HOME COMPUTING WEEKLY
AN ARGUS SPECIALIST PUBLICATION
April 23-29 1985 No.109 45p

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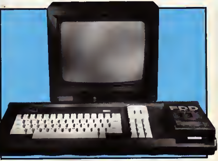
New Amstrad: Here it is!



Amstrad CPC

The new Amstrad CPC was unveiled last Wednesday in London Almost exactly a year since the CPC464 made its debut, the new model incorporates a disc drive in place of the built-in cassette player

And the keyboard has been redesigned a new, narrower QWERTY keyboard stands out against its dark background and the cursor keys are now arranged in a square above the numeric keypad

The good news is that the new micros are bouncing in at a lower than scheduled price At the launch of the CPC464, the new models were forecast at £429 and £529 for green and colour monitor, respectively. One year later, the actual prices are £339 and £449

Although the new model doesn't have any additional memory, it has extra graphics capabilities Now the Amstrad can draw in dotted lines, and fill in colour at high speed Bundled with the hardware is Dr LOGO on disc, a graphics and teaching language

Software on disc will cost £12 95, and you can also connect a standard cassette recorder to transfer programs for tape to disc, via the CPC464's built in interface

The scheduled target for sales of the CPC464 in 1984 was 200,000 and that figure was attained, according to Michael Miller, marketing director.

Tatung Einstein — work of genius?

See review on page 14

Light up your life

Win a Trojan light pen for your machine

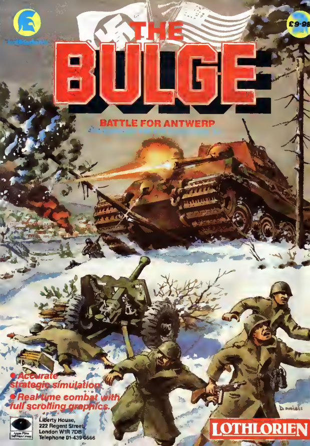
Inside your bolder, brighter, better, HCW .

Print-out on printers

Slay the dragon — St. George's Day program p. 28

Time for a bath! See p. 3

Gribbly's Day Out — reviewed p. 8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April 23-April 29, 1985 No. 109

Soapbox

The new Amstrad model has appeared on the scene almost precisely a year after the launch of the CPC464. And the price — significantly lower than that foreseen this time last year — reflects the changes which have taken place in the computing industry over the last 12 months.

With prices slashed by many major manufacturers, hardware companies must re-assess how much machines are worth on the street. And a reduction of approximately £100 has been deemed necessary by Amstrad.

With the strong possibility of further price-cutting by MSX companies throughout the next year, the industry looks set for more upheaval.

At this stage, we would like to register our continuing interest in and support for Amstrad. The Amstrad machines have an exciting future, and we pledge to be there to back them. Liz

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Coming Soon...

- Get to grips with the Demon modem
- Elementary music theory in simple steps
- Take a look at the Sure Shot Supreme

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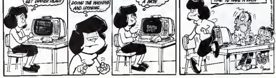
BASIC LIVING

by Jon Wedge and Jim Barker


I REALLY SHOULD GET DINNER READY
I OUGHT TO BE DOING THE WASHING AND IRONING
I SHOULD HAVE A BATH
GAME OVER
GOOD! I NEARLY DIDN'T HAVE TIME TO HAVE A BATH!

Music and movement

Records with tracks containing computer software aren't new. The new single from Kissing the Pink is a little different because the programs provide the graphics for the music.

The 12-inch single contains three music tracks and one computer track for a BBC computer. The idea is that you load the program before you play the music and you are then entertained by the full colour graphics on your micro.

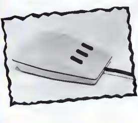
The idea came from Gary Jones who was working with the band about a year ago, when he started the project. Fans who like the music and graphics can also send for a listing of the program and full notes on what the various commands do. The idea is that they might like to produce their own versions of the graphics and then send them to the band.

The listing gives you the chance to become a "video editor", according to Gary. There will be prizes for the best graphics donated by well known computer companies in a competition to be announced soon.

There is even a sheet of notes to help those who are having difficulty loading the program.

The Program Bureau, Chasham Hse, 136 Regent St, London W1

KISSING
THE PINK
THE OTHER SIDE
OF HEAVEN
INCLUDES COMPUTER
VISUALS PROGRAM



Megamouse from Wigmore House

Mice-infested

The computer industry seems to have declared 1985 as Year of the Mouse.

Wigmore House has released the Megamouse for the BBC, at a cost of £88.55, including the Mousepaint program.

The program provides rubberbanding, variable brush sizes, shape design, icons, save, load and print options. There is no hardware modification required — all the software is disc- or cassette based.

Cadmouse is an optional enhanced program that allows the use of two screen modes and up to four colours. Claimed to be the "most advanced general design/graphics package available for the BBC", it has hundreds of options for design manipulation.

The unit is currently available by mail order from Wigmore House but dealers will have them soon.

Wigmore House, 32 Savillo Row, London W1X 1AG

Software update

Ariolasoft has announced the conversion of a number of its best-selling games for the Atari and Amstrad.

Frank Brunger of Ariolasoft said: "As far as possible we've tried to reproduce the exact graphics and games-play of the top selling Commodore 64 versions."

The five titles which head the range are Archon, One-on-one, Hard Hat Mack, MULE and Murder on the Zinderneuf.

The Enterprise 64 is now getting better software support, with a line-up of 14 titles, commissioned from various software houses.

Among the companies involved are Hewson Consultants, CDS, Level 9 and Widgit. A further 16 programs are planned for release in April.

Entersoft is the name of Enterprise's new software arm. Product manager Steve Gandy commented: "Our objective is to produce over 100 titles, either own-label or third-party, in time for peak buying season this year. And we won't sacrifice quality for quantity."

Title	Machine	Price	Publisher
Thermo Nuclear War	Spectrum	£5.95	Zircon
Killer Gorilla/Gauntlet	Amstrad	£9.95	Micro Power
Ket Trilogy	Dragon	£9.95	Incentive
Chaos	Spectrum	£7.95	Games Workshop
Millionaire	Amstrad	£6.95	Incentive
Talladega	C64	£8.95	Audiogenic
Berks III	C16	£6.95	CRL
Super Pipeline II	C64	£8.90	Taskset
Moon Cresta	C64	£6.95	Incentive
Steve Davis Snooker	Enterprise	£8.95	Enterprise
Heathrow Air Traffic Control	Enterprise	£7.95	Enterprise
Colossal Adventure	Enterprise	£9.95	Enterprise
Adventure Playground	Enterprise	£7.95	Enterprise
Alien 8	Spectrum/ Amstrad	£9.95	Ultimate
Entombed	C64	£9.95	Ultimate
Gates of Dawn	C64	£8.95	Virgin
Hit for Six	Spectrum	£3.75	Birdbrain

Micros in church

Churches are often accused of being behind the times but a group of computer users are getting together to try and change all that

The newly formed Christian Micro Users Association hopes to link together a large number of Christian users and also promote the use of machines in church activities

They would like to hear from anyone who is producing software for such use and those who have ideas and expertise in this area

Interested parties might like to send a SAE to the address below to receive further details and a sample magazine

Christian Micro Users Association, 6 Walkley St, Sheffield S6 3RG

PAUSE - press a key to restart

Dragon slayed!

Hewson Consultants reports that a number of players have already finished its new game Dragontore.

The players took different times but one claimed to have finished the game at one sitting, taking just 10½ hours

The winner of the certificate is 14-year-old Eamon McGing from Yately in Hampshire "I bought my copy on April 1st and played it over the next six days," he told us.

"I liked Avalon and so I thought I would try this one too. It was easier than Avalon, which I still haven't finished, it flowed much more easily. The game is excellent, the design is smashing and I particularly liked the graphics. They really give you the impression that the scene is real," he commented.

He has owned his Spectrum for two years but this is the first time he has won any prize playing a game. He usually plays arcade games, never adventures, so winning this arcventure prize was a real surprise

Hewson Consultants, 56b Milton Trading Est Milton, Abingdon Oxon OX14 4RX

Eggstra security

Software piracy is still an issue for a number of companies and A 'n' F has decided to protect its new Chuckie Egg program with holograms

Each cassete will have a special sticker, produced by the reflection holographic method, showing the A 'n' F copyright symbol and the word "egg"

Future enhancements might include a numbering system which should give the company 100% security, any large scale pirating operation will be detected in moments

There is £1800 at stake in the Chuckie Egg competition, open to all purchasers of the program. Six regional finalists will play off against each other in August and the first prize winner will walk away £500 richer

Entries must be posted by July 19th 1985 and must be on the card supplied with the program. Winners of our Easter competition will also be able to enter

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

Publishers feel the pinch

Computer book publishers were present in force at the London Book Fair held at the Barbican from April 10 - 12. However, the number of new titles in evidence were few and all publishers seem to be watching and waiting for the big new Commodore and Atari machines.

Shiva's stand space lay empty following the company's recent collapse. Holt Saunders is still distributing Shiva's publications, which include a series on artificial intelligence, but a spokeswoman for Holt Saunders would not comment on the present situation.

Bernard Babani, known for its pocket guides to many aspects of computing, only has plans for two books in the future: introductions to programming on the BBC and MSX computers.

Thankfully, it wasn't all news of cutbacks and company crises. Hutchinson has just published a new series known as Handbooks, covering the QL, Sinclair, Commodore and Amstrad user. Interface had a number of new books on display including the intriguing Winning At The Races Using Your Computer.

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* * * AMSTRAD * * *

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[illegible]	9.95	7.95
[illegible]	9.95	7.95
[illegible]	14.95	10.40
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[illegible]	10.95	9.95
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So, if you are fed up of struggling with the qwerty keyboard and fancy trying the light fantastic, send an entry for this week's competition It can only cost you a stamp!

All the words in the square are taken from the following list cassette, VIC, printer, Commodore, Einstein, cable, Amstrad, home, BBC, Oric, Sord, disc, Spectrum, Trojan, computing, Memotech, Apple, drive, Dragon, light, weekly, enterprise, Tandy, pen

You'll need to search carefully, since they're written horizontally, vertically, diagonally and back to front

How to enter

- Study the wordsquare and mark all the words you find from the list given with a ballpoint or semi-opaque felt tip pen Complete the coupon clearly and fully — if you are a winner it will be used as a label Send the wordsquare and coupon to us
- **Important:** write the number of words you found on the back of the envelope
- Send your entry to Trojan Light Pen Competition, Home Computing Weekly, No 1 Golden Square, London W1R 3AB Closing date is first post on Friday May 10, 1985
- You may enter as many times as you wish, but each entry must be on an official coupon — not a copy — and sealed in a separate envelope
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The rules

Entries will not be accepted from employees of Argus Specialist Publications Alther Computer Group and Alabaster Passmore & Sons This restriction also applies to employees' families and agents of the companies

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No correspondence can be entered into and the editor's decision is final.

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X	C	V	Q	E	N	M	R	E	Q	C	W
E	R	D	R	A	G	Q	N	K	T	D	Y
U	I	T	A	N	D	Y	A	L	D	M	S
P	A	S	X	D	D	F	J	Y	N	P	G
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E	D	Q	L	I	G	H	T	W	E	I	S
C	T	Y	U	C	I	S	D	P	A	N	S
D	F	G	N	J	U	K	L	Z	X	G	C
P	V	B	N	M	Q	W	E	R	T	Y	U

SOFTWARE

Gribbly's Day Out

Gribbly Grobbly lives on the planet Blabgor and is a little green creature with a big head, one foot and antennae. The idea behind the game is for Gribbly to rescue the gribblets, which are young gribblys. This is done by moving about the screen. On land Gribbly bounces on his one foot, but he can also fly by power of his mind and Psi energy!

To make things a little more difficult there are things called topsies which attempt to capture and carry off the gribblets. A topsie starts as a sort of flying sycamore seed floating down to land. Once down the topsie becomes a little green tube that flips along like a slinky. If a topsie meets a gribblet on the ground he will flip the Gribblet onto its back. Gribbly can destroy the topsies in their airborne form by 'bubbling' them.

Another feature is the Anti-Psi web that is in the sky, this is harmful to Gribbly if he touches it as it drains Psi but the web may be controlled and moved about. Finally there is Seon, a bad gribbly, like a crab, which inhabits the web, if Gribbly touches Seon he must immediately return for more Psi.

The control of the game is difficult to master as Gribbly moves up under his Psi power but gravity brings him down and the web is never far away. Graphics are excellent especially the topsie airborne and land creatures and the expressions on Gribbly's face at various stages. Sound is average and consists of a few tunes. Overall a very innovative game, well done.

J.G.D.

Price: £7.95

Publisher: Hewson Consultants

Address: 56B Milton Trading Est, Abingdon

C64

CAULDRON
COMMODORE 64

Cauldran

After the not particularly impressive Evil Dead from Palace, Cauldron is a breath of fresh air. My original impression is of a Defender type, scrolling screen, with superbly detailed forests, graveyards, islands, and other bits and pieces running across the bottom of the screen.

However, instead of a spaceship you have a witch, and instead of aliens you have bats, ghosts, sharks, and other various nasties. It is here that the similarity with Defender ends. Whilst you are blasting (sorry, casting spells) at the baddies you must look for some keys, a key of one particular colour will let you into a door of the same colour. There are four keys and eight doors.

Entering a door changes everything. The game now moves on to a ladders and ramps type game, but I found it much more satisfying than most L&R stuff as it has a much more intesting style and some puzzles extend over many screens.

Completing the room rewards you with an ingredient for your spell. Collecting six of these and dumping them in the pot in your cottage rewards you with a spell, with which you can get rid of the giant pumpkin in the final room. No mean feat at all.

The instructions are presented in verse. Buy this game without delay, shift/run stop, and then pess play **M.D.R.**

Price: £9.95

Publisher: Palace Software

Address, 275 Pentonville Rd, London N1

C64

Falcan Patrol II

"Oh", my brother said when he saw me playing this, "a horizontal Zaxxon." Personally I thought it was more like the old Defenda, but that gives you a general idea of the game.

Armed with 100 missiles, you fly the Falcon over a 3-D landscape fighting waves of enemy helicopters. There are three types of helicopter — fast solo fighters, gunships and transporters which drop flak bombs and radar jammers. As in Defenda, the top part of the display includes a radar showing the location of nearby enemy ships.

This is a good version of Defenda, though it does have its limitations. The graphics are very good, and the movement of the scrolling landscape and aircraft is nice and smooth. But, although the landscape is drawn in 3-D, the Falcon's movement is purely two-dimensional, so that the landscape graphics are really just decoration and don't add much to the game play.

Also, controlling your altitude is a little tricky, as you can't position yourself, for instance, half way up the screen and then continue flying horizontally at that level. One touch of the Up/Down controls moves you continuously in those directions. So, to fly on one level you must constantly alternate between Up/Down to try and keep steady.

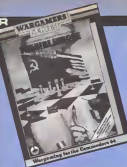
Still, once you've mastered that, FPII is a good shoot-em-up that gets enjoyably frantic after the first few levels. Oh, FPII also has the novelty of a SCREEN$ that loads backwards. **C.J.**

Price: £6.95

Publisher: Virgin Games

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

SPECTRUM



Theatre Europe

The theme of this computerised wargame is a potential Third World War caused by Soviet incursion upon West German soil. Ignoring the controversial subject of whether or not it is right to turn the prospect of nuclear holocaust into a mere game, I shall describe its concept and leave the moral judgements to the conscience of the buyer.

At the beginning you are invited to adopt the role of commander of the Warsaw Pact or NATO forces, the computer takes the opposing role. The aim is to either maintain control of West Germany for NATO or to dominate the country for the Pact. It soon becomes obvious that the idea is to achieve your chosen objective by non-nuclear means, or at least controlled use of tactical nuclear weapons.

