HOME COMPUTING WEEKLY
AN ARGUS SPECIALIST PUBLICATION
August 13-19 1985 No. 125 50p

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

How many 128s by Christmas?

Amstrad's new machine will be unveiled to the press on 20 August and should be available in the shops for Christmas.

The rumour file on the computer is positively bulging. It is suggested that it will have a minimum of 128K, be disc based and retail at around the same price as the CPC664.

Amstrad themselves are enjoying the guessing game. A spokesman said, "We don't want to spoil things by giving details but it does keep us in the public eye."

"If you got all the ideas published about the machine together and threw out 90 per cent you may be close to the truth. But of course we are not saying which 90 per cent."

The spokesman did, however, reveal that the computer is "a major new machine which makes the CPC664 look boring."

Sinclair are rivalling Amstrad in the secrecy stakes by maintaining a total silence on the progress of the 128K Spectrum Plus. Sinclair refused to comment on whether the 128 had been scheduled for release.

The current identikit picture of the Spectrum 128 includes a price tag of less than £200, an AY series sound chip and a high degree of software compatibility with the Spectrum.

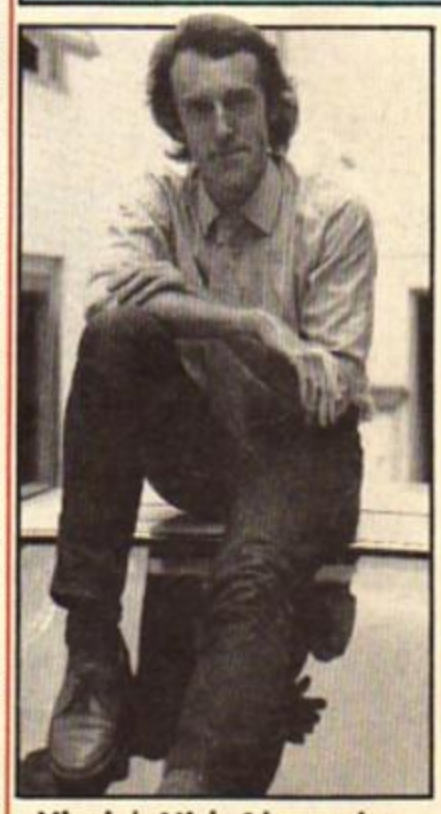
Commodore have, of course, already released details of their 128 and it is expected to be in the shops in early September priced at £269.

A spokesman for Commodore stated, "Our whole philosophy is not to pre-announce and I think we have stolen a march on our rivals because we are actually going to deliver the thing."

It remains to be seen which of the new machines will fire the public's imagination. Retailers are seemingly in agreement, however, that increased memory alone will not be enough to persuade the micro users to upgrade.

C128 waiting for competition

Virgin six-pack in TV ad



Virgin's Nick Alexander

The final line-up of Now Games, the six game compilation from Virgin to be rush released on August 20th has been announced.

A breathless Nick Alexander, managing director of Virgin Games told HCW that the sixth slot will be filled by Brian Bloodaxe (Edge).

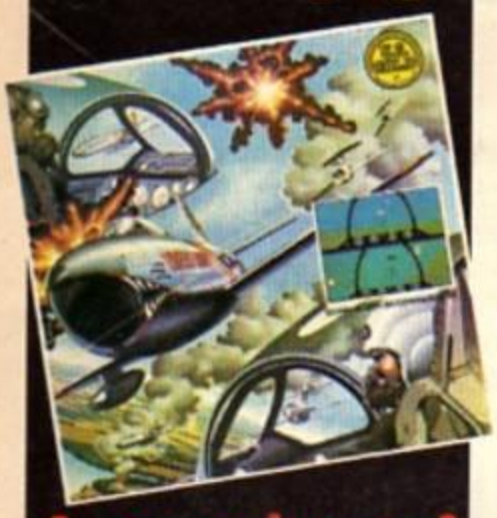
The other five titles are Lords of Midnight (Beyond), Everyone's A Wally (Mikro Gen), Arabian Nights (Interceptor) and Strangeloop and Falcon Patrol (both Virgin).

Now Games will be available for the Spectrum and C64 and retails at £8.95. The launch of the compilation will coincide with a TV advertising campaign costing £100,000, featuring brief clips from the games.

Nick said that putting together the package in such a short time had been "a bit of a nightmare" but added that "If Now Games goes well there could be more compilations on the way."

The aim of Now Games, said Nick, was to offer best selling games at "a good price."

SOFTWARE RELEASES



A round up of the latest programs

SOFTWARE REVIEWS

5 pages of the latest and greatest

SOFTWARE LISTINGS

to type in on Spectrum, C64 and Amstrad

Write your own Amstrad game p.16
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Trouble at the Meatball and Micro p.28
Books for Z80, Spectrum and Amstrad p.15
C64 Sprites make their moves p.20

MIRRORSOFT

has had a BRAINWAVE!

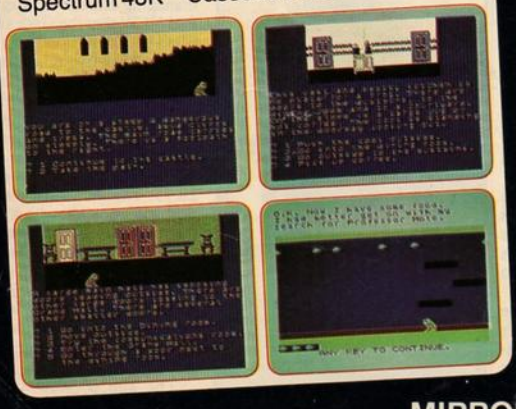
Introducing new BRAINWAVES – arcade/adventure programs for the under-12's. They require quite a lot of thought and planning, so get the old grey cells working for

PHINEAS FROGG

Super Sleuth

Phineas Frogg is a rather sophisticated secret agent in the tradition of James Bond (or maybe we should say James Pond, since being a frog, that's where Phineas spends a lot of his time!).
His boss, Badger, known to all as Big B, has informed Phineas that Professor Mole, the world-famous scientist, has been kidnapped and taken to the Secret Lair of the Terrible Hamsters (S.L.O.T.H.).
Your task as Phineas is to read up the background thoroughly (provided in a small book), and rescue the Professor, passing the various tests that Hamsterchief sets along the way.

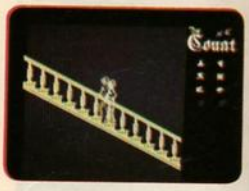
Spectrum 48K Cassette £7.95 Disk £10.95



ANCIENT QUESTS

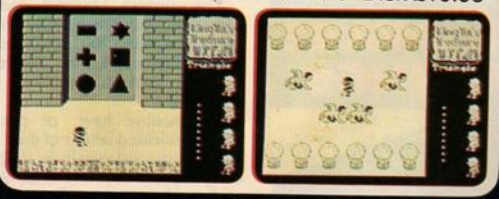
Two educational arcade action games

In KING TUT'S TREASURE, you're an archaeologist, scouring the deserts of Egypt for the keys to the famous tomb. You are equipped with a metal detector to locate buried clues but you must watch out for the hazards that appear in different parts of the desert – you only have a limited number of lives!



In THE COUNT, you are in the evil Count Dracula's Castle. You have a number of items to locate which may be found in any of the castle's dozens of rooms, and then you must escape without falling into the hands of the Count. With careful planning, you could manoeuvre the Count into a situation where sunshine will pour through the windows and turn him into a pile of dust.

Spectrum 48K Cassette £7.95 Disk £10.95



MIRRORSOFT programs are available from good software stockists everywhere. In case of difficulty or for further information, please contact:

MIRRORSOFT
MIRROR GROUP NEWSPAPERS LTD, Holborn Circus, London EC1P 1DQ
Telephone: 01-822 3580

HOME COMPUTING WEEKLY

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Soapbox

Oh how I agree with the plaintive cries heard recently from the HCW Soapbox on the subject of Computer Studies in school! Yes, it is painful to learn, but it's just as painful to teach, because the teacher/computer enthusiast is chained to the awful syllabus dictated by the exam boards.

In a five term course, starting from scratch, only one term can be allowed to teach program development, documentation and coding, a total of 24 hours teaching. Forget structured programming! One board actually dictates that you miss out most of the BASIC which would allow this to be taught.

So where does all the time go? Teaching about punched card systems, the history of computer development, computer arithmetic, etc. all very dry stuff which some would argue is irrelevant in comparison to the encouragement of logical thinking, and its expression in computer language. So much is crammed into the syllabus in order to cover every aspect of computing that we will teach less and less about more and more until we teach nothing about everything.

Sigmund Pedagogue

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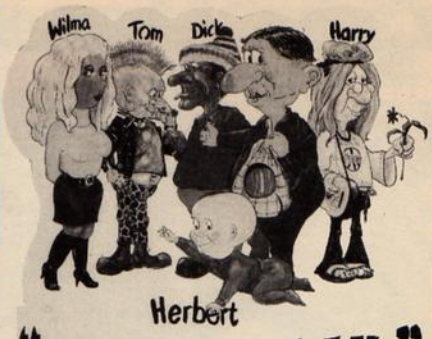

"Everyone's a Wally"

Another Wally on TV

REGULARS

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British Telecommunications plc.

Adaptability

If you're forever tripping over your extension leads or simply can't find enough sockets to accommodate the hi-fi, computer and TV, then maybe Nu- Way Styli Components have found the answer with Masterplug.

This range of multi outlet adaptors features Powerclean, a four into one connector with a mains filter designed specifically for use with sensitive electronic equipment such as computers.

Masterplug Powerclean is available at £16.99 for the non-fused model and £18.99 for the fused version.

Nu-Way Styli Components, 15 Hayward Ind Pk, Castle Bromwich B35 7PG.

Masterplug Nu-Way Styli's range.

Having his cake ...

It was a very nice gesture on SSL's behalf to send us a piece of Saga 1 Emperor's first birthday cake.

It wasn't quite such a nice gesture for our Editor, Dave sweet-tooth Carlos, to have eaten it before we even got a look in. Anyway thanks Saga and congratulations on selling over 15000 Emperor keyboards.

Saga Systems, 2 Eve Rd, Woking, Surrey GU21 4JT.

Many happy RETURNS to the Saga keyboard

BBC BASIC for the Commodore

The Commodore BBC Emulator is now available from Micro Dealer UK.

The emulator converts the C64 into a machine which can be programmed in exactly the same way as a BBC machine. It provides the user with an 80 column mode in which full hi-res graphics and editing are possible.

Priced at £14.95 it comes complete with self-explanatory manual.

Micro Dealer UK, 29 Burrowfield, Welwyn Garden City, Herts.

Comfort and joy . . .

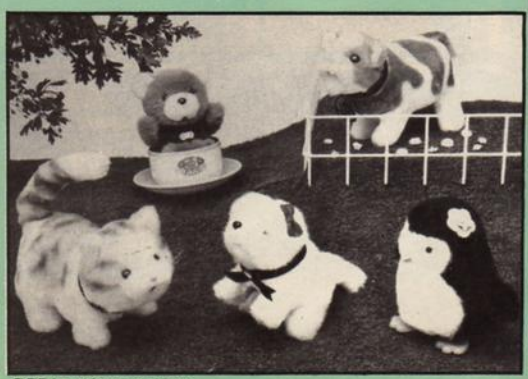
You couldn't hope to find more user-friendly technology than CGL's Ani-Mates.

This range of cuddly animated toys includes such bundles of joy as Roly Poly, a mooing, tail-wagging calf and Peeper the Polar Penguin who flutters his wings to his heart's content.

So if your computer won't speak to you and you're in need of some hi-tech affection, — or simply looking for that early Christmas present — this could be the answer.

Ani-mates range in price from £9-£17.

CGL, CGL Hse, Goldings Hill, Loughton, Essex IG10 2RR.



CGL's software range

Musical M.P.

Commodore's new Music Maker underwent parliamentary inspection when Kenneth Baker M.P. visited Commodore's Corby headquarters.

Mr Baker, the Minister for Local Government, had the chance to try out his musical skills after Chris West, the software Development Manager, demonstrated the use of the keyboard.

Who knows — could this be the beginnings of musical party political broadcasts?

Commodore UK, 1 Hunters Way, Weldon Corby, Northants NN17 1QX.

Kenneth Baker M.P., centre, humming along to Commodore's Music Maker.

Pinball Wizardry

The software house, PSS, are about to release Macadam Bumper, a pinball machine game with a difference.

PSS are running a "Best Pinball Table Design" competition for the purchasers of the game and the lucky winner will receive — yes, you've guessed — a pinball machine, plus a gold cassette with the program containing the winner's design.

Macadam Bumper will be available in August at the price of £7.95.

PSS, 452 Stoney Stanton Rd, Coventry CV6 5DG.

At the Show . . .

It's rather like counting how many shopping days to Christmas waiting for the PCW show and it looks like everybody who's anybody is going to be there.

Atari will be launching their range of ST computers with the 520ST at the forefront. Over 80 software houses will be featured on the Atari stand who will be showing packages for both the new 16/32 bit 520ST and the 8-bit 130XE and 800XI machines.

You'll have a chance to see Level 9's Red Moon in action and also get a sneak preview of their new adventure, Worm in Paradise. Pete Austin the author of some of Level 9's epic adventures — which have over 200 locations and can take weeks to solve — will be there to let you see a great mind at work.

Of course the HCW team will be there — well I did say anybody who's anybody — and will be looking forward to meeting you. Ron's getting more complex by the minute in anticipation!

What a lot of happy Ghostbusters there are in the world, or should I say potential Ghostbusters!

We have had one of the largest postbags for a number of weeks for our competition and the vast majority of entrants got the correct number of differences seven. As usual with large entry competitions we had to choose the winners out of the hat, and this time we used Kerry's as that was the biggest to hand.

Our hearty congratulations to the winners who are (deep breath: James Adams, Ashbourne; Keith Chapman, Thamesmead; M Howarth, Bolton; C Dickinson, Alsager; Richard Charters, Carlisle; Sidney Reeves, Birmingham; Marcus Prescott, Burton; Jack Hughes, Cadishead; M Radley, Fife; Ian Garrow, BFPO 825; Dennis Richards, London; John Osborne, Woodbridge; Stan Fowell, Dagenham; Ashley Nock, Kinver; BM Atwood, Tottenham; Natalie Wood, BFPO 825, Joel John-Baptiste, Peckham; Steven Cheung, Cleethorpes; B Mawson, Slough; Brian Moate, Selsdon; Heirion Thomas, Dolgellau; D N Atkins, Welling; Arthur Bailes, East Dereham; David Sheils, Bolton; D Brown, Winchester; Michael Zaltzman, Versailles; W N Gilks, Chelmsford; Valerie Hill, Southampton; Christopher King, Swinton; E Haggerty, Blyth; R F Ashdown, Devizes; Peter Baldwin, BFPO 30; K Thornton, Canvey Island; Patricia Ramsey, Arbroath; Warren Wright, Rochdale; Andrew Pearce, Bristol; Keith Mawson, Slough; Ryan Halley, Leicester; Clive Viagas, Gibraltar; Alan Watson, Inverness; David White, Bellshill; Richard Hirst, Huddersfield; Tim Prince, Ware; Jonathan Yarker, Davyhulme; Cpl Hampton, BFPO 26; Nigel Impey, Higham Ferrers; G J Holmes, Brighton; Graeme Lacey, Tunbridge Wells; J C Crees, Colchester; Phillip Ridley, Northwich; A J Prigg, Exeter; Steve Wood, Wombourne; David Tricksey, Poole; Michael Clark, Newton Grange; Joseph Toomey, London; Mark Shalland, Andover; Matthew Fisher, Lichfield; Jonathan Leach, Sidmouth; M Salleh, Prices Gates; Scott Thomson, BFPO 42; Michael Edwards, Shepperton; B Lomas, Crediton; Nick Smith, Burton; D A Edwards, Manchester; J Tyrell, Anfield; Michael Thompson, Weymouth; Alyson Key, Hull; Christopher Slatter, Gloucester; Daire O Sulivan, Dublin; Tommy Horner, Glasgow; B D Everingham, Romford; Vijay Lad, Wrexham; David Fletcher, Portsmouth; Andrew Bird, Ripley; Michael Harman, Withernsea; David Smith, Melton Mowbray; P Shepherd, Woodthorpe; Dave Parish, West Wickham; Jonathan Evans, St Asaph; Simon Roche, Formby; Michael Halpin, Bridgewater; Patricia Moore, Crewe; R L Stacey, Killamarsh; Martin Newman, Bretton; D J Hirani, Oldham; E White, Northampton; Susan Foyston, Hull; L Valentine, Corsham; Steven Osborne, Maidstone; M L French, Norwich; Jonathan Biddle, Leiston; Don Causton, Wellinborough; Naeem Iqbal, Bannockburn; Barry Eames, Hardwicke; Eddy Van Gelder, Belgium; D Goodwin, Wallingford; A M Robinson, Maidstone; Carl Smith, Barrow-on-Soar; Paul Baldwin, Barnet; Cpl C J Gregory, BFPO 106.

In the first of our new weekly columns we look at the latest games to pass across the HCW desk. If it's new it's here!

Battle away

It's been Amstrad week at CCS with two new conversions for the CPC 464 and 664.

The first is **Arnhem**, a tactical war game which gives a realistic simulation of the 1944 Market Garden operation. There are four parts to the game, each one being a complete game but all contributing to the full simulation. There are also options for one or two players and an automatically scrolling battlefield. Priced at £9.95 the game will be available from 7th August.

The second Amstrad release is **War Zone** which uses the computer to set a new battlefield every time you play. All the dangers are changed so the plains, roads, woodland, hills and minefields can appear anywhere. You play against the computer and you select the number of playing pieces that are to be used and thereby affect the complexity or otherwise of the game. War Zone is already available and costs just £6.95.

Big soft

Martech have been signing up all the big names for their forthcoming releases and when I say Big I mean BIG!

In mid October we will be having a game from **Geoff Capes**, yes he of the mighty muscles and strong neck. The game will not follow the usual software game approach in that there will be no joystick bashing here. The idea is that you try to bring Geoff to the peak of physical fitness ready for the next event.

During the actual event speed and reaction will be important if you are to give Geoff any chance of success. Those of you who are coming to the PCW show might be able to meet the mountain, sorry I mean man, himself as he will be there to promote the program. The actual name has yet to be decided but it will be available for a huge range of micro's at £7.95 from mid October.

The other new program from Martech will feature the **Zoids**, TOMY's robot monster toys. The game will be written by The Electronic Pencil Company, the same group who were responsible for the 4th Protocol program.

There are very few further details available at this stage but the game will sell for between £7.95—£8.95 and be written for C64, Amstrad, MSX, BBC, Electron, Spectrum and Atari machines.

Golden nuggets

US Gold are keeping up their one company assault on the software charts with one new release this week and two conversions.

The new game is available for the Atari and the C64 at £9.95 on cassette and £14.95 on disc. **Mig Alley Ace** is a combat simulation which "excites, stimulates and challenges your fighter pilot instincts". What surprised us it that the game is being sold in a double cassette case with the other space holding a small card with details of future releases. Seems a waste of shelf space to me!

The conversions released this week are **Beach Head** for the Amstrad and the BBC (is this the first US Gold title for the Acorn Micros?) both are at the usual price of £9.95 on cassette but just £12.95 on disc.

