

March 1985

An independent magazine published by EMAP Publications

sinclair user

Issue No 36

Only
95p

BRITAIN'S BEST SELLING SINCLAIR MAGAZINE

MONTY IS INNOCENT

50 games
up for grabs

Sinclair
buggy — who
needs it?

ENTRY POINT

A new series
for beginners

FREE INSIDE..

Giant poster reveals Spectrum anatomy

Skool Daze

The Beak
speaks out



GIFT FROM THE GODS



GIFT FROM THE GODS

"The Power of Destiny"

- Number 1 Blockbuster from the "MEGA TEAM"
- Spectacular arcade – adventure played in a multitude of ways and at many different levels.
- Watch the Secrets of the Labyrinth unfold as our Hero, ORESTES, tests his skill against the power of GOD and MAN.
 - Stunning animated graphics take you beyond time ... into the "FIFTH DIMENSION".
- "INTELLIGENT" controls allow ORESTES to perform an astonishing repertoire of feats from the command of joystick or keyboard.
- Discover the key to "AGAMEMNON'S puzzle, through the power of Intrigue and Illusion!

Ocean Software is available from selected branches of: **WOOLWORTH**, **WHSMITH**, **John Menzies**, **LASKYS**, **Rumbelows**, **COMET**,
Spectrum Shops and all good software dealers. Trade enquiries welcome.

sinclair user

Editor

Bill Scolding

Deputy editor

John Gilbert

Staff writers

Chris Bourne

Clare Edgeley

Illustrator/designer

Craig Kennedy

Advertisement manager

Rob Cameron

Deputy advertisement manager

Louise Fanthorpe

Advertisement sales executive

Kathy McLennan

Production assistant

James McClure

Advertisement secretary

Maria Keighley

Editorial assistant

Colette McDermott

Subscriptions manager

Carl Dunne

Publisher

Neil Wood

Sinclair User is published monthly
by EMAP Business & Computer
Publications



96,271

Jan-June 1984

Telephone

Editorial and advertising departments
01-251 6222

If you would like to contribute to
Sinclair User please send
programs or articles to:

Sinclair User,
EMAP Business & Computer Publications,
Priory Court,
30-32 Farringdon Lane,
London EC1R 3AU

Original programs should be on cassette and
articles should be typed. We cannot
undertake to return them unless a
stamped-addressed envelope is
included.

We pay £20 for the copyright of each
program printed and £50
for star programs.

All subscription enquires to

Magazine Services,
EMAP Business & Computer Publications,
Priory Court,
30-32 Farringdon Lane,
London EC1R 3AU

Telephone 01-251 6222

© Copyright 1985

Sinclair User

ISSN No 0262-5458

Typeset by Saffron Graphics Ltd.,

London EC1

Printed by Peterboro' Web

Woodstone, Peterborough

Distributed by EMAP Publications Ltd.

FEATURES

58 **STATE OF THE ART** Psion
graphics ace Ann Hughes.

61 **ENTRY POINT** The basics of
computing. New series.

110 **SINCLAIR C5** Is Sir Clive tak-
ing us all for a ride? We pedal his
wares.

116 **COMPETITION** Spring Monty
Mole from his cell.

122 **ADVENTURE PROGRAM-
MING** John Gilbert creates
some AI characters.



Street credibility? page 110

REGULARS

5 **SINCLAIRVOYANCE** Old
wounds are re-opened in the
Sinclair/Acorn battle.

7 **NEWS** The C5 hits the streets,
Spectrum hits the deck, Clive
hits Chris Curry.

10 **SINCLAIR SIMON** A quiet
evening down at the local.

11 **QL NEWS** New packages from
Sinclair, QL disc interface.

17 **GREMLIN** Sir Clive proves he
has punch and Chris Curry of
Acorn gets it.

25 **HARDWARE WORLD** A new
range from DK'tronics and the
Touchmaster graphics pad.

34 **SPECTRUM SOFTWARE**
SCENE Ghostbusters, Airwolf,
Match Day and Danger Mouse.

47 **SINCLAIR SURGERY** The
good doctor is in.

50 **HIT SQUAD** David Reidy mas-
ter programmer, reminisces about
his skool daze, hem-hem.

53 **BOOKS** Seymour Papert has
mind storms and we try some
software projects.

68 **ADVENTURE** Graphics games
explored. Gordo Greatbelly ven-
tures forth.

101 **SINCLAIR BUSINESS USER**
Mike Wright takes a look at the
electric office and QL Quilmerge.

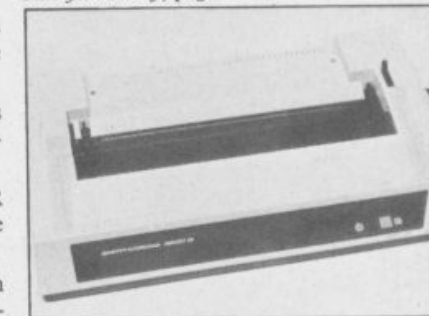
128 **HELPLINE** Andrew Hewson
delves into the Spectrum mem-
ory and builds a digital clock.



Spectrum price war, page 7



Kno yore enemy, page 50



W H Smith gets into print, page 25

PLUS

19 **LETTERS** More gas and gripes
from our mail-bag.

30 **TOP 30** The most popular soft-
ware of 1984.

45 **CROSSWORD** Cryptic clues
from Henry Howarth.

45 **SUBSCRIPTIONS** The best
way to avoid disappointment.

77 **PROGRAM PRINTOUT** QL
user-defined graphics package.

131 **CLUB CORNER** Enthusiasts
from all over the globe.

137 **SOFTWARE DIRECTORY**
Our guide for buyers.

143 **HARDWARE DIRECTORY**
DIY Sinclair Repairs.

The best deal for SPECTRUM owners?

Prove it

We wanted to tell you about the Logic 3 Spectrum Club.

We wanted to show you how our independent reviewers praise products that are good and slate those that are bad (even if a product has been hyped into the charts). We absolutely had to explain how we pick software from some of the biggest (and some of the smallest!) publishers in the business, and how our range of games, educational software, books and programming utilities is second to none.

Of course, we were going to tell you about the top discounts for club members, our New Member's bonus scheme, the "Win a Microdrive Competition", and how the club had grown to 8,000 members in just six months . . .

But then we figured out that you would want to check all this out for yourself. So this month we are making a special offer—send in the coupon—and we will send you, absolutely FREE, the latest 20-page edition of the club catalogue—packed with 150 reviews!



I have
seen your ad
"The best deal for Spectrum
owners" - Now prove it.

name

address.....

post code



FREE 20-PAGE
catalogue packed with
150 reviews

Mountbatten House, Victoria Street, Windsor SL4 1HE, England.

HITTING someone over the head with a rolled-up newspaper may not be featured in the latest guides to modern business practice but it is a certain way of making sure you hit the headlines.

It is definitely a more entertaining way of settling your differences than bringing in the lawyers. Cheaper and more effective as well, if the festive season disagreement between Sir Clive and his arch-rival, Chris Curry of Acorn Computers, is anything to go by.

Following the tortuous road of legal processes to obtain redress can always ensure that the original course of the dispute will be remembered far better than the outcome. The Rule of Rolled Newspaper, on the other hand, ensures headlines and the immediate opportunity to put the record straight. It is more satisfying too.

It does help if you are the media's favourite new technologist and if the object of your spontaneous irritation is a former colleague and most serious competitor, but it opens up many new possibilities which could hit the pockets of the legal profession and provide the need for a new correspondent in the newspapers.

Perhaps the battle for circulation in the popular tabloids could be settled with rolled-up copies of the *Mirror* and the *Sun* held by Robert Maxwell and Rupert Murdoch instead of Bingo; elections could be decided by Margaret Thatcher and Neil Kinnock with copies of the *Daily Telegraph* and the *Guardian*.

Readers will have realised by now that the basis for all this speculation is the incident which occurred just before Christmas at a public house in Cambridge and which is related in more detail on the news pages.

The fact that it took place between two grown, apparently intelligent, men says a great deal about the competitive nature of the home computer market and the rivalry between the two industry chiefs.

When Sir Clive set up his first company, Sinclair Radionics, one of his employees was Chris Curry. He worked as a technician during the period when the calculators, black watch and small television were being developed, produced and sold.

Their association continued as Sir Clive reduced his interests in Radionics and was involved in a company called Science of Cambridge – the forerunner of Sinclair Research.

Then towards the end of 1979, as Sir Clive was doing the preparatory work on the revolutionary ZX-80, Chris left. He set up Acorn Computers with Hermann Hauser, launched the Atom in the same year as the ZX-80 and the two have been in keen competition ever since.

While being serious business rivals they have remained friends, apart from the odd incident. But Sir Clive has never been able to hide his disappointment at not getting the BBC contract which went to Acorn. That meant he suffered in the education market, and while he succeeded in the selling stakes he came second in product image: the BBC micro has always been the serious machine while the Spectrum was relegated to games playing.

That says much for the character of Sir Clive. It is not sufficient for him to be a commercial success – he has to be a success on his own terms. Despite the fact that the Spectrum is by far the most popular micro in Britain, and is a serious contender for the number one position in the world, Sir Clive gives the impression he would have preferred to have sold fewer machines and have them

taken as seriously as the BBC machines.

He is an innovative thinker who sees himself as changing the world for the better. He does not like to think of himself as the mastermind behind the best value games machine on the market.

All that would appear to make little difference to the consumer. There are however two problems which could arise.

Competition is good for the consumer providing that it is fair competition. Advertising which makes outrageous claims about one machine's reliability and another's lack of it does nothing to help anyone. It does not enable customers to take better informed decisions but instead only confuses. That means that more people will make bad decisions about which computer to buy and find they have a machine which does not suit their needs.

Secondly, the industry is reaching a turning point. The tremendous growth of the past few years, for which Sir Clive is responsible, is over. If the market is to see further growth a manufacturer has to take the quantum leap of producing a machine that will appeal to the majority of the population which has shown no inclination to join the computer-owning classes.

What is needed is a person with the vision to see what those people will find attractive and then provide it. On past experience there is only one person who has demonstrated that necessary imagination – Sir Clive Sinclair.

Games-playing is not to be sneered at. It has already made the Spectrum the most popular computer in the UK, and surveys indicate that most alien-zappers sooner or later progress to exploring the full potential of their machines.

Nigel Clarke

CLASH OF THE TITANS



SINCLAIR
ORIC, COMMODORE
ACORN, MEMOTECH, ETC

MICRO

We export Microcomputers
and Peripherals to all Countries
Any make. Any Quantities
BIG DISCOUNTS

send for comprehensive price list to:

Dept V
MICRO-X LTD
765-767 HARROW ROAD, LONDON NW10 5NY
TELEPHONE 01-968 6622 TELEX 915866 MICROX G.

EXPORT

Why wait any longer

Upgrade your 16K ZX SPECTRUM Now!

The CHEETAH 32K RAMPACK
simply plugs into the user port at
the rear of your computer and
increases the memory instantly to 48K.

- ★ Fully compatible with all SINCLAIR accessories via rear edge connector
- ★ **NO NEED TO OPER COMPUTER AND INVALIDATE GUARANTEE**
- ★ Why send your computer away and wait weeks for upgrade
- ★ Fully cased tested and guaranteed

only £39.95
including VAT and P&P

Now make your Spectrum and ZX-81 Talk Compatible with Interface I & II

The Cheetah "SWEET TALKER" just plugs into the back of the computer using the existing power supply. Based on an allophone system you can easily program any word sentence or phrase. Fully cased, tested guaranteed and compatible with all SINCLAIR accessories via rear edge connector. Complete with demonstration cassette and full instructions.
No more lonely nights!

Simply incredible at **£29.75**
(Please quote when ordering whether Spectrum or ZX81 owner)

16K RAM Pack for ZX-81
64K RAM Pack for ZX-81

£19.75
£44.75

Dealer enquiries welcome

Cheetah, products available from branches of

John Menzies

Boys

WHSMITH

Rumbelows

and all good computer stores

Cheetah

Marketing



Dept SU
Cheetah Marketing Ltd, 24 Ray Street,
London EC1R 3DJ. Tel: 01 833 4909.
Telex: 8954958.

Prices include VAT, postage & packing. Delivery normally 14 days. Export orders at no extra cost.

Sinclair declares Spectrum price war

THE SPECTRUM is to be discontinued and the Spectrum Plus to be priced at £129.95 in a series of massive price cutting moves by Sinclair Research.

The shock moves come only weeks after the announcement of an upgrade kit which turns the Spectrum into a Spectrum Plus for £50. Kits will now

cost £30.00 if installed by Sinclair Research and £20.00 in do-it-yourself form.

Reasons for the cuts, which could lead to a new price war, were given by Sir Clive Sinclair. "The home computer market is currently entering a very vigorous phase and we anticipate strong competition from US manufacturers in particular".

As a result, Acorn Computers has brought the price of the Electron in line with that of the Plus, to £129.95.

All is not well, however, in the add-on business. Companies such as DK'tronics and Saga Systems could lose business in the keyboard market. David White of Saga says: "We have brought

down the price of our Emperor keyboard from £55.95 to £49.95. We think that people will still want to put a good keyboard onto their machines."

The one piece of bad news in the package concerns the Six-Pack sold with the Spectrum Plus. Customers will now have to pay a promotional price of £14.95 to obtain the six titles, worth £67.00.

Celebrations of Sinclair's success in the computer market continued at the *Which Computer?* Show in Birmingham. A competition was held in which the five millionth computer was up for grabs. In typical Sinclair style it was a gold coloured QL.

Radioactive micro fashion

WHAT, you might wonder, is the well-dressed computer user going to wear this Spring? What better than the Microshield VDU Smock?

Surprisingly, that is not as funny as it may seem at first. There is great controversy as to whether or not radiation from VDU screens is harmful. Your 14in portable TV gives off far more radiation than a commercial VDU so if your bits start slipping you will know why.

As yet, the question of TV radiation affecting home computer users has not been raised, possibly because it appears mainly to affect pregnant women and there are few female users.

Details from Rolenworth International Ltd, 8 North Street, Chichester, West Sussex PD19 1LB. Tel 0243-774271.



Reports of death greatly exaggerated

THE HOME computer boom is over, according to recent reports in the national press.

Except for the Sinclair Spectrum and Commodore 64, computer sales last Christmas did not live up to expectations and it is doubtful whether the predicted one million units were sold.

Of all the hardware manufacturers, Sir Clive Sinclair is the happiest, describing the Christmas season as "extremely good and way up on last year".

Gary Lockwood, PR agent for Commodore, comments, "the Commodore 64 has exceeded our expectations", and on the subject of Commodore's sales over the Christmas period, says, "we have not got our exact sales figures at present and I am not going to pick a number out of the air — which is

what Sir Clive has done".

Acorn suffered its worst Christmas ever. The *Sunday Times* reported that despite a £4.5m pre-Christmas advertising campaign, Acorn's sales fell far short of its target of 30,000 machines.

Dealers overstocked and, when the Christmas rush didn't happen, were lopping as much as £40.00 off the BBC price.

Perhaps the biggest surprise was the lack of MSX hardware. Although the Japanese are eager to corner a large section of the UK market, there were only a few thousand MSXs for sale, mostly from Toshiba, Sanyo and Sony.

There have been predictions of doom ever since the computer industry evolved. 1985 will be the turning point for many but competition is still fierce.

Micronet matters

ONE OF four young hackers involved in the recent spectacular breach of Prestel security — during which the Duke of Edinburgh's private electronic mail was examined — has been recruited by Clive Sinclair for a job at his Cambridge Metalab.

The hacker, who remains anonymous, was given this remarkable reward for ingenuity after explaining to Sir Clive how he and his friends managed to obtain the highest possible security clearance on the Prestel system and thereby gain complete power over the 350,000 page database.

The 19-year old Micronet member explained his new job as "investigating opportunities for Sinclair Research in the field of telecommunications"; he refused to say if this might be connected with the rumoured portable Spectrum with integral modem.

Micronet's Chatline is the most popular area on Prestel — and that's official.

Chatline is Micronet's 'Citizen's Band' emulator, allowing subscribers to send electronic messages, uncensored by the editorial staff, for immediate display to the thousands of other users.

Only two months after Chatline's opening, over 15,000 messages were posted on the system during December 1984.

"It's just gossip," says Micronet Technical Manager, Mike Brown. "Nobody talks about technical stuff — it's just people chatting and talking about the things which friends discuss."

"The nicest thing is that people can feel they're being left alone to partake in their own event. Micronet just set up the facility and then walked away."

Sid Smith, Micronet news editor

more news on page 8

Clivemobile cruises in

SIR CLIVE'S electric buggy — the Sinclair C5 — was unveiled at Alexandra Palace on January 10, almost a year after the launch of the controversial QL.

Before the assembled and sceptical press Sir Clive announced his latest revolutionary product — a battery-powered tricycle, the result of 10 year's research and development, and over £7m of investment.

With a top speed of 15mph and a range of only 20 miles, the vehicle is termed a 'pedal-assisted cycle' and can be driven by anyone aged over 14, without needing a driving licence, road tax, insurance or helmet.

The open top, single-seater is steered by handlebars placed, surprisingly, underneath the driver's thighs. It is nevertheless

easy and comfortable to drive. The battery is recharged by connecting it to a domestic power socket for eight hours; its range might be considerably less than the 20 miles stated, depending on road conditions and manoeuvres.

The basic machine costs £399. It is available through mail order only at first, with an additional £29 for delivery, though retail outlets are

planned by the summer. Optional extras, considered by many to be essential, include wing mirrors, indicators, horn, seat cushions and weather-proof clothing. Those push up the price to more than £600.

The C5 has met with widespread criticism in the press and on TV: the British Safety Council, the Royal Society for the Prevention of Accidents and the Auto-

mobile Association have also expressed reservations about its safety on the roads. The AA says, "It could, due to its size and inconspicuousness, present a hazard to its occupant and other road users."

Sir Clive is dismissive of critics, claiming that the trike is safer than any conventional two-wheeled transport, but admitted at the launch that it had not yet been test-driven in daytime traffic on public roads.

Sinclair Vehicles is hoping for sales in excess of 100,000 in 1985. Orders were taken at Alexandra Palace, and sales approached 1,000 in the first week.



Currah vow of silence

CURRAH will never speak again. The company which made the speech synthesis products for the Spectrum and Commodore 64 has been bought recently by DK'tronics for a substantial but undisclosed sum. Says David Heelas, head of DK, "The purchase of Currah is a natural complement to our existing range."

DK'tronics has bought the sole rights to manufacture and sell Microspeech, Speech 64, Microslot and Microsource and will be manufacturing those products at their factory.

However, John Herrin, chairman of Welwyn Electronics — which manufactured the Currah products before the takeover — stated in the *Standard*, "Welwyn will be taking over sales as well as manufacture... we expect to treble production to some 250,000 units this

year." Apparently, Welwyn are looking for a turnover of some £7,500,000 from sales in the first year and have formed a sales and marketing team to sell the products direct to retail outlets and distributors as agreed under the original contract.

David Heelas was not pleased with the news. "Welwyn has no right to sell anything after it has disposed of its stocks." He added, "we have all the tools for the injection-moulded cases". Those will be supplied to Welwyn under the terms of the contract and in that way, Heelas reckons he will be able to monitor the number of units Welwyn will be producing.

Under the terms of Welwyn's contract with Currah was a clause stating that if Currah went into liquidation, Welwyn would have

the rights to sell the products remaining in stock and to manufacture a stated number of units.

Richard Philbrick from Welwyn says "Our output is limited to the terms of our contract, we will be selling and manufacturing around 120,000 units". That differs considerably from the 250,000 units stated by Welwyn's chairman in the *Standard*.

Welwyn's future in the home computer market seems to be limited unless it produces a product under its own name. Philbrick thinks that is a possibility and adds, "120,000 units is a lot of units in the speech market". DK'tronics will also be producing speech synthesisers but Philbrick is not worried, "DK'tronics hasn't many units and will have to start production from scratch."

Modem price slashed 30%

THE PRICE of the Prism VTX-5000 communications modem for the Spectrum has been cut from £99.95 to £69.95.

Paul Streeter, the sales director of Prism, is confident that the move will create more interest in computer networks such as Micronet 800. He says of the VTX: "The drop in price will clearly help it to appeal to a broader range of Spectrum owners who are keen to get into communications as long as the price is right."

The modem has been available for two years and was designed to work only with the Spectrum. It gives access to computer networks which provide users with telesoftware, viewdata services such as Prestel and electronic mailbox facilities on which messages can be left and answered.

The modem may undergo design changes in the future as a result of the discontinuation of the Spectrum. Such a move is being considered, claims Prism, but is unlikely in the near future.

Sir Clive hits out in pub punch-up

THE RIVALRY between Sir Clive Sinclair and former employee Chris Curry, now head of Acorn Computers, developed into open warfare over the Christmas period.

Having commissioned a survey on the reliability of micros which appeared to demonstrate the superiority of the BBC over the Spectrum, advertisements were placed in two national newspapers on behalf of Acorn, implying that Spectrums bought as Christmas presents would soon be taken back to the shops, and their owners would do better to buy BBC computers instead.

The advertisement so angered Sir Clive that he attacked Curry in the *Baron of Beef*, a Cambridge pub where both are regular cus-

tomers. Sir Clive walked up to Curry and slapped him about the head, then argued with him about the advertisement. There was some shoving and jostling, and the two men later began fighting again in *Shades*, an upmarket Cambridge wine bar.

Such strong passions amazed the national press, which appear to have believed that the world of technology is populated by cold fish with few emotions. Sir Clive even fell victim to the notorious columnist Jean

Rook, who said in the *Daily Express* that she thought the fight gave him sex appeal.

The two leaders of British home computing are now said to have made up their differences, and Chris Curry was a welcome guest at Sir Clive's New Year's Eve party.

Sir Clive's brother Iain Sinclair comments, "It's nice to know our captains of industry are just as capable of letting their hair down and making complete idiots of themselves as the rest of us."

The force is going soft

RETURN of the Jedi and *Deathstar Battle* form two major software releases from Sinclair Research.

The games, both for the Spectrum Plus, follow the adventures of Luke Skywalker and bear more than a slight resemblance to the events portrayed in the George Lucas *Star Wars* film trilogy.

The two packages will be part of the Spectrum Plus six pack, available free with the machine, replacing two other titles.

The fate of a stuntman

ELITE has suffered a small setback with its latest game — *Fall Guy*. A few days after its launch *Fall Guy* stumbled, damaging the game's turbo load facility in the process.

Five thousand copies of the game were initially released with the turbo load facility which refused to load the game at all. *Fall Guy* has since been recalled.

Steve Wilcox from Elite comments, "We immediately remastered the tape to produce the game without the turbo load. Anyone experiencing loading problems should return them to us for a replacement."

The fault can be rectified by adjusting the alignment of the cassette heads.

Spectrum + upgrade

SINCLAIR has just launched the official Spectrum Plus upgrade kit — so if you are feeling hard done by, having just bought a Spectrum 48K, cheer up because you can upgrade it for a mere £20.00.

The kit provides you with the new keyboard — complete with 58 hard, moulded keys including a space bar — an 80-page user guide and companion cassette which provides you with three arcade games and an 'interactive tour of the new keyboard'. You will, however, lose out on the free pack

of software which comes with a new Spectrum Plus.

According to Sinclair, you need no knowledge of electronics to tackle the upgrade, only a soldering iron and a steady hand.

If you do not feel up to the job, Sinclair will do it for you for £30.00 and return your computer within a record-breaking 10 days.

The Spectrum Plus upgrade will accept all peripherals in your Sinclair system. All future Spectrum peripherals are being designed with the Plus in mind.

Bugs attempt to sabotage free booklet

DUE to some unfortunate type-setting errors in last month's free booklet four of the programs contained errors in syntax.

Tip 18. Line 9915 contained an extra opening bracket at the beginning of the line. It should start IF (PEEK(. . .

Tip 31. Line 100 should read: IF A(K) < B THEN LET B=A(K); LET D=K. Line 135 should be inserted: NEXT M

Tip 36. At lines 30 and 40 LENS should read LEN.

Tip 47. The two extra opening brackets at the start of line 270 should be deleted.

We apologise to readers for these errors and hope that they are finding the booklet useful.

Runner drops out of the race

FRONT RUNNER, the K-Tel software subsidiary, appears to be tightening its belt in 1985.

K-Tel entered the software market in 1983 and its first batch of releases included *It's Only Rock 'n' Roll*, which proved a minor success. The company name, Front Runner, was launched less than a year ago

and its recent releases include *Boulder Dash* and *Space Professor*.

However, the recession seems to be hitting even major record companies like K-Tel and a decision was taken recently to withdraw Front Runner from the LET show — a trade show at which almost every software house will be present.

According to a company spokesman, Front Runner is, at present, taking a close look at the market. Asked if that meant that Front Runner would be pulling out of the market altogether, the spokesman replied, "Not necessarily so", but did not specifically deny the suggestion.

more news on page 10

Expert ghostbusters

THERE was an outstanding response to the **Ghostbusters** competition published in the December issue of *Sinclair User*. The 100 winners are listed below:

Craig Dudley, Beeston, Leeds; T E Cheese, Lordshill, Southampton; Jon White, Banbury, Oxfordshire; P Edmonds, Hyde, Cheshire; Dean Guilder, London, E7; David Matson, Stockport, Greater Manchester; Clive Marner, Halstead, Essex; Michael Guest, Cramlington, Northumberland; J Molony, Denmead, Hampshire; John Bishop, West Bridgford, Nottingham; Jonathan Hart, Alton, Hampshire; Mark Edwards, Ledbury, Herefordshire; J Gordon, Bridgwater, Somerset; Jonathan Ruddock, South Shields, Tyne and Wear; Paul Mallon, Carnmoney, County Antrim, Northern Ireland; S Beesley, Erdington, Birmingham; Simon Groves, Park Avenue, Wolverhampton; P W E Camp, Cowley, Oxford; Scott Lewis, Tonbridge, Kent; Jason Kilner,

Ardsley, Barnsley; J Catton, Pinner, Middlesex; S G Mitchell, Basingstoke, Hampshire; J M Carr, Darlington, County Durham; M Stevens, Fairford, Gloucester; Stephen Rees, Winstanley, Wigan; Tumai Gmver, Scunthorpe, South Humberside; Stephen Grover, Banstead, Surrey; Neil Smith, Cronton, Cheshire; Paul McNeil, Penicuik Midlothian, Scotland; P Sellick, Abingdon, Oxfordshire; M McMahon, Lanarkshire, Scotland; M Jenkins, Hollywood, Birmingham; Ron Canham, Epsom, Surrey; Adam Coxall, East Molesey, Surrey; Barry Gill, St Helens, Merseyside; B J Griffin, Grapenhall, Warrington; Andrew Collins, Dronfield, Sheffield; H Wallis, Greenford, Middlesex; G Kerr, Prescott, Merseyside; Andrew Brown, Dulverton, Somerset; Stephen Watson, By Cupar, Fife; C Crane, Stoke-on-Trent, Staffordshire; J Castle, London E6; John Mee, Grimsby, South Humberside; S Tett, Bridgwater, Somerset; R Walsh, Birkenhead, Merseyside; Jason Brown, Camberley, Surrey; Gavin Marshall, Kingston-upon-

Thames, Surrey; Andrew Biggs, Horley, Surrey; Lee Hughes, Coventry; Chris Fletcher, St Bees, Cumbria; Keith Stewart, Eastleigh, Hampshire; Michael Polak, Dundee; Richard Johnson, Bolton-Le-Sands, Lancashire; Hilda Gibson, Chorlton, Manchester; Matthew Plumbtree, Colchester, Essex; J Redpath, Herne Bay, Kent; Barbara Bamfield, Scarborough, Yorkshire; James Millington, Dronfield, near Sheffield; Ben Taylor, Stroud, Gloucestershire; Rich Porter, Wirral, Merseyside; Mrs Littlewood, Hull, North Humberside; Clive Wood, Nantwich, Cheshire; A G Sleeman, Lincoln; Simon Carn, Bristol, Avon; Owen Whitehead, Barnsley; E Fairless, Killingworth, Newcastle on Tyne; Andrew Hogg, Barking, Essex; D Williams, Stockport, Cheshire; John Myatt, Upton-on-Severn, Worcester; Serena Gabrielsen, Huyton, Liverpool; Bill Walsh, Bangor, County Down, Northern Ireland; Peter Johnston, Ballymeana, County Antrim, Northern Ireland; George Rivers, Basingstoke, Hampshire; Simon Howard,

Crewes, Paul Jordon, Pontefract, West Yorkshire; N Blundell, West Derby, Liverpool; Lee Jackson, West Bromwich, West Midlands; J M Maybury, Walsall, West Midlands; K Sonubi, Derby; Colin McAlister, Ballycastle, County Antrim, Northern Ireland; Andrew Long, London E8; Carolyn Lamb, Rochdale, Lancashire; Darren Williams, Spennymoor, County Durham; David Ames, Richmond, North Yorkshire; Paul Donough, Clevedon, Avon; W O R Benoy, Bury St Edmunds, Suffolk; D Hindle, Ulverston, Cumbria; James Wolfe, Evesham, Worcestershire; Phil Thornley, Tyldesley, Manchester; James Davey, Tonbridge, Kent; Michael Park, Scarborough, North Yorkshire; David Balmer, Gateshead, Tyne and Wear; Stephen Wade, London E8; Matthew Hill, Harlow, Essex; R Armstrong, Ealand, South Humberside; Jennifer Strom, Amlwch, Anglesey, Gwynedd; John Parkinson, Rotherham, South Yorkshire; Charles Harbour, Robertsbridge, East Sussex; Christine Brierley, Swindon, Wiltshire.



Sinclair upgrade for easier access

THE QLKIT, the toolkit from Sinclair Research, has at last been announced.

For £29.95 the QL owner gets a package of nearly 60 routines which have been written by QDOS author Tony Tebby. They include

Assembler price cut

THE Metacomco Assembler Development Package has been enhanced and its price dropped.

A linker has been added to enable assembler modules and user code to be chained together. Existing users will be able to obtain the upgrade for a sum which is as yet unspecified. The company says, however, that any charge will be nominal.

Metacomco hopes to draw a new type of customer with the price cut from £59.95 to £39.95. The company says that the new price will make the product more accessible to the growing number of home users of the QL.

a full screen editor, which is a welcome replacement for the inflexible line editor which resides in the machine, alternative character fonts and extended EXEC commands which allow programs and jobs from QDOS to be chained.

QLKit also provides easier access to the operating system. Pipes, such as those to be found in the Unix operating system, can be used to provide communication between programs, job

control is made simple and routines have been included for memory management.

Other releases from the company include the standard specification for QL floppy disc interfaces and a QDOS programming manual.

The manual includes information necessary for programmers to get to grips with Tony Tebby's operating system. It costs £14.95 and will be available from Camberley.

Big storage squeeze

THE STOP storage optimiser, from Digitex, will compress your microdrive files to as little as half their original size.

Digitex says that STOP, which is supplied on microdrive, will work on text files and data of any size; it makes the process of backing-up files easier and will work with any QL compatible software.

The optimiser uses a sim-

ple process. It reads the microdrive file, calculates the best practical way of condensing it and then produces another file which is about half the size of the original.

STOP is recommended for use on large text files, Basic programs, word processor documents and data files. Digitex warns that it is not intended for use on code files, such as machine code.

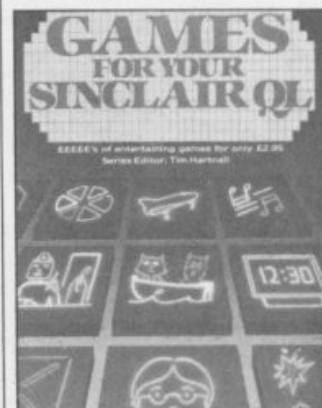
The program can be obtained for £17.95 from Digitex Computers.

Hartnell's handy books

"PROGRAMS of originality and quality for all the family" are promised by Virgin Games in its new book of listings by Peter Shaw.

Games for your Sinclair QL, edited by Tim Hartnell, provides 20 games which you can type into the QL and retails at £2.95. Programs include Nimrod, Clock, Worms and Buzzphrase generator.

Hartnell has also launched his own book of listings and explanations. *Tim Hartnell's QL Handbook* retails at £7.95 and includes routines to produce a version of the programming language Logo, a section on creating adventures and programs to allow you to define your own character sets.



First of the floppies?

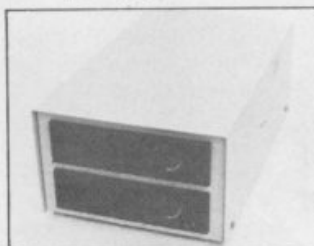
A FLOPPY disc interface to supplement the Sinclair microdrives has been launched by Computamate.

The Q-Disk interface is available from WH Smith for £149.00. It is easy to plug in, says the manufacturer, and uses the RAM expansion slot at the left-hand side of the machine.

The operating system software which drives the product was written by QDOS author Tony Tebby. It uses the official Sinclair floppy disc format and is compatible with all software written for the QL. The company says that several companies have shown in-

terest in putting new software on disc using the system.

As well as manufacturing the interface Computamate provides disc drives for the QL. A dual 5¼in. unit with a capacity of 400K is available for £459.00. The 3¼in. single drive costs £299.00. Both will accept double-density floppies.



Initial releases

QL INTEGRATED Accounts, from Sagesoft, forms the centrepiece of a range of five new releases from Sinclair Research.

The package will retail at £89.95, a quarter of the amount charged for the program on other systems.

The other packages include *Cash Trader*, *Decision Maker*, *Program Planner* and *Touch and Go*.

Cash Trader, at £69.95, is the second major string in the Sinclair bow. Together

with the accounts package it will provide a powerful money management system for the small business man or for large companies with low staffing levels and many interests.

Decision Maker and *Touch and Go* were written by Triptych. The latter provides an easy introduction to the QL keyboard and aims to make you as familiar with it as possible. *Decision Maker* provides answers to questions which you do not want to ask yourself.

REGARDEZ

LANGUAGE LEARNING AIDS FOR
FRENCH, GERMAN & SPANISH

FOR BBC(32K) · ELECTRON
SPECTRUM (48K)

As used in numerous schools and colleges these programs provide a highly successful aid to modern language learning. Each cassette contains a sophisticated control program and a comprehensive series of vocabulary lessons which can be used in a variety of self-paced learning and test modes. Words, phrases etc are displayed with all necessary accents and special characters, different colours are used for masculine, feminine and neuter words to assist gender learning.

The programs are suitable for beginners, 0-level and beyond as simple commands enable new lessons in vocabulary or grammar to be created by the user, edited as required, then permanently saved for later use. Invaluable for homework and exam revision!

Two cassettes are available for each language, together these contain a vocabulary of thousands of words; Level A provides 16 lessons in general subjects; Level B provides a further 16 lessons including adjectives, adverbs and fully conjugated verb lists.

Available from your computer store or by mail order Price £9.95
Also Available "ANSWER BACK General Knowledge Quiz" Price £10.95



KOSMOS SOFTWARE

KOSMOS Software: 1 Pilgrims Close, Harlington, DUNSTABLE, Beds. LU5 6LX
Telephone (05255) 3942

Please supply the following programs

The French Mistress Level A @ £9.95 ☐ The French Mistress Level B @ £9.95 ☐
The German Master Level A @ £9.95 ☐ The German Master Level B @ £9.95 ☐
The Spanish Tutor Level A @ £9.95 ☐ The Spanish Tutor Level B @ £9.95 ☐
ANSWER BACK Quiz (Senior) @ £10.95 ☐

I have a BBC/Electron/Spectrum computer (delete as necessary)

Mr/Mrs/Miss

Address

Post code

I enclose a cheque/postal order for £ payable to KOSMOS Software

KOSMOS SOFTWARE
1 Pilgrims Close, Harlington, DUNSTABLE, Beds. LU5 6LX

BETA BASIC 1.8

ENHANCED BASIC FOR SPECTRUM 48K
FOR GRAPHICS — STRUCTURED PROGRAMMING
— DATA HANDLING

Release 1.8 is more powerful than ever! We don't have space to do this program justice — if you can't believe the ad, send us a large S.A.E. for further information.

Features: Commands are single-entry keywords in graphics mode. Syntax is checked on entry. Fully compatible with Spectrum Basic. Microdrive compatible. Comprehensive manual.

NOTE: Release 1.0 is still available for 16/48K Spectrum at £11.00.

ALTER screen colours
(general or specific)
AUTO line numbering
BREAK out of code loops
CLOCK digital clock
CURSOR CONTROL CODES allow
strings to have complex shapes
DEF KEY user definable keys
DELETE a block of lines
DO-LOOP structure
DPOKE double poke
EDIT specified line
ELSE used with IF THEN
EXIT leave DO-LOOP

FILL enclosed area with specified ink
or paper
GET wait for keypress
JOIN two program lines
KEYIN a string
KEYWORDS new keywords on/off
LIST/SET line TO line
USED used with GOTO, GOSUB
ON ERROR trap errors
(with LINE, STAT and ERROR)
PLOT a string may contain cursor
control codes
POKE a string
POP Basic's stack
PROC, DEF PROC, END PROC
(for named procedures)

RENUM versater renumber
ROLL all or part of screen in any
direction by specified number of
pixels, with or without attributes
SCROLL like ROLL, but without wrap
round
SORT arrays (very fast)
SPLIT program lines
TRACE program execution
UNITS used with DO or LOOP
USING used with PRINT
WHILE used with DO or LOOP
XOR, YOR move PLOT origin
XRG, YRG change PLOT scale

FUNCTIONS

AND (bit-by-bit)
BINE decimal to binary
CHARS number to 2 characters
CODE fast cosine
DEC hexadecimal to decimal
DPEEK double PEEK
FILLED filled area

HEX8 decimal to hexadecimal
INSTR string search
MEM free memory
MEMORY all of memory as a string
MOD modules
NUMBER 2 characters to number
OR (bit-by-bit)

RND48 fast RND
SCANS recognise user graphics
SINE fast sine
STRINGS repeats strings
TIME current time
UNITS format numbers
XOR (bit-by-bit)

Only £11.00 inclusive! (Upgrade price for Release 1.0 owners is £4.00. This includes a 12-page supplement to your manual. Please quote date of purchase. If you did not purchase from us, state supplier and return original cassette.)

Please send me:

Beta Basic, Release 1.8. Payment of £11.00 is enclosed.
(or £11.50 for foreign orders). Cheques payable to BETASOFT.

I don't believe it! Please send me full details of Beta Basic 1.8. I enclose a stamped addressed envelope.

NAME:

ADDRESS

BETASOFT
92 OXFORD ROAD, MOSELEY,
BIRMINGHAM B13 9SQ.

TWO GREAT WAYS TO TURN ON YOUR SPECTRUM THE SWITCH

£4.95

No Spectrum Should Be
Without One



- ★ Allows the Spectrum to be reset or switched off easily
- ★ Simple - Just plugs into the power socket
- ★ Reset with separate on/off and LED
- ★ Compatible with ALL add ons

THE SWITCH 2

£2.49

Designed with the real keyboard user in mind, this smart kit fits ALL add on keyboards to give a "fitted" reset.

- ★ Anti power surge
- ★ Fitted in minutes
- ★ Flush fitting
- ★ NO SOLDERING

Now in most good computer shops

All prices include VAT. Please add 25p P&P per order.

EIDERSOFT 01-478 1291

FREEPOST, PO BOX 54, ILFORD, ESSEX. IG1 1BR.

Please allow 14 days for delivery

With Quest the QL really means business



Executive Series



QL Expansion Console



Memory Expansion Board



Business Accounts Software



CP/M 68K



Disk Drive

Quest's Executive series of quality peripherals and software for the Sinclair QL allows the business and serious home user to fully realise the full potential of the most exciting computer of the 80's.

Post the coupon below to obtain details of a wide range of Quest Executive products including:

- CP/M 68K
- Business Accounting Software
- Floppy and Winchester Disk Drives
- Memory Expansion Boards
- Monitors
- Printers
- Consumables

Telephone Sales Desk 04215 66488

CP/M is a registered trademark of Digital Research
QL is a registered trademark of Sinclair Research



Quest International Computers,
School Lane,
Chandlers Ford, Hants. SO5 3YY
Telex 47326.

Please send me details of the Quest Executive Series

Name _____ Tel. No. _____

Address _____ My QL Serial Number
is _____

Position _____



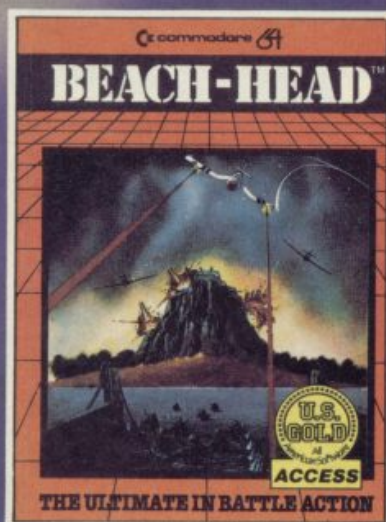
Another leap forward
QUEST

FAST

THERE'S NEVER BEEN A BETTER

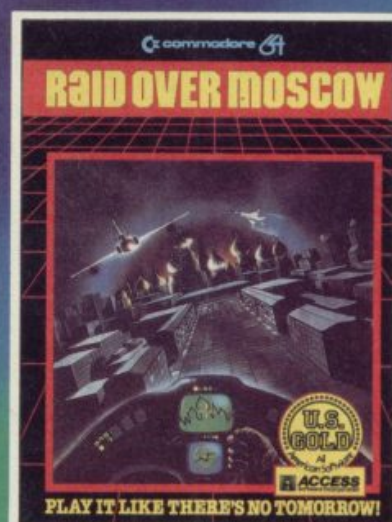
★★★★★★★★★★★★★
U.S. GOLD
 All American Software

Until now, this fantastic range of American games has been available only to the fortunate owners of Atari and Commodore computers. Now, thanks to U.S. Gold, you and your Spectrum/Spectrum+ can team up with some of the best games available today, from such famous-name American software houses as SEGA,



BEACH-HEAD

£7.95



RAID OVER MOSCOW

£7.95

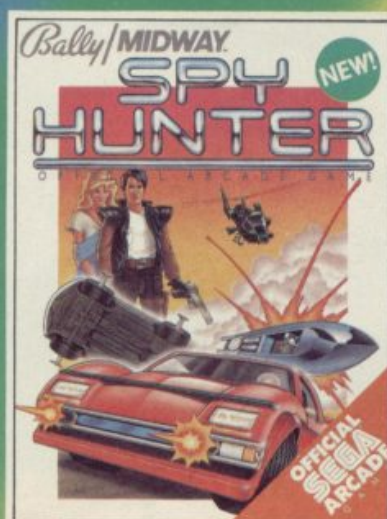


ZAXXON



TAPPER

£7.95



SPY HUNTER

£7.95



BUCK ROGERS

£7.95

The Ultimate in American Software

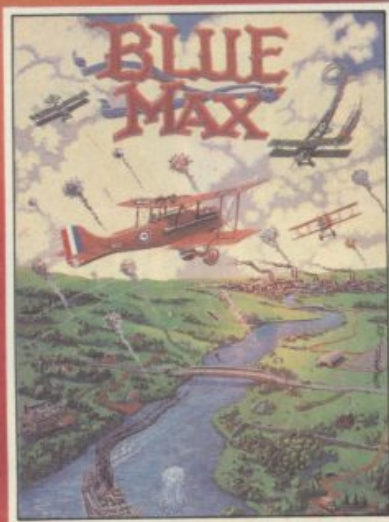
the

FORN

ER TIME TO OWN A SPECTRUM...

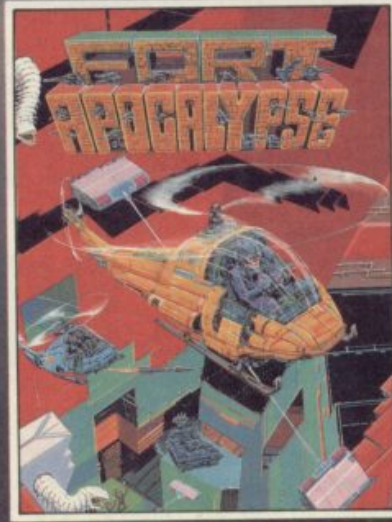


£7.95



BLUE MAX

£7.95

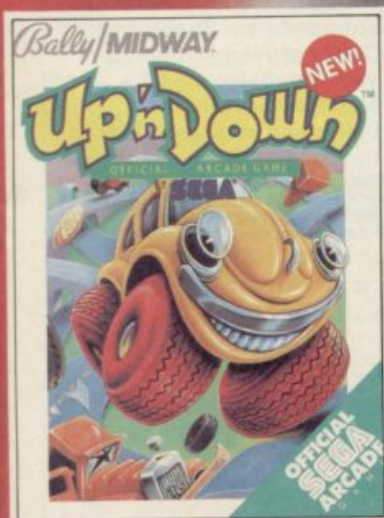


FORT APOCALYPSE

£7.95

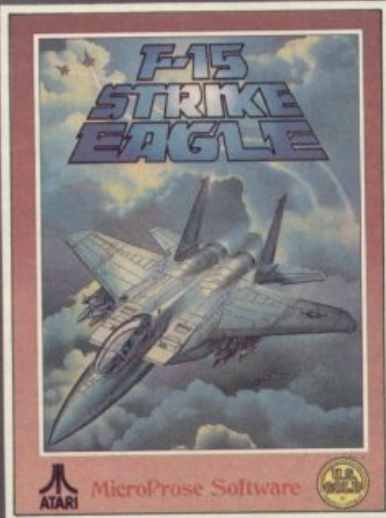
★★★★★★★★★★★★★
U.S. GOLD
 All American Software

BALLY MIDWAY, MICRO-PROSE and ACCESS. Amongst our winning line-up you'll find games of proven popularity, not only in the home, but in arcades across America! So play the game and discover for yourself why there's never been a better time to own a Spectrum!



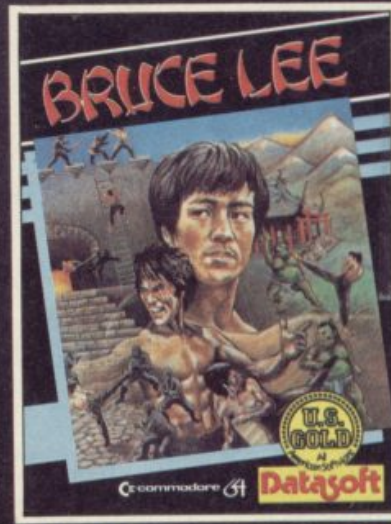
UP'N'DOWN

£7.95



F-15 STRIKE EAGLE

£9.95



BRUCE LEE

£7.95

U.S. Gold is stocked by all leading computer stores including: **Booth** / John Menzies / WHSMITH WILDINGS WOOLWORTH
 Dealers! For information on how to become a U.S. Gold stockist write to CentreSoft, Unit 10, The Parkway Industrial Centre, Hensley Street, Birmingham B7 4LY. Telephone: 021-359 3020. Telex: 337268. Overseas enquiries welcome.

**4 FREE
WAFERS
INCLUDING
SPECTRAL
WRITER WORD
PROCESSOR**

As a result of SMT's purchasing power, we are now able to offer the superb Rotronics Wafadrive data storage system for only £99.95*. But hurry! Stocks will not last long. You've read the reviews. Now's your best chance to buy!



ROTRONICS WAFADRIVE

SMT Special offer!

Wafadrive only £99.95*

*Plus VAT and £2.00 post and packing

Integrated System

The Wafadrive is a complete system which contains the micro interface, two 128K drives, RS232 and Centronics ports, all in one attractively-styled, compact unit. There is a minimum of connecting leads and no extra boxes to clutter the desk top. Like the majority of professional systems, the units are dual drive. This offers the optimum balance between system flexibility and cost. Built-in serial and parallel interfaces allow the direct connection of just about any popular printer.

Fast and Reliable

The Wafadrive achieves very fast loading and saving, but not at the expense of reliability. Extensive research and the use of high grade materials ensure that the Wafadrive will give years of dependable operation. Data integrity is on a par with

floppy disk. Three fully interchangeable blank wafers in three sizes – 128K, 64K and 16K – are also included. Low capacity wafers give faster access. They are therefore most suitable for program development applications. The high capacity wafers are suitable for more general data storage. Loading rate is well over ten times as fast as cassette!

Software

Armed with the comprehensive user manuals, blank wafers and superb Spectral Writer word processor, you'll have a professional system to be proud of. See the coupon below for details of the rapidly growing range of software to enable the

programmer and games player to exploit the Wafadrive system to the full.

Buy Now!

Cheap, reliable mass data storage for the Spectrum has finally arrived – make sure you benefit from SMT's special offer. Clip the coupon below and your order will receive immediate attention.

FOR USE WITH THE SINCLAIR SPECTRUM

Please send me (enter as appropriate):

- | | |
|--|----------------|
| — ROTRONICS Spectrum Wafadrive(s) | @ £117.24 each |
| — 16K wafer(s) | @ £3.45 each |
| — 64K wafer(s) | @ £3.65 each |
| — 128K wafer(s) | @ £3.95 each |
| — Heathrow/Nightflight II | @ £14.95 each |
| — Space Wars/Seiddab Attack/Luna Attack | @ £14.95 each |
| — Bear Solver/Wong's Loopy Laundry/World Cup | @ £9.95 each |
| — Starbike | @ £7.95 each |
| — ZAP machine code | @ £19.95 each |
| — Sherlock | @ £14.95 each |
| — RS232 lead | @ £9.95 each |
| — Centronics lead | @ £9.95 each |

All prices include VAT and P&P

TOTAL £

- ☐ I enclose a cheque/PO* made payable to SMT
☐ debit my Access/Barclay card* account no.

(*delete as applicable)

Signature: _____

Name: _____

Address: _____

Send to (no stamp required): **SMT, FREEPOST, Greens Norton, Towcester, Northants, NN12 8BR**

Please allow 28 days for delivery.



SMT

Clive eats pub curry

SIR CLIVE has added fisticuffs to his already formidable verbal arsenal of offensive weapons against business rivals. You will have read already of the bust-up before Christmas at a Cambridge pub. Gremlin however is delighted to bring you an account of the proceedings as described by a short, stout, inebriated eye-witness



Jack 'Business is War' Tramiel, having just bought Atari, explains the technology behind the company's latest word processing package.

who has been held incommunicado for the past three months pending negotiations with the Gremlin slush fund.

The microworld's answer to Frank Bruno stormed through the doors of the *Baron of Beef*, elbowed his way through the crowd and slapped Acorn supremo **Chris Curry** about the head with an open hand, reports our informant — a closed fist being, of course, illegal in all-in wrestling. Curry, who has already taken an early bath at Clive's dive — Gremlin, January — dragged the enraged tycoon behind a partition where a frank and candid exchange of views took place.

Sluggo Sinclair then reappeared, holding Curry in the notorious twisted-ear-

grip, now outlawed from the ring, and waving the Acorn advertisement which had offended him. He introduced Curry to the assembled drinkers as a 'very silly little boy' or words to that effect. Whereupon both corners retired to an exclusive wine bar, *Shades*, to continue their negotiations.

Those expecting a rematch at Big Uncle's New Year's thrash, to which Curry was invited, were disappointed. The two are reported to have spent an amicable evening together at the same table. Another guest was the landlord of the *Baron of Beef*, Bob 'they are both respected customers of mine and I have no further comment' Wass. Perhaps Sir Clive is beginning to learn something about the gentle art of public relations

Not everybody talks with his fists, however. One Alan Osborne, currently squatting in Amsterdam, has been writing letters to various magazines complaining that his Commodore 64 game *Havoc* has been ripped off for the Spectrum and generally abused in the process. Osborne wants everybody to boycott the Spectrum version, which reviewers agree is eminently avoidable.

Dynavision, which publishes both versions, now hopes to receive a letter from Alan declining to accept royalties for the Spectrum version. What, and spoil all the fun? . . .

Spoiling all the fun for BBC owners is journalist Mike Cook of *Micro User*. Answering a reader's problem, he advised that a particular error message meant

the machine was about to explode. Hundreds of owners of the swanky Beeb — a machine for social climbers if ever there was one — displayed their collective genius by believing the joke. One housewife dunked hers in a bucket of water, which must have done wonders for the notoriously slow tape-load system . . .

The two-part *Masquerade* spin-off **Hare-restorer** refuses to give up the ghost. **Haresoft's** prolific PR agency are now claiming the boring brainteaser is being bought by schools "to involve pupils in developing computer logic skills". "We couldn't make an awful lot of sense of it," says headmaster Peter Holman. "I think most schools bought **Hareraiser** to try and win the £30,000 for their school. That's certainly why we had a look at it."

Gremlin thanks Peter for his comments, and Jeff Lubbock at Haresoft for arranging the interview. Better luck next time, Jeff

Brazen Backslappers of the Month award goes to **Imperial Software**, responsible for **Empires**, the intergalactic yawn that needs at least four Spectrums to play at a rate of one move per forty minutes.

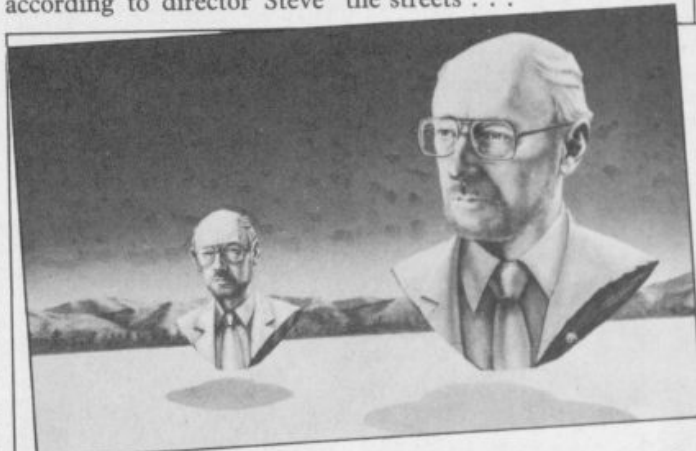
Players are said to be "in the grip of a galactic cult", according to director Steve

Baker. He also says he "receives phone calls every day from nuts", which speaks for itself, really . . .

Also speaking for himself is programmer Don Priestley, who wrote **Minder** for **DK 'tronics**. To himself as well, to judge from the three pages of drivel emanating from his 'seminar' on the game. We are told that TV spinoffs are encouraging programmers to develop new forms of Artificial Intelligence. Priestley says he's not sure what AI is, but whatever it is, **Minder** has got it . . .

They call it the electric slipper down at **Sinclair Research** when Sluggo isn't listening. The excitingly named **C5**, the ZX-80 of the motoring world, may yet refute cynics and scoffers, but so far automobile expert **Sir Clive** has declined to drive his electric trike through the London traffic to demonstrate its roadworthiness.

What Gremlin would like to know is, when is **Kempston** bringing out a joystick interface to replace those dreadful handlebars? And, given a name like **C5**, what was so awful about the first four models? A million unsold copies of **Driller Tanks** to any reader who can answer these burning questions about the finest washing machine ever to hit the streets . . .



Huge killer busts of Sir Clive roam the countryside seeking out the organisers of the Quickbyte awards. Sinclair won the We Acquire Software Titles Earnestly award for its acquisition of the Imagine mega-con Banderbotch.

RAM MAKE MORE OF YOUR SPECTRUM...

Two great new add-ons to boost the power of your Spectrum (and Spectrum Plus).

The Ram Interface Mk.II is Kempston compatible. It lets you get the best out of your action games, with all the best joysticks around - even the Quickshot II rapid fire joystick. Electrify your enemies, with real power and lightning-fast reactions at your fingertips.



JOYSTICK
INTERFACE MK II

£9.95

£21.95

Then there's our Spectrum Upgrade Kit. Boost your 16K memory to a fantastic 48K and run all the latest superb action software.

SPECTRUM
UPGRADE KIT

...FOR LESS.

(Both Ram products are made to last. And fully guaranteed.)
Get some real action into your Spectrum Games today!
Simply return the coupon below to Ram Electronics (Fleet) Ltd., Dept. SU, 106 Fleet Road, Fleet, Hampshire GU13 8PA.
Or call our credit card hot line on 02514 25252.

Please send me
..... Spectrum Joystick Mk.II Interface(s) at £9.95.

..... Quickshot II rapid fire joystick(s) at £9.95.
(only when purchased with interface. Normally £12.95)

..... Spectrum Upgrade Kit(s) at £21.95.

Please state issue 2 ☐ or 3 ☐

(Please add £1 p+p for UK orders. £3 p+p for Europe)
I enclose cheque/postal order, or charge my Access/Visa for £.....



Expiry date

Name

Address

Postcode

Telephone

To: Dept. SU, Ram Electronics (Fleet) Ltd.
106 Fleet Road, Fleet, Hampshire GU13 8PA

Trade and export enquiries welcome



Friendly Face

MICRODRIVE/CARTRIDGE UTILITIES

A complete suite of new routines

LOAD, CATALOG, ERASE cartridge files, by menu choices from master, autorun routine. Intelligent FORMAT routine formats batches of cartridges for optimum storage space. Print Filespace or CATALOG or Duplicate Master Routine on batches of cartridges. Also — "Expert" Microdrive Troubleshooter!

THE ONLY UTILITY OF ITS KIND

Now with fully updated Microdrive routines to MERGE with Master-file and Tasword Two, and give optimum professional performance.

MEMO and ACTION (scheduler) formats for MASTERFILE and free with cartridge version.

INCREDIBLE VALUE from MONITOR Ltd.
Cartridge £12.95, Cassette £6.95, incl. VAT and P&P within U.K. or P&P within Europe.

Suite 11, 526-8 Watford Way, London NW7 4RS
Tel. (01) 906 0911

O'LEVELS

not just revision but also tuition

MATHS 8 programs TOTAL 150k	fractions, square roots, decimals, logarithms, areas, sets, accuracy, bases, interest, volumes, indices, standard form, modulo, number sets, pie charts, histograms, simultaneous equations, bar charts, averages, probability, algebraic laws, quadratics, matrices, vectors, transformational geometry, trigonometry, differentiation, integration, factors, angles.	Spectrum 48k <input checked="" type="checkbox"/>
PHYSICS 7 programs TOTAL 140k	reflection, wavelength and frequency, refraction, lenses, the eye and its defects, diffraction, colour, magnetism, motors, Ohm's law, amps, volts, series, parallel, electronics, heat, gas laws, energy forms, specific heat, kinetic energy, half-lives, atomic structure, radiation, isotopes, Newton's laws.	BBC model B <input checked="" type="checkbox"/>
BIOLOGY 6 programs TOTAL 120k	plant and animal cells, genetics, inheritance, reproduction in man, asexual and sexual reproduction, flowering plants, photosynthesis, osmosis, transpiration, transport, bacteria food classes, diet, alimentary canal, respiration, excretion eye, skin, nervous system, ecosystem, food cycles, fungi earthworm, amphibians, birds, mammals, response.	Commodore 64 <input checked="" type="checkbox"/>
COMP. ST. 7 programs TOTAL 140k	data collection, coding, storage, processing, presentation, validation, d.p. systems, privacy, security, hardware, I/O devices, software, low and high level languages, machine-code, assemblers, interpreters, compilers, errors in programming, aids to debugging, microcode, machine organisation.	Spectrum 48k <input checked="" type="checkbox"/>
		BBC model B <input checked="" type="checkbox"/>
		Commodore 64 <input checked="" type="checkbox"/>

each subject only £7.95 inc p/p

LOGO, FORTH PASCAL & C

Languages 1 program Each 30k	Teaching versions of these languages, including a full text editor (screen editor) and a 48 page tutorial manual. Saving and loading of programs is a screen editor function. Trace facilities are provided for easy tuition and debugging. Availability: Pascal now, C now, Logo soon, Forth soon.	Spectrum 48k <input checked="" type="checkbox"/>
		BBC model B <input checked="" type="checkbox"/>
		Commodore 64 <input checked="" type="checkbox"/>

each language only £5.95 inc. p/p
GCE TUTORING DEPTa
40 BRIMMERS HILL, WIDMER END, HIGH WYCOMBE, BUCKS. HP15 6NP

please send me:

my name and address:

my computer is a:

I enclose a cheque / P.O. for £.....

Pirate bashing is puritanical

THE rather sanctimonious letter of Andrew Turek bemoaning children who copy programmes because they can't afford the originals — January *Sinclair User* — should be taken with a pinch of salt, because of what he left unsaid.

If it is wrong for children to "pirate" games, can the often extortionate prices charged by some software houses be morally defensible?

Most people I see buying games programs in Telford are children, and the attitude pervading part of the industry is summed up in a short story by Robert Heinlein — *The Man Who Sold The Moon* — in which two rather dubious characters say "... I want an angle to squeeze dimes out of school kids, too." ... "Why stop at a dime?"

An old business maxim is 'charge what the market will bear.' School-child piracy indicates that the price is generally higher than the market will bear, but that greedy or stupid software makers will not see it. Some houses have and are to be praised.

Perhaps children are not the willing dupes that the 'adults' — and I use the word with reservations — controlling some software houses seem to hope, and will refuse to use their pocket money to subsidise the financial aspirations of people who want to get rich very quick.

Could Mr Turek please explain the difference to readers of *Sinclair User* between a software house deliberately setting out to market a copy of a board game without first bothering to obtain the permission of the legitimate copyright holders, and a school child who

makes one copy of a game for a friend?

The answer is, of course, that the software house hires an army of lawyers to prove why they should be allowed to pirate other people's work.

Right and wrong exist for people who make things as well as for those who use them, and it is high time that everyone realised that.

Martin Scholes,
Telford, Shropshire.

IN REPLY to the comments on pirate-copying, may I say that here in Zimbabwe there is really no other way of obtaining games but by copying. There are no personal computer stores here, so we have to order from Britain or South Africa.

However, we are only allowed an allowance of Z\$360 — which is about £200 — per person, per year. We must live on this when we go on holidays outside the country. That amount must also be used to buy hardware and software. If you do you have to pay a 69 per cent customs tax. A Spectrum bought privately here, with no extras, costs Z\$800.

Jonathan Waters,
Harare,
Zimbabwe.

New improved print driver

WHILE agreeing with all that is said in your review of the Print-SP, Spectrum Centronics Interface — January, *Hardware World* — we feel that the heading of 'New COPY causes corruption' is confusing if not misleading. May we point out what your reviewer has very correctly said, that if the printer driver routine has already been loaded then

a NEW command should not be executed.

We have accepted his constructive criticism and Print-SP is now supplied with a second printer driver routine which resides above RAMTOP.

Print-SP is meant to be a low cost, utilitarian unit. Those who want a sophisticated unit will have to wait a few weeks longer for our Polyprint which displays and prints in up to eight languages.

L Dicks,
Cambridge
Microelectronics,
Cambridge.

Up against a brick wall

I HAVE *Knight Lore* from Ultimate but I find it very hard. I can't get over or around walls.

Peter McCabe,
Basildon,
Essex.

● Try standing on one of the objects which you have collected, not forgetting to pull it up after you as you jump over.

Reviews are influential

I FIRST bought *Sinclair User* six months ago, before I bought my Spectrum. Using the ads and features I

was able to plan ahead, and know exactly what I wanted from my machine and the software available.

My favourite section is Spectrum Software Scene because you show an exact copy of the tape on the TV screen, one thing that put me off buying TLL, by Vortex.

Good luck in the future with your mag. You've got it right.

S P Strong,
Betws-y-coed,
Gwynedd.

Last word on Sabre Wulf

I AM just writing to update the *Sabre Wulf* affair.

I finished the game on a much earlier date than June 7, in fact before it was made generally available. My dad, who owns a software shop in the Outer Hebrides, was given a pre-production copy.

I decided that five minutes work was not worth writing about, until now.

I claim to be mega super incredible amazing wonderful *Sabre Wulf King*.

P.S. I finished (my first go) with a score of 300 (clocked 8 times) and 99%.

Jeremy Gilder,
Beaconsfield,
Buckinghamshire.

Hewson's prompt

THE REPLY given by THORS" DATA B\$(): Andrew Hewson to Mike POKE 23736,181: SAVE Hughes' query — January "SUBJECT" DATA C\$()

1985 — is unnecessarily complicated. The query concerned the suppression of the "start tape and press any key" prompt when saving multiple program parts. In fact this can be achieved by a simple POKE before each Part which is to be saved, POKE 23736,181.

In a program the line which does all the saving would look something like
5000 SAVE "TITLES"
DATA A\$(): POKE
23736,181: SAVE "AU-

It is not advisable to put the Poke before the first item to be saved otherwise the SAVE would start without warning. Once the SAVE is underway then all the parts would be saved continuously. Note that all parts of the program, the screen display, the variables and machine code can be saved by this method.

John Bloxham,
Stratford-upon-Avon,
Warwickshire.

more letters on page 20

Faulty interface was reviewed

I WAS most concerned to hear from one of our many satisfied customers that your review in *Hardware World* of the AGF Protocol 4 joystick interface which appeared in the January *Sinclair User*, described certain operating problems with regard to the card programming system and controller movement response times.

Those problems are obviously the result of a defective unit and not a mode of operation which we would expect any of our customers to tolerate and I am most surprised that your reviewer considers those to be normal operating conditions.

I do note, however, that your tests were carried out on a pre-production unit and whilst I appreciate that your evaluation has to be based entirely on what you are given, it concerns me that much time and effort can be spent developing a product whose reputation can be instantly marred by comments which might be best levelled at the originator first in order to assess their validity. That would avoid misrepresentation and also a possible lack of credibility of reviews when users find that listed faults do not exist on their units.

Concerning the comment regarding limited life of membranes, regardless of our well-founded confidence in this proven technology, a quick calculation reveals that, even considering the worst possible parameters of operation, a card can be inserted 274 times a day over a period of 10 years without any adverse affect to the switching characteristics of the membrane. It is as well to remember that membranes are now widely used

in keyboards which receive fairly constant operation — inserting and removing program cards is done relatively rarely.

The use of membrane switching on the Protocol 4 is a contributing factor to our 18-month guarantee on the product as it greatly enhances the reliability of operation.

In closing, I would suggest your reviewer should return his interface for immediate replacement as that is what we would expect anyone to do if any of our products fail to operate correctly.

A G Fosberry,
AGF Hardware,
Bognor Regis,
West Sussex.

Allophones explained

IN reply to Declan Grady — Letters, January — full information on the SPO256-AL2 allophone set can be obtained from Maplin's Project Book Six. It contains a section called 'Allophone Speech Synthesis Technique' including information on the allophone names and length, sound, values in decimal, hex and oct.

It is available from Maplin Electronic Supplies, PO Box 3, Rayleigh, Essex SS6 8LR. Price 70 pence plus 50 p&p.

Rex Perkins,
Watford,
Herts.

The meaning of the word

AS AN ex-university lecturer with 10 years of research into computer languages and their implementation by code generation and interpretation, I must take issue with a statement in your

magazine that Metacomco have produced the first 'true compiler' for the QL — *Sinclair User* January 1985.

Computer One has been selling a Pascal compiler for the QL since late summer. In fact we were the first company to sell a range of languages for the QL. Although our compiler produces a fast compact version of P-code which is subsequently interpreted this is still a 'true' compiler implementing full Pascal. You would have been more accurate to say their BCPL compiler was the first to produce 68000 machine code.

Hamish I E Gunn,
Technical Director,
Computer One,
Cambridge.

● John Gilbert replies: While agreeing with Mr Gunn that the Metacomco compiler could be more accurately described as producing 68000 code the term 'true compiler' has become a loose one meaning 'a package which generates true machine code'. If my use of this term has misled any readers then I can only apologise to *Computer One*.

High-score scaremonger

I CLAIM to have the highest score on *Hunchback*, to be the first person to finish *Beach-Head*, and *Ghostbusters*.

On *Hunchback* I scored 1,800,900. I bought *Beach-Head* on the morning of

December 8 and finished it after one hour. I finished *Ghostbusters* on my sixth attempt, on December 24.

In the latter, when you reach the Temple of Zuul, you must avoid the Marshmallow Man and close the portal to the spirit world. When you do this, it gives you an account number. I have \$22,600, and my account number is 11527002.

Miles Sturt,
Horsham,
West Sussex.

Call for a ZX-81 club

HAVING read Robert Tempest's letter in the December 1984 issue of *Sinclair User*, concerning a general lack of ZX-81 software and features, I can only give my wholehearted support to his points of view.

However, as I am not one to sit around and complain, I should like to suggest to Mr Tempest and the many, many other frustrated ZX-81 users, that they should band together to form some sort of national, postal, users' club for owners of that excellent little machine.

If there is anyone out there who has similar thoughts on the matter then please write to me.

Iain Dale,
78 Cobden Street,
Thornaby,
Stockton-on-Tees,
Cleveland, TS17 7ET.

In defence of dirt

I AM writing in protest against your unfair review of *Travel with Trashman* in your December edition. Despite your reviewer's shocked attitude, I went out and bought it, and it turned out to be a very good purchase. I agree that Jerusalem and Benares are in bad taste, but the rest is tremendous.

I have managed to complete, in one game, all the screens except *Kanyu*,

where the irksome little guy with the spear manages not only to bump into me, but also to out-run me. There are also various interesting 'things' on each screen. For instance, has anyone tried going into the large, dark arch on Moscow, the little hut doors on *Kanyu*, or behind the set of steps in Madrid? Nick Liassides,
aged 15,
Worthing, Sussex.

KEMPSTON

MICRO ELECTRONICS LTD

CENTRONICS, RS232 INTERFACES



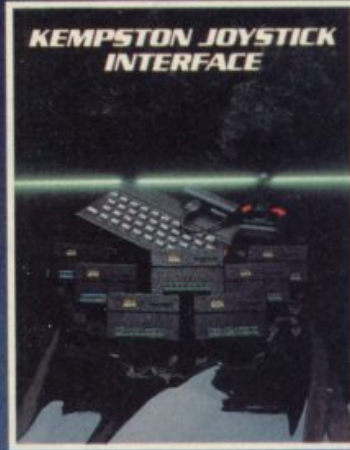
Printer interfaces for the ZX Spectrum allowing you to use a wide range of printers.

BBC PRO JOYSTICK



Complements the BBC computer in both design and performance. 8-way micro switches for precision control.

KEMPSTON JOYSTICK INTERFACE



Allows all joysticks in the Kempston range and others that are Atari compatible to be used with the Spectrum.

PRO 3000/5000 JOYSTICKS



Kempston's proven winners with excellent arcade quality action. Suitable for Atari Commodore 64 & Sinclair ZX Spectrum (when used in conjunction with a Kempston Joystick Interface).

JUNIOR PRO JOYSTICK



Offering maximum arcade quality features at an unbeatable price. Available in a special Combination pack with the Kempston Joystick Interface.

PRO JOYSTICK INTERFACE



The ultimate interface for the ZX Spectrum. Compatible with the Sinclair/Psion software, Kempston Joystick software and cursor key software, together with cartridge slot for ROM based software.

The Circuit Professionals



Most items available from

WHSMITH
Selfridges
spectrum Currys

Available directly from
Kempston Micro Electronics Ltd
Fast mail order service
Please send me the following

<input type="checkbox"/> Centronics "E" Interface	£49.00	<input type="checkbox"/> RS232 Interface	£45.00
<input type="checkbox"/> Centronics "S" Interface	£35.00	<input type="checkbox"/> BBC Pro Joystick	£16.95
<input type="checkbox"/> Kempston Joystick Interface	£11.50	<input type="checkbox"/> Pro 3000 Joystick	£12.75
<input type="checkbox"/> Pro Joystick Interface	£19.95	<input type="checkbox"/> Pro 5000 Joystick	£13.50
<input type="checkbox"/> Junior Pro Special Combination	£14.99	<input type="checkbox"/> Junior Pro Joystick	£5.99

I enclose a cheque/P.O. for £

Access/B'card

Name

Address

P/code

Signature

SU4

All prices include VAT P&P Overseas add £4 P&P

Kempston Micro Electronics Ltd Singer Way Woburn Road Industrial Estate Kempston Bedford MK42 7AF Tel (0234) 856633 Telex 826078 KEMPMI G

The ZX Spectrum
Expansion System. Only £99.⁹⁵

Sinclair's complete alternative to floppy discs...



**The ZX Spectrum
Expansion System contains:**

- One ZX Microdrive
- One ZX Interface 1
- One wallet containing four programs on Microdrive cartridge
- Microdrive demonstration cartridge
- One blank Microdrive cartridge
- Full documentation
- Connecting lead for Microdrive/Interface 1
- ZX Net Lead

The new ZX Spectrum +

Fully compatible with all Spectrum software and peripherals, including this Expansion System

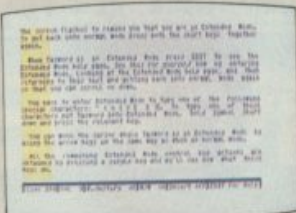


Tasword Two word processor

Turns your ZX Spectrum into a high-quality word processor!

Tasword Two has all the essential features of professional word processing packages – move and copy, insert, margin settings, 'help' pages, find and replace, and much more.

Written by Tasman Software Ltd.
Usual price (RRP): £13.90.



Games Designer

Now, all you need to create original games are original ideas – and Games Designer! It has eight, very different, pre-programmed games for you to play as they are – or modify out of all recognition!

There's never before been an easier, more enjoyable, way into games design.

Written by Quicksilver Ltd.
Usual price (RRP): £14.95.



Masterfile filing system

Address lists... personal files... stock inventories... stamp or album collections... club records... recipes... if you can file it, you can Masterfile it!

Masterfile is a menu-driven filing and retrieval system of immense power. Display formats are user-defined, so the range of applications is enormous. Written by Campbell Systems Ltd.
Usual price (RRP): £16.95.



Ant Attack

The all-time classic 3D strategy game. Ant Attack combines stunning Escher-like graphics with fast-moving action and a real tactical challenge.

Your task is to enter the walled city, seek out your captured partner, and escape. At all times you can choose from four angles of view. But beware: the city is patrolled by giant ants...

Written by Quicksilver Ltd. Usual price (RRP): £6.95.



All programs run on a 48K Spectrum or Spectrum+. Recommended retail prices are for each program on cassette.

...includes this great set of Microdrive programs!



The unique ZX Microdrive system sets the Spectrum apart from all other home computers.

It gives you all the advantages of floppy disc drives – at a fraction of the cost. And tests show the Microdrives are faster than some disc drives.

Now, the complete Microdrive system comes in one package – together with four of the best-ever Spectrum programs, on Microdrive cartridges.

This software alone would normally cost you over £50.

Yet the Sinclair price for the complete ZX Spectrum Expansion Pack is just £99.95!

You'll find full details of its contents in the panel opposite.

ZX Microdrives – another Sinclair first!

The ZX Microdrive is a revolutionary fast access / mass storage device. And it's the only truly affordable alternative to disc drives ...

- Loads or saves up to 85K of program or data from Microdrive cartridges.

- Just 3.5 seconds to access a typical file.
- Only 9 seconds to load a typical 48K program.

The ZX Microdrive cartridge – a unique storage medium.

Smaller than a matchbox, the ZX Microdrive cartridge packs in a massive amount of data and programs.

Each Microdrive cartridge holds at least 85K bytes of data or programs (that's 30 pages of A4 text). And you can store up to 50 different data files per cartridge, identified by titles of your choice.

Every cartridge comes in its own protective case. Simply remove the cartridge, slot it into the Microdrive, and it's ready to use.

ZX Interface 1 – adds powerful new capabilities to your Spectrum.

ZX Interface 1 connects to the back of your Spectrum and controls up to 8 Microdrives. (Additional Microdrives are available for £49.95 each.)

It also gives you:

- An RS 232 interface – to link your Spectrum with full-size printers, other

computers using RS 232 (the industry-standard interface) and provide data transmission over telephone lines, via modems.