Each side has a number of military units which can be moved a fixed distance each turn, war being waged or retreats made according to your estimation of each unit's strength against that of the opposing forces. Having engaged one or more units in battle it is then possible to monitor one of these skirmishes on the screen and influence the outcome by controlling missiles on an arcade action screen.

The game can be played at one of three levels, the higher levels have special operations which you can select in an attempt to gain superiority. The end of the game arrives when the computer decides that sufficient advantage has been gained by one side or the other.

The graphics in this game are very good but the introductory music, 'Give Peace A Chance', seems a little corny and unnecessary.

The manual has sufficient detail to allow the game to be played, but I felt in need of further details to help me to understand the decision of the computer to end the game. Judging by the bibliography, the research for this game has been thorough and it states that the Designers Notes are available on request. Personally I feel that it would have been useful to include these as part of the package instead of the superfluous leaflets.

I was left with the impression that far too much time was spent on developing the cosmetic aspects of this game, such as the nuclear cloud mushrooming over a doomed city.

Wargaming is at its most enjoyable when complex and it is essential to feel that decisions made have a logical basis. I found myself getting bored and frustrated by the decisions of the computer to launch all-out nuclear strikes for no apparent reason or to award the game itself just when I felt the tide had turned in my favour. More documentation may have alleviated these problems but as it stands it leaves me cold. **E.D.**

Price: £9.95

Publisher: PSS

Address: 452 Stoney Stanton Rd, Coventry CV6 5DG

C64

GLIDER PILOT
Commodore 64
SUPERGRAPHICS

Glider Pilot

Many of today's aircraft simulators are so complex that amidst the controls and gadgets the aim of the program is completely forgotten and the outside weather conditions become irrelevant. This is not true with Glider Pilot because, as you may know, gliders have few controls and rely on thermals to gain height.

The game comes with a fairly comprehensive manual which explains quite well how to fly Glider Pilot. Having said this, I must admit that I have not yet got round the course without crashing.

If you feel that you cannot land the glider on your own then you can leave the computer to do this. As long as there is an airfield near by it will land the glider safely. It's a pity that the computer cannot fly it as well, just to give a full demonstration of how to play.

The graphics are well implemented. Areas on the ground are just line drawings but the clouds are solid and move in relation to each other. When you bank to one side the whole display through your window will twist around. The effect given is really very good.

There are three different maps available. One large and two small scale. The small scale is used for determining when you cross the starting point if you have a held line start.

The game offers you much control over the weather conditions and simulation speeds. It was designed and written by a fully qualified glider pilot and seems to be very realistic. **K.I.**

Price: £8.95

Publisher: CRL

Address: CRL House, 9 Kings Yard, Carpenters Rd, London E15 2HD

C64

★ ★ ★ ★ ★

Flipped

★ ★ ★ ★

Hooked

★ ★ ★

Keen

★ ★

Yawning

★

Comatose

REVIEWS

Pole Position

There have been a variety of Grand Prix games This one, the Atari version, is the original The idea is quite simple You control a grand prix car and your task is to win the race

You are given a view of your car from behind with the road disappearing in the distance. As the road twists and turns, you must follow it and avoid leaving the road At best leaving the road loses time at worst, your car crashes To add to the anguish, there are opposing cars to overtake

As in normal racing, there are preliminaries to be dealt with before you race. To help you get your hand in, there is a practice option This is valuable since it gives you the chance to get a feel for the circuit and to practise accelerating and gear shifting Once you've got it sussed, there's a small matter of qualifying This race is a nominal 90 seconds long, but you must complete the race in 73 seconds to qualify Depending on your finishing time in qualification, your position in the starting grid for the main race is decided

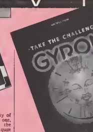
The graphics are typical for this type of game with smooth scrolling of the track The feeling of movement is enhanced by the signs which change size and position as they approach. The game is fast and quite testing but in the light of the fact that there are one or two games of comparable quality about, its release is probably too late **A.W**

Price: £9 95

Publisher: US Gold

Address: Unit 10, Parkway Ind Centre, Heneage St, Birmingham B7 4LY

C64



Gyron

I know that the people at Firebird, as well as a number of other magazines, have been raving about this, but I'm afraid I just don't quite share their enthusiasm for it Don't get me wrong, there's nothing cheap or shoddy about Gyron Technically it's awe inspiring, and the graphics are nothing short of superb, unfortunately I just didn't find it particularly thrilling to play

Stripped of the manual's pseudo-mystical waffle about gods and time and space, the plot places you inside either of two mazes — the Atrium and Necropolis — which are displayed using vector graphics The mazes are patrolled by Celestial Spheres, fatal to the touch, and defended by Towers of Silence which can zap you to bits, but are vulnerable to attack from behind To navigate the mazes you travel in a ship called a Hedroid, and the main part of the screen display represents the forward view from within the Hedoid

As I mentioned, the line graphics as you move around the maze are excellent The line graphics as you move around the maze scroll smoothly and without even a hint of flicker as they are rapidly redrawn The Spheres that roll gracefully around the maze are also marvellously animated and when two or more cross paths it's astonishing to see how their individual outlines and patterns of movement remain so clear From a programming point of view, the techniques employed to achieve this must be mind-bogglingly complex The opening screen (don't blink or you'll miss it) features a sequence so well animated that it gave me a real start when I saw it for the first time

Yet despite all this, I came to the conclusion that Gyron is really just another maze game, albeit a wonderfully complicated one There's no real sense of achievement when you zap one of the Towers, and you only get one life with which to try and complete the enormous mazes, which made the whole thing seem a little futile after a few tries And, after a while, one stretch of corridor looks very much like any other, no matter how well drawn, and it starts to get a bit monotonous.

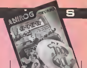
I tried hard to enjoy Gyron, I honestly did A vast amount of work has clearly gone into it and I feel a bit guilty dismissing all that effort, but my final view is that as an exercise in programming technique, Gyron is brilliant But as a game it's rather dull Sorry. **C.J.**

Price. £9 95

Publisher: Firebird

Address: Wellington Hse, Upper St Martin's La, London WC2

SPECTRUM



Las Vegas

Once upon a time apart from Pinball tables the only arcade machines were one-arm bandits What surprised me most was that programmers have elected to write one-arm bandit simulations for computers As such, this program is not original and the simple question remains as to how it compares with the rest

The format is quite standard The main segment of the display holds three reels which scroll up giving an impression of rotation These reels carry the various symbols and fruit To add to the options available, you have occasional options to hold reels, nudge reels and there is a bonus scale activated by number symbols on the reels. The bonuses offer extra nudges or cash Each time you win some cash, you have the option to gamble This either doubles or halves your winnings

The cassette carries versions for the 64, VIC-20, C16 and Plus/4 This innovation is intended to make life simpler for the retailer. All versions were colourful with decent effect and scrolling

The main problem with this sort of simulation is that you miss the whole point of one-arm bandits The excitement of risking your own cash is missing In an attempt to offset this deficiency, this game counts the number of spins you get for your allocated cash and this goes on a high-score table

Overall Las Vegas compares very well against the opposition but in spite of this, it's not really that exciting. **A.W.**

Price: £6 95

Publisher. Anirog

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

C64
VIC-20

ANIROG
Catacombs
C16 & CBM64

Catacombs

This illustrated adventure places you in search of the formula and ingredients for a lost elixir needed to rid the land of a plague You are offered a choice of two alter egos a warrior called Duke or a witch called Oswich

The screen is split in two. The upper portion gives a view of the location and the lower portion gives textual information The method of play is quite standard with you entering simple commands and solving various problems An interactive element is provided with the presence of various elves and a cat.

The first and most irritating aspect of the game to strike you is the lack of sensible responses to your commands. Any unacceptable command elicits the response That's no good This means that you don't really know what is unacceptable about your command

The instructions state that there are clues everywhere in the text and pictures, I didn't find this to be the case The first screen requires an action before you can go anywhere, although no indication is given anywhere what this action may be The only way I found it out was by phoning Anirog

The design of the game is fair with decent multicolour graphics Some animation is included with doors opening, cats walking and rocks moving.

Whilst I enjoy a testing adventure, I felt that this game was more obscure than intellectually tough I would have preferred more emphasis on textual descriptions and helpful responses Overall fair but probably too daunting for newcomers to adventures **A.W.**

Price: £6 95

Publisher: Anirog

Address. Unit 10, Victoria Ind Pk, Victoria Rd, Dartford, Kent DA1 5AJ

C64

Mastermaths
Software

Mastermaths

Mastermaths is a set of two tapes containing four maths programs covering addition, subtraction, multiplication and division for an age range of 5 to 11 years.

Each of the four programs contains a wide range of options in terms of difficulty and approach to each of the four operations, and there's a successful attempt to make learning fun by combining the questions with stimulating games The various options are menu driven and each option can be exited by pressing escape. In addition to the tests there is a demonstration mode which shows how the game is played

The addition program is based upon a game where the player has to beat a monster to a treasure chest at the bottom of a mine Subtraction is a complex game where coloured balls have to be caught in cups or nets

Multiplication features a grid within which a fly is trapped, while Division centres around a game where balloons have to be won and burst.

Each program shows the correct answer or hints if a wrong answer is given and the more complex questions require each stage of the calculation to be entered. My main complaint here was that the instructions weren't clear as to what the program wanted entering for each step of the solution. However, by watching the demonstration it soon became clear what was required

Each program gives six levels of difficulty and a demonstration can be requested for each level The programs combine good teaching with entertainment and pupils won't tire easily of their lesson **J.D.**

Price: £19 95

Publisher: Oxford University Press

Address: Walton St, Oxford OX2 6AB

BBC

Up 'n' Down

All you mad motorists will love this game The object is to drive your car as far up a hill as you can get The difficulty is that the roads are chaos but to help you with this small problem you have a rather special car

There is a network of diagonally crossing single-track roads along which cars and lorries may go in any direction Working your way up the roads may cause problems if you meet anything coming the opposite way To tackle this you may jump over or on top of the oncoming vehicles Beware though if your jump too near to a corner you could over-run the road and crash

Getting up the steep inclines is quite hard due to the fact that you struggle to get your car up hills and so slow down or sometimes even stop and start rolling backwards The other factor which makes it difficult is that you can't jump over anything when on a hill

The background graphics scroll up and down depending on the direction in which you are moving A nice 3-D effect is given — the display seems to have some depth and reality to it Good use is made of the colours and sprite graphics

Our pre production copy had no instructions — I sat and worked out the rules by trial and error Despite this it does seem to have a good potential and is definitely hard enough to keep you going for a while **K I.**

Price: £9 95

Publisher US Gold

Address: Unit 10, Parkway Ind Centre, Heneage St, Birmingham B7 4LY

C64

NOTE INVADERS

Note Invaders

This package is designed to teach the user some basic principles involved in reading music The idea behind the programs is to teach in an informal manner which will relieve the tedium of a textbook It is of use to education establishments and the home user who wishes to learn music.

There are three programs The first introduces and explains the arrangement of notes on the stave for the treble clef

The second program works as a teaching aid/test of the student's ability A note is sounded and displayed on the stave, the student then has to put a name to it If a wrong reply is given then the answer and a reminder of the notes are displayed

The last program is an arcade space invaders type game A note runs along a line of the staff You must shoot it by typing in its name before it reaches the other side of the screen Points are awarded depending on your reaction time to name the note If you get the wrong answer then a life is lost. This program in particular is good for increasing the speed at which you read music

The whole package is well presented and thoughtfully laid out Different difficulty levels are available so that a wide variety of academic abilities may be suited A four page sheet of instructions is given to explain how the programs should be used **K I.**

Price: £9 95

Publisher: Chalksoft

Address: 37 Willowslea Road, Worcester WR3 7QP

C64

Airwolf

Airwolf is a game based upon flying a helicopter through a series of caves and tunnels in order to rescue scientists. Then you must escape. There are many ways through the caverns — it's up to you to find the correct one.

The helicopter you control is affected by gravity and also has momentum. This would add some reality to the game if the helicopter wasn't so large. The problem is that you are controlling a fast cumbersome object in a small screen space. When the screen scrolls to show more of the cavern you do not have time to slow down, manoeuvre or stop before you hit the walls. On further screens with moving obstacles to avoid I found that playing the game was totally impossible.

To get between caverns you may have to flick a switch or shoot a hole in the wall. There are no rules that apply to all caverns — it is basically a trial and error game. There are occasional arrows hidden in the cave walls which point out clues to the exit. These are a great help and very valuable to the player's success.

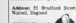
The graphics and sound are extremely good. All screen displays seem to contain a lot of detail and colour. Scrolling is smooth and flicker-free.

The instructions are very poor. They do not tell you how to play the game or exactly what your aims are. There are only a few paragraphs of waffle that tell you just what you already know — nothing. **K.I.**

Price: £7.95

Publisher: Elite Systems

Address: 55 Bradford Street, Walsall, England



Jouste

How else can I describe this game but as a very nice version of a fairly popular arcade game?

The screen contains several rock platforms at various heights, at the bottom there is a wide island surrounded by molten lava.

You are an ostrich type of animal with a long lance. The object of the game is to jouste creatures like yourself with your lance and turn them into eggs. The eggs will then roll and land on a platform where you can collect them. If you do not collect the eggs straight away they will turn into lava trolls.

In a similar way you must not let anything land on you or else you will suffer similar consequences. Occasionally a pterodactyl will fly onto the screen. These are very unpredictable and dangerous.

Controlling the game is made very realistic with the inclusion of inertia and gravity. A joystick must be used to play.

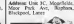
The graphics and movement are of an extremely high standard. In many respects they are almost as good as the original arcade game. The only limitation is the computer's screen size and resolution. The sounds are not very exciting but this is also true of the arcade version.

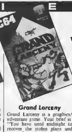
I feel that a little bit more effort could have been put into the instructions printed on the inlay card. As it happens there is a demo routine included which does show you the principles involved and can help if you are totally bemused by the game. **K.I.**

Price: £6.95

Publisher: IJK

Address: Unit 3C, Moorfielde, Moor Park Ave, Bispham, Blackpool, Lancs





Grand Larceny

Grand Larceny is a graphics/adventure game. Your brief is "You have until midnight to recover the stolen plans and escape from the Hotel. Be cunning, be careful and be quick!" Perhaps Melbourne House should replace the word "quick" with "slow" — or even "extremely slow."

The screen is split into two halves, the upper part is used to display a moving picture and the lower for your input. When you enter text instructions the computer displays what you type on the screen at the rate of one character per second. It then takes even longer to evaluate what you have entered.

The picture scrolls left and right depending upon where you go. One annoying point is the length of time it takes to make a simple move from one cell to the next — each time you have to watch a silly little man (or at least I think that's what it is) walk to the next location.

The instructions are good — even if they do exaggerate the game out of all proportion. A list of all the commands which the computer understands, is given. It appears to have a vocabulary of about 24 nouns.

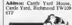
If you fill in and send off your Melbourne House registration card you will be informed of any new software or special offers.

I can honestly say that I am disappointed with Melbourne House for producing a game such as this since it does not live up to the reputation which has been built up over the past few years. **K.I.**

Price: £7.95

Publisher: Melbourne Hse

Address: Castle Yard House, Castle Yard, Richmond TW109 6TF



ROCKET BALL

Rocketball

Rocketball is played by two teams of five roller-skated players on a circular track. The objective is to get the ball and throw it at the goals to score a point.

There are very few rules — you may even punch other players and push them out of your way. Due to the complexity of the movements you will need a good joystick to play the game. It is played fast and gives you little room for error if any other players are near you.

The screen will display the portion of the track that has the ball in it. Not all the men will be on at once, some which have fallen down will only be seen briefly until they stand up again.