Spectrum **Dambusters** is now with us and there are versions planned for the BBC, Amstrad, Enterprise and Atari. Each game also has an offer on the Airfix model of the bomber used in the raid but be careful with that glue, you don't want to jam up your cassette recorder with cassettes costing £9.95 each do you?

A full list of future Amstrad titles from the company has also been announced. Besides those named above there will be **Return to Os, Goonies** and **Zorro** games soon as well as conversions of **Beach Head II, Pole Position, Up 'n' Down, Buck Rogers, Congo Bongo, Dambusters** and **Bounty Bob Strikes Back**. It looks like it's going to be an Amstrad Christmas if this deluge of software continues.

Blowing bubbles

The bubble has burst for the Amstrad and the Einstein as **Use It** emerges.

The overall aim is to get you and your micro doing something useful instead of playing games all day. The package has three parts — Graph It, Time It and Calc It. I don't expect that it needs a mastermind to sort out what each of the programs do but so that you can play Trivial Pursuits with them the answers are draw graphs, display the time and do calculations. For the Amstrad the cassette costs £8.95 and on the Einstein the disc is £12.95.

The Wizard has been waving his magic wand and the next tape out of Bubble Bus' cave is the **Wizard's Lair** which will have the Amstrad Version on one side and the C64 version on the other. I wonder how many will be returned as faulty due to buyers trying to load the wrong side?

In this game Pot Hole Pete finds an amazing subterranean network of tunnels and caves which comprise the home of our subject, the Wizard. He has to find the four pieces of the Gold Lion in order to escape and there are plenty of energy sapping creatures who try to stop him. The game is priced at £8.95 and will be in the shops at the end of this month.

Kuma MSXtra

Kuma Computers have announced a new range of games for the Amstrad range of machines but the only title as yet made public is **Rock Raid**.

This will be available on 21 August for £6.95 and Kuma claims that it is a "High speed arcade game with smooth graphics and full use of the Amstrad's facilities". There will be both keyboard and joystick control and user defined keys. Each level of the game will be faster and more challenging with greater numbers of enemies.

Also from Kuma, who are claiming the title "the leading MSX software house" comes **SHNAX**. This game has a number of differences from the ordinary according to its publishers. There are an infinite number of levels, actually 10 scenarios but with differing features and speeds each time around. It is controlled by joystick only and the objects which you find along the path can be used to defeat your opponents if only you can match the object and the nasty!

This "ultimate maze game" will be in the shops by the time you read this and will set you back £6.95.

Shorts

Alligata have decided to take the michael out of the software industry with their latest release for the Atari and C64. Called **Shoot em up** we hear that it has camels. Uncle Claude and various other well known symbols floating across the night sky in a shoot em up game that lives up to its name. We are even informed that it starts with a bunch of Irish Jokes. We wonder if there will be a special version prepared for the Irish market with English jokes?

The near relatives of the crocodile have another game up their collective sleeves that might be available at the PCW show but no details are flowing out of Sheffield yet.

Rather late for this year's examination candidates, is a new collection of revision software from Charles Letts, perhaps they forgot to put the exam dates in their diary! The software will follow from their successful **Keyfacts revision aids** and will be available for BBC, Electron and Spectrum machines. C64 versions are promised for later in the year. Subjects to be covered include Biology, Chemistry, Computer Studies, English Lit, Geography, Mathematics and Physics. Each program will cost £11.50 and we have requested review samples, so check the software reviews in a couple of weeks time.

If you ever fancied building a robot, then the new game from Silversoft is likely to appeal to you greatly. In **Talos** you have to locate and then assemble parts of a robot which have been spread over 200 screens of a rural landscape. The whole operation is made more difficult because certain parts carry weapons which are likely to go off at a moments notice. Claimed to be an Arcventure, even after you have assembled to machine you have to find the Crown of Eternity from its secret vault. It sounds like good value on the Spectrum at £7.95.

Future action from US Gold announced this week are **Goonies**, based on Speilberg's newest movie and the official **World Cup** game based on the contest in Mexico 1986. The football game will be for Amstrad, C64 and Spectrum at about £8.95 but don't hold your breath waiting — it isn't due for release until two weeks before the finals commence!

As mentioned in John Henderson's Education column a few weeks ago, **Maths with a Story 2** is now released. This book and cassette packages follows from a schools radio series which is due to be broadcast again from Thursday Sept 26, at 10.25am. The book is priced at £4.50 and the cassette at £10.95, they cannot be bought as one package at the moment. BBC and Electron versions only.

A couple of weeks ago we had a review of the **Red Arrows** game on the Amstrad. Database have now released the Spectrum version at £8.95 with a percentage of the profits going to various forces charities. There is a free High Score competition for players with the chance to visit the team at their base in RAF Scampton. So follow the red leader!

Four new Amstrad games from a range of companies have landed on our desk this week. Knightsoft have released **Lucky Fruits** and there are no prizes whatsoever for guessing what type of game that is. You are paying £8.95 for the privilege of letting this bandit rob you. CP software have **3D Voice Chess** with a transfer routine for disc users built in. It appears that the pieces actually talk, I can't wait to see the game of the new Tim Rice musical — that should be something. Finally in this section we have two new releases from Amsoft, big daddy itself, **Dragons** and **Braxx Bluff**.

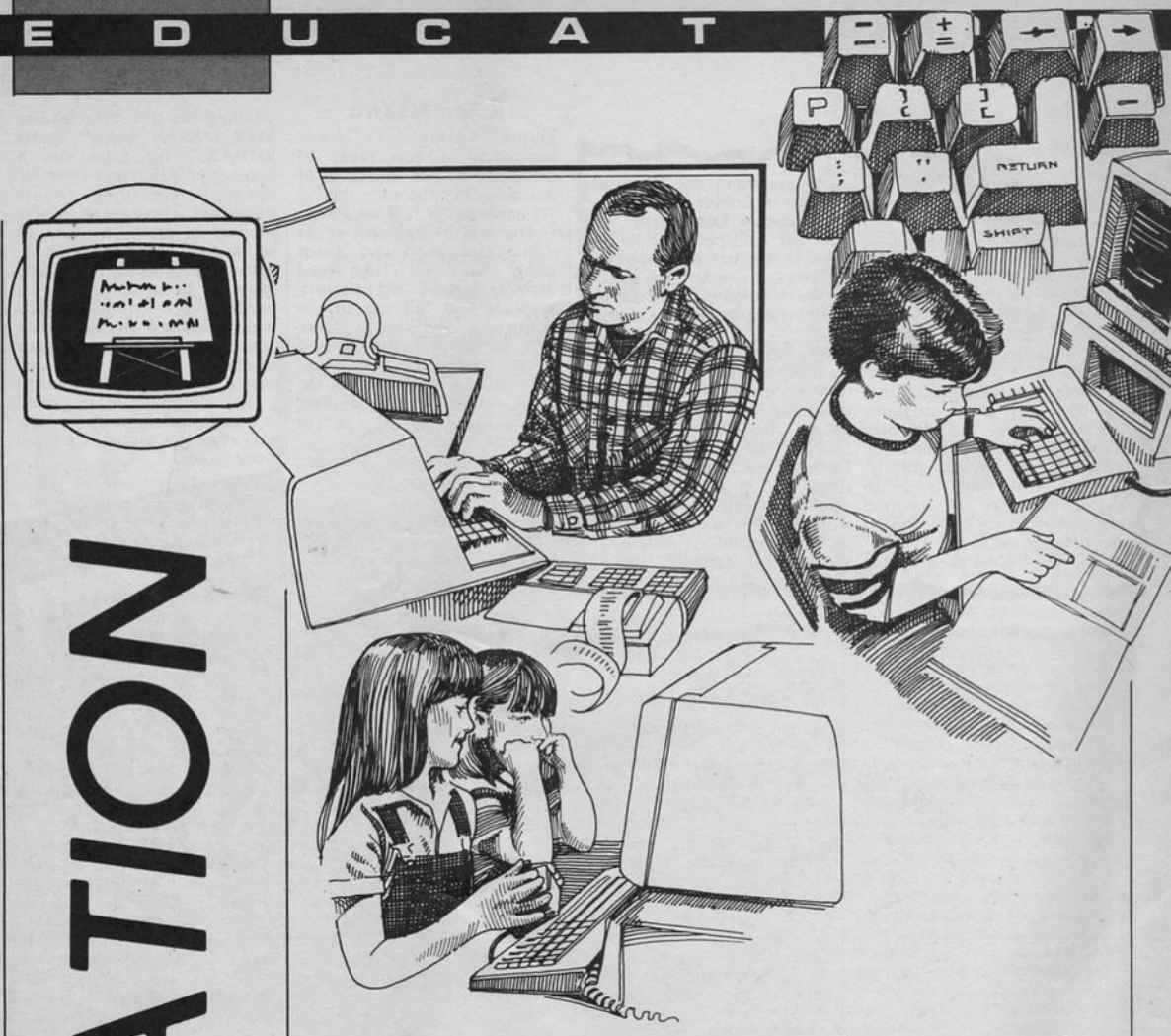
Cheapest software of the week award goes to Central Solutions for their four Spectrum games at just 99 pence each. they are a mixture of arcade games, graphic adventures and text adventures and there are promises of more to come.

Lovers of utilities might like to hear that our own Diana Smith has written an indexing program for the Spectrum called **V-Notch**, don't ask me why. The cassette is available from Transform at £12.95 and it appears that it is simplicity itself to produce an index of HCW articles. Diana claims that it is a programming miracle with 122,500 bytes crammed into the Speccy.

Activision are rather saddle sore from testing their new game **Tour de France**. The game will be promoted by Robert Millar nicknamed the King of the Mountains due to his stringy little legs. Originally for the C64 other versions will follow soon, price? £9.95.

Finally Robico inform us that one of their adventure titles has fallen foul of Chemical giant ICI. It appears that **Assassin** had been registered as a software trade mark by the conglomerate and they objected to Robico using the name. So if you want a copy of **Assassin** (by Robico not ICI) you have to ask for **Rick Hanson** or the boys will be around.

EDUCATION



With a look at the future of computing in schools and reviews of Jacaranda's new programs this week's education article from John Henderson is overflowing

Talk in the schools at the moment is based upon fears for the future. The rapid swing of the pendulum in the world of education is slowing down.

Over the last four years, schools have been hit by the computer revolution to such an extent that the same revolution is beginning to take its toll. Government plans to place a micro in every school have been very successful. However, in every revolution there are casualties. Already schools are suffering from the additional pressures of extra training and the search for educationally valuable software.

The BBC Micro, the most popular educational micro, is in danger of becoming extinct as new 16 bit machines hit the market. The government has already modified its plans and claims to want 16 bit machines in all schools to be comparable with industry. In reality, schools cannot cope with these changes. Even if a full subsidy was allowed, it would have drastic consequences — idle machines, a lack of software and still more training to try and help teachers cope with yet another development where results are required as from yesterday.

In reality what will happen is a general consolidation of the revolution to date. There are still many bridges to build. Software needs must be more adaptable to individual schools. Further skills need to be developed to allow all children access to computers — one computer in a school of 30 children, one computer in a school of 300 children is still common. Schools will look to extend hardware they already possess with comparable machines.

The Home versus School problem is yet to be tackled, although the Electron is proving a popular alternative to the Beeb. Home sales have risen over the last year so that Acorn's share of the home market stands at 22%, as opposed to 8% a year ago. Acorn is attempting to updata the BBC computer. At this moment a BBC B+ is available. Later in the year rumours suggest a B++ and even a C model. Without further financial help and training the problems of today will increase

until the revolution comes to an end. That would be unforgiveable, but serves as a reminder that all change cannot take place overnight.

The educational software scene has been explored by this column over the last few months. Software for this market is not popular among the publishers as the market is limited and the profit relatively small. Is this the real reason? Perhaps the truth is that the market is tired of over-protected and educationally damaging software designed not to educate but to occupy.

In this light it is always pleasing to see a new name come onto the software scene. This name is Jacaranda — quite a mouthful.

Jaracanda software is from the Australian stable of John Wiley, so hang onto your digeredoo and lets have a look. Six titles have been released and they all demand that players co-operate with each other. Three in particular will be looked at in this article.

Raft Away River is a simulation program for 2 to 6 players, aged approximately 7-12 years of age. Documentation is provided in the form of two booklets, one a teachers guide with follow-up suggestions, the other a students guide.

The adventure starts with the intrepid explorers stranded in a wild and remote area after their raft was destroyed. The aim is to escape before the river floods the surrounding area. The game begins in a familiar fashion by choosing one of four levels of play: Easy, Medium, Difficult and Very Difficult! Having taken an age to choose, let's look at one attempt where R Harris from class 1 (Rolf to his friends) is in league with D Edna (his friend from class 2).

A map is drawn on the computer screen and a list of the tools which each player carries is displayed. From now on it's a matter of real strategic planning. Harris, sporting a nice line in fishing rod and rope, immediately heads for the river to catch fish. Edna, being a big girl, heads for the trees to chop wood with her lusty axe in order to build a new raft.

As they near the end of day one, Harris persuades her to use this wood to start a fire. See what I mean about co-operation! Edna wins the race as it takes Harris three attempts before a fish is caught. They have further trouble lighting the fire, and the computer reminds them that they are starving by now. Hardly suprising when there are 21 commands to chose from. Starting to get the idea?

As in real life, the explorers will suffer if they do not eat. Mistakes are checked by the program. Moves already completed are greeted with a "You have done that" message and the impossible with a message "You can't do that" plus an explanation of why not. Wording in capital letters on the screen refers to things to be read by the players, wording in italics shows things to remember. Overall the screen display is pleasing and not too cluttered.

Any instructions are confined to a display window at the bottom of the screen and the players, stick figures, move to each location so that each player knows where the action is. A counter in the bottom left-hand corner of the screen records the number of moves made in the game. There is a choice of sound on/off. The ESCAPE key has been disabled, but surprisingly the BREAK key has not. Pressing this stops the program.

Gold Dust Island strands between two to five players on a desert island — fortunately not the one Roy Plumley frequents. The aim is naturally to escape. Again the emphasis is on teamwork. A screen map of the island shows three main areas to be used for boat building, collecting water and digging for gold. The fourth part of the screen is reserved for a picture of the rescue ship to be used for escape.

Each day on the island, players can choose to move, fetch water, fill a well, trade, build a boat or dig for gold. A status screen shows players which tools they are carrying, how much gold they have, how much water (starting with 10 days supply), and how many boat points they possess. As each member of the team is successful in gaining points and surviving, a portion of the rescue ship is completed to carry one, two, three people etc. Only if this ship is completed before the cyclone comes, will lives be saved. Players are represented on screen by stick figures which flash on and of when it is time to move.

Movement around the screen is by way of eight compass directions. Each movement takes up one day. Children have to be able to estimate distances as they move in screen units, with a maximum of 40 per day. Actions such as collecting water cannot be completed until the player is within each specified area. Moving too far into an area wastes time and gives the player more ground to cover.

Water can be transported into other areas to prolong activity. The best way to survive is by co-operating with another person, although there is no guarantee that any trading arrangements e.g. water for a share in the boat building, will be adhered to. This is where you discover who your real friends are.

The effects used for the cyclone are realistic, but both rescue and/or death are greeted in other ways. Rescue releases a chorus of Happy Days Are Here Again, although there is no movement from the ship, whilst a very slow version of The Death March is the sign of failure to overcome the forces of nature. Not the most effective program from Jacaranda and perhaps the one to avoid. Real children don't find desert islands full of gold. Gold Dust Island comes with three booklets — a teacher's guide, students guide and an operating manual.

Cunning Running is — guess what? — yes, a simulation, and a good one too. Up to four players take part in an orienteering course, the object of which is to collect markers hidden at random on the screen. The actual course, shown in the diagram, contains a variety of open ground, swamp, forest, paths etc. Navigation is by movement on a grid using a grid reference based on a letter and number code e.g. B2 to C4. According to where you are on the map, movement can be one, two or three squares at a time up, down or diagonally. Move three squares if on a clear path, but only one at a time if wading through the forest. Markers may be clearly displayed on the screen as small flashing triangles in one square, or else hidden in one area of the map, only to be revealed when you are in the square next to the marker.

The game ends when each participant has at least four markers, the player who collected them with the least mistakes and in the fewest moves being the winner. There is an opportunity to end the game early by pressing CTRL-P. A score sheet is displayed at the end — Jake found four markers in 44 moves with 10 mistakes — moral of the tale is not to follow him. After this, players can opt for a new game between the same players again or a different team, or to finish altogether.

Of all these programs, this one developed the most interest and excitement and was not difficult to relate to children's own experiences. With very little practice, children were able to plot the most efficient paths across the terrain.

All these programs have an element of fun and use the micro to simulate activities that would otherwise be difficult in a classroom situation. Children are in charge of the micro and their own destiny. Whilst some of the outcomes are predictable, a great effort has been made to encourage the instincts of survival through co-operation and sensible decision making. A pity that the BREAK key is not disabled. Some of the red keys could also have been programmed to help cut down the typing. All programs allowed a choice of sound on or off. This range of software will appeal to many children and teachers. Support materials are well designed and the packaging is both attractive and durable for life in the classroom. Whilst the price is on the high side — there is the possibility to extend work from these programs and they should fit well into the work of schools. Jacaranda are even running a competition to find the best classroom use for their programs. £500 to spend on hardware awaits the winners, so at least one school will get their BBC B+ at a subsidised rate.

End of first term report reads Jacaranda has settled in well and made a promising start.

Program References

All programs on 40/80 track discs.

Raft Away River £19.95
Gold Dust Island £19.95
Cunning Running £14.95
Quick Cartage Company £19.95
Scavenger Hunt £14.95
Sheep Dog Trial £14.95

John Wiley & Sons Ltd, Baffins Lane, Chichester, Sussex PO19 1UD Tel: 0243-784531

SOFTWARE

One on One

This is a simulation of a two player basketball game featuring four different levels of play. The loading screen looks great, and sadly, it's the last thing that does. The game is played on a so-called 3-D court by two very flickery and jerky block-men. Mind you, it took me about half an hour to fathom out how to get the menu to work from the instructions given in order to get to that stage!

According to the blurb, the program actually represents the playing characteristics of two well-known American players, and rambles on about tactics and offences and variations in play. To be fair, you can set it up for a one or two player game, and in addition to keyboard, there are Sinclair and Kempston joystick options.

In the final analysis, the players are so badly represented, it's difficult to see which has the ball as a result of attribute problems and flicker, and their response to control is poor. Even on the pro level, where a referee interjects every ten seconds, play is simple and rapidly becomes boring.

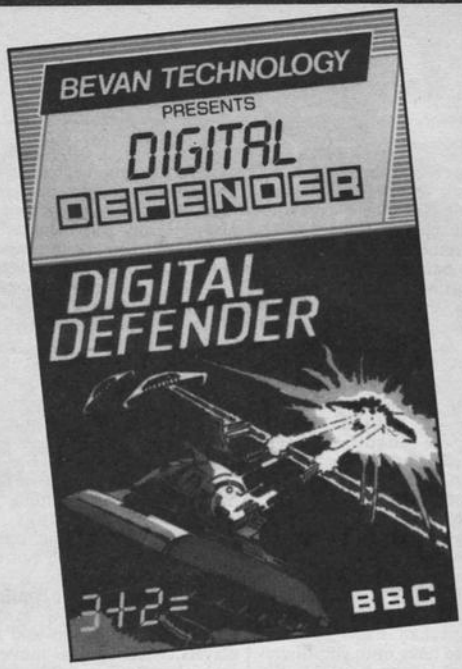
Given the excellence of Ultimate's animation techniques, this could have been really good. As it is, it has all the technical elegance of a poor £1.99 game and thus cannot be recommended at any price. As Ariolasoft illustrate the sleeve with screen shots from the Commodore 64 version, are we to presume that they too recognise its limitations? **D.M.**

Price: £8.95

Publisher: Ariolasoft

Address: Asphalte House, Palace Street, London SW1E 5HS

SPECTRUM



Digital Defender

I'm sure that if I hear the Star Wars theme played once more on a piece of alien zapping software, I will scream! Not a bad implementation here, however, and a neat idea the game offers is the option to centre the screen display with the cursor keys whilst the main program is loading.