- ZX Net – lets you set up a local area network of up to 64 Spectrums, for high-speed data communications between you and Spectrum-owning friends.

At your local Sinclair stockist – today!

The ZX Spectrum Expansion System adds an exciting new dimension to Spectrum and Spectrum+ computing. At £99.95 it's superb value too.

To find out more, call in at your local Sinclair stockist now!

Sinclair Research Ltd,
Camberley (0276) 685311.

® Sinclair, ZX, ZX Spectrum, ZX Microdrive, ZX Net and ZX Interface are Trade Marks of Sinclair Research Ltd.

sinclair

STOP PRESS: SAGA 1 EMPEROR NOW SPECTRUM + COMPATIBLE. NEW PRICE £49.95 (Please state model)

SAGA 1 EMPEROR



THE KEYBOARD FOR ZX SPECTRUM COMPUTERS

- * **EASY FITTING**
- * **PLEASURE TO USE**
- * **LONG LASTING**

The Saga 1 Emperor, equipped with 67 keys, is a carefully designed replacement keyboard incorporating many special functions for the popular Spectrum Computer. For business or pleasure, the Emperor will make your computing time more productive and

enjoyable. The SAGA 1 Emperor will enable you to use the Spectrum as a powerful programming tool easier and faster.

The style is easy:- for your benefit, the SAGA 1 Emperor has been designed to ensure that available Spectrum Peripherals will fit in the usual manner.

The assembly of the keyboard is simple — and fast. No soldering required, so that within just 5 minutes you can replace your current ZX Spectrum with the new SAGA 1 Emperor.

AND ALL THIS FOR JUST £54.95 (inc. VAT)

SAGA P.C.!

Your very own Personal Carrier, partitioned to neatly accommodate your Spectrum, Saga 1 Emperor and peripherals; Tape Recorder; Power Supply, Cables, manuals and cassettes. Of solid and attractive construction the P.C. is ideal for storing and transporting your computer accessories. The case uses a strong double stitched and bound Black Calf Vinyl with a tough thick ABS inner compartment, leather buckles and a strong handle. Only **£26.95** (inc. VAT).

DUSTCOVER

Another top quality product, this expertly produced long-lasting bound and sewn dustcover has been specifically designed for the SAGA 1 Emperor, which will keep everything looking neat and dust free. Only **£4.95** (inc. VAT).

THE COLLECTION



SOUNDBOOST

Hear that keyboard click with a SAGA SOUNDBOOST. The SAGA SOUNDBOOST is a tiny electronic circuit which considerably enhances the sound volume and quality of the Spectrum sound output. Adjustable from a whisper to a roar, the SOUNDBOOST provides added realism and excitement for games players and security for programmers (Hear that Keyboard Click!). No cutting, no soldering — just connect. Only **£9.50** (inc. VAT).

FLEXICABLE

Developed to relieve your Spectrum from the pressure of life, to fit your Spectrum and your add-ons taking the load with ease. By popular demand we now have two versions of the 9 inch FLEXICABLE available to suit your needs.

Male-Female FLEXICABLE — **£12.45**
Female-Female FLEXICABLE — **£9.50**
Converter PCB — **£2.95**

THE COLLECTION

COLLECTION 1 — SAVE £10.00!!

r.r.p. **£53.85**
Our special price **£43.85**
includes: Saga Personal Carrier **£26.95**
Soundboost **£9.50**
Dustcover **£4.95**
Flexicable (M-F) **£12.45**

COLLECTION 2 — SAVE £20.00!!

r.r.p. **£108.80**
Our special price **£88.80**
Collection 1 **£53.85**
Saga 1 Emperor **£54.95**

COLLECTION 3 — SAVE £30.00!!

r.r.p. **£238.75**
Our special price **£208.75**
Collection 2 **£108.80**
48K Sinclair ZX Spectrum **£129.95**

DISTRIBUTOR & TRADE ENQUIRIES
CALL NOW ON
WOKING (04862) 22922



Please write to: SAGA Systems Limited,
Dept. SF 2 Eve Road, Woking, Surrey
Telephone Woking (04862) 69527/22922
or Telex 859298
All prices include VAT
P&P free for Sound Boost and Flexicable.
P&P £1.25 for SAGA 1 Emperor U.K.
£4.00 for SAGA 1 Emperor Europe
£15.00 for SAGA 1 Emperor U.A.E.

Please send me

Name _____

Address _____

The following SAGA PRODUCTS _____

Total amount enclosed £ _____

Please make CHEQUES/P.O. Payable to SAGA Systems Ltd.

STOP PRESS: SAGA PC REDUCED TO £14.95. EXCELLENT VALUE. LIMITED STOCKS AVAILABLE

More from DK stable

AS ONE of the oldest suppliers of add-ons for the Sinclair market, DK'tronics has built up a reputation for good, basic, hardware. The latest additions to its range for the Spectrum — two joystick interfaces, a printer interface and a sound generator — do not break any new ground but are well designed and constructed.

All use a new, restyled, case which can be used with the Spectrum Plus and should also fit most full-sized keyboards. In addition, three of the four items have through connectors — a welcome change.

The less expensive joystick interface is Kempston/Sinclair compatible. It has two standard joystick sockets on the top, the left Kempston and the right Sinclair — keys 6, 7, 8, 9

and 0 for fire. Priced at £13 it should prove popular with arcade fanatics. It does not have a through connector, and thus must be the last add-on attached.

For those who need a wider choice of keys the programmable interface at £22.95 could be the answer. It can be programmed using the tape provided or, when a game is running, via a

switch on the top. The tape allows you to program any of the keys, including Shift and Enter, and to read two or more keys at once, so you can move diagonally and fire at the same time.

The printer interface is disappointing. It can drive any Centronics printer but it has disadvantages which make it a doubtful buy.

The software tape pro-

vided has two pieces of code on it, one for Epson compatibles and the other for the MCP 40. The Epson code is only 520 bytes long and redirects LPRINT and LLIST to the printer. A copy routine is included but only in one size and, when tested on an Epson printer, appeared to give a line feed which was out by 1/72in. The bottom two lines of the screen are not copied. The MCP code is 680 bytes long and includes a half-sized copy option as well as supporting the INK command.

For MCP 40 users the interface might well be a good buy at £39.95 but Epson or Seikosha users who want to use COPY should look carefully before buying.

The Sound Generator, priced £29.95, is based around the ever popular AY-3-8912 chip and includes a built-in amplifier and external speaker; it also amplifies the BEEP. The problem with this chip is that it is not one of the easiest to program, although thorough instructions are included that show you how to do this in Basic or code.

To overcome that, software is included on tape which allows you to write a tune in three-part harmony and replay it. You cannot alter the length of note — you have to enter two notes to double the length — nor edit a voice once it is entered; you are limited to 256 notes per voice.

The chip has 15 envelopes built in and a different one, and/or noise, can be assigned to each voice. That, again, is rather basic and reflects the age of the chip.

Although the chip is well known the problem has always been lack of support from software writers. DK'tronics is well placed to change this and some future releases will contain routines to drive the generator.

more hardware on page 26



Low cost for high quality print

A PRINTER is a major expense for most computer users but a number of low cost printers are becoming available. The Fastext 80 by Smith Corona is classed as a budget, Centronics, printer but it has most of the features you are likely to need. RS232 is an optional extra.

As well as normal-sized text you can print in Condensed, elite or enlarged type — all with true descenders, change the international character set, underline characters and change the

line spacing and form length. An automatic line feed can be set using the single DIP switch on the back of the printer and in graphics mode you can print up to 576 dots.

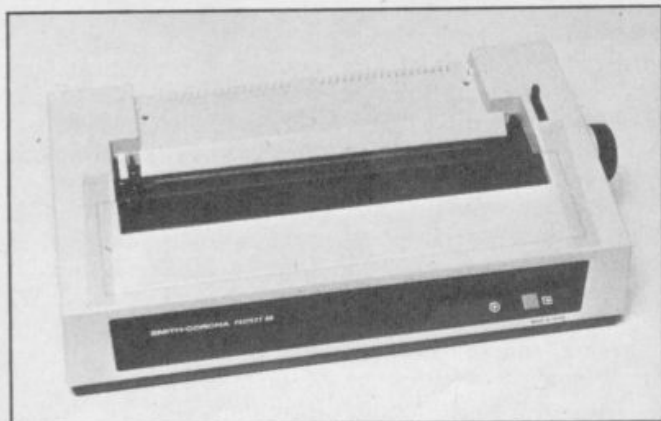
The standard printer can accept paper up to 10in. wide and a tractor feed can be added for fan-fold paper. The friction feed works tolerably well but snags, occasionally. At normal print size it prints at a fast 80 cps.

With all that it should be

a reasonable buy but there are problems. The first are the instructions. The initial setting up is well documented but the list of control codes is poorly laid out and is a mine-field for newcomers. Although the codes are Epson compatible the common DCA is replaced by ESC W, ESC J executes at n/72 rather than n/216 and ESC C only operates on the number of lines.

The front panel has only an on-line button, line feeds and form feeds have to be sent by software or by using the manual knob. There is an LED to show if you are on-line but there is 'no end of paper' warning.

All the above could be forgiven if the printer were competitively priced, but at £224.25, plus £17.25 for a tractor feed and £8.20 for extra ribbons, it is not. For the same price you can get an Epson RX80 which has a proven track record and cheaper ribbons.



Tactile teacher

FOR MANY applications the standard QWERTY keyboard is far from ideal. The Touchmaster, from Touchmaster Ltd, is one way to make data input easier.

It is a pad with a flat surface on which, as you draw, the position of the pen is returned to the computer. By using a number of different overlays different parts of the pad can be made to represent different things and so the keyboard can almost be dispensed with.

The Touchmaster is sold as a complete package of pad, power supply, stylus, interface and a drawing program. Interfaces are

available for a number of computers — Spectrum, BBC, Commodore 64, VC, 20 and Dragon — so if you change your computer you need only a new interface. As the package costs £149.95 that is a definite advantage.

The Spectrum interface is a standard black box which fits flat into the user port. An extension edge connector is provided on the back and a 3ft cable connects to the parallel socket on the pad. The pad also has a serial connector, possibly useful for a QL version, and a socket marked 'Foot Switch' but there is nothing in the instructions about that.

The drawing program, called Multipaint, has a number of features but does not compare too well with other drawing programs. On

the plus side, apart from entering text and loading the program, the keyboard does not have to be used, which consequently speeds drawing. When drawing freehand you can alter the 'brush' to give different thicknesses and styles.

The usual facilities of filling areas, drawing circles, boxes and polygons and changing the attributes are available. You can load and save screens but for some reason that facility could not be made to work. What it lacks are the grid overlays, magnification, scrolling and flipping of the more comprehensive programs. You can only draw on the top 22 lines of the screen and, as there is no grid on the pad overlay, you can easily lose your position.

Touchmaster sells a number of other programs for

use with the pad.

Of the three we look at — Simon's Shapes, Simon Saw and Simon Says — only the last one would hold a child's attention for long.

Simon Saw entails finding the correct jigsaw pieces to make a picture. If you succeed you can feed the cat. In **Simon Says** you build up a cartoon style photo-fit face. The computer then moves randomly some of the features and you have to repeat the sequence. You do that by pressing either the feature or the word on the pad. Then you get to feed the by now grossly overweight cat.

Although the instructions say you can run the Touchmaster using your finger, instead of the stylus, it needed more pressure than a small child could give. That may be because it was new but try one out if you are buying for your children.

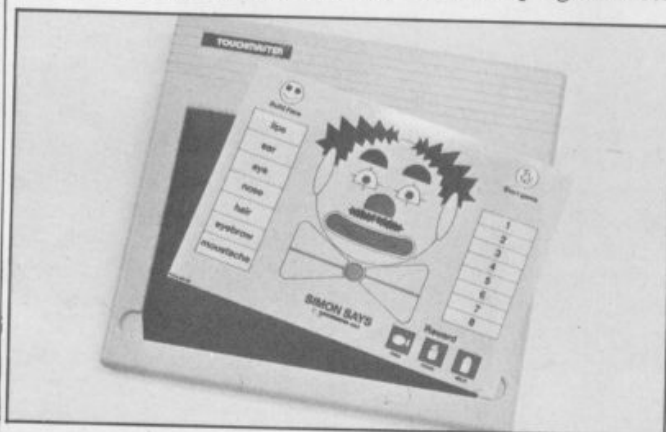
The only comparable product to the Touchmaster is the British Micro Graphpad. The Graphpad is about £6.00 cheaper and has a superior drawing program but can not be swapped from one computer to another and, as yet, does not have any additional software. If Touchmaster can improve the quality of the software it could better realise its potential. Touchmaster Ltd, PO Box. 3, Port Talbot, West Glamorgan, SA13 1WH.

Assistant aid pack

IT often seems that the only qualification you need to work in a computer shop is a complete lack of knowledge about computers. How often have you asked an assistant a question, other than the price, to be told "I think it uses something called Basic", "it's got nice graphics", or "the expert will be in after school"? Help is at hand.

Stephen Adams has brought out a pack with which all the shop assistant has to do is plug it in the back of a Spectrum and turn on. The computer will then cycle through seven screens which show what it can do. The display is simple but it is better than being greeted by a row of blank screens in a store, simply because the assistant does not know how to load a program.

Further details of the unit, priced £50 plus VAT, from Stephen Adams, 1 Leswin Road, London N16 7NL. A customising service is also available.



Get turned on to reset

ONE advantage of the Spectrum Plus over the Spectrum and ZX-81 is the inclusion of a reset switch. That saves a lot of wear and tear on the power socket which, if it becomes too worn, can lead to reliability problems.

To save you the trouble of making your own switch, two companies, Yewser Friendly Products and Computerworld, have brought

out their own. Both consist of the inevitable little black box, into which the power lead is plugged, a push switch, an LED indicator and a lead to the computer.

The push switch on the YF unit turns the power on and off — like the switch on a bedside lamp — while that from Computerworld requires a simple push to break contact. Neither of the units is a substitute for

a mains on/off switch but both are convenient and simple to use.

Priced £5.45 for the Spectrum version, £4.95 for the ZX-81, plus 70p postage, the Yewser Friendly switch can be obtained from 7 Thames Street, Hampton, Middlesex TW12 2EW. Computerworld at 208 Kent House Road, Beckenham, Kent at £4.99 for a Spectrum unit.

GHOSTBUSTERS™ THE COMPUTER GAME.

BY DAVID CRANE



© 1984 COLUMBIA PICTURES

Yes. Ghostbusters is a computer game, too.

The game play follows the film with incredible accuracy. Even down to the chart-topping music score.

Your task is to rid the world – and in particular New York City – of a cataclysmic plague of ectoplasmic nasties.


Play it well and we give you a Ghostbusters franchise – with your own secret account number. Use this number and the money it brings you, to buy the same ghost busting gear they had in the film. (Don't worry – we'll give you some money to get started.)

You will have earned it. And you can use it to go to undreamed of levels. Don't try to use someone else's number, we'll find out.


From then on, it's you against the ghosts. All the way to the Temple of Zuul.

Where the final battle begins...

Designed by USA's David "Pitfall II and Decathlon" Crane and running on Commodore 64 cassette and disk and Spectrum. Coming soon on other systems.


ACTIVISION®
Your computer was made for us.

AVAILABLE FROM SELECTED BRANCHES OF BOOTS, WH SMITH, JOHN MENZIES, LASKY'S, SPECTRUM, RUMBELOWS, WOOLWORTH AND GOOD COMPUTER SOFTWARE STORES EVERYWHERE.



Really inexpensive way of writing down whatever comes up on your computer screen.

Lightweight and totally portable — independent power source!

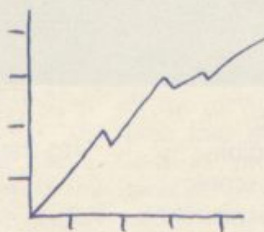
Normal, **EMPHASIZED**, CONDENSED and ENLARGED print.

Works perfectly in the dark even during a power cut!

45 characters per second (only in optional "totally-illegible-squiggly-line" mode).

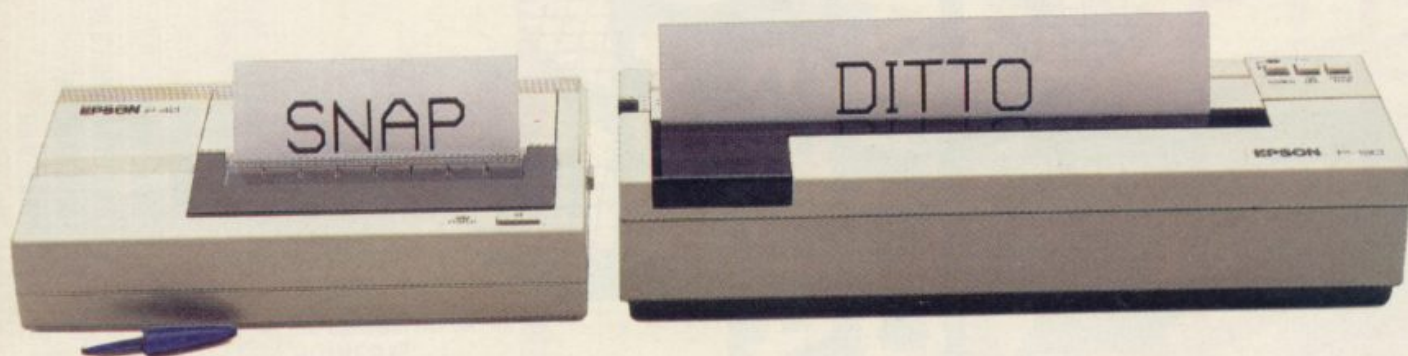


DO



ICS.

Dear Me,
Even writes letters!



The New Epson Portable Printers.

Now the home computer user can have a true business quality printer, from Epson – maker of the world's most popular computer printers.

Our new P40 and P80 are only £99.95 and £184 respectively – and that's including VAT and mains recharger. They're suitable for BBC,

Sinclair, Commodore, Oric and almost any other popular home computer, as well as virtually any portable or desk top micro.

Running off their own rechargeable batteries as well as mains, they're totally portable and being Epson, an absolute doddle to use. And while the

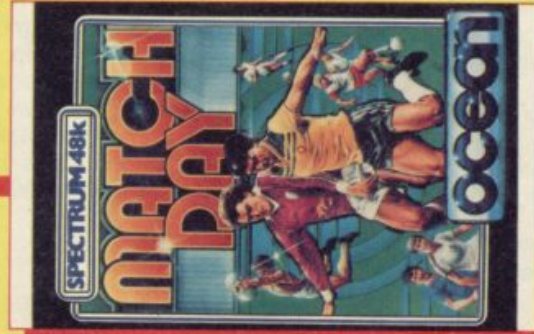
P40 is particularly compact it too gives you 80-column width printing in condensed mode.

So wherever and whenever you want to print, now you can – with the new Epson portables. In fact, anything a ball-point does they can do – better.

Ring 01-200 0200 for details.

EPSON

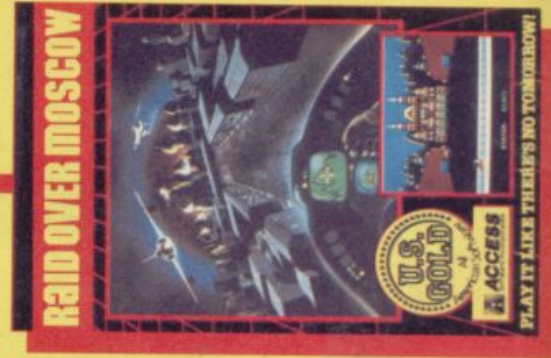
DAILY **Mirror** **sinclair user**

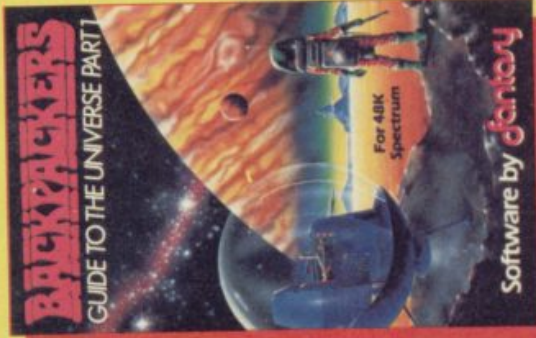


Top 30 SOFTWARE GAMES OF 1984



POSITION	HIGHEST POSITION	WEEKS IN CHART	TITLE	Publisher	Computer	(Also Available on)									
1	1	19	JET SET WILLY SOFTWARE PROJECTS		SPECTRUM	•	SPECTRUM	•	VIC 20	•	CMMORE 64		ELECTRON	ATARI	DRAGON
2	2	16	FIGHTER PILOT DIGITAL		SPECTRUM	•								ORIC	BBC
3	2	16	MANIC MINER BUG BYTE/SOFTWARE PROJECTS		SPECTRUM	•		•							OTHER
4	1	10	SABRE WULF ULTIMATE		SPECTRUM	•									
5	1	8	DALEY THOMPSON'S DECATHLON OCEAN		SPECTRUM	•		•							
6	3	12	CODE NAME MATT MICROMEGA		SPECTRUM	•									
7	5	11	TRASHMAN NEW GENERATION		SPECTRUM	•				•					
8	2	10	FULL THROTTLE MICROMEGA		SPECTRUM	•									
9	2	10	TORNADO LOW LEVEL VORTEX		SPECTRUM	•									





THIS TOP 30 HAS BEEN COMPILED
FROM CHART INFORMATION
SUPPLIED BY
N.O.P. MARKET RESEARCH LTD
BETWEEN 6th FEBRUARY
AND 19th DECEMBER 1984

9	2	10	TORNADO LOW LEVEL VORTEX	SPECTRUM	•
10	3	11	NIGHT GUNNER DIGITAL	SPECTRUM	•
11	2	12	CHEQUERED FLAG PSION	SPECTRUM	•
12	3	10	PSYTRON BEYOND	SPECTRUM	•
13	6	10	LORDS OF MIDNIGHT BEYOND	SPECTRUM	•
14	4	8	HUNCHBACK OCEAN	SPECTRUM	•
15	3	6	WANTED: MONTY MOLE GREMLIN GRAPHICS	SPECTRUM	•
16	11	9	BLUE THUNDER WILCOX	SPECTRUM	•
17	7	8	JACK & THE BEANSTALK THOR	SPECTRUM	•
18	4	8	MUGSY MELBOURNE HOUSE	SPECTRUM	•
19	6	6	BEACHHEAD ACCESS/U.S. GOLD	SPECTRUM	•
20	6	5	MATCH POINT PSION	SPECTRUM	•
21	7	8	BLADE ALLEY PSS	SPECTRUM	•
22	8	8	SCUBA DIVE DURRELL	SPECTRUM	•
23	8	6	JET PAC ULTIMATE	SPECTRUM	•
24	9	9	ALCHEMIST IMAGINE	SPECTRUM	•
25	7	6	HOBBIT MELBOURNE HOUSE	SPECTRUM	•
26	7	4	MICRO OLYMPICS DATA BASE/MICRO USER	SPECTRUM	•
27	3	5	ANT ATTACK QUICKSILVA	SPECTRUM	•
28	6	3	PYJAMARAMA MICRO GEN	SPECTRUM	•
29	5	3	SHERLOCK HOLMES MELBOURNE HOUSE	SPECTRUM	•
30	12	4	KOKOTONI WILF ELITE	SPECTRUM	•



Commodore 64
Spectrum 48K
BBC
MIRROSOFT

WHERE WOULD SANTA HIS LITTLE GREMLIN



**PERCY THE
POTTY PIGEON**
COMMODORE 64 NOW AVAILABLE
SPECTRUM 48K

MERRY
CHRISTMAS
£6.95
SPECTRUM



Make a suicide journey with our fluffy little friend Percy in his desperate attempts to build himself a cosy little home. Plunging to near certain destruction this crazy little bird has to pluck ten nest building twigs from the path of onrushing traffic, frantically avoiding the unwelcome attentions of a pigeon eating cat and starving ferret. Once off the tarmac the danger doesn't end as Percy carefully avoids the kamikaze planes, balloons and twig snatching sparrows before he can complete his nest and move to the next level. But don't be totally disheartened; our loveable little character has a few surprises of his own in the shape of revolting explosive eggs.



**MONTY IS
INNOCENT!**
COMING SOON

Damned by the nasties of the coal mining industry and their lacky socialist puppets for challenging the authority of their leadership when all he needed was compassion and warmth in his hour of need, poor Monty looks like serving a long stretch at Her Majesty's pleasure. But the heavy handed authorities hadn't counted on the wave of national outrage at our little friend's indisposition or the devious tricks and skills of his long time friend Sam Stoat. Watch carefully for the thrilling and nerve racking adventure these two encounter in springing Monty from his expectant doom.

**COMING
SOON**

Gremlin's collection of software hits are a must for any enthusiast's Xmas list. From fast moving action in *Suicide Express* to the absorbing skill of *Monty Mole*, play with Gremlin and those long cold winter days will pass in a flash. And don't be greedy – think of friends and family as well – they make great gifts and at a good price. Thanks to a little Gremlin Santa's job will be a little easier this year.

TA BE WITHOUT HELPER?



SUICIDE EXPRESS

COMMODORE 64

As android SCIH - PARG the destiny of the human race is in your hands. Transported by your masters to the planet NILMERG, your mission is to clear the planet of all alien life and threatening dangers, making it fit for human habitation.

Match the reflex actions demanded of SCIH - PARG as you guide your nuclear train on its perilous journey along the speeding monorail. Chased by alien rafts, harried by NILMERG jet bombers, threatened by menacing watchers, the only ally you have is your train, with its fully armed missile silos and faster than light speed.

Put on to your space helmet, keep your finger on the button and save the human race from its gloomy doom.



WANTED: MONTY MOLE

SPECTRUM 48K COMMODORE 64

MERRY
CHRISTMAS
£7.95
COMMODORE 64



With a long cold winter and bone chilling Christmas ahead, Monty Mole makes a daring, coal snatching raid to his local South Yorkshire pit. Grabbing a miner's bucket he heads off into the darkness, soon to wish he'd caught a cold instead. Alas there's no turning back. Onward to do battle with flying pickets and mammal eating fish, filling his bucket as he dodges the trundling coal crushers and roaming coal drills; keeping an eye on the constantly disappearing floor.

With his bucket filled, Monty makes his escape, only to surface in Arthur's castle where his way is blocked by a fiery figure seated on a graphite throne. Seizing his only chance of toppling the great man Monty collects the secret ballot papers and vote casting scroll. But Arthur's no fool when it comes to the heavy stuff and his personal bodyguard of super fit pickets and deadly flying hairsprays, put up an almighty struggle with our valiant Mole.



Alpha House, 10 Carver Street,
Sheffield S1 4FS. Tel: (0742) 753423



Fixed to the
right hand
wall is a
plaque.

Wandering through the labyrinths
Through corridors that never end
Passed doors to other worlds and
From the beginnings of time to
I'm destined to wander forever
On and on and on.
What do you want to do now?

The Sandman Cometh

ARE YOU lying comfortably? A little sand in your eyes and across the border of sleep you go.

The **Sandman Cometh** takes you into the shifting regions of the unconscious. Freud, Lewis Carroll and Her-

man Hesse are thrown together with liberal helpings of humour and fantasy to offer you a journey in search of the Hourglass of Infinity. Ghost trains, spies, gunslingers and perplexing puzzles await you in the palace of dreams.

The game is a standard text adventure with unobtrusive location graphics. Unusually, you are provided with the full vocabulary of the game if you care to ask for it. There are two 48K games on the cassette but you must obtain your 'ticket number' from the first to get into the second.

The adventure is attractively pre-

sented and the difficulty of the tasks and problems is progressive, so much so that you will soon find your head swimming. The concept is imaginative and allows the game to contain a number of different settings. Each is self-contained but you will need items from one scenario to help you in another.

Richard Price

THE SANDMAN COMETH

Star Dreams
Memory: 48K
Price: £10.95
Gilbert Factor: 7

Gift from the Gods

BENEATH the legendary palace of Mycenae, where Agamemnon the conqueror of Troy was horribly murdered by his wife Clytaemnestra, are vast labyrinths. Gates lead from one multi-tiered section to the next.

In **Gift from the Gods** you are cast as Orestes, son of the dead king. Your task is to collect certain geometric shapes from rooms within the maze and place some of them in their



correct arrangement inside the chamber of the Guardian. Only then is escape possible.

Your sister Electra will help you if you can locate her, whilst the shade of Clytaemnestra will attempt to destroy you by reducing your stamina.

The graphics are well made and the figure of Orestes walks and flies realistically. Technically an excellent production, but it does seem rather short on events. You can wander around the maze for quite a time with little happening to provide interest.

Gift from the Gods is a curate's egg really: long in technical merit, short on excitement.

Richard Price

GIFT FROM THE GODS

Ocean Software
Memory: 48K
Price: £6.90
Gilbert Factor: 6

Espionage

GET YOUR O Level chemistry textbooks out if you have the slightest intention of buying and playing **Espionage**.

The posh packaging may well lead you to think that you are getting some kind of fancy spy adventure set in the cut-throat world of JR. No way.

The program is a set of tests about oil and its chemistry and, unless you are interested in hydrocarbons in a

really heavy way, you'll soon find yourself swimming around in a big greasy mental pool of ethane, ethene, butene, butane, gasp, help.

You may deduce from errors in the information the identity of the mole in the company for which you are working. If petrochemicals are a closed book to you, this might be rather difficult.

Espionage is either mutton dressed up as lamb or homework masquerading in good clean fun.

The presentation is dull, the content dry and specialised and both the introductory and main programs failed to autorun. It may be useful if you want to be chairman of BP but if you just want a good time steer clear. Must rush off, my catalytic cracker's boiling.

Richard Price

ESPIONAGE
Modular Resources
Memory: 16K
Price: £8.95
Gilbert Factor: 4

Assignment East Berlin

AT CHECKPOINT Charlie only the swirling mists of the sub-Le Carré spy thriller show any signs of life. Checkpoint Charlie is the crossover point from West to East Berlin. It is also the starting point for **Assignment East Berlin** from Sterling Software.

Your job is to bring back the plans for LOBOT, a brain-numbingly important radio transmitter, and you are to achieve your patriotic objective in the conventional North-South-Get-

Rope-You-Are-Dead style of text adventures.

Unfortunately many of the conventional commands such as Inventory or Take are not supported, and consequently fiddling around trying to discover the correct words takes even longer than usual. Although the game is atmospheric, some of the detail is sloppy — what, for example, is a Russian guard doing manning an East German border post?

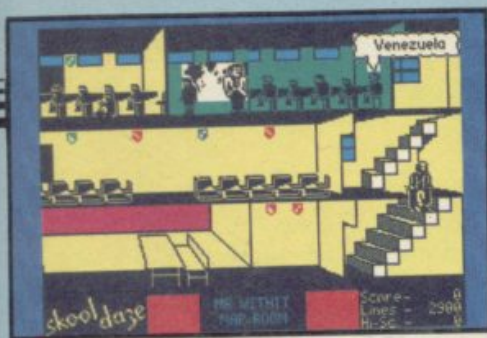
There is also a tendency to make problems unrealistic; the 'small book' turns out to be your passport, something you would know perfectly well

in real life. Such tricks spoil the illusion of involvement in an adventure.

Unattractively presented on-screen, and slow to respond, the game is less good than it should be. The story is not at all bad, and the ever-present threat of capture adds to the tension. It makes no sense therefore to spoil things by lumbering the user with a poor vocabulary and slow interpreter.

Chris Bourne

ASSIGNMENT EAST BERLIN
Sterling Software
Memory: 48K
Price: £5.95
Gilbert Factor: 3



Skooldaze

SKOOLDAZE explodes into the imagination with a cloud of chalk dust and a hail of catapult bullets. It is one of those rare games where nothing over-ambitious is attempted in the way of programming but all the elements unite to provide an addictive and satisfying romp.

The screen displays a school, with classrooms spread over three floors. The playing area is not large, being about three screensful of scrolling school, but the careful planning of the game allows for plenty of action.

You are Eric, a Bad Boy whose dreadful school report is locked in the

headmaster's safe. The task is to get it out. Only the masters know the combination of the safe and to make them reveal it you must set all the school shields flashing by hitting them with your catapult. A nice refinement is that Mr Creak the History Master is a doddering fellow who cannot remember his part of the combination and must be forced to reveal it by writing his date of birth on his blackboard.

In between performing the quest, you must take part in the normal activities of the school — that is, playing and attending lessons. Instructions appear at the bottom of the screen and if you are caught in the wrong place by a master you will receive lines. 10,000 lines and you are sent home, and have to start again.

The characters of the game have a cartoon-style quality and represent school stereotypes — the trendy master, the bully, the tearaway and the swot. You can change the names to

those of your choice which should make the game even more fun.

Whether or not you want to attempt the extremely difficult problem of cracking the headmaster's safe, **Skooldaze** is tremendously enjoyable. You can have a great time simply trying to survive, as masters dole out lines with hideous abandon and, sometimes, quite unfairly. You can have catapult fights with other boys, and if you manage to fool a master into giving the bully or swot some lines then you lose some from your own tally.

They may not be the happiest days of your life, but **Skooldaze** should provide some of the happiest hours of the day.

Chris Bourne

SKOOLDAZE

Microsphere

Memory: 48K

Price: £5.95

Joystick: Sinclair, Protek Kempston

Gilbert Factor: 8

Macman's Magic Mirror

TALK about Alice Through the Looking Glass! **MacMan's Magic Mirror** is an exploration of the world of mirror reflections, not only the relatively simple vertical mirror but also horizontal, a combination of both and diagonal.

The first problem presented is to match up pegs on the mirror screen moving MacMan around to place

them. There is a time limit, but using a joystick speeds up the action. When the pegs have been matched the next task is to reproduce a simple jigsaw and then comes the really fiendish problem of repeating a mirror image of patterned blocks. The puzzle requires careful observation, not only to recognise the pattern but also to reverse the blocks to their mirror image. It can be very tricky indeed especially using the horizontal/vertical mirror.

MacMan's Magic Mirror provides

plenty of practice in the all important skills of visual discrimination and observation of patterns in an entertaining and original way. The stated target age is four to eight but four year olds might find it rather difficult, and six to 10 is probably more appropriate.

Theo Wood

MACMAN'S MAGIC MIRROR

Sinclair Research

Memory: 48k

Price: £7.95

Gilbert Factor: 8

Match Day

THE CROWD rises to its feet, screaming and cheering in frenzied excitement as two international teams are heralded onto the pitch by that well known tune from *Match of the Day*.

The scene is set for the cup final in **Match Day** from Ocean — the crowd falls silent as the teams prepare themselves. The whistle blows.

The Tooting Tigers fight desperately for supremacy, but they are out of their league. The Camden Crawlers start to win, scoring goal after goal. Ten-nil to the Crawlers at half time. The Tigers seem to have lost their claws and retreat desolately to the changing rooms.

Match Day is viewed from the eye of the camera with the pitch scrolling from left to right. Although move-

ment is slow there is a lot of detail in the program — your player can dribble, kick, head and throw the ball. The game includes corners and is as realistic as possible on the Spectrum.

As well as playing against the computer you can opt for a club match where as many as eight players can take part, each team playing the other through to the finals.

There is an extensive menu through which various game details can be altered — even to changing the team's name and colours.

You can control only one player at a time. He is always nearest the ball,

identified when his socks turn the same colour as his strip. This places you at a disadvantage when playing the computer as the opposing team work as one to get control of the ball.

There is no sound other than the introductory tune. Strangled bleeps and squeaks filter from the computer at intervals throughout the game and sound more like a happy budgie than the grunts of the players.

It would be impossible to capture the atmosphere of football on a computer, but **Match Day** is a worthwhile attempt at reproducing a live game. If you are a football fanatic, you should enjoy this one.

Clare Edgeley



MATCH DAY

Ocean Software

Memory: 48K

Price: £7.95

Joystick: Kempston

Gilbert Factor: 6

more software on page 36



Ghostbusters

THE SPIRITS of Christmas just passed may not have had the pleasure of the spectres from **Ghostbusters** in December due to a late release. The ghouls have, however, finally arrived and the results of programmer David Crane's hard work are likely to pay off as it is tipped for the bestseller charts.

The game has three phases each of which includes travelling around a city capturing ghosts with the equipment bought by you with a bank loan at the start of the game.

You can also select your mode of transport, which can be anything from a compact or 1963 hearse to a high

performance car which costs \$15,000. As you travel around the city map ghosts will float onto the screen and possess buildings which turn red when inhabited. Your aim is get into those buildings to catch the ghosts while running over and immobilising any spectres which you might find on the way.

When you arrive at the distressed building you must drop your trap and coax the itinerant ghoulie into the path of a mechanical arm which takes a grab at it.

At any point a Marshmallow Alert may sound and you will have to press the 'B' key to trap the mallow before it marshes all over the buildings. If he escapes from your trap then the city and your score will suffer.

Scaring, sorry, scoring, is achieved in two ways. You will gain \$100 for every ghost that you catch. If you attract a Marshmallowman, however, the mayor of the city will give you \$2000 for your trouble.

The game draws to its conclusion when the ultimate baddies arrive at the Temple of Zuul at the centre of the screen. If you have enough dollars you can take part in the final conflict, perhaps win the game, and gain access to a secret pass number which will give you access to any other **Ghostbusters** game in the universe.

The game is not much to shout about but cannot be damned just because it emulates the plot of a film and contains nothing new. One of the more interesting features of the game is the soundtrack, coupled with a nifty voice synthesiser which insists on shouting 'Ghostbusters' and 'Behind you' in a passable imitation of Ray Parker Junior's strangled wheeze.

John Gilbert

GHOSTBUSTERS

Activision

Memory: 48K

Price: £9.99

Joystick: Sinclair, Kempston, Cursor

Gilbert Factor: 7

Arrow of Death (1 & 2)

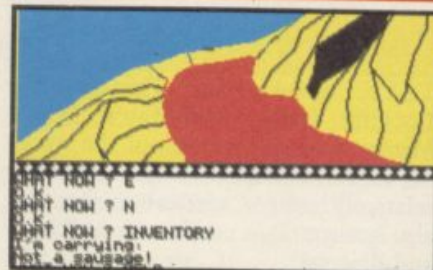
THE TWO parts of **Arrow of Death**, each sold separately, form the sequel to the tale of the **Golden Baton**. This magic object, which once brought luck to the heroic world it presides over, has now become tainted by the evil of the sorcerer Xerdon. Crops wither, the land is sick, the people murmur.

In Part One you must gird your loins and head up country to seek out the pieces of an arrow — the only weapon which will destroy the magi-

cian provided it is made of the correct materials. You begin your journey in the deserted palace where the baton throbs with malevolence and despair.

The second program is a game in its own right and needs no data from the first. In this part you have found the pieces and must now take them to the only fletcher who can make the Arrow in the correct, magical, way. He has unfortunately already been captured by the agents of the evil one, so don't expect it to be easy.

The games have similar styles and feature graphics for many locations. You can switch between the text description and the picture by using the ENTER key — though the in-



structions don't tell you that, which may confuse the unwary.

Richard Price

ARROW OF DEATH (1 & 2)

Channel 8

Memory: 48K each

Price: £6.95

Gilbert Factor: 6

Se-Kaa of Assiah

EVIL rules the land — yawn — and only a hero can bring home the bacon by finding the Three Great Artifacts of Power and returning them to their rightful owners. In **Se-kaa of Assiah** you become the hero of the title — geddit? — and begin your quest in a village close to the dread castle of the Dark Ones. Enter at your peril and brave the forces of darkness.

The program is a two-part game which purports to be a text adventure with graphics. After a short foray into the fortress you will soon realise that

there is precious little description or supporting text beyond your own input. The inevitable result is a featureless and empty world which fails to grasp the imagination successfully. The graphics are interesting but do not add enough to the very slim story line to hold your attention for very long.

In some ways the game might have been more likely to succeed if the

programmers had decided to make it into either a graphic monster maze type game or a pure text adventure. The concentration on slick pictures has clearly reduced the power of the interpreter and the space available for words.

Although the program is cheap adventurers still have the right to expect more than this for their money.

Richard Price



SE-KAA OF ASSIAH

Mastervision

Memory: 48K

Price:

Gilbert Factor: 3

more software on page 38

SPECTRUM'S ADVANCED KEYBOARD

HI QUALITY

■ The **LO>>PROFILE** professional keyboard is the ultimate upgrade for your Spectrum. By replacing its existing keyboard with a high quality **LO>>PROFILE**, you give this world-beating computer the keyboard it deserves.

■ The **LO>>PROFILE** is a full size QWERTY keyboard with full-travel positive-action keys for super-fast entry of programs and data. Presented in an ultra-modern and robust enclosure, the **LO>>PROFILE** is elegantly styled and is inclined forwards for convenient operation.

■ Featuring a full size space bar with dedicated numeric and cursor keypad the **LO>>PROFILE** increases the number of keys from 40 to 53. A combination of clearly labelled, sculptured and height-adjusted keys aids the advance to fault-free touch-typing.

■ Advanced Memory Systems have established an excellent reputation for product reliability and prompt delivery. This product has been tested to an impressive 20,000,000 depressions per key and AMS offer a full one year guarantee.

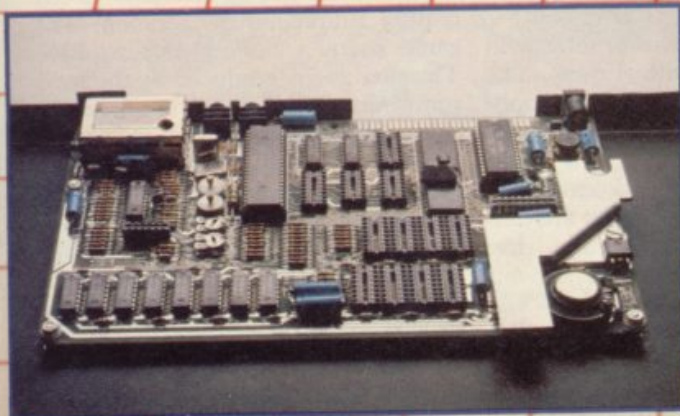
LO>>PROFILE



THE LO>>PROFILE PROFESSIONAL FROM ADVANCED MEMORY SYSTEMS LIMITED.

Fitting your Spectrum computer board into the **LO>>PROFILE** keyboard is easy. All you need is a screwdriver to secure the board onto the base of the keyboard enclosure using the mountings provided. The **LO>>PROFILE** is compatible with all Spectrum add-ons.

If not available from one of our 200+ dealers then fill in the coupon and we will send you a **LO>>PROFILE** with our full no-quibble money-back guarantee. Or phone 0925 602690/62907 for instant Access or Visa orders.



Please send No. _____ **Lo>>Profile Keyboard** at £49.95 plus £2.50 p&p (VAT inclusive)

I enclose a cheque/PO for £..... or debit my credit card.

Card No

☐ Barclaycard

☐ Access card

Signature _____ Date _____

Name _____

Address _____

Postcode _____

To: Advanced Memory Systems Ltd.,
Woodside Technology Centre,
Green Lane, Appleton, Warrington WA4 5NG

SU/12/84

Microfitness

A DANCE and health studio based in Walsall has come up with a get-fit program aimed at computer sloths. **Microfitness** is geared to get your corpuscles moving, the program first gives you a few simple exercises to perform and then tells you how unfit you are.

Before the program can gauge your fitness level it asks you a series of detailed questions about your body's dimensions including how much extra fat you are carrying and your resting heart rate.

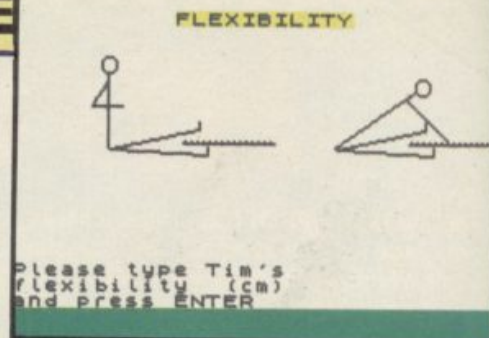
You then start to get physical and are given a series of simple exercise to perform. The data from these helps the computer to predict accurately your anaerobic power, muscle power and flexibility, amongst others.

A detailed booklet comes with the package giving diagrams and explanations

on each exercise. To relieve the tedium of the computer screen, a line drawing of a man performing each exercise shows how it should be done. Should you find certain exercises difficult you are told in no uncertain terms to consult your doctor before continuing with the assessment.

Once your physical state has been decided, you can choose from among 54 sporting activities, those on which to base your training schedule. Those include running, jogging, windsurfing, skiing and also less strenuous sports like golf and snooker. It is difficult to imagine anyone getting fit playing snooker – unless that is, they keep well away from the beer. Having chosen your sports, you are given a strict training program designed to push you, with points being awarded at the end of each session according to how well you have done.

Microfitness has been well



documented and all computations are based on the national norm. For those who are fitness freaks this program is a godsend – for those who are not, it might be a good idea to try it – you never know, you might end up attempting a marathon.

Clare Edgeley

MICROFITNESS VO²

Memory: 48K
Price: £8.95
Gilbert Factor: 8

Oil Strike

OIL STRIKE is a strategy game for eight to fourteen year-olds based on the oil industry search for new resources.

The action takes place on a screen grid and the object of the game is to search likely squares for supplies of oil. A player can choose to survey a square which will show the geological strata beneath and, if the survey is favourable, drilling can take place.

Drilling is not always successful as a survey may show conditions likely to produce oil, whereas in fact water is

the end result. On the first two concessions squares are numbered as to their potential for oil bearing, but after that players have only the strata to guide them.

Once found the oil gushes and a production level can be set. As the months pass messages scroll up on the screen, such as 'Oil price drops', and it will be time for the budding oil magnate to reduce production.

Other messages include money spent on cleaning up the environment after an oil spill or a well has dried up. Scoring is in the form of a bank balance and a monthly totalling of

income and expenditure.

Oil Strike is a valuable introduction to the interactive forces of the world commodities market and the language of the business world, as well as an exploration of geological maps. Its appeal lies in the strategic decision making which has to be revised continuously as world market conditions change, a heinously difficult task.

Theo Wood

OIL STRIKE Sinclair Research

Memory: 48k
Price: £7.95
Gilbert Factor: 8

Airwolf

BUY the rights to a well-known TV series. Find an old game knocking around which bears a passing resemblance to the scenario. Hey presto! another spin-off is born.

In **Airwolf** you are the pilot of the eponymous helicopter which you fly through a series of scrolled scenes.

Two-thirds of the screen contains scrubs and mountains and the middle third, through which **Airwolf** travels, looks like a long black tunnel.

The inlay card informs you that **Airwolf** must rescue five scientists, who are being held in a base somewhere beneath the Arizona desert. You are not told why or by whom.

Viewers of the television series will already be familiar with **Airwolf**. The plot rotates around a slick and sophisticated helicopter which fights the baddies.

Sadly though, the arcade game is a poor substitute. The graphics are dull and the tasks uninspired. The first obstacle, a wall, appears as **Airwolf** shoots through the 'tunnel'. While busy destroying the wall with full firing power it starts rebuilding itself.

If you succeed in demolishing that wall the next obstacle which comes into view is — yes, you guessed — a very familiar looking wall. Very imaginative.

Although there is the option for keyboard or joystick control the latter is well advised as all five keys would require simultaneous operation. The game bears a resemblance to **Blue Thunder** and is produced by the same company. This sheep in **Airwolf**'s clothing is best avoided.

Colette McDermott

AIRWOLF Elite

Memory: 48K
Price: £6.95
Joystick: Kempston
Gilbert Factor: 3

more software on page 40





**NEW AND
STILL ONLY £2.95**

**Everything you want
to know about computing**

AND IT'S FUN!

DENNIS JARRETT

THE GOOD COMPUTING BOOK FOR BEGINNERS

**THE GOOD
COMPUTING
BOOK**

**Over
100,000
copies
sold**

**FULLY REVISED
AND EXPANDED**

An irreverent and entertaining, but **thorough** reference source with the most readable, comprehensive glossary you'll find anywhere. **The Good Computing Book for Beginners** is an essential A-Z of all the facts you need to know about computing – and none you don't.

Whether you're brand new to computing, or an old hand keen to stay ahead, you'll score by keeping this classic, top-selling book within reach to use again and again.

The author, Dennis Jarrett, is a successful journalist who was also the founder editor of Which Computer? magazine – so his first edition became a standard work. NOW this **3rd** substantially enlarged and revised edition covers the latest trends, terms and technology with the relevant facts – and **only** the relevant facts – **in plain English**.

You'd expect such a vital book to cost an arm and a leg . . . but the **new 3rd** edition only costs £2.95.

Use the coupon below to get your copy right away – or buy it from your bookshop or computer store. It's the one computer book you'll turn to again and again.

**To: HCP, 17-21 Conway Street,
London W1P 6JD**

Please send me copy(ies) of THE GOOD COMPUTING BOOK FOR BEGINNERS (ISBN 09 9387603)

by Dennis Jarrett at £2.95 each plus 55p postage and packing. I enclose my cheque for

Please debit my Visa/Access account number

Name Address

Signature:

HCP



Disease Dodgers

DISEASE DODGERS is one of those programs which are much more fun than the program notes suggest. We are told that the game will show how health, diet and exercise are inter-related. It is based on this quite complex idea. You have to move the Dodger family over a series of jumps, eating food and drinking as you go along. The terrain varies and gets more awkward depending on which re-

gion of the world you are in.

The family consists of Dad, Mum, Gran, teenager and toddler. Invariably Dad has the best chance of survival, a dubious position to hold. As the dodger moves about the terrain he or she has to jump over obstacles and, if no food is eaten, gets progressively weaker. All the time various coloured blobs representing diseases attack your dodger.

The aim of the game is to build up immunity by eating the healthy foods on offer. Weight, immunity levels and survival scores are shown at the top of the screen.

Unusually for an educational game this has true arcade action. The dodgers have to take running jumps over the walls and not simply hop over

them, which all adds to the motivation factor. The big problem with the game is with the graphics. Some of the foods are difficult to distinguish; for instance was that purple shape a dyed egg or an aubergine?

Despite the colour problems **Disease Dodgers** is fun to play and demonstrates the relationships stated if only on an elementary level. Certainly it is to be recommended as an alternative to the average arcade game for children between eight and 12.

Theo Wood

DISEASE DODGERS
Sinclair Research
Memory: 48k
Price: £7.95
Joystick: Sinclair
Gilbert Factor: 9

The Great Space Race

In space nobody can hear you scream which is just as well if you intend buying **The Great Space Race**. It is one of the most vacuous products we have seen and its time that this sci-fi 'epic' was exposed as yet another dose of Legend super-hype.

The loose plot involves a race between space ships, some piloted by user-controlled characters and others by the computer, to deliver consignments of an alcoholic beverage called Natof to as many planets as possible. During the delivery runs characters may indulge in ship-to-ship laser gun butchery or lift the lid on the cargo and arrive at the next port of call in a drunken haze.

At seemingly random times during the game one of the characters may discover the code number of a booby trap bomb which has been hidden on a planet or ship. If you have time to scribble the number and location down before the information is scroll-

led off the screen you can defuse the bomb in the unlikely event of arriving at the location.

If the game Loads without crashing back into Basic you will immediately see the most attractive aspect of the package. The graphics in which the characters are displayed are in brilliant high resolution which is produced on the screen with the utmost professionalism.

It is, however, a pity that the programmers at Legend do not seem to be able to produce a good animated representation of a space battle. The two ships on the screen look like two mis-shaped fried eggs sliding around in a pan. Legend has taken minimal graphics to new heights.

As for playability, if you want to make a cup of tea or 'phone a distant relative in Australia you can leave the game to play with itself. As with soaps such as *Coronation Street* or *The Archers* you can go away and come back without having missed much.

It is incredible that the company which produced **Valhalla** with interac-

tive characters and real-time action, difficult to program by any standards, could produce such a whimper after the bang. **The Great Space Race** includes real-time action but if intelli-



gent character interaction does exist within the game it must be hiding somewhere. As for the Natof, the game plays as if it was written under the influence of the stuff.

John Gilbert

THE GREAT SPACE RACE
Legend
Memory: 48k
Price: £14.95
Gilbert Factor: 3

Grand Prix Manager

GRAND PRIX MANAGER heralds the return of the Toms, following a long silence after the incredibly successful **Football Manager**. Not that author Kevin Toms has written the sequel, **Grand Prix Manager**, but the game has been published by his company and is firmly based on the blend of menu-based decisions and highlights of the action which made the

previous game a Spectrum classic.

Unfortunately, the simulation of life as manager of a Formula One team is far less impressive.

You must choose a driver from a short list while keeping in close contact with the sponsors. Decisions regarding the race depend on the percentage of straights and bends, weather conditions and temperature. You can decide on your tyres, their hardness and tread depth, and set the elevation of the car's spoiler.

Then you sit back and watch user-

defined graphics stay motionless in the centre of the screen while other user-defined graphics whizz past them.

Written in Basic with occasional POKES of the crazy border variety, it is a dud effort if ever there was one.

Chris Bourne

GRAND PRIX MANAGER
Silicon Joy
Memory: 48K
Price: £6.95
Gilbert Factor: 1

more software on page 42



**'Engines on...check...
flaps to 10 degrees...
check...increase
throttle, release
brakes. Increase
throttle to full power
...watch air speed
indicator. Aircraft
taxiing, increasing
speed...170 knots...
rotate, observe
vertical speed
indicator...
increase elevator
angle.
Take off achieved!'**

The excitement of a
**DACC 747 take off fires the adrenalin
like no other computer simulation. The 3D
pilot's view and full array of instrumentation
challenges you to take the role of piloting a
Jumbo Jet...and once in control and taxiing down
the runway, there's no turning back.
Take off achieved. Full flying control at your
fingertips and seven British Airports to fly to...the
drama of landing is waiting to unfold as you sit in
the hot seat of a 747 flight deck.**

Over 45 dials and indicators to control with simulated emergencies, systems failures and audible alarms. Runways visible in true perspective on take off and landing. Optional use of joysticks.
100% Machine Code on Commodore 64k Sound and Spectrum 48k.
Also available for Dragon 32/64, Tandy C/C (32k), BBC Model/B, Acorn Electron, Atari 400/600/800 (48k).
Cassette Price £9.95 including VAT and postage. Spectrum Price £27.95. Commodore on Disk Price £11.95.



747 FLIGHT SIMULATOR FROM DACC

The leaders in Flight Simulation.

dacc
● LIMITED ●

To: DACC Ltd. (Dept. SU4),
23 Waverley Road, Hindley,
Wigan, Lancashire WN2 3BN.

Name (BLOCK LETTERS) _____

Address _____

County _____ Postcode _____

Please send me copies of the DACC 747 Flight
Simulator at

I enclose cheque/Postal Order for the total of

My computer is a

All dealer enquiries to sole distributor: MICRO AIDS, Beech House, Hob Hey Lane, Culcheth, Warrington.
Tel: 092 576 2613/5930.

You are at the Chateau entrance. There is a deep murky moat that surrounds the Chateau. It is crossed by a large stone bridge. Some tracks lead back into the forest.

Do you want to:

Follow the murky moat
to the forest?
Cross the stone bridge



Danger Mouse

DANGER MOUSE is back, fighting fit and once again ready to pit his wits against the mad Baron Silas Greenback in the Black Forest Gateau. Whoops! Chateau.

Colonel K, head of a department so secret that even he does not know its name, has sent his right-hand mouse with trusted assistant Penfold to the Black Forest to destroy the Baron's secret weapon — a Pi-beam, which poses a threat to world security. 'It should be a piece of cake', mutters Danger Mouse as they leave for Ger-

many in the mousemobile.

Many strange adventures follow in the quest for the Pi-Beam, more than once the intrepid pair find themselves in the soup as time after time they fall into the fiendish traps set by the mad Baron.

Their immediate problem is finding a way into the chateau, preferably in one piece, and with a little ingenuity and lots of luck they start to make headway.

Danger Mouse in the Black Forest Chateau is an adventure game played in a multiple choice format with a number of options to choose from at every move. Your success is dependent upon learning the area and picking up the right objects and you might find it helpful to draw a map of your progress.

Nearly all the objects have some uses although you might find a few red herrings. Penfold plays his part and

lets fall cryptic clues at almost every opportunity. Pay close attention to the dialogue — there is nearly always something there to help you.

The game is played in two parts, and you will have to solve the first half to gain the skeleton's secret bone number — this is a code allowing you to load part two.

Charming illustrations accompany each location. The game is fast moving with no long delays before arrival at new locations and the adventure is easy to solve. The simplicity of the game makes it ideal for young adventurers and an enjoyable break for those seasoned adventurers not wishing to expend much brain power.

Clare Edgeley

DANGER MOUSE IN THE BLACK FOREST CHATEAU

Creative Sparks

Memory: 48K

Price: £6.95

Gilbert Factor: 8

Heathrow International ATC

PROBABLY the most disturbing simulation ever written has been re-released in a new improved form by Hewson Consultants. **Heathrow International Air Traffic Control** is guaranteed to dispel any idea you might have had that airports are safe places to be in.

The original program was a classic of simulation, and with the addition of Concorde flights, and a completely different version for Schiphol airport

in Holland thrown in on the B side of the cassette, the new product is even more impressive.

The screen displays a radar map of the area around the airport. Aeroplanes enter the screen at any one of four stacks, points where pilots are instructed to circle until the controller brings them in to land.

It sounds easy, but it is not. The idea is to get everything moving in an orderly flow, but you only have to make one mistake to start a chain reaction leaving bits of broken aircraft strewn all over West London or the Zuider Zee. Although the program is slow, being conducted in real time, and tests you over half an hour of

activity, once something starts to happen you will find it very difficult to work out the instructions for each individual aircraft quickly enough.

Although it is not the sort of thing to drive everybody wild with excitement, for those who like beating their brains into a pulp on wet weekends watching Concorde carving up the rear end of a DC10, Heathrow ATC is what they have been looking for.

Chris Bourne

HEATHROW INTERNATIONAL AIR TRAFFIC CONTROL

Hewson Consultants

Memory: 48K

Price: £7.95

Gilbert Factor: 8

The Magic Sword

THE WORLD of fairy tale is married with text adventure in **The Magic Sword**, a bookware package with a format calculated to appeal to the six to eight year-old child.

The story pits Princess Poppy and Prince Fred against Bad Bertha the wicked witch and is attractively illustrated without being desperately original in content. The tale ends with the imprisonment of the princess by Bertha. At that point you load up your program and take on the part of Fred in his quest for the sword. Naturally, he must rescue pretty Poppy from her ordeal.

The adventure uses bright, blocky

graphics and enlarged text to help the young reader. Movement and a few basic actions are carried out by single key presses. A compass flashes out the directions in which it is possible to move — a useful and sensible idea given that children of this age will have little concept of cardinal points. It is the kind of game which will probably be best played with an adult to help, at least at the beginning.

Although the package is well produced the press blurb suggests that the game is suitable for toddlers. This is definitely not the case as the reading and reasoning skills required are well beyond tinies. More sophisticated juniors might also find the story a little old hat.

Nevertheless, this is a creditable

attempt to reach an age group who are rarely catered for in games computing.

Richard Price

THE MAGIC SWORD

Database Publications

Memory: 48K

Price: £8.95

Gilbert Factor: 5



You are by a wooden gate

You can see a green frog

You can go W.

What do you want to do?



NOW
PROGRAMMING

YOUR HOME
COMPUTER

IS AS EASY

AS READING
THIS.

Let's face it, most 'beginner's guides' are anything but easy reading.

Now Dorling Kindersley have come up with a new way of learning BASIC that's unique, simple and down-to-earth.

It's called 'Screen Shot'.

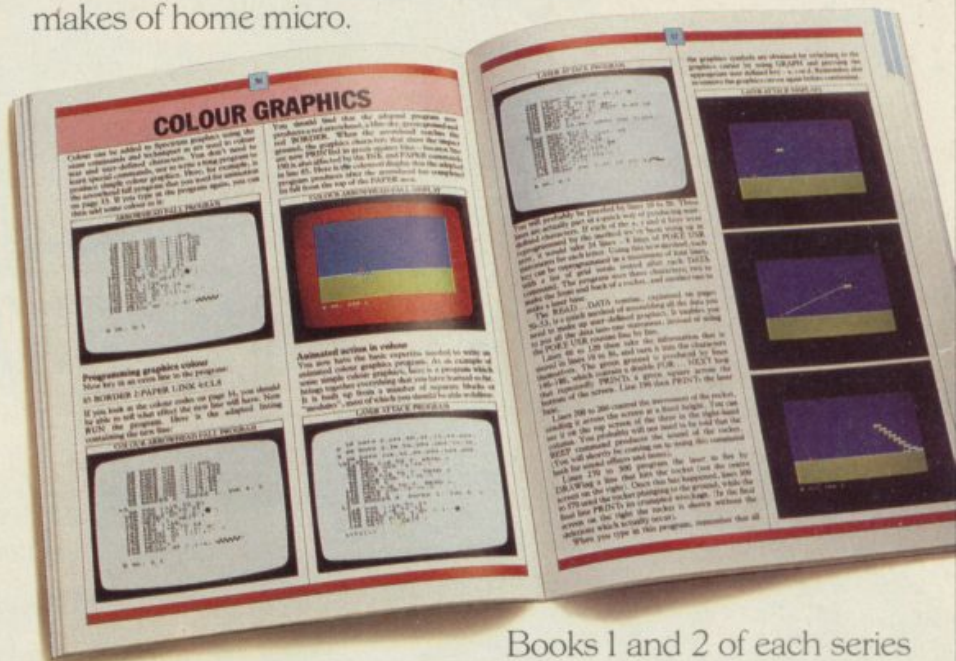
Unlike ordinary guides, Screen Shot uses full-colour photographs of real computer screens to show instructions, program listings and displays.

So what you see on the screen in the book is precisely what you'll see on your own computer screen.

Which makes our programs easy to understand, easy to read and free from misprints or other sources of confusion.

The accompanying explanations are clear, practical and are written by experts.

You'll find there are Screen Shots for most popular makes of home micro.



Books 1 and 2 of each series form a complete guide to BASIC programming for that computer.

For the more adventurous programmer, Books 3 and 4 explore the creative world of computer graphics.

In the words of a reviewer in 'Big K' magazine, Screen Shots are "...clearly and expertly written with the best layout I have seen in a book of this sort... what you see is (for once) what you get. Outstandingly good and for beginners or semi-beginners: highly recommended."

The message is clear. If you really want to get into programming, get a Screen Shot.

With anything else, you won't be fully in the picture.

Screen Shot
PROGRAMMING SERIES

Screen Shot books available from larger branches of BOOTS, MENZIES, WH SMITH and other leading bookshops and computer stores. In case of difficulty, write to: Dorling Kindersley, 1-2 Henrietta Street, London WC2E 8PS.



Screen Shot Books 1 and 2 available for Sinclair ZX Spectrum, Sinclair ZX Spectrum+, Acorn Electron, BBC Micro, Commodore 64, Apple IIe. Books 3 and 4 available from April 1985.

Dorling Kindersley Publishers Limited.



THE AGE OF THE R.A.T



CONVENTIONAL JOYSTICKS ARE DEAD!

The Cheetah Remote Action Transmitter is the most sophisticated computer controller available.

It has these features:

- Infra Red transmission – so there are no leads trailing across the living room. Just sit back in your chair up to 30 feet from your machine.
- Touch control – no moving parts, extremely fast, long life.
- No extra software required.
- Can be used with all Cheetah RAT/Kempston compatible software.
- Fits comfortably in your hand for long play periods.
- Comes complete with receiver/interface unit which simply plugs into the rear of your Spectrum.
- Compatible with all Sinclair/Cheetah peripherals via the rear edge connector.



Simply incredible at £29.95 including VAT and p & p.

Dealer enquiries welcome. Export orders at no extra cost.

Send cheque/p.o now to:

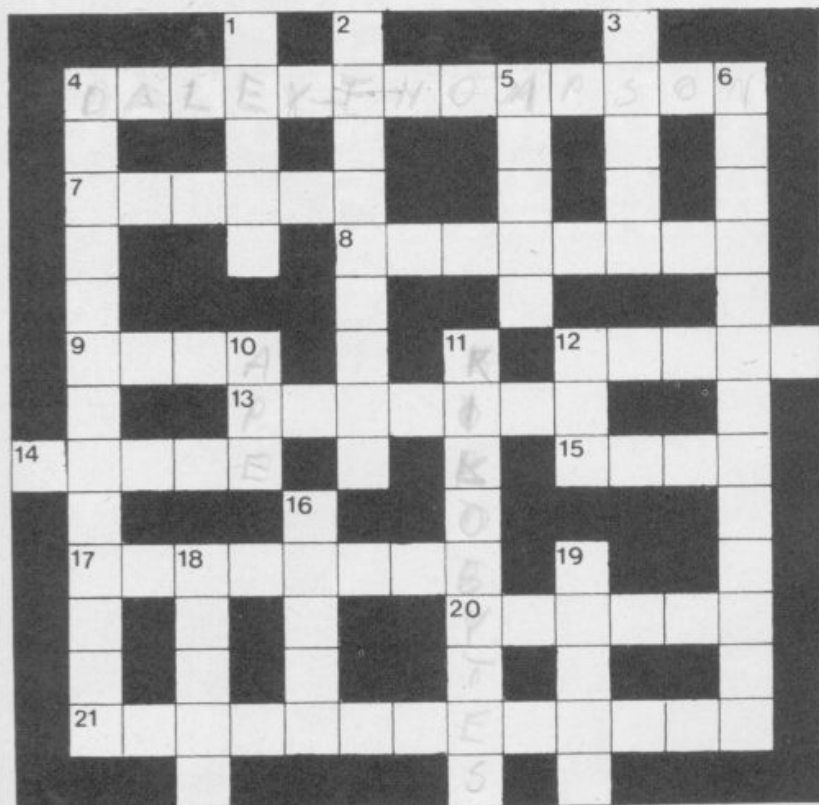
Cheetah Marketing Ltd. (Dept. SU), 24 Ray Street, London EC1R 3DJ. phone 01-833 4909

Cheetah products are also available from branches of

John Menzies  WHSMITH  Rumbelows
and all good computer shops.



ZXWORD *by Henry Howarth*



Across

4. The Decathlon's his game (5,8)
7. RAM location kicked when dead (6)
8. Expounder of mathematical index (8)
9. Gigantic start to a very large number (4)
12. Basically a dim structure (5)
13. Cards or tape — boxed (7)
14. Argument of trigonometric functions (5)
15. Blemishes in a matrix on the printer (4)
17. TAN/COS Control Unit corrupted in business applications (8)
20. Man out to get the quantity (6)
21. Part-time band leader from Silicon Valley? (11)

Down

1. Accesses memory in high places, we hear (5)
2. Program instruction sent by the bank (9)
3. Monthly instalment of tissues? (5)
4. Moth-balls, perhaps, in the utility kit (9,4)
5. Status of Bishop and Knight (5)
6. Junction initially not producing new sort of radio (1-1-1 10)
10. Mimic character in Crazy Kong (3)
11. Numbers of Ks (9)
12. Sounds like some arithmetic (3)
16. It may be played with a MIDI interface (5)
18. Punctuation found by graduate on microfiche (5)
19. Cambridge computer company a leading light in adventure games? (5)

Solution on page 142

Explore the world of Sinclair

Sinclair User, the monthly magazine, will ensure that all ZX81, Spectrum and QL users get the most from their computers.

Every month we include exciting 'games programs, reviews on the latest software, bench tests on hardware and peripherals, as well as technical advice and development news on Sinclair products.

Sinclair User interviews key people within Sinclair Research, authors of top selling games plus regular features on the developments in the fast moving computer industry.

We cover all aspects of Sinclair, for beginners to enthusiasts right through to business users —

Sinclair User will keep you informed. So, don't miss out —

place an order with your newsagent or complete and return the coupon below and we will ensure that your personal monthly issue is sent to you direct.

Please send me SINCLAIR USER each month for the next twelve months. I enclose a cheque/PO to the value of £13.20 (UK rate including p&g). For overseas rate please contact Subscriptions Department.

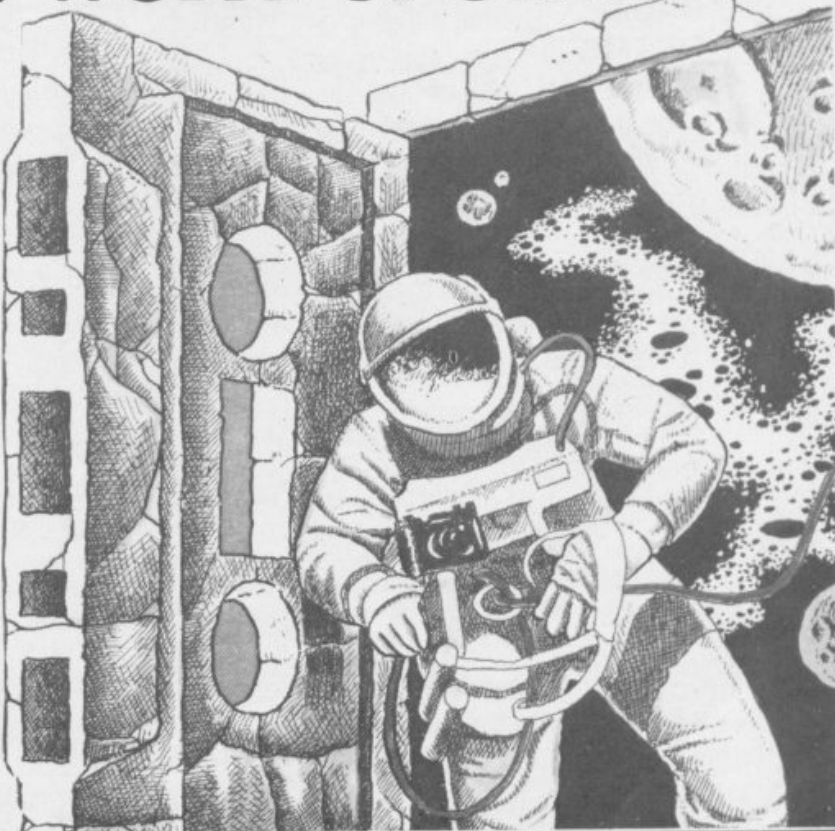
Name

Address

Signed

Date

Cheques should be made payable to Sinclair User Publications Ltd, Priority Court, 30-32 Kensington Lane, London W11 3AU



A NEW, IMPROVED ZX81 KEYBOARD AT THE SAME OLD PRICE. £9.95.



There's only one thing wrong with the ZX81. Its keyboard.

Or rather its lack of one.

Since it's flat your fingers don't feel as if there's any response to the pressure put on the keys.

ZX81 KEYS

FILESIXTY KEYS

In other words, you're not quite sure which keys you've pressed until the screen actually tells you.

Our new, improved push button keyboard changes all that.

It matches the ZX81 perfectly. And the keys give a real calculator-type feel.

To set it up all you have to do is peel off the adhesive backing and stick it on top of the ZX81 touchpad.

Because no tampering or soldering is involved the guarantee is not affected. And it will last for up to 3½ million operations.

But our keyboard doesn't just come loaded with features. With it comes a separate overlay and a set of coloured stick-on labels to make game playing easier.

It's yours for the original price of £9.95.

Whichever way you look at it, we think you'll agree that it's a keyboard that's quite outstanding.

Orders to Filesixty Ltd., FREEPOST, London W9 2BR.
Cheques/PO made payable to Filesixty Ltd.
Please send me _____ (qty.) Keyboards at £9.95 each
(including VAT and P&P).

Total £

Name

BLOCK CAPITALS

Address

SU3/85

FILESIXTY

Filesixty Ltd., 25 Chippenham Mews, London W9 2AN, England. Tel: 01-289 3059. Telex: 268 048 EXTLDN G 4087.

**Acute add-on allergy?
Chronic hardware headaches?
Don't suffer in silence —
write to Sinclair Surgery.**

Sinclair Surgery

Hearing aids the volume

READERS may be interested to hear of a way of amplifying the sound from a Spectrum inexpensively.

Connect a television ear-plug, or 'Walkman' ear-phones, to the EAR socket of the computer, and this will amplify the sound when you wear the appliance. Although you cannot alter the volume — and ear-phones are louder than an earplug — it is far cheaper than any peripheral device for amplifying.

I am sure that this idea is not new, but I have never seen it in print before.

**David Gilchrist,
Basingstoke.**

Updated is outdated

I SENT my 16K ZX Spectrum away for an update and when it returned B,N,M, and Symbol Shift were no longer functioning properly.

**Michael Doherty,
Uxbridge, Middlesex**

● It seems that the company which carried out the upgrade has damaged the ribbon cable. If you do not trust them to fix it try TV Services of Cambridge, Chesterton Mill, French's Road, Cambridge CB4 3NP. Tel 0223 311371. They can supply a new one at a reasonable price.

ROMs around the world

YOUR REPLY to Daniel Morgan — Sinclair Surgery, December 1984 — regarding the Universal Modem Adaptor for the ZX-81 has brought us numerous en-

quiries regarding this adaptor. We have replied individually to those who enclosed a stamp but for the benefit of your other readers may we explain that although Comprosys Ltd developed the copyright ROM for the UMA we did not produce the adaptor itself and ceased supplying our copyright ROM to the hardware manufacturer in May 1984.

However we do continue to produce and supply direct to customers worldwide our own ZX Aszmic ROM and Aszmic External Card for the ZX-80/ZX-81 and our SP ROM.

I hope this may clear up any misunderstanding.

**Donald F Johnson,
Comprosys Ltd,
29 Campden Road,
South Croydon,
Surrey CR2 7ER.**

Brother runs as printer

WILL the Spectrum, through an appropriate RS232 interface drive a Brother EP22 electronic typewriter printer?

**Richard Wall,
Pirbright, Surrey.**

IN the July 1984 issue of *Sinclair User* it was stated that the Brother EP44 was not suitable as a computer printer.

I see that the Argos chain is offering the Brother EP22 dot matrix print typewriter at £145.00. It is described as follows: "Built-in interface for use as printer for micro-computers with these specifications: RS232C, 75 or 300 Baud, 8 bit no parity, DTR Hand Shake."

I have a Spectrum 48K

with Interface One and microdrive. Could you please tell me if this printer would be suitable for use with this micro?

**R A Russell,
Orpington, Kent.**

● We have received a number of enquiries regarding the Brother EP22 and EP44. Both can be used with the Spectrum although the EP44 in particular is rather slow. If you have an Interface One then use the standard Sinclair cable to connect the two together. To print something consult Chapter 8 of the microdrive manual. For listings enter:

OPEN #3;"t":LLIST
or for simple printing:

OPEN #3;"t":LPRINT
"This should work".

Monitoring a connection

IS there any way of connecting a monitor to an Issue One Spectrum?

**Peter Copping,
Manchester.**

● If you want to use only a composite monitor then it is easy. On Issue One and Two the video signal is not taken through to the edge connector. All you must do is find the word VID printed in white on the circuit board above two solder points. If you join those, the circuit is complete.

To use an RGB monitor you will need an adaptor. The only company which makes a separate one for the Spectrum is Adapt Electronics, 20 Starling Close, Buckhurst Hill, Essex IG9 5TN. Microvitec PLC, Futures Way, Bolling Road, Bradford BD4 7TU, sell a monitor which includes an adaptor. To use either you will need to make connections inside the Spectrum and they can advise you.

Receiving the Oracle

IS there any hardware which will enable my Spectrum to receive Ceefax and Oracle?

Also, is it possible to put the computer in and out of graphics mode during a program?

Finally, can I connect a DK'tronics 56-way ribbon connector to a Currah µslot?

**Jan Heath,
Bristol, Avon**

● To answer your points in turn: 1 — the TTX 2000 from OEL, North Point, Gilwilly Industrial Estate, Penrith, Cumbria CA11 9BN, priced £143.75; 2 — use POKE 23617,2 for graphics mode; POKE 23617,1 for extended mode; POKE 23617,0 for the normal L cursor (that is best seen if you follow the POKE by an INPUT statement); 3 — yes.