You control one of your players at a time. If he should fall or move off the screen you take control of the player nearest the ball who is capable of the job. The man which you control is displayed in a colour slightly lighter than the rest of your team.

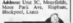
The graphics are good and clear. It is advisable to have a colour monitor — you need to be able to distinguish between colours and their various shades.

I found the game rather boring to play — too much is done automatically by the computer. I should point out that this is a one or two player game, I have been using it to play against the computer and have always lost. **K.I.**

Price: £7.95

Publisher: IJK

Address: Unit 3C, Moorfields, Moor Park Ave, Bispham, Blackpool, Lancs



Scoredraw

This is a computerised approach to picking score draws for football pools The program assesses a database of past results and gives 22 forecasted results On running and after entering your password, you are offered five options Two of these save and load the database to cassette

When starting a new season, you obviously need to start a new database There is an option which allows this and you are requested to enter the data and the numbers of the score draws On subsequent weeks, you use the update/amend database option The final option gives you the prediction

In spite of some thought, I find it difficult to decide how the program does it's stuff If you input only a single result to an empty database, it gives 22 forecasts This implies some form of resident database. The system is, however equally applicable to Australian football Perhaps early forecasts where data are scant is based on random factors.

The forecasts generated were compared with several weeks results and the forecasts of the experts in the papers. The result .. inconclusive The program seemed to have about 50% accuracy

The program is available only by mail order and it contains your own password. The insert requests that if you win, a donation of 10% to the company would be appreciated. If the donation is big enough, you'll even get a self updating version of the program Overall, I found no evidence to show that the program is any better than a blindfold and a pin **M.W.**

Price: £13

Publisher. Nagram

Address: Soho Synth Hse, 18A Soho Sq, London W1V 5FB

SPECTRUM

Gremlins

Adventure International has now added film adaptations to its Marvel Comics tie-in adventures Based on the recent Gremlins film this is a fairly simple adventure that seems to have been aimed at those who may not have ventured into this field before, and of course anything that helps to bring more people to adventuring is to be welcomed

The plot of the adventure is simple you must prevent the gremlins from overrunning your home town To do this you assume the role of the film's young hero Billy Peltzer as you visit the various locations

This is a fairly simple adventure and as far as I can tell, seems only to have around 40 locations, but these all have excellent graphic representations, including some limited animation (the tavern location has a flashing gremlin, just as in the film) and others change in response to your actions In one location, GET SWORD will show that a sword has been moved, and KILL GREMLIN will show a picture of a dead gremlin in place of a live one

The sentence parser is very sophisticated and will accept full sentences, and this helps to make the game more playable for those who are new to adventuring, but I am not sure how challenging it will prove for more experienced adventurers as many of the puzzles are fairly straightforward (especially if you've seen the film)

Still, it's nice to see that Adventure International is bringing a new audience to adventuring

Price: £7 95

Publisher: Adventure International

Address: 85 New Sumner St, Birmingham B19 3TE

SPECTRUM

SPECTRUM
CHUCKIE EGG 2

Chuckie Egg 2

OK, so it isn't exactly state-of-the art, but I've always had a soft spot for Chuckie Egg, and I had high hopes for its sequel Perhaps I expected a little too much, as I was initially disappointed to see that Egg 2 had joined the ranks of JSW clones (egg two, Brute?)

To be fair though, after a while it does prove to be a reasonably superior clone, with some nice extra features

Henhouse Harry has now moved on to a chocolate egg factory with 120 rooms, through which he must be guided to collect ingredients and parts of toy kits to put inside the eggs. As well as all the usual ledges, ropes and stairs, there are some nicely detailed sprites to avoid (including a pink elephant and a creeping hand which, confusingly, kills you in some rooms but just pushes you out of the way in others)

One extra feature that puts Egg 2 in the arcade/adventure category is the ability to collect objects which will be needed to solve problems elsewhere in the factory As in a text adventure you can only carry a limited number of objects.

However, the one stroke of genius that will forever endear this game to me is the Save Game facility which prevents you travelling all the way to the last but one screen, only to lose your last life and have to start all over again I don't know of any other arcade game with this facility — why didn't somebody think of it before? **C.J.**

Price. £6 90

Publisher: A 'n' F

Address: Unit 8, Canalside Ind Est, Rochdale, Lancs

SPECTRUM

Combat Leader

This game is a multiscenario land based war game offering a wide variety of options The concept is simple You command the good guys and must perform a specified operation against the bad guys

The screen display gives a view of the action Topographical features such as woods, rocky areas, depressions and hills are shown by different symbols The map is equivalent to three screen areas so scrolling is used to reveal new areas as you move about The display uses hi-resolution bit mapping so whilst single pixel movement is used, everything is shown in the same green colour This makes visibility difficult on domestic TVs As you move your tanks and other units, the change in positions is updated on the map Overall the handling of the graphics is first rate

As commanding officer, your job is simply to command This involves deployment of forces and choice of tactics. The programmer has spared no pains to give a complex game A wide range of factors including fire accuracy, armour, anti tank unit, scouts, panic under fire and scenario interact to give a realistic game To make life even more interesting, you can define your own scenario To help you in this task, a long list of the characteristics of different tanks and carriers is provided in the excellent manual

This is a high calibre war game which will appeal to the average user who doesn't want to relive a specific campaign. The one real black mark is the price A fiver cheaper would be nearer the mark **A.W.**

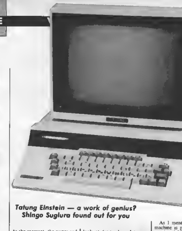
Price: £14 95

Publisher: US Gold

Address: Unit 10, Parkway Ind Centre, Heneage St, Birmingham B7 4LY

C64

HARDWARE



Tatung Einstein — a work of genius? Shingo Sugiura found out for you

At the moment, the upper end of the home computer market is dominated by the BBC micro However, even this amazingly versatile micro is beginning to show its immense age Its tiny memory capacity, extraordinarily high price and high cost of peripherals haven't helped much either

For those wishing to upgrade to a more powerful computer, the only other choice would seem to be the Sinclair QL But perhaps you don't fancy that unresponsive flat keyboard? Or maybe you've heard that the Microdrives are ridiculously slow and lose their data when dropped from a height of more than 10 cm? Or perhaps you don't want a machine with hardly any software support In fact, there is another machine — the Tatung Einstein

Hardware

The machine costs £500 and comes with a built-in three-inch drive, a proper keyboard, 64K of RAM, a separate 16K of video memory and 8K ROM all powered by a Z80A central processor running at 4 MHz It is light grey in colour and the drive(s) are neatly built into the front of the machine It can support a colour monitor and as such, takes up a lot of room However, overall it is nice to look at (certainly a lot nicer than the curvy Enterprise "space age look")

The full QWERTY typewriter keyboard contains 67 keys, including eight user definable function keys and 11 control keys such as shift, control, alpha lock etc However, this is where I must start criticising For a start, there is no TAB key, the shift keys are too small and the keys themselves felt very soft I was often troubled by bouncing problems and because the keyboard isn't buffered, half the input was ignored whenever the machine was too busy A numeric keypad would have been useful too

Behind the main box, there lies a whole array of interfaces There is an on/of switch, a reset button (which would have been more useful at the side of the machine rather than at the back which is virtually inaccessible when there is a huge colour monitor sitting on the machine), socket for external disc drives, the "PIPE", user input/output port, printer port and the video socket On the side of the machine, there is a volume control knob (very thoughtful and should have been included on the Beeb), two analogue joystick ports and the RS232C socket

As I mentioned earlier, the machine is powered by a Z80 running 4 MHz It is complemented by a full 64K of memory, an 8K ROM and a totally separate 16K video RAM Of course, this means that whether you're in high resolution mode or not, the amount of memory available for programs remains the same So unlike many other so-called 64K machines, the Einstein is a true 64K machine

The display is incidentally controlled by the same chip used in MSX machines and judging from some of the games I've seen (both on the Einstein and the MSX), very nice effects may be achieved.

The trouble with this chip is that the text is on a 32-column screen which is rather restricting However, to overcome this, Tatung has managed to get a 40-column screen by having 6 x 8 characters rather than the more usual 8 x 8 This does result in a rather ugly character set, but the advantages of a 40-column screen far outweigh the cosmetics Unfortunately, there is no way to get an 80-column display, but there is an optional 80-column board for around £45

System software

The operating system is called Xtal DOS It is so similar to CP/M that some CP/M software will run on the Einstein with little or no conversion. All the standard CP/M commands plus a MOS command to get you into a machine code monitor (which incidentally, supports a full screen editor whereas the DOS supports a simple line editor!) are supported The BASIC supplied with the machine Xtal BASIC rather than the more usual Microsoft BASIC It has a very nice full screen editor, similar to those used by C64, MSX and IBM I personally find this system by far the easiest to use when compared with those on machines such as the BBC, Oric, Spectrum etc

The BASIC itself is a good implementation providing all the facilities you would expect Full access to the hardware is given via extensions to the standard Xtal BASIC and I found that the graphics and sound commands were, on the whole, very well implemented. I was especially impressed by the sound commands which were powerful but also easy to use Plenty of file handling commands, such as ERAse, DIRectory, REname, [illegible], LOCK and UNLOCK were supplied. I was rather disappointed to find that there are no structured commands such as REPEAT-UNTIL loops, WHILE-WEND loops or PROCEdures but on the whole, Xtal BASIC was very nice to use

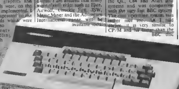
Documentation

The Einstein comes with three manuals An Introduction to the Einstein, DOS/MOD Introduction and Basic Reference Manual An Introduction to the Einstein takes you through the first steps of setting up the micro and programming in BASIC, amongst other things Although it's very well written and interesting, I did find that it was rather long winded (it's 229 pages long) After all, it is meant to be a gentle introduction to the world of computers The Basic Reference Manual is similar to any other book which aims to teach you a bit about the BASIC language All the commands are described clearly in detail but a few more examples would have been helpful

The DOS/MOS manual has all the information but I felt it was set out very badly and first-time buyers may find the facts difficult to digest

Commercial software and support

On the games side I was quite surprised at the number of Spectrum/C64 classics which have been converted for the Einstein I was most impressed by the standard of games such as Hunchback by Ocean, Punchy by Mr Micros and Shark Hunter by Electric In all the games, the sprite and sound facilities were used very well and the overall quality was higher than the quality of a typical game for the BBC micro and on a par with Spectrum games. I am assured that many more classic titles such as Elite, Airwolf, Chuckie Egg, JSW, Manic Miner and the Adventure International range will be available soon [illegible] you get much information on business software, but already standard packages such as Wordstar, Dbase II and Multiplan are available Obviously, to use most of the serious software (including those I've not mentioned), you need the optional 80-column board With the Xtal DOS, I would expect that many more titles will become available on the Einstein three-inch format as the machine's popularity grows



There is in fact a user magazine for the Einstein I have read the first two issues and was very impressed by the genial quality of the articles Admittedly, because the Einstein hasn't taken off yet, there weren't many program listings, but on the whole, they were very interesting

Unfortunately, the well established micro magazines don't [illegible] much attention [illegible] the Einstein

Verdict

You couldn't possibly describe this machine as exciting For a start, it is controlled by a standard Z80A processor rather than by one of the 6800 series (like the QL) The graphics capability is good, but not exceptional. I thought that an 80-column text screen should have been included as standard since both the BBC and the QL (and even the much cheaper Amstrad) supports this When it comes to games type graphics, it is far better than say the BBC or the Spectrum By using the 32 hardware sprites cleverly some exceptional high speed animation is possible

The built in disc drive was a delight the speed of access was infinitely better than those on the QL, C64 and Atari disc systems and was comparable with the very fast BBC system. The disc operating system was rather nice too. As I said earlier, it is very similar to CP/M and far faster than the BBC disc operating system. However, you must remember that there is no cassette system so you can't get any cheap software (blank discs cost £5) Even games software is priced [illegible] above the [illegible] (a typical game is around £15), and you certainly couldn't get hold of any budget software at £2, This may deter most younger computer users, and I don't think leaving out the cassette system was a wise decision

At £500, the Einstein is at the top of the home micro market and at the bottom of the business micro market However, as a business micro, it should have come with an 80-column board built in and a numeric keypad Also, at the moment, there is very little software available on the three-inch format

As a home micro, it may be too expensive Well, it certainly begins to look weak when compared with a comparable system based on the Amstrad For little over £400, you could get an Amstrad with built in tape system, a monochrome monitor, an 80-column screen, a three-inch drive and a full CP/M operating system

However, in the end, what matters most for home users are factors such as large software base and magazine coverage Unfortunately, large software base usually develops as a result of a large user base and that depends on a large software base! But seriously, the Einstein has been in existence for more than six months and the software base isn't extensive and magazines have hardly covered the machine at all

If Tatung doesn't employ a far more aggressive marketing strategy, the Einstein may go the way of other technically sound machines such as the Oric, Lynx, Dragon etc This is a shame since it is a great machine and I certainly wouldn't mind one myself.

Technical data

Memory 64K RAM
Separate 16K RAM for display
8K ROM
DOS, Tatung/Xtal DOS

Display

Resolution: 256 x 192
32 sprite planes
40 x 24 or 32 x 24 text display
16 colours

Interfaces

RS232C port
RGB, UHF, YUV
Eight-bit bidirectional user port
Four-bit high speed analogue to digital converter

External Interfaces

Tatung pipe — A buffered Z80 bus with clock and control signals
Parallel printer port

Principal semiconductors

CPU Z80A (4 MHz)
Display TMS9129
Sound generator AY-3-8910
Disc controller WD1770

PRINTER REVIEWS

Star SG10 — Complete character set

Shingo Sugiura assesses three dot-matrix printers. Read on for the final analysis

One of the first computer peripherals micro users consider buying is a printer. Whether you are interested in running serious business software or you are hooked on programming, a

BUYING A BASIC PRINTER WAS A
THOUGHT HARGREAVES IN ONE OF HIS

printer is a very useful piece of equipment However, there is such a wide variety of printers available spanning across a very wide price range, it's difficult to make a choice In this article, I have looked at three monochrome dot-matrix printers the Smith Corona Fastext 80, Star SG10 and the Star SG15

Smith-Corona

Priced at a mere £170 (excluding VAT), the Fastext 80 is definitely in the lower price bracket of the printer market When I opened the box, I was surprised to find that a tractor feed is optional This is a shame since fanfold papers are very cheap and common Of course, fanfold paper may be used with the friction feed mechanism but it has a tendency to clog up the paper feeding mechanism and to creep slowly to one side

Setting up the printer was relatively easy It is just a matter of connecting a standard 13-amp plug (not supplied), connecting the printer to the computer via a suitable lead and slotting a small ink cartridge in the printer Actually fitting the cartridge was easy (unlike many other printers) but I felt it was rather miniscule and could quickly dry up

The characters are in the form of a 9 x 8 matrix and available in three forms: normal, elite and condensed These characters may be enlarged and/or underlined for emphasis but it did not support double strike or emphasised modes which are found on all but the cheapest of printers The characters were defined fairly well with true descenders although because only the bottom of the matrix is used for descenders, characters such as "j" looked distinctly short

However, in some places, the text tended to look slightly "uneven" or even stripy (this was with a brand new ink ribbon) Printing speed is claimed to be 80 characters per second but in practice, it turned out to be closer to 60 However, exaggerating the printing speed is a common policy among printer manufacturers and 60 instead of 80 cps is a reasonable claim It was also relatively quiet which was a pleasant surprise

There are two graphics modes: 480 and 576 dots per line Unfortunately, this is where I must complain about the quality of the manual which comes with this printer It is 15 pages long, lacks technical information and is generally incomprehensible A printer which is clearly aimed at the hobbyists market should really come with a far better manual