Originality stops there, I'm afraid. Despite a kind of cute parable offered as the background to the game (aliens have landed whilst we've been busy playing Invaders and they have stolen all of our formulae), I'm forced to admit that I could hardly bear to play this — and hopefully I'm getting paid to do so!

Your MFB (Manoeuverable Flying Base) snails its way across the low horizon whilst an assortment of pathetically slow-moving aliens cross the sky at various heights. Some fun, huh? Well, what makes it almost unbearably awful is that these aliens can only manage to appear one at a time, thus allowing you to answer the phone or make a cup of coffee or whatever and still shoot the "mutant" down.

However, this isn't a version of Invaders, despite the promise of the cassette cover and the background documentation. The whole pointless exercise is just an excuse to offer you a simple equation to solve — addition, subtraction, multiplication or division depending on which mega scenario you choose. Despite the presence of a hi-score table and three lives (you lose if you should miss the alien — ha! — or fail to solve the equation — double ha!).

Now it may be that you need a little bit of fun to sweeten the pill of a basic teach 'em game and on that basis I suppose this is as good and as bad as half a dozen others, but it does seem a mite sneaky to try and package it as a shoot 'em up.

If you're into aliens you might well pick this up and be more than a touch annoyed, especially as the fun elements are so incredibly dull; if you're a teacher or parent looking for a simple maths aid for your kids then you'll probably never even pick this up. Come to think of it, that is almost certainly the best possible thing that could happen to you. **D.R.**

Price: £7.95

Publisher: Bevan Technology

Address: Gresham Chambers, 14 Lickfield St, Wolverhampton WV1 1DG

BBC

Vagan Attack

Sometimes, I wonder whether anybody takes much notice of the reviews that my colleagues and I write. Time and time again I have read or indeed written that just because software is labelled "budget" it does not mean that software companies can get away with releasing sub-standard material.

Atlantis Software obviously haven't applied the above maxim to their latest release for the Amstrad. Vagan Attack is a sort of Star Trek game where you wander from quadrant to quadrant ridding the galaxy of Klingons, Zargs or whatever the malevolent enemy is called.

This sort of game is essentially a management game with you planning your journeys, refuelling at starbases, keeping a close eye on energy, weapons and so on. Code Name MAT, which is available for the Amstrad and many other computers, added great arcade action to the basic plot, while Salamander Software's Star Trek was so detailed and graphically excellent that it was a joy to play. These were both programs released some time ago.

This new product has neither the graphical quality nor the combat action to keep you playing. Commands have to be clumsily entered by two letter codes and the response time is pretty slow. I couldn't find a way to break into it at first but could see that the whole program was written in BASIC. There is nothing actually wrong in this but it is not even particularly well-written.

I suppose one could purchase it under the pretence of buying a traditional computer game, Star Trek being one of the earliest, but you may be just as well advised to scour the computer magazines for a "free" listing. **C.G.**

Price: £1.99

Publisher: Atlantis Software

Address: 19 Prebend St, London N1 8PF

AMSTRAD

Alien

I have a slight distrust of software which leans heavily upon a well-known title from the cinema. There are exceptions, such as Rocky Horror, but frankly I'm not sure this program would really create any ripples if it were not for the book and the film.

The screen is split into three main sections. The left-side shows a map of part of Nostromo, the spaceship on which the unfortunate crew find themselves. The right side gives the various menus from which actions can be selected, and at the bottom of the screen is the final window containing status reports, messages of despair and the like!

Nostromo, as you are doubtless aware, has been invaded by the Alien, who has utilised the body of one of the crew, although this varies from game to game. By moving various other members of the crew around the ship, the idea is to decide where the Android is — and then trap it. Care must be taken with weapons, as the body exudes an acid-like substance when wounded, but with luck it might be possible to blast the creature into space through an airlock.

The menu system is simple, with keys or joystick moving a selection band on a menu. It is fast and responsive, often faster than the program allows the character to move.

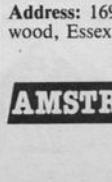
I found the program a little repetitive to play, but I am sure that it will appeal to many owners, and will be a big seller. Perhaps I would enjoy it more if I was better at it... **P.T.**

Price: £8.95

Publisher: Amsoft

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

AMSTRAD



Kayak

One of the first computer games I ever played, years ago, involved driving a car around a winding racetrack. The edges of the track were marked by rows of white posts, and all the player had to do was to move to the left or right to keep the car between the posts. This game is very reminiscent of that one, except that the car has been replaced by a kayak.

The screen display is of a scrolling river, its smooth blue surface broken at intervals by white blodges. As your kayak moves steadily along the river — it is paddled automatically, you only have to steer it — pairs of posts appear. You are supposed to aim the kayak between these posts, keeping the white posts to your left and the red ones to your right. However, the steering becomes very erratic as you get close to the posts, so success depends more on luck than good judgement.

If you negotiate a pair of posts successfully, a white square appears instead. When you have passed 25 pairs of posts, the game ends. No score is given, but I suppose you could count up the black and white squares if you want to know how you've done.

The sound effects, a steady splish-splosh which continues even after you have completed the course, add to the soporific effect. A dull idea, poorly executed — give this one a miss. **M.N.**

Price: £2.50

Publisher: Creative Sparks

Address: Thomson Hse, 290 Farnborough Rd, Farnborough Hants

C64

★★★★★

Flipped

★★★★

Hooked

★★★

Keen

★★

Yawning

★

Comatose

REVIEWS

The Covenant

This game reminded me a lot of Backpackers Guide To The Universe and other games from Fantasy. Your task, as the last survivor of an ancient race, is to re-assemble the covenant detailing its culture. This has carelessly been scattered in 64 pieces over 256 caverns. You must also capture the creatures living in these caves and use them to re-populate the planet's surface.

In practice, you power a globe shaped craft, but can only fire outside of it. The caverns are divided into zones of four screens. In each zone you must find the specific ammunition, then stun the particular type of creature which inhabits the area — there are eight creatures per zone — and drive over them to collect them. Next you need to find a key, take it to an electronic lock, and the entrances to more zones will be revealed.

There is a tough energy limit, which makes the game very hard to play initially. Without using the save option I could not pass the first zone. It's fair to say this would be too difficult for some buyers.

Graphically, the caverns look attractive, and the animation is good, particularly when your man is jumping around. Colour is well used, and sound is reasonable. The game has a professional feel and is well presented.

PSS call this an arcventure, but it doesn't require that much thought, and I think it will appeal more to the crack arcade addicts. I also feel it is a pound overpriced. **P.S.**

Price: £6.95

Publisher: PSS

Address: 452 Stoney Stanton Rd, Coventry CV6 5DG

SPECTRUM

Grand Prix Rally II

This program is one of the first motor racing games to be released for the Amstrad computer. Sat behind the wheel of your powerful rally car you tear around 10 different circuits at break neck speed.

The circuits provided all have differing characteristics, these include rain, fog, ice, darkness, deserts, bridges. All of which have varying effects upon the performance of your car.

Control is via the joystick, with steering and braking being the only controls available. There are no gears and acceleration occurs automatically.

The roads are drawn with perspective going into the screen, the effect of movement being provided by a flashing striped edge to the road. The circuits are constructed of straights and bends of differing severity. Some bends require you to brake quite heavily if you are to stay on the road. On many of the circuits you can actually get two wheels on the grass verge and overtake a car. Try the same manoeuvre on the bridge circuit and you had better be a good swimmer.

Should you tire of the 10 circuits that are provided you can create your own race tracks using the in-built editor. These can then be saved to tape for use at a later date.

Graphically the game is very good, the cars are huge, the scenery is detailed; it is such a pity that you have so little control over the car. If they had provided gears and an accelerator the game would have been much better. **J.R.**

Price: £8.95

Publisher: Amsoft (Loriciels)

Address: Brentwood House, 169 Kings Road, Brentwood, Essex CM14 4EF

AMSTRAD

AirWolf

Airwolf is a computer game which is based on the popular TV series of the same name. Your mission is to rescue five US scientists who are being held hostage deep within a subterranean base in the Arizona desert.

You must guide Airwolf on a tortuous twisting route through the base. The base is scattered with defence shields through which you must blast your way. As if these didn't provide sufficient hinderance you must avoid the rotating radar dishes, the killer droids, and fly through tunnels which are no wider than Airwolf itself.

Essentially Airwolf is a variant on the "Scramble" variety of arcade game, but is far superior to any of its predecessors. The theme tune from the TV series is played in stereo throughout the game. Loving care and attention has been paid to both the background and character designs. These are drawn in glorious colour and incredible detail.

The game can only be used in conjunction with a joystick. Airwolf reacts instantly to any slight movement of the stick, which can be quite a problem when negotiating the narrow sections.

As the game begins, five emblems are displayed at the bottom of the screen. Each time you come into contact with a wall there is a nasty grating noise and one of the emblems is erased. Run out of emblems and your billion dollar chopper goes up in smoke — I hope it's covered by fully-comprehensive insurance.

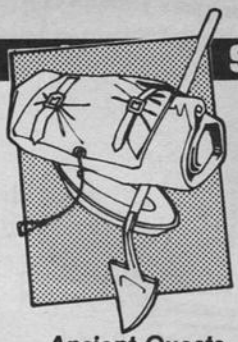
I thought the game was excellent yet my wife was disappointed. She thought a copy of Jean Michael Vincent, the star of the show, should have been provided with the game. **J.R.**

Price: £8.95

Publisher: Amsoft (Elite Systems)

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

AMSTRAD



Ancient Quests

This educational arcade package is aimed at the 5-11 year old, and has a game on each side of the tape.

Side one, King Tut's Treasure, is a Sabre Wulf variant, with the player taking on the role of an explorer in Egypt. Using a metal detector, you search for fragments of the treasure shown at the side of the screen, which can involve matching shapes, matching shapes with names, matching fractions with names, finding the missing part and matching fractions with decimals. If something is buried on a screen, using a beep and a bar graph which increase as the player gets nearer, it can be dug up. If the treasure doesn't match, the player may need to remember its location anyway for later use.

The Count on side two is a castle maze game, like Atic Atac but without anything to avoid. At certain points a number of rats, ghosts, crocodiles and the like float past, and the player has to answer a question involving counting, addition, subtraction, division or multiplication.

Both games are well programmed, and speed, difficulty and the type of question are all definable. Presentation is clear and simple. Both have attractive, smooth and well defined graphics. The Count is more colourful, with very appealing sound, but King Tut is a more playable game, which can be quite challenging on the harder skill levels. Neither game has good control keys, but joysticks are supported. Both games will require some mapping skills from the child

Generally, a good package. The child will enjoy the games and there is plenty of educational value. **P.S.**

Price: £7.95

Publisher: Mirrorsoft

Address: Holborn Circus, London EC1P 1DQ

SPECTRUM

The Great American Cross-Country Road Race

Why, I wonder, are nearly all road race games set in America? Driving across the Sahara or over the Andes would be much more exciting than this predictable slog from the Pacific to the Atlantic coast of the USA.

The instructions appear to be dauntingly long, until you realise that they are in four different languages and cover three different versions of the game. Once you have identified the relevant sections, there isn't that much to wade through. They describe how to choose one of the four possible routes and select your next destination city, and how to drive the car. Driving is surprisingly easy once you have mastered the art of gear changing, as the great American highways are quite straight and carry very little traffic.

The most awkward part is filling up with gas, as the gas stations are few and far between. If you run out, or blow the engine by mistiming your gear changes, you have to "push" the car to the next gas station by repeatedly pressing the joystick button. This takes so long that you will almost certainly run out of time and be disqualified.

You are told your position in the race at the end of each stage, and there is a hi-score table in which you can enter your name if you finish in the top 10.

A few more potential disasters might have redeemed this game, but as it is it's marginally less exciting than a long drive up the M1. **M.N.**

Price: £9.99

Publisher: Activision

Address: 15 Harley Hse, Marylebone Rd, Regent's Park, London NW1 5HE

Mad Doctor

Dr Blockenspiel, commonly known as the Mad Doctor, has a great ambition: he means to create a monster and bring it to life. He intends to obtain the parts for his creation from the village of Studelberg — the dwellings, the village centre and the graveyard are all good hunting grounds.

As he wanders around the village, he inspects everyone he meets, selecting the head, body, arms and legs he will use, and also keeps a look out for other necessary items such as the bolt which will hold the parts together and the metal kite which will attract lightning to bring the monster to life.

This is a very gory scenario for an adventure. Killing villagers and digging up corpses is really not my idea of fun, and a distaste for the idea prejudiced me against the game before I had even started to play it. However, I have to admit that though the storyline is revolting, it has been well executed. The 3-D animated graphics are quite impressive, and the joystick control, with the options being selected from a panel at the bottom of the screen, works well.

As you only have to choose between the options listed instead of having to work out for yourself what commands are available, this is rather easier than most text adventures. I did not, however, succeed in bringing a monster to life because the program kept crashing halfway through the process.

I do hope the programmer will find less blood-thirsty outlets for his undoubted talents in the future. **M.N.**

Price: £8.95

Publisher: Creative Sparks

Address: Thomson Hse, 296 Farnborough Rd, Farnborough Hants

Merlin

This is one of Creative Sparks "Sparklers" range. Your task is to help Merlin fight off his adversaries and the only way he can do this is by mixing up a spell.

You have to collect a part of the spell as it appears at the bottom of the screen and then drop it into a cauldron. He is hindered in this process by myriad flying creatures, all out to stop him depositing his pieces of spell — a jewel, a skull, an eye and a lizards leg — into the pot.

Once five pieces of Merlin's magic are in the pot he is whisked to the next and more dangerous level. This seems very easy (I hear you say) but there is more.

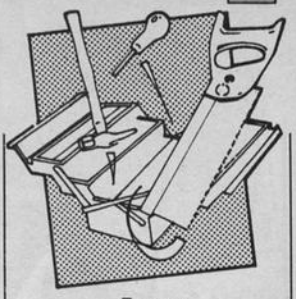
Every now and then the opposition drop a parachute into the cauldron. The anti-magic spell suspended from the parachute nullifies the contents of the cauldron and forces you to start once again on your quest.

Graphically the game is quite good, Merlin and the nasties all move very smoothly. I especially like the way Merlin rides to the pot on a fluffy cloud and how the parachute floats gracefully downwards. Sound is limited to a noise meant to create a magic spell effect — not very inspiring. Notwithstanding this Merlin is a game worth looking at and at £2.50 comes within the range of pocket money games. **M.W.**

Price: £2.50

Publisher: Creative Sparks

Address: Thomson Hse, 296 Farnborough Rd, Farnborough Hants



Fmon

There are many powerful ROM based monitors available so I was surprised to find Fsoft's RAM based monitor for review.

Apart from being RAM based, Fmon is peculiar in its use of three system variables, A1, A2 and A3. Parameters for commands are read from these so if you wanted to move a block of memory from &2000 to &217F into RAM from &3500 onwards, you have to set A2 to &2000, A3 to &217F and A1 to &3500, and then invoke the memory move command.

Setting A1 is easily accomplished by simply entering a number but A2 and A3 cannot be set directly. Instead, there are commands to cop A1 to A2, swap A1 with A2 etc. In actual fact, these commands have been so designed that to achieve the block move, you simply type "2000,217F X3500M" First A1 is set to &2000, comma swaps A1 with A2, " X" swaps A1 with A3, finally set A1 to &3500 and invoke command. After a while, you could probably get used to this system, but I prefer to be able to type in M 2000, 217F 3500 instead without worrying about variables.

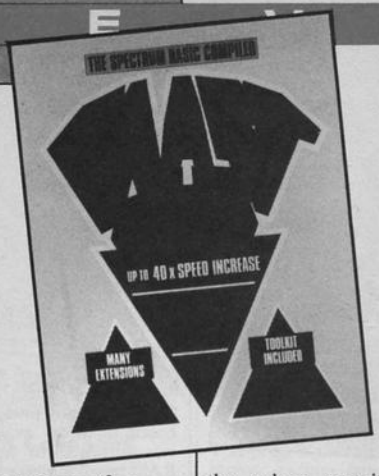
It's a shame I had to be so critical about something so fundamental because the monitor is in fact packed with features. It includes a disassembler, relocator, line assembler, break point handler, user defined variables, recursive procedures and macros.

These features are very powerful but do take up 5K. This means that on a disc based machine, debugging a game in a graphics mode is almost impossible. If only this monitor was in ROM. **S.S.**

Price: £9.00

Publisher: Fsoft

Address: PO Box 352, Brighton BN1 3AY



Blast Compiler

I'll freely admit that Blast is about the best compiler you're ever likely to want or need. The amount of thought and development that must have gone into it was probably enormous. Yet all the time I was using it, the thought that it would cost me virtually £25 to buy this program, if I weren't reviewing it for HCW, loomed large in my mind.

This is the first compiler I've used that accepts all the commands available in BASIC. Previously when writing programs with compilers I've often spent ages trying to work out how to carry out certain tasks when a number of BASIC commands aren't accepted by the compiler (one compiler that I've used hardly let you use any commands relating to string variables). With Blast though, any BASIC program at all can be compiled, either into machine code or a special 'p-code'. This is more compact than BASIC or m/c, but runs at a speed somewhere between the two.

Once loaded, Blast leaves you with very little spare ROM — barely 3K to play around with! Fortunately the manual deals with this in some detail, and describes methods of loading and saving larger programs to and from both tape and microdrive.

The manual as a whole is very well done. It covers all of Blast's features with laudable clarity, and even kicks off with explanations of some of the jargon involved. There is, however, one small and fairly irritating error with regard to the colour security system (similar to the one in JSW), which might lead you to enter an incorrect code and have it all crash on you. So, once you've entered the relevant letter (W for white, G for green, and so on) don't press ENTER as the manual instructs, — the program interprets that as part of the code.

So, what about the speed of the compiled programs? Well, to start with, I wrote a short program to plot a series of circles — not using the CIRCLE command, but using the algebraic formula for plotting points on the circumference of a circle.

This is a fairly complex bit of calculating, along the lines of: PLOT r*SIN t+127,r*COS t+87 — with a few other variables and a FOR/NEXT loop thrown in (pretty impressive huh?). In ordinary BASIC this is a hideously slow and inefficient way of drawing circles, but I wanted to make things as tough as I could for the compiler, and, to be honest, the compiled program was only a few seconds faster than the BASIC program (from 34 to 29 seconds). But, as I mentioned this was a very inefficient bit of programming in the first case, and once I started to use more sensible methods the speed factor started to drop considerably.

