
50 DIM b(40)
60 RESTORE 70: FOR f=1 TO 40: READ a: LET b
(f)=a: NEXT f
70 DATA 1,5,1,1,1,5,1,5,1,5,5,1,5,5,1,5,1
,5,5,5,1,1,5,5,5,1,5,5,1,5,1,5,1,5,5,5
99 REM  Menu
100 BORDER 7: PAPER 7: INK 1: CLS
110 PRINT AT 0,0: INVERSE 1: " WORLD FLAGS
By Andrew Bird "
120 PRINT AT 6,2: INK 2:"1 Demonstration of
flags":AT 8,2:"2 Draw flag of your choice":
AT 10,2:"3 Test on selection of flags"
130 PRINT AT 15,7: INK 3:"Press 1, 2, or 3"
140 IF INKEY$="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$(g,l)="#" THEN GO T
O 575
570 NEXT l
575 PRINT AT 21,16-(1/2): INK 9;c$(g,1 TO 1-
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$(n,l)="#" THEN GO T
O 785
780 NEXT l
785 PRINT AT 0,16-(1/2): INK 9;c$(n,1 TO 1-1
)
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 f1=INT (RND*40)+1
860 IF t(f1)=1 THEN GO TO 850
870 LET t(f1)=1
880 LET g=f1: GO SUB 2300
890 GO SUB f1*100+4900
900 PRINT AT 0,5: INK 9;"THIS IS THE FLAG OF
...."
910 INPUT "          ": LINE i$
920 IF LEN i$>14 THEN GO TO 910
930 FOR l=1 TO 15: IF c$(f1,l)="#" THEN GO
TO 950
940 NEXT l
950 LET a$=c$(f1)(1 TO 1-1)
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 REM 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