The printer itself is constructed from white plastic which makes it look rather cheap but it is certainly not ugly However, this does not mean that it is well designed On the front, there is only one button which performs on- and off line Since this button is of the push to-make type and there is no indicator light, it isn't immediately obvious whether the printer is on- or off-line

Also, for a printer which comes with friction feed as standard, I was rather irritated to find that there was no convenient way to tear the paper cleanly It would have been nice to have buttons for form feed and line feed but one nice thing about the design was the position of the DIP switch At last, someone has realised that a DIP switch should actually be accessible without having to tear the printer apart Smith-Corona has the DIP switch conveniently located at the back Very sensible

Although I have made many criticisms about this printer, it must be remembered that it's very cheap Perhaps the biggest disappointment was the lack of compatibility with the Epson range which means that much of the published software will not work Also, the manual could be vastly improved However, for those of you on a tight budget who simply need a

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Star SG10/15

The SG10 and SG15 are in fact very similar, the only difference being paper width and printer buffer capacity The SG10 is an 80-column printer with a 2K printer buffer and the SG15 is a 136-column with a massive 16K printer buffer Apart from these points, they are almost identical and the manual for both printers are the same

Unlike the Smith-Corona, these printers came with tractor feed as standard However, unlike the Corona, fitting the ink ribbon was fiddly and messy and the plug wasn't supplied To begin with, a few comments about the general design of these printers

The tractor feed mechanism is placed so high that nearly half of the first sheet of paper is wasted This may not sound too bad, since the cost of one sheet of paper is minimal, however, it is irritating to waste half a sheet each time you start to print, especially if you simply want to print a short letter Secondly, there is no easy way to hinge the cover You either have it on or leave it off

On the plus side, it is built to a high quality and seemed solid The buttons to control form feed, line feed and on-/off-line control are placed in a convenient position and there is a light to indicate whether the printer is on- or off-line

When it comes to quality of print and variety of typefaces, the SG10 is unique within its price range The standard character set consists of a 9 x 11 dot matrix which gives a very respectable print quality Printing is in normal, elite, condensed, enlarged, italic and NLQ modes The first four modes are available in most of the other printers, but what really impressed me about the SG range is the last option The NLQ (Near Letter Quality) mode as you would expect, allows you to print characters which come close to those produced by daisy wheel printers Since these characters consist of a 17 x 11 matrix, the quality is nothing short of superb Of course, there are facilities to emphasise, double-strike and underline text Also super- and subscripts are supported

There are many other features which are only supported by more expensive printers For a start, I don't think a 2K printer buffer is supported by any other printer under £300 The SG15 has a 16K printer buffer This means that large amounts of text may be dumped to the printer's buffer and you may continue with something constructive rather than wait for the printer to print all the text

The quality of manual was unusually high In fact, I would even be tempted to describe it as very well written and informative In 236 pages, it manages to describe virtually everything you want to know

In this short article, there is no way I could describe every single facility of these printers Some facilities worth a mention are user defined characters, 120 cps printing speed, ultra high resolution bit image printing, vertical and horizontal tabs and macro instructions Personally, I think these two printers are unbeatable For the price, the print quality is superb and the sheer number of extras definitely puts these printers in a class of their own

Highly recommended for those who want a printer to do more than just print listings of programs

Smith-Corona Fastest 80 (£170 + VAT) SCM Data Products, Unit 23, Northfield Ind Est, Beresford Ave, Wembley, Middx HA0 1XP

Star SG10/15 (£259/£380) Star Micronics, Craven Hse, 40 Uxbridge Rd, Ealing, London W5

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EDWORD

EDucational WORD processor system

John Henderson gives an in-depth analysis of Edword word processing package

In any word processing package ease of use must come high on the list of priorities This means not only a clear screen display, but also commands which are simple to remember

Edword lists these attributes amongst its aims In the words of Clwyd Technics it's "a package adapted to the pupils rather than pupils adapting to the package" Edword has been especially designed for use in schools, although recently a version has become available for the home market Extensive school trials produced a well thought out system which is designed for use in schools, although recently a version has become available for the home market Extensive school trials produced a well thought-out system which is designed to introduce children and adults to the world of the word peocessor

The program is supplied on a 16K ROM chip, and will only oparate on machines with operating system OS 1 2 or later The package consists of the ROM chip, self-teaching booklet, reference guide and a function strip insert Documenta-tion is in the form of a "word for word" guide which is simple to understand, but takes a long time to read The user reference guide summarises the commands for more expert users

Edword is entered using the commands *EDWORD 40 OR *EDWORD 80 With 40-character printing, a maximum of nine pages per document can be stored, whereas with 80 character printing five pages is the limit

Common functions within the program are accessed through a single key press As with most useful BBC packages, the function keys play a full part in restricting the amount of typing by storing various commands

These keys have been grouped into three categories' Yellow keys (f0 to f3) for objects — word, line, paragraph and page 2 Green keys (f5 to f9) for operations — justify, underscore, print and command 3 Blue key (f4) for error help Any error sounds an audible beep, pressing f4 details the error to the user

On entry to Edword a menu is presented giving five options **CREATE** a new document allows children to start writing **REVISE** an old document allows the user to load in a file which has already been created for the purpose of editing If the file name does not exist an error message will be given **VIEW** allows the user to examine an existing document but not to make any alterations **INDEX** catalogues documents, while the **FORMAT** system allows users to enter the mode which changes parameters within the program This is a particularly user-friendly option, which allows the document parameters to be displayed at all times, either from the main menu or by pressing red key f9 when editing Entries can easily be changed, and the confusion of using embedded commands is overcome

Tab and margin settings can be seen immediately, but line spacing requires a printout before the results become obvious Up to six different tab settings can be made. Setting of page length, top margin, bottom margin and line spacing is also possible

Use of any command is made simpler because single-letter abbreviations are available e g **C** centres text, **M** moves a block of text and **P** splits a paragraph etc

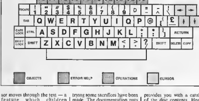
The screen is divided into three sections The document window displays the current document on the central screen, at the top of the screen is the system area which displays information about the document At the base of the screen is the command area, which is an error reporting screen

System commands give details such as the document name, position of the cursor, current page and the current mode, and indicating **PR** if printing, **OU** if overtyping or **US** when underscoring

Control of the cursor positions is by use of the arrow keys — allowing scrolling of the document — and with other commands, instant line positioning or homing of the cursor Delete operates as usual, but key f7 is used during editing The copy key allows the last operation to be repeated

As with many WP packages, automatic line-wrap takes care of longer words to improve display, and pressing Return produces a paragraph You can print all the document or parts of it Pressing key f8 results in a message "is your printer ready (Y/N)" — what could be simpler?

Edword is prepared for the Epson MX series of printers, but a printer file generator is included for other models. As the document is printed the cur-



sor moves through the text — a feature which children appreciate. Pressing Escape interrupts the printing at any time.

Two special print styles, wide or bold print, can be selected by use of invisible embedded characters.

All in all this seems a user-friendly package. However, in trying some sacrifices have been made. The documentation puts off many users. Double height text on the menu pales into insignificance when working with 80-character text, even when sections of text are highlighted through the "inverse video" facility.

The Index mode is usable only with discs and this provides you with a catalogue of the disc contents. However there are no facilities for using other disc commands, and it isn't possible to load text to a cursor position with tape-only facilities.

Pressing the Break key has an interesting effect — the whole document is lost — a difficulty which a WP package designed to be used by children should have foreseen. A Break key disabler is available for £5, but this should really be part of the package, not an add-on.

Children find this package easy to use, perhaps easier than adults, but there are other WP packages available more cheaply. The new version, Edword+ improves some of the WP functions, but isn't due for release until September. No price as yet. In the meantime, a disc enhancement facility is available for £15.

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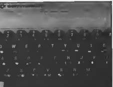
WELCOME TO BASIC

This week Brian Jones shows you how to use jump instructions, and leaves you with some problems to work out on your own



Hello again, and welcome to the fourth part of this introduction to programming in BASIC, primarily on the Commodore 64. Each week I've left you with a few problems to attempt on your own. Here's the solution to last week's puzzles

1 The program to calculate the amount of fertilizer at 50 grams per square metre, given the length and breadth of the lawn could be written as follows -

```
10 PRINT"FERTILISER CALCULATION"
20 INPUT"LENGTH OF LAWN IN METRES";L
30 INPUT"BREADTH OF LAWN IN METRES";B
40 LET A=L*B
50 LET W=50*A
60 PRINT"WEIGHT REQUIRED =";W;"GRAMS"
```

A more compact version would be to replace lines 40-60 by

```
40 PRINT"WEIGHT REQUIRED =";L*B*50;"GRAMS"
```

However, I'd advise you to concentrate on getting the correct formulae and logic and let compactness come later. If you have to use a few extra lines, that will be no great disaster. After all, a compact program which gives wrong answers is useless

2 The second program I asked you to try was to allow the rate per square metre to be INPUT, using the Commodore programmed cursor to provide 50 as the default option, i.e. the value to be used unless told otherwise. The solutions to take the above program and add:

```
35 INPUT"RATE PER SQ METRE  50████";R
```

and substitute R for the 50 on line 50 — or 35 in the compact version.

Now, to do the substitution you could re-enter the line, but last week we introduced Commodore's powerful screen editor which makes such tasks much easier. This means we use a line appearing on the screen and alter it, using the INST/DEL insert/delete key and overtyping to produce the new version. Then press the Return key, so that the new version replaces the original one in the computer's program memory. Try it, and if the program is not already on the screen, LIST it

Now on to "jump" instructions. This opens up vast possibilities, in particular programming alternatives and loops. The most useful jump is the "conditional jump", which looks something like this

IF X<0 THEN 100

This is interpreted as "if the variable called X has value less than zero then go to line 100 and carry on from there". In general it is

IF condition THEN line number

Try adding this to the fertiliser program

```
70 PRINT"ANY MORE DATA"
80 INPUT"Y OR N";A$
90 IF A$="Y" THEN 10
100 IF A$<>"N" THEN 80
```

A$ is the string variable to which you give a value in response to line 80. If it has value Y the program goes back to the start. If it isn't Y, it should be N and line 100 makes sure that it is, otherwise it asks again. Notice that <> means "not equal to". Notice also the double quotes around the Y. This is to distinguish "Y" the character from Y a variable. RUN this new version and see the effect.

Now supposing your lawn isn't rectangular but made up of a number of more or less rectangular bits. We could arrange to use this new version of the fertilizer program to keep a running total by adding two more lines.

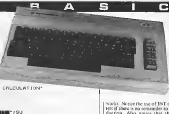
```
55 LET T=T+W
65 PRINT"TOTAL
   REQUIRED IS",T
```

The effect of 55 is to accumulate the values of W as they are calculated with an add-to memory button — usually marked M+ — then you will be able to see the similarity. By the way, Acorn/BBC users will need to add another line

```
5 LET T=0
```

The reason why Commodore users don't need this is because their micros set all values to zero automatically when the command RUN is entered

Here's another program along the same lines. Instead of asking if there's any more data, it assumes there is until the data given equals zero. When I make a phone call and I need to reclaim it, I write the details on a card by the phone. When the card is full, I use this very



program to calculate how much to claim

```
10 REM TELEPHONE BILL
20 REM BSJ FOR C64 DEC 83
30 READ UP:REM UNIT PRICE
100 PRINT"J       TELEPHONE BILL CALCULATION"
110 INPUT"█MINUTES";M
120 INPUT"SECONDS";S
130 IF M=0 AND S=0 THEN 200
140 INPUT"SECONDS PER UNIT  46████";SU
150 NU=INT((M*60+S)/SU)+1
160 CU=CU+NU
170 PRINT"UNITS";NU,"CUM UNITS";CU
180 GOTO 110
200 PRINT"█TOTAL UNITS USED =";CU
210 PR=CU*UP
220 PRINT"COST OF UNITS = £";PR/100:PRINT"VAT =";PR*.15/100
230 TV=INT(PR*1.15+.5)/100
240 PRINT"TOTAL COST + VAT = £";TV
500 DATA 4.7
```

The REM means remark, and allows me to put reminders in the program The GOTO on line 180 is an unconditional jump Look carefully at the use of INT at line 230 The + 5 rounds the number of pence to the nearest whole number, while the /100 converts from pence to pounds

Notice also the compound condition at line 130 You can use two combining words, AND and OR, but they can combine as many conditions as you like But beware, like add and multiply, there is an order of precedence Just as 2+3*4 is calculated as 2+(3*4), so A=0 OR B=0 AND C=0 is interpreted as A=0 OR (B=0 AND C=0) You can use brackets in a compound condition and it's often advisable, to make sure that it does what you intend

Notice the READ and DATA statements This, like LET and INPUT, is a method of allocating a value to a variable It's used here because it would be a nuisance to INPUT it each RUN since it is the same for a long while I could use LET UP=4 7, but READ is the generally agreed method

Finally, notice the use of the comma rather than a semicolon in line 170 This moves the print position to the start of a new "print zone" The print zones start at columns 1, 11, 21 and 31, rather like a fixed tab Try experimenting by replacing , by ; in other PRINT statements

Now, our conditional jump in most versions of BASIC allows, as well as, or instead of, a jump to line number, any list of commands to be done if the condition is true Here's an example

```
10 PRINT"J   PRIME NUMBER EVALUATION"
20 INPUT"NUMBER TO BE TESTED";X
30 F=0
40 IF X/2=INT(X/2) THEN PRINT"2 IS A FACTOR":F=1
50 N=3
60 IF X/N=INT(X/N) THEN PRINT N;"IS A FACTOR":F=1
70 N=N+2
80 IF N < INT(SQR(X)) THEN 60
90 IF F=0 THEN PRINT X;"IS A PRIME NUMBER"
```

This test can be used on any positive whole number, it's not the most efficient test, since numbers over 100 000 take more than 10 seconds, but it works Notice the use of INT to test if there is no remainder to a division Also notice that the largest number you need to test is the INT of the square root of X, that's the effect of the SQR(X) function

Homework time

1 Write a program to check if a 72-inch pipe can be cut into a number of lengths X inches long, without any wastage X is the value you decide when the program is RUN in response to an INPUT request

2 Write a program to accept as input a series of positive numbers and find the largest one To indicate the end of the series a negative number should be input as the signal to give the answer

BOOKS

My Spectrum and Me

Since children under 10 are now gaming exposure to microcomputers at school, the age of the average programmer is sure to drop. Normal teach yourself programming books are too complicated for such young students, so it's good to see a book dedicating itself to primary school children and to the current favourite home computer, the Spectrum.

Assuming that mum or dad has set up the Spectrum, the book's 84 pages take the youngster through elementary computer programming, starting with PRINT, then arithmetic, variables, colours, strings, and the like. The text is easy to follow, without talking down to the reader, and there are many amusing cartoon illustrations and short example programs.

One good example of the book's style is when it explains the word "concatenation". This is what it says — "Concatenation is a very, very big word. It's a bit of a mouthful, but its meaning is very simple. It just means putting characters side-by-side. So if you put DON next to KEY, you'll get DONKEY." It then goes on to put this concept into computer terms, already covered in the book. It couldn't be simpler, or more clearly explained.

The true test of such a book is not what an adult thinks but the reaction of children. My two testers, aged seven and nine just couldn't put the book down. It made a very pleasant change for them to be learning something about the Spectrum, rather than just playing games. At half the price of most games, that must make it excellent value for money.

Price: £2.95

Publisher: Duckworth

Author: Meyer Solomon

Address: The Old Piano Factory, 43 Gloucester Factory, London NW1

SPECTRUM

Amstrad Concise BASIC Specification

It is an unfortunate fact of life that whilst computer manufacturers may produce some excellent hardware the accompanying manuals are often a failure. The Amstrad CPC464 user instructions may not be the worst manual I have even seen but it is far from perfect.

