Atari 130 XE

Hardware review p.18

Toys for all from CGL

30 Henshin Robos must be won!

Free

Holiday fever from Commodore

The holiday season has certainly arrived at Commodore. The company plans to offer free holidays in its new C64 package deal.

The new 'bundle' of hard and software will contain the C64 itself, its dedicated cassette recorder and International Soccer, its best selling game. The pack will cost £199, a large saving on the recommended price but not on the price that has recently been charged by high street stores.

The holiday voucher that will be given with each package offers three free nights' accommodation in a hotel from a list of about 250. The accommodation is for two people and can be taken both in the UK and abroad.

Some dealers are so keen to offer the new deal that they aren't even waiting for supplies from Commodore. They are putting the package together from their existing stocks. The offer is open until August although what happens to the price and package after that date has yet to be decided.

There will also be a new peripheral pack available soon. As we went to press details had still to be confirmed but a disc drive, modem and selected software will be offered at £299. This represents a saving of over £100 on current prices.

Other packs planned for summer release are two business packages based around the Plus 4 computer. The first includes the computer, the MPS801 printer, the 1541 disc drive unit and software at a price of £449.

Existing owners of the Plus 4 might like to take advantage of the peripheral pack without the com-

Paul Welch, Commodore's marketing and consumer manager

puter for £349.

Commodore hopes that these bundles will encourage sales in the traditionally slack summer period.

Coming soon: MSX Plus

The MSX Plus, the first major upgrade to the MSX system, was announced this week by ASCII Microsoft, developers of the MSX standard.

The new version will offer enhanced graphics capability giving "a picture display at present unavailable in home computers". It will be launched in Japan in September 1985.

The graphics resolution has been upgraded to 512 dots horizontal by 192 vertical and the text display will be 80×24 instead of the maximum of 40 characters per line available on current machines. The upgraded version offers a selection of 256 colours and the nine voice synthesiser chip more than doubles the present sound capabilities.

MSX: about to be upgraded

Graphics conversion chart inside

Computers in society — special feature

Amstrad: Machine code the easy way

Train horses with your C64

10 out of 10 for your Spectrum

HOME COMPUTING WEEKLY

CONTENTS

June 11-June 17, 1985   No. 116

Soapbox

I feel very strongly about computer education and I feel I must express my views about a recent Soapbox on computers in schools.

I myself am still at school and will be in my last year after the big holiday in September which, I think, leaves me in a very good position to be commenting on this subject.

My mathematics standard used to be much lower than I'd have liked it to be, but for 18 months now I have owned a very fundamental Commodore VIC, which has improved my maths and my memory at the same time. My maths improved from writing machine code routines without a monitor (although I don't recommend it) and also from all the calculations needed, and all the thought which goes into a complex program. My memory improved from remembering the hundreds of important memory locations needed when programming, and remembering what variables or memory locations I used for which calculations.

I don't think the theory side of computer studies is as important as the practice, although schools seem to think it is more essential. But if schools taught programming on computers as basic as the VIC and maybe went as deep in as machine code programs, instead of skimming the surface with simple BASIC routines, it would give the pupils experience with computers, help improve their maths and improve their memory, which is an essential requirement to pass any exam.

Taking this into consideration I think anyone must agree a computer is an important part of education today.
M Howarth, Bolton

If you have something you want to say, write to Soapbox at Home Computing Weekly, No. 1 Golden Square, London W1R 3AB. We give a prize to the writer of each letter printed.

Coming soon

BASIC LIVING

Jim Barker · Jon Wedge

WHY DON'T YOU GIVE UP TRYING TO LEARN THAT ASSEMBLY LANGUAGE, GEORGE? IT'S RUINING THE HOLIDAY!

MAYBE I'LL TAKE A WALK AFTER DINNER AND THINK ABOUT IT

LATER... LARGE WHISKY, PLEASE!

EVEN LATER ...AND ANOTHER PLEASE...

ARE YOU ALRIGHT, SIR?

NOTHING THAT A CLEAR EXPLANATION OF "ROTATE RIGHT WITH CARRY" WOULDN'T FIX!

© 1985 JIM BARKER 'N' JON WEDGE

Happy families

Help is at hand for parents who find it hard to keep up with their computer whizz-kids. Ardmore Adventure are running family computer weekends at the Crest Hotel near High Wycombe in Buckinghamshire.

These activity weekends are deesigned to give parents a crash course in computer programming and applications in a relaxed, informal atmosphere. Meanwhile, their children receive tuition which ranges from beginner's to advanced classes on C64 and BBC computers in a neighbouring room.

High point of the first successful weekend was a visit by BBC presenter John Craven who takes an active interest in Ardmore's new venture.

Future weekends are planned for June, September and October.

Ardmore Adventure, 23 Ramilies Place, London W1. Telephone: 01 439 4461.

John Craven and friends give computer weekends the thumbs up

Erratum

Gravesend Home Computers, in Kent, were mentioned recently in our letters page by a reader who said that this company could supply TI-99/4A Extended BASIC for £39. This is not the case and Gravesend Computers has received many enquiries from HCW readers who have been disappointed to hear that they cannot get Extended BASIC for this cheap price. We have been asked to set the record straight.

Enslaved

A 'n' F's Slave 16K Eprom has been reduced in price and is now available for £39.95 — a price cut of £10.

Slave comes with a 68 page manual and, according to A 'n' F it highlights some utilities not available elsewhere.

The price change has been made possible due to the dramatic reduction in the cost of ROM chips. Until now it has only been available through mail order but soon it will be appearing in the shops.

A 'n' F Software, Unit 8, Canalside Ind Est, Woodbine St East, Rochdale, Lancs OL16 5LB

Top games come home

Eight of Japan's top arcade games are to be launched on the Spectrum, Commodore and Amstrad computers by Ocean. Ocean has acquired the rights from Konami and the titles will be available throughout Europe.

Ocean's director, David Ward said: "Konami has produced some of the most famous coin-operated arcade games in the world which will now appear on our Imagine arcade label for the mass market micros."

Kenji Hiroaka, of Konami UK commented: "We took a close look at British software houses. Because of Ocean's record of converting arcade hits into chart topping computer games, we concluded that Ocean had both the programming, publishing and marketing expertise to produce our top titles."

Ocean, 6 Central St, Manchester M2 5NS

Sealng the deal

Software update

A seasonal touch this week, with the launch of Graham Gouch's Test Cricket from Audiogenic.

Revealed at the Commodore Show at the Novotel, Hammersmith, the game can be set to simulation or arcade mode, so that you can be a spectator or a participant.

Choose your teams from the best of English or Australian players, and sit back for a relaxing game, with the sounds of the ball on the bat and the applauding audience in the background.

Global Software is a new operation, running from south-of-the-river Wandsworth. Operation Caretaker is the first product out of the stable: it's a first-aid kit for most major computers. Three major problems with data recorders — dirty tape heads, unwanted magnetism and faulty azimuth alighment — are taken care of. Operation Caretaker will soon be available for the C64, VIC-20, MSX and Atari.

"Feel, hear, see and be electrified by the experience!" enthuses Activision about Web Dimension. You progress from one dimension to the next, weaving your way through time and space, according to the promotional blurb. Judge for yourself whether it lives up to expectations.

Super Gran the Adventure is now finished and Tynesoft are looking towards an early release date. The graphics are very attractive, as you can see from that shown here but a full review of the game will follow.

Palace's Cauldron has finally made it to the Spectrum. The game will be released on 14th June and flip side will contain a Spectrum version of the Evil Dead. Palace Software apologise to their eager customers but they left muttering something about having got the spell wrong!

Title	Machine	Price	Publisher
Repton	BBC/Elec	£9.95	Superior
Triangle	C64	£19.95	Argus Press Sftwr
Activity Centre	C64	£14.95	Argus Press Sftwr
Web Dimension	C64	£10.99	Activision
Operation Caretaker	Ams/Spec	£9.95/	
	BBC/Elec	£10.95	Global
The Covenant	Spectrum	£6.95	PSS
MCT Estimator	BBC	£19.75	Micro Com Trding
Graham Gooch Test Crkt	C64	£9.95	Audiogenic
Amstrad Artist	Amstrad	£9.95	CRL
Cauldron	Spectrum	£7.99	Palace Software
Manic Death Chase	C16/Plus 4	£6.95	Knightsoft
Danger Mouse in Trouble	Amstrad	£8.95	Creative Sparks

Exclusive:— Hewson's future games

If you are one of those computer users who keeps train numbers in your database program then Hewson will soon have something just for you.

Mike Maile, the writer of the incredibly successful Air Traffic Controller program, is currently working on a simulation that involves driving a steam train to Brighton.

It isn't only for the train buffs however. The train involved is the Southern Belle. This will be familiar to the older computer users as the run that featured on the television interludes. This took you from London to Brighton in just three minutes. Andrew Hewson assures us that the simulation is likely to take you a great deal longer than that.

Engine driver Mike

You have to control the amount of fuel being fed into the boiler and the type of smoke tells you about the fire's condition. The only part of the simulation that they haven't perfected yet is the smell of smoke but they are working on that.

The Southern Belle is due for release in August. Destined for a July release is Dragontorc for the Amstrad, a conversion of the Steve Turner Spectrum game.

Watch this space for further details.

Light work

Dk'tronics has started producing a lightpen for the Amstrad CPC464.

According to Dk'tronics, the lightpen is supported by a highly sophisticated software package which gives a colour palette (tonal monochrome for green screen models), a choice of brush size, an airbrush mode, the ability to define your own graphics, move them around or enlarge or shrink them. There are also many other facilities in the package.

The light pen is suitable for green screen and colour models and TV modulators and will be available soon priced £24.95.

Dk'tronics, Unit 6, Shire Hill Ind Est, Saffron Waldon, Essex CB11 3AQ

Watch out!

There were seven differences in our Virgin watch competition, and many readers found more — or less — than the seven we'd made.

We've got 15 winners of great trendy watches from Virgin. Their names are: Antonio Rodrigues, Bromley; Christopher Wragg, Sheffield; James Lomax, East Ham; Richard Hirst, Huddersfield; P Shepherd, Woodthorpe; Alistair May, Elgin; Jack Hughes, Cadishead; Roger Morton, Normanton; James Carver, Knaresborough; C Paulton, St Helens; Daniel Russell, Dagenham; Dave Parish, W Wickham; Lee Joyce, Northolt; S McMenamin, Ayrshire; G Murray, Echt.

And 35 more HCW readers will be receiving prizes from Virgin. Spectrum winners will get Falcon Patrol II, while C64 users will soon be playing with Gates of Dawn. These are the lucky winners: Arthur Beale, Dorset; Jonathan Leach, Sidmouth; Mick Cliff, Stannington; E C Jones, Coventry; Paul Delph, BFPO 29; David Blackledge, Bolton; D A Porter, Rochford; F L Harland, Levenshulme; Karen Rolph, Heaton; D Lloyd, Sittingbourne; Simeon Kaylor, Manchester; Mark Pepperrell, Feltham; R C Sharp, Dundee; Bryan Steele, W Drayton; D E Nicholls, Holborn; P Brookland, Hassocks; Steve Wood, Oldbury; Keith Mawson, Slough; D J Blundell, Bishops Waltham; A Rahman, Nottingham; Andrew Taylor, Rogerstone; B Mawson, Slough; Mark McIntyre, Newport; Mark Srebalius, Eccles; Justin Stokes, Willenhall; Morris Corbett, Dingwall; Dale Russell, Warminster; James Williams, Stourbridge; P Powley, King's Lynn; Jill Woffenden, Markyate; S A Brown, Hull; M Starks, Weston-super-Mare; Andrew Bird, Ripley; Andy Stone, Bristol; A Davis Worthing.

GET CONVERTED

Toys for children of all ages are on offer in this week's free competition.

Anyone who visited the Toy Fair early this year must have concluded that 1985 will be the year of the transforming toy. There were cars that transform, planes that transform, and even insects that transform.

CGL, the parents of George the computer robot, have launched a new range of toys, the Henshin Robos. They are characters from a Japanese television series in which the heroes and heroines, the Mospeada, are struggling to reclaim the Earth from the grip of the mysterious Invids.

The Invids' fighting force is made up of Legioss which can transform into three different fighting machines. They can be Armo soldier robots, Armo divers and Armo fighters.

Each of the Armo Soldiers is worth £22 and we have 30 to give away to lucky HCW readers. These sturdily-built toys will give hours of pleasure and we aren't even going to ask your age!

All you have to do to win this week's competition is spot the difference between the two robot pictures below. So waste no more time, transform yourself into a hawk-eyed super spotter plane and win yourself a super prize.

How to enter

● Study the two cartoons — there are a number of differences between them.
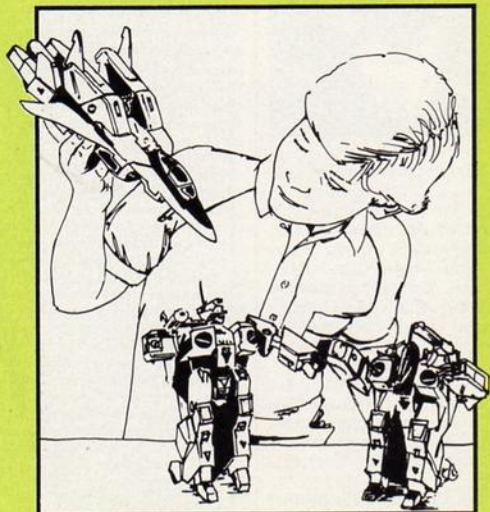
Toys worth £660 are on offer in this week's competition. They convert from soldiers into divers and fighters too

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 CGL Competition, Home Computing Weekly, No.1 Golden Square, London W1R 3AB. The closing date is first post on Friday 28 June, 1985.

● **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, Computer Games Limited 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. The editor's decision is final and no correspondence can be entered into.
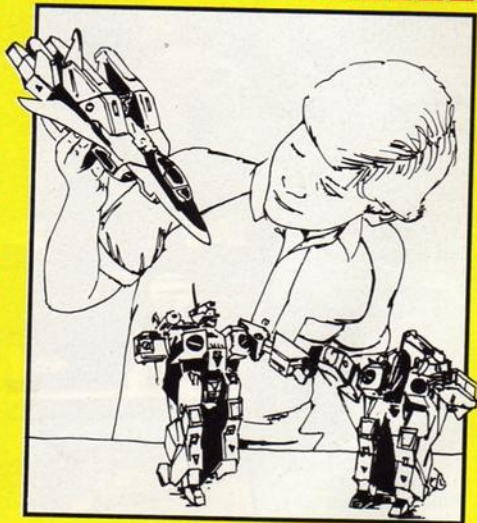
CGL Competition

Entry Coupon

Name _____

Address _____

_____

_____

_____ post code _____

Number of differences found

Complete clearly and fully — if you are a winner this will act as a label for your prize. Post to: CGL Competition, Home Computing Weekly, No 1 Golden Square, London W1R 3AB. Closing date: first post, Friday June 28, 1985. Don't forget to follow closely the advice in the How to enter section including writing the number of differences you have found on the back of your envelope.

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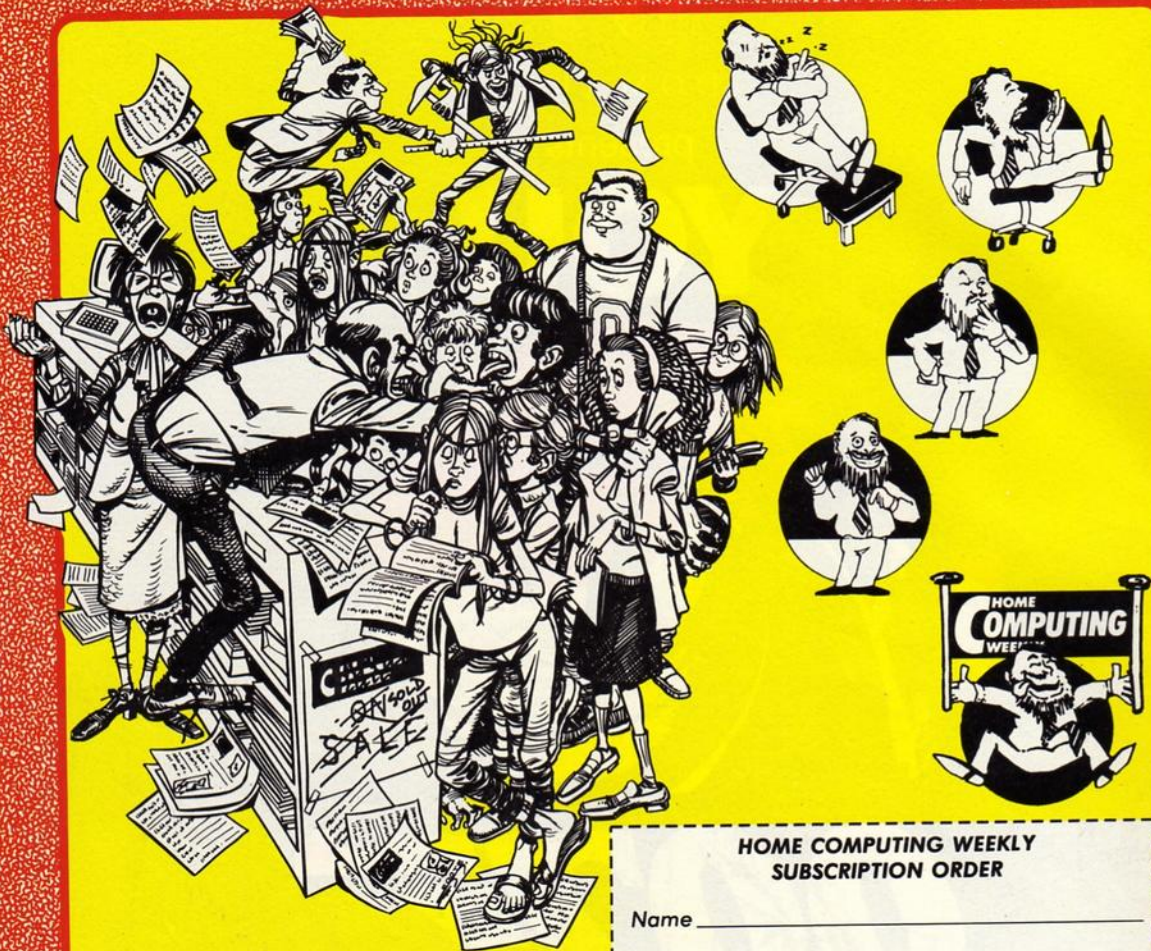Please debit my CREDIT CARD ☐ Signature:..........................

