

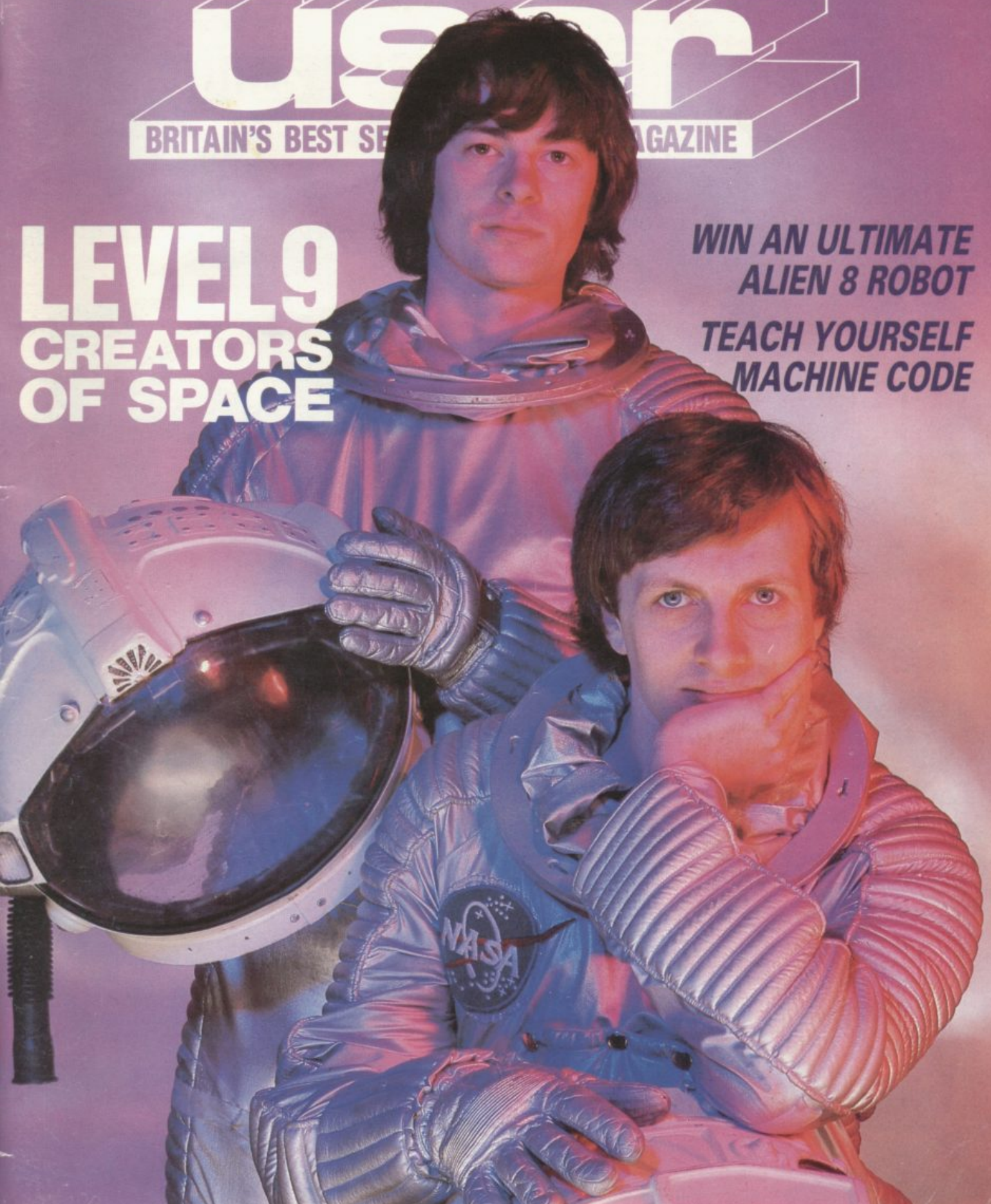
sinclair user

BRITAIN'S BEST SELLING MAGAZINE

LEVEL 9
CREATORS
OF SPACE

**WIN AN ULTIMATE
ALIEN 8 ROBOT**

**TEACH YOURSELF
MACHINE CODE**



A map of the study area showing the River Sever and surrounding hills. The river is depicted as a blue line flowing from the top left towards the bottom right. Key locations marked include GRAHAM HILL BEND, PADDOCK HILL, HAILWOOD RISE, and DRUIDS. A scale bar indicates distances of 0, 100, and 200 meters.

KEMPSTON
MICRO ELECTRONICS LTD

NEW GRAND PRIX SERIES!



Available directly from Kempston
Micro Electronics Ltd Fast Mail order service
I would like to receive the following

Name

Address

Postcode

1	Kempston Joystick Interface	£9-95
2	Centronics 'E' Interface	£39-95
3	Formula 2 Joystick	£11-95
4	Kempston Pro Joystick Interface	£18-95
5	Formula 1 Joystick	£16-95
6	Junior Pro Joystick	£5-95

I enclose a cheque/P.O. for £
Access/B' card

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

Kempston Micro Electronics Ltd, Singer Way, Kempston, Bedford MK42 7AW
Tel (0234) 856633. Telex 826078 KEMPMI G

DANGER! THESE PRODUCTS WILL SERIOUSLY DAMAGE OUR COMPETITORS MARKET.

Most items available while stocks last.

Selfridges

Most items available from

LITTLEWOODS • WHSMITH

Selfridges *RITZ* John Menzies

spectrum **Currys** Hamleys

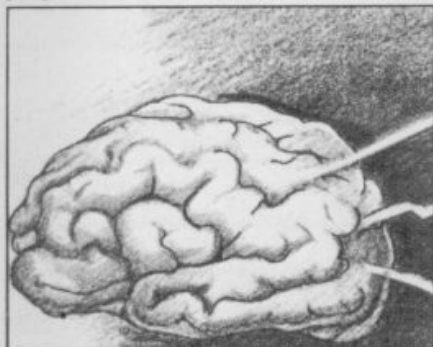


EDITORIAL Editor Bill Scolding Deputy editor John Gilbert Staff writers Chris Bourne, Clare Edgeley Designer Craig Kennedy Editorial secretary Norisah Fenn Publisher Neil Wood
ADVERTISING Advertising manager Rob Cameron Deputy advertisement manager Louise Fanthorpe Advertisement sales executive Kathy McLennan Production assistant Jim McClure Advertisement secretary Maria Keighley
MAGAZINE SERVICES Subscriptions manager Carl Dunne
TELEPHONE All departments 01-251 6222
Sinclair User is published monthly by EMAP Business & Computer Publications

FEATURES

MASS STORAGE John Lambert provides an in-depth review of the new Opus disc drive for the Spectrum. **37**

MACHINE CODE Put a hex on your Spectrum with the help of programmer Marcus Jeffrey. **46**



Mind over machine, page 46

TASWORD 2 Customising the popular word-processor to suit your own needs. John Lambert spreads the word. **51**

QL PROGRAMMING The structure of Superbasic – exclusive extracts from The QL Book by our own John Gilbert. **69**



The walking, talking robot, page 102

COMPETITION The Ultimate robot could be yours in a super competition for space-hounds. **102**

SPECIAL OFFER Ten hit games in one package. Dare you miss out on your order? **117**

REGULARS

NEWS High finance and low profits, Sinclair plans for chip manufacturing plant. **5**

SINCLAIR SIMON How not to sell a computer game . . . **6**

QL NEWS Hilton show relaunches the QL, plus new software releases. **9**

GREMLIN Horror from beyond the tomb – David Ward revives Imagine. **13**

SPECTRUM SOFTWARE SCENE Exclusive reviews of Herbert and Overlords. **21**



They came from outer space, page 60

HARDWARE WORLD Boxer and Citadel monitors. **39**

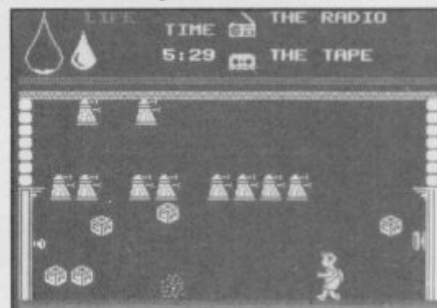
BOOKS Hackers reveal their secrets, Sinclair unveils the mysteries of QDOS. **55**

HIT SQUAD Level Nine in outer space. Chris Bourne follows the great adventure. **60**

ENTRY POINT John Gilbert puts his memory to the test. **63**

BUSINESS SOFTWARE Office in miniature from database. Mike Wright reports. **78**

PROGRAM PRINTOUT Get a hole in one at the Golf Club, then shoot it out with Duke. **85**



Herbert gets the runs, page 21

ADVENTURE HELPLINE Slaughter on the road, but Gordo Greatbelly is undeterred. **109**

ADVENTURE Richard Price investigates new mysteries and travels to the Emerald Isle. **112**

ADVENTURE PROGRAMMING John Gilbert teaches the Spectrum to understand English. **119**

HELPLINE Andrew Hewson interrupts a ghost. **123**



Meet Big John, page 85

PLUS

NEXT MONTH **8**

LETTERS **16**

SINCLAIR SURGERY **45**

CROSSWORD **48**

SUBSCRIPTIONS **113**

SOFTWARE PUBLISHERS **125**

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 each program printed and £50 for star programs.

Typeset by Saffron Graphics Ltd, London EC1

Printed by Peterboro' Web Woodstone, Peterborough.

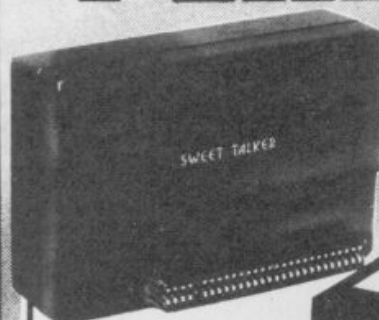
Distributed by EMAP Publications Ltd.

© Copyright 1985 *Sinclair User* ISSN No 0262-5458



91,901
Jun-Dec 1984

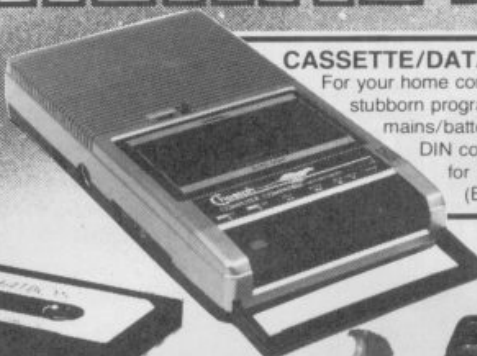
PERIPHERAL POWER



CHEETAH "SWEET TALKER"

Based on an allophone system, program any word or phrase, providing unlimited speech. Now make your Spectrum talk. Compatible with Interface I

£24.95



CASSETTE/DATA RECORDER

For your home computer, will allow easy loading of even the most stubborn program. Features include single key record, mains/battery, accepts standard computer leads and 5 pin DIN connector. Also provides exceptional audio quality for fine listening.