I've only touched on some of the features of Blast here, and to do it full justice would require a considerable amount of time and experimentation. To sum up, I can only repeat that this is the best compiler around, but how many of us amateur programmers have £25 lying around spare. **C.J.**

Price: £24.95

Publisher: Oxford Computer Systems (Software)

Address: Hensington Road, Woodstock, Oxford

SPECTRUM

Tournament Snooker

Snooker simulations are available for virtually every decent machine. Now Einstein owners can get their hands on a very good snooker simulation.

On booting the disc, rather a neat representation of a snooker table pops up and on pressing SHIFT-I, you are taken into one of the most comprehensive set of instructions. After 10 pages, I finally started the game.

On pressing SHIFT-Q, the cue pops up in the vicinity of your white ball and its direction may be changed easily (according to the instructions, it may be altered in steps as small as 0.17 degrees!). To make a shot, you press the space bar twice. The strength of the shot is determined by the time between the successive presses. The balls move smoothly and quickly although it seemed much too difficult to actually pot a ball!

During a game, you have all the usual options such as top spin, back spin and side spin as well as an option to ask your opponent to play a foul shot again and an option to concede. Surprisingly, there is also an option to save the game. I felt this option was slightly over the top but it just goes to show how much thought went into the design of this game.

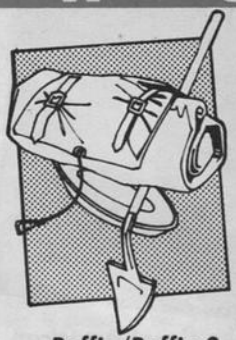
Overall, I enjoyed Tournament Snooker, — this does not automatically mean that you'll enjoy it too. But, if you like this style of game, you won't find a better snooker simulation for the Einstein at the moment. **S.S.**

Price: £14.95

Publisher: Hard Software Ltd

Address: 6 Arum Way, Braunstone Frith, Leicester LE3 6NB

EINSTEIN



Boffin/Boffin 2

Just when you thought that the platform games had got too stale and boring to be of any further interest, along comes Addictive Games (remember their semi-cult Football Manager?) to breathe new life back into the cliches.

This machine code game for both BBC and Electron offers all the usual friendly facilities — hi-score table, sound option, pause option and the familiar Z/X/Return keys for left/right/jump.

The basic aim is simple — get from one cave to the next by routes which, although studded with traps, are quite obvious. Your little scientist character (Professor Boffin, of course!) has to destroy all the unlucky horseshoes on the way before touching a resident owl who allows access to the next level. So far, so predictable.

What makes the game fun is both the means of destroying horseshoes (with an umbrella of all things) and the ablity to float down from platform to platform using the raised umbrella as a parachute. Tripods and petri-dishes are also up for grabs as well as the now common time bonuses.

Trampolines are a great way of getting over some obstacles and I spent some time on one screen just enjoying the technique before the call of further caverns drew me on.

Interesting to see the original version of Boffin here as well — good value too with 25 caverns in Boffin 2 and another 20 in Boffin. In short, a good game with lots of fun features. Addictive — but then it would have to be, wouldn't it? **D.R.**

Price: £9.95

Publisher: Addictive Games

Address: 7A Richmond Hill, Bournemouth, Dorset BH2 6HE

BBC

BOOKS

Watson's Notes: First Steps in BASIC Exploring Basic Spectrum +

These books are exactly as their titles suggest, a very simple introduction to the art of programming in BASIC. They make no assumptions about you having read the computer manual or how to get into the extended mode. Being specifically designed for the Spectrum + they even show you the position of the relevant key on the keyboard using a diagram.

This is a consistent feature of both books. After each instruction, a diagram shows you what you should see on the screen, down to the error messages and the appropriate cursor. Handy hints are given in each section, questions are asked and a space provided for the answer to be written in, there are exercises to do, and in the best school-book tradition, the answers are given at the back!

The first volume covers PRINT, SHIFT, DELETE, ENTER, CLS, BORDER, PAPER, INK, strings, sums, editing, simple programming using GOTO, NEW, RUN, BEEP, PRINT AT, LIST, on board graphics symbols, error messages, and important punctuation. Volume 2 carries on with looping, assigning values to variables, FOR-NEXT, STEP, CHR$, BREAK, using a series of graphic displays on the screen coordinates.

The best thing about these books is their simplicity and clarity. There really is no point in a teach yourself book which needs a reading age of 96 to comprehend it. With these, you don't get very far in each volume, but you do stand a chance of understanding, even if you can't program your video recorder. **D.M.**

Price: £2.95 (each)

Publisher: Glentop

Address: Standfast Hse, Bath Place, High St. Barnet, EN5 1ED

SPECTRUM

Amstrad Machine Language for the Absolute Beginner

I usually regard any book titled like this with great caution. They are often confusing and badly written, or subtly condescending. Either way, I found them hard going, none giving me the basic understanding I needed to make a start on machine code. Joe Pritchard is to be congratulated, therefore, on a book which really does start at the beginning. Not only that, he uses a very simple approach to give you a picture in your head of what's going on in the CPU and what it all means. You don't need to know about binary, hex or any of the other pitfalls before starting, Joe covers the lot with reference to counting on your fingers and toes!

You have all that you require to hand assemble simple programs for any Z80 based micro and more, because, using the published routines in the Amstrad firmware spec. you are shown how to build these into your own work. Interestingly, Joe also shows how machine language interfaces with and controls the hardware too.

Don't imagine, however, that you will sail through this in one night, then go on to write your own chart busting game. That would be too much to ask. Serious study is required, and at some point the purchase of an assembler will be useful. Even so, the first steps being the hardest, I would recommend this heartily as the best introduction I have yet to see. **D.M.**

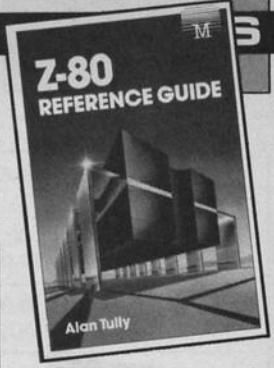
Author: Joe Pritchard

Price: £6.95

Publisher: Melbourne House

Address: Castle Yard, Richmond, TW10 6TF

AMSTRAD



Z-80 Reference Guide

As the title suggests the "Z-80 Reference Guide" is not a teach yourself Z-80 assembly language book. It is intended as a reference book for competent Z-80 programmers and also for users with some experience of assembly language who wish to expand their knowledge.

The book contains a treasure trove of information for the Z-80 programmer. Beginning with various flags and the effect of the range of Z-80 instructions upon their status. Moving on we come to the Z-80 instruction set, which appears twice. Firstly they are presented as groups which have a specific function or activity eg. single byte load groups, two byte arithmetic group, and rotate and shift group. Displayed in tabular format with a short descriptive paragraph, they are also cross-referenced to the chapter containing the second version of the instruction set.

These are merely presented in alphabetical order but each instruction has at least one page of information devoted to it. The information given is very comprehensive, it consists of the object code in decimal and hex, a written description of the action carried out by the instruction, a table showing the effect upon each of the flags, and an example of its use.

One final chapter worth mentioning is a short but very useful section of hints and tips. This consists of several routines which may be second nature to the experienced user, but could save the novice hours.

The Z-80 reference guide is a book that no Z-80 programmer should be without. **J.R.**

Author: Alan Tully

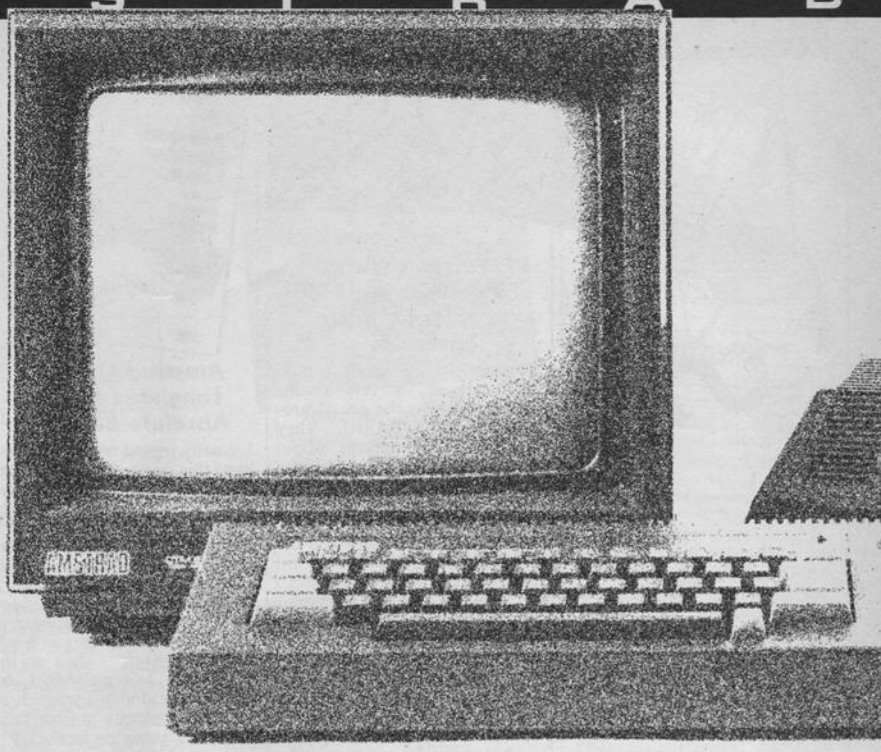
Price: £9.95

Publisher: Melbourne House

Address: Castle Yd Hse, Castle Yd, Richmond TW10 6TF

Z80

IT'S A GAME



Dave Ellis returns with a new series on the elements of games writing for Amstrad owners. This week there's advice on colours and drawing

In this series of articles I shall be taking a look at various techniques which should prove useful to anyone who wishes to write their own games programs. I can't promise that you are going to end up with a 'KNIGHT LORE' or 'SORCERY' but hopefully you will be a lot wiser at the end of the series. Points that I shall be covering are: Graphics and Text colours, colour stippling, scaling, rotating, movement by ink switching and other types of movement, logical operations and, to round off, some interrupt handling and sound. Phew!!

As the manipulation of colours plays a major part throughout the series, this first article is a recap of what you should already know. Although the four BASIC commands PEN, INK, PAPER and BORDER seem to be fairly easy to understand they do cause a lot of confusion — especially to newcomers.

The diagram DEFAULT PEN COLOURS shows the state of the colours when the Amstrad is first switched on or reset. A useful firware routine to make a note of here is &BC02. This jumpblock routine will reset the screen pack — the inks are set to their default values as shown in the diagram, as are the ink flashing rates. If you get 'lost' with the colours then a CALL &BC02 should prove useful! I've also used it at the beginning of some programs later on to make sure that the colours are set correctly. The routine at &BBFF in the jumpblock will go even further and reset just about everything.

Study the diagram again — the two dotted lines show the boundaries for MODE 2 and MODE 1. For each Mode there are a given number of 'Pens' that you can use. In MODE 2 there are just the two — 0 and 1. In MODE 1 there are four — 0 to 3, and in MODE 0 there are sixteen — 0 to 15. The confusion that exists here is that although MODE 2 only allows you to use PENS 0 and 1, it will quite happily accept a statement such as PEN 13. What happens in effect is that a Modulus is performed on the PEN colour to brings its number to within bounds. Thus:—

PEN 13 MOD 2

gives the result of 1 (MOD returns the remainder), so the PEN is set to 1. In MODE 1 a Modulus of 4 is used so:-

PEN 15 MOD 4

would give the result of 3, so PEN 3 would be the one that is used.

Each of the sixteen PENS can be filled with anyone of 27 INK colours. The diagram **COLOUR PALETTE** shows the range of the colours that can be used. The **INK** command is used to set the colour of a particular PEN. So:—

INK 3, 16

would set the colour of PEN 3 to PINK.

It would help if you think of the INK command as meaning . . . . 'Set the colour of PEN P to X' . . . where P is the PEN number and X is any one of the 27 available colours. If you specify two colours for the INK, then this will set the PEN to 'flash' between the two colours. ie:—

INK 6,0,16

would set PEN6 to flashing BLACK/PINK.

Issuing a PEN command will set the colour of any text that is to be printed with whatever colour ink the PEN is currently set to — bearing in mind the comments about the modulus. Note that previously written text is not affected by the use of the PEN command.

PAPER acts in the same manner and sets the colour that

any future background will be to that of the pen number given. I find that this is also a little confusing — the number given after PAPER is actually referring to the PEN number which 'draws' the background. A modulus is also performed on PAPER the same as for PEN. And whilst we're at it you'll be glad to know that no modulus is performed on the BORDER colours .... TNYTITCYG ... **T**he **N**umber **Y**ou **T**ype **I**s **T**he **C**olour **Y**ou **G**et!

Try typing out the listing **PEN & PAPER EXAMPLE** and you will see how PEN and PAPER work together. The whole screen background will only change colour if you do a CLS, and this will clear the background to whatever colour ink is in the current background 'pen'. To change the colour of text on the screen, or the background without issuing a CLS will need the colour of the ink in the PEN used to be changed. This technique will be looked at in greater detail in few weeks time.

Of course, the PENS and PAPERS discussed so far only operate on TEXT. Setting the colours of graphics lines and text sent to the graphics cursor (by using TAG) will be looked at in my next article. I shall also include a useful program which will help you to experiment with colour stippling.

```
10 CALL &BC02:MODE 1
15 PEN 0:PAPER 1:PRINT
20 PRINT "this is inverse video"
25 PEN 1:PAPER 3:PRINT
30 PRINT "bright yellow on bright red"
35 PEN 3:PAPER 1:PRINT
40 PRINT "bright red on bright yellow"
45 PEN 2:PAPER 3:PRINT
50 PRINT "bright cyan on bright red"
55 PEN 0:PAPER 2:PRINT
60 PRINT "blue on bright cyan"
65 PEN 1:PAPER 0:PRINT
```

PEN & PAPER EXAMPLE

PAPER/PEN	INK	COLOUR
0	1	BLUE
1	24	BRIGHT YELLOW
2	20	BRIGHT CYAN
3	6	BRIGHT RED
4	26	BRIGHT WHITE
5	0	BLACK
6	2	BRIGHT BLUE
7	8	BRIGHT MAGENTA
8	10	CYAN
9	12	YELLOW
10	14	PASTEL BLUE
11	16	PINK
12	18	BRIGHT GREEN
13	22	PASTEL GREEN
14	1/24	BLUE/BRIGHT YELLOW
15	16/11	PINK/SKY BLUE

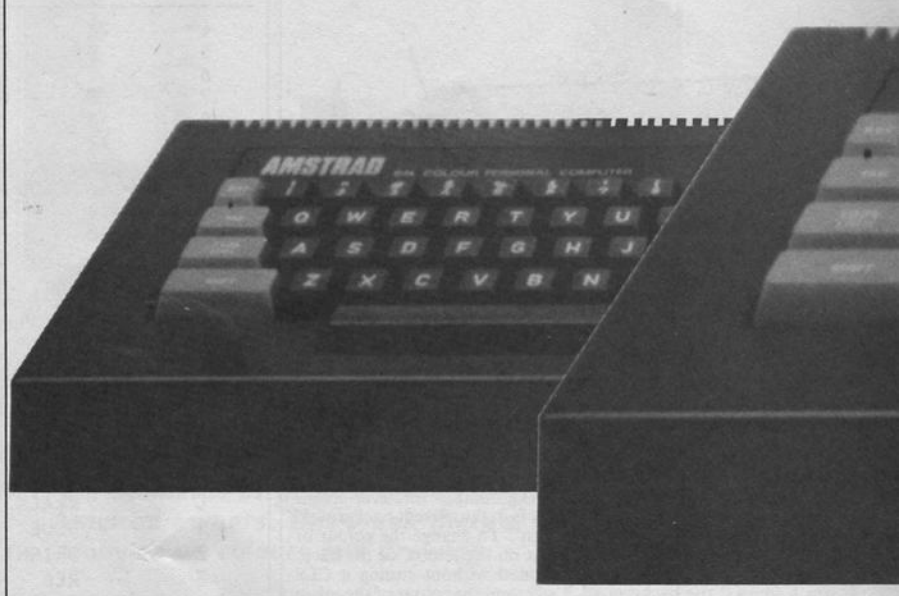
DEFAULT PEN COLOURS

NUMBER	COLOUR
0	BLACK
1	BLUE
2	BRIGHT BLUE
3	RED
4	MAGENTA
5	MAUVE
6	BRIGHT RED
7	PURPLE
8	BRIGHT MAGENTA
9	GREEN
10	CYAN
11	SKY BLUE
12	YELLOW
13	WHITE
14	PASTEL BLUE
15	ORANGE
16	PINK
17	PASTEL MAGENTA
18	BRIGHT GREEN
19	SEA GREEN
20	BRIGHT CYAN
21	LIME GREEN
22	PASTEL GREEN
23	PASTEL CYAN
24	BRIGHT YELLOW
25	PASTEL YELLOW
26	BRIGHT WHITE

COLOUR PALETTE

AMSTRAD UTILITY

EXTENSIONS



This useful program from J Keneally shows how the prowess of the Amstrad CPC464 can be enhanced using a set of expanded Basic commands

You may not be able to get a new ROM to upgrade your CPC464 to a 664, but this is the next best thing — a set of expanded Basic commands which simulate many of the extra 664 commands, and also add some additional goodies not even available to 664 users!

The extra commands

These are installed as Resident System Extensions (RSX), as described later. As with all RSX commands, they must be preceded by a vertical bar character (Shift @, and followed by exactly the right number of parameters for that command. Examples are given below.

Graphics commands

The usual MOVE, MOVER, PLOT, PLOTR, DRAW, and DRAWR commands are not able to directly set the graphics write mode, i.e. whether the graphic is written in Replace, Exclusive OR, normal OR, or AND modes. As most will know, the screen data is held in the screen memory, so it is possible to merge new data onto the existing screen in several ways.

The simplest is just to replace what was there previously by the new graphic, but many times it is useful to be a bit more subtle. Of particular use is the Exclusive OR method, as this has the property that if you write the same information twice in exactly the same way, after the second write the screen will be restored to the same state as it was before the first write. This is very useful to, for example, make a sprite pass in front of a background object (or behind it, come to that!).

Another restriction is that the MOVE commands will not accept a pen colour. The expanded commands will all accept both pen and write mode parameters as follows:—

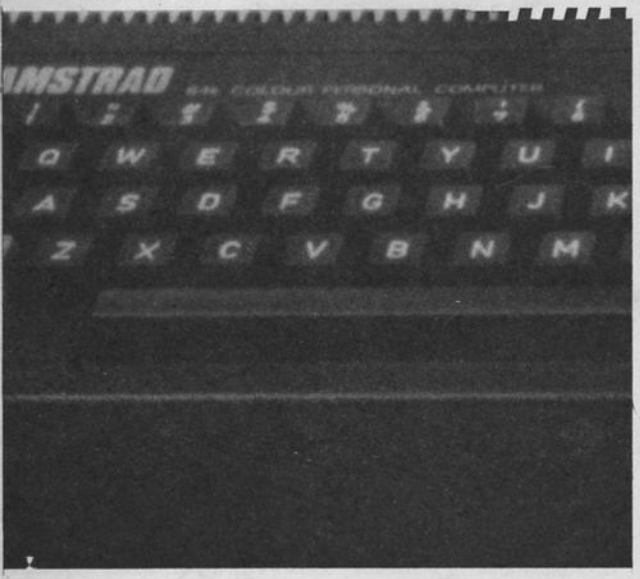
```
!MOVE,x,y,p,w
!MOVER,dx,dy,p,w
!PLOT,x,y,p,w
!PLOTR,dx,dy,p,w
!DRAW,x,y,p,w
!DRAWR,dw,dy,p,w
```

where x = xcoord, y = ycoord, dx,dy = x,y offsets p = pen, w = write mode (0 = Replace, 1 = Exclusive OR, 2 = AND, 3 = OR)

Note that the ! character has been used instead of the vertical bar, as this cannot be printed.