Account No: ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

Expiry Date: ....

HCW

BBC UTILITIES

PROTECT YOUR SOFTWARE

Beverley Kennet's two short utilities enable you to protect your programs from prying eyes

Hide

If you list some commercial software you may see that some lines appear to be blank. These lines use a protection technique that is very simple to implement. Type in this listing and this will enable you to hide the relevant lines in your own programs.

How to use it

To indicate what is to be hidden use the characters @ to begin hiding and # to stop hiding. These should be placed in REM statements at each side of the section to be hidden. Anything that appears between these two markers will not show up on a listing.

The program resides in memory at the same time as the program to be protected. So to tell the program the beginning and the end of this, first type T%=TOP and then P%=PAGE. Then simply set page to &7000 and Chain the HIDE program. The program will then search through the listing and hide the relevant code.

How it works

The program uses the control code 21. This is the code to turn off the VDU drivers. If this code is printed to the screen then the screen is switched off until the code 6 is printed.

File locker

If you have ever wanted to know how software houses make those m/c files that must be *RUN and give the error message "Locked" if you attempt to *LOAD them, then this utility will show you and enable you to produce your own.
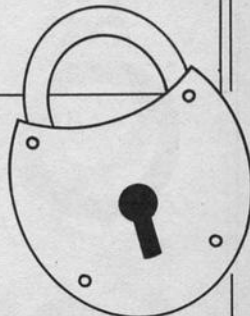
How it works

The program makes use of the Beeb's event facility. This is a simple way of using interrupts.

The event has to be enabled with a *FX 14 X call where X is the type of event required. The one we will use is for the start of Vertical Sync event. This can be used for flicker-free animation but the point about this one is that it occurs 50 times a second.

What the program does then is every 50th of a second POKEs the location &3CA with the value 1. This sets the protection bit of the block flag. If this happens when the file is saved then the file will be locked.

```
10 REM Locker utility
20 REM Press f0 to *LOAD
30 REM Then f1 to *SAVE
40 *KEY 1 *FX 14,4¦M *SAVE"
45 REM (C)
50 CLS
60 PRINT"Locker utility resident"
80FOR I%=0 TO 2 STEP2
90 P%=&A00
100[OPTI%
110PHP
120PHA
130TXA
140PHA
150TYA
160PHA
170LDA &3CA
180AND #&FE
190 CLC
200 ADC#1
210STA &3CA
220PLA
230TAY
240PLA
250TAX
260 PLA
270PLP
280RTS
290]NEXT
300?&220=0
310?&221=&A
320*OPT 1,2
```

```
10REM Hide Utility
20REM Load with PAGE=&7000
30REM after setting P%=PAGE
40REM  & T%=TOP
45 REM (C)
50 *KEY 0 PAGE=&1900¦M OLD¦M LIST¦M
60 FOR X=P% TO T%
70IF ?X=64 THEN ?X=21
80IF ?X=35 THEN ?X=6
90NEXT X
100 *FX -138,0,128
```

SOFTWARE

RIP

Mastertronic appears to have bought a job lot of programs from the same author since this is similar in layout to the excellent Rockman. The concept is extremely simple. You must run about 20 different screens collecting the chalices located in each. Your endeavours are impeded by swarms of nasties who are intent on killing you off. they can be readily destroyed by your own arrows. These nasties aren't too bright and will shoot everything in sight, including each other — this feature can be used to your own advantage.

The graphics are good for the VIC with an expanded screen and colourful well-designed figures. Everything moves at a frantic pace and you've got to be on your toes to survive. The most irritating feature is the repetitive playing of the death march — I soon turned the volume down.

I felt that through either lack of space or foresight, the author had missed some important error checking. This resulted in you starting the game adjacent to a nasty with almost certain death or, more irritatingly, a chalice appearing in an area where you couldn't reach it!

These features really don't spoil the game too much and overall this is an addictive game which offers a fair challenge. Younger owners will find the game quite a test, although I suspect that real arcade fanatics may find it a little easy.

Great value, well worth buying.   **A.W.**

Price: £1.99

Publisher: Mastertronic

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

Hotch Potch

Aimed at young children, this is one of Mastertronic's first releases on their Mistertronic educational range, and a very good start to the range too.

The program holds a number of pictures which are divided into a 3x3 grid, and after you've had a look at the complete picture to get it into your memory, the nine sections are mixed up. The child must then restore the picture to its original form in the least number of moves.

It's a fairly well-known type of puzzle, but this particular implementation is very good. There's a high-score table to add an element of competition, and although some of the pictures look deceptively simple at first, when they've been rearranged they can be very difficult to sort out. One picture in particular, that just had the simple words Hotch Potch on it, took me ages to complete (and an embarrassingly high number of moves, too).

As I mentioned, there is a counter for the number of moves taken, and this is an excellent idea, for by introducing that competitive element, the program encourages the child (and any adult too, for that matter) to think carefully and logically about each move rather than aimlessly rearranging the picture sections in the hope of randomly finding the right arrangement.

At first I thought this would be yet another uninspired piece of educational software, but I very quickly found it to be both challenging and addictive, and at the price it's a bargain.
                                    C.J.

Price: £1.99

Publisher: Mastertronic

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

Fourth Encounter

This game is on EMI's budget label, sparklers and retails at £2.50. Even better than that, it's for the VIC. The scenario is tediously familiar and involves protecting your planet from power-crazed aliens who are intent on enslaving everyone. You pilot your trusty space ship and must repulse the waves of meanies. Four waves of nasties attack you, each with a different type of alien and different tactics.

The first three waves are the usual downward moving objects with different patterns of movement and means of attack. The last screen of reminiscent of Jeff Minter's Matrix and involves attack from both the horizontal and vertical axes. This last screen is certainly the trickiest. Each screen has four levels of difficulty, offering a significantly different challenge. You can choose any of the four screens to play, which ensures that you can try all of the game.

The graphics of this game are pretty fair with some interesting animation on screen two. The action is fast and challenging. The choice of colours is sensible and ensures that no problems occur due to mismatching.

Overall, I have mixed feelings about this game. The plot certainly doesn't break new ground and the graphics are no better than average. But the program is fast and slick showing quality programming. Add to that the low price and my overall conclusion must be that this game is excellent value and well worth a close look.
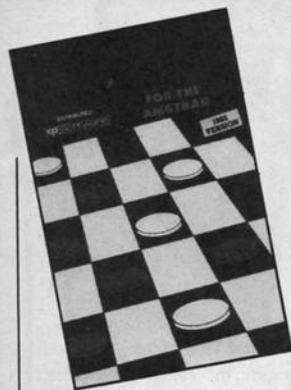   **A.W.**

Price: £2.50

Publisher: Thorn EMI

Address: Thorn EMI Hse, Upper St Martin's Lane, London WC2H 9ED

VIC-20

SPECTRUM

VIC-20

Draughts

I have to be honest and confess that board games have never been of great interest to me. None the less, it's clear that a home computer must be a boon to those interested in getting some practice in without the shame of losing to another human being, hence the value of software like this.

Some years ago, I used to think that draughts was a simple, gentle game, until I saw enthusiasts playing with what can only be called killer instinct! So be warned before loading, this tape plays a mean game. Try as I may, I couldn't win against it even on the beginners' level. Moves are made on the co-ordinate principle, like computer chess, and a record of moves kept on screen. All the legitimate moves are possible, and the illegal ones blocked.

The screen is well laid out, though there is no attempt to give the impression of 3-D. Machine code appears to have been employed to move the pieces, because if you take your eyes off the screen for a microsecond, the whole thing has happened without your seeing it, and that means poring your way through the co-ordinates to work it out. A rather slower routine would have helped. Similarly, although the colours of the pieces and board can be reset, the background remains a rather glaring white. After a while this is a real strain on the eyes, particularly as close study is required. If draughts is what you like, see this.　**D.M.**

Price: £8.95

Publisher: CP

Address: 10 Alexandra Rd, Harrogate, HG1 5JS

AMSTRAD

Amazon Warrior

The steamy jungle harbours creatures which strike fear into the hearts of the brave. Such is the setting for Amazon Warrior.

With nothing but a blowpipe and forty poisoned darts, you must travel through the jungle, the crystal caves and the ruined temples to face the final conflict.

The jungle is inhabited by tree snakes, scorpions and head-hunters, all of whom are after your blood. To fend off these relentless attacks you must stand and fight or run but whatever you decide it has to be done quickly. The jungle waits for no-one.

In the caves the vampire bats and wraiths lurk and the temples harbour spiders which will wrap you up in a cocoon and carry you off. The temples are old and crumbling so beware of falling masonry.

The game could be played indefinitely simply by running away all the time but there comes a time where you must stand and fight. After loading the blowpipe, it can be moved through a 180 degree arc until it is brought to bear on the target. A quick press of the fire button dispatches the dart (and hopefully the enemy too!).

I think the main question to be answered about this action adventure is: what does it offer that Forbidden Forest does not?

Having played the game I still can't answer this one. The graphics give the same 3-D scrolling effect, the music is throaty and insistent. Shoot the creatures or be eaten. No, can't see much difference apart from the transposition to the Amazon. Don't misunderstand me, the game is enjoyable, addictive and all that, but my warrior had a tremendous feeling of deja-vu.　**E.D.**

Price: £7.95

Publisher: New Generator Software

Address: The Brooklands, Sunnybank, Lyncombe Vale, Bath

C64

Backgammon

Less well known than chess or draughts, backgammon is addictive and compelling. In some ways like a sophisticated Ludo, your task is to pilot your counters back round the board to their base, at the same time knocking and blocking your opponent. On-screen dice indicate the moves you can make, either one piece for the total, or any combination for individual men. Catch an opponent's piece undefended and you can banish it from the board. He can only resume his master plan when he succeeds in releasing it. Great fun.

Written principally in BASIC with some machine code, this offering from CP features a black background, so no eye strain, redefinable colours, and an attractive representation of the board, though movement is rather flickery and the dice are by no means state-of-the-art graphics. Illegal moves are simply not accepted, as opposed to the message the inlay leads you to expect. Otherwise the instructions are good, though a little terse.

Settling down to a good game revealed two fatal flaws. In my first game, when inputting a co-ordinate, I accidentally pressed ESC instead of a number. The program crashed a move later and the computer reset. I loaded again, and after a few minutes play, the game ground to a halt with a BASIC "improper argument" message, and the program disappeared, it being a protected file. Very sad; this could have been a useful acquisition, but with the bugs present, it cannot be recommended.　**D.M.**

Price: £8.95

Publisher: CP

Address: 10 Alexandra Rd, Harrogate HG1 5JS

AMSTRAD

★ ★ ★ ★ ★
Flipped

★ ★ ★ ★
Hooked

★ ★ ★
Keen

★ ★
Yawning

★
Comatose

Rockman

It's nice to see that Mastertronic are turning their hands to the distribution of software for VIC-20 owners. At the £1.99 price, this has got to be good news for a great many people.

The author of this program has obviously played that well known masterpiece Boulder Dash since this game has many similar elements. You have 20 caves to tackle. The eight pieces of an amulet in each cave must be collected before you move onto the next cave. Within each cave are rocks embedded in a matrix of earth. As you dig through the earth, the rocks will tumble, crushing you if you get in the way. Also lurking in the caves are purple figures which will grab you given half a chance and skulls which have a similar inclination.

I must give full marks to the author of this program. The game uses an expanded screen and to fit 20 screens into an un-expanded VIC must have been a bit of a challenge. The graphics are as good as the VIC can offer with passable animation and colour. The behaviour of the rocks is occasionally a little haphazard but with practice this can be overcome. Better attention to detail would have been helpful since the game often started with you being adjacent to a purple nasty with instant death resulting. I also wonder how many of the random layouts of the amulet pieces were actually possible to complete.

Notwithstanding these minor quibbles, a great game.   **M.W.**

Price: £1.99

Publisher: Mastertronic

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

The Captive

The current trend in adventures is to get away from text and use other forms of communication with the computer. This game is quite interesting in that whilst it's a fairly straight-forward graphical adventure, a quite novel means of communication is used. The idea is to escape from the Glen of Coloured Corpses. The top half of the screen shows a map of the area with your figure in the middle. as you move about the map scrolls to show your new position. Scattered about the map are objects which can be used to gain strength or to further your escape. There are also hazards to be avoided.

The lower half of the screen controls your actions. A menu is used to decide your actions. You can take, drop and use items along with other options. The consequence of your action is also shown in this area. If, for example, you use a scroll, the text of the scroll is displayed. The idea is to use logic to decide the value of the items and thereby escape.

The quality of graphics and sound are excellent. The map is colourful, showing well-designed buildings and woods. The play area is large involving a fair bit of exploration. The background music is a jolly arrangement of the Sorcerer's Apprentice.

The nice thing about this game is that not only is it good quality but that it only costs £1.99. Overall, excellent value for money.   **A.W.**

Price: £1.99

Publisher: Mastertronic

Address: Park Lorne, 111 Park Rd, London NW8 7JL
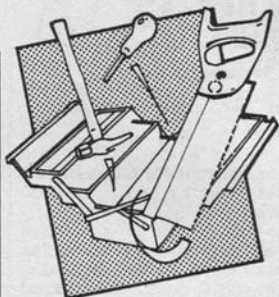
The Code Machine

If you decide to write machine code programs, you will need some programming utilities to enter the code and experiment with it. An assembler allows you to do this as a series of pro-gram lines, in a similar way to BASIC. The computer then 'assembles' them into machine code. A monitor allows you to examine and edit the contents of the memory. Both programs are essential to someone wishing to write serious machine code programs.

The Code Machine offers both on one cassette. Supplied with an excellent no-frills manual, the package offers a wide range of features. All Z80 mnemonics are covered and it allows an unlimited number of labels as well as either hex or decimal numbers. It is very easy to use with a quick editor and assembles at a maximum rate of seven seconds for every 1K of code. For long programs, it allows the code to be assembled in up to 26 linked sections which can be loaded in sep-arately, assembled and stored together. The assembler works in either MODE 0 or MODE 1.

The monitor has the same characteristics; it is quick and simple to use. The comprehensive error detection made it especially simple.

The code machine is not cheap and this prevents it getting top rating. Still, if you're interested in writing code and can afford the price tag, then it's a must.**CCCCCCC.G.**

Price: £19.95

Publisher: Picturesque

Address: 6 Corkscrew Hill, West Wickham, Kent BR4 9BB

Repton

Despite the rather high price, which probably reflects the shrinking state of the Acorn software market, I believe that Superior has a winner in this game.

The game is based on the Bolderdash idea that has already been seen on some other computers and which involves collecting treasure from a field full of dangerous elements. In this case you are the rather alien-looking creature which stalks the screen and the nasties are many and various.

The graphics are very good indeed. They are large and colourful and the animation is superb. I particularly like the way the character which you control has a look around him if you don't move him for a while.

Another danger are the eggs which if cracked turn into the dreaded Reptons of the title. These green and yellow creatures pursue you around and will kill you if you touch them. Once again the animation is superb.

This game has that addictive element which is becoming rare in software these days — perhaps I'm just becoming more jaundiced. I think it's the strategy element that makes it so good.

You can study the map on the lower levels so as to plan your moves and try out different ideas.

Repton has all the features of a well thought out and profes-sionally finished product; good graphics, clever sound and superb animation. Despite its price it still gets top marks.
R.S.

Price: £9.95

Publisher: Superior Software

Address: Regent Hse, Skinner Ln, Leeds LS7 1AX

VIC-20   **C64**   **AMSTRAD**   **BBC**

Steve Davis Snooker

Having been an avid player of CDS's snooker program for the Amstrad, I looked forward to this Enterprise version. Surely with the higher quality graphics, an extra 8K of spare memory and a number of other advanced features, this version would be even better than the excellent Amstrad title? Wrong! The Amstrad version is better, while the Enterprise version looks as if it was rather a rush-job getting it ready for publication.

For those readers that haven't come into contact with CDS's Snooker programs, a brief explanation is necessary. The game simulates graphically the game of snooker. All the balls are in colour and after you have decided exactly where you wish your cue ball to aim for, set the strength of shot and the spin on the cue ball, you fire away!