(Batteries not included) £24.95



MEGASOUND

For 48K Spectrum and ZX Spectrum +. Achieve amazing sound capabilities that your Spectrum has been lacking. Just plugs into the user port at the rear of your computer and amplifies sound through your T.V.

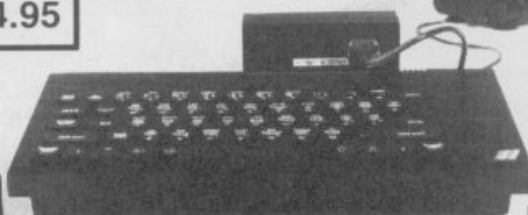
£10.95



32K RAMPACK

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.

£39.95



SPECTRUM JOYSTICK INTERFACE

Simply plugs into the user port at the rear of the computer and accepts any Atari style joystick including Quickshot and Kempston.

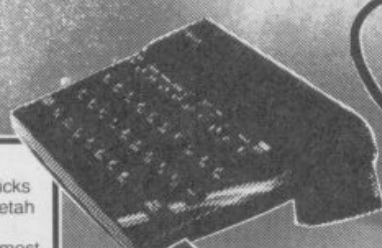
Comes without rear edge connector at £11.50

or with connector which allows other peripherals to be stacked up at £12.75

56 WAY EXTENSION CONNECTOR

Cheetah's 6" long extension cable enables Spectrum peripherals to be distanced from your computer.

£7.95



R.A.T.

Conventional joysticks are dead! The Cheetah Remote Action Transmitter is the most sophisticated computer controller available! Infra red transmission - so there are no leads trailing across the living room. Touch control, extremely fast, can be used with Cheetah RAT/Kempston compatible software. Complete with receiver / interface.

£29.95



AERIAL SPLITTER

Cheetah's neat splitter unit complete with self adhesive pad allows you to keep your T.V. and computer aerial leads plugged in without disturbing the picture.

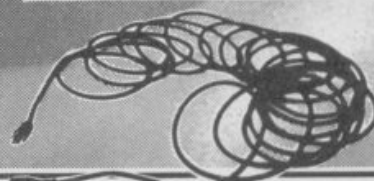
£2.25



HI-STAK FEET

These instantly applied stick on feet for your ZX 81, Spectrum, New Brain, VIC, TRS etc. tilt the computer and make your keys easier to see and more enjoyable to use, allowing smoother programming.

£2.99



EXTRA LONG AERIAL LEAD

Over 15' long. Our super lead will allow you to sit back away from your T.V. and enable you to play games in the comfort of your armchair.

£1.50

All Cheetah Peripherals have rear edge connectors for compatibility with all Sinclair accessories.

Prices include VAT, postage & packing.

Delivery normally 14 days.

Export orders at no extra cost.

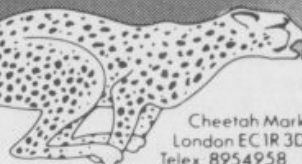
Dealer enquiries welcome.

Cheetah, products available from branches of

John Mannes WHSMITH Rumbelows

WOOLWORTH Spectrum dealers and all good computer stores.

Cheetah
Marketing



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

Nordic is still alive

OUR APOLOGIES must go to Nordic Keyboards for our news story last month where we stated that Nordic had 'gone under'. Dennis Rowlands, managing director, phoned to inform us that Nordic was alive and well.

The confusion arose when Turngrade Electronics — the company which assembled keyboards for Fuller — went into liquidation with £70,000 owed to them by Fuller. Turngrade originally formed Nordic with CMC Ltd. Nordic then moved from Turngrade's premises

and British Telecom was instructed to place a redirect to their new telephone number. Rowlands explains the mix-up, "BT in their wisdom placed a redirect onto a line which did not exist, which is why people couldn't contact us."

Roy Backhouse now runs a computer shop in Dale Street, Liverpool, where keyboards manufactured by Nordic were sold. "Nordic is receiving a lot of mail which should have been sent to Backhouse in Dale Street. Monies sent in for

keyboards were cashed but no goods were sent out. Dissatisfied customers then contacted Nordic saying that we were responsible," says Rowlands, "Roy Backhouse has nothing to do with and has never been employed by Nordic."

For four months after the takeover, Nordic honoured the guarantee on Fuller keyboards. That situation has now changed and there is no reference to Fuller on the new Nordic keyboards. Nordic no longer hold themselves responsible for keyboards bearing the Fuller name.

Nordic has moved from its old premises at Randles Road and all correspondence should now be sent to Nordic Keyboards, % CMC Ltd, Tarran Way East, Tarran Way Industrial Estate, Moreton, Wirral, Merseyside. Tel: 051-606 9300/0088.

Dennis Rowlands sums up the situation. "We are a very reputable company and want to provide a good service to the public."

And the good news — the price of the Executive Keyboard is now £49.95 — a drop of about £10.00.

Logic 3 sell budget club

LOGIC 3, which used to run a cut-price software club in addition to publishing its own programs, has gone bust. The club side of the business has already been sold to Mr Software Ltd.

The telephone number for Mr Software is (0494) 450586. Nobody was answering the phone at the time of going to press, but members of the club with outstanding orders might care to try for themselves.

Making war with Argus

SELECTED strategy games from Lothlorien are to appear as part of the Argus Software Mind Games series.

Roger Lees of Lothlorien said the wargame specialists will continue to sell other products in their own right.

Lothlorien believes the marketing support available from a large group such as Argus can make longterm survival more secure.

The first game to appear under the new deal will be **The Bulge**, a recreation of the last great German offensive of World War Two.

Space battle in time

MELBOURNE HOUSE has recently released **Starion**, in which you have to alter the outcome of various incidents in Earth's history.

You start off in space, fighting aliens in superfast 3D action. The game is divided into a series of time grids containing 243 time zones in blocks of nine.

The idea is to kill the aliens in each time zone — and as they die they release an alphabetical letter. When all the aliens have been exterminated you will be left with a string of letters, which when unscrambled will form a word — the name of a cargo.

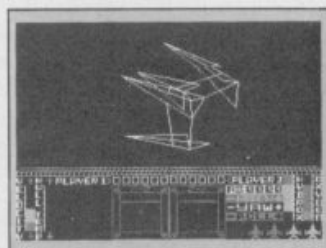
Armed with the word, you must fly through a time warp to find the timegrid and decide which of eight neighbouring time zones in the Earth's history your cargo belongs to. You then fly to Earth and see if your cargo will set history right.

You will then be transferred to eight new time grids where more battles and word puzzles take place to alter history in that time block. The process is repeated until all 243 zones have been altered and you gain the title of Creator.

Starion is not just an

arcade game. It demands a general knowledge of history, the ability to make sense from a jumble of letters and an element of luck.

The game is incredibly fast with superb 3D wireframe graphics. It is available at £7.95.



Peddalling into the future

INTREPID but youthful tricyclists may never have to buy petrol in their life, according to Sir Clive Sinclair. Announcing plans for further models, he described today's young teenagers with C5s as the first of the 'electric generation'.

Clive anticipated the launch of a two-seater C10 model within two years, which would have double the speed and range of the C5. That is to be followed by the *pièce de résistance*, a pear-shaped four-seater machine with a top speed of

80 mph and a range of more than 200 miles.

In the meantime, interest among retailers appears to be growing as discount chain Comet has agreed to stock the machine. "The initial response from our stores around the country has been extremely good," says managing director Jerry Mason. Comet joins an increasing gallery of outlets including selected branches of Woolworth.

Following on from previous reports of C5s going down well on oil-tankers



and holiday camps, the latest original use of the trike comes from Pontypridd in South Wales.

Local driving schools there are using C5s for pre-driving tuition, especially with older learners who suffer from 'car-fear'.

more news on page 6

Famine appeal big success

SOFT-AID, the compilation games tape sold in aid of the Ethiopian Famine Appeal, is proving a smash hit in the shops. The game has rocketed up the charts, and Lee Guinty of Microdealer UK, which distributes the tape, says sales totalled 35,000 by the second week of March.

"Demand is outstripping supply," he says. "It is difficult to put pressure on duplicators when it is for charity, and I keep running out of copies. Even little shops, whom we asked to take a minimum of ten copies, are re-ordering."

The compilation, which includes 10 chart hits sells for £4.99, of which £3.00 goes to Bob Geldof's famine appeal. Geldof also allowed the organisers to release the hit single *Feed the World* on the tape as an added bonus.

Retailers, Dixons have gone so far as to buy the

game at the full £4.99 retail price, and donate every penny to the appeal. However, as with the Band-Aid single, the Government will levy VAT on the product, which amounts to 65p for each copy.

"Personally, I feel the Government could make a gesture on it," says Mark Tilson of Quicksilver, one of the main organisers of the campaign, "however the game's going very well indeed."



Disc drive withdrawn

THURNALL Electronics is withdrawing its current disc drive from the market because of lack of interest from customers.

A spokesperson for the Manchester-based company said, "We didn't get the response we needed to make the product viable."

She added that the company had no plans to introduce new disc drives for the Spectrum.

Sinclair changes terms of guarantee

OWNERS of faulty Spectrums will no longer be able to get a new one over the counter due to a change in the guarantee issued by Sinclair. The warranty still runs for one year, but unless you return the machine to the retailer within 30 days of purchase it will have to be repaired by Sinclair Research rather than replaced

from existing stocks.

"At the moment shops will replace Spectrums over the counter even when they have been brought in after an 11 month pounding," says a spokesman for Sinclair Research.

The Sale of Goods Act does not fix a precise time limit, but if your Spectrum goes down after 30 days

because of a manufacturing fault, you still have the right to your money back or a new machine.

The point was emphasised by a spokesman for WH Smith. "We are honouring the guarantee as offered by Sinclair," he says, "but that does not prejudice the customer's basic rights under the law."



Sinclair profit down

DISAPPOINTING profits were again dogging Sinclair Research at the beginning of 1985. The figures for the nine months before Christmas show a pre-tax profit of £7.9m, against £14m for the preceding period.

A spokesman for Sinclair Research explains that the figures include a 'highly conservative' estimate based

on bad debts and other provisions. Those include £1.5m against post-Christmas returns of Spectrums, £1m due to the demise of distributors Prism, £1m on advertising in Germany and £1m from cutting prices on the Spectrum Plus after Christmas.