Colourless keyboards

I RECENTLY acquired a Spectrum and I am not happy with the keyboard. Not just because of its sloppiness, but because I am colour deficient, which means that the colours red and green present a problem. I wonder if you could suggest an alternative keyboard.

**G F Jones
London SW3.**

● There are as far as we know, no keyboards that use different contrasting colours. The best we can suggest is that you have a look at the 68FX1 from Fox Electronics which uses only red and black or the Fuller Executive which only uses white — as does the Spectrum Plus.

software that's hard to beat...

48K
SPECTRUM

TASWORD TWO

The Word Processor *

"If you have been looking for a word processor, then look no further."

CRASH June 1984

"The number of on-screen prompts, together with the excellent manual, make it ideal - even for an absolute beginner."

PERSONAL COMPUTER WORLD

September 1983

"Without doubt, the best utility I have reviewed for the Spectrum."

HOME COMPUTING WEEKLY

April 1984

Your Spectrum becomes a professional standard word processor with TASWORD TWO. Sixty-four characters per line on the screen is just one of the many features of this versatile program. The cassette also contains TASWORD TWO TUTOR. This teaches you word processing using TASWORD TWO. Whether you have serious applications or simply want to learn about word processing, TASWORD TWO and TASWORD TWO TUTOR make it easy and enjoyable. TASWORD TWO is readily adapted for the microdrives to give super-fast saving and loading of both program and text.

PRICE £13.90

TASCOPY

The Screen Copier

Screen copy software for ZX Interface 1. Print high resolution screen copies (in a choice of two sizes), and also large "shaded" copies with different dot densities for the various screen colours. Tascopy supports all eight pin dot matrix printers with Epson type control

codes. e.g. Epson RX-80 and FX-80, Shinwa CP-80, Mannesmann Tally MT-80, Star DMP 510/515, Brother HR5.

PRICE £9.90

TASMERGE

The Mail Merger

Transfer data from MASTERFILE to TASWORD TWO! Letters and forms typed on TASWORD can be printed with addresses and data taken from MASTERFILE. The mail merge facility allows, for example, multiple copies of a letter to be printed, each containing a different name and address taken from your MASTERFILE data. To use TASMERGE you must have one or more microdrives as well as TASWORD and MASTERFILE by Campbell Systems. (version 9 or later).

PRICE £10.90

TASPRINT

The Style Writer

A must for dot-matrix printer owners! Print your program output and listings in a choice of five impressive print styles. TASPRINT utilises the graphics capabilities of dot-matrix printers to form, with a double pass of the printhead, output in a range of five fonts varying from the futuristic DATA-RUN to the hand-writing style of PALACE SCRIPT. TASPRINT drives all dot-matrix printers with bit image graphics capabilities and can be used to

print TASWORD TWO text files. TASPRINT gives your output originality and style!

PRICE £9.90

TASWIDE

The Screen Stretcher

With this machine code utility you can write your own Basic programs that will, with normal PRINT statements, print onto the screen in the compact lettering used by TASWORD TWO. With TASWIDE you can double the information shown on the screen!

PRICE £5.50

TASMAN PRINTER INTERFACE

Plug into your Spectrum and drive any printer fitted with the Centronics standard parallel interface. Supplied complete with ribbon cable and driving software. The user changeable interface software makes it easy to send control codes to your printer using the method so successfully pioneered with TASWORD TWO. The cassette also contains fast machine code high resolution full width SCREEN COPY SOFTWARE for Epson, Mannesmann Tally, Seikosha, Shinwa, Star, and Tandy Colour Graphic (in colour!) printers. Compatible with microdrives and ZX Interface 1.

PRICE £39.90

TASMAN SOFTWARE

All prices include VAT and post and packaging. Telephone orders: Leeds (0532) 438301

* Available from larger branches of Boots.

Tasman

SOFTWARE

Springfield House, Hyde Terrace, Leeds LS2 9LN. Tel: (0532) 438301



If you do not want to cut this magazine just write your order and post to:

TASMAN SOFTWARE, dept. SU, Springfield House, Hyde Terrace, Leeds LS2 9LN.

I enclose a cheque/P.O. made payable to Tasman Software Ltd. OR charge my ACCESS number

NAME _____

ADDRESS _____



COMPUTER _____ ITEM _____ PRICE _____

_____ £ _____

_____ £ _____

_____ £ _____

Outside Europe add £1 for each item airmail £ _____

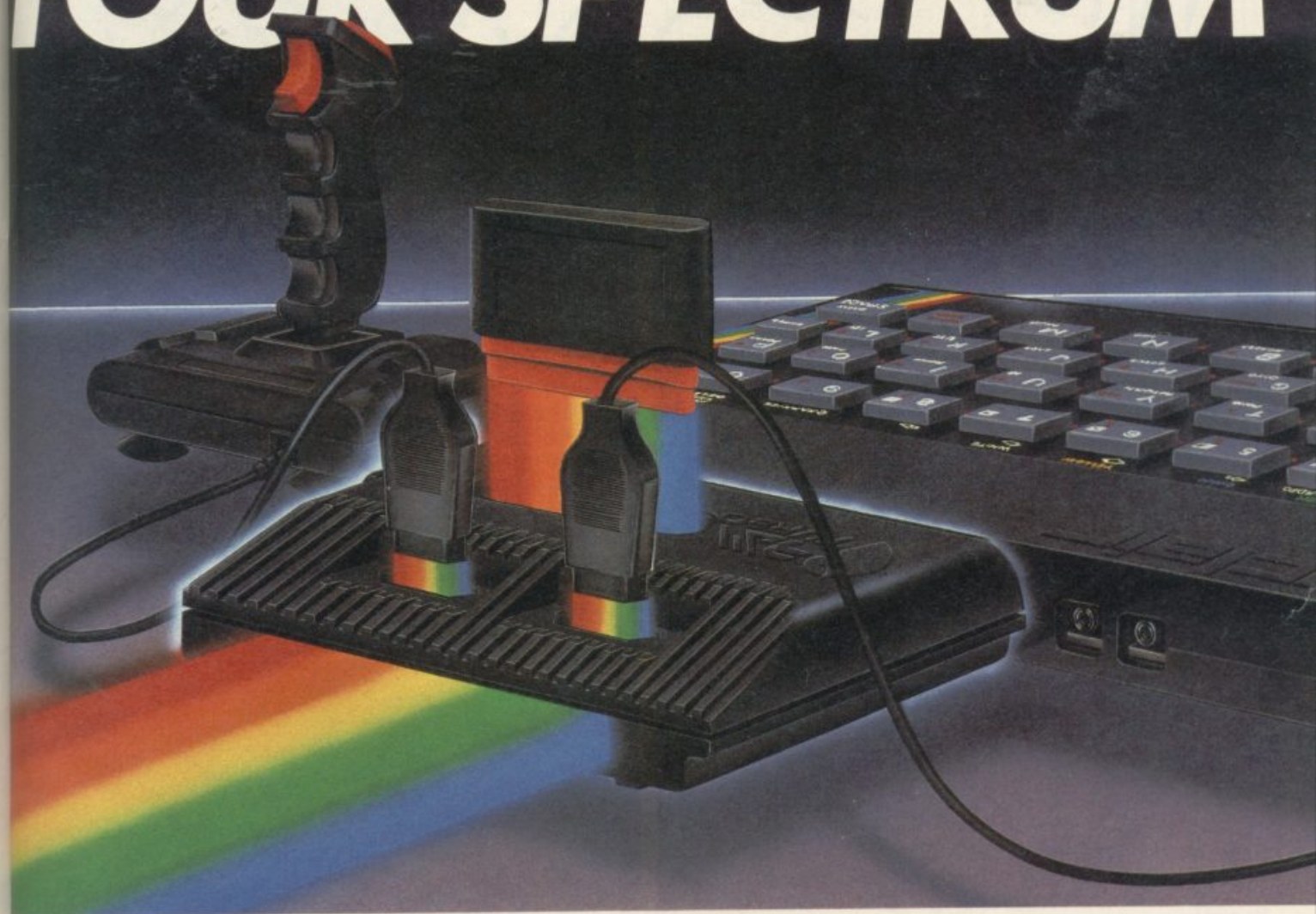
TOTAL £ _____

Send me the FREE Tasman brochure describing your products. tick here: ☐

I would like to know more about your programs for:

ZX Spectrum ☐ MSX ☐ Amstrad CPC 464 ☐

TURBO CHARGE YOUR SPECTRUM



Outperforms any Spectrum interface

The unique Turbo interface from Ram gives you all these features – and more – in one unit:

- * A variety of interfaces including: Rom cartridge, two 9-way D plugs for standard joysticks, PLUS full expansion at rear.
- * Compatible with Kempston, Protek and Interface 2 protocols.
- * Works with latest Quickshot II rapid-fire joysticks and trackballs.
- * Choice of Rom cartridge, tape cassette or Microdrive software.
- * Works with virtually all joystick-compatible software.
- * Instant program loading with cartridge software.
- * Built-in power safety device – unique to Ram Turbo.
- * Full one year guarantee.
- * Immediate availability – orders will be despatched within 24 hours upon receipt of postal orders or credit card details (cheques – seven days).

So don't wait around. It's available from Boots, Menzies, Greens, Spectrum

Group home computer centres and all good computer shops everywhere.

Or simply complete the coupon below and send it to us today.

Ram Electronics (Fleet) Ltd, Dept. SU, 106 Fleet Road, Fleet, Hampshire GU13 8PA.

Or call our credit card hot line on 02514 25252.

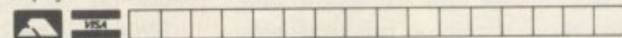
Please send me

_____ Spectrum Turbo Interface(s) at £22.95
+ £1.00 p+p (overseas orders £3.00 p+p).

_____ Quickshot II Joystick(s) at £9.95
(only when purchased with Turbo – normally £12.95 + £1 p+p)

I enclose cheque/postal order or charge my Access/Visa for: £ _____

Expiry Date ____/____/____



Name _____

Address _____

Postcode _____

Telephone _____

To: Dept. _____, Ram Electronics (Fleet) Ltd, 106 Fleet Road, Fleet, Hampshire GU13 8PA.

24 Hour
despatch for
credit cards and
postal orders



Trade and export enquiries welcome.

Wizz for Skooldaze!

WHEN YOU write a computer game it always go wrong becos of THE BUGS as any fule kno. Peason who is my grate frend wrote an utterly wet game in prep. but Mr Reidy make up games for MICROSPHERE and his are all grate fun with v. good graffics.

I decided to write about Mr Reidy for a projekt and espechally about **SKOOLDAZE**. It is a wizz game about skool you hav to hit the skool shields with gats and also the masters it is fantastic. In the game the head-master has a **BAD REPORT** in his study and you must get it back. Evidently Mr Reidy hav not heard of the Molesworth Bogus Report system for good marks.

Here is the projekt.

Mr Reidy

Mr Reidy live in a house his name is David but he is 32 yrs. He hav a wife called Helen. She is a teacher chiz chiz but she only teach tiny boys and gurls. Mr Reidy write the programs and Mrs Reidy she does the adverts and things in the offis.

Before he write games strange to relate Mr Reidy work with big computers price £1000000002 they are called **MAINFRAMES**. He sa, "I was a production systems manager working with on-line dataframe — all the buzzword stuff."

All profeshunal programers talk like this e.g. on-line dataframe which mean everybode on the same machine at once don't pull the ribbon cable peason **CRASH** and yet again the skool BBC xplodes and no more math. today cheers cheers.

Mr Reidy did not go to skool like us mere mortals but to **UNIVERSITY** insted. He learn about **NEUROPHYSIOLOGY** and **ZOOLOGY**. "Now you are going to ask me why someone like me is writing computer programs. In fact nerves are all about communication. From a practical viewpoint knowing the mathematics of information theory did help with computers, and I have an active interest in certain aspects of artificial intelligence, mainly graphical. I am not

Chirs Bourne unWisely allows a grate frend to investigate **Microsphere**.

talking about the Spectrum but big mainframes, the sort of stuff where you give it nine points and it draws a landscape."

That is quite enuff about that.

How to start a company

Mr Reidy start his own company at the end of 1982. He write for the **ZX-81** but it is all weedy bizness programs. For the Spektrum he write **OMNICALC** it is a spreadsheet. Grabber hav it, it add up numbers and does all his homework. Grabber is head boy and a big bully.

"I was marketing software under the Microsphere name but also doing a lot of contract work. Optimax, a linear programming thing was sold by Hilderbay," sa Mr Reidy.

"Then we were begining to get games out. There was the **Train Game** and **Wheelie**. Wheelie broke very slowly, but it has been selling steadily now for over twelve months, which is remarkable."

Microsphere is a small company but Mr Reidy work with another man, Mr Warrington, his name is Keith. He does the **GRAFFICS** for the games becos he is an artist. All artists are suposed to be weedy unless they are French and kno about life and gurls hem-hem. But Mr Warrington is not bad, to judge from **Skooldaze**.

Skooldaze

"The only reason for doing **Skooldaze** was I wanted to see lists of all the dates of battles in English History appearing in the hint pages of magazines," sa Mr Reidy.

He sa this because in the game you must find when Mr Creak was born to open the safe with the dreaded report in it. He is the History teacher and v. old and he gives clues to do with battles.

I hav doubts about this, dates are better left in books where they belong. It is more fun firing the catapults at the masters insted. Mr Reidy do not mind this when I tell him.

"A game should not depend on the desire to achieve a single aim. If it is a simple maze there should be distractions along the



way. In **Skooldaze** you don't have to know what to do to enjoy it."

Mrs Reidy sa a boy rang up to ask how to write on the blackboards, which any fule kno. "I told him how to do it and then I went into the teacher bit and told him he shouldn't be writing on blackboards anyway."

Everybody in the game are just like in my skool. "It was designed for school stereotypes," sa Mr Reidy. "Every school has a swot, and a bully. Every school has one angelic looking little boy who is a real terror — Boy Wander in the game. And there is always someone who you wish you were as nasty as, but always gets away with it."

"Then there are the masters. The science master is always a mad boffin. Every school has one trendy master — Mr Withit the Geography master. You can put your own

FLETE ST.: "How do you do the graffics etc.?"

MR REIDY (*amazed by sagacity of question*): "I need a strong visual sense right at the beginning even if it does not coincide with that of the graphics artist. Keith Warrington will discuss it with me and do some roughs, so I know what sort of animation is required."

Mr Warrington kno all about colours and how they look next to each other, and also about what you do not see in the picture, i.e. if you look at a picture you do not notice everything there, and Mr Warrington kno xactly what you are not looking at. Mr Reidy think this is v. important.

Some companies write wizz games about killing things with germ guns and the PUKON but Microsphere do not write those games. Mrs Reidy sa "I'm not thrilled by violent games. We don't kill persons. Our games are usually to try and save yourself from something or other."

The state
of the
NATION

All programers like to sa wot they think about the SOFTWARE INDUSTRY. It is becos they want to be reassured about working in it. Grabber sa the software industry is in trouble becos his dad has 700000 shops selling games and canot afford to give him more pocket money but Mr Reidy sa it is not true.

"We are not feeling a squeeze at all at the moment but it does seem to have got into a seasonal market. That creates cash-flow problems and nobody likes it. In general there will probably be a shakeout this year."

What he means is when you shake a bottle of ginger beer it xplodes because the mollicules get excited. So we can ekspect to hear a lot of banging all over England in 1985.

"It was all little people at first," sa Mrs Reidy. "And now the big ones seem to be moving in." Mr Reidy agrees. "Quicksilver and Ocean were small once" sa he. "But the bigger things get, the more hype there is and there are less authentic original games. For us it is very healthy because we have a very successful game. If we were setting up at this stage I wouldn't bother.

continued on page 52

names in, which is very important. It makes the game more social, like a family occasion."

Aktually you do not want to involve your family in **Skooldaze** it is sordid enuff as it is without pater getting cross about your high score and becos sombode has drunk all his best gin hem-hem.

How to be Topp
at Games

"It takes four or five months to get an idea together for a game," sa Mr Reidy. "You say, 'I'm going to write a game about a school' and then several months later you can get on with it. You have to structure it properly to being with."

Mr Reidy hav a grate brane e.g. he can write MACHINE CODE straight down on paper, he does not even use an assembler sometimes.

LORD MOLESWORTH OF

Hit Squad

continued from page 51

"The usual silly things happened at Christmas. We had to push quite hard to get into Smiths and Boots. They are not dependent on your game, and they also sell to a slightly different market to specialist shops. A lot of it is caused by hyping products to the eyeballs. They ask 'What backup do you have?' and if you have a massive advertising campaign they say 'OK, we'll take it'".

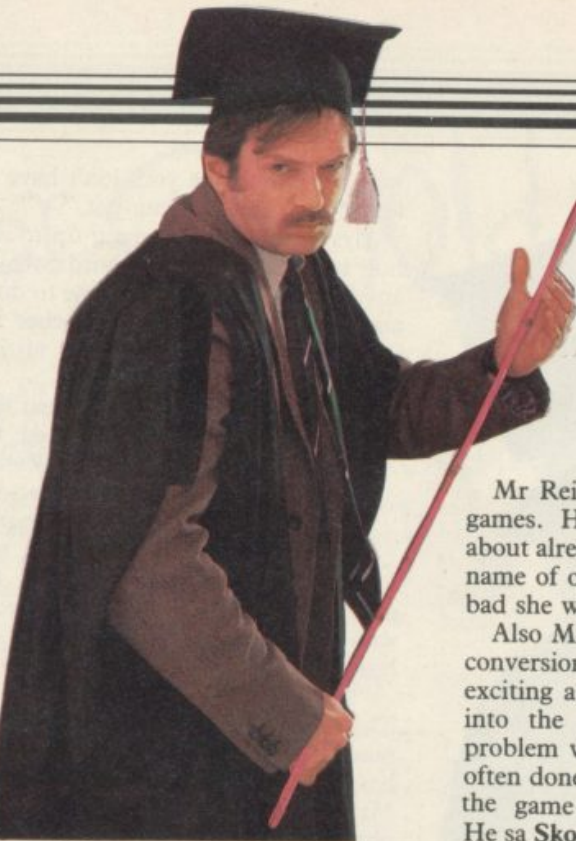
Well that is life and no more than you ekspect. If you think it is all a bed of roses just ask Mr Grabber he will tell yu a different story hem-hem.

ALL WORK AND NO PLAY etc

All programers do wierd things when they are not programing which they do nearly all the time as far as i can see.

Mr Reidy runs up and down all the rodes in N. London v. slowly, it is called jogging and worse even than GYM which make the body beatiful as if anyone could, look at peason his is beyond redemption.

He also pla the guitar, he pla the blues and Mrs Reidy pla classical tunes. He like to pla games but only those which exercise his grate brane



A Look into the Future

Mr Reidy sa he will go on writing games. He hav two he is thinking about already. Mrs Reidy made up the name of one she sa it is a pun and so bad she will not tell me chiz chiz.

Also Mr Reidy is going to do some conversions, it is like in Div. not as exciting as you think. "I want to get into the Commodore market. The problem with conversions is they are often done by people who do not like the game and do not understand it." He sa *Skoldaze* may be one so all the oiks with Commode 64s will hav it.

THE END

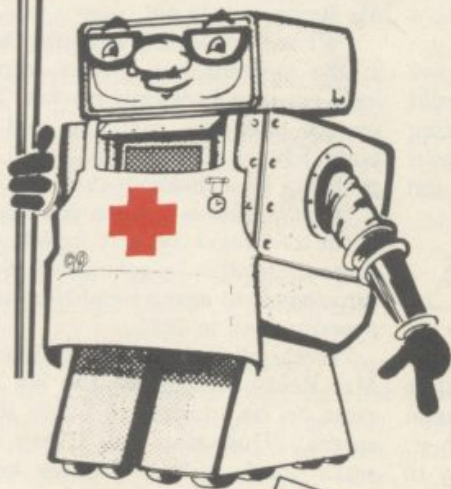
That is my projekt about Mr Reidy and Microsphere. Peason help with the title graffics, that is why they are all wet and weedy and uterly pathetic.

NATIONAL NETWORK

Computer-fix

GUARANTEED

SPECTRUM REPAIRS



£19.55

FULLY INCLUSIVE

- SUPER FAST LOW COST GUARANTEED REPAIRS
- 48 HOUR TURNAROUND
- ENORMOUS STOCKS OF SPARES ALWAYS HELD
- AUTHORISED SERVICE REPAIR AGENTS
- AN ALL INCLUSIVE REPAIR PRICE INCLUDES ALL NECESSARY SPARES
- RETURN POSTAGE AND TRANSIT INSURANCE PAID
- COMPREHENSIVE RANGE OF COMPUTERISED TEST EQUIPMENT FOR FAST AND ACCURATE DIAGNOSIS
- ALL REPAIRS GUARANTEED FOR THREE MONTHS
- THE WORLDS LARGEST SERVICE ORGANISATION FOR SINCLAIR REPAIRS

For the repair of your Spectrum, please send your computer and details of the fault, along with a cheque or postal order to:-

COMPUTER-FIX - VERRAN MICRO MAINTENANCE LIMITED
Albany Park · Frimley Road · Camberley · Surrey GU15 2PL
or please telephone Camberley (0276) 66266 for further details.

STOP PRESS: ONE YEAR MAINTENANCE POLICY for only **£12.60**

Papert's prophecy

SEYMOUR Papert, the father of the Logo language, has arguably done more for computers in education with his book *Mind Storms* than anyone else.

His ideas about the lifting of restrictions and enjoyment of learning within the classroom form the basis of the book which describes the conception and use of MIT Logo within educational environments around the world.

The basic premise, which he supports vehemently, is that children learn more by discovery rather than by rote. Give a child the choice between a multiplication table and a computer running Logo and the child is more likely to take the latter. Papert also asserts that the child will learn more and in *Mind Storms* he makes a good job of proving it.

Papert's arguments make sense not least because he is

more literate than many of his colleagues in education. As he explains his proposals he sets up questions between the lines which critical readers are likely to ask and then with great modesty knocks those critics down with practical solutions to the problems.

In the introduction critics are at first likely to attack him for his apparent lack of concern for the teacher/pupil ratio. Many will say

that his ideas seem to point to an educational system where the lack of resources and trained staff can be corrected through the use of computers.

Papert sets up the critics and then says: "My goal is not educational economies: It is not to use computation to shave a year off the time a child spends in an otherwise unchanged school or to push an extra child into an elementary school classroom... I believe that certain uses of very powerful computational technology and computational ideas can provide children with new possibilities of learning, thinking and growing emotionally as well as cognitively."

Papert is obviously a utopian but this book shows that he is willing to adapt, just as his language is adaptable. His book is a worthwhile read for everyone who is disenchanted with the computer scene.

John Gilbert

Simple QL games master

AS PREDICTED, the flow of QL games listings books has started and, ever to the fore, Granada, now Collins, Publishing and its seemingly resident authors Kay Ewbank, Mike James and S M Gee have released *QL Gamesmaster*.

The book is not to be confused with other titles in the Gamesmaster series. *QL Gamesmaster* has been written from scratch and provides some original and entertaining listings to enter for those who have nothing better to do with their time or £400 worth of Quantum Leap.

Ewbank and Co have tried to disguise the nature of the book by including an introduction which, in general, repeats the advice of author Roy Atherton in the Beginner's Guide which is packaged with the machine. Once they have got over that hurdle they sprint into a series of "simple but effective" program listings.

Admittedly, the programs are simple but the explanations do reveal new information about games design on the QL. That is not surprising as almost nothing has been written about the QL and its game-playing abilities. Programs include *Ant*

Hill, Leap Frog, Frogling and *Tadpole*. You can probably take an intelligent guess as to what they look like and how they all play.

If you are interested in demeaning the abilities of your expensive new computer then buy *QL Gamesmaster*.

John Gilbert

QL Gamesmaster
Publisher: Collins
Price: £7.95 (paperback)



Putting theory into practice

THE immediate impression upon opening *Software Projects for the Spectrum* is "oh no, not another book about structured programming".

You may feel by now you have grasped everything that there is to know about the subject, but few books ever show how to put that knowledge to good use. *Software Projects* is, thankfully, different.

Despite the usual introduction where the author, Rudolf Smit, tries to show what an artist he is with words — describing software writing in terms of analogies and similes — the book gets off to a promising start with a blow-by-blow account of the projects to be

attempted within the following chapters.

The programs include a birthday and anniversary calendar, a word guessing game and three-die roller. A motley crew, and not the most inspiring of topics, but we must not grumble as the book is, after all, for the beginner who has just received a Spectrum.

Each chapter contains a series of sections illustrating the program which is to be built and reproducing the subroutines which make up its main structure. The author is not content to give only lists of programs.

For instance, in the chapter on calendars Smit talks about the construction of

dummy statements in the computer which are then replaced with real program code when the programmer knows how the code should be written.

Although *Software Projects* succeeds in its aim of introducing new users to the practice, rather than the theory, of programming techniques it has to be asked whether the book provides too much help. The author may not give the full listings of projects but the descriptions of the programs leave little to the imagination.

John Gilbert

Software Projects for the Spectrum
Publisher: Melbourne House
Price: £6.95

GAMES WORKSHOP

The New Force in Software

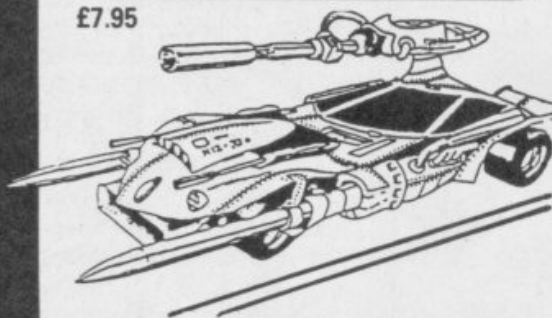


THE GAME OF DEADLY DRIVING

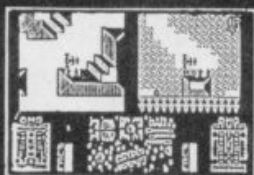
BATTLECARS

48K SPECTRUM

£7.95



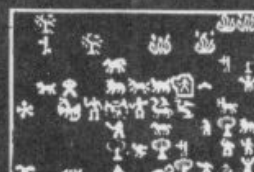
"You know you've got a winner the instant you open the package - go out and buy it today!" - P.C.N. The only Real-Time simultaneous action 2 player Spectrum game.



CHAOS

48K SPECTRUM

£7.95



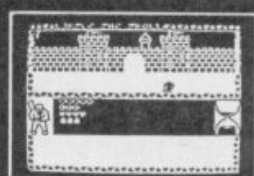
Magic and death on the plane of limbo for 1-8 sorcerers. Over 50 animated creatures and spells to summon from the depths of hell and beyond!



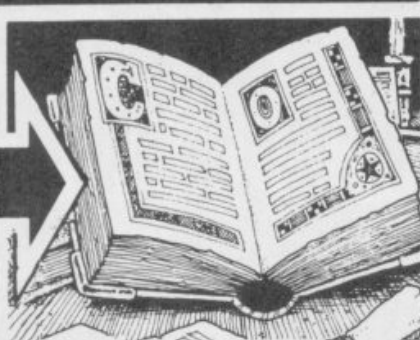
TALISMAN

48K SPECTRUM

£7.95



A brilliant interactive arcade adventure for 1-4 players. 50 locations full of beautiful graphics and deadly foes - the crown of command awaits!



Tower of Despair

48K SPECTRUM
£7.95

NEW
ON C64
£8.95



"'Tower' is a classic... It refines the traditional adventure to perfection."
- *Popular Computing Weekly*
"A startlingly original and fresh approach. Fantasy fans will love this game."
- *CRASH*
"It lives up to all the claims made for it."
- *Micro Adventurer*.

D-DAY

48K SPECTRUM COMMODORE 64
£7.95 £8.95



QL £24.95



"An excellent and detailed wargame with graphics to match - at last!"
CRASH
The acclaimed wargame is now on C64 and QL - contains over 200K!



Tower II Key of Hope

48K SPECTRUM £7.95
THE SPECTACULAR GRAPHIC
SEQUEL TO THE CLASSIC
ADVENTURE



Games Workshop games available from all good shops or direct from
GAMES WORKSHOP MAIL ORDER, 27/29 SUNBEAM ROAD, LONDON NW10
with this coupon. Please Rush Me (tick boxes):-

<input type="checkbox"/>	Battlecars (48 Spectrum)	£7.95
<input type="checkbox"/>	Chaos (48K Spectrum)	£7.95
<input type="checkbox"/>	Talisman (48K Spectrum)	£7.95
<input type="checkbox"/>	D-Day (48K Spectrum)	£7.95
<input type="checkbox"/>	D-Day (C-64)	£8.95
<input type="checkbox"/>	D-Day (QL)	£24.95
<input type="checkbox"/>	Tower of Despair (48K Spectrum)	£7.95
<input type="checkbox"/>	Tower of Despair (C64)	£8.95
<input type="checkbox"/>	Key of Hope (48K Spectrum)	£7.95

Cheques/POs made payable to Games Workshop Ltd.
Post & Packing free in UK. Overseas add 15% to total cost.



THE WINNERS!



ADVENTURE, STRATEGY, SIMULATION OR WAR GAME ?

Whatever your choice the 1984 Cambridge Award competition has the game for you.

THE PRINCE, an adventure game, won the **Cambridge Award** and is an entirely new concept in adventure games, creating a believable world of medieval intrigue and counter-intrigue in which the four players become totally immersed. The game is very interactive and each player represents a particular 'power base' within the castle. The players need to make alliances with each other before the mystery is solved and become the new Lore-Master. Untrustworthy henchmen are recruited to spy or steal from other players, plots are hatched and unholy alliances formed. **Price £7.95**

1942 MISSION is an adventure where a British Agent is sent to find the rocket fuel plans in a German High Security camp. **Price £5.95**

BLUE RIBAND is a simulation where the Master of a modern ferry has to navigate his way through the narrow river channels of five South Sea islands. **Price £5.95**

INSURGENCY is a strategy war game which is unique in that the 2 players have very different types of armies. The government forces are better equipped but are less mobile than the guerrilla forces. **Price £5.95**

WAR ZONE is a war game where the player plays against the computer's Red Forces. There are 9 zones and up to 150 pieces on each side. Stunning, fast moving graphics. **Price £5.95**

Available for Spectrum 48K from larger branches of Boots or mail order from



CASES COMPUTER SIMULATIONS LTD.

14 Langton Way, London SE3 7TL.

Telephone: 01-858 0763



The ultimate development from

The New Protocol4 interface for the ZX Spectrum brings you game control customising in a way that no other interface can. It accepts all commercially standard joysticks and is compatible with ALL Spectrum software. Operates like fixed option interfaces or can be fully hardware programmed. Infinite flexibility is achieved by the unique "CustomCard" System. CustomCards are easily programmed to suit all types of games. Protocol4 comes with 3 pre-programmed cards and allows operation with Kempston, AGF/Protek, Sinclair joystick 1 and 2 options as well as 2 programmable CustomCards and 10 Quick Reference Programming Cards. Simply clip in programmed card for immediate customised control.

Other exciting features include:

- ★ Automatic 8 direction control
- ★ Guaranteed conflict-free with other peripherals
- ★ Reset Button to clear memory between games
- ★ Fully guaranteed for 18 months
- ★ No power-down programming loss
- ★ Keyboard remains fully operative
- ★ Complete with full instructions

Also from the AGF Hardware range:

★ **Programmable Interface** — Ever popular fully hardware programmed joystick interface for ZX81 or Spectrum ... £24.95 + £1.00 p & p.



Protocol 4
Only £29.95 + £1.00 p+p
Now comes with a free
CustomCard Pack
worth £3.95

New Protocol K — converts your Kempston type into a fully programmable joystick interface for ALL Spectrum software! Only £17.95 + £1.00 p+p

★ **Interface II** — The best low-cost introduction to joystick control for ZX81 or Spectrum ... £9.95 + £0.50 p & p.

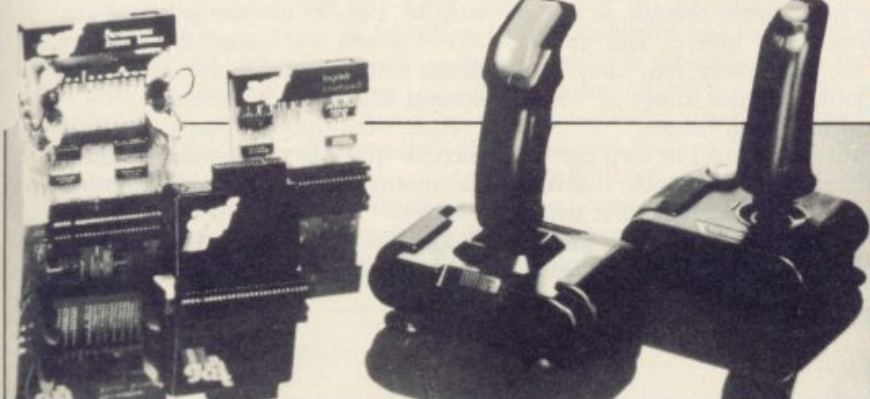
NEW: ★ RomSlot — Adds ROM cartridge software facility to Spectrum programmable joystick interface owners ... £9.95 + £0.50 p & p.

★ **Quickshot Joystick** — Excellent value game controller. ... £7.95 + £0.50 p & p

★ **Quickshot II** — Trigger action firing button and unique Auto-Fire ... £10.50 + £0.50 p & p

★ Extra "CustomCards" (5 per pack) ... £3.95 inc p & p

★ Extra "Quick Reference Programming Cards" (10 per pack) ... £0.65 inc p & p



Please send me
I enclose cheque for
debit my Access/Barclay/Diners Card
Account No.....Signature.....
Name.....
Address.....

Specify computer ZX 81 ☐
Spectrum ☐

Send to: AGF Hardware
Dept. SU
Freepost
West Sussex PO22 9BR
Tel: 0243 823337



Lending an extra dimension to chess

Theo Wood reveals the secrets of Ann Hughes' QL graphics

QL CHESS was one of the games software high points of 1984, a year which included the state-of-the-art **Match Point**. Both games were produced by Psion. Both games featured graphics designed by Ann Hughes.

The company began in Huntsworth Mews, London — a small informal office packed to the gills with desks and people. The new base in Dorset Square is in direct contrast, an elegant Georgian house swamped with pile carpet.

Ann Hughes works here — one of a team of three graphic designers who have joined Psion over the past year. Ann is typical of many graphic designers; trained to use methods involving paper technology she is discovering that a knowledge of computer graphics is an almost indispensable skill in the commercial world.

Just before starting at Psion in October 1983 she had been working as a freelance stage designer, wielding massive brushes which could scarcely have been further from the pixel resolution required in a microworld.

She had no experience of using

computers: "I didn't know one end of a computer from another; I thought a pixel was a pistol." Her first work for Psion, designing the QL manuals and working on cassette packaging was little different from her previous training. The only problem was a lack of specialist graphic equipment to reproduce diagrams and charts. That was soon remedied.

Match Point was her first challenge in designing for the screen. "The game came to me with the dimensions of the court laid out so there wasn't very much to do in designing the game itself. Most of the work went into the design of the characters."

Ann found the limitations of screen design very frustrating in that the Spectrum screen attributes allow only two colours. When animation was introduced the problem became worse, and there was also the memory limitation to be considered. Tackling even a minor problem, like the movement of the heads in the crowd, had to be subject to an ingenious solution, "I did just two screens and narrowed the heads to make it look as if you were seeing their profiles, and then flicked them. There wasn't much else to do within the memory."

The animation of players and ball boys was done first on graph paper, colouring in the individual pixels, with eight positions for the ball boys and ten for the players. Steve Kelly — driving force behind the classic **Chaquered Flag** — then wrote an animation program on a Vax computer which would remember the individual characters, send them down to the Spectrum and then run them in a sequence.

Initial results were not spectacular. "It was really funny though, as I'd not done animation before, and at first when the characters ran, they were doing some dreadful things . . . Some had peglegs," Ann laughs.

The title screen had its own particular difficulties. "This took the most blood, sweat and tears, and is what I would count as the most graphic thing. The skin tones were very diffi-

cult — I used a photograph and tried pixellating it to scale. I started with one version and then modified it. One aspect that really killed me was when he was holding the racket and I wanted the handle part to be a different colour. Then there was his hand and the background, so that was three different colours in one attribute. So I had to put it on the edge of an attribute and that meant that his arm might be too long. I had to really play around with those features."

Ann went on to design the title screens for the educational games **Estimator Racer** and **Number Painter**.

Then it was **Chess** for the QL. There was no software available at the





time, and to remedy that Steve Kelly wrote a graphics program providing the facilities that Ann required. Nicknamed QDraw, the program is on microdrive and has a number of useful functions — enlarge/reduce, alter pen size, and patterning are just some. Designs can be SAVED on microdrive.

QDraw is obviously a powerful graphics package but QL users will have to live in hope, as what can be used as an in-house design program still requires a great deal of work before it can be introduced to the market. Psion has no immediate plans to do that.

Ann found it was with this program that pencil and paper became redundant. "When I started I was so used to

paper and pencil that I couldn't relate to the screen at all," she explains. "I did everything on graph paper, but when you draw on paper you don't get the same effect, as the light out of the screen tends to flatten everything. Now that I'm used to it I do most of my designing straight onto the screen."

One of the most useful facilities QDraw gave Ann as a designer was the ability to replicate pieces behind and on top of other pieces as well as to move them. That gave her the power to see how each piece would look behind or in front of another in various stages of play.

The problems of white pieces on white are obvious and the same goes

for black on black, but Ann found that the white/green and black/red combinations also suffered from lack of definition. A black line round the white pieces, and white round black, was used to overcome the difficulty — something she would not have done in an ordinary drawing. That technique is only used when necessary and the lines disappear otherwise.

Colours were a source of frustration: "It is totally restricting, coming from something where you have everything at your fingertips and to be told that you have to work in squares and you can't mix colours." Ann 'mixed' colours for the base of the board where she tessellated black and red to gain a similar effect.

Problems cropped up. "I started off by doing the pawn and did it much bigger because I wanted the pieces to really fill the screen. But then there was an overlap so I had to redo all the pieces I had done until then, as I started trying out the relationships."

Ann also designed the display board on the flick screen which records the moves made. That, unlike the playing board, is in 2D. But it is the 3D effects which are the most stunning, although Ann is self-deprecating: "Let's be frank. This QL gives me so much more. I don't necessarily think it's an advance because of what I have done."

Ann feels that the way forward for computer graphics will be towards higher resolution at lower cost. That means more realistic animation will be possible, and it is that aspect of computer graphics which interests her most.

She also feels that there will be a radical change in cassette packaging based, in many cases, on the 'cosmic' art of the '60s. Psion has gone through this change, exemplified in its logo which is now more abstract.

Her current work is mainly translations of various programs to other machines, and **Chess** will be translated for machines such as the IBM and Mackintosh. Ann Hughes however is not someone to rest on past glories and although already highly qualified as a graphic designer she wishes to perfect her work; she is attending a computer graphics course which will involve using programming techniques.

For would-be designers she recommends starting with a drawing package and using graph paper to work out animation sequences. And, "Be patient, that's the main thing really."

A L I E N



In space no one can hear you scream.



NAVIGATOR
Shy, Skilful and
Intelligent — Panics Easily.



EXECUTIVE OFFICER
Direct, Imaginative,
Cautious, Loyal.



SCIENCE OFFICER
Secretive, Unlikeable, Brilliant —
Occasionally Illogical.



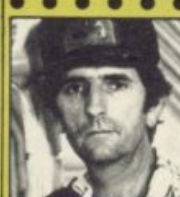
CAPTAIN
Solid, Dependable, Courageous —
Excellent Leader.



ENGINEERING OFFICER
Physically Strong, Low I.Q.
Potentially Rebellious



3RD OFFICER
Willful, Ambitious,
Authoritative, Resourceful.



ENGINEERING OFFICER
Cynical, Rebellious,
Untrustworthy, Unflappable.

THE CREW
Personnel
files follow—
yours to
command—
well almost...

MIND GAMES
SPECTRUM 48K · CBM64



*Featuring
the unique
Personality Control System*

No. 1 Golden Square, London W1R 3AB, Telephone 01-437 0626



£8.99

YOU ARE NOW the owner of a valuable piece of hardware — a Sinclair Spectrum. Hardware is a computer word meaning the computer itself, whereas software means programs that run on the computer.

A Spectrum may be under the protection of a year's guarantee which is reassuring but is not the same as insurance. A sensible move is to insure it, make a note of the serial number — found on the underside — and mark your name and postcode on it using an invisible marking pen.

Humidity, direct sunlight and dust are all potential hazards as are the many leads necessary to the operation of the computer. The Spectrum can get quite warm, even hot, and it is essential that the ventilation holes are not blocked up — a firm flat surface is the best place for it, not on a cushion on your knees.

A less obvious source of trouble is the plugging and unplugging of leads and the various accessories which you can buy. Apart from the cassette lead, all other leads and peripherals should only be plugged in or removed when the computer is switched off; never use force as they are vulnerable to mechanical damage which is expensive to repair.

The most popular way of storing programs is on ordinary domestic cassette tape and a very large proportion of all programs are supplied in that way. The problem is that the ordinary domestic cassette recorder is not designed for this purpose; Sinclair Research has kept the cost of the Spectrum down by making use of it along with the other necessary item — the television set.

The computer can be particularly sensitive to the cassette recorder and the setting of volume and tone controls. Once the correct levels are found then there should be no trouble. The tone control usually works best at one end of the range or the other and will be easy to set. The volume control will have a minimum setting above which all other settings ought to be correct.

Loading a program is generally easier than saving one; the cassette recorder controls may require experimentation before the correct levels are found. As there is no way of checking that a program is being saved correctly at the time Sinclair has provided a means of checking that a good copy has been made afterwards. That process is known as verifying and if it fails the cassette recorder controls should



Spectrum users get down to Basics

Our new series for beginners starts with an overall look at hardware and software. Michael Spencer is your guide

be re-adjusted and a fresh copy taken.

Mono cassette recorders are the most suitable type of tape recorder to use; stereo cassette recorders can be troublesome because there are two recording channels and unless provision can be made for recording and playing back on one channel alone it is unlikely that such a recorder will be consistently successful.

A useful feature is a tape counter, which can save time when finding previously saved programs or the space to save another. When buying such a recorder it is prudent to state that it is being bought for use with the Spectrum. If it is then found to be unsuitable it may be easier to exchange for another model.

A reduction in recording quality after many successful recordings may be due to poor quality tape or dirty recording heads in the cassette recorder. Do not be tempted to buy an expensive computer or tape recorder cleaning kit but read the manufacturers' instruction book instead. In many cases cotton buds and a little alcohol from the local chemist is a cheaper alternative. Most computer users record on short cassette tapes such as C15 and not long ones like C120. Buying very cheap tapes is false economy; buying a pack of short tapes

can be a worthwhile investment.

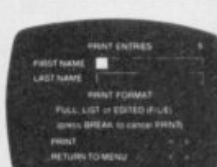
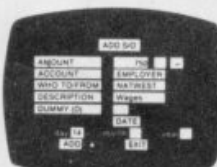
Televisions are as much a compromise as cassette recorders and often suffer from visual oddities. New users of home computers are very often disappointed at the picture quality and tend to blame the computer. If you are prepared to spend the money, about £300, then the most recent Spectrum models can drive some colour monitors with suitable connections. A colour monitor is not capable of picking up TV broadcasts so it is expensive for what it does, but you do get a good quality picture.

On an ordinary television set full use of tuning, brightness, colour and contrast can optimise the picture. There will be certain visual aberrations which cannot be eliminated — and a common complaint is something called dot crawl. The little dots which make up a television picture seem to be moving slightly and changing colour at the edges. There may also be small wavering lines or areas which can be equally annoying.

Devices which can be connected to a computer are known as peripherals and one useful peripheral is a printer. For any serious programming a printer is essential so that programs can be studied away from the pressures of the

continued on page 64

Spectrum + me



If you've got a 48K Spectrum™ and accounts to manage, OCP will make the job easier and faster.

All our business and utility programs are Sinclair Microdrive Compatible, and the Plus 80 versions are versatile enough to drive full size 80 Column Printers through most Centronics and RS 232 Interfaces including the ZX Interface 1. However, our standard programs (except Stock Manager) only work with ZX and Alphacom 32 Column printers.

The magic of MACHINE CODE has enabled us to produce the very latest "on the page" presentation which lets you enter and edit data naturally, as if filling in a form.

FINANCE MANAGER £8.95 PLUS 80 £19.95

Voted the best in its class by the Sinclair Users Annual, this easy to use program is a powerful and flexible aid to practically all domestic and business accounting applications. Show up to 255 separate accounts with running totals, and review standing orders as you scroll back and forth through your accounts. But that's not all, this program automatically raises a corresponding debit or credit for every entry, and will even open a new account if an entry features an unrecorded account name.

Having all your finance records so neatly stored is the height of efficiency! The program is entirely menu driven for ease of operation, yet the facilities are so extensive you'll soon wonder how you managed without it.

ADDRESS MANAGER £8.95 PLUS 80 £19.95

A very useful MACHINE CODE application program with limitless applications at work and at home.

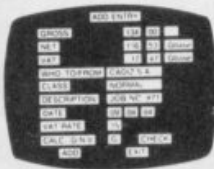
Manage your address book with efficiency and speed! Address Manager stores up to 350 names, addresses, and phone numbers – depending on their length. Or up to 1200 individual names/titles/references. The Plus 80 version also embodies a comprehensive Label Printing routine.

In the office, Address Manager can store internal phone directories, store and analyse customer's records, and much much more.

If you've already got Finance Manager and/or Address Manager but in non-Microdrive format, and you'd like to update them, we'll give you a £3 rebate towards the cost of a Microdrive Compatible 32 Column, or £5 off the Plus 80 version. This offer is available via mail order only.

The OCP range includes: VAT Manager, Address Manager, Finance Manager, Stock Manager (80 Column only).

means serious business!



VAT MANAGER £8.95 PLUS 80 £19.95

Your VAT 100 return need no longer be a headache! Simply key in the Gross or Net values of all the period's sales and purchase invoices and VAT Manager will check, analyse and total all the relevant details. Available in 32 Column or Plus 80 versions, VAT Manager will check all calculations automatically, and will even work out details of exempt totals where the trader is not required to pay VAT. This is performed with its CLASSIFY feature for types of transactions, and GROUP feature for more detailed analysis.

PLUS 80 STOCK MANAGER £19.95

Provides a controlled stock environment for up to 600 different product lines.

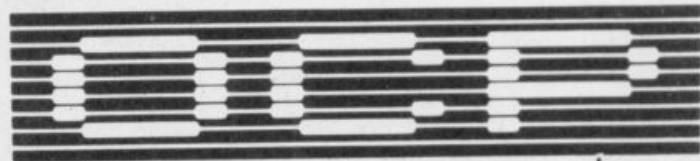
The program has facilities for the production of invoices, sales totals, price lists, and shows stock status, stock adjustment and re-order requirements.

No business should be without this crucial Microdrive program. Now you can compute your entire stock balances all on one program - Stock Management has never been so easy! Coupled with a suitable printer it will take advantage of the 80 column width printout to produce quality hard copy.

Now the most helpful aids to business efficiency are as near as your local software stockist. Call in soon and see the latest in OCP's exciting range of business software. Available from larger branches of WHSMITH or mail order direct.

For instant purchase contact the **OCP** Hotline with your details. Telephone: 0753 889 055

SINCLAIR, ZX, ZX SPECTRUM & ZX MICRODRIVE ARE ALL TRADEMARKS OF SINCLAIR RESEARCH LTD.



Simply The Best

4 High Street, Chalfont-St-Peter, Bucks SL9 9QB

Our Utilities include: Machine Code Test Tool, Editor/Assembler and Master Tool Kit.

continued from page 61

keyboard and at leisure — a printer is not considered essential for this series. The Alphacom printer uses special paper which is quite expensive, it is rather noisy and slow and is again a compromise. It is inexpensive and for the small amount of use to which it will be put at home it is adequate.

The software scene for the Spectrum is far ranging with all sorts of programs available. A goodly proportion of that software is bought over the counter in the high street and the rest is sold by mail order. There is an element of risk in mail order especially when ordering new titles which may not be as ready as the advertisements suggest, whereas in a shop you can see what you are buying.

Unfortunately for the software producers a growing market exists in pirate software. The knowledge acquired in learning to program is being abused by using this skill to copy software. Software piracy is a relatively new phenomenon and as yet there is not really any legislation to tackle it.

Another source of programs is computer magazines, some of which are devoted almost entirely to printing program listings. Most of those programs are written in Basic and are a good source of teaching material. Typing in, amending and running such programs can greatly help understanding of how they work. Learning the location of all the keys is also achieved.

If you want to progress from running programs and want to know how to program then you will need help. That can be obtained by reading books, following a teaching course, reading magazines or by more active methods such as computer clubs.

There are dozens of books published about the Spectrum, not to mention those about Basic. Many of these books are poor in quality and unless carefully selected might be a disappointment. *Sinclair User* reviews many books and you may find a recommendation which will suit your requirements.

To help you learn your way around the keyboard there is a teaching program on the introductory **Horizons** cassette called Keyboard Trainer. It is well worth working through this program, until you are familiar and happy with the keys and their meanings. It explains the modes, K,L,C,E,G and how to recognise which mode the Spectrum is in and what will happen

when a particular key is pressed. Once the use of the keyboard is mastered it will be much easier to type in programs from magazines, you can then learn what all the words and symbols do in a program and eventually progress on to your own programming.

If you are loading and running programs from tapes, or typing in programs from books or magazines, then all you need to know are a few commands — LOAD, RUN, LIST, SAVE, VERIFY and NEW. This is not programming but operating. NEW is a useful command, when used with care, as it causes the Spectrum to restart — almost as if you had turned it off and on. If you do not like a program you have loaded and wish to delete it then NEW will do this most effectively; note that you will still have the copy on cassette tape. LOAD achieves the same thing and



loads another program at the same time from cassette tape. LOAD needs a program name thus:

LOAD "FOOTBALL"

where FOOTBALL is the name of the program on cassette tape.

Once a program is loaded it may run itself or it may need an additional command to start it — RUN. If you have typed in a program then it is very likely that you will use RUN to start it. Before you run it you might need to see a listing in order to correct any typing errors and for that the command LIST is used. LIST will list lines of the program a screen at a time, and to see the next screen you press any key. The lines of a program are numbered, rather like a list of questions. It is possible to use LIST from a particular line thus:

LIST line-number
where line-number is replaced by a line number of the first line you wish to see.

Having typed in the program, run it to see that it works and perhaps correct the odd mistake, then save it to tape for another day with the command SAVE. That takes a copy of the

program from the Spectrum to the cassette tape; if you have set the tape recorder controls correctly it will be a good copy otherwise you will have to SAVE it again.

SAVE "CRICKET"

will save the program to tape. The copy should be checked afterwards by a process known as verification. The command VERIFY is similar to LOAD and it compares the tape copy with that still loaded in the Spectrum.

VERIFY "CRICKET"

will do this and if for any reason it cannot verify then the message

R TAPE LOADING ERROR

will be seen. The only course of action then is to SAVE the program again after checking the cassette recorder leads and control settings. This error message may also be seen when a program fails to load.

The ability to edit lines is also considered an essential skill and one which ought to be practised. Lines are checked for mistakes as they are entered. If there is an error then the line is rejected and it has to be corrected before it can be re-entered. That is called syntax checking and means the line is being checked for grammar such as spelling and order of commands. It ensures the line will be understood by the Spectrum when it is run but does not mean the line is wholly correct; you might have given one instruction where you meant another, which is something the computer cannot know.

Incorrect lines can be corrected by the process of editing. The line is recalled, changed and re-entered. The mechanics of the process are covered in the Sinclair manuals and ought to be practised. The best advice on avoiding mistakes when typing in a program is to take care and pay attention to what you are doing — it takes but a little effort at the time and can save considerable trouble later on.

Finally as a taste of the next article in this series type in the following very short program, making sure there is nothing else in the computer either by switching off and on again or typing in NEW:

10 PRINT "PROGRAMMING IS FUN"

Type RUN and notice how the computer immediately responds by printing the message in quotation marks on the television screen. By reading the Sinclair manual find out how to put this message in the middle of the screen.

CP software FOR Spectrum, Amstrad, Commodore 64 & QL

THE STRONGEST VERSIONS OF THE CLASSIC GAMES — from good retailers or by mail order

SUPERCHESS 3-5

GUARANTEED TO CONSISTENTLY BEAT ANY SPECTRUM OR COMMODORE 64 CHESS PROGRAM WHATSOEVER

NEW FOR 1985

- ★ Save Game & Program to Microdrive
- ★ On-screen clocks for tournament realism
- ★ Unique new way of setting hundreds of levels
- ★ All play within tournament time limits

FEATURES

- ★ Unique new way of setting levels by time gives you total control with three different options: tell the computer to match your response times, give it a time limit to play to, or give it an average time to make its moves. And you can force it to play its best move found so far...
- ★ Change sides and levels during play if required
- ★ Stop the game and change positions at any time
- ★ Set up particular games you want to try at any stage
- ★ Will recommend your best move when asked
- ★ Can be set to solve problems up to mate in four
- ★ Extensive library of opening moves
- ★ Option to determine your own display and piece colours
- ★ You can play blindfold chess
- ★ Absolutely suitable for beginners; just set the minimum move time
- ★ Fascinating self-play mode for you to study the game
- ★ TOTAL INFORMATION about the computer's thought processes, including: best line of play found so far, number of positions evaluated, depth of search, internal scoring system, display of previous moves if required, help menu if you should ever get stuck

DEDICATED TO EXCELLENCE IN THE GAME OF CHESS

STRONG—100 times faster, 1500 times more intelligent
FAST—from 5 secs to the highest levels, all within tournament times
PENETRATING—at tournament levels it searches at least 7 moves deep, trying tens of thousands of lines of play
FRIENDLY—keeps you informed. Ideal for the expert or as a tutor for beginners
SAVES TO MICRODRIVE TO SAVE YOU TIME
£9.95 48K SPECTRUM

BRIDGE PLAYER 2

THE STRONGEST BRIDGE PLAYER YET

NEW FOR 1985

- ★ Play a realistic game of bridge against the computer
 - ★ Computer can play as defender or declarer
- At last, here is a program with everything the solo Bridge Player ever needed: The computer generates random hands, allows proper bidding in the ACOL system including the Stayman and Blackwood conventions, and then IT TAKES YOU ON, playing both your opponents' hands. Every feature that can be packed into the Spectrum has been included in this program to give you a really satisfying and enjoyable game of computer Bridge.

FEATURES

- ★ Versatile bidding routines give you a worthy opponent
- ★ Study your game: post-mortem facility allows rebidding and replaying of any hand
- ★ You can review the bidding or play to previous tricks while playing a hand
- ★ Or input a hand or contract of your choice to test yourself
- ★ **COMPREHENSIVE ON-SCREEN INFORMATION DISPLAYS**: contract, tricks won so far, cards played in current and last trick, score
- ★ Option to **BIAS THE DEAL** to give you your "partner" more high card points if you prefer to play as declarer

A REALLY STRONG OPPONENT FOR A REALLY GOOD GAME OF BRIDGE

BRIDGE TUTORS with full manual & set hands to teach you the game
Beginners £5.95 Advanced £5.95
SPECIAL OFFER
Bridge Player 2 & both tutors £19.95

£9.95 48K SPECTRUM WITH EXTENSIVE MANUAL

ASTRONOMER

THE UNIVERSE OF STARS IN YOUR OWN PLANETARIUM

NEW FOR 1985

Astronomer has everything in one powerful program... See the night sky of more than 1000 stars from any time or place on earth. Watch it plot the planets or draw in the constellations for you. See close-ups from the Star Atlas of 362 charts. Watch animated detail of our Solar System in motion and see how it changes with the months. Calculate everything needed for serious astronomy to a high standard of accuracy and produce your own tables to save having to buy them. Anything can be transferred to a ZX Printer.

FEATURES

- ★ Comprehensive Manual with reference sections
- ★ Suitable for serious astronomical study
- ★ Night Sky views from anywhere on earth
- ★ Works for past, present and future times
- ★ Displays over 1000 stars
- ★ Draws the constellations on your command
- ★ Plots the solar system on the night sky
- ★ Huge Star Atlas for detailed study
- ★ Shows the motion of the solar system
- ★ Calculates position for the Sun, Moon, Planets, Comets and Asteroids
- ★ Then plots them on the Night Sky or Star Chart
- ★ Displays the phases of the moon
- ★ The distance from earth of any object
- ★ Sidereal time and rising and setting times
- ★ Ephemeris section: generate and print your own tables
- ★ Fully-compatible with ZX Printer

ASTRONOMER
 cp software

THRILLING command over the night sky from any time or place on earth
SERIOUS tool for the amateur astronomer — with excellent manual
 "For those interested in the night sky it should prove fascinating"
 "User friendly"
 "Very good value"
 CRASH Oct 1984

£9.95 48K SPECTRUM

PINBALL WIZARD

FOR COMMODORE 64 AND ANY SPECTRUM

Superb, colourful fast-action graphics and sound give this game the feel of a real arcade pin-table. Realistic launch, flippers, bumpers, high-score, bonus scores and freeball features. Be a Wizard!

"... I thought that a few minutes would suffice, and then found that a couple of hours had passed and I was still at it. Excellent... Pinball Wizard has it made!"

CRASH MAGAZINE

"A brilliant idea that's totally absorbing and so addictive..."

YOUR SPECTRUM

"The display is well-designed and colourful and ball movement is very realistic."

PERSONAL COMPUTER GAMES

ANY SPECTRUM—£5.95
COMMODORE 64—£6.95

NEW FOR OTHER COMPUTERS

BRIDGE PLAYER for AMSTRAD—£9.95
for COMMODORE 64—£9.95
COMING SOON... for the QL—£18.95
Amstrad Pinball and Superschess—£9.95

FRENCH language versions from our European distributor:
 SEMAPHORE, CH 1283, La Plaine, Geneve, Switzerland. Tel. Geneva (022) 54 11 95
WANTED: Strong and original programs of an intelligent nature for any of the above computers. Top royalties paid by this reliable company.

OTHER PROGRAMS for 48k Spectrum

Toolkit/Utility — (ALL AT £9.95)	Classic Games	
SUPERCODE II	Othello (powerful)	£6.95
FLOATING POINT FORTH (with editor)	Airbase Invader (Arcade)	£5.95
INTEGER FORTH	Golfing World (better than the ones you see heavily advertised)	£5.95
EXTENDED BASIC	Draughts (very strong program)	£5.95
SNAIL LOGO (Turtle graphics)	Backgammon (excellent)	£5.95
	Yatzee	£4.95
	Bridge Player	£9.95
	Superschess 3.0	£9.95

SPECIAL OFFER any two of these invaluable programming aids for **£17.95**.
 Any three for **£23.95** OR **£1 OFF** any if you also buy SUPERCODE III at £12.95.

JUPITER ACE SUPERCHESS **£8.95**

SPECIAL OFFER Any two classic games **£1.50 OFF** OR **£1 OFF** if you buy with one of our new featured programs at £9.95. (Astronomer, Bridge 2 or Superschess 3.5)

MAIL ORDER

Simply state which programs and send cheque, postal order or Access number (with expiry date). Telephone for instant credit-card orders. Send SAE for catalogue and return postage for submitted programs.

CP SOFTWARE, Dept (SU1), 10 Alexandra Road, Harrogate, North Yorks HG1 5JS
Tel: (0423) 57089

DELIVERY by soonest post. Post free in UK. Europe add 80p per program. All other places add £1 per program for surface mail or for Airmail add £2 for first program and 50p for each additional.

SUPERCODE III

FOR 48K SPECTRUM & SPECTRUM+

150 ROUTINES
 100% MICRODRIVE COMPATIBLE

NEW FOR 1985

With 150 ROUTINES and 100% MICRODRIVE COMPATIBILITY this has to be the ultimate Spectrum toolkit. It gives you the power to do everything you always dreamed of with your Spectrum in your own BASIC or M/C programs. Born of the earlier Supercodes (which themselves received 5 star reviews) we can claim confidence that we have packed absolutely everything into this State of The Art development. With Interface 1 it transfers easily to microdrive and is recognised by Sinclair as fully compatible. Needs no special knowledge to operate and comes with a comprehensive manual.

FEATURES

- ★ Unique Access Program lets you INDEX/ LIST/TEST/TAILORE/RUN/RELOCATE/SAVE (to tape or microdrive with new or default name) /VERIFY automatically
- ★ Options include EXAMPLE/REPEAT/JUMP/AGAIN/CONT/TIR/DEMO/DIAGNOSIS/MOVE
- ★ 100% menu-driven with on-screen training
- ★ Brilliant user manual
- ★ Routines guaranteed SHORTEST AND FASTEST for all applications

ROUTINES INCLUDE

SUPER MICRODRIVE CATALOGUE - TRACE (with 256 preset program speeds) - SCREEN COMPRESS FOR ADVENTURES - ON ERROR GOTO - DOZENS OF RS232 AND MICRODRIVE ROUTINES - ON BREAK GOTO - THE SUPER RENUMBER (Does everything) - VARIABLE LIST - STRING SEARCH - REPLACE - PAINT FIL - 5 SUPERB PROGRAMMABLE SOUND EFFECTS - RECORD - REPLAY - SOUND MUSIC - CONFUSE - UNCONFUSE - LISTING - REMILL - PROGRAM CONTRACT/EXPAND - PROGRAM ANALYSIS - NUMBER - VAL - SCOMPRESS - CHARACTER SWOP/SCRAMBLE/INVERT/REVERSE/ROTATE - WHOLE NEW CHARACTER SET (ISO-FI) - FLASH - BRIGHT - ON/OFF/SWOP - MEMORY FREE - PROGRAM LENGTH - BLOCK LINE - MEMORY ERASE/FILL/COPY - APPEND CURSOR - SCREEN SAVE/LOAD/SWOP/MERGE/FILL/SEARCH - HEX - DEC - DEC - HEX - CONVERTERS - REMILL - DATAFILL - GRID - INK - PAPER - CHANGE ATTRIBUTE - SWOP/INVERT/RESET - JUMP - HEAD - READER - PROGRAM PROTECT - PROGRAM BREAKIN - HEADLESS - FILE CREATE - AUTORUN - CODE - PROGRAM AS CODE - TAPE - COPER - DEFEAT - MICRODRIVE - DIAGNOSIS - FAST LOAD - MICRODRIVE - SURE - SAVE - MICRODRIVE - ADAPT - TO MICRODRIVE - SURE - CLOSE - STRINGS - PROGRAM - CASE - CHANGE/SWOP - HEX - LOADER - ANALYSIS - MEMORY - LINE - ADDRESS - STADIUM - FREE - SCROLLER - 24 LINE PRINTING - LOWER SCREEN - CLS - NEW - UDC - PROGRAMMABLE BORDER - EFFECTS - REMOVE - COLOUR - RIPPLE - SHUTTER - SCROLLSIL - R - SCROLL - PIXELS/CHARACTERS/ATTRIBUTES, SINGLY OR JOINTLY - UP/DOWN/LEFT/RIGHT - WITH OR WITHOUT WRAP-AROUND, IN A USER DEFINED WINDOW OF ANY SIZE POSITIONED ANYWHERE ON THE SCREEN - SPIRIT EFFECTS... and many more besides.

£12.95 48K SPECTRUM WITH EXTENSIVE MANUAL

**ONLY
£129.95**

**INCLUDING
4 FREE
WAFERS**

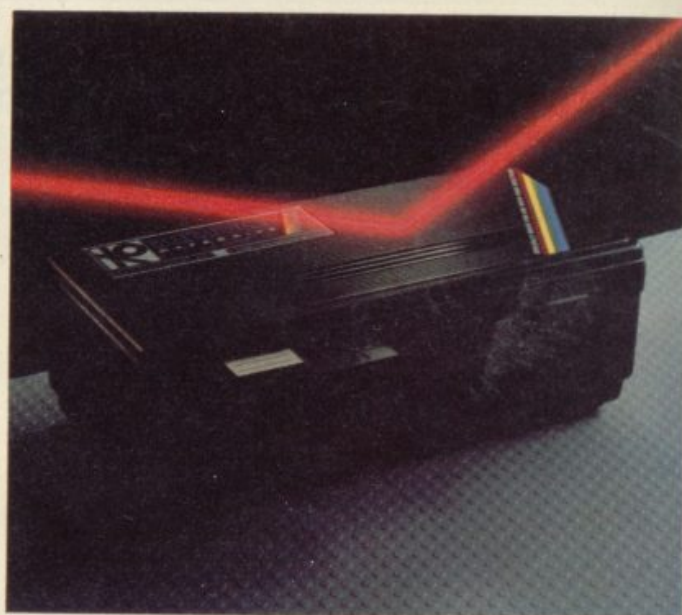
ROTRONICS WAFADRIVE FOR 48K SPECTRUM/ SPECTRUM+

Dual 128K storage. Fast access. Centronics and RS232 interfaces. And now FOUR free wafers from SMT, including the Spectral Writer word processing package. We're now including a free 16K, 64K and 128K wafer with each Wafadrive. All this makes the price of £129.95 (inc. p & p) even more attractive.



The Rotronics Wafadrive has now proved itself as the storage system that offers more. More features, more reliability and more speed. Its micro interface, two 128K drives, RS232 and Centronics ports are all contained within one attractively-styled, compact unit. Wafadrive achieves very fast loading and saving but not at the expense of reliability, which is on a par with floppy disk.

The fully interchangeable wafers are available in three sizes – 16K, 64K and 128K. Low capacity wafers are most



suitable for program development as they offer faster access. High capacity is most suited to general data storage. Loading rate is well over ten times as fast as cassette!

Software selection is ever growing – see list below for details. A full colour brochure on Wafadrive and up-to-the-minute software and accessory information is available.

Look to SMT for the best deal on all Rotronics peripherals

ROTRONICS DX-85 DOT MATRIX PRINTER

High quality and high speed. The DX-85 prints bi-directionally at 100 cps, logic-seeking. It offers a 96 character set at 10/12.5/16.5 cpi which extends column width up to 132 characters. Programmable typefaces including extended and italic. Centronics interface standard and free dust cover supplied. Options include typewriter ribbon adaptor, telex roll holder, RS232 serial interface and sheet feeder.

See our special price when bought with Wafadrive. This offer also applies to previous SMT Wafadrive customers (proof of purchase required).



ROTRONICS PORTABLE CASE

Ideal portable work station. Tailored foam insert holds ZX81/Spectrum/Spectrum+ manuals and cassettes within executive style case. All components remain fully operational in situ.



Size 138mm x 700mm x 363mm.
ONLY £34.45 (p&p £2.50).

**WAFADRIVE
PLUS DX-85 PRINTER
ONLY**

£299.95

**DX-85 PRINTER
ONLY**

£199.95

ORDER FORM

Please send (enter as appropriate)

Rotronics Wafadrive	@ £129.95 each
Rotronics DX-85 Printer	@ £199.95 each
Wafadrive plus DX-85 Printer	@ £299.95 pair
Rotronics Portable Case for ZX81/Spectrum/Spectrum+	@ £36.95 each
16K wafer	@ £3.45 each
64K wafer	@ £3.65 each
128K wafer	@ £3.95 each
Heathrow/NightRite II	@ £14.95 each
Space Wars/Seridab Attack/Luna Attack	@ £14.95 each
Bear Rover/Wong's Loopy Laundry/World Cup	@ £9.95 each
The Artist	@ £9.95 each
Starbike	@ £7.95 each
ZAP Machine Code	@ £19.95 each
Sherlock	@ £14.95 each
RS232 lead	@ £9.95 each
Centronics lead	@ £9.95 each

All prices include VAT and p & p

TOTAL

£

☐ I enclose a cheque/PO* made payable to SMT

SU.3.85

☐ Debit my Access/Barclaycard* account no. _____

(*delete as applicable)

Signature _____

Name _____

Address _____

Send to: SMT, FREEPOST,
Greens Norton, Towcester,
Northants, NN12 8BR.

(no stamp required)

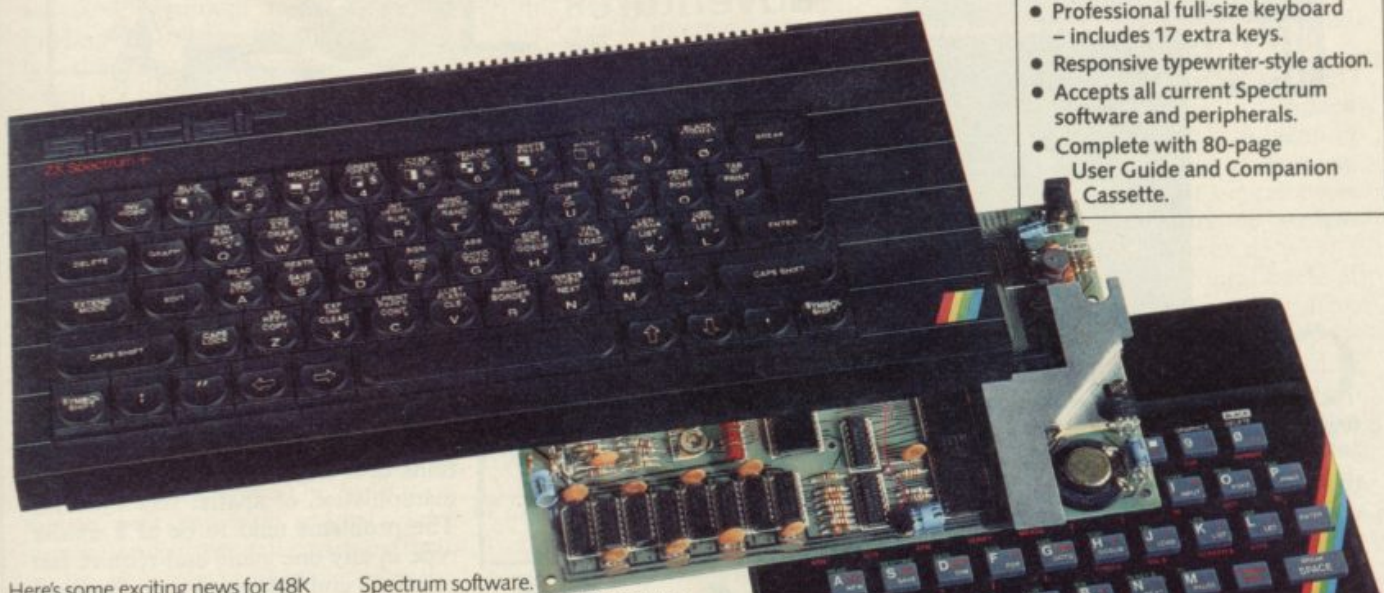
Please allow 28 days for delivery.



New - the official Spectrum Upgrade!

Turn your Spectrum into a Spectrum+ for just £20

- Professional full-size keyboard – includes 17 extra keys.
- Responsive typewriter-style action.
- Accepts all current Spectrum software and peripherals.
- Complete with 80-page User Guide and Companion Cassette.



Here's some exciting news for 48K Spectrum owners ... the official Spectrum Upgrade Kit.

The £20 Kit has everything you need to turn your Spectrum into the stylish new Spectrum+. You don't even need an understanding of electronics, just the ability to solder a few wires together! The leaflet in the kit gives clear, step by step instructions.

If you're not sure about doing it yourself, don't worry. Simply return your 48K Spectrum to Sinclair and for £30 we'll upgrade it for you.

Whichever you decide on, you'll also receive the new 80-page User Guide and Companion Cassette.

The bigger, better Spectrum keyboard

The Spectrum+ measures 12½" x 6". It has a large typewriter-style keyboard, with hard, moulded keys.

You'll find the new keyboard has a smooth, positive action – ideal for touch-typing, word processing, simulation programs, and extended programming sessions. Two retractable legs give a perfect typing position.

There are 58 keys in all, including 17 new keys. Programmers will be pleased to see dedicated punctuation keys, a space bar, and separate shift keys for graphics and extended modes. And a reset button allows you to clear a program from your computer's memory without disconnecting the power supply.

The official Spectrum Upgrade

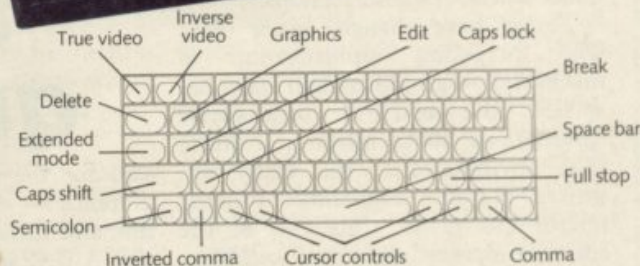
Naturally your upgraded computer will accept all the peripherals in your Sinclair system - Interface 1, Microdrives and so on - as well as all

Spectrum software.

Just as important, new Spectrum software and peripherals will be designed with the Spectrum+ in mind. So the Sinclair upgrade adds stylish looks, new capabilities ... and new potential for the future.

Included – the new Spectrum+ User Guide and Companion Cassette

The new User Guide has over 80 pages of information, including a handy BASIC dictionary. The Companion Cassette provides an interactive tour of the new keyboard, and includes three entertaining arcade games.



TO ORDER BY MAIL:

When ordering the Upgrade Service, send off your 48K Spectrum to the address below, carefully wrapped, together with the completed coupon and appropriate payment. (Please do not return the mains adaptor, manual or other ancillaries.) Your upgraded computer will be despatched to you within 10 days of receiving your order.

When ordering the Upgrade Kit, simply complete the coupon, enclosing the appropriate payment and post it to us at the address below. Please allow up to 28 days for delivery.

BY PHONE: Access or Barclaycard holders can call Camberley (0276) 685311 for personal attention, 9am to 5pm Monday to Friday. Only the Upgrade Kits can be ordered by phone.

Please note: the upgrade offer applies to working 48K Spectrum models in the UK only.

To: Sinclair Research Limited, Upgrade Dept., Stanhope Road, Camberley, Surrey, GU15 3PS.

All prices include VAT, post and packing, User Guide and Companion Cassette.

☐ Please send me the Spectrum+ Upgrade Kit. I enclose payment of £20.

OR

☐ Please upgrade my 48K Spectrum for me. I enclose my computer together with payment of £30.

I enclose a cheque/postal order

payable to Sinclair Research Limited for £ _____

OR

Please charge my Access/Barclaycard no. _____

Signature _____ PLEASE PRINT

Name: Mr/Mrs/Ms _____

Address _____

SUS 503

Sinclair Research Limited,
Upgrade Department,
Stanhope Road, Camberley,
Surrey, GU15 3PS.

sinclair

Richard Price investigates the introduction of arcade and animated graphics into adventures



Bladi throws the food at Lodi
Lodi attacks
Lodi kills
Lodi gets
Bladi's



ONCE UPON a time in the remote era of the early 80s, adventurers knew exactly where they stood.

When they entered a software store they could ask the assistant for an adventure and be fairly sure that they would end up playing a pure text-based game of the Crowther and Woods variety. No frills, no nonsense, no pretty pictures — just a pile of deduction problems without time limits or fast-reaction sections.

Things have changed since then. The increasing sophistication of machines, programmers and users has spelled the end of comfortable assumptions about adventure. More than anything else, the vastly improved graphics capability of home micros has turned this end of the software market into a confused blurred area.

Now there are arcade adventures and graphic adventures, in such profusion and variety that many defy easy definitions.

Early programmers were faced with a simple problem — adding pictures to a text game used up valuable RAM and drastically reduced the memory available for vocabulary. That would result in descriptions bare of any real atmosphere, badly affecting the playability and general appeal of the game.