The action as balls connect and are sent zooming around the table is astonishingly realistic, particularly when you consider the number of calculations as well as screen movements which must be performed. As with all versions of this game from the CDS stable, the Enterprise also features a one- or two-player game, high score table and short or long game (10 reds to pot as opposed to 15).

I doubt if you will see a better snooker program on the Enterprise. The table is realistic and provides for a most entertaining computer game. Though it is not as good as the Amstrad, I think that I'll chalk up, put on my imitation World Champion Oversize Glasses and try and get a 147 break on my Enterprise.   **C.G.**

Price: £8.95

Publisher: CDS

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

Operation Caretaker

In theory, this is an excellent idea — a care and cleaning kit for your cassette player (although not, as Global implies, for the computer). In practice though, I couldn't figure out what was going on or what it all meant when I had the program up and running.

The kit consists of a head cleaner and demagnetiser tape, a small screw-driver for adjusting the head alignment (so far so good, both of these are good ideas) and a short program which checks azimuth alignment.

It's the latter which causes problems, as there are no instructions at all to explain how this program works, or to explain what jargon like "azimuth alignment" means. The screen display consists of an animated bar graph with three columns, but there is no explanation of what the bars measure. Beneath the graph are five lines of text referring to the Read Status, Bytes Read, Read Errors, Speed and Sensitivity of (I assume) whatever data is being LOADed.

Now though those headings might sound self-explanatory, the figures which accompanied them were completely confusing. According to the program, my cassette player, which has been completely reliable since I bought my Speccy in '83, is a complete wreck which apparently makes more errors than there are bytes in any given file.

As I said, this kit is a good idea, but as it stands the lack of instructions and explantory notes make it very lacking in user-friendliness.   **C.J.**
Price: £9.95
Publisher: Global Software
Address: 33 Shelgate Road, London SW11 1BA

Adventure Playground

This package is a collection of educational programs for early readers up to 11 year olds. The first side contains four separate programs which are loaded into the Enterprise together and are all based around the Crooked Man nursery rhyme; no, it wasn't one of my favourites either.

These four programs basically involve you trying to get the crooked man, the crooked cat and the crooked mouse all to reach the crooked house. Each program uses a line of the nursery rhyme on which to base its game. In the first game, for example, you have to get the crooked man to the crooked stile. You can only move the man when you get one of the simple problems/questions right.

In this first game, the questions deal with sets. A number of green shapes will appear and a different coloured shape will appear at the other side of the screen which changes colour every second or so. You press the key when you think that the shape belongs to the set. All four programs tend to work along similar lines, though the subjects covered range from sets to set progression, matching of objects and simple numerical calculation. These programs for the young user (certainly not above seven or eight) may be of interest.

The second side, featuring The Queen Of Hearts is an altogether sorrier affair. Described as a child's first adventure it does feature some very nice graphics but its content is of little use to the child or parent. The adventure is poor and badly directed. It is complex enough to be used by eight-year-olds and up, but is this age group still interested in nursery rhyme and early story-book characters? I doubt the value of this educational package, despite all its good intentions.   **C.G.**

Price: £7.95

Publisher: Widgit

Address: 48 Durham Rd, London N2 9DT

Frank 'N' Stein

Dr Stein's monster has gone to pieces and he requires your help in locating his various little parts, scattered around the laboratory.

Frank 'N' Stein is a game of ladders and levels with several of the monster's parts embedded in the floor on each level. Also embedded in the floor are a number of giant springs. Your normal movements are left and right except when standing on a spring, when a quick dab at the firebutton will propel you skywards to the level above.

On the first level your progress is hindered by the presence of a large boot, hypodermic syringe, and tank. Contact with any of these items results in the loss of one of your three lives. All the monsters limbs must be collected in the correct order, working from the head down. As each part is acquired it appears at the top of the screen encased in some weird and wonderful device. Having constructed your creation, all that is required is to flick the switch and give him life.

On subsequent screens the monster joins in the fun by hurling huge cannon balls in your direction, usually with uncanny accuracy. The cassette card claims that the quicker you construct the monster the less aggressive he will be on the higher levels.

A competent program but I can't see it being the monster hit of 1985.   **J.R.**

Price: £8.95

Publisher: Amsoft

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

ENTERPRI
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AMSTRAD

The Key Factor

The Key Factor by Paul Aitman is a very useful program aimed at improving your mastery of the keyboard — and cleverly disguided as a space invaders game.

Having selected the level of play the screen clears and battle commences. Your laser bases are represented by eight squares at the bottom of the screen, each containing a letter or symbol from the keyboard. Above your bases are numerous shields, which are eroded each time an alien escapes your fire and touches the shield.

Missiles are fired by pressing any of the keys displayed. On the lower levels this doesn't present too many problems as the symbols at the bottom of the screen don't change until that particular missile has been fired. However, as you improve and reach the higher levels you may notice that although you appear to be pressing the correct keys there are no little missiles soaring skywards and annihilating the baddies. This is because the symbols are changing constantly, so if you dawdle before hitting the correct key you will find that it has already changed to a new symbol.

All of the aliens are displayed in glorious colour and great detail. Paul Aitman has obviously taken great care and it shows. A well presented and fun way to find your way around the keyboard. **J.R.**

Price: £8.95

Publisher: Amsoft

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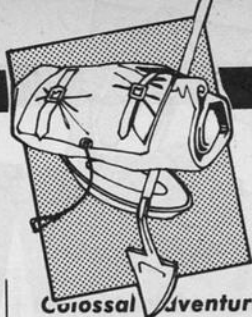
Colossal Adventure

This is the grandfather of the modern computer adventure, the first ever adventure game, written on a DEC mainframe computer by Crowther and Woods, two Americans in the mid-1970s. As home computers became cheaper and cheaper and the amount of memory they had spare grew and grew, home computerised adventure gaming became a possibility. This adventure has been converted to almost every popular home computer and it is a sign of its great quality that it is still as entertaining today as it was back in the late 70s.

Colossal Adventure is a very tough adventure to solve. Set in a hybrid world of fantasy mixed with modern day devices, you must find all the treasure littered around the mass of locations, collect it and manage to get it back to the building. The text to this adventure is so atmospheric and filled with clues, riddles and red herrings. The solutions to the many puzzles that confront you require lateral thinking; this is not an adventure you are going to finish in a couple of evenings.

Level 9, known for its excellent adventures for a host of other home micros, is the company behind this conversion and it has given the user an additional bonus. While they have stuck pretty faithfully to the original's storyline and puzzles including pretty faithfully to the original's storyline and puzzles including the annoying omission of the word LIST as a command, they have added an extra end-game once you have collected all the treasures. This additional part of the adventure covers a staggering further 70 locations and is in the same style as the original. Without doubt, this is a must if you have never played the game before. A superb version of the adventure classic. **C.G.**

Price: £9.95

Publisher: Level 9

Address: 229 Hughenden Rd, High Wycombe, Bucks

Cavefighter

This is yet another conversion of a C64 game by this company. In this case I am particularly pleased since it is for the now defunct VIC. This game is effectively a platform-type game where you must travel down a network of caves. You make your way by climbing ropes and jumping chasms. The caves are inhabited by nasties which, of course, kill you. You can shoot these creatures but they will reappear.

Since this game runs on an unexpanded VIC, some fiddles must be used. The caves are kept on tape and loaded as required. The cave actually in memory is displayed in sections, each appearing as you move off screen. The graphics are really very good with the aliens appearing as soft sprites with sprite background priorities. I can't understand why only now programmers are using soft sprites on the VIC to any extent. I can only recall one other game which really used this approach and that appeared about two years ago!

The control of this game is a little eccentric with the fire-button determining how high you jump — the longer you hold it down, the higher you jump. Another oddity is that you can walk in mid air!

Overall I didn't really like the feel of play in this game. Rather than experiencing the challenge of a testing game, I was filled with irritation. Sadly, this game is less effective than the C64 original. In view of the material appearing for the VIC on the budget labels, I consider this game a little overpriced. **A.W.**

Price: £5

Publisher: Bubble Bus

Address: 87 High St, Tonbridge Kent TN9 1RX

Knockout

The press releases accompanying this told us that our review copy was not the final version of the game, though presumably the review copy has most of the features planned for the final version, otherwise there's no point in reviewing it.

Anyway, after a (pretty feeble) couple of bars of the theme to one of the umpteen Rocky films, we are introduced to t Italian Stallion (yes, that's you) and his boxing opponent. The purpose, of course, is to knock the stuffing out of each other using a combination of fancy footwork and a flurry of haymakers.

Actually, the fancy footwork consists of moving left/right, and the punches can be either to the head or body. There is also a guard control, to cover yourself from your opponent's attacks, but it didn't seem to do much when I used it.

The animation of the boxers is good, and they are both large, well-drawn figures. Once I got the hang of it, I managed to land a few thumps on my opponent, but it seems that you can't move fast enough to avoid his blows once they're launched. After a while I got used to the pace of the game and then it seemed that we just took turns punching each other and the whole thing started to seem a bit mechanical and monotonous. Perhaps additional skill levels would add some variety.

I found Knockout enjoyable to play for a while, but the excitement faded fairly quickly. **C.J.**

Price: £6.95

Publisher: Alligata

Address: 1 Orange St, Sheffield

AMSTRAD

ENTERPRI

VIC-20

SPECTRUM

Hustler

This pool simulation first appeared on the 64 and has now been converted to the C16. Six games are available, three each of one- and two-players. The usual types of game are supported, i.e. pot any ball in any order, pot each ball in the indicated pocket, pocket the balls in the correct order, normal pool rules and each player potting in reverse orders. The computer keeps track of scores and allocates shots for fouls etc.

A cruciform cursor is provided to allow you to aim. This is moved to the required direction of contact by use of the joystick or cursor keys. The strength of shot is varied by shooting when a "strength meter" reaches the required level. I found this feature a little difficult to control since the strength changed rather too quickly. All types of spin can be used by pressing the relevant function key.

This type of program inevitably presents programming problems due to the need for continuous movement of the balls. On the 64 there's no problem since sprites are available. On the C16, this requires soft sprites. The author has tackled this problem well and the motion of the balls is smooth and convincing. Some of the collisions are definitely not according to Newton's laws — nor was the 64 version — but the inconsistancy isn't too distracting. The standard of graphics was very high.

Unlike most C16 games, this program offers real music. I found this game highly enjoyable and a good quality simulation. **M.W.**

Price: £7.95

Publisher: Bubble Bus

Address: 87 High St, Tonbridge Kent TN9 1RX

C16

Heathrow Air Traffic Control

"Aircraft A reduce speed to 150 knots, head 240 right and reduce altitude to 6000 ft. Aircraft Q reduce speed to 130 knots, course steady. No, increase altitude to 8000 ft. so as not to collide with aircraft E coming in very fast at 6200 ft. at the last quote point. Aircraft J as you have a slow descent rate turn 180 left and head to LAM stack."

This is a typical couple of minutes when playing Hewson's Air Traffic Control for the Enterprise. The scenario, as if you haven't guessed by now, is that you constitute the A T C at Heathrow and must bring a number of aircraft in safely.

Believe me, this is no easy task. It's not just a matter of heading in the right direction and gradually lowering altitude until they are within landing sight, you have the arduous task of co-ordinating a number of aircraft all at different heights and positions. Even at the simple levels you have to deal with windspeeds, landing position, radar and communications; a bewildering array of subjects, concepts and controls to master. The small manual is helpful and if you're patient you should find your way around the game in a few hours.

If you master the first level (something I must admit I have yet to do) then you can move on to one of the other seven levels. Apart from featuring different sized aircrafts of vastly varying descent rates, speeds and manouvrability, you will find that aircraft may declare emergencies, in which case you must land that plane as quickly as possible.

A most difficult and interesting simulation but one you will either enjoy or wish not to touch. I suggest that you try it out and see. **C.G.**

Price: £7.95

Publisher: Hewson Consultants

Address: 60A St Mary's St, Wallingford, Oxon

ENTERPRI

Galaxia

In this space game you control a rocket on the left of the screen and both background and aliens scroll in from the right. The graphics are good and use the sprite capability effectively. A considerable amount of movement up to the centre of the screen is allowed, hence you can manoeuvre around the oncoming hordes of aliens.

The nasties come towards you at varying speeds and perform odd movements which mean you have to keep your wits about you. There are some imaginative creatures like sly baiters and zappers plus some silly ones like banging bangers, which are wobbly sausages! Sometimes the creatures simply pass by and you have to avoid them but usally you are fired at in a pattern exclusive to the particular alien.

My son, a hardened arcade game player, managed nine out of the 10 screens on offer and felt there was little incentive to go on. There are options, however, to make the game more difficult as you can adjust the speed of the game at the beginning. There is also a demonstration mode which goes through the whole sequence and shows a docking procedure at the end which presumably allows you to go round again and clock up more points. All scoring and screen status is shown in a well laid out display.

Not bad if you want an undemanding game that allows you to make fast progress. **M.P.**

Price: £6.95

Publisher: Kuma

Address: Pangbourne, Berkshire

MSX

Match Fishing

Ok, I'll admit I was surprised to see that this program contained a pretty large amount of BASIC, but I was determined not to hold that against it, since one of my favourite games (Apocalypse by Red Shift) was written in much the same way.

However, what I do hold against it is the almost complete lack of content, excitement and action involved in the game.

Up to eight people can play (can you imagine eight people crowded around the Spectrum keyboard?), and once you've chosen your bait, type of line, and size of welly-boot, all you have to do is sit and look at an (admittedly very good) picture of a lake, whilst waiting for your "peg" (the numbers 1-8 scattered around the lake edge) to flash. You then leap to the keyboard, press the relevant number key, and are rewarded with a picture of a little fish swimming towards a fisherman on a bank.

By pressing the appropriate key you can attempt to hook the little blighter (which I failed to do, but I gave up quite quickly out of sheer boredom).

The press release assures me that all sorts of subtle tactics are available to the enthusiast, but I can't imagine a fishing enthusiast being lured to the screen by this, and for the non-enthusiast it's boring in the extreme.

Some sports lend themselves to computer games, but on the evidence of this one, fishing is probably the least suitable sport I can think of. **C.J.**

Price: £6.95

Publisher: Alligata

Address: Orange St, Sheffield

SPECTRUM

MACHINE CODE — THE EASY WAY

In the second part of David Ellis's new series, we get down to the nitty-gritty of machine code programming

After last week's "questions and answers" session, it's now time to get down to some machine code programming. Before making a start though, there are a few things that need sorting out.

Firstly, where will the machine code programs reside in memory?

As the BASIC program is stored from location 368 upwards it will obviously need to be somewhat higher than this. If the cassette buffer is used this will use locations 39806 (&9b7e) upwards. If the disc system is used then this will reduce this figure by a further 1280 bytes to 38526 (&967e). Using the area from say 30000 (&7530) to 38000 (&9470) will give some 8000 bytes for machine code programs, and still leave nearly 30,000 bytes for any BASIC programs, which in both cases should be more than ample.

For the purpose of these articles I shall use locations 30000 (&7530) upwards for the demonstration machine code programs. If you wish to protect your machine code programs from being over-written by a large BASIC program then the use of the MEMORY command will set a "barrier" at the beginning of the machine code program, thereby protecting it. Set MEMORY to one less than the start of the machine code program — in our case there-fore this will be MEMORY 29999.

Now how do we put the machine code program into memory?

One way is to use an assembler program, which will also take a lot of the hard work out of machine code programming. However, I am assuming that most of you will not have an assembler, so we shall be doing it the hard way by hand assembling the programs and then POKEing the machine code numbers into memory with the help of a small BASIC program.

For small programs, hand assembling is quite satisfactory. If you are well organised then quite large programs can be tackled, although the use of an assembler would be advisable.

As for the actual machine code numbers, the machine code instructions will be entered in decimal, and addresses will be entered in hexadecimal. The reason for using hex with the addresses will soon become apparent. If you don't understand hex then it really makes no difference. The CPC464 will do all the converting that's needed.

The BASIC program to place the machine code numbers to memory will be as follows:

The highest usable memory location for BASIC is set at &752f (29999) in line 10, and location is set at &7530 (30000), the start of the machine code program. The list of machine code numbers is then placed in DATA statements (starting at line 100), and these are then POKEd into memory in line 30. The memory address is then incremented until the value -1 is read, which signifies the end of the list of machine code numbers.

I shall refer to this program as the BASIC loader. The only difference between each program will be the list of numbers held in the DATA statements, starting at line 100, so these will be the only lines that I shall give you in future.

The simplest machine code program that you could write would be:

100 DATA 201

201 is the Z80 code for RETURN or RET for short. This will return the program to its original calling place. If this was a CALL from BASIC then a return would be made back to BASIC. Enter the BASIC loader and line 100 as given above — RUN the program, then type:

CALL &7530

```
10   MEMORY &752f : location=&7530

20   READ code : WHILE code <> -1

30   POKE location,code : READ code

40   location=location + 1

50   WEND

100  DATA  (list of machine code numbers)

999  DATA -1
```

If all is well then you should return back to BASIC right away. Rather a useless program, I agree, but from little acorns . . .

Now let's try something that's a little more useful. The best way to experiment with machine code is to use programs that display something on the screen. In this way you can actually see what is going on! The traditional way of learning machine code programming — ie how to add, subtract, multiply and divide etc is best forgotten — at least until you have gained some hands-on experience.