Nevertheless, Sinclair Research has decided to re-

schedule production of the Spectrum Plus. "The Spectrum sold very well over Christmas and also in January," says a spokesman, refuting reports of a slow new year. "However, most of those sales came out of large stocks because retail outlets over-ordered before Christmas. We felt it would be ridiculous to add paraffin to the fire and continue the same production levels." Stocks at the beginning of March were said to be worth £34m, and Sinclair Research has ceased buying components for new production for the time being.

While Sir Clive is clearly confident that the situation is of short-term significance only, a meeting of shareholders was called to explain the situation, given the company's expansive plans in other areas. Whether or not Sir Clive's optimism is justified, it is nevertheless acknowledged that the planned flotation of Sinclair Research on the Stock Exchange has been abandoned for the present.

Renaissance of Imagine

LIKE a phoenix from the ashes, Imagine, in name if not in spirit, returns from the past with new software titles. Ocean supremo David Ward, who acquired the rights to the name last October, has set up Imagine 84 to market two new arcade titles, **World Series Baseball** and **Wizadore**.

World Series Baseball is shortly to be available on the Spectrum, and is said to mimic the 'live pitch and throw of real baseball'.

In the meantime, work proceeds on the **Frankie goes to Hollywood** game, and a new project, based on *The Neverending Story*, the popular fantasy classic by Michael Ende. The hero is young Bastian Balthazar Bux, and the story follows his adventures in Fantastica as he tries to save the princess Moonchild.

"We anticipate the game will succeed on the same scale as **The Hobbit**," says David Ward. "The storyline and scenarios have a surreal fascination."

Brotherly competitors

THERE was an extraordinary response to the Brother printer competition in the February issue, with the largest entry ever.

The three winners were Arthur Cummings of Peterlee, County Durham, H J P Arnold of Havant, Hampshire, and Oliver Burns of Saltash, Cornwall. Arthur wins an M1009 dot matrix printer, while Mr Arnold and Oliver Burns win an HR-5 and EP22 typewriter/printer respectively.

The answers to the six questions were 1 - Caxton; 2 - Italic; 3 - Daisywheel; 4 - Thermal; 5 - Print Buffer;

6 - Centronics. The final word, when assembled from the answers was Dot Matrix Printer.

The first answer, Caxton, to the question 'Who invented the printing press?' has roused some controversy. We are compelled to confess that the consensus of opinion suggests Gutenberg got there first and Caxton borrowed the process from him. However, no harm has been done since all who entered seem to have got Caxton anyway. It just goes to show you should not believe everything they tell you in schools.

The protocol of subversion . . .

NEWS coming in about **The Fourth Protocol** suggests that the game is likely to be as big a seller as the novel, written by Frederick Forsyth.

The game has three parts, and access to parts two and three is only possible with a code word hidden in the previous section.

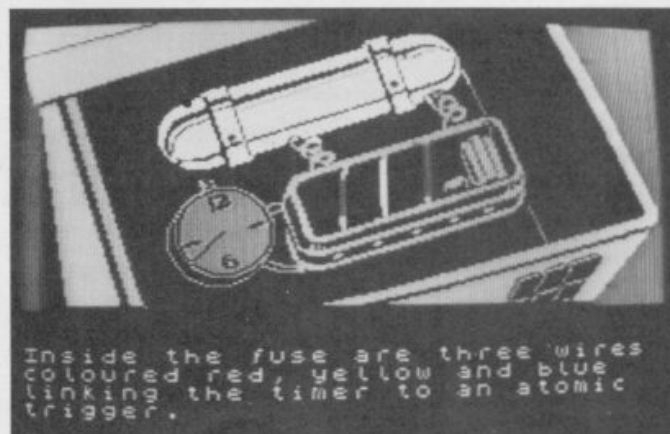
Part one is an icon-driven adventure in which you, MI5 investigator John Preston, runs a surveillance operation from your office. With the help of memos, files, voice prints and telephone calls you piece together the jigsaw of Plan Aurora, a Soviet plot to undermine the stability of

Great Britain.

The Graphics are accomplished and generated instantaneously, and there is an innovative and imaginative use of windows.

Part two is a search sequence in the traditional adventure mould, where you travel the UK and abroad in a race against an unknown deadline. In part three, an arcade game, you arm your SAS troops for a shoot-out with the KGB.

Having successfully completed all three phases, you will find yourself face to face with the Soviet nuclear device, with only 30 seconds to defuse it. To do so correctly you must remember a frag-



ment of information chanced upon earlier in the game, and which at the time seemed unimportant or meaningless. Depending upon your success and speed in neutralising the weapon,

there are several apocalyptic climaxes to the program.

Published by Hutchinson, **The Fourth Protocol** is to be released on May 23, and will cost £12.95.

more news on page 8

Modems in danger

QCOM, the QL modem package, appears to be in dire jeopardy following the demise of OEL, which has called in the receiver.

OEL also manufactured the VTX5000 modem for the Spectrum which was marketed by Prism, also in receivership. Prism Communications which handled the modems, has been bought by Modem House and that company is now selling the Prism stocks and extending its own repair service to cover all VTX modems, whether bought through Modem House or not. If the modem was not supplied through Modem House, a charge will be made, which would be unlikely to exceed £25.00.

Spokesman Keith Rose says the company has enough stocks to serve the market for an 'indefinite'

period, although with customers in 16 different countries the situation could change. "Now we're in the retailing area we will have to change our marketing strategy," he says.

"We are in a position to manufacture modems, and talks are underway concern-

ing OEL. In an ideal world they would continue manufacturing, but the situation is very fluid."

Rose is pessimistic about the chances of QCom. "OEL cannot get the plastic to make it and it owes a lot of money to the supplier," he says.

Modem House is anxious to dispel any idea that it will simply bail out OEL, assuming it decides to become financially involved at all. "There is no point in buying OEL in its present form," he says, referring also to OEL's links with its financial backers.

For details of the repair service contact Modem House, Iolanthe Drive, Exeter, Devon EX4 9EA. Tel: (0392) 69295.

Sinclair's wafer factory

THE revolutionary new wafer scale chip is to be produced by Sinclair Research itself. The decision represents a significant change in policy by the company, which has always preferred to hire others, such as Timex, to manufacture its products.

In the case of the wafer scale chip, Sir Clive Sinclair has decided to set up a factory to manufacture the

product himself.

Production schedules are geared towards 300,000 chips a year by the end of 1986, rising to 1 million in 1987. One of the first products to use the new chip will be the QL Wafer drive peripheral, but a spokesman said other companies will be able to buy the new chips if they wish.

The project will not be headed by a Sinclair man,

but by ICL chairman Robb Wilmot. Wilmot's initial task will be to raise £50m in venture capital, within or without the UK. "Clive and he have known each other for a long time," says a spokesman, "we value his credibility and experience."

Wilmot will continue as chairman of ICL, but has also taken on a non-executive directorship at Sinclair Research.

Look out!

NEXT MONTH

We're giving away a FREE 24-page booklet on the front of our June issue. It's crammed with information, prices, features, suppliers and star ratings of all the available Spectrum and QL add-ons. So you'll never again buy an overpriced joystick or non-compatible printer.

Plus there is an exclusive review of the 'Fourth Protocol' a revolutionary new game based on Frederick Forsyth's latest novel.

Not to be missed. On sale May 18th.

sinclair
user



The QL bounces back

FACED with a fading market image and indifferent Christmas sales, Sir Clive Sinclair gathered together those companies with QL products to present a miniature trade show for the machine in London on February 27.

Held at the London Hilton, the relaunch saw Sir Clive defending the QL against rumours that Atari's promised range of 16-bit micros would demolish QL sales.

"I don't rate Atari," he said, with something of the old Sinclair flamboyance. "We are a year ahead of

them, and we have a cleverer machine, with the microdrives, for example."

Sir Clive went on to announce plans for the first waferchip product, a 0.5 megabyte storage medium which he said would be a viable alternative to Winchester drives. "Being solid state, it is more rugged than a Winchester," he said.

The product will be priced at under £300 and battery powered. It will retain data stored after the power has been switched off, and the batteries can be changed without a break in power continuity. As yet,



Sir Clive: "We are a year ahead of the competition."

said Sir Clive, there was no firm production schedule, but he hinted that it should be available by the end of the year.

New products displayed at the show included a C-compiler from GST, Cambridge LISP from Metacomco, and QL Home Finance and Entrepreneur from Buzz Software and Tryptych Publishing respectively.

New model on the scene

YET ANOTHER QL is on the way from Sinclair Research. The JS ROM includes a new series of Super-Basic commands centred around WHEN ... ERROR statements, as well as improved microdrives.

The command checks for errors and then, instead of simply crashing the program, activates another part of the program instead. One danger is that it is non-recursive, which means that if there is an error in the new routine, the program will keep nesting the errors until it crashes completely.

Knott adds that the new ROM is not considered to constitute a major change in the QL specifications, and those changes which are significant would only be of interest to highly skilled programmers.

Doctor retrieves data

HELP IS AT hand for budding QL programmers from Glasgow software house Talent.

A comprehensive graphics package has been released to enable full-screen or part-text graphics pictures to be drawn. The package includes facilities for 16x magnification of any part of the screen plus the ability to pan the magnified picture.

Other facilities include fill, routines for 'rubber' circles and ellipses, airbrush effects, reflection and rotation. The package costs £34.95, and comprises two microdrive cartridges.

Talent is also releasing a Microdrive Doctor utility, which will retrieve corrupted data from a damaged cartridge. It will apparently deal with cartridges where data has been corrupted by faulty saving and also where the tape has suffered physical damage. Whatever data can be salvaged is transferred to a new cartridge and the contents listed.

A spokesperson points out that commercially protected software cannot be copied using the utility. "It

is not part of our policy to encourage piracy," she says. The product costs £21.95 and should be available as you read this magazine.

On a marginally lighter note, CP Software are among the first established games companies to produce conversions for the QL. The first program to be released is **Bridge Player**, based on the Amstrad version of the game. The game allows the use of Stayman, Blackwood and Gerber bidding conventions, and full facilities for play, including double-dummy play, and standard play. The game retails at £18.95.

QL apes the big Mac

ALL FOUR Psion programs running concurrently on a QL which walks and talks tall as an Apple Mac is the claim made by Medic Datasystems for its new 'Mac User Interface'.

The package will be included free to purchasers of the company's other products which include disk drives and RAM expansions.

According to managing

director Christer Skoglund the product will turn the QL into something like an Apple Mac, with single-keystroke entries and full multi-tasking.