If I had to sum up the style of the Amstrad manual in a word it would be "cluttered". In the keywords section, there are often three or four commands crammed on to each page. Even the program listings are teeming with multi-statement lines. The manufacturer must have been aware of the drawbacks of the documentation as this manual, the Concise BASIC Specification, has been published by Amstead.

The Concise BASIC Specification contains none of the chapters on programming than can be found in the user instructions. What it does is present all other information, present in the user instructions, in a very clear manner. Each keyword is presented on its own page with a fractionally more detailed description accompanying it — but only fractionally!

The manual consists of a black plastic ringbinder complete with its own library case, and is very impressive looking. However careful examination of the contents reveals that 95 per cent of the material can be found in the original manual.

The only advantage of the book is the speed with which one can locate information. To charge £20 is daylight robbery. It may be excellent, but it should have been provided as standard with the machine. **J.R**

Price: £19.95

Publisher: Amstrad

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

AMSTRAD

Commodore 64 Omnibus

This volume is a combination of two earlier books. As such, it provides information for both the beginner and the more advanced user. No effort has been made to integrate the two component works, one is simply tagged straight onto the other. This means that the sequence of chapters isn't always logical and some page/figure references haven't been changed to allow for the new format. These points are fairly small and don't really mess things up too much.

In effect, this book fills the huge number of holes left by the official Commodore manuals. For beginners, detailed information is provided on BASIC programming, hi-res graphics, redefining characters, sprites, sound and permanent storage. The text is easy to follow and enhanced with example routines. Sound and redefined character sections are particularly well supported with routines for designing characters and a simple synthesiser program.

The advanced section moves on to machine code and it's use in graphics. The use of the 1541 disk drive is discussed in some depth and is given a better treatment than the booklet which comes with the disc. A number of useful machine code routines are provided for the manipulation of hi-resolution graphics and raster interrupts. Whilst BASIC loaders are provided for some routines, I would have liked to have seen an assembler to enable the easy entry of source code.

Overall this is an extremely useful compilation which is both informative and readable. At the price it represents good value with some 500 pages.

A.W

Price: £9.95

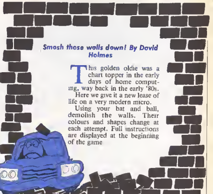
Publisher: Century

Address: Portland Hse, 12-13 Greek St, London W1V 5LE

C64

AMSTRAD CPC464 GAME

GOLDEN OLDIE



Smosh those walls down! By David Holmes

This golden oldie was a chart topper in the early days of home computing, way back in the early '80s.

Here we give it a new lease of life on a very modern micro.

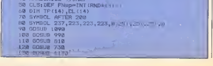
Using your bat and ball, demolish the walls. Their colours and shapes change at each attempt. Full instructions are displayed at the beginning of the game

Variables

P(14)	music notes
CL(14)	colour values
CT(16,38)	playing area
X,Y	co-ordinates of ball
X2,Y2	current ball position
XT,YT	previous ball position
TARGET	value of complete wall
A$	reads which key pressed
B	ASC of A$
BAT	row co-ordinate of bat
Y3	new bat position
FR	previous bat position
Q,L	working loop counters
CL1,CL2,CLR	colour control
TS	title string
Q1,Q2,Q3,Q4	control position and shape of walls
VE	volume envelope selector
TQ	reads data into sound

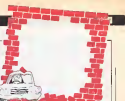
How it works

10-140	initialise arrays, variables colours and shapes
150-250	check for contact, update score and change direction of ball
260-250	if last brick then build new wall
340-380	has ball hit side or end walls?
390-450	move bat
460	back to main line
470-520	did ball hit bat?
530-560	supply new ball and return to main line
570-660	end game routine Update hi-score feature
670-710	move bat
720-750	set up windows, keyboard and sound
800-970	opening sequence and display instructions
980-1070	evaluate working variables
1080-1110	fill music note array
1120-1150	fill colour array
116-1220	display screen heading Zero screen array
1230-1470	build walls in chosen colour
1480-1540	set up screen display
1550-1580	clear main window for new game
1590-1610	read keyboard inputs
1620-1640	breakpoint re-sets keyboard
1650-1770	introductory tune
1780-1800	tone periods and duration data
1810-1880	game over sound loop



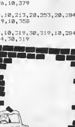
```
10 REM SMASHOUT on AMSTRAD
20 REM David Holmes 1984
30 ON BREAK GOSUB 1620
40 RANDOMIZE (TIME)
50 CLS:DEF FNsp=INT(RND*[illegible]
60 DIM TP(14),CL(14)
70 SYMBOL AFTER 200
80 SYMBOL 237,223,223,223,0,251,251,251,0
90 GOSUB 1090
100 GOSUB 990
110 GOSUB 810
120 GOSUB 730
130 GOSUB 1170
```

```
140 [illegible]B [illegible]40
150 GOSUB 680
160 REM MAIN LINE
170 IF ct(y,x)<1 THEN 230
180 SOUND 7,tp(FNsp),16,12,1
190 LOCATE x,y:PRINT CHR$(32)
200 ct(y,x)=0
210 x2=-x2:score=score+10
220 PEN 3:PAPER 2:LOCATE 7,25:PRINT sc[illegible]
230 FEN 2:PAPER 0:LOCATE xt,yt:PRINT CH[illegible]
240 LOCATE x,y:PRINT CHR$(231)
250 ct(yt,xt)=0
260 IF score<1 OR INT(score/target)<>score/target THEN 340
270 LOCATE x,y:PRINT CHR$(32)
280 PRINT #1," Press the COPY key for the next wall."
290 GOSUB 1660
300 GOSUB 1600
310 PRINT #1,CHR$(7):GOSUB 1560
320 target=target+780:GOSUB 1000
330 GOTO 130
340 yt=y:y=y+y2
350 IF y>15 OR y<5 THEN SOUND 7,1136,16,10,1: y2=-y2
360 xt=x:x=x+x2
370 IF x>37 THEN SOUND 7,956,16,10,1: x2=-x2
380 IF x<4 THEN x2=-x2:GOTO 470
390 REM MOVE THE BAT
400 a$=INKEY$
410 IF a$="" THEN 170 ELSE b=ASC(a$)
420 IF(b=241 OR b=10) AND bat<13 THEN bat=bat+1:er=bat:GOTO 450
430 IF(b=240 OR b=11) AND bat>3 THEN bat=bat-1:er=bat+4:GOTO 450
440 GOTO 170
450 GOSUB 680
460 GOTO 170
470 IF(bat+1=y)OR(bat+2=y)OR(bat+3=y) THEN SOUND 7,956,16,10,1:GOTO 3[illegible]
480 PAPER 0:LOCATE xt,yt:PRINT CHR$(32)
490 y3=y3+1:IF y3>15 THEN y3=4
500 y=y3:balls=balls-1
510 IF balls<0 THEN 570
520 GOSUB 1520
530 PRINT #1," Press the COPY key for the next ball.'
540 GOSUB 1600
550 PRINT #1,CHR$(7)
560 GOTO 170
570 PRINT #1," ## GAME OVER ##':TARGET=780
580 GOSUB 1820
590 IF SCORE>HSCORE THEN HSCORE=SCORE
600 SCORE=0:GOSUB 1200:GOSUB 1000
610 PRINT #1," Press the COPY key for another game."
620 GOSUB 1660
630 GOSUB 1600
640 PRINT #1,CHR$(7)
650 GOSUB 1560
660 GOTO 140
670 REM BAT
680 PEN 2:FAPER 0:LOCATE 2,er:PRINT CHR$(32)
690 FOR q=1 TO 3:LOCATE 2,bat+q
700 PRINT CHR$(138):NEXT
710 RETURN
720 REM STARTER
730 MODE 1
740 DIM 13(6):DIM ct(16,38)
750 DEFINT a,z
760 WINDOW #1,1,40,21,21
```



```
770 ENV 1,4,-2,2
780 SPEED KEY 2,2
790 RETURN
800 REM INSTRUCTIONS
810 FOR q=25 TO 1 STEP -1
820 LOCATE 1,0
830 clr=cl(FNsp):INK 1,clr
840 PEN 1:PRINT STRING$(40,CHR$(237));
850 NEXT
860 INK 1,6
870 LOCATE 12,4:PEN 2
880 PRINT "SMASHOUT on AMSTRAD"
890 LOCATE 2,7:PRINT"Use the cursor keys or the joystick to"
900 LOCATE 2,9:PRINT"control the bat."
910 LOCATE 2,11:PRINT"Keep on knocking the walls down to get"
920 LOCATE 2,13:PRINT"the highest score."
930 LOCATE 2,15:PRINT"Press the COPY KEY to start."
940 LOCATE 11,24:PRINT CHR$(164);" David Holmes 1984"
950 GOSUB 1660
960 GOSUB 1600
970 RETURN
980 REM VARIABLES
990 target=780:hscore=0:score=0
1000 y=4:xt=x:y3=4:y=y3:yt=y:y2=1:x2=y2:
1010 bat=0:er=14
1020 balls=9-INT(score/780)
1030 IF balls<5 THEN balls=5
1040 PAPER #0,0
1050 INK 0,0:INK 2,26:BORDER 15
1060 PEN # 1,3:PAPER #1,0
1070 RETURN
1080 REM MUSIC
1090 RESTORE 1110
1100 FOR q=1 TO 14:READ tp(q):NEXT
1110 DATA 119,106,95,89,80,71,63,239,213,190,179,159,142,127
1120 REM COLOURS
1130 FOR q=1 TO 14:READ cl(q):NEXT
1140 DATA 2,6,6,11,0,8,14,15,15,16,18,18,21,24
1150 RETURN
1160 REM SCREEN
1170 t$="SMASHOUT on AMSTRAD"
1180 PEN  3:PAPER 2
1190 LOCATE 11,1:PRINT t$:RETURN
1200 FOR q=1 TO 30:FOR q2=1 TO 16
1210 ct(q2,q)=0:NEXT:NEXT
1220 RETURN
1230 REM BUILD THE WALLS
1240 PEN 3:PAPER 2
1250 FOR l=2 TO 39:LOCATE l,3:PRINT CHR$(237)
1260 LOCATE l,17:PRINT CHR$(237):NEXT
1270 FOR l=4 TO 16:LOCATE 39,l
1280 PRINT CHR$(237):NEXT
1290 cl1=cl(FNsp):IF cl1=cl2 THEN 1290
1300 cl2=cl1
1310 INK 1,cl1:PAPER 2
1320 PEN 1
1330 ON INT(RND*2)+1 GOTO 1340,1410
1340 FOR q=1 TO 6
1350 q1=INT(RND*19)+17
1360 IF(q1=q3(1))OR(q1=q3(2))OR(q1=q3(3))OR(q1=q3(4))OR(q1=q3(5)) THEN 1350
1370 FOR q2=4 TO 16
1380 LOCATE q1,q2:PRINT CHR$(237):ct(q2,q1)=1:NEXT q2
1390 q3(q)=q1:NEXT q
```

```
1400 GOTO 1490
1410 q4=INT(RND*6)+19
1420 FOR q=1 TO 6
1430 q2=INT(RND*13)+4
1440 IF(q2=q3(1))OR(q2=q3(2))OR(q2=q3(3))OR(q2=q3(4))OR(q2=q3(5)) THEN 1430
1450 FOR q1=q4 TO q4+12
1460 LOCATE q1,q2:PRINT CHR$(237):ct(q2,q1)=1:NEXT q1
1470 q3(q)=q2:NEXT q
1480 REM SCREEN DISPLAY
1490 PEN 3
1500 LOCATE 1,25:PRINT" SCORE";SPACE$(11);"BEST";SPACE$(11);"BALLS"
1510 LOCATE 22,25:PRINT hscore
1520 PEN 3:PAPER 2:LOCATE 7,25:PRINT score
1530  LOCATE 38,25:PRINT balls;
1540 RETURN
1550 REM CLEAR FOR NEW GAME
1560 FOR q=4 TO 16:LOCATE 2,q
1570 PRINT SPACE$(37):NEXT
1580 RETURN
1590 REM INPUT KEYS
1600 IF INKEY(76)<0 AND INKEY(9)<0 THEN 1600
1610 RETURN
1620 SPEED KEY 6,6
1630 END
1640 REM
1650 REM TUNE
1660 notes=61:volume=12
1670 ENV 1,10,-1,1:ENV 2,10,-1,2
1680 ENV 3,10,-1,3:ENV 4,10,-1,4
1690 RESTORE 1780
1700 FOR play=1 TO notes
1710 READ period,duration
1720 ve=INT(duration/10)
1730 SOUND 7,period,duration,volume,ve
1740 IF INKEY(9)>-1 OR INKEY(76)>-1 THEN 1770
1750 NEXT:SOUND 7,319,100,0
1760 GOTO 1690
1770 RETURN
1780 DATA 319,20,319,30,319,10,213,30,253,10,284,30,319,10,358,30,284,10,253
,30,379,10,379,30,358,10,379,30,426,10,426,30,426,10,379
,30,379,10,319,30,319,10
1790 DATA 284,30,253,10,213,30,213,10,190,30,190,10,213,20,253,20,284,30,319
,10,319,40,319,30,319,10,213,30,253,10,284,30,319,10,358
,40,253,30,379,10,379,30
1800 DATA 358,10,379,30,426,10,426,40,379,30,379,10,319,30,319,10,284,20,253
,20,213,30,213,10,190,30,190,10,213,20,253,20,284,30,319
,10,319,40
1810 REM END GAME
1820 RESTORE 1880
1830 FOR Q=1 TO 8
1840 READ TQ
1850 SOUND 7,TQ,5,15,1
1860 NEXT
1870 RETURN
1880 DATA 60,63,71,80,89,95,106,119
```



SPECTRUM DRAGON-SLAYER

To celebrate St George's day we've gat a special dragan program, from Andrew Bird. Kill the beastie ta save the damsel in distress

Today is St Geoge's day and we've got a topical George and the dragon program.