The Z80 chip contains a number of registers which will be looked at in more detail in the next article. A register is simply an internal storage location within the Z80 chip which is used for storing and manipulating numbers at high speed. The most often used register is the ACCUMULATOR which is usually referred to as just A. This register is the workhorse of the Z80 and is used for just about everything! Perhaps the most common operation is to place a value in the accumulator. As the register is eight bits wide (one byte), it

can hold integer values from zero to 255. To place the value of 255 in the accumulator you would use the assembly language mnemonic:

LD A, 255

This stands for — LoaD the Accumulator with the value 255.

Another common instruction is to store the value that is in the accumulator to a memory location. The assembly mnemonic used is:

LD (address), A

The address given in brackets will be a memory location between zero and &ffff (65535). For example: the start of screen memory on the CPC464 is at &c000 (49152). The following program will place the value of 255 to this first screen address:

LD A, 255
LD (&c000), A
RET

All that needs doing now is to look up the Z80 instructions and find the corresponding opcode number. Each Z80 instruc-

tion has a unique opcode number allocated to it. In fact, some opcode numbers consist of two numbers which enables the Z80 to use over 800 different codes. All of the opcode numbers are eight bits long and will therefore be from zero to 255. The opcode number for LD A,n (where n represents the number to load the accumulator with) is 62 (decimal). LD A,255 will therefore be 62,255. The opcode number for LD (nn), A (where nn represents a two byte address) is 50. This number must then be followed by the address. The address must be given in two bytes, with the Least Significant Byte (LSB) first, followed by the Most Significant byte (MSB). If the address is in decimal then the LSB can be calculated by using the BASIC statement:

LSB = address MOD 256

However MOD can only be used for numbers up to 32767 so its use is somewhat limited. The MSB and LSB could by found by:

MSB = INT(ADDRESS/256)
LSB = address — (MSB * 256)

The reason for using hex addressing is that none of this is necessary! With the screen address &c000 the first two digits are the MSB, and the last two digits are the LSB. So the MSB is &c0 and the LSB is &00. LD (&c000), A will therefore become 50,&00,&c0. The whole program will then be represented by the one DATA line:

100   DATA
62,255,50,&00,&c0,201

Enter this line into the BASIC loader and then RUN it. The result of CALLing the machine code program will depend on what MODE the CPC464 is presently in, and also the offset that the screen is currently set at. Try entering:

MODE 2 : CLS : PRINT : CALL &7530

In the top left hand corner of the screen you should see a single '_' line. This line represents the value 255 and shows that the machine code program has worked correctly. Hardly exciting, I know, but in the next article we will develop on the program to produce a rather more impressive display.

Mike Roberts takes a good look at the latest in Atari's long line of machines and he likes what he sees!

The Atari computer system is probably the oldest computer still on sale — having a basically unchanged design from its original spec back in 1979-1980. Then the 16K Atari 400 or 800 cost a large sum of money — but it was worth it. The 800 could be (at vast cost) expanded up to 48K by plugging 16K expansion cards into a frame in the rear of the machine, and 48K of memory was a huge amount then!

Amongst the things that made a computer attractive in those days was a cartridge port. Cartridges had been used on some earlier machines — notably the Exidy Sorcerer — with little success. Nolan Bushnell carried over the philosophy of the Atari VCS video game to the computer industry. What also changed a lot of things was the idea of the hardware manufacturer marketing his own software.

At the time of the computer's launch, a cartridge called Star Raiders was also released. This sold Ataris in the same way that Acornsoft Elite sells BBCs now, and the game had a similar earth shattering impact as the Acornsoft product.

Since then, Nolan Bushnell sold off Atari to Warner Communications where it started to lose $10m a month. They went through the XL period and now that Jack Tramiel has bought the company, the XE series is upon us. At the time of going to press, however, only the 130XE is likely to see the light of day.

The internal architecture is similar to the original 800 — though the layout and construction is much more rationalized for cheaper manufacture. The old Ataris had a separate board for everything, a memory board, a video board, a processor board, and so on. All plugged into a cast metal frame to guard against interference.

The 130XE has a single board with all the components on it sandwiched between two layers of steel sheet. There is the same video, sound, and I/O chips — GTIA, ANTIC, POKEY. This means that all Atari software will run without modification, as far as we know, and Atari computers have a huge software library. The video circuitry has been cleared up a bit to produce a clearer display, but this should be a transparent modification. The electronics are slightly different for more efficient manufacturing — in line with the new Tramiel philosophy of low overheads to keep profitability up.

The 130XE has 128K or RAM. This RAM takes up most of the circuit board — 16 chips in all. There is also a RAM manager called FREDDY — Atari always give their custom chips odd names. Much better than meaningless digits or three letter designations.

The main processor is a 6502C running at about 1.79 MHz, but the computer ends up running much slower due to the video chip. This chip can theoretically only access 64K of memory at one time. So how does the XE do it?

Well, the 6502 can only access 64K at any one time — the trick is to switch it in and out when you don't need it, a concept familiar to C64 owners. It has 64K RAM, 20K ROM, and 4K I/O. It's like having a book and only being able to see two pages at once. The Atari 130XE has 64K RAM, 64K RAM, and 24K of ROM (I haven't a clue where the I/O is). The bank switching is therefore more complex.

You will find about 38K free for Basic programs. So what about the other 90K? — I hear you ask. 24K is inaccessable except from machine code, because this is what hides behind the 24K ROM used for Basic etc. The other 64K is known as The Extra Memory. This can be brought into your programs in 16K chunks. The 16K that is "paged out" is the second section in the memory map from $4000 to $7FFF. This is just above where the hi-res screen normally resides in memory.

In this section of memory you can look at either the original (normal) 16K of memory or the extra memory. The extra memory (64K) is divided up into four 16K chunks. You can then say which memory chunk should occupy the memory area designated as the banked memory sector.

Another refinement of this system is allowing the main procesor or the video processor to look at the memory. This

means that the video processor can use the extra memory to store all its sprite, UDG, colour, and hires data. It is now feasible to draw a number of objects in hi-res (you can store 8 hi-res screens in 64K) and flick through them to produce faultless animation. Added to this you also get an extra 8K for your programs.

The keyboard of the XE is new, and I found it to be lacking in both feel and quality from the XL and even the original 800, it is a low profile type, very similar to the Commodore +/4 keyboard. The function keys are sculptured into the top of the case and have a very "tacky" feel to them, in fact the standard of finish on the case is poor overall, the edges are very rough and look unfinished.

The I/O ports are similar to those on the XL except the cartridge port is on the back of the machine (à la Commodore) and not the top. The expansion connector of the XL series is missing, but to the best of my knowledge this has never been used for either Atari or third party hardware. Instead of this there is what's called an ECI (Enhanced Cartridge Interface) this is sited next to the cartridge port and allows the cartridge capacity to be extended from the normal 8K up to a full 64K if it ever becomes necessary. It could also be used by any other kind of add on.

There are the two joystick ports which take "Atari type' D9 joysticks and paddles, remember that Atari invented this standard. There is also the serial bus, which connects peripherals in a similar manner to the Commodore serial bus. The cassette deck connects up here so you still need to use an official Atari tape recorder.

The manual is a great leap forward for Atari, their manuals are usually unreadable. This one isn't too bad, although it is still hideously Americanised.

All in all for £169, I think that you get an excellent machine with bags of memory and expansion options. A large user base, readily available peripherals, and a large software base. I think that within a very short length of time it will be up among the leaders.

Thanks to Silica Shop, Hatherly Rd, Sidcup, Kent, for the loan of the review machine.

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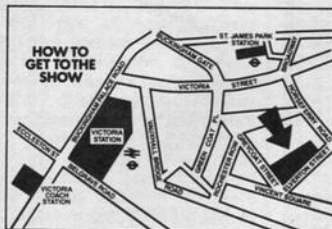
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COMPUTERS IN SOCIETY

This week our telecommunications specialist, Doreen Naylor, introduces herself and explains why she became interested in this fascinating area of computing

It was suggested to me that I write an article to introduce myself and explain my views on telecommunication and the micro-computer. I agreed without realising that my views on telecommunication may be slightly different from the majority of HCW readers as I am profoundly deaf. No doubt it was felt that my experience could prove useful as I have been looking into various computer/modem combinations so as to find a cheap and efficient set up which will be suitable for the hearing-impaired.

As a housewife with a part-time job as an information clerk, I first became involved in telecommunication in 1982 when I was asked to participate in the Visicom Project. This was set up to investigate the various ways in which the telephone could be used by the hearing-impaired. The Department of Industry funded the project to the tune of 60,000 pounds.

Principally the project concentrated on the Electronic Mailbox facilities provided by Telecom Gold and Prestel together with assessment of the Vistel (a dedicated terminal used by the deaf for some years).

Since the termination of the project I have begun to realise that using computers back-to-back via the telephone together with the chat mode facilities found in the electronic mailbox is very attractive to the hearing-impaired and has proved to be a very reliable form of communication.

Consequently I am hooked on telecommunication and have set up a Dircomm (DIRect COMMunication network in the vicinity of Leeds, comprising 11 families (deaf and hearing, parents, in-laws and friends etc). I am in the process of compiling information on various types of home computer and modems capable of being used for telecommunication by the hearing impaired. I am particularly interested in modems since they are becoming more sophisticated and relatively cheaper.

My current set-up comprises a BBC (Model B), Pace Nightingale Modem (V21, V23, Bell 103) and Commstar. I originally started out by using a Transdata 307A acoustic-coupler type modem which was used mainly for Telecom Gold.

Later I acquired a Prism TX75/RX1200 acoustic coupler when I joined Micronet which increased the speed of downloading in Telecom Gold. Problems occurred because the modem did not have rubber-cups to hold the telephone handset so it was susceptible to background noise from TV, kids etc and consequently suffered considerable corruption of text. Whilst having a good chin-wag using chat mode on Telecom Gold I was frequently chucked out of chat mode which necessitated rapidly redialling and logging-

on again so as not to lose my friend who may have become frustrated by my disappearance.

This problem annoyed me for some time before it dawned on me that when I laughed the signal generated was ejecting me from chat mode. I overcame the problem by the generous application of Blu-Tak between handset and plastic cup of the mode.

This kept me going for a while until I heard that Pace of Bradford was bringing out a hard-wired modem at what I considered was a reasonable price. I managed to borrow one for field testing and found it lived up to expectations.

I now have a "Black Museum" containing No.2 Prism modem TX75/RX1200, Tandata Td1616 (viewdata terminal), Transdata 307A acoustic-coupler, GEC Datel Modem RX75/TX1200 with which I am hoping to set-up a bulletin board for the hearing-impaired. Recently I have been playing about with NEC PC-8201A (lap computer), Epson CX-21 acoustic coupler (battery operated) and C64 with Commodore modem.

The use of home computers, in my case, has opened-up a whole new world of telecommunication long denied to me and other hearing-impaired individuals. Being able to use the telephone to contact friends both deaf and hearing has made tremendous changes in my life! I have made many new friends

some of whom I have never met other than on-line. However, my husband will tell you there is one big snag: COST. On average it takes seven times longer to transmit a typed message than a voiced message so you can imagine that I am (well, he is!) having to pay seven times your average telephone bill!

I currently subscribe to Prestel/Micronet, Telecom Gold (B.T. electronic mailbox) and the RNID Voice Bureau.

The Voice Bureau was set up by Royal National Institute for the Deaf, London. It is manned by a hearing telephone operator. Instead of just an ordinary switchboard, the operator has a monitor and telephone linked to microcomputer so any subscriber (hearing-impaired) is able to contact the bureau by way of Prestel viewdata adaptor or micro-computer at TX75/RX1200 to convey messages to a hearing person. The operator observes the message typed by the subscriber on the screen and passes the message to the hearing person via ordinary telephone and vice-versa.

The disadvantage of this is that it is based in London and is expensive for people living outside London though it is useful in an emergency. It is also very expensive to man, and lacks privacy as the operator is a party to the conversation. It is not a 24 hour service and, finally, no provision is made for users with only a 300/300 set-up as the service is restricted to TX75/RX1200.

DRAWING THE LINE

Part four of our BASIC conversion series finds Peter Green with spots before his eyes

This has been a very difficult article to put together. In the beginning there was BASIC, and it was good, but it ran on big computers with teletypes, and it knew not graphics. Then Chuck Peddle stretched forth his hand, and lo, the PET was born.

Then lots of other manufacturers built home computers. All using BASIC with only minor changes (which we've covered in parts one to three) but with wildly differing ideas about the way to implement graphics extensions. As a result of everyone thinking they know best, the graphics routines from five different BASICs look like they come from five different languages.

I could fill two issues of HCW just discussing all the subtle details of graphics on our five machines. How can I fit it into two or three pages? I've decided to compile a table of the most basic operations available, which is printed in two parts, this week and next week: you identify the operation in the source machine column, then see how to convert it by looking in the target column. Next week you'll be able to collect and keep part two.

This may not be of much help in some cases: for example, flashing colours are possible on the Oric/Atmos but involve manipulating the serial attributes, and we'd need a large article to explain serial attributes. Again, although the C64 can have excellent graphics in machine code, from BASIC it's virtually useless, so most of the table is unhelpful.

Brief notes that may help you: first, everyone uses different co-ordinate systems. In X, Y terms the Amstrad is 0-639, 0-399: the BBC Micro, 0-1279, 0-1023: the C64 is 0-319, 0-199: the Oric, 0-239, 0-199: and the Spectrum 0-255, 0-175.

The Amstrad may have eight text windows with different settings: you spot these by a #n after the BASIC keywords, where n is the window number.

On the BBC and Amstrad, characters 240-255 are user-definable on power-up: extra UDGs require memory to be reserved using *FX 6 and SYMBOL AFTER commands respectively. These two micros allow the flash rate of flashing inks to be altered using *FX 9 and 10, and SPEED INK.

Where operations are performed by PRINTing strings of control characters and parameters using CHR$, a whole set of these can be run together into a long PRINT statement, such as PRINT CHR$(12); CHR$(22);CHR$(0); which clears the screen and turns off transparent mode on the Amstrad. On the BBC Micro, PRINT CHR$() can be abbreviated to VDU followed by a string of numbers. Here the punctuation is vital: a comma after a number means "send as a single byte", while a semicolon means "send as a low-byte, high-byte ordered pair".

Colour and cursor control codes on the C64 are embedded in PRINT statements and appear as odd symbols in the listing. Magazines usually provide a key or include REM statements to interpret the commands.

Screen mode table

Amstrad

Mode 0 16 colours, 160 by 200, 20 by 25 text
Mode 1 4 colours, 320 by 200, 40 by 25 text
Mode 2 2 colours, 640 by 200, 80 by 25 text

BBC micro

Mode 0 2 colours, 640 by 256, 80 by 32 text
Mode 1 4 colours, 320 by 256, 40 by 32 text
Mode 2 16 colours, 160 by 256, 20 by 32 text
Mode 3 2 colours, text only, 80 by 25
Mode 4 2 colours, 320 by 256, 40 by 32 text
Mode 5 4 colours, 160 by 256, 20 by 32 text
Mode 6 2 colours, text only, 40 by 25
Mode 7 Teletext mode. 40 by 25 text, block graphics, serial attributes

Commodore 64

Text screen is 40 by 25 with 16 colours. Other modes beyond the scope of this article.

Oric/Atmos

Text 39 by 27 text screen. (40 column screen but column 0 reserved for serial attributes). 8 colours
Lores 0 As TEXT using standard character set
Lores 1 As TEXT using alternate character set
Hires 8 colours, 240 by 200

Spectrum

No modes 8 colours (16 if BRIGHT is used), 256 by 176, 32 by 24 text.

