

# HOME COMPUTING WEEKLY

AN ARGUS SPECIALIST PUBLICATION

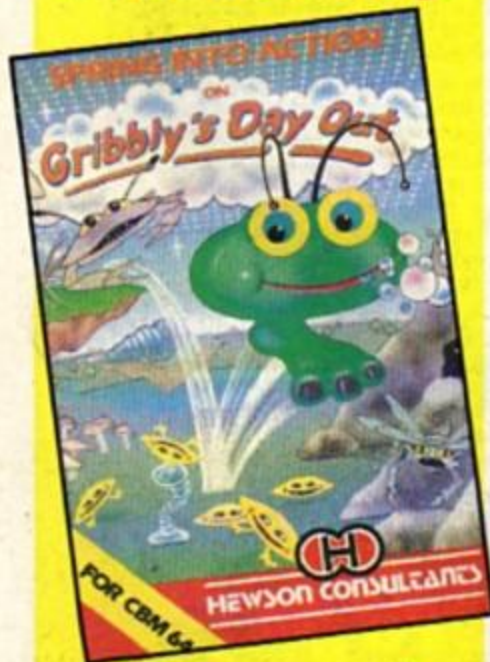
June 4-10, 1985 No. 115 45p



Design a screen  
and be a star!  
with  
**Character  
Designer**  
from



Don't be a mug!



Gribbly mugs for  
150 winners

"Computers changed  
my life". See p.41

## New Spectrum not imminent

Sinclair Research has scotched rumours that the launch of a new 128K Spectrum is imminent.

Details of an upgraded Spectrum Plus, which would use bank switching to access the additional 64K of memory, have appeared in the computer press. However, a spokesman for Sinclair Research said: "I can't confirm or deny the existence of this model."

"The Spectrum has been so successful that it makes sense to look at the Spectrum family," he said. "Having said that, it's definitely not the right time of the year. The Spectrum Plus was launched in October last year, and that was sensible timing. We will certainly not launch a new machine now."

And there are conflicting opinions about which machine will be the next from Sinclair. Sir Clive is reported to have denied the existence of the 128K model, drawing attention to the Pandora—the portable version of the Spectrum—as the only machine under development.

A number of major software houses claim to know nothing of the new 128K model. Staff at Mel-



A new addition to the family?

bourne House, Ocean and Ultimate state that they have seen or heard nothing of the machine, and are not involved in the development of soft-

ware to support it.

And Psion, the software house which was in at the initiation of the Spectrum, denied all knowledge.

## Boogie on down

Virgin Games is about to launch "the first computer musical". The new game, for the C64, is entitled GhettoBlaster.

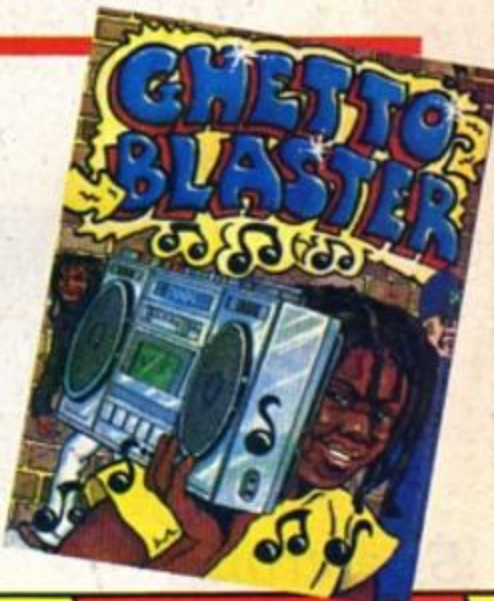
Programmed by Tony Gibbo Gibson and Mark Harrison, who created such games as Jammin' and Seaside Special for Taskset, GhettoBlaster contains 12 original pieces of music.

Rockin' Rodney, the hero must travel the streets of Funky town

trying to pick up good demos for Interdisc Records. All the streets are named after famous songs like Route Sixty-Six and Electric Avenue.

Rodney must also try and make the locals dance—no easy task when they keep trying to sabotage his ghettoBlaster.

The game will be available on 10 June for the C64, at £8.95.



In depth review  
of Anirog's  
Jump Jet

Cookie monster  
on the TI-99/4A

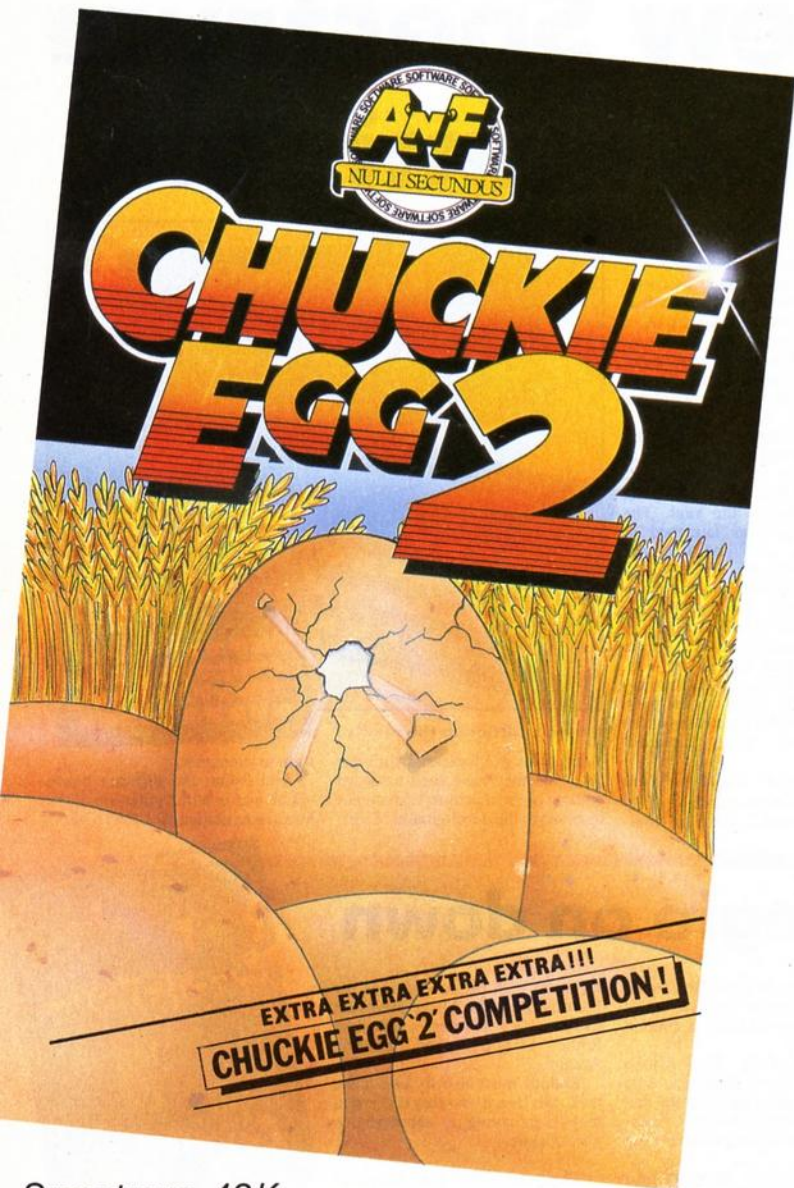
Spectrum joystick  
interfaces review

Amstrad machine  
code—the  
easy way

Have a  
shot at  
our  
gunboat game



# A great NEW game from A&F.



EXTRA EXTRA EXTRA EXTRA!!!  
CHUCKIE EGG 2 COMPETITION!

Spectrum 48K

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Our intrepid hero "Hen House Harry" of "Chuckie Egg" fame has been called in to help a "Chocolate Egg" manufacturer sort out his automated factory, which has gone haywire. Harry, using all the skills he acquired working in the Hen House must get the wheels of industry moving.

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

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

Chuckie Egg 2 contains 120 screens, plenty of surprises, and it is a true Arcade/Adventure game - you don't just find things, you actually move them and use them.



Great games. Great ideas.

A&F Software, Unit 8, Canal Side Industrial Estate,  
Woodbine Street East, Rochdale, Lancs OL16 5LB.  
Telephone: 0706 341111



# HOME COMPUTING WEEKLY

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June 4-June 10, 1985 No. 115

### Soapbox

As the software houses are asking us to keep our eyes open for commercially pirated software by taking notice of photocopied inlay cards, I wonder if they might consider planning the product a little more thoroughly?

For example, many Imagine (pre-1984) titles were hyped in cardboard boxes or goldsprayed cassette cases, as in the case of Alchemist. However, when I obtained my copy of the game, by mail order from Imagine themselves, it came in an ordinary black cassette box. Am I to believe that this was pirated, even though it came direct from the publisher?

It now also seems that MikroGen is jumping on the bandwagon. Its arcade multi-role adventure Everyone's a Wally was on sale in my local computer shop in an A5 cardboard box for £9.95. However when I went into a large town and was looking in a popular retail chain

store, I saw it in an ordinary cassette box for £7.95! The inlay wasn't photocopied and the whole pack seemed genuine — but how can we tell?

Could the manufacturers possibly put a note in their advertisements or catalogues — Sinclair Research does — and state in what packaging the game comes?

I could state many other examples — some of which, I feel, perhaps take the tapes out of cardboard boxes when they don't sell too well and transfer the tape to a cassette case, e.g. Ocean, whose Daley Thompson's Decathlon, Match Day, Roland's Rat Race and Kong Strikes Back have been seen first in boxes, but then changed mysteriously to cases...

**Jonathan Brough, Seaton**  
*Here's your chance to get your opinions off your chest. Write to us and express yourself — you win a prize if your letter is printed here!*

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### Coming soon

- Telecommunications special
- Protect your software
- Vampire! on the VIC-20

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

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### BASIC LIVING

Jon Wedge · Jim Barker





NEWS

A new series of Grampian TV's home computer series, Bits 'n' Pieces, will soon be going on the air. The series will last for six weeks and include reviews of the Commodore 128, the BBC B+, the Amstrad CPC664, the Enterprise 128 and the Atari 130 XE. This will be the first TV appearance for many of these new computers.

Tony Crowther, author of Monty Mole, Potty Pigeon and Gryphon will be a guest during the series and Ian Bell and David Campbell, co-authors of Elite, will also be interviewed.

Many of the new machines being reviewed were still in prototype form when the program was recorded and were only available to the Bits 'n' Pieces team on the strict understanding that they were to remain secret. According to Grampian TV, on the day Acorn's marketing manager arrived with his BBC B+, Enterprise's technical director was leaving with his 128; meanwhile a Commodore 128 lay safely locked away in a cupboard!



"Hurry up or I'll drop 'em!": Bobby Hain

**Radio BASIC**

Computer programs are now being broadcast on radio as part of an advertising campaign by 3i Ventures to help entrepreneurs start their own high growth companies.

The campaign is running on six local radio stations: LBC, Radio Forth, Radio 210, Hereford Radio, Saxon Radio and Radio West. All computerised advertisements are broadcast at 8.30p.m. and the programs will run on Amstrad, BBC and Spectrum computers. Listeners will be able to record the initial 3i Ventures Business Summary, live from their radios and then load and run the programs on their computers.

The last broadcast will be on 8 June.



The new Toshiba data recorder

A new data recorder is now available from Toshiba. The HX-C810 features complete line review for easy access to data, AC/DC operation, a tape counter and monitor switch allowing audible proof of transmission. The recorder costs £34.95.

Toshiba, 11a W Halkin St,  
London SW1X 8JL

**Eye aid**

If you're fed up of getting sore eyes when you sit in front of your computer all evening, then Wireless & Electronics Ltd may have the answer to your problems.

Wireless & Electronics has just released a TV filter which cuts down the glare from your screen and so reduces eyestrain. The filter is available in sizes varying from 9 inches to 26 inches and clips and brackets are included to make fitting a simple matter.

Wireless & Electronics, 5 Lansdowne Way, London SW8 1HL

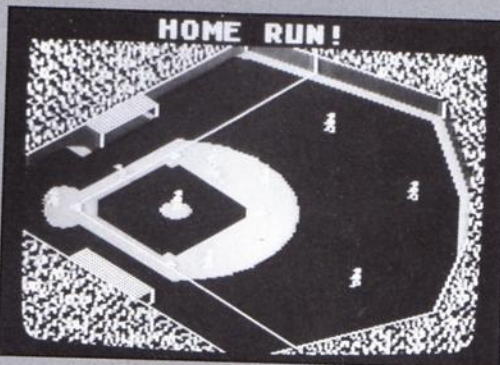


### Software update

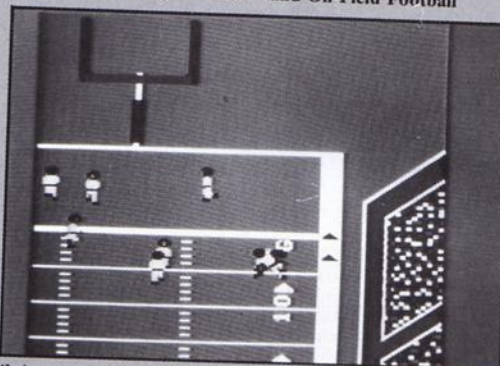
British software is at last breaking into America, according to Digital Integration. Fighter Pilot was launched in the USA on the Epyx label on 1 May and so far it looks like being a success. Digital Integration's Dave Marshall said: "This is a significant achievement considering penetration of the US market by British software has been very difficult." The game is still available over here for C64 (£9.95, £14.95), Spectrum (£7.94) and Amstrad (£8.95).

Taskset's Super Pipeline II has just been released on the Amstrad and Spectrum. According to Taskset a follow-up to the original game was written because "the public have been crying out for a sequel". The makers say that there are many more fascinating features incorporated into the game to make it more interesting and challenging to the player.

Activision has just added another new title to its wide range of games, Star League Baseball for the C64. There are also two thoroughly British Sport games from Activision, On-Court Tennis and On-Field football both for the C64.



A Super League Baseball and On-Field Football



C View from the cockpit in Revs

B Digital Integration's Fighter Pilot



Title	Machine	Price	Publisher
Galaxia	MSX	£6.95	Kuma
Tapper	Spectrum	£7.95	US Gold
The Code Machine	Amstrad	£19.95	Picturesque
Backgammon	Amstrad	£8.95	CP Software
Draughts	Amstrad	£8.95	CP Software
Hit & Miss	C16/Plus 4	£7.99	Venturegate
Cave Fighter	C16	£6.95	Bubble Bus
Hustler	Einstein	£12.95	Bubble Bus
Boardello	Einstein	£12.95	Bubble Bus
On-Court Tennis	C64	£10.99	Activision
Star League Baseball	C64	£10.99	Activision
On-Field Football	C64	£10.99	Activision
Revs	BBC	£14.95	
		d £17.95	Acornsoft
Super Pipeline II	Amstrad	£8.90	Taskset

### Wally's birthday

Wally Weeks was one year old on 1 June 1985. To date he has starred in three very successful games, Automania, Pyjamarama and Everyone's a Wally. His son has now got his own game called Herbert's Dummy Run.



Wally the mechanic

Mikro-Gen, employers of Wally, recently interviewed this elusive character on the top deck of a No 92 bus. He said: "I'm very happy to have survived for so long — I nearly had a very nasty accident with a paper clip and a packet of jelly babies last week. Wait a minute, this bus is going the wrong way — I'd better go and tell the driver."

Mikro-Gen, 44 The Broadway, Bracknell, Berks

### Watch out!

Arthur Beale of Blandford Forum is the lucky winner of our Seiko wrist terminal competition. He answered all the questions correctly and will shortly be receiving his very own C64-compatible Seiko RC-1000 wrist terminal.

Here are the answers to the questions:

- 1 HCW114 was available on May 28 1985
- 2 The clocks go backwards in October
- 3 The year 2000 will be a leap year
- 4 Greenwich is on the River Thames
- 5 The speaking clock is now a man

Congratulations to Arthur.

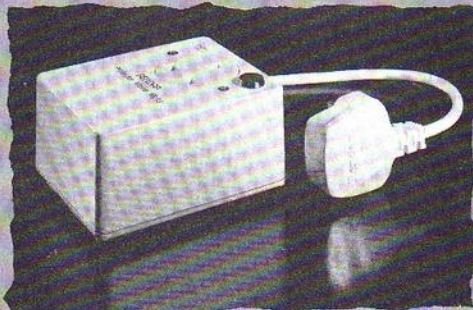


S  
W  
E  
N

### Cleaning up

Rendar has just produced a gadget which will protect sensitive electronic equipment from the hazards of electrically noisy environments.

The new product is called the Spikebloc and works by using electric power lines to pick up natural and man made interference — ranging from surges induced by lightning to those caused by other machinery being used nearby. According to the manufacturers the Spikebloc filters and absorbs this interference to provide clean power for your equipment.



Rendar, Durban Rd, S Bersted, Bognor Regis, W Sussex PO22 9RL

Block those spikes

### Kempston interface



Kempston is producing a disc interface for the Spectrum which, according to the makers, has been designed to offer the maximum amount of user facilities in a compact unit. It comes in an easily recognisable Kempston interface case which is both "robust and stylish".

Features of the new disc interface include: an 8K ROM based operating system; uses advanced BASIC overlay techniques; supports single or multiple disc drives up to a maximum of four.