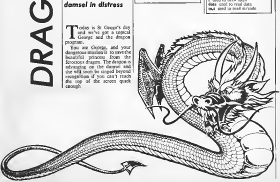
You are George, and your dangerous mission is to save the beautiful princess from the ferocious dragon. The dragon is advancing on the damsel and she will soon be singed beyond recognition if you can't reach the top of the screen quick enough

How it works

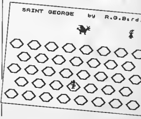
1-22	initialise
20-70	set up arrays
400-530	draw game
1000-1190	main loop
2000-2280	slay dragon routine
4000-4100	dragon advances
5000-5080	damsel burned
7000-7060	re-colour steps
8000-8160	instructions
9000-9040	graphics
9500-9520	m/code sound

Variables

t$	title
so	m/code sound
st,ge	St George co-ordinates
dr	dragon position
Dim x, Dim y	stepping stone co-ords
f,n	general purpose loops
d	calls up m/code
fi,ght	used when St George fights dragon
i	ink colour
t	used to draw steps
data	used to read data
m,s	used to read m/code

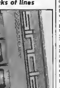


```
   1 REM  Saint George
   2 REM  By A G Bird
   3 LET t$=" SAINT GEORGE "
   4 GO SUB 9000
   5 GO SUB 8000
   6 POKE sc+7,0
   7 RANDOMIZE
  10 LET st=19: LET ge=17: LET dr=0
  22 DIM x(30): DIM y(50)
  29 REM  Set up arrays
  50 FOR f=1 TO 8: LET x(f)=8: LET y(f)=4*f-3: NEX
T f
  80 FOR f=9 TO 15: LET x(f)=11: LET y(f)=4*f-33:
NEXT f
  30 FOR f=16 TO 23: LET x(f)=14: LET y(f)=4*f-63:
 NEXT f
  60 FOR f=24 TO 30: LET x(f)=17: LET y(f)=4*f-93:
 NEXT f
  70 FOR f=31 TO 50: LET x(f)=20: LET y(f)=4*f-123
: NEXT f
 399 REM  Draw game
 400 BORDER 0: PAPER 0: CLS
 430 PRINT AT 0,0; PAPER 1; INK 6;" ";t$;"  by  A.
G Bird. "
 450 PRINT AT 3,0; INK 4; PAPER 0;"EFG";AT 4,0;"HI
J";AT 3,27; INK 7;"O";AT 4,27;"D"
 460 GO SUB 4030
 550 GO SUB 7000
 999 REM  Main loop
1000 PRINT AT st,ge; INK 6;"A";AT st+1,ge;"B"
1050 IF st=7 THEN  GO TO 2000
1050 IF INKEY$<>"" THEN  GO TO 1100
1060 GO TO 1000
1100 IF INKEY$=" " THEN  GO SUB 7000: GO SUB 4000:
 GO TO 1000
1110 IF INKEY$="a" AND ATTR (st,ge+1)=ATTR (st-1,g
e-1) THEN  PRINT AT st,ge;" ";AT st+1,ge;" ": LET
st=st-3: LET ge=ge-2: GO TO 1000
1130 IF INKEY$="d" AND ATTR (st,ge+1)=ATTR (st-1,g
e+1) THEN  PRINT AT st,ge;" ";AT st+1,ge;" ": LET
st=st-3: LET ge=ge+2: GO TO 1000
1130 IF INKEY$="z" AND ATTR (st,ge-1)=ATTR (st,ge-
3) THEN  PRINT A st,ge;" ";AT st+1,ge;" ": LET ge=
ge-4: GO TO 1000
1140 IF INKEY$="x" AND ATTR (st,ge+1)=ATTR (st,ge+
3) THEN  PRINT AT st,ge;" ";AT st+1,ge;" ": LET ge
=ge+4: GO TO 1000
1150 GO TO 1000
1999 REM  Slay Dragon
2000 PRINT AT st,ge;" ";AT st+1,ge;" "
2010 LET st=st-2
2030 PRINT AT st,ge-1; INK 6;" A ";AT st+1,ge-1;"
B "
2030 IF ge=dr+1 THEN  GO TO 2100
2040 IF dr+1>ge THEN  LET ge=ge+1
2050 IF dr+1<ge THEN  LET ge=ge-1
2030 GO TO 2030
2100 PRINT AT st,ge;" ";AT st+1,ge;" "
2110 LET st=st-2
2120 FOR f=1 TO 30
2130 LET f1=INT (RND*2): LET ght=INT (RND*3)-1
2140 FOR n=1 TO 2
2150 PRINT AT st+f1,ge+ght; OVER 1; INK 2;"A";AT s
t+f1+1,ge+ght;"B"
2160 POKE sc+10,INT (RND*100)+10: LET d=USR sc: NE
XT n
2170 NEXT f
2200 FOR f=3 TO 5: PRINT AT f,dr;"    ": NEXT f
2210 PRINT AT 3,26; INK 6;"A";AT 4,26;"B"
2220 POKE sc+7,20: FOR f=1 TO 50: POKE sc+10,110-f
*2: LET d=USR sc: NEXT f
2230 FOR f=7 TO 21: PRINT AT f,0;"
                   ": NEXT f
2240 FOR f=16 TO 30: PRINT AT f,4; PAPER 6;"
                   ": NEXT f
2245 PRINT AT 18,4; PAPER 6; INK 1;"  BY GEORGE GU
GIS IT! "
2250 LET d=USR sc: PAUSE 50
2260 FOR f=16 TO 20: PRINT AT f,4; PAPER 1;"
                   ": NEXT f
2265 PRINT AT 18,4; PAPER 1; INK 6;"      PRESS ANY
 KEY       "
2270 FOR d=1 TO 150: IF INKEY$<>"" THEN  GO TO 5
2280 NEXT d: GO TO 2240
3999 REM  Dragon
4000 PRINT AT 3,dr;"   ";AT 4,dr;"   "
4010 LET dr=dr+3
4020 PRINT AT 3,dr; INK 4;"EFG";AT 4,dr;"HIJ"
4030 FOR n=1 TO 3: FOR i=2 TO 6 STEP 4
4040 FOR f=dr+3 TO dr-8: PRINT AT 3,f; INK i;"KL";
 NEXT f
4050 POKE sc+10,9: LET d=USR sc
4060 NEXT i: NEXT n
4070 PRINT AT 3,dr+3;"   "
4500 IF dr=18 THEN  GO TO 5000
4100 RETURN
4999 REM  Damsel Burned
5000 PRINT AT 3,27; INK 1;"O";AT 4,27;"D"
5010 POKE sc+7,30: FOR f=1 TO 50: POKE sc+10,f*2:
LET d=USR sc: NEXT f
5020 FOR f=1 TO 200: PRINT AT INT (RND*21),INT (RN
D*30); PAPER 2;"  ": NEXT f
5030 BORDER 2: PAPER 2: CLS
5040 FOR f=8 TO 11: PRINT AT f,9; PAPER 6;"
   ": NEXT f
5050 PRINT AT 9,11; PAPER 6; INK 0;"THE DRAGON";AT
 10,12;"HAS WON !"
5060 PRINT AT 21,2; INK 7; OVER 1;"PRESS ANY KEY F
OR ANOTHER GO": LET d=USR sc
5070 IF INKEY$<>"" THEN  GO TO 1
5080 GO TO 5060
6999 REM  Color steps
7000 FOR f=1 TO 50
7010 LET i=INT (RND*7)+1
7020 INK i: FOR t=0 TO 1
7030 PLOT t+8*y(f)-8,171-8*x(f): DRAW 8,0: DRAW 8,
8: DRAW 0,-8: -8,-8: DRAW -8,0: DRAW -8,0
7040 PRINT AT st,ge; INK 6;"A";AT st+1,ge;"B"
7050 NEXT t: POKE sc+10,5+f: LET d=USR sc: NEXT f
7060 BEEP .1,40: BEEP .01,50: RETURN
7999 REM  Instructions
8000 BORDER 1: PAPER 7: CLS
8010 FOR f=0 TO 21: PRINT AT f,13; PAPER 2;"
": NEXT f
8020 FOR f=0 TO 13: PRINT AT f,0; PAPER 2;"
                               ": NEXT f
8030 FOR f=1 TO 100: POKE sc+10,120-f: LET d=USR s
c: NEXT f
8050 BORDER 1: PAPER 1: INK 7: CLS
8060 FOR f=1 TO 50: PRINT AT 0,9; INK INT (RND*5+3
); INVERSE 1;t$: NEXT f
8070 PRINT  "Help Saint George to reach the"  "d
amsel in distress by guiding"  "him nto the adjoin
ing stepping"
8080 PRINT  "stones of the same colour.If you"  "f
ind that there aren t any, then"  "press Break Spa
ce & they change"
8090 PRINT  "However BEWARE, for every time"  "you
 do this the Dragon advances "
8100 PRINT AT 21,5;"Press any key to start.": PAUS
E 0: BEEP .01,30
8110 CLS : PRINT AT 2,12;"CONTROLS";AT 6,11; INVER
SE 1;"A";AT 6,20;"D";AT 10,10;"Z";AT 10,21;"X"
8120 PLOT 108,92: DRAW -16,0: DRAW 4,4: DRAW 0,-8:
 DRAW -4,4
8130 PLOT 148,92: DRAW 16,0: DRAW -4,4: DRAW 0,-8:
 DRAW 4,4
8140 PLOT 110,106: DRAW -11,11: DRAW 0,-6: DRAW 6,
6: DRAW -6,0
8150 PLOT 145,108: DRAW 11,11: DRAW 0,-6: DRAW -6,
6: DRAW 6,0
8160 PRINT AT 21,5;"Press any key to start.": PAUS
E 0: RETURN
8999 REM  Graphics
9000 RESTORE 9010: FOR g=USR "a" TO USR  "l"+7: REA
D data: POKE g,data: NEXT g
9010 DATA 0,30,190,162,190,190,136,136,62,157,29,2
9,30,28,30,54,15,62,76,72,40,146,124,56,56,56,124,
124,280,255,40,40
9020 DATA 63,7,3,3,7,227,193,176,192,224,240,248,2
52,254,254,285,44,36,24,63,46,128,252,231
9030 DATA 31,15,7,3,3,3,3,3,255,256,253,253,255,3,
3,131,192,130,128,128,128,0,0,130
9040 DATA 0,0,0,15,255,255,255,60,0,0,0,28,240,236
,240,56
9499 REM  M/c sound
9500 LET sc=50000
9510 RESTORE 9530: FOR a=0 TO 38: READ a: POKE sc+
a,a: NEXT a: RETURN
9530 DATA 58,72,92,31,31,31,6,18,14,250,37,32,6,23
0,16,237,121,38,3,45,32,244,230,16,237,121,46,250,
14,236,201
9999 SAVE "St George" LINE 1
```



BLOCK DELETE

This utility, written by H Shaw, enables you to delete blocks of lines



Many computers have a command to allow deletion of a block of lines from a BASIC program which can be a useful aid when writing a program. With the standard Spectrum this is not possible and it is necessary to delete each line individually

The machine code routine printed here remedies this The routine is only 200 bytes long and is extensively error trapped to eliminate the possibility of crashing the computer No knowledge of machine code is required to enter the program or to use it. Just follow the step by step instructions

How to enter routine

1. Type in the BASIC program in listing 1

2. Save a copy of the program on tape before running This is a wise precaution in case you have made some error which will cause the computer to crash — this way you can re-load the program rather than re-type it in

3. Run the BASIC program The BASIC loader contains a sumcheck routine and if you have made an error in entering any of the DATA statements the program will stop and indicate which line contains the error If this happens correct the DATA and re-run the program

When the correct DATA has been POKEd, the program will indicate this and instruct you to place a blank cassette in your recorder and save the code

Line 310 takes care of saving the actual machine code

The BASIC program finally gives brief instructions on the command syntax for calling the delete utility

4. The BASIC program is no longer required but a copy should be saved in the normal way as a back-up since it can be run at any time to regenerate the machine code for the utility

How to use block delete

1. Switch on the Spectrum and enter as a direct command CLEAR 64984 This ensures that after loading the block delete program stored above this address will not be corrupted by your BASIC program

2. Load the saved machine code using Load ""CODE

3. The block delete utility is now present in high memory to be used as required and will remain there until you switch off the power You can NEW a BASIC without losing the utility

4 Now load your own BASIC program from tape in the usual way or type in a BASIC program

5. To use the block delete utility use the command

RANDOMIZE USR 65000 :
REM 120, 240

where the numbers after the REM are the first and last line numbers in the block of lines to be deleted

6 The correct syntax for the command is necessary for a successful deletion However the routine is extensively error trapped and the worst that should befall you is that receive an error message

7. The Spectrum ROM error handling routine is used and the possible error messages are

Invalid Arguement if you call the Delete routine when no BASIC program is present

Number too big if either of the line numbers after the REM are more than four digits long (max Spectrum line number is 9999)

Parameter error if the comma separating the line numbers is omitted

OR if the second line number is

Listing 1 — BASIC

```
  50 BORDER 1: PAPER 5: INK 1: CLS
 100 REM BASIC COMPILER FOR BLOCK DELETE M/C
 110 PRINT AT 8,1; FLASH 1;"COMPILING CODE - PLEAS
E WAIT."
 120 LET X=64985
 140 FOR J=1 TO 25
 150 LET T=0
 160 FOR K=1 TO 8
 180 READ A: LET T=T+A
 200 POKE X,A
 210 LET X=X+1
 220 NEXT K
 230 READ CHECK
 240 IF T<>CHECK THEN  CLS : PRINT AT 8,4;"DATA ER
ROR IN LINE ";990+10*J: STOP
 260 NEXT J
 270 CLS
 280 PRINT "CORRECT DATA POKED."
```

lower than the first

OR if the line numbers contain characters which are not digits

8. Following an error re-enter the command correctly.

How it works

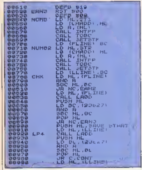
- **10-140** define system pointers
- **160-230** set aside 15 store addresses and initially load these with #FF
- **260** reads system variable CH ADD — the next character to be interpreted
- **270-420** check that the first line number parameter is valid
- **430-570** check second line number parameter
- **580-630** contain error message routines
- **640-700** system variable is loaded with store address ST1
- **710-770** repeat routine described in lines 640-700
- **780-810** check the second line number is greater than the first and, if it is not, returns to BASIC via the error 'Parameter error'
- **820-900** the address in the program area of the first line to be deleted is found using the ROM subroutine LADD which returns the start address of a given line number
- **910-1020** the address in the program area of the last line to be deleted is found using the ROM subroutine LADD
- **1030-1100** the ROM subroutine NEXT1 is used to find the start address of the next line number NEXT 1 returns the address

```
 300 PRINT '"PLACE A 8LANK CASSETTE IN YOUR  RECOR
DER AND SAVE THE M/C."
 310 SAVE "8LOCKOEL"COOE 64985,200
 400 CLS : PRINT '"MACHINE CODE NOW SAVED.
 TO USE THE 8LOCK DELETE UTILITY ENTER THE COMMAND
 "
 410 PRINT ''"RANDOMIZE USR 65000:REM 120,450"
 420 PRINT ''"WHERE 120 IS THE FIRST LINE TO  8E D
ELETED AND 450 THE LAST."
 990 REM DATA FOR M/C
1000 DATA 255,255,255,255,255,255,255,255,2040
1010 OATA 255,255,255,255,255,255,255,33,1818
1020 OATA 165,220,6,15,54,255,35,16,766
1030 OATA 251,62,2,205,1,22,42,93,678
1040 DATA 92,35,35,17,165,220,126,205,895
1050 DATA 27,45,56,48,6,5,126,254,567
1060 DATA 44,40,12,205,27,45,56,36,465
1070 DATA 18,19,35,16,241,24,27,35,415
1080 OATA 17,170,220,126,205,27,45,56,866
1090 DATA 19,6,5,126,254,13,40,16,479
1100 DATA 205,27,45,56,7,18,19,35,412
1110 DATA 16,241,207,5,207,25,207,9,917
1120 OATA 33,165,220,34,93,92,126,205,968
1130 OATA 59,45,205,162,45,205,197,22,940
1140 OATA 237,67,175,220,33,170,220,34,1156
1150 DATA 93,92,126,205,59,45,205,162,987
1160 OATA 45,205,197,22,237,67,177,220,1170
1170 DATA 42,175,220,167,237,66,48,204,1159
1180 DATA 42,175,220,205,110,25,229,237,1243
1190 DATA 75,75,92,167,237,66,225,48,985
1200 DATA 189,229,42,177,220,205,110,25,1197
1210 DATA 229,237,75,75,92,167,237,66,1178
1220 DATA 225,56,9,42,177,220,43,3,806
1230 OATA 177,220,24,233,205,184,25,98,1166
1240 OATA 107,209,205,229,25,207,255,201,1438
```