CHARACTERS	CHARACTERS	CHARACTERS	CHARACTERS	CHARACTERS	CHARACTERS
Place character N on screen at cursor position	PRINT CHR$(N); or PRINT CHR$(1);CHR$(N); (for N<32)	VDU N (N>32)	PRINT CHR$(N); (for 32<=N<=127, 160<=N<=255). POKE screen address,M (0<=M<=255, but M from a non-ASCII code table)	PRINT CHR$(N); (32<=N<=128)	PRINT CHR$(N); (32<=N<=164)
See what character is on screen at column X, row Y	Not a BASIC function	Not a BASIC function	PEEK (screen address)	SCRN(X,Y)	SCREEN$(Y,X) (NB. Row comes first!)
Print inverted characters	PRINT CHR$(24); (exchanges current pen and paper inks)	Use COLOUR or VDU 17 statements to swap pen and paper inks	Use colour control codes to swap colours	Use colour control codes or set bit 7 of text serial attributes	INVERSE 1 to enable INVERSE 0 to disable
Redefine user-defined character N (a–h are bytes of pixel data)	SYMBOL N,a,b,c,d,e,f,g,h or PRINT CHR$(25);CHR$(N); CHR$(a);CHR$(b); etc	VDU 23,N,a,b,c,d,e,f,g,h	See Note 3	POKE data into character memory, &9800–&BB80 in TEXT mode, &9800–&BA00 in HIRES mode	FOR n=0 to 7 POKE USR "letter",data NEXT n (letter = A–U)
Select 'transparent' printing (only foreground is printed)	PRINT CHR$(22);CHR$(1); PRINT CHR$(22);CHR$(0); to enable/disable effect	Use VDU 5 for similar effect	Not applicable	Not applicable	OVER 1 to enable OVER 0 to disable
Select text foreground colour C	PEN C or PRINT CHR$(15);CHR$(C);	COLOUR C or VDU 17,C	Use colour control codes	PEN C	INK C
Select text background colour C	PAPER C or PRINT CHR$(14);CHR$(C);	COLOUR 128+C or VDU 17,128+C	Use colour control codes	PAPER C	PAPER C
GRAPHICS					
Set up graphics window, boundaries Left, Right, Top, Bottom	ORIGIN X,Y,L,R,T,B (X,Y is graphics origin and must be specified)	VDU 24,L;B;R;T	Not applicable	Not applicable	Not applicable
Move graphics origin to co-ordinate X,Y	ORIGIN X,Y (window co-ords are optional, see above)	VDU 29,X;Y;	Not applicable	Not applicable	Not applicable
Move graphics origin to co-ordinate X,Y	ORIGIN X,Y (window co-ords are optional, see above)	VDU 29,X;Y;	Not applicable	Not applicable	Not applicable
Clear graphics window to colour C	CLG C	Select C using GCOL, then use CLG or VDU 16	Not applicable	Not applicable	Not applicable
Move graphics cursor to co-ordinate X,Y	MOVE X,Y	MOVE X,Y or use PLOT or VDU 25 command (see separate table)	Not applicable	CURSET X,Y,FB (see Note 2)	PLOT INVERSE 1;OVER 1;X;Y;

Text Mode	Amstrad CPC464	BBC	Commodore 64	Oric/Atmos	Spectrum
Select screen mode	MODE M or PRINT CHR$(4):CHR$(M); (M=0,1,2)	MODE M or VDU 22,M (not recommended) (M=0-7)	See Note 1	TEXT LORES 0 LORES 1 HIRES	Not applicable
Turn off text cursor	PRINT CHR$(2);	VDU 23,1,0;0;0;0; or VDU 23,0,8202;0;0;0;	Not applicable	PRINT CHR$(17); (toggle action)	Not applicable
Turn on text cursor	PRINT CHR$(3);	VDU 23,1,1;0;0;0; or VDU 23,0,8670A;0;0;0; (use 8720A in Mode 7)	Not applicable	PRINT CHR$(17); (toggle action)	Not applicable
Select text-at-graphics-cursor	TAG (all characters) PRINT CHR$(5):CHR$(N); (just character N)	VDU 5 (all characters)	Not applicable	CHAR X,S,FB X=character code, 32-127 S=character set, 0 or 1 FB – see Note 2	Not applicable
Select text-at-text-cursor	TAGOFF (all subsequent characters)	VDU 4 (all subsequent characters)	Not applicable	Not applicable	Not applicable
Enable text screen	PRINT CHR$(6);	VDU 6	Not applicable	Not applicable	Not applicable
Disable text screen	PRINT CHR$(21);	VDU 21	Not applicable	Not applicable	Not applicable
Move text cursor back one space	PRINT CHR$(8);	VDU 8	PRINT CHR$(157);	PRINT CHR$(8);	PRINT CHR$(8);
Move text cursor forward one space	PRINT CHR$(9);	VDU 9	PRINT CHR$(29);	PRINT CHR$(9);	PRINT CHR$(9);
Move text cursor down one line	PRINT CHR$(10);	VDU 10	PRINT CHR$(17);	PRINT CHR$(10);	No control code
Move text cursor up one line	PRINT CHR$(11);	VDU 11	PRINT CHR$(145);	PRINT CHR$(11);	No control code
Clear text window and move cursor to top left	CLS or PRINT CHR$(12);	CLS or VDU 12	PRINT CHR$(147);	PRINT CHR$(12);	No control code
Move cursor to top left of text window	PRINT CHR$(30);	VDU 30	PRINT CHR$(19);	No control code	PRINT AT 0,0;
Move cursor to start of current row	PRINT CHR$(13);	VDU 13	PRINT CHR$(13):CHR$(145);	No control code	PRINT AT PEEK 23689,0;
Move cursor to start of next row	PRINT or PRINT CHR$(13):CHR$(10);	VDU 13,10	PRINT CHR$(13);	No control code	PRINT CHR$(13);
Move cursor to column X, row Y	LOCATE X,Y or PRINT CHR$(31):CHR$(X): CHR$(Y);	PRINT TAB(X,Y); or VDU 31,X,Y	Home the cursor, then use a string of cursor control codes	PLOT X,Y,"string"	PRINT AT Y,X; (NB. Row comes first!)
Set up a text window, boundaries Left, Right, Top, Bottom	WINDOW L,R,T,B or PRINT CHR$(26):CHR$(L): CHR$(R):CHR$(T):chr$(B);	VDU 28,L,B,R,T	Not applicable	CLS	Not applicable
Restore default windows	Change mode (not given)	VDU 26	Not applicable	Not applicable	Not applicable

BOOKS

Wordwise Applications Guide

I have been a Wordwise user for several years now but like many other such users I have a set of standard layouts which serve my purposes and have therefore never delved any deeper into the many facilities of this, friendliest, of wordprocessors. The Wordwise Applications Guide by Paul Beverly is aimed at users such as me.

The guide is a 94 page A4 size booklet, it is designed to perform four separate functions. Firstly, it expands on the areas of the Wordwise manual that the author considers difficult for first time users. Secondly, it answers some of the questions which Computer Concepts (the producers of Wordwise) are most frequently asked. The third section is a series of hints and tips which are designed to make life easier for the Wordwise user, and finally there is a section which suggests some quite unusual uses for your wordprocessor eg. producing Christmas cards and knitting patterns.

Apart from the treasure trove of information, the book also contains many subroutines and programs to aid the Wordwise user. One program will convert View files into Wordwise files and vice versa, another assembly language program gives the facility to produce multiple copies. Should you not be the world's greatest typist, or just lack the time, then all of the programs can be purchased for £5.00 on a floppy disc.

The Wordwise Applications guide makes essential reading for the user who would like to make the most of his Wordwise chip. **J.R.**

Price: £7.00

Publisher: Norwich Computer Services

Address: 6 Upper King Street, Norwich NR3 1HA

Author: Paul Beverley

BBC

BASIC ROM User Guide

If you are a very serious BBC user or you have a very inquisitive mind then you might want to understand what is going on inside the machine.

This book tries to give you a full description of the workings of BBC BASIC both in overview and with a considerable amount of detail where full explanation is required.

I have to comment that Mr Plumbley's writing style is very lucid. Within seconds he had me understanding a number of routines and concepts over which I have struggled for a number of months.

This book covers all the information you could possibly use and includes such details as the 6502 assembler, BASIC's use of memory, expression evaluation, program control, how to add new commands, how to user overlay techniques to squeeze even more from the BBC's memory and how to recover programs corrupted in some way.

What I didn't expect from this book was a series of program listings but there are a number of fascinating utility programs of all types.

The main section is the fully detailed reference to all the BASIC subroutines and this will be of enormous help to a programmer or student of microprocessor control. **R.S.**

Price: £9.95

Publisher: Adder

Address: 12 Sterndale Close, Girton, Cambridge CB3 0PR

BBC

Guide to the BBC ROMs

In this 230-page book you are offered an "at-a-glance picture of the fundamental concepts of the BBC ROMs". Well, I'm sure that all the information is there, but finding it isn't easy.

This book tries to do far too much in far too little space and in the process I feel that it fails miserably.

When I first opened it I could only believe that it was written to avoid copyright prosecution in some way. The first real chapter deals with the operating system ROM and is a set of notes which you can't really understand without a full disassembly of the ROM in front of you. I'm aware that to provide this would be illegal but the text rambles on as if the inner workings of the ROM are quite plain and easy to understand.

The book also lacks any kind of overview which could explain the features of the BBC system and how BBC programmers have decided to implement those features.

It aims to cover both the operating system ROM and the BASIC chip. There is a huge imbalance between the two however. The OS is given about 180 pages while the BASIC chip is given less than 20. This means that all those who might have considered buying this book instead of two more detailed, and expensive, books will be very disappointed.

Overall, this book served to muddle me rather than make things more explicit. **R.S.**

Price: £9.95

Publisher: Melbourne House

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

BBC

SPECTRUM GAME

10 OUT OF 10

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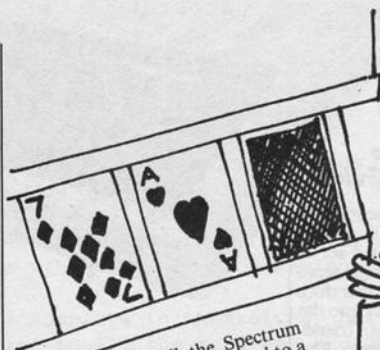
Please note: All the Spectrum listings in HCW are printed to a special format. All user defined characters are printed as capital letters but with an underline. In order to type them into your computer you need to place the machine in GRAPHIC mode and then press the capital letter indicated. If you follow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

Andrew Bird's game has you pitting your wits against the computer: which card comes next?

If you have even wanted to appear on a certain TV programme Play Your Cards Right, but never quite got there, then this is just the thing to cheer you up. Switch on, sit back and try to outwit the computer as you tackle the 10 freshly shuffled cards.

You will know of course that the idea is to predict whether the next card in the sequence is higher or lower than the previous one. Should you reach the end of the line you may consider yourself in the same class as the great Doc Haliday.

4010-4110	checks card
5000-5030	correct routine
6000-6100	wrong routine
7000-7070	lost routine
8000-8070	win routine
8500-8570	instructions
9000-9120	graphics
9500-9520	machine code sound

Variables

f,d general purposee loops
dim x, dim y card co-ordinates
dim c$ 10 cards
dim z$ pack of 52 cards
dim o$ type of card

dim p$ value of card
dim n$ name of card, e.g. queen, two, king etc
dim c used to check if card repeated
z$,x$ used to read data
l$ name of previous card
i$ instructions
ca random card chosen
k loop giving three goes
g main loop through game
card calculates value of card
gu shows if guess is higher or lower
m,n position of man
lastc, thisc used to compare two cards

How it works

3-90 GOSUB instructions, set up arrays
95 3 go loop
100-140 shuffles cards
150-320 draws games
500-900 main loop
1000-1150 draws and erases man
2010-2100 turns card
3000-3030 prints card face

ZX Spectrum

```
   1 REM   10  out of  10
   2 REM   By ANDREW BIRD
   3 GO SUB 8500
   4 PRINT AT 21,4; FLASH 1;" PRESS ANY KEY TO START ": PAUSE 0: CLS
   5 POKE 23658,8
   7 RANDOMIZE
  10 DIM x(10): DIM y(10)
  20 FOR f=1 TO 5: LET x(f)=2: LET x(f+5)=12: LET y(f)=f*4-1: LET y(f+5)=f*4-1:
NEXT f
  25 DIM c$(10,2): DIM c(10)
  30 DIM z$(52,2)
  40 LET o$="ABCD"
  50 LET p$="23456789EJQKA"
  55 DIM n$(13,5)
  60 FOR f=1 TO 13: FOR d=0 TO 39 STEP 13
  65 LET z$(f+d,1)=p$(f): NEXT d: NEXT f
  70 FOR f=1 TO 13: FOR d=0 TO 3
  75 LET z$(f+13*d,2)=o$(d+1): NEXT d: NEXT f
  80 RESTORE 90: FOR f=1 TO 13: READ x$: LET n$(f)=x$: NEXT f
  90 DATA " two","three"," four"," five"," six","seven","eight"," nine"," ten","
jack","queen"," king"," ace"
  95 FOR k=1 TO 3
  99 REM   Shuffle cards
 100 FOR f=1 TO 10
 105 LET ca=INT (RND*52)+1
 110 FOR d=1 TO 10: IF ca=c(d) THEN  GO TO 100
 115 NEXT d
 120 LET c$(f)=z$(ca): LET t(f)=ca
 130 IF f=1 THEN  NEXT f
 135 IF c$(f,1)=c$(f-1,1) THEN  GO TO 105
 140 NEXT f
 150 REM   Draw Game
 160 BORDER 4: PAPER 4: CLS
 180 PINT AT 0,3; PAPER 7; INK 1;" TEN  OUT  OF  TEN "; PAPER 4;"  "; PAPER 7;"
GO ";k;" "
 190 PRINT AT 2,26; INK 7;"BY";AT 3,24;"ANDREW";AT 4,25;"BIRD"
 200 PAPER 3: BRIGHT 1: INK 0
 210 FOR f=1 TO 10
 220 PRINT AT x(f),y(f);"***";AT x(f)+1,y(f);"***";AT x(f)+2,y(f);"***";AT x(f)+
3,y(f);"***"
 230 PLOT y(f)*8-1,143-x(f)*8
 240 DRAW 0,33: DRAW 25,0: DRAW 0,-33: DRAW -25,0
 250 NEXT f
 260 BRIGHT 0
 310 LET g=1: GO SUB 2000
 320 GO SUB 3000
 499 REM   Main Loop
 500 FOR g=2 TO 10
 510 PRINT AT 12,25; PAPER 4; INK 7;"PRESS";AT 14,25; PAPER 1;"H"; PAPER 4;" OR
"; PAPER 1;"L"
 520 LET card=(CODE c$(g-1,1))-49
 530 IF card=16 THEN  LET card=13
 532 IF card=25 THEN  LET card=10
 534 IF card=26 THEN  LET card=12
 536 IF card=32 THEN  LET card=11
 538 IF card=99 THEN  LET card=9
 550 LET l$=n$(card)
 560 GO SUB 1000
 570 IF INKEY$="H" THEN  PRINT AT 14,25; PAPER 7; INK 1;"H": LET gu=1: GO TO 600
 580 IF INKEY$="L" THEN  PRINT AT 14,30; PAPER 7; INK 1;"L": LET gu=0: GO TO 600
 590 GO TO 570
 600 FOR d=1 TO 50: NEXT d
 610 GO SUB 1110
 620 GO SUB 2000
 650 GO SUB 3000
 700 GO TO 4000
 900 NEXT g: GO TO 8000
 999 REM   Man
```

```
1000 LET m=x(g)+5: LET n=y(g)
1020 PRINT AT m,n; PAPER 4; INK 0;" F";AT m+1,n;"GH";AT m+2,n;"IJ";AT m+3,n;"K
L"
1030 INK 0: PLOT y(g)*8+32,138-x(g)*8
1040 DRAW -4,-4: DRAW 0,-8: DRAW -12,-4: DRAW 12,-4: DRAW 0,-14: DRAW 4,-4: DRAW
 62,0: DRAW 4,4: DRAW 0,30: DRAW -4,4: DRAW -62,0
1050 PAPER 4: INK 7: PRINT AT m,n+5;"Higher";AT m+1,n+4;"or lower";AT m+2,n+5;"t
han a";AT m+3,n+5;l$;"?"
1060 BEEP .05,30
1100 RETURN
1101 REM  Erase man
1110 INK 0: PLOT y(g)*8+32,138-x(g)*8
1120 OVER 1: DRAW -4,-4: DRAW 0,-8: DRAW -12,-4: DRAW 12,-4: DRAW 0,-14: DRAW 4,
-4: DRAW 62,0: DRAW 4,4: DRAW 0,30: DRAW -4,4: DRAW -62,0: OVER 0
1140 FOR f=m TO m+3: PRINT AT f,n;"              ": NEXT f
1150 RETURN
1999 REM  Turn Card
2010 PLOT y(g)*8-1,143-x(g)*8
2020 OVER 1: DRAW 0,33: DRAW 25,0: DRAW 0,-33: DRAW -25,0: OVER 0
2040 PRINT AT x(g),y(g); PAPER 4; INK 3; BRIGHT 1;" ███ ";AT x(g)+1,y(g);" ███ ";A
T
 x(g)+2,y(g);" ███ ";AT x(g)+3,y(g);" ███ "
2045 BEEP .01,40
2050 PRINT AT x(g),y(g); PAPER 4; INK 7;" █ ";AT x(g)+1,y(g);" █ ";AT x(g)+2,y
(g
);" █ ";AT x(g)+3,y(g);" █ "
2055 BEEP .01,41
2060 PRINT AT x(g),y(g); PAPER 4; INK 7;" ███ ";AT x(g)+1,y(g);" ███ ";AT x(g)+2,y
(g
);" ███ ";AT x(g)+3,y(g);" ███ "
2065 BEEP .01,42
2070 PRINT AT x(g),y(g); PAPER 7;"   ";AT x(g)+1,y(g);"   ";AT x(g)+2,y(g);"   "
;AT x(g)+3,y(g);"   "
2075 BEEP .01,43
2080 PLOT y(g)*8-1,143-x(g)*8
2090 DRAW 0,33: DRAW 25,0: DRAW 0,-33: DRAW -25,0
2100 RETURN
2999 REM  Print card face
3000 IF c$(g,2)="A" OR c$(g,2)="B" THEN  INK 2: GO TO 3020
3010 INK 0
3020 PRINT AT x(g),y(g); PAPER 7;c$(g,1);" ";c$(g,2)
3030 RETURN
3999 REM  Card check
4010 FOR f=1 TO 13: IF c$(g-1,1)=p$(f) THEN  GO TO 4030
4020 NEXT f
4030 LET lastc=f
4040 FOR d=1 TO 13: IF c$(g,1)=p$(d) THEN  GO TO 4060
4050 NEXT d
4060 LET thisc=d
4070 IF gu=0 THEN  GO TO 4100
4080 IF lastc<thisc THEN  GO TO 5000
4090 GO TO 6000
4100 IF lastc>thisc THEN  GO TO 5000
4110 GO TO 6000
4999 REM  Correct
5000 POKE 50007,10: POKE 50018,10: LET d=USR 50000
5010 FOR f=1 TO 10: POKE 50018,40-f*2: LET d=USR 50000: PAUSE 2: NEXT f
5020 GO TO 900
5999 REM  Wrong
6000 POKE 50007,100
6010 FOR f=1 TO 10: POKE 50018,70+f*2: LET d=USR 50000
6020 FOR d=1 TO 20: NEXT d: NEXT f
6030 PAPER 4: CLS
6040 IF k<>3 THEN  PRINT AT 10,10; INK 0;"Please Wait"
6100 NEXT k
6999 REM  End
7000 INK 0: FOR f=6 TO 12: PRINT AT f,8; PAPER 5;"                ": NEXT f
7010 PLOT 64,72: DRAW 0,56: DRAW 136,0: DRAW 0,-56: DRAW -136,0
```

```
7040 PRINT AT 7,9; PAPER 5; INK 0;"THAT WAS YOUR";AT 9,9;"LAST ATTEMPT";AT 11,9;
"YOU HAVE FAILED"
7050 POKE 50007,20: FOR f=1 TO 100: POKE 50018,f/2: LET d=USR 50000: NEXT f
7060 PRINT AT 21,0; PAPER 7; INK 1;"  Press any key for another go   "
7070 BEEP .1,0: PAUSE 0: CLS : GO TO 5
7999 REM  Won
8000 FOR d=1 TO 50: NEXT d: BORDER 0: PAPER 0: CLS : POKE 50007,10
8005 BRIGHT 1: INK 6
8010 PLOT 62,72: DRAW 0,56: DRAW 136,0: DRAW 0,-56: DRAW -136,0
8015 PRINT AT 8,9;"CONGRATULATIONS";AT 10,9;"YOU'VE DONE IT!"
8020 FOR f=1 TO 150
8030 RANDOMIZE : BORDER 3: BORDER 4: BORDER 2: BORDER 4: BORDER 2: BORDER 1: BOR
DER 0
8040 LET d=USR 50000
8050 NEXT f
8060 POKE 50007,25: FOR f=1 TO 50: POKE 50018,90-f: LET d=USR 50000: NEXT f
8070 BRIGHT 0: GO TO 7060
8100 STOP
8499 REM   Instructions
8500 LET i$="If you have ever wanted to be on a certain television programme  'Pl
aying Your Cards Right',then this game is for you.
         The idea is to predict whether  the next card in a sequence of   ten
  is higher or lower than the previous one. You have 3 goes."
8510 BORDER 2: PAPER 2: CLS : INK 7
8515 PRINT AT 0,0; PAPER 1;"  T E N   O U T   O F   T E N  ": PRINT ''
8520 FOR f=1 TO LEN i$
8530 PRINT i$(f);
8540 IF i$(f)<>CHR$ 32 THEN  BEEP .01,30: BEEP .005,50
8550 IF f=32 OR f=64 OR f=96 OR f=128 OR f=160 OR f=192 OR f=224 OR f=256 OR f=2
88 OR f=320 THEN  PRINT : PRINT
8570 NEXT f
8999 REM  Graphics
9000 RESTORE 9010: FOR g=USR "a" TO USR "l"+7: READ r: POKE g,r: NEXT g
9010 DATA 0,16,56,124,254,124,56,16
9020 DATA 0,68,238,254,254,124,56,16
9030 DATA 0,16,56,124,254,254,84,16
9040 DATA 0,16,56,84,254,84,16,16
9050 DATA 0,78,81,81,81,81,78,0
9060 DATA 0,0,8,8,14,10,10,12
9070 DATA 28,51,36,33,34,17,22,25
9080 DATA 28,24,152,56,48,112,224,224
9090 DATA 127,255,223,223,223,255,127,63
9100 DATA 192,128,0,0,0,0,0,0
9110 DATA 31,27,27,27,27,27,29,30
9120 DATA 0,0,0,0,0,0,128,192
9499 REM  M/c sound
9500 RESTORE 9510: FOR m=0 TO 30: READ s: POKE 50000+m,s: NEXT m
9510 DATA 58,72,92,31,31,31,6,25,14,254,37,32,6,238,16,237,121,38,3,45,32,244,23
8,16,237,121,46,250,16,236,201
9520 RETURN
9999 SAVE "10 o.o.10" LINE 1
TYPE-↓ AS GRAPHIC J ECT
```