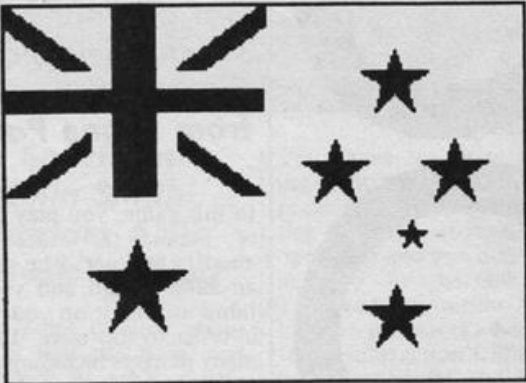
```



CANADA

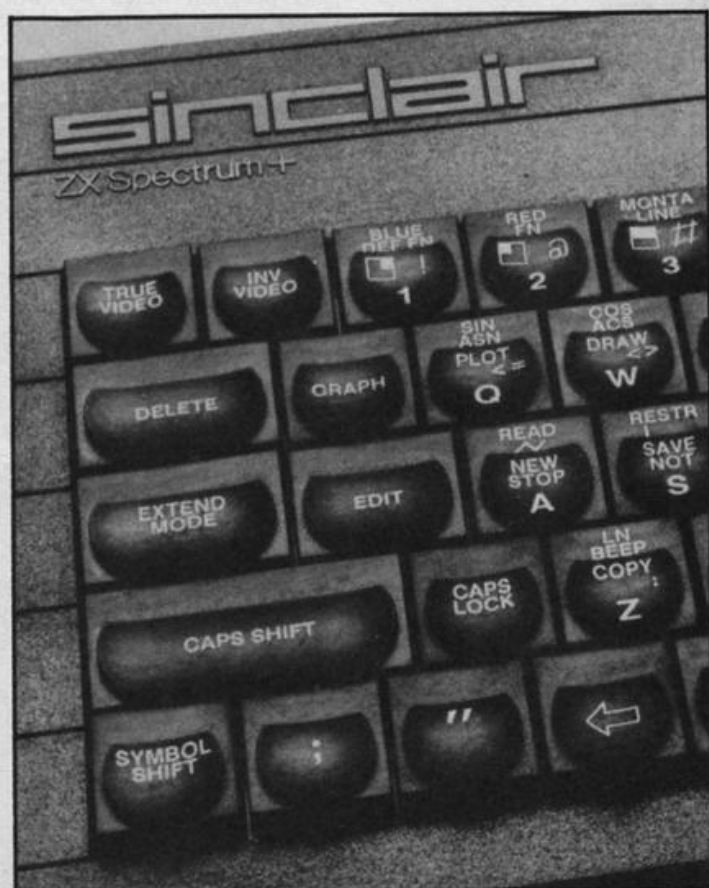


This is the flag of



AUSTRALIA

CON  
TIN  
UE  
RO  
TH





## 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  
AS,BS,CS,DS cursor positions  
KS 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$(0):POKE53280,5:POKE53281,0:GOSUB6000
1 PRINT"J:ISP%=-10:IFSP%>1THENINIT
2 GOSUB4000:AS="
3 BS="
4 FORT=0T020:PRINT"
5 Z=195:VO=54296:WA=54276:AT=54277:HI=54273:H=40:LI=1:LI=3:SC=0
6 PRINT"
7 DS="
8 CS="
9 V=53248
10 C=PEEK(V+31)
11 C=PEEK(V+31)
12 POKE2040,130:POKE2041,129:POKE2042,128
13 POKEV+39,5:POKEV+40,1:POKEV+41,7
14 POKEV+21,7
15 POKEV,80:POKEV+1,195
16 POKEV+4,79:POKEV+5,200
17 GETK$
18 P=INT(RND(0)*3)+1
19 SC=SC+1
20 SYS50000
21 IFINT(RND(0)*100)+1>87THENPRINT"J:DS:CS:MID$(C,1),P,1)
22 PRINT"J:DS:LEFT$(C,1),P,1)
23 PRINT"J:SC
24 IFK$="J"THENGOSUB1000
25 IFPEEK(V+31)=4THENGOSUB2000
26 SYS50000
27 GOTO70
28 REM ***** JUMP ROUTINE *****
29 POKEV,15:POKEWA,129:POKEAT,15
30 SS=INT(RND(1)*5)+1:POKE53280,SS
31 IFSP%>1THENSAYS$(SS)
32 FORT=200T0175STEP-5:LI=1+1
33 SYS50000
34 Z=Z-5
35 POKEHI,1
36 POKEV+5,T:POKEV+1,Z
37 NEXT
38 FORT=175T0200STEP5
39 I=1-1
40 POKEHI,1
41 Z=Z+5
42 SYS50000
43 POKEV+5,T:POKEV+1,Z
44 NEXT
45 POKEWA,0:POKEAT,0:LI=1
46 RETURN
47 REM ***** HIT OBJECT *****
48 POKEV,15:POKEWA,17:POKEAT,15
49 FORT=79T0200STEP2
50 POKEHI,T
51 POKEV,T:INEXTT
52 POKEV+2,215:POKEV+3,185:IFSP%>1THENSAY"DRAT"
53 FORT=0T0500:INEXTT
54 POKEWA,0:POKEAT,0
55 POKEV+2,0:POKEV+3,0:IFFORT=0T0500:INEXTT
56 POKEV+1,200
57 POKEV,80:POKEV+1,195
58 LI=LI-1:IFLI=<0THENGOSUB3000
59 PRINT"J:FLI
60 RETURN
61 REM ***** UPDATE *****
62 POKEV+21,0
63 PRINT"J:ANOTHER GAME (Y/N)"
64 FORT=0T01500:INEXTT
65 IFSP%>1THENSAY"ANOTHER GAME YES OR NO"
66 GETK$
67 IFK$="Y"THENGOTO0
68 IFK$="N"THENGOTO5000
69 GOTO3018
70 :
71 REM ***** INSTRUCTIONS *****
72 IFSP%>1THENSAY"SCOOT,, BY S PARRIS STEEN BEE 5"
73 PRINT"J:
74 PRINT"J:
75 PRINT"J:
76 PRINT"J:
77 PRINT"J:
78 PRINT"J:
79 PRINT"J:
80 PRINT"J:
81 PRINT"J:
82 PRINT"J:
83 PRINT"J:
84 PRINT"J:
85 PRINT"J:
86 PRINT"J:
87 PRINT"J:
88 PRINT"J:
89 PRINT"J:
90 PRINT"J:
91 PRINT"J:
92 PRINT"J:
93 PRINT"J:
94 PRINT"J:
95 PRINT"J:
96 PRINT"J:
97 PRINT"J:
98 PRINT"J:
99 PRINT"J:
100 PRINT"J:
101 PRINT"J:
102 PRINT"J:
103 PRINT"J:
104 PRINT"J:
105 PRINT"J:
106 PRINT"J:
107 PRINT"J:
108 PRINT"J:
109 PRINT"J:
110 PRINT"J:
111 PRINT"J:
112 PRINT"J:
113 PRINT"J:
114 PRINT"J:
115 PRINT"J:
116 PRINT"J:
117 PRINT"J:
118 PRINT"J:
119 PRINT"J:
120 PRINT"J:
121 PRINT"J:
122 PRINT"J:
123 PRINT"J:
124 PRINT"J:
125 PRINT"J:
126 PRINT"J:
127 PRINT"J:
128 PRINT"J:
129 PRINT"J:
130 PRINT"J:
131 PRINT"J:
132 PRINT"J:
133 PRINT"J:
134 PRINT"J:
135 PRINT"J:
136 PRINT"J:
137 PRINT"J:
138 PRINT"J:
139 PRINT"J:
140 PRINT"J:
141 PRINT"J:
142 PRINT"J:
143 PRINT"J:
144 PRINT"J:
145 PRINT"J:
146 PRINT"J:
147 PRINT"J:
148 PRINT"J:
149 PRINT"J:
150 PRINT"J:
151 PRINT"J:
152 PRINT"J:
153 PRINT"J:
154 PRINT"J:
155 PRINT"J:
156 PRINT"J:
157 PRINT"J:
158 PRINT"J:
159 PRINT"J:
160 PRINT"J:
161 PRINT"J:
162 PRINT"J:
163 PRINT"J:
164 PRINT"J:
165 PRINT"J:
166 PRINT"J:
167 PRINT"J:
168 PRINT"J:
169 PRINT"J:
170 PRINT"J:
171 PRINT"J:
172 PRINT"J:
173 PRINT"J:
174 PRINT"J:
175 PRINT"J:
176 PRINT"J:
177 PRINT"J:
178 PRINT"J:
179 PRINT"J:
180 PRINT"J:
181 PRINT"J:
182 PRINT"J:
183 PRINT"J:
184 PRINT"J:
185 PRINT"J:
186 PRINT"J:
187 PRINT"J:
188 PRINT"J:
189 PRINT"J:
190 PRINT"J:
191 PRINT"J:
192 PRINT"J:
193 PRINT"J:
194 PRINT"J:
195 PRINT"J:
196 PRINT"J:
197 PRINT"J:
198 PRINT"J:
199 PRINT"J:
200 PRINT"J:
201 PRINT"J:
202 PRINT"J:
203 PRINT"J:
204 PRINT"J:
205 PRINT"J:
206 PRINT"J:
207 PRINT"J:
208 PRINT"J:
209 PRINT"J:
210 PRINT"J:
211 PRINT"J:
212 PRINT"J:
213 PRINT"J:
214 PRINT"J:
215 PRINT"J:
216 PRINT"J:
217 PRINT"J:
218 PRINT"J:
219 PRINT"J:
220 PRINT"J:
221 PRINT"J:
222 PRINT"J:
223 PRINT"J:
224 PRINT"J:
225 PRINT"J:
226 PRINT"J:
227 PRINT"J:
228 PRINT"J:
229 PRINT"J:
230 PRINT"J:
231 PRINT"J:
232 PRINT"J:
233 PRINT"J:
234 PRINT"J:
235 PRINT"J:
236 PRINT"J:
237 PRINT"J:
238 PRINT"J:
239 PRINT"J:
240 PRINT"J:
241 PRINT"J:
242 PRINT"J:
243 PRINT"J:
244 PRINT"J:
245 PRINT"J:
246 PRINT"J:
247 PRINT"J:
248 PRINT"J:
249 PRINT"J:
250 PRINT"J:
251 PRINT"J:
252 PRINT"J:
253 PRINT"J:
254 PRINT"J:
255 PRINT"J:
256 PRINT"J:
257 PRINT"J:
258 PRINT"J:
259 PRINT"J:
260 PRINT"J:
261 PRINT"J:
262 PRINT"J:
263 PRINT"J:
264 PRINT"J:
265 PRINT"J:
266 PRINT"J:
267 PRINT"J:
268 PRINT"J:
269 PRINT"J:
270 PRINT"J:
271 PRINT"J:
272 PRINT"J:
273 PRINT"J:
274 PRINT"J:
275 PRINT"J:
276 PRINT"J:
277 PRINT"J:
278 PRINT"J:
279 PRINT"J:
280 PRINT"J:
281 PRINT"J:
282 PRINT"J:
283 PRINT"J:
284 PRINT"J:
285 PRINT"J:
286 PRINT"J:
287 PRINT"J:
288 PRINT"J:
289 PRINT"J:
290 PRINT"J:
291 PRINT"J:
292 PRINT"J:
293 PRINT"J:
294 PRINT"J:
295 PRINT"J:
296 PRINT"J:
297 PRINT"J:
298 PRINT"J:
299 PRINT"J:
300 PRINT"J:
301 PRINT"J:
302 PRINT"J:
303 PRINT"J:
304 PRINT"J:
305 PRINT"J:
306 PRINT"J:
307 PRINT"J:
308 PRINT"J:
309 PRINT"J:
310 PRINT"J:
311 PRINT"J:
312 PRINT"J:
313 PRINT"J:
314 PRINT"J:
315 PRINT"J:
316 PRINT"J:
317 PRINT"J:
318 PRINT"J:
319 PRINT"J:
320 PRINT"J:
321 PRINT"J:
322 PRINT"J:
323 PRINT"J:
324 PRINT"J:
325 PRINT"J:
326 PRINT"J:
327 PRINT"J:
328 PRINT"J:
329 PRINT"J:
330 PRINT"J:
331 PRINT"J:
332 PRINT"J:
333 PRINT"J:
334 PRINT"J:
335 PRINT"J:
336 PRINT"J:
337 PRINT"J:
338 PRINT"J:
339 PRINT"J:
340 PRINT"J:
341 PRINT"J:
342 PRINT"J:
343 PRINT"J:
344 PRINT"J:
345 PRINT"J:
346 PRINT"J:
347 PRINT"J:
348 PRINT"J:
349 PRINT"J:
350 PRINT"J:
351 PRINT"J:
352 PRINT"J:
353 PRINT"J:
354 PRINT"J:
355 PRINT"J:
356 PRINT"J:
357 PRINT"J:
358 PRINT"J:
359 PRINT"J:
360 PRINT"J:
361 PRINT"J:
362 PRINT"J:
363 PRINT"J:
364 PRINT"J:
365 PRINT"J:
366 PRINT"J:
367 PRINT"J:
368 PRINT"J:
369 PRINT"J:
370 PRINT"J:
371 PRINT"J:
372 PRINT"J:
373 PRINT"J:
374 PRINT"J:
375 PRINT"J:
376 PRINT"J:
377 PRINT"J:
378 PRINT"J:
379 PRINT"J:
380 PRINT"J:
381 PRINT"J:
382 PRINT"J:
383 PRINT"J:
384 PRINT"J:
385 PRINT"J:
386 PRINT"J:
387 PRINT"J:
388 PRINT"J:
389 PRINT"J:
390 PRINT"J:
391 PRINT"J:
392 PRINT"J:
393 PRINT"J:
394 PRINT"J:
395 PRINT"J:
396 PRINT"J:
397 PRINT"J:
398 PRINT"J:
399 PRINT"J:
400 PRINT"J:
401 PRINT"J:
402 PRINT"J:
403 PRINT"J:
404 PRINT"J:
405 PRINT"J:
406 PRINT"J:
407 PRINT"J:
408 PRINT"J:
409 PRINT"J:
410 PRINT"J:
411 PRINT"J:
412 PRINT"J:
413 PRINT"J:
414 PRINT"J:
415 PRINT"J:
416 PRINT"J:
417 PRINT"J:
418 PRINT"J:
419 PRINT"J:
420 PRINT"J:
421 PRINT"J:
422 PRINT"J:
423 PRINT"J:
424 PRINT"J:
425 PRINT"J:
426 PRINT"J:
427 PRINT"J:
428 PRINT"J:
429 PRINT"J:
430 PRINT"J:
431 PRINT"J:
432 PRINT"J:
433 PRINT"J:
434 PRINT"J:
435 PRINT"J:
436 PRINT"J:
437 PRINT"J:
438 PRINT"J:
439 PRINT"J:
440 PRINT"J:
441 PRINT"J:
442 PRINT"J:
443 PRINT"J:
444 PRINT"J:
445 PRINT"J:
446 PRINT"J:
447 PRINT"J:
448 PRINT"J:
449 PRINT"J:
450 PRINT"J:
451 PRINT"J:
452 PRINT"J:
453 PRINT"J:
454 PRINT"J:
455 PRINT"J:
456 PRINT"J:
457 PRINT"J:
458 PRINT"J:
459 PRINT"J:
460 PRINT"J:
461 PRINT"J:
462 PRINT"J:
463 PRINT"J:
464 PRINT"J:
465 PRINT"J:
466 PRINT"J:
467 PRINT"J:
468 PRINT"J:
469 PRINT"J:
470 PRINT"J:
471 PRINT"J:
472 PRINT"J:
473 PRINT"J:
474 PRINT"J:
475 PRINT"J:
476 PRINT"J:
477 PRINT"J:
478 PRINT"J:
479 PRINT"J:
480 PRINT"J:
481 PRINT"J:
482 PRINT"J:
483 PRINT"J:
484 PRINT"J:
485 PRINT"J:
486 PRINT"J:
487 PRINT"J:
488 PRINT"J:
489 PRINT"J:
490 PRINT"J:
491 PRINT"J:
492 PRINT"J:
493 PRINT"J:
494 PRINT"J:
495 PRINT"J:
496 PRINT"J:
497 PRINT"J:
498 PRINT"J:
499 PRINT"J:
500 PRINT"J:
501 PRINT"J:
502 PRINT"J:
503 PRINT"J:
504 PRINT"J:
505 PRINT"J:
506 PRINT"J:
507 PRINT"J:
508 PRINT"J:
509 PRINT"J:
510 PRINT"J:
511 PRINT"J:
512 PRINT"J:
513 PRINT"J:
514 PRINT"J:
515 PRINT"J:
516 PRINT"J:
517 PRINT"J:
518 PRINT"J:
519 PRINT"J:
520 PRINT"J:
521 PRINT"J:
522 PRINT"J:
523 PRINT"J:
524 PRINT"J:
525 PRINT"J:
526 PRINT"J:
527 PRINT"J:
528 PRINT"J:
529 PRINT"J:
530 PRINT"J:
531 PRINT"J:
532 PRINT"J:
533 PRINT"J:
534 PRINT"J:
535 PRINT"J:
536 PRINT"J:
537 PRINT"J:
538 PRINT"J:
539 PRINT"J:
540 PRINT"J:
541 PRINT"J:
542 PRINT"J:
543 PRINT"J:
544 PRINT"J:
545 PRINT"J:
546 PRINT"J:
547 PRINT"J:
548 PRINT"J:
549 PRINT"J:
550 PRINT"J:
551 PRINT"J:
552 PRINT"J:
553 PRINT"J:
554 PRINT"J:
555 PRINT"J:
556 PRINT"J:
557 PRINT"J:
558 PRINT"J:
559 PRINT"J:
560 PRINT"J:
561 PRINT"J:
562 PRINT"J:
563 PRINT"J:
564 PRINT"J:
565 PRINT"J:
566 PRINT"J:
567 PRINT"J:
568 PRINT"J:
569 PRINT"J:
570 PRINT"J:
571 PRINT"J:
572 PRINT"J:
573 PRINT"J:
574 PRINT"J:
575 PRINT"J:
576 PRINT"J:
577 PRINT"J:
578 PRINT"J:
579 PRINT"J:
580 PRINT"J:
581 PRINT"J:
582 PRINT"J:
583 PRINT"J:
584 PRINT"J:
585 PRINT"J:
586 PRINT"J:
587 PRINT"J:
588 PRINT"J:
589 PRINT"J:
590 PRINT"J:
591 PRINT"J:
592 PRINT"J:
593 PRINT"J:
594 PRINT"J:
595 PRINT"J:
596 PRINT"J:
597 PRINT"J:
598 PRINT"J:
599 PRINT"J:
600 PRINT"J:
601 PRINT"J:
602 PRINT"J:
603 PRINT"J:
604 PRINT"J:
605 PRINT"J:
606 PRINT"J:
607 PRINT"J:
608 PRINT"J:
609 PRINT"J:
610 PRINT"J:
611 PRINT"J:
612 PRINT"J:
613 PRINT"J:
614 PRINT"J:
615 PRINT"J:
616 PRINT"J:
617 PRINT"J:
618 PRINT"J:
619 PRINT"J:
620 PRINT"J:
621 PRINT"J:
622 PRINT"J:
623 PRINT"J:
624 PRINT"J:
625 PRINT"J:
626 PRINT"J:
627 PRINT"J:
628 PRINT"J:
629 PRINT"J:
630 PRINT"J:
631 PRINT"J:
632 PRINT"J:
633 PRINT"J:
634 PRINT"J:
635 PRINT"J:
636 PRINT"J:
637 PRINT"J:
638 PRINT"J:
639 PRINT"J:
640 PRINT"J:
641 PRINT"J:
642 PRINT"J:
643 PRINT"J:
644 PRINT"J:
645 PRINT"J:
646 PRINT"J:
647 PRINT"J:
648 PRINT"J:
649 PRINT"J:
650 PRINT"J:
651 PRINT"J:
652 PRINT"J:
653 PRINT"J:
654 PRINT"J:
655 PRINT"J:
656 PRINT"J:
657 PRINT"J:
658 PRINT"J:
659 PRINT"J:
660 PRINT"J:
661 PRINT"J:
662 PRINT"J:
663 PRINT"J:
664 PRINT"J:
665 PRINT"J:
666 PRINT"J:
667 PRINT"J:
668 PRINT"J:
669 PRINT"J:
670 PRINT"J:
671 PRINT"J:
672 PRINT"J:
673 PRINT"J:
674 PRINT"J:
675 PRINT"J:
676 PRINT"J:
677 PRINT"J:
678 PRINT"J:
679 PRINT"J:
680 PRINT"J:
681 PRINT"J:
682 PRINT"J:
683 PRINT"J:
684 PRINT"J:
685 PRINT"J:
686 PRINT"J:
687 PRINT"J:
688 PRINT"J:
689 PRINT"J:
690 PRINT"J:
691 PRINT"J:
692 PRINT"J:
693 PRINT"J:
694 PRINT"J:
695 PRINT"J:
696 PRINT"J:
697 PRINT"J:
698 PRINT"J:
699 PRINT"J:
700 PRINT"J:
701 PRINT"J:
702 PRINT"J:
703 PRINT"J:
704 PRINT"J:
705 PRINT"J:
706 PRINT"J:
707 PRINT"J:
708 PRINT"J:
709 PRINT"J:
710 PRINT"J:
711 PRINT"J:
712 PRINT"J:
713 PRINT"J:
714 PRINT"J:
715 PRINT"J:
716 PRINT"J:
717 PRINT"J:
718 PRINT"J:
719 PRINT"J:
720 PRINT"J:
721 PRINT"J:
722 PRINT"J:
723 PRINT"J:
724 PRINT"J:
725 PRINT"J:
726 PRINT"J:
727 PRINT"J:
728 PRINT"J:
729 PRINT"J:
730 PRINT"J:
731 PRINT"J:
732 PRINT"J:
733 PRINT"J:
734 PRINT"J:
735 PRINT"J:
736 PRINT"J:
737 PRINT"J:
738 PRINT"J:
739 PRINT"J:
740 PRINT"J:
741 PRINT"J:
742 PRINT"J:
743 PRINT"J:
744 PRINT"J:
745 PRINT"J:
746 PRINT"J:
747 PRINT"J:
748 PRINT"J:
749 PRINT"J:
750 PRINT"J:
751 PRINT"J:
752 PRINT"J:
753 PRINT"J:
754 PRINT"J:
755 PRINT"J:
756 PRINT"J:
757 PRINT"J:
758 PRINT"J:
759 PRINT"J:
760 PRINT"J:
761 PRINT"J:
762 PRINT"J:
763 PRINT"J:
764 PRINT"J:
765 PRINT"J:
766 PRINT"J:
767 PRINT"J:
768 PRINT"J:
769 PRINT"J:
770 PRINT"J:
771 PRINT"J:
772 PRINT"J:
773 PRINT"J:
774 PRINT"J:
775 PRINT"J:
776 PRINT"J:
777 PRINT"J:
778 PRINT"J:
779 PRINT"J:
780 PRINT"J:
781 PRINT"J:
782 PRINT"J:
783 PRINT"J:
784 PRINT"J:
785 PRINT"J:
786 PRINT"J:
787 PRINT"J:
788 PRINT"J:
789 PRINT"J:
790 PRINT"J:
791 PRINT"J:
792 PRINT"J:
793 PRINT"J:
794 PRINT"J:
795 PRINT"J:
796 PRINT"J:
797 PRINT"J:
798 PRINT"J:
799 PRINT"J:
800 PRINT"J:
801 PRINT"J:
802 PRINT"J:
803 PRINT"J:
804 PRINT"J:
805 PRINT"J:
806 PRINT"J:
807 PRINT"J:
808 PRINT"J:
809 PRINT"J:
810 PRINT"J:
811 PRINT"J:
812 PRINT"J:
813 PRINT"J:
814 PRINT"J:
815 PRINT"J:
816 PRINT"J:
817 PRINT"J:
818 PRINT"J:
819 PRINT"J:
820 PRINT"J:
821 PRINT"J:
822 PRINT"J:
823 PRINT"J:
824 PRINT"J:
825 PRINT"J:
826 PRINT"J:
827 PRINT"J:
828 PRINT"J:
829 PRINT"J:
830 PRINT"J:
831 PRINT"J:
832 PRINT"J:
833 PRINT"J:
834 PRINT"J:
835 PRINT"J:
836 PRINT"J:
837 PRINT"J:
838 PRINT"J:
839 PRINT"J:
840 PRINT"J:
841 PRINT"J:
842 PRINT"J:
843 PRINT"J:
844 PRINT"J:
845 PRINT"J:
846 PRINT"J:
847 PRINT"J:
848 PRINT"J:
849 PRINT"J:
850 PRINT"J:
851 PRINT"J:
852 PRINT"J:
853 PRINT"J:
854 PRINT"J:
855 PRINT"J:
856 PRINT"J:
857 PRINT"J:
858 PRINT"J:
859 PRINT"J:
860 PRINT"J:
861 PRINT"J:
862 PRINT"J:
863 PRINT"J:
864 PRINT"J:
865 PRINT"J:
866 PRINT"J:
867 PRINT"J:
868 PRINT"J:
869 PRINT"J:
870 PRINT"J:
871 PRINT"J:
872 PRINT"J:
873 PRINT"J:
874 PRINT"J:
875 PRINT"J:
876 PRINT"J:
877 PRINT"J:
878 PRINT"J:
879 PRINT"J:
880 PRINT"J:
881 PRINT"J:
882 PRINT"J:
883 PRINT"J:
884 PRINT"J:
885 PRINT"J:
886 PRINT"J:
887 PRINT"J:
888 PRINT"J:
889 PRINT"J:
890 PRINT"J:
891 PRINT"J:
892 PRINT"J:
893 PRINT"J:
894 PRINT"J:
895 PRINT"J:
896 PRINT"J:
897 PRINT"J:
898 PRINT"J:
899 PRINT"J:
900 PRINT"J:
901 PRINT"J:
902 PRINT"J:
903 PRINT"J:
904 PRINT"J:
905 PRINT"J:
906 PRINT"J:
907 PRINT"J:
908 PRINT"J:
909 PRINT"J:
910 PRINT"J:
911 PRINT"J:
912 PRINT"J:
913 PRINT"J:
914 PRINT"J:
915 PRINT"J:
916 PRINT"J:
917 PRINT"J:
918 PRINT"J:
919 PRINT"J:
920 PRINT"J:
921 PRINT"J:
922 PRINT"J:
923 PRINT"J:
924 PRINT"J:
925 PRINT"J:
926 PRINT"J:
927 PRINT"J:
928 PRINT"J:
929 PRINT"J:
930 PRINT"J:
931 PRINT"J:
932 PRINT"J:
933 PRINT"J:
934 PRINT"J:
935 PRINT"J:
936 PRINT"J:
937 PRINT"J:
938 PRINT"J:
939 PRINT"J:
940 PRINT"J:
941 PRINT"J:
942 PRINT"J:
943 PRINT"J:
944 PRINT"J:
945 PRINT"J:
946 PRINT"J:
947 PRINT"J:
948 PRINT"J:
949 PRINT"J:
950 PRINT"J:
951 PRINT"J:
952 PRINT"J:
953 PRINT"J:
954 PRINT"J:
955 PRINT"J:
956 PRINT"J:
957 PRINT"J:
958 PRINT"J:
959 PRINT"J:
960 PRINT"J:
961 PRINT"J:
962 PRINT"J:
963 PRINT"J:
964 PRINT"J:
965 PRINT"J:
966 PRINT"J:
967 PRINT"J:
968 PRINT"J:
969 PRINT"J:
970 PRINT"J:
971 PRINT"J:
972 PRINT"J:
973 PRINT"J:
974 PRINT"J:
975 PRINT"J:
976 PRINT"J:
977 PRINT"J:
978 PRINT"J:
979 PRINT"J:
980 PRINT"J:
981 PRINT"J:
982 PRINT"J:
983 PRINT"J:
984 PRINT"J:
985 PRINT"J:
986 PRINT"J:
987 PRINT"J:
988 PRINT"J:
989 PRINT"J:
990 PRINT"J:
991 PRINT"J:
992 PRINT"J:
993 PRINT"J:
994 PRINT"J:
995 PRINT"J:
996 PRINT"J:
997 PRINT"J:
998 PRINT"J:
999 PRINT"J:
1000 PRINT"J:
1001 PRINT"J:
1002 PRINT"J:
1003 PRINT"J:
1004 PRINT"J:
1005 PRINT"J:
1006 PRINT"J:
1007 PRINT"J:
1008 PRINT"J:
1009 PRINT"J:
1010 PRINT"J:
1011 PRINT"J:
1012 PRINT"J:
1013 PRINT"J:
1014 PRINT"J:
1015 PRINT"J:
1016 PRINT"J:
1017 PRINT"J:
1018 PRINT"J:
1019 PRINT"J:
1020 PRINT"J:
1021 PRINT"J:
1022 PRINT"J:
1023 PRINT"J:
1024 PRINT"J:
1025 PRINT"J:
1026 PRINT"J:
1027 PRINT"J:
1028 PRINT"J:
1029 PRINT"J:
1030 PRINT"J:
1031 PRINT"J:
1032 PRINT"J:
1033 PRINT"J:
1034 PRINT"J:
1035 PRINT"J:
1036 PRINT"J:
1037 PRINT"J:
1038 PRINT"J:
1039 PRINT"J:
1040 PRINT"J:
1041 PRINT"J:
1042 PRINT"J:
1043 PRINT"J:
1044 PRINT"J:
1045 PRINT"J:
1046 PRINT"J:
1047 PRINT"J:
1048 PRINT"J:
1049 PRINT"J:
1050 PRINT"J:
1051 PRINT"J:
1052 PRINT"J:
1053 PRINT"J:
1054 PRINT"J:
1055 PRINT"J:
1056 PRINT"J:
1057 PRINT"J:
1058 PRINT"J:
1059 PRINT"J:
1060 PRINT"J:
1061 PRINT"J:
1062 PRINT"J:
1063 PRINT"J:
1064 PRINT"J:
1065 PRINT"J:
1066 PRINT"J:
1067 PRINT"J:
1068 PRINT"J:
1069 PRINT"J:
1070 PRINT"J:
1071 PRINT"J:
1072 PRINT"J:
1073 PRINT"J:
1074 PRINT"J:
1075 PRINT"J:
1076 PRINT"J:
1077 PRINT"J:
1078 PRINT"J:
1079 PRINT"J:
1080 PRINT"J:
1081 PRINT"J:
1082 PRINT"J:
1083 PRINT"J:
1084 PRINT"J:
1085 PRINT"J:
1086 PRINT"J:
1087 PRINT"J:
1088 PRINT"J:
1089 PRINT"J:
1090 PRINT"J:
1091 PRINT"J:
1092 PRINT"J:
1093 PRINT"J:
1094 PRINT"J:
1095 PRINT"J:
1096 PRINT"J:
1097 PRINT"J:
1098 PRINT"J:
1099 PRINT"J:
1100 PRINT"J:
1101 PRINT"J:
1102 PRINT"J:
1103 PRINT"J:
1104 PRINT"J:
1105 PRINT"J:
1106 PRINT"J:
1107 PRINT"J:
1108 PRINT"J:
1109 PRINT"J:
1110 PRINT"J:
1111 PRINT"J:
1112 PRINT"J:
1113 PRINT"J:
1114 PRINT"J:
1115 PRINT"J:
1116 PRINT"J:
1117 PRINT"J:
1118 PRINT"J:
1119 PRINT"J:
1120 PRINT"J:
1121 PRINT"J:
1122 PRINT"J:
1123 PRINT"J:
1124 PRINT"J:
1125 PRINT"J:
1126 PRINT"J:
1127 PRINT"J:
1128 PRINT"J:
1129 PRINT"J:
1130 PRINT"J:
1131 PRINT"J:
1132 PRINT"J:
1133 PRINT"J:
1134 PRINT"J:
1135 PRINT"J:
1136 PRINT"J:
1137 PRINT"J:
1138 PRINT"J:
1139 PRINT"J:
1140 PRINT"J:
1141 PRINT"J:
1142 PRINT"J:
1143 PRINT"J:
1144 PRINT"J:
1145 PRINT"J:
1146 PRINT"J:
1147 PRINT"J:
1148 PRINT"J:
1149 PRINT"J:
1150 PRINT"J:
1151 PRINT"J:
1152 PRINT"J:
1153 PRINT"J:
1154 PRINT"J:
1155 PRINT"J:
1156 PRINT"J:
1157 PRINT"J:
1158 PRINT"J:
1159 PRINT"J:
1160 PRINT"J:
1161 PRINT"J:
1162 PRINT"J:
1163 PRINT"J:
1164 PRINT"J:
1165 PRINT"J:
1166 PRINT"J:
1167 PRINT"J:
1168 PRINT"J:
1169 PRINT"J:
1170 PRINT"J:
1171 PRINT"J:
1172 PRINT"J:
1173 PRINT"J:
1174 PRINT"J:
1175 PRINT"J:
1176 PRINT"J:
1177 PRINT"J:
1178 PRINT"J:
1179 PRINT"J:
1180 PRINT"J:
1181 PRINT"J:
1182 PRINT"J:
1183 PRINT"J:
1184 PRINT"J:
1185 PRINT"J:
1186 PRINT"J:
1187 PRINT"J:
1188 PRINT"J:
1189 PRINT"J:
1190 PRINT"J:
1191 PRINT"J:
1192 PRINT"J:
1193 PRINT"J:
1194 PRINT"J:
1195 PRINT"J:
1196 PRINT"J:
1197 PRINT"J:
1198 PRINT"J:
1199 PRINT"J:
1200 PRINT"J:
1201 PRINT"J:
1202 PRINT"J:
1203 PRINT"J:
1204 PRINT"J:
1205 PRINT"J:
1206 PRINT"J:
1207 PRINT"J:
1208 PRINT"J:
1209 PRINT"J:
1210 PRINT"J:
1211 PRINT"J:
1212 PRINT"J:
1213 PRINT"J:
1214 PRINT"J:
1215 PRINT"J:
1216 PRINT"J:
1217 PRINT"J:
1218 PRINT"J:
1219 PRINT"J:
1220 PRINT"J:
1221 PRINT"J:
1222 PRINT"J:
1223 PRINT"J:
1224 PRINT"J:
1225 PRINT"J:
1226 PRINT"J:
1227 PRINT"J:
1228 PRINT"J:
1229 PRINT"J:
1230 PRINT"J:
1231 PRINT"J:
1232 PRINT"J:
1233 PRINT"J:
1234 PRINT"J:
1235 PRINT"J:
1236 PRINT"J:
1237 PRINT"J:
1238 PRINT"J:
1239 PRINT"J:
1240 PRINT"J:
1241 PRINT"J:
1242 PRINT"J:
1243 PRINT"J:
1244 PRINT"J:
1245 PRINT"J:
1246 PRINT"J:
1247 PRINT"J:
1248 PRINT"J:
1249 PRINT"J:
1250 PRINT"J:
1251 PRINT"J:
1252 PRINT"J:
1253 PRINT"J:
1254 PRINT"J:
1255 PRINT"J:
1256 PRINT"J:
1257 PRINT"J:
1258 PRINT"J:
1259 PRINT"J:
1260 PRINT"J:
1261 PRINT"J:
1262 PRINT"J:
1263 PRINT"J:
1264 PRINT"J:
1265 PRINT"J:
1266 PRINT"J:
1267 PRINT"J:
1268 PRINT"J:
1269 PRINT"J:
1270 PRINT"J:
1271 PRINT"J:
1272 PRINT"J:
1273 PRINT"J:
1274 PRINT"J:
1275 PRINT"J:
1276 PRINT"J:
1277 PRINT"J:
1278 PRINT"J:
1279 PRINT"J:
1280 PRINT"J:
1281 PRINT"J:
1282 PRINT"J:
1283 PRINT"J:
1284 PRINT"J:
1285 PRINT"J:
1286 PRINT"J:
1287 PRINT"J:
1288 PRINT"J:
1289 PRINT"J:
1290 PRINT"J:
1291 PRINT"J:
1292 PRINT"J:
1293 PRINT"J:
1294 PRINT"J:
1295 PRINT"J:
1296 PRINT"J:
1297 PRINT"J:
1298 PRINT"J:
1299 PRINT"J:
1300 PRINT"J:
1301 PRINT"J:
1302 PRINT"J:
1303 PRINT"J:
1304 PRINT"J:
1305 PRINT"J:
1306 PRINT"J:
1307 PRINT"J:
1308 PRINT"J:
1309 PRINT"J:
1310 PRINT"J:
1311 PRINT"J:
1312 PRINT"J:
1313 PRINT"J:
1314 PRINT"J:
1315 PRINT"J:
1316 PRINT"J:
1317 PRINT"J:
1318 PRINT"J:
1319 PRINT"J:
1320 PRINT"J:
1321 PRINT"J:
1322 PRINT"J:
1323 PRINT"J:
1324 PRINT"J:
1325 PRINT"J:
1326 PRINT"J:
1327 PRINT"J:
1328 PRINT"J:
13
```