Cassette Commands

The normal cassette commands all insist on saving file-structured data complete with gaps between records, file headers, and so on. However, it is very useful to simply save or load a section of memory as a single continuous record. This



is done with:—

!DUMP,address,length
!LOAD,address,length

where the parameters are the start address, and the number of bytes. You must supply both of these, otherwise strange results will occur.

The other extra cassette command is an expanded CAT instruction:— 'CAT

This works in a similar way to the normal CAT, giving a catalogue of a tape, but with much more information including load address, entry address (for code segments), file type, number of bytes in the block, the state of the Protect bit, and the block number. All numbers are printed in hexadecimal.

File type is:—
0 = Basic
1 = Binary
2 = Screen image
3 = ASCII
4-7 Undefined

Protect bit is 1 if protected.

Occasionally it is useful to be able to flush out the keyboard input buffer, effectively causing the computer to wait until no keys are being pressed. This can be tricky in Basic, due to the debounce delays etc. As in the 664, this is done with the command:— !CLEARINPUT

Reading a character from the screen can be a handy trick, for example for detecting the presence of an object on the screen or overwriting and restoring an area of the screen. Although the 464 operating system has a routine for this, it is not implemented as a Basic command. The extended command is of the form:— !COPYCHR,@A$ where A$ is any string.

The @ character is essential! It allows a$ to be loaded with the screen data starting at the current position of the cursor. The string a$ should be set up initially with the number of characters you want to read along the line. For example: a$ =STRING$(5,32):!COPY CHR, A$ would read 5 characters from the screen, advancing the cursor by 5 places.

Finally, it is possible to wait for the start of a screen scan. This can also be done using CALL&BD19, but it is much easier to remember: !FRAME as the equivalent BASIC command.

The command is used to synchronise software action with the screen, e.g. to prevent flicker on sprites.

Installing the program

The BASIC listing is used to install the machine code for the extended commands. After typing it in, run it to create the code segment, and then save the code for later use using the command: SAVE"UP464",B, 43302,585

As well as creating the code, the BASIC program does a CALL 43302 in line 70 to activate the expanded commands. On subsequent occasions, you will find it quicker to load the code segment alone, rather than BASIC program. Do this by using MEMORY 43301: LOAD"" Then activate the extra command using CALL 43302.

Remember that the vertical bar character typed in front of any extra command is actually (SHIFT @ on the keyboard.

How it works

40 set memory size
50 initialise
60 poke in code
65 do checksum
70 complete loop, then check if O.K. If so, activate extra commands.
80-90 finish
100-530 code in hexadecimal

Variables

a$ hex value of code byte
ldadr current address to poke code byte
check checksum

Conversion

This uses the special properties of the CPC464, so conversion to another machine is not practical.

```
10 REM program to create extra commands
20 REM for 464-664 upgrade.
30 REM Copyright J. Keneally 1985
40 MEMORY 43301
50 RESTORE 100:READ a$:ldadr=43302:check=0
60 WHILE a$<>"end":POKE ldadr,VAL("&"+a$)
65 check=check+PEEK(ldadr):ldadr=ldadr+1
70 READ a$:WEND:IF check<>63460 THEN PRINT"Typing error":STO
P ELSE CALL 43302
80 CLS:PRINT"You may save the extra commands":PRINT"using SA
VE";CHR$(34);"UP464";CHR$(34);",B,43302,585"
90 STOP
100 DATA 01,71,a9,21,6d,a9,cd,d1,bc,c9,43,4c
110 DATA 45,41,52,49,4e,50,55,d4,43,4f,50,59
120 DATA 43,48,d2,46,52,41,4d,c5,4d,4f,56,c5
130 DATA 4d,4f,56,45,d2,50,4c,4f,d4,50,4c,4f
140 DATA 54,d2,44,52,41,d7,44,52,41,57,d2,44
150 DATA 55,4d,d0,4c,4f,41,c4,43,41,d4,00,c9
160 DATA 00,00,00,30,a9,c3,97,a9,c3,9d,a9,c3
170 DATA b9,a9,c3,ef,aa,c3,f5,aa,c3,fb,aa,c3
180 DATA 01,ab,c3,07,ab,c3,0d,ab,c3,bd,a9,c3
190 DATA d7,a9,c3,db,a9,cd,09,bb,38,fb,c9,dd
200 DATA 6e,00,dd,66,01,7e,a7,c8,47,23,7e,23
210 DATA 66,6f,cd,60,bb,77,23,3e,09,cd,5a,bb
220 DATA 10,f4,c9,cd,19,bd,c9,06,01,dd,5e,00
230 DATA dd,56,01,dd,6e,02,dd,66,03,3e,16,10
240 DATA 04,cd,9e,bc,c9,cd,a1,bc,c9,06,00,18
250 DATA e4,21,2e,ab,11,40,00,3e,2c,cd,a1,bc
260 DATA d0,cd,71,bc,cd,a7,aa,4e,61,6d,65,3a
270 DATA 20,20,00,21,2e,ab,cd,b4,aa,e5,dd,e1
280 DATA cd,a7,aa,4c,6f,61,64,20,41,64,64,72
290 DATA 65,73,73,2e,2e,00,dd,6e,15,dd,66,16
300 DATA cd,ca,aa,cd,a7,aa,42,6c,6f,63,6b,20
310 DATA 4c,65,6e,67,74,68,2e,2e,00,dd,6e,13
320 DATA dd,66,14,cd,ca,aa,cd,a7,aa,42,6c,6f
330 DATA 63,6b,20,4e,6f,2e,2e,2e,2e,2e,2e,00
340 DATA dd,6e,10,26,00,cd,ca,aa,cd,a7,aa,45
350 DATA 6e,74,72,79,20,41,64,64,72,65,73,73
360 DATA 2e,00,dd,6e,1a,dd,66,1b,cd,ca,aa,cd
370 DATA a7,aa,50,72,6f,74,65,63,74,2e,2e,2e
380 DATA 2e,2e,2e,2e,00,dd,7e,12,e6,01,6f,26
390 DATA 00,cd,ca,aa,cd,a7,aa,54,79,70,65,2e
400 DATA 2e,2e,2e,2e,2e,2e,2e,2e,2e,00,dd,7e
410 DATA 12,e6,0e,1f,6f,26,00,cd,ca,aa,c3,db
420 DATA a9,e3,7e,23,a7,20,02,e3,c9,cd,5a,bb
430 DATA 18,f4,e5,06,10,7e,cd,5a,bb,23,10,f9
440 DATA e1,3e,0d,cd,5a,bb,3e,0a,cd,5a,bb,c9
450 DATA 7c,cd,d4,aa,7d,cd,d4,aa,18,eb,47,e6
460 DATA f0,1f,1f,1f,1f,cd,e1,aa,78,e6,0f,fe
470 DATA 0a,30,05,c6,30,c3,5a,bb,c6,37,c3,5a
480 DATA bb,cd,13,ab,c3,c0,bb,cd,13,ab,c3,c3
490 DATA bb,cd,13,ab,c3,ea,bb,cd,13,ab,c3,ed
500 DATA bb,cd,13,ab,c3,f6,bb,cd,13,ab,c3,f9
510 DATA bb,dd,7e,00,e6,03,cd,59,bc,dd,7e,02
520 DATA cd,de,bb,dd,5e,06,dd,56,07,dd,6e,04
530 DATA dd,66,05,c9,end
```

BRIGHT SPRITES

Some more spritely advice from Andrew Clarke. In part three he looks at expansion, multi-colour and priorities

```
 0 REM **** PROGRAM ONE *****
 9 REM **** READ IN DATA
10 FORT=0TO62:READA
12 POKE199*64+T,A:NEXT
13 REM **** SET UP SPRITES
14 V=53248:PRINT"□"
16 POKEV+39,7:POKEV+40,14
18 POKE2040,199:POKE2041,199
20 POKEV+1,150:POKEV+2,150
22 POKEV+21,3
23 REM **** MOVE SPRITES
24 FORXY=0TO255
26 POKEV,XY:POKEV+3,XY
28 NEXT:GOTO24
99 REM **** SPRITE DATA
100 DATA0,0,0,19,255,254,48
102 DATA2,0,120,2,0,248,31
104 DATA192,255,254,32,7,248,16
106 DATA1,254,8,0,127,4,0
108 DATA15,255,0,12,48,0,24
110 DATA48,7,255,254,0,0,0
112 DATA0,0,0,0,0,0,0
114 DATA0,0,0,0,0,0,0
116 DATA0,0,0,0,0,0,0
```

Last week I left you with the problem of making sprite zero move horizontally whilst sprite one moves vertically. Program 1 will show how this is done, although this will be slightly more complicated and lengthy than yours as I've included DATA lines and a routine to POKE the DATA into memory. This is so that you have something to look at.

Easy, isn't it? Or did you try to make a mountain out of a molehill?

Quite simply the XY FOR/NEXT loop provides both the X co-ordinate for sprite zero and the Y co-ordinate for sprite one. You may have used separate X,Y variables and incremented them each time — if the effect is the same then you didn't fail!

This time I want to deal with expanding sprites, using them in multi-colour mode and how to use sprite priorities. These are three areas that really add the frills to sprite control — they are not neccessary and can be ignored, but are worth getting to know.

With expansion you have control over expanding horizontally and vertically. These can be controlled independently. Therefore a sprite can be in four expansion states:—

1 Normal (no expansion either way)
2 Expanded vertically only
3 Expanded horizontally only
4 Expanded horizontally and vertically

First let us see an expanded sprite. Place sprite zero on screen where you can see it — you ought to be able to do that easily by now. (It would help if you have typed in the program I gave you earlier as you should have something to look at).

Now type V = 53248 and press RETURN then type POKE V+23,1 and press RETURN. The sprite will expand vertically in the Y direction. Typing POKE V+23,0 will set things back to normal.

Type POKE V+29,1 and press RETURN and you'll have expansion in the X direction. Again POKEing the location with a zero will get it back to normal. (RUN/STOP and RESTORE also rectifies this but it will take the sprite off the screen as well).

If you use both POKEs together then the sprite will be really large. Various combinations can be tried to make the sprite appear different from its original shape.

The advantages should be obvious. One sprite can be displayed in four ways giving the, false, assumption that four sets of DATA are being used. You will have noticed, however, that when fully expanded the sprite appears chunky. This is more obvious with multi-colour sprites which I shall cover next.

It is possible to overcome this chunkiness by using two or more unexpanded sprites and "linking" them together to form one large character — the players in International Soccer are done this way, one sprite is the head and body, another is the legs.

For a long time, along with multiple screens, scrolling screens and hires graphics, multi-colour sprites have been an important feature of Commodore 64 games. Many cassette inlay cards mention these as one of the main game

features. This leads to the false impression that multi-colour is a forbidden zone for amateurs, where nothing could be further from the truth.

Three additional POKEs will convert any sprite to multi-colour. Get sprite zero on the screen and expand it. Leave it there and type in and RUN Program 2.

editor. You can buy them or type them in out of books — the one I use came out of HCW!

An expensive one allows you to overlay, i.e. put one sprite on top of another. This means that you can create a single colour "wire frame" sprite and then use another sprite underneath to add to a second colour.

```
0 REM **** PROGRAM TWO *****
9 REM **** READ IN DATA
10 FORT=0TO62:READA
12 POKE200*64+T,A:NEXT
13 REM **** SET POINTER
14 V=53248:PRINT"□"
16 POKE2040,200
99 REM **** MULTICOLOUR SPRITE DATA
100 DATA2,0,128,2,0,128,2
102 DATA0,128,2,130,128,0,130
104 DATA0,0,130,0,0,170,0
106 DATA2,170,128,10,170,160,42
108 DATA170,168,249,155,230,233,155
110 DATA166,249,155,230,233,155,166
112 DATA233,91,229,170,170,170,42
114 DATA170,168,10,170,160,2,170
116 DATA128,0,170,0,0,0,0
```

An unusual sprite is now on the screen. It does have a shape but then again it is hard to distinguish. The trouble is that we have used a multi-colour sprite definition in single colour mode. Type V = 53248:POKE V +28,1 and press 'RETURN. Suddenly colour! — and three colours!

One colour is controlled by the normal sprite colour POKE — POKE V + 39 for sprite zero, V + 40 for sprite one and so on. Two other POKEs control multi colours 1 and 2 for ALL sprites. They are POKE V + 37 and POKE V + 38. POKE these registers with a value between 0 and 15 and try to get a combination with POKE V + 39 that you find pleasing. Note that the fourth colour available is simply the screen colour showing through any "holes" in the sprite, so it isn't a true colour as such.

As with locations V + 16, V + 21, V + 23 and V + 29 mentioned last time, location V + 28 is able to affect sprites individually — i.e. value of 1 refers to sprite zero, 64 refers to sprite six. Therefore 65 is **both** sprites zero and six.

To create sprites in multi-color or in single colour requires the use of a sprite

Bruce Carver uses this technique in both Raid Over Moscow and Beach Head. It has one advantage in that it offers better graphics definition. Look at the multi-colour sprite in expanded mode — a little too chunky perhaps?

Overlay will rectify this. But it does mean the use of two sprites thereby leaving you with just another six to play around with — you may not need them all in your current simple games, but later on you'll miss them. Also it means controlling two sprites together, which in BASIC can mean a slower game. So for us multi-colour is easier than overlay — try the unexpanded multi-colour sprite and everything looks a lot better.

Our final topic this week is priorities of sprites. There are two types of priority — sprite to sprite and sprite to background.

Sprite to sprite priority is fixed and may not be altered. Sprite zero has the highest priority, sprite 1 is next, then 2 and finally up to 7, which has the lowest priority. This means that whenever sprites cross, the one with the highest priority will always appear to be on top.

So how do we use this?

Let us consider a tennis game written in the same way as Matchpoint where you view the court end-on. The priorities must be related to the way the sprites will be used. For example, the player nearest to us will always be "over" the other player and also "over" the ball — he will obscure it if he passes in front of it. The ball, though, will not be obscured by the other player.

Common sense tells us that the nearest player ought to be sprite zero, the ball sprite one and the other player is sprite two. If we were to write this game, however, we should need to ascertain character priorities before we start so that sprites can be correctly assigned to the appropriate game character.

Sprite to background priority can be changed, though. This is achieved by POKEing location V + 27 with the sprite value — as before 1 for sprite zero, 2 for sprite one, 4 for sprite two and so on.

The chosen sprite will now go behind any character data that is on screen. To demonstrate this put sprite zero on screen then type around where it is. You'll notice that all the letters and other characters cannot be seen as the sprite blocks them out — although some will show through the "holes" in the sprite.

Now type V = 53248:POKE V + 27,1 and press RETURN. All the type will now appear on top of the sprite. Using this has to be carefully thought out too. Think of the tennis game again, where the net is made of character data, as are the court lines. Obviously the nearest player will not go "behind" the net so his sprite to background priority remains untouched. The other player, however, must be switched to go behind the net each time he approaches it. When he isn't near it you should switch back so that the court lines do not show through him.

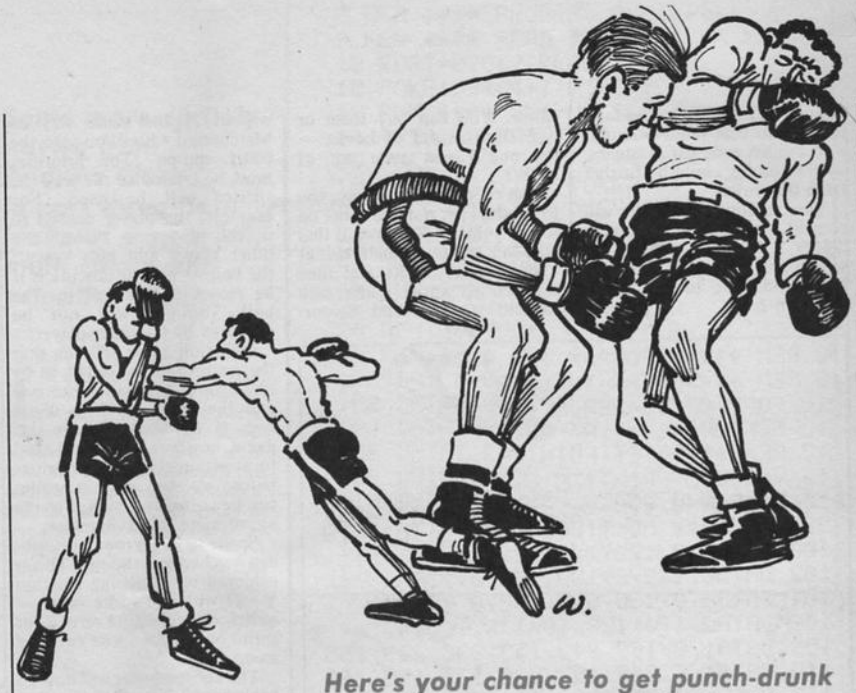
And the ball sprite? This too must be switched continually. It should be "over" the net when in the nearest court and under it when in the far court — it should also be switched to avoid going behind the court line markings. Complicated, isn't it?

The answer is to plan out your programs carefully before you write them. If it is too complicated then simplify it, drastically.

To end, I'll leave you with some rather pleasant homework. No typing, just watching and playing. Try to spot the examples of expansion, multi-colour, priority, and the other points made here, in games that you have bought. Happy hunting! Next time we look at animated sprites.

C64 GAME

SECONDS OUT



Here's your chance to get punch-drunk in this knockout game for the C64 from Richard Webb

Only you can decide the future for cockney contender Bruno and reigning champion American Holmes as they battle it out in the ring.

After 14 hard fought rounds the two muscle-bound lads go into the 15th and final round with all points square. The object of the game is to outwit Holmes with some cunning right hooks and perhaps an uppercut or two.

Bruno gets into action by the Z and X keys to go right and left and the return key to punch. So put in your gum-shields (if you want to feel really silly) — and let's keep it a good clean fight.