"We wish to produce a system on which people can develop better software," says Mr Skoglund. Details can be obtained from Medic Datasystems on 0256 460748.

Free Psion upgrades chopped

QLUB members will no longer be able to get the new versions of the Psion software packages as free upgrades. Instead, membership of the club is free but the packages will cost an extra £15.00 each or £50.00 for all four from Sinclair Research as a separate item.

"Even the early versions of the software were worth the money," says a spokesman for Sinclair Research.

"When you consider that the Psion Xchange suite for the IBM PC costs £475 and contains the same four programs as the new versions, £50.00 is still good value."

On the plus side, QLUB is providing a free telephone service which will operate from 9.30 am to 5.30 pm every weekday. Advice is promised on using printers and other peripherals, as well as help with Easel,



Abacus, Archive and Quill. Members will still be able to buy selected QL products at discount prices.

AN IMPORTANT ANNOUNCEMENT TO ALL QL OWNERS

bad or changed medium

Your data is worth a lot to you. Source programs, text, scientific information, records, all represent hours of your time and effort. Losing a file could at worst cost you money – and it's **always** infuriating!

No storage medium is 100% reliable. That's why TALENT has developed the CARTRIDGE DOCTOR. It's a sophisticated machine code program which will, in most cases, enable you to:

- recover files from a bad medium
- recover files which have been accidentally deleted
- recover files with lost or damaged blocks using the 'block patch' utility.

It's very easy to operate and no knowledge of BASIC or machine code is required.

Can YOU afford to be without the CARTRIDGE DOCTOR?

Available only from:

£21.95

+ 50p postage & packing

QL is a Registered Trade Mark of Sinclair Research

TALENT

COMPUTER SYSTEMS

Curran Building,

101 St. James Road, Glasgow G4 0NS

Tel: 041-552 2128 (ACCESS & VISA accepted)

SOFTWARE FROM SCOTLAND

**NOW, buy a CARTRIDGE TIDY
and you're a free! member of**

**CARTRIDGE
CADDY SYSTEM**

What Cartridge Caddy
membership offers you

**Microdrive cartridges
at £1.50 delivered to your door!**



- Holds 16 Microdrive Cartridges
- Interlocking design feature allows Horizontal and Vertical Stacking – Space Saver

Please send me (Qty) Cartridge Tidy's, ☐ ZX ☐ QL,

at £6.99 each, inclusive, and blank microdrive cartridges

at £1.50 each. I enclose a cheque for £.....

Make cheques payable to:

4 Systems, 4QL House, 68 Foxwood Close, Feltham, Middlesex

TW13 7DL Telephone 01-844 1399 Dept SU/5/85

Mr/Mrs/Miss

Address

4

Systems

68 FOXWOOD CLOSE, FELTHAM, MIDDLESEX TW13 7DL TEL: 01-844 1399

**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

**GARDENERS

CHOOSE THE
FLOWERS YOU WANT
NOT JUST THE
ONES YOU KNOW!
with the Garden Plant Directory**

- ★ Find your ideal plant (on up to 5 requirements out of 17... height, sun, water and soil needs, month of flowering, colour, etc.) from 350 flowers, shrubs and garden trees - within seconds.
- ★ Look up plants you know by Latin names, common names or parts of names (e.g. 'lily' displays nine different lilies, for which you can get full details within 60 seconds).

To order cassettes for the 48k SINCLAIR SPECTRUM, send cheque/PO. for £8.95 to

**PRACTICAL SOFTWARE,
DEPT.SU,
40 WORPLE ROAD,
LONDON, SW19.**

CAMEL PRODUCTS

NIKE POWER BUFFERS
for Spectrum, Atmos, ZX81 **£17.35**

NEW

POLYPRINT for Spectrum
... The interface which likes to say ... Ja and Oui and Si & of course YES! A Spectrum Centronics interface unit with up to 8 sets of characters displayed on screen, as per international set in EPSON FX80 printer. Printer driver also in EPROM.
POLYPRINT from Silicon City **£44.95**


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**

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. **£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 **£24.95**

DHOB1 1
Compact. Mains powered. Safe. Fully cased. Up to 3 EPROMS **£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. Software on tape. See also Polyprint. **£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. **£59.95**

MEMIC-81
4K CMOS RAM with lithium battery. Easy SAVEing. 10yr storage and instant retrieval of programs. **£29.95**

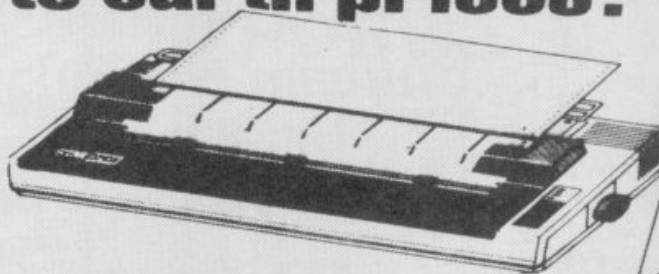
**UK. VAT extra. No VAT on exports P+P UK Free
Europe +5% - Overseas +10% TLX 81574 CML**

Cambridge Microelectronics Ltd. One Milton Rd. Cambridge CB4 1UP Tel: (0223) 314 814

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 £173.88 + 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.

Canon PW 1080A £265 + VAT = £304.75

Near letter quality • 160 cps • bi-directional • 96 chars. plus graphics • 5 print sizes • 11 x 9 matrix • 23 x 18 NLQ matrix

COMPLETE RANGE

DOT MATRIX

Canon PW 1080A £265 + VAT = £304.75

Epson RX80 £198.95 + VAT = £228.79

Epson RX80 F/T £228.95 + VAT = £263.29

Epson FX80 £319.95 + VAT = £367.94

Canon PW 1156A £359.95 + VAT = £413.94

Star Gemini 10x £189.95 + VAT = £218.44

Star Delta 10 £319.95 + VAT = £367.94

Star Radix 10 £498.95 + VAT = £573.79

DAISYWHEEL PRINTERS

Brother HR15 Ring for prices

3k buffer Subscripts & superscripts
18CPS max Proportional spacing
Text reprinting Two-colour printing
Auto underlining
RS232 or Centronics

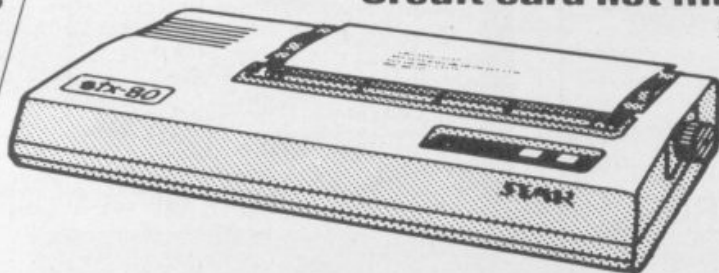
Juki 6100 £325 + VAT = £373.75

20 CPS max Bold & shadow printing
Diablo protocols Subscripts & superscripts
Auto underlining
Standard 2k buffer
Wordstar compatible
Comprehensive user-friendly manual
1 year parts & labour warranty

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

Datastar Systems UK

Unicom House, 182 Royal College Street, London NW1 9NN
Telex 295 931 Unicom G Telephone 01-482 1711

GOD-EMPEROR of Ocean David Ward is relaunching the Imagine label under the name **Imagine 84**, to distinguish it from the other 83 versions which were current when the company folded, depending on which director you talked to.

Guess who balding ex-hippy Ward hired to head the new venture? None other than **Colin Stokes**, who was drummed out of the old company following unsavoury allegations of treason. Colin joined the gaggle of businessmen at **Software Projects** who pander to the grossly decadent tastes of **Matthew Smith**, but for some reason became dissatisfied.

"I always wanted to join Ocean when I left Imagine," burbles Colin, "but it was not to be." He then waxed lyrically about the nostalgia of it all, until a peculiar buzzing sound rendered him inaudible. Probably a Gremlin on the line . . .

But you shouldn't believe everything you hear about Ocean. Why, the other day it was suggested the whole caboodle, Ocean, US Gold and all was 96 percent owned by a shadowy intergalactic finance group run from Aldebaran. Is Ward a puppet of alien beings, or

Hands across the ocean . . .

does he have green blood in his veins? Or is the whole thing a figment of a disgruntled distributor's imagination . . . ?

The poor distributors may have a right to feel disgruntled, after the way they were conned over **The Great Space Race**. Legend's awful game was hyped into the stratosphere pre-Christmas, and the trade took a dive when it flopped. Most of the blame is laid at the door of Legend supremo **John Peel**. He it was who hired a country mansion last summer for several months and filled it up with Legend programmers. TGSR - written in glorious Basic - was the result . . .

One man who can hardly be accused of hype is **Paul 'hermit' Duffy** of **GOSH**. Paul took over the general secretaryship from jovial, rotund **Mike Johnston**. At least Mike used to let people know what the Guild of Software Houses was up to, even when the answer was frequently 'nothing at all'. Duffy, one of the rats who left sinking ship **Prism** (who? . . . Ed.) appears to have taken a vow of silence. In the four months of Duffy's tenure nary a single press release has winged our way. Mind you, if the Guild has any sense it probably made it a condition of Duffy's employment that he *didn't* open his mouth . . .

That is not the case with **Mike Howard** of **Buffer Micro**, who has been boasting of his prowess at ejecting women from his shop. Howard claims to have thrown out one who complained about the porno pix stuck on the back wall of his Streatham emporium, saying, 'I bet she has hairy armpits.'

Caveman Howard should watch it. Quite apart from what his wife might have to say about it all, his comments are a bit rich coming from a man who used to prance about in public wearing a leotard, silk pantaloons and makeup. Or perhaps he wants to put his circus days behind him . . .

On then to **Sir Clive**, and his miserable little do at the London Hilton to launch the **QL**. Pressed on the small matter of **Atari** threatening to match his baby with its own 16-bit machine, he said "Jack Tramiel is a great guy, but he does have a habit of launching machines well before they are ready." Gasps of amazement from the assembled hacks, followed by furtive chuckles. ". . . as do we all, I suppose," continued Slugger, unperturbed . . .

The show started at 5.00pm, but before we were all kicked out at seven there was just time to meet the lads from **GST**, who were showing off their new **C-Compiler** for the **QL**.

So paranoid are they that they insisted any journalists who wanted a copy for review should sign a form swearing they would be fair in what they wrote. Failure to comply meant paying the full whack for the software. "GST has the most outrageous combination of arrogance and incompetence of any company in Cambridge," confided a nameless source . . .