# 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.

```
A AND 0 0 1 1 0 1 1 1
B      1 0 1 0 1 1 1 0
-----
A      0 0 1 0 0 1 1 0
```

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
30005 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
      109
30017 ADD A,D 130
30018 LD (HL),A 119
30019 LD A,B 120
30020 OR C 177
30021 JR NZ,L1 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 (0) 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.

**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.

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)

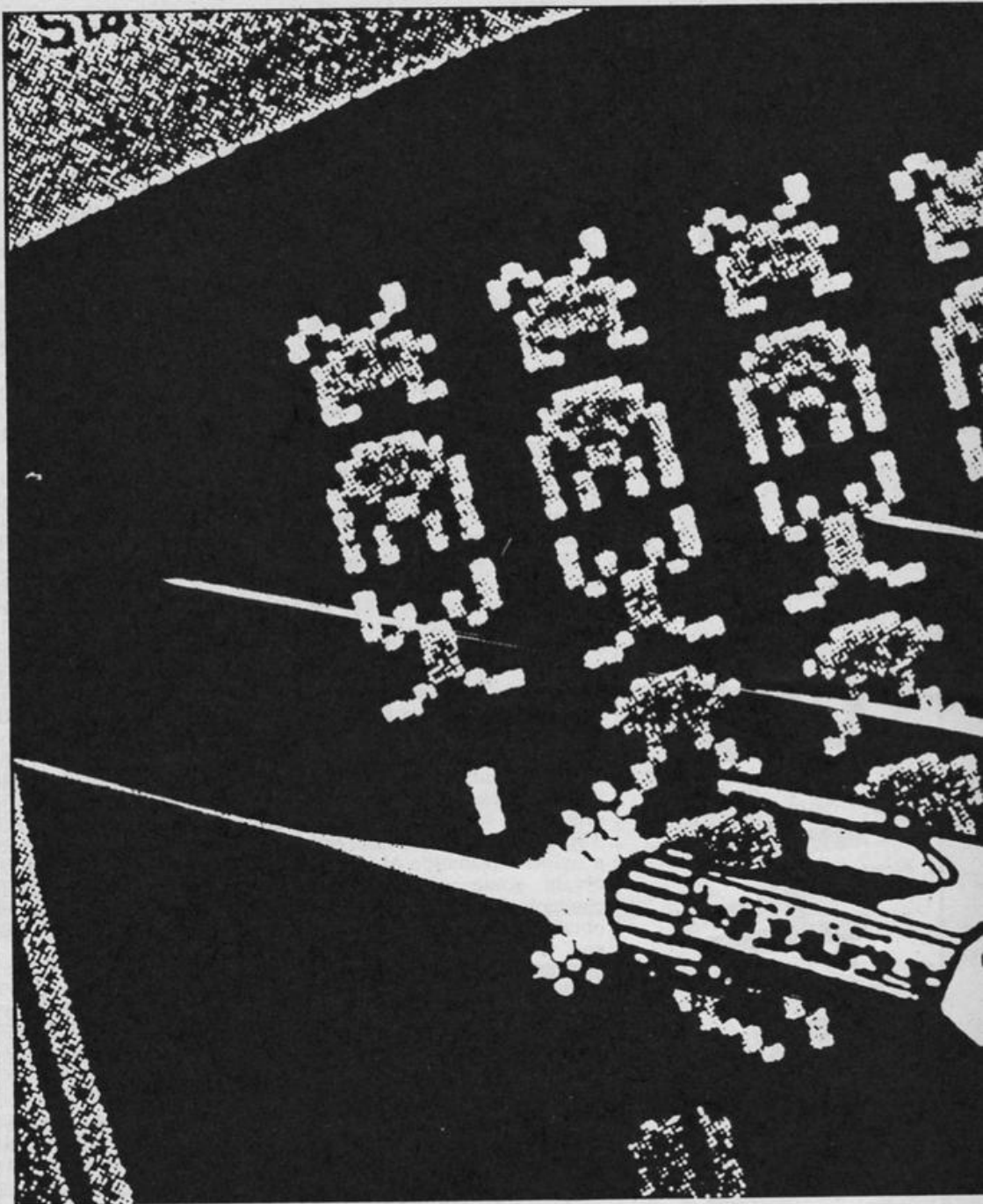
**Manufacturer:** Canon UK Ltd

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





# 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

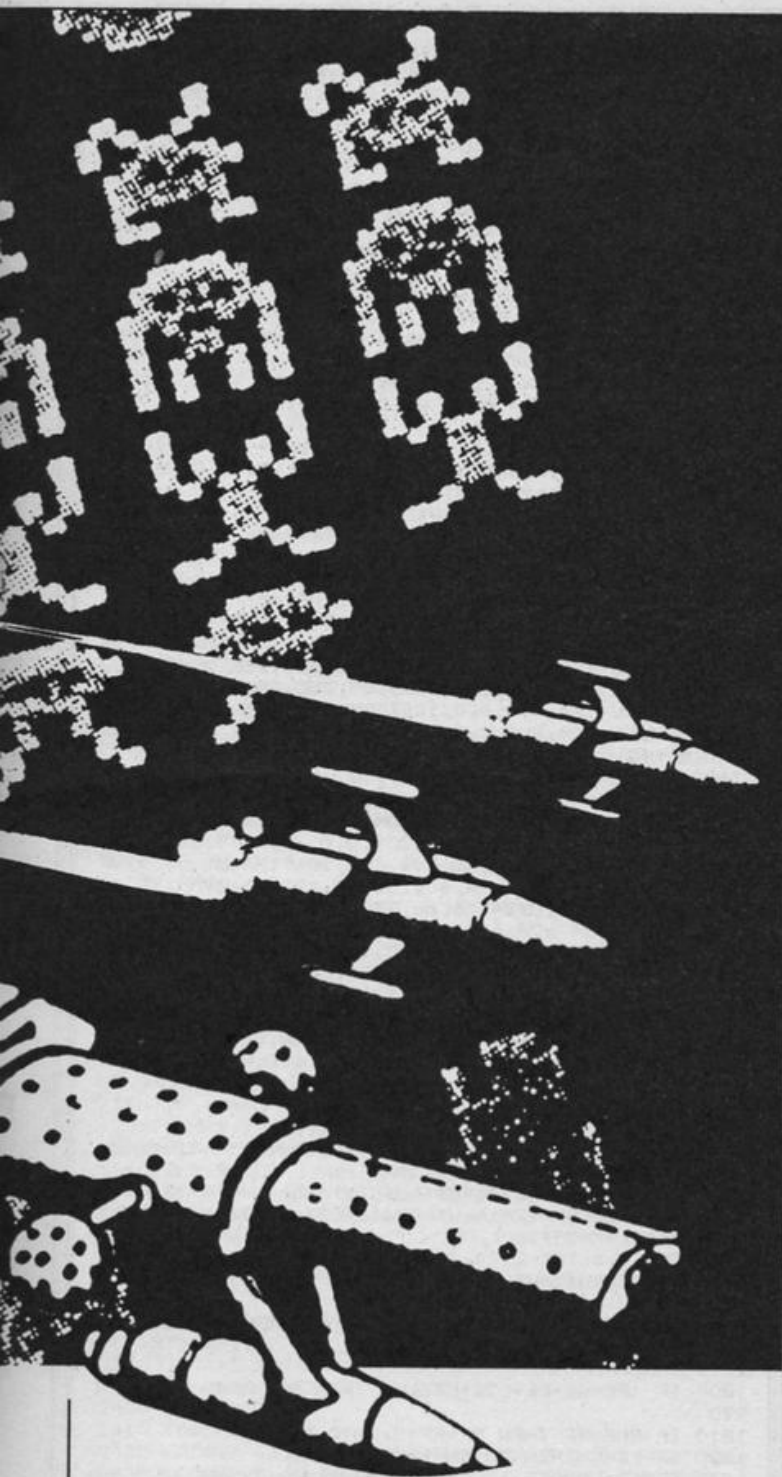
### Variables

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





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
```

```
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$(238):PLOT PX,PY:PRINT "
":PX=38*16:FOR N=7 TO 1 STEP -1:SOUND 7,0,15,N,0,
0,7:NEXT:SH=SH-1:PLOT SX,SL:PRINT " ":GOSUB 1170:
GOSUB 1740:GOTO 70
560 RETURN
570 IF WE=1 THEN C=254
580 IF WE=0 THEN C=247
590 WY=INT(RND*25)*16
600 IF WY<64 OR WY>320 THEN GOTO 590
610 PLOT EX,EY:PRINT " ";
620 EX=WY:EY=WY
630 WF=TEST(WX-4,WY-12):WT=TEST(WX+8,WY+4):WB=TEST
(WX+8,WY-8)
640 PLOT WX,WY,2:PRINT CHR$(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,
```