The interface costs £85 and, says Kempston, it marks an important change in the home computer market since the need for more storage and faster access is growing all the time.



Kempston, Singer Way, Woburn Rd Ind Est, Kempston MK42 7AF

### Future training

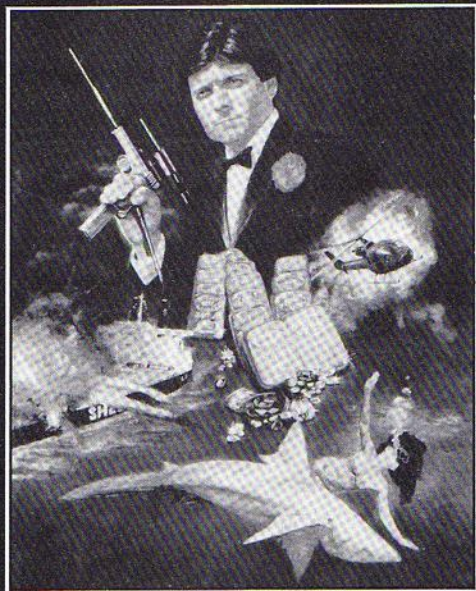
A new computer training centre was officially opened in Wakefield on 16 May. The training network based on British made Future computers, has been installed by Barbara Sheldon Associates, a Wakefield training agency.

The centre has been designed to provide high quality computer applications training to YTS trainees, to the public and also local businesses.



The opening of the Wakefield centre





Domark's new Bond game

## Showing off!

There will be several famous names present at the Commodore '85 show, 7-9 June at the Novotel, Hammersmith, London.

Glamorous Bond girls, Nike Clark and Maggie Defreitas, will be present at the opening of the show at 10am on 7 June. They will be helping launch Domark's Bond adventure, *A View to Kill*.

On Sunday 9 June, UK Warriors, the breakdancing group will be giving a series of displays which will tell the story of breakdancing. They will also be having a go at some of the breakdancing games which will be on show.

Mirrorsoft's Spitfire '40 will also be on show and there will be a special version set up in the events room for visitors to play

The highest scorer will receive a Commodore 1541 disc drive after a play off on the final day of the show.

Graham Gouch, captain of England's cricket team will be attending the last day of the show to help launch Audio-genic's new game for the C64, Graham Gouch's Test Cricket. He will be there till 11am to sign autographs and talk about the game.

Also on show for visitors to try will be Tim Love's cricket, Pyjamarama, Everyone's a Wally, International Football and Llamasoft's newest title, Batalyx. There will also be the chance to see the Video Digitizer from Computer-peripherien which produces computer printout portraits through a video camera.

**The 6th Commodore Computer Show, Novotel, London**

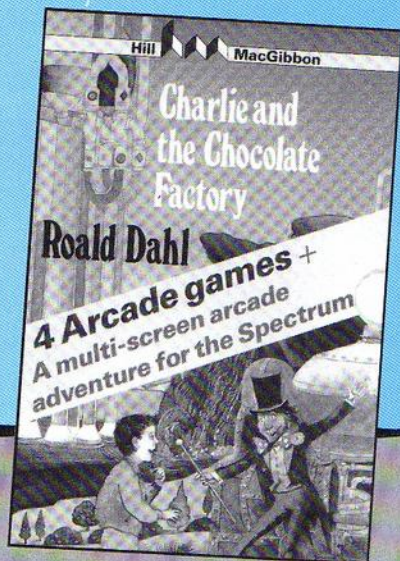
Welwyn Systems, the company which has been marketing Currah Speech synthesizers for the last eight months has recently announced a 50% price cut for the product.

Tony Jude, Welwyn's director of sales says that this is due to quality and customer satisfaction. He commented: "Less than 1% of the 10,000 units we have sold have been returned by customers as unsatisfactory, and it is this and other factors which have enabled us to cut our prices."

**Welwyn Systems, Bedlington, Northumberland NE22 7AA**



Cut price Currah



## A right Charlie

Roald Dahl's Charlie and the Chocolate Factory, originally a book, has been portrayed on stage and screen — and now you can play the game on your computer.

And if you've never read the story, you can buy a special gift pack which includes the book, for £9.95. It makes an attractive present. However, if you're just interested in the game, it can be yours for £8.50.

The game, which runs on the

Spectrum, comprises four fast-moving arcade games as well as a multi-screen arcade adventure set in the chocolate factory.

Hill MacGibbon has worked together with Soft Option to prepare the program. You'll find all your favourite characters there, like Veruca Salt, Violet Beauregarde, Augustus Gloop, Mike Teavee and, of course, Charlie and Willy Wonka.

**Hill MacGibbon, 8 Grafton St, London W1X 3LA**

## Link up

Tymac has produced a printer interface for C64, C16, Commodore Plus 4 and VIC-20 computers.

According to Tymac, the Connection is a fully intelligent parallel interface which plugs into the disc socket so you can select from a wide range of quality printers.

The Connection supports Epson, Gemini 10X, Prowriter, Okidata, NEC and many other popular printers. The Epson version costs £84.95, and the version for all other printers is £79.95.

**Tymac, Unit 78 Standard Way, Gravelly Industrial Park, Tyburn Rd, Birmingham B24 8TL**



WIN A MUG!

**There are 150 cute Gribbly mugs for this week's competition winners and entering couldn't be easier**

Some of you may have been wondering what Gribbly was doing on his day out!

Now the answer can be revealed. He was buying 150 delightful pottery mugs for lucky HCW readers who win this week's competition. These are unique prizes, not available in any shops.

Each mug features a portrait of Gribbly and all you have to do to win one is find the differences between the Gribbly pictures shown below.

Gribbly is a quiet, kind creature who doesn't make too much fuss but has only his bubbles with which to destroy the Topsisies and Seed Pods which bedevil his very existence.

He is trying to rescue the gribblets, future gribblys, but they are hidden around the psi web. This drains Gribbly's psi energy if he touches it. In all, life for Gribbly is far from easy and you are likely to find controlling him taxes your two hands. Just imagine what it is like for Gribbly with only one foot!

Anyone can enter this week's competition and 150 of the special mugs will be sent to our winners by Hewson Consultants who look after Gribbly and all the little gribblets.

**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 Gribbly Competition, Home Computing Weekly, No.1 Golden Square, London W1R 3AB. The closing date is first post on Friday 21 June, 1985.

You may enter as many times

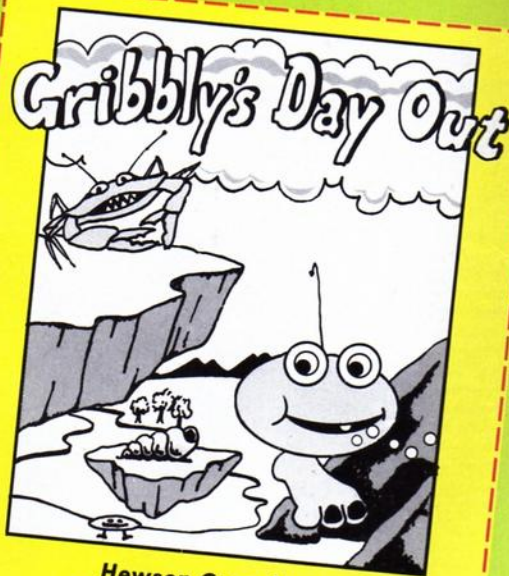
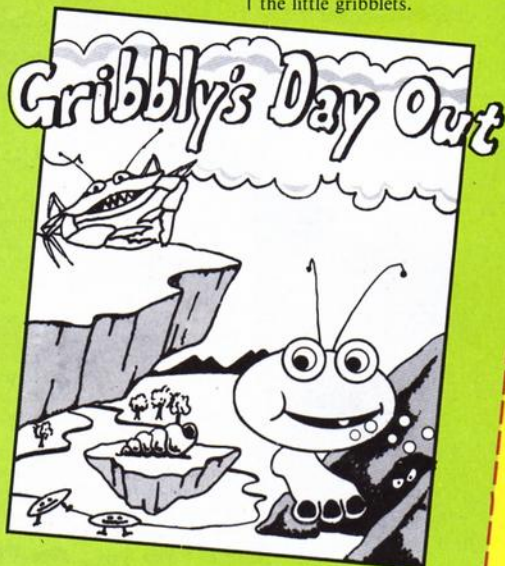
as you wish, but each entry must be on an official coupon — not a copy — and sealed in a separate envelope.

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

**The rules**

Entries will not be accepted from employees of Argus Specialist Publications, Hewson Consultants and Alabaster Passmore & Sons. This restriction also applies to employees' families and agents of the companies.

The How to Enter section forms part of the rules.



**Hewson Consultants  
Gribbly Mug Competition**

Entry Coupon

Name \_\_\_\_\_

Address \_\_\_\_\_

post code \_\_\_\_\_

**Number differences found**

Complete clearly and fully — if you are a winner this will act as a label for your prize. Post to: Hewson Consultants Competition, Home Computing Weekly, No 1 Golden Square, W1R 3AB. Closing date: first post, Friday June 21, 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.





DOMARK

presents

**YOU** as ...



**007**

# **A VIEW TO A KILL**

## **THE COMPUTER GAME**

From 7th June,  
**YOU** will become  
**James Bond**  
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**Spectrum 48K, Commodore 64,**  
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Please debit my CREDIT CARD  Signature:.....

Account No:

Expiry Date: .....



DOMARK

To: Domark Ltd., 204 Worple Road,  
London SW20 8PN  
Telex: 894475 G



## SOFTWARE

**Jammin**

Jammin is a game with a musical theme: help Rankin' Rodney collect his instruments and make beautiful music — well, that's the theory.

The screen is divided into several multi-coloured sections. The four corner ones contain musical instruments, while the four central ones contain triangles. Access from the centre to the corner sections is via one of two escalators of moving coloured squares. You are only allowed to jump on to a square of the escalator which corresponds to the colour of the section in which you are standing.

Having reached a corner section, Rodney avoids the nasty and steps on to the instrument, picks it up and starts one of the central triangles flashing. It is at this point that the bum note which has been drifting around the screen quite harmlessly becomes a nuisance. Allow the note to touch Rodney and the instrument returns to its original position and you must start again.

When you do eventually manage to get an instrument to its appropriate triangle a little man appears and begins to boogie around. I don't quite know what he is supposed to do but on one occasion when I walked through him the program failed to erase him completely, leaving half a man on the screen whilst the rest of him walked off.

The only thing that kept me awake was the monotonous tune which plays incessantly.

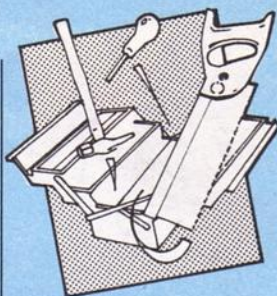
J.R.

Price: £8.95

Publisher: Amsoft

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

AMSTRAD

**Money Manager**

This is a home accounts analysis program. By using it you can record and examine your income and expenditure over the period of a year. You can set up a number of accounts, classify income and expenditure passing through them, then sort them by each attribute above, and in addition by date. You can even establish who spent how much! Output can be to the screen or printer in the form of monthly or yearly accounts, or for a graphic interpretation, a pie or bar chart is shown on the screen.

The program allows you to save updated statistics to tape, though the advice given in the manual contradicts that given by Amstrad, namely, always use new tapes for important data. The manual tries hard to be very clear, but often fails. It isn't good enough to write "here is a fact, it's important, think about it." Ordinary mortals need to be told exactly why, and how the facility can be used to best effect. Similarly, to set the program up to your own spec requires you to wade through to page 11. Sample accounts are provided, but no tutorial as to how to get the best out of them.

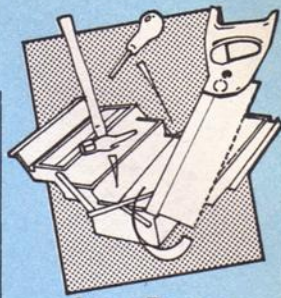
Whilst input is reasonably easy, presentation on screen often falls down with bits of labels missing, and what seemed to be inaccuracy in the bar graphs. Sorting is painfully slow, and internal "garbage collection" makes for frequent machine hang-ups.

Sound idea; more work needed on both program and documentation. D.M.

Publisher: Connect Systems

Address: 3 Flanchford Rd, London W12 9ND

AMSTRAD

**Super Teams**

This disc bears the description "a bio-rhythm analyser for the BBC Micro B" and before we go any further I feel that I should admit to being a great sceptic about such things.

The program has a long introductory sequence giving a full description of its facilities and its basis. This is required for there was no documentation supplied at all. There are even references to books that you might like to consult.

The title refers to the various types of group dynamics that you can analyse using the programs. There are graphs for individuals and numerical data for groups. You can even check up on certain notable dates in history and the rhythms of the people involved.

However, there is little to the program excepting the presentation. It's not much more than the bio-rhythm program supplied with all BBC machines as part of the Welcome package.

There are also a couple of niggles making the package more difficult to use. There is no record of the date taken from program to program. This means that for each rhythm you wish to display you must keep inputting the date. Just a simple line of BASIC could have avoided this.

There is no error message reporting either. If you cause an error then you are sent straight back to the main menu without any explanation.

Overall, this is a specialist package that will appeal to very few. R.S.

Price: £10

Publisher: Gilvale Software

Address: 10 Sidford Close, Hemel Hempstead, Herts HP1 2LF

BBC







## Jump Jet

Combat and flight simulators seem to be in vogue these days. Following Dambusters and Spitfire '40 from US Gold and Mirrorsoft, Jump Jet brings us right up to date with modern flight and warfare techniques.

A vast improvement over Anirog's much earlier flight simulator Flight Path 737, this program puts you behind the controls of a Sea Harrier VTOL. After reading the clearly written instruction manual, the simulator itself is not as daunting as it may at first appear.

Vertical take off and landing is achieved simply by changing the angle of the plane's jet nozzles to vertical, after ensuring the flaps are down. Taking the engines up to full power causes the jet to rise. The screen at this point shows an aerial view of an aircraft carrier deck above a simplified representation of a Harrier's console. As the plane rises the shadow of the jet shrinks on the deck until the screen splits to give a head-on and sidelong view of the carrier with the jet above.

Reducing power at this point allows you to hover over the carrier. Pulling back or pushing the joystick causes the plane's nose to rise or fall and the jet creeps forwards or backwards accordingly. Increasing the height above 50 feet causes the screen to change to a conventional view from the cockpit complete with moving clouds and waves.

Forward motion is achieved by angling the nozzles at 45 degrees. When sufficient forward momentum is achieved, the flaps and undercarriage are raised and the nozzles adjusted to their horizontal position for normal

jet flight.

The console shows all the necessary instruments for fuel, height, speed and power. Additionally, undercarriage, flap and nozzle positions are graphically displayed at the right of the panel, whilst the artificial horizon is at the centre. On the left of the panel is a radar display which shows the location of the carrier and enemy planes, and it can also calculate their range.

By far the most rewarding aspect of this simulator is the ability to choose a target, navigate to intercept and destroy and then to return to the carrier or engage another plane if enough fuel remains. Sounds easy but just try it!

Landing is particularly difficult especially if one of the higher levels of play are chosen. The five levels range from Practice on a calm day to Group Captain in a storm with mountainous seas. The level chosen also determines the number of errors which will be tolerated before resulting in a crash.

The only criticism I have of this game is purely a cosmetic one relating to the console which looks a little overcrowded because of the size of the lettering. Otherwise the graphics are quite good, I especially liked the increase in speed of the clouds and the waves in sympathy with the Harrier's speed.

Although Anirog has used its Voicemaster interface to add speech to the program, the quality of synthesis is deliberately low, but clear, to simulate the pilot's intercom. The voice is totally software driven and will work on any 64.

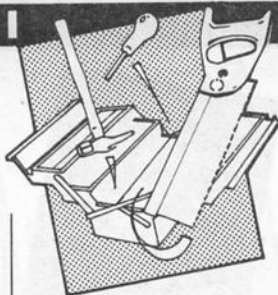
All in all this program is a jump in the right direction for Anirog. **E.D.**

Price: £9.95

Publisher: Anirog

Address: Unit 10, Victoria Trading Estate, Victoria Rd, Dartford, Kent

C64



## The Investment Monitor

As its title suggests, this is a program to help record and analyse investments in various kinds of stocks, shares and bonds. Written in BASIC, but with very well designed screens and input error traps, setting up is helpfully described using plain language in the accompanying documents. Instead of getting bogged down in files, fields and records, the author refers to cards in a card index file, then introduces the notion of automatic calculations where relevant. Demonstration information is included, but not mentioned in the documentation.

Up to 50 separate investments can be catered for, and a menu allows selection of type:—accumulation units, income units, reinvestment units, investment bonds, savings and insurance units, ordinary shares, and gilts. The layout of each card, and the nature of the calculations to be made is automatically tailored by this choice. Details are added in appropriate places on the cards, and when input is complete, you may then choose to review all your investments, or just look at one, update, sell, and amend current values. Analysis allows returns to be calculated overall, or on each type of investment.

Saving of both program and data can be made to either tape or Microdrive, and, if a printer is connected, built in software allows dumping of details, facilities that seemingly more sophisticated programs lack.