Brazen Backslappers of the Month Award goes to **Activision**, producers of **Ghostbusters**. The publicity conscious yanks called round the *Sinclair User* offices to present editor **Bill Scolding** with a framed gold cassette, "in appreciation of



In the complete absence of any gossip about St Bruce, here's a pic of the Holy One. Software houses with vacancies to fill, beware.

your contribution to sales in excess of 250,000 units in the UK." The incorruptible Bill accepted in good grace, ignoring hoots of 'Bribe!' and staring modestly at his grubby corduroys. Considering *Sinclair User* only published a review in the March issue, it's hard to see what contribution it could have made to sales. Unless, of course, it was the small matter of the December front cover . . .

Congratulations to all involved with **Soft-Aid** for their great success in raising money for Ethiopia. Thanks too to **Lee Guinty** at **Micro-dealer UK** for a titbit about the package. It appears Commodore 64 owners have been experiencing problems trying to load the Band-Aid music track into their machines. Spectrum owners, according to Guinty, are not afflicted with the desire to digitise **Bob Geldof's** hit single. More confirmation that C64 lovers are the undisputed *Sun* readers of the microworld . . .

Finally, thanks to **Mikro-Gen** for once again demonstrating excellent taste by sending us a promotional gift for the new game, **Herbert's Dummy Run**. It's a disposable nappy, with 'There's a Big One coming your way' printed on it in blue. The product is the message, as some wise ad-man once said . . .



Chunky Rod Evans of New Generation gives a lesson to squash star Jonah Barrington. The resulting confrontation led to Rod slipping a disc. Better stick to rubbish in future, Rod . . .

NEW!

THE GAMES PLAYER

12.95
COMPLETE

Our latest Interface for the Spectrum is the ultimate in games playing accessories. Not only is it a joystick-interface but also a games speed controller. This interface will enable you to become the master of any computer game.

Joystick Interface

When playing any game at normal speed the interface has all the features you would expect from a DK product. It is compatible with almost all games currently on the market and is fully Microdrive compatible. The port simulates in (31) command and will accept any joystick fitted with a 9 way D plug including the rapid fire types. (e.g. QuickshotII).

Freeze Feature

The secret of the interface is the "Freeze" control, after slotting the interface onto your Spectrum's expansion port you can adjust the speed of any game or program and even "freeze" frames simply by turning the speed control. The games controller has an extremely wide appeal; young children, the disabled, less experienced games enthusiasts, programmers and software developers will find individual benefits, you can slow games down to a complete stop and so improve your skills and high scores. You can also freeze individual screens to examine them in more detail. The freezer adds a new dimension to your games playing (or cheating).

Quickshot II Joystick

The perfect companion for your games controller, the Quickshot II offers the following features: Super positive response. 2 fire buttons. Stabilising suction grips. 4ft lead. Improved control grip. Trigger fire button. Rapid fire option. At only £11.95, it represents superb value for money.

dk'tronics

Saffron Walden, Essex CB11 3AQ
Tel: (0799) 26350 10 lines



How to Order

The Games Player Interface costs only £12.95 and like all our products is covered by a comprehensive guarantee. You can obtain your interface from any good computer store or by completing the order form below and returning it to: dk'Tronics Ltd, Shirehill, Saffron Walden, Essex. or by telephone, quoting your Access or Barclaycard number.

Orders normally despatched within 24 hours.

Please rush me:

..... Spectrum Games Controllers @ £12.95

..... Quickshot II Joysticks @ £11.95

add postage and packing £1.50

Total:

I enclose cash/cheque/Postal Order. Please charge my

Access/Barclaycard No.

Name:

Address:

..... Tel:

Signature..... SU

CUMANA Special Price Offer!

DOUBLE DENSITY DISK INTERFACE FOR THE SPECTRUM AND SPECTRUM + FROM CUMANA
At last Spectrum owners can take full advantage of the speed, convenience and reliability of Cumana's 5 $\frac{1}{4}$ " or 3 $\frac{1}{2}$ " floppy disk drive systems with storage capacities of up to 1.4 MB available. The interface just slots into the back of the Interface 1 for networking enabling Microdrive and floppy to run in complete harmony! It comes complete with utility diskette and manual - and uses only 128 bytes of Spectrum memory!

Cumana are offering the following upgrade systems:-
SYSTEM OFFER 1:
Double density interface with Cumana's 5 $\frac{1}{4}$ " slim line CCS 100 (40 track 180K drive) **£219.95**

SYSTEM OFFER 2:
Double density interface with Cumana's 5 $\frac{1}{4}$ " slim line CDS 200 (2x40 track 360K) drive system. **£329.95**

SYSTEM OFFER 3:
Double density interface with Cumana's 3 $\frac{1}{2}$ " CSS 351 (40 track single 180K) **£219.95**

SYSTEM OFFER 4:
Double density interface with Cumana's 3 $\frac{1}{2}$ " CDS 352 (2x40 track 360K) **£309.95**

Limited offer, all products are subject to availability.
All prices are inclusive of VAT. Delivery extra E&OE.

ORDER FORM

To: CUMANA LIMITED, THE PINES TRADING ESTATE, BROAD STREET, GUILDFORD, SURREY, GU3 3BH. TEL. 0483 503121.
(Qty) Please Tick

System 1 (r) £219.95 ☐

System 2 (r) £329.95 ☐

D/D interface only (r) £99.95 ☐

I enclose cheque/PO* for or debit my

access/visa* card no. which includes

£9.14 for postage and packing *Delete as applicable

NAME: ADDRESS:



Should women review games?

OVER the past couple of months I have noticed a substantial increase in the number of software reviews. I notice the review team seems to be split 50/50 male and female, and welcome as it may be to have women in the business I wonder if it gives a true reflection of the user base on the Spectrum. I have often wondered what qualifies a person to pass judgement on other people's products, particularly since so many mistakes are made.

Some reviews suffer from misinterpretation and over-sights, or simply not reading the instructions properly. That is unacceptable as it may damage the sales potential of some programs.

I would also like to reply to a letter from Miles Sturt who claims to be the first person to finish **Beach-Head**. As the co-author of this program I would like to set the record straight. The highest known score is 382,000, set by myself on the day the program was completed and it was the first recorded score on the fully debugged version of the game.

Finally, you really seem to be scraping the board with your interviews recently. Since Mathew Smith there hasn't really been anyone remotely well known. Most decent programmers still design their own graphics and very good they are too. If you really want a scoop get an interview with the people behind Ashby Computer Graphics and give us some real state of the art.

David J Anderson,
Platinum Productions,
Kilwinning,
Ayrshire.

● So, reviewers must be male because the majority of Sinclair users are male, and

women are incapable of reviewing games which will be played by men. Such a pathetic, illogical attitude deserves to be treated with contempt.

The 'mistakes' you refer to are largely a matter of opinion. Where we make genuine errors we are happy to accept the blame, and do so within the pages of the magazine.

As for our interviews, I am sure that Julian Chappell, Lee Kristofferson, David Reidy and the Automata team — all authors of best-selling games — are of interest to our readers. Perhaps you're just hurt that we haven't talked to you about your mediocre efforts. Ed.

Avalon goes walkabout

TURNING to page 68 of the March issue I read 'Richard Price investigates the introduction of arcade and animated graphics into adventures'.

Oh good, I thought, I wonder what they'll say about **Avalon**. I scanned the article but found no mention so I re-read it more carefully, searching diligently in case your typesetters had hidden **Avalon** cunningly as **Avalot**, **Lovano** or **Novalon**. Nothing remotely resembling the required word could I glean, nor even a passing reference to our company and its works.

Now, I know you have to demonstrate to your readers that just because I write your Helpline column every month, you are not biased in favour of our products. But **Avalon** is an 'adventure movie', equally as interesting and fun to play as **Tir Na Nog**, **Lords of Midnight** and the rest. So how come you missed it out?

Well, I'm a philosophical

sort, but just to show there's no hard feelings, for the benefit of those readers and players who are stuck half way through the game, a detailed help sheet is available to all who send a large stamped addressed envelope to our business address.

Andrew Hewson,
Hewson Consultants Ltd,
56b Milton Trading Estate,
Milton, Abingdon,
Oxfordshire OX14 4RX.

Conflicting opinions

I WAS taken aback by your ridiculous review of **Elite's Airwolf** in your March issue.

Several people I know have the game, and they all agree that it is extremely addictive — more so than most other software on the market. There are very few programs around which have kept them glued to the screen for so long.

I see that the reviewer was **Colette McDermott**. She must have strange hands — she finds the keys hard to use. No one I know does.

You have a right to your opinion, but this time you seem to be in a minority.

F Thomson,
Edinburgh.

AFTER I had read the review of **Elite's Airwolf** I was very annoyed with the person who reviewed the game.

The graphics are far from dull and after the first two screens the tasks are much more exciting and difficult. It is worth more than three out of 10 as a Gilbert Factor.

The reviewer mentions at the end that it resembles **Blue Thunder**. The only way in which it resembles **Blue Thunder** is that it involves a helicopter.

Chris Muir,
aged 13,
Glasgow.

● And the only way which **Airwolf** resembles the TV series is that it involves a helicopter. Still, we do seem to

be in a minority on this one. *Colette — you're fired! Ed.*

Skool of high standards

CONGRATULATIONS on your excellent software review of **Microsphere's Skool Daze**. I purchased this program and your software review was perfect in describing it. Keep up the good work, *Sinclair User*.

Craig Lovelace,
Whepstead,
Suffolk.

Programs for pigs and cows

THERE are many Sinclairs in this country, but no business software available. I know of one farmer who writes his own programs, and he assures me that they are extensive, covering 2000 head of cattle, 1000 pigs, the sales data of 1100 bales of tobacco and a farm turnover of \$500,000.

Do you know where I could obtain software for a 48K Spectrum, related to farming operations and in particular a wages program for about 130 workers?

H P Arnold,
Salama Farm,
PO Box 106,
Macheke, Zimbabwe.

● D J Programs, *Lawn-speedie*, North Duffield, Selby, North Yorkshire, has a range of software for farmers.

Give girls a chance

I BELONG to a computer club at my school, but, I seem to be the only female. Surely girls must own computers as well as boys.

I find computers very interesting and I think that more girls should give them a chance!

Rachel Cutts,
aged 13,
Newark,
Nottinghamshire.

Politics enter by the back door

I AM distressed at the amount of games of aggression but what I find equally disturbing is the adverts for Gremlin Graphics on pages 32 and 33, March issue. One refers to the 'nasties of the coal mining industry and their lackey socialist puppets'. On page 56 there is an advert for CCS where one game refers to playing against 'the computer's red forces.'

A common complaint against the left is that they introduce politics into everything. It seems to me that it is the software companies which are doing this.