```

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 104,0,0,0,0,129,195,231,255
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$="fgfgghghfgfgffggfhfgfgghhgfhghfgggfg"
1740 SX=2*16:SY=12*16:LX=37*16:L2X=37*16:L3X=37*16
:PX=38*16:WX=39*16
1750 INK 1,6:INK 2,24:INK 3,18
1760 SC2=SC:HI2=HI
1770 IF SC>HI THEN HI=SC
1780 IF SC>EM THEN FOR N=70 TO 5 STEP -5:SOUND 7
N,2,7:NEXT:EM=EM+10000:SH=SH+1
1790 TAGOFF
1800 IF (PE+WE+LE+L2E+L3E)=6 THEN SHE=SHE+1:GOTO 1
990
1810 IF SHE=RF THEN RF=RF+5:GOTO 2080
1820 IF FS=0 THEN SH=SH-1:FS=FS+100
1830 PEN 2:LOCATE 12,2:PRINT"SHIPS":LOCATE 13,3:PR
INT:SH:LOCATE 3,2:PRINT"SCORE":LOCATE 2,3:PRINT:SC
:LOCATE 29,2:PRINT"HI SCORE":LOCATE 28,3:PRINT:HI
1840 LOCATE 21,2:PEN 2:PRINT"FUEL":LOCATE 20,3:PRI
NT:FS
1850 IF SH=0 THEN GOTO 1890
1860 TAG
1870 MOVE 0,348:DRAW 639,348,1:DRAW 639,399:DRAW 0
,399:DRAW 0,348
1880 RETURN
1890 MODE 0
1900 LOCATE 5,12:PEN 2:PRINT"GAME OVER"
1910 FOR T=1 TO 3000:NEXT
1920 MODE 1
1930 LOCATE 1,12:PRINT"DO YOU WANT ANOTHER GAME ?(Y
,N)"
1940 D$=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*BON
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);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);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$="fgfgfghghghfgfgffggfhfgfgfghghghfgfhghfg
gfg"
2700 INK 1,0:INK 2,0:INK 3,0
2710 SPEED INK 10,10
2720 LOCATE 1,9:PEN 1:PRINT"zzzzzzzzzzzzzzzzzzzzzz
zzzzzzzz"
2730 LOCATE 1,10:PEN 2:PRINT"z
z"
2740 LOCATE 1,11:PEN 3:PRINT"z z
z"
2750 LOCATE 1,12:PEN 1:PRINT"z
z"
2760 LOCATE 1,13:PEN 2:PRINT"zzzzzzzzzzzzzzzzzzzz
zzzzzzzzzzzz zz"
2770 LOCATE 1,14:PEN 3:PRINT"z z z z z
z z z z z"
2780 LOCATE 1,15:PEN 1:PRINT"z z zzzz zzz
z z z z z"
2790 LOCATE 1,16:PEN 2:PRINT"z z z z z
z z z z z"
2800 LOCATE 1,17:PEN 3:PRINT"z z z z zzzz
z z z z z"
2810 LOCATE 5,24:PRINT"*(C) MARK.A.ANGLIN 4.2.85
**"
2820 FOR C=0 TO 26:INK 1,C:INK 2,C:INK 3,C:SOUND 7
,C*10,3,7:NEXT
2830 FOR T=1 TO 26:FOR N=1 TO 200:NEXT:INK 1,26,T:
INK 2,6,T:INK 3,15,T:NEXT
2840 FOR C=26 TO 0 STEP -1:INK 1,C:INK 2,C:INK 3,C
:SOUND 7,C*10,3,7:NEXT
2850 CLS
2860 INK 0,0:INK 1,6:INK 2,24:INK 3,18:BORDER 0:PA
PER 0
2870 LOCATE 16,1:PEN 2:PRINT"SCORING"
2880 TAG
2890 PLOT 32,320,2:PRINT CHR$(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

```

## SHEKHANA COMPUTER SERVICES

### \*\*\* SPECTRUM \*\*\*

	OUR RRP PRICE
Ghostbusters	9.95 7.50
Knight Lore	9.95 7.50
Underworld	9.95 7.50
Daley Thomp Decathlon	6.90 4.99
Matchday	7.95 5.90
Tapper	7.95 5.90
Moon Cresta	6.95 5.75
Spy Hunter	7.95 5.90
Every Ones A Wally	9.99 7.50
The Artist	12.95 10.50
Matchpoint	7.95 5.50
Technician Ted	5.95 4.45
Shadow Fire	9.95 7.50
Dark Star	7.95 5.90
Star Strike	5.95 4.45
Animated Strip Poker	6.95 5.50
Hunchback II	6.90 5.25
Tir Na Nog	9.95 7.50
Airwolf	6.95 5.50
Pyjamarama	6.95 5.50
Strange Loop	7.95 5.90
Pole Position	7.99 6.70
Raid Over Moscow	7.95 5.90
Hard Hat Mac	8.95 6.95
The Fourth Protocol	12.95 10.95
Knightshade (Ultimate)	9.95 7.50
One on One	8.95 6.95
Cauldron	7.99 5.99
Project Future	6.95 5.20
Fighter Pilot	7.95 5.90
Manic Miner	5.95 3.50
J Barr Squash	7.95 5.90
Beachhead	7.95 5.90
Hyper Sports	7.95 5.90
Lords of Midnight	9.95 7.50
Gremlins	9.95 7.50
Archon	10.95 8.95
Starion	7.95 5.90
Buck Rogers	7.95 5.90
Full Throttle	6.95 5.50
Twin Kingdom Valley	7.95 3.99
Tales of Arabian Nights	5.50 4.25
World Series Baseball	7.95 5.50
Rocky	7.95 6.50
Eureka	14.95 7.50
Zaxxon	7.95 5.90
Fantastic Voyage	6.95 5.50
Bruce Lee	7.95 5.90
Alien 8	9.95 7.50
Death Star Interceptor	7.95 5.90
Death Star Interceptor	7.95 5.90

### \*\*\* SPECTRUM \*\*\*

	OUR RRP PRICE
Warlords	5.50 4.25
Hobbit	14.95 9.99
Dun Darach	9.95 7.20
Night Gunner	6.95 4.99
Dragonorc	7.95 5.90
Grand National	6.95 5.90
Herby's Dummy Run	9.95 7.50
Chuck Egg 2	6.95 5.75
Backgammon	6.95 4.99
Avalon	7.95 5.90
Rocky Horror Show	8.95 6.75
F. Bruno's Boxing (avail. 18/7)	6.95 5.50
Testmatch	6.95 4.99
Flight Simulation	7.95 5.50
Steve Davis Snooker	7.95 5.90
Street Hawk	6.95 5.25
Jet Set Willy	5.95 5.25
Minder	9.99 7.50
Frankie Goes To Hollywood	9.95 7.50
Super Gran Adventure	9.95 7.50
Daley Toms Supertest	6.95 5.45
Spy V Spy	9.99 7.50
Way of Exploding Fist	9.95 7.50
A view to a kill	10.99 8.50

### \*\*\* AMSTRAD \*\*\*

	OUR RRP PRICE
One on one	8.95 7.50
Archon	11.95 9.99
Everyone's a Wally	9.95 7.25
Beach Head	9.95 7.50
Way of the Exploding Fist	9.95 7.50
Daley Toms Supertest	8.95 6.75
Dun Darach	9.95 7.50
Combat Lynx	8.95 6.90
Pole Position	9.95 7.50
Alien 8	9.95 7.50
Knight Lore	9.95 7.50
F. Bruno's boxing (avail 18/7)	8.95 6.95
Street Hawks	8.95 6.75
Azimuth (h'd alignm't)	8.95 7.50

### \*\*\* BBC \*\*\*

	OUR RRP PRICE
Knight Lore	9.95 7.50
Revs	14.95 11.75
Combat Lynx	8.95 7.25
Manic Minor	8.95 7.25
Matchday	8.95 6.95
Alien 8	9.95 7.50

### \*\*\* COMMODORE \*\*\*

	OUR RRP PRICE
Elite	14.95 11.25
On court Tennis	10.99 8.99
On field Football	10.99 8.99
Star League Football	10.99 8.99
Strip Poker	9.95 7.50
Tir Na Nog	9.95 7.50
F. Bruno's boxing (avail 18/7)	9.95 7.50
Beachhead	14.95 11.20
Solo Flight	9.95 7.50
Death Star Interceptor	9.95 7.50
Bruce Lee	9.95 7.50
Nato Commander	9.95 7.50
Spitfire Ace	9.95 7.50
Ghostbusters	10.99 8.40
Battle For Midway	9.95 7.50
Frankie Goes To Hollywood	9.95 7.50
Daley Toms Supertest	7.95 5.90
Dropzone	9.99 7.95
Jewels of Babylon	7.00 5.25
Mr Do	9.99 7.95
Zaxxon	9.95 7.50
Summer Games	14.95 11.20
Quo Vadis	9.95 7.50
The Rocky Horror Show	8.95 6.95
Dambusters	9.95 7.50
Hyper Sports	8.95 7.50
Raid Over Moscow	9.95 7.50
Staff Of Karnath	9.95 7.50
Blue Max	9.95 7.50
Tapper	9.95 7.50
Eureka	14.95 8.99
Int Basketball	5.99 4.99
A view to a kill	10.99 8.50
Manic Miner	7.95 5.95
Daley Thomp Decathlon	7.95 5.90
Dig Dug	9.99 7.95
Fighter Pilot	9.95 7.50
Pitstop II	10.95 8.40
Jet Set Willy II	8.95 6.75
Quasimodo	9.95 7.50
Herby's Dummy Run	9.95 7.50
Street Hawks	7.95 5.90
American Football	9.99 7.50
Do Boy	9.99 7.95
Spy Hunter	9.99 7.50
World Series Baseball	7.95 5.90
Fistful of Fun	9.95 7.50
Spitfire 40	9.99 7.50
Slap Shot	8.95 7.50
International Tennis	5.99 4.99

### \*\*\* COMMODORE \*\*\*

	OUR RRP PRICE
Boulder Dash	8.95 7.25
Graham Gooch Cricket	9.95 7.50
Airwolf	7.95 5.90
Hobbit	14.95 9.99
Way of Exploding Fist	9.95 7.50
Super Huey	11.95 9.99
Combat Lynx	8.95 6.99
Lords of Midnight	9.99 7.50
The Fourth Protocol	12.95 9.99
Shadowfire	9.95 7.50
Arabian Knights	7.00 5.25
Cad Cam Warrior	9.95 7.50
F15 Strike Eagle	14.95 11.20
Black Thunder	7.95 5.50
Archon	11.95 9.99
Impossible Mission	8.95 7.50
Castle of Terror	9.95 7.50
Hunchback II	7.90 5.90
Matchpoint	7.95 -5.95
Raid on Bungling Bay	9.95 7.50
Strangeloop	8.95 6.95
Tim Loves Cricket	8.95 7.95
System 15000	14.95 9.99
Internat. Football (Rom)	14.95 11.20
Colossus Chess	9.95 7.50
Gremlins	9.95 7.50
Pacman	9.99 7.95
Ian Bothams Cricket	9.95 7.50
Sky Fox (Disc)	12.95 11.95
Everyones A Wally	9.95 7.20
Roland Rat Race	7.95 5.95
Bounty Bob	9.99 7.50
Entombed	9.95 7.50
Cauldron	7.95 5.90
Azimuth (Head Alignment)	8.99 7.50
Choplifter	9.95 7.95
Hard Hat Mack	9.95 7.95
Realm/Impossibility	9.95 7.95
Gorgs Revenge	9.95 7.50

### \*\*\* C16/PLUS 4 \*\*\*

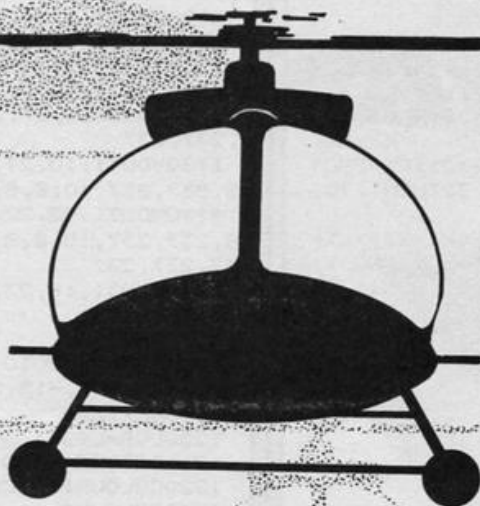
	OUR RRP PRICE
Airwolf	6.95 5.90
Olympiad	6.95 5.25
Rig Attack	6.95 5.25
Lunar Docking	6.95 5.25
Superfile 16 (d'base)	7.95 7.95
Canoe Slalom	9.95 6.50
Super Gran	7.95 5.25
Super Gran Adventure	6.95 5.90
Slagger	6.95 5.50
Roller Kong	6.95 5.50
Quickshot II Joystick £8.50	

All Prices include p&p in UK.  
Europe add £1.00p per tape. Elsewhere at cost.  
Cheques/PO payable to:  
SCS, Dept (HCW), 653 Green Lanes,  
London N8 0QY. Tel: (01) 800 3156.  
SAE for list.

Come and pick up your Software at 'Marbles Shopping Centre', Unit 11-12, 527-531 Oxford St., London W1R 1DD (1 min from Marble Arch Tube Stn)  
Further titles and offers available at our shop which is open 7 days a week from 10am-19.00.  
Above discounts applicable on production of this Advert at our shop.



# 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;0;
200SC=0:LVS=3:LVL=1:R1=30
210A1=0
220X=0:Y=15:D=0:IX=224:JY=225:KX=226:LX=227
:MZ=228:NZ=229
230IFLVS=0THEN1220
240COLOUR131:CLS:VDU19,3,132,0,0,0
250PROCCITY
260PROCALIENS
270COLOUR1
280VDU31,X,Y,MZ,NZ,10,8,8,KX,LX
  