Variables

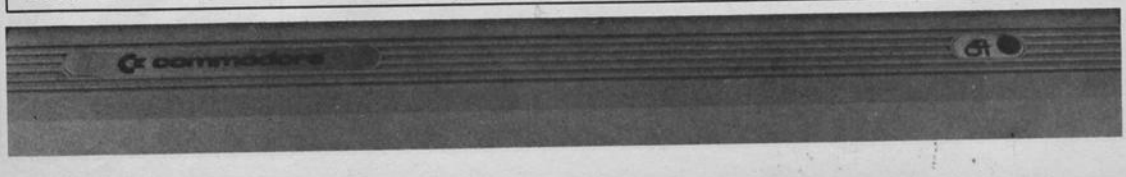
V beginning of VIC register
S beginning of SID register
X1,Y1 X & Y positions of Bruno sprite
X2,Y2 X & Y positions of Holmes sprite
P1,P2 points score of Bruno & Holmes
TI$ the time
CM random number to choose Holmes' action
Q variable showing detection of a collision of sprites
X$ checks for the depression of a key
A$,B$,C$ used to help print the screen, score & time

How it works

20-85 read in sprites, sets their colours and positions
90-145 prints screen and the boxing ring
150-160 starts round
200-300 main program — checks for a key pressed and then reacts
600-640 prints time and score
650-670 shows Bruno punching
700-780 chooses Holmes' action, then carries it out
3000-4000 title and instructions
5000-5500 sound recreating bell and sound of a punch
6000-6060 end of game with relevant options
7000-8000 shows a knock-out

```
1 REM ------------------------------
2 REM ---- S E C O N D S  O U T ----
3 REM ------------------------------
4 REM ---- B Y   R . W E B B    ----
5 REM ------------------------------
10 POKE53281,0:POKE53280,13:GOSUB2999
20 A$="[RIGHT][RIGHT][RIGHT][RIGHT][RIGHT][RIGHT][RIGHT][RIGHT][RVSON][BLUE][s N
][c 7]                        [BLUE][s M][RVSOFF]           ":B$="[HOME][DOWN][DOWN][
DOWN][DOWN][RIGHT][RIGHT][RIGHT][RIGHT][RIGHT][RIGHT][RIGHT][RIGHT][RIGHT][RIGHT
]"
25 C$="[RIGHT][RIGHT][RIGHT][RIGHT][RIGHT][RIGHT][RIGHT][RIGHT][RVSON][BLUE][s N
]                     [BLUE][s M][RVSOFF]"
29 REM -- SET UP SPRITES COL. & POS.--
30 V=53248:GOSUB60
32 POKE2040,192:POKE2042,194
35 POKEV+21,5:POKEV+29,63:POKEV+23,63:POKEV+28,63:POKEV+38,11
40 POKEV+39,7:POKEV+40,7:POKEV+41,10:POKEV+42,10
50 X1=105:Y1=175:POKEV+0,X1:POKEV+1,Y1:X2=200:Y2=175:POKEV+4,X2:POKEV+5,Y2
55 GOTO90
59 REM ---- READ IN THE 6 SPRITES ----
60 FORX=0TO62:READA:POKE12288+X,A:NEXT
65 FORX=0TO62:READA:POKE12352+X,A:NEXT
70 FORX=0TO62:READA:POKE12416+X,A:NEXT
80 FORX=0TO62:READA:POKE12480+X,A:NEXT
81 FORX=0TO62:READA:POKE12544+X,A:NEXT
82 FORX=0TO62:READA:POKE12608+X,A:NEXT
85 RETURN
90 POKE53265,PEEK(53265)AND239
95 P1=0:P2=0
99 REM --- SCREEN,BOXINGRING ETC ----
100 PRINT"[CLEAR][DOWN][DOWN][DOWN][DOWN][DOWN][DOWN][DOWN][DOWN][DOWN][DO
WN][DOWN][DOWN][DOWN][DOWN][DOWN][DOWN]":FORX=0TO3:PRINTA$;:NEXT:PRINTC$
110 PRINT"[HOME]";:FORX=0TO19:PRINT"[YELLOW][s Q][c 3][s Q]";:NEXT
120 FORX=0TO10:PRINT"[YELLOW][s Q]";SPC(38);"[c 3][s Q]":NEXT
130 FORX=0TO19:PRINT"[YELLOW][s Q][c 3][s Q]";:NEXT
140 PRINT"[HOME][DOWN][DOWN][RIGHT][RIGHT][YELLOW]  BIG BRUNO";SPC(11);"[c 3]HAS
SLER HOLMES"
145 POKE53265,PEEK(53265)OR 16
150 PRINTB$;"SECONDS OUT!!!!":FORX=1TO500:NEXT:PRINTB$;"                    "
160 GOSUB5000
199 REM --- MAIN PROGRAM -----
200 TI$="000000"
210 GOSUB600
220 GETX$:IFX$=""THEN300
230 IFX$="Z"THENX1=X1-3:IFX1<90THENX1=90
240 IFX$="X"THENX1=X1+3:IFX1>X2-23THENX1=X1-3
250 IF X$=CHR$(133)THEN POKEV+21,0:RUN
290 IFX$=CHR$(13)THENGOSUB649
300 POKE198,0:POKEV+0,X1:POKEV+1,Y1:GOSUB699:GOTO210
600 REM- --- TIME PRINTED AND PTS ----
610 PRINTLEFT$(B$,8);P1;" PTS";SPC(17);P2-2;" PTS"
620 PRINTB$;SPC(6);MID$(TI$,3,2);" MINS"
630 PRINTB$;SPC(6)"[DOWN][DOWN]";RIGHT$(TI$,2);" SECS"
635 IF TI$="000300"THENFORX=0TO2999:NEXT:GOTO6000
640 RETURN
649 REM ---- BRUNO'S PUNCH -----
650 X1=X1+4:POKE2040,193:POKEV+0,X1:POKEV+1,Y1:Q=PEEK(V+30):IFQ=5THENP1=P1+2
655 GOSUB5500:IFQ=5THENX2=X2+2
660 Q=0:POKE2040,192:X1=X1-4
670 IFP1>250 AND P1>P2THEN8000
699 REM ------ HOLMES' GO ------
700 CM=INT(RND(1)*4)+1
710 IFCM=1 THENX2=X2+3:IFX2>210THENX2=210
720 IFCM=2THENX2=X2-4:IFX2<X1+23THENX2=X1+23
730 IFCM<>3 AND CM<>4THEN760
740 X2=X2-3:POKE2042,195:POKEV+4,X2:POKEV+5,Y2:Q=PEEK(V+30):IFQ=5THENP2=P2+2
750 GOSUB5500:POKE2042,194:X2=X2+3:Q=0:X1=X1-1:IFX1<90 THENX1=90
760 POKEV+4,X2:POKEV+5,Y2
```

```
 770 IFP2>350THEN7000
 780 RETURN
1999 REM ----- LEFT - SPRITE 1 -------
2000 DATA 0,252,0,0,239,0,0,252,0,0,252,0,0,48,128,0,255,128,0,255,128,0,252,0
2010 DATA 0,255,128,0,252,128,0,252,0,0,168,0,0,168,0,0,168,0,0,136,0,0,204,0
2020 DATA 0,204,0,0,136,0,0,136,0,0,136,0,0,170,0
2029 REM ----- LEFT - SPRITE 2 -------
2030 DATA 0,252,0,0,239,0,0,252,0,0,252,0,0,48,2,0,255,254,0,252,131,0,255,128
2040 DATA 0,252,128,0,252,0,0,252,0,0,168,0,0,168,0,0,136,0,0,204,0
2050 DATA 3,204,0,2,8,0,2,8,0,2,8,0,2,138,0
2059 REM ----- RIGHT- SPRITE 3 -------
2060 DATA 0,63,0,0,251,0,0,63,0,0,63,0,2,12,0,2,255,0,2,255,0,0,63,0,2,255,0
2070 DATA 2,63,0,0,63,0,0,42,0,0,42,0,0,42,0,0,34,0,0,51,0,0,51,0,0,34,0,0,34,0
2080 DATA 0,34,0,0,170,0
2089 REM ----- RIGHT- SPRITE 4 -------
2090 DATA 0,63,0,0,251,0,0,63,0,0,63,0,128,12,0,191,255,0,130,63,0,2,255,0
2100 DATA 2,63,0,0,63,0,0,63,0,0,42,0,0,42,0,0,42,0,0,34,0,0,51,0,0,51,192
2110 DATA 0,32,128,0,32,128,0,32,128,0,162,128
2119 REM ----- LEFT -SPRITE 5 ------
2120 DATA 0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
2130 DATA 0,128,0,0,128,0,0,128,0,0,192,0,0,192,0,0,192,0,48,192,0,252,192,8
2140 DATA 239,251,168,255,251,168
2149 REM ----- RIGHT-SPRITE 6 -----
2150 DATA 0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
2160 DATA 0,2,0,0,2,0,0,2,0,0,3,0,0,3,0,0,3,0,0,3,12,128,3,63,171,175,251
2170 DATA 171,175,255
2999 PRINT"[CLEAR][HOME][c 7]";
3000 REM --- TITLE & INSTRUCTIONS ----
3010 PRINTSPC(10);"  SECONDS OUT !"
3020 PRINTSPC(10);" ---------------"
3030 PRINT:PRINT" WELCOME!! TO WEMBLEY ARENA .[c 3]"
3040 PRINT"IN THIS GAME [YELLOW]YOU [c 3]PLAY THE PART OF[YELLOW] FRANK BRUNO[c
3] IN THE LAST ROUND";
3050 PRINT" OF HIS WORLD      TITLE FIGHT AGAINST[YELLOW] LARRY HOLMES[c 3] WITH
 THE";
3060 PRINT"  POINTS ALL SQUARE."
3070 PRINT"      TO SCORE POINTS YOU MUST PUNCH THE  OPPONENT AS MANY";
3080 PRINT" TIMES AS YOU CAN,BUT  WATCH OUT FOR HIS PUNCHES....."
3090 PRINT:PRINT:PRINT"KEYS:-  [YELLOW]PUNCH [c 3]-[RETURN]"
3100 PRINTTAB(88)"[YELLOW]LEFT  [c 3]- 'Z'"
3110 PRINTTAB(88)"[YELLOW]RIGHT [c 3]- 'X'"
4000 RETURN
4999 REM ----- START OF ROUND -----
5000 S=54272:POKES+24,15:POKES+5,0:POKES+6,99:POKES+4,17:POKES+1,99:POKES+0,199
5010 FORX=0TO99:NEXTX:POKES+4,0:RETURN
5499 REM ----- PUNCH SOUND -----
5500 POKES+24,15:POKES+4,129:POKES+6,200:FORX=0TO30:NEXT:POKES+4,0:RETURN
5999 REM -----END OF GAME-----
6000 PRINT"[CLEAR]":POKEV+21,0:IF P1>P2THENPRINT"WELL DONE YOU DEFEATED THE CHAM
P":GOTO6020
6010 PRINT"NEVER MIND TRY AGAIN"
6020 PRINT"[DOWN][DOWN][DOWN][RIGHT][RIGHT]ANOTHER GAME?"
6030 GETX$:IFX$=""THEN6030
6040 IFX$="N"THENPRINT"[CLEAR]":END
6050 IFX$="Y"THEN32
6060 GOTO6030
6999 REM ---- BRUNO'S BEEN K.O. -----
7000 POKE2040,196:POKE2042,195:FORX=0TO1999:NEXT
7010 GOTO6000
7999 REM ---- HASSLER'S BEEN K.O. -----
8000 POKE2040,193:POKE2042,197:FORX=0TO1999:NEXT:GOTO6000
```



C64 USERS

Attention all C64 users! Listings will be simpler to type in due to the new standard that we have adopted from our sister magazine Your Commodore

Commodore listings are rather well known for the horrible little black blobs that always abound. Unfortunately the graphics characters which are used to represent graphic and control characters do not reproduce very well and they are also difficult to find on the Commodore keyboard.

For this reason HCW used to precede any control characters with a REM statement on the previous line that explained exactly what the black blobs were meant to be. Unfortunately the graphics characters were not documented and these still cause some confusion. For this reason we are marking the control and graphic characters in our listings.

In future all control and graphics commands will be replaced by a mnemonic within square brackets. This mnemonic is not typed out as printed in the magazine but rather the corresponding key or keys on the keyboard are pressed. For example [RIGHT] means press the cursor right key, you do not type in [RIGHT]. All of the keywords, what keys to press and how they are shown on the screen are shown below.

Any character that is accessed by pressing shift and letter will be printed as [s LETTER]

[s A]	shift and A
[s C]	shift & C

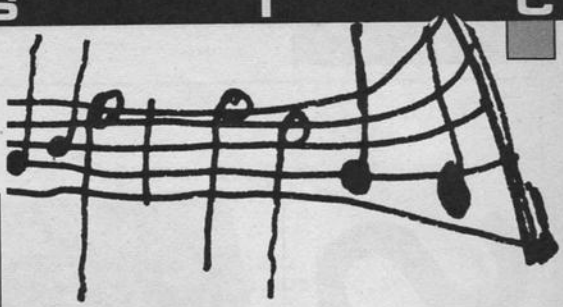
Any character that is accessed by pressing the Commodore key and a letter will be printed as [c LETTER]

[c A]	Commodore & A
[c C]	Commodore & C
[c 1]	Commodore & 1

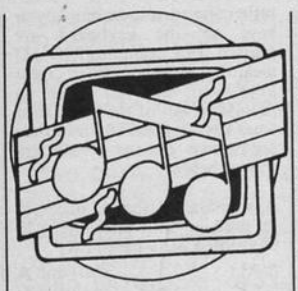
Any control key will be printed out as a number. For example [001]. Control codes are accessed by pressing the CTRL and a letter at the same time [001] is CTRL & A, 002 is CTRL & B etc. See the manual for more information about control codes.

[001]	CTRL & A
[026]	CTRL & Z

Mnemonic	Symbol	what to press
[RIGHT]		left/right
[LEFT]		shift left/right
[UP		Shift & up/down
[DOWN]		up/down
[F1]		f1
[F2]		shift & f1
[F3]		f3
[F4]		shift & f3
[F5]		f5
[F6]		shift & f5
[F7]		f7
[F8]		shift & f7
[CLEAR]		shift & CLR/HOME
[HOME]		CLR/HOME
[RVSON]		CTRL & 9
[RVSOFF]		CTRL & 0
[BLACK]		CTRL & 1
[WHITE]		CTRL & 2
[RED]		CTRL & 3
[CYAN]		CTRL & 4
[PURPLE]		CTRL & 5
[GREEN]		CTRL & 6
[BLUE]		CTRL & 7
[YELLOW]		CTRL & 8



MUSIC AND THE MICRO



This week we've hints for BBC and Oric users and a look at books for Commodore owners. All this and more in Clive Gifford's regular column

Yet another book on the sound and music capabilities of the Commodore 64 made its way to me recently. Entitled Sound Effects And Music On The Commodore 64, it is published by Duckworth. The two authors, William Turner and Alf Vella have impressive credentials. Both are senior lecturers at Polytechnics and the latter author wrote the sound effects for the excellent Macbeth adventure package.

The book can be split into two distinct parts; the first on music and the second section dealing with sound effects. The first section was, frankly, disappointing. Though it covered the main features of music, it seemed to be lacking something in depth. The example programs were of a standard no higher than average and, of course, included the obligatory electronic organ.

Some areas of music were skipped over. Whilst discussing playing music with feeling and style, the authors state that if you want a piece played with a certain feel, then you'll have to play it yourself. This is not the case, one can program the computer to play in a certain style with emphasis on a certain beat, or with certain parts played at slightly varying speeds. The result may not be genuine human feeling, but is a form of styling all the same. The authors could have demonstrated this with a piece of music played "straight" and the same piece played with a certain style. Incidentally, this is a very interesting area of computerised music and a subject which I hope to discuss in greater detail in a future column.

In marked contrast, the second section on sound effects, is far more comprehensive. Any book of this kind is bound to have a laser effect and an explosion, but how many have a computerised cat miaowing or a telephone ringing? The range of effects is quite surprising and many, indeed most, are very realistic. The programs take advantage of a modular format to save space and more importantly for the reader, time, typing them all in.

For the sound effects, there is a basic library program. This is typed in once and saved on tape and then is loaded every time that a sound effect is wanted. The new effect's lines are added in front of the library program and hey presto, one sound effect.

Rounded off nicely with some useful appendices, this book is a fairly good one. Its style is lighter than most books in this vein yet the results obtained are as good as, if not better than, much of the competition. Reasonable value at £6.95.

Talking about sound effects, here we have some effects for owners and users of the Oric. The PLAY command is the main command for making an envelope which is then accessed by MUSIC or SOUND. Below are a few effects that can be obtained using PLAY. To switch off a PLAY statement, one needs to add a program line or type direct the command, PLAY 0,0,0,0.

PLAY 58, 80, 100, 60	Helicopter
PLAY 200, 100, 100, 200	Train
PLAY 40, 40, 60, 4000	Waves
PLAY 17, 80, 100, 200	Alarm
PLAY 7, 0, 1, 20000	Piano
PLAY 12, 91, 555, 3	Jet

I've recently received a few letters. Please send any of your views, tips, ideas or complaints in: it all makes for a more interesting column. Several people have mentioned to me how difficult it is to find suitable music to convert for originally converting tunes by ear — a long and laborious instrument of some kind. I eventually found a school music book which was simple enough for my needs.

Wise Publications in conjunction with Music Sales Ltd have produced a series of guides which may ease such problems. This series, the SFX range, are designed for the simple electronic keyboards of the type made by such manufacturers as Yamaha and Casio. Each guide contains a number of linked tunes, one guide contains all Beatle hits while another is full of well-known classical tunes.

Each tune is displayed using large scaled basic music notation and features the basic melody with accompaniment chords and advice on suitable rhythms. I have little musical playing ability, but after half an hour with the Stevie Wonder guide and my sister's little Casio VL-Tone, I was playing "Living For The City" and "Lately" reasonably well. These guides cost £3.50 each and there are 15 of them in all.

Concluding this issue's "Music And The Micro" is a tip for BBC users. To get a tinkling effect, use the following routine.

```
10 ENVELOPE 1,1,0,1,1,-1,0,1,1,96,-48,0,-78,126,78

20 SOUND 1,1,240+RND(15),RND(2)

30 FOR T=1 TO RND(950):NEXT

40 GOTO 20
```

their computer. What is needed is simple musical scores just showing the basic melody. I have had the same trouble, process unless you have a very good ear or play a musical

Duckworth Publishing, The Old Piano Factory, 43 Gloucester Cres, London NW1

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RON COMPLEX

Fresh from his icy hibernation, Ron Complex special investigator, has arrived in the near future and donned his trilby to track down the bug hatchers

Part three: Software in a basket

Ron Complex stood alone under a streetlamp savouring the drizzle. Night was falling and across the street, the windows of the Meatball and Micro were filled with the dim flickerings of the hundred monitor screens within. A mad miscellany of noise spilled through the open door — the unmistakeable sound of simultaneous game playing.

Ron flipped a cashew casually into his mouth at the third attempt and crossed the road. As he stepped through the doorway every screen in the pub went dark and there was not an alien death cry to be heard. Two hundred bleary eyes swivelled in Ron's direction — one hundred and ninety nine to be exact for the landlord was wearing an eyepatch.

There's a basic rule in this sort of situation, thought Ron, — act as if nothing has happened and if things get really rough resort to whistling out of tune. Ron stepped up to the bar and noticed for the first time that the landlord had a parrot on his shoulder.

"Give me a glass of ice — on the rocks", said Ron.

The landlord remained expressionless.

"Don't do cocktails huh? Okay give me a bourbon — and I don't mean a biscuit."

Slowly the landlord turned and went to the other end of the bar. Ron peered over the counter fully expecting to see a pegleg but instead there were just two standard legs.

The landlord returned and slammed a bottle down in front of Ron. Silence pervaded the room broken only by the parrot who occasionally pecked at the landlords gold earring.

"So you're just a pirate from the waist up huh?" asked Ron

An audible gasp from a hundred mouths echoed round the pub.

The landlord scratched his long black beard and leered, "State your business me hearty and then be on your way while your gizzard is still in one piece."

Ron had always wondered what a gizzard was but thought this might not be the right time to ask.

"I'm a private investigator and I'm looking for the bug nest."

For a short moment Ron thought he had mastered the art of levitation, then he noticed he was getting some help as he was carried to the door by five of the Meatball's clientele.