Should software be politically neutral, or would anyone like to join me and write a program about a possible scenario where mad Ron and his pet poodle Maggie are leading the world to almost total nuclear destruction. Where all that are left in the bunkers are computer programmers having at last to exercise their minds on the complexities of moral issues instead of children's games?

Trevor Slack,
112 Heathwood Gardens,
Charlton, SE7 1ER.

Epson printer offline?

IN YOUR review of printers — July 1984, *Sinclair User* — I was surprised that you dismissed the EP44 without explanation. Now the matter has arisen again in the March 1985 issue.

I bought an EP44 in March 1984. Apart from printing the drafts of two books it has faultlessly churned out hex dumps and listings from a variety of computers as well as miscellaneous documents. The text illustration in the July 1984 review clearly showed

that the EP44 produces print of excellent quality. The machine responds to typewriter and seven-bit codes as well as ASCII. That means that some useful extra characters are available.

True, it is slow — but so is a daisy wheel printer. But why the rush?

I have but two wishes as far as the EP44 is concerned: one is that it had the HR5 graphics capability; the other is that I could input **Tasword** text to the Spectrum from the EP44 keyboard. The EP44 will input text into other computers. I feel sure that a program alteration to allow text entry from any RS232 source must be simple. I am afraid I find the Interface 1 handbook almost totally opaque in many respects, including RS232 techniques. I would be delighted if someone would enlighten me.

P L Patient,
28 Youngs Rise,
Welwyn Garden City,
Hertfordshire AL8 6RU.

Women make a stand

REGARDING your short news report on the Microshield VDU smock in the March edition, I found it offensive to see female computer users dismissed as being such a minor group.

No one can deny that computing is a male-dominated activity, but I should just like to make three points.

If TV radiation is harmful at all, it is not harmful only to pregnant women.

There are thousands of women in the computer industry, some of whom actually buy their own home computer — Good heavens!

A dismissive attitude that

women and girls working with home computers do not matter because there aren't any to speak of, is both inaccurate and is setting a bad example to youngsters of both sexes.

Kate P Glover,
Norwich, Norfolk.

● *In remarking that the controversy surrounding TV radiation had not been raised adequately because it seemed to affect only 'pregnant women and there are few female users', we were attempting to comment ironically on the attitude of the computer industry towards women. Unfortunately, we merely appeared to condone that attitude. For the record, we do not dismiss the female user base in any way.*
Ed.

Logic from confusion

THE MAYFIELD Computer Dyslexia group produces programs for the Spectrum to aid teachers and parents with dyslexic children.

All programs are in the public domain, but a small copying charge of £5.00 is made for a suite of some 20 programs, either on tape or microdrive.

There are programs to aid left/right confusion, short-term memory diagnosis, as well as spelling. A large SAE will bring further details.

Brother Henry,
Mayfield College,
Mayfield, East Sussex.

Software club to the rescue

ONCE again I put pen to paper in response to Iain Dale's plea for a ZX-81 Club.

There is one! Run by ourselves, the Software Farm Software Club — (SFSC) — has an international following. Members are encouraged to air their views, ask questions, swap information, hints, tips and hardware through the media of the Club Newsletter. ZX-

81 owners can communicate with other users around the world with anything connected to their beloved but neglected little machine.

Full details of the Club are available from Software Farm.

Julian Chappell,
Software Farm,
155 Whiteladies Road,
Clifton, Bristol.

In search of the Timelord

YOU ONCE printed a review of a software adventure **The Key to Time**.

Can you please advise me from whom I can buy this program? Can you also tell me whether there have been any other *Dr Who* adventures for the Spectrum.

A J Mowat,
West Sussex.

● *It is now published by Sentient Software, Branch House, 18 Branch Road, Armley, Leeds LS12 2AQ.*

Pertaining to penfriends

I CONDUCT a private radio transmission named Radio Software, for Spectrum users. The transmission is put together by physicians at the Gaslini Hospital Sinclair Club.

We hope to collaborate with UK users by tape or letter. Write to:

Dr Giuseppe Marini,
Viale Primavera, 25 A/3
Genova.

I AM 13 years old and would very much like a penpal in the UK. I am from London, but I'm living in Swaziland for a few years. I have a 48K Spectrum inside a Transform keyboard, two microdrives, a Star Gemini printer and a Kempston joystick. My interests are games and word-processing.

Paul Owen,
PO Box 163,
Mbabane, Swaziland,
Southern Africa.

Poke around for more tips

FOR THOSE who have **Sabre Wulf** I have a poke which enables you to go twice the normal speed and also makes all animals and amulets disappear. That means that you don't need to get all the pieces of the amulet to beat **Sabre Wulf**, all you need to do is get into the cave. However, if you press the fire key, everything will turn back to normal as long as you are holding the fire key down.

First type in MERGE "", enter, and start your tape as if loading normally. When the header has loaded type in POKE 23756,1. Then press the edit key. Move the cursor to just before the PRINT USR command. Type in POKE 44876,0: then enter. Type in RUN. Then restart the tape. Sometimes the program crashes but that is rare.

And if there are still **Jet Set Willy** fanatics out there I have some useful pokes. For any of the pokes type in CLEAR 30000: LOAD "" CODE: (put all pokes here separated by colons) : RANDOMISE USR 33792 (ENTER) Start your tape player.

The pokes are: POKE 36353,44 - allows you to be sucked up a left hand wall; POKE 35899,0 - infinite lives; POKE 34795,x - type x as the number of the starting room, 0 to 60; POKE 36477,1 - stops you dying when you fall from a height; POKE 59900,255 - an anti-attic poke; POKE 41983,255 - get the tap from the bathroom, jump on your bed and see what happens; POKE 34275,10 - access to any room by pressing nine and another number key; POKE 36358,0 - jump higher than normal; POKE 35123,0 - deletes all baddies

which move and removes ropes.

Ian Comerford,
Wallasey, Merseyside.

Ultimate brain damage

I FINISHED **Sabre Wulf** three months before it was conceived by Ultimate, and at the time I had two broken arms and was playing with my tongue. I finished half an hour before I'd started playing and blew a chip on my machine because it couldn't hold my score. My percentage was 329.

For anyone who didn't know already, when you get to a score of 177 the screen flashes and a message appears proclaiming you the "Hyper-intelligent astrally tantric mega-ultra **Sabre Wulf** lord". So there!!!

I've done **Knight Lore** about eight times - really. I completed it on January 25 with 82 percent - (Adventurer).

Please, please, no more **Sabre Wulf** letters!

Hyper-intelligent etc,
Shrewsbury, Shropshire.

Quasimodo at the top

IN REPLY to Miles Sturt's letter - March, *Sinclair User*. I have scored 3,401,627 in **Hunchback** and rescued Esmerelda nine times.

Paul Sweeney,
Manchester.

Bug invades the pitch

I HAVE bought Ocean's **Match Day** and I seem to have found a bug.

I was playing in the FA cup quarter finals and winning eight-nil. As the clock

ticked to 90 I scored. The clock carried on and the circular timer was a graphical mess.

When the clock passed 100 the timer started again and carried on for 45 minutes. The final score was 14-1.

Paul Blewett,
Hayle, Cornwall.

Barricading the base

THE HIGHEST score I have achieved in **Combat Lynx** is 93,950.

It is essential that you protect Base 0 as this is your only supply of troops, fuel and weapons, you should lay mines around it. The minefields can be breached by enemy tanks and lorries.

Colin Reekie,
St Monans, Fife.

Fly through trouble

A FEW tips on **Underwulde**. To get past the guardians without the weapon you can swing on the rope next to the room where the guardian is and then press CAPS SHIFT. You should then fly past the guardian - if not, try, try again.

K Harvey,
Keyworth,
Nottinghamshire.

Moonlighting mothers

I AM a member of that horrifying species known as Spectraholic Mums Anonymous. We're the ones who sneak off-spring's Spectrums out of their rooms in order to have a bash at Eureka's £25,000.

Can someone enlighten me as to where **Technician Ted**'s diffusion furnace is and how to get there? The situation is fraught; burnt dinners are a daily occurrence.

All help will be gratefully received.

Diffused-up mum,
Westcliff-on-sea, Essex.

Spectral bust-ups

I FINISHED **Ghostbusters** on December 14 and my bank account stands at \$112,100; my account number is 10242021 and my code name is Peter Smith - entered Smith Peter. I claim to be a professional Ghostbuster - "Who ya gonna call?"

Frazer Smith,
Coatbridge,
Lanarkshire.

Slimed from behind

IN REPLY to Miles Sturt - letters, March, my friend Paul Humphries and I finished **Ghostbusters** on December 19 with a score of \$18,000.

Since then our top score is \$100,400; the account number is 02062420.

When the ghost hits you, if you failed to trap it, the man says 'It slimed me' not 'behind you' as John Gilbert thinks.

David Jenkins,
London, NW10.

Record break for jailbird

I HAVE completed **Monty is Innocent** in two minutes 20 seconds, on February 24.

Stephen Forbes,
Kincardinshire,
Scotland.

Scrambled letters

I AM a **Scrabble** enthusiast.