RACEHORSE TRAINER

You've got the chance to win or lose a lot of money in this exciting racing game from Sean Conway

This is a simulation game for the C64 in which you play the part of a racehorse owner acting on behalf of a syndicate. You have £100,000 to buy, train and race your horses.

You can only buy one horse at a time and bidding is very fierce at the auction because Sheik Abdul tries to push the prices up. You must then train your horses which is expensive although you can choose to spend less money and run badly trained horses.

On the day of the race you can place bets of up to £5,000 and winnings are displayed at the end of the race. You can own a maximum of five horses.

The members of the syndicate are ruthless so if you run out of money you will be fired.

Variables

LP	main loop
N$(I)	horse name
SP(I)	horse rating
BB(I)	horse owned flag
HS$	names of horses owned
VA(I)	horse's value
O	number of horses owned
OT$	other horses names
ZI$	player's name
M	money left
B(I)	number of horses for auction
C	horse chosen for bid
C1	your bid
C3	highest bid
C5	horse chosen to sell
T(I)	training rating
TU(I)	rating of horse for race
CT(I)	race category
OH(I)	race difficulty
AT(I)	ratings of other horses in the race
PR(I)	prices of horses in the race
X9	horses to bet on
WX	winner of race
HU(I)	movement decider
X8	amount bet
PO	horses to move
X(I)	sprite 1 x co-ordinate X(2),X(3),X(4)
WN	winnings on bet
WG	prize money
V	display chip

How it works

|	
40	dimension arrays
50	sets loop
53	sets variables
100	sets up sprites
130-165	title page
200-235	input name, general instructions
250-290	horses owned
300-425	pick horse to buy, auction bidding
470-488	horse bought message
500-560	sell horse
600-660	pick type of training for each horse
680-686	update horse training
700-772	enter horses in races
800-890	other horses in race, prices, betting
900-905	race announcement
910-982	run race by moving sprites horizontally
990-1020	find winner, print winnings
1040	resets x co-ordinates of sprites
1100	updates loop
10000-10020	not enough money routine
10030-10038	bankrupt, end game
18000-18015	press space routine
20000-20015	sprite data for horses
20030-20036	horse's name and rating data
20040-20046	horses in race name data

```
40 REM **** SET UP DIMS****
41 DIMN$(16),P(16),BB(16)
42 DIMOT$(16)
50 REM*****SET VARS****
51 O=0:M=100000
52 X(1)=30:X(2)=40:X(3)=50:X(4)=60
53 REM**** FALSE LOOP***
54 LP=1
100 REM***SET UP SPRITES AND OPENING**
110 POKE53280,14:POKE53281,14
115 V=53248
116 POKEV+21,60
120 POKE2042,13:POKE2043,13:POKE2044,13:POKE2045,13
125 FORN=0TO62:READQ:POKE832+N,Q:NEXTN
130 POKEV+23,4:POKEV+29,4
135 POKEV+41,4
138 POKEV+4,160:POKEV+5,110
140 PRINT"�****RACEHORSE OWNER"
141 PRINT"�****                ──────────"
144 FORI=1TO6:PRINT'****           |              |"
145 NEXTI
147 PRINT"****           \──────────/ "
148 PRINT"****           BY SEAN CONWAY"
149 PRINT"****           (C)  MARCH  1985"
150 PRINT"�****"
151 PRINT"****                                ■"
152 PRINT"****                           •  ■"
153 PRINT"****                           |  ■"
154 PRINT"****                 ─┐         ■"
155 PRINT"****               | | | | | | ■"
156 PRINT"****                            ■"
160 GOSUB18000
165 POKEV+21,0
200 REM ****INPUT NAME ETC
210 POKE53280,0:POKE53281,0
215 C$(1)="◆":C$(2)="■":C$(3)="◆":C$(4)="■"
220 FORI=1TO4:PRINTC$(I)"■    RACEHORSE OWNER   ■";:NEXTI
225 PRINT"◆◆◆◆   WHAT IS YOUR NAME ?■"
226 INPUTZ1$
230 PRINT"◆◆◆◆ HELLO , ■";Z1$
231 PRINT"◆ YOU HAVE BEEN GIVEN £■100,000◆ BY A HORSE RACING SYNDICATE TO BUY";
232 PRINT" HORSES AND PUT  THEM IN TRAINING.  YOU WILL THEN ENTER THEM IN";
233 PRINT" RACES AND WILL USE ANY PRIZE    MONEY TO ADD TO THE HORSES YOU OWN."
235 GOSUB18000
250 REM **** HORSES OWNED *******
252 POKE53280,0:POKE53281,0
255 FORI=1TO4:PRINTC$(I)"■      HORSES OWNED     ■";:NEXTI
260 IFO=0THENPRINT"◆◆◆◆◆◆YOU DO NOT OWN ANY HORSES YET":GOTO290
265 PRINT"◆◆◆◆◆◆       ■ HORSE ■      ■ VALUE ■   ■"
268 FORI=1TO O
270 PRINTTAB(9)HS$(I);TAB(25)VA(I)
272 NEXTI
290 GOSUB18000
300 REM ****HORSE SALES*******
302 PP=1
305 IFO=5THEN500
306 Y1$="◆◆◆◆◆◆◆◆◆◆◆":Y2$="◆◆◆◆◆◆◆◆◆◆◆◆"
307 Y3$="◆◆◆◆◆◆◆◆◆◆◆
308 Y4$="◆◆◆◆◆◆◆◆◆◆◆◆                      "
309 IFLP>1THEN315
310 FORI=1TO15:READN$(I):READP(I):NEXTI
```
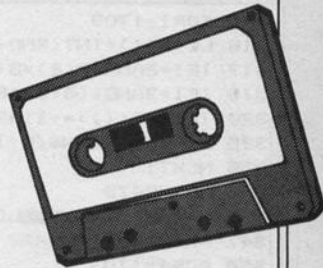
```
315 FORI=1TO3
316 LETB(I)=INT(RND(1)*15)+1
317 IFI=2AND(B(2)=B(1))THEN316
318 IFI=3AND((B(3)=B(1))OR(B(3)=B(2)))THEN316
320 IFBB(B(I))=-1THEN316
325 LETSN$(I)=N$(B(I)):LETSP(I)=P(B(I))
335 NEXTI
340 GOSUB470
345 PRINT"          LOT NO.     HORSE          BREEDER    RATING "
347 PRINT" "
350 FORI=1TO3
355 PRINTTAB(4);ITAB(12)SN$(I)TAB(31);SP(I)*2
360 NEXTI
365 LETZ2$="                    "
367 PRINTZ2$" WHICH DO YOU WISH TO BID ON          ('0' FOR NONE )"
370 PRINT" ":INPUTC
375 IFC<0ORC>3THEN367
380 IFC=0THEN450
381 GOSUB470
385 PRINT"   BIDDING ON LOT NO ";C;" ";SN$(C)
386 PRINT"   MONEY : £";M
387 PRINT" "
389 C2=SP(C)*10000
390 PRINT" "Y3$Y1$" WHAT IS YOUR BID          ":INPUTC1:IFC1>MTHENGOSUB490
391 IFPP=1THENC3=C1
392 PP=0
393 PRINTY3$:PRINT" "Y3$
394 IFC1<C3THENPRINTY1$" '" THAT BID HAS ALREADY BEEN EXCEEDED.":PRINTY2$
395 IFC1<C3THENFORTT=1TO500:NEXTTT:GOTO390
396 IFC1<(C2)THEN408
400 GOSUB480:GOTO450
408 PRINT    Y3$
410 FORII=1TO500:NEXTII:PRINTY1$" SHEIHK ABDUL BIDS    £ ";(C1+5000):C3=C3+5000
411 FORII=1TO500:NEXTII
415 PRINTY3$Y1$"   ANOTHER BID  (Y/N)          ":INPUTC$
416 PRINTY3$:PRINT    Y3$
420 IFC$="N"THEN315
425 GOTO390
450 FORI=1TO3:LETSN$(I)="":NEXTI
455 GOSUB18000:GOTO500
470 FORI=1TO4:PRINTC$(I)"       HORSE SALES      ";:NEXTI:RETURN
480 PRINT"                          "SN$(C);" HAS JOINED "
482 PRINT"           YOUR RANKS FOR A SUM"
484 PRINT"           OF £  ";C1
485 M=M-C1
486 HS$(O+1)=SN$(C):BB(B(C))=-1:VL(O+1)=SP(C)*4:VA(O+1)=SP(C)*10000:O=O+1
488 RETURN
490 PRINTY3$Y1$"YOU HAVEN'T THAT MUCH 'ONEY LEFT.":FORI=1TO750:NEXTI
500 REM **** SELL HORSES ****
505 GOSUB470
506 IFO=0THENPRINT"             YOU HAVE NO HORSES TO BE SOLD.":GOTO560
510 PRINT"   HERE ARE THE HORSES YOU OWN
512 FORI=1 TO O
515 PRINT"     ";I;"....."HS$(I):NEXTI
520 PRINTY1$" WHICH DO YOU WISH TO SELL          ('0' FOR NONE )"
525 INPUTC5
527 IFC5<0ORC5>OTHEN525
528 IFC5=0THEN560
530 PRINT"        THE AUCTIONEER IS TAKING BIDS."
532 FORI=1TO1000:NEXTI
535 PRINT"   ";HS$(C5);" HAS BEEN SOLD FOR £";VA(C5)-2000;"        "
```

```
536 M=M+(VA(C5)-2000)
540 HS$(C5)="":VA(C5)=0:SP(C5)=0
545 FORJ=C5TOO
550 LETHS$(J)=HS$(J+1)
555 NEXTJ
557 HS$(O)="":VA(O)=0:SP(O)=0
558 O=O-1
560 GOSUB18000
600 REM ***** TRAINING *****
602 IFO=0THENPRINT"▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓▓YOU HAVE NO HORSES TO TRAIN":GOTO680
605 FORI=1TO4:PRINTC$(I)"▓       TRAINING       ▓":NEXTI
610 PRINT"▓▓ THESE ARE THE TYPES OF TRAINING TO      CHOOSE FROM : -"
615 PRINT"▓1..VERY GOOD TRAINING  - £▓10,000."
616 PRINT"▓2..GOOD TRAINING       - £▓ 5,000."
617 PRINT"▓3..ADEQUATE TRAINING   - £▓ 2,000.▓"
618 FORI=1TOO
619 PRINT"▓MONEY : £";M;"▓"
620 PRINTY1$"▓▓WHICH DO YOU WANT FOR ";HS$(I);"           "
625 INPUTT(I)
630 IFT(I)=1THENM=M-10000:TT(I)=10:IFM<0THENGOSUB10000:M=M+10000
635 IFT(I)=2THENM=M-5000:TT(I)=5:IFM<0THENGOSUB10000:M=M+5000
640 IFT(I)=3THENM=M-2000:TT(I)=2:IFM<0THENGOTO10030
645 TS(I)=INT((TS(I)+TT(I))/LP)
648 PRINT"▓▓▓▓▓"
650 NEXTI
660 GOSUB18000
680 REM***** UPDATE RATINGS *****
681 IFO=0THEN700
682 FORI=1TO O
684 LETTU(I)=VL(I)+TS(I)
686 NEXTI
700 REM*****ENTER RACES*******
705 FORI=1TO4:PRINTC$(I)"▓      RACE ENTRY      ▓":NEXTI
707 IFO=0THENPRINT"▓▓▓▓▓▓▓▓▓▓▓▓▓▓YOU HAVE NO HORSES TO ENTER.":GOTO770
710 PRINT"▓▓▓THE FOLLOWING ARE THE RACES YOU CAN      ENTER YOUR HORSES IN."
715 PRINT"▓▓       ENTRY FEE    PRIZE MONEY"
716 PRINT"▓CAT.1    2,500        15,000"
717 PRINT"CAT.2    1,500         9,000"
718 PRINT"CAT.3    1,000         6,000"
719 PRINT"CAT.4      500         3,000"
725 FORI=1TO O
730 PRINTY1$"▓▓▓▓▓WHICH CATAGORY RACE FOR ";HS$(I);"           "
731 PRINT" ('0' FOR NO RACE )"
735 INPUTCT(I)
740 IFCT(I)=0THEN765
745 IFCT(I)=1ANDM<2500THENGOSUB10000:GOTO730
750 IFCT(I)=2ANDM<1500THENGOSUB10000:GOTO730
752 IFCT(I)=3ANDM<1000THENGOSUB10000:GOTO730
754 IFCT(I)=4ANDM<500THENGOSUB10000:GOTO730
756 IFCT(I)=1THENM=M-2500:OH(I)=30
758 IFCT(I)=2THENM=M-1500:OH(I)=27
760 IFCT(I)=3THENM=M-1000:OH(I)=22
762 IFCT(I)=4THENM=M-500:OH(I)=18
765 NEXTI
770 GOSUB18000
772 IFO=0THEN250
800 REM*******RACES*********
801 FORD=1TO O
802 IFOH(D)=0THEN1050
803 POKE53280,0:POKE53281,0
804 IFLP>1THEN810
```

```
805 FORI=1TO15:READQT$(I):NEXTI
810 FORI=1TO3
812 LETPY(I)=INT(RND(1)*15)+1
814 IFI=2AND(PY(1)=PY(2))THEN812
816 IFI=3AND(PY(1)=PY(3))THEN812
817 IFI=3AND(PY(2)=PY(3))THEN812
818 NEXTI
820 FORI=1TO3
822 LET HT(I)=INT(RND(1)*OH(D))+1
824 LETPR(I)=INT(80/HT(I))
826 NEXTI
827 LETPR(4)=INT(80/TU(D))
830 FORI=1TO4:PRINTC$(I)"     BETTING     ";:NEXTI
832 PRINT"THE BETTING IS AS FOLLOWS :-"
834 PRINT"  1...";OT$(PY(1));TAB(25)PR(1)"/1"
836 PRINT"2...";OT$(PY(2));TAB(25)PR(2)"/1"
838 PRINT"3...";OT$(PY(3));TAB(25)PR(3)"/1"
840 PRINT"4...";HS$(D);TAB(25)PR(4)"/1"
850 PRINTY1$"YOU HAVE £ "M
855 PRINTY1$"DO YOU WANT A BET ON THIS RACE."
860 INPUTYN$
865 IFYN$="N"THEN890
870 PRINTY1$"WHICH HORSE DO YOU WANT TO BET ON."
875 INPUTX9
876 IFX9<0ORX9>4THEN875
877 PRINTY1$"HOW MUCH DO YOU WANT TO PUT ON IT."
880 INPUTX8
881 IFX8>5000THENPRINTY3$Y1$"     BETTING LIMIT IS £5000     ":GOTO877
882 IF(M-X8)<0THENPRINTY1$"NOT ENOUGH MONEY     ":FORI=1TO500:NEXTI
884 WN=(X8*(PR(X9)))+X8
886 M=M-X8
890 GOSUB18000
900 PRINT"               THE RACE IS ABOUT TO BEGIN"
905 GOSUB18000
910 PRINT""
920 POKE53281,13
925 PRINT""
926 FORI=1TO20
927 PRINT"   |O|";:NEXTI
930 AS$="                          "
931 PRINT""
932 FORI=1TO2:PRINTAS$"|":PRINT"":
933 NEXTI
934 PRINTAS$""
935 POKEV+21,60
936 POKE2042,13:POKE2043,13:POKE2044,13:POKE2045,13
940 POKEV+23,60:POKEV+29,60
945 POKEV+44,4:POKEV+45,8:POKEV+41,16:POKEV+40,32
946 IFX(1)=250THENWX=1:GOTO990
947 IFX(2)=250THENWX=2:GOTO990
948 IFX(3)=250THENWX=3:GOTO990
949 IFX(4)=250THENWX=4:GOTO990
950 POKEV+4,X(1):POKEV+5,130
951 POKEV+6,X(2):POKEV+7,120
952 POKEV+8,X(3):POKEV+9,110
953 POKEV+10,X(4):POKEV+11,100
960 LET HU(1)=INT(RND(1)*HT(1))+1
961 LET HU(2)=INT(RND(1)*HT(2))+1
962 LET HU(3)=INT(RND(1)*HT(3))+1
963 LET HU(4)=INT(RND(1)*TU(D))+1
965 FORI=1TO4
```
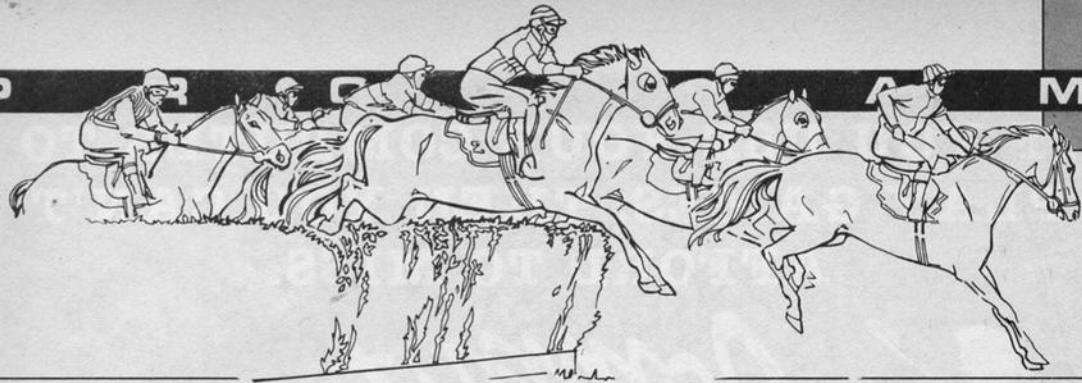
```
967 IFHU(I)>MXTHENMX=HU(I):PO=I
970 NEXTI
975 MX=0
980 LETX(PO)=X(PO)+2
981 PO=0
982 GOTO946
990 IFWX=4THEN993
991 PRINT"◨◨◨◨◨◨◨◨◨THE WINNER IS ";OT$(PY(WX));" AT ";PR(WX);"/1"
992 FORI=1TO1000:NEXTI:GOTO996
993 PRINT"◨◨◨◨◨◨◨◨◨THE WINNER IS ";HS$(D);" AT ";PR(WX);"/1"
994 PRINT"          CONGRATULATIONS !!!"
996 IFWX=X9THENPRINT"YOU HAVE WON £";WN;" ON YOUR BET.":M=M+WN
999 IFCT(D)=1THENWG=15000
1000 IFCT(D)=2THENWG=9000
1001 IFCT(D)=3THENWG=6000
1002 IFCT(D)=4THENWG=3000
1005 IFWX=4THENPRINT"YOU HAVE WON £";WG;" IN PRIZE MONEY.":M=M+WG
1010 FORI=1TO1000:NEXTI
1020 GOSUB18000
1030 POKEV+21,0
1040 X(1)=30:X(2)=40:X(3)=50:X(4)=60
1050 NEXTD
1100 LP=LP+1
1110 GOTO250
10000 REM*****LOAN*****
10010 PRINT"◨◨◨◨◨◨◨◨◨◨◨◨◨◨◨◨◨◨◨YOU HAVEN'T ENOUGH MONEY TO DO THAT."
10012 FORPU=1TO1000:NEXTPU
10014 PRINT"◨◨◨◨◨◨◨◨◨◨◨◨◨◨◨◨◨◨◨◨"
10020 RETURN
10030 REM*****BANKRUPT*******
10032 FORI=1TO4:PRINTC$(I)"◨      BANKRUPT      ◨";:NEXTI
10034 PRINT"◨◨◨◨◨◨YOU HAVE RUN OUT OF MONEY AND THEREFORE CANNOT CONTINUE."
10035 PRINT"◨I HOPE YOU HAD A GOOD GAME."
10036 PRINT"◨IF YOU WANT TO PLAY AGAIN JUST RUN THE  PROGRAM."
10038 END
18000 REM******PRESS SPACE*********
18005 PRINT"◨◨◨◨◨◨◨◨◨◨◨◨◨◨◨◨◨◨◨◨◨◨◨◨◨◨◨◨◨PRESS ◨'SPACE'◨ TO CONTINUE"
18010 GETSS$:IFSS$<>" "THEN18010
18015 RETURN
20000 REM ***SPRITE DATA******
20005 DATA0,0,0,0,0,0,0,1,192,0,1,128,0,3,0,0,7,16,0,15,56,0,28,248,0,14,252
20010 DATA1,255,238,3,255,198,7,255,128,12,255,128,25,255,128,19,96,192
20015 DATA6,192,96,13,128,240,27,1,152,54,3,12,0,0,0,0,0,0
20030 REM ***HORSE DATA*******
20032 DATASLY FOX,5,FAST FRED,5,COMRADE,5
20033 DATAQUICK JIM,4,FLYER PHIL,4,DORIS WOOD,4
20034 DATAPURE SPEED,3,CHAIRMAN,3,HEAD PIECE,3
20035 DATARAINBOW,2,SHARKY,2,SKIPPY,2
20036 DATALIGHTNING,1,BEAVER,1,MOSS,1
20040 REM***OTHER HORSE DATA******
20042 DATASUPERSONIC,DREDGER,BLACKJACK,HOOKJAW,WILD ONE
20044 DATASLIPAWAY,FUNG KU,THE GAMBLER,THE MASTER,MACH 3
20046 DATAGONE AWAY,DUAL KING,HAMMERHEAD,SPICEWORM,RED HOT
```