Pleasant illustrations of the locations were all very well but players were often peeved to find that they had lost a lot of complexity in the trade-off. Purists would sneer at such unnecessary waste, feeling that companies were conceding to the demands of the contemptible arcade market.

Snobbery aside, there is a lot to be

said for the adventure untainted by graphics — Artic has produced very fine and difficult games in its perennial A,B,C series whilst Level 9 has programmed some of the very best of British adventures with **Lords of Time** and **Snowball**. Their intricacy is formidable and there is very little doubt that they will remain classics of their type for a long time to come.

Nowadays the majority of commercial adventures use location graphics. Programmers have learnt a great deal about squeezing information to get the best of both worlds — or nearly. Even the most staid, conservative adventure player will not raise an eyebrow to such practices anymore.

It is the power of the arcade game which has begun to exert strong and almost irresistible pressures for change in adventuring. Whatever you feel about them, arcade games, if they are well made, can be utterly compelling, mainly due to their visual qualities. So what is the difference be-

tween text adventure and arcade game?

The skills needed for each type are distinct. In style, most arcade productions deal in your understanding and manipulation of spatial relationships. The problems tend to be of a similar type in any one game and require fast reactions and manual agility. Any sort of intellectual input is limited and the range of activities the central character can perform rarely extend beyond two or three physical actions left, right, jump, fly or the like.

Take a look at Miner Willy, or Ziggy, the odd little hero of **The Backpacker's Guide to the Universe**. Nobody would argue that they can do much or that they possess wildly interesting personalities. There are also no other characters to relate to — the 'other' in arcade games is usually something to be destroyed or used in some way.

In text games there is a vast difference. Whereas in the arcade you progress in a simple linear way from screen to screen, in adventure you are provided with an interlinking and mappable world for exploration as you choose. Problems are hidden or obscured in some way and your major activity is mental. The stress is on persistent thought, intuition and deductive thinking, almost always in a verbal form. The visual has played a very minor part until recently. Puzzles will vary, running from codes to wordplays. Above all, you are given far more time to resolve problems, allowing you to reflect and try an alternative strategy.

Personalities abound — through your own imagination you can become

Behold the quest

the character you want to be. Other people in the game can also behave in a rudimentary human sort of fashion and your success depends on your ability to understand them rather than your speed at killing them. So far this has simply not been a feasible proposition in arcade games.

Slowly but surely the two species are now beginning to intermingle. Finding the missing links is difficult but there are a few types of game which cry out to be candidates.

Although they may not have been hugely popular the monster mazes can claim some part in the history. In those you travelled through large three-dimensional mazes avoiding dinosaurs or vampires, all the while collecting valuable items. There is no text input of any note in those games but they clearly had an influence on today's animated adventures.

Then along came **Valhalla**, where the vicious and unpredictable inhabitants of the Nordic afterworld come to life before your eyes. The little stick figures walk, eat, fight and die on the screen whilst you take part in their antics in a text adventure of some complexity — players are still racking their brains to find the magical objects and there is no sign of its popularity waning. Animation had arrived with a vengeance and in a way about which traditionalists could not really complain.

The speed of development since **Valhalla** has been astonishing. **Halls of the Things** was a milestone in the use of at least some adventure themes in what was essentially an arcade setting. The labyrinthine cavern of the game has doors, treasures and a variety of swift and deadly monsters all shown in a cellular system of interlocking locations.

Magic spells and combat routines are possible and planning plays a great role in your survival. Manoeuvring and manipulating the central figure is no simple task and jaded D&D players can take time out from their cerebral fantasy by enjoying a visually exciting and mentally taxing bit of cut and thrust.

Halls really set the cat among the pigeons and the companies began falling over one another in their attempts to outprogram the other — no bad thing as there have always been plenty of goats sprinkled amongst the sheep of the industry. Knowing the public has the ability to be discriminating concentrates the mind wonderfully.

More experiments followed. **The Oracle's Cave** took a standard adventure plot, animated the central character's journey through a group of caverns and introduced the idea of the single key process to cover certain actions. The animation is superior to that of **Valhalla** though the game does not have the same area or number of possible actions.

The Cave is interesting but is not very gripping to play. All too often the strict time limit on each quest means that you rarely finish. Dorcas has improved the format and eliminated the constricting time scales in its new game **The Runes of Zendos**, which uses similar animation.

Sprite graphic techniques and the

'Animation had arrived with a vengeance and in a way about which traditionalists could not complain'

use of various types of three-dimensional image have now brought what are effectively animated cartoons within the reach of the Spectrum user. One leader in this field is Ultimate.

Atic Atac can be said to be the first in a new generation of games where adventure motifs are combined with the thrill and visual appeal of the arcade. Pseudo-3D is achieved by the scene being depicted from above. Players can choose their roles and must travel the haunted rooms of the Castle in search of the fabled ACG key. Within the rooms you will find furniture, food, objects and monsters — the very stuff of heroic adventure but all played with a joystick. That is no simple progression from screen to screen and many routes are available to you in your wanderings. The graphics are sharp, fast and smooth.

Knight Lore, by the same company, took the art a stage further. It is a strong contender for Game of 1984. The 3D effect is vastly improved and the pictures are worthy of a Disney cartoon.

You are given total directional control over the hero; objects have to be collected and returned to the steaming cauldron somewhere in the castle. That is nothing new.

What is staggering is that objects, furniture — even the masonry — can

be moved and used to assist you achieving your goal. Precious objects may well be placed in highly inconvenient places and you will need plenty of the old lateral thinking skills you used in text adventure.

This is an arcade-quality game which can be called an adventure. So, it's not verbal, but it is intelligent and demanding in ways which will appeal to even the most stick-in-the-mud adventurer.

Controlling what amounts to a computer movie is a long way from **Space Invaders** or the original **Adventure** but it is the way things are moving now. **Tir Na Nog** from Gargoyle has the same filmic quality as **Knight Lore** though in a different style.

Here, deep in the mythical world of Celtic legend you send your hero through a landscape which shows convincing perspective, with fore- middle and backgrounds scrolling to help sustain the illusion. Unlike **Knight Lore**, there are other characters, some of whom may be hostile or helpful, but all living their own lives. Again, the game is almost entirely visual but adopts the style of adventure both in its aims and its enormous scope.

It would be difficult to talk about the new generation of adventures without mentioning **Lords of Midnight** and its sequel. The game is set apart from arcade games by using static location graphics and still retains features of the text adventure. Although it is governed by single key presses for choices the sheer vastness of the land gives you a convincing feel of taking part in the terrible campaign against Evil. The sense of moving slowly through the countryside is quite intense as the terrain 'grows' as you approach features.

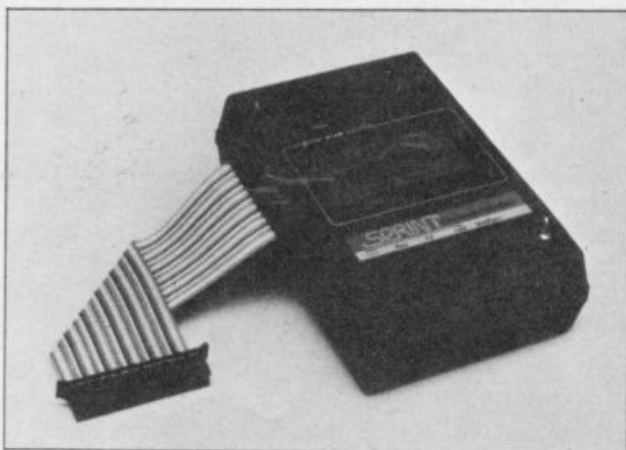
The game has also taken on some of the qualities of strategy and wargaming. You must control the movements of large numbers of troops and vassals to forestall the assaults of the Dark.

Adventure is spreading its wings. There is a synthesis, where all available techniques are being used for the production of games which once tended to stick jealously to their own territories. The idea of separate compartments for adventure, arcade or strategy is becoming outdated.

Serious adventure players should not regard that as a threat to the games they enjoy most. There will always be text adventures just as there will always be pure arcade games. What is

continued on page 72

The **SPRINT**, loads at four times speed!



The Sprint loads standard cassette programs at high speed without having to resave them first.* Microdrive compatible version now available.

The Sprint, from Challenge Research, loads and saves programs on the Spectrum four times faster than normal. Both commercial and home recorded programs will load at speed, and they do not have to be resaved to do so.

Price: £64.95 inc VAT and p/p

Off-line switch version £5.00 extra — to suit Interface 1, Centronics I/F printers etc.

Features: Retains standard commands, no software to load first, has internal ROM containing 4× speed routines. Connects via 56 way ribbon cable, no interface, has its own full expansion slot at rear. 3 digit tape counter and auto-stop system.

Order from: Challenge Research Ltd,



218 HIGH STREET, POTTERS BAR, HERTS

(0707) 44063

(*Turbo-load programs require resaving to Standard tape format.)



The Quill & The Illustrator

The Graphic
Adventure Writing System
For The 48K Spectrum

The Quill £14.95

The Illustrator £14.95

GILSOFT
30, Hawthorn Road
Barry, South Glam
0446 - 732765

From Computer shops Nationwide
Or direct from us by post or phone
Credit Card Order Line Staffed 24 Hours Daily

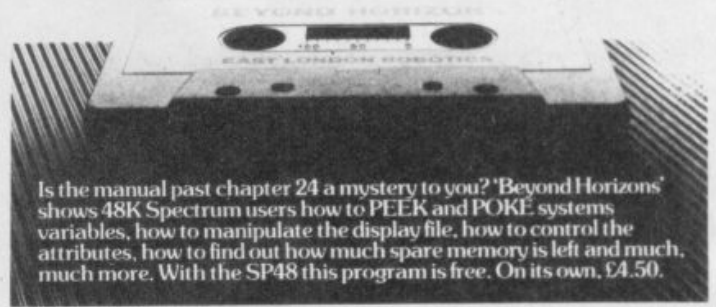
0222 - 41361 Ext 430

Ask for our products at
your local computer shop

Extend your 16k Spectrum to 48k for just £27.00.

And get a Free program worth £4.50 into the bargain.

Is the manual past chapter 24 a mystery to you? 'Beyond Horizons' shows 48K Spectrum users how to PEEK and POKE systems variables, how to manipulate the display file, how to control the attributes, how to find out how much spare memory is left and much, much more. With the SP48 this program is free. On its own, £4.50.



SP48B, 32k Memory Extension with Program — £27

The SP48 simply plugs into the sockets provided by Sinclair inside your Spectrum and turns your 16k machine into an absolutely standard 48k ready to run 48k programs.

The SP48 fits Issue 2 and Issue 3 Spectrums. Full step-by-step instructions are provided. Fitting is easy and there is no soldering.

The SP48 carries our full warranty and all our customers enjoy the benefits of our renowned product support.

And you get a free copy of Beyond Horizons, an educational program which has already enlightened thousands of 48k Spectrum owners about the inner workings of their computers.

48/80 FORTH

This compiler and editor is fast becoming recognised as the most professional and highest quality implementation of the FORTH language on the Spectrum. FORTH gives you the speed of machine code without the tedium of machine-code programming.

All the Spectrum's excellent graphics commands are retained including DRAW, PLOT and CIRCLE. Real arcade quality sounds can be produced using BEEP.

More advanced FORTH programmers will find that 48/80 FORTH provides a complete implementation of FIG-FORTH, including the sophistications of BUILDS, DOES and CODE.

Each 48/80 FORTH cassette includes a separate FORTH editor which uses part of RAM as if it were disk. The 48K Spectrum allows a 16k RAM 'disk', while leaving nearly 20k of dictionary space. A comprehensive user-manual is also included, which covers both compiler and editor, and has a lucid beginners introduction.

Extensions to 48/80 FORTH will shortly be available to existing customers at a nominal charge. These will include floating point arithmetic, and microdrive handling.

TRADE ENQUIRIES WELCOME — Are you on our trade/export mailing list?

All products on this order form are in stock. Same day dispatch for phoned Access and Visa orders.

To East London Robotics Ltd; Please send by return (tick items required)

- ☐ SP48B (for Spectrum Issues 2 or 3) £27 _____
- ☐ BEYOND HORIZONS (48k) £4.50 _____
- ☐ 48/80 FORTH (48k or 80k) £14.95 _____

Postage 0.65p. I enclose a cheque/PO for _____ My Access/Visa No. is _____

[illegible]

Name _____

Address _____

SU3

East London Robotics Limited, St. Nicholas House, The Mount Guildford,
Surrey GU2 5HN.

Orders and special enquiries
Guildford (0483) 505605
Telex 859428 (Trade only)

EAST LONDON ROBOTICS

continued from page 69

exciting is the sudden growth of novel concepts which will add to the repertoire of home computer entertainment.

The more variation, the better; it is healthy for the computing public who will have a wider choice and it is healthy for your imagination. After

all, who really wants to be stuck in the same old repetitive rut year after year.

Making predictions is a tricky business — as one or two computer tycoons may well have realised by now — but the likelihood is that computers will stay well within the reach of Joe Public and will get smarter and faster as chip technology improves. Net-

working should be common soon and video techniques will be enlisted in the search for the game to beat them all. The 'interactive' video cartoon games in the arcades now may well be seen as primitive in a short while. What shape will the networked, truly interactive and fully animated — or filmed — adventure take? Dream on.

At the sign of THE DANCING OGRE

At his inn on the moors landlord Gordo Greatbelly dishes out spicy mead and help for adventurers

NOW, that letter from Janga. I tell you I came near to tapping the messenger's skull with my club when I glanced through it. This miserable Prince Janga, Lord of Maru — a stinking sand-ridden hole if ever I knew one — summoned me to undertake a quest. And, wrote this snivelling fop, if I declined his necromancers would weave a curse so strong that my hair — such as it is — and teeth would drop out and my belly shrink.

Well, I am a superstitious man I knew well that Agonnar, his warlock, could achieve this threat. Where would my business be then, eh? What recommendation is a skinny, starveling, bald and gummy landlord? No, I knew I must forsake the comforts of the Ogre for the perils of the road — and at my age too.

Let us dwell on other things for the present though. The grim rites of the Priests of Artie still perplex many of you. On **Espionage Island** young Ian McCartney of Birmingham cannot leave the trail in the jungle. Consultations with the priesthood reveal that there is little point in wandering from the path — its whole purpose is to lead you to the boat.

I have a number of missives requesting help with the journey on the **Planet of Death**. I would suggest to the fair Tomlinson of Matlock that the force field can only be passed in this way — first, fire your laser three times at the field. Then hold the mirror and dance. I have been assured that this is the proper spell. She also asks if the green man is of use. My own experience is that he is best put out of the way and is potentially a serious danger.

Kathleen Burnett of Frazerburgh is equally stranded. She wishes to know whether there is any other route from the shed besides returning past the ravine. Ma'am, it is the only way. Then there is the prison — escape from here is only possible by bribery. Though it goes against the grain, corruption brings results.

John Evans of Merthyr cannot obtain information from the computer on the planet. It seems as if you should first ask for help or a hint. If that achieves nothing then examine whatever you can in the room and keep Looking!

So much for that. Shirley Edge of 12 Maelor Court, Overton on Dee, Wrexham, Clwyd wishes to enter **The Inferno** but, whatever she does, cannot pass from the Portal into the Circles of Hell. I cannot help her here but those of you have been that way may know.

Andrew Willshire has embarked on a **Classic Adventure** and is labouring in vain with a vending machine. I think you must first pour oil on it to loosen its workings and then drop any coins you have. It should work well enough then.

A metal smith of Nottingham, Ralph Venables by name, cannot even begin his quest yet — he cannot pass the great snake which blocks his way. I hope he has his flute with him — he will need it. Play this flute and you will soon see the serpent sleep. There is more though; when you see it nodding off release your bird and the snake will flee in utter panic.

Former deck-hand Neil of the Wood is landbound in the saga of **Erik The Viking**. Ah, Neil — this is



no mystery to one such as I! If you wish to board the Gold Dragon, Erik's longship, do thus: summon your crew with a horn blast. When they have assembled at the boat-shed, pull the ship down to the shore. Here you can enter the boat at your leisure.

Simon Yates watered his steeds at the Ogre whilst returning from **Kentilla**. He tells me that saying 'Kentilla' transports the great sword to your hand — useful in a fight. To cross the river Cara adventurers should throw or swing a rope, and pulling the arms from a gargoyles statue within the castle will open a steel door leading to a teleport chamber. Simon could not use the furnace in the castle nor open the desk there. Should you be able to help him he can be contacted at 100a Trentham Road, Langton, Stoke on Trent.

So, farewell until we meet again next moon. Zul and Zel have begun packing my weapons and rations — we have ten mules for the purpose. I have little taste for foreign fare and my own beer is still the best. Tomorrow we set off for Maru. Your letters will reach me by the Royal Couriers, so fear not and keep writing.

Gordo Greatbelly, landlord

If you have a tale to tell, or are in need of a helping hand, write to the Landlord of the Dancing Ogre c/o Sinclair User, Priory Court, 30-32 Farringdon Lane, London EC1R 5BH.

Eureka!



DOMARK

Dear Reader

16th January 1985

You've probably heard all about **Eureka!**, the '5 games in one' graphic adventure written by Ian Livingstone with a £25,000 prize. No one has yet won it although many of you are extremely close.

The storylines travel through five time zones of our history - Prehistoric, Roman Empire, Medieval Britain, Colditz and the Caribbean, where you come face to face with the evil Hugo Von Berg. He is holding us all to ransom and demands to be made Emperor of the World, otherwise he will destroy it. A secret telephone number direct to the British Prime Minister has been specially installed for you to ring when you have worked out the secret code which will save us all. You must find this code and decipher the telephone number.

The **Eureka!** Hotline number is:

01-460 1115

Ring this at any time to witness Von Berg's evil progress and to check that the prize is still available.

We wish you all the best of luck in your search and to help you on your way, will send you a FREE Guide to Adventure Games (no clues to the £25,000 though!) if you send in a stamp plus your name and address to us.

Happy searching!

Mark Strachan

David Bentley

Managing Directors

DOMARK LTD, 204 WORPLE ROAD, LONDON SW20 8PN

SPECTRUM
48K

Eureka!

COMMODORE
64

ENGLISH, FRENCH AND (SOON!) GERMAN VERSIONS AVAILABLE FROM
ALL GOOD SOFTWARE SHOPS OR FROM US ON 01-947 5624

MATCH DAY



MATCH DAY
SPECTRUM 48k
7-95



KONG
STRIKES BACK
SPECTRUM 48k
6-90
COMMODORE 64
7-90



Don't
miss a
red-hot
with
OCEAN
WINTER



Ocean Software
Ocean House · 6 Central Street · Manchester · M2 5NS · Telephone 061 832 6633

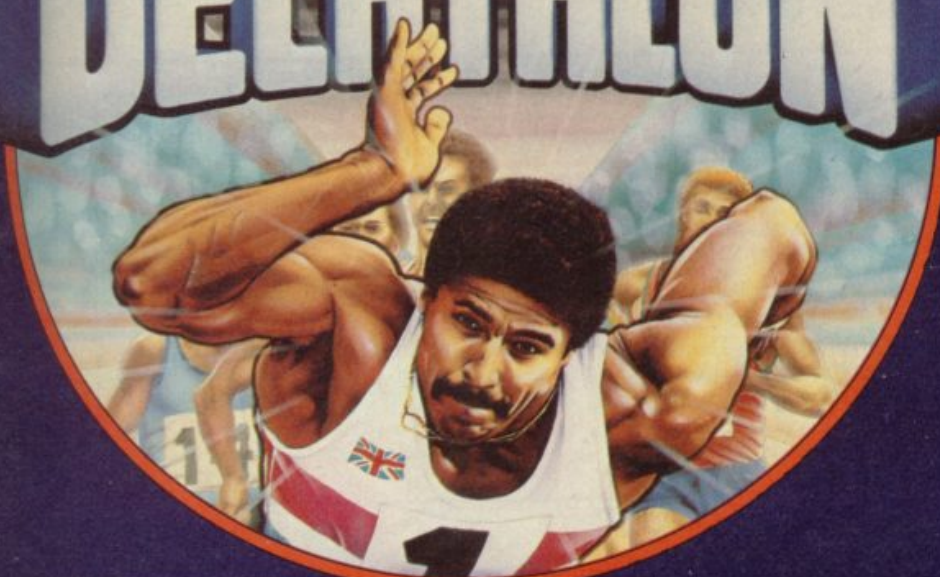
OCEAN

n't you
 all the
 ot action
 with
 EAN'S
 R GAMES



DALEY THOMPSON'S

DECATHLON



HUNCHBACK II
SPECTRUM 48k

6-90

COMMODORE 64

7-90



DALEY THOMPSON'S
DECATHLON
SPECTRUM 48k


6-90

COMMODORE 64

7-90



Ocean Software is available from selected branches of:

WOOLWORTH, WHSMITH,  **John Menzies**, LASKYS, Rumbelows, **COMET**,
 Spectrum Shops and all good software dealers. Trade enquiries welcome.



LOOK!

NOW THERE ARE HI-RES PROGRAMS FOR THE 16K ZX-81

3



1. Nuggets
2. Giant Rats
3. Burrowing Rat
4. Support
5. Cave In
6. Snake
7. Snake Nest
8. Gremlin
9. Mound
10. Pile of Earth
11. Cave

FORTY NINER

In 1849 the Great American Gold Rush started. Almost everyone who could sold up everything and dashed to the west coast to look for this precious metal – including you!

You must excavate this precious metal – but can you survive the giant rats and that vicious Gremlin which will come to infest your mine? Can you trick the snakes into leaving their comfortable nests and destroy the rats for you? Can you keep the Gremlin at bay?

Riches await you – but so do the hazards!

ROCKET MAN

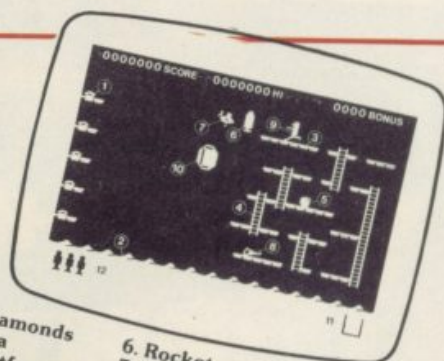
Get rich quick by collecting Diamonds that are simply lying there waiting for you!

Oh... I forgot to mention that there are one or two problems!

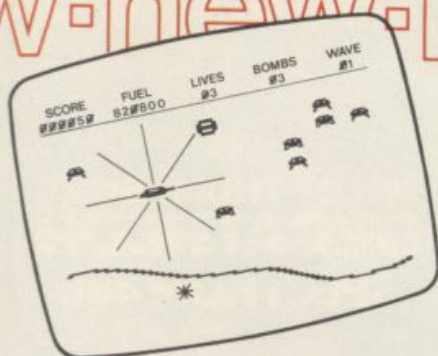
There is an expanse of shark infested water between you and the Diamonds and a strange breed of Bubble that seems hell bent on getting you in it! Somehow you must cross it...

You have a Rocket Pack to help you (a Vulture on higher levels) but you must rush around the platforms and ladders collecting cans of fuel (legs of lamb with the Vulture) and cursing that weird Bubble. Once you have enough fuel then it's Chocks Away!

Oh... but don't run out of fuel on the way – otherwise it's... SPLASH!



1. Diamonds
2. Sea
3. Platforms
4. Ladders
5. Fuel Cans
6. Rocket
7. Vulture
8. Leg of Lamb
9. Player
10. Bubloid
11. Fuel Gauge
12. Men remaining



Z-XTRICATOR

A long time ago, in a galaxy far, far, away a terrible war took place between two hostile races. Any prisoners taken could not expect to live very long in the hands of their captors. Their only hope lay with a group of valiant warriors – the XTRICATORS – whose task it was to rescue fellow beings from the alien planet's surface. You are about to take on the role of such a warrior....

Please send me:

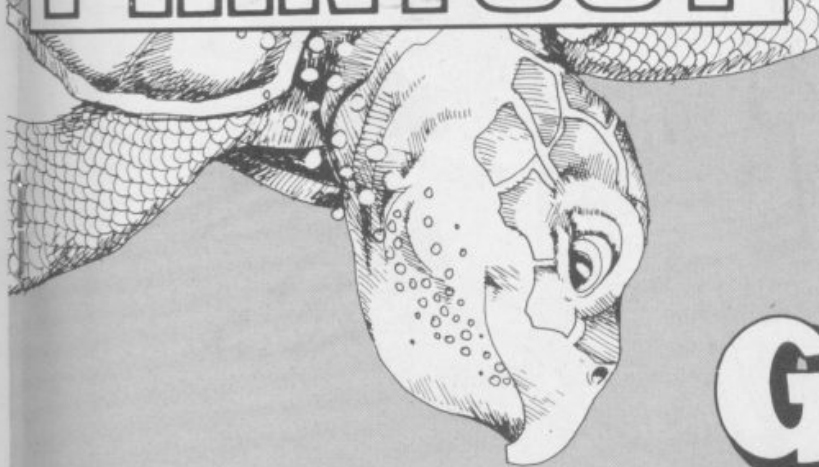
	QTY	TOTAL AMOUNT
FORTY NINER £5.95		
ROCKET MAN £5.95		
Z-XTRICATOR £5.95		
TOTAL		

Available from all good computer shops or send cheque/P.O. for £5.95 (inc. P&P) to:

Software Farm,
FREEPOST (No stamp required) (BS3658),
BS8 2YY.

Software Farm, 155 Whiteladies Road, Clifton, Bristol BS8 2RF.
Telephone (0272) 731411. Telex 444742 AFMADV G

PROGRAM PRINTOUT



GRAPHICS INSTRUCTIONS

Instructions for graphics characters are printed in lower-case letters in our listings. They are enclosed by brackets and separated by colons to distinguish them and the brackets and colons should not be entered.

Inverse characters are represented by the letter "i" and graphics characters by "g". Thus an inverse W would be represented by "iw", a graphics W by "gw", and an inverse graphics W by "igw".

Spaces are represented by "sp" and inverse spaces by "isp". Whenever any character is to be used more than once, the number of times it is to be used is shown before it, together with a multiplication sign. Thus "6*isp" means six inverse spaces and "(g4:4*i4:g3)" would be entered as a graphic four, followed by an inverse four repeated four times, followed by a graphics three. Control codes appear with cc before the appropriate key. They are obtained by pressing Caps Shift while in Extended mode.

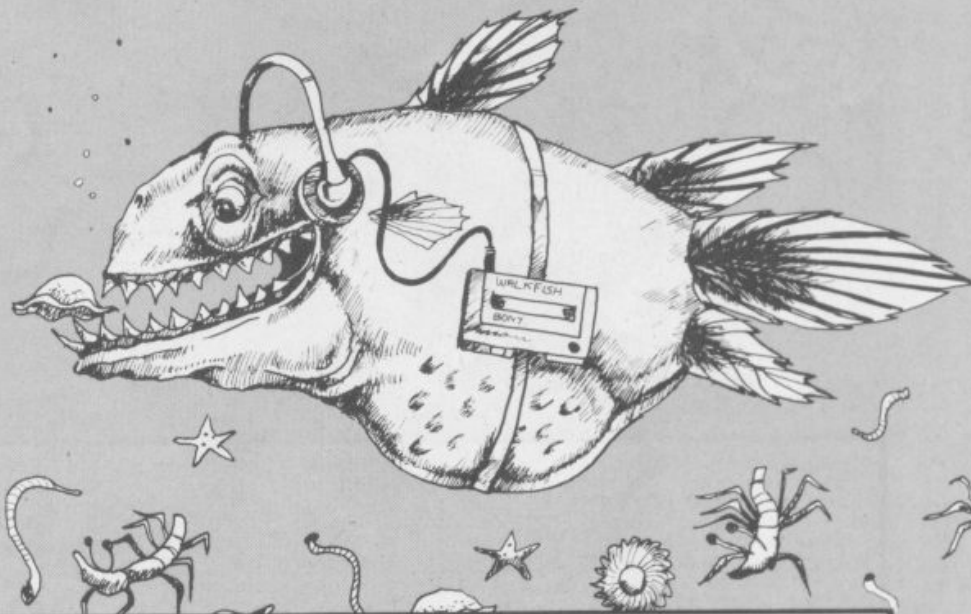
Where whole words are to be written in inverse letters they appear in the listings as lower-case letters. Letters to be entered in graphics mode on the Spectrum are underlined.

Inverse characters may be entered on the ZX-81 by changing to graphics mode and then typing the appropriate characters and on the Spectrum by changing to inverse video and typing the appropriate letters. Graphics characters may be entered on the ZX-81 by changing to graphics mode and then pressing symbol shift while the appropriate characters are entered. On the Spectrum graphics characters may be obtained by changing to graphics mode and then pressing the appropriate character. User-defined graphics will appear as normal letters until the program has been RUN.

GHOTI

A TASTY dish for a funky fish awaits you in **Ghoti** by K Jefford of Upminster, Essex. You must eat as much plankton as you can in a single day to survive, but watch out for the diving turtles which terrorise the denizens of your cosy swamp. Full instructions are provided, and the game runs on any Spectrum.

Ghoti uses our special abbreviations for graphics characters, so please read the above instructions before entering the program.

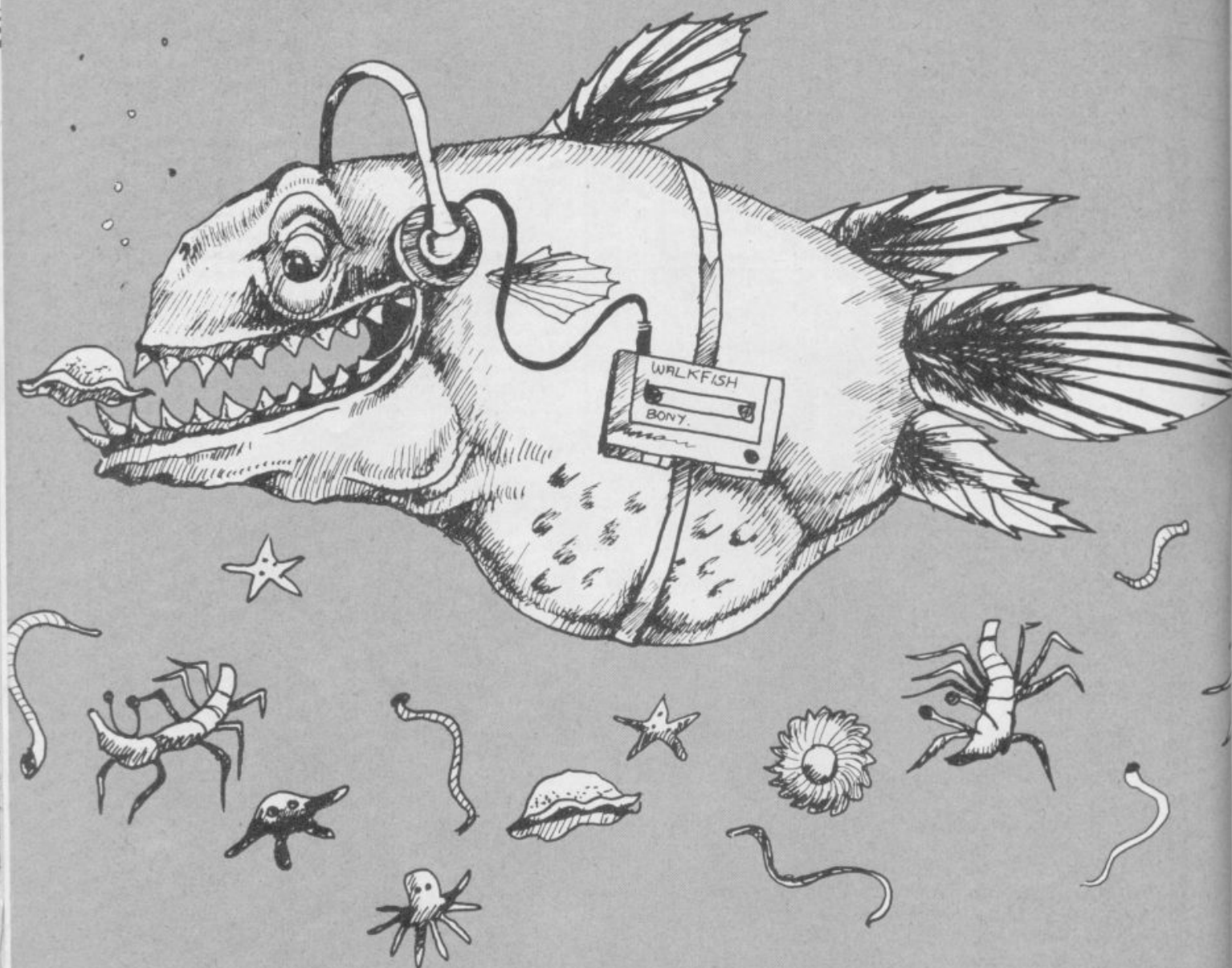


```
1 REM "GHOTI"
5 BORDER 1: PAPER 7: INK 2
6 GO TO 9100
8 GO SUB 1000
20 GO TO 500
100 REM NEXT BUBBLE RUN
121 LET y=y+RND*2
122 PLOT 0,120: DRAW 255,0
123 PRINT AT 0,0: BRIGHT 1: INK
4: INVERSE 1: "(2*sp)LIVES LEFT:
";lives
125 IF y>=29 OR y<=2 THEN LET
y=y-2
126 PRINT AT a,b: "(2*sp)"
127 PRINT AT x,y: INK 2: "0"
135 FOR d=1 TO 2
140 LET a$=INKEY#
147 LET a=a+(a$="6")-(a$="7")
148 LET b=b+(a$="8")-(a$="5")
150 IF a<=7 THEN LET a=7: IF b
<=1 THEN LET b=1
151 IF a>=15 THEN LET a=15
152 IF b>=29 THEN LET b=29
153 NEXT d
154 IF INKEY#="S" THEN PRINT A
T a,b: INK 1: "SE": BEEP .01,3:
```

```
GO TO 156
155 PRINT AT a,b: INK 1: "SE": B
EEP .01,2
156 LET time=time-1: PRINT AT 1
,0: INK 3: BRIGHT 1: INVERSE 1: "
TIME LEFT: ";time
157 IF ATTR (a,b)=ATTR (x,y) TH
EN GO TO 600
158 IF x<=7 THEN GO TO 6000
159 PRINT AT 0,16: INVERSE 1: B
RIGHT 1: "BUBBLES EATEN: ";bcount
160 IF bcount=10 THEN GO TO 89
90
162 IF time<100 THEN PRINT AT
1,13: INK 3: "(igB)": IF time<=9
THEN PRINT AT 1,12: INK 3: "(igB
)"
164 IF time=0 THEN GO TO 7500
165 PRINT AT x,y: "(sp)"
350 LET x=x-1: IF x=6 THEN GO
TO 500
360 IF INT (RND*20)=1 THEN GO
TO 7000
480 GO TO 120
499 REM BUBBLE SET UP
500 LET y=INT (RND*25): LET x=2
```

```
1-INT (RND*6): GO TO 24
600 LET bcount=bcount+1: PRINT
AT a,b: "(sp)": PRINT AT x,y: "(sp
)": GO TO 20
999 REM GRAPHICS SET UP
1000 FOR n=0 TO 31
1060 FOR a=21-INT (RND*7) TO 21
1070 PRINT AT a,n: INK INT (RND*
6): "0"
1075 NEXT a: NEXT n
1080 FOR f=0 TO 54: READ t: POK
EUSR "a"+f,t: NEXT f: RESTORE
1100 DATA 131,71,111,127,127,127
,95,143,192,224,208,216,253,248,
240,192
1125 DATA 16,16,17,146,84,40,0,2
39
1130 DATA 3,7,15,27,63,31,15,3,1
93,224,246,254,254,254,250,241
1140 DATA 192,224,240,240,247,25
5,224,112,7,63,255,127,63,239,19
9
1930 LET a=12: LET b=5
1935 LET bcount=0
```

continued on page 78



continued from page 77

```

1936 LET c=0
1937 LET LIVES=4
1950 RETURN
5999 REM BUBBLE BURST
6100 PRINT AT 7,y;"(sp)": FOR z=
1 TO 30 STEP 2: BEEP .001,z: PRI
NT AT 6,y;" ": NEXT z: PRINT AT
6,y;"(sp)"
6300 GO TO 159
6999 REM DIVING TURTLES
7000 FOR j=1 TO INT (RND*5)
7009 LET h=INT (RND*17)
7010 LET f=INT (RND*12)
7011 LET cr=0: FOR r=.01 TO .100
STEP 5: FOR s=1 TO 20: BEEP r,s
: NEXT s: NEXT r: LET cr=cr+1: I
F cr=5 THEN GO TO 7012
7012 LET t=lives
7013 LET cr=0
7020 FOR l=6 TO 0 STEP -1
7030 PRINT AT 9+f-1,10+h-1: INK
3;"GF"
7035 IF ATTR (a,b)=ATTR (9+f-1,1
0+h-1) THEN LET lives=lives-1:
IF lives=0 THEN GO TO 8000
7040 PAUSE 4: PRINT AT 9+f-1,10+
h-1;"(2*sp)"
7050 NEXT l
7060 FOR o=9 TO 7 STEP -1
7070 PRINT AT -o,-20-h+o: INK 3;
"GF"
7075 IF ATTR (a,b)=ATTR (-o,-20-
h+o) THEN LET lives=lives-1: IF
lives=0 THEN GO TO 7910

```

```

7080 PAUSE 10: PRINT AT -o,-20-h
+o;"(2*sp)"
7085 IF t<>lives THEN GO TO 120
7090 NEXT o
7091 NEXT j
7100 GO TO 120
7500 REM LOSER!
7501 IF INKEY#<>"" THEN GO TO 7
501
7510 CLS : PRINT AT 10,6;"YOU ST
ARVED TO DEATH"
7520 FOR N=0 TO 10: BEEP .1,12-N
: BORDER INT (RND*6)+1: INK 9: N
EXT N
7530 GO TO 8000
7900 REM GAME END
7910 PRINT AT 10,8;"EATEN ALIVE!
": PAUSE 50
8000 CLS : PRINT AT 10,8;"ANOTHE
R GAME?": PAUSE 0: IF INKEY#="y"
OR INKEY#="Y" THEN CLS : GO TO
9150
8010 STOP
8990 REM NEXT GAME
8995 IF INKEY#<>"" THEN GO TO 8
995
9000 CLS : PRINT AT 8,2;"CONGRAT
ULATIONS! YOU SURVIVED" " A D
AY IN THE SWAMP." " FEELING MO
RE SKILLFUL, PERHAPS?"
9015 PAUSE 150: GO TO 9150
9030 RETURN
9100 REM INSTRUCTIONS
9132 BORDER 3: PRINT AT 3,10: IN
K 3: INVERSE 1;"G H O T I"

```

```

9135 PRINT AT 7,3;"GHOTI is the
phonetic" " spelling of the wor
d fish." " You are a pescatori
al predator" " hunting the smal
l bubble-like" " plankton which
rise from the" " primordial sl
ime." " TAB 3: INVERSE 1;"PRESS A
NY KEY TO CONTINUE"
9136 PAUSE 0
9140 CLS : PRINT AT 5,2;"Choose
your level of skill" " then spe
nd your first day in" " your ne
w home. But beware! When" " the
diving turtles are around" " e
verything in the swamp goes" "
still! how many days will YOU" "
survive?"
9145 PRINT AT 20,3: INVERSE 1;"P
RESS ANY KEY TO CONTINUE"
9146 PAUSE 0: IF INKEY#="" THEN
GO TO 9146
9150 CLS : BORDER 6: PRINT AT 8,
6: INVERSE 1: INK 3;"WHAT SKILL
LEVEL?" " (9=easy,1=expert!
)"
9151 FOR n=0 TO 10: BORDER INT (
RND*6)+1: BEEP .1,n*2+INT (RND*1
0): NEXT n
9152 PAUSE 0
9155 LET time=VAL INKEY#*40
9156 IF time>30 OR time>360 THEN
GO TO 9151
9160 CLS
9167 GO TO 8

```


Full instructions are contained within the program, and Simon has thoughtfully provided REM statements in front of the graphics lines to make it easier for you to count off the number of spaces and graphics characters.

QUBERT

[illegible][illegible]

```

009 PRINT AT A(BERT), B(BERT)
010 AT A(BERT)+2, B(BERT)
011 A(BERT)+2, B(BERT)
012 IF BERT=BALL THEN GOTO 151
013 IF NO=15 THEN GOTO 168
014 GOTO 71
015 IF BERT=10 THEN GOTO 140
016 IF A$(BERT)="Y" THEN GOTO 9
020 LET A$(BERT)="Y"
021 SC=3C+10
022 PRINT A$(BERT), 0, 6, SC
023 IF NO=NO THEN
024 PRINT AT A(BERT), B(BERT)
025 AT A(BERT), B(BERT)
026 AND BERT+1 AND BERT+2 AND BERT+3
027 AND BERT+7 AND BERT+11 AT A(B
028 BERT+2
029 AND BERT+1
030 AND BERT+3 AND BERT+6 AND BERT
031 BERT+15 AT A(BERT)+1
032 AT A(BERT)+2, B(BERT)
100 LET BERT=BERT+(1 AND BERT+
+3 AND BERT+1)+(1 AND BERT+3
AND BERT+6)
101 PRINT AT A(BERT), B(BERT)
102 AT A(BERT)+1, B(BERT)
103 A(BERT)+2, B(BERT)
104 IF BERT=BALL THEN GOTO 151
105 IF NO=15 THEN GOTO 168
106 GOTO 71
107 IF BERT=1 OR BERT=3 OR BERT
OR BERT=10 AND R$=" " OR BERT
THEN GOTO 140
108 IF A$(BERT)="Y" THEN GOTO 9
110 LET A$(BERT)="Y"
111 SC=3C+10
112 PRINT AT A(BERT), 0, 6, SC

```

```

110 LET NO=NO+1
111 PRINT AT A(BERT),B(BERT); "
AND BERT+1 AND BERT+2 AND BERT+4
AND BERT+8 AND BERT+11 AT A(B
ERT),B(BERT)+2 (" AND BERT+1
AND BERT+3 AND BERT+6 AND BERT
+10 AND BERT+15) AT A(BERT)+1
B(BERT); " AT A(BERT)+2,B(BER
T); "
112 IF BERT=10 THEN GOTO 200
113 LET BERT=BERT+1 AND BERT+1
AND BERT+3)-(1 AND BERT+5)-
(1 AND BERT+10)
114 PRINT AT A(BERT),B(BERT); "
AT A(BERT)+1,B(BERT); " A
(BERT)+2,B(BERT); "
115 IF BERT=BALL THEN GOTO 151
116 IF NO=15 THEN GOTO 168
117 GOTO 71
118 IF BERT=10 THEN GOTO 140
119 IF A$(BERT)="Y" THEN GOTO 1
24
120 LET A$(BERT)="Y"
121 LET SC=SC+10
122 PRINT AT 0,6:SC
123 LET NO=NO+1
124 PRINT AT A(BERT),B(BERT); "
BERT+1 AND BERT+2 AND BERT+4
AND BERT+8 AND BERT+11 AT A(B
ERT),B(BERT)+2 (" AND BERT+1
AND BERT+3 AND BERT+6 AND BERT
+10 AND BERT+15) AT A(BERT)+1
B(BERT); " AT A(BERT)+2,B(BER
T); "
125 LET BERT=BERT+12 AND BERT+0

```

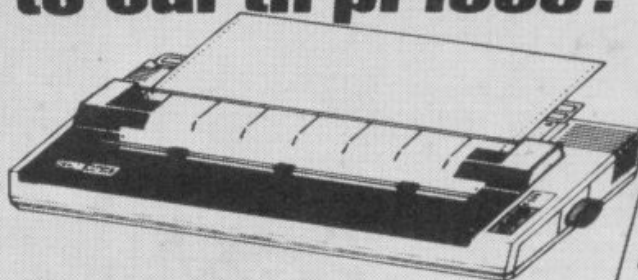
continued on page 80



DATA STAR QUALITY

At down to earth prices.

When it comes to printers, whichever way you look at it, we've got the lowest prices, the widest range and the best back-up service in the country. What you won't get from us, are special gifts, or false promises - just honest value and a fully guaranteed after-sales service.



SPECIAL OFFERS

Brother - M1009 £173.86 + VAT = £199.95

50cps • bi-directional • logic seeking • 96 chars plus international and graphics • 9 x 9 matrix.

Gemini 10X £189.95 + VAT = £218.44

120 cps. • bi-directional • logic seeking • friction, tractor and roll holder standard • down loadable characters • ultra high resolution • 80 cols. • IBM PC version available.

Kaga-Taxan KP 810 £257.00 + VAT = £295.55

Near letter quality • 160 cps • bi-directional • 96 chars. plus graphics • 5 print sizes • 9 x 9 matrix.

COMPLETE RANGE

DOT MATRIX

Cosmos JP 80 £169.95 + VAT = £195.44

Epson RX80 £198.95 + VAT = £228.79

Epson RX80 F/T £228.95 + VAT = £263.29

Epson FX80 £319.95 + VAT = £367.94

Epson FX100 £498.95 + VAT = £573.79

Star Gemini 10x £189.95 + VAT = £218.44

Star Delta 10 £319.95 + VAT = £367.94

Star Radix 10 £498.95 + VAT = £573.79

THERMAL MATRIX PRINTERS

Brother HR5 Ring for prices

Brother EP44 Ring for prices

DAISYWHEEL PRINTERS

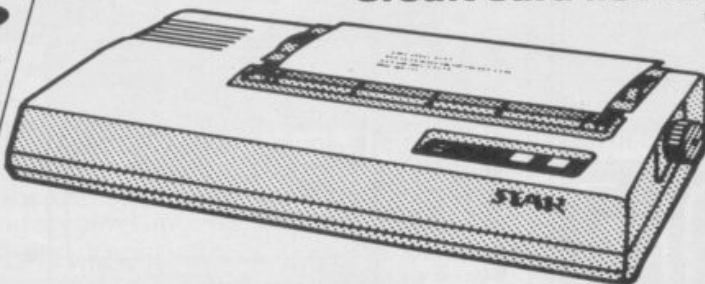
Brother HR15 Ring for prices

Juki 6100 £325 + VAT = £373.75

Cables • Paper • Ribbons • Sheet and tractor feeders
• Interfaces

If you have any technical queries or want our latest prices please telephone:

Credit card hot line... 01-482 1711



Please add £10 for delivery, we guarantee 48 hour delivery from payment. Personal callers welcome. We're at the junction of Camden Road, near the railway bridge. Anytime 9.00am to 6.00pm Monday to Friday 10.00am to 1.00pm Sunday. Export and dealer enquiries welcome. Post your order with cheque to

© Certain Advertising Ltd 01-930 1612

Datastar Systems UK

Unicom House, 182 Royal College Street, London NW1 9NN
Telex 295 931 Unicom G Telephone 01-482 1711

COMCON

Programmable Joystick Interface for the Spectrum

£19.95

(incl. VAT and P & P)



Simple and fast programming: Plug the six function connectors into the required Spectrum key positions - Ready!

Two independent fire actions: Photon Blasters and Neutron Bombs at the touch of your fingertips.

Extension port for Currah Micro-speech unit: Combine joystick with

sound and speech for ultimate arcade action.

Compatible with all Atari-type joysticks including Quickshot II (without rapid fire action).

Interface operates joystick parallel to keyboard. Joystick action compatible with any add-ons including Microdrives.

Select key functions anytime - even when the game is already loaded.

QUICKSHOT 2+2 JOYSTICK

modified to incorporate 2 independent fire actions and no rapid fire option

£13.95

(incl. VAT and P & P)

FLIGHTLINK JOYSTICK

with 2 independent fire actions

£10.50

(incl. VAT and P & P)

CURRAH µSPEECH UNIT

fits into COMCON extension slot

£29.95

(incl. VAT and P & P)

Dealer Enquiries Welcome
Phone Ludlow (0584) 4894

Send to

ALSO AVAILABLE FROM
SELECTED RETAIL
OUTLETS

FREL LTD.

Hockeys Mill, Temeside,
Ludlow, Shropshire SY8 1PD

Mr/Ms/Miss

Address

Postcode

Qty	Code	Item	Item Price	Total	£
	01	Comcon Interface	@ £19.95		
	02	Flightlink Joystick	@ £10.50		
	03	Quickshot 2+2 Joystick	@ £13.95		
	04	Comcon + Quickshot 2+2	@ £31.90		
	05	Comcon + Flightlink	@ £28.45		
	06	Currah µSpeech unit	@ £29.95		

I enclose a cheque/postal order made payable to FREL LTD for: £

COMCON

HIRE SPECTRUM SOFTWARE

OVER 280 different tapes for hire including **ARCADE, ADVENTURE, BUSINESS, EDUCATIONAL** etc. - even an m/c Compiler. **FREE** 26 page catalogue. **FREE** newsletter, with hints, tips and our top tape chart.

OVER 3000 tapes in stock, with up to 60 copies of each title for fast service. All tapes sent by 1st class post.

LOWEST PRICES - hire up to 3 tapes at a time, from 63p each for two weeks hire (Plus p&p and VAT). European members welcome.

Tapes for sale at **DISCOUNT** prices. Telephone 01-661 9240 (9am - 5pm) or write for further details, or complete the coupon and **JOIN TODAY** - you've nothing to lose!

SAVE £3.00!!

For a limited period, we are offering **HALF-PRICE** membership to readers of this magazine. Join now. **LIFE** membership is only £3.00 (normally £6.00).

SWOP SHOP

A new service from N.S.L. **SWOP** your unwanted tapes with tapes from other members for a small handling charge of only 60p (plus p&p and VAT).

NATIONAL SOFTWARE LIBRARY

42 Harefield Avenue, Cheadle, Surrey SM2 7NE

Enclose cheque/postal order for £3.00 for LIFE membership. Please rush my membership kit to me. If, within 28 days, I'm not delighted with your service you'll refund my membership fee.

Name

Address

SUPER-LEAGUE

For use on
**48K
SPECTRUM**

Acclaimed the best football simulation game....

"...after using it for several days I had to write and congratulate you on a really excellent program." - A.M. (Middlesex)

"The program is addictive, last night I spent from 11.00a.m. to 11.30p.m. taking Leeds to win the championship by 1 point." - I.B. (Shropshire)

"I must congratulate you on an outstanding game well worth every penny. Thank you." - S.S. (Essex)

"My son and grandson in Australia are delighted...a gem...neither of them have stopped playing it. Thanks for a great game." - N.C. (West Sussex)

"I thought I should write because of your excellent game." - Mr. McD. (W. Mids)

Note the following true-to-life features....

● Full 11-a-side match action

● On-screen commentary showing current score, name of player in possession, time played



£6.50

(inc. p. & p.)

direct from
CROSS SOFTWARE
72 Swanshops,
Burney Drive,
Loughton, Essex, IG10 2NB

**CROSS
FT
WARE**

Also available from selected stores in the London area (including **VIRGIN GAMES CENTRE**, Oxford Street, W.1)

NOW 3RD GREAT YEAR!

HIRE

SPECTRUM and ZX81 PROGRAM TAPES

LIFE MEMBERSHIP
£5.00
TAPE HIRE FROM
50P
INCLUDING VAT

FREE
ILLUSTRATED
QUARTERLY
MAGAZINE WITH
TIPS, NEWS,
REVIEWS
DISCOUNT OFFERS

OVER 3,000 DELIGHTED MEMBERS!

HUGE RANGE!
ADVENTURE GAMES
ARCADE and SIMULATION GAMES
BUSINESS and PRACTICAL PROGRAMS
UTILITIES
M/C COMPILERS
EDUCATIONAL
FROM OVER 60 TOP SUPPLIERS

SPECIAL OFFER!
YOUR FIRST TWO TAPES FREE
IF YOU USE THIS COUPON!

or send £1 for magazine & details.
Props: ALEC FRY ARPS, FRSA and ERNA FRY, BA

■ The first true software library to be set up in the world—and still the largest ■ Unrivalled tape stock, as you'd expect from our head start ■ Run by a 16-bit computer (2 million bytes of program and data on disk!) with the help of six less able but more friendly mere humans! ■ Often imitated (sometimes almost to the letter—flattery indeed!) but never equalled ■ Friendly, helpful service—at the end of a phone if needed ■ Free membership of our Discount Club: pounds off peripherals and top-of-the-chart tapes ■ Any loading problems (rare!) automatically credited ■ Shop now open (next to Post Office) for rental and discount sales of tapes and peripherals ■ Branches throughout the world ■ No complicated schemes, no commitment to quantity—rent what and when you like ■ Printed, illustrated magazine "Computerchat" packs in more than any mere typed newsletter ■ Keenest-ever rates ■ ACCESS holders can join by telephone on 0730 892732 ■ **NO RIVAL can offer all this...**

To: SOFTWARE LIBRARY, Farnham Road, West Liss, Hants GU33 6JU

NAME..... Machine.....

ADDRESS.....

THE ORIGINAL SINGLIER LIBRARY!

Special offer from this issue: LIFE MEMBERSHIP £5
(normally £9.50). Overseas (Europe only) £10, or join local branch in W. Germany, France, Holland, Belgium, Scandinavia, South Africa, Ireland—send Int. Reply Coupon and we'll forward your enquiry.

★ NOW AVAILABLE FOR THE AMSTRAD CPC 464!! WIN THE POOLS?

SPECTADRAW 3—THE LATEST VERSION OF THE ORIGINAL AND BEST POOLS PREDICTION PROGRAM FOR THE 48K ZX SPECTRUM!!

AND NOW... AMSTRA-DRAW—THE FIRST POOLS PREDICTION PROGRAM FOR THE AMAZING NEW AMSTRAD CPC 464!!



- Supplied with Database containing data on over 10,000 matches since 1980!
- You update the Database each week—but no tedious typing, as team and division names already in program!
- Errors easily corrected—the program even checks your entries!
- Comprehensive instruction manual and menu driven program—easy to use, even for a newcomer to computing!
- Will forecast the least likely draws for those who prefer to bet on fixed odds!
- Built in perm generator—complete your coupon direct from the screen!
- Fully microdrive compatible! (Spectadraw only).
- Compatible with Currah Microspeech—the first pools program to read you its predictions! (Spectadraw only).

Spectadraw 3 for the 48K Spectrum.....£9.95 inclusive
Amstra-Draw for the Amstrad CPC 464.....£9.95 inclusive
(Cheques/P.O.s payable to B. S. McALLEY)

We dispatch every Monday with the database made up to include all matches up to the date of dispatch.

SPECTADRAW (Dept SU), 1 Cowleaze, Chinnor, Oxford OX94TD.
(Tel: 0844-52426)

7 REASONS TO GO MICROFRAME . . .

Disc interface connects up to two mini or micro floppies.

PROM boots Disc Operating System into on-board 16K DRAM.

Decoding circuit for up to 256 I/O channels.



Easy expansion with a 5 slot card frame.

Full buffering on signal lines.

External System Reset button.

Simply plugs directly into the Spectrum.

The GORDON MICROFRAME plugs directly into the back of any Spectrum, allowing the user full control of over 256 I/O channels through its 5 slot motherboard. It also has a floppy disc controller interface which boots the operating system into 16K of memory which shadows the BASIC ROM. The operating system supports basic commands such as load, save, merge, erase, cat., open and close.

To purchase a MICROFRAME or obtain further information about all GORDON MICRO products, including the full range of interface cards, please write or telephone:

**Gordon Micro Limited, 3 Callendar Rd,
Heathfield Industrial Centre, Ayr KA8 9DJ.**
Telephone: (0292) 280467.

**GORDON MICROFRAME £149.50 (inc. VAT)
(plus £3.00 p & p)**

Software Supermarket is a very different kind of software shop. First, we actually play all the programs ourselves - and choose just the best to offer you. Second, we send FREE with your order our unique 32-page catalogue of the best programs - which quotes all the reviews and even lists load times! (For a catalogue only, send £1 cash and we will send you a voucher for £1 off any order - plus your catalogue.) Third, **WE ALWAYS TRY TO SEND OUT YOUR PROGRAMS ON THE SAME DAY WE GET YOUR ORDER.** UK prices include VAT: Export prices are the same (plus p&p). To order by VISA/ACCESS call 01-789 8546 at any time, 24 hrs a day. We're not the cheapest, but our customers in over 40 countries tell us we're the fastest - and we only sell the best.

GHOSTBUSTERS

"The best game I have ever played on a micro...the graphics are superb and the sound is better than anything you've ever heard...this game is terrific." (Comp&VidGames).

"Simply brilliant...colourful, creative and slick graphics...it's a winner." (PersCompNews).

"The speech synthesis is very good indeed and the tune is really catchy...THE GAME IS REALLY JUST AS GOOD AS THE FILM." (PopCompWkly)

(ACTIVISION) CASSETTE £10.00

upon *Lords of Midnight*: by developing the graphics, options available and scope of the game." (PopCompWkly). "How Mike Singleton has managed to pack so much into 48K is a mystery." (MicroAdventurer). 48,000 entirely new graphic views: 20-page manual: keyboard overlay: 28 single-key commands: PRINT out a record of your quests. Very long, totally absorbing adventure. (BEYOND) **CASSETTE £3.95**

MINI OFFICE "QUITE EXCEPTIONAL value... the first affordable program suite I have seen... I strongly recommend beginners get this first." (PersCompNews). 4 programs on one tape all working with EPSON-compatible printers. **WORDPROCESSOR: DATABASE: SPREADSHEET: GRAPHICS.** An amazing collection at an unbelievable price.

(DATABASE) CASSETTE £5.95

own night, it is the superb animation which will be the more immediate attraction of what is a very fine game." (CRASH) **12 GRAPHIC ADVENTURES FOR THE PRICE OF 1.** There are 12 gates to the castle of Zendos the wizard and each one leads you into a different, but very graphic, animated adventure. Understands every word it displays. **SAVE TO TAPE OR MICRODRIVE (DORCAS) CASSETTE £7.95**

CYCLONE

"STUNNING is the word to describe these graphics. The game is so absorbing you lose track of time...even the sound is good...The best game I've seen in months" (HomeCompWkly) "Tornado Low Level" with even more impressive graphics and much increased playability...a winner, the best ever Vortex game." (PopCompWkly). The helicopter movie - by the T.L.L. programmers.

Kempston/Interface2/Cursor STICKS (VORTEX) CASSETTE £6.95

THE ILLUSTRATOR "Just about the best designer program I've seen for the Spectrum...one other amazing detail - it still leaves a total of 35K for your adventure." (PopCompWiz). The Illustrator allows full-screen hi-res pictures to be added to your QUILLed adventures. Your pictures use only 100 - 600 bytes each! 19 commands: 8-direction cursor; 28-page manual. (GILSOFT) **CASSETTE £14.95**. THE QUILL adventure writer program also available at £14.95.

programs we have ever used. Brilliant use of a full-screen scrolling menu where, in a very Macintosh-like way you move an arrow around with the joystick and point out the commands you want to execute. 32-page 'hands-on' guide. Demo. Capable of most effects, including even recursion, with variable drawing speeds. SAVE AND PRINT. (ACTIVISION) Kempton/Interface2/Cursor STICKS. CASSETTE £9.95

SYSTEM 15000

"One of the most gripping and compulsive Spectrum games so far...utterly absorbing and compelling...absolutely recommended" (SinciarUser) "AN ABSOLUTELY WONDERFUL IDEA...ARTIFICIAL HACKING! System 15000 closely mimics a vast number of different databases and you have to hack your way around discovering passwords." (PopCompWkly)

"The game provides a convincing simulation of the hacker's trade." (YrCompu'n)

(CRAIG) CASSETTE £9.95

WHITE LIGHTNING "The most extensive and effective games-making package yet to appear...almost as fast as assembly language, but easier to use. IF YOU WANT TO WRITE A GAME OF COMMERCIAL QUALITY USING A GAMES DESIGNER, THIS IS THE ONE TO BUY." (YrComputer) "Anyone who wants to write compiled games ought to buy White Lightning. It is easily the most complex games language on the market and produces stunning effects on the screen." (Sinclair User) (OASIS) **TWO CASSETTES £14.95. MICRODRIVE VERSION £19.95. MACHINE LIGHTNING: TWO CASSETTES £19.95.**

for 2 players with hundreds of questions and spare sets to be loaded. 73K of program altogether! 9 skill levels. Plays the 'Blockbusters' theme and is tolerant of speed-spelling errors. Very hard to stop playing! (MACSEN) **CASSETTE £7.95**

THE BEST MACHINE-CODE TUTOR...no serious Spectrum programmer should learn machine-code without it. (Crash) "Simple to use...the lessons are comprehensive enough to help even the beginner...an excellent introduction to assembly language...very user-friendly." (SinclairUser) Over 70K of data loads in 4 parts from 2 cassettes. Helpful manual. (NEW GENERATION) **TWO CASSETTES £14.95**

and challenging to play than 'BeachHead' and will certainly take a lot longer to master." (Comp&VidGames) "An excellent arcade spree...will bring hours of fun and challenge." (JCInt'l) Begin with the 'view from space' at S.A.C.H.Q then lead your squadron to knock out Soviet missiles and eventually attack the Kremlin. Morally, a bit dubious, but everything else is perfect! (U.S.GOLD)

Kempston/Interface2 STICKS **CASSETTE £7.95**

hideously addictive and compelling arcade/adventure. The game is a triumph of design." (PopCompWkly) "Quite simply the most technically awesome game Ultimate have released." (PersCompNews) "This is the first 'arcade adventure' that requires good arcade skills and presents a series of problems to be solved within a satisfying whole." (YrComputer)

(ULTIMATE) Kempston/Interface2/Cursor STICKS. CASSETTE £9.95

black switch clips on to your Spectrum and stops you pulling the power lead in and out ever again. No soldering, glueing or anything. Takes 5 secs to fit and works brilliantly. **£4.95**

Post to: SOFTWARE SUPERMARKET (SU28)
87 Howard's Lane, London SW15 6NU, England.

For CATALOGUE ONLY, send £1 cash. Refunded with your first order. I own a **48K Spectrum**. I enclose a cheque/PO payable to Software Supermarket.
OR Charge my VISA/ACCESS/EUROCARD/MASTERCARD

--	--	--	--

Signature:

Please write clearly. If we can't read it, you won't get it.

Name

Address _____

Postcode _____

PHONE NO.: if any, in case of query

Program	Price
Postage & Packing	UK add 75p per order
	Europe ADD £1.00 per program
	Outside Europe ADD £ 1.50 program
	Total Order

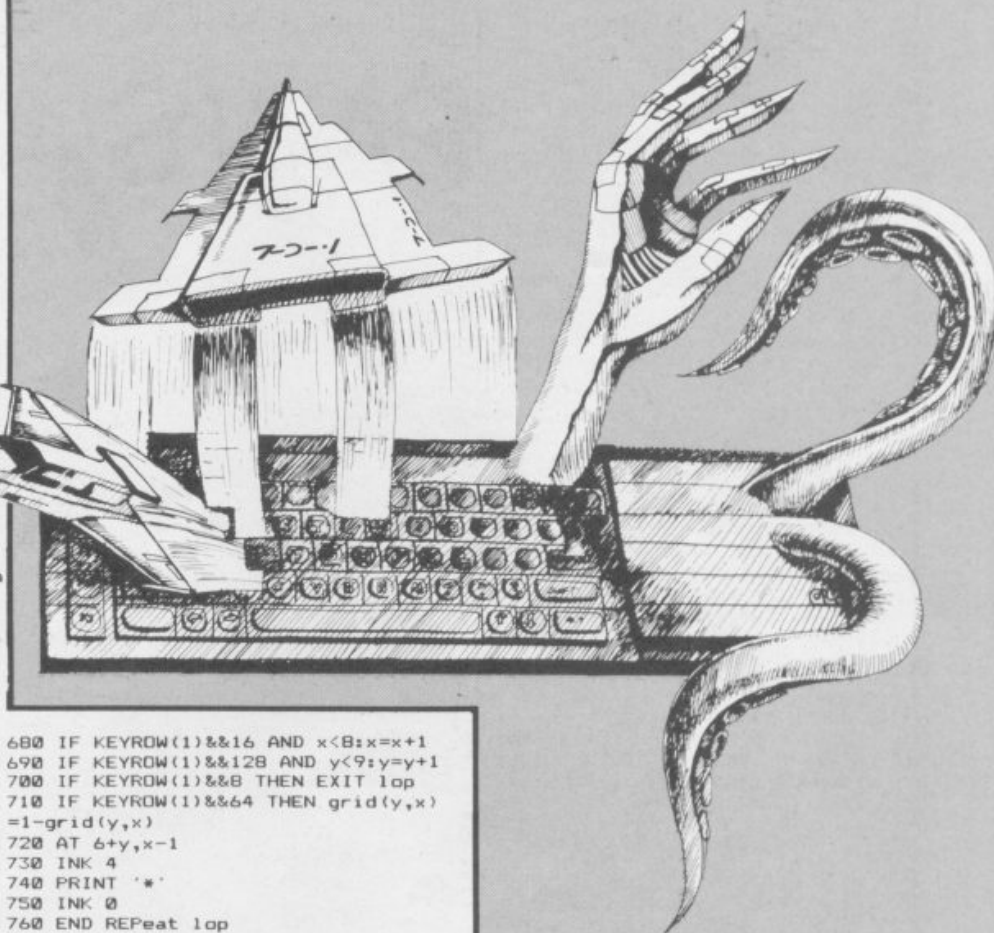
THE QL has excellent graphics potential, but little help is given by the manual to realise it. Philip Smith of Biggin Hill, Kent has written two programs to define your own characters.

The first listing enables you to redefine any part of the character set from space to copyright. When you have your new set of characters, you can SAVE them. The second program consists of two procedures for using the new set. Procedure 'udg' should be used once and LOADs the new set into memory. The second procedure, 'start char set,' should be used every time you open the stream.

To return the characters use: POKE L 167722,41304.

The program uses our special abbreviations for graphics, so please read the instructions on the first page of Program Printout.

QL Characters



Listing one

110 REMark
120 REMark By Philip 'Bagnell' Smith
130 REMark

```
150 MODE 4
160 instructions
170 INK #2,2
180 ex=PEEK_L(167722)
190 base=RESPR(1024)
200 FOR loo=0 TO 875 STEP 4
210 POKE_L base+loo,PEEK_L(ex+loo)
220 END FOR loo
230 POKE_L 167722,base
240 udg
250 :
260 DEFine PROCEDURE udg
270 REPEAT loop
280 PAPER 4:INK 0
290 CLS
300 CSIZE 1,0
310 FOR f=32 TO 127:PRINT CHR$(f);
320 PRINT '\Select the character
to be re-defined\'by entering it.
330 INPUT \'Character ? \'a$;
340 a=CODE(a$)
350 IF a<32 OR a>127 THEN CLS:NEXT
loop
360 PRINT \' Character code=\'a
370 pos=base+11+(a-32)*9
380 DIM grid(9,8)
390 FOR a=pos TO pos+8
400 ai=PEEK(a)
410 FOR b=7 TO 0 STEP -1
420 IF (ai&(2^b))<>0 THEN
430 grid(a-pos+1,b-b)=1
440 PAPER 0
450 ELSE
460 PAPER 7
470 END IF
480 PRINT \'(sp)';
490 END FOR b
500 PRINT
510 END FOR a
520 x=1:y=1
530 PAPER 4
540 AT 7,10
550 PRINT \'Keys:-\'
560 AT 9,10
570 PRINT \'Cursors to move.'
580 AT 10,10
590 PRINT \'Space toggles.'
600 AT 11,10
610 PRINT \'<<ESC>> when finished.'
620 REPEAT loop
630 AT 6+y,x-1
640 PAPER 7*(1-grid(y,x))
650 PRINT \'(sp)'
660 IF KEYROW(1)&&2 AND x>1:x=x-1
670 IF KEYROW(1)&&4 AND y>1:y=y-1
```

```
680 IF KEYROW(1)&&16 AND x<8:x=x+1
690 IF KEYROW(1)&&128 AND y<9:y=y+1
700 IF KEYROW(1)&&8 THEN EXIT loop
710 IF KEYROW(1)&&64 THEN grid(y,x)
=1-grid(y,x)
720 AT 6+y,x-1
730 INK 4
740 PRINT \'*\'
750 INK 0
760 END REPEAT loop
770 AT 16,0
780 DIM num(9)
790 FOR qwe=1 TO 9
800 FOR qw=1 TO 8
810 IF grid(qwe,qw)=1 THEN num(qwe)
=num(qwe)+2^(8-qw)
820 END FOR qw
830 POKE pos-1+qwe,num(qwe)
840 END FOR qwe
850 PAPER 4
860 INK 0
870 INPUT \'Continue ? [y/n] \'ans$
880 IF \'n\'INSTR ans$ THEN EXIT loop
890 END REPEAT loop
900 CLS
910 PRINT \'To save type:-\'
920 PRINT \'SBYTES mdv1_filename,base,
1000:udg <<ENTER>>\'
930 PRINT
940 PRINT \'To load type:-\'
950 PRINT \'LBYTES mdv1_filename,
base:udg <<ENTER>>\'
960 END DEFine
970 :
980 DEFine PROCEDURE instructions
990 OPEN #2,con_448x190a32x16_128
1000 PAPER #2,0
1010 PAPER #0,0
1020 PAPER 0
1030 MODE 4
1040 INK 2
1050 PRINT \'UDG\'\'By Bagnell.'
1060 INK 4
1070 PRINT \' This program redefines
the QL character set ( space
to copyright only ).\'
1080 PRINT \' But there is one bug
in the ROM, that is if the
characters are going to be used in
```

csizes :-'\'', '0,0\'', '0,2\'
'\'', '1,0 or 1,2'
1090 PRINT \'then the first and the
last 2 squares on each row must
not be used. This does not apply
when the other sizes are used.'
1100 PRINT \'
Also only nine of the rows on the
character are programmable , the
top ones not. The program only
displays the programmable lines.'
1110 PRINT
1120 INK 2
1130 PRINT \'PRESS ANY KEY TO START\'
1140 PAUSE
1150 END DEFine

Listing two

```
32000 DEFine PROCEDURE udg
32010 LOCAL base,a$
32020 base=RESPR(1024)
32030 INPUT#0;\'Filename in
format :- mdv1_filename \'a$
32040 LBYTES a$,base
32050 POKE_L 262126,base
32060 start_char_set
32070 END DEFine
32080 :
32090 DEFine PROCEDURE start_char_set
32100 LOCAL base
32110 base=PEEK_L(262126)
32120 POKE_L 167722,base
32130 END DEFine
```



```

1 RESTORE : FOR m=0 TO 7: REA
D a: POKE USR "A"+m,a: NEXT m: F
OR r=0 TO 7: READ b: POKE USR "C
"+r,b: NEXT r: FOR d=0 TO 7: REA
D c: POKE USR "B"+d,c: NEXT d: F
OR z=0 TO 7: READ d: POKE USR "D
"+z,d: NEXT z
2 DATA 0,36,24,24,60,60,126,0
,33,114,122,25,249,58,218,188,35
,225,225,51,63,62,33,66,196,135,
135,204,252,188,132,66
3 CLS
4 LET bt=100000: LET bs=0
5 BORDER 7: PAPER 7: INK 1:
CLS : PRINT AT 0,0:"This game ha
s been produced for Kempston Joy
stick (8 positions)/Keyboard Con
trol (using the 4arrow keys).
The cat can spit aeadly pois
onous venom .....": BRIGHT 1:
"Press buttons on Joystick or ..
.Press '0' key on Keyboard.
": BRIGHT 0: PRINT INK 2;AT 11
,0:"There is an on-screen timer
andboth time and score are show
n atthe end of each game. If you
cansuccessfully complete the g
ame,the ": BRIGHT 1;TAB 4:"best
time": BRIGHT 0;TAB 16;"and ":
BRIGHT 1;TAB 20:"best score":
BRIGHT 0:"(since loading) are d
isplayed.": PAUSE 750
6 PRINT INK 0;AT 21,0:"More
instructions follow shortly": PA
USE 500: CLS
7 PRINT INK 2:"MICE = 1 POIN
T : RATS = 2 POINTS":AT 3,0; BRI
GHT 1:"THE CAT CAN ONLY DESTROY
A RAT WHEN IT IS MOVING TO THE
LEFT ": BRIGHT 0: PAUSE 400: P
RINT INK 3;AT 8,0:"Your overall
objective is to EATall the MICE
and to DESTROY allthe RATS as
QUICKLY as you can.": PRINT : P
RINT INK 2:" TAKE CARE
!": PAUSE 500: PRINT AT 15,0; IN
K 1:"A simpler version might b
e to see how quickly you can ea
t allthe MICE while avoiding the
RATS": PRINT : PRINT INK 2;AT
19,7:"BEWARE AT LEVEL 3!": INK 4
;AT 21,9:"Happy Hunting!": PAUSE
750: CLS
8 PRINT AT 4,0:"Select diffi
culty 1 2 3 ":AT 10,8;"1.
Easy":AT 12,8;"2. Tricky":A
T 14,8;"3. Difficult": PAUSE 0
: IF INKEY$="1" THEN LET w=1
9 IF INKEY$="2" THEN LET w=2
10 IF INKEY$="3" THEN LET w=3
11 CLS : PAPER 3: BORDER 3: CL
S : PRINT INK 7;AT 9,3:" Press
'j' for joystick ":AT 14,3:" P
ress 'k' for keyboard": PAUSE 0
12 IF INKEY$="j" THEN LET zz=
2500: GO TO 15
13 IF INKEY$="k" THEN LET zz=
155: GO TO 15
14 GO TO 11
15 RESTORE
17 PRINT FLASH 1: INK 6;AT 3,
2:"Do you want instructions? y/n
":AT 20,27: FLASH 0: PAUSE 0: IF
INKEY$="y" OR INKEY$="Y" THEN
GO TO 20
18 IF INKEY$="n" OR INKEY$="N"
THEN GO TO 30
19 GO TO 17
20 PAPER 7: BORDER 7: CLS : PR
INT INK 2;AT 0,2: FLASH 1:"PRES
S 'q' TO STOP GAME": GO SUB 9997
21 PRINT INK 1;AT 2,2:"There
are fifty mice....their positi
ons change with each new g
ame. The CAT has to EAT al
l the mice.": PAUSE 100: PRINT
INK 1;AT 21,2: INK 3: BRIGHT 1:
"AAAAAAAAAAAA": PAUSE 200: PRINT AT
21,2: PAPER 7: INK 3: BRIGHT 0:
"AAAAAAAAAAAA"
22 PRINT INK 3;AT 7,2:"There
are also four rats ...to begin
with ....their positions change
with each new game.": PAUSE 100
: PRINT INK 3;AT 21,15: PAPER 6

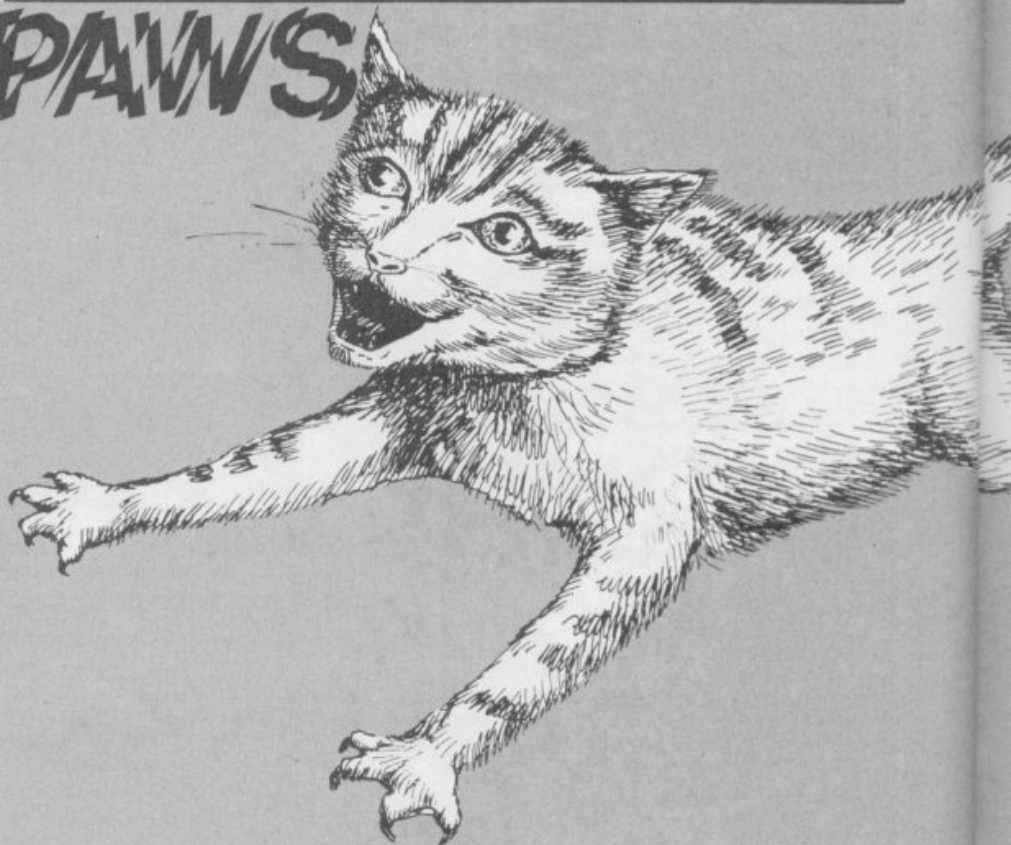
```

Gobble up the mice but watch out for the much more dangerous rats in **Paws** by Terry Braverman of Cambridge for the 48K Spectrum. Luckily you play the part of a particularly gruesome moggie with poisonous spit just right for dealing with the rats.