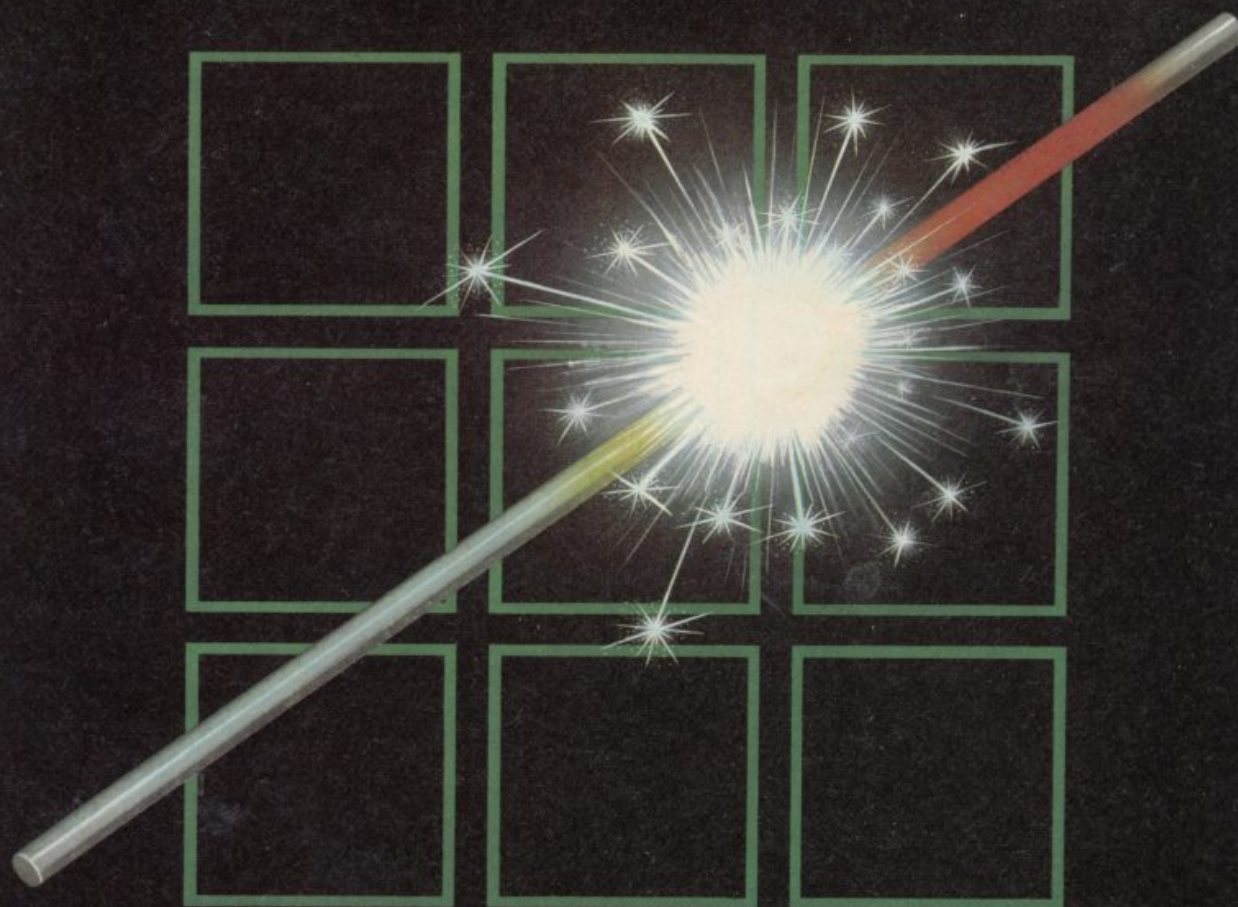
When I am losing, and on the last seven tiles, I find if those are fed in at random using an already accepted word as a basis the rubbish will be accepted by the computer.

TWEED had already been accepted to which I added my remaining tiles making TWEEDQKYTT. This was accepted by the computer.

T S Paterson,
Alvaston, Derby.

INCENTIVE

CONFUZION



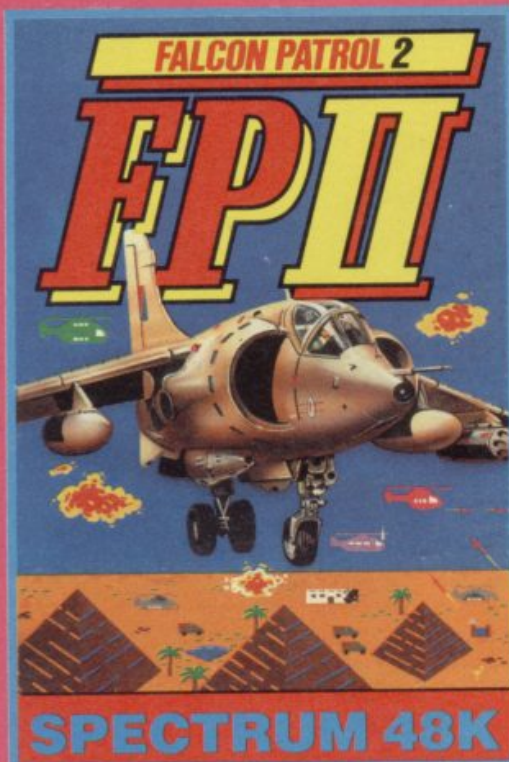
THE FUZION OF MIND AND MACHINE

★ SPECTRUM ★ SPECTRUM ★ SPECTRUM ★ SPECTRUM ★ SPECTRUM ★

Price £6.95 Trade and Credit Card orders: Telephone (0734) 591678

INCENTIVE, 54 London Street, Reading RG1 4SQ

Now by public demand the screen-scorching Falcon Patrol II is available on the Spectrum 48K as well as the CBM 64.



COMMANDING YOUR HARRIER JUMP JET YOU MUST SINGLE-HANDEDLY DEFEND YOUR BATTERED TOWN AGAINST THE FEROCIOUS ONSLAUGHT OF ENEMY HELICOPTERS. THEY ARE USING EVERY TRICK IN THE BOOK, BARRAGES OF LETHAL MISSILES AND DEADLY GROUND-BASED FLAK-BATTERIES. RADAR JAMMERS BLIND YOUR VISION.



"THERE'S NOTHING LIKE IT... YOU MUST KEEP COOL AND STAY ON TOP!"

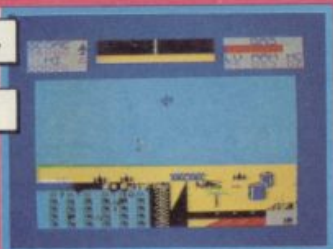
STUNNING 3D GRAPHICS
ACTION-PACKED FAST SCROLLING

AERIAL COMBAT

AUTHENTIC HARRIER SIMULATION

DEVISIVE CHOPPER ATTACKS

PURE ADRENALIN



"FPII is Virgin's best game yet!"
- Computer and Video Games

SPECTRUM 48K VERSION AVAILABLE FROM 29th APRIL FROM ALL LEADING COMPUTER STOCKISTS.
CBM 64 version R.R.P. £8.95
SPECTRUM 48K version £6.95

AVAILABLE FROM VIRGIN GAMES TEL: (01) 727 8070

2 HITS ARE BETTER THAN 1



"It's Unique, Graphically Impressive, Vast and Devious; in short, BRILL..." PCW Not only all this but it's NOW available on the Commodore 64.

STRANGELOOP IS A MASSIVE ARCADE ADVENTURE WITH A WEALTH OF RICH AND COLOURFUL GRAPHICS.



ON YOUR SOLE MISSION TO THE ROBOT FACTORY ON THE EDGE OF A DISTANT SOLAR SYSTEM, YOU WILL UNCOVER MANY MYSTERIES AND CHALLENGES. YOU WILL MEET ROBOTS, SOME FRIENDLY, SOME HOSTILE, SOME LETHAL AND SOME FUNNY. COUNTLESS PUZZLES LIE BETWEEN YOU AND THE SINISTER ALIEN FORCES IN THE CONTROL ROOM - YOUR ULTIMATE DESTINATION. HERE YOU MUST RE-PROGRAM THE ROBOTS TO STOP THE DESTRUCTION OF THE EARTH.



DARE YOU ACCEPT THIS MISSION???

250 SCREENINGS OF TIGHT AND CHALLENGING GAME PLAY.

A FEAST OF STUNNING GRAPHICS.

GAME-SAVE FACILITY.

INTERACTIVE ROBOTS.

PICK-UP, USE, DROP FACILITY.

TELEPORTERS.



CBM 64 VERSION AVAILABLE FROM 29th APRIL FROM ALL LEADING COMPUTER STOCKISTS.
CBM 64 VERSION - RRP £8.95;
SPECTRUM 48K VERSION - RRP £6.95

2-4 VERNON YARD, PORTOBELLO ROAD, LONDON W.11

LAST NOVEMBER *Sinclair User* went foolishly where no other magazine had gone before, and compiled the definitive Top 50 of software classics for the Spectrum.

Failing to learn from our mistakes, we have decided to go one step beyond. Starting this month, we will attempt to grant classic status to programs as they are reviewed, rather than with the benefit of hindsight.

These **Sinclair User Classics** are programs which, in our biased and eccentric opinion, set new standards in software. They are the programs by which the others should be measured.



If you buy no other software, buy these. No self-respecting Sinclair user should be without them.

OBIT

THE Gilbert Factor, much admired and much maligned, has gone the way

of all good things. Henceforth software reviews will carry a star rating, the basis of which will be value for money. Programming, graphics, speed, presentation, addictive qualities and the rest will all be taken into account, but the bottom line will be whether or not you should part with the folding stuff.

Guide to ratings

- ★★★★★ 24 carat. Buy it
- ★★★★ Value for money
- ★★★ Nothing special
- ★★ Over-priced
- ★ A rip-off

A Day in the Life

RUMOURS that Sir Clive has been made Dame Commander of the British Empire have been confirmed by Micromega. The epic tale of the day he set out to collect his gong takes some telling, though.

Gremlin can report that on the way to the palace Slugger Sinclair suffered a mishap at the barber's and was rendered completely bald. Even the stubbly little bits at the sides were hacked away...

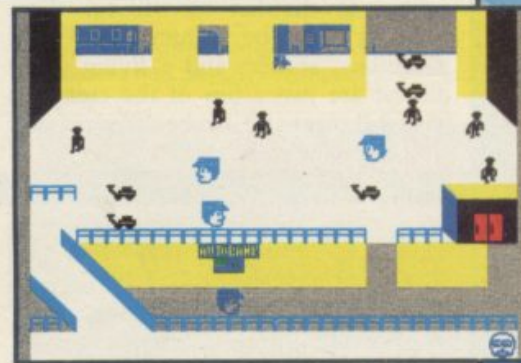
More vignettes from the tempestuous saga include the robbing of a bank, a mad dash from the 8.15 to Euston to buy the *Financial Times* — doubtless to check up on Polecat Tebbit's conversations with the Italian typists who bought Acorn — scenes of drunken abandon in Carlos' bistro, and petty larceny at the chemists in

search of a bottle of hair restorer...

The full version of Uncle's Big Day is told by Micromega in **A Day in the Life**, a new departure for gossip columnists in that the sordid tale is recorded on cassette, and accessed by joystick, for 27 screens of attractively clear and stylish graphics.

Slugger is represented by a rotund head with that distinctive hairstyle which has made the micro magnate the Lady Di of the computer scene. He bounces with respectable speed through the crowded streets of London, up and down stairs, all the while attempting to avoid ticket collectors, rogue gobstoppers, dancing beermugs and the like. A whiff of the Manic Miner is definitely in the air...

Humour and intelligence are not qualities Gremlin associates with the microworld generally, excepting of course the offices and pages of *Sinclair User*. Micromega certainly seems to



have found a private supply of its own. 20 billion unsold waterproof C5 ponchos in grey plastic to anyone who can explain how to get past the sentries at Buck House in time to hear the wonderful full BEEP version of *Land of Hope and Glory*...