Both the documentation and program are crystal clear to use, thus my only reservation is the cost. Those with a use for it, however, will certainly find it worthwhile. **D.M.**

Price: £12

Publisher: Michael Slatford Software

Address: 3 Campden Rd, South Croydon, Surrey CR2 7EQ

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In the tummy, avoid the fried eggs, but collect the greasy bacon for use as a lubricant. I couldn't get any further; ran out of air! But I'm reliably informed that the heart and brain are similarly tricky. Every now and then, you get the chance to zap rampant oxygen molecules thus replenishing your supply.

The graphics are excellent bearing a striking similarity to the real thing. In fact, the whole production is very well done, down to the loading screen, sound, movement and controls. It's a really silly idea, but the humour of the concept and the slick presentation are very appealing.

Just one gripe. This appears to be a conversion from an Electron game. Why can't I zap the dreaded throat frogs or fag packets or fried eggs in this version? **D.M.**

Price: £6.95

Publisher: Icon

Address: 65 High St, Gosforth, Tyne and Wear



### Confuzion

"The fuzion of mind and machine" is the enigmatic slogan that has accompanied Incentive's recent glossy advertising campaign, yet none of the adverts have provided any clue as to the nature of the game. Forever the sceptic, I am always wary of such advertising, but having just spent the past three days playing Confuzion I can confidently say that it is one of the best and most original programs that I have seen on any micro in several years!

The action takes place in a 64 story industrial plant which is involved in the production of confuzion bombs. Each floor is constructed from a series of sliding panels plus one empty section, just like the sliding block puzzles that children play with. Each of the panels contains lengths of fuze wire of differing shapes, wandering around this fuze wire is a brightly glowing spark. Your task is to guide the spark to a bomb by sliding the panels in such a way that they create one continuous length of fuze which leads to the bomb. All of this is carried out in a race against time as the fuze at the top of the screen burns away.

As your ability increases you will encounter multiple bombs and water droplets from the sprinkler system, these droplets also move around the fuze and will dampen your en-fuze-iasm should you inadvertently let one touch the spark.

The whole game is presented with dazzling colour and incredible attention to detail, I cannot recommend this game too highly! **J.R.**

Price: £6.95

Publisher: Incentive

Address: 54, London St, Reading RG1 4SQ



### Strangeloop

This is an arcade adventure game set in a space age robot factory. If you take to this game it will keep you occupied for weeks.

Your objective is to regain control of the robot factory by finding your way to one particular room of the 250 in the complex. The games designers have considerably provided a game save option so you can take overnight breaks. For shorter coffee breaks you can freeze the game as and when required.

As it is an arcade adventure there is no text input to worry about. You move your space person around the screen with the joystick. Any useful items encountered can be pocketed by simply moving over them. Hitting the space bar puts you into pocket mode. This allows you to use and move an item using the joystick.

The screen not only shows you the current room you're in but gives you details of the items in your pocket. There is also a compass which points towards the central room you are trying to get to. In wandering through the various rooms your space suit is likely to get cut by flying metal. The screen shows you how many leaks you have, how many spare patches you have and how much oxygen is left. I found I didn't have much time for repairs though as I was too busy trying not to fall into dissolving baths of chemicals and avoiding other bits of nasty machinery.

The design of the rooms is quite original and generally the game has good graphics. Only the price of the game makes it a debatable buy. **L.C.**

Price: £8.95

Publisher: Virgin

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



### Kikstart

This is an off-road biking game where you do wheelies and jump over obstacles. There are eight courses to choose from, and a game consists of your choice of any three from the eight. A rather unique feature is that two people can compete simultaneously.

The program opens with some amusing credits and you choose your mode of play, that is, one or two players and one or two joysticks. Choose your three courses and you're off. The screen is split into two, a half for each player. The joystick, or keyboard, allows you to accelerate, jump and do wheelies as required, though the outcome is not always as required. I kept on falling off my bike after attempting jumps over buses etc.

The art apparently is to go fast over tyres, hedges and rows of barrels, to jump over the water, vans and buses but to go slow at brickwalls and gates.

Being a coward at heart I quite enjoyed racing round these courses crashing and falling off without really injuring myself. Also I didn't have the bother of having to clean the bike afterwards. This game is interesting and entertaining because its theme is different. The graphics are good and the two player facility means you don't have to take it in turns.

At the price I think this is very good value and is the sort you're likely to come back to again and again. **L.C.**

Price: £1.99

Publisher: Mastertronic

Address: Park Lorne, 111 Park Rd, London NW8 7JL

SPECTRUM



AMSTRAD



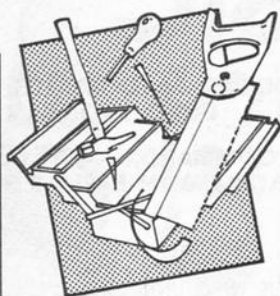
C64



C64







**Numbers at Work**

This package, part of Collins' Brainpower series, is a two disc and manual set. It can also be purchased as a twin cassette and manual pack. The aim of the series is to teach new skills and then to show the user how to apply the skills learned.

The manual suggests three different approaches to using the package. The first is to jump straight in and use the teaching program or as an alternative you could sit and read the textbook to learn how the teaching process works. The third option is to go directly to the applications program and use it to help you solve your own problems.

The teaching program is comprised of eight sections each with an optional timer — so you can see if your responses are getting better — and a progress target. The latter sets a target for you to attain in the test section before moving on to a new lesson. The subjects taught are working with fractions, ratios and proportions, decimals and percentages, applying percentages, growth rates and indices and a final section on useful techniques.

Each section is easy to use for the absolute beginner or for anyone wishing to revise a particular subject. The application program is equally easy and helps solve your problems quickly.

It's only drawback is the price. **M.W.**

**Price:** £24.95 (disc)

**Publisher:** Collins Soft

**Address:** 8 Grafton St, London W1E 7JZ



**Chopper**

Chopper is a shoot-'em-up game with you piloting a helicopter. The game loads up with a menu screen. From this screen you can obtain instructions about the four phases of the game, the high scores, and set the skills level. Unfortunately once I left this screen I could find no way back.

At the end of a game, no more lives, the game restarted. I wanted to re-read the instructions and change the skills level. This meant switching the computer off and reloading the game.

The opening screen has you flying past enemy choppers. You have to shoot them down and avoid their fire. If you are successful you are taken to the refuelling screen. Careful positioning of your chopper allows you to refuel in flight from a tanker plane. Another screen presents you with fast moving enemy balloons and geese. If you manage to survive all this you eventually get through to a screen where you have to shoot through a shield in the rocks and destroy the underground enemy power station.

During the game the screen shows your score to date, your remaining lives, highest score, and skill level. The graphics aren't bad but not outstanding. The game itself though didn't grab me, it wasn't different enough from other shoot or be shot games. On the other hand the game is reasonably priced so if you have a yen for chopper flying it might appeal. Of course all pilots must learn somewhere, sometime so the relative simplicity of this game makes it suitable for the younger tyro. **L.C.**

**Price:** £2.50

**Publisher:** Creative Sparks

**Address:** 296 Farnborough Rd, Farnborough, Hants



**Flip!**

This game is being introduced as a cartoon strategy game and you can be forgiven for thinking that's an original idea. In fact it involves matching pairs of animated graphics to reveal a hidden word.

Its main virtue is in the many new features of the game that make it fairly absorbing. Firstly you are given the choice of normal words, user words, computer words or the more difficult scrambled words. You can choose the two player game or the solo practice option.

The main screen is a grid filled with boxes and an arrow which is controlled smoothly from the keyboard. Choose two boxes which are revealed and memorise them. The number of tries you have is recorded.

The cartoons are block graphic animations which take their theme from computer games like Ghostbusters, TV series like Z Cars, and one or two nursery themes like the jack in the box. Each is accompanied by its own theme tune with the pairs complimenting each other.

Wild guesses are greeted with a suitable remark and correct answers, rewarded.

The words were quite difficult to guess, even with many of the blocks revealed. The competitive element is therefore keen and the two player game is preferable.

I enjoyed it and I imagine the user-defined words could add a further dimension. It's really a game for concerned parents as it's simple to operate by young children with lots of visual excitement. It could also be used in schools for juniors up to 10. **M.P.**

**Price:** £7.95

**Publisher:** Icon Software

**Address:** 65 High St, Gosforth, Tyne & Wear



**Quackshot**

This is a budget game, set in a toy factory in which you are the night watchman. Making your routine inspection, you discover the toys having a go at you, so naturally, you blast back with your stun gun and duck buster bombs. Well, you would, wouldn't you? On you go blasting and bombing, collecting keys to gain access to other areas shown on an overhead scanner, in what is effectively a complex and extensive maze.

Graphically, rather good, with smooth movement and some animation, the sprites are flicker free, but in one colour. Joysticks are catered for but I couldn't get the bombs to work, and response to the fire button was very slow and inaccurate. Hi-score and demo modes are here, though the existing entries in the score table are so high that I didn't discover it for a while. There are modest sound effects, but I found them rather irritating.

Given the difficulty in control, after 10 minutes play, I watched the demo mode to see what was in store. There's certainly plenty here to challenge you of ever increasing complexity.

Even though this is very good value, I wouldn't buy it myself. The plot didn't grab me, and thus I didn't feel compelled to continue. You may well disagree. **D.M.**

**Price:** £2.50

**Publisher:** Creative Sparks

**Address:** Thomson Hse, 296 Farnborough Rd, Farnborough Hants

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# A PAIR OF INTERFACES

*Cliff Joseph has put his joystick into action to bring you the lowdown on interfaces*

Two new interfaces have joined the merry throng already available for the zap-happy Spectrum owner, both of which are Kempston compatible and can therefore be used with the vast majority of games available for the Spectrum.

The Ram Interface Mark 2 is a neat, fairly slim unit, matt black and featureless except for the actual joystick socket, and when plugged into the Spectrum's rear port stands vertically, at right angles to the machine. It's quite light, rattles a bit, and doesn't seem to be as robust as some other interfaces. There were no instructions with it, and although it might seem obvious how to plug it in, there should be a warning to remind the user to have the Spectrum's power supply disconnected before plugging in or unplugging the interface.

When plugged into the Spectrum the MK2 tends to wobble a bit, not so much that it puts a strain on the edge connector, but I personally would prefer it to fit a little more snugly. A look at the base reveals that the pins running from the edge connector into the body of the interface are exposed and look very vulnerable. I know that in 'normal use' this shouldn't really matter, but this could well affect its long term reliability, since it might only take a slight knock to damage one of the pins and make the interface useless.

Unlike the edge connector, the joystick socket was a very snug fit. The first game I played crashed, and, when reloaded, sometimes failed to respond to the joystick. I checked that the joystick was firmly plugged into the interface to make sure that a loose connection was not responsible for the crash, and it seemed to be firmly in place, but only after giving the joystick's plug a pretty hefty shove into the socket did the game respond properly. Once that was done the MK2 performed perfectly well, but though I can't criticise its responsiveness my doubts about the standard of construction remain.

The Interstate 31 from Bud

computers seems a more well designed unit. When connected to the Spectrum, it lies horizontally, with the socket, rapid-fire switch, and power on/off indicator facing upwards. It feels more robust than the Mk2, and with the Interstate logo and other features on the face, also looks more attractive. However, the interface doesn't quite lie flush with whatever surface the Spectrum is on, so that any pressure on the interface (fiddling with the joystick socket, for example) can cause it to wobble just a bit. And, here too, the edge connector pins are exposed for a small fraction of their length (though considerably less so than on the Mk2). Admittedly, I am nit-picking here, as these details aren't really major criticisms, but are the only flaws in an otherwise well designed unit. Even so, they are details that could be eliminated altogether — my Stonechip interface fits like a glove, and has the edge connector completely protected by a thick plastic sleeve.

The Interstate 31 does have one feature that I haven't yet mentioned, and which goes a long way to overcoming these other minor criticisms. Sitting on the face of the unit is a little grey reset button, and when you consider that a reset switch could cost up to five pounds on its own, the inclusion of such a feature is not only a very good idea (saving wear and tear on the power socket), but also represents good value. In fact, I found it so convenient to have a reset button that I've been leaving the interface plugged in even when I'm not using a joystick.

Once I'd finished prodding and rattling them and actually got down to some serious game playing, both interfaces performed well, although the Mk2 did initially have the problems that I mentioned earlier. I tried both interfaces with a couple of shoot-em-ups and they gave good, fast responses to the joystick as I pounded away at it. The auto fire option on both units proved handy, though I found that on some games, such as Firebird's Don't Panic, it

was actually better to have the Interstate's auto fire option switched off for some reason.

When using either joystick with games such as Knight Lore, which require delicate manoeuvring rather than a fast trigger, I found that you do have to be careful, when moving the joystick to differential movements and simple up/down/left/right movements or you will find that the Sabre Man goes wandering off on his own occasionally.

On responsiveness, I'd say that both interfaces performed equally well, however the construction of the Mk2 is definitely inferior to that of the Interstate 31, so if I had to choose between them I'd definitely go for the Interstate — but of course this is the more expensive of the two so, as always, you get what you pay for.

## Ram Mk2

**Price:** £9.95

**Manufacturer:** Ram Electronics

**Address:** 106 Fleet Rd, Fleet, Hants GU13 8PA

**SPECTRUM**



## Interstate 31

**Price:** £11.95

**Manufacturer:** Bud Computers

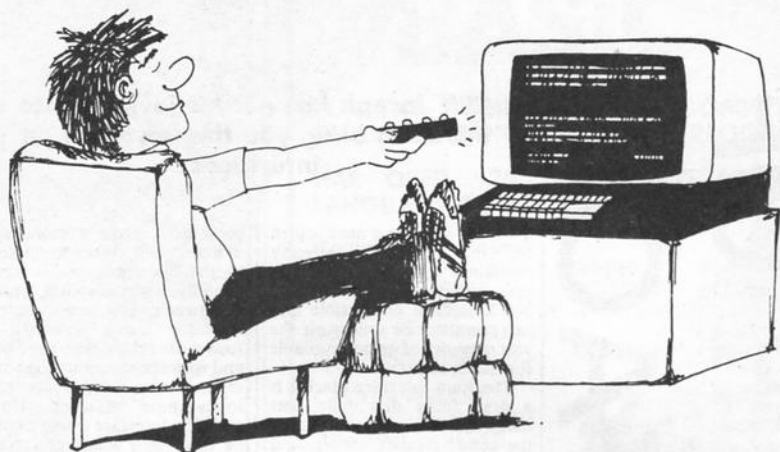
**Address:** 11 Newarke St, Leicester LE1 5SS

**SPECTRUM**





# MACHINE CODE — THE EASY WAY



**In the first of an exciting new series, David Ellis leads you gently into machine code programming**

#### What is machine code?

Machine code is just a list of numbers that the micro-processor is able to decode, and perform various functions as a direct result. The Z80 chip handles numbers eight bits (one byte) in width — so these numbers will be in the range from 0 to 255. The following list of numbers of therefore an actual Z80 machine code program:

```
6 0 205 77 188 201
```

Each number will occupy one memory location, therefore this program will be stored in six sequential (one after the other) memory locations.

#### What do the numbers stand for?

Some of the numbers are instructions to tell the Z80 what action to take. Others are part of addresses and data that are required by the program. The number 77 in the above program is actually part of an address, but in another program it may be an ASCII character 'M', or some form of data, or an actual instruction — 77 is the instruction to load the C register of the Z80 with the contents of the L register.

#### How does the chip know what the number stands for?

The answer is simple — it *doesn't!*

The only thing it does know is that the first number is an instruction. It is the programmer's responsibility to make sure that the numbers are presented to the Z80 in the correct order.

In the above program for example, the number 6 tells the Z80 to load the B register with the following number — in this case 0. The number 205 tells the Z80 to make a CALL to the subroutine, the address of which is given in the next two numbers ( $188 \times 256 + 77 = 48205$ ). The last number 201 is the instruction to RETURN from subroutine, which if the program had been CALLED from BASIC would return you back to BASIC.

If by some error the zero had been omitted, then the B register would get loaded with the value of 205, 77 would become the next instruction, which loads the C register with the L register. This instruction only requires the one byte, so 188 would be taken as the next instruction. This compares the contents of the Accumulator register with the H register. This is also a one byte instruction so the next instruction is 201 which RETURNS us back to BASIC.

As you can see, omitting the one number has caused the Z80 to perform very differently from the original intention. In this case we've been lucky as the program has returned to BASIC even though the program has not performed properly. In most cases, if you make a mistake, you won't be so lucky — a program *crash* is more likely!

#### But what about the error messages?

Sorry — but you don't get any in machine code!

#### So how do I know when there's an error?

Quite simply you *don't!* The program will probably *crash!*

#### Do these crashes damage the computer?

No. It may take a few seconds to cool off, but no damage will be done. Unless of course you lose your temper!

#### Will an assembler help?

An assembler program will help reduce errors as it does check for various errors, although many of these will be concerned with the actual syntax of the assembler, and not the logic of the program itself. Just because the assembler compiles the machine code without error is no guarantee that the program itself will work.