A few seconds later Ron was getting acquainted with the finer points of the London street drainage system. As he lay face down in the gutter Ron reflected that perhaps his direct approach work needed some fine tuning.

"Where do I go from here?" he pondered.

Ron felt a tap on his shoulder, he looked round and saw a furtive tatty haired youth.

"I was in the pub and heard everything. I think I can help you."

Ron was getting accustomed to seeing the world from ground level but leapt to his feet in an instant.

"You can start by telling me who the Long John Silver impersonator with the extra leg is."

"Oh that's Captain Counterfeit, he was a software buccaneer back in the 80's. He faced so many piracy charges that it went to his head."

"Okay kid, so what do you know about the bugs?"

"I don't know anything but I can take you to the Erratic Club."

"The Erratic Club?"

Next week: Part 4. "The enemy is simplicity itself."

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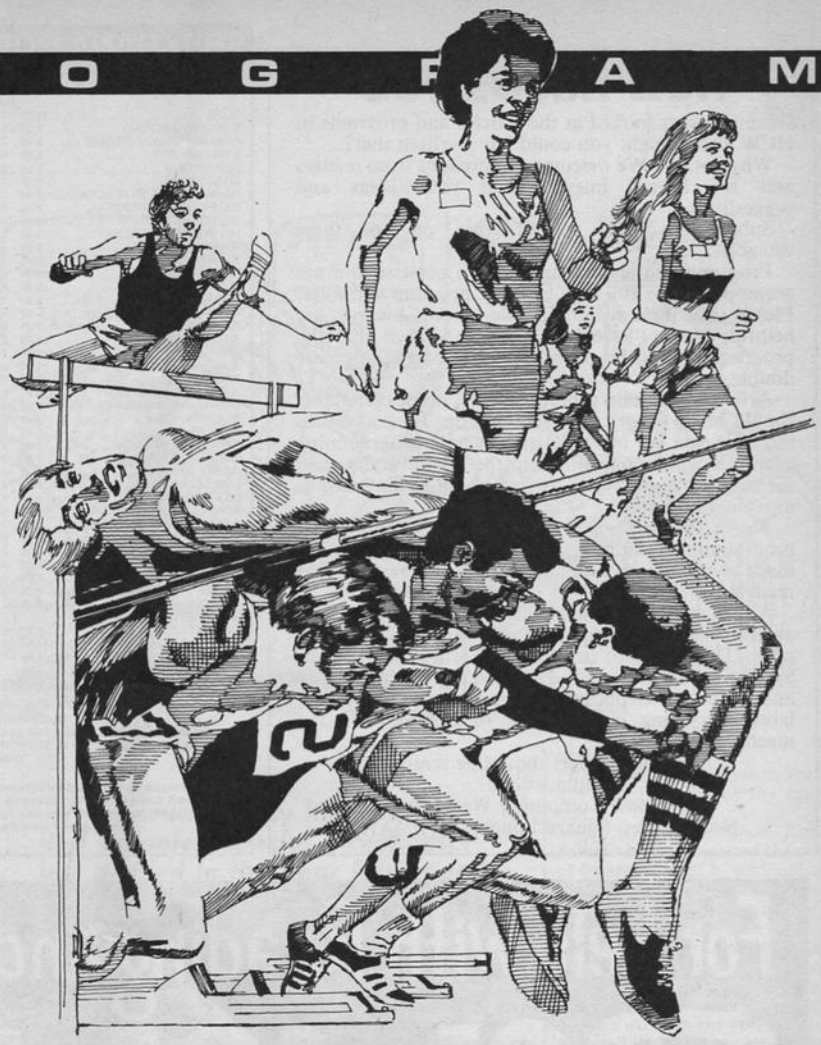
SPECTRUM GAME

TRACK-RACE



You're under starters orders in this Spectrum game from HCW regular R N Butcher

At last a game where you can break the tape and still win! Track-Race lets you test your athletic prowess over a variety of distances — with you as the sporting hero.

The athlete is cursor-controlled and you put him into action by pressing keys five and eight alternately (these may be altered for personal preference). Up to six people can enter the race and the Result screen announces the winner.

The World Record and individual times can be displayed and updated as and when you or your friends become the fastest thing on two legs.

Variables

h(1) h(2) h(3) 'world records'
e$ race distance
horiz position of athlete
keys used for animation of athlete
t time in seconds
DIM b() array for keeping race times
**t$** str$ t (for 00 after whole seconds)
DIMa$() array for athletes competing
f1 colour of flags
z$ clouds UDG
r used for calculation in animation of athlete

```
    1 POKE 23561,20: POKE 23562,2: DIM h(5):
 LET h(1)=10.49: LET h(2)=21.75: LET h(5)=45.
68
   2 RANDOMIZE 0: GO SUB 3000
   3 GO TO 4998
   9 REM **********GAME**********
  0 PRINT  PAPER 0;AT 20,11;e$: PRINT  PAPER
0;AT 21,23;h(r): LET horz=1: LET keys=0
  11 PRINT  PAPER 0;AT 20,23;"    "
  12 PRINT AT 15,horz;"BB";AT 16,horz;"CD";AT
 17,horz;"EF";AT 18,horz;"GH"
  15 GO SUB 300
  16 PAUSE 0
  17 IF INKEY$="5" THEN  GO TO 19
  18 GO TO 16
  19 PAUSE 0
  20 IF INKEY$="8" THEN  GO TO 30
  21 GO TO 19
  30 LET keys=keys+1
  40 IF keys=r*2 THEN  GO TO 60
  50 GO TO 65
  60 LET keys=0: LET horz=horz+1
  61 IF horz=30 THEN  GO TO 149
  65 IF INT (keys/2)<>(keys/2) THEN  GO TO 68
  66 PRINT AT 15,horz;" BB";AT 16,horz;" CD";
AT 17,horz;"NEF";AT 18,horz-1;"  GH"
```

```
  67 GO TO 16
  68 PRINT AT 15,horz;" BB";AT 16,horz;" LM";
AT 17,horz;"NEF";AT 18,horz;"IJM"
  69 GO TO 16
 149 PRINT  PAPER 4;AT 14,30;"U": PRINT AT 15
,30;"QR";AT 16,30;"ST"
 151 LET t=(PEEK (p)+256*PEEK (p+1)+65536*PEE
K (p+2))/50+(INT (RND*2)/100)-r*r
 152 LET x=x+1: LET b(x)=t
 153 LET t$=STR$ t: FOR f=1 TO 500: NEXT f
 154 IF t>=10 THEN  GO TO 160
 155 IF LEN t$=1 THEN  LET t$=t$+".00"
 156 IF LEN t$=3 THEN  LET t$=t$+"0"
 157 GO TO 165
 160 IF LEN t$=2 THEN  LET t$=t$+".00"
 161 IF LEN t$=4 THEN  LET t$=t$+"0"
 165 PRINT  PAPER 0;AT 20,23;t$
 166 IF t<h(r) THEN  PRINT  FLASH 1;AT 13,8;"
WORLD  RECORD": FOR f=1 TO 400: NEXT f: PRINT
  PAPER 4;AT 13,8;"                ": PRINT  PAP
ER 0;AT 21,23;"      ": PRINT  PAPER 0;AT 21,2
3;t$: LET h(r)=t
 167 PAUSE 100: PRINT  PAPER 4;AT 14,30;" ":
PRINT AT 15,30;"  ";AT 16,30;"  ";AT 17,30;"
 ";AT 18,29;"   "
 168 PLOT 0,36: DRAW 255,0: PLOT 252,55: DRAW
 0,-39
 169 PAUSE 0
 180 RETURN
 299 REM *****START******
 300 PAPER 4: PRINT  INK 0;AT 13,0;"Q": PAUSE
 150: PRINT  INK 7;AT 12,1;"P": BEEP .015,55:
 PAUSE 8: PRINT AT 12,1;" ": PAUSE 20: PRINT
AT 13,0;" ": PAPER 2
 301 LET p=23672: POKE p+2,0: POKE p+1,0: POK
E p,0
 320 RETURN
 600 LET keys=0: LET t=t+1
2999 REM *****TITLE****
3000 BORDER 0: PAPER 2: CLS
3010 INK 7: FOR f=0 TO 175 STEP 8: PLOT 0,f:
DRAW 255,0: NEXT f
3020 FOR f=8 TO 13: PRINT  PAPER 4;AT f,0;"
                          ": NEXT f
3030 INK 0: PRINT  PAPER 7;AT 10,2;" T R A C
K  R A C E ";AT 13,10;"by Raymond Butcher"
3040 FOR f=0 TO 7: PRINT  PAPER 7;AT f,26;f+1
: NEXT f
3041 INK 7: FOR f=60 TO 94 STEP 17: CIRCLE f,
42,12: NEXT f
3042 CIRCLE 69,25,12: CIRCLE 85,25,12: INK 0
3050 PAUSE 250
3051 REM ****INSTRUCTIONS****
3060 PAPER 5: CLS : PRINT  PAPER 7;"<><><><><
>TRACK RACE<><><><><>": PRINT '"Using keys
(5)&(8) alternately, make your athlete sprint
 along  the track over 3 distances:100M 200M
400M.  Any no. of athletes can play,having al
ternate goes  at each distance.At the end of
 each race press any key for the next event."
: PRINT "Try to beat the World Record or go f
or a new Track Record."
3070 INPUT "No. of athletes(max 6) ";ath
3071 DIM a$(18,10): DIM b(18): LET x=0
3072 FOR z=1 TO ath
3073 INPUT "Athletes name ";a$(z)
3074 NEXT z
3080 RESTORE 3080: FOR a=USR "a" TO USR "e"+7
3085 READ b: POKE a,b
3090 NEXT a
3092 DATA 3,99,10,152,24,98,102,9,48,0,204,19
2,12,0,99,99
3094 DATA 10,25,10,23,228,83,19,35,133,109,17
0,109,164,134,190,169,132,128,56,174,16,85,41
,17
3099 REM ****SCREEN****
3100 CLS : BORDER 1:  FOR f=0 TO 4: PRINT  PA
PER 5;AT f,0;"
 ": NEXT f
3102 PRINT  PAPER 0;AT 5,0;"

  "
3103 INK 7: LET a=8: FOR f=131 TO 0 STEP -8:
PLOT f,120: DRAW -8+a,14: LET a=a+1: NEXT f
3104 INK 7: LET a=8: FOR f=131 TO 255 STEP 8:
 PLOT f,120: DRAW 8-a,14: LET a=a+1: NEXT f:
INK 0
3105 FOR f=3 TO 27 STEP 6: LET f1=INT (RND*7)
+1: IF f1=5 THEN  LET f1=6
3106 PRINT  INK f1;AT 2,f;"■■■": NEXT f
3108 FOR f=22 TO 240 STEP 48: PLOT f,160: DRA
W 0,-24: NEXT f
3110 PAPER 1: FOR f=7 TO 10: PRINT  INK 7;AT
f,0;"▮ ▮▮▮▮▮▮▮▮▮▮▮ ▮▮▮▮▮▮▮▮▮▮▮ ▮▮▮▮▮▮▮▮▮▮▮ ▮": NEXT
f
3112 PRINT  PAPER 7;AT 11,3;"▮ ";AT 11,11;"▮ ";
AT 11,15;"▮ ";AT 11,15;"▮ ";AT 11,26;"▮ "
3113 PRINT  PAPER 6;AT 11,0;"OIL";AT 11,12;"G
AS";AT 11,27;"@ TEA": PRINT  PAPER 3; INK 7;A
T 11,4;"BUY HCW";AT 11,16;"DRINK MILK"
3114 FOR f=12 TO 19: PRINT  PAPER 2;AT f,0;"
                          ": NEXT f
3116 FOR f=12 TO 14: PRINT  PAPER 4;AT f,0;"
                            ": NEXT f
3118 LET z$="CDE"
3120 PAPER 5: PRINT  INK 7;AT 0,6;z$;AT 0,20;
z$;AT 0,23;z$;AT 1,17;z$
3122 INK 7: PLOT 0,19: DRAW 255,0: PLOT 0,36:
 DRAW 255,0
3124 PLOT 252,55: DRAW 0,-55
3126 FOR f=20 TO 21: PRINT  PAPER 0;AT f,0;"
                          ": NEXT f
3128 PAPER 0: PRINT AT 20,4;"EVENT:-";AT 20,1
7;"TIME:-";AT 21,8;"WORLD  RECORD:-"
3130 INK 7: PAPER 2
4100 RESTORE 4100: FOR a=USR "a" TO USR "u"+7
4101 READ b: POKE a,b
4102 NEXT a
4103 DATA 7,13,8,9,11,7,3,14,128,128,192,224,
192,192,128,128
4104 DATA 31,31,27,27,55,27,12,15,192,224,224
,224,224,132,116,192
4105 DATA 0,15,15,207,15,24,30,60,32,224,224,
231,224,0,240,248
4106 DATA 60,56,120,64,192,224,112,112,124,60
,56,48,0,224,112,120
4107 DATA 0,0,47,111,103,96,64,0,240,224,224,
192,0,0,0,0
4108 DATA 120,120,56,60,28,0,15,15
4109 DATA 31,60,119,239,239,112,63,15,195,239
,220,216,208,96,96,192
4112 DATA 0,0,0,255,0,0,0,0
4113 DATA 3,6,12,24,48,120,56,24,6,30,31,63,6
3,126,112,128
4114 DATA 13,13,12,13,13,13,13,14,128,128,192
,224,192,192,128,128,29,19,31,31,63,31,15,15,
192,192,224,224,224,224,192,192,0,0,0,0,12,0,12
,12,12
4120 RETURN
4999 REM *****RACES*****
5000 FOR q=1 TO ath
5001 LET e$="100M"
5002 LET r=1
5003 GO SUB 10
5004 NEXT q
5010 FOR q=1 TO ath
5011 LET e$="200M"
5012 LET r=2
5013 GO SUB 10
5014 NEXT q
5020 FOR q=1 TO ath
5021 LET e$="400M"
5022 LET r=5
5023 GO SUB 10
5024 NEXT q
5150 REM ****results screen****
5160 CLS : PRINT AT 0,7;"<><><>RESULTS<><><>"
: PRINT
5170 FOR s=1 TO 3: FOR z=1 TO ath
5180 PRINT TAB 4;a$(z): NEXT z: NEXT s
5190 FOR z=1 TO ath
5200 PRINT  INVERSE 1;AT z+1,17;"100M": NEXT
z
5210 FOR z=1 TO ath
5220 PRINT AT z+1+ath,17;"200M": NEXT z
5230 FOR z=1 TO ath
5240 PRINT  INVERSE 1;AT z+1+ath*2,17;"400M":
 NEXT z
5250 FOR x=1 TO ath*3: PRINT AT x+1,25;b(x):
NEXT x
5260 FOR f=1 TO 500: NEXT f: PRINT  PAPER 7;
INK 0;AT 21,0;"   Press any key for new meet
  ": PAUSE 0
6000 GO TO 2
9999 SAVE "track" LINE 1
```

How it works

1 poke keyboard response, set hi scores
10 print event., print hisc., set variables
12 print athlete at starting position
16-21 checks for keyboard input
30-69 works out & animates athlete
149-180 prints end of race, calculates time & prepares screen for new race
300-320 prints gun & starts timer
3000-3650 title screen
3060 instructions
3070-3074 input for information
3080-3094 UDGs
3100-3130 set up game screen
4100-4120 UDGs
5000-5024 sets up variables for races
5150-5260 sets up results screen
6000 for new game

BEGINNING MACHINE CODE

Terry and Diana Smith take us right around the block with Spectrum machine code this week

The block move and search instructions which we cover this week are probably the most powerful in the Z80 CPU instruction set.

To see what I mean, load the code of Listing 1, using the loader given in the first article in the series or an assembler. Run the code with RAND USR 30000 and you will see every pixel on the screen change to the current ink colour.

There are two points to be made about this routine. It is short. It is quick. We have, in an instant, filled each of the 6144 bytes in the display file with a value of 255. Whoopee! So what use is it and how does it work?

Change the value of A e.g. LD A,0 and you have a routine which will clear the screen of characters but not affect the attributes which set the screen colours. I'll leave you to think of some applications.

The LDDR instruction reads LoaD, Decrement and Repeat. It moves blocks of code very economically. First you must load HL with the address of the first byte to be moved. Then load DE with the DEstination address for that first byte and load BC with the number of bytes to be moved. LDDR then copies the byte addressed by HL to the byte addressed by DE and both HL and DE are decremented by one. The Byte Count in BC is then decreased by one, and the process is repeated, moving more bytes until BC is zero.

This instruction works automatically through a block of memory but its "colleague" LDD (LoaD and Decrement) works just like LDDR but stops after one byte has been transferred. It is not used as often!

LDIR is the counterpart of LDDR and is read as LoaD, Increment and Repeat. It works like LDDR except that HL and DE are incremented. And, surprise, surprise, there is an LDI (LoaD and Increment) which operates as LDD but increments HL and DE.

A more useful example is shown in Listing 2. This is the moving starscape program mentioned in my previous article. Load it and save the code to tape. NEW the Spectrum and key in the BASIC given in Listing 3. This will load the code, produce a starscape and scroll it downwards one pixel line at a time.

It works like this. The bottom pixel row of 32 bytes is transferred to a suitable storage area in memory, in this case, the printer buffer. The pixel row above is copied to the row below and this process is repeated until all pixel rows have been moved one row down. The top row is unaltered, so it is overwritten by copying the original bottom row from the printer buffer. This process scrolls the screen downwards by one pixel buffer. This process scrolls the screen downwards by one pixel with wrap-around.

The routine uses a ROM routine at address 8874. It is called with B holding the pixel row and C holding the pixel column. It returns with HL holding the memory address of the byte containing that pixel, ready for LDIR to be used to move the 32 bytes that form a

Listing 1

```
30000          LD    HL,22527    33
                                 255
                                 87
30003          LD    A,255       62
                                 255
30005          LD    (HL),A      119
30006          LD    DE,22526    17
                                 254
                                 87
30009          LD    BC,6143     1
                                 255
                                 23
30012          LDDR              237
                                 184
30014          RET               201
```

Listing 2

```
30000          LD    BC,0        1
                                 0
                                 0
30003          CALL  8874        205
                                 170
                                 34
30006          LD    DE,23296    17
                                 0
                                 91
30009          LD    BC,32       1
                                 32
                                 0
30012          LDIR              237
                                 176
30014          LD    B,175       6
                                 175
30016 L1       PUSH  BC          197
30017          LD    A,175       62
                                 175
30019          SUB   B           144
30020          LD    B,A         71
30021          PUSH  BC          197
30022          CALL  8874        205
                                 170
                                 34
30025          PUSH  HL          229
```

```
30026    POP  DE          209
30027    POP  BC          193
30028    INC  B           4
30029    CALL 8874        205
                          170
                          34
30032    LD   BC,32       1
                          32
                          0
30035    LDIR             237
                          176
30037    POP  BC          193
30038    DJNZ L1          16
                          232
30040    LD   HL,23296    33
                          0
                          91
30043    LD   DE,16384    17
                          0
                          64
30046    LD   BC,32       1
                          32
                          0
30049    LDIR             237
                          176
30051    RET              201
```

Listing 3

```
10 CLEAR 29999
20 LOAD *"m";1;"starcode"CODE 30000
30 PAPER 0: INK 7: CLS
40 FOR n=1 TO 100
50 PLOT RND*255,RND*175
60 NEXT n
70 FOR n=1 TO 175
80 RANDOMIZE USR 30000
90 NEXT n
```

pixel row.