```



```

290R=R+1:IFR=(R1) THENPROCALIENS:R=0
300IFINKEY(-99) ANDD=1 THENPROCFIREFLT
310IFINKEY(-99) ANDD=0 THENPROCFIREF
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>=250 ANDSC<290 THEN1470
380IFSC>=600 ANDSC<640 THEN1470
390IFSC>=900 ANDSC<940 THEN1470
400IFSC>=1100 ANDSC<1140 THEN1470
410IFSC>=1250 ANDSC<1290 THEN1470
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%>32 THEN1170:
GOTO270
460IFINKEY(-105) THEND%=FNC(X+1,Y+2):P%=FNC(
X,Y+2):GOSUB500:Y=Y+1:IFD%>32ORP%>32 THEN1170:
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%>32 THEN1170:
GOTO270
480IFINKEY(-73) THEND%=FNC(X,Y-1):E%=FNC(X+1
,Y-1):GOSUB500:Y=Y-1:IFD%>32ORE%>32 THEN1170
490GOTO270
500VDU31,X,Y,32,32,10,8,8,32,32
510IFX>17 THENX=17
520IFX<1 THENX=1
530IFY<1 THENY=1
540IFY>28 THENY=28
550SOUND0,-15,5,1
560RETURN
570DEFPROCFIREF
580PROCZAP
590FORL=2TO6
600IFX+L>19 THEN650
610FG=FNC(X+L,Y)
620IFFG=142ORFG=144 THENSC=SC+10:SOUND1,-15,
212,2
630COLOUR1
640VDU31,X+L,Y,95
650NEXTL
660FORL=2TO6
670VDU31,X+L1,Y,32
680NEXTL1
690ENDPROC
700DEFPROCFIREFLT
710PROCZAP
720FORL2=-1TO-55STEP-1
730IFX+L2<0 THEN780
740FG=FNC(X+L2,Y)
750IFFG=142ORFG=144 THENSC=SC+10:SOUND1,-15,
212,2
760COLOUR1
770VDU31,X+L2,Y,95
780NEXTL2
790FORL3=-1TO-55STEP-1
800IFX+L3<0 THEN820
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=1 THENA2=238

```

```

950IFA2=2 THENA2=240
960IFCO=3 THENCO=0
970COLOURCO
980IFA1>=8 THENB=RND(17)+A1
990PRINTTAB(A,B);CHR$A2
1000IFB>=27 THENW=1
1010NEXTL
1020IFW=1 THENPROCLAND
1030ENDPROC
1040DEFFNC(V,D)
1050PRINTTAB(V,D);
1060A%=135
1070=(USR(&FFF4) AND &FF00)/&100
1080DEFFPROCCITY
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
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,
8,237,237,10,8,8,237,237,10,8,8,237,237,2
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<=2 THENR1=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
1900DEFFPROCFAT
1910GCOLO,2
1920FORL=1TO120
1950DRAWNRD(1280),RND(1024)
1955SOUND1,-15,RND(200),1
1960NEXT
2000ENDPROC
    
```



JUST WHEN YOU THOUGHT  
IT WAS SAFE TO WALK  
THE STREETS.....

## PAWS

Guide Selwyn the cat through the treacherous woodland, town and scrapyard mazes. Armed with vicious paws and a few other feline weapons you must battle past the likes of Bulldog Billy and his motley pack to collect your kittens and protect your home.

*"Thoroughly addictive game not to be missed."* HOME COMPUTING WEEKLY

**PAWS £6.95**

ARTIC COMPUTING LTD.  
MAIN STREET  
BRANDESBURTON  
DRIFFIELD YO25 8RL  
TEL:(0401) 43553



## GOOD BYTE

COMMODORE	RRP	OUR PRICE
A VIEW TO KILL	10.99	8.99
ELITE	14.95	11.00
DUN DARACH	9.95	7.50
MORDENS QUEST	6.95	5.25
JUMP JET	9.95	7.50
TEST CRICKET	9.95	7.50
CRYSTALS OF CARUS	7.00	5.50
JEWELS OF BABYLON	7.00	5.50
HYPERSPORTS	8.95	6.50
THEATRE EUROPE	9.95	7.50
BRIAN JACK'S SUPERSTARS	7.95	4.99
COMBAT LYNX	8.95	6.50
EVERYONES A WALLY	9.95	7.50
HERBERTS DUMMY RUN	9.95	7.50
TIR NA NOG	9.95	7.50
MINI OFFICE	5.95	4.75
ROCKY HORROR SHOW	8.95	6.50
ROCKY HORROR SHOW (DISC)	12.95	9.75
AZIMUTH 3000	8.95	6.50
MOON CRESTA	6.95	5.25
CONFUZION	6.95	5.25
SLAP SHOT	8.95	6.50
SLAP SHOT DISK	10.95	8.25
SHADOWFIRE	9.95	7.50
SHADOWFIRE DISK	13.95	9.75
ROMPER ROOM	9.95	7.50
J.S.W. II	8.95	6.50
DALEYS SUPER TEST	7.95	5.95
STREET HAWK	7.95	5.95
GHETTOBLASTER	8.95	6.50
WORLD SERIES BASEBALL	7.95	5.95
CAULDRON	7.99	5.99
STRANGELOOP	8.95	6.50
GATES OF DAWN	8.95	6.50
ELIDON	8.95	6.50
MURDER ON THE WATERFRONT (TALKIES)	9.95	5.99
SKULL ISLAND	9.95	5.99
THE SCROLL OF AKBAR		
KHAN	9.95	5.99
THE LOST CITY	9.95	5.99
SELECT 1	11.95	7.00
NODES OF YESSOD	8.95	7.50
FRANK BRUNO'S BOXING	6.95	5.25
DROP ZONE	9.95	7.50
ELITE DISC	17.95	13.95
SPECTRUM		
DUN DARACH	9.95	7.50
EVERYONES A WALLY	9.95	7.50
MORDENS QUEST	6.95	5.25

STARION	7.95	5.95
WRIGGLER	5.95	4.75
HYERSPORTS	7.95	5.95
SAIMAZOOM	6.95	5.25
BABA-LIBA	7.95	5.95
WORLD SERIES BASEBALL	7.95	5.95
BATTLE FOR MIDWAY	9.95	7.50
DATASTAR INTERCEPTOR	7.95	5.95
DALEY SUPER TEST	6.95	5.25
STREETHAWK	6.95	5.25
CAULDRON	7.99	5.99
ROMPER ROOM	9.95	7.50
SHADOWFIRE	9.95	7.50
ARABIAN NIGHTS	6.00	4.75
HERBERTS DUMMY RUN	9.95	7.50
T.K.V. ***	7.95	3.99
GYRON	9.95	7.25
ANIMATED STRIP POKER	6.95	5.25
ROCKY HORROR SHOW	8.95	6.50
FORMULA ONE	8.95	6.50
CONFUZION	6.95	5.25
NODES OF YESSOD	9.95	7.50
FRANK BRUNO'S BOXING	6.95	5.25
JSW II	6.95	5.25
ON THE RUN	6.95	5.25
BBC/ELECTRON		
COMBAT LYNX	8.95	6.50
ARABIAN NIGHTS	7.99	4.95
MINI OFFICE	5.95	4.75
WIZARDORE (BBC)	7.95	5.95
MR MEPHISTO	7.00	4.95
MICRO OLYMPICS	5.95	4.75
BRIAN JACKS	7.95	5.95
GREMLINS	7.95	5.95
AMSTRAD		
AZIMUTH 3000	8.95	6.50
ANIMATED STRIP POKER	8.95	6.50
JET SET WILLY	8.95	6.50
SORCERY	8.95	6.50
DARKSTAR	7.95	5.95
3D STAR STRIKE	6.95	5.25
TANKBUSTERS	7.95	5.95
ALL INTERCEPTOR	6.00	4.50
DALEY THOMPSONS		
DECATHLON	8.95	6.50
KONG II	8.95	6.50
GREMLINS	9.95	7.50
A SMUGGLER'S COVE	5.95	5.00
HANDICAP GOLF	6.95	5.50
FRANK BRUNO'S BOXING	8.95	7.95
BEACH HEAD	9.95	7.50
ROCKY HORROR SHOW	8.95	6.75

PLEASE NOTE IF YOUR ORDER  
EXCEEDS £50 YOU GET  
10% FURTHER DISCOUNT

SEND CHEQUES/P.O. TO:

GOODBYTE (HCW)  
94 LEATHER LANE, LONDON EC1  
(TEL: 01-484 4245)

ALL PRICES INCLUDE P&P

Overseas orders welcome, please add £1.50 per order



# 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 TO 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 letters
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

```