Paws was an entry in the 1984 Cambridge Awards competition and is compatible with the Kempston joystick interface. Full instructions are given in the program.

Paws uses our special abbreviations for graphics characters, so please read the instructions on the first page of Program Printout before entering the listing.

PAWS



```

; INK 2: BRIGHT 1:"(sp)(sp)(sp)
p)": PAUSE 200: PRINT AT 21,15:
PAPER 6: INK 2: BRIGHT 0:"(sp)
(sp)(sp)(sp)"
23 PRINT INK 2;AT 11,2:"BUT
EVERY TIME A MOUSE IS EATEN
, MORE RATS APPEAR!": GO S
UB 9997
24 PRINT INK 0;AT 15,2:"WARNI
NG!!! CAT....BEWARE! IF YO
U TRY TO CATCH A RAT..... TH
E RAT WILL EAT YOU!": PRINT OVE
R 1: INK 0;AT 16,2:"-----
(9*sp)
-----": OVER 0: PRINT AT 21,27
; INK 0: BRIGHT 1:"(sp)E": GO S
UB 9997: PAUSE 250: PRINT AT 21,
27: BRIGHT 0:"(sp)E"
26 PAPER 7: BORDER 7: CLS : PR
INT : FLASH 1: INK 0;AT 4,1:"CAT
IS IN TOP LEFT HAND CORNER":AT
0,0:"E": INK 0;AT 10,10:"GET REA
DY": PAUSE 350: FLASH 0: CLS
30 PAPER 7: BORDER 7: CLS : FO
R a=0 TO 21: PRINT INK 1;AT a,0
;"(ig0)": NEXT a
35 FOR b=0 TO 31: PRINT INK 1
;AT 21,b:"(sp)": NEXT b
40 FOR c=21 TO 0 STEP -1: PRIN
T INK 1;AT c,31:"(sp)": NEXT c
45 FOR d=31 TO 0 STEP -1: PRIN
T INK 1;AT 0,d:"(sp)": NEXT d
46 FOR a=0 TO 21: PRINT PAPER
4: INK 1: OVER 1;AT a,0:"*": NE
XT a: FOR c=21 TO 0 STEP -1: PRI
NT PAPER 4: INK 1: OVER 1;AT c,
31:"*": NEXT c
47 RESTORE 47: FOR a=1 TO 10:
READ b,c: PRINT PAPER 4: INK 1:

```

```

OVER 1;AT 0,b:"*":AT 21,c:"*":
NEXT a
49 DATA 24,1,25,2,26,3,27,4,28
,5,29,26,30,27,1,28,7,29,8,30
55 PRINT INK 8: OVER 1;AT 0,1
0:"CAT 'n' MOUSE":AT 21,7:"(2*sp
)T.Braverman(5*sp)": GO SUB 9997
60 FOR n=1 TO 50
65 LET e=2+INT (RND*18): LET f
=2+INT (RND*28)
70 IF ATTR (e,f)=59 THEN GO T
O 65
80 PAPER 7: PRINT INK 3;AT e,
f;"E"
85 NEXT n
98 FOR o=1 TO 4
100 LET g=2+INT (RND*18): LET h
=2+INT (RND*28)
105 IF ATTR (g,h)=59 THEN GO T
O 100
108 IF ATTR (g,h)=50 THEN GO T
O 100
110 PAPER 7: PRINT PAPER 6: IN
K 2;AT g,h:"E": NEXT o
130 LET s=0: LET ss=0
140 LET x=1: LET y=1
150 POKE 23672,0: POKE 23673,0
155 PAPER 7: PRINT INK 0;AT x,
y;"E"
160 IF INKEY$="8" THEN PRINT
PAPER 7: INK 0;AT x,y:"E"
165 IF zz=2500 THEN GO TO 2500
166 IF INKEY$="" THEN BEEP .04
,-25: GO TO 243
170 LET lx=x: LET ly=y
180 IF INKEY$="q" THEN GO TO 9
999
181 IF INKEY$="0" AND ATTR (x,y
-1)=50 THEN PRINT FLASH 1: INK

```




```

2:AT x,y-1;"*": FOR n=0 TO 20:
BEEP (.25*.1),n: NEXT n: FOR n=2
0 TO 0 STEP -1: BEEP (.25*.1),n:
NEXT n: PRINT AT x,y-1;"(sp)":
LET ss=ss+2
186 IF INKEY$="5" THEN LET y=y
-1: BEEP .05,-50
191 IF INKEY$="8" THEN LET y=y
+1: BEEP .05,-50
196 IF INKEY$="6" THEN LET x=x
+1: BEEP .05,-50
201 IF INKEY$="7" THEN LET x=x
-1: BEEP .05,-50
203 PRINT AT 1x,1y;"(sp)"
210 IF x<1 OR x>20 THEN LET x=
1x
215 IF y<1 OR y>30 THEN LET y=
1y
225 IF ATTR (x,y)=59 THEN LET
s=s+1: BEEP .025,30: BEEP .025,1
2: GO TO 9980
232 LET ab=0: IF s=50 THEN CLS
: GO TO 400
240 IF ATTR (x,y)=50 THEN PRIN
T AT x,y: FLASH 1;"C": LET b=.02
5: FOR t=1 TO 20: BEEP b,24: BEE
P b,20: BEEP b,17: BEEP b,12: NE
XT t: PRINT INK 0;AT x,y: FLASH
0;"C": GO TO 450
243 LET t=(PEEK 23672+256*PEEK
23673)/50
244 PRINT INK 2;AT 0,2;t
245 GO TO 155
405 PRINT TAB 8: INK 2;"Score =
";s+ss;AT 3,8;t;" seconds ":
GO SUB 9997: PAUSE 75
406 IF t<bt THEN LET bt=t: PRI
NT INK 4;AT 6,4;"BEST TIME ";bt
;" SECONDS";AT 9,7;"CONGRATULATI
ONS!": GO SUB 9997
407 IF t>bt THEN PRINT INK 4;
AT 6,4;"BEST TIME ";bt;" SECONDS
";AT 9,1;"SLOWCOACH! I'M SURPRIS
ED YOU CATCH ANYTHING!
": PRINT OVER 1;AT 10,14;"-----
": GO SUB 9997
410 IF s+ss>bs THEN LET bs=s+ss
s: PRINT INK 2;AT 19,7;"Best sc
ore is ";bs
412 IF s+ss=50 OR s+ss<bs THEN
PRINT INK 2;AT 12,0;"Can't you
do better? Try again!"

```

```

413 PRINT AT 19,7;"Best score i
s ";bs
414 PRINT AT 21,0;"MAXIMUM: Lev
el 1:156 2:352 3:450": PAUSE 150
416 PRINT INK 1: FLASH 1;AT 15
,1;"Do you want to play again? y
/n": PAUSE 0: IF INKEY$="y" OR I
NKEY$="Y" THEN FLASH 0: GO TO 3
000
418 IF INKEY$="n" OR INKEY$="N"
THEN FLASH 0: GO TO 9999
420 GO TO 408
450 PRINT INK 2;AT 8,1;"CATast
rophe! Eaten by THE RAT!";AT 10,
7: FLASH 1;"Your score is ";s+ss
: GO SUB 9997: FLASH 0
455 PAUSE 150
460 PRINT INK 2: FLASH 1;AT 12
,1;"Do you want to play again? y
/n"
465 IF INKEY$="y" OR INKEY$="Y"
THEN FLASH 0: GO TO 3000
467 IF INKEY$="n" OR INKEY$="N"
THEN FLASH 0: GO TO 9999
468 GO TO 460
470 IF a$="y" THEN GO TO 10
475 CLS : GO TO 9999
2500 PRINT PAPER 7: PRINT INK
0;AT x,y;"E"
2502 IF IN 31=1 THEN PRINT PAP
ER 7: INK 0;AT x,y;"D"
2505 IF IN 31=0 THEN BEEP .04,-
25: GO TO 243
2510 LET 1x=x: LET 1y=y
2520 IF IN 31=2 THEN LET y=y-1:
BEEP .05,-50
2521 IF IN 31=16 AND ATTR (x,y-1
)=50 THEN PRINT INK 2: FLASH 1
;AT x,y-1;"*": FOR n=0 TO 20: BE
EP (.25*.1),n: NEXT n: FOR n=20
TO 0 STEP -1: BEEP (.25*.1),n: N
EXT n: PRINT AT x,y-1;"(sp)": LE
T ss=ss+2
2525 IF IN 31=1 THEN LET y=y+1:
BEEP .05,-50
2530 IF IN 31=4 THEN LET x=x+1:
BEEP .05,-50
2531 IF IN 31=10 THEN LET x=x-1
: LET y=y-1: BEEP .05,-15
2532 IF IN 31=6 THEN LET x=x+1:
LET y=y-1: BEEP .05,-15
2533 IF IN 31=9 THEN LET x=x-1:

```

```

LET y=y+1: BEEP .05,-15
2534 IF IN 31=5 THEN LET x=x+1:
LET y=y+1: BEEP .05,-15
2535 IF IN 31=8 THEN LET x=x-1:
BEEP .05,-50
2537 PRINT AT 1x,1y;"(sp)"
2540 IF x<1 OR x>20 THEN LET x=
1x
2545 IF y<1 OR y>30 THEN LET y=
1y
2550 IF ATTR (x,y)=59 THEN LET
s=s+1: BEEP .025,30: BEEP .025,1
2: GO TO 9980
2555 LET ab=0: IF s=50 THEN CLS
: GO TO 400
2560 IF ATTR (x,y)=50 THEN PRIN
T AT x,y: FLASH 1;"C": LET b=.02
5: FOR t=1 TO 20: BEEP b,24: BEE
P b,20: BEEP b,17: BEEP b,12: NE
XT t: PRINT INK 0;AT x,y: FLASH
0;"C": GO TO 450
2565 LET t=(PEEK 23672+256*PEEK
23673)/50
2570 PRINT INK 2;AT 0,2;t
2573 IF IN 31=1 THEN GO TO 160
2575 GO TO 155
3000 RESTORE
3005 CLS : GO TO 8
9980 LET i=2+INT (RND*18): LET j
=2+INT (RND*28)
9981 LET ab=ab+1: IF ATTR (i,j)<
>57 THEN GO TO 9980
9982 PRINT PAPER 6: INK 2;AT i,
j;"C"
9983 IF w=2 AND ab=1 THEN GO TO
9980
9984 IF w=2 AND ab=2 THEN GO TO
9980
9986 IF w=3 AND ab=1 THEN GO TO
9980
9990 IF w=3 AND ab=2 THEN GO TO
9980
9991 IF w=3 AND ab=3 THEN GO TO
9980
9996 GO TO 232
9997 BEEP .25,0: BEEP .25,5: BEE
P .25,0: BEEP .25,-3: BEEP .25,0
: BEEP .25,5: BEEP .25,0: BEEP .
25,-3: BEEP .25,0: BEEP .25,5: B
EEP .25,9: BEEP .25,7: BEEP .25,
5: BEEP .5,7: RETURN
9999 NEW

```


seeing red

WHAT do Scottish men wear under their kilts? The bull knows and it is seeing red in this game for the 16K Spectrum. The author, C C Stock

more programs on page 93

This program uses a graphics notation explained at the start of Program Printout.

```

5: LET a=15: LET p=1: LET b=0: L
ET m=15: LET s=0
120 REM MAIN LOOP
125 REM FARMER
130 LET j1=j: LET j=j+INT (RND*
3-1)
140 IF j<1 THEN LET j=2
150 IF j>20 THEN LET j=19
160 INK 2: PRINT AT j1,m;"(sp)"
: IF p>0 THEN PRINT AT j,m;"A":
GO TO 170
165 PRINT AT j,m;"L"
170 INK 1: LET s=s+1: LET a1=a
298 REM BULL
300 BEEP .005,-8: BEEP .005,-6
310 LET a=a+(INKEY#="6")-(INKEY
#="7")
320 LET a=a+(a1)-(a>20)
322 PRINT AT a1,b1;"(2*sp)"
325 IF ABS p=2 THEN GO TO 340
330 LET b=b+2: IF p=1 THEN PRI
NT AT a,b;"HI": GO TO 350
335 PRINT AT a,b;"JK": GO TO 35
0
340 LET b=b-2: IF p=2 THEN PRI
NT AT a,b;"DE": GO TO 350
345 PRINT AT a,b;"FG"
350 LET b1=b: IF a=j THEN IF b
=m-1 OR b=m THEN GO TO 800
360 LET p=-p: IF b=26 THEN LET
b=29: LET p=2: LET m1=-1
380 IF b=3 THEN LET b=0: LET p
=1: LET m1=1
385 GO TO 120
798 REM RAM FARMER
800 LET m=m+1: PRINT AT j,m; P
APER 6: INK 2;"A"
820 BEEP 1,0: BEEP .5,8
825 PRINT AT j,m;"(sp)"

```

```

827 LET m=m+1: IF m<2 OR m>27
THEN GO TO 910
830 GO TO 360
900 REM FARMER IN DITCH
910 PAPER 2: INK 6: FLASH 1: PR
INT AT 8,7: " YOU GOT HIM!! "
920 FLASH 0: PRINT AT 10,6: "
SCORE = ":AT 10,10;s
930 FOR b=1 TO 16
935 PAPER 5: INK 2: PRINT AT j,
m;"C"
940 LET a=INT (RND*12+RND*12)
950 BEEP .1,a: PRINT AT j,m;"
": BEEP .1,a: NEXT b
965 IF s<1s THEN LET 1s=s
970 PRINT AT 12,5: " LOWEST SCOR
E = ":AT 12,22;1s
980 GO TO 50
990 REM GRAPHICS
1000 FOR n=0 TO 95: READ x: POKE
USR "A"+n,x: NEXT n: RETURN
1010 DATA 60,24,126,126,189,189,
100,4
1020 DATA 0,0,129,189,219,126,60
,60
1030 DATA 0,0,60,24,126,255,189,
189
1040 DATA 243,95,255,255,103,13,
24,16,224,248,254,251,249,236,6,
2
1050 DATA 243,95,255,255,103,6,3
,1,224,248,254,251,249,24,48,32
1060 DATA 7,31,127,223,159,55,96
,64,207,250,255,255,230,176,24,8
1070 DATA 7,31,127,223,159,24,12
,4,207,250,255,255,230,96,192,12
8
1080 DATA 60,153,189,255,60,60,3
8,32

```

SINCLAIR USER March 1985

ONLY THE BEST BECOME A....

FIGHTER PILOT

A SPECTACULAR FLIGHT SIMULATION OF THE WORLD'S MOST EXCITING JET FIGHTER WITH STUNNING 3D COCKPIT VIEW AND THE MOST REALISTIC 3D AIR-TO-AIR COMBAT EVER SEEN ON THE SPECTRUM!

FIGHTER PILOT
NOW ON
COMMODORE 64

48K SPECTRUM
BY D.K. MARSHALL



Only the bravest fly TOMAHAWK

48K SPECTRUM

BY D.K. MARSHALL

FROM THE AUTHOR OF FIGHTER PILOT...THE FIRST AUTHENTIC HELICOPTER SIMULATION FOR THE ZX SPECTRUM. CLIMB INTO THE HOT SEAT OF THE MEANEST, DEADLIEST COMBAT HELICOPTER EVER TO RULE THE SKIES!

COMING SOON!



Only the fastest win in TT RACER

48K SPECTRUM

BY R.J. SWIFT

THE SUPREME MOTORCYCLE RACING SIMULATION FOR THE SPECTRUM. TT RACER PUTS YOU ON THE HOT SEAT. RACING FOR THE FINISHING LINE. YOU'LL NEED TO BE A TOP RIDER TO TAKE THE WINNING FLAG AS ONLY THE FASTEST WIN!



ONLY ACES SURVIVE IN ...

NIGHT GUNNER

48K SPECTRUM
BY R.J. SWIFT

THE AMAZING AIR BATTLE SCENARIO THAT STRETCHES YOU TO THE VERY LIMIT — GUNS BLAZING. ENEMY FIGHTERS ATTACK FROM ALL DIRECTIONS — 3D GROUND ATTACK SORTIES AND THERE'S STILL THE FLIGHT BACK HOME!



COMMODORE 64

Fighter Pilot Disk ☐ £14.95
Fighter Pilot Cassette ☐ £9.95

SPECTRUM

Night Gunner 48K ☐ £6.95
Fighter Pilot 48K ☐ £7.95
Tomahawk 48K **Coming soon**
TT Racer 48K **soon**

VAT and p. & p. inclusive within UK
(Overseas inc. 55p. per cassette)

Cheques payable to Digital Integration Ltd

I enclose a cheque/P.O. for _____ Total

Name _____

Address _____ SU3

Or debit my Access Account No.

_____ Access

Tele Sales
(0276) 684959

Please send to Digital Integration, Dept SU12. Watchmoor Trade Centre, Watchmoor Road, Camberley, Surrey GU15 3AJ.

Trade and Export enquiries welcome. Lifetime Guarantee.

Selected products available from: Boots, Woolworths, H.M.V., Menzies, W.H. Smith, Greens, Lasky's, Currys, Rumbelows, Selfridges, Spectrum Dealers, Video Palace, Zappo and all good computer shops.

DIGITAL
INTEGRATION

Watchmoor Trade Centre,
Watchmoor Road, Camberley,
Surrey GU15 3AJ

TM Trademark

University Software

UNISTAT

STATISTICAL PACKAGE

MULTIVARIATE REGRESSION: Main output consists of estimated coefficients, t-stats, standard errors, R^2 , corrected R^2 , standard error of regression, F stat, and Durbin-Watson stat. Further output options: multiple correlation matrix, var-covar matrix, ANOVA of regression, residuals, plot of residuals, interpolation. Data options: Log/ln option for each variable, no-constant regression, choice of dependent variable, selection of independent variables, auto-omission of linearly dependent variables.

ANALYSIS OF VARIANCE, SCATTER DIAGRAMS AND TIME SERIES PLOTS: One-way and two-way (without interaction) ANOVA tables, scatter diagrams of paired data and time series plots with auto-scaling.

STATISTICAL TESTS, CORRELATION COEFFICIENTS AND PROBABILITY DISTRIBUTIONS: Basic stats on each column of data (size, sum, mean, variance, std. dev.), Chi-square (contingency table), t (one sample, two sample, paired), F, Mann-Whitney U, and Wilcoxon signed rank tests. Pearson's, Spearman's rank and Kendall's rank corr. coeffs. Chi-square, t, F, binomial, Poisson and normal (std., non-std.) distributions. Results of tests and corr. coeffs are displayed with significance levels.

DESCRIPTIVE STATISTICS, FREQUENCY DISTRIBUTIONS AND HISTOGRAMS: Analysis of raw data or data with frequency counts. Raw data sorted and grouped. Choice of lower bounds and class intervals. Absolute, cumulative and relative frequencies. Histograms with up to 200 classes. Output displays sum, mean, mean deviation, median, variance, std. dev., 3rd and 4th moments, skewness, kurtosis, range, etc.

All programs are datafile compatible with Matrix Operations program in UNIMAX package. Data matrix capacity examples (columns by rows): **CBM-64:** 2x1250, 5x700, 10x380, **BBC-B:** 2x750, 5x400, 10x200, **48K Spectrum:** 2x1800, 5x900, 10x500. **CBM-64 (disk/cass): £85, BBC-B (disk/cass): £85, 48K Spectrum (mdvcart/cass): £60**

UNIMAX

LINEAR PROGRAMMING PACKAGE

LINEAR PROGRAMMING: A powerful and instructive optimisation program capable of handling all sorts of linear programming problems (min/max, any combination of $< =$, $=$, $> =$ constraints and $x_i > = 0$, $x_i < = 0$, $-\alpha < x_i < \alpha$ sign constraints). Primal, canonical, dual and their solutions are displayed in standard mathematical form. Unbounded problem and no feasible solution prompts. Edit option for all inputs. Capacity examples (variables by constraints): **CBM-64:** 10x35, 25x30, 40x25, **BBC-B:** 10x25, 20x20, **48K Spectrum:** 10x45, 25x35, 50x25.

MATRIX OPERATIONS: Inversion, transposition, determinant, pre- and post-multiplication, scalar multiplication, addition and subtraction of matrices and vectors. Any output can in turn be used as the input of the next operation without re-typing. Matrices can be saved or loaded at any stage. Datafile compatible with UNISTAT package. Capacities: **CBM-64:** 35x35, **BBC-B:** 25x25, **48K Spectrum:** 45x45.

CBM-64 (disk/cass): £60, BBC-B (disk/cass): £60, 48K Spectrum (mdvcart/cass): £45.

ALSO AVAILABLE FOR 48K SPECTRUM
INTRODUCTION TO ECONOMICS SET: £25
ECONOMIC GEOGRAPHY: £9.95 • BIBLIOFILE: £9.95
POLYNOMIALS: £6.95 • INTEGRATION: £6.95

To: **UNISOFT LIMITED**
(Dept. B) 29 ST PETER'S STREET, LONDON N1 8JP.
TEL: 01-359 0978

Prices include VAT and delivery within the UK. For orders from Europe add £1.50, outside Europe £3.00 per item for airmail post. Dealers enquiries welcome.



COMMODORE 64, BBC-B, 48K SPECTRUM

* Comprehensive user manual * Full data handling facilities (display, print, change, save, load)
* All results can be printed out *



For a better image



The Sinclair QL gives you the best in micro technology. So why entrust it to a screen that cannot match this?

A blurred, incomplete or fuzzy image can ruin even the best program. Not to mention the strain it may put on your eyes.

Now, we can offer you the monitor to match the micro.

The Prism QL14 colour monitor has been designed to meet the exact needs of the QL.

It gives you clear, pin-sharp graphic images, and the ability to display the full 85 column text available on the QL.

And the light-weight Prism QL14 is fully portable, incorporating a retractable handle and is provided with the necessary connecting cable.

PRISM

TRANSFORM LTD. Computer Accessories

ZX Spectrum and QL Microdrive Storage Box



- Designed to match QL and Spectrum
- Holds 20 cartridges and index cards
- Fully interlocking

Available Now

QL Centronics Interface	£39.95
QL Dust Cover	£5.00
QL RS 232 Lead	£10.00
Spectrum Monitor Connector	£11.50

• We also supply printers, monitors, labels, ribbon and listing paper.

£5^{·95}

Available from selected WH Smith's and leading computer shops



TRANSFORM LTD. (Dept. SU) 089 283 4783
Swatlands, Lucks Lane, Paddock Wood, Kent TN12 6QL.

VISA

..... picture this

At only £199.99, the stylish QL14, finished in matt black and including a detachable anti-glare glass front, ensures that you get the best from your QL.

So for a clearer picture simply speak to your local dealer.

After all, it's not only the image on your QL that's at stake.

TECHNICAL SPECIFICATIONS

Number of columns	85
Tube.....	90° 14" (34 cm "V") self-converging colour tube
Video Bandwidth.....	12 MHz
Shadowmask pitch.....	0.63 mm
Direct RGB input	5 volt pp into 390 ohms
Dimensions.....	375 mm wide x 375 mm high x 390 mm deep
Weight.....	12 kg (26 lbs)
Country of origin	UK



Prism Microproducts Limited
 Prism House, 18/29 Mora Street
 City Road, London EC1 8BT
 Telephone: 01-253 2277



This 3" CRESCENT unit is the real alternative to tape filing systems utilizing state of the art floppy disk system.

THE MICRO COST £129.95 3" DISK DRIVE

All units have Japanese mechanisms and are manufactured by Servicon Dynamics, a company with over 15 years of success in specialist electronic manufacturing. All items carry a 12-month warranty.

- ◐ Completely compatible with 5¼" drives
- ◐ Full software support (plus INNER CIRCLE CLUB†)
- ◐ Full disk interface system for SPECTRUM
- ◐ Exclusive low cost accessories through INNER CIRCLE CLUB
- ◐ One-touch disk load/unload
- ◐ Compact and lightweight
- ◐ Cables included in price
- ◐ Full manual provided

† See address below for details.

New Crescent 3" disk drive upgrade for Spectrum.

SPECIFICATION OF DFS

- ◐ Handles up to 78 files (200K) on 3" diskette (39 files per side)
- ◐ Interface uses 8K of user RAM. However, the manual contains a machine code program which allows 48K programs to be loaded and saved
- ◐ Has extension edge connector to allow plug in peripherals like printers and joysticks
- ◐ Random access filing of data arrays
- ◐ Has additional BASIC commands
- ◐ Will support 3", 3½" or 5¼" drives
- ◐ Black livery to match SPECTRUM

CRESCENT 401 £129.95*

CRESCENT 401
Plus
CRESCENT 200DFS £199.95*

CRESCENT POWER
SUPPLY £29.95*

The CRESCENT 200S combines the CRESCENT 401 3" drive with the CRESCENT 200 DFS.

* Price excludes 15% VAT and delivery £6.00
Please allow 28 days for delivery

Servicon Dynamics Limited,
Brook Street, Mitcheldean, Gloucestershire GL17 0SL
Tel: 0594 542021. Telex: 43586 SERDYN G

I enclose cheque for £..... or debit my credit card.



Name/Address

Signature



ELFIN WAY



THE SHADOWY landscape in which the Elves hide is fraught with danger of both natural and supernatural origin. Climb up to peaceful hill-tops but beware the chasms which could spell your death.

Also be wary of Goblin Settlements. Those evil folk love their weapons as much as they hate Elfinkind.

This gentle adventure for the 48K Spectrum was written by J Gorman of Greenford in Middlesex.

```
1 POKE 23675,0: POKE 23676,0
2 PAPER 7: BORDER 7: INK 0: F
LASH 0: BRIGHT 0: CLS
3 POKE 23609,100
4 CLEAR 65535: LET w$="nothi
```

```
ng"
5 LET boat=0: DIM e(100,8)
10 DIM o$(100,4,13)
20 DIM d$(100,110)
21 LET o$(17,1)="a rowing bo
```

```
t"
22 LET o$(84,1)="a rowing bo
```

```
t"
23 LET o$(54,1)="a sword"
24 LET o$(61,1)="a gold nugge
```

```
t"
26 PRINT AT 10,10;"Please Wait
```

```
"
30 FOR a=1 TO 100: READ d$(a)
50 IF d$(a,1)="a" THEN LET d
```

```
$(a)="on an enormous plateau cov
ered in short grass"
51 IF d$(a,1)="b" THEN LET d$(
```

```
a)="on the edge of the plateau
,belowthere is a long sheer drop
east,south east & south"
```

```
52 IF d$(a,1)="c" THEN LET d
$(a)="on top of a fortified emba
```

```
nkmentit is impossible to get ov
er but you can see the great mou
```

```
ntains"
```

```
53 IF d$(a,1)="d" THEN LET d
```

```
$(a)="in a giant lake you can se
```

```
e an island on the horizon"
```

```
70 NEXT a: FOR a=1 TO 100
```

```
80 FOR b=1 TO 8: READ e(a,b)
```

```
100 NEXT b: NEXT a: LET pos=1
```

```
110 CLS
```

```
5120 PRINT "you are:" d$(pos)
```

```
5130 IF o$(pos,1,1)<>"(sp)" THEN
```

```
PRINT "you can see:"
```

```
: FOR a=
```

```
1 TO 5: PRINT o$(pos,a): IF o$(p
```

```
os,a,1)="(sp)" THEN GO TO 5137
```

```
5135 NEXT a
```

```
5137 IF boat=0 THEN IF pos=10
```

```
OR pos=19 OR pos=28 OR pos=38 OR
```

```
pos=49 OR pos=59 OR pos=77 OR p
```

```
os=85 OR pos=86 OR pos=87 OR pos
```

```
=88 OR pos=89 OR pos=94 OR pos=9
```

```
5 OR pos=96 OR pos=98 OR pos=99
```

```
OR pos=100 THEN PRINT "you are
```

```
engulfed by the water and drow
```

```
n": FOR a=1 TO 500: NEXT a: GO T
```

```
D 9999
```

```
5138 IF pos=97 THEN GO TO 9900
```

```
5139 IF boat=1 THEN PRINT "yo
```

```
u are in the boat"
```

```
5140 PRINT "exits:"
```

```
"north"
```

```
5150 IF e(pos,1)<>0 THEN PRINT
```

```
"south"
```

```
5170 IF e(pos,3)<>0 THEN PRINT
```

```
"east"
```

```
5180 IF e(pos,4)<>0 THEN PRINT
```

```
"west"
```

```
5190 IF e(pos,5)<>0 THEN PRINT
```

```
"north-east"
```

```
5200 IF e(pos,6)<>0 THEN PRINT
```

```
"north-west"
```

```
5210 IF e(pos,7)<>0 THEN PRINT
```

```
"south-east"
```

```
5220 IF e(pos,8)<>0 THEN PRINT
```

```
"south-west"
```

```
5240 PRINT : FOR a=0 TO 31: PR
```

```
INT "-": NEXT a: PRINT
```

```
5270 INPUT LINE i$: IF i$="" T
```

```
HEN GO TO 5270
```

```
5272 IF i$="1" THEN PRINT "you
```

```
are carrying "w$: GO TO 5240
```

```
5273 IF LEN i$>5 THEN IF i$( T
```

```
D 6)="get in" THEN GO TO 6500
```

```
5274 IF LEN i$>6 THEN IF i$( T
```

```
D 7)="get out" THEN GO TO 6550
```

```
5275 PRINT i$
```

```
5276 IF pos=72 THEN GO TO 7000
```

```
5277 IF LEN i$>7 THEN IF i$( T
```

```
8)="push off" THEN GO TO 6600
```

```
5278 IF i$="n" AND e(pos,1)=2 T
```

```
HEN PRINT "you fall down a ste
```

```
ep cliff & smash your skull .
```

```
You are dead": FOR a=1 TO 500: N
```

```
EXT a: GO TO 9999
```

```
5279 IF i$="s" AND e(pos,2)=2 T
```

```
HEN PRINT "you fall down a ste
```

```
ep cliff & smash your skull .
```

```
You are dead": FOR a=1 TO 500: N
```

```
EXT a: GO TO 9999
```

```
5280 IF i$="e" AND e(pos,3)=2 T
```

```
HEN PRINT "you fall down a ste
```

```
ep cliff & smash your skull .
```

```
You are dead": FOR a=1 TO 500: N
```

```
EXT a: GO TO 9999
```

```
5281 IF i$="w" AND e(pos,4)=2 T
```

```
HEN PRINT "you fall down a ste
```

```
ep cliff & smash your skull .
```

```
You are dead": FOR a=1 TO 500:
```

```
5282 IF i$="ne" AND e(pos,5)=2
```

```
THEN PRINT "you fall down a st
```

```
eeep cliff & smash your skull .
```

```
You are dead": FOR a=1 TO 500:
```

```
5283 IF i$="nw" AND e(pos,6)=2
```

```
THEN PRINT "you fall down a st
```

```
eeep cliff & smash your skull .
```

```
You are dead": FOR a=1 TO 500:
```

```
NEXT a: GO TO 9999
5283 IF i$="nw" AND e(pos,6)=2
THEN PRINT "you fall down a st
eeep cliff & smash your skull .
You are dead": FOR a=1 TO 500:
NEXT a: GO TO 9999
5284 IF i$="se" AND e(pos,7)=2
THEN PRINT "you fall down a st
eeep cliff & smash your skull .
You are dead": FOR a=1 TO 500:
NEXT a: GO TO 9999
5285 IF i$="sw" AND e(pos,8)=2
THEN PRINT "you fall down a st
eeep cliff & smash your skull .
You are dead": FOR a=1 TO 500:
NEXT a: GO TO 9999
5286 IF pos=77 THEN LET pos=76
: LET boat=0: GO TO 5100
5287 IF i$="n" AND e(pos,1)<>0
THEN LET pos=pos-10: GO TO 5100
5290 IF i$="s" AND e(pos,2)<>0
THEN LET pos=pos+10: GO TO 5100
5295 IF i$="e" AND e(pos,3)=5 T
HEN LET pos=pos+2: GO TO 5100
5300 IF i$="e" AND e(pos,3)<>0
THEN LET pos=pos+1: GO TO 5100
5305 IF i$="w" AND e(pos,4)=5 T
HEN LET pos=pos-2: GO TO 5100
5310 IF i$="w" AND e(pos,4)<>0
THEN LET pos=pos-1: GO TO 5100
5320 IF i$="ne" AND e(pos,5)<>0
THEN LET pos=pos-9: GO TO 5100
5330 IF i$="nw" AND e(pos,6)<>0
THEN LET pos=pos-11: GO TO 510
0
5340 IF i$="se" AND e(pos,7)<>0
THEN LET pos=pos+11: GO TO 510
0
5345 IF i$="sw" AND e(pos,8)=5
THEN LET pos=pos+18: GO TO 5100
```

continued on page 94

continued on page 93

```

5350 IF i$="sw" AND e(pos,8)<>0
  THEN LET pos=pos+9: GO TO 5100
5351 IF i$="look" THEN GO TO 5100
5352 IF LEN i$>3 THEN IF i$(T
O 4)="take" AND i$(TO 4)="take"
  THEN GO TO 6000
5359 IF i$="n" OR i$="s" OR i$=
"e" OR i$="w" OR i$="ne" OR i$="
nw" OR i$="se" OR i$="sw" THEN
  PRINT "you cannot get through th
  at way": GO TO 5240
5360 PRINT "i do not understand
  you": GO TO 5240
6000 IF i$="take" THEN PRINT "
  take what?": INPUT LINE b$: PR
  INT b$: GO TO 6130
6010 LET b$=i$(6 TO )
6030 IF b$="boat" THEN PRINT "
  it is too heavy to lift": GO TO
  5240
6040 IF b$="goblin" THEN PRINT
  "you don't just 'take' a goblin
  ".
6050 IF b$="rowing boat" THEN
  PRINT "it is too heavy to lift"
  : GO TO 5240
6060 IF b$="elf" THEN PRINT "y
  ou don't know what disease you m
  ight catch": GO TO 5240
6070 IF b$="sword" THEN FOR a=
  1 TO 4: IF o$(pos,a)="a sword
  " THEN PRINT "ok you have th
  e sword": LET g$=w$: LET w$=o$(
  pos,a): LET o$(pos,a)=g$: GO TO
  5240
6071 NEXT a
6072 IF b$="sword" THEN PRINT
  "I see no sword"
6080 IF b$="gold" OR b$="gold n
  ugget" OR b$="nugget" THEN FOR
  a=1 TO 4: IF o$(pos,a)="a gold n
  ugget" THEN PRINT "ok you have
  the gold nugget": LET g$=w$: LE
  T w$=o$(pos,a): LET o$(pos,a)=g$
  : GO TO 5240
6081 NEXT a: GO TO 5240
6500 FOR a=1 TO 4: IF o$(pos,a)
  ="a rowing boat" THEN PRINT "o
  k you are in the rowing boat": L
  ET boat=1: PRINT ": GO TO 5240
6550 FOR a=1 TO 4: IF o$(pos,a)
  ="a rowing boat" AND boat=1 THEN
  PRINT "ok you are out of the
  boat": LET boat=0: PRINT ": GO T
  O 5240
6551 NEXT a
6600 FOR a=1 TO 4: IF o$(pos,a)
  ="a rowing boat" AND boat=1 THEN
  PRINT "the boat slips into th
  e river ": PRINT ": LET pos=pos+
  2: GO TO 5100
6999 GO TO 5240
7000 IF w$(TO 7)<>"a sword" TH
  EN PRINT "then the goblin says
  'I see you have no sword', then
  goblin draws his dagger and
  kills you": FOR a=1 TO 200: NEXT
  a: GO TO 9999
7010 IF w$(TO 7)="a sword" THE
  N IF i$="give sword" OR i$="giv

```

```

e" THEN LET w$="nothing": PRINT
  "the goblin takes the sword hid
  es it in another location he come
  s back and kicks you so hard tha
  t you land on the tower": LET po
  s=54
8000 GO TO 5100
9006 DATA "a","a","a","a","b","
  near a large hole with boiling
  water bubbling out"
9007 DATA "near a large hole wi
  th boiling water bubbling out"
9008 DATA "on the banks of a sm
  all stream full of boiling wate
  r, which isflowing west"
9009 DATA "on the west bank of
  the goblin'sriver southward is t
  he river. An elven ship passes
  by with a cargo of limestone"
9010 DATA "in the goblin's rive
  r .An elven ship passes by.The r
  iver flows sw"
9011 DATA "a","a","a","b"
9012 DATA "under a high cliff th
  ere is an old goblin sitting on
  a boulder"
9016 DATA "near a large hole wi
  th boiling water bubbling out"
9017 DATA "next to a small boat
  -house the door has been broken
  down to theeast is a slipway"
9018 DATA "on a small slipway t
  o the south is the river"
9019 DATA "in the goblin's rive
  r .An elven ship passes. The r
  iver flows south-west"
9020 DATA "in the goblin's town
  a group of chanting goblins has
  surrounded you they are brandis
  hing knives"
9023 DATA "a","b","b","just on the
  edge of the plateau to the south
  -east is a small staircase in
  the rocks leading down"
9024 DATA "in a small cave, a go
  blin is sleeping by the centr
  al caldron which smells of elf"
9025 DATA "under a shear cliff
  face, you can see the remains
  of a small elf who must have fa
  llen"
9026 DATA "on a small dried out
  mud hole from the north comes
  the smell of sulphur"
9027 DATA "on a small dried out
  mud hole tothe east is the rive
  r"
9028 DATA "in the goblin's river
  a log-likethings floats past .Th
  e river nowgoes south"
9029 DATA "lying on mud-flats i
  t might be low tide, two gobli
  ns walk pastlooking for worms"

```

```

9030 DATA "in the goblin's town
  a group of chanting goblins has
  surrounded you they are brandis
  hing knives"
9032 DATA "b","at the bottom of
  a shear cliff face, there are
  the remains of a small elf who
  must have fallen"
9033 DATA "on the edge of the p
  lateau belowthere is a long shea
  r drop east,south east & south"
9034 DATA "on a path leading so
  uth-east to the north-west is a
  steep path it leads to the plat
  eau"
9035 DATA "in an enormous quarr
  y there are goblins everywhere t
  here is an enormous hobgoblin w
  ho is movinglimestone"
9036 DATA "in an enormous quarr
  y there are goblins everywhere b
  usy mining limestone blocks"
9037 DATA "on a long wooden jett
  y there is an elven ship moored
  here some goblins are loading i
  t up"
9038 DATA "in the goblin's river
  the river flows south-east"
9039 DATA "lying on mud-flats i
  t might be low tide, two gobli
  ns walk pastlooking for worms to
  eat"
9040 DATA "on a path going nort
  h it is welltroden there is a tr
  ail of lime-stone dust"
9043 DATA "b","b","under a shea
  r cliff face,lyingthere are th
  e remains of a fat goblin it's
  head is under a rock"
9044 DATA "next to a small wood
  en fence it has a notice which r
  eads 'dangerfrom falling rocks'"
9045 DATA "on a path leading ea
  st; it is not very wide, it l
  ooks old and is probably elven"

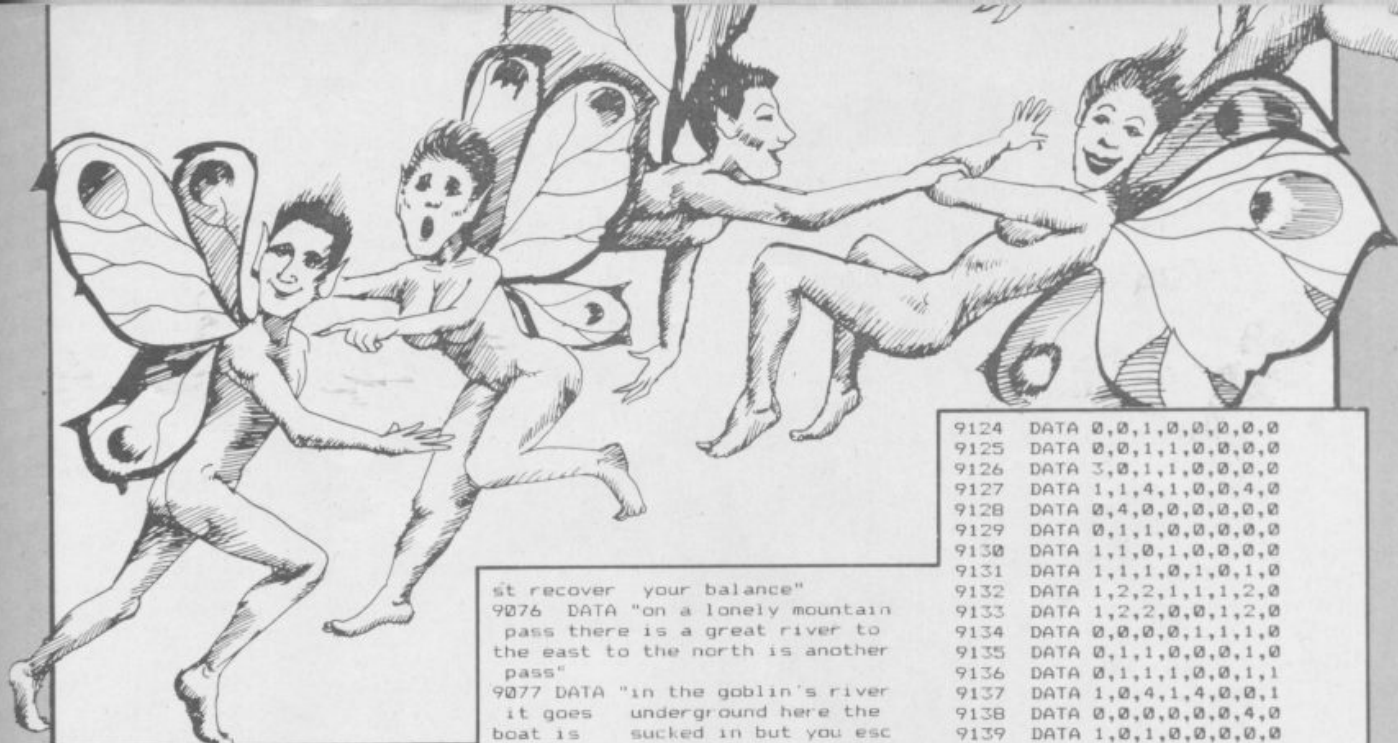
```

```

9046 DATA "on a path leading so
  uth-east; it is not very wide
  , it looks old and is probably
  elven"
9047 DATA "near to a boat build
  ing yard. There are some gobli
  ns painting the hull of a schoo
  n er"
9048 DATA "on the slipway of a
  boat yard. There are some gobli
  ns painting the hull of a schoo
  n er"
9049 DATA "in the goblin's river
  a goblin floats past the river
  goes south"
9050 DATA "on a path going nort
  h it is welltroden there is a tr
  ail of lime-stone dust"
9051 DATA "under a cliff, abov
  e, at the top of the cliff is
  a hobgoblin poised to throw a b
  o ulder on you"
9052 DATA "standing on a goblin
  it wrigglesfree, gets up & hit
  s you, thenit runs off to the n
  orth-east"
9053 DATA "standing under an oa
  k tree, to the east is a tall w
  atch tower flying the goblin's
  flag"
9054 DATA "standing inside a ta
  ll watch tower, there are so
  me stairs going up to the top
  of the tower"
9055 DATA "standing next to a o
  nd, there is a half eaten fish

```





st recover your balance"

9076 DATA "on a lonely mountain pass there is a great river to the east to the north is another pass"

9077 DATA "in the goblin's river it goes underground here the boat is sucked in but you escape"

9078 DATA "on a mountain pass which leads east, to the north-east is a garden"

9079 DATA "on a mountain pass which leads east, to the north is a garden"

9080 DATA "on a mountain pass which leads south, to the north-west is a garden"

9081 DATA "in a partially flooded tunnel, there are old railway tracks on the floor"

9082 DATA "in the old gold mine you slip and fall into a deep hole the green slime on the walls makes you fall in"

9083 DATA "on a mountain pass which has stopped on the shore of a giant lake which is to the south-east"

9084 DATA "on a small wooden jetty, to the east, south & south-east is the giant lake"

9085 DATA "d", "d", "d", "d", "d", "d"

9090 DATA "on a mountain pass which has stopped on the shore of a giant lake which is to the south-west & south"

9091 DATA "in a partially flooded tunnel, there are old railway tracks on the floor"

9092 DATA "in a partially flooded tunnel, there are old railway tracks on the floor"

9093 DATA "on a mountain pass which has stopped on the shore of a giant lake which is to the east"

9094 DATA "d", "d", "d", "in the elven town hundreds of elves rush out to greet you", "d", "d", "d"

9101 DATA 0,1,1,0,0,0,1,0

9102 DATA 0,1,1,1,0,0,1,1

9103 DATA 0,1,1,1,0,0,1,1

9104 DATA 0,1,1,1,0,0,1,1

9105 DATA 0,2,2,1,0,0,1,1

9106 DATA 0,3,3,0,0,0,0,0

9107 DATA 0,1,3,3,0,0,0,0

9108 DATA 0,1,3,3,0,0,0,0

9109 DATA 0,4,4,3,0,0,0,0

9110 DATA 0,0,0,0,0,0,0,4

9111 DATA 1,1,1,0,1,0,1,0

9112 DATA 1,1,1,1,1,1,1,1

9113 DATA 1,1,1,1,1,1,1,1

9114 DATA 1,2,2,1,0,1,2,1

9115 DATA 0,1,0,0,1,0,0,0

9116 DATA 3,1,0,1,0,0,0,1

9117 DATA 3,1,0,0,0,0,0,0

9118 DATA 3,4,4,1,0,0,0,0

9119 DATA 0,0,0,0,0,0,0,4

9120 DATA 0,3,0,0,0,0,0,0

9121 DATA 1,1,1,0,1,0,2,0

9122 DATA 1,1,1,1,1,1,1,1

9123 DATA 1,1,1,1,1,1,1,1

9124 DATA 0,0,1,0,0,0,0,0

9125 DATA 0,0,1,1,0,0,0,0

9126 DATA 3,0,1,1,0,0,0,0

9127 DATA 1,1,4,1,0,0,4,0

9128 DATA 0,4,0,0,0,0,0,0

9129 DATA 0,1,1,0,0,0,0,0

9130 DATA 1,1,0,1,0,0,0,0

9131 DATA 1,1,1,0,1,0,1,0

9132 DATA 1,2,2,1,1,1,2,0

9133 DATA 1,2,2,0,0,1,2,0

9134 DATA 0,0,0,0,1,1,1,0

9135 DATA 0,1,1,0,0,0,1,0

9136 DATA 0,1,1,1,0,0,1,1

9137 DATA 1,0,4,1,4,0,0,1

9138 DATA 0,0,0,0,0,0,4,0

9139 DATA 1,0,1,0,0,0,0,0

9140 DATA 1,1,0,1,0,0,0,0

9141 DATA 1,2,2,0,0,0,2,0

9142 DATA 1,2,2,0,0,1,2,0

9143 DATA 0,1,1,0,0,0,0,0

9144 DATA 0,0,0,1,0,0,1,0

9145 DATA 1,1,1,0,1,1,1,1

9146 DATA 1,0,1,1,1,1,1,1

9147 DATA 0,0,1,1,0,1,0,0

9148 DATA 0,0,4,1,0,0,0,0

9149 DATA 0,4,0,0,0,0,0,0

9150 DATA 1,1,0,1,0,0,0,0

9151 DATA 0,1,1,0,0,0,0,0

9152 DATA 0,1,1,1,1,0,1,0

9153 DATA 1,1,0,1,0,0,0,1

9154 DATA 0,0,1,0,1,0,0,0

9155 DATA 0,0,1,1,1,1,0,0

9156 DATA 0,0,0,1,0,1,0,0

9157 DATA 0,0,1,0,0,1,0,0

9158 DATA 0,0,5,1,0,0,0,0

9159 DATA 0,0,0,0,0,0,0,5

9160 DATA 1,1,0,5,0,0,0,0

9161 DATA 1,1,0,0,0,0,0,0

9162 DATA 1,0,1,0,1,0,0,0

9163 DATA 1,0,0,1,0,1,0,0

9164 DATA 0,1,0,0,0,0,1,0

9165 DATA 0,1,1,1,0,0,1,1

9166 DATA 0,1,1,1,0,0,4,1

9167 DATA 0,4,1,1,0,0,0,1

9168 DATA 0,0,1,1,0,0,0,1

9169 DATA 0,1,0,1,0,0,1,1

9170 DATA 1,0,0,0,0,0,0,0

9171 DATA 1,1,0,0,0,0,0,0

9172 DATA 0,1,0,0,0,0,0,0

9173 DATA 1,1,0,0,0,0,0,0

9174 DATA 1,1,1,1,1,0,0,0

9175 DATA 1,0,1,1,1,1,0,0

9176 DATA 1,0,4,1,1,1,0,0

9177 DATA 0,0,0,1,0,0,0,0

9178 DATA 0,0,1,0,1,0,0,0

9179 DATA 1,0,1,1,0,0,0,0

9180 DATA 0,1,0,1,0,1,0,0

9181 DATA 1,1,0,0,0,0,0,0

9182 DATA 6,1,0,0,0,0,0,0

9183 DATA 1,1,0,0,0,0,1,0

9184 DATA 1,1,4,0,0,0,4,0

9185 DATA 0,4,4,0,0,0,4,4

9186 DATA 0,4,4,4,4,0,1,4

9187 DATA 0,1,4,4,0,0,4,4

9188 DATA 0,4,4,4,0,0,4,1

9189 DATA 0,4,0,4,0,0,0,4

9190 DATA 1,4,0,0,0,0,0,4

9191 DATA 1,0,1,0,0,0,0,0

9192 DATA 1,0,0,1,0,0,0,0

9193 DATA 1,0,4,0,0,0,0,0

9194 DATA 0,0,4,0,4,0,0,0

9195 DATA 4,0,4,4,4,0,0,0

9196 DATA 4,0,1,4,4,4,0,0

9197 DATA 9,9,9,9,9,9,9,9

9198 DATA 4,0,4,1,4,4,0,0

9199 DATA 4,0,4,4,0,4,0,0

9200 DATA 0,0,0,4,0,4,0,0

9910 PRINT "You have finished t

his adventure with ";ws: BEEP 1,

20: BEEP 1,30: BEEP .5,20: BEEP

.5,20

floating in the pool"

9056 DATA "in the middle of the goblin's rest area, it is deserted the central fire is smoldering"

9057 DATA "on a path leading east; it is not very wide, it looks old and is probably elven"

9058 DATA "on a path leading east over an old stone bridge, it looks like a goblin bridge"

9059 DATA "in the river you glide gently under an old stone bridge. The river goes sw"

9060 DATA "on a path leading north, to the west is an old stone bridge it goes over the river"

9061 DATA "under a great stone archway it is covered in gold and smothered in ivy"

9064 DATA "c", "c", "on a path which looks elven to the north is a great watch tower flying the goblin's flag"

9065 DATA "in a bramble bush, you can see some elves picking blackberries they run off on seeing you"

9066 DATA "on a pass leading up into the mountains which are southwards"

9067 DATA "on a pass leading from the old mountains to some small steppingstones leading east across the river"

9068 DATA "on some old stepping stones they look very slippery and worn"

9069 DATA "in a small oriental garden it is warm, to the south, south east and south-west you can see mountains"

9070 DATA "in an impassable forest there are lots of vines hanging down a giant stone idol is in front of you"

9071 DATA "in the entrance to a disused gold mine which winds off southwards"

9072 DATA "in a partially flooded tunnel it turns east, a goblin jumps out he traps you and says 'give me your sword'"

9073 DATA "on a lonely mountain pass there are loose rocks on the floor you slip and fall but just recover your balance"

9074 DATA "on a path which looks elven to the east is a mountain pass"

9075 DATA "on a lonely mountain pass there are loose rocks on the floor you slip and fall but ju

st recover your balance"

9076 DATA "on a lonely mountain pass there is a great river to the east to the north is another pass"

9077 DATA "in the goblin's river it goes underground here the boat is sucked in but you escape"

9078 DATA "on a mountain pass which leads east, to the north-east is a garden"

9079 DATA "on a mountain pass which leads east, to the north is a garden"

9080 DATA "on a mountain pass which leads south, to the north-west is a garden"

9081 DATA "in a partially flooded tunnel, there are old railway tracks on the floor"

9082 DATA "in the old gold mine you slip and fall into a deep hole the green slime on the walls makes you fall in"

9083 DATA "on a mountain pass which has stopped on the shore of a giant lake which is to the south-east"

9084 DATA "on a small wooden jetty, to the east, south & south-east is the giant lake"

9085 DATA "d", "d", "d", "d", "d", "d"

9090 DATA "on a mountain pass which has stopped on the shore of a giant lake which is to the south-west & south"

9091 DATA "in a partially flooded tunnel, there are old railway tracks on the floor"

9092 DATA "in a partially flooded tunnel, there are old railway tracks on the floor"

9093 DATA "on a mountain pass which has stopped on the shore of a giant lake which is to the east"

9094 DATA "d", "d", "d", "in the elven town hundreds of elves rush out to greet you", "d", "d", "d"

9101 DATA 0,1,1,0,0,0,1,0

9102 DATA 0,1,1,1,0,0,1,1

9103 DATA 0,1,1,1,0,0,1,1

9104 DATA 0,1,1,1,0,0,1,1

9105 DATA 0,2,2,1,0,0,1,1

9106 DATA 0,3,3,0,0,0,0,0

9107 DATA 0,1,3,3,0,0,0,0

9108 DATA 0,1,3,3,0,0,0,0

9109 DATA 0,4,4,3,0,0,0,0

9110 DATA 0,0,0,0,0,0,0,4

9111 DATA 1,1,1,0,1,0,1,0

9112 DATA 1,1,1,1,1,1,1,1

9113 DATA 1,1,1,1,1,1,1,1

9114 DATA 1,2,2,1,0,1,2,1

9115 DATA 0,1,0,0,1,0,0,0

9116 DATA 3,1,0,1,0,0,0,1

9117 DATA 3,1,0,0,0,0,0,0

9118 DATA 3,4,4,1,0,0,0,0

9119 DATA 0,0,0,0,0,0,0,4

9120 DATA 0,3,0,0,0,0,0,0

9121 DATA 1,1,1,0,1,0,2,0

9122 DATA 1,1,1,1,1,1,1,1

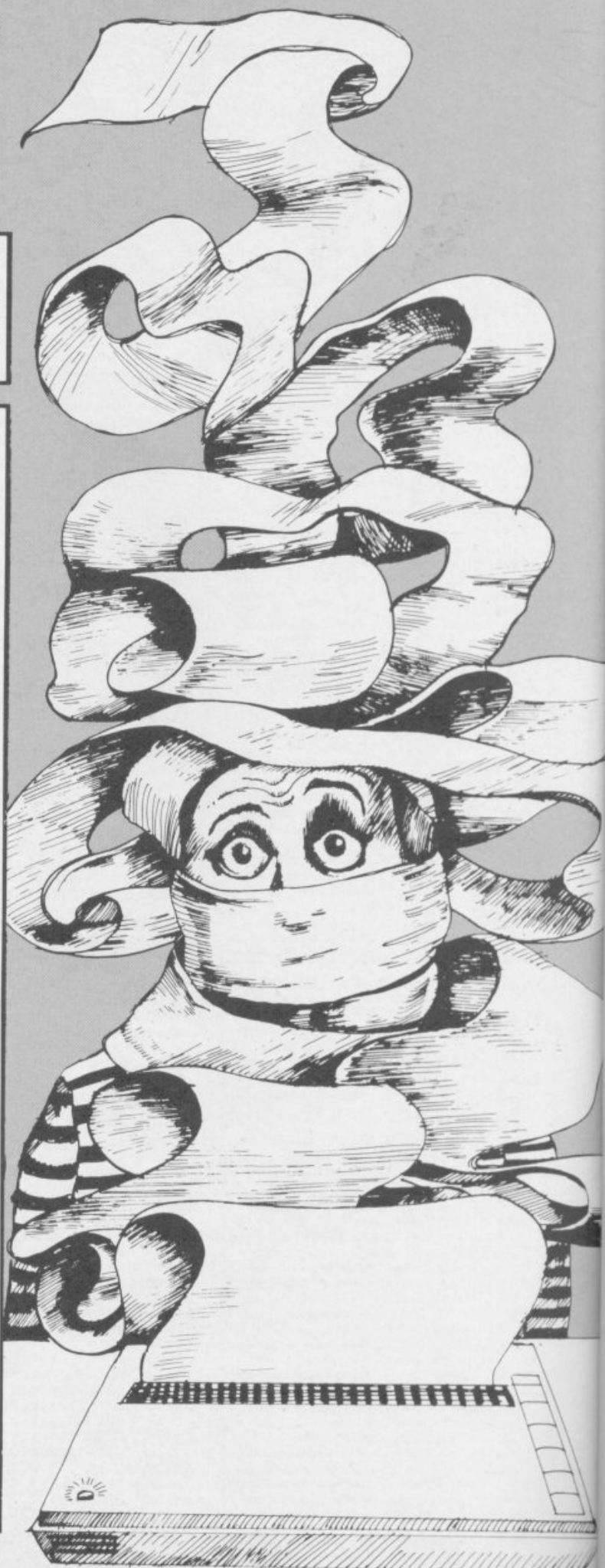
9123 DATA 1,1,1,1,1,1,1,1

Infinite Scroll

REMOVE the pauses in a long screen listing with the **Infinite Scroll** utility for the 16K Spectrum. Written by Jonathan Hatcher of Bournemouth in Sussex is allows fast smooth scrolling through any Basic program without have to press 'ENTER' to continue. It is a boon to all programmers.

```

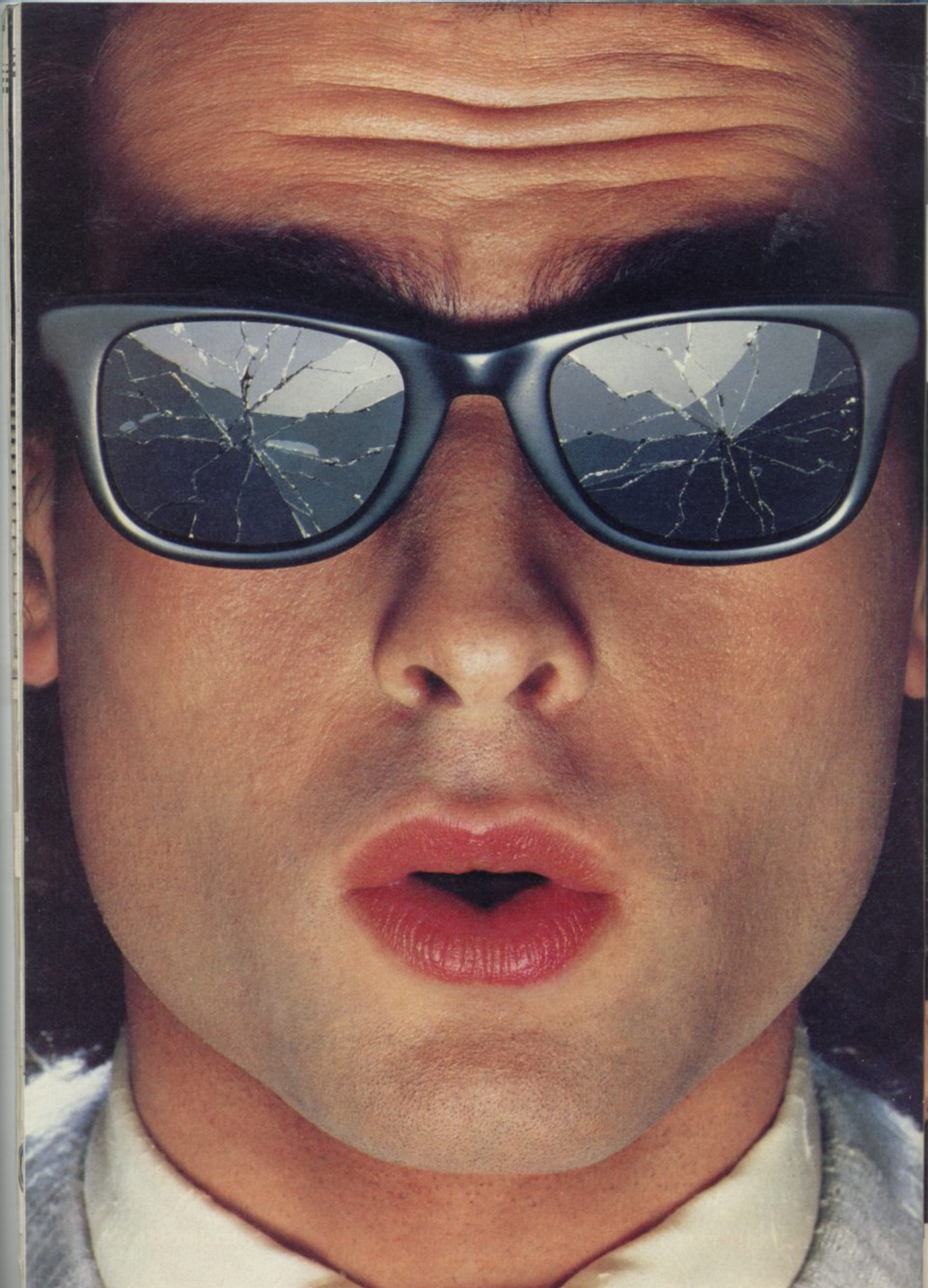
4 CLEAR 32338
5 GO TO 1000
10 DATA 62,40,237,71,237,94,20
1,0,0,255,243,245,197,229,213,58
,228,126,254,1,40,8,205,164,126,
62,1,50,228,126
20 DATA 62,255,50,140,92,62,12
7,219,254,230,2,32,32,62,127,219
,254,230,1,32,24,62,1,50,140,92,
24,17,62,62
30 DATA 237,71,237,86,205,176,
126,62,0,50,228,126,205,3,19,209
,225,193,241,251,201,33,29,64,17
,222,126,6,3,205
40 DATA 188,126,201,33,29,64,1
7,225,126,6,3,205,188,126,201,19
7,213,229,26,111,38,0,41,41,41,2
35,33,0,60,25
50 DATA 235,225,6,8,229,26,119
,19,36,16,250,225,209,35,19,193,
16,223,201,32,79,78,79,70,70,0
1000 GO SUB 2000: LET tot=0: FOR
c=32339 TO 32484: READ d: LET t
ot=tot+d: POKE c,d: NEXT c
1010 IF tot<>16599 THEN CLS : P
RINT AT 10,0: BRIGHT 1: INK 7: F
APER 1: "DATA ENTRY ERROR PLEASE
RE-CHECK": FOR F=1 TO 10: BEEP .
01,F: NEXT F: STOP
1015 PRINT AT 21,5: "PRESS ANY KE
Y TO SAVE"
1020 SAVE "16KSCROLL"CODE 32339,
146
1030 CLS : PRINT AT 10,5: "REWIND
TAPE TO VERIFY"
1040 VERIFY ""CODE
1999 STOP
2000 PRINT AT 8,3: "TO START SCRO
LL ENTER:-": AT 10,5: "RANDOMIZE U
SR 32339": AT 12,3: "TO STOP SCROL
L ENTER:-": AT 14,5: "RANDOMIZE US
R 32397"
2005 PRINT AT 16,5: "TO PAUSE SCR
OLL PRESS:-": AT 17,0: "SYMBOL SHI
FT TOGETHER WITH SPACE"
2010 RETURN
  
```



48K SINCLAIR ZX SPECTRUM



"ALIEN 8" recommended retail price £9.95 inc VAT
Available from W.H.SMITHS, BOOTS, J.MENZIES, WOOLWORTHS
and all good software retail outlets. Also available from
ULTIMATE PLAY THE GAME, The Green, Ashby-de-la-Zouch, Leicestershire LE6 5JU
(P&P included) Tel: 0530 411485



You should see what he's just seen.

Micronet 800.

Stretching the mind of your micro far beyond its limits.

Micro evolution continues with this unique communications, information and software system. Set on our mainframes nationwide.

Includes 30,000 pages and access to Prestel™ with its full range of services.

A tremendous Communications section that networks you to thousands of other members across the country. Send and receive electronic messages and graphics at a touch of a button.

And there's the Chatline service, Swapshop and Teleshopping.

Check with daily updates on the very latest computer news.

Micronet also has its own huge facts data base.

And a choice of up-to-the-minute software to download absolutely free.

For only £13 a quarter and just a local* telephone call whenever you want to connect up (that's only 22p per half hour at cheap rates) you could be part of Micronet.

The only accessory you need is a Modem.

A small price to pay to join the other visionaries on this exciting new system.



Fill in the coupon for more details and send to Micronet 800, Durrant House, 8 Herbal Hill, London EC1R 5EJ.

But be warned, Micronet 800's features are almost limitless and constantly updating. So maybe you'd be better to call in at Laskys, John Lewis, main Boots or your local Micronet 800 Action Station.

To feast your eyes on all the amazing things it can do.

To: MICRONET 800, Durrant House, 8 Herbal Hill, London EC1R 5EJ. Telephone 01-278 3143. Please send me the full facts about Micronet 800.

Name _____

Make/Model of Micro _____

Address _____

Telephone _____

*For 97% of telephone users.

™Prestel is a trademark of British Telecommunications.

See Micronet 800 in action.

AVON

Bath. Boots, 1 Marchants Passage, Southgate. Tel: 0225 64402.
Bristol. Boots, 59 Broadmead, Tel: 0272 293631.
Bristol. John Lewis, Horsefair. Tel: 0272 29100.
Bristol. Laskys, 16-20 Penn Street. Tel: 0272 20421.
Keynsham. Key Computer Systems, 42b High Street. Tel: 02756 5575.
Weston-super-Mare. K & K Computers, 32 Alfred Street. Tel: 0934 419324.

BEDFORDSHIRE

Bedford. Boots, The Harpur Centre, Harpur Street. Tel: 0234 56231.
Dunstable. Dormans, 7-11 Broad Walk. Tel: 0582 38302.
Leighton Buzzard. Datasine, 59 North Street. Tel: 0525 374200.
Leighton Buzzard. Milton Keynes Music & Computers, 17 Bridge Street. Tel: 0525 382504.
Luton. Hobbyite, Unit 16, The Arndale Centre. Tel: 0582 457195.
Luton. Laskys, 190-192 Arndale Centre. Tel: 0582 38302.
Luton. Terry More, 49 George Street. Tel: 0582 23391.

BERKSHIRE

Reading. Heelas, Broad Street. Tel: 0734 559555.
Reading. Laskys, 118-119 Prior St. Tel: 0734 595459.
Slough. Data Supplies, Templewood Lane, Farnham Common. Tel: 2 820004.
Slough. Laskys, 75 Queensmere Centre. Tel: 0753 78269.
Slough. MV Games, 245 High Street. Tel: 75 21594.

BUCKINGHAMSHIRE

Bletchley. RAMS Computer Centre, 117 Queensway. Tel: 0908 647744.
Chesham. Reed Photo & Computers, 113 High Street. Tel: 0494 783373.
Milton Keynes. John Lewis, 11 Field Walk, Secklow Gate East, Tel: 0908 679171.

CAMBRIDGESHIRE

Cambridge. Boots, 65-67 Sidney Street and 28 Petty Curry Street. Tel: 0223 350213.
Cambridge. Hefflers Stationers, 19 Sidney Street. Tel: 0223 358241.
Cambridge. Robert Sayle, St Andrews Street. Tel: 0223 612929.
Peterborough. Boots, 40-42 Bridge Street, Queensgate. Tel: 0733 65352.
Peterborough. John Lewis, Queensgate Centre. Tel: 0733 44644.

CHESHIRE

Chester. Boots, 47-55 Foregate Street. Tel: 0244 28421.
Chester. Computer Link, 21 St Werburgh Street. Tel: 0244 316516.
Chester. Laskys, 7 The Forum, Northgate Street. Tel: 0244 317667.
Crewe. AS Wootton & Sons, 116 Edleston Road. Tel: 0270 214118.
Crewe. Midshires Computer Centre, 68-78 Nantwich Road. Tel: 0270 211086.
Ellesmere Port. RFR TV & Audio, 1 Pooltown Road, Whitby. Tel: 051-356 4150.
Hyde. C Tech Computers, 184 Market Street. Tel: 061-366 8223.
Macclesfield. Camera Computer Centre, 118 Mill Street. Tel: 0625 27468.
Macclesfield. Computer Centre, 68 Chestergate. Tel: 0625 618827.
Marple. Marple Computer Centre, 30-32 Market Street. Tel: 061-427 4328.
Stockport. National Micro Centres, 36 St Petersgate. Tel: 061-429 8080.
Stockport. Stockport Micro Centre, 4-6 Brown Street. Tel: 061-477 0248.
Widnes. Computer City, 78 Victoria Road. Tel: 051-420 3333.
Wilmslow. Wilmslow Micro Centre, 62 Grove Street. Tel: 0625 530890.

CLEVELAND

Middlesbrough. Boots, 88-90 Linthorpe Road, The Cleveland Centre. Tel: 0642 249616.

CUMBRIA

Kendal. The Kendal Computer Centre, Stramongate. Tel: 0539 22559.

Whitehaven. PD Hendren, 15 King Street. Tel: 0946 2063.
Workington. Technology Store, 12 Finkle Street. Tel: 0900 66972.

DERBYSHIRE

Alfreton. Gordon Harwood, 69-71 High Street. Tel: 0773 836781.
Chesterfield. Boots, 35-37 Low Pavement, Market Place. Tel: 0246 203591.
Chesterfield. Computer Stores, 14 Stephenson Place. Tel: 0246 208802.

DEVON

Exeter. Boots, 251 High Street. Tel: 0392 32244.
Exeter. Open Channel, Central Station, Queen Street. Tel: 0392 218187.
Plymouth. Syntax, 76 Cornwall Street. Tel: 0752 28705.
Seaton. Curtis Computer Services, Seaton Computer Shop, 51c Harbour Road. Tel: 0297 22347.
Tiverton. Actron Microcomputers, 37 Bampton Street. Tel: 0884 252854.

DORSET

Bournemouth. Brook Computers, 370 Charnminster Road. Tel: 0202 533054.
Bournemouth. Lansdowne Computer Centre, 1 Lansdowne Crescent, Lansdowne. Tel: 0202 20165.
Dorchester. The Paper Shop, Kings Road. Tel: 0305 64564.

ESSEX

Chelmsford. Maxton Hayman, 5 Broomfield Road. Tel: 0245 354595.
Colchester. Boots, 5-6 Lion Walk. Tel: 0206 577303.
Grays. H Reynolds, 28a Southend Road. Tel: 0375 31641.
Harlow. Laskys, 19 The Harvey Centre. Tel: 0279 443495.
Hornchurch. Comptel Computer Systems, 112a North Street. Tel: 0402 446741.
Ilford. Boots, 177-185 High Road. Tel: 01-553 2116.
Southend-on-Sea. Computerama, 88 London Road. Tel: 0702 335443.
Southend-on-Sea. Computer Centre, 336 London Road. Tel: 0702 337161.
Southend-on-Sea. Estuary Personal Computers, 318 Chartwell North, Victoria Circus Shopping Centre. Tel: 0702 614131.

GLOUCESTER

Cheltenham. Laskys, 206 High Street. Tel: 0242 570282.
Cheltenham. Screen Scene, 144 St Georges Road. Tel: 0242 528979.
Gloucester. Boots, 38-46 Eastgate Street. Tel: 0452 423501.

HAMPSHIRE

Basingstoke. Fishers, 2-3 Market Place. Tel: 0256 22079.
Southampton. Business Electronics, Micromagic At Atkins, 7 Civic Centre Road. Tel: 0703 25903.
Southampton. Tyrrell & Green, Above Bar. Tel: 0703 27711.

HERTFORD

Hitchin. County Computers, 13 Bucklebury. Tel: 0462 36757.
Hitchin. GK Photographic & Computers, 68 Hermitage Road. Tel: 0462 59285.
Potters Bar. The Computer Shop, 197 High Street. Tel: 0707 44417.
Stevenage. DJ Computers, 11 Town Square. Tel: 0438 65501.
Watford. Laskys, 18 Charter Place. Tel: 0923 31905.
Watford. SRS Microsystems, 94 The Parade, High Street. Tel: 0923 26602.
Watford. Trewins, Queens Road. Tel: 0923 44266.
Welwyn Garden City. DJ Computers, 40 Fretherne Road. Tel: 96 28444.
Welwyn Garden City. Welwyn Department Store. Tel: 0707 323456.

HUMBERSIDE

Beverley. Computing World, 10 Swabys Yard, Dyer Lane. Tel: 0482 881831.

KENT

Beckenham. Supt Computers, 425 Croydon Road. Tel: 01-650 3569.

Bexleyheath. Laskys, 15-16 Broadway Shopping Centre. Tel: 01-301 3478.
Bromley. Boots, 148-154 High Street. Tel: 01-460 6688.
Bromley. Computers Today, 31 Market Square. Tel: 01-290 5652.
Bromley. Laskys, 22 Market Square. Tel: 01-464 7829.
Bromley. Walters Computers, Army & Navy, 64 High Street. Tel: 01-460 9991.
Chatham. Boots, 30-34 Wilmott Square, Pentagon Centre. Tel: 0634 405471.
Sevenoaks. Ernest Fielder Computers, Dorset Street. Tel: 0732 456800.
Sittingbourne. Computer Plus, 65 High Street. Tel: 0795 25677.
Tunbridge Wells. Modata Computer Centre, 28-30 St Johns Road. Tel: 0892 41555.

LANCASHIRE

Blackburn. Tempo Computers, 9 Railway Road. Tel: 0254 691333.
Blackpool. Blackpool Computer Store, 179 Church Street. Tel: 0253 20239.
Burnley. IMO Business Systems, 39-43 Standish Street. Tel: 0282 54299.
Preston. 4Mat Computing, 67 Friargate. Tel: 0772 561952.
Preston. Laskys, 1-4 Guildhall Arcade. Tel: 0772 24558.
Wigan. Wildings Computer Centre, 11 Mesnes Street. Tel: 0942 44382.