We will finish off by mentioning the block compare instructions CPIR, CPDR, CPI and CPD. Their operation is similar to the block move instructions but they compare the contents of the byte addressed by HL with the contents of the A register.

Suppose you are writing a data base program and want a routine to find a record called "Fred" within a block of code starting at address 40000 and which is 1000 bytes long. Load A with the code for "F" (70). Load HL with 40000 and BC with 1000. Then use CPIR (ComPare, Increase and Repeat) to search through the code. If it can't find a character "F" in that block of code, BC will be zero and the zero flag will be reset. If a match is found, the HL register will point to the address after the matching byte and the zero flag will be set, indicating a successful match.

You can then check if HL is pointing to an "r" character and, if so, move HL on to check for "e" and "d". If all matches are successful, you have found Fred!

The next article will be the last in this series and will give some general tips on writing machine code routines.

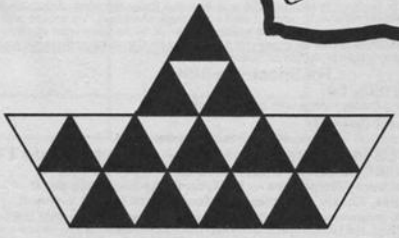
Tri Count

The Sinking Ship Software Co has created this attractive logo to attract the eye to their products. A couple of girls in the office, though, are hung up on some problems of their own rather than dealing with customer complaints. They are trying to work out;

A how many triangles are there altogether in this design and

B how many triangles are more black than white?

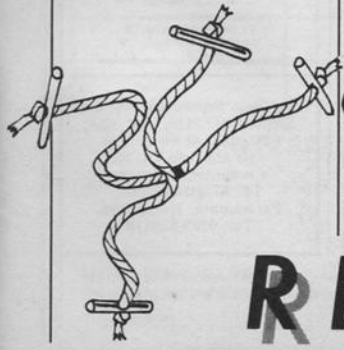
Can you sort it out for them?



Join the club

Amstrad users seem to be banding together all over the country and the latest group to form is in Sheffield. D Boland writes that the group aims to help members "use the computer to its full capabilities" and he is hoping that hardware and software manufacturers can be persuaded to demonstrate their products to the group.

For further information contact: Mr D E Boland, 61 Heather Rd, High Wincobank, Sheffield S5 6GB



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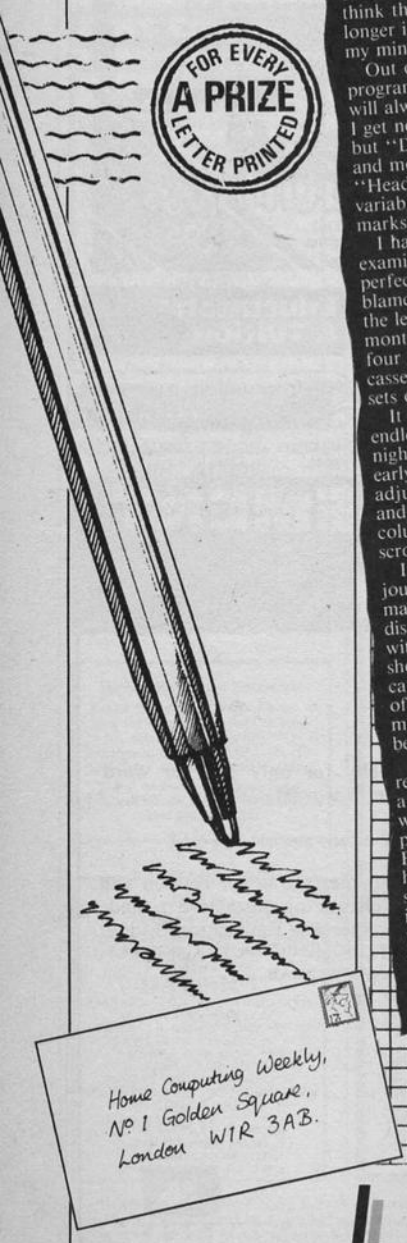
LETTERS



BBC blues

Can someone out there who knows about computers please help me? I am the owner of a BBC B and I think that before very much longer it will drive me out of my mind.

Out of three taped programmes that I buy two will always refuse to load. I get nothing on the screen but "Data?" and "Block" and more occasionally "Header" together with a variable amount of question marks.

I have had the computer examined and tested. It is perfect. Everyone I ask blames the tape recorder or the leads. In the eight months I've had it I've had four different brand new cassette players and three sets of leads.

It seems to me I've had an endless history of sitting night after night into the early hours rewinding tapes, adjusting volume controls and watching endless columns of error messages scroll up the screen.

I have often made return journeys to computer shops many miles away and had disturbing confrontations with understandably upset shopkeepers. I have sent carefully wrapped cassettes off in the post to their makers sometimes never to be seen again.

I can't understand it and I really am getting worried and upset. The tapes that will load continue to load properly on my machine. But I've had more than a hundred bad ones. Are there so many bad tapes about or is it me? Can someone please tell me what I am doing wrong?

Jennifer Guttridge, Potters Bar

Rave reviews

I would first and foremost like to congratulate your team for producing an excellent magazine, crammed with relevant information for the weekly enthusiast. There are a number of reasons why I rate your magazine as No 1 in the weekly range.

The first of which is the design and layout of the front cover. The highlights of what is going on in the computer world are printed in big bold test so even my grandmother could read it if she liked computing.

Finally I would like to give you a big thank you for your review section. The idea of a small bearded man either dozing off into oblivion or going head over heels in excitement is excellent. Perhaps it will encourage other magazines to try something different, not simply print a mark out of ten.

I think others out there will agree with me that yours is truly the most enjoyable computing magazine in the shops today. Action.... buy it.

Andrew Ritson, South Wirral

Texas down under

I am an Australian HCW reader who really enjoys using his TI-99/4A. Lately I have noticed a real lack of reviews, programs and articles on the TI and I ask you please not to forget about your loyal readers who own a Texas.

Texas Instruments may have stopped production of the TI-99/4A but there are still thousands of contented users in Australia (as well as many more in England and all over the world) who need the support of a magazine like yours for a long time to come. Don't let the Texas become a memory.

Does anyone know if the TI has machine code and if so is there a book available on the subject?

Alan Blinder, New South Wales, Australia

Apologies

In reply to Karen Rolph from Heaton's letter I would just like to say that I am sorry that I got my priorities mixed up. It should have been "girls and computers". It is a pity we cannot make music together so I suppose it's back to the old drawing board.

Malcolm Logan, Hawick, Scotland

Play the game

I have purchased HCW ever since it went into circulation in March 1983 and every week it has been worth the money. I think it's excellent value with all the reviews and programs etc.

Every week when I get HCW I look down the contents page for a C64 program. I turn to the page and find it's something like "Welcome to Basic" as in HCW 112 which is totally useless to me.

Please could you print some decent games without bugs which will be fun to type in and play at the end.

I understand it's hard to get good games from readers these days but please please, please could you try because otherwise what will I do during the summer holidays?

Philip Morgan, Benfleet

Worse best

Why not have a worst selling chart instead of best sellers? Maybe you could have the computer equivalent of the worst of Hollywood. Secondly are we seeing a new wave of discrimination — computer discrimination? (to an unnamed person from Heaton, HCW 122) Hearts Club Weekly? — maybe... I own a C64 just like you...

Paul Lucas, Potters Bar

LETTERS PAGE

TOP 20

Compiled by Gallup

SOFTWARE

Fortnight Ending July 30, 1985

LAST WEEK	MOVE	THIS WEEK	TITLE	PUBLISHER	SPECTRUM	CBM 64	BBC	ELECTRON	VIC 20	AMSTRAD	ATARI	OTHERS
2	▲	1	Hypersports	Imagine	•	•						•
–	NE	2	Frank Bruno's Boxing	Elite	•							
1	▼	3	Way of The Exploding Fist	Melbourne House		•						
9	▲	4	Action Biker	Mastertronic	•	•						
3	▼	5	Soft Aid	Various	•	•						
4	▼	6	Elite	Acornsoft		•	•	•				
47	▲	7	Dynamite Dan	Mirrorsoft	•							
7	▼	8	Jet Set Willy 2	Software Project	•	•						
10	▲	9	Spy Hunter	UD Gold	•	•						
8	▼	10	Combat Lynx	Durell	•	•	•	•		•		
29	▲	11	BMX Racers	Mastertronic	•	•						•
5	▼	12	Cauldron	Palace	•	•						
6	▼	13	Rocky	Gremlin Graphics	•							
13	▼	14	Spy Vs Spy	Beyond	•	•						
25	▲	15	Dun Darach	Gargoyle Games	•	•				•		
16	•	16	View to a Kill	Domark	•	•						
32	▲	17	Vegas Jackpot	Mastertronic	•	•				•		•
18	•	18	Pitstop 2	Epyx/US Gold		•						
15	▼	19	World Series Baseball	Imagine	•	•						
37	▲	20	Kik Start	Mastertronic	•			•				

Up and Coming

It's tough at the top. Way of the Exploding Fist has got the chop from the number one slot but Hypersports could have only a brief stay because at number three Frank Bruno is ready to strike. Big Frank's Boxing is the biggest new entry this week.

Another new entry is Nick Faldo's Open Golf in at number 21, Thing on a String from Gremlin Graphics has entered at number 39 and believe it or not has no connection with sport whatsoever.

No less than 17 of the top 50 in the chart are sports games. Where will it end? Rumours of a Frank Bruno's pole vaulting game in the pipeline are however completely without foundation.

Other games on the move are Dynamite Dan from Mirrorsoft up a massive 40 places to number 7, BMX Racers, up to 11 from 29 and Kik Start up 17 places to number 20.

SPECTRUM Top Ten

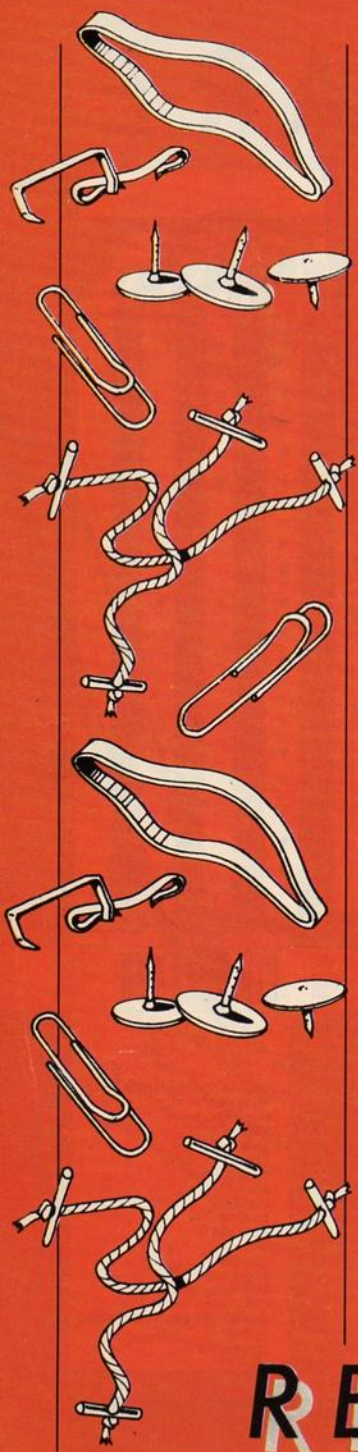
1. **Frank Bruno's Boxing** — Elite
2. **Hypersports** — Imagine
3. **Dynamite Dan** — Mirrorsoft
4. **Soft Aid** — Various
5. **Action Biker 2** — Mastertronic
6. **Rocky** — Gremlin Graphics
7. **Jet Set Willy 2** — Software Projects
8. **Spy Hunter** — US Gold
9. **Spy vs Spy** — Beyond
10. **Nodes of Yesod** — Odin

BBC Top Ten

1. **Revs** — Acornsoft
2. **Combat Lynx** — Durell
3. **Knight Lore** — Ultimate
4. **Repton** — Superior Software
5. **Alien 8** — Ultimate
6. **Elite** — Acornsoft
7. **Music Composer** — Vulcan
8. **Brian Jacks Superstar Challenge** — Martech
9. **Attic Atac** — Ultimate
10. **Mini Office** — Database

COMMODORE Top Ten

1. **Way of the Exploding Fist** — Melbourne House
2. **Hypersports** — Imagine
3. **Elite** — Firebird
4. **Action Biker** — Mastertronic
5. **Pitstop 2** — Epyx/US Gold
6. **Soft Aid** — Various
7. **Kik Start** — Mastertronic
8. **International Tennis** — Commodore
9. **Graham Gooch Test Cricket** — Audiogenic
10. **Dambusters** — US Gold



Reader's hi-score table

Name	Game	Machine	Score
Darren Parker	Donkey Kong	TI-99/4A	264,500
Dean Parker	Pole Position	TI-99/4A	105,600
Richard Matthews	The Attack	TI-99/4A	100,000
	Munchman	TI-99/4A	65,700
Lee Thornton	Daley Thompson	Spectrum	330,199
	Bruce Lee	Spectrum	178,450
	Monopoly	Spectrum	£7,480
Andrew Clarke	Ghostbusters	C64	$649,200
	Spy vs Spy	C64	8,970
	Way of the Exploding Fist	C64	24,000

Ye olde helpline

Verily the art of riddling is not dead and Kevin Young from Blyth, Northumberland, a budding soothsayer, has come up with these conundrums to assist those trapped in Entombed by Ultimate.

"With your whip a note shall chime and you will find a light to shine.
To free the mummy of its curse find the know of Isis first.
A room of pools ye shall get past when each in order stand thou hast.
Move the pots and ye shall find the statue with the clue behind.
There's a room thou canst not see until scrolls are safe with thee.
The cobra guards the way ahead but it doth fear a book that's dead.
Osiris will not let you past until the Schroll of Thoth thou hast.

Thee impresseth us here at HCW Kevin, with thy weirdly way of imparting gaming hints and if other readers can find strange ways of passing on tips we would like to hear from you. So...
"If thee can find a funny way to show,
how stuck gamers through a game shall go,
why not droppeth us a line,
and a prize to covet can be thine."

"I can't stand much more of this", Ed.

Solution to last week's competition

A 39 B 22

Keys to immortality

Ewan Baker of Dunfermline is currently enjoying everlasting lives playing Pengwyn on his BBC, whilst down in Lancaster David Killick has obtained infinite lives in Le Flics on the Spectrum.

Ewan writes, "All you have to do is type; *LOAD"PENG WYN" followed by RETURN. Then list line 350 which reads PAGE=&ICOO:CHAIN "BR DI" and change it to PAGE= &ICOO:*LOAD "BIRDI" and run the program as normal.

List line 10 in "BIRDI" and change the variable M to any number of lives you want. Now you just run the program and wait for the last piece to load. Ewan adds, "Don't change the value of the variable M to 0 for infinite lives because you cannot get onto the high score chart."

Dave recommends these pokes for longer lasting games of Le Flics; POKE 26789,0 (for infinite lives) and POKE 36789,n (where N = the desired number of lives). "One of these pokes should be entered as line 50 in the program header and the header can be listed by typing MERGE"" and then playing the tape. An OK message should soon appear. Stop the tape and type LIST. You have now listed the program header and can insert one of the above pokes.

However with infinite lives there are disadvantages, like starving for a big score. "Using either poke when you enter a building do not move again and you will find that you will not appear inside that particular building."

"If you stay in this position your score will gradually go up. But you eventually start to die as your food goes down, however if you keep repeating the above you will end up with a mega-score."

READERS PAGE

"These days, my favourite things are in bits..."

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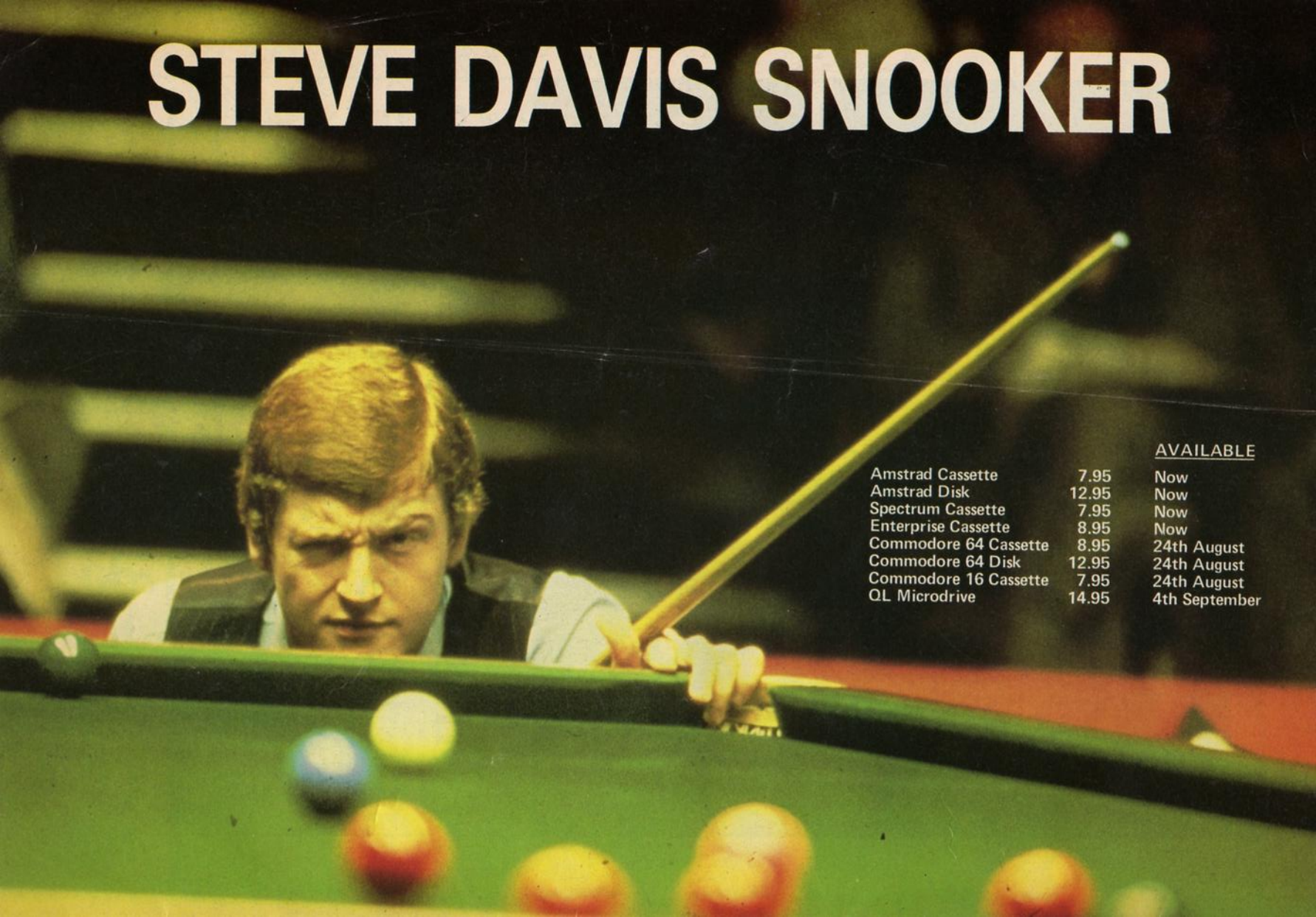

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