```

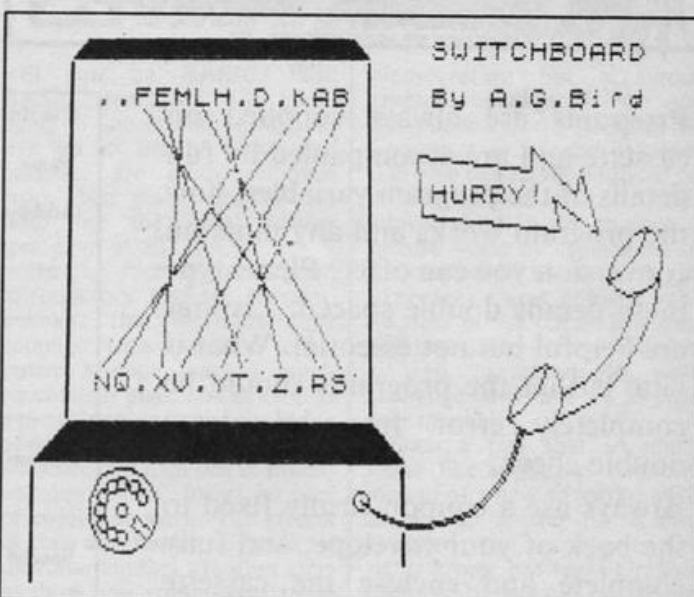
990 LET phone=100
999 REM Keypress
1000 LET key=PEEK 23560
1010 IF key>64 AND key<78 THEN GO TO 1100
1020 IF key>77 AND key<91 THEN GO TO 1200
1030 LET phone=phone-(sk+pc/4)
1040 IF phone<0 THEN LET phone=100: GO SUB 6
500
1050 GO TO 1000
1100 IF top=1 THEN GO TO 1030
1105 IF bot=1 THEN GO TO 1500
1110 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: NEXT 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

```





# FREE SOFTWARE FOR LIFE!

**Probably the best offer ever made to the micro user...**

Directors: Alec Fry ARPS, FRSA; Erna Fry BA.

**New Gold Star life membership of The Software Library is your key to a vast treasure trove of tapes costing up to £18 each. They are yours whenever you want them, three at a time... and a full week's rental won't ever cost you a penny in hire fees!**

Only the original Software Library has the resources to make such an amazing offer—free software for life! Our ten megabyte computer ensures fast service; our illustrated, descriptive catalogue makes it fun to choose from over 80 top arcade games, 124 Adventures, simulations and other games, and over 120 great utilities and serious applications; 65% are for the Spectrum, the rest divided between Commodore 64 and ZX81. New releases are constantly being added. Joining this money-saving scheme should cost you £24; as an introductory offer, you can join this month at **half price—£12**. From then on, you can take away three tapes from our shop whenever you wish; or if you order by post, all we ask is 30p post/packing per tape. The rental is perfectly free in either case.

What's more, you can sell your surplus software to other members (we have over 5,000!) and recoup the cost of membership in no time at all. We offer huge discounts on peripherals and tapes... and so much more. Phone us now on 0730 892732, quoting your Access number, or return the coupon without delay!

**GUARANTEED to save you more than any other software library scheme!**

**SOFTWARE LIBRARY**

Please enrol me at the introductory offer, and send my membership pack by return.

NAME..... I enclose cheque/P.O. for £

ADDRESS.....

**FARNHAM ROAD, LISS, HANTS GU33 6JU**

OVERSEAS: join here for £18, or join one of our foreign branches: Postfach 7800, 4600 Bielefeld, W. Germany; Jacobsmitslaan 75, B-2400 Mol, Belgium (also covers Holland); 122 S Circular Road, Dublin 8; Peder Lykkesvej 33, 2300 Copenhagen S; Box 1769, Manzini, Swaziland. France & Italy soon. Branch terms vary. All software hired with supplier's permission. GW

**THE ORIGINAL SOFTWARE LIBRARY!**

## If an advertisement is wrong we're here to put it right.

If you see an advertisement in the press, in print, on posters or in the cinema which you find unacceptable, write to us at the address below.

**The Advertising Standards Authority.**

ASA Ltd, Dept 3 Brook House, Torrington Place, London WC1E 7HN

### 1541 GT LOADER CARTRIDGE

This CARTRIDGE will enable your 1541 disc drive to load approximately 4 times faster and is compatible with most commercial software. Although there are slightly faster turbo disc loaders available, TRIGSOFT's GT LOADER is the only one (that we are aware of) that retains full disc error checking and as it is a cartridge is always available for instant use. Abbreviated LOAD/SAVE commands are 'built in' eg typing LOAD filename will load file etc. Typing LOAD \$ will display the directory to the screen without affecting basic memory. An ON/OFF switch is fitted so there is no need to remove it in the unlikely event of software conflict. Just think, from the moment that you turn on, you will be able to load programs 4 times quicker.

ORDER AS GTLOADER Price £20.00 (CBM 64 WITH 1541 DISC)

**RESET1** — This reset unit plugs into your computer enabling a reset without erasing the program.

ORDER AS RESET1 Price £3.00 (CBM 64 & VIC-20)

**\*\* 10 DAY MONEY BACK GUARANTEE \*\***

We will refund your payment less postage if any hardware item is returned undamaged within 10 days.

ORDERING: ALL PRICES INCLUDE RECORDED DELIVERY & ARE FULLY INCLUSIVE (overseas add £1.00). Send to mail order depts at either Bradford or Grimsby.

**Trigsoft, (Dept HCW)**  
29 Holme Lane,  
Bradford,  
BD4 0QA

Bradford dept for mail order only.

Please send SAE for free catalogue.

**Trigsoft, (Dept HCW)**  
161-163 Rutland Street,  
Grimsby,  
South Humberside, DN32 7NP

Tel: 0472 48304

Callers welcomed at Grimsby dept.

**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

Program submission

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

Name \_\_\_\_\_

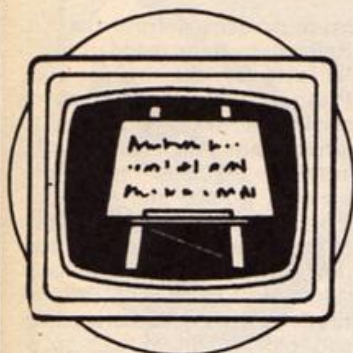
Address \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Program title \_\_\_\_\_ Machine \_\_\_\_\_





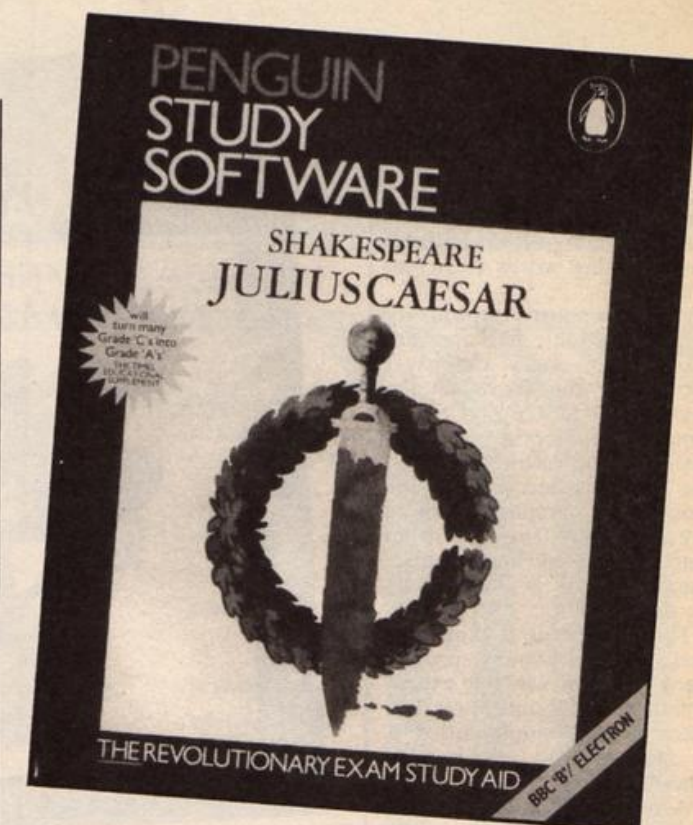
**Home Sweet Home is John Henderson's theme this week — Is home software worth buying and does it help or hinder?**

**L**ife 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, let's 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 layman's 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 jummy 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

# EDUCATION



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.

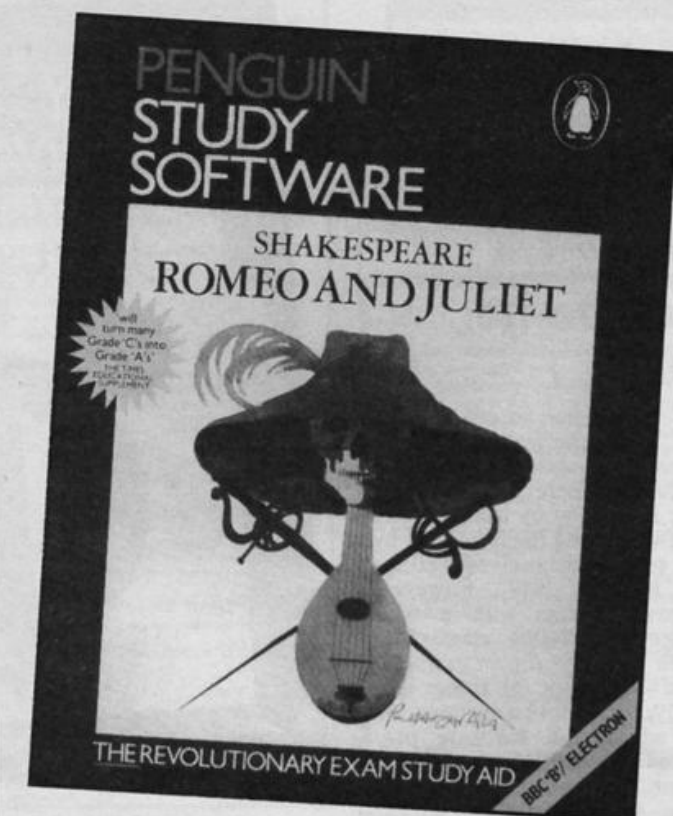
This is a useful, if expensive, package that could provide many hours of valuable experience. Parents should, however, check to see if similar software is available for children in school.

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.

#### Programs detailed:

##### Using your Computer

BBC Software  
BBC B  
£29.95

##### Picture Logic

Addison Wesley Homesoft  
BBC B  
£32.10

##### Spooky Manor

Acornsoft Home Education  
BBC B  
£9.95

##### Penguin Study Software

includes  
Romeo and Juliet  
Julius Caesar  
Macbeth  
Henry IV Part 1  
Twelfth Night  
Merchant of Venice  
£7.95 + VAT  
Also available for the  
Spectrum, Commodore &  
Electron.





# TOP 20

Compiled by  
**Gallup**



# 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	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

BBC

COMMODORE



Top Ten

- Soft Aid  
Various
- Spy Hunter  
US Gold
- Cauldron  
Palace
- Dun Darach  
Gargoyle
- Jet Set Willy 2  
Software Projects
- View to a Kill  
Domark
- Hypersports  
Imagine
- Shadowfire  
Beyond
- Spy vs Spy  
Beyond
- Starion  
Melbourne House

Top Ten

- Revs  
Acornsoft
- Alien 8  
Ultimate
- Knightlore  
Ultimate
- Combat Lynx  
Durell
- Elite  
Acornsoft
- Attic Attac  
Ultimate
- Castle Quest  
Micro Power
- Repton  
Superior
- Mini Office  
Database
- Football Manager  
Addictive

Top Ten

- Elite  
Firebird
- Way of the Exploding Fist  
Melbourne House
- Soft Aid  
Various
- Pitstop 2  
US Gold
- View to a Kill  
Domark
- Dam Busters  
US Gold
- Drop Zone  
US Gold
- Kik Start  
Mastertronic
- International Basketball  
Commodore
- 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



## 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

## 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.*

Home Computing Weekly,  
No 1 Golden Square,  
London W1R 3AB.





# GLASS

Battle your way to three enemy bases.  
Do you have the courage, stamina  
and skill to become a Game Lord?

**£7.99**  
**SPECTRUM 48K**

From

# QUICKSTVA

*The most powerful games in the Universe!*

Available from all good software shops.

In case of difficulty write to:

QUICKSTVA Ltd, Liberty House, 222 Regent Street, London W1B 3DB tel: 01 439 0666





# HOME COMPUTING WEEKLY CLASSIFIED

Lineage:  
35p per word



01-437 0699  
EXT 322.

Send your requirements to:  
**David Horne**  
**ASP LTD.**  
1 Golden Square,  
London W1R 3AB

Semi display: £7.10 per single column centimetre  
Ring for information on series bookings discounts.

All advertisements in this section must be prepaid.  
Advertisements are accepted subject to the terms and conditions printed on the advertisement rate card (available on request).

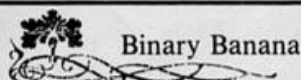
## Accessories

### COMMODORE 64

Konami's Hyper Shot game controller.  
£9.95 each, £18.95 pair.  
Prices include P&P and VAT. Suitable to play Konami's Hyper Sports and other sports simulator games. Only available from:

Konami Ltd, Television House,  
269 Field End Road, Eastcote, Ruislip,  
Middx HA4 9LS Tel: 01-429 2446

## Amstrad



Binary Banana