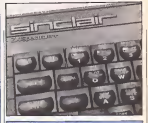
Listing 2 — m/c assembler

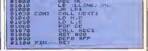
```
00010 ORG 56485
00020 ST1 EQU 56485
00030 ST2 EQU 56490
00040 CHADD EQU 23645
00050 SETSTK EQU #16C5
00060 NUMERIC EQU #2D1B
00070 INTFP EQU #2D38
00080 LADD EQU #196E
00090 NEXT1 EQU #19B8
00100 REC1 EQU #19E5
00110 TOBC EQU #2DA2
00120 CHANOPEN EQU #1601
00130 FLINE EQU 56495
00140 LLINE EQU 56497
00150 ;*************************
00160 SYSU   DEFS 15
00170 ;*************************
00180        ENT
00190 START  LD HL,ST1
00200        LD B,15
00210 LP1    LD (HL),#FF
00220        INC HL
00230        DJNZ LP1
00240        LD A,2
00250        CALL CHANOPEN
00260        LD HL,(CHADD)
00270        INC HL: INC HL
00280 INP1   LD DE,ST1
00290        LD A,(HL)
00300        CALL NUMERIC
```

```
00310        JR C,ERN2
00320        LD B,5
00330 LP2    LD A,(HL)
00340        CP ",
00350        JR Z,INP2
00360        CALL NUMERIC
00370        JR C,ERN2
00380        LD (DE),A
00390        INC DE
00400        INC HL
00410        DJNZ LP2
00420        JR ERN1
00430 INP2   INC HL
00440        LD DE,ST2
00450        LD A,(HL)
00460        CALL NUMERIC
00470        JR C,ERN2
00480        LD B,5
00490 LP3    LD A,(HL)
00500        CP 13
00510        JR Z,NUMB
00520        CALL NUMERIC
00530        JR C,ERN2
00540        LD (DE),A
00550        INC DE
00560        INC HL
00570        DJNZ LP3
00580 ERN1   RST #08
00590        DEFB #05
00600 ERN2   RST #08
```

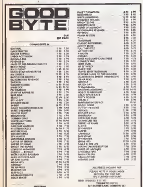


```
00610          DEFB 019
00620  ERN3    RST #08
00630          DEFB #09
00640  NUMB    LD HL,ST1
00650          LD (CHADD),HL
00660          LD A,(HL)
00670          CALL INTFP
00680          CALL TOBC
00690          CALL SETSTK
00700          LD (FLINE) BC
00710  NUM02   LD HL,ST2
00720          LD (CHADD) HL
00730          LD A,(HL)
00740          CALL INTFP
00750          CALL TOBC
00760          CALL SETSTK
00770          LD (LLINE),BC
00780  CHK     LD HL,(FLINE)
00790          AND A
00800          SBC HL,BC
00810          JR NC,ERN2
00820          LD HL,(FLINE)
00830          CALL LADD
00840          PUSH HL
00850          LD BC,(23627)
00860          AND A
00870          SBC HL,BC
00880          POP HL
00890          JR NC,ERN3
00900          PUSH HL,SAVE START
00910          LD HL,(LLINE)
00920  LP4     CALL LADD
00930          PUSH HL
00940          LD BL,(23627)
00950          AND A
00960          SBC HL,BL
00970          POP HL
00980          JR C,CONT
00990          LD HL,(LLINE)
```





```
01000          DEC HL
01010          LD (LLINE) HL
01020          JR LP4
01030  CONT    CALL NEXT1
01040          LD H,D
01050          LD L,E
01060          POP DE
01070          CALL REC1
01080          RST #00
01090          DEFB #FF
01100  FIN     RET
```



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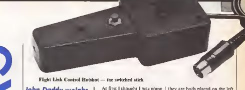


Flight Link Control Hotshot — the switched stick

John Daddy weighs up the comparative merits of analogue versus switched joysticks

Reviewing the Computek and Flight Link Control joysticks was a stimulating experience. It was interesting to be able to compare two different approaches to the problems of joystick control. One box held a single joystick made by Computek which used the analogue principle, and the other, by Flight Link Control, held a pair of switched joysticks. It was also a salutary lesson on how you shouldn't jump to conclusions. My first impressions were that the switched joysticks were much more positive and more accurate but I was soon to learn that both models had their merits.

For the uninitiated, joysticks can be actuated by two methods. One method uses two potentiometers (variable resistors) set at right angles to each other so that movement of the joystick from left to right turns one potentiometer, and any movement up and down turns the other. These potantiometers then send back to the analogue port voltages which depend upon the position of each of the potentiometers.

The switched version usually has four switches, two set along the Y axis at either side of the joystick and two placed similarly along the X axis. Thus movement of the joystick along either of the two axes contacts either one or two switches depending upon the direction of movement. For instance, movement south east (diagonally) will operate a switch on both the X and Y axes.

At first I thought I was going to prefer the switched sticks because they were more positive and responsive, but switched sticks give an all or nothing signal, the object being controlled on the screen moving either flat out or not at all, whereas the analogue method gives a varying voltage to the port, thus giving control of the position, speed and direction of movement of the screen object.

The problem of switched joysticks is highlighted when using computer aided design or sketching programs. When a switched joystick is used to control the cursor you find that when the joystick is moved the cursor jumps to the outer limit of the screen, thus making it impossible to position the cursor at any intermediate point. However, the analogue type of joystick gives you control of speed and screen position of the screen character. When using an analogue stick, the swept area of the top of the joystick can be thought of as a model of the screen and it is as though the joystick handle is attached to the screen cursor, or character with the cursor following every movement of the stick.

The Computek joystick is a large table top model, 100 x 110 x 150cm high, with a good solid selfcentring stick which fits snugly into the hand and is linked to two potantiometers. There are two firebuttons which, despite their different sizes, seem to serve the same purpose. These buttons give rise to my biggest criticism because they are both placed on the left hand side — terrible for left-handers.

There is some free movement which could have been eliminated at the design or manufacturing stages, but nevertheless the joystick is pleasant to use and gives good control of the screen character. The mechanism is strongly made but I was concerned about the crude method used to fix the mechanism to the casing. Four rubber suckers prevent the joystick moving about on the table.

The Hotshot units are a pair of small, hand-held, switched joysticks with one firebutton on each. They feel very positive, are extremely well engineered and have very little free movement. They are also very light so you can sit back and enjoy a game without getting backache.

The choice really depends upon your needs. If you spend all your computer time playing games then I recommend the Hotshot units which are well engineered and have a very responsive and positive joystick movement. However, some games depend upon the precise positioning of a screen character in free space which may give Hotshot some problems. If you need a general purpose joystick then Computek is the best choice, especially as some programs can't be controlled by anything other than an analogue device. Both units are comfortable to use and both have strong self-centring actions and moulded plugs.

Price: £9.95

Manufacturer: Computek

Distributor: Euromas

Address. Pinfold La, Bridlington, N Humberside Y016 5XR

Price: £20.95

Manufacturer: Flight Link Control

Address: Unit 12, The Maltings, Turk St, Alton, Hants

ASSEMBLY TECHNIQUE

Shingo Sugiura demonstrates how to make the best use of the built-in BBC assembler

One of the most useful features of the BBC micro is its built-in assembler. Because it is part of BASIC, some people may be misled into thinking that it isn't very powerful or flexible. In fact, it is, but still very easy to use. Clever clogs out there may be thinking "Doesn't he know the Beeb assembler doesn't have pseudo operators, macros or conditional assembly?". That's right to a certain extent in that pseudo operators, macros and conditional assembly are not implemented in the usual "professional" assembler fashion but then, there's hardly anything that's usual about the Beeb assembler!

However, all these features can be very neatly and easily implemented but before I do that I'd better explain what these apparently missing features are.

Pseudo operators are names given to commands directed at the assembler rather than the machine itself. In BASIC-II some pseudo operators are available. These are

EQUB stands for EQUate Byte. This inserts the byte at the current point of assembly (indicated by P%).

EQUW stands for EQUate Word. This inserts an eight bit number (a word) at the current point of assembly.

EQUD stands for EQUate Double word. This inserts a double word (16 bit number) at the current point of assembly.

EQUS stands for EQUate String. This inserts a string (up to 255 characters in length) at the current point of assembly.

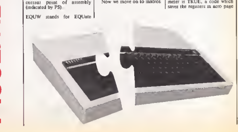
Listing 1 shows you how these can be used but don't forget these are only available on BASIC-II. Now I will explain how they and others may be implemented on BASIC I. This method exploits the fact that one pseudo operator "OPT" exists on both BASIC-I and BASIC-II. "OPT" simply expects to get a number between 0 and 3 (0 and 7 in BASIC-II), so we can incorporate a function which returns an integer in an OPT statement. Since functions in Beeb BASIC can be more than one line, unlike other BASICS, most of you have probably already realised how pseudo operators can be implemented. The functions shown in listing 2 should be stuck at the end of your source code and then these new pseudo operators may be used, as shown in listing 3. One of the instructions "resv" simply reserves a block of memory by a specific number of bytes as specified by the parameter by advancing the assembly address pointer. This can be used in BASIC-II as well.

Now we move on to macros.

A macro is a group of assembler statements which may be slotted at the current point of assembly when required. It is important to realise the difference between a macro and a subroutine. A subroutine is a set of instructions written once only and called with a JSR instruction whereas a macro is repeated everytime it's needed. A good example would be PHA TXA PHA TYA PHA. This cannot be done neatly in a subroutine for obvious reasons and in any case, it's so short, it's not worth writing a subroutine and calling with JSR. Since functions can contain assembler statements as well as BASIC statements, macros may be implemented in the same way as pseudo operators. See listing 4.

Now we move onto conditional assembly. This is a method of varying the object code according to a test. The test may be carried out in BASIC so very sophisticated criteria may be tested with ease. For example, you may build in a de-bugging routine into the object code when testing a piece of code or you may test for a piece of hardware and assemble the appropriate piece code. The latter option is useful if you are writing programs on one machine for various other machines but it isn't a particularly useful technique for writing relatively short pieces of code for a micro. However the first technique may be very useful if used wisely.

Take listing 5 as an example. If a boolean passed as a parameter is TRUE, a code which saves the registers in zero page



Listing 1

```
  10REM Pseudo operators
  20REM In Basic-II
  30REM By Shingo Sugiura
  40
  50MODE3
  60FOR pass=0 TO 3 STEP3:P%=&A00
  70[OPT pass
  80EQUB(5)           \Insert 19 at current assembly address
  90EQUW(&1900)       \Insert &1900 at current assembly address
 100EQUD(&12345678)   \Insert &12345678 at current assembly address
 110EQUS("HELLO")     \Insert "HELLO" at current assembly address
 130]NEXT
 140END


0A00          OPT pass
0A00 05       EQUB(5)           \Insert 19 at current assembly address
0A01 00 19    EQUW(&1900)       \Insert &1900 at current assembly address
0A03 78 56 34
     12       EQUD(&12345678)   \Insert &12345678 at current assembly address
0A07 48 45 4C
     4C 4F    EQUS("HELLO")     \Insert "HELLO" at current assembly address
```

Listing 2

```
  10REM Pseudo operators
  20REM For Basic-I
  30REM By Shingo Sugiura
  40
  50DEFFNequb(number)
  60?P%=number:P%=P%+1
  70=pass
  80DEFFNequw(number)
  90?P%=number MOD 256:P%=P%+1
 100?P%=number DIV 256:P%=P%+1
 110=pass
 120DEFFNequd(number)
 130!P%=number:P%=P%+4
 140=pass
 150DEFFNequs(string$)
 160$P%=string$
 170P%=P%+LEN string$
 180=pass
 190DEFFNresv(bytes)
 200P%=P%+bytes
 210=pass
```

is inserted in the object code otherwise the code is left as it is. In this way, the user may check the contents of the registers from BASIC using indirection operators. Run the program, and then call the machine code routine by typing CALL &A00. Now type PRINT ?&70, ?&71, ?&72. The values printed are the contents of the accumulator, X register and Y register just after the OSBYTE call has been executed. When you have tested this piece of code, it may be reassembled with "OPT FNdebug(TRUE)" amended to "OPT FNdebug(FALSE)"

Listing 3

```
  10REM Pseudo operators
  20REM For Basic-I
  30REM By Shingo Sugiura
  40
  50MODE7
  60FOR pass=0 TO 3 STEP3:P%=&7000
  70[OPT pass
  80OPT FNequb(5)           \Insert 19 at current assembly address
  90OPT FNequw(&1900)       \Insert &1900 at current a7ssembly`address
 100OPT FNequd(&12345678)   \Insert &12345678 at current assembly address
 110OPT FNequs("HELLO")     \Insert "HELLO" at current assembly address
 120OPT FNresv(&A)          \Reserve 10 bytes
 130]NEXT
 140END
 150DEFFNequb(number)
```

```
160?P%=number:P%=P%+1
170=pass
180DEFFNequw(number)
190?P%=number MOD 256:P%=P%+1
200?P%=number DIV 256:P%=P%+1
210=pass
220DEFFNequd(number)
230'P%=number:P%=P%+4
240=pass
250DEFFNequs(string$)
260$P%=string$
270P%=P%+LEN string$
280=pass
290DEFFNresv(bytes)
300P%=P%+bytes
310=pass
7000         OPT pass
7001         OPT FNequb(5)          \Insert 19 at current assembly address
7003         OPT FNequw(&1900)      \Insert &1900 at current assembly address
7007         OPT FNequd(&12345678)  \Insert &12345678 at current assembly
address
700C         OPT FNequs("HELLO")    \Insert "HELLO" at current assembly
address
7016         OPT FNresv(&A)         \Reserve 10 bytes
```

Listing 4

```
 10REM Implementing Macros
 20REM For Basic-I
 30REM By Shingo Sugiura
 40   \
 50MODE7
 60FOR pass=0 TO 3 STEP3:P%=&7000
 70[OPT pass
 80OPT FNsave     \Save registers on stack
 90               \
100               \ Any coding here
110               \
120OPT FNrestore  \Restore registers
130RTS            \Back to Basic
140]NEXT
150END
160DEFFNsave
170[OPT pass
180PHA            \Push accumulator onto stack
190TXA:PHA        \Push X-register onto stack
200TYA:PHA        \Push Y-register onto stack
210]
220=pass
230DEFFNrestore
240[OPT pass
250PLA:TAY        \Pull Y-register from stack
260PLA:TAX        \Pull X-register from stack
270PLA            \Pull A from stack
280]
290=pass
7000         OPT pass
7000         OPT pass
7000 48      PHA            \Push accumulator onto stack
7001 8A      TXA
7002 48      PHA        \Push X-register onto stack
7003 98      TYA
7004 48      PHA        \Push Y-register onto stack
7005         OPT FNsave     \Save registers on stack
7005         \
```

```
7005            \ Any coding here
7005            \
7005            OPT pass
7005 69         PLA
7006 A8         TAY          \Pull Y-register from stack
7007 68         PLA
7008 AA         TAX          \Pull X-register from stack
7009 68         PLA              \Pull A from stack
700A            OPT FNrestore    \Restore registers
700A 60         RTS              \Back to Basic
```

Listing 5

```
 10REM Example of conditional assembly
 20REM By Shingo Sugiura
 30REM August 1984
 40                                          0A00            OPT pass
 50FOR pass=0 TO 3 STEP3:P%=&A00             0A00 A9 87      LDA#135
 60[OPT pass                                 0A02 20 F4 FF   JSR &FFF4
 70LDA#135                                   0A05            OPT pass
 80JSR &FFF4                                 0A05 85 70      STA&70
 90OPT FNdebug(TRUE)                         0A07 86 71      STX&71
100RTS                                       0A09 84 72      STY&72
110]NEXT                                     0A0B            OPT FNdebug(TRUE)
120END                                       0A0B 60         RTS
130DEFFNdebug(switch)
140IF switch [OPT pass:STA&70:STX&71:STY&72:]
150=pass
```

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STRINGS ATTACHED

In part three of our BASIC conversion series, Peter Green demonstrates how to manipulate strings

A string, in BASIC, is simply a string of characters This is often just text to be printed, but it's possible to code items as characters in a string variable (eg a 52-character string using a single-byte code to represent playing cards), or have a string of printer or screen control codes, so that printing the string sets the printer to bold face or sets up a text window.