LEICESTERSHIRE

Leicester. Boots, 30-36 Gallowtree Gate. Tel: 0533 21641.
Market Harborough. Harborough Home Computers, 7 Church Street. Tel: 0858 63056.

LONDON

W1. Computers of Wigmore Street, 104 Wigmore Street. Tel: 01-486 0373.
W1. HMV, 363 Oxford Street. Tel: 01-629 1240.
W1. John Lewis, Oxford Street. Tel: 01-629 7711.
W1. Laskys, 42 Tottenham Court Road. Tel: 01-636 0845.
W1. Lion House, 227 Tottenham Court Road. Tel: 01-637 1601.
W1. Rother Cameras, 256 Tottenham Court Road. Tel: 01-580 5826.
W1. The Video Shop, 18 Tottenham Court Road. Tel: 01-580 5380.
W1. Walters Computers, DH Evans, Oxford Street. Tel: 01-629 8800.
WC1. Transam Micro Systems, 59-61 Theobalds Road. Tel: 01-405 5240.
W5. Laskys, 18-19 Ealing Broadway Shopping Centre. Tel: 01-567 4717.
W8. Walters Computers, Barkers, Kensington High Street. Tel: 01-937 5432.
SW1. Peter Jones, Sloane Square. Tel: 01-730 3434.
SE9. Square Deal, 373-375 Footscray Road, New Eltham. Tel: 01-859 1516.
Lewisham. Laskys, 164 High Street. Tel: 01-852 1375.
SE13. Walters Computers, Army & Navy, 33 and 63 High Street, Lewisham. Tel: 01-852 4321.
SE15. Castlehurst Ltd, 152 Rye Lane, Peckham. Tel: 01-639 2205.
EC2. Devon Computer Centre, 155 Moorgate. Tel: 01-638 3339.
N7. Jones Brothers, Holloway Road. Tel: 01-607 2727.
N14. Logic Sales, 19 The Bourne, The Broadway, Southgate. Tel: 01-882 4942.
NW3. Maycraft Micros, 58 Rosslyn Hill, Hampstead. Tel: 01-431 1300.
NW4. Davinci Computer Store, 112 Brent Street, Hendon. Tel: 01-202 2272.
NW7. Computers Inc, 86 Golders Green. Tel: 01-209 0401.
NW10. Technomatic, 17 Burnley Road, Wembley. Tel: 01-208 1177.

MANCHESTER

Manchester. Boots, 32 Market Street. Tel: 061-832 6533.
Manchester. Laskys, 61 Arndale Centre. Tel: 061-833 9149.
Manchester. Laskys, 12-14 St Marys Gate. Tel: 061-833 0268.
Manchester. Mighty Micro, Sherwood Centre, 268 Wilmslow Road, Fallowfield. Tel: 061-224 8117.

Manchester. NSC Computer Shops, 29 Hanging Ditch. Tel: 061-832 2269.
Oldham. Home & Business Computers, 54 Yorkshire Street. Tel: 061-633 1608.
Swinton. Mr Micro, 69 Partington Lane. Tel: 061-728 2282.

MERSEYSIDE

Heswall. Thornguard Computer Systems, 46 Pensby Road. Tel: 051-342 7516.
Liverpool. George Henry Lee, Basnett Street. Tel: 051-709 7070.
Liverpool. Hargreaves, 31-37 Warbreck Moor, Walton. Tel: 051-525 1782.
Liverpool. Laskys, Dale Street. Tel: 051-236 3298.
Liverpool. Laskys, St Johns Precinct. Tel: 051-708 5871.
St Helens. Microman Computers, Rainford Industrial Estate, Mill Lane, Rainford. Tel: 0744 885242.
Southport. Central Studios, 38 Eastbank Street. Tel: 0704 31881.

MIDDLESEX

Enfield. Laskys, 44-48 Palace Garden Shopping Centre. Tel: 01-363 6627.
Harrow. Camera Arts, 42 St Anns Road. Tel: 01-427 5469.
Hounslow. Boots, 193-199 High Street. Tel: 01-570 0156.
Teddington. Andrews, Broad Street. Tel: 01-977 4716.
Twickenham. Twickenham Computer Centre, 72 Heath Road. Tel: 01-892 7896.
Uxbridge. JKL Computers, 7 Windsor Street. Tel: 0895 51815.

NORFOLK

Norwich. Bonds, All Saints Green. Tel: 0603 24617.

NOTTINGHAMSHIRE

Sutton in Ashfield. HN & L Fisher, 87 Outram Street. Tel: 0623 54734.
Nottingham. Jessops, Victoria Centre. Tel: 0602 418282.
Nottingham. Laskys, 1-4 Smithy Row. Tel: 0602 413049.

OXFORDSHIRE

Abingdon. Ivor Fields Computers, 21 Sturt Street. Tel: 0235 21207.
Banbury. Computer Plus, 2 Church Lane. Tel: 0295 55890.
Oxford. Science Studio, 7 Little Clarendon Street. Tel: 0865 54022.

SCOTLAND

Edinburgh. Boots, 101-103 Princes Street. Tel: 031-225 8331.
Edinburgh. John Lewis, St James Centre. Tel: 031-556 9121.
Edinburgh. Laskys, 4 St James Centre. Tel: 031-556 1864.
Glasgow. Boots, 200 Sauchiehall Street. Tel: 041-332 1925.
Glasgow. Boots, Union Street and Argyle Street. Tel: 041-248 7387.

SHROPSHIRE

Telford. Telford Electronics, 38 Mall 4. Tel: 0952 504911.

STAFFORDSHIRE

Newcastle-under-Lyme. Computer Cabin, 24 The Parade, Silverdale. Tel: 0782 636911.
Stafford. Computerama, 59 Foregate Street. Tel: 0785 41899.
Stoke-on-Trent. Computerama, 11 Market Square Arcade, Hanley. Tel: 0782 268524.

SUFFOLK

Bury St Edmunds. Boots, 11-13 Cornhill. Tel: 0284 701516.
Ipswich. Brainwave Micros, 24 Crown Street. Tel: 047 350965.

SURREY

Croydon. Laskys 77-81 North End. Tel: 01-681 8443.
Croydon. The Vision Store, 96-98 North End. Tel: 01-681 7539.
South Croydon. Concise Computer Consultants, 1 Carlton Road. Tel: 01-681 6842.
Epsom. The Micro Workshop, 12 Station Approach. Tel: 0372 721533.
Guildford. Walters Computers, Army & Navy, 105-111 High Street. Tel: 0483 68171.
Haslemere. Haslemere Computers, 17 Lower Street. Tel: 0428 54428.
Wallington. Surrey Micro Systems, 53 Woodcote Road. Tel: 01-647 5636.
Woking. Harpers, 71-73 Commercial Way. Tel: 0486 225657.

SUSSEX

Bexhill-on-Sea. Computerware, 22 St Leonards Road. Tel: 0424 223340.
Brighton. Boots, 129 North Street. Tel: 0273 27088.
Brighton. Games, 71 East Street. Tel: 0273 728681.
Brighton. Laskys, 151-152 Western Road. Tel: 0273 725625.
Crawley. Gatwick Computers, 62 The Boulevard. Tel: 0293 37842.
Crawley. Laskys, 6-8 Queensway. Tel: 0293 544622.

TYNE & WEAR

Newcastle-upon-Tyne. Bainbridge, Eldon Square. Tel: 0632 325000.
Newcastle-upon-Tyne. Boots, Eldon Square. Tel: 0632 329844.
Newcastle-upon-Tyne. Laskys, 6 Northumberland Street. Tel: 0632 617224.
Newcastle-upon-Tyne. RE Computing, 12 Jesmond Road. Tel: 0632 815580.

WALES

Aberdare. Inkey Computer Services, 70 Mill Street, The Square, Trecony. Tel: 0685 881828.
Aberystwyth. Aberdata at Galloways, 23 Pier Street. Tel: 0970 615522.
Cardiff. Boots, 26 Queens Street & 105 Frederick Street. Tel: 0222 31291.
Cardiff. P & P Computers, 41 The Hayes. Tel: 0222 26666.
Swansea. Boots, 17 St Marys Arcade, The Quadrant Shopping Centre. Tel: 0792 43461.

WARWICKSHIRE

Coventry. Coventry Micro Centre, 33 Far Gosford Street. Tel: 0203 58942.
Coventry. JBC Micro Services, 200 Earlston Avenue, North Earlston. Tel: 0203 73813.
Coventry. Laskys, Lower Precinct. Tel: 0203 27712.
Leamington Spa. IC Computers, 43 Russell Street. Tel: 0926 36244.
Leamington Spa. Leamington Hobby Centre, 121 Regent Street. Tel: 0926 29211.
Nuneaton. Micro City, 1a Queens Road. Tel: 0203 382049.
Rugby. OEM Computer Systems, 9-11 Regent Street. Tel: 0788 70522.

WEST MIDLANDS

Birmingham. Boots, City Centre House, 16-17 New Street. Tel: 021-643 7582.
Birmingham. Laskys, 19-21 Corporation Street. Tel: 021-632 6303.
Dudley. Central Computers, 35 Churchhill Precinct. Tel: 0384 238169.
Stourbridge. Walters Computer Systems, 12 Hagley Road. Tel: 0384 370811.
Walsall. New Horizon, 1 Goodall Street. Tel: 0922 24821.
West Bromwich. D S Peakman, 7 Queens Square. Tel: 021-525 7910.
Wolverhampton. Laskys, 2 Wulfrum Square. Tel: 0902 714568.

YORKSHIRE

Bradford. Boots, 11 Darley Street. Tel: 0274 390891.
Leeds. Boots, 19 Albion Arcade, Bond Street Centre. Tel: 0532 33551.
Sheffield. Cole Brothers, Barkers Pool. Tel: 0742 78511.
Sheffield. Laskys, 58 Leopold Street. Tel: 0742 750971.
York. York Computer Centre, 7 Stonegate Arcade. Tel: 0904 641862.



Contents

Mike Wright assesses new packages for Spectrum and QL on page 103, and there are more goodies in the Shop Window on page 104.

SINCLAIR BUSINESS USER

Transform top

REFERRING to the letter 'Transform Warning' in your January 1985 issue, I feel that Mr Delby has been remarkably unfortunate with his professional keyboard from Transform. I bought one some months ago and had no problems except for an occasional jump in picture response.

The letter enclosed by Transform said that I might have problems with Spectrum Issue Three, which I have, and following a most helpful phone conversation, I purchased the recommended buffer — delivered in under 24 hours. Since then I have had perfect results from my keyboard and Spectrum — including microdrive, printer, **Tasword II**, **Masterfile**, **Tasmerge** and so on.

Would that more suppliers were as co-operative as Transform.

M G Miller,
Chertsey,
Surrey.

IN ANSWER to L S Delby, who condemns the Transform keyboard, I have such a keyboard and have experienced no problems whatsoever.

He should realise that no matter how strict quality control is, the odd defective unit does escape detection.

If he had looked at past issues of *Sinclair User* he should have noticed that in the June 1984 edition, in the

review of keyboards, it was stated that there were some problems with the keyboard when used with Issue Three Spectrums, so he had been forewarned.

I recommend all readers considering buying a keyboard to consider strongly the Transform keyboard; it is excellent.

Derek Easton,
Falkirk,
Scotland.

Spreadsheet satisfaction

I READ in the January issue the letter from W L Simpson and it prompts me to write, not just on that particular question, but generally on the Spectrum.

My company has Olivetti and Tandy computers, which I use regularly; but on a number of occasions I have used my Spectrum for

the development of new systems.

This letter was typed on a 48K Spectrum using **Tasword II**, which I have also used for producing a small mail-shot. I also use **Omnicalc** for our annual budget, and in addition have recently devised a computer estimating system.

Probably the best business program for the Spectrum is Campbell's **Masterfile**. I am using this program to develop an order entry system and related production list.

So the answer to Mr Simpson is that **Omnicalc** is a reliable and useful tool. The Spectrum is capable of excellent work and will give real benefits to any serious business user.

M A Harris,
Edenbridge,
Kent.

I NOTED with interest the letter from W L Simpson since I am also a church

treasurer and employ a 48K Spectrum in connection with that task.

I find the Campbell **Masterfile** package best because although it is not a true spreadsheet — one does need a pencil from time to time — that is balanced by the ease of creating records coupled with the ability to total by category.

I handle accounts bearing upwards of 600 entries each year and certainly the Spectrum with **Masterfile** has made the preparation of interim and final balance sheets very much quicker. It is also easy at finance committee meetings to find specific items.

While on the subject I have written programs in both Basic and Pascal — using the Hisoft compiler — to compile figures for the recovery of income tax relating to deeds of covenant.

E W Bromley,
Biggleswade,
Buckinghamshire.

Unjustifiable criticism?

I WAS interested to see your review of Wafadrive and **Spectral Writer** in the December issue, and I agree with most of your reviewer's comments. However, he was wrong when he said that you cannot justify a paragraph at a time with **Spectral Writer**. The AND command is used to reform a single paragraph with **Spectral Writer**, exactly as the STEP command is used in **Tasword**.

I have found only one problem with **Spectral**, and perhaps a reader may be able to help me. I was able to add another option to the **Tasword** menu, to allow for printing multiple copies of reports without having to return to the menu and printing option after each copy. It is just a simple FOR — NEXT loop which repeats the printing process a specified number of times. Provided you enter a form

feed printer control at the end of the last page of your text, it works perfectly.

A similar arrangement will not work with **Spectral**, because it prints from the cursor to the end of the file, and after the first printing the cursor stays at the end of the text until you return to the text file option.

Carol Brooksbank,
14, Willow Grove,
Tile Hill,
Coventry CV4 9EP.

TRANSFORM LTD.

Business Software

Are you taking your Spectrum seriously?



£69.95
plus
£2.00 p&p

The Transform Keyboard transforms your Spectrum into a fully operational professional machine.

- Will incorporate micro-drive interface and power supply
- 60 keys including fullsize space bar
- Large ENTER key
- Full stop, comma, semi-colon, colon, single delete and edit keys
- On/off switch with LED
- Easy installation – no soldering required
- Black anodised case
- Now with 3 colour printed key tops
- EMODE key

"Its price of £69.95 reflects the kind of use to which it will be put but it is certainly the top keyboard at the moment."

SINCLAIR USER JUNE 1984

Business Software

Business Bank Account £10.75

This program will enable you to enter debits under 17 different subheadings. Statements include totals of all subheadings.

Sales Day Book £10.75

For all your invoices, this program will enable you to prepare statements of outstanding invoices. Program will also calculate VAT.

Purchase Day Book £10.75

Keeps a complete record of all your purchases under 17 different subheadings. This program also calculates VAT.

Business Pack £25.00

Including all the above programs.

Stock Control £10.75

Handles 900 lines, including details of supplier. Program has full search facilities enabling you to search and update all lines from one supplier.

Invoicing £15.00

This program will print out invoices, calculates discounts and VAT. The program will calculate totals from unit prices. Up to 50 accounts with 250 outstanding invoices.

Word Processing by Tasman £13.90

Tasword Two is a powerful word processing program that will perform all the functions available on large processors. The program will give you 64 characters per line on screen.

Masterfile by Campbell Systems £15.00

This is one of the best database programs available for the ZX Spectrum. This program has many uses in a small business.

Dlan by Campbell Systems £7.95

Use your Spectrum to sell your products. Dlan will display messages in up to 11 different typefaces. Will scroll text in any direction.

64 Column Generator by Tasman £5.50

You can use this program within your other programs to display 64 columns on screen.

Payroll by Byte One £19.95

This payroll program will handle up to 40 employees and will calculate NIC, PAYE, super-annuation and many other deductions. This is a very user friendly program and extremely good value.

NEW

Sales/Purchase Ledger Invoicing £25.00

This program is for use on micro-drive only. The program will print an invoice using a built-in price list and post the invoice to your customer's account. Will also print price lists, statements, labels etc.

Tasmerge £10.95

Allows you to transfer data from Masterfile into Tasword enabling you to use Tasword for mail merge. The program allows you to specify line and column of each field. For use on micro-drive only.

Superfile £14.95

This is a new database program that stores pages of text 64 columns x 22 rows. The program includes word processing and full search facilities.

Omnicalc 2 £14.95

This is the long-awaited micro-drive version of omnicalc complete with histograms and many other features.

Projector 1 £13.90

Business graphics program that will help you present your cashflow, sales expenditure in many different ways including pie line, and histogram charts.

Tasprint £9.90

Use this program with Tasword Two to produce 5 different fonts on a dot matrix printer.

MF-Print £6.95

Enables you to set a print format for your full-size printer within masterfile. Supplied complete with masterfile for £19.95.

Trans Express £9.95

Micro-drive utility program which will enable you to backup all your micro-drive cartridges.

Now in stock

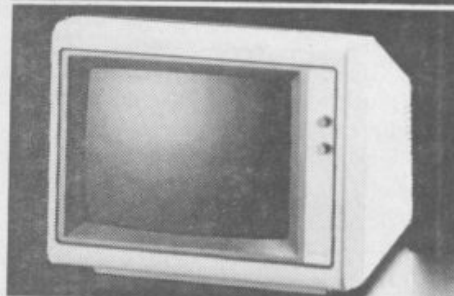
Blank micro-drive cartridges **£4.95**
Continuous paper **£12.99**
Printer ribbons from **£3.50**

QL

Centronics Interface **£39.95**
QL Dust Cover **£5.00**

Transform can supply a wide range of printers, monitors, and leads for the QL. For further details send S.A.E.

Monitors



It is possible to connect your Spectrum to both Black/Green and composite Video monitors using high resolution monitors are particularly useful with programs like Tasword that use 64 columns. We supply complete instructions on how to connect monitors to both Issue Two and Issue Three Spectrums. These monitors can also be connected to your QL.

Phillips black and green **£75.00**
Kaga/Taxan black and green **£99.95**
Sanyo Med res for QL **£273.60**

Printers

All the software we supply runs on full-size printers (unless you are using interface 1) you will require an interface to connect your Spectrum to a printer, the interface we supply uses the graphics characters to set printer codes as in Tasword and prints a double size screen dump.

Centronics/RS232 Interface **£45.00**

Dot matrix printers

Brother HR5 **£132.00**
Brother M1009 **£163.00**
Star Gemini 10x **£199.00**
Epson RX80 FT **£229.00**
Epson FX80 **£324.00**

Daisywheel printers

Smith-Corona TP I **£189.00**
Silver Reed EXP500 **£284.00**
Brother HR15 **£349.44**

Please add **£5.00** delivery plus VAT to the price of printers and monitors. All software prices include VAT, post and packing.



TRANSFORM LTD. (Dept. SU) **01-658-6350**
41, Keats House, Porchester Mead, Beckenham, Kent.



Sending circulars the easy way

Documents from files: Mike Wright finds the latest software package wanting

A NEW PIECE of independent business software for the QL has arrived — **Quilmerg**, produced by Pitch Associates. It attempts to fill a space left by the original Psion package and is designed to merge database fields stored in an **Archive** file into a document created by the word processor **Quill**.

The program is written in SuperBasic and will handle documents about three pages long and with up to 15 different fields. Each field is restricted to a maximum of 25 characters.

Before **Quilmerg** is used two separate files must be produced, one of which contains the selected records from **Archive**. Once the required records have been selected they are written to a file using the Export command. Apart from the restrictions mentioned above, the fields must be character fields — they must end with a sign — and their names must be less than 15 characters long.

The second file contains the document. It is created using the print option in **Quill** and typing in the name of a microdrive file when **Quill** suggests printing to a printer. The blank document is typed in as normal but where a field is to be merged from the **Archive** file the name of the field is typed in surrounded by `<` and `>`.

The first disadvantage is that **Quilmerg** will not reformat the document after the fields have been inserted. That means, effectively, that the field name inside the brackets must be padded out to the length of the longest record. That in turn produces unsightly gaps for data with fewer characters and makes it difficult to use with text that is centred or right justified.

Quilmerg is loaded using the 'Irun' command. The option of loading directly from the F1 Monitor/F2 Television option has not been provided. Once run **Quilmerg** asks for the file names of the text and merge (database) files. It also allows various parameters to be set. Those include the printer baud rate, the serial port to be used, the type of paper and the

number of lines per page and characters per line.

Once the parameters have been set the program searches for the first record and displays it on the screen. You then have the option of printing the text using the record or of moving onto the next record in the file. If the print option is selected the data is merged with the text file and printed.

Once all the records have been dealt with, the message 'Quilmerg complete' is displayed and an analysis of the number of records read, printed and reprinted is shown.

The program, however, remains something of a curate's egg. The program is easy to use and certainly

fills a void, yet it leaves a disappointed feeling. That may be due to the limitations on the fields and the gaps left by not reformatting the text.

Other aspects indicate a lack of thought in the preparation of the program, such as the title screen. That is fine if the program is loaded from TV mode but if you are in Monitor mode it is squashed into the right-hand window with the consequent overflow. Another minor but irritating point is at the end of the merge, when you are dumped into SuperBasic and have to enter 'run' instead of being given the option of another run or going to SuperBasic.

Despite those disadvantages it should be pointed out that it is the only program available to fill this gap and it is certainly easier to send out circular letters this way rather than manually inside **Quill**.

QUILMERG

Pitch Associates, 39 Rockleigh Avenue, Leigh-on-Sea, Essex
Price: £12.50
Gilbert Factor: 5

Electrifying efficiency in office automation?

A four-in-one package attempts to ease the monotony of general administration

EVEN IF your office comprises only one filing cabinet, a battered Remington, a desk and telephone, attempting to run it from a single 48K program is unlikely to make the difficult task of office automation any easier.

Electric Office from Fisher Software, however, is a suite of four programs on one cassette which tries to do just that. The programs consist of a word processor, mailing list, graph plotter and diary.

The programs are written in Basic and each one occupies about 7K. They are linked by a header program which is used to load any one of them. There is no provision for loading one program from another; each time you want to use one of the other programs you must clear the memory and again load the header.

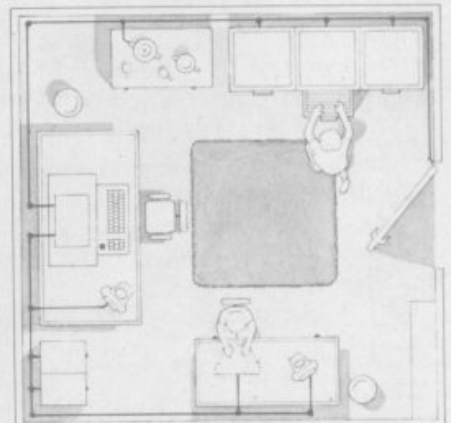
The 'manual' consists of two A4 sheets and contains little more than the message that the programs are self-explanatory and that demonstration files are held on side two of the cassette — unfortunately absent on

the review copy. The header program graphically displays a desk, chair and blackboard. The instructions are displayed, unclearly on the blackboard.

The mailing list is run by a seven-option menu which allows names, addresses and telephone numbers to be added, deleted or listed. Despite seven options the prompt on the bottom of the screen is to press keys 1 to 6.

Adding a name is easy: select option

continued on page 104



continued from page 103

1 and type in the name and address, remembering to separate the different lines by a colon. The program tells you that you may only use 60 characters but the manual quotes 100; neither mentions that you are further restricted in the number of characters per line or that a name and address must contain at least one colon.

Deleting and listing a name can be done by specifying either the record number, the name or the road. Your choice in naming files which you want to save is restricted to giving a number from 1 to 9. The program prefixes it automatically with "M.list:".

The word processor is woefully inadequate for nearly every use which can be imagined. It is run from a menu with seven options which allow text to be entered, printed, saved, loaded, wiped or displayed on screen. The seventh option clears both program and data from memory.

As new text is entered the last two lines only are displayed. ENTER is used, as usual, to start a new paragraph, but is only shown as a special character — a reverse arrow — in the text. Text can be inserted at any point by using CAPS SHIFT 1 to move to the required line, inserting a number

of blank spaces and then typing in the text. Excess blanks can then be deleted using CAPS SHIFT 0.

The graph plotter can draw bar charts, line graphs or both together with up to 30 — though the manual says 32 — values or columns. Before the data is entered the screen colour, number of values, maximum and minimum values and a title must all be entered. The program then prompts for each value in turn, checking to make sure that it is within the specified range. As it is entered the value is plotted. Although the program is easy to use there are several major omissions, including the ability to edit data once it has been entered. That entails having to start afresh every time you make a mistake.

The diary is probably the best of the four programs. It enables you to make an entry for any date in any order. The entries can then be recalled by date or by listing them for a particular month. A list of the dates for which entries have been made can be displayed and the usual save and load functions complete the options.

Making an entry into the diary involves entering the date. The only error trapping seems to be on the year, where two digits must be entered. In

all cases any mixture of two numbers and/or letters is acceptable. The entry to the diary is typed in normally with the only restriction on size being the amount of memory left.

When a date is entered, even one which does not exist, the program checks to see if an entry for that particular date has been made. If so, then it prompts for you to take the "recall an entry" choice and add the extra information.

Electric Office is a set of programs which could be useful but has been written and presented very carelessly. Of the four programs the diary is the best and is possibly a better word processor than the dedicated one. The mailing list can have few practical uses since the names cannot be merged into letters produced on the word processor. The graph plotter is easy to use but requires data preparation beforehand; care is necessary to ensure the data is entered correctly.

Mike Wright

ELECTRIC OFFICE
Fisher Software, 47 London Road,
Buxton, Derbyshire
Memory: 48K
Price: £4.50 mailorder
Gilbert Factor: 4

SHOP WINDOW



SHOP WINDOW IS a regular service to Sinclair User readers to enable you to publish details of specialist programs with limited markets. Details of such programs will only appear once in Sinclair Business User, at no charge. If readers would like details to appear regularly they should advertise in Sinclair Supermart.

Computer Estimating Versatile program for use by any section of industry who prepare multi-item tenders containing rates built up from component parts and/or part use of subcontractors quotes. Can cope with up to 300 items. 48K Spectrum. SAE to A Macdonald, 8, Loch Place, South Queensferry, West Lothian.

Duplicate Bridge Computer scoring for the Spectrum 48K. Allows for up to 36 boards and from 4 to 250 teams, as well as catering for Howell, Mitchell or individual competitions. The program checks the scores on each hand and gives cumulative totals to date and instantaneous final placings, which can be copied to your printer. £25.00 from R F Wheen, The Grange, Rectory Lane, Buckland, Betchworth, Surrey.

Occurance Chart. Spectrum 48K. A histogram program

to record and store four years of events in monthly charts. Each block of the bars can contain any character, including user-definable, so differing events can be identified. Colour, sound, user-definable key and print-out options are included. Suggestions for use: weather, test results, crime and accident records, sales figures, sickness reports, bird spotting. £5.00.

Telephone charge. Spectrum (16K and 48K). Automatically records a running cost whilst you make a telephone call, with digital clock, time elapsed, name of caller, and date. £4.00.

Questionnaire. Spectrum 48K. Easily-entered results from a questionnaire with three answers for each question. Displays results in table form and histogram, with two lists for additional suggestions. Allows for four classes of persons' answers to be compared. Initially set for 60 questions, with printout facility. £4.00.

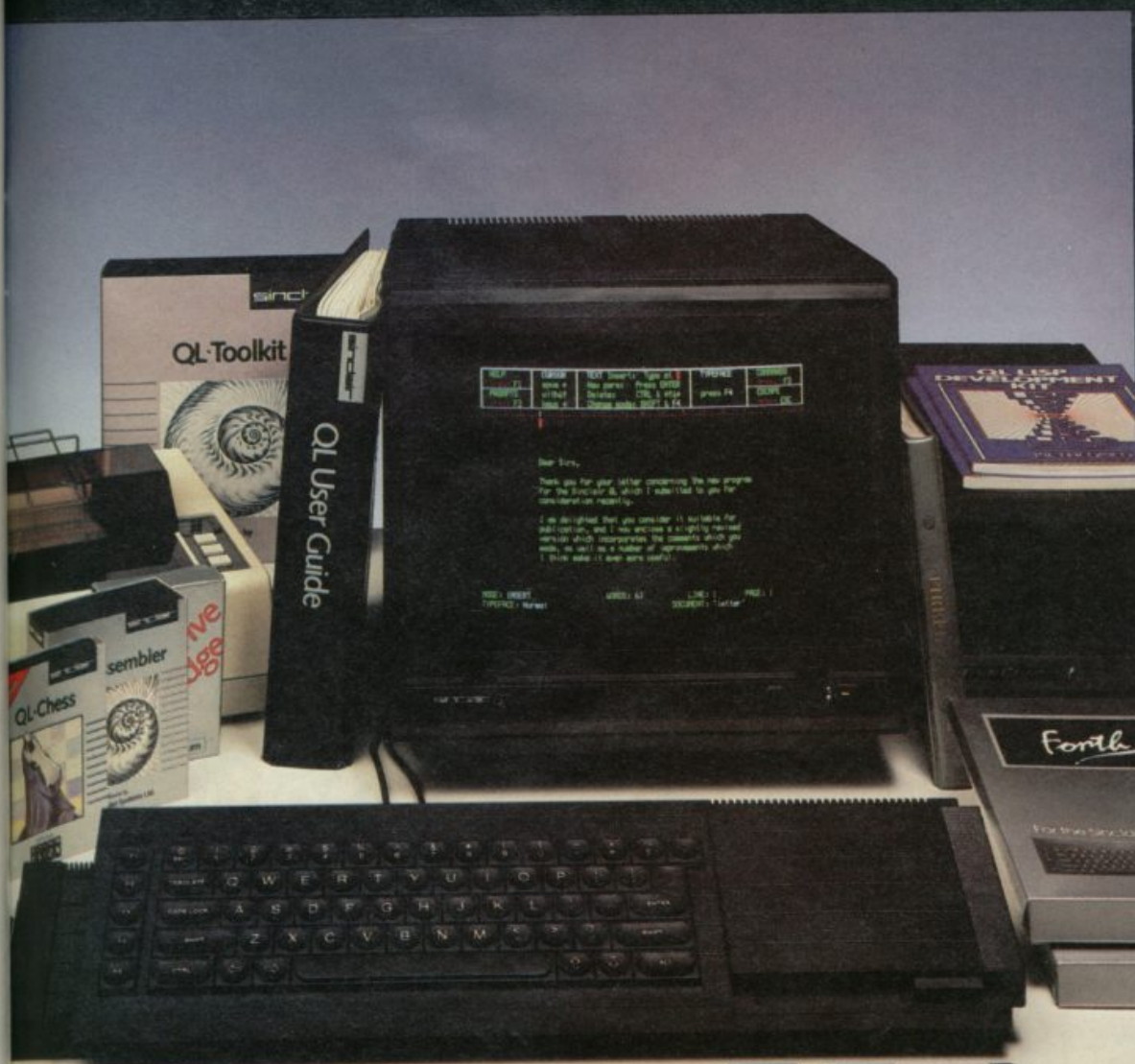
Box Flow Chart Designer Spectrum 48K. With vertical scrolling. When completed the chart can be used one box at a time with the ENTER key for lectures, or automatically for continuous displays. Will make 400 entries, as one or more charts. £5.00.

All programs are available from B M Wornham, 20 The Parklands, Droitwich, Worcs. WR9 7DG.

Sail Racing. A range of seven microdrive-compatible Spectrum programs which cover all the calculations required for handicapping, corrected times, performance indicators, series racing, with a database covering membership of a sailing club. £6.50 each inc. p&p from John Caine, 4 Birch Hill Avenue, Onchan, Isle of Man.

News from the world of
Sinclair QL computing.

QL NEWS



One year old... and look how we've grown!

When we launched the QL last year, we knew we were starting a revolution.

For the first time, the serious computer hobbyist could afford the same power and performance as the professional computer user.

A year later, and the QL is more than a unique computer, it's the heart of a unique system.

And the next 12 months promise even more for QL owners... new software options, extra storage devices, printers, monitors...

Read on, and see how far we've come, and how much further we're going!

Nº1



NIGEL SEARLE

Now it's the quantum leap for QL software and peripherals

Without doubt, the QL was the computer innovation of 1984. Launched to outstanding reviews, it soon gathered thousands of happy owners, and recognition from people like ICL, who have incorporated QL technology and its Microdrives into the new One Per Desk.

The quickest glance at the QL's specification shows what the fuss was all about...128K RAM, 32-bit processor architecture, 200K built-in mass storage, bundled software. They're features that would normally cost you three or four times as much!

But that's only half the story, because the QL is now the heart of a computer system, with a growing library of software...

As you'll see from these pages, 1985 is the year of the quantum leap for software and peripherals. Already there are no less than five QL languages together with special programs for software developers, a world-beating chess game... and much more on the way!

On the hardware side, there's a special QL monitor to make the most of that high-resolution 512 x 256 pixel display. There

are memory expansion boards, Winchester disk drives, printers, and low-cost Microdrive cartridges.

In fact, there's so much going on, we'll be running these regular Newsletters just to keep you in touch!

If you already own a QL, the next few pages will give you a taste of the exciting year ahead.

And if you don't... take a look at what you're missing. It should be all the persuasion you need!

Now read on...the quantum leap into serious computing starts here.

Nigel Searle, Managing Director, Sinclair Research Limited.



From sophisticated business packages to superb animated games... QL software makes the most of the computer's extraordinary specification.

New QL Software

Utilities, languages, games and business packages...with more on the way!

Two things are now certain about QL software. First, there's going to be plenty of it. And second, it's going to set completely new standards for microcomputers...

At the moment, there are well over 100 software programs in development. And the first

software releases, shown here, demonstrate how exceptional the best QL software will be.

The QL already has five languages, superb programs for software developers, a top quality accounting package and in QL Chess it has its first game.

QLUB: 10,000 members and growing!

QLUB is the special Users Bureau for Sinclair QL owners. There are now well over 10,000 QLUB members, and membership is growing all the time.

For their annual subscription of £35, QLUB members are enjoying a whole range of information and advisory services, exclusive offers and special discounts.

One of the most important QLUB benefits is the special news magazine, appearing six

times a year. The magazine provides a forum for QL owners to exchange views and keep in touch with all the latest developments.

Each issue is packed with updates on QL hardware and software, tips on applying the four QL Programs, and news of how other people are using the QL. QLUB members also receive a range of special discounts, with savings of at least 20% on selected software products.

Current special offers include:
QL Chess for £14.95
QL Toolkit for £19.95

QL Assembler for £31.95
QL Cash Trader for £54.95
Special subscription rates for Personal Computer News and QL User.





The multilingual Sinclair QL

BCPL – a forerunner of C, BCPL has been described as a systems programmer's delight. In the words of QL User, this compiler is a 'brilliant compromise between a high-level language and a low-level systems language'. Whilst not for beginners, this is an essential buy for anyone with a good knowledge of systems programming. Complete with manual.

Available from
Metacomco – £59.95.
Tel: 0272 428781.

LISP – already well-known for its artificial intelligence appli-

cations, LISP is a powerful and versatile language. This is a sophisticated implementation of LISP, by one of its leading exponents, Dr Arthur Norman. This package features full QL graphics, and a full manual is supplied.

Available from
Metacomco – £59.95.
Tel: 0272 428781.



Pascal – probably the most popular high-level language of all. Pascal is particularly well-suited to structured programming, sophisticated data manipulation and algorithmic problems. Pascal interpreter complete with 87-page manual.

Available from
Computer One – £39.95.
Tel: 0223 862616.



Forth – this 'new generation' language is proving both popular and easy to learn. The program provides a full implementation of the latest Forth 83 standard with graphics and sound extension.

Available from
Computer One – £29.95.
Tel: 0223 862616.

APL – the compact mathematics-based interpreted language designed for scientists and mathematicians.

APL keyword interpreter complete with manual.

Available from
MicroAPL – £99.95.
Tel: 01-622 0395.

Programmer's packs

QL Assembler – two programs operating in tandem. The first is a full-screen editor for creating and altering program files. The second, a Motorola-format compatible 68000 assembler which converts source files written in M68000 assembly language into machine code files which can run on the QL.

Both assembler and editor are written in machine code and can be multi-tasked with SuperBASIC, so you can switch

between editor, assembler and SuperBASIC instantly.

Written by GST Computer Systems – £39.95.*

QL Toolkit – a programmer's toolkit with over 70 programs, and extensions to SuperBASIC. Most are linked to SuperBASIC initially and can then be used from commands or from within a program. Enhancements include printer spooling (print a file while running a SuperBASIC program); improved file access (with full random input/output command); job control (allows management of multi-tasking programs including the ability to display, alter priorities, and delete jobs from the QL); and SuperBASIC screen editor.

Written by Q Jump – £24.95.*

World-beating chess!

QL Chess – fresh from its victory at the World Microcomputer Chess Championship. This program sets a completely new standard for games software.

There's a high resolution display, animated 3-D graphics, and 28 levels of play from novice to champion. Features include an openings book of nearly 4000 moves, HINT and TAKEBACK functions that help you learn from your mistakes, and the option to play a human opponent or the computer.

Written by Psion – £19.95.*

Software at work

QL Touch 'n' Go – a unique approach to learning touch-typing skills. The program is designed to give you mastery of the standard QWERTY keyboard in just 24 hours. With practice, you should soon reach 40 words per minute, with over 95% accuracy.

Written by Harcourt – £24.95.*

QL Cash Trader – a unique computerised book-keeping system for small businesses. The program provides a complete course in the principles of accountancy, and goes on to become an essential aid in the day-to-day running of a business. Complete with comprehensive manual.

Written by Accountancy Software of Torquay – £69.95.*

*This title is available from
Sinclair Research on
0276 686100, and selected
Sinclair stockists nationwide.

Psion troubleshooting service

All QLUB members can obtain special assistance from Psion on using the QL Quill, Abacus, Archive and Easel programs supplied with the computer. Psion will normally answer any queries within 48 hours.

Free updates

QLUB members will also receive one free update of each of the four QL Programs – incorporating many new developments.

New QL Hardware

An industry is born

From the moment of its launch, the revolutionary QL attracted massive interest from all quarters.

In one area, the interest quickly turned to action, as high-tech hardware manufacturers realised the immense potential of the QL for vast expansion, for system development and for

widespread networking. Already the list of peripherals for the QL is very exciting – and lengthening by the day!

Here, we've covered many of the latest, most important developments.

As more appear, be sure to keep in touch with QL News!



The dedicated Sinclair Vision QL monitor

Once you see the incredible graphics capabilities of the QL you may decide an ordinary TV just can't do them justice.

If that's the case, a high-resolution monitor is needed. (And if you're creating presentation-quality charts, for example, it's quite essential.)

The new Vision QL monitor is specially designed for the computer by Kaga Electronics, with full support from Sinclair Research.

So it exploits the QL's maxi-

mum 512 x 256 pixel resolution to the full, with a pin-sharp 85 column display.

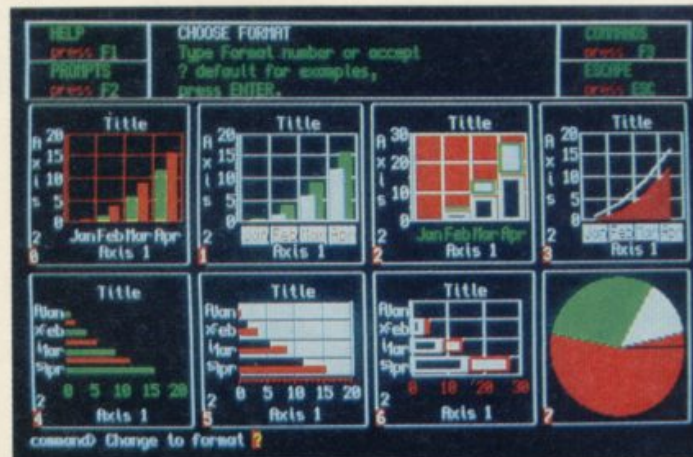
It's also specially styled to suit the QL – in looks, and in use. There's a 12" non-glare tube, and etched screen to diffuse reflections.

So the display is bright, sharp, much easier to look at... and invaluable for those late-night programming sessions!

And like the QL, the Vision monitor is designed with space in mind: it has a compact foot-

print of just 12½" by 15" – no more than a typical portable typewriter.

It's available from MBS Data Efficiency on 0442 60155 and selected Sinclair stockists.



The QL's superb graphics capabilities – as demonstrated by the Sinclair Vision QL monitor.

Microdrive cartridges. Now only £1.99!

Microdrive cartridges are the QL's own unique storage media. Each stores up to 100K of information, on a cartridge no

bigger than a matchbox!

Over 500,000 cartridges are now being used throughout Britain. And QL Microdrives

themselves are standard equipment on the new ICL One Per Desk micro.

Now there's more good news for QL enthusiasts: from February 1, the cost of QL Microdrive cartridges are down from £4.95 to £1.99 each!



Sinclair Microdrive cartridges – up to 100K of programs and data on a medium so compact you can pop it into your pocket.

Powerful hard-disk system

For the QL business user, the new Firefly QL Winchester disk will boost the QL's power in one huge leap.

Designed by Quest, it uses CP/M and offers all the benefits of Winchester technology: fast access, reliability, compact size and quiet operation.

With 7.5 Mb storage, the Quest Firefly is ideal for large databases such as stock or cus-

tomers lists. And at under £1,200, it represents exceptional value for money.

The Firefly will be available very shortly from Quest on 04215 66488.



Winchester hard disk drives supplement your QL's built-in mass storage.

Expansion boards for up to 4 times more memory!

Also from Quest, a simple and inexpensive way to expand the QL's RAM: with memory expansion boards.

These compact units connect to the standard QL expansion port, using the QL's internal power source or, for larger boards, an external power source.

The units range from 64K and 128K RAM boards to massively powerful 256K and 512K RAM boards, so there's something for every user.



Compact expansion boards.

Prices start at £117, and the 512K board is a very cost-effective investment at just £587.

With affordable memory like this, the QL is more than a match for any other micro under £2,000!

Interface options

The QL comes complete with two built-in RS-232C interfaces.

In addition, interfaces for Centronics printers are widely available from manufacturers such as CST, Miracle Systems and Sigma Research... with

prices from only £35.

And that's just the beginning. For attaching scientific and laboratory instruments to the QL, CST even offer an IEEE-488 interface, which can handle up to 16 connected devices simultaneously!



A Centronics interface slips discreetly into place.

Where to find the QL. The Sinclair QL is available at selected branches of Dixons, W H Smith, John Lewis Partnership, Currys, Greens in Debenhams and Ultimate, and larger branches of Boots, John Menzies and specialist computer stores nationwide.

Sinclair, QL, QLUB, and Qdos, are trademarks of Sinclair Research Ltd. Quill, Easel, Archive and Abacus are trademarks of Psion Ltd. Due to the rapid pace of continual product improvement, Sinclair Research Ltd reserve the right to alter specifications at any time.

The spec behind the spectacle

CPU – Central Processing Unit
Fast, powerful Motorola 68008 chip. A second processor, an Intel 8049, controls the keyboard, generates the sound, and acts as an RS-232C receiver.

RAM
128K. Now expandable to 640K.

ROM
48K.

Operating system
Qdos – revolutionary single-user, multi-tasking, windowing operating system.

Storage
Twin built-in QL Microdrives. Up to 100K storage each – transfer rate, up to 15K per second.

Keyboard
Full moving 65-key QWERTY, five function keys, four cursor keys.

Language
Sinclair structured SuperBASIC.

Application software
QL Quill – word processor
QL Abacus – spreadsheet
QL Easel – graphics
QL Archive – database
All four packages supplied with the QL.

Interfaces
Two serial RS-232C interfaces, Microdrive expansion port (up to 6 may be added), ROM cartridge port, local area network, 2 joystick ports, RGB monitor and TV output.

Text screen
Various modes – up to 85 columns by 25 rows on monitor. On TV, up to 60 columns.

Graphics resolution
512 x 256 pixels (four colour),
256 x 256 pixels (eight colour).

Sinclair Research Ltd
Camberley, Surrey, GU15 3BR.
Tel: Camberley (0276) 686100.

sinclair



The Sinclair C5:
Is it reliable?
Is it even safe?
Chris Bourne on
Clive's dream car

PEDAL-POWER THE HI-TECH

THE SINCLAIR C5, a 99lb battery-powered, one-seater tricycle with a white plastic body, seems set to create more noise in the motoring world than John De Lorean and the BL Maestro rolled into one.

There was much advance speculation about the machine, and Sinclair staff remained tight-lipped to the bitter end. A few spectacular leaks proved more or less accurate, but the extent of the marketing support from such worthies as Woolworth and the Electricity Council was a surprise.

The original design was expected to involve radically new battery technology, as a previous problem facing electric car designers had been the construction of a battery powerful enough to drive the car but light enough for the car to carry.

The C5 does not provide anything new in that area, but uses a 33lb lead-acid battery, based on existing car batteries. When you consider that the rest of the machine weighs only twice as much, you realise the sacrifice a conventional battery entails.

Unable to produce a radically new battery design, the designers chose to create a lightweight vehicle to suit existing technology. With the aid of Lotus, the British sports car specialists, a sleek body was designed. Steering is through handlebars situated beneath the thighs, with brakes similar to cycle brakes. The accelerator is a button on the handlebars, and there is no reverse gear.

In order to get the thing moving, pedals are provided, but on a dry level start we found that only a couple of revolutions were needed before the motor cut in. The pedals are also required when driving up steep hills. The motor delivers a maximum speed of 15mph. The battery has a range of 20 miles, according to Sinclair Vehicles, the company set up to handle the



manufacture of the buggy.

Overall, it measures 2'6" wide, 2'6" high, and 6'6" long. There is a boot of one cubic foot capacity, enough for a very small shopping load, a few school textbooks or a flimsy party costume. We were unable to squeeze an executive briefcase in. Two lights, one at the back and one at the front, along with a futuristic Liquid Crystal Display, complete the basic package, at £3'9 mail order in a tough cardboard box. It may be more fun than a QL, but is it safer?

Taking advantage of a change in the law in 1983 designed to help disabled drivers and milk float manufacturers, the C5 was carefully designed so that anybody over 14 years old could drive it, without insurance, driving licence, road tax or crash helmet, and even if they had already been disqualified from driving a car in the courts. It is classed as a pedal-assisted tricycle, and it is probably fairest to think of it as an alternative to mopeds or bicycles rather than a serious challenger to the conventional car.

Safety organisations have already voiced concern about the C5. The

Royal Society for the Prevention of Accidents — RoSPA — was commissioned by Sinclair Vehicles to write a booklet on driving the machine safely. That booklet, provided with the C5, was compiled by Howard Boyd, RoSPA's National Cycling Officer. It warns of the danger caused by the low height of the machine, which means lorry-drivers and less alert car drivers may have difficulty spotting it.

If you buy the C5 in its basic form, you will not get wing mirrors, indicators, or a horn. Those accessories may be bought as an extra from Sinclair Vehicles, along with a high visibility mast to attach to the car. RoSPA regards such items as essential for safety, particularly the mast. Those cost £143, and together with insurance, spare battery and delivery the full cost of the C5 is around £600, rather more than the £399 quoted.

Bill Nichols of Sinclair Research says it was never the intention to hide such costs to the user, and points out that "none of those items is legally required." However, the issue at stake is not the legality of the machine, or even its structural stability. "We are

BEHIND TRIKE



satisfied that it is not inherently unsafe" says Geoff Large, RoSPA's assistant director for Road Safety, with a subtle use of the double negative.

What is causing the most concern is how well the C5 will fit in with current traffic conditions, and whether conventional motorists will treat C5 drivers with due respect on the roads. There are training schemes for cyclists and motorcyclists, and saturation advertising to warn motorists of the problems faced by cyclists. So far there is nothing similar to support the vulnerable C5 enthusiast.

The first people to test the C5 in normal traffic will be the customers. Because of the secrecy surrounding the production of the machine, the

only tests conducted on public roads have been held at night with little traffic about. That is a completely different environment to a busy high street full of frustrated motorists, pick-up trucks, vans, buses and taxis.

In spite of reservations, RoSPA does not believe the C5 should be banned. Geoff Large feels that, with the visibility mast, the C5 scores over bicycles for its stability. "If people change from cars to C5s that would be a positive gain for road safety in reducing the traffic load," he says, "but as an alternative to public transport there would be a problem, as there would be no change in the growth of car owners."

Of the design itself, regardless of safety considerations, reaction has been kinder. We found it great fun to drive, and the low height gives an added impression of exhilarating speed. According to Sir Clive, the polypropylene body is incredibly tough. "Hit it with enormous force," he says, "and it just bounces back".

Although the C5 performed well on the level concrete of Alexandra Palace, test models driven at the launch expired halfway up Muswell Hill, and there were reports of at least one early C5 pioneer finding himself stranded four miles out of Streatham on his way to work. The problem appears to be with the battery. Does it work or not?

There are three factors involved, according to Bill Nichols, which can make the battery's performance seem less than impressive. Firstly, when you buy a C5 you must recharge the battery before you set off. There is considerable power loss if it is left sitting around for a long period of time. It takes about eight hours to recharge on the domestic mains, so serious owners will want at least two batteries.

Secondly, the C5 requires a new technique of driving, dubbed 'push and coast'. The temptation is to keep your finger firmly on the accelerator button at all times, but that drains the power swiftly. What you should do is give a burst of power, then coast along for a bit, then give another burst. Bill Nichols claims effective use of that technique may push the range well beyond the stated twenty miles. Of

course, if you don't use the motor at all, you can keep going until your pedals drop off.

The third point, not mentioned in the brochure, is that of weather. Apparently the battery loses 8-10 per cent of its efficiency at zero degrees, and more below freezing. "That was a problem in launching it at this time of year" says Nichols.

While the pundits mutter, the public appears to be ready to give it a go. Sales in the first week were fast approaching 1000, according to Nichols, with only "four or five complaints so far." At present it is only available mail-order, but Sinclair says it will be appearing in high street electrical stores later in the year. There is a possibility of Woolworth stocking it. It is already on view in selected Electricity Council showrooms, but not for sale or trial.

It is right and proper that a machine which can be driven by an untrained fourteen-year-old should be subjected to as severe a criticism as can be justified. Design faults in a Spectrum are not going to kill anybody: design faults in a car might well do so.

But it is worth remembering that Sir Clive has yet again demonstrated his commitment to entrepreneurial risk-taking in no uncertain fashion. Whether the C5 will catch on, either as a toy for rich kids who don't mind looking silly, a novelty at amusement parks, a motorised golf caddy or a genuine new means of urban transport, does not affect that fact.

Sir Clive may seem an unlikely candidate for the Henry Ford of the 80s but if nobody ever took those risks, we would still be riding horses. There is a lot to praise in the C5, and many questions which only experience can answer in full. In the meantime, you have to admire his nerve.



■ A wealth of Peripherals for your Spectrum! ■

By RICK BRAVO

Since the 48K Spectrum was launched the opportunities it offered has attracted peripheral manufacturers throughout the world.

One of these manufacturers was bound to emerge as the "brand leader" and in the case of the Spectrum this turned out to be DK'tronics. The company is based in Saffron Walden in Essex and proudly boasts a history dating back to the ZX80. All the company's products are manufactured in England at their own factory and they have now established themselves as world leaders, exporting to over 30 countries.

Below you will find a review of their range which now includes over 16 products, all of which are available for the Spectrum and Spectrum + models.

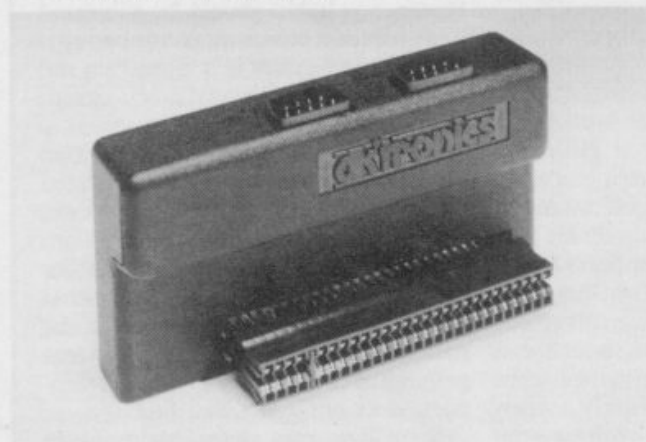
Keyboard

The DK Microdrive Compatible Keyboard is the best selling keyboard in the world and is now used by around 10% of all U.K. Spectrum owners. It is microdrive compatible and offers more key functions than any other keyboard in its price range. The stepped keys and space bar make it even easier to use. It is constructed from high density black ABS and has 52 keys and a full width space bar. A separate numeric keypad of 12 red keys including single entry 'delete' plus single entry 'decimal point' facilitate fast numeric data entry.

From good computer shops everywhere at only £37.50 or direct from DK'tronics, add £1.50 post & packing.



Dual Port



This highly successful Light Pen for the Sinclair Spectrum plugs neatly onto the rear of the Computer or the rear of the printer connector. The operating software now runs faster and supports 16 pre-defined instructions. You can change all the colours (Border, Paper, Ink), draw circles, arcs, boxes, lines and insert text onto the screen (ideal for diagrams etc.) Save & load completed or partly completed screens onto or from the tape.

There are also features to draw Free Hand and animate on the 48K Spectrum, you can retain and animate 5 screens.

You can also use the machine code on its own in your own programs for selecting out of a menu, playing games etc. All entry points necessary are given. The Pen works down to pixel level with pixel accuracy.

From good computer shops everywhere at only £19.95 or direct from DK'tronics, add £1.50 post & packing.

The first port simulates 6,7,8,9, & 0 Keys. The second port simulates in (31) command.

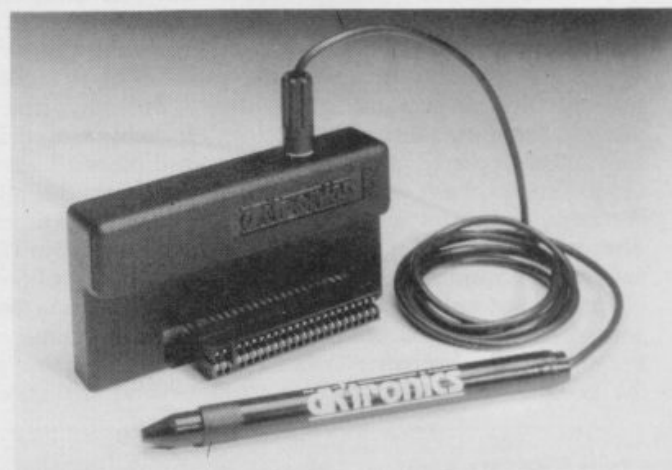
The port will accept any Atari style joystick. It will run any software. That is:-

- (a) Using Keys 6,7,8,9 & 0.
- (b) Having redefinable key instructions.
- (c) Using in (31) (i.e. Kempston).

This Dual Port interface interconnects with the existing range of DK'tronics products to form the most comprehensive range of Spectrum peripherals available from any manufacturer.

From good computer shops everywhere at only £13.00 or direct from DK'tronics, add £1.50 post & packing.

Light Pen



From **DK'tronics**®

3 Channel Sound Synthesizer

Any microcomputer is capable of manufacturing sound, however, in order to produce a single octave 'C' note with a frequency of 8372Hz the signal needs attention over 16,000 times per second.

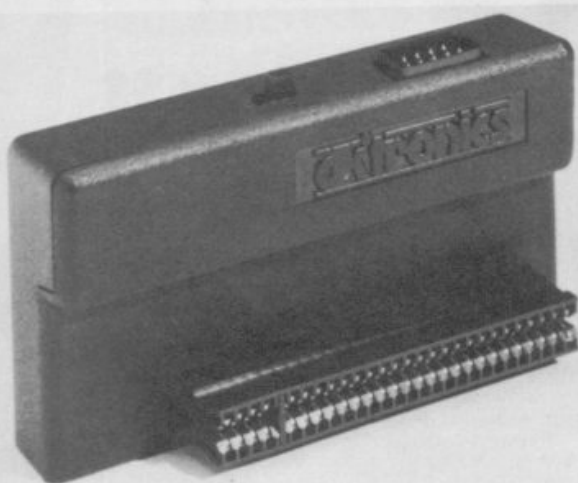
To produce software capable of performing just this one task would be difficult if not impossible, especially when you consider that to produce arcade type sound effects requires even greater attention.

The production of these sound effects without the constant attention of the processor is now possible thanks to the AY Sound Chip, its flexibility makes it essential for a wide range of applications including music synthesis and sound effects generation, continuing the monitoring and production of sound after the initial command.

More often than not realistic sounds require more than one effect and this function is provided by 3 independently controlled channels, as an example compare the sound produced by the single note of 'C' with that produced by the chord 'C' and you will know just what I mean, likewise producing the sound of an explosion using all 3 channels gives games a totally new dimension.

Add to this the ability to alter the pitch tone and shape of the sound you have produced and it's flexibility is unlimited. In simple terms, imagine the note you have produced as a calm sea, by altering the pitch and shape you can produce waves, the top of the wave corresponds with the maximum volume and pitch of the note, which like the wave itself rises and falls.

Programmable



At last! A fully programmable joystick interface with feed through connector that really works!

Now you can run ANY software from ANY supplier with the DK'tronics fully programmable joystick interface. It comes complete with machine code software and can be programmed in seconds to give full 8 directional joystick movements plus five capabilities and will accept any Atari/Quickshot type joystick. A catalogue is now available showing the full range of products available from DK'tronics the world's leading Spectrum peripheral manufacturer. The through connector enables other add-ons to be plugged into the rear.

From good computer shops everywhere at only £22.95 or direct from DK'tronics, add £1.50 post & packing.

Saffron Walden, Essex
CB11 3AQ tel:(0799) 26350



Speech Synthesizer

The speech synthesizer uses the popular SL0/256 speech chip and has an almost infinite vocabulary. It is supplied with a text to speech converter for ease of speech output creation. Everything you wish to be spoken is entered in normal English, without special control codes or characters, it is therefore extremely easy to use. The voicing of the words is completely user transparent and the computer can carry on its normal running of a program while the speech chip is talking.

Although there are only 26 letters in the alphabet, letters have a totally different sound when used in different words. For example, the 'a' in Hay is much longer and softer than in Hat. When you speak you automatically make adjustments because you know just how a word should sound. Not quite so easy with a computer. After looking at other speech synthesizers we decided that it was essential that the DK'tronics Spectrum Speech would offer a simple system that would enable the user to produce realistic speech that was instantly recognisable.

The solution to the problem was extremely complicated, it required hours of programming to enable the computer to look at the individual letters that make up each word and compare their relative position to each other before deciding on the appropriate sound.

I consider this to be the best Spectrum Speech Synthesizer on the market. From good computer shops everywhere at only £24.95 or direct from DK'tronics, add £1.50 post & packing.

Centronics

The new Dk'tronics Parallel Centronics Interface will link your Spectrum to any printer with a standard centronics input. As the choice is vast, you can select the printer exactly suited to your needs.

Features of the interface include: Runs all parallel centronics type printers: Controlling software fully relocatable; Interfaces with any software using the printer channel e.g. Tasword Dev Pack etc; LList Lprint recognised. High res screen dumps; All control codes allowed through to printer; Fully microdrive compatible.

Supplied with full instructions and controlling software. From good computer shops everywhere and sensibly priced at only £39.95 or direct from DK'tronics, add £1.50 post & packing.

PRINT-SP
ROM 81
PROMER 81 S
MONITOR STANDS
MULTEPROM
BLOPROM-SP
DHOB1
PRINTER STANDS

CAMEL PRODUCTS

NIKE POWER BUFFERS

WAITING TILL YOU GET CAUGHT OUT?

Nickel Cadmium batteries with ON-OFF switch. Versions for Spectrum, ZX-81, ATMOS. Gives time to save program on tape. Visible status warning by LEDs £17.35.

DEALER ENQUIRIES WELCOME.

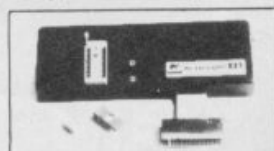


EPROM PROGRAMMER

BLOPROM-SP A uniquely sophisticated EPROM PROGRAMMER

Eprom programmer for the 2516, 2716/32/32A/64/64A/28/128A, yes even the 64A/128A from Intel. Check, Read, Program & Verify all or part of Eprom.

So immensely user friendly you'll hardly need the manual. Designed for the beginner but includes a single key entry route for the professional. Supplied as firmware, the m/c driver routine alone is worth more than the price of BLOPROM-SP. No Personality Cards, or other additions, just a Spectrum. Several inbuilt safety features. On-board Vpp generation. 28pin ZIF socket. Cabled connector and extender plug. ABS case. £89.95



STATUS NO. OF SYSTEM — HEX
EPROM TYPE — 27128
RAM START ADDR — 4000
EPROM ST / DUR — 0000
JOB LENGTH — 4000
TASK — CHECK

WHICH TASK DO YOU WISH TO DO
W) CHECK THAT EPROM IS CLEAN
X) READ THE CONTENTS OF EPROM INTO RAM
Y) BLOW AN EPROM WITH DATA FROM RAM
Z) VERIFY THAT EPROM DATA IS THE SAME AS IN RAM
Q) TO QUIT R) TO RESTART

FAST CODES AVAILABLE
D H POR WXYZ

BLOPROM-81

As above but for ZX81. Programs 2516, 2716/32/32A/64 & 27128 £79.95

AT LAST! for the Spectrum user. Put your programs, utilities, Assemblers into EPROMS for instant load from the unique ROM-SP



ROM-SP

Ingenuous unit for Spectrum, with 2x28 pin sockets and a Reset button allows up to 16K of Basic or M/C program to RUN or LOAD instantly from EPROMS. Cabled connector and full extender card. NOTE: Does not disable Sinclair ROM. £29.95

PROMER-SP

A brand new Spectrum programmer for 2764/128. Zero insertion force socket & software on tape. Delivery Jan. 84. Order now at £29.95

PROMER 81-S

The very popular PROMER-81 for the ZX81 has been adapted to the Spectrum and the price kept low. NEW PRICE £24.95

ROM-81

Provides two 24 pin sockets for up to 8K of EPROM memory in the 8-16K area. Can use 2516/32 or 2716/32 £14.95

PROMER-81

A low cost reliable programmer for 2516/32, 2716/32 EPROMS. Requires 4xPP3 batteries NEW PRICE £24.95

DHOB1 1

Compact. Mains powered. Safe. Fully cased. Up to 3 EPROMS UV ERASER £18.95

DHOB1 2 With automatic timer

£22.95

CRAMIC-SP

Ingenuous software paged 16K non-volatile CMOS RAM to co-exist in the same area as Spectrum ROM. Easy storage and retrieval of BASIC, M/C or DATA on a 48K Spectrum £89.95

PRINT-SP

Centronics Interface with standard centronics Cable. Plus free introductory offer SPWRITE text processor. for Spectrum £31.25

DREAM-81

64K Rampack with link options to disable 0-8-16K. Plus a 28 pin EPROM socket for 2716, 2732/2764 and 27128. for ZX-81 £59.95

MEMIC-81

4K CMOS RAM with lithium battery. Easy SAVEing. 10yr storage and instant retrieval of programs. £29.95

INTRODUCING MULTEPROM

The most economical, sophisticated gang copier in the world. Based on BLOPROM £199.95



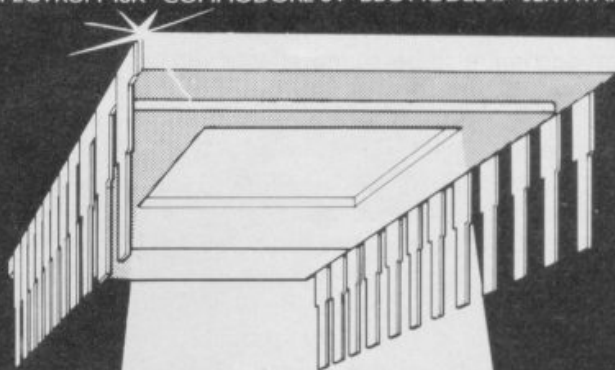
UK. VAT extra. No VAT on exports P+P UK Free Europe +5% — Overseas +10% TLX 81574 CML

Cambridge Microelectronics Ltd. One Milton Rd. Cambridge CB4 1UY Tel: (0223) 314 814

PROMER 81
P10 81
NIKE
81
P10 SP
MEMIC
CRAMIC-SP
ROM SP
CRAMIC 81
BLOPROM-81
PROMER SP

The Complete Machine Code Tutor

SPECTRUM 48K · COMMODORE 64 · BBC MODEL B · 32K ATARI



Trust New Generation to strip the mystery away from Machine Code. Now the Complete Machine Code Tutor makes learning machine code simple so there's never been a better time to discover the really great benefits of machine code programming — see what the press says.

“A colourful, clear, interactive computer teaching package — the best I've come across in any field.”
Jan Watterson — Popular Computing Weekly

“This pair of tapes forms a worthy addition to the range, giving a thorough exposition from the most elementary level of machine code programming on the BBC Micro.”

“Which Micro & Software Review”
“The best machine code tutor and no serious Spectrum programmer should learn machine code without it.”

“Crash”
“By far the best attempt comes from New Generation Software who has recently issued its Complete Machine Code Tutor for the BBC and the Spectrum.”

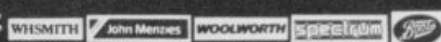
“Popular Computing Weekly”
“New Generation have got a very nice product here. It's well thought out, easy to use, aesthetically pleasing, and (as far as I could tell) bug-free and crash-proof”
“Overall then, an excellent idea, well executed.”

“Computing Today”
“Supplied with full notes, this package teaches machine code the way it should be taught — at your own pace and actually from the microcomputer, not from a book. You learn programming the professional way, plus a few tricks of the trade. Available from all good computer stores at £14.95.”



New Generation products are sold according to their terms of trade and conditions of sale.
FREEPOST, Bath BA2 4TD. Tel: 0225 316924

Selected titles of New Generation Software are available from your local computer store and larger branches of:



ASD Connections Ltd

RIBBON CABLE (Price per ft)			SPECTRUM EXTENSION LEADS	
	Grey	Rainbow	6 inch extension cable double end M to F	£10.50
9-way	13	24	12 inch extension cable double end M to F	£10.75
10-way	15	28	Other configurations made to order write or phone for quote.	
14-way	18	32		
15-way	20	36		
16-way	22	40		
20-way	30	50		
24-way	36	60		
25-way	40	65		
26-way	45	70		
34-way	60	80		
37-way	65	85		
50-way	70	90		
50-way	95	£1.25		
60-way	£1.10	£1.40		
64-way	£1.15	£1.50		
EDGE CONNECTORS			SPECTRUM PROGRAMMABLE JOYSTICK INTERFACE	
2 x 23-way (ZX-81)	£1.85		Will work with any Spectrum Software	
2 x 28-way (Spectrum)	£2.10			
DOUBLE SIDED PLUG BOARDS			SPECTRUM JOYSTICK INTERFACE	
ZX-81 23-way	£1.25		OUR PRICE ONLY	
Spectrum 28-way	£1.50		BOTH INTERFACES HAVE RESET BUTTONS	
D CONNECTORS			COMPUTER LEADS	
Solder	Bucket	Male Female	7 Pin DIN Plug to 2 x 3.5mm	
9-way			1 x 2.5mm Jack Plugs	£2.25
15-way	75	£1.00	5 Pin DIN Plug to 2 x 3.5mm	
25-way	£1.50	£1.90	1 x 2.5mm Jack Plugs	£2.20
37-way	£2.40	£3.25	6 Pin DIN Plug to	
HOODS	.95		2 x 3.5mm Jack Plugs to	
PRINTER LEADS			2 x 3.5mm Jack Plugs	£1.25
ALL 1 METRE LENGTH			7 Pin DIN Plug to 5 Pin DIN	
BBC	£9.95		Plug	1.95
BBC serial	£8.95		7 Pin DIN Plug to 3 Pin DIN	
AMSTRAD	£16.75		Plug & 2.5mm Jack Plug	£2.25
MEMOTECH	£12.75		7 Pin DIN Plug to 7 Pin	
EINSTEIN	£12.75		DIN Plug	£2.25
IBM PC	£15.75		5 Pin Domino Plug to 5 Pin	
SPECTRUM interface	£9.75		Domino Plug	£1.95
1 to RS 232			Phono Plug to Coaxial TV	
SPECTRUM interface	£10.75		Aerial Plug	95p
1 to Centronics				
CENTRONICS to				
Centronics	£15.20			
DRAGON	£9.95			
QL	£10.75			

TRADE ENQUIRIES WELCOME

FREE P&P IN UK. Access & Visa accepted. Add 15% VAT to all orders
Cheques made payable to
Computer Link, Dept SU3,
PO Box 1, Ware, Herts.
Tel: 0920 5285

CURRAH

SLOT

USPEECH

SPEECH 64

NOW AVAILABLE IN VOLUME DIRECTLY FROM MANUFACTURERS WELWYN ELECTRONICS

For further information, please contact:
RICHARD PHILBRICK, General Manager

(0670) 822181

WELWYN SYSTEMS · BEDLINGTON · NORTHUMBERLAND
NE22 7AA · ENGLAND · TELEX 53514

Welwyn

SYSTEMS

Welwyn Systems is a Division of Crystalate Electronics Limited.
A member of the Crystalate Group.



48K SPECTRUM

THE PUNTER'S PAL COLLECTION

"Yours is far superior to any other tapes I have tried."

Mr D. Walker, Brighton.

STARTER'S ORDERS: The Original and best horse race predictor.
(67% winners on top tips with very good SP's).

Whilst the vast majority of punters had a bad flat season. Users of
STARTER'S ORDERS enjoyed over £150 profit to a £1 level stake on
each day's 'nap'. (Compare this to newspaper tipsters.) Already after
three months of the NH proper the program shows over £125 profit
on 'naps' to a £1 level stake.

All the computer need know is the name and 6-figure form of each
horse in a race. (Found in any daily newspaper.)

Just one program to predict on both NH and flat.

No experience of horse racing is necessary to use the program.

No tedious updating of databases.

The only horse race predictor with a brand new dual and straight
forecast and tri-cast facility. In three months correct tri-casts have
paid 360-1, 211-1, 105-1, 102-1 plus many others below 100-1.

**ONCE YOU HAVE THIS PROGRAM, THE ONLY THING IN
DOUBT IS THE STARTING PRICES OF YOUR WINNERS!**

HARE'S RUNNING: A successful and easy to use as **STARTER'S
ORDERS** but for use on greyhound races.

If in doubt of the authenticity of the above, telephone on Saturday,
March 2nd and 9th between 9 am and 1 pm for the day's best bet
plus the TV Nap.

HARE'S RUNNING.....£5

STARTER'S ORDERS.....£6

BOTH PROGRAMS.....£10

(including P&P IMMEDIATE DISPATCH)

Orders to:

**D. C. JACKSON, 1 OSBORNE PLACE,
TODMORDEN, LANCS OL14 5BQ.
Tel: TODMORDEN (070681) 6854.**

MACHINE CODE EXTENSIONS FOR SPECTRUM BASIC

Now find out from the experts how
to add new commands to make your
Spectrum faster and more versatile.
Specially written for Hewson Consultants,
winners of the 1983 Computer Book of
the Year Award given by the Computer
Trades Association, the book is the third
in a series on the ZX Spectrum and
Spectrum -

To obtain your copy simply fill in the
coupon, or phone quoting your Access
or Barclaycard number. The book is
also available from all good micro-computer outlets.



HEWSON CONSULTANTS

56B Milton Trading Estate, Milton, Abingdon, Oxon OX14 4RX

SU3

Please rush me a copy of Machine Code Extensions for Spectrum Basic. I enclose
a cheque/postal order made out to Hewson Consultants Ltd for £4.95.

Name _____

Address _____

Signed _____ Date _____

Card No. _____

SAVE THE MOLE!

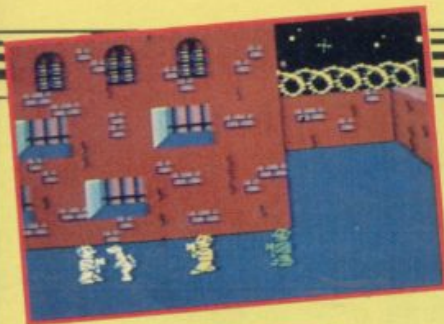
*Win the latest
Monty game PLUS
membership to
the Gremlin Gang*

MONTY, the hero of the best-selling **Wanted: Monty Mole**, is languishing in jail. The sequel, **Monty is Innocent**, casts you in the role of Monty's friend Sam Stoat. You have to rescue Monty, who has been unfairly convicted of borrowing a bucket of coal.

A 48-screen arcade adventure, **Monty is Innocent** requires you to break into Scudmore prison, find the cell holding Monty — it changes every game — get the correct key from the governor's office and escape with your black velvet friend. Easy? It might have been, but for all the horrors you will meet along the way, such as skeletons, the mad axeman, or the dead-end solitary confinement cells. You will also need to find guns and invisibility potions along the way. After a few hours of **Monty is Innocent**, Wormwood Scrubs can hold no terrors for anybody.

Gremlin Graphics is providing 50 copies of the game for the lucky readers who win our equally fiendish competition. As a bonus, the first 10 will also be made members of the Gremlin Gang, the company's software club which provides a newsletter about Gremlin Graphics, the opportunity to swap ideas with other members, and exclusive club offers. Club members will also get a special certificate, the amazing Gremlin Gang sweatshirt, and posters of **Wanted: Monty Mole** and **Suicide Express**.





All you have to do to win **Monty is Innocent** is solve the maze opposite. After all, no self-respecting Molebuster would attempt a jailbreak without a bit of practice first. There are five cells — A, B, C, D and E — and Monty is in one of them. You must also pick up one of each object — potion, gun and key — as you go. Beware of the secret alarm system: it will be activated as soon as you walk down a path already travelled. So visit the gun, potion and key once

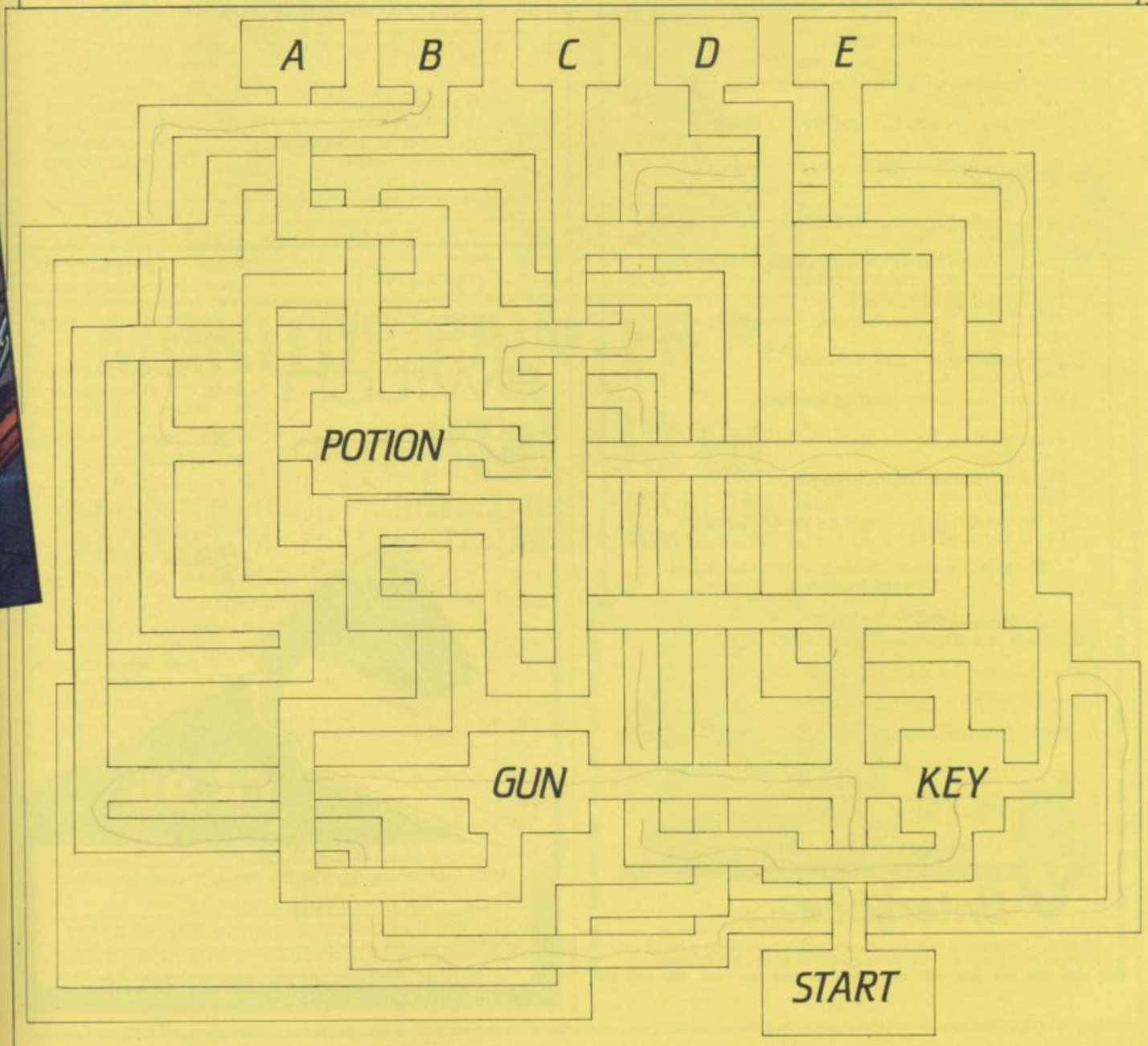
only, and do not pass the same way twice.