**AMSTRAD 464**  
**MAGIC PEN:** By itself, probably the ultimate ART utility. Save to tape — supplied with loader sketch, or filled, £4.95. **SYMBOL 464:** Design your own lettering, copy pictures from anywhere or original. Save to tape plus decimal print-out. £3.95. **BIG LETTERS:** By itself it's good, with the above, fantastic. Big lettering to 224 pixels. Save to tape. £2.95. **PAINT 464:** Add the fill function. Full or alternate line, plus program subroutine supplied. £3.50. **MOVE IT:** Move the files produced around with this handy utility. £2.50. **THE ARTISTS EASEL:** A collection of integrated graphic functions and subroutines, "25" options plus MAGIC PEN, plus SYMBOL 464, plus BIG LETTERS, plus PAINT 464, plus MOVE IT, plus AIRBRUSH, plus SCREENED ON FACILITY with hand-book. The complete collection: £9.95.

All price inc. p&p. Export enquiries welcome.  
**BINARY BANANA**  
PI TEC, Park Crescent, Peterborough,  
Tel: Peterborough 312120

## Clubs

**Computer Games Club.** Tournaments, Contacts. Original Games & Classic Games. Contact Chris, 6 Solnar Ave, Putney, London SW15.

## Education & Tuition

**Mainframe computer programming** tuition by experienced programmer. Cobol, Assembler, systems analysis intensive part-time course. 01-935 2045.

## For Hire

To hire a computer and/or peripherals by the week or month, please ring 01-607 0157 or 01-997 6457. We specialise in BBC and Apricot computers. Computer Hire Services 294a Caledonian Road, London N1 1BA

## COMMODORE

### C16

**CASSETTE HIRE**  
AT LAST! ALL THE TOP GAMES AVAILABLE FOR THE C16 CAN NOW BE HIRED FROM

### DABSOFT

LIBRARY CONSTANTLY UPDATED  
AS NEW GAMES BECOME AVAILABLE. MEMBERSHIP FEE OF £6.50 INCLUDES 2 FREE RENTALS! ONE PRICE FOR ANY GAME. CHARGE OF £1.25 INC P&P BOTH WAYS. FOR COMPLETE MEMBERSHIP KIT POST CHEQUE OR POSTAL ORDER TO

**DABSOFT (HCW)**  
39 GUILDFORD ROAD,  
LEVENSHULME M19 3FG  
01-445 4375 061-445 4375

### ORIC, ATMOS, COMMODORE 64, LYNX SOFTWARE LIBRARY

Over 150 Oric and 200

Commodore 64 titles.

Stamp for details:-

Les Wilson 100 Blenheim  
Walk, Corby, Northants.

## For Sale

C64, 1541 Disc Drive, C2N cassette recorder, loads of software, serious and silly. £350 ono 01-788 8749 evenings.

## Libraries

**BBC B/Electron/Dragon** software library — Membership £5.00. — Tapes 1 (+30p P&P). Stamp for details. E. Tucker, (H) 58, Blenheim Walk, Corby, Northants.

## Music

**ORIC — BACH:** The famous Toccatina and Fugue in D-minor for Oric /Atmos (48K only). Cassette £2.95. Mixoft, 124 Town Lane, Whittle-le-Woods, Chorley, Lancs.

## Opportunities

If you are a Software Representative and would like to carry a second line, please contact us: Binary Banana, Pi-Tec, Park Crescent, Peterborough. Tel: Peterborough 312120.

## Software

### WD Software

For the QL:-

#### WD Utilities (3rd ed) (base £5.50)

Print 60-file DiRectory or view it on one screen, one-key LOAD. COPY or PRINT 60 files with one key (allows for namesakes). Multiple FORMATTing to prevent corruption by stretching of tape. TOOLkit to give dated, numbered modules in program development. PRUNE old files to release space (one key DELETes a file). Full instructions in QUILL file. Use up to 6 EXTRA MICRODRIVES (add on your Spectrum ones!)

#### WD Utilities for CST Q-Discs (base £8)

100-file capacity, for CST/Computamate disc system AND up to 4 extra microdrives. User-friendly timesavers.

#### RefQL (3rd ed) (base £3)

500 useful QL references in an ARCHIVE file (too long for one cartridge with Utilities and Morse).

For the Spectrum/QL/BBC

#### WD Morse Tutor (base £4)

From absolute beginner to beyond RYA and Amateur Radio receiving. Adjust pitch. Set speed to your test level (4-18 wpm). Learn from single characters, via groups with wide spaces to random sentences; decrease spacing to normal. Write down what you hear, then CHECK on Screen or Printer (or speech for Spectrum with Currah MicroSpeech). Also own message, random figures, letters or mixed.

For Spectrum 48K

#### Tradewind (base £4)

Sailing/trading strategy game with graphic surprises.

#### Jersey Quest (base £4)

Text adventure with Bergerac and the Dragon (not disc).

**PRICES (incl Europe postage — elsewhere add £1)**

Spectrum/BBC cassettes — base price only

QL or Spectrum Microdrives — £2.00/cartridge plus base price

5 1/4" Floppies, £2; 3 1/2" Floppies, £5 (please state format wanted).

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.** No special hardware needed. £3 for listing. Firefly Software, 8 Poolsford Road, London NW9 6HP

## Software Libraries

It's here — The CBM 64 Software library for you! Top titles available. Send for membership details to USH 64, 23 Dominic Street, Kilkenny, Ireland.

## Nationwide Shops and Dealers



24 The Parade,  
Silverdale, Newcastle  
Tel: 0782 636911

**Official Acorn computer dealer and BBC service and information centre**

Huge stocks available backed up by sophisticated service dept for all popular computers. Direct orders through Micronet page no. 60043726

**ROM SOFTWARE FOR THE AMSTRAD CPC 464**  
**FULFILLS THE PROMISE OF YOUR AMSTRAD**  
**SUPERPOWER ROM-CARD**  
— 7 Sockets for 8K or 16K eproms (external cased unit with bus extension) £39.95.  
**SUPERPOWER ROM-BASED SOFTWARE**  
Disk User's Utilities • Mailing List/Club Membership • Programmer's Toolbox • Assembler/Disassembler/MC Code Monitor • All £39.95 each.  
Word Processor, Database, Spreadsheet, Graphics/Statistics — With Data Interchange. Prices to be announced. Available Aug/Sept.  
Order today Phone 0532 434006 or by mail order from MicroPower Ltd., Sheepscar House, Sheepscar Street South, Leeds LS7 1AD. P&P 95p. Access/Visa.



## HOME COMPUTING WEEKLY 16 July 1985 Page 45



## 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 Sivils 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 tingling 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?"

## Thames Television Database Micronet 800 Crossword Competition Week Three

### Clue 3

#### Part A

"Centuries ago as the water swelled,  
The Holy Grail lay in the Chalice Well,  
From Joseph's staff thrown down for a rest  
Grows the thorn bush, flowering in winter best,  
Where a wounded king, carried by six black clad knights,  
Was taken to die on his Isle, a Tor of great height."

#### Part B

"Experience, though noon auctoritee  
Were in this world, is right ynogh for me  
To speke of wo that is in mariage;  
For, lordynges, sith I twelve yer was of age,  
Thonked be God that is eterne on lyve,  
Housbondes at chirche dore I hae had fyve, —  
If I so ofte myghte have ywedded bee, —  
And alle were worthy men of hir degree."

### Micronet 800 also gives you Prestel

300,000 pages at your fingertips! Joining Micronet brings you British Telecom's full range of Prestel services.

Instant Information: World news, weather, travel, sports results, entertainment guides and consumer advice.

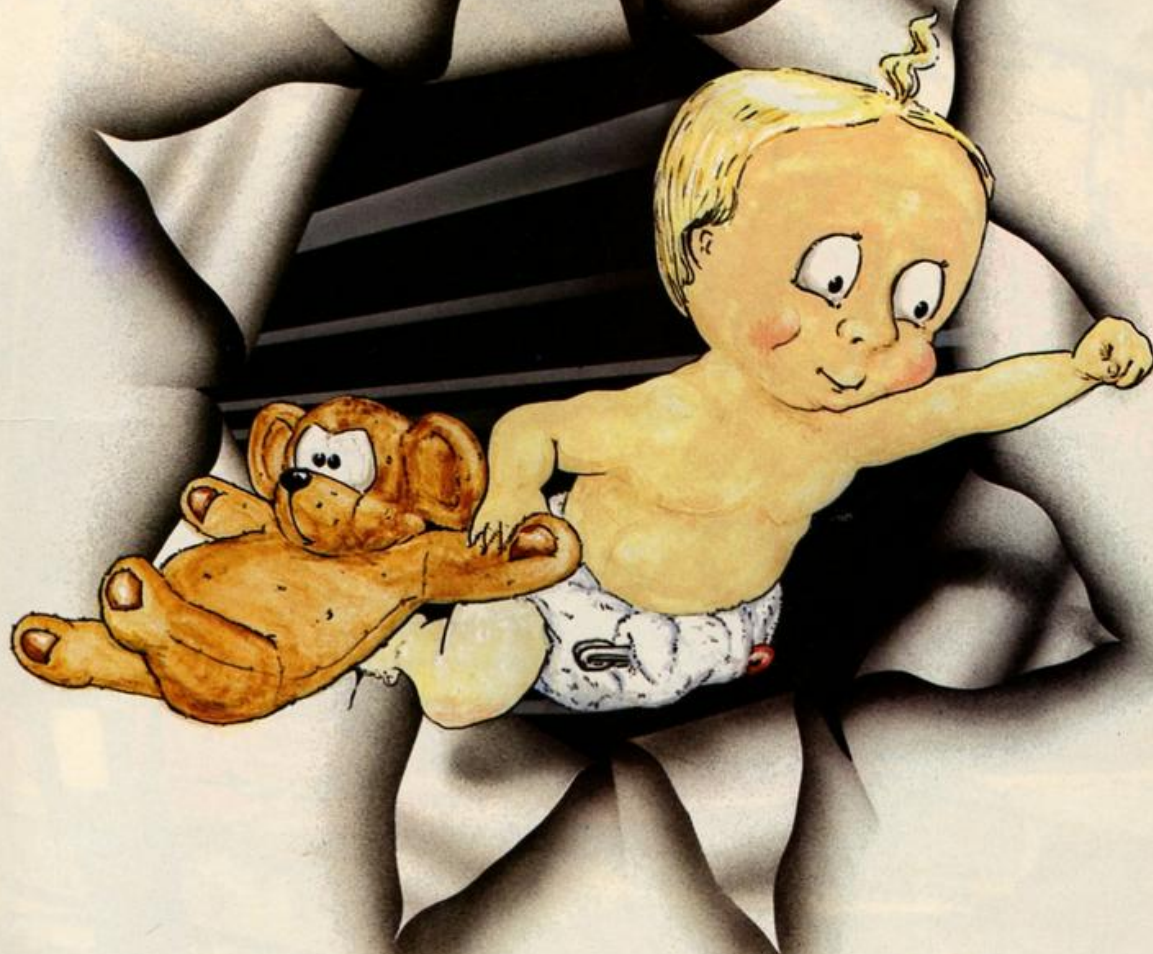
Specific Information: Comprehensive business/share bulletins, farming, education and medical sections keep your finger on the pulse.

Interaction: Homebanking, hotel and holiday bookings Dateline and competitions are convenient and entertaining.

Final clue next week.



# Herbert's



## Dummy Run

*Trouble In Store for Herbert*

Spectrum 48K £9.95

Commodore 64 £9.95

Amstrad CPC 464 £9.95



## MIKRO-GEN

44 The Broadway, Bracknell, Berks. 0344 427317



# JUMP JET

**CBM 64**  
CASSETTE £9.95  
DISK £11.95

Every pilot has the dream of flying one of these unique and complex fighting machines. Here is your chance to do what few pilots have the privilege to try.

Depending on your skill, confidence and courage, you have the choice of remaining near the landing pad, learning to hover and land, or venturing higher to practise your approaches.

When you think you have mastered these, then accelerate the Jump Jet into an attack fighter. Use the radar and range finder to seek and destroy the enemy, by launching heat-seeking air-to-air missiles. Beware! His radar and missile systems are as good as yours. Reckless pursuit is ill-advised: you must maintain a fuel level that will enable you to relocate and return to the aircraft carrier, executing the skills you have learned to achieve a successful landing.

You are now ready to proceed to the next skill level to face additional hazards, such as unpredictable swell and treacherous cross-winds.

Be warned, this program is not a toy or game. You will need to co-ordinate your hands, eyes and mind to successfully complete each mission. Do not hope to achieve in a short time that which took the author three years to learn as a Jump Jet pilot, and over a year to record on this computer program.



Written by  
Vaughan Dow  
Jump Jet Pilot

## ANIROG