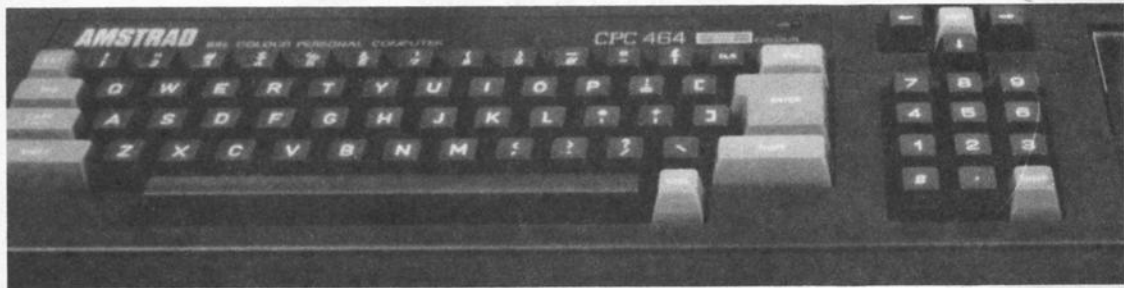
#### Do I need to buy an assembler to program in machine code?

No. For short programs, hand assembling is quite satisfactory. For longer programs an assembler is desirable, but not essential. An assembler will save you the trouble of looking up all the Z80 operation codes (and there are a lot!) and of working out the various displacements for the jumps. If you're well organised though, and follow a structured approach to the programs (by using sub-routines) hand assembling is quite in order.

#### How much quicker is machine code compared to BASIC?

It's difficult to say really. A lot





depends on how efficient the BASIC on your computer is, and on the type of program. As a rough guide though, it will be from 100 to 1000 times quicker. Machine code will also use up a lot less memory than BASIC as well, although this is probably of less importance now than it used to be when the largest RAM size on a home micro was 16K.

### Are there any other advantages?

Yes. With a machine code program it's possible to work out the exact time it will take for the program, or part of the

program, to run.

This may be as small as a microsecond, or even smaller, depending on the "clock" speed of the processor. This clock speed is usually given in MHz, which stands for mega herts. Mega stands for one million and hertz is one-cycle per second. One Z80 machine code instruction will take, on average, about 10 cycles. In theory, 400,000 instructions could therefore be performed in one second.

Mainframe computers will run considerably quicker than this, and the timings will be in nanoseconds. One thousand

nanoseconds are equal to one microsecond.

### Do I need to learn binary and hexadecimal?

Contrary to popular belief, a knowledge of the binary and hexadecimal number systems is not essential to be able to program in machine code. In fact, quite useful programs can be written without any knowledge whatsoever of these two number systems. However, it's rather like spending £20,000 on an electric organ and then only using one finger to play it — a lot of potential is going to

waste! Sooner or later, you really will have to learn them.

### Is it difficult to learn machine code?

In theory, the basics of machine code programming are quite simple. Being forced to learn binary and hexadecimal and being instructed how to do sums in machine code (as do many tutorial books) right from the beginning will probably put you off for life!

Follow the series in HCW over the next few weeks on the Amstrad CPC464 using the Z80, and see how simple it all is.

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# GUNBOAT



*Can you calculate the angle and velocity to sink the enemy? David Muir's game will have you trying*

In this game you control the armory of one of the two facing gunboats.

You have the option to move your boat, fire shells and alter the velocity of the shell. Your enemy is controlled by the computer and fires, moves and changes its velocity at random.

The program uses the following formulae to calculate the parabolic motion of the projectiles:

$$x \text{ (horizontal displacement)} = \text{start velocity} * \text{time} * \cos(\text{angle of fire})$$

$$y \text{ (vertical displacement)} = \text{start velocity} * \text{time} * \sin(\text{angle of fire}) - \text{time} * \text{time} * \text{gravity}/2$$

The angle of fire is set, by the program, to 30 degrees. Rather than have time appearing in the formulae they have been compounded into one complex formula.

When a shell is fired it moves horizontally one column at a time, the vertical position of a shell is calculated, the old position is erased and the shell printed in the new position.

The program contains title page, instructions and a large number of REM statements so that you can follow its working. Control can be via either cursor keys or joystick.

### Variables

**pv** muzzle velocity player gun  
**cv** muzzle velocity computer gun  
**sc** score  
**pli** player lives left  
**cli** computer lives left  
**bo** number of computer boats sunk  
**mS(1,1)** strings to print boats  
**nx** player boat position  
**cx** computer boat position  
**binc** amount computer boat can move  
**num** record of computer boat movement steps  
**dir** direction of movement of computer boat  
**bmK** flag to show computer boat moving  
**csx,csy** new position computer projectile  
**psx,psy** new position player



**projectile**  
**ocmx,ocmy** old position computer projectile  
**opmx,opmy** old position player projectile  
**bx,by** displacement of computer projectile from initial position  
**ax,ay** displacement of player projectile from initial position  
**cr** adjustment to computer gun range for next firing  
**r** changing ink colour for hit boat  
**bb** dummy argument for Defined Function

### How it works

#### Used Defined Functions

**FNsa** calculated the vertical position of the player's projectile  
**FNsc** calculates the vertical position of the computer's projectile  
**FNc** converts a text horizontal position into graphic coordinate so that TEST may be used to check if a boat has been hit by a shell  
**FNf** converts text vertical position into a graphic coordinate





```

10 *-GUNBOATS-
20 *D.MUIR *84
30 GOTO 1310
40 *
50 * set up
60 *
70 MODE 1
80 BORDER 13
90 DEFINT a-r:DEFSTR t-z
100 DEF FNsa=ax*TAN(PI/6)-(((ax*ax)/(pv*pv*COS(PI/6)*COS(PI/6)))^2*16)
110 DEF FNsc=bx*TAN(PI/6)-(((bx*bx)/(cv*cv*COS(PI/6)*COS(PI/6)))^2*16)
120 DEF FNe(bb)=(bb-1)*16+6:DEF FNf(bb)=(25-bb)*16+7
130 SYMBOL 255,3,7,14,28,56,44,36,24
140 SYMBOL 254,192,224,112,56,28,52,36,24

```



# P R O G R A M

```

150 SYMBOL 253,255,255,255,255,127,127,63,15
160 SYMBOL 252,255,255,255,255,254,254,252,240
170 DIM m$(1,1)
180 m$(0,0)=" "+CHR$(141)+CHR$(255)+" "
190 m$(0,1)=" "+CHR$(253)+CHR$(143)+CHR$(252)+" "
200 m$(1,0)=" "+CHR$(254)+CHR$(142)+" "
210 m$(1,1)=m$(0,1)
220 INK 0,23:INK 1,12:INK 2,9:INK 3,6
230 CLS
240 WINDOW #1,1,40,20,25:PAPER #1,2:PEN #1,0:CLS #1
250 WINDOW #2,10,20,21,21:PAPER #2,0:PEN #2,2:CLS #2
260 WINDOW #3,10,20,22,22:PAPER #3,0:PEN #3,2:CLS #3
270 WINDOW #4,10,20,23,23:PAPER #4,0:PEN #4,2:CLS #4
280 WINDOW #5,25,35,21,21:PAPER #5,0:PEN #5,2:CLS #5
290 WINDOW #6,25,35,23,23:PAPER #6,0:PEN #6,2:CLS #6
300 WINDOW #7,10,20,24,24:PAPER #7,0:PEN #7,2:CLS #7
310 PEN 1
320 FOR i=0 TO 1:PEN 1:LOCATE 5,18+i:PRINT m$(0,i);PEN 3:LOCATE 29,18+i:PRINT m
$(1,i);NEXT
330 nx=5:bin=0:bm=0:cx=29:num=0:pfk=0:cv=25:score=0:pli=5:pv=25:cli=3:cr=0:bo=
0
340 LOCATE #1,1,2:PRINT #1,"VELOCITY"
350 PRINT #1,"SCORE"
360 PRINT #1,"LIVES"
370 PRINT #1,"BOATS"
380 GOSUB 770:GOSUB 780:GOSUB 790:GOSUB 800:GOSUB 810:GOSUB 820
390 '
400 ' player decision
410 '
420 EVERY 350,3 GOSUB 960
430 EVERY 200,2 GOSUB 690
440 EVERY 40,1 GOSUB 610
450 IF lck THEN lck=0:FOR i=1 TO 5000:NEXT:GOTO 420
460 IF k1 THEN 1260
470 EI:DI
480 IF INKEY(74)=0 OR INKEY(8)=0 THEN nx=nx-1-1*(nx=1):GOSUB 570:GOTO 450
490 IF INKEY(75)=0 OR INKEY(1)=0 THEN nx=nx+1+1*(nx=15):GOSUB 570:GOTO 450
500 IF INKEY(72)=0 OR INKEY(0)=0 THEN pv=pv+1+1*(pv>30):GOSUB 770:GOTO 450
510 IF INKEY(73)=0 OR INKEY(2)=0 THEN pv=pv-1-1*(pv<20):GOSUB 770:GOTO 450
520 IF INKEY(76)=0 OR INKEY(9)=0 THEN GOSUB 860:GOTO 450
530 FOR i=1 TO 50:NEXT:GOTO 450
540 '
550 ' /print player new position
560 '
570 PEN 1:FOR i=0 TO 1:LOCATE nx,18+i:PRINT m$(0,i);NEXT:RETURN
580 '
590 ' computer boat move
600 '
610 DI:IF NOT bm THEN EI:RETURN
620 num=num+1:IF num>bin THEN bm=0:num=0:EI:RETURN
630 IF cx+dir>35 OR cx+dir<21 THEN bm=0:num=0:EI:RETURN
640 cx=cx+dir
650 PEN 3:FOR i=0 TO 1:LOCATE cx,18+i:PRINT m$(1,i);NEXT:EI:RETURN
660 '
670 ' set computer boat move
680 '
690 DI:IF bm THEN EI:RETURN
700 bm=-1
710 dir=INT(RND*2)*2-1
720 bin=4+INT(RND*8)
730 EI:RETURN
740 '
750 'update scoreboards subroutines
760 '
770 CLS #2:PRINT #2,pv;:RETURN
780 CLS #3:PRINT #3,sc;:RETURN
790 CLS #4:PRINT #4,pli;:RETURN
800 CLS #6:PRINT #6,cli;:RETURN

```



```

P                                     R                                     M
810 CLS #5:PRINT #5,cv;:RETURN
820 CLS #7:PRINT #7,bo;:RETURN
830 '
840 ' player fire
850 '
860 psx=nx+5;psy=17:PEN 2:LOCATE psx,psy:PRINT CHR$(144);:opmx=psx:opmy=psy:ax=0
870 SOUND 7,500,10,4,0,0,5
880 ax=ax+1:ay=FNsa:SOUND 7,35-ay,15
890 IF psy-ay>19 OR psx+ax>40 THEN LOCATE opmx,opmy:PRINT " ";:RETURN
900 IF TEST(FNe(psx+ax),FNf(psy-ay))=3 THEN LOCATE opmx,opmy:PRINT " ";:GOSUB 11
910:RETURN
920 LOCATE opmx,opmy:PRINT " ";:opmx=psx+ax:opmy=psy-ay:LOCATE opmx,opmy:PRINT C
HR$(144);
930 GOTO 880
940 '
950 ' computer fire
960 DI:csx=cx:csy=17:PEN 2:LOCATE csx,csy:PRINT CHR$(144);:ocmx=csx:ocmy=csy:bx=
0
970 cv=cv+2*(cr-(cv<20)+(cv>30))
980 GOSUB 810
990 SOUND 7,500,10,4,0,0,5
1000 bx=bx+1:by=FNsc:SOUND 7,35-by,15
1010 IF csy-by>19 OR csx-bx<1 THEN cr=SGN(csx-bx-nx):LOCATE ocmx,ocmy:PRINT " ";
:EI:RETURN
1020 IF TEST(FNe(csx-bx),FNf(csy-by))=1 THEN LOCATE ocmx,ocmy:PRINT " ";:GOSUB 1
080:cr=0:EI:RETURN
1030 LOCATE ocmx,ocmy:PRINT " ";:ocmx=csx-bx:ocmy=csy-by:LOCATE ocmx,ocmy:PRINT
CHR$(144);
1040 GOTO 1000
1050 '
1060 'player boat hit
1070 '
1080 SOUND 7,900,50,7,0,0,7:r=12:FOR i=1 TO 10:r=15-r:INK 1,r:FOR j=1 TO 20:NEXT
:EXT
1090 pli=pli-1:IF pli=0 THEN k1=-1
1100 GOSUB 790:RETURN
1110 '
1120 'computer boat hit
1130 '
1140 SOUND 7,900,50,7,0,0,7:r=6:FOR i=1 TO 10:r=6-r:INK 3,r:FOR j=1 TO 20:NEXT:N
EXT
1150 cli=cli-1:sc=sc+10-90*(cli=0):GOSUB 800:GOSUB 780
1160 IF cli>0 THEN RETURN
1170 pli=pli+1:GOSUB 790:cli=3:bo=bo+1:GOSUB 820
1180 FOR i=0 TO 1:LOCATE cx,18+i:PRINT " ";:NEXT:cx=29
1190 i=REMAIN(1):i=REMAIN(2):i=REMAIN(3):FOR i=1 TO 5:SOUND 7,700+i*50,50,i+2:NE
XT:FOR i=1 TO 1000:NEXT
1200 GOSUB 800
1210 PEN 3:FOR i=0 TO 1:LOCATE 29,18+i:PRINT m$(1,i);:NEXT
1220 lck=-1:RETURN
1230 '
1240 ' end of game
1250 '
1260 MODE 0:INK 1,12,24:INK 0,1:PAPER 0:PEN 1:PRINT " YOUR FINAL SCORE":PRINT:P
RINT " ";sc:PRINT:PRINT " ANOTHER 60 ?"
1270 IF INKEY(46)=0 THEN END ELSE IF INKEY(43)=0 THEN RUN 70 ELSE 1270
1280 '
1290 ' titles
1300 '
1310 MODE 0:INK 1,12,24:INK 0,1:PEN 1:PAPER 0:CLS
1320 LOCATE 1,11
1330 PRINT " ";CHR$(143);CHR$(143);CHR$(133);CHR$(133);CHR$(133);CHR$(138);CHR$(138);CHR$(
215);CHR$(133);CHR$(135);CHR$(215);CHR$(138);CHR$(143);CHR$(133);CHR$(214);CHR$(
215);CHR$(138);CHR$(143);CHR$(138)
1340 PRINT " ";CHR$(133);" ";CHR$(133);CHR$(138);CHR$(138);CHR$(213);CHR$(133);
CHR$(141);CHR$(212);CHR$(138);" ";CHR$(133);CHR$(133);CHR$(138);" ";CHR$(133);CH
R$(136)

```



```

1350 PRINT " ";CHR$(133);CHR$(213);CHR$(133);CHR$(133);CHR$(138);CHR$(138);" ";
CHR$(135);CHR$(215);CHR$(138);" ";CHR$(133);CHR$(143);CHR$(143);" ";CHR$(133)
1360 PRINT " ";CHR$(143);CHR$(143);CHR$(133);CHR$(213);CHR$(212);" ";CHR$(141)
;CHR$(212);CHR$(138);CHR$(143);CHR$(133);CHR$(133);CHR$(138)
1370 FOR i=1 TO 7: SOUND 7,50,i*10,i:FOR j=1 TO 50:NEXT: NEXT
1380 FOR i=1 TO 2000:NEXT
1390 CLS:PRINT "INSTRUCTIONS?"
1400 IF INKEY(46)=0 THEN RUN 70 ELSE IF INKEY(43)<>0 THEN 1400
1410 '
1420 ' instructions
1430 '
1440 MODE 1:INK 0,24:INK 1,1:CLS
1450 PRINT "INSTRUCTIONS":PRINT:PRINT "You control the gunboat on the left of":P
RINT "the screen; the computer that on the":PRINT "right.":PRINT:PRINT "Horizont
al joystick or cursor movement":PRINT "moves your ship."
1460 PRINT:PRINT "Vertical joystick or cursor movement":PRINT "raises and lowers
the muzzle velocity":PRINT "of your gun.":PRINT:PRINT "Use the fire button or c
opy key to shoot":PRINT
1470 PRINT "You have 5 lives and each enemy gunboat":PRINT "has three. You scor
e 10 points for":PRINT "each hit. 3 hits and you score 100 and":PRINT "gain an
extra life. Then a new enemy":PRINT "appears":PRINT
1480 PRINT:PRINT "(PRESS ANY KEY)":
1490 CALL &BB03
1500 u$=INKEY$:IF u$="" THEN 1500 ELSE RUN 70
    
```



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### Loading

To load type:

```
LOAD*(DESIGNER)7,1)
      (press ENTER)
```

To run type:

```
SYS 16384
      (press ENTER)
```

This program requires a joystick plugged into port two.

If the computer has just been switched on or you haven't loaded a character set the bottom of the screen will contain garbage, both in the character set itself and in the space above. The six lines above the set are all spaces (character 32). You can rid yourself of this unsightly mess by redefining character 32 to be totally devoid of "set" pixels and thus a genuine empty space. Alternatively you could copy one of the Commodore sets or load a previously saved set.

If at any time you return to BASIC by hitting RUN/STOP and RESTORE the program can be restarted without loss of data using SYS 156384.