There is only one cell you can reach while obeying those rules, and luckily that is the one holding Monty. When you have discovered the route, write the letter of the cell on a postcard along with the objects *in the order in which you found them*. You must have everything correct in order to win.

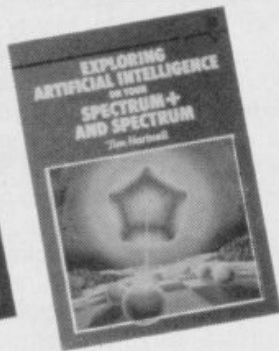
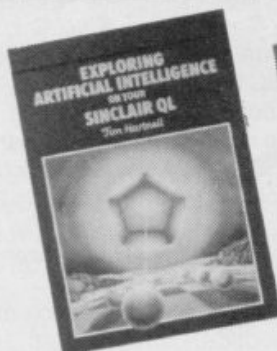
Postcards must reach us by Friday March 22, 1985. Address your entry

to: Monty Competition, *Sinclair User*, Priory Court, 30-32 Farringdon Lane, London EC1R 3AU. Make sure you include your name, address and telephone number on the postcard. The first 50 correct entries selected after the closing date will decide the winners.

Employees of EMAP and Gremlin Graphics, their friends and associates, are not allowed to enter the competition.



MAKE THE MOST OF YOUR SINCLAIR.



- ☐ Exploring Artificial Intelligence on your SPECTRUM+ and SPECTRUM
Tim Hartnell. £6.95
- ☐ Tim Hartnell's QL HANDBOOK
Tim Hartnell. £7.95
- ☐ Tim Hartnell's QL Games Compendium —
Tim Hartnell. £5.95
- ☐ Mastering Machine Code on your ZX Spectrum
Toni Baker £9.95
- ☐ Exploring the Sinclair QL — An Introduction to
SuperBASIC
Andrew Nelson £4.95
- ☐ 49 Explosive Games for the ZX Spectrum
Tim Hartnell £4.95
- ☐ Creating Adventure Programs on the ZX Spectrum
Peter Shaw and James Mortleman £4.95
- ☐ Putting your Spectrum to Work
Chris Callender (includes a full word-processing
program) £4.95
- ☐ Programming your ZX Spectrum
Tim Hartnell and Dilwyn Jones £6.95
- ☐ Delving Deeper into your ZX Spectrum
Dilwyn Jones £7.95
- ☐ Practical Uses for the Micro in the Home
David Hole £4.95
- ☐ The Art of Structured Programming
Peter Juliff £5.95
- ☐ 60 Games and Applications for the ZX Spectrum
David Harwood £4.95

These books are available from most book and computer stores.

Interface Publications, Dept. QSU,
9-11 Kensington High Street, London W8 5NP

Please send me the indicated books. I enclose £ _____

Name _____

Address _____



Interface Publications Ltd

Interface

(TRADE ONLY: Interface Publications are distributed exclusively in the UK and Eire by WHS Distributors. Export trade handled by Interface Publications.)

MICROMEND

COMPUTER REPAIR SERVICE

IF you want a professional repair
THEN LET us help you

We don't charge a fixed rate —
you only pay the cost of **YOUR** repair

e.g. FAULT: BLOWN U L A **£22.39**

FAULT: BROKEN KEYBOARD MEMBRANE **£17.65**

ABOVE PRICES INCLUDE P & P:

Maximum charge (excluding abnormal damage) **£30.00**

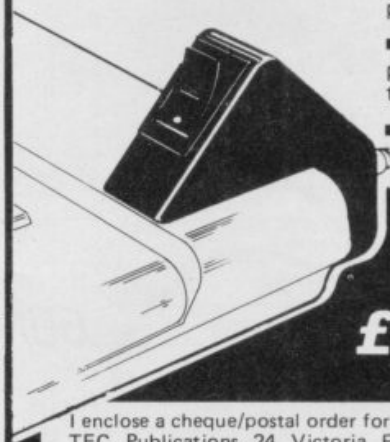
OUR RATES FOR PRINTERS & ZX 81's, ARE JUST
AS FAIR: PLEASE PHONE US FOR QUOTES.

Send your machine with your name, address, tel. no. and fault
symptoms, or bring it to

We can supply you with
full-size printers and
Tasman Software products
Please write for details

Micromend
8 Manor Drive
Leeds LS6 1DE
TEL. (0532) 742858

on-off
re-set
switch
for
spectrum



- No more crashing from worn power supply socket
- Does not affect expansion port
- Just pushes into position does not affect spectrum or power supply lead.
- No need to remove once in position.
- Ergonomically designed — no more fumbling with power supply leads.
- Positive rocker action prevents accidental operation.
- Ideal for re-setting rom cartridge games — saves time when changing microdrive cartridges.

£4.95

I enclose a cheque/postal order for £ _____ payable to
TEC Publications 24 Victoria Road, Bromsgrove, Worcs.

Name _____

Address _____

U

Dealer Enquiries Welcome. Telephone (0527) 74567

campbell systems

for spectrum 48k

Can YOUR Database Handle This?

PROFESSIONAL FILE MANAGEMENT, DATA RETRIEVAL AND PRESENTATION
ANY ADDRESS LISTS, INVENTORY, CUSTOMER OR PERSONNEL RECORDS...

MASTERFILE can!

Microdrive commands included; 32, 42 or 51 characters per line!; 26 fields per record; Unrestricted number of records; 36 user defined Display/Print formats; Fast search & sort facilities; Around 32K of RAM available for data!

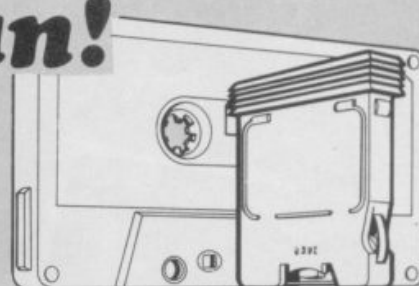
Now with **MF-PRINT** and MASTERFILE version 09, you can format your data for a full width printer!

Works with most popular printer interfaces. Fully variable report widths (over 100 columns) and lengths. Powerful numeric editing and column totals. Almost no reduction in space available for data.

Many more products available. Send SAE for details!

MASTERFILE version 09	£15.00
MF-PRINT	£ 6.95
MASTERFILE with MF-PRINT	£19.95

All programs mailed 1st class by return.
Prices include VAT and postage within Europe.
New Address: Campbell Systems
(Dept.SU) 57 Trap's Hill, Loughton,
Essex. IG10 1TD. England 01-508 5058



With MYRMIDON'S
Micro-Print ©
up to 51 columns!



MONITOR/PRINTER PACKAGES FOR SINCLAIR QL

- NO INTERFACING PROBLEMS. JUST PLUG IN AND GO!
- ALL SYSTEMS FACTORY-TESTED BEFORE DESPATCH TO YOU!

PACKAGE DEALS		Package Price
MONITOR	with Printer	
	Brother HR5 + mains adaptor	£425
Microvitec 14" colour 1451DQ3	Epson RX80 F/T	£585
	Epson FX80	£725
	Epson FX100	£869
	Epson DX100	£745
	Brother HR15	£715
	Canon PW1080A NLQ	£649
	Epson JX80 colour	£895
	Canon PJ1080A colour	£835

Epson parallel printers supplied with RS232C I/F
fitted Canon printers supplied with Miracle Systems I/F. All monitor and printer leads included.

Prices are inclusive of VAT. Add £12 for delivery.



(Illustrated: QL with Microvitec 1451DQ3 and Epson RX80F/T)



We can't show you all the views
of the Lords of Midnight,
there are 32,000!



We've invented a new programming technique called Landscaping, creating a completely new kind of game, the EPIC. You'll get the chance to shape the characters into your own fantasy novel by playing out the different rôles in the ever changing world of Midnight.

BEYOND



To... Beyond Competition House,
Farndon Road, Market Harborough,
Leicestershire LE19 9NR.

Please send me . . .

QTY Total Price

THE LORDS OF MIDNIGHT £9.95

PSYTRON £7.95

SPELLBOUND £5.95

BEYOND ORDER HOTLINE 0858 34567
BEYOND ENQUIRY HOTLINE 01-251 8496

GRAND
TOTAL

all prices include p&pp

BEYOND
CHALLENGING SOFTWARE



I enclose a Postal Order/Cheque payable
to Beyond, or charge my credit card.

Card Number

Access/Visa (Delete as necessary)

NAME

ADDRESS

POST CODE

SIGNATURE

Please rush me details of the "ENTER the BEYOND"
Software Club . . .





STEVE JACKSON'S SWORDMASTER SERIES

The definitive role playing
adventure from the pen of the
world's leading author and the
keys of the world's leading
software house.

In your High Street shortly.

Adventure
INTERNATIONAL™

85 New Summer Street, Birmingham B19 3TE Tel: 021-359 0801

HORNBY SOFTWARE SPECTRUM PRO GOLF SERIES



NEW ERA IN COMPUTERISED GOLF

Recommended by "Sinclair User", August

EXACT SIMULATION OF BRITAIN'S TOP GOLF COURSES

- (1) ALL GOLF RULES APPLY
- (2) DESIGNED FOR ONE OR TWO PLAYERS
- (3) PLAYED OFF ANY HANDICAP
- (4) ON EACH HOLE DIST, PAR, GREEN ENLARGEMENT
- (5) CONTROL SHOT — CLUB, STRENGTH, DIRECTION, SHAPE OF SHOT
- (6) GRAPHICS EXCELLENT
- (7) EXTREMELY REALISTIC

**NOW INCLUDES
MATCH PLAY**

• TROON £6.95 48K

NEW BIRKDALE £6.95 48K

LINDRICK £6.95 48K

WENTWORTH — EAST & WEST COURSES £10.00 48K

MOORTOWN — SCENE OF CAR CARE PLAN
INTERNATIONAL 1984 £6.95

9 HOLE SIMULATED COURSE

ALL PRICES INCLUSIVE OF VAT, P+P, AVAILABLE FROM:

HORNBY SOFTWARE
21 PINFOLD HILL, LEEDS LS15 0PW

SU 11

TOUCHTYPE

For the 48K Sinclair Spectrum and Spectrum+
(Microdrive Compatible)

DO YOU YEARN TO DO SOMETHING USEFUL ON YOUR SPECTRUM?

Are you fed up with silly games? Make this the moment you take a step forward using your Spectrum into the world of "The Office of the Future".

Learn to touch type on any QWERTY keyboard using the Spectrum as the teaching machine.

- ★ Full touch typing (no eyes down to the keyboard) from the first lesson.
- ★ Carefully designed lessons progress from key learning to speed practice at each stage.
- ★ Full ten finger touch typing with correct left and right shift key operation.
- ★ Learning psychology built in to the program to keep you motivated and interested in progressing.
- ★ Full feedback of performance — you know it is working — you are learning to type.
- ★ Learn at your own pace neither hurried nor restricted by other pupils.
- ★ Comprehensive instruction manual included with every cassette.
- ★ In the age of computers isn't it time YOU learned to type! £8.95 inc p&p and VAT.

TO: JCS Software, 1 Paddocks Close, Cobham, Surrey KT11 2BD. O.K. I'm ready to step forward and improve my ability. Please rush me a copy of TOUCH-TYPE for the 48K Spectrum. I enclose a cheque for £8.95 (Please make cheques payable to JCS Software) Tel: 0932 65354. Dealer enquiries welcome.

Name

Address

TOUCH TYPE
(delete as appropriate)

Spectrum 48K

Spectrum +

Interactive BASIC Programming for 48K ZX Spectrum WHO'S THE SLAVE: YOU OR YOUR SPECTRUM?

You probably bought your ZX Spectrum in order to find out about computing (remember?). But the manual isn't easy to follow and programming books are not much better. What's the best way of learning how to ride a bike or make furniture or program a computer? The answer is: do it. Reading books is never as good as practical experience.

Now you can learn ZX BASIC programming with your Spectrum. 'Interactive BASIC Programming' is a unique package of twelve Learning Modules, (we didn't cut down to one unintelligible program!). Look at these features:

- * Plain English (yes, real English not jargonese).
- * You have complete control over Spectrum BASIC. So you can write, save and load programs while using 'Interactive BASIC Programming'.
- * All ZX BASIC is covered.
- * You'll learn about graphics, colour, sound, motion, strings, arrays, underlining words, writing on the lower half of the screen, system variables, menus, loops, characters and much more, explained simply.
- * More than a hundred problems with hints and answers in the form of programs that are put into BASIC for you to look at, run and change.
- * You'll learn how to write your own games (by way of examples) and how to put your machine to serious use.
- * There's no manual (!): everything is explained by your Spectrum.
- * The package has been written by a computer science teacher
- * Low price, excellent value.

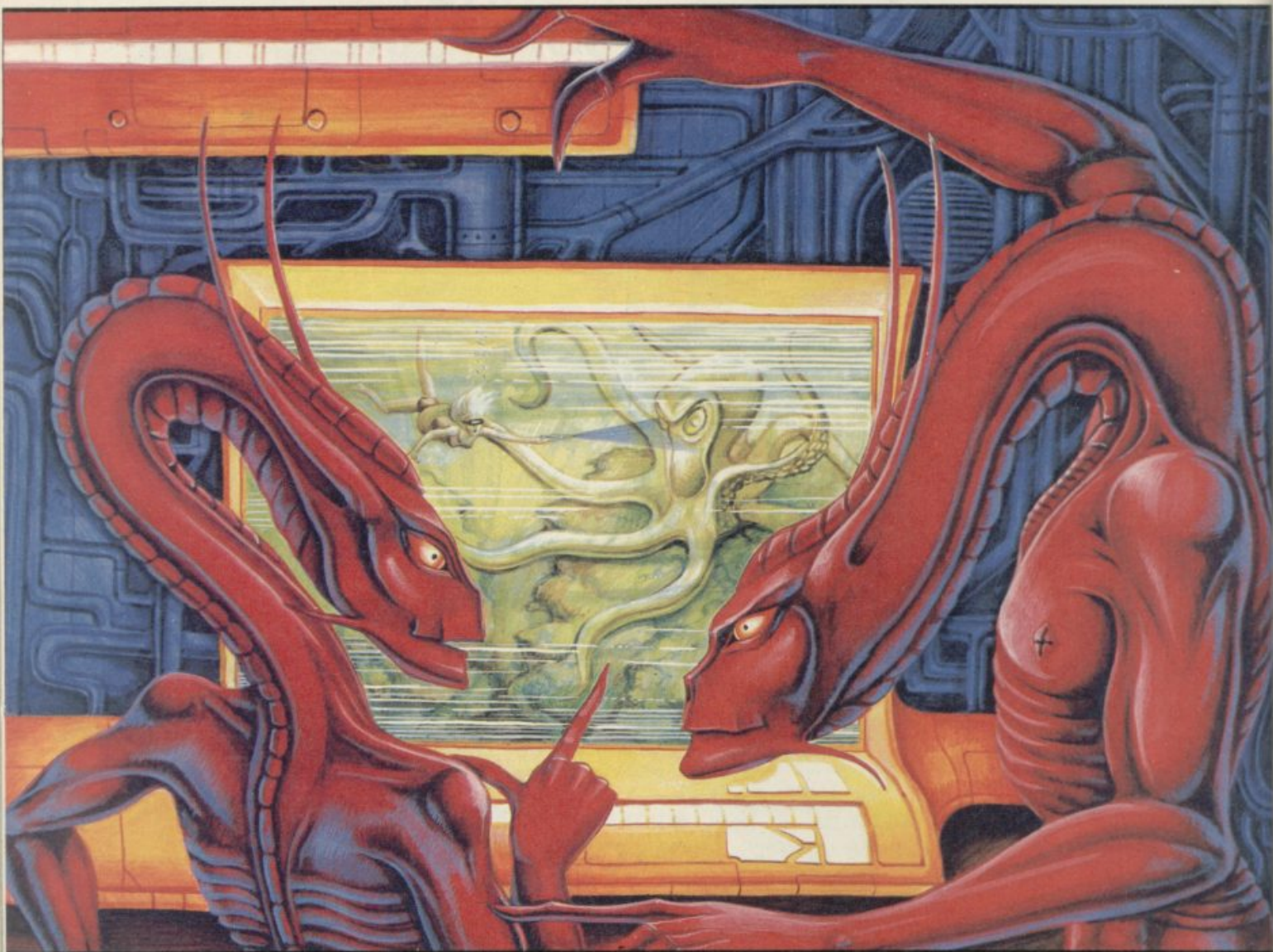
If you want your 48K ZX Spectrum to teach you BASIC then send £9.95 to:

EIGEN SOFTWARE 45 Bancroft Road, Widnes, Cheshire. WA8 0LR

Tel. 051-423 6201

$$\hat{H}\psi = E\psi$$

EIGEN SOFTWARE create reality



Giving a monster a mind of its own

Produce intelligent characters with the
second part of John Gilbert's series

THE STORY so far. Last month we looked at how to plan an artificially intelligent adventure, plotting storylines and mapping them into Basic routines.

Our example plot concerned the theft of the Crysan clock, an atomic timepiece which keeps the universe running, from a marine institute off the coast of Florida.

Kagan, the moderator of the institute, and two researchers, Marla and Morris, board a sea launch and search

for the yacht in which the purloiners escape.

This month we consider the attributes used to build artificially intelligent characters and see how they can be used to create life on the Spectrum and QL.

Character construction consists of three phases or parts. Those are conception, modulation and interaction. The last two are inter-connected. Interaction, which includes communication, will inevitably change a charac-

ter's actions — the province of modulation. Any change in attitude, resulting from an alteration to a character's attributes in the modulation phase, produces changes in the way in which characters see the world and behave towards others.

One character's creation and manipulation influences the movement of other characters and objects within the adventure world. For instance, depending upon how brave a character is feeling, an object may be picked up

within the Delta Class Yacht in our adventure. If that object is taken another character may suffer because a food source or weapon is not available at the appropriate time. For that reason movement is considered as one of the main aspects of writing AI adventures and will be discussed in detail in a future article.

The process of character conception is simple to describe but can be made as complex as a planned adventure requires. We can stay on familiar ground, at least for the present, and look at the types of general characteristics used by most games and then home in on the specific requirements of *The Crysan Incident*.

Role-playing games, such as *Dungeons and Dragons*, all use remarkably similar attribute systems. They include Strength, Intelligence, Dexterity, PSI, and Attack Points. Strength and Intelligence show the physical well-being and mental powers of a character, while Dexterity indicates how agile he or she can be. The PSI attribute usually represents magical powers of the mind and is used in combat with demons. Attack Points are used in battle and represents the number of blows a character can receive without being injured.

You can see that such characteristics are best suited for games in which battles are the order of the day or night. They are not ideal for adventures where more subtle interaction is required. They do not describe the inner qualities of a character's persona.

In our adventure we need reactions within the characters which spring from fear, hate, pain or any of the other expressions associated with life. There are four characters involved in this month's instalment in which the research team discover the missing yacht beneath the waves.

While one of the researchers — Morris, say — remains on board the launch, the other two — Kagan and Marla — don scuba gear and plunge into the depths.

They are not prepared for what they meet — two creatures related to the squid family, Genghis and Boreel. Those are slow in body but have excellent reasoning powers, they will not engage in fighting, or continue a battle, without a good chance of winning. Behind them lies the wheelhouse door of the submerged yacht.

The general attributes which can be used for each of the characters are

Attribute	Changeability	Range (+10/-10)
Emotional	X	stable/unstable
Stress	X	capable/incapable
Strength	X	strong/weak
Intelligence		genius/moron
Ego	X	inflated/deflated
IQ		high/low

Figure 1. General attributes

shown in figure one. Those marked with an 'X' will change throughout the game. The final sector of the chart shows the scales used for each attribute. Those range from -10 to +10. For instance, if Kagan's Stress mark is -5 then the next situation in which stress is involved will be handled badly by him. Mistakes will be made and strength, ego and emotion factors would be adversely affected.

The key to artificial intelligence, using attributes as sensors of ability, therefore lies in the way in which each of them is inter-related with the others. Using this system no character will ever be inherently good or evil as in many other games. It should be possible to win enemies over to your side or make enemies of friends.

Although hundreds of changes may be made to character attributes during

in figure three. You will find that when it comes to plotting the adventure you can tell at a glance how characters should react to the events and what will happen if the player-character, Kagan in this case, performs a certain action.

You could even give the player-character some autonomy where the character, and not just the player, has some say in what he or she does. That happens in listing one when Kagan may flee at the sight of a fight. Such actions are more interesting than using a lifeless puppet which exists just to move you through the game. Make a player-character rebellious and you change the nature of your games.

Once the character data has been assimilated on the chart you can start working it into your adventure. A simple scenario has been set up in

Attribute	Kagan	Marla	Genghis	Boreel
Emotional	5	-2	-3	2
Stress	4	-1	6	-3
Strength	3	2	4	4
Intelligence	7	6	6	6
Ego	6	-5	7	4
IQ	6	-6	3	6

Figure 2. Character table

a game all of them have to be set at the start. The table containing Kagan's initial attribute levels is shown in figure two.

Figure three is a progression of the one-character table and shows all attributes used in listing one. One array is used to store attributes for all the characters. It may seem confusing on paper but such an arrangement saves memory and is not so confusing when transferred to a program listing. You will only have one array to remember.

When creating your own characters it is helpful to use a chart such as that

listing one. Lines 100 to 180 set up the data in an array marked 'a'. As shown in line 120, there are four characters involved and six types of attributes. Line 130 sets up the data for the array between lines 190 and 220 and then lines 140 to 180 use loops to enter that data.

The brief scenario is described between lines 240 to 290. These are a temporary measure as there are better ways of creating a complete adventure and those will be discussed in a future article.

continued on page 124

New type	Formula
Anger	Stress/Intelligence/Strength
Courage	Stress/Strength/Ego
Cowardice	Stress/Strength/Ego
Happiness	Intelligence/Stress/Ego/Strength
Elation	Stress/Strength/Ego
General characteristics are coupled to give new, more complex, characteristics.	

Figure 3. Creating complex attribute formulas using general attributes

continued from page 123

The REM statement at line 300 introduces one of the most important parts of the listing regarding character interaction and modulation. Lines 310 to 330 look at each of the monsters and decide which, if any, guards the yacht. Ghenghis is the most powerful and holds a rusty sword which he has discovered in an old wreck. As you will see next month, Kagan or Marla can take the sword away if Ghenghis is confused. If, however, Ghenghis is not around then neither is his sword, which you may take for a blessing or a

Listing 1

```
100 LET c$="": LET p$="": LET n$=""
110 REM create attribute bank
120 DIM a(4,6): REM (character index, attribute index)
130 RESTORE 190
140 FOR k=1 TO 4
150 FOR m=1 TO 6
160 READ a(k,m)
170 NEXT m
180 NEXT k
190 DATA 5,4,3,7,6,6: REM Kagan
200 DATA -2,-1,2,6,-5,-6: REM Marla
210 DATA -3,6,4,6,7,3: REM Ghenghis
220 DATA 2,-3,4,6,4,6: REM Boreel
230 REM set up example scenario
240 CLS
250 PRINT "The murky water clears as you"
260 PRINT "and Marla travel downward"
270 PRINT "towards the dark shadows which"
280 PRINT "mask the yacht which you have"
290 PRINT "picked up on your scanner."
300 REM set up monsters
310 IF a(3,2) OR a(3,3) OR a(3,5) < -1 THEN LET c$="Boreel": LET f$="one creature guards": GO TO 340
320 IF a(4,2) OR a(4,3) OR a(4,5) < -1 THEN LET c$="Ghenghis": LET f$="one creature guards": GO TO 340
330 IF c$="" THEN PRINT "The yacht looms before you, its": PRINT "open inviting you in": GO TO 380
340 REM print monsters
350 PRINT "Soon the yacht looms menacingly"
360 PRINT "in the darkness."
370 PRINT f$; " the doorway.": GO TO 400
380 PRINT "You pass into the darkness beyond the doorway."
390 STOP
400 REM decide whether to fight
410 IF a(1,2) AND a(1,3) AND a(1,5) < -8 THEN LET p$="Marla": LET n$="Kagan": GO TO 440
420 IF a(2,2) AND a(2,3) AND a(2,5) < -8 THEN LET p$="Kagan": LET n$="Marla": GO TO 440
430 LET p$="Kagan and Marla": STOP
440 REM one runs away
450 PRINT "The thought of a fight chills "; n$; "s"
460 PRINT "blood."
470 PRINT "He swims upward, back to the surface,"
480 PRINT "leaving "; p$; " to face the foe.": STOP
```

curse.

In order to see what is happening in the 'set up monsters' section it is necessary to take those lines to pieces:

310 — if Ghenghis has stress problems, a(3,2), or is low (-1) on the range in strength, a(3,3), or ego, a(3,5) then Ghenghis leaves the fighting to Boreel;

320 — the same is done for Boreel and if his stress, strength or ego tolerance is below -1 he will disappear and the name 'Ghenghis' will be put in the c\$ variable. The f\$ variable in both lines is used later — in line 370 — where the number of monsters around the yacht is printed.

330 — if neither monster is put in c\$ then you are free to enter the yacht as shown at line 380.

The monster modulation in the example is simple to follow but, as with everything else in the series, it can be as complex as you wish. You could incorporate hundreds of attributes in a massive array for hundreds of characters. Remember that the Sinclair machines do not restrict you to a limited number of conditions with an IF ... THEN statement when using Basic.

Moving on to the next modulation routine, between lines 400 to 430, a similar procedure to that above is used for the goodies Kagan and Marla. This time we decide whether one of them acts the coward and swims away from the fight.

The difference lies in the type of conditional operators used. In the

The murky water clears as you and Marla travel downward toward the dark shadows which mask the yacht which you have picked up on your scanner.

Soon the yacht looms menacingly in the darkness.

One creature guards the doorway. The thought of a fight chills Kagan's blood.

He swims upward, back to the surface, leaving Marla to face the foe.

Figure 4a

The murky water clears as you and Marla travel downward towards the dark shadows which mask the yacht which you have picked up on your scanner. Soon the yacht looms menacingly in the darkness.

one creature guards the doorway.

Figure 4b

monster modulation, line 310 to 330, the OR operator is used to make it easy for one of the creatures to escape. In the goodie modulation phase the AND operator is used in the IF statements making it more unlikely that one would leave the scene. He would have to be low on stress, strength and ego whereas the monsters need only be low on any one factor to disappear.

The character data in the example has been fixed in an array. If you want to change the situation, shown in figure four, just change the character data between lines 190 and 220.

Next month we will consider how that data can be changed from within the program when the thieves show their hand and some character assassination takes place. We will take a closer look at that rusty sword and see how objects can change a scenario.



1985 – THE YEAR OF COMMUNICATIONS

Everybody's doing it – linking their home computers to giant mainframes and networking to thousands of micro users via the phone and a modem.

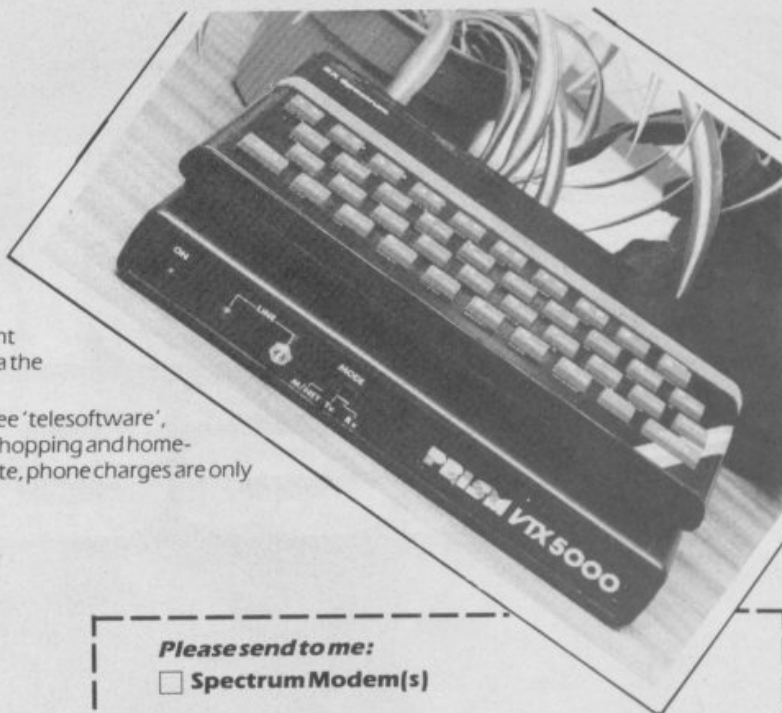
A whole new world of mainframe games, electronic mail, free 'telesoftware', electronic notice boards, real time conversation, armchair shopping and home-banking will be at your fingertips! And at local and cheap rate, phone charges are only around 40p for a whole hours' entertainment.

Spectrum: The VTX5000 modem reduced from £69.95 to only £64.95 inclusive of VAT & p.+p.

** All Modems provide 1200/75 baud, enabling access (with a subscription) to Prestel, BT Gold, Micronet and some free bulletin boards.*

Simply clip the coupon and send it with a cheque (payable to Telemap Ltd) to:

**EMAP Modem Offer, 3rd Floor,
8 Herbal Hill, London EC1R 5JB.**



Please send to me:

☐ Spectrum Modem(s)

I enclose £ _____

Name _____

Address _____

Telephone _____

WHICH **MICRO** COMMODORE 64 HANDBOOK SPECTRUM HANDBOOK



ISBN No: 185096 0003

ISBN No: 185096 0011

Britain's two most popular personal computers, the Commodore 64 and Spectrum are covered from basic to semi-expert in **Which Micro Magazine's Handbooks**.

Author Pete Gerrard, a regular columnist for **Which Micro**, has put together an accurate and practical guide to both computers, reduced from £4.99 to £3.50 per book.

Many programs are included and both 160-page books are spiral bound for easy use and are available in all good bookshops from November or direct through your letterbox by sending to EMAP Books, Bushfield House, Orton Centre, Peterborough PE2 0UW.

COMPARE OUR PRICES AND SAVE ££££

Save £20 on Rotronics WAFADRIVE Rec 129.95
DIGITAL DISCOUNT 109.95
March Top 30 Super Savers

		REC	D.D.P.
1	Ghostbusters	9.95	8.65
2	Sabre Wulf	9.95	8.65
3	Lords of Midnight	9.95	8.65
4	D.T. Decathlon	6.95	5.95
5	Mighty Mole	6.95	5.95
6	Match Point	7.95	7.25
7	Under World	9.95	8.65
8	Jet Set Willy	5.95	5.35
9	Full Throttle	6.95	6.25
10	Altic Atac	5.50	4.95
11	Pjammarama	6.95	5.95
12	Code Name Mat	6.95	5.95
13	Avalon	7.95	6.95
14	Luner Jet Man	5.50	4.95
15	Automania	6.95	5.95
16	Manic Miner	5.95	4.95
17	Moon Alert	6.90	5.90
18	T.L.L.	5.95	4.95
19	Kokotoni Wolf	5.95	5.35
20	Wheelie	5.95	4.95
21	Kosmic Kanga	5.95	4.95
22	Trashman	5.95	4.95
23	Knight Lore	9.95	8.95
24	Antics	6.95	5.95
25	Pystron	7.95	6.95
26	Sherlock Holmes	14.95	12.95
27	Hobbit	14.95	12.95
28	Beach Head	7.95	6.95
29	Football Manager	Addictive	5.95
30	The Quill	Gilsoft	14.95
	Activision	Ultimate	8.65
	Beyond	Ocean	6.95
	Gremlin	Psion	7.95
	Ultimate	Sop Proj	5.95
	Micromega	Ultimate	6.95
	Mikro Gen	Mikro Gen	6.95
	Micromega	Micromega	6.95
	Hewson	Ultimate	7.95
	Soft Proj	Mikro Gen	5.95
	Ocean	Soft Proj	5.95
	Vortex	Ocean	6.90
	Elite	Vortex	5.95
	Mikro Gen	Elite	5.95
	Micromania	Mikro Gen	5.95
	New Generation	Micromania	5.95
	Ultimate	New Generation	5.95
	Bug Byte	Ultimate	9.95
	Beyond	Bug Byte	6.95
	Melbourne House	Beyond	7.95
	Melbourne House	Melbourne House	14.95
	Ultimate	Melbourne House	14.95
	Addictive	Ultimate	7.95
	Gilsoft	Addictive	6.95
		Gilsoft	14.95

All prices include P&P + V.A.T.

We can supply any peripheral or software
The lowest possible prices.

Telephone Decathlon 24 hour hotline
(Please state computer when ordering.)

Digital Discount
47 Oxford Road
Acocks Green
Birmingham B27 6DS
(021) 706 4054

An EMAP
Publication

£2.25

The 1985 sinclair user annual

ALL THAT MADE THE NEWS IN THE SINCLAIR YEAR

25 PAGES OF NEW
PROGRAM LISTINGS

THE FULL
QL STORY

TOP SOFTWARE
AUTHORS
INTERVIEWED

HITS AND MISSES
IN SOFTWARE IN 1984

ORDER A COPY FROM
YOUR NEWSAGENT NOW



Surprise!

SPECIAL FREE 32-PAGE
ADVENTURE SUPPLEMENT
COMPUTER & VIDEO GAMES
ON SALE FEB. 16TH



There's an even bigger surprise in store for you in the March edition of Computer & Video Games. A special 32-page Adventure supplement edited by resident expert Keith Campbell, plus great games listings, reviews, the Top 30 chart and much more.
At your newsagent on the 16th of February.

ELECTRONICS AND COMPUTING MONTHLY

Britain's best selling computer applications magazine

March issue on sale
from February 13th

Hackers exposed!

On the trail of database crackers
We focus on the activity of the microcomputer hackers, examining the techniques they use and suggesting some ways in which database managers could improve the security of their systems.

HACKERS CHALLENGE

Win cash prizes in our competition designed to select the UK's supreme hacker.

CAD on a shoestring

A low cost circuit drafting program for the BBC micro that will give your circuit diagrams that professional look.



Spectrum screen dump software

Software that allows a faithful copy of the Spectrum's screen display to be reproduced by an Epson type printer.

Tapping into QL pipes

Unleash the communications power of the QL by making use of the versatile pipes that are a feature of the computer.

PLUS

News, reviews and features covering all the popular micros.

Electronics and Computing, the magazine that reaches the bits that other magazines don't even know about.

Place a regular order to avoid disappointment.

On sale at all leading newsagents

THE INSPIRATION for the column this month comes from a letter from Peter Green of Gravesend who writes: "I was recently given a Spectrum and I want to learn how it works. I have been reading the manual, particularly Chapter 24 on the internal workings, but it does not make much sense to me."

A computer is a machine which is capable of storing a sequence of instructions and then executing them. To do so requires a memory in which the instructions can be stored. Most home micros contain two distinct types of memory. The first type is read-only-memory — ROM — which contains the fixed set of instructions implanted in the machine by the manufacturer. The second type is random-access-memory — RAM.

RAM is the notepad of the computer. When it is performing a task it is continually looking at what is in RAM — 'reading' from memory — and altering the contents of RAM — 'writing' to memory. The notepad is not used haphazardly — different parts of RAM are used to store different sorts of information.

A Basic program entered by the user, for example, is stored in one part of RAM, whilst the variables used by the program are stored elsewhere. In Sinclair machines, the size of the notepad is limited so the machine is careful to allocate just the right amount of space required to hold a given piece of information.

Spare space is always collected in one place so that if, for example, the user wants to add a line to his program the information in RAM is shuffled along so that some spare space is used up and just enough space is created at the location at which the line is to be added.

Blueprint for Spectrum memory manipulation

Andrew Hewson investigates the memory map and puts the tick into a Spectrum screen clock using machine codes



There are 16384 memory locations in RAM in the 16K ZX Spectrum — the 48K machine has a further 32768 locations making 49152 in all. Each location can hold a single whole number between 0 and 255 inclusive and is identified by its 'address' which is a positive whole number.

Addresses 0 to 16383 are assigned to

the fixed form of memory, the ROM, and so the first address assigned to RAM is 16384. Table one shows the memory map of the Spectrum: how RAM is used starting at 16384. The display file, for example, which holds the information which is currently displayed on screen, occupies locations 16384 to 22527. The attributes, which determine the colour, brightness and so on, of the screen display, follow immediately afterwards in locations 22528 to 23295.

The first five addresses in the first column of table one are all fixed because the display file and the attributes all occupy a fixed amount of space. The fifth area is assigned to the microdrive maps. If a microdrive is attached to the Spectrum that area contains the information on the layout of the data on the cartridge.

If a microdrive is not attached, the area is not needed in which case the sixth area, channel information, lies immediately after the fourth, the sys-

Starting address or system variable name	Location of system variable	Memory contents
16384	—	display file
22528	—	attributes
23296	—	printer buffer
23552	—	system variables
23734	—	microdrive map
CHANS	23631	channel information
PROG	23635	Basic program
VARS	23627	variables
E-LINE	23641	command/line being edited
WORKSP	23649	data being INPUT
STKBOT	23651	calculator stack
STKEND	23653	spare
sp	—	machine stack and GOSUB stack
RAMTOP	23730	user machine code routines
UDG	23675	user-defined graphics
P-AMT	23732	end of RAM

Table 1. Spectrum memory map. The stack point, sp is held not in RAM but in the sp register in the Z80A microprocessor.

tem variables, in line with the practice of saving space wherever possible. Hence the starting address of the channel information area and all subsequent areas is not fixed but can 'float' up and down RAM.

The Spectrum keeps track of the starting address of all those areas by storing the current value of each address within the system variables area. The system variables area is the fourth in the sequence, between the printer buffer and the microdrive maps at locations 23552 to 23733. The address within the system variables area which holds the starting address of each 'floating' area is listed in column two of table one. The address of the Basic program area, for instance, is held at 23635 within the system variables area.

Referring to each system variable by the address at which it is held is rather awkward and so each is given a name — PROG in the case of the location which holds the address of the Basic program area. Those names are for the user's convenience only. They are not

recognised by the Spectrum. Thus entering the line:

PRINT PROG

will cause the error message '2 Variable not found' to be PRINTed unless a Basic variable called PROG has been generated coincidentally by a program or by the user. The value of such a Basic variable would in general have nothing to do with the value of the PROG system variable.

Simon Carver of Manchester also has a Spectrum. He writes: "Can you explain the difference between PEEK and POKE?"

The memory map is the key to understanding the use of RAM by the Spectrum but the keys to exploring RAM are the Basic keywords, PEEK and POKE, which allow the user to look at the contents of a memory location and alter it respectively.

PEEK is a function of the form:

PEEK address

The address can be a positive whole number between 0 and 65535 or an arithmetic expression which when evaluated gives such a positive number.

It is important to enclose an arithmetic expression in brackets because

PEEK 16384 + 2

is integrated as 2 added to the result of:

PEEK 16384

whereas

PEEK (16384 + 2)

is interpreted as

PEEK 16386

The value returned by the PEEK function is the number currently held at the address in question which will always be a positive whole number between 0 and 255 inclusive. It was explained above the PROG system variable is held at address 23635 but that is not strictly correct. The value of PROG, being an address in RAM, is always much larger than 255, and therefore two adjacent addresses, 23635 and 23636, are needed to hold it. The value of PROG can be PRINTed by entering:

PRINT "PROG ="; PEEK 23635 + 256 * PEEK 23636

All addresses are held in two adjacent

continued on page 130

Table 2. A Spectrum routine to display minutes and seconds in the top right hand corner of the screen.

Decimal	Assembly Code	Comment	Decimal	Assembly Code	Comment
14 255	defw clock	define address of clock routine	241	exit pop af	restore all registers from stack
50	tix defb 50	50 "ticks" per second	193	pop bc	
0	mins defb 0	store for minutes counter	209	pop de	
0	secs defb 0	store for seconds counter	225	pop hl	
237 86	stop im 1	reset interrupt mode 1	195 56 0	jp 56	return via normal interrupt routine
201	ret	return	229	push hl	preserve hl
	chars equ 23606	set address of character set	42 54 92	ld hl,(chars)	character table address to hl
62 254	start ld a,254	beginning of routine	214 32	sub 32	subtract 32 from character code
237 71	ld i,a	transfer part of address to i register	135	add a,a	double code
237 94	im 2	set interrupt mode 2	135	add a,a	double code
201	ret	return	135	add a,a	double code
229	clock push hl	preserve all registers on stack	95	ld e,a	calculate address of character in table
213	push de		22 1	ld d,l	
197	push bc		25	add hl,de	
245	push af		6 8	ld b,8	print each eighth of character in turn
58 2 255	ld a,(mins)	minutes counter to a	209	pop de	restore hl to de
33 27 64	ld hl,401bh	address in display file to hl	126	ld a,(hl)	load eighth into a
205 114 255	call disp	call routine to display minutes	35	inc hl	increment pointer
62 58	ld a,58	character code for colon to a	18	ld (de),a	post eighth to display
33 29 64	ld hl,40ldh	address in display file to hl	20	inc d	increment display pointer
205 91 255	call pchr	call routine to display colon	16 250	djnz zero	jump back for next eighth
58 3 255	ld a,(secs)	seconds counter to a	201	ret	end of sub-routine
33 30 64	ld hl,401eh	address in display file to hl	205 135 255	disp call cvrt	call conversion routine
205 114 255	call disp	call routine to display seconds	122	ld a,d	transfer tens column to a
58 1 255	ld a,(tix)	tick counter to a	198 48	add 48	add base code
61	dec a	decrement tick count	213	push de	preserve de and hl
50 1 255	ld (tix),a	new count to tick store	229	push hl	
32 31	jr nz,exit	jump if tick count is non-zero	205 91 255	call pchr	call routine to print tens character
62 50	ld a,50	tick count is zero — set a to 50	225	pop hl	restore hl
50 1 255	ld (tix),a	and transfer to tick store	35	inc hl	increment hl
58 3 255	ld a,(secs)	seconds counter to a	209	pop de	restore de
60	inc a	increment seconds count	123	ld a,e	transfer units column to a
254 60	cp 60	compare to 60	198 48	add 48	add base code
32 15	jr nz,two	jump if less than 60	205 91 255	call pchr	call routine to print units character
58 2 255	ld a,(mins)	seconds equal 60 — load a with minutes	201	ret	end of sub-routine
60	inc a	increment minutes	22 255	cvrt ld d, 255	load d with 255
254 60	cp 60	compare with 60	20	inc d	increment d
32 2	jr nz,one	jump if less than 60	214 10	sub 10	subtract 10 from a
62 0	ld a,0	minutes equal 60 — load a with 0	48 251	jr nc,three	jump if positive
50 2 255	one ld (mins),a	set new minutes count	198 10	add 10	add back last ten
62 0	ld a,0	load a with 0	95	ld e,a	store result in e
50 3 255	two ld (secs),a	set new seconds count	201	ret	end of sub-routine

continued from page 129

locations in this fashion and can be inspected by entering:

PRINT PEEK first address + 256 *
PEEK subsequent address

For example, if a Spectrum is used without a microdrive attached the microdrive map will be non-existent and the channel information will follow immediately after the system variables areas. Thus the value of the CHANS system variable will be the same as the starting address of the microdrive map, were it to exist, that is, 23734. CHANS is held at 23631 and 23632 and so entering

PRINT PEEK 23631 + 256 *
PEEK 23632

will yield the value 23734.

The PEEK function can be used to look at the contents of any location in memory, including the fixed instructions in ROM. It is therefore a very important tool. PEEKing any location will not cause the Spectrum to crash or corrupt a program or variables. Very occasionally, the results of a PEEK can be misleading because the contents of the location being PEEKed may alter during or immediately after the execution of the instruction. For example, if the contents of the locations which are assigned to the top left

hand corner of the screen display are PEEKed and the results PRINTed in the top left hand corner of the screen, the information will already be out-of-date by the time the user views it.

The POKE command is altogether more dangerous than the PEEK function because by invoking it the user is likely to interfere in the functioning of the Spectrum. It is quite possible using this command to make a nonsense of the information in RAM causing the machine to crash, or to halt and display an error code.

The form of that command is:

POKE address, number

Once again, the address is a positive whole number between 0 and 65535 inclusive, or an arithmetic expression which gives such a number when evaluated. Unlike PEEK is is not essential to enclose an arithmetic expression in brackets because POKE is a command, not a function, and therefore cannot be evaluated as a whole. The number POKed into a location must lie between 0 and 255 inclusive.

Both the ZX-81 and the Spectrum will accept and execute a POKE command directed at an address in ROM — an address between 0 and 16383 inclusive. However, the number will never reach its destination because the

contents of ROM are fixed. That fact can be demonstrated by RUNNING the following program:

10 PRINT PEEK 0

20 POKE 0, 92

30 PRINT PEEK 0

Line 10 PRINTs the contents of the first location in ROM. Line 20 attempts to alter the contents to 92 but line 30 will show that no effect has registered.

The final letter comes from Michael Mehta of Stoke-on-Trent. He writes: "Could you supply a machine code routine on the Spectrum which shows the elapsed time in minutes and seconds on the screen? I know how to do the job in Basic but the routine takes too long to run."

The machine code routine to display minutes and seconds is listed in table two. As usual, I have listed the code in decimal so that those people who do not have an assembler can POKE it straight into memory.

Please note that the routine runs under the interrupt system. This is achieved by setting the Z80 into interrupt mode two and then vectoring the call to the beginning of the routine.

● Please address problems and queries to Andrew Hewson, Helpline, Graham Close, Blewbury, Oxfordshire.



£8.50 INC VAT, P&P



£7.50 INC VAT, P&P

SPECTRUM THE MACHINE CODE SYSTEM

- * "... one of the all too few jewels of Spectrum programming ... deserves a place in every serious programmer's library" (Simon Springett—Popular Computing Weekly—June 1984)
- * "... the whole package is very friendly and easy to use ... can be highly recommended for those who are just about to start programming in Machine Code." (Phil Holliday—Your Computer—May 1983)
- * Fully compatible with MICRODRIVES/NETWORK/RS232 (with Interface 1) and most popular Centronics interfaces for 80 col. printout.

AMSTRAD THE MACHINE CODE SYSTEM

- * Both programs in one package
- * Many NEW FEATURES
- * Compatible with CASSETTE and DISC

AVAILABLE SHORTLY

- * Send S.A.E. for fully detailed leaflet
- * Available from many computer shops, or by FAST mail order by sending a cheque/PO. to—

Dept SU, Picturesque, 6 Corkscrew Hill, West Wickham, Kent BR4 9BB

PICTURESQUE
PICTURESQUE
PICTURESQUE

Micro-Computer Show



AT

PUDSEY CIVIC CENTRE

(midway between Leeds and Bradford)

SATURDAY, 16th MARCH, 1985

Admission: Adults £1.00 Children 50p

10am till 5pm

VISIT THE COMPLETE SHOW FOR THE HOME USER
AND SEE:

Dragon

Amstrad

Acorn

Oric

Sinclair

Commodore

& Others

Northern
Premier
Exhibitions

Hardware, Software, Books and
Magazines everything for the home user.

EXHIBITORS please call 0532-552854 after 4 pm
for booking details.

Venue: Civic Hall, Dawsons Corner, Pudsey, W. Yorkshire

Britain

Alton Computing & Electronics Society: C/o Kevin Weatherhead, Sheen, Old Oldham Road, Alton, Hampshire, GU34 4BW.
Aylesbury Computer Club: 12 Long Plough, Aston Clinton, Aylesbury, Bucks.
Aylesbury ZX Computer Club: Ken Knight, 22 Mount Street, Aylesbury (5181 or 630867).
Basildon: Roundacre Microcomputer Users' Club. J Hazell, Basildon 285119/416333. Meetings every Wednesday 7.30 to 10.30pm.
Blackburn Computer Club: 1 Sutton Street, Feniscowles, Blackburn, Lancashire. Tel: B'burn 60033 (office hours) or 28127. Meets twice a month, subscription £5 (£3 juniors).
Bristol Yate and Sodbury Computer Club: 99 Woodchester Yate, Bristol, BS17 4TX.
Broughty Ferry Magic Micro Spectrum Users Club: Lindsay Darroch 78 Marlee Road, Broughty Ferry (0382) 75459 or Fraser McGuire, 7 Kenaway Place, Broughty Ferry, Dundee (0382) 75821.
Cardiff ZX Club: Steve Smith (0222) 593237 or Mike Hayes (0222) 371732. Meets twice a month.
Cheshire Spectrum Club: 186, Holland Street, Crewe, Cheshire. Telephone: 0270-212653 for details.
Colchester Sinclair User Group: Richard Lown, 102 Prettygate Road, Colchester CO3 4EE.
Computer Club International: 6 Drumdoon Walk, Downpatrick, N. Ireland BT30 6UF.
Cornard Sinclair User Group: Neil MacDonald, 15 Potkilm Road, Great Cornard, Sudbury, Suffolk CO10 0DA.
Crewe and Nantwich Computer Users' Club: J E A Symondson, 46 London Road, Stapely, Nantwich, Cheshire CW5 7JL.
Daventry & District Computer Club: c/o Daventry Ex-servicemen's Club, Market Square, Daventry, Northants.
Doncaster and District Micro Club: John Woods, 60 Dundas Road, Wheatley, Doncaster DN2 4DR; (0302) 29357.
Eastwood Town Microcomputer Club: E N Ryan, 15 Queens Square, Eastwood, Nottingham NG16 3BJ.
Edinburgh: Edinburgh Home Computing Club. John Palmer (031 661 3183) or Iain Robertson (031 441 2361).
EZUG-Educational ZX-80-81 Users' Group: Eric Deeson, Highgate School, Birmingham B12 9DS.
Furness Computer Club: R J C Wade, 67 Sands Road, Ulverston, Cumbria (Ulverston 55068). Meets every other Wednesday.
Glasgow ZX-80-81 Users' Club: Ian Watt, 107 Greenwood Road, Clarkston, Glasgow G76 7LW (041 638 1241).
Gloucester: Mid-weekly Spectrum User Group. Barry Ledbury, 8 Linnert Close, Gloucester GL4 9XA (0452) 23186.
Gravesend Computer Club: Steve Janday, The Council Tenants Club, Whitehill Lane, Gravesend, Kent.
Hassocks ZX Micro User Club, Sussex: Paul King (Hassocks 4530).
Independent QL Users Group: Brian Pain, 24 Oxford Street, Stony Stratford, Milton Keynes MK11 1JU. Tel: 0908 564271.
Inverclyde ZX-81 Users' Club: Robert Watt, 9 St John's Road, Gourrock, Renfrewshire PA19 1PL (Gourrock 39967). Meets every other Monday at Greenock Society of the Deaf, Kelly Street, Greenock.
Keighley Computer Club: Colin Price, Redholt, Ingrow, Keighley (603133).
Lambeth Computer Club: Robert Baker, 32 Heatherington Road, London SW4 7NX.
Liverpool ZX Club: Wednesdays 7pm at Youth Activities Centre, Belmont Road, Liverpool 6. Keith Archer, 031-236 6109 (day-time).
Llanelli Computer Club: 40 Tan-Y-Bryn, Burry Port, Dyfed. Llanelli 56917.
Manchester Sinclair Users' Club: Meets every Wednesday, 7.30pm, at Longsight Library, 519 Stockport Road, Longsight — 061 225 6997 or 061 445 6316.
Meopham: National ZX Spectrum User Club. Guy Fullalove, Woodcotes, Camer Park, Meopham, Kent DA13 0XS. Bi-monthly newsletter, subscription £1.50. Send SAE for details.
Merseyside Co-op ZX Users' Group: Keith Driscoll, 53 Melville Road, Bootle, Merseyside L20 6NE; 051-922 3163.
Micro Users' Group: 316 Kingston Road, Ewell, Surrey KT19 0SY.
Mid-Kent Micro Club: Meets once monthly. Enquiries to M Gates, 65 Buckland Road, Maidstone ME16 0SH.
Mill Lane Association Computer Group: Bryan McAlley, 1 Cowleaze, Chinnor, Oxfordshire. (0844) 52426.
Newcastle (Staffs) Computer Club: Meetings at Newcastle Youth and Adult Centre, Thursday, 7.30. Enquiries to R G Martin (0782 62065).
North Hertfordshire Home Computer Club: R Crutchfield, 2 Durham Road, Stevenage. Meetings: first Friday of the month at the Settlement, Nevells Road, Letchworth.

Northern Ireland Sinclair Users' Club: P Gibson, 11 Fitzjames Park, Newtownards, Co Down BT23 4BU.
North London Hobby Computer Club: ZX users' group at North London Polytechnic, Holloway Road, London N7 Monday, 6pm.
Nottingham Microcomputer Club: ZX-80-81 users' group. G E Basford, 9 Holme Close, The Pastures, Woodborough, Nottingham.
Orpington Computer Club: Roger Pyatt, 23 Arundel Drive, Orpington, Kent (Orpington 20281).
Perth and District Amateur Computer Society: Alastair MacPherson, 154 Oakbank Road, Perth PH1 1HA (29633). Meetings: third Tuesday of each month at Hunters Lodge Motel, Bankfoot.
Regis Amateur Microcomputer Society: R H Wallis, 22 Mallard Crescent, Pagham, Bognor Regis, West Sussex PO21 4UU.
Roche Computer Club: 8 Victoria Road, Coop Rooms, Roche, Cornwall: 0726 890473. Twice weekly meetings. Monday and Friday.
Saltcoats Computer Club: Colin Borland, 117 High Road, Saltcoats, Ayrshire KA21 5SD. Weekly meetings.
Scunthorpe ZX Club: C P Hazleton, 26 Rilestone Place, Bottesford, Scunthorpe, (0724 63466).
Sheffield: South Yorkshire Personal Computing Group. R Alderton (0742 20571), S Gray (0742 351440), P Sanderson (0742 351895).
Sinclair Amateur Radio User Group: SAE or two IRCs for details. Paul Newman G4 INP, 3 Red House Lane, Leiston, Suffolk IP16 4JZ.
Sinclair Mind Games Circle: Formerly the Hobbit Appreciation Society. 12 Middlefield Lane, Hinckley, Leics.
Sinclair Postal User Group: 24 St Mary's Way, Code SUL, Chigwell, Essex IG7 5BX. Produces magazine with competitions.
St Albans: Bi-monthly meetings and a magazine. Details from Adam Slater, 40 Watford Road, St Albans, Herts AL1 2HA. (0727 54176).
Stratford-on-Avon Computer Club: Meets on the second Wednesday of every month. Telephone: 0789 68080 for details.
Swansea Computer Club: B J Candy, Jr Gorlau, Killay, Swansea (203811).
Swindon ZX Computer Club: Andrew Bartlett, 47 Grosvenor Road, Swindon, Wilts SN1 4LT; (0793) 3077. Monthly meetings and library.
Sutton: Sutton Library Computer Club, D Wilkins, 22 Chestnut Court, Mulgrave Road, Sutton, Surrey SM2 6LR.
Swale Computer Club: 1 Eastwood Road, Sittingbourne, Kent ME10 2LZ. Meets twice monthly. Contact: John Waterman.
Washington Sinclair Users' Club: Columbia Community Centre, Tyne and Wear. Meets twice a month, tel. 4179483 or 4167367.
West Sussex: Midhurst and District Computer User Group. Enquiries to V Weston (073 081 3876), R Armes (073 081 3279).
Worle Computer Club: S W Rabone, 18 Castle Road, Worle, Weston-super-Mare BS22 9JW (Weston-super-Mare 513068).
Universal ZX Club: Postal club for Spectrum owners in the UK and abroad. C Shaw, 1 Swiss Walk, Batley, W. Yorkshire.
ZX-Aid: Conrad Roe, 25 Cherry Tree Avenue, Walsall WS5 4LH. Please include sae. Meetings twice monthly.

Overseas

Australia: Australian ZX Users' Newsletter, incorporating QL User. Paul Janson, P.O. Box 397, Dapto 3530, Australia. Also seeks unpaid contributions for the newsletter. — W.A. ZX Users' Group, Garth Gregson, 34 Chester Street, South Fremantle 6162. Phone 3351671.
ZX Spectrum Users Group: P.O. Box 466, Epping 2121, N.S.W., Australia. Contact: Craig Kennedy.
Austria: ZX User Club, Thomas Christian, c/o Wissenschaft Forscht e. V., Postfach 141, A1190 Vienna. Meets every first Friday of the month. Telephone 0222-44 32 050 for details.
Denmark: Danmarks National ZX-8081 Klub (DNZK), Jens Larson, Skovmosevej 6.4200 Slagelese, post giro 1 46 24 66.
ZZ-Brugergruppen i Danmark, Boks 44, 2650 Hvidovre, Gratis medlemskab og gratis blad til enhver interesseret.
J Niels-Erik Hartmann, OZ-ZX-Radioamator, Bruger Gruppe, Bredgade 25 DK-4900, Nakskov.
Finland: ZX-kerho, c/o Kalevi Hamalainen, Siltakatu 9 A 8, 33100 Tampere 10, Finland. Phone 35831-34238. Publishes quarterly paper.
France: Club Micro-Europe, Chemin du Moulin 38, B-1328 OHAIN, Belgium (19/32/6332769 ou soir 19/32/6537468) or Paris-Micro, 19 rue de Tilly, 92700, Colombes, France, associated with Club Micro-Europe.
08 Informatique Clubs, 18 rue P Curie, 08000 Charleville-Mezieres, 24/572106; associated with Club Micro-Europe.
Yves Chapron, no. SUS-1047, Rue du Puy, La Terrasse, 38660 Le Touvet, France. Specifically for users in the Alps.
Germany: ZX Club, a postal club; contact Aribert Deckers, Postfach 967, D-7000 Stuttgart 1, West Germany.
Greece: Athens Spectrum Club; Paris Stamelos, Spetsou 2, isi22 Marousi, Athens, Greece.

continued on page 132

Club Corner

continued from page 131

Indonesia: Jakarta ZX-80/81 Users' Club, J S Wijaya, PO Box 20, Jkukg, Jakarta, Utara, Indonesia.

Irish Amateur Computer Club: Martin Stapleton, 48 Seacourt, Clontarf, Dublin 3 (331304).

Irish Sinclair Users' Club: PO Box 1238, Dublin 1. Publishes a newsletter. Send SAE for details.

Italy: Sinclair Club, Via Molino Vecchio 10/F, 40026 Imola, Italy. Genova Sinclair Club; Vittorio Gioia; Via F Corridoni, 2-1, telephone 010 3125 51.

The Netherlands: Clive's Bits and Bytes, Paus Joannesstraat 32, 6235 CK Ulestraten. Telephone 043-644244. Contact: Louis Last.

Republic of Ireland: Irish ZX-8081 Users' Club, 73 Cnoc Crionain, Baile Atha, Cliaith 1.

Singapore: Sinclair Users' Group: Charles Wong, 1005 Upper Bukit Timah Road, Singapore 2367.

South Africa: Amateur Spectrum Users' Club, PO Box 280, Winklespruit, Natal 4145. Steve Reinemo is interested in corresponding with users worldwide.

South African Sinclair Users' Club: PO Box 3923, Randburg 2125, Simon Lucas, chairman. Tel. (011) 704 2596.

Dumont and Syndercombe Amateur Computer Club: Jean-Pierre Dumont would like to correspond with ZX-81 owners via tapes. Write to 8 Kipling Road, Farrarmere, Benoni 1500, Transvaal.

ZX SA Club: Jonathan Jones, House 14, Anglo Alpha PO Box 15, 1725 Roodepoort.

Spain: Club Nacional de Usuarios del ZX-81, Joseph-Oriol Tomas, Avda. de Madrid, No 203 207, 10, 3a esc. A Barcelona-14 Espana. International ZX Spectrum Club: Gabriel Indalecio Cano, Sardana, 4 atrico 2a, San Andres de la Barca, Barcelona. Send international reply coupon. Produces a bi-monthly magazine. Spanish ZX Micro Club: Apartado 181, Alicante (Costa Blanca), Spain.

ZX Club Spain; C Benito PO Box 3253, Madrid, Spain.

Swedish ZX-club: Sinclair Datorklubben, Box 1007, S-122, 22 Enskede.

United States: Bay Area ZX-80 User Group, 2660 Las Aromas, Oakland CA94611. — Harvard Group, Bolton Road, Harvard MA 01451: (617 456 3967) — SAF Users' Group, 2749 Eden Road, Leslie, Michigan 49251. — ZX Users' Group of New York, Box 560 Wall Street, New York, N.Y. USA 10005. Subscriptions \$15US, publishes international newsletter. Seeks newsletter exchange with other groups.

POOLSWINNER

THE ULTIMATE POOLS PREDICTION PROGRAM

- **MASSIVE DATABASE** Poolswinner is a sophisticated Pools prediction aid. It comes complete with the largest database available - 22000 matches over 10 years. The database updates automatically as results come in.
- **PREDICTS** Not just SCOREDRAWS, but ALWAYS, HOMES and NO SCORES.
- **SUCCESSFUL** SELEC guarantee that Poolswinner performs significantly better than chance.
- **ADAPTABLE** Probabilities are given on every fixture - choose as many selections as you need for your bet. The precise prediction formula can be set by the user - you can develop and test your own unique method.
- **SIMPLE DATA ENTRY** All English and Scottish team names are in the program. Simply type in the reference numbers from the screen. Or use FIXGEN to produce fixture list automatically (see below).
- **DISC/MICRODRIVE COMPATIBLE** All versions (except Apple and IBM) are supplied on tape, with simple instructions for conversion to disc/microdrive operation. (This seasons results are supplied with the package so that predictions can start immediately.)

AVAILABLE FOR Spectrum (48K), Commodore 64, VIC 20 (+ 16K), AMSTRAD CPC 464, BBC B, Atari (48K), ZX81 (16K), Dragon, Apple II, IBM pc

PRICE £15.00 (all inclusive)



FIXGEN 84/5

AT LAST! No more struggling for hours to get the fixture list into the computer. FIXGEN has been programmed with all English and Scottish fixtures for 1984/5. Simply type in the date, and the full fixture list is generated in seconds. Fully compatible with Poolswinner.

POOLSWINNER with FIXGEN £16.50 (all inclusive)
Fixgen alone £5.50



COURSEWINNER V3
THE PUNTERS COMPUTER PROGRAM

Coursewinner is designed to allow you to develop and test your own unique winning system. Using information from daily newspapers or 'Sporting Life', the most important factors can be input and analysed. The program is supplied with a database detailing best trainers and jockeys, and effect of the draw for all British courses. (Flat & National Hunt.)

AVAILABLE FOR Spectrum (48K), Commodore 64, BBC (B), Dragon, Atari (48K), Apple II

PRICE £12.50 (all inclusive)

AVAILABLE (RETURN OF POST) FROM ...



phone 24 hrs



phone 24 hrs



phone 24 hrs

37 COUNCILLOR LANE, CHEADLE, CHESHIRE. ☎ 061-428 7425

THETFORD MICROS

SPECIALIST IN SPECTRUM REPAIRS

21 Guildhall Street,
Thetford,
Norfolk,
Tel: (0842) 61645

Service Department
Unit 4, Leyland Close,
Thetford, Norfolk,
Tel: (0842) 65897

Why wait weeks to get your Spectrum repaired

We at Thetford Micros (Service Dept) have just put into operation a new fully equipped workshop to allow us to keep up our 24 Hours "Guaranteed" repair service on your Sinclair Spectrum computers. We have fully trained staff and our workmanship and repair work is fully warranted to give you the confidence that your micro is in the safest hands. Any first time repairs will be £16.00 + VAT + £2.00 postage and package = total £20.40 for any repair on your computer. Payment may be made by cheque, Barclaycard, Access, American Express, or Postal Order. So all you have to do is post your faulty Spectrum to us along with payment and we will do the rest, your repaired Spectrum will be back in the post within 24 hours (we never sleep!) and depending on the post office it will be back with you within 5-6 days.

We have already undertaken repairs from all over England and the continent.

We also undertake repair work on Acorn, Commodore, Amstrad, Texas, Dragon etc., at the lowest of prices.

Any problems with your micro phone Pete on the above telephone numbers - I'll be only too pleased to assist.

Trade enquiries welcome

ZAXXON FORT APOCALYPSE
 POLE POSITION
 SPITFIRE ACE
 UP 'N DOWN
 BRUCE LEE
 BLUE MAX
 STELLA 7
 PAC MAN
 SENTINEL
 FLAM NATO
 COMMANDER
 BUCK ROGERS
 INDIANA JONES
 TAPPER FORBIDDEN FOREST



BEACH HEAD
 CONGO BONGO
 SOLO FLIGHT
 SPY HUNTER
 DROP ZONE
 RAID OVER
 MOSCOW
 F15 STRIKE
 EAGLE MR.
 DO DRELS
 KNIGHTS OF
 THE DESERT
 CONAN SLINKY
 DALLAS QUEST

GOLD STRIKE

GUARANTEED PAYMENTS
FOR FIRST CLASS ASSEMBLY LANGUAGE
PROGRAMMERS

Translation work on the chart-topping
 U.S. Gold Commodore games to the
Spectrum 48K



Become part of the best motivated team in the U.K.
 ... one-off or long term contracts available
 and original game or software concepts also required
 for World Wide publication.



For fame and fortune from U.S. Gold
 write in confidence to:
 Software Development, U.S. Gold,
 6 Central Street, Manchester M2 5NS,
 or phone 061-832 6633 for details.

'PSSST!'

...ELLO JON GOTTA NEW COMPUTA'

Games Extra

So now you've got a new Commodore computer what are you going to do with it? We have the answer and it won't cost you a penny.

The January edition of **COMMODORE USER** has a **FREE** 36 page Games Extra. It contains six super listings for the 64, many written by professional authors for companies like Melbourne House and McGraw Hill. Shiver in Dracula's Nightmare, discover the North-West Passage in Francis Drake's Adventure or dodge the avalanche in Everest.

We haven't forgotten Vic owners either. Brick, Beaglebug or dodge the traffic with Hoppa. All are published complete with our 'Easy-Enter' technique exclusively developed for **COMMODORE USER**.

Look out for the January issue of **COMMODORE USER**.
AT YOUR NEWSAGENT FROM THE 22ND OF DECEMBER.

The Complete Commodore Software Guide

Not content with one free gift, our February edition contains a 36 page Complete Commodore Software Guide. We list over a thousand programs, with prices. Whatever the software package you are after for your Commodore — from Jet Set Willy to word processors — The Complete Commodore Software Guide is the place to start.

On sale Feb 1st 1985.

COMMODORE
user



BEYOND

CHALLENGING SOFTWARE

From the Ruins of
Blasted Ushigarak
I pledge that the Moonprince's
triumph be short lived
Shareth my daughter will
lure him to
her frozen Empire and
to his doom
This I vow for this is

**DOOMDARK'S
REVENGE**

THE GAME THAT LARD YOU UP AFTER MIDNIGHT!

Please send me **Doomdark's Revenge** (Spectrum £9.95)
(But not unless you've already experienced PART ONE)

The Lords of Midnight (Spectrum £9.95)

Order Hotline **0855 34567**
Enquiries **01-887 5007**

Total
Price £

I enclose a Postal Order/Cheque payable to **Beyond**, or charge my credit card

Card Number
Access/Visa (Delete as necessary)

Name

Address

Post Code

Signed

Please rush me details of
the **Beyond Club!** ☐



Beyond Competition House, Farndon Road, Market Harborough,
Leicestershire LE19 9NR

SP/2/85

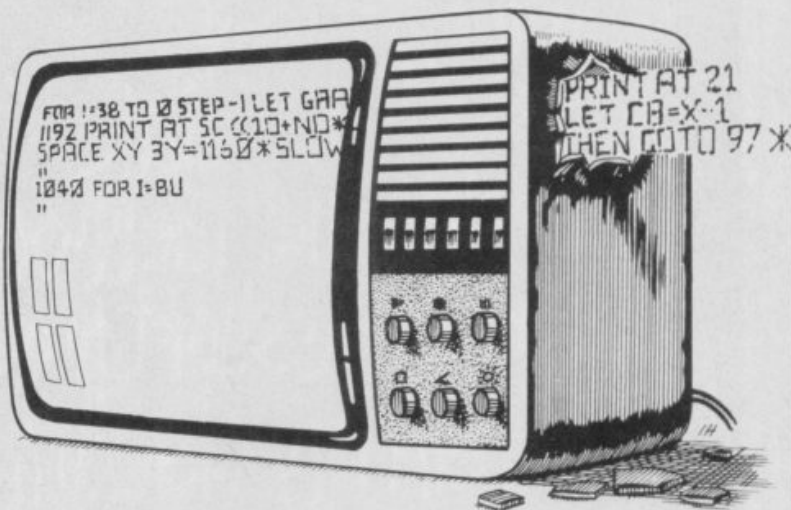
ENOUGH TO BLOW ANYONE'S FUSE.

Every month, SINCLAIR PROGRAMS features extensive listings for the Sinclair Spectrum and ZX81, as well as graphics instructions, letters, 'game of the month', and even a special section for beginners. See you in a month's time!

If it's games you want,
you'll find plenty in
Sinclair Programs

Available from your
newsagents, only 95p

*Sinclair
Programs*



QL USER

Get your FREE Micro-Drive stickers!
Available at your newsagents from February 16th



If we have reviewed a program we have given it a rating known as the Gilbert Factor, named after our Software editor, John Gilbert. That factor includes clarity of instructions, speed of operations, ease of use, originality, lasting appeal, use made of graphics and sound, and success in accomplishing stated aims.