Gremlin

Publisher Micromega Price £6.95
Memory 48K Joystick Kempston,
Cursor, Sinclair
★★★★

Toy Bizarre

IF YOU have always stayed away from balloons because they make a loud bang when they pop then **Toy Bizarre** from Activision will give you a chance to get your own back.

Leap around the levels of the toy factory using Merton, your puppet guide, to pop the balloons which are blown up from six huge valves. But beware! Break the balloons before they pop or they will deposit malign mechanical toys to snare you into losing one of your four lives.

An indicator at the top of the screen shows how many balloons you need to pop before moving to the next screen difficulty level. The initial levels are easy, and can be made easier if you have some understanding of hot air.

Not only do you have to contend with balloons but a manic robot, which goes by the name of Hefty Hilda, makes life hell by sliding along the platforms, intent on crushing you and turning on all the balloon valves. A jump is in order if you want to avoid a battering by Activision's answer to Nora Batty.

All is not doom and gloom, however, as the toys can be stunned if you jump on one of the two pistons on each level while the toys are on the other. Hilda can be sprung off the screen using the same technique but she can do the same to you.

Toy Bizarre is addictive and will attract those who find *Jet Set Willy* too difficult to master. It should also prove appealing to young children, not only because of the toy factory concept but also because there are few

operation keys and the plot is simple. The only danger is that they will be put off by the repetitive nature of the game.

John Gilbert

Publisher Activision Price £7.99
Memory 48K Joystick Kempston,
Sinclair
★★★



more software on page 22

Dragon Torc

DABBLE in a spot of dark age magic, pitting your wits against Morag, witch queen of the north.

Dragon Torc, from Hewson Consultants, is the sequel to **Avalon**. You play Maroc who, with the help of a few spells, has to search for the five crowns of Dragon Torc.

The search takes Maroc into the Lost Vaults of Locris and from there, along ley lines, to various locations across the British Isles.

You start with three spells, Servant, Move and Bane. Other spells must be added to the list as without them nothing can be achieved. Wisps, skeletons, spiders and a flying cauliflower are just a few of the creatures you will meet and can be disposed of if you have the right spells.

Other characters who you meet may help you and the manner in which they are approached will affect their attitude towards you. Elves are particularly useful.

Maroc travels via levitation, gliding along in a lotus position. In fact Maroc is really sitting by a fire and you are guiding his astral projection.

The actions of all characters are fairly realistic. Skeletons come running with outstretched arms and snakes stop, wait and then dart forward to strike. Doors really open.

All spells, objects collected and instructions from Merlin are listed in a scrolling window at the bottom of the screen. Selection is simple — bring Maroc to a halt and press the fire button, use your joystick to select the option and press the fire button again to implement it.

Although the graphics are relative-



ly simple, they are clearly defined and scroll in four directions. However, when Maroc is in motion, the scrolling is jerky and can be distracting.

Avalon fans will love **Dragon Torc**, which is more user friendly. The puzzles are well hidden and tricky. If you have never played **Avalon**, however, start with **Dragon Torc**, it is the better game.

Clare Edgeley

Publisher Hewson Price £7.95
Memory 48K Joystick Sinclair,
Kempston
★★★★

The Biz

I BLAME this geezer Chris Sievey. He's the one who got us into **The Biz**. Who's he, anyway? Just some cat who cut a single back in '83 with some naff ZX-81 programs on the flip side. Now he's written a Basic simulation of the pop industry for Virgin.

The first person to get a number one hit single in **The Biz** gets to appear live on stage with Sievey. Despite that, me and the lads thought we'd give it a go and formed this band called the Y Fronts.

At first we played local scout groups and the Labour Clubs. We had a dodgy manager and an agent who

fixed us gigs in places we'd never heard of. Our gear got lifted regularly and eventually our drummer joined a bunch of heavy metal headbangers.

We cut our own disc and pressed 10,000 copies. Our manager fixed an interview on Radio Forth, we ligged it around the campuses and the single shot to 142 in the charts. Then the record stiffed — we hadn't pressed enough copies — and our drummer left to play with some outfit which *Sounds* were hailing as the new Beatles.

We did some local promo, got a new manager went to a hair salon and hit the London nightclubs. The band was really tight by now and the songs weren't so lousy. Stage presence was zilch, but then who's seen a C&W

band with dry ice?

Then we got the break — the Factory gave us an advance and we made a new single. Capital put us on the C list and we were on standby for *Top of the Pops*. We made it to number; 42.

Then our drummer split, the gigs got cancelled, the record stiffed and the Factory told us where to go. We were back at square one, playing the Leeds Amnesia for peanuts. A groupie offered us some drugs, and we're not looking back now. We're not looking forward either. Tell you the truth, the colours make it difficult to look at anything at all...

Bill Scolding

Publisher Virgin Price £6.95
Memory 48K
★★★★

Skyranger

MICROSPHERE'S **Skyranger** is one of those games which looks great until you start to play it.

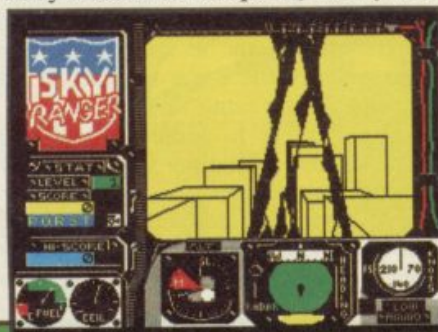
The idea is to fly your copter above the city to rid the skies of hostile Watchers — Drags, Trums, Rics and Dors. 10 points for guessing which micros they are named after.

The screen is impressive. As well as the view from your cockpit depicting the city's skyscrapers there is an array of instrument panels including altitude, radar and fuel.

When fuel runs out you can land at fuelling stations if you can find them.

An indicator on the control panel tells you when one is in close proximity and it is up to you to penetrate the jungle of buildings and find it.

The screen is yellow with black wire frame graphics and when night falls those colours are reversed. Occasionally a sea mist creeps in, totally obs-



curing all graphics.

Trums, Rics and the rest of the crew are black blobs and unrecognisable. The radar will flash red when one is within target range.

If you crash or touch a building the cockpit window will crack. At the end it looks as though someone has been at the screen with a sledgehammer — which would not be at all surprising if playability is taken into account.

The music consists of annoying and inappropriate jingles, totally unsuited to this type of game.

Clare Edgeley

Publisher Microsphere Price £5.95
Memory 48K Joystick Programmable
★★

Gyron

GYRON, a game in which brains and logic count, stands in a class of its own.

Maze games are usually easily described — but not this one. Firebird's **Gyron** is a complex game comprised of two labyrinths, one nestling in the other. Atrium is the easier game and within it is Necropolis with the wisdom of the Sorcerer hidden at its centre. The idea is to reach the founts of wisdom before the sorcerer can rise from the dead to claim his knowledge.

Massive balls roll in predetermined, circuitous paths through the trenches of the labyrinths. Contact with those means instant death. Rising above the walls are monolithic towers guarding the paths to Necropolis and wisdom. Each tower faces one of the four points of the compass, blocking certain routes, and each is ready to strike if you come within range.

The orientation of the towers is possibly the most important aspect of **Gyron**. Shooting the towers affects your route as each directly affects the positioning of other towers in surrounding areas. A tower may vanish when hit, sometimes only to reappear instantly later on.

The screen is viewed through the cockpit of your hedroid craft in full 3D glory. Two green lateral indicators to either side of the screen act as laser canons. As you have only a forward view of the screen, red bands descend to indicate side entrances.



A green square at the bottom of the screen indicates your position in the trench. Colliding into walls will damage the hedroid and an indicator in the control panel shows how much damage you have sustained.

A radar shows each section you are negotiating from a bird's eye view. You are always at the centre. That is an invaluable indication of where the towers are situated, the direction they are facing and also the numbers of balls rolling in that section. Another way to verify your direction is to look at the four constellations in the night sky above the labyrinth.

A timer is linked to the central computer and is synchronised to the motion of the balls. Below that is a

revolving icosahedron which changes to one of 12 colours related to each section of the maze.

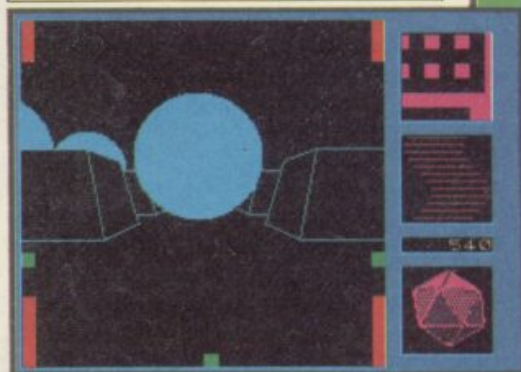
The graphics are wireframe with the balls and towers in solid blue. The balls are masked if they are rolling behind a wall. Movement is fast and smooth, and a pat on the back must go to the four programmers who took over a year to produce the game.

Firebird has produced a brilliant game combining strategy and arcade skills. A Porsche 924 motor car is on offer to the first person to discover the secrets of Necropolis.

If that isn't an incentive to buy this game, I don't know what is.

Clare Edgeley

Publisher Firebird Price £9.95
Memory 48K Joystick Kempston
★★★★



Wizard's Lair

A FIRST reaction to **Wizard's Lair**, from Bubble Bus, is to check that **Atic Atac** has not been loaded by mistake, as the game is so obviously similar.

You play Pothole Pete who by accident stumbles across the wizard's lair and seems doomed to remain in the underground maze. Fortunately, he remembers a dreadful little rhyme he once saw on a cassette inlay which offers a clue to his escape: "If this lair thou doest uncover, four pieces of lion thou must discover. Only then may you escape past the lion that guards the gate." Sounds familiar?

Like **Atic Atac**, each room is viewed from above giving an impression of playing from the game's blueprint. There are many hostile guardians to overcome — easy enough as Pete occasionally stumbles across abandoned weapons. He also needs to keep up his energy and to that end must eat any food he discovers. Gold, diamonds and other valuable objects

should also be collected as they will be needed later on.

There are several levels and those can be reached via magic lifts and wardrobe lifts. Wardrobe lifts take you straight to the next level and it is wise to note the names of those as the magic lift will ask for the name of the level you want.

A number of original features included in **Wizard's Lair** make the game more enjoyable. There is a variation in the scenery of each cavern and in some screens the vegetation border has been taken straight from **Sabre Wulf** with the same colourful jungle foliage. The speed of play is the same though certain screens in **Wizard's Lair** do take longer to draw.

Each room has between one and four exits which open and close at random. However, in many rooms there are well hidden secret exits. One sure sign that there is such an exit is to watch from where the guardians enter.