TWO FOR THE PRICE OF ONE

Here are two programs to type in for VIC-20 owners: Graphics Editor and Calendar, by W A Douglas

Here are two useful programs for your VIC-20. One of them is a graphics editor, while the other is a calendar.

Graphics editor is in two parts. The first section shows the instructions and loads and runs the second part, which displays two 8 x 8 graphics on which two graphics can be drawn using the checkerboard keyboard graphic.

If the unnecessary spaces are deleted, the two lines can be entered into the program. The cursor is then placed on the "1 = 502" and RETURN pressed twice and it is then ready to accept the next two graphics.

When finished the original program can be erased and your own program can be entered using the graphics.

Calendar displays the calendar for a month, selected by entering the year and the number of the month. It allows for leap years every four years up to 1752, when the English calendar was adjusted to the Gregorian calendar by losing 11 days in September of that year. The program displays that month from print statements.

From then on the program allows for leap years every four years except when the new century isn't divisible by 400, e.g. the year 2000 is a leap year, but the year 1900 isn't.

I, the author, have checked the accuracy of the program with the Royal Historical Society Handbook of Dates for Students of English History by C R Cheney, and have been unable to fault it.
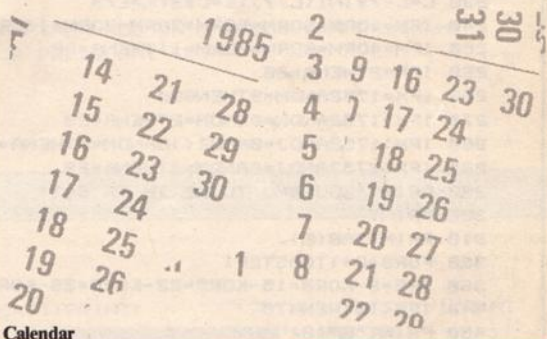
Calendar

```
10 PRINT"⌂":POKE36879,29
15 PRINT"█**********************"
20 PRINT"█*  ■CALENDER FOR ANY█  *"
21 PRINT"* ■MONTH IN ANY YEAR!█ *"
22 PRINT"*█  THE OLD CALENDER ■ *"
23 PRINT"*█FROM AD1 TO■3RD SEPT█*"
24 PRINT"*█  1752 AND THE NEW █ *"
25 PRINT"*█ CALENDER FROM THEN█ *"
26 PRINT"*█ ■DN TO INFINITY!  █ *"
27 PRINT"*■ BY   W.A.DOUGLAS  █ *■"
35 PRINT"█**********************■"
40 PRINT"INPUT YEAR":CLR
45 INPUTX
50 PRINT"INPUT NO.OF MONTH"
55 INPUTM
60 IFX<1752THENA$="OLD CALENDER"
62 IFX=1752ANDM<9THENA$="OLD CALENDER"
65 IFX=1752ANDM>9THENA$="NEW CALENDER"
70 IFX>1752THENA$="NEW CALENDER"
72 PRINT"▨"TAB(5)"■***■"X"■***■"
73 PRINTTAB(5)A$"■█"
75 IFM=1THENQ=1:PRINTTAB(7)"JANUARY"
80 IFM=2THENQ=4:PRINTTAB(7)"FEBRUARY"
90 IFM=3THENQ=4:PRINTTAB(8)"MARCH"
100 IFM=4THENQ=0:PRINTTAB(8)"APRIL"
110 IFM=5THENQ=2:PRINTTAB(9)"MAY"
120 IFM=6THENQ=5:PRINTTAB(9)"JUNE"
130 IFM=7THENQ=0:PRINTTAB(9)"JULY"
140 IFM=8THENQ=3:PRINTTAB(8)"AUGUST"
```

```
145 IFX=1752ANDM=9THENPRINT"    11DAYS LOST TO ADJUST TO GREGORIAN CALENDER"
150 IFM=9THENQ=6:PRINTTAB(6)"SEPTEMBER"
160 IFM=10THENQ=1:PRINTTAB(8)"OCTOBER"
170 IFM=11THENQ=4:PRINTTAB(7)"NOVEMBER"
180 IFM=12THENQ=6:PRINTTAB(7)"DECEMBER"
185 PRINT
190 Z=X-100*INT(X/100)
195 W=X-400*INT(X/400)
197 R=INT((X-1)/100)
200 Y=INT(X/100)
205 V=INT((X-1)/400)
210 P=INT((Z-1)/4*5)
212 IFZ=-0THENP=-1
215 J=Z-4*INT(Z/4)
216 IFJ=0ANDX<1753ANDM>2THENQ=Q+1
218 IFX>1752ANDJ=0ANDZ<>0ANDM>2THENQ=Q+1
219 IFX>1752ANDW=0ANDM>2THENQ=Q+1
220 IFX<1752ORX=1752ANDM<10THENL=Y*124+P+R+Q-2
225 IFX>1752ORX=1752ANDM>10THENL=Y*124+P+V+Q
230 C=L-7*INT(L/7):E=C*3:K=E/3
240 IFM=1ORM=3ORM=5ORM=7ORM=8ORM=10ORM=12THENA=31
250 IFM=4ORM=6ORM=9ORM=11THENA=30
260 IFM=2THENA=28
262 IFX=1752ANDM=9THEN600
270 IFX>1752ANDW=0ANDM=2THENA=29
280 IFX>1752ANDJ=0ANDZ<>0ANDM=2THENA=29
285 IFX<1753ANDJ=0ANDM=2THENA=29
290 PRINT" SU  MO TU WE TH FR SAT"
300 PRINT
310 PRINTTAB(E)
320 FORB=D+1TOASTEP1
360 IFB=8-KORB=15-KORB=22-KORB=29-KORB=36-KTHENPRINT" "
440 IFB<10THEN470
450 PRINT"  ";B;
460 GOTO480
470 PRINT;B;
480 NEXTB
490 PRINT
495 D=D+1
502 FORAA=38576TO38840STEP22:FORBB=38577TO38841STEP22
504 POKEAA,2:POKEBB,2
506 NEXTBB:NEXTAA
510 GOTO635
600 PRINT" SU  MO TU WE TH FR SAT"
605 PRINT
610 PRINT"       1  2 14 15 16"
615 PRINT
620 PRINT" 17  18 19 20 21 22 23"
625 PRINT
630 PRINT" 24  25 26 27 28 29 30"
635 PRINT"                        "
640 GOTO40
```

Graphics editor — listing 1

```
5 PRINT"  **********************";
10 PRINT"*  GRAPHIC DATA EDITOR  *";
15 PRINT"**********************";
20 PRINT"      DESIGN YOUR OWN   GRAPHICS AND GET TWO"
25 PRINT" LINES OF DECIMAL DATA  READY FOR PROGRAMMING,"
27 PRINT"   'GRAPHIC EDITOR',     REFERREDTO AS 'THE
28 PRINT" PROGRAM' IS LOADED    AFTER THESE          INSTRUCTIONS"
29 PRINT"    PRESS ANY KEY"
```
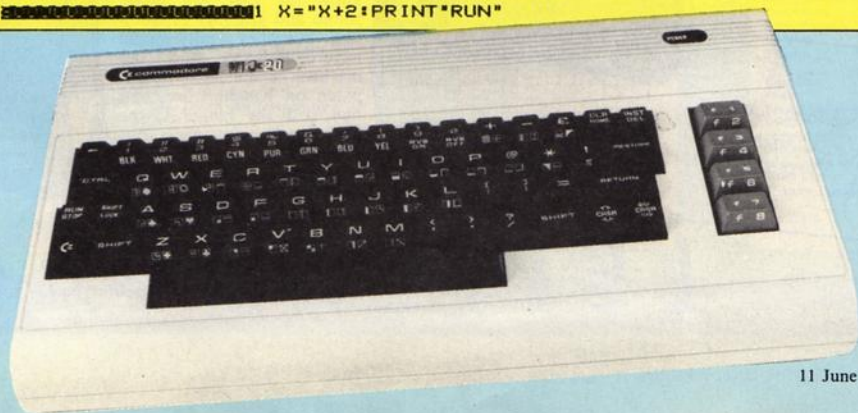
```
30  GETA$:IFA$=""THEN30
35  IFA$<>""THEN40
40  PRINT"◼◼DRAW YOUR GRAPHICS ON◼ THE TWO 8 BY 8 GRAPHS◼ USING THE'◼' SYMBOL "
45  PRINT"(COMMODORE & '+' KEY)       ————————  "
47  PRINT"◼ WHEN YOUR DESIGN IS ◼ COMPLETE PRESS RETURN"
50  PRINT"◼AND TWO LINES COMPLETE◼ WITH LINE NUMBERS, ◼'DATA' AND COMMA'S"
52  PRINT"◼ WILL BE PRINTED."
53  PRINT"◼◼ PRESS ANY KEY◼"
55  GETA$:IFA$=""THEN55
60  IFA$<>""THEN70
70  PRINT"◼THEN DELETE ALL SPACES BETWEEN NUMBERS AND   COMMA'S THEN ENTER"
75  PRINT"EACH OF THE TWO LINES.MOVE THE CURSOR ON TO"
80  PRINT"◼'1 X=502',PRESS RETURN  TWICE AND YOU ARE       READY TO DRAW TWO"
85  PRINT" MORE GRAPHICS WHICH  WILL BE PRINTED WITH  THE NEXT TWO LINE NO'S";
90  PRINT"AND SO ON."
100 PRINT"◼◼   PRESS ANY KEY◼"
110 GETA$:IFA$=""THEN110
115 IFA$<>""THEN120
120 PRINT"◼◼◼◼ WHEN YOU HAVE ENTERED ◼ALL YOUR GRAPHICS,    ◼ERASE THE PROGRAM B
Y"
125 PRINT"◼ RETURNING 1 TO 22 AND ◼YOU CAN THEN ADD ON   ◼YOUR OWN PROGRAM"
130 PRINT"◼◼ TO LOAD'GRAPHIC  ◼    EDITOR'PRESS ANY KEY"
135 PRINT"◼◼◼◼◼◼GOOD LUCK.◼"
140 GETA$:IFA$=""THEN140
145 .IFA$<>""THEN150
150 POKE198,10:POKE631,131
```