ZX-81

Adventure

Adventure	Bug-Byte	6
Adventure	Gavin Barker	6
Adventure 1	Abersoft	6
Black Crystal	Mastervision	7
Espionage Island	Artic	*
Greedy Gulch	Phipps	7
Lost Island	JRS	*
Magic Mountain	Phipps	*
Merchant of Venus	Crystal	7
Pharaoh's Tomb	Phipps	*
Pimania	Automata	6
Secret Valley	New Soft	*
Serpents Tomb	Vortex	*
Ship of Doom	Artic	7
Time Bandits	New Soft	*
Tomb of Dracula	Felix	6
Trader Trilogy	Quicksilva	5
Volcanic Dungeon	Mastervision	5
World of Illusions	Contrast	4

Arcade

Alien Dropout	Silversoft	*
Asteroids	Silversoft	8
Asteroids	Software Farm	6
Bank Robber	Romik	6
Bears in the Wood	Unicorn	6
Bubble Bugs	Romik	6
Byter	Protek	*
Cassette 1	Orwin	7
Cassette 2-5	Orwin	7
City Patrol	Sinclair	7
Damper	Quicksilva	7
Defenda	Quicksilva	8
Door Slammer	Cathedral	7
Forty-Niner	Software Farm	9
Froggy	DJL	7
Full-screen Breakout	New Generation	*
Galactic Trooper	Romik	6
Galaxians	Quicksilva	6
Galaxy Jailbreak	Romik	6
Games Tape 1	J K Greye	*
Games Tape 2	J K Greye	*
Games Tape 3	J K Greye	*
Gamestape 1	Fawkes Computing	7
Glooper	Quicksilva	7
Gloops	Quicksilva	5
Gobbler	Software Farm	*
Grand Prix	dk'tronics	*
Hang Glider	S Electronics	5
Hickstead	CCS	5
High-resolution Invaders	Odyssey	*
Invaders	Abersoft	5
Invaders	Bug-Byte	8
Invaders	Odyssey	8
Invaders	Selec	7
Krazy Kong	PSS	7
M. Mouse goes de-bugging	Lothlorien	7

Maze Death Race	
Maze Man	
Mazogs	
Micro Mouse	
Namtir Raiders	
Night Gunner	
Rocket Man	
Sabotage	
Six Games	
Space Raiders	
Space Rescue	
Space Trek	
3D Monster Maze	
Three Games Cassette	
Zuckman	
ZX Invasion Force	
ZX Panic	
ZX-81 1K Games Pack	
ZX-81 Pocket Book	

Business

Accounts (Limited company)	Hestacrest
Accounts (Sole Trader)	Hestacrest
Business Bank Account	Transform
Critical Path Analysis	Hilderbay
Draft	Myrmidon
Payroll	Hilderbay
Payroll	Soft Tech
Payroll	V&H Computing
Personal Banking System	Hilton
Purchase Ledger	Hestacrest
Sales Day Book	Transform
Sales Ledger	Hestacrest
Text	Contrast

Education

Binary Brains	Pooter
Four Rules of Number	Micro Master
Integration	University
Intermediate English 1-2	Rose
Language Devel. Series	Glasson
Language Devel. Series	Micro Master
Linear Programming	University
Matrix Operations	University
O Level Chemistry	Calpac
O Level French Revision	Rose
O Level Maths Revision	Rose
Primary Arithmetic	Rose
Regression	University
Self teach Program	Anvil

Language

Forth	Sinclair
ZX Forth	Artic

Practical

Ephemeris	Bridge
Poolster	Naigram

Puzzle

Nowotnik Puzzle	Phipps
Word Fit	Ram Writer

Simulation

Flight Simulation	Sinclair
Pilot	Hewson
Print Shop	CCS

Strategy

Airline	CCS
Auto Chef	CCS
Battleships	JRS
Conflict	Martech
Cyborg Wars	Stratagem
Dallas	CCS
Dictator	Bug-Byte
Fighter Pilot	Digital Integration
Football Manager	Addictive Games
Fort Apache	Contrast
Galaxy Conflict	Martech
Ocean Trader	Quicksilva
Pioneer Trail	Quicksilva
Racehorse Trainer	G Barker

Traditional

Do Not Pass Go	Work Force
Lynchmob	Bridge
Original Superchess	CP Software
ZX 1K Chess	Artic
ZX Compendium	Mastervision
ZX-Chess 1	Artic

Utility

Graphics	IPA
Graphics Toolkit	JRS
HI Resolution	CRL
Machine Code Test Tool	OCP
MCoder	PSS
Programme Enhancement	
Renumber Delete	Work Force
Trace	Texgate
ZX Compiler	Silversoft
ZX Screenkit	Picturesque
ZX-Bug	Artic
ZXAS	Bug-Byte

SPECTRUM 16K

Adventure

Android One	Vortex
Escape	New Generation
Moria	Severn
Planet of Death	Artic
Secret Valley	New Soft
The Great Western	New Soft
Time Bandits	New Soft

Arcade

Aquarius	Bug-Byte
Arcadia	Beau Jolly
Arcadian	J K Greye
Assassin	Spectrasoft
Avenger	Abacus
Baron	Temptation
Black Hole	Quest
Blind Alley	Sunshine
Caterpillar	CDS
Cavern Fighter	Bug-Byte
Centi-Bug	dk'tronics
Children's Compendium	Dymond
City Defence	Mikro-Gen
Colour Clash	Romik
Cookie	Ultimate
Cosmic Guerilla	Crystal
Crazy Cranes	Voyager
Creepy Crawler	Mikro-Gen
Crevasse and Hotfoot	Microsphere
Cruising	Sunshine
Cyber Rats	Silversoft
Death Chase	Micromega
Demolition	Comp. Rentals
Destroyer	Winters
Di-lithium Lift	Hewson
Doombugs	Work Force
Dymonoids	Dymond
Earth Defence	Artic
Ed-On	Add-On
Eskimo Eddie	Ocean
Family Games Pack	Hornby
Fireflash	Abacus
Froggy	DJL
Fruit Machine	dk'tronics
Galactians	dk'tronics
Galactic Trooper	Romik
Galactic Warriors	Abacus
Galaxians	Artic
Ghost Hunt	PSS
Gnasher	Mastertronic
Gobble-a-Ghost	CDS
Gobbleman	Artic
Godzilla and Martians	Temptation
Ground Attack	Silversoft
Gulpmen	Campbell
Haunted Hedges	Micromega
Hopper	PSS
Horace and the Spiders	Sinclair
Horace Goes Skiing	Sinclair
Hungry Horace	Sinclair
Invasion Force	Artic
It's the Wooluf	Crystal
Jet Pac	Ultimate
Labyrinth	Axis
Luna Crabs	Micromega
Magic Meanies	CDS
Maze Chase	Hewson
Meteor Storm	Quicksilva
Meteoroids	dk'tronics
Meteoroids	Softtek
Micro Mouse	Lothlorien

Milypede
 Mined Out
 Moon Buggy
 Mr Wong's Loopy Laundry
 Muncher
 Nanas
 Orbiter
 Ostron
 Pengy
 Planetoids
 Proteus
 Rapedes
 Repulsar
 Rider
 Road Toad
 Robot Panic
 Sam Spade
 Santa
 Sentinel
 Shark Attack
 Sheer Panic
 Sir Lancelot
 Slippery Sid
 Space Intruders
 Space Lanes
 Space Raiders
 Space Zombies
 Spec. Invaders
 Spec. Scramble
 Spectipede
 Spectral Invaders
 Spectral Panic
 Spectres
 Strike Four
 Styx
 Sub
 Tank Battle
 3D Monster Chase
 Train Game
 Trom
 Vortex
 Winged Warlord
 Wizard's Warriors
 Yomp

Add-on
 Quicksilva
 Visions
 Artic
 Silversoft
 Mikro-Gen
 Silversoft
 Softek
 Micromania
 Sinclair
 Abacus
 Visions
 Softek
 Virgin
 dk'tronics
 Soft Mill
 Silversoft
 Artic
 Abacus
 Romik
 Visions
 Melbourne House
 Silversoft
 Quicksilva
 Cathedral
 Sinclair
 Mikro-Gen
 Artic
 Work Force
 Mastertronic
 Bug-Byte
 Hewson
 Bug-Byte
 Spectresoft
 Bug-Byte
 Romik
 dk'tronics
 Romik
 Microsphere
 dk'tronics
 JK Greye
 CDS
 Abersoft
 Virgin

7 Regression
 7 Self-teach Program
 6 Shape Sorter
 6 Special Agent
 6 Spellbin
 * Use and Learn
 7 **Language**
 4 Beta Basic
 8 **Practical**
 5 Biorhythms
 * Countries of the World
 * Cycle Planner
 6 Map of the UK
 7 Spectrasort
 5 **Puzzle**
 * Flippit
 7 Hanoi King
 5 Lojix
 7 Nowotnik Puzzle
 7 Quazar

Simulation

* Air Traffic Controller
 6 Airliner
 * Golf
 * Golf
 7 NightFlite
 5 Print Shop
 8 Pro-Golf
 5 **Strategy**
 4 Auto Chef
 4 Big Match Soccer
 7 Dallas
 * Dictator
 8 Football
 3 Heathrow

Traditional

5 Backgammon
 6 Bridge Tutor
 * Bridgmaster
 7 Challenge
 9 Gambling Tape
 9 Las Vegas
 * Odds-on
 * Othello
 * Pinball
 * Pool
 7 Reversi
 8 Solo Whist
 Spec. Microchess
 Super Play 1
 Tennis

Utility

* Aspect
 * Audio Sonics
 * Auto Sonics
 7 Basic Utilities
 * Character Generator
 * Dietron
 * Disassembler
 8 Display
 * Editor/Assembler
 * Extended Basic
 * FP Compiler
 * Friendly Face
 * Keysounder
 * Letterfont
 8 Machine Code Test Tool
 * Master Toolkit
 * MCoder
 * Micropen
 * Print Utilities
 * Programmer's Dream
 * Renumber Delete
 7 Slow Loader
 7 Sound FX
 * Spec. Editor/Assembler
 7 Spec. Monitor
 * Spectrum Super Toolkit
 * Spectsound
 * Supercode
 * Taswide-64
 * Trace
 8 TT-S
 * ZX Spectrum Assembler
 * ZXED

University
 Anvil
 Widget
 Heinemann
 Startersoft
 Microl
 Betasoft
 Spectrasoft
 Hewson
 Medidata
 Kuma
 Spectradraw
 Sinclair
 Contrast
 Virgin
 Phipps
 Rose

Hewson
 Protek
 R & R
 Virgin
 Hewson
 CCS
 Hornby

Hewson
 CP Software
 Serin
 Temptation
 Dymond
 Temptation
 RSD
 CP Software
 Winters
 Bug-Byte
 Sinclair
 Video Soft.
 Artic
 Video Soft
 Winters

Bug-Byte
 Work Force
 Buttercraft
 Jaysoft
 Spectrasoft
 Custom
 dk'tronics
 Work Force
 Picturesque
 CP Software
 Softek
 Monitor
 S and G
 Allanson
 OCP
 OCP
 PSS
 Contrast
 Sinclair
 Work Force
 Work Force
 ELR
 dk'tronics
 Picturesque
 Picturesque
 Nectarine
 PDQ
 CP
 Tasman
 Texgate
 Timedata
 McGraw Hill
 dk'tronics

SPECTRUM 48K

Adventure

* Abyss
 8 Ace in the Hole
 * Adventure 1
 9 Adventure Island
 Alchemist
 Arcane Quest
 * Atlas Assignment
 8 Black Crystal
 4 Black Planet
 7 Buffer Adventure
 4 Castle
 Castle Blackstar
 Circus
 7 Classic Adventure
 7 Colditz
 3 Colossal Caves
 7 Demon Lord
 4 Detective
 Diamond Quest
 Diamond Trail
 6 Doomdark's Revenge
 6 Dragonsbane
 7 Dungeon Master
 7 Dungeons of Doom
 5 Erik the Viking
 8 Espionage Island
 7 Eureka
 Everest Ascent
 * Eye of Bain
 * Faerie
 * Fantasia Diamond
 6 Flight from the Dark
 * Frog Face
 * Ghoules
 8 Golden Apple
 Gorgon
 * Halls of Things
 8 Hampstead
 9 Here comes the sun
 * Hobbit
 * Horror Atoll
 5 Ice Station Zero
 * Inca Curse
 * Inferno
 * Invincible Island
 7 Island
 8 Island
 * Jericho Road
 * Jungle Adventure
 * Kentilla
 * King Arthur's Quest
 Knight's Quest
 Legend
 5 Leopard Lord
 4 Lords of Midnight
 5 Lords of Time
 6 Lost Over Bermuda
 * Mad Martha
 6 Mad Martha II
 7 Mountains of Ket
 * Murder at Manor
 8 Mysterious Fairground
 7 Odyssey of Hope
 9 Oracle's Cave
 7 Orc Slayer
 * Paradox
 8 Perseus and Andromeda
 7 Peter Pan
 7 Pimania
 * The Prince
 7 The Prisoner
 8 Project X
 * Quest
 9 Quetzalcoatl
 6 Return to Eden
 6 Roundby Incident
 7 Runes of Zandos
 8 Satan's Pendulum
 2 Sherlock
 8 Ship of Doom
 * Solaris
 8 Spool
 8 Superspy
 4 System 15000
 * CCS
 Add-on
 Abersoft
 Contrast
 Beau Jolly
 Add-on
 Virgin
 Mastervision
 Phipps
 Buffer Micro
 Bug-Byte
 SCR
 Channel 8
 Melbourne House
 Phipps
 CP Software
 MCE
 Arcade
 CCS
 Gilsoft
 Beyond
 Quicksilva
 Crystal Comp.
 Temptation
 Level Nine
 Artic
 Domark
 Shepherd
 Artic
 8th Day
 Hewson
 Hutchinson
 Positive Image
 IMS Software
 Artic
 Phipps
 Crystal Comp.
 Melbourne House
 Alligata
 Melbourne House
 Add-on
 8th Day
 Artic
 Shepherd
 Shepherd
 Crystal
 Virgin
 Shards
 CCS
 Micromega
 Hill MacGibbon
 Phipps
 Century Software
 Add-on
 Beyond
 Level Nine
 Add-on
 Mikro-Gen
 Mikro-Gen
 Incentive
 Gentime
 Buffer Micro
 Martech
 Doric
 Gamma Software
 Runesoft
 Channel 8
 Hodder &
 Stoughton
 Automata
 CCS
 Spool Software
 Compass Software
 Hewson
 Virgin
 Level Nine
 Add-on
 Dorcas Software
 Minatron
 Melbourne House
 Artic
 Softel
 Runesoft
 Shepherd
 Craig
 Communications

Business

Finance Manager
 Masterfile 16
 Matcalc
 Micropen
 Vu-Calc
 Vu-File

OCP
 Campbell
 Work Force
 Contrast
 Sinclair
 Sinclair

Education

Alphabet Games
 Apostrophe
 Ballooning
 Calpac 1-3
 Car Journey
 Cargo
 Chess Tutor
 Counting
 Education One
 Educational
 Estimator Racer
 Firework Music
 40 Educational Games
 Four Rules of Number
 French Voc Test
 Hidden Letters
 Hot Dot Spotter
 Integration
 Intermediate English 1-2
 Know Your Tables
 Language Devel. Series
 Learn Basic
 Marks Book
 Maths Invaders
 Matrix Operations
 Money
 Night Sky
 Number Painter
 O Level Maths
 O Level Physics
 Paddington's Shopping Mix-up
 Pathfinder
 Polynomials
 Primary Arithmetic
 Punctuation Pete

Sinclair
 Sinclair
 Heinemann
 Calpac
 Heinemann
 Sinclair
 Artic
 Widget
 Lerm
 Startersoft
 Psion
 Soft Cottage
 Granada
 Micro Master
 Tutorial
 Poppy
 Longman
 University
 Rose
 Collins
 Micro Master
 Logic 3
 Lerm
 Stell
 University
 Poppy
 Bridge
 Psion
 Homestudy
 Homestudy
 Collins
 Widget
 University
 Rose
 Heinemann

Temple of Vran	Incentive	8	Froot Loop	NTD Software	5	Stop the Express	Sinclair	8
Terror from The Deep	Add-on	*	Galaxy Attack	Sunshine	4	Strangeloop	Virgin	9
The Final Mission	Incentive	7	Ghost Rider	Positive Image	4	Submarine Strike	Pulsonic	6
The Wild Bunch	Firebird	3	Giant's Revenge	Thor	3	Tachyon Command	Century Software	2
Tir Na Nog	Gargoyle	9	Gilligan's Gold	Ocean	6	Tank Trax	Mastertronic	3
Titanic	R&R	5	Glug Glug	CRL	6	Technician Ted	Hewson	7
Tower of Despair	Games Workshop	5	H. Dumpty and the F.			Terrahawks	CRL	5
Transylvanian Tower	Shepherd	7	Wuzzies	Artic	5	The Guardian	PSS	6
Twin Kingdom Valley	Bug-Byte	8	Havoc	Dynavision	2	The Pyramid	Fantasy	7
Urban Upstart	Shepherd	7	Harry Goes Home	Pulsonic	6	The Snowman	Quicksilva	8
Valhalla	Legend	7	Hickstead	CCS	4	3D Bat Attack	Cheetahsoft	6
Vampire Village	Terminal	4	High Noon	Work Force	9	3D Lunattack	Hewson	6
Velnor's Lair	Quicksilva	8	House of Living Dead	Phipps	7	3D Seiddab Attack	Hewson	5
Volcanic Dungeon	Mastertronic	6	Hunchback	Ocean	7	3D Star Wars	Add-on	1
War of the Worlds	CRL	4	Invasion Body Snatch.	Crystal	9	3D Tank Duel	Real Time	6
Waydor	IMS Software	3	Jack and the Beanstalk	Thor	5	3D Tunnel	New Generation	9
Width of the World	Mosaic	4	Jasper	Micromega	6	Tiler Tim	Microwish	6
Ziggurat of Dread	Add-on	*	Jet Set Willy	Software Projects	9	Time Gate	Quicksilva	8
Arcade			Jump Challenge	Martech	6	Timebomb	CDS	7
Ad Astra	Gargoyle Games	8	Killer Knight	Phipps	5	Tobor	Add-on	7
Adven. of a St Bernard	Mastertronic	7	Knight Lore	Ultimate	9	Tornado Low Level	Vortex	8
Alcatraz Harry	Mastertronic	3	Knight Rider	Hewson	*	Tranz Am	Ultimate	*
Android Two	Vortex	*	Kokotoni Wilf	Elite	6	Trashman	New Generation	8
Ant Attack	Quicksilva	8	Kosmic Kanga	Micromania	5	Travel with Trashman	New Generation	7
Antics	Bug-Byte	8	Krakatoa	Abbex	8	Traxx	Quicksilva	7
Arena 3000	Microdeal	5	Krazy Kong	PSS	*	Tribble Trubble	Software Projects	8
Armageddon	Silversoft	3	Kung-Fu	Bug-Byte	6	Trom	dk'tronics	4
Astroplanner	Romik	2	Laser Zone	Quicksilva	8	Turtle Timewarp	Softstone	4
Atic Atac	Ultimate	8	Laserwarp	Mikro-Gen	6	Tutankhamun	Micromania	8
Automania	Micro-Gen	6	Lazatron	Contrast	*	Two-Gun Turtle	Lothlorien	7
Avalon	Hewson	9	Les Flics	PSS	6	Underwulde	Ultimate	8
Backpacker's Guide to			Lode Runner	Software Projects	6	Warlock of Firetop		
the Universe	Fantasy Software	6	Loony Zoo	Phipps	6	Mountain	Penguin	*
Base Invaders	Work Force	6	Lunar Jetman	Ultimate	8	Wheelie	Microsphere	7
Battle Zone	Quicksilva	5	Magic Roundabout	CRL	4	Worm Attack	Pulsonic	2
Beach Head	US Gold	8	Manic Miner	Bug-Byte	9	Worse Things Happen at Sea	Silversoft	7
Bear Bovver	Artic	8	Matrix	Salamander	7	Wrath of Magra	Mastertronic	8
Bewarehouse	Positive Image	4	Maze Death Race	PSS	*	Xadom	Quicksilva	4
Birds and Bees	Bug-Byte	8	Maziacs	dk'tronics	8	Zenji	Activision	8
Black Hawk	Creative Sparks	7	Metagalactic Llamas	Salamander	8	Zig-Zag	dk'tronics	7
Blade Alley	PSS	6	Mission Impossible	Silversoft	6	Zipper Flipper	Sinclair	4
Blue Thunder	Foundry Systems	6	Mission Omega	Pulsonic	4	Zombie Zombie	Quicksilva	7
Booty	Firebird	7	Monkey Biznes	Artic	7	Business		
Boulder Dash	Front Runner	5	Moons of Tantalus	Cornhill	5	Accounts (Limited	Hestacrest	*
Bubble Trouble	Arcade	*	Mr Wimpey	Ocean	7	Company)	Hestacrest	*
Bugaboo	Quicksilva	7	Mummy Mummy	Lothlorien	6	Accounts (Sole Trader)	OCP	7
Butterfly	Pulsonic	4	Munnery's Mergatroids	Abacus	5	Address Manager	K Gouldstone	8
Buzz Off	Electric	5	New Cylon Attack	A'N'F	6	Bank Account System	SD Micro	*
Caesar the Cat	Mirrorsoft	7	Night Gunner	Digital Integration	4	Bank Verifier	Transform	*
Carnival	Eclipse	5	1994	Visions	6	Business Bank Account	Shepherd	7
Carpet Capers	Terminal	7	Olympimania	Automata	5	Cash Controller	Sinclair	7
Cavelon	Ocean	7	Orion	Software Projects	7	Collector's Pack	Hilderbay	*
Centipoid Plus 3	Orwin	5	Pedro	Beau Jolly	7	Critical Path Analysis	Microl	7
Chequered Flag	Sinclair	8	Penetrator	Melbourne House	7	Database	RAMTOP	*
Chinese Juggler	Ocean	5	Pi-Balled	Automata	6	DIY Book-keeping	Heath Computing	7
Chuckie Egg	A & F	8	Pi-Eyed	Automata	6	Heathplanner	Kuma Computers	5
Chuckman	CCI/Add-on	8	Pitfall II	Profisoft	5	Home Budget		
Close-In	Pulsonic	4	Potty Pigeon	Activision	6	Investment, Insurance,	Inform	5
Codename Mat	Micromega	9	Psi-Spy	Gremlin Graphics	5	Information	Transform	8
Corridors of Genon	New Generation	9	Pssst	Postern	7	Invoicing/Accounting	Keysoft	7
Cruise Attack	Mikro-Gen	*	Pyatron	Ultimate	9	Keyfile	Campbell	8
Crusoe	Automata	5	Pyjamarama	Beyond	8	Masterfile	Contrast	5
Cyber Zone	Crystal	*	Pyramid	Mikro-Gen	8	Money Manager	Creative Sparks	6
Cyclone	Vortex	8	Raider Cursed Mine	Fantasy	6	Multi-File	ISP	6
Daley Thompson's			Rapscallion	Arcade	7	Omnicalc	Microsphere	9
Decathlon	Ocean	8	Reactor	Bug-Byte	*	Payroll	Transform	*
Dangermouse in Double			Rescue	Gemini	*	Personal Banking System	Hilton	*
Trouble	Creative Sparks	8	Revenge of the Killer	Comp. Rentals	6	Personal Financ.		
Death Chess 5000	Artic	7	Rescue	Ocean	6	Profile 2	McGraw-Hill	6
Defenda	Interstella	2	Revenge of the Killer			Projector 1	McGraw-Hill	8
Defendar	Mikro-Gen	*	Rider	Visions	6	Management Syst.	Fulwood	*
Defusion	Incentive	6	River Rescue	Virgin	3	Sales Day Book	Transform	*
Defusion/Worms	K-Tel	3	Robot Riot	Creative Sparks	6	Sales Ledger	Hestacrest	8
Demon Chase	Mansfield	4	Rommels Revenge	Silversoft	8	Small Business Accounts	Sinclair	*
Deus Ex Machina	Automata	9	Sabre Wulf	Crystal	9	Spectext	McGraw Hill	7
Devil Rides In	Mastertronic	7	Scuba Dive	Ultimate	*	Spreadsheet	Microl	7
Dimension Destructors	Artic	4	Security Shelter	Add-on	7	Stock Control	Hilderbay	*
Dinky Digger	Postern	7	Select 1	Computer Records	7	Stock Control	Transform	*
Dodge City	Phoenix	5	Skull	Various	5	Tasword	Tasman	8
Dr Franky and the Monster	Virgin	6	Snowball	Games Machine	9	Tasword II	Tasman	9
Dragonfire	Cheetahsoft	3	Sorcery	Level 9	7	Utility File	SD Micro	*
Driller Tanks	Sinclair	3	Space Station Zebra	Virgin	6	VaETrack	Morley Davies	7
Energy 30,000	Elm	6	Spectron	Beyond	7	Word Processor	Quicksilva	2
Eric and the Floaters	Sinclair	4	Spellbound	Beyond	8	Education		
Eskimo Eddie	Ocean	3	Splat	Incentive	6	ABC Liftoff	Longman	*
Exodus	Firebird	7	Sports Hero	Melbourne House	7	Angle	Chalksoft	5
Frank N Stein	PSS	6	Stagecoach	Creative Sparks	6	Angle Turner	Arnold Wheaton	7
Fred	Quicksilva	*	Starbike	The Edge				
Freez Beez	Silversoft							

Astro Maths	Scisoft	6	Beamscan	9	Red Weed	7	Lothlorien	7
Biology	Longman	7	Computer Cookbook	5	Reichswald	3	MW Gamesworld	3
Blockbuster	Compusound	7	Cricket Averages	7	Scatterbrain	7	Manor	3
Castle	L'Ensouleiado	7	Diet	*	Sheepwalk	7	Virgin	7
Castle of Dreams	Widgit	7	Diet Master	6	Special Operations	8	Lothlorien	8
Castle Spellerous	Sinclair	8	Dietician	4	Spectreallm	6	Runesoft	6
Chess Tutor 1	Sinclair	7	First Aid	4	Star Trader	6	Bug-Byte	6
Clown	Englefield Software	4	Football Pools	*	Stonkers	9	Beau Jolly	9
Cortes	L'Ensouleiado	6	How Long have you got?	6	Super-League	6	Cross	6
Countabout	Longman	*	I Ching	7	Viking Raiders	6	Firebird	6
Dyslexia Beater	Dunitz	8	I Ching	*	War 70	8	CCS	8
Eiffel Tower	Chalksoft	6	Know Your Own	6	Whodunnit	8	CCS	8
Electronic Learner's Guide			Personality	5	Wilfred the Hairy	2	Microbyte	2
No. 1	ETST	6	Love Oracle	5	Traditional			
French	Longman	8	Spectadraw 2	8	Arcturus	7	Visions	7
French is Fun	CDS	5	Star Gazer	8	Backgammon	7	CP Software	7
French Voc Test	Tutorial	*	The Complete Guide to	4	Brag	7	Turtle	7
Friend or Foe	Longman	6	Medicine	7	Bridge Master	7	Serin	7
Viking Raiders	Firebird	6	Vega-Table	*	Bridge Player	8	CP Software	8
German is Fun	CDS	*	World Info	*	Bullseye	4	Mastertronic	4
German Master	Kosmos	*	Puzzle				CRL	5
Guitar Tutor 1	Harlequin	*	Arcturus	7	Derby Day	6	Work Force	6
Guitar Tutor 2	Harlequin	*	Computaword	2	Do Not Pass Go	5	MFM Software	5
Highway Code	Learning Systems	6	Flix	7	Double Dealer	7	CP Software	7
Highwire	Englefield Software	5	Hanoi King	*	Draughts	*	Automata	*
Hotline	Chalksoft	8	Hareraiser	*	Go To Jail	*	Arcade	*
Humpty Dumpty	Widgit	5	Jumbly	3	Grid run/Pontoon	7	Oasis	7
Inkosi	Chalksoft	*	Mazecube	*	Mind Games	*	CP Software	*
Jungle Jumble	Clever Cloggs	*	Stuart Henry's Pop Quiz	6	Original Superchess	3	Contrast	3
Jungle Maths	Scisoft	7	3D Strategy	8	Pontoon	*	Dymond	*
Learn to Read 1-5	Sinclair	7	Simulation				Sinclair	8
Letters and Numbers	Jimjams	6	American Football	7	Roulette	8	Visions	*
Linkword	Silversoft	7	Ashes	7	Scrabble	7	Buffer Micro	7
Look Sharp	Mirrorsoft	7	Combat Lynx	8	Snooker	8	CP Software	8
Macman in the Treasure			Crickit Captain	6	Super Bridge	9	CP Software	9
Caves	Sinclair Research	6	Fighter Pilot	9	Superchess II	8	CP Software	8
Magnets	Sinclair	*	Flight Simulation	6	Superchess III	8	OCF	8
Make-a-Chip	Sinclair	*	Full Throttle	8	The Turk	9	Artic	9
Mansfield Park	Sussex	7	Golf	8	Voice Chess	*	Work Force	*
Mathskills II	Griffin	7	Howzat	8	Yahtzi	5	CP Software	5
MDA-PCSS	MDA Assoc.	7	Match Point	8	Yatzee	7	CP Software	7
Mr T's Measuring Games	Ebury	7	New Birkdale	8	ZX Draughts	7	CP Software	7
Mr. Men	Mirror	*	Olympics	8	ZX Reversi	7	CP Software	7
Musicmaster	Sinclair	6	Royal Birkdale	8	ZX-Chess II	*	Artic	*
Nineteenth C. England	Sussex	*	Steve Davis Snooker	8	Utility			
O Level Chemistry	Calpac	*	Strike Attack	7	Allsort S-1	7	A Firminger	7
O Level Physics	Think Tank	*	Super Soccer	7	Assembler	6	Artic	6
Party Time	C. Tutor	*	Test Match	6	Beyond Basic	5	Sinclair	5
Pathfinder	Widget	7	The Forest	7	Building Price	6	J Redman	6
Pirate	Chalksoft	7	Troon	5	Cartoon Animation	*	Fowler	*
Postman Pat's Trail Game	Longman	7	United	8	Character Generator	8	ISP	8
Riddle of the Sphinx	Longman	6	World Cup Football	7	Compiler	6	Softek	6
Run, Rabbit, Run	Longman	7	Strategy				Contrast	2
Sequences	Chalksoft	5	Airline	7	Composer	9	Softek	9
Snaffle	Longman	8	Angler	6	FP Compiler	7	Quicksilva	7
Spanish Gold	Chalksoft	*	Apocalypse	8	Games Designer	8	Melbourne House	8
Speak and Spell	S and G	7	Atram	5	HURG	7	Timedata	8
Speech Marks	Sinclair	7	Battle 1917	8	Keyword Extension			
Spelling Bee	Image Systems	5	Battle of Britain	7	Linked Software:			
Star Reader	Scisoft	*	Brewery	7	Information Handling			
Startrucker	Widgit	7	British Lowland	6	Make Music	3	McGraw Hill	3
SuperTed	Longman	6	Caribbean Trader	6	Melbourne Draw	8	Buffer Micro	8
Teacher Data	B Farris	8	Confrontation	7	Monitor/Diss.	7	Melbourne House	7
Tense French	Sullis	7	Master Programme	8	Music Maker	8	Sinclair	8
Time Traveller	Willey	*	Confrontation Scenarios	3	Paintbox	8	Bellflower	3
Tuner	Soft Cottage	*	Volume 1	8	Print Utilities	8	Print & Plotter	8
Wizard Box	Scisoft	*	Conquest	7	Quill	7	Sinclair	7
Words and Pictures	Chalksoft	6	Dix Mille	9	Screen Machine	9	Gilsoft	9
Wordsetter	Sinclair Research/	7	Fall of Rome	5	Softalk 1-2	7	ISP	7
	Macmillan	7	Football Manager	7	Spec. Compiler	8	CP Software	8
Word Wizard	Longman	6	Galaxy Conflict	7	Spectre Mac/Mon	7	Softek	7
Zoo	L'Ensouleiado	6	Gangsters	6	Spectrosim	8	Oasis	8
Language				6	Spectrum Extended Basic	4	Shiva	4
Beta Basic	Betasoft	9	Gatecrasher	7	Spectrum Monitor	7	CP Software	7
Forth	Melbourne House	9	General Election	5	Spectrum Sprites	7	Picturesque	7
Forth	Sinclair	7	Great Britain Ltd	6	Spectrum Super Toolkit	8	ISP	8
48/80 Forth	E London	7	Hunter Killer	7	Supercode II	8	Nectarine	8
	Robotics	7	It's Only Rock 'n' Roll	7	The Complete Machine Code	8	CP Software	8
Hisoft C	Hisoft	9	King Arthur	7	Tutor	8	New Generation	8
Logo	Sinclair	9	Millionaire	8	Trans Express	8	Romantic Robot	8
Micro Prolog	Sinclair	*	Mugsy	9	Vu3D	8	Sinclair	8
Pascal Computer	Hi-Soft	8	New Venture	9	White Lightning	9	Oasis	9
Snail Logo	CP	8	Oligopoly	5	Zeus Assembler	9	Sinclair	9
Spec. Forth	Abersoft	9	Plunder	7	QL			
Spec. Forth	CP	8		8	Assembler Dev. Package	9	Metacomco	9
ZX Forth	Artic	8		8	Pascal	7	Computer One	7
Practical				8	QL Chess	9	Pision	9
Astronomer	CP Software	7		8	Zkul	7	Talent Computer	7
				8			Systems	7

A & F Software, Unit 8, Canalside Industrial Estate, Woodbine Street East, Rochdale, Lancashire OL16 5LB
Abacus Software, 21 Union Street, Ramsbottom, Nr Bury, Lancashire
Abbex, 20 Ashley Close, Manor Hall Drive, London NW4
Abersoft, 7 Maesfallen, Bow Street, Aberystwyth, Wales
Activision, 15 Harley House, Marylebone Road, London NW1
Adder Publishing Ltd, PO Box 148, Cambridge CB1 2EQ
Add-on Electronics, Units 2,3 & 4, Shire Hill Industrial Estate, Saffron Walden, Essex CB11 3AQ
Addictive Games, 7a Richmond Hill, Bournemouth BH2 6HE
ADS, 8 Bronchurch Street, Portsmouth, Hampshire PO4 8RY
Allanson Computing, 77 Chorley Road, Adlington, Chorley, Lancashire PR6 9LH
Alligata Software, 1 Orange Street, Sheffield S1 4DW
APSm 1 Golden Square, London W1
Arcade Software, Technology House, 32 Chislehurst Road, Orpington, Kent BR6 0DG
Arnold Wheaton, Parkside Lane, Dewsbury Road, Leeds LS11 5TD
Artic Computing, Main Street, Brandesburton, Driffeld YO25 8RG
Automata UK, 27 Highland Road, Portsmouth, Hampshire PO4 9DA
Axis, 71 Brookfield Avenue, Loughborough, Leicestershire LE11 3LN
Beau-Jolly, 19A New Broadway, Ealing, London W5
Bellflower Software, 6 Rosewood Avenue, Greenford, Middlesex UB6 7QP
Betasoft, 92 Oxford Road, Moseley, Birmingham B13 9SQ
Beyond Software, Lector Court, 151 Farringdon Road, London EC1
Bridge Software, 36 Fernwood, Marple Bridge, Stockport, Cheshire SK6 5BE
Bridgemaster, Sandymouth, Beeches Road, Farnham Common, Buckinghamshire SL2 3PS
Buffer Micro, 310 Streatham High Road, London SW16
Bug-Byte, Mulberry House, Canning Place, Liverpool L1 8JB
Calpac Computer Software, 108 Hermitage Woods Crescent, St Johns, Woking, Surrey
Campbell Systems, 57 Trap's Hill, Loughton, Essex IG10 1TD
CCS, 14 Langton Way, Blackheath, London SE3 7TL
CDS Micro Systems, Silver House, Silver Street, Doncaster, South Yorkshire DN1 1HL
Century Communications, Portland House, 12-13 Greek Street, London W1V 5LE
Chalksoft, 17 Willowslea Road, Northwick, Worcester
Channel 8, 51 Fishgate, Preston, Lancashire PR1 8BH
Cheetahsoft, 24 Ray Street, London EC1R 3DJ
Clever Clogs, Argus Press Software Group, 1 Golden Square, London W1R 3AB
Collins, 18/20 Stephenson Way, North Gower Street, London NW1 2DX
Compusound, 32/33 Langley Close, Redditch, Worcester B98 0ET
Computatutor, 3 Thalia Close, Greenwich, London SE10 9NA
Computer One, 32 Science Park, Milton Road, Cambridge CB4 4DH
Contrast Software, Warren Road, Liss, Hampshire GU33 7DD
Cornhill Software, 2 Penrith Way, Aylesbury, Buckinghamshire HP21 7JZ
CP Software, 1 Glebe Road, Uxbridge, Middlesex UB8 2RD
Craig Communications, PO Box 46, Basingstoke, Hampshire
Creative Sparks, Thomson House, 296 Farnborough Road, Farnborough, Hampshire
CRL, 9 King's Yard, Carpenters Road, London E15 2HD
Cross Software, 36 Langford Crescent, Barnet, Hertfordshire EN4 9EH
Crystal Computing, 2 Ashton Way, East Herrington, Sunderland SR3 3RX
CSP Systems, 213 Stainbeck Road, Leeds
D Pinch, 72 Norwood Crescent, Coldbrook, Barry, South Glamorgan
Digital Integration, Watchmoor Trade Centre, Watchmoor Road, Camberley, Surrey GU15 3AJ
DJL, 9 Tweed Close, Swindon, Wiltshire SN2 3PU
DK'tronics, Unit 6, Shire Hill Ind Est, Saffron Walden, Essex CB11 3A
Domark, 228 Munster road, London SW6
Dorcas Software, 3 The Oasis, Glenfield, Leicester
Doric Computer Services, 3 The Oasis, Glenfield, Leicester LE3 8QS
Dunitz, 154 Camden High Street, London NW1 0NE
Durrell Software, Castle Lodge, Castle Green, Taunton TA1 4AB
Dymond Software, 22 Hospital Road, Annan, Dumfriesshire DG12 5HP
Dynavision Production Studio, PO Box 96, Luton LU3 2JP
East London Robotics, St Nicholas House, The Mount, Guildford, Surrey GU2 5HN
Eastmead, Eastmead House, Lion Way, Camberley, Surrey GU16 5EZ
Ebury Press, Humphrey Bull & Barker, 62 Dean Street, London W1V 5HG
8th Day, 18 Flaxhill, Moreton, Wirral, Merseyside LU6 7UH

Electric Abacus, Oaklands House, Solartron Road, Farnborough, Hants
Elite Systems, 55 Bradford Street, Walsall, West Midlands WS1 3QD
Elm Computers, 59 Bateman Road, East leake, Loughborough, Leicestershire LE12 6NN
Englefield Software, High House, Mill Street, Buxton, Norfolk NR10 5JE
Fantasy Software, Fauconberg Lodge, 27a St Georges Road, Cheltenham
Fawkes Computing, 41 Wolfridge Ride, Alveston, Bristol BS12 2RA
Felix Software, 19 Leighton Avenue, Pinner HA5 3BW
Front Runner, 620 Western Ave, London W3 0TU
Fulwood, 20 Templestowe Hill, Whitkirk, Leeds LS15 7EJ
Games Machine, 40 Fretherne Road, Welwyn Garden City, Hertfordshire AL8 6NU
Gamma Software, 12 Milverton Road, London NW6 7AS
Gargoyle Games, 4 North Western Arcade, Birmingham BS 5LH
Gavin Barker, 12 Fleming Field, Shotton Colliery, County Durham DH6 2JF
Gemini Software, 18a Littleham Road, Exmouth, Devon EX8 2QG
Gemtime Software, 16 Ben Ledi Road, Kirkcaldy, Fife KY2 5RP
Gilsoft, 30 Hawthorn Road, Barry, South Glamorgan, South Wales
Gouldstone, 45 Burleigh Avenue, Wallington, Surrey SM6 7UG
Granada Publishing, 8 Grafton Street, London W1X 3LA
Gremlin Graphics, Alpha House, 10 Carver Street, Sheffield S1 4FS
Griffin & George, Frederick Street, Birmingham B1 3HT
Haresoft, PO Box 365, London NW1
Harlequin Software, 43 Osprey Park, Thornbury, Bristol BS12 1LY
Hartland Software, 32 Ivor Place, London NW1 6DA
Heath Computing, 7 The Meadows, Flackwell Heath, Buckinghamshire HP10 9LX
Heinemann Computer Education, 22 Bedford Square, London WC1B 3HH
Hessel, 15 Lythan Court, Cadwell Crescent, Sunningdale, Berkshire
Hestacrest, PO Box 19, Leighton Buzzard, Bedfordshire LU7 0DG
Hewson Consultants, 56B Milton Trading Estate, Milton, Abingdon
Hilderbay, 8/10 Parkway, Regents Park, London NW1 7AA
Hilton Computer Services, 14 Avalon Road, Orpington, Kent
Hisoft, 180 High Street, Dunstable, Bedfordshire LU6 1AT
Hodder & Stoughton, PO Box 6, Dunton Green, Sevenoaks, Kent TN13 2XX
Homestudy Ltd, Treleigh Woods Farm, Treleigh, Redruth, Cornwall TR16 4AW
Hornby Software, 21 Penfold Hill, Leeds LS15 0PW
IMS Software, 143/145 Uxbridge Road, Ealing, London W13 9AV
Image Systems, 34 Lynwood Drive, Worcester Park, Surrey KT4 7AB
Incentive, 54 London Street, Reading, Berkshire RG1 4SQ
Inform Software, 3 Treesdale Close, Birkdale, Southport PR8 2EL
Interstella Software, 82 New Forest Drive, Brockenhurst, Kent
ISP Marketing Ltd, Crown Hill, 38B High Street, Godalming, Surrey GU7 1DZ
JK Grege Software, 16 Park Street, Bath, Avon BA1 2TE
JRS Software, 19 Wayside Avenue, Worthing, Sussex BN13 3JH
K-Tel International (UK), 60 Western Avenue, London W3 0TU
Kemp, 43 Muswell Hill, London N10 3PN
Keysoft, 6 Bruce Grove, Tottenham, London N17
Kosmos Software, 1 Pilgrims Close, Harlington, Dunstable, Bedfordshire LU5 6LX
Kuma Computers, 12 Horseshoe Park, Pangbourne, Berkshire RG8 7JW
Learning Systems, 11 Warwick Court, Princes Drive, Harrow, Middx HA1 4UB
Legend, PO Box 435, London E4 7LX
Lerm, 10 Brunswick Gardens, Corby, Northamptonshire
Level Nine, 229 Hugenden Road, High Wycombe, Buckinghamshire HP13 5PG
Logic 3, Unit 18, Wye Ind Est, London Road, High Wycombe, Buckinghamshire
Longman, Longman Group, Longman House, Harlow, Essex CM20 2JE
Lothlorien, 56a Park Lane, Poynton, Stockport, Cheshire SK12 1RE
Manor Software, 24 Manor Gardens, London SW20
Martech Games, 9 Billingburgh Road, Eastbourne, East Sussex BN20 8LY
Mastertronic, (as for Mastervision)
Mastervision, Park Lorne, 111 Park Road, London NW8 7SL
McAlley, 1 Cowleaze, Chinnor, Oxfordshire OX9 4TD
McGraw Hill, Shoppen Hangers Road, Maidenhead, Berkshire
Medidata, PO Box 26, London NW9 9BW
Melbourne House, Castle Yard House, Castle Yard, Richmond TW10 6TF

continued on page 142

Software Publishers

continued from page 141

Metacomco, 26 Portland Square, Bristol BS2 8RZ
 Micro Dealer UK, Unit 6 Marlborough Road Trading Estate, Lattimore Road, St Albans, Hertfordshire
 Micro Wish, PO Box 15, Colne, Lancashire BB8 9DB
 Microbyte, 19 Worcester Close, Lichfield, Staffordshire
 Microcosm, 68 The Glade, Clayhall, Ilford
 Micromania, 14 Lower Hill Road, Epsom, Surrey KT19 8LT
 Micromega, 230/236 Lavender Hill, London SW11
 Microsphere, 72 Rosebery Road, London N10 2LA
 Mikro-Gen, 44 The Broadway, Bracknell, Berkshire RG12 1AG
 Minatron Computing, 34 Pinewood Close, Westbury on Trym, Bristol BS9 4AJ
 Mirrorsoft, PO Box 50, Bromley, Kent BR2 9TT
 Monitor Software, PO Box 442, London NW7 2JF
 Mosaic, 187 Upper Street, London N1 1RQ
 MW Gamesworld, 12 Lawnswood Avenue, Chasetown, Walsall WS7 8YD
 Myrmidon Software, PO Box 2, Tadworth, Surrey, KT20 7LU
 Naigram Software, c/o Soho Synth House, 18A Soho Square, London W1V 5FB
 Nectarine, 837 Yeovil Road, Slough SL1 4JH
 New Generation Software, FREEPOST, Bath BA2 4TD
 Newsoft, 12 White Broom Road, Hemel Hempstead, Hertfordshire
 NTD Software, 19, Radipole Road, London SW6
 Oasis Software, 9a Alexandra Parade, Weston-Super-Mare, Avon BS23 1QT
 Ocean Software, 6 Central Street, Manchester M2 5NS
 OCP, 4A High Street, Chalfont St Peter, Buckinghamshire SL9 9QB
 Orwin Software, 26 Brownlow Road, Willesden, London NW10 9QL
 PD Visual Marketing, Thanet House, Craven Road, London W2
 Penguin, 536 King's Road, London SW10
 Phipps Associates, 172 Kingston Road, Ewell, Surrey
 Phoenix Publishing, 14 Vernon Road, Bushey, Hertfordshire WD2 2JL
 Picturesque, 6 Corkscrew Hill, West Wickham, Kent BR4 9BB
 Pooter Games, 24 Parsloes Avenue, Dagenham RM9 5NX
 Poppysoft, The Close, Common Road, Headley, Newbury, Berkshire
 Positive Image Software, 129 Dumbarton Road, Glasgow
 Postern Software, PO Box 2, Anderovers Ford, Cheltenham, Gloucester GL54 5SW
 Print 'n' Plotter Products, 19 Borough High Street, London SE1 9SE
 Protek Computing, 1a Young Square, Brucefield Ind Park, Livingston, West Lothian
 Psion, 2 Huntsworth Mews, Gloucester Place, London NW1
 PSS, 452 Stoney Stanton Road, Coventry CV6 JDG
 Pulsonic, Warwick Distribution Ltd, 3 Standard Road, Park Royal, London NW10 6EX
 Quest International Computer Systems, Gillingham House, 38-44 Gillingham Street, London SW1
 Quicksilver, Palmerstone Park House, Southampton, Hampshire SO1 1LL
 RAM Writer, 3 Vumba House, 2 Cedar Gardens, Sutton, Surrey
 Ramtop Services, 5 Rue D'Artois, 75008, Paris, France
 Red Shift, 12c Manor Road, Stoke Newington, London N16 5SA
 Romantic Robot, 113 Melrose Avenue, London NW2 4LX
 Romik Software, 272 Argyll Avenue, Slough SL1 4HE
 Rose Software, 148 Widney Lane, Solihull, West Midlands
 Runesoft, Charnwood House, Crossgate Drive, Nottingham NG2 TLW
 Salamander Software, 27 Ditchling Rise, Brighton, East Sussex BN1 4QL
 Scisoft, 5 Minister Gardens, Newthorpe, Eastwood, Nottingham NGJ6 2AT
 SCR Adventures, 190 Shelbourne Road, Tottenham, London
 SD Microsystems, PO Box 24, Hitchin, Hertfordshire SG4 0AQ
 Selec Software, 37 Councillor Lane, Cheadle, Cheshire
 Serim Software, Freepost, Dept SU7, PO Box 163, Slough, Berkshire SL2 3YY
 Shards, Suite G, Roycraft House, 15 Linton Road, Barking, Essex
 Shepherd Software, Elm House, 23-25 Elmshott Lane, Chippenham, Slough, Berkshire
 Shiva Publishing, 64 Welsh Row, Nantwich, Cheshire CW5 5BR
 Silversoft, London House, 271/273 King Street, London W6 9LZ
 Sinclair Research, 6 Kings Parade, Cambridge
 Soft Cottage, 19 Westfield Drive, Loughborough, Leicestershire LE11 3QJ
 Soft Tech, 31 Lampits, Hoddesdon, Hertfordshire
 Softek International, 12/13 Henrietta Street, Covent Garden, London WC2E 8LH
 Softel, 5 Durward Drive, Glenrothes, Fife KY6 2LB

Software Farm, 155 White Ladies Road, Clifton, Bristol BS8 2RG
 Software Projects, Bear Brand Complex, Allerton Road, Woolton, Liverpool, Merseyside L25 7SE
 Spartan CC, 29 Feltham Avenue, East Moseley, Surrey KT8 9BJ
 Spectradraw, I Cowleaze, Chinnor, Oxfordshire OX9 4TD
 Spectrasoft, Capital House, Market Place, London W3 6AL
 Spoof Software, 58 Railway Road, Urmston, Manchester M31 1XT
 Startersoft, 32 Parkfields, Chippenham, Wiltshire
 Stell Software, 36 Limefield Avenue, Whalley, Lancashire BB6 9RJ
 Stratagem Cybernetics, 286 Corbin Place, 2E, Brooklyn, New York 11235
 Sulis Software, 4 Church Street, Abbey Green, Bath BA1 1FP
 Sunshine Books, 12/13 Newport Street, London WC2
 Sussex Publication, Townsend Poulshot, Devizes, Wiltshire SN10 1SD
 Talent Computer Systems Curran Building, 101 St James Road, Glasgow G4 0NS
 Tasman Software, 17 Hartley Crescent, Leeds LS6 2LL
 Temptation Software, 27 Cinque Ports Street, Rye, East Sussex
 Terminal Software, Derby House, Derby Street, Bury BL9 0NW
 Texgate, 14 Brook Lane, Corfe Mullen, Wimbourne, Dorset
 Think Tank, 35 Wellington Road, Wimbledon Park, London SW19
 Thor Computer Software, Erskine Industrial Estate, Liverpool L6 1AP
 Timedata, 16 Hemmells High Road, Laindon, Basildon, Essex SS15 6ED
 Transform, 41 Keats House, Porchester Mead, Beckenham, Kent
 Tutorial Software, 'Vilands', Glasllwch Lane, Newport, Gwent NP1 3PS
 Ultimate Play the Game, The Green, Ashby de la Zouche, Leicestershire LE6 5JU
 Unicorn Micro Systems, 312 Charminster Road, Bournemouth BH8 9RT
 University Software, 29 St Peters Street, London N1
 US Gold, Unit 24, Tipton Trading Estate, Bloomfield Road, Tipton, West Midlands DY4 9AH
 Vega Space Systems, 28 Watford Road, St Albans AL1 2AJ
 Virgin Games, 2-4 Vernon Yard, London W11
 Visions, 1 Feldgate Mews, Studlands Street, London W6
 Vortex software, 280 Brooklands Road, Brooklands, Manchester M23 9HD
 Widex Software, 48 Durham Road, London N2 9DT
 Wilcox Software, Station Road, Walsall WS7 6JZ
 Winters, 24 Swannington Close, Cantley, Doncaster, South Yorkshire
 Woosoft, 5 Andrews Close, Robertsbridge, Sussex TN32 5PB
 Workforce, 140 Wilsden Avenue, Luton, Bedfordshire
 Wyvern Software, 2 Princes Building, George Street, Bath BA1 2ED

ZXWORD SOLUTION



Sinclair spares and repairs

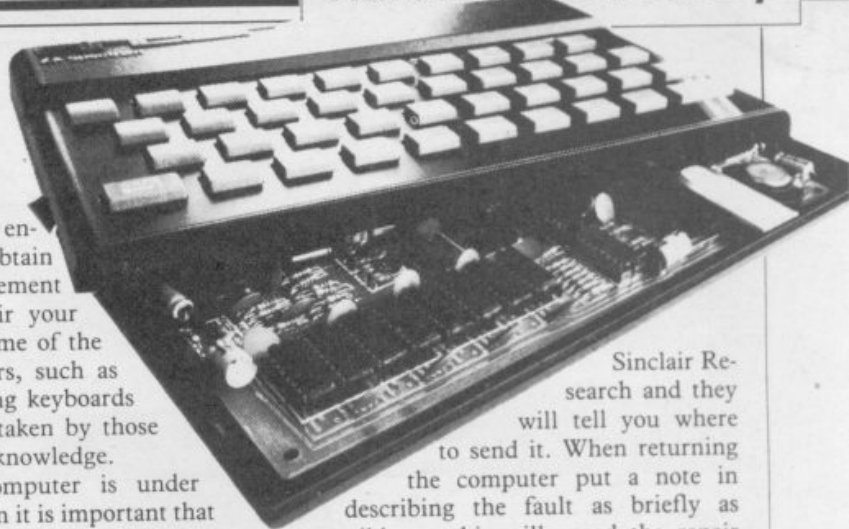
IF, LIKE MANY other Spectrum owners, you find one day that your computer has died, you will have a major problem on your hands. Phoning the Sinclair Research customer relations department in Camberley will not help very much either.

If your electronics knowledge is limited, then you will decide to send your Spectrum to one of the companies who specialise in repairing computers. If you have a good working knowledge of electronics then the addresses listed

below should enable you to obtain most replacement parts to repair your computer. Some of the simpler repairs, such as those involving keyboards can be undertaken by those with limited knowledge.

If your computer is under guarantee then it is important that you do not invalidate that guarantee. Talk to the customer service division at

Sinclair Research and they will tell you where to send it. When returning the computer put a note in describing the fault as briefly as possible, as this will speed the repair process.



Suppliers of Sinclair parts:

Adaptors and Eliminators, 14 Thames Street, Louth, Lincolnshire. (050782) 8011. Spectrum and ZX-81 power supplies.

ASTEC (UK), 16 Albury Close, Reading, Berkshire. (0734) 53067. Supplies modulators for all countries PAL, NTSC, SECAM.

CPC, 194-200 North Road, Preston, Lancashire. (0772) 555034. Supplies all parts for Spectrum, ZX-81, ZX printer, ZX RAM pack including all case parts, power supplies and keyboard parts. Probably the best place to get ULA, ROM, case parts and keyboard.

Ferranti Semiconductors, Computer Road, Hollinwood Avenue, Oldham, Lancashire. (061) 682 6844, (061) 624 0515/6661. Supplies Spectrum and ZX-81 ULA.

Maplin Electronics, Southend on Sea, Essex. (0702) 552961. Supplies general components and data and technical books.

National Semiconductors (UK) Ltd, 301 Harpur Centre, Horne Lane, Bedford. (0234) 47147. Supplies Spectrum RAM/74LS series TTL; LM 1889 video chip.

NEC (UK) Ltd, Block 3, Carfin Industrial Estate, Motherwell. (0698) 73221. Supplies Spectrum ROM and RAM/74LS TTL; Z80A.

Sinclair Research Ltd, Camberley, Surrey. (0276) 685311.

Texas Instruments, Manton Lane, Bedfordshire. (0234) 223000, (0234) 211655. Supplies RAM 4116, 4532, 4164, 74LS TTL (Spectrum).

Timex Corporation, Camperdown Plant, Harrison Road, Dundee, Tayside. (0382) 819211. Makers of Spectrum, ZX-81, Printer, Interface one, Microdrives, RAM Pack. Repair and service for Sinclair.

Verran (Computerfix), Units 2H & 2J, Albany Park, Frimley Road, Camberley, Surrey. (0276) 66266. Repairs Spectrums and ZX-81.

Zilog (UK) Ltd, Zilog House, 45-53 Moorbridge Road, Maidenhead, Berkshire. (0628) 39200. Supplies Z80A.

Component companies

SOME OF THE large companies mentioned above do not like dealing directly with the public. The following is a list of component companies which should be happy to deal with you. Most will have catalogues available and will supply data sheets for their products on demand.

These firms are only distributors and they do not make components. If you have a problem with a particular device contact the manufacturer as listed above because not many of the distributors can answer technical questions; RS Components, Farnell, Ambitt and Hawkes may do. Anyone needing NEC parts should phone them direct and ask for some distributors dealing with them.

Abacus Electronics, Kennet House, Pembroke Road, Reading, Berkshire. (0734) 33311. Makes dealt with: National Semiconductors, SGS.

Access Electronic Components Ltd, Austin House, Bridge Street, Hitchin, Hertfordshire. (0462) 57244. Makes dealt with: National Semiconductors.

Alpha Electronic Components Ltd, 66 Wilbury Way, Hitchin, Hertfordshire. (0462) 57244. Makes dealt with: National Semiconductors.

AM Lock Distribution Ltd, Nevill Street, Middleton Road, Oldham, Lancashire. (061) 652 0431. Makes dealt with: Motorola, Mostek.

Anzac Components Ltd, Burnham Lane, Slough, Buckinghamshire. (06286) 4701. Makes dealt with: Hitachi.

Axon Electronics Ltd, Unit F, Turnpike Road, Cressex Industrial Estate, High Wycombe, Buckinghamshire. (0494) 442181. Makes dealt with: Motorola.

BA Electronics Ltd, Millbrook Road, Yate, Bristol. (0454) 315824. Makes dealt with: Texas Instruments.

Celdis Ltd, 37-39 Loverock Road, Reading, Berkshire. (0734) 585171. Makes dealt with: Motorola, Mostek.

Crellon Electronics Ltd, 380 Bath Road, Slough, Berkshire. (06286) 4434. Makes dealt with: Motorola, SGS, Zilog.

Dialogue Distribution Ltd, Watchmore Road, Camberley, Surrey. (0276) 682001. Makes dealt with: Hitachi.

DTV Group, 10-12 Earnest Avenue, West Norwood, London SE27. (01) 670 6166. Makes dealt with: National Semiconductors.

Farnell Electronic Components Ltd, Canal Road, Leeds. (0532) 636311. Makes dealt with: Hitachi, National Semiconductors.

Hawke Electronics Ltd, Amotex House, 45 Hanworth Road, Sunbury on Thames, Middlesex. (01) 979 7799. Makes dealt with: Motorola, Texas Instruments. Will answer technical queries.

Hill Electronics (NI) Ltd, 290 Antrim Road, Belfast, Northern Ireland. Makes dealt with: Mostek.

ITT Multicomponents, Edinburgh Way, Harlow, Essex. (0279) 442971. Makes dealt with: Motorola, National Semiconductors, SGS, Texas Instruments and Hitachi.

Macro Marketing Ltd, Burnham Lane, Slough, Berkshire. (06286) 4422. Makes dealt with: Motorola, National Semiconductors, Zilog, Texas Instruments.

Quarndon Electronics Ltd, Slack Lane, Derby. (0332) 32651. Makes dealt with: Texas Instruments.

STC Electronics, Edinburgh Way, Harlow, Essex. (0279) 26777. Makes dealt with: Motorola, National Semiconductors, SGS, Texas Instruments and Hitachi.

Computer parts

Z80A: Zilog, SGS, NEC (Spectrum/ZX-81).

ULA: Ferranti (Spectrum/ZX-81).

ROM: Hitachi, NEC (Spectrum), Mostek, Motorola (ZX-81).

RAM: 4116 type — NEC, National Semiconductors, Texas Instruments, ITT (Spectrum). 4532 type — Texas Instruments, OKI (Manhattan Skyline) (Spectrum). 2114 type — Motorola, NEC (ZX-81). 4118 type — Mostek (ZX-81). 2K type — Mostek, Toshiba, Motorola, Texas Instruments, NEC (ZX-81).

LM1889: ICI4 — National Semiconductors (Spectrum).

TTL: 74LS00/74LS32/74LS157 — Texas Instruments, SGS, Motorola, National Semiconductors, NEC.

The following are all used on the 48K Spectrum.

Regulator: LM7805 +5V Reg. — SGS, NEC, Texas Instruments, Motorola.

Crystals, Capacitors, Resistors, Diodes, Sockets: available through general component suppliers.

Modulator: UM1233 Astec (UK) Ltd.

Leads: available at most TV/electrical shops.

Case parts: Sendale Plastics.

Keyboard: CPC.

Sinclair Supermart

TO ADVERTISE IN THE SUPERMART CALL SINCLAIR USER ON 01-430 1200

FAST SPECTRUM REPAIRS

MANCOMP LTD.

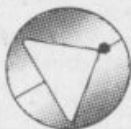
Average price £25

FIRST CO.
IN ALL U.K. TO
INTRODUCE WHILE-U-
WAIT SERVICE. NOW
FIRST TO OFFER AN
INTERNATIONAL
REPAIR SERVICE.

- MOST SPECTRUMS REPAIRED IN 45 MINS.
- PLEASE PHONE FOR APPOINTMENT FIRST.
- OR PHONE/SEND SPECTRUM FOR FREE ESTIMATES. ENC £1.80 (U.K. I.O.M. EIRE. C.I.) £6.50 (EUROPE/SCANDANAVIA)
- NO HIDDEN HANDLING CHARGES.
- 24 HR TURNAROUND.
- EVERY MICRO INSURED FOR RETURN JOURNEY.
- OPEN TILL 7 P.M. MON-SAT.

"I have come across a firm that will be more than willing to advise you as to how to remedy your problem. They are called MANCOMP, and as well as repairing faulty Spectrums, are also quite willing to discuss your problems with you, and offer reasonably cheap, and (more importantly) correct cures"

PHIL ROGERS 'PEEK & POKE'
"POPULAR COMPUTING WEEKLY"
JAN 1985. (VOL IV NO 1)



Deutscher Express-Dienst

Auf Bitten unserer deutschen Kunden bieten wir jetzt einen Reparatur-Eildienst zum Festpreis von £35,00 (einschl. Porto und Verpackung).

Sie senden Ihren SPECTRUM und £35,00 per Eurocheck (ohne Netzstromgerät oder Kabel).

Stecken Sie Ihren Brief in einen Umschlag sussen am Paket.

Wir bessern Ihren SPECTRUM am gleichen Tag aus, an dem wir ihn erhalten.

Sie sollten Ihren SPECTRUM innerhalb von 6 Tagen zurückerhalten.

Für dringende Reparaturen berechnen wir Ihnen einen Zuschlag von £8,00 zur Rücklieferung innerhalb 48 Stunden, überall in der Bundesrepublik.

Für Bildungsstätten und Schulen gelten Sonderpreise.

Wir suchen Techniker für unsere geplante deutsche Niederlassung, die wir ausbilden und bitten um Zuschriften von Interessenten.

MANCOMP LTD. (DEPT SU)

Printworks Lane,
Manchester M19 3JP
061-224 1888

THE SOFTWARE LENDING AND EXCHANGE LIBRARY

SPECTRUM, COMMODORE 64, DRAGON, VIC 20, BBC & ZX 81

YES! We have programs for your computer. We have programs from 50p (ZX 81). Two weeks £5.00 LIFE MEMBERSHIP (less than the cost of a single game) brings you our membership kit, including free listings, software exchange catalogue and introductory letter.

We now have OVER 300 HIRE TITLES, and 500 EXCHANGE TITLES, with large Spectrum and Commodore sections.

All mail dealt with on a daily basis and OVERSEAS MEMBERS VERY WELCOME. New software discounted to our members at aggressive rates.

Send cheque/PO for £5.00 to:
THE SOFTWARE LENDING LIBRARY,
PO Box 3, CASTLEFORD,
WEST YORKSHIRE WF10 1UX

Stating name, address and computer type.
FORGET THE REST AND JOIN THE BEST!

HEMEL COMPUTER CENTRE LTD

Send us your faulty 16K/48K Spectrum and we will repair it for £20 plus postage and packing (£1.60).

Price includes parts, labour, VAT and a 3 month guarantee.

We also repair BBC and Commodore.

HEMEL COMPUTER CENTRE LTD

Dept SU, 52 High Street (Old Town),
Hemel Hempstead, Herts HP1 3AF.
Tel: (0442) 212436.

DRIVE A TRAIN

Drive in your own home such famous trains as the Flying Scotsman, Cornish Riviera, Master Cutler and Royal Scot. Exciting and addictive games for the enthusiast and layman alike.

Out latest game - ROYAL SCOT. Drive from Euston to Crewe with a choice of motive power, Class 87, Advanced Passenger Train and Class 86.

CORNISH RIVIERA. From Paddington to Exeter with a stop at Reading hauled by an HST, Class 47, or Class 50.

MASTER CUTLER. From St. Pancras to Leicester, fast or stopping (6 stations) behind Peak Class 45, Class 47, or the HST.

FLYING SCOTSMAN. A fast dash from Kings Cross to Doncaster behind the legendary Delics, HST or Brush 47.

All the above available for CBM 64, BBC 'B' and Spectrum 48K

NOSTALGIA SERIES

WESTRAIL, MIDRAIL & SOUTHRAIL

Recall the days of steam in the 1950's and 1960's and enjoy train spotting the way it used to be. Many hundreds of engines to be seen at stations throughout each region, all graphically depicted with named and un-named engines.

Spotting games for Spectrum 48K only

All games £7.50 inc P&P

Dee-Kay Systems (Dept SU)

18 Salford Close, Woodrow South, Redditch, Worcs. B98 7UN

CARDS OF FATE

Let Gypsy Lea reveal your past, present and future as she deals and interprets the cards which govern your fate.

Using brilliant graphics and sound, this program has been a proven hit at parties and great family fun too. Not only the ladies will find this program appealing. Based on genuine cartomancy. For 48K Spectrum.

Send only £4 to:

D. C. Jackson, 1 Osborne Place
Todmorden, Lancs OL14 5BQ

LEARN PROGRAMMING

We'll develop your skills more quickly and professionally with our home study Programming Course, based on Spectrum. Write today for: **FREE BROCHURE - NO OBLIGATION.** Ref. SU5.

IDEAL SCHOOLS
FREEPOST, Glasgow G1 4BR
Tel. 041-248 5200

If you have written a good games programme then we would like to hear from you.

Contact:

Senior Programmer,
O.V.L. Ltd, 1 Glanvor
Road, Edgeley,
Stockport SK3 9PF.

SINCLAIR COMPUTER REPAIRS

All machines dispatched within 72 hours of receipt

Spectrum: £16.00

ZX-81: 12.00

Spectrum 16-48K Upgrade: £27.50 (includes parts, VAT and return postage)

For a fast and reliable service, send machine, brief description of fault and cheque or postal order to the experts:

CAPITAL COMPUTER SERVICES
44 Rich's Road, Cardiff CF4 4AA.
Tel: (0222) 614401

G.R.P. SOFTWARE



1 000's of programs for SPECTRUM, ZX81, BBC ELECTRON, AMSTRAD etc.

Most 20% Discount

Games utilities adventure, education. Top 10 in this magazine all 20% of Rec Rate! Price. Delivery fast free and first class. Phone, send cash with order, or SAE for list state machine.

GRP SOFTWARE
81 Openshaw Drive
Bicknham BB1 8RB
Tel: 0254 670915



MICRODRIVE STORAGE BOX

Spectrum-QL — 50 Cartridges
Stove Enamelled Metal Case
£12.00

CLAYDALE LTD.
Bidwell Close
Drayton High Road
Norwich, Norfolk NR8 6AP.

Spectrum and ZX-81

REPAIRS

Fast efficient service
48K upgrades

ACESURE LTD. 43 Old Street,
Ashton-under-Lyne, Lancs
Tel: 061-339 8266

SPECTRUM REPAIRS

Rapidly fixed Spectrums £15 fully inclusive.

RA ELECTRONICS
50 Kimberley Road
Lowestoft, Suffolk NR33 0TZ
Tel: (0502) 66289

SERIOUS SPECTRUM USERS. Send SAE/IRC now for our catalogue of business/practical software including Micro Office, Flexi-File and other useful programs. Microdrive compatible. 5D Micro Systems, (Dept SU), P.O. Box 24, Hitchin, Herts.

REQUIRED: Programme, tape, to simulate planet (Earth) rotation before and after pole shift. Plus eventual pole position, reaction to and from weight of polar ice caps, in relation to Europe.

ZX SWAP SHOP: Membership totally free, cut price offers, SAE for details please to MAK Swap Shop, 87 Chancel Row, Hyde Park, Sheffield S25LP.

INTELLIGENT JOYSTICK FOR SALE: Program-mable with interface and tape, by Cambridge computing works with all software, brand new, only £20. Write to Mr E Bennett, 36/8 Chayofita, Costa Del Silencio, Arona, Tenerife Sur, Canary Islands.

SPECTRUM 48K DRAW AND ANIMATOR: 2 types of animation, 3 types of draw, colour fill, text, save/load, circles. Only £4.95 (incl). Cheques to P. Lees, 104 Elmhurst Gardens, Tonbridge, Kent TN10 3QZ.

HARDLY USED SPECTRUM: Games at half price, includes Midnight, Panzer, Quill, Murder Manor, several Lethalities, Cricket plus others. Telephone for details, bulk buying possible, ring King's Langley 67392 NOW!

ZODIAC: Special Offer! Astrological game for 48K Spectrum. Tells you and friends about your sun signs and relationships. Ideal for parties! £3.50 from Summer Solstice, 19 Rosehill Road, Crewe CW2 8AR.

ZX INTERFACE 1 AND MICRODRIVE: Unwanted gift £75.00. I will also include all my software (Worth over £140.00) ZX Spectrum, 48K £85.00. New QL forces sale (reluctantly) 0669 20565.

WANTED ZX SPECTRUMS: Non working, good prices paid for faulty computers. Also required, faulty ZX printers. Tel: 0669 20565. Always for sale, ZX Spectrums 48K includes all my manuals, leads £85.00.

"IMPRISONED!", 48K SPECTRUM. Fast Mcode Maze action. Ten skill levels and great graphics! Only £2.99. P & M Designs, Quadrant House, The Quadrant, Sutton, Surrey. Special offer! Free C-15 cassette with order.

DK'TRONKS KEYBOARD: Will accept interface 1 and PSU. Brand new (unwanted gift). Consequently £40 or nearest realistic offer. Price includes postage/delivery. Contact: Chris Powell, 82 Harwood Street, Humberstone Road, Leicester, LE5 3LW.

SILAS SOFTWARE: Presents **English Pack** - an amazing quiz game on English Words and Literature, suitable for EVERYBODY! Over 200 questions. Only £3.95 from 24 Highcroft Gardens, London NW11 0LX. 48K Spectrum.

START UP IN BUSINESS. What is legally involved in running ANY type of business? How to cost business ideas of your own, or do it for friends. Large SAE brings FREE comprehensive details. Business Critique Limited. SUser, Capital House, Market Place, London W36AL.

"BREAK DANCE" AND "GRAFFITI ARTIST" Only £4.00 in-laid p/p for both. Learn with good graphics 48K Spectrum. Send Cheque or PO to Bradley Clutton, 56 Ranelagh Gardens, Ilford, Essex U1 3JP.

"QUEST FOR THE ORB" 48K Spectrum. Great new adventure, over 70 locations on screen status, full instruction sheet included. £3.45 Chq/PO: David Cowling, "League Lodge", Fernwood Crescent, Whetstone, London N20 0RN.

SINCLAIR REPAIRS

Spectrum and ZX-81's repaired quickly for £12.50 + parts and postage. Send/bring with fault symptoms to:

TECHNICON SERVICES
(South West)

80 Colston Street, Bristol BS1 5BB
or Tel: 093484 3460
(closed Saturdays)

RACING LEAGUE

If you think that all computer games are variations on the same themes then join the Racing League! 1985 version is for up to four players. Routines include betting, trading, jockeys, optional graphics race sequence etc. Can you become Top Owner? Skill and Luck are needed to succeed in this refreshing simulation game. The perfect antidote to zapping aliens. Racing League will be around for a long time and is available for 48K Spectrum at £2.90 post free from R.L. Software, 22 Lindale Garth, Kirkhamgate, Wakefield, West Yorks WF2 0RW.

MICROLINK SYSTEMS

FOR
CASIO KEYBOARDS
AND
HOME COMPUTERS

* PA-1 COMPUTER ADAPTOR FOR MT-200
* ML-10 EDITOR/INTERFACE FOR SPECTRUM
* ML-13 INTERFACE FOR COMMODORE 64
* ML-14 INTERFACE FOR BBC MODEL B

MICRO MUSICAL LTD
37 WOOD LANE, SHILTON
COVENTRY CV7 9LA
COVENTRY (0203) 616760

DON'T VAT THE PRESS

There are strong reasons to believe the Chancellor of the Exchequer is planning to impose VAT on your magazine.

Such a move would turn the clock back 130 years — the last tax on newspapers and journals was repealed in 1855. Since then 'No tax on knowledge' has been a principle agreed by all Governments, even in the darkest days of war.

A free Press is a tax-free Press.
No Government should be given the power to impose financial pressure on a Press it may not like.

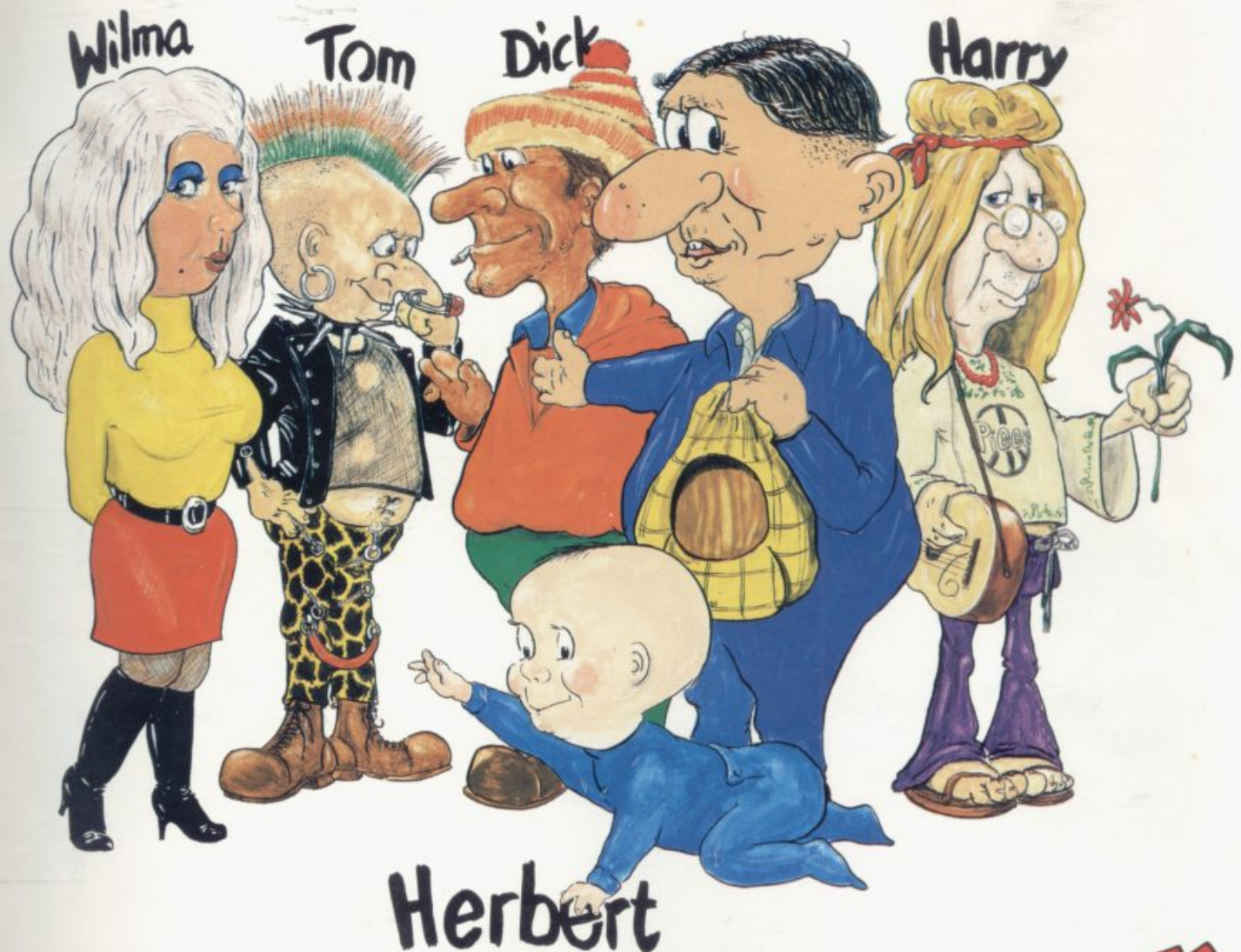
Tell your MP to say 'NO' to any tax on reading.

Issued by the Periodical Publishers Association, London

Advertisement Index

Activision	27	Games Workshop	54/55	Picturesque	130
Adventure International	121	GCE Tutoring	18	Prism	90/91
AGF	37	Gilsoft	70	Punters Pal	115
AMS	37	Gordon Micro	83		
Argus		Gremlin Graphics	32/33	Quest	13
				Quicksilver	0BC
Betasoft	125	Hewson	115	Ram	18,49
		Hornby Software	121	RSD	115
		Interface	118		
Cambridge Micro Electronics	114	JCS Software	121	Saga	24
Cambell Systems	119			Selec	132
CCS	36	Kempston	21	Servicon	92
Challenge Research	70	Kosmos	125	Sinclair Research	22,23,67,105-9
Cheetah Marketing	6,44	Logic 3		SMT	66
CP Software	65	Micro X	6	Software Farm	76
Cross Software	82	Micromend	118	Software Library	83
		Micronet	97-100	Software Supermarket	84
DACC	41	Micro Gen	IBC	Spectadraw	83
Dastar	46	Monitor	18		
DR'ronics	112/113	National Software Library	82	Tasman	48
Digital Integration	89	New Generation	114	Tec Publications	118
Domark	73	Northern Premier	130	Thetford Micros	132
Dorling Kindersley	43			Transform	91,102
		OCP	62/63		
East London Robotics	71	Ocean	IFC,74/75	Ultimate	97
Eiderson	125			University Software	90
Eigen Software	121			US Gold	14,15,133
Epsom	28/29				
				Verran	52
File Sixty	81			Welwyn Electronics	115
Frel	82			Zeal Marketing	119

Meet the Gang!



"Everyone's a Wally"

1ST EVER MULTI-ROLE ARCADE ADVENTURE

Spectrum 48K £9.95

Commodore 64 £9.95

Available shortly on Amstrad CPC 464

Including Hit Single on reverse side "Everyone is a Wally" performed by Mike Berry

MIKRO-GEN

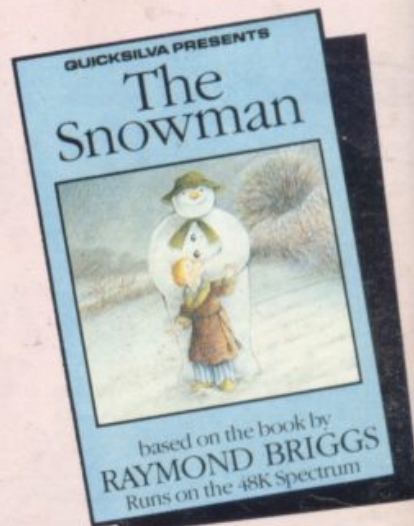
44 The Broadway, Bracknell, Berks. 0344 427317

BATTLEZONE

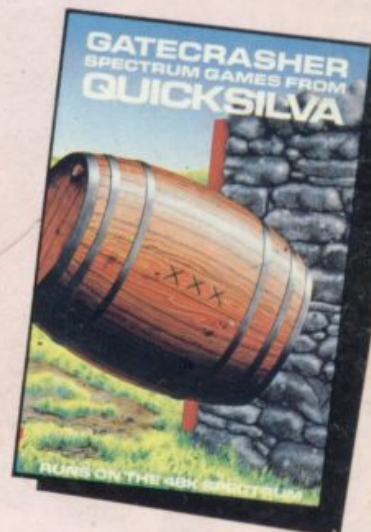


The Official Atari approved
version of the popular
arcade game.

48K Spectrum
£6.95



An enchanting Christmas
game based on
RAYMOND BRIGGS' best
selling book and film.



A Game of strategy that
will test your mind to
its limits.



A fantastic fight to
the death within your
own bloodstream!

Blood & Guts



A battle to the
end with the
deadliest killers
in the Galaxy!

Strontium
the ACE
Killing

available from
QUICKSILVA

Quicksilva Mail Order, P.O. Box 6, Wimborne, Dorset BA21 7PY.
Tel. (0202) 891744

48K Spectrum
£6.95 each