In this case a conversion depends on knowing what effect the control codes have, and what the equivalents are on the target machine (Naturally they aren't standard — on the BBC PRINT CHR$(16) means select screen mode, on the Amstrad it means delete the current character This is more properly a graphics problem, and conversion tables will be includrd in my next article

Strings can be manipulated in several ways, and as usual there are two methods — Sinclair's, and everyone else's Most people use the standard Microsoft commands, so conversion isn't required LEFT$ and RIGHT$ remove a specified number of characters from the left or right ends of the specified string MID$ pulls a substring of characters from the middle of the string LEN returns the length of a string STR$ converts a number to its equivalent character string (123 4 becomes " 123 4") Watch this one, most BASICs tag an extra character on the front of the string to represent the sign, making this a space if the number is positive If your BASIC doesn't, STR$ produces strings one byte shorter than you expect for positive numbers This is very rare and simply means you have to add a space on to the front of strings from positive numbers

VAL does the reverse operation, converting a string to a number This is standard across all machines, except that the Spectrum will evaluate a string expression before doing VAL, all other BASICs ignore everything after the first non-numeric character For example, VAL ("22+10") gives 32 on the Spectrum and 22 on everything else On the BBC/Electron, the function EVAL does this job, allowing a straight conversion. On other computers, you've got problems!

If the program really can't be altered to work in some other way, you'll need a new subroutine which can split up strings of numerical expressions and evaluate them This isn't exactly a trivial programming job — especially since you have to maintain algebraic priority (ie brackets, division, multiplication, addition, subtraction, not to mention logical operators)

CHR$ of a number produces a one-byte string whose ASCII code is the number supplied This works in any BASIC (amazing! True compatibility at last)

The inverse operation is ASC, which returns the ASCII code of the first character in a string Once again Sinclair goes its own sweet way, and uses CODE as the BASIC keyword Also watch what happens if you try ASC(null string) The BBC returns —1, the Amstrad, Commodore and Atmos report an error, and the Spectrum returns 0

Either make sure that strings can't be empty, or include a test to set the same value that the source program uses (see Example 1)

INSTR is a very useful word which appears in more modern BASICs It tests to see if one string is contained within another, returning the position of the match, or zero if there is no match Example 2 uses standard string commands to duplicate INSTR Both the BBC and Amstrad allow the search to start at any point in the first string, a point represented here by variable s

This program uses non Sinclair keywords, so how can you alter it to run on a Spectrum? Read on.

Sinclair BASIC dispenses with the specific string commands of Microsoft BASIC, using instead a single concept of string slicing Slicing means that a string variable is treated as a one-dimensional areay of single characters, parts of which can be sliced out using the syntax:

A$(S TO E)

Here A$ is the string, S is the starting character, and E is the end character under consideration i.e. we're looking at the 'Sth' to 'Eth' characters in the string A$

Obviously this is analogous to MID$(A$,S,length), where length is E-S+1.

Either S or E may be left out completely, as BASIC assumes that you mean "the first character" or "the last character" respectively i.e. LEFT$ and RIGHT$ equivalents. It isn't much use, but

A$(TO) or A$( )

would mean the whole string, i.e. A$.

Remember that the start and end characters are inclusive, which is why 1 is added when calculating the equivalent length for a Microsoft command. You also need mental gymnastics (and the length of the string) to work out the equivalent for a RIGHT$ command. Example 3 gives string slicing equivalents for each of the three Microsoft commands. Pay attention to the MID$ and RIGHT$ versions to understand the relationship between S, E and length.

There's an added complication to string arrays on the Spectrum: the number of dimensions in the DIM statement must be one more than on other machines, the last figure being the maximum length of each entry. This last figure may be replaced by a slicing expression in string expressions, or omitted altogether (meaning, as we saw above, the whole of that array entry).

An example should make things clearer. On most BASICs, DIM A$(3,20) will set up a three-by-twenty string array, with each array entry capable of being any size up to the maximum (usually 255 characters). On the Spectrum, DIM A$(3,20) sets up a one-dimensional array of three strings, each of which is 20 characters long. (There is no such thing as a null string array entry on the Spectrum: entries are padded out with spaces to the maximum length.) So the equivalent statement on other machines is just DIM A$(3).

Consider slicing an array. A$(2, TO 11) means A$(2, (TO 11)), or A$(2)(TO 11), which is LEFT$(A$(2), 11) in normal BASICs. Easy, really. Like so BASIC conversion problems, converting arrays to and from the Spectrum involves deciding what effect the source program is trying to achieve, then seeing how to do the equivalent thing in the target machine.

The Amstrad version of MID$ can also function as a command: that is, it can appear on the left-hand side of an equals sign, meaning "replace the indicated part of the string with the string on the right hand side of the equals sign". Example 4a shows how this works, and 4b and 4c give the Microsoft and Sinclair equivalent functions.

Example 1

```
100 REM ** Spectrum source program
110 LET c=CODE A$
120 rest of program
```

```
100 REM ** Amstrad or Beeb target program
110 IF A$="" THEN c=0:GOTO 120 'Force c to
Spectrum value
115 c=ASC(A$)
120 rest of program
```

Example 2

```
100 ' S1$ = string to be searched
110 ' S2$ = string to be searched for
120 ' s = starting position for search
130 ' p = match position (0 if no match found)
140 '
150 '
160 p=0
170 IF LEN(S2$)>LEN(S1$)+1-c THEN RETURN
180 ' (string cannot be contained in a smaller
     string)
190 FOR c=s TO LEN(S1$)-LEN(S2$)+1
200 ' (No point in searching once remainder of S1$
     is shorter than S2$)
210 IF MID$(S1$,c,LEN(S2$))=S2$ THEN p=c : c=LEN(S
1$)+1
220 ' (if S2$ found within S1$, save position in p
     and force exit from FOR/NEXT loop)
230 NEXT
240 RETURN
250 '
500 ' ** EXAMPLE **
510 S1$="UNDERGROUND" : S2$="UNO" : s=1
520 GOSUB 160
530 ' Now p=1
540 s=6
550 GOSUB 160
560 ' Now p=9
```

Finally, on the BBC or Electron you may come across something like $6000 = "ABCDE", $S="ABCDE" (where S is a numeric variable), or A$=$S. The first two expressions mean POKE the characters of string A$ into successive memory locations starting at address 6000 (or address S), while the third means let A$ equal the string found by PEEKing characters from memory location S onwards.

When POKEing, CHR$(13) is added at the end to indicate the end of the string; conversely, when PEEKing, the end of the string is assumed to be the first CHR$(13) encountered. If the string has to be entered directly into known memory locations (for machine code manipulation, perhaps), other computers can use POKE and PEEK on the string characters. Otherwise, just use a new string variable to hold the string.

Example 3

```
100 a$="ABCDEFGH"
110 b$=LEFT$(a$,3)
120 b$=a$( TO 3)
130 REM ** b$="ABC"
140 c$=RIGHT$(a$,4)
150 c$=a$(5 TO )
160 REM ** c$="EFGH"
170 d$=MID$(a$,2,5)
180 d$=a$(2 TO 6)
190 REM ** d$="BCDEF"
```

Example 4a

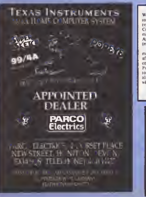
```
100 a$="ABCDE":s=3:length=2
110 MID$(a$,s,length)="XY"
120 REM ** a$ is now "ABXYE"
```

Example 4c

```
100 a$="ABCDE":s=3:length=2
110 LET a$(s TO s+length-1)="XY"
120 REM ** a$ is now "ABXYE"
```

Example 4b

```
100 a$="ABCDE":s=3:length=2
110 a$=LEFT$(a$,s-1)+"XY"+RIGHT$(a$,s+length)
120 REM ** a$ is now "ABXYE"
```



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Christopher Morgan, Keyworth

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Would appreciate it if Kenny Moriarty who wrote the program would get in touch with us as we appear to have lost his address.

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May we add for the benefit of your readers, that the loading and saving is perfectly normal on the final version now on sale. Angelique does everything a good woman should, and, no doubt, quite a few that she shouldn't!

Doreen Harris, Nemesis

Good... and bad news

I have never written to a mag before. But now I feel it's about time I wrote to you. First the good news. I like the new look of your magazine, and mainly the software reviews. As a Spectrum owner I can just look along the bottom of the page until I find a game with a good rating, then read about it.

Now the bad news. I am fed up with reading the letters page, only to read about a TI-99/4A owner running down the Spectrum or vice versa. Is it not time you stopped printing this type of letters and point something of interest. As Mr K says in HCW 102, it's not fair to say one is better than the other.

I Jones, Aberdeen

This correspondence is now closed and we will not be printing any more letters criticising other computers.

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Thank you very much for your complimentary comments about Everyone's A Wally (reviews, HCW 106).

In response to your closing comments about the program being expensive I'm afraid that the new packaging and free music track have very little to do with the price tag of £9.95.

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Bootiful problem

I have recently bought Booty for my 48K Spectrum+. I had to use my little sister's tape recorder to load it because it wouldn't load at first. Once I got it loaded I enjoyed it immensely until I got to one of the screens that I hadn't been on before.

I mistimed one of my steps and fell. I should have been killed, but I landed on a number six door and stuck there. It wouldn't move left or right or go on to another screen.

If anyone else has had this problem and has overcome it please let me know.

Graeme Davidson, Glasgow

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Sutton Library Computer Club has been going now for over two years, and has between 80 and 90 members. I would like to take this opportunity to inform HCW readers about our activities.

Meetings are held in the Central Library, Sutton on the first Friday and the third Tuesday of each month from 8.15 p.m. All makes of computers are covered, and there's no need to own a computer to join the club.

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David Wilkins, Sutton

LETTERS PAGE

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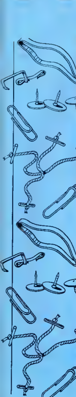


POKEs and PEEKs

Here are some VIC-20 POKEs from Andrew Griffiths of Shropshire.

Here is a tip for TI owners from T D Grant of Harlow. To speed up your TI-99/4A key responses use them in the following order of priority: "=", "space", "ENTER", "o". These are equal to the joystick: fire, left, right and down inputs.

Pedro Magalhaes of Porto, Portugal has sent in this useful tip for scrolling characters on the Spectrum.

```
100 FOR I=0 TO 30 STEP 5
110 FOR W=30 TO 0 STEP -5
120 CALL SOUND(-99,1200,I,1202,1,1204,I
130 CALL SOUND(-99,2400,W,2402,W,2404,W)
140 NEXT W
150 NEXT I
```

The following routine produces sound on the TI-99/4A and is also from Pedro.

```
100 FOR a=0 TO 255
110 POKE 23606,a
120 PRINT AT 20,3;"ABCDEFGHIJKLMNOPQRSTUVWXYZ"
230 NEXT a
```

Helpful hints

Here's Pedro Magalhaes' tip to enhance movement on the TI-99/4A

```
100 CALL CLEAR
110 CALL SCREEN(2)
120 CALL CHAR(129,"FFFFFFFFFFFFFFFF")
130 CALL CHAR(131,"")
140 FOR I=1 TO 11
150 VAR=130+(-1)^1
160 CALL COLOR(13,5,6)
170 CALL HCHAR(I,I,VAR,34-2*I)
180 CALL VCHAR(I+1,33-I,VAR,24-2*I)
190 CALL HCHAR(25-I,I,VAR,34-2*I)
200 CALL VCHAR(I+1,I,VAR,24-2*I)
210 CALL COLOR(13,6,5)
220 NEXT I
230 CALL COLOR(13,5,2)
240 CALL COLOR(13,2,5)
250 GOTO 230
```

Readers' Jokes

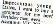
What do you get if you cross a well-known arcade game with Chuckie Egg?
Scrambled eggs
T Simcox, Derby

What kind of aid does a partially deaf fisherman have?
A herring aid
Ziaur Rahman, Nottingham

Which computers grow on trees?
Apples

Ziaur Rahman, Nottingham

Impecunious young lady
Listen, I want to buy a cheap computer for my boyfriend's birthday next week...
Assistant VIC-20?
IYL No he's 19 on April 12th!
Eric Waters, Solihull



Whoops and whoopees

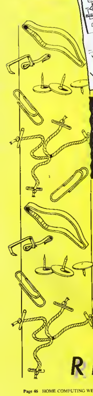
Jim Barton of Beverley has pointed out that the word WAIT in David Ellis's RSX words series contained an error.

The eighth line should read as follows

```
&82CA      JR NZ LOOP
  20 FB    branch to LOOP if
  not zero
```

Due to a design error issue 102's George competition was mixed up. The program which will run is B and not A. We apologise, and thank R B Jones who pointed out the error among others.

READERS PAGE



OPTICIAN
ACE MICRO

Peter Medlicott thrashed Wonkey Warlock

Readers' hi-score table

Name	Game	Machine	Score
Peter Medlicott	Worky Warlock	TI 99/4A	15 907
J Chalk	Flight Path 737	C16	76
	Skramble	C16	29,860
	Harbour Attack	C16	5,646
Ian Muriss	Castle Quest	BBC	2 050

Helpline

Alan Riley of 601 Chorley New Rd, Horwich, Bolton BL6 6LA would like to know which hardware is Atmos-compatible. He's particularly interested in disc drives.

Neil McPherson of Cardoss has sent a useful tip for ZX81 users. When loading software, if the 0/0 report does not come up but a k cursor or blank screen appears, then the volume level is too high. If a 1 cursor appears then the volume is set too low.

Invisible ink

Here's how to print text on the screen as if it were being written by an invisible hand. Look at this program for the C64 and you'll see that the phrase in line 10 — in this case Home Computing Weekly is Great! — is kept in the variable PH$

Line 20 makes a loop from 1 to LEN (PH$) and is kept by the variable LO. Line 30 first finds and then displays the letter picked by LO using PRINT MID$(PH$,LO,1). Line 40 makes a delay using another loop and then repeats the routine LEN (PH$) times, using NEXT LO

More words can be added to the original phrase using PH$=PH$+' EXTRA WORDS-' This extra bit must be added after line 10 and between line 20 to work properly

Here's the program

```
10 PH$='NOME COMPUTING WEEKLY IS GREAT!'
20 FORLO=1TOLEN(PH$)
30 PRINTMID$(PH$,LO,1),
40 FORDE=1TO50 NEXTDE NEXTLO
```

Jon Chatten, Norwich

Queen's high

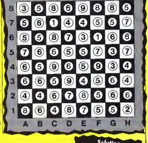
It isn't too difficult to place eight queens on this chessboard so that there is only one piece in each row and column and no two queens are in a diagonally straight line

Thus if you put one on, say, C4 you couldn't put another anywhere in column C or row 4, nor on squares like D5 or F2

However it may be worth collecting eight pennies and trying it before going on to the main course

The real puzzle is to place the eight queens, or, if you like, put eight crosses in eight squares, so that you obey the above rule and score the highest possible total when you add your eight numbers together

Just how high a score can you get?



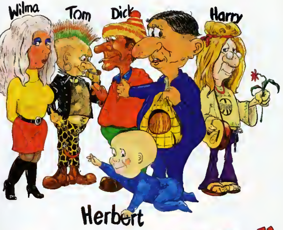
	A	B	C	D	E	F	G	H
8	3	5	8	6	9	8	8	5
7	5	8	1	4	4	5	5	7
6	5	5	8	7	3	1	6	6
5	7	6	6	5	5	7	3	7
4	6	5	9	6	5	9	3	4
3	6	6	5	9	4	5	6	4
2	4	4	6	7	8	5	6	6
1	8	6	4	8	7	5	5	2

Solution to last week's puzzle

Fifty-seven is the best score available. You use squares A7, B2, C6, D3, E1, F4, G8 and H5.

READERS PAGE

Meet the Gang!



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