If you wish to have a small BASIC program in memory at the same time as Character Designer, after loading Character Designer type:

```
POKE 52,15:POKE 56,
15:NEW
```

to lower the top of memory to 3840 then load your program and enter

```
SYS 16384
```

This extremely powerful piece of professional software allows you to edit up to four individual character sets containing 256 characters each — a total of 1024 characters — in memory simultaneously. The use of raster interrupt techniques enables the entire character set to be redefined without affecting the main screen display.

With most character designers if you redefine your alphabet to look like, say, Space Invaders the on-screen prompts will turn to Space Invaders too! Not so with Character Designer!

Although designed for the professional user Character Designer is extremely user-friendly and suitable for anyone who is willing to spend a little time reading this manual to familiarise him- or herself with the scope of commands. All

commands are entered with a single keypress, or via the joystick, and a help screen is available displaying the options.

The program is written in 100% machine code and occupies only 5K of memory including the HLP screen. It also includes a screen designer enabling you to see the characters in combination on-screen or to design a screen for use in a BASIC or machine code program.

### Concepts

#### Character sets

On the Commodore 64 all graphics are handled by the dedicated VIC II chip. One drawback of this chip is that it can only look at 16K of memory at a time. This 16K needs to contain all of the data for the character set(s), sprites and the screen data. (See Memory Map).

If a screen is drawn in hi-res mode, 9K of memory is used in total out of the 16K available, which is why most commercial programs tend to use a character mode, but instead of being letters these are redefined to make up a small part of the picture and are then placed together on the screen.

To define such characters without the aid of a utility such as Character Designer involves sketching your design on graph paper, testing your binary arithmetic, converting the sketches to data, typing in endless lists of data statements and then finally running a BASIC program to POKE the characters into memory.

Character Designer enables you to use the TV screen or monitor instead of graph paper, then it does all of the calculations and POKEing to memory. The data is saved to tape or disc as a block of memory which can be loaded from within a BASIC program or as part of a machine code program eliminating the time-consuming use of DATA statements.

Character Designer enables you to work on 1024 characters in memory at the same time. These are divided into four sets of 256 characters, each occupying 2K of memory. Your program can use any of these sets instead of the Commodore sets and even switch between sets during a program with a simple POKE (see Switching

Character Sets).

You could redefine the alphabet to give you, say, gothic script or italics or even a futuristic character set for use in your latest space epic. Or maybe by defining blocks of characters as walls, trees etc, you can create amazing backgrounds over which sprites can do battle, or whatever it is sprites care to do! At the risk of sounding clichéd the only limit is your imagination!

#### Colour table

One method often used in commercial software to save time and memory and help simplify programming in multi-screen games is to allocate a colour to each character. This method is used by Character Designer.

The character designer section allows you to set the colour of each character. This colour is stored in a 256-byte table (one byte for each character in the set) and is primarily used by the screen designer when printing a character.

As with the character set the colour table can be saved to tape or disc and loaded again for use in your own program.

#### Banking the VIC chip

As mentioned earlier, the VIC II chip can only look at 16K of memory at a time. It usually uses the first 16K of memory. This can cause problems as any character sets or sprites limit the amount of memory available to BASIC.

One solution to this is to move the VIC chip to a different location. The only 16K that is completely free is that from 16384 to 32767.

This is done using the following commands:

```
POKE 56578, PEEK (56578)
OR 3
POKE 56576, (PEEK(56576)
AND 252) OR 2
```

Now all of the character sets, sprite data, and screen locations will need to have 16384 added to their addresses. The program in the section Moving Blocks of Memory can be used to move the character sets. (See also Programmer's Reference Guide pp 101—102).

#### Example sets

Included in the package are two

example character sets. The first, ADVENT.SET is a "gothic"-style alphabet together with some characters to make up a picture of the type seen in many graphic adventures. This loads into the designer at SET 5. The associated colour table and screen are called ADVENT.CLR and ADVENT.SCR respectively. For this set multi-colour mode needs to be on and the multi-colours should be light grey and mid grey.

The second example, which loads at SET 6, is a double-sized alphabet that could be used in an educational program along with a picture of a cuddly toy. The files are called TEDDY.

SET, TEDDY.CLR and TEDDY.SCR. To see the picture properly, multi-colour mode has to be switched off. A rather challenging exercise might be to write a program to convert an ASCII string to these double height characters and PRINT or POKE them to the screen.

### Bibliography

There are many, many books on the market about the Commodore 64, especially concerning graphics. There is one which is absolutely essential and has been referred to throughout this manual: the Commodore 64 Reference Guide, published by Commodore.

### Using the character designer Screen layout

- 1 Grid on which an 8 x 8 pixel character can be edited
- 2 Character set: the current set of 256 characters
- 3 Cursor indicating character being edited
- 4 Character being edited, displayed along with its "POKE code"
- 5 Mode indicates current process. Should read EDIT or SELECT
- 6 Current set, numbered from 4 to 7
- 7 Multi-colour indicator — reads ON or OFF. The coloured figures show the selected multi-colours

As mentioned in the section on loading, Character Designer is run by typing SYS16384. If the computer has just been



switched on or you haven't loaded a character set the bottom of the screen will contain garbage, both in the character set itself and in the space above. The six lines above the set all contain "spaces" (i.e. character 32). When you run Character Designer the screen will appear full of unsightly garbage. Clearing character 32 of any set pixels (making it a true empty space) will clear the top six lines and loading a Commodore character set or one of your own will make sense out of the bottom lines.

### Memory map

The diagram below shows how Character Designer is located in RAM along with the character sets, colour table etc.

		Hex	Decimal
(1K bytes)	Designed screen	\$6400	25600
		\$5500	21760
(256 bytes)	Colour table	\$5400	21504
	Help screen	\$5000	20480
Program loads here (5K)	Program	\$4000	16384
Redefinable character sets (2K each)	Set 7	\$3800	14336
	Set 6	\$3000	12288
	Set 5	\$2800	10240
	Set 4	\$2000	8192
Commodore character generator ROM image not redefinable (4K bytes)	Set 3	\$1800	6144
	CBM 1/c u/c	\$1000	4096
(64K bytes)	Cursor sprite	\$0FC0	4032

(See also Programmer's Reference Guide pp 104-105)

### Select Mode

This is the mode of the designer when first run, allowing you to move quickly to any character. Using the joystick in port two the character to be edited, indicated by the flashing cursor, can be selected from the current character set. The cursor can be moved in all four directions. When the fire button or any key is pressed the designer goes into EDIT mode.

### Edit mode

Once your chosen character has been selected and button or key pressed you will be in EDIT mode. As suggested by the name, all editing commands are entered in this mode. The most

important function is the ability to turn on or off individual dots on the grid, which correspond to pixels of the character. The purple filled circles indicate "on" pixels whilst the green hollow circles indicate "off" pixels. The white circle is the cursor, controlled by the joystick. Pressing the fire button switches the pixel from off to on or vice versa. The actual character can be seen below the grid.

As well as being able to design the character directly, there are a large number of commands that can be input from the keyboard. These are described as follows.

### Editing commands

These commands are all

initialised with a single key press and are detailed in the order they appear on the HELP screen.

#### 1 Left arrow and up arrow — mirror

These keys mirror the character on the grid horizontally and vertically respectively. NB These are **not** the cursor keys but the keys to the left of the "1" key and to the right of the "0" key.

#### 2 I — Invert

Inverts the character on the grid: i.e. all "on" pixel off or vice versa.

#### 3 R — Rotate

Each press of "R" rotates the

current character 90 degrees anticlockwise.

#### 4 Cursor keys

These scroll the character on the grid one pixel in the appropriate direction with full wrap-round.

#### 5 Shift/CLR

Clears the grid, making the current character a space.

#### 6 Home

Returns the cursor to the top left of the grid.

#### 7 C — Copy

This powerful command enables any character from any of the four sets to be copied to the current character. When "C" is pressed the mode changes to "COPY", the bottom cursor stops flashing, and the prompt "SET?" appears. If the "L" key is pressed the designer cycles through the four sets (as described under LOCATE). When the desired set is located, or if you wish to copy from the set on show, simply move the joystick or press the button. The prompt will change to "CHAR?" and the cursor will start flashing. The character to be copied can now be chosen with the joystick as described later in the section dealing with SELECT MODE, i.e. as soon as the button is pressed that character and its colour will be copied to the current character.

#### 8 X — Exchange

This enables the current character to be swapped with another character from the same set. On pressing "X" the mode changes to "XCHANGE". Simply select the character with which to swap the current character by moving the joystick until the cursor covers it and then press the button or any key.

#### 9 CBM/C — CBM U/C

Will copy the entire upper case Commodore set into the current set. The mode will change to "CBM U/C". If you do not wish to copy the set press "N" otherwise press any other key to complete the copy.

#### 10 CBM/V — CBM L/C

As above but will copy the lower case Commodore set.

#### 11 L — Location

This is used to choose which

character set to edit (sets four to seven). Pressing "L" moves you to the next set. If the current set is seven, the next will be four.

#### 12 S — Select

This puts the designer into SELECT mode.

#### 13 N — Next

Will advance to the next character. If the current character is 255, this will have no effect.

#### 14 P — Previous

Will go back to the previous character. If the current character is 0 this will have no effect.

#### 15 Shift/N — Number

This allows you to input a character as eight decimal numbers. When SHIFT/N is pressed the mode will change to "NUMBER" and a prompt ">" will appear by the top row of the grid. A decimal number (0 - 255) can be typed in followed by Return. If a number greater than 255 is entered it will disappear leaving just the prompt. If there is no number following the prompt when Return is pressed it will have no effect on the current row. This is then repeated for the remaining seven rows.

#### 16 D — Data

This prints eight items of data in decimal alongside the character. This list will disappear when any key is pressed.

#### 17 F1 — Character colour

Advances the colour of the current character.

#### 18 F3 — Multi-colour 1

Advances multi-colour 1.

#### 19 F5 — Multi-colour 2

Advances multi-colour 2.

#### 20 F7 — Background

Advances background colour.

#### 21 Shift/F7 (F8) — Border

Advances border colour.

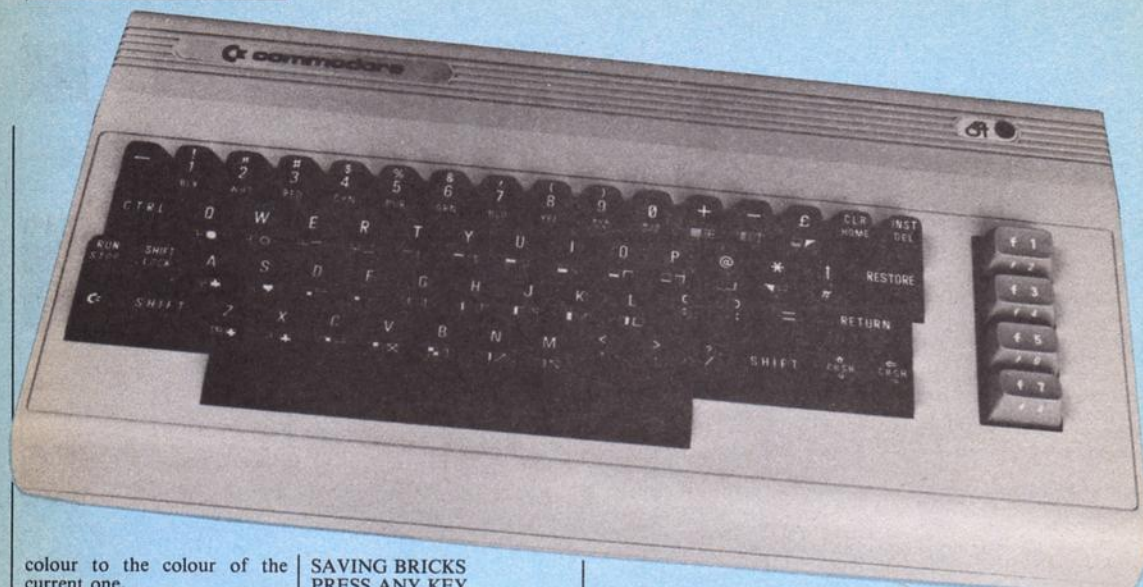
#### 22 M — Multi-colour ON/OFF

Turns multi-colour mode on or off.

#### 23 K Colour all

Will change every character





colour to the colour of the current one.

#### 24 Shift/L — Load

Loads a file. See Cassette and Disc Operation.

#### 25 Shift/S — Save set

Will save the current character set.

#### 26 Shift/C — Save colour table

Will save colour table.

#### 27 Shift/A — Save screen

Will save the designed screen.

#### 28 H — Help

Will display the HELP screen.

#### Q — Quit

Will enter the Screen Designer.

**NB:** Where the instructions say "press any key" (e.g. to leave SELECT mode) if the key pressed is a valid editing command it will then be executed.

### Cassette and disc operation

These are the system messages as they appear on-screen:

SAVE COLOURS type of save or load

CASSETTE OR DISK type of device you are using

FILENAME BRICKS the name you give your file

then:

PRESS RECORD AND PLAY ON TAPE

OK

### SAVING BRICKS PRESS ANY KEY

When any load or save command is entered the screen will clear and the following will appear:

- The type of operation (LOAD, SAVE CHARS, SAVE COLOURS or SAVE SCREEN)
- Select device — press C or D to select cassette or disc, followed by Return to confirm your choice. Character Designer will remember the previous device used, so normally you will just need to press Return.
- A filename of up to 16 characters can be entered from the keyboard followed by Return. Delete may be used as normal but the cursor keys and Insert will not work. The only occasion on which a null file name can be used is during a cassette load.

When using a disc drive "@ Ø:NAME" can be used for a save and replace and wildcards can be used for loading.

If using cassette the border will change to light blue and the prompt "PRESS PLAY ON TAPE" or "PRESS RECORD & PLAY ON TAPE" will appear. The screen will then blank and your Commodore 64 will load or save in the normal manner.

- After the load or save is completed, pressing any key will return you to the designer in SELECT mode.

### Screen Designer

To enter the Screen Designer section of Character Designer press "Q" in EDIT or SELECT mode. If no screen has been designed or loaded you will see a screen full of garbage. Press SHIFT/CLR to clear the screen.

At the top left of the screen a white cursor will be visible; this can be moved around with the joystick. Pressing Fire will put the current character at the cursor position. The character can be changed either by returning to the character designer and SELECTing a different character, or by pressing "S" or "G" (see below).

**NB:** Only characters from the same set may be used on screen at any one time. The set used by the Screen Designer will be that currently chosen in character designer mode.

### Summary of Screen Designer commands

- SHIFT/CLR clear screen
- HOME home cursor
- SPACE put a space at cursor position
- FIRE BUTTON put current character at cursor position with colour from colour table
- D display current character at cursor position. When "D" is released the character will disappear
- F1 change cursor colour from white to black or vice versa
- S select a new character; this will only work if the cursor is on the bottom eight

lines. These bottom eight lines will be replaced by the current character set. The cursor may be moved around as usual and pressing Fire will select the character under the cursor. No other commands will work while the character set is displayed. The set will turn off automatically when the cursor is moved out of the bottom eight lines and the bottom of your screen will reappear unharmed.

- G get new character — if G is present the character under the cursor becomes the current one
- T enter TEXT mode. The cursor will turn green and text can be entered from the keyboard. To exit TEXT mode press Return.
- NB:** TEXT mode assumes that the alphabet is in the normal Commodore upper case position, i.e. A=1, Z=26
- Q quit Screen Designer and return to Character Designer in SELECT mode.

### Hints and tips

This section is intended for the beginner but contains much information of use to the more advanced user.

### Creating multi-colour graphics

In its normal hi-resolution colour mode the Commodore 64 can only display two colours in each character square: the background colour and the



character colour. Luckily it is possible to display four colours in one square at the cost of halving the horizontal resolution. Although this can give the graphics a slightly chunky look, much more colourful displays are possible.

Instead of a character being eight pixels wide, as in hi-res colour, a multi-colour character is only four pixels across, each pixel being twice the width of a hi-res pixel. This means that with Character Designer we are able to use two dots for each of the four horizontal pixels with the colour chosen according to the chart below:

OFF OFF	Background colour
OFF ON	Multi-colour one
ON OFF	Multi-colour two
ON ON	Character colour

You will notice that the chart says that when both dots are "on" the double pixel will be displayed in the character colour. This is not quite true. If the character colour is between 0 and 7 (black to yellow) the character will be displayed in hi-res. If the colour is between eight and 15 it will be displayed in multi-colour with the character colour appearing as character colour minus eight, e.g. if the character colour is 10 (light red) and multi-colour is on, any double pixels with both dots "on" will appear as colour  $10 - 8 = 2$  (red).

To demonstrate this try setting multi-colour one to light blue, multi-colour two to white and the character colour to red

and switch multi-colour ON. Then enter the following data into a spare character using NUMBER:

85, 170, 0, 255, 85, 170, 0, 255

You should see a red character like Fig.1. Now use F1 to advance the colour to yellow. Press F1 three more times and the character should look like Fig.2.

You will notice that we are restricted to using the first eight colours (the ones printed on the keys) when using multi-colour, but if we wish to have the character actually appear in multi-colour we need to add eight to the desired colour code. No such restriction applies to the multi-colours themselves where we can choose from all 16 colours. (See also Programmer's Reference Guide pp 115-119.)

### Using graphics in your own programs

If you wish to use a character set you have designed in your own program you will need to use a program similar to the one that follows:

```
1 X = X + 1
2 IF X = 1 THEN LOAD "CHARS",1,1
3 REM YOUR PROGRAM
```

When run this program will firstly load the file called "CHARS", presuming of course that it is saved on tape

Fig.1

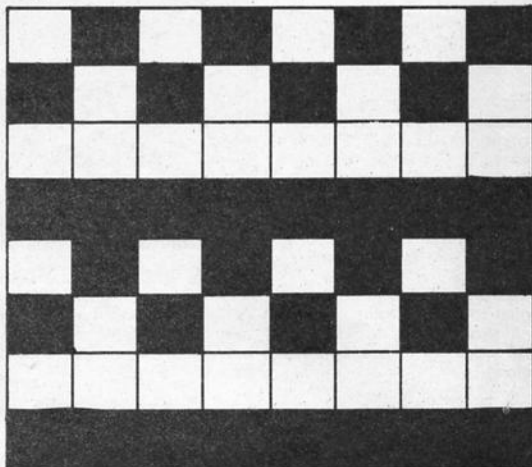
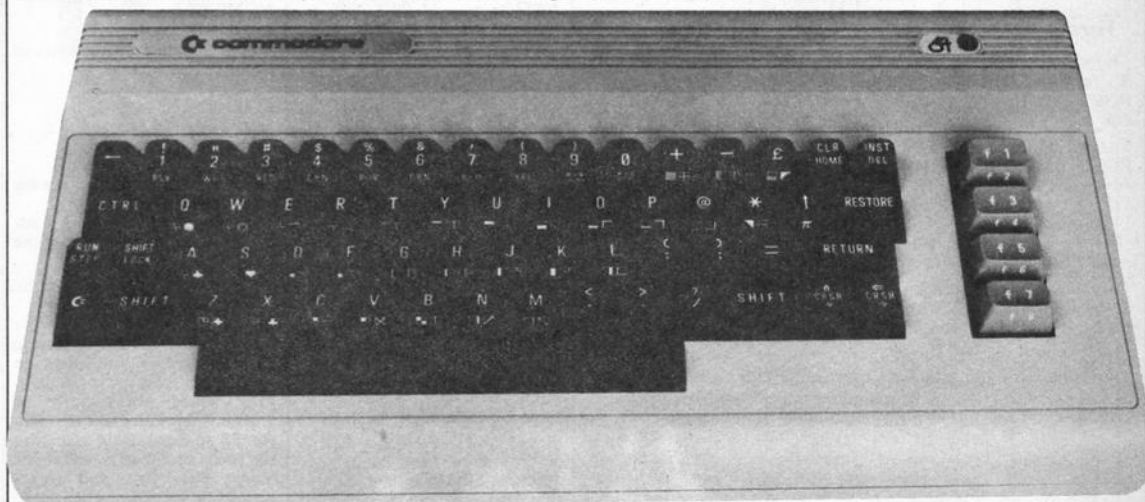
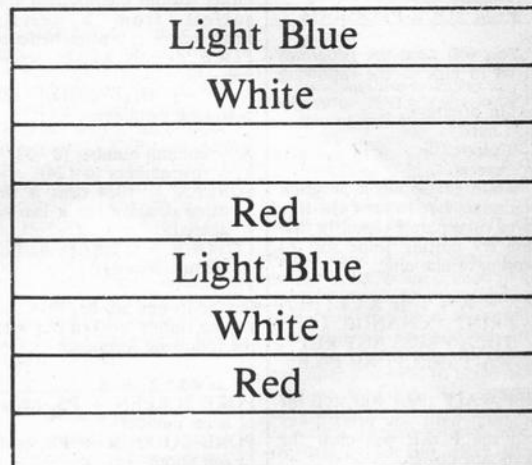


Fig.2







after your program or you change tapes after your program has loaded. This will cause the 64 to continue running the program from the first line. (After a LOAD from within a program the 64 performs the equivalent of a GOTO (first line) retaining all variables.) After loading "CHARS" X will no longer be equal to one, so your program will run as normal. This will also work with several files as below:

```
1 X = X + 1
2 IF X = 1 THEN "CHARS",
  1,9
3 IF X = 2 THEN "COL
  OURS",1,1
4 IF X = 3 THEN "SCREEN",
  1,1
4 REM YOUR PROGRAM
```

You will need the programs saved to tape in the following order:

- 1 your program
- 2 "Chars"
- 3 "Colours"
- 4 "Screen"

While developing a program you might like to have the files saved on separate tapes. In that case try putting some sort of prompt in line one:

```
1 X = X + 1: IF X < 4 THEN
  PRINT "CHANGE TAPE
  THEN PRESS ANY KEY":
  WAIT 198,1:POKE 198,0
```

**NB:** WAIT 198,1 will stop the program until you press a key and the POKE will clear the keyboard buffer.

### Turning multi-colour on and off

To turn multi-colour mode on POKE 53270, PEEK (53270) OR 16.

To turn multi-colour mode off POKE 53270, PEEK (53270) AND 239.

### Switching character sets

To choose which character set to use POKE 53272,X where X is one of the following values.

X	Set	Comments
20	2	Commodore upper case (default)
22	3	Commodore lower case
24	4	
26	5	
28	6	
30	7	

Note that if you move the screen from its normal position (1024-2023) the value of X will need to be changed accordingly. See also Programmer's Reference Guide pp 103-104.

### POKEing the screen

Printing to the screen using strings of cursor characters is a rather tedious method and also suffers from a certain sluggishness. It is often better to POKE directly to the screen memory.

If we first assign the following variables:

```
X = column number (0 - 39)
Y = row number (0 - 24)
SCREEN = 1024 (this is the
usual position but it can be
altered)
COLOUR = 55296 (the start of
colour memory)
```

the addresses to be POKEed can be simply worked out with the following formulae:

```
PS = 40 * Y + X
POKE SCREEN + PS, (char-
acter number)
POKE COLOUR + PS, (col-
our code)
```

eg:

```
100 X = 20:Y = 15
110 PS = 40 * Y + X
120 POKE SCREEN + PS,1
130 POKE COLOUR + PS,1
```

will print a white "A" near the centre of the screen (providing that SCREEN and COLOUR have already been defined).

### Using the colour table

If in addition to defining SCREEN and COLOUR we

define another variable

```
CTAB = 21504
```

and use CHAR to hold the character number the following subroutine will print a character using the colour table created with Character Designer.

```
100 PS = 40 * Y + X
110 POKE SCREEN = PS,
  CHAR
120 POKE COLOUR + PS,
  PEEK (CTAB + CHAR)
130 RETURN
```

### Background and border colours

To set up the colours of the background, border and the multi-colours:

```
Border — POKE 53280,X
Background — POKE 53281,X
Multi-colour 1 — POKE 53282,
  X
Multi-colour 2 — POKE 53283,
  X
```

where X represents one of the following colours:

- |          |                |
|----------|----------------|
| 0 black  | 8 orange       |
| 1 white  | 9 brown        |
| 2 red    | 10 light red   |
| 3 cyan   | 11 dark grey   |
| 4 purple | 12 medium grey |
| 5 green  | 13 light green |
| 6 blue   | 14 light blue  |
| 7 yellow | 15 light grey  |

### Downloading a screen

You may wish to use a screen you have designed using Character Designer in your own programs. To do this set up the Background, Border and Multi-colours, choose the character set and turn multi-colour on or off as desired, then use one of the following subroutines to download the desired screen on to the real screen.

**NB:** You must have loaded the screen, character set and colour table beforehand.

#### 1 BASIC

```
1000 SCREEN = 1024:
  COLOUR = 55296:CTAB
```

```
= 21504
1010 S2 = 24576:REM
  DESIGNED SCREEN
1020 FOR I = 0 TO 999
1030 CH = PEEK(S2 + I)
1040 POKE SCREEN = I,CH
1050 POKE COLOUR = I,
  PEEK (CTAB + CH)
1060 NEXT I
1070 RETURN
```

### 2 Machine code loader

```
1000 FOR I = 0 TO 45:READA:
  POKE49152 + I,A:NEXT
1010 DATA 169,216,133,196,
  4,133,252
1020 DATA 169,96,133,254,
  160,0,132,195
1030 DATA 132,251,132,253,
  177,253,145,251
1040 DATA 170,189,0,84,145,
  195,200,208
1050 DATA 243,230,196,230,
  230,254,165
1060 DATA 254,201,100,208,
  231,96
```

To download the screen type: SYS 49152 (RETURN)

**NB:** This program will overwrite any sprite pointers.

### Moving blocks of memory

There may be times when you wish to move a character set, screen or even a colour table to a different place in memory. The short program below will do this for you.

```
10 FOR I = 0 TO LL-2
20 POKE DD + I, PEEK
  (SS + I)
30 NEXT I
```

Where LL is number of bytes to be moved as follows:

```
Character set — 2048
Screen — 1000
Colour table — 256
```

**DD** = the address you want to move block to  
**SS** = the address you want to move from (see the Memory Map)

### Sprites

If you wish to use sprites in your program, remember to leave room for your sprite data. (The space occupied by a character set can hold the data for 32 sprites.) Note also that the space occupied by the ROM image (sets two and three) cannot be used for sprite data.



# SCREENSTORE

**If you own a Spectrum then try out this utility from R G Luxton, it could save you a lot of time**

Screenstore is a program for the Spectrum 48K which enables up to five full screens previously recorded by the SCREENS function, to be stored in memory and recalled rapidly to the screen.

The program, in BASIC, is menu-driven and uses a small machine code of 24 bytes housed in DATA statements to control the loading to memory, and to effect rapid recalling of the screens.

The routine has a number of uses. For example: as a

continuous rolling "menu" of 5 pages for shop window display; as a neat and effective way to store and display "screen art"; to produce simple animation; SCREENS images can be placed into memory, SAVED to tape in code, LOADED back into the routine later, or used in other programs. Screens saved thus are recalled to the screen instantly using a simple RANDOMIZE call; once loaded into the routine, 5 screens can be SAVED as code on tape and re-LOADED individually or as a large single block of code.

#### How it works

10 sets RAMTOP at 31102 to prevent the machine code and memory blocks being overwritten by the BASIC

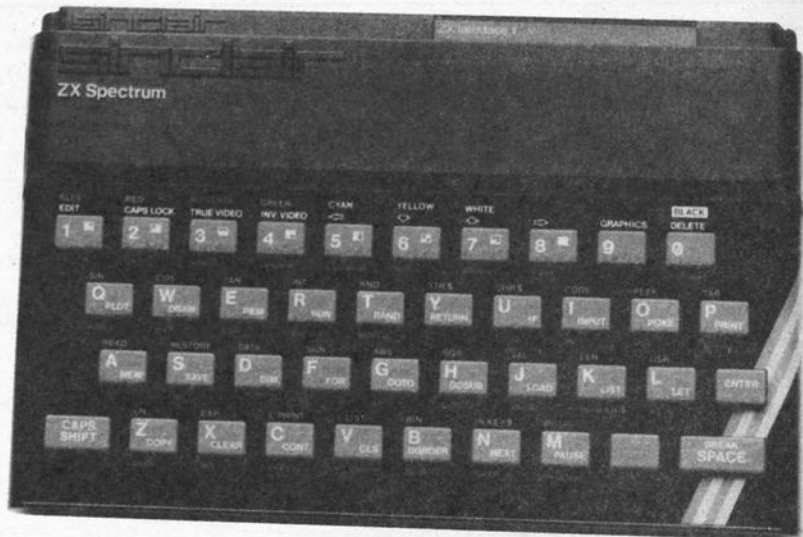
program  
 9020-9040 machine code for handling input of screens and recalling them to display  
 9050-9070 DATA for s array (blocks of code for each page)  
 9100 and 9120 subroutine for POKEing addresses into machine code for LOADING and calling each block  
 2010 print on line 23

**Please note:** All the Spectrum listings in HCW are printed to a special format. All user defined characters are printed as capital letters but with an underline. In order to type them into your computer you need to place the machine in GRAPHIC mode and then press the capital letter indicated. If you follow these instructions to the letter the graphic characters will be shown on screen when you run the program.

```

1 REM *PROGRAM 1*
5 REM (c)R.G.LUXTON
7 REM *SCREENSTORE*
10 CLEAR 31102
20 GO SUB 9000
30 REM *MENU*
40 BORDER 1: PAPER 1: INK 7: CLS
50 PRINT AT 0,7;"SCREENSTORE";"TAB 7;"
60 PRINT AT 3,4;"1. LOAD from Screens";AT 5,4;"2. Display screens";AT 7,4;"3. SAVE to memory";AT 9,4;"4. LOAD from memory";AT 11,4;"5. Demonstration"
70 PRINT AT 15,7;"SELECT A NUMBER";AT 16,7;"
80 PRINT AT 20,2;"GOTO m" returns to Menu &" " "e" Exits where necessary"
90 FOR i=3 TO 11 STEP 2: PRINT AT i,2: PAPER 7: INK 0: BRIGHT 1;">";AT i,25;"<"
100 PAUSE 15: PRINT AT i,2: PAPER 1;" ";AT i,25;" "
110 LET a$=INKEY$: IF a$<"1" OR a$>"5" THEN GO TO 140
120 IF a$="" THEN GO TO 140
130 BORDER 7: PAPER 7: INK 0: CLS : GO TO 1000*VAL a$

```





```

140 NEXT i: GO TO 90
1000 REM *SCREEN$ LOAD ROUTINE*
1010 BORDER 7: PAPER 7: INK 0: FLASH 0: BRIGHT 0: CLS
1020 IF 1>5 THEN CLS : PRINT AT 10,10; FLASH 1;"FILE FULL";AT 1
2,8; FLASH 0; INVERSE 1;"Press any key": PAUSE 0: GO TO m
1030 PRINT AT 21,0;"Load screen No. ";1;"?": PAUSE 0
1040 LET a$=INKEY$: IF a$="" THEN GO TO 1040
1050 IF a$="y" OR a$="Y" THEN CLS : GO TO 1060
1055 GO TO m
1060 PRINT AT 10,0;"Start recorder and press any key": PAUSE 0:
CLS : PRINT AT 10,12;"LOADING";AT 11,14;"NOW"
1070 GO SUB 9090
1080 PRINT AT 0,0: LOAD ""SCREEN$
1090 RANDOMIZE USR z
1100 CLS : LET 1=1+1: GO TO 1010
2000 REM *DISPLAY SCREENS*
2010 PRINT #0 ;AT 0,0;"Screen No.? (E to return)": PAUSE 0
2015 LET a$=INKEY$: IF a$="" THEN GO TO 2015
2020 IF a$="e" OR a$="E" THEN GO TO m
2030 IF a$<"1" OR a$>"5" THEN GO TO 2010
2040 LET r=VAL a$
2050 GO SUB 9110
2060 RANDOMIZE USR (z+12)
2070 GO TO 2010
3000 REM *SAVE TO MEMORY*
3010 BORDER 1: PAPER 5: INK 0: CLS
3020 PRINT TAB 7;"TO SAVE TO MEMORY:";TAB 7;"-----"
3030 PRINT AT 3,4;"To save all screens,"" enter 1,";AT
6,4;"To save a screen,"" enter 2."
3040 PRINT AT 3,16; PAPER 2; INK 7; FLASH 1; BRIGHT 1;"FIVE";AT
6,14; INVERSE 1;"SINGLE"
3050 INPUT a$: IF a$<"1" OR a$>"2" THEN GO TO 3050
3060 IF a$="2" THEN GO TO 3140
3070 PRINT AT 18,0;"To save all FIVE screens-""(Save""store""
CODE 31103,34240)... "
3080 SAVE "store"CODE 31103,34240
3090 CLS : PRINT AT 10,10;"Verify ?": INPUT a$
3100 IF a$(1)="n" OR a$(1)="N" THEN GO TO m
3110 CLS : PRINT AT 21,0;"Start recorder now...."
3120 PRINT AT 0,0: VERIFY "store"CODE 31103
3130 CLS : PRINT AT 10,12; FLASH 1;"OK": PAUSE 100: GO TO m
3140 PRINT AT 15,0;"Enter number of screen to save:": INPUT a
3150 IF a<1 OR a>5 THEN GO TO 3140
3160 RESTORE 9070
3170 PRINT AT 18,0;"To save screen No. ";a;" ""(CODE ";s(a);",684
8)....."
3180 SAVE "store"CODE s(a),6848
3190 CLS : PRINT AT 10,10;"Verify ?": INPUT a$
3200 IF a$(1)="n" OR a$(1)="N" THEN GO TO m
3210 CLS : PRINT AT 21,0;"Start recorder now...."
3220 PRINT AT 0,0: VERIFY "store"CODE s(a)
3230 CLS : PRINT AT 10,12; FLASH 1;"OK": PAUSE 100: GO TO m
4000 REM *LOAD FROM MEMORY*
4010 BORDER 1: PAPER 5: INK 0: CLS
4020 PRINT TAB 7;"TO LOAD FROM MEMORY:";TAB 7;"-----"
--"
4030 PRINT AT 3,4;"To load all screens,"" enter 1,";AT
6,4;"To load a screen,"" enter 2."
4040 PRINT AT 3,16; PAPER 2; INK 7; FLASH 1;"FIVE";AT 6,14; INVE

```



```

RSE 1;"SINGLE"
4050 INPUT a$: IF a$<"1" OR a$>"2" THEN GO TO 4050
4060 IF a$="2" THEN GO TO 4100
4065 IF 1>=2 THEN CLS : PRINT AT 10,9; PAPER 2; INK 7; FLASH 1;
"TO PROCEED WILL";AT 11,3;"OVERWRITE EXISTING SCREENS";AT 21,9;
FLASH 0;"Press any key": PAUSE 0: GO TO m
4070 PRINT AT 16,0;"To load all FIVE screens-'"(Load """"CODE 3
1103)";AT 20,0;"Start the recorder and""Press any key.....":
PAUSE 0
4080 PRINT AT 9,0: LOAD ""CODE 31103: LET l=6
4090 GO TO m
4100 IF 1<1 OR 1>5 THEN GO TO 1020
4105 PRINT AT 13,0;"The next empty screen is No. ";l
4110 RESTORE 9070
4115 IF 1>5 THEN GO TO 1020
4120 PRINT AT 15,0;" ";AT 15,0;"To
load screen No. ";l;"(CODE ";s(1);)";AT 19,0;"Start recorder
and, ""Press any key": PAUSE 0
4130 PRINT AT 9,0: LOAD ""CODE s(1): LET l=l+1
4140 GO TO m
5000 REM *DEMONSTRATION*
5005 BORDER 6: CLS
5010 FOR r=1 TO 5: GO SUB 9120
5020 RANDOMIZE USR (z+12)
5030 PAUSE 200: IF INKEY$="e" OR INKEY$="E" THEN GO TO m
5040 NEXT r: PAUSE 300: GO TO 5010
9000 REM *INITIALISE*
9010 LET m=30: LET M=m: LET l=1: LET z=65343: LET p1=(z+4): LET
p2=(z+5): LET p3=(z+13): LET p4=(z+14)
9020 FOR i=z TO z+23: READ j: POKE i,j: NEXT i
9030 DATA 33,0,64,17,62,0,1,192,26,237,176,201
9040 DATA 33,62,0,17,0,64,1,192,26,237,176,201
9050 DIM s(5)
9060 FOR s=1 TO 5: READ s(s): NEXT s
9070 DATA 58495,51647,44799,37951,31103
9080 RETURN
9090 REM *POKE LOAD ROUTINE*
9100 POKE p1,(127 AND l=1)+(191 AND l=2)+(255 AND l=3)+(63 AND l
=4)+(127 AND l=5): POKE p2,(228 AND l=1)+(201 AND l=2)+(174 AND
l=3)+(148 AND l=4)+(121 AND l=5): RETURN
9110 REM *POKE DISPLAY ROUTINE*
9120 POKE p3,(127 AND r=1)+(191 AND r=2)+(255 AND r=3)+(63 AND r
=4)+(127 AND r=5): POKE p4,(228 AND r=1)+(201 AND r=2)+(174 AND
r=3)+(148 AND r=4)+(121 AND r=5): RETURN
    
```

Disassembly of Lines 9020 to 9040

Hex	Op	Operand	
FF3F	210040	LD HL,4000	Load HL,16384 (Display file)
FF42	113E00	LD DE,003E	Load DE,00 (Poke destination)
FF45	01C01A	LD BC,1AC0	Load BC,6848 (Bytes for 22 lines)
FF48	EDB0	LDIR	Load, increment and repeat
FF4A	C9	RET	Return to Basic
FF4B	213E00	LD HL,003E	Load HL,00 (Poke call from)
FF4E	110040	LD DE,4000	Load DE, 16384 (Display file)
FF51	01C01A	LD BC,1AC0	Load Bc, 6848 (Number of bytes)
FF54	EDB0	LDIR	Load, increment and repeat
FF56	C9	RET	Return to Basic



```

5 REM *PROGRAM 2*
10 REM *SCREENSTORE DEMO*
15 REM *(c)R.G.LUXTON*
20 BORDER 6: PAPER 6: INK 1: CLS
30 RESTORE : DIM c(106): FOR i=1 TO 2: READ c: LET c(i)=c: NEX
T i: PLOT c(1),c(2): FOR j=4 TO 106 STEP 2: FOR i=(j-1) TO j: RE
AD c: LET c(i)=c: NEXT i: DRAW c(j-1),c(j): BEEP .005,50: NEXT j
40 LET a=1: GO SUB 200
50 INVERSE 1: PRINT AT 2,1;"ISLE OF WIGHT"
60 GO SUB 200
70 PRINT AT 5,14;"o";AT 7,21;"o";AT 10,15;"o";AT 10,25;"o";AT
12,3;"o";AT 13,21;"o";AT 15,21;"o";AT 17,19;"o";AT 18,15;"o"
80 GO SUB 200
90 INVERSE 0: PRINT AT 4,16;"Cowes";AT 7,23;"Ryde";AT 11,9;"Ne
wport";AT 9,23;"Bembridge";AT 13,0;"The";AT 14,0;"Needles";AT 13
,23;"Sandown";AT 15,23;"Shanklin";AT 17,21;"Ventnor";AT 19,16;"S
t.Catherine's";AT 20,16;"Point"
100 GO SUB 200
110 PRINT AT 17,1; INK 2; FLASH 1;"THE      ";AT 18,1;"SUNSHINE"
;AT 19,1;"ISLE !  "
120 GO SUB 200
140 STOP
200 PRINT #0;AT 0,0; PAPER 5;"To save ""map";a;"""....": SAVE "
map"+STR$ aSCREEN$: LET a=a+1: RETURN
9000 DATA 135,127,12,-9,8,0,7,-4,16,-2,6,-2,0,0,10,-11,0,-3,10,-
6,0,-4,-7,-1,-5,-7,-11,0,-5,-3,-6,-6,-3,-9,0
9010 DATA -15,0,0,-2,-3,-40,-15,-5,2,-1,5,-17,10,-2,0,0,4,-14,10
,-18,9,-8,9,0,0,-9,0,-10,-3,-7,-2,-6,1,5,3,1
9020 DATA 4,5,3,8,13,2,2,3,-1,4,1,21,11,7,1,20,9,2,5,12,11,4,0,2
,-4,2,0,2,2,3,1,2,-2,2,-4

```





# INVISIBLE ALIEN



**Chase the invisible Arg in this Spectrum game from R G Sharman, it should keep you on your toes**

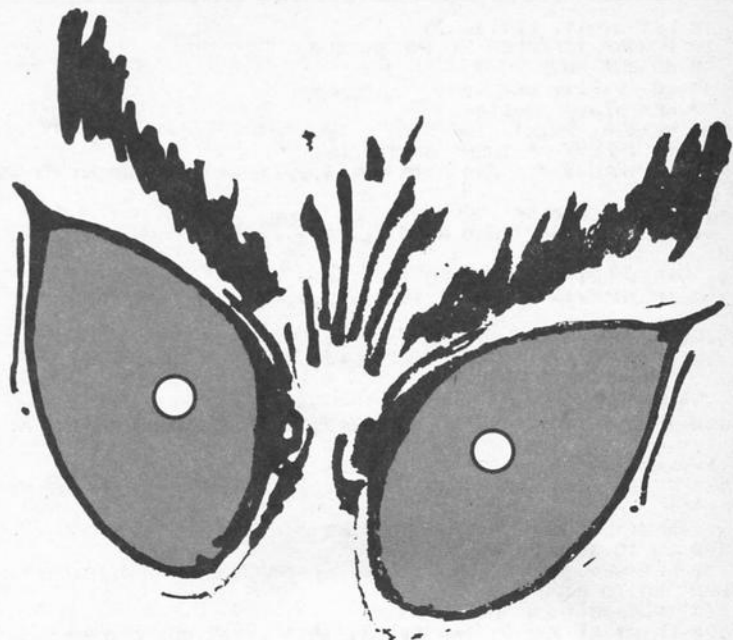
Here's a neat little arcade game which will be a great favourite with the kids. You must chase the Arg around the hexagonal

grid. You'll have to be quick because he's a very fast little mover.

There's one big snag: the Arg is invisible so no matter how hard you look you'll never find him. Don't worry too much though because you can see his last position: look out for the little yellow flashes.

You get 20 attempts to catch him and if you don't manage it you can always have another

**Please note:** All the Spectrum listings in HCW are printed to a special format. All user defined characters are printed as capital letters but with an underline. In order to type them into your computer you need to place the machine in GRAPHIC mode and then press the capital letter indicated. If you follow these instructions to the letter the graphic characters will be shown on screen when you run the program.







b  
: NEXT a  
430 FOR a=4 TO 28 STEP 4: FOR b=3 TO 19 STEP 4: PRINT AT b,a;"A": NEXT b: NEXT

a  
440 INK 0: PRINT AT 1,2;"THE TERRIBLE,DREADED ARG GAME";AT 21,2;"FOR ONE VERY  
BRAVE PLAYER"  
450 PRINT AT 10,2;"Y";AT 10,30;"A";AT 11,2;"O";AT 11,30;"R";AT 12,2;"U";AT 12,3  
0;"G"  
460 PRINT AT 11,4; INK 5; FLASH 1;"A";AT 11,28; INK 6; FLASH 1;"A"  
470 PRINT #1;AT 1,1; INVERSE 1;"DO YOU WANT INSTRUCTIONS - Y/N"  
480 IF INKEY\$="Y" OR INKEY\$="y" THEN GO TO 0510  
490 IF INKEY\$="N" OR INKEY\$="n" THEN PRINT #1;AT 1,1;"  
": GO TO 0530

500 GO TO 0470  
510 LET i\$=" THE OBJECT OF THE GAME IS TO CATCH  
THE INVISIBLE ARG - ALL YOU WILL SEE OF HIM IS A MOMENTARY YELLOW FLASH AS HE LE  
AVES THE SPOT THAT HE WAS ON. YOU CAN MOVE IN 6 DIRECTIONS, CONTROLLED BY KEYS  
1 - 6. YOU HAVE 20 MOVES, THEN.....WELL, YOU'LL SEE !!!!!!"  
520 FOR n=0 TO LEN i\$: LET i\$=i\$(2 TO )+i\$(1): PRINT #1; BRIGHT 1;AT 1,i\$:i\$( TO  
31): BEEP .05,n/5: NEXT n  
530 PAUSE 50  
540 LET sc=20: PRINT #1; INK 6; INVERSE 1;AT 0,12;"SCORE=";sc;" ";AT 1,1; INK 7  
; INVERSE 1;"1=B 2=C 3=D 4=E 5=F 6=G"  
550 RETURN  
560 REM graphics  
570 RESTORE 0580: FOR n=USR "a" TO USR "g"+7: PRINT "STANDBY "": READ d: BE  
EP .05,d/4: POKE n,d: NEXT n: CLS : GO TO 0380  
580 DATA 28,62,127,127,127,62,28,0,0,8,28,42,8,8,0,0,28,12,20,32,0,0,0,32  
,20,12,28,0,0,0,8,8,42,28,8,0,0,4,40,48,56,0,0,0,56,48,40,4,0,0  
Rem enter B as Graphic A

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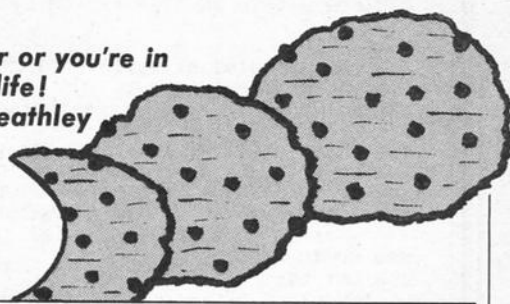
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# COOKIE MONSTER



**Avoid the cookie monster or you're in danger of your life!**  
 By Paul and Cara Leathley



The object of this game is to collect as many cookies as possible, avoiding the cookie monster, who is also eating them. Ladders are provided to enable you to move from one floor to the next.

You lose your life if you collide with the cookie monster or touch a ledge. If all the cookies are eaten then the game continues with a different screen and new cookies.

Use F and H to go left and right respectively and L to go up ladders. There are holes in the ledges, down which you may drop with loss of life, by walking off the edge.

**How it works**

- 10-160 defines characters and colours
- 190-240 gets light green screen and prints "cookie" in large letters at top of screen
- 270-360 draws ledges
- 370-460 prints ladders
- 470-560 prints cookies
- 570-630 sets initial values of variables
- 700-750 checks which key, if any, is pressed
- 760-790 changes shape of man as he turns right or left
- 800 checks man doesn't leave screen
- 810-860 checks what man hits next
- 870-920 checks whether man has gone off edge of ledge
- 940-1010 man goes up
- 1030-1040 changes shape of man as he climbs ladder
- 1050-1070 touch of ledge
- 1080-1100 collision with cookie monster
- 1110-1210 man hits cookie
- 1230-1280 new game option
- 1290-1580 moves monster
- 1590-1610 prints scores in terms of cookies

**Variables**

- SCM player's score
- SCC monster's score
- MX, MY co-ordinates of man
- CX, CY co-ordinates of cookie monster
- CHR character number for man: 96 = left, 97 = right, 98 = up ladder
- PCM character number of what man last hit
- PCC character number of what cookie monster last hit
- T number of man's moves since monster moved last
- MCX how many spaces monster moves vertically
- MCY how many spaces monster moves horizontally

```

10 CALL CHAR(96,"181838FE181C744
6")
20 CALL CHAR(97,"18181C7F18382E6
2")
30 CALL CHAR(98,"5A5A7E183C2466"
)
40 CALL COLOR(9,2,4)
50 CALL CHAR(104,"81FF818181FF81
81")
60 CALL COLOR(10,11,4)
70 CALL CHAR(112,"FFFF44AAAA44FF
FF")
80 CALL COLOR(11,5,4)
90 CALL CHAR(120,"007E5AFF242466
")
100 CALL CHAR(121,"FFFFFFFFFFFFFF
FFF")
110 CALL CHAR(122,"FFFFFFFF")
120 CALL CHAR(123,"00000000FFFFFF
FFF")
130 CALL CHAR(124,"0000FFFFFFFFF0
000")
140 CALL COLOR(12,14,4)
150 CALL CHAR(128,"3C42A98391C34
A3C")
160 CALL COLOR(13,7,4)
170 SCM=0
180 SCC=0
190 CALL CLEAR
200 CALL SCREEN(4)
210 PRINT "    YZZ YZY YZY Y Y Y
    YZZ"
220 PRINT "    Y    YXY YXY YY Y
    Y!!"
230 PRINT "    Y(( Y(Y Y(Y Y Y Y
    Y((("
240 PRINT "::::::::::::::::::::::::::"
250 C$(0)="COOKIE"
260 C$(1)="COOKIES"
270 FOR I=7 TO 23 STEP 2
280 RANDOMIZE
290 A=INT(RND*28)+3
    
```

```

300 B=INT(RND*10)
310 IF 30-R<B THEN 280
320 CALL HCHAR(I,3,112,28)
330 CALL HCHAR(I,A,32,B)
340 NEXT I
350 CALL HCHAR(23,3,112,28)
360 CALL HCHAR(5,3,112,28)
370 FOR I=8 TO 22 STEP 2
380 RANDOMIZE
390 P(1)=INT(RND*28)+3
400 P(2)=INT(RND*28)+3
410 P(3)=INT(RND*28)+3
420 FOR C=1 TO 3
430 CALL HCHAR(I,P(C),104)
440 CALL HCHAR(I-1,P(C),104)
450 NEXT C
460 NEXT I
470 FOR I=6 TO 22 STEP 2
480 FOR C=1 TO 3
490 RANDOMIZE
500 P(C)=INT(RND*28)+3
510 IF ((I=6)*(P(C)=3))+((I=22)*
(P(C)=3)) THEN 490
520 CALL GCHAR(I,P(C),GET)
530 IF (GET=104)+(GET=128) THEN 4
90
540 CALL HCHAR(I,P(C),128)
550 NEXT C
560 NEXT I
570 MX=22
580 MY=3
590 CHR=96
600 PCM=32
610 CX=6
620 CY=3
630 PCC=32
640 T=T+1
650 CALL HCHAR(MX,MY,CHR)
660 CALL HCHAR(CX,CY,120)
670 IF T<=1 THEN 690
680 GOSUB 1290
690 TIM=0
700 CALL KEY(3,K,S)
710 IF S<>0 THEN 740
720 TIM=TIM+1
730 IF TIM=20 THEN 680 ELSE 700
740 IF K=76 THEN 940
750 IF (K<>70)*(K<>72) THEN 700
760 ON K/2-34 GOTO 770,790
770 CHR=97
780 GOTO 800
790 CHR=96

```

```

800 IF (MY+(K-71)<3)+(MY+(K-71)>
30) THEN 700
810 CALL GCHAR(MX,MY+(K-71),Z)
820 IF Z<>32 THEN 930
830 MY=MY+(K-71)
840 CALL HCHAR(MX,MY-(K-71),PCM)
850 PCM=Z
860 IF PCM=104 THEN 640
870 CALL GCHAR(MX+1,MY,CH)
880 IF CH<>32 THEN 640
890 MX=MX+1
900 CALL HCHAR(MX-1,MY,PCM)
910 CALL HCHAR(MX,MY,CHR)
920 GOTO 870
930 ON (Z/8)-12 GOTO 1030,1050,1
080,1110
940 CALL GCHAR(MX-1,MY,Z)
950 IF Z<>32 THEN 980
960 IF PCM<>104 THEN 700
970 GOTO 990
980 IF Z<>104 THEN 1020
990 MX=MX-1
1000 CALL HCHAR(MX+1,MY,PCM)
1010 GOTO 850
1020 ON (Z/8)-13 GOTO 1050,1080,
1110
1030 CHR=98
1040 GOTO 830
1050 CALL CLEAR
1060 PRINT "OUCH! YOU BUMPED INT
O THE ":" LEDGE!"
1070 GOTO 1220
1080 CALL CLEAR
1090 PRINT "COOKIE MONSTER ATE Y
OU!"
1100 GOTO 1220
1110 CALL SOUND(500,880,0)
1120 SCM=SCM+1
1130 IF SCM+SCC=27 THEN 190
1140 IF (PCM<>104)+(K<>76) THEN 1
180
1150 MX=MX-1
1160 CALL HCHAR(MX+1,MY,PCM)
1170 GOTO 640
1180 MY=MY+(K-71)
1190 CALL HCHAR(MX,MY-(K-71),PCM
)
1200 PCM=32
1210 GOTO 870
1220 GOSUB 1590
1230 PRINT ":" PLAY AGAIN ?(Y
/N)"

```



```

1240 CALL KEY(3,K,S)
1250 IF S=0 THEN 1240
1260 IF K=78 THEN 1280
1270 GOTO 170
1280 END
1290 IF CX<>MX THEN 1310
1300 MCX=0
1310 IF CX<=MX THEN 1330
1320 MCX=-1
1330 IF CX>=MX THEN 1350
1340 MCX=1
1350 IF CY<>MY THEN 1370
1360 MCY=0
1370 IF CY<=MY THEN 1390
1380 MCY=-1
1390 IF CY>=MY THEN 1410
1400 MCY=1
1410 CALL GCHAR(CX+MCX,CY+MCY,CH
A)
1420 IF (CHA<>32)*(CHA<>104)*(CH
A<>112) THEN 1500
1430 CX=CX+MCX
1440 CY=CY+MCY
    
```

```

1450 CALL HCHAR(CX-MCX,CY-MCY,PC
C)
1460 PCC=CHA
1470 CALL HCHAR(CX,CY,120)
1480 T=0
1490 RETURN
1500 IF (CHA<96)+(CHA>98) THEN 15
10 ELSE 1080
1510 CALL SOUND(500,220,0)
1520 SCC=SCC+1
1530 IF SCC+SCM=27 THEN 190
1540 CX=CX+MCX
1550 CY=CY+MCY
1560 CALL HCHAR(CX-MCX,CY-MCY,PC
C)
1570 PCC=32
1580 GOTO 1470
1590 PRINT : "COOKIE MONSTER GOT"
: SCC;C$((SCC=1)+1)
1600 PRINT :: "YOU GOT";SCM;C$((S
CM=1)+1)
1610 RETURN
    
```

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**Articles** on certain aspects of using home computers should be no longer than 1000 words. Try to keep to the style you see in HCW and include programming examples where they will help the reader understand the subject. We will convert your sketched illustrations into final artwork.

We also use **short tips**, articles and **brief programming routines**. Any discoveries you have made about your machine might be of interest to other readers.

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**Chopper sounds**

After finishing Sorcery with a hi-score of 87750 points, I wondered if Virgin had any other plans for the Amstrad CPC464. I received my Amstrad as a Christmas present and Sorcery is by far the best game I've got.

In contrast to Mark Bayley, I've had no problems (well, a few perhaps) in loading Sorcery. I must however agree with his letter, which appeared in HCW 108, that perhaps Virgin shouldn't use such an unreliable unloading system.

Thanks for the mini-synth Amstrad program. I like collecting all the parts of Clive Gifford's series. Using one of his demo-sound programs I managed to get rather a good helicopter-like sound. This is it:

10 ENV 1,20,4,2  
20 SOUND 1,50,40,15,1,0,15  
30 SOUND 2,50,40,15,0,0,15  
40 SOUND 4,25,40,15,1,0,15  
50 GOTO 20

Nicholas Mann, Birgelen, W Germany

**Tape heads all clear**

I was very interested in the letter from Karen Ralph about Soft Aid. I also bought Soft Aid for the 64 and couldn't load Gumshoe. I couldn't return it as I had written on the cover. The load numbers on the cover are wrong. I also bought a second copy which would not load Gumshoe.

I then bought the Azimuth Head Alignment Tape. I can now load Gumshoe and also highly recommend the Azimuth tape.

Ian Russell, Dagenham

**Bored of the Reviews?**

After reading your review of our game "Bored Of The Rings" in your May 7-13 edition, I felt I had to write and correct a few errors in the column.

The object of the game is to destroy the Great Ring of Power. Rather than 45 words (suggesting a reading age of 2), the adventure recognizes well over 200 words.

The game is priced £5.95 on cassette (£8.95 on micro-drive cartridge) and is available by mail order from DELTA 4 Software, The Shieling, New Road, Swanmore, Hants SO3 2PE.

To your reviewer's question: Judith is the kind individual who originally inspired the program. Stephanie Stranger is a friend and Catherine. . . well, never mind.

I hope the incorrect address hasn't inconvenienced Games Workshop or any of our customers.

Fergus McNeill, DELTA 4 Software, The Shieling, New Road, Swanmore, Hants SO3 9PE

*Our apologies to Delta 4 for the wrong price and address printed with the review. We hope that the points made in Mr McNeill's letter clear up any misunderstanding.*

**Morish mag**

After taking your magazine again after a long break, I find it very morish and I must admit that the content gets better with every issue. I also must compliment you in not letting the VIC-20 programs die.

I find it very sad to see this machine neglected by both Commodore and software houses. I feel there must be many VIC users who feel the same.

So please publish more programs like Squashed Frog (HCW 111). It is superbly graphical and shows the true capability of the VIC.

Mr Bamford, Kibworth Beauchamp

**Hi-score mix-up**

After seeing the notice proclaiming "Each month hi-scores win £25", in HCW 110, I thought I'd have a go on my favourite game, Sorcery on the Amstrad CPC 464. It has taken me until now to achieve a reasonable score, this being 92,250, releasing eight sorcerers and returning to the sanctuary. To achieve higher scores, as many monsters as possible have to be killed. It also helps to finish with a full energy count.

Antony Palourti, Harrogate

*Sorry, you've got the wrong end of the stick. If you look back to issue 110, you'll notice that we're only offering £25 for high-scorers on Mirrorsoft's Ashkeron. Look at the news item on page four of that issue for further details.*

**Book problem resolved**

I recently bought a book called Using Your VIC-20 as a Music Synthesizer by Paul Copeland. For some reason the book was published with no program listings. Through Interface, the publishers, I have been in touch with Mr Copeland in Australia. He has very kindly supplied me with tapes of the programs and would like to help other owners of his book.

He has asked me to supply him with as many addresses of the major Commodore clubs as possible. If any reader is a member of such a club or has a copy of the book but doesn't belong to a club, would they get in touch with me please, and I will pass the information on to Mr Copeland.

Thomas Carey, Runcorn

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COMPUTERS IN  
SOCIETY

*In the first of a regular series, Liz Graham talked to Edna Smith, who explained how computers can revolutionise handicapped peoples' lives*

Computers can facilitate communication, and communications is an essential need for handicapped people. According to Edna Smith, who's in charge of Bridge House, the focal point of London's Redbridge Association for Handicapped People, there are three things vital to those who are handicapped: communication, information and mobility.

And she's over the moon about their new system, which has recently been installed. It

enables the group to make giant steps towards the ideal of instant communication, in particular with the powers that be, such as the GLC.

Edna's enthusiastic about the potential of computers to change peoples' lives, and in particular the sector of the community she knows the most about: disabled people. She suffered from polio when she was 25, and she's been confined to a wheelchair ever since.

"But I don't see my illness as a tragedy," she said. "It

changed my life and it was very traumatic at the time, but it's not tragic."

Edna is active in RAHP, which works together with Redbridge Borough to improve disabled peoples' living conditions and access to public places. Ironically, Edna still can't get into Redbridge Town Hall unassisted, and has to be helped up the steps: but this should change too in the future.

"It's a very slow process for anything to change," she said. "Handicapped people don't find it easy to change, either. But what I'm excited about is our project to familiarise handicapped people with computers. At Woodbine, which is our new day centre run by a committee of handicapped people, we've got computer terminals. Computers are a magnificent opportunity for disabled people



to perhaps get employment, and also enhance their lives, and give them another interest."

She went on: "We want all members of the centre to communicate. Some peoples' speech is bad, but that handicap can now be overcome and these people can participate in so many things through using a computer."

Bridge House is funded partly by the GLC and partly by the Department of the Environment. Edna is aware that handicapped people need to increase their involvement with areas of decision, so they've set up Redbridge Forum so that local handicapped people can moan unofficially, and then be encouraged to take up the claims at a higher level, with the authority concerned.

It's taken two years since the talking stage for the computers to be installed at Bridge House. "I went to a GLC conference run by the Greater London Association of Disabled People

(GLAD), which is our parent body. They proposed that four borough associations be used for research into linking information — the other three are Brent, Newham and Ealing — and just after Christmas something came up. It was quite amazing — within six weeks all the decisions were made, the money supplied and the equipment installed."

The centre boasts an IBM XT, which provides word-processing facilities. Edna also has an IBM at home, courtesy of the project, and she uses it to link up by modem.

"It gives me so much independence," she said. "It makes me much more flexible. I can work in the evening if I want. Because of my disability my arms and hands are deteriorating, so I can't always work office hours."

And another benefit of the computer is access: "We're now linked up with the GLAD computer, and we enjoy an

immediacy which we've never had before. We can now find out all the information we need in much less than half the time." The computers are used to run out mailing lists and link together lots of small groups.

According to Edna, funding isn't a problem this year, but it will be. She's very grateful to the GLC for supplying the money: "It's marvellous, for it to have been made possible. We've used the money they gave us very well."

Edna's a mature woman — in fact, she's a granny — but she wasn't affected by any trepidation at the thought of approaching computers for the first time. "I've never had any fear," she said. "I've always seen the potential of modern technology, if it's used properly."

"I'm still very new to it," she admitted. "I'm not going to learn to program, though. I've got far too much to do, and we have to use our resources as best

we can."

She continued: "It's a very exciting project. We're going to learn a lot more, and see how we can use computers. I'm enjoying the venture. But one thing I don't enjoy is if people say I'm too old. My grandson, who's 14, laughs at me. He's got a computer, but what I like about the way he uses it is that it's just one aspect of his life. He still plays rugby, goes sailing and does cross-country running."

The computers at RAHP go a long way to achieving two out of three of their aims, information and communication. And Edna's enthusiastic about the future.

Computers have given a lease of new life to disabled people in the London borough of Redbridge — but what about all the other boroughs which weren't chosen for the experiment? And what about the funding, particularly with the GLC in jeopardy?

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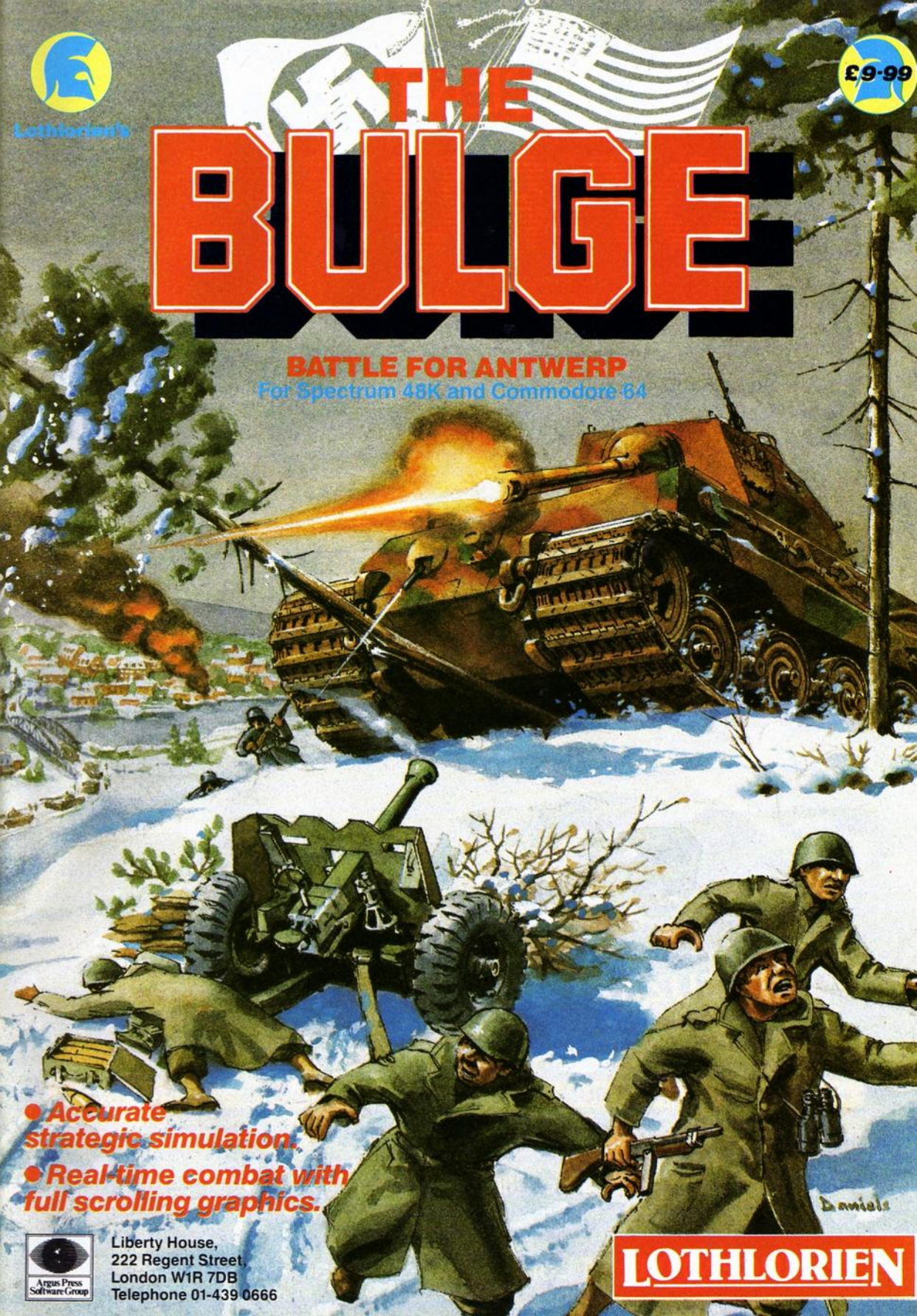
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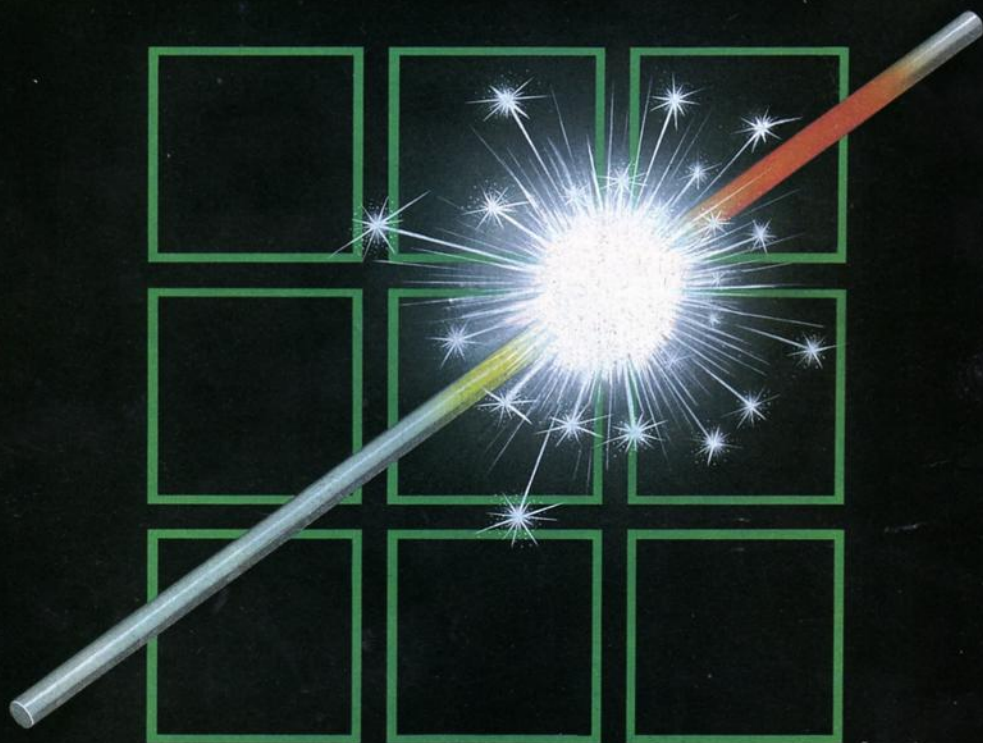
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