Graphics editor — listing 2

```
1  X= 500
2  PRINT"◼":C$="DATA"
3  PRINT"◼◼◼  76543210 76543210"
4  FORI=0TO7:PRINTI" □□□□□□□□ □□□□□□□□":NEXTI:PRINT"      ———————— ————————":PRINT
5  Z=LEN(STR$(X))-1:Q=7932+Z:T=Q+30720:PRINT"◼◼◼◼◼◼◼◼◼◼◼◼◼◼◼◼":INPUTA$
6  FORH=1TO8:A=F+7728
7  R=0
8  FORI=7TO0STEP-1:FORJ=1TO8
9  IFPEEK(A+I)=102THENR=R+2↑(7-I)/8
10 NEXTJ,I
11 PRINT"◼◼◼◼◼◼◼◼◼◼◼◼◼"
12 PRINTX;C$"◼◼◼◼"SPC(4*H)R;:F=H*22:NEXTH
13 F=0:FORH=1TO8:A=F+7737
14 R=0
15 FORI=7TO0STEP-1:FORJ=1TO8
16 IFPEEK(A+I)=102THENR=R+2↑(7-I)/8
17 NEXTJ,I
18 PRINT"◼◼◼◼◼◼◼◼◼◼◼◼◼◼◼"
19 PRINTX+1;C$"◼◼◼◼"SPC(4*H)R;:F=H*22:NEXTH
20 FORL=0TO26STEP4:POKEQ+L,44:POKET+L,0:NEXTL
21 FORL=0TO26STEP4:POKEQ+66+L,44:POKET+66+L,0:NEXTL
22 PRINT"◼◼◼◼◼◼◼◼◼◼◼◼◼◼◼◼◼◼◼◼◼1 X="X+2:PRINT"RUN"
```

Where there's a will...

Remember me? I had all that trouble with the Gumshoe tape. Well, I'm writing to let you know how I fared and thanking you for your help, by getting in touch with A 'n' F.

I did as you suggested and got in touch with Mike Fitzgerald. He was more than helpful. I didn't even have to return my Soft Aid tape. Today I received a copy of Gumshoe together with some A 'n' F promotional goodies. The Gumshoe tape was made straight off the Commodore, one side is fast loading, the other slow. I'm happy to say that both sides work perfectly.

My letter in HCW was headed "If at first you don't succeed" — well, I'll close with another familiar saying "All's well that ends well". A 'n' F's logo is Nulli Seeundus — and I'll drink to that (with Coke, of course).

Karen Rolph, Heaton

Conversions not up to par

I think it is high time that Activision started doing something about the state of its conversions for the Spectrum.

I find them slow and boring and the graphics are more suitable to games which would have been available two or more years ago, but not today.

"Ha ha!" I hear you cry, "A conversion is never as good as the original!" Oh no? Well, I think that Spy Hunter by US Gold is as good if not better than the C64 version.

Take Ghostbusters for example. On the C64 it was fab. It had everything, and the sound was really catchy. Excellent! But on the Spectrum, it quickly fades into a bad conversion. Yes, I know the C64 had better sound and graphics capabilities, but they really could have done better. And it set me back a tenner! It isn't a patch on Knight Lore, and that cost the same. Knight Lore loads every time, but not so Ghostbusters.

Paul Griffiths, Edleston

We want more!

I would like to thank you for continuing to support the C16. I especially enjoyed the adventure, Escape from Aria, it was very absorbing.

Please could you review some C16 programs in the magazine instead of concentrating on Amstrad, Spectrum, C64 and BBC games. Otherwise, how are the growing number of C16 owners going to know about the quality of games being published for their machine?

I would also like to make a comment about the Gallup Top 20 chart. There is a column for Spectrum, C64, Amstrad, VIC-20 — which is constantly blank — and then there is a column labelled "others". Please could you have a column for the C16 so that users will not constantly have to look at the "others" column for C16 software releases. I know that it is very difficult to cater for all the different micros, but couldn't you just squeeze a review in here and there, plus a place in the Gallup chart and a few more programs.

Even before I started computing I used to buy HCW because the price is reasonable and the magazine is the best value on the market. Well done!

S Evans, Rossington

Sorry that you feel we don't cater well enough for the C16. We do include as much material for this machine as we can and we review all the programs which the software houses publish. We are always looking for good C16 programs to feature in the magazine so we welcome any contributions from our readers.

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

Good things appreciated

I thought it was about time I wrote to you again. Being one of your older readers (40+) I can appreciate the good things in life, like your magazine, but I'm not too old to learn some new ones.

Now that BASIC and Advanced BASIC are under my belt, I have turned to machine code, but I've come up against a stumbling block. Although I understand hex and binary, how do you know which label :— or operand —: goes with which order, e.g. LDA #:—LDA #$ which is immediate and why. Which is implied and why which is absolute and why and so forth.

I own a C64 and without this information I can't break out into a new world of computing. As you have helped me and thousands of others, I'm sure that you can triumph once again. I have numerous books on machine code but none explain what I need to know.

S J G Reeves, Birmingham

Addressing modes are difficult to understand at first and, as different assemblers use differing symbols to denote these modes, life is not made any easier.

In general the # sign means immediate addressing the $ sign indicates that a hexadecimal number follows. So LDA #10 means LoaD the Accumulator with the number 10 (decimal) whereas LDA #$10 would load the accumulator with the number 16 (10 in hex). Incidentally LDA 10 would load the accumulator with the contents of memory location number 10.

Most good machine code books cover this area but you might find the series in Your Commodore magazine easier to follow.

LETTERS PAGE

TOP 20

SOFTWARE

Fortnight Ending May 28, 1985

Up and coming

Soft Aid is continuing to keep a form hold on the number 1 position in the chart this week but elsewhere there has been a lot of moving around.

There are 12 climbers in this week's chart and only six games on the way down. US Gold seems to be a very popular software house with three games in the chart and one of them is this week's only new entry, Dambusters.

Bubbling under the top 20 this week is Cauldron from Palace Software which is at number 23 and CRL's Rocky Horror Show stands a very good chance of being in our chart since it is currently at number 30.

One extra point of interest is that Daley Thompson's Decathlon and Football Manager have both clocked up an amazing 32 weeks in the charts.

LAST WEEK	MOVE	THIS WEEK	TITLE	PUBLISHER	SPECTRUM	CBM 64	BBC	ELECTRON	VIC-20	AMSTRAD	ATARI	OTHERS
1	●	1	Soft Aid	Various	●	●						
3	▲	2	World Series Baseball	Imagine	●	●						
6	▲	3	Knightlore	Ultimate	●		●		●			
2	▼	4	Spy Hunter	US Gold	●	●						
8	▲	5	Starion	Melbourne Hse	●							
17	▲	6	International Basketball	Commodore		●						
NE	☐	7	Dambusters	US Gold		●	●		●	●		●
4	▼	8	Combat Lynx	Durell	●	●	●	●		●		
7	▼	9	Bruce Lee	US Gold	●	●				●		●
11	▲	10	Pitstop 2	CBS		●						
28	▲	11	Death Star Interceptor	System 3	●	●				●		
21	▲	12	Everyone's a Wally	Mikro-Gen	●	●						
14	▲	13	Daley Thompson's Decathlon	Ocean	●	●						
13	▼	14	Football Manager	Addictive Games	●	●	●	●				●
22	▲	15	BMX Racers	Mastertronic	●	●						●
12	▼	16	Shadowfire	Beyond	●	●						
9	▼	17	Gremlins	Adventure Int	●	●	●	●	●	●		
34	▲	18	Moon Cresta	Incentive	●	●						
36	▲	19	Emerald Isle	Level 9	●	●	●			●	●	●
25	▲	20	Finders Keepers	Mastertronic	●							

SPECTRUM Top Ten

1	Soft Aid	Various
2	Starion	Melbourne Hse
3	Spy Hunter	US Gold
4	World Series Baseball	Imagine
5	Finders Keepers	Mastertronic
6	Death Star Interceptor	System 3
7	Bruce Lee	US Gold
8	Rocky Horror Show	CRL
9	Everyone's a Wally	Mikro-Gen
10	Shadowfire	Beyond

BBC Top Ten

1	Knight Lore	Ultimate
2	Castle Quest	Micro Power
3	Emerald Isle	Level 9
4	Elite	Acornsoft
5	Alien 8	Ultimate
6	Combat Lynx	Durell
7	Football Manager	Addictive
8	Attic Attac	Ultimate
9	Revs	Acornsoft
10	Mini Office	Aardvark

COMMODORE Top Ten

1	Soft Aid	Various
2	International Basketball	Commodore
3	Dam Busters	US Gold
4	Pitstop 2	CBS
5	Cauldron	Palace
6	World Series Baseball	Imagine
7	Entombed	Ultimate
8	Impossible Mission	CBS
9	Theatre Europe	PSS
10	Air Wolf	Realtime

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HCW needs you

Have you ever looked at the articles and programs in HCW and thought you could have written that?

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Submissions tend to fall into one of three categories...

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

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.

All contributions are acknowledged and those accepted for publication are paid for at competitive rates. The copyright in such work will pass to Argus Specialist Publications Ltd. Keep a copy of your work and include a telephone number and an SAE. Please label everything clearly with your name and the machine concerned.

All contributions should be sent to:
Submissions
Home Computing Weekly
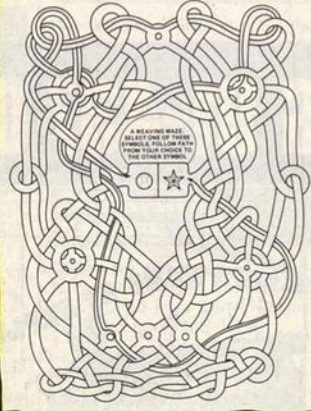No.1 Golden Square London W1R 3AB

Steven Doherty — egg eddict

Helpline

Stuart Rodgers, of 6 Newton St, Crosshill, by Maybole, Ayrshire writes: "After buying Castle of Terror for the C64 I have not yet found the pin to put in the gate wheel. I have had this game for five months and I can only find the lamp, cross, coin, help from old man, key, flint, bone — but I just can't find the pin. Please, please help or I am going to lose all of my hair by scratching my head."

J Sourley of 10, Lanton St, New Herrinton, Tyne and Wear DN4 7BA has written to us about Football Manager. "I think it's a very good game. I have tried very hard but never managed to get out of the fourth division or past the fourth round of the FA cup. Is it possible?"

Readers' hi-score table

Name	Game	Machine	Score
Phil Brussell	Munch Man	TI-99/4A	120,370
Stephen Crane	Galaxians	C16	14,800
	Harbour Attack	C16	9,784
	Stellar Wars	C16	4,200
Richard Burton	Roland in Time	Amstrad	85 crystals
	Football Manager	Amstrad	5 FA cups
Dean Moxon	Picnic Paranoia	TI-99/4A	562,150
	Car Wars	TI-99/4A	61,720
Lee Caller	Centipede	Atari	133,780
	Donkey Kong	Atari	230,600
Kenneth Penney	Doom'darks Revenge	Spectrum	completed in 65 days
Stephen Doherty	Chuckie Egg	BBC	30 screen, 369260

Solution to last week's puzzle

A WEAVING MAZE
SELECT ONE OF THESE SYMBOLS. FOLLOW PATH FROM YOUR CHOICE TO THE OTHER SYMBOL

Chuckie Egg addict

Since reading the hi-score for Chuckie Egg in HCW, I have tried desperately hard to beat it. I got very close at one stage but I got killed. After a while I got close and made up a good routine. I finished the game and got 315810. While I was achieving this my friends were disturbing me and saying that they could have 10 games to my one and I would still be on longer than them.

One night at about 10pm I loaded and started the game and said I would not stop till I had beaten it and was still going strong.

I got a bit nervous on the 29th screen because I kept on getting killed. I eventually made it past that but was killed on the 30th screen. I ended up with a score of 369260.

I kept meaning to write to HCW to tell you about this but I forgot until I finally wrote this letter.

I can't wait till Chuckie Egg 2 comes out on the BBC. When it does, I'm going to buy it straight away. On Chuckie Egg is got very hard when you were being chased by a big yellow one six little blue ones.

Steven Doherty, Peterborough

Blankety-Blank

Just as in the famous Head To Head, you are asked to supply one word which goes with the clue.

For instance, blood... might be blood clot, blood bank, blood feud, blood bath and so on.

To help you find the right word from several which may fit, the number tells you how long the word is.

Also, if you find the correct word each time, the first letters will form a word reading downwards, as will the last letters.

All four words are connected to make a short phrase. Can you find it?

	1st letter	Middle letters	Last letter
Bacon . . . . (6)			
. . . . .Ran (4)			
Keep . . . . (3)			

. . . . Measure (6)			
. . . . .Stew (5)			
. . . . .Bean (6)			
. . . . Cord (3)			
Desert . . . . (5)			
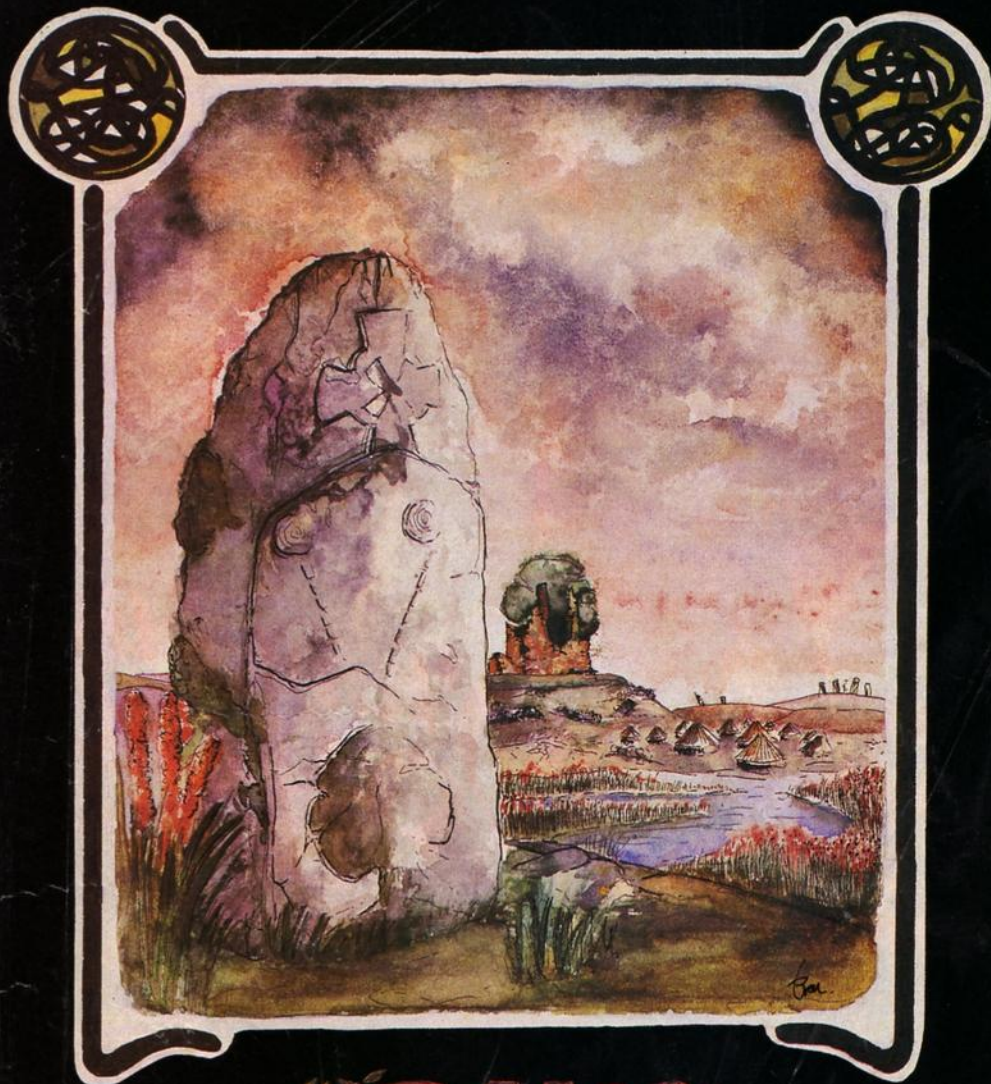
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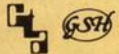
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WHSMITH Boots WOOLWORTH
John Menzies and leading multiple retailers and specialist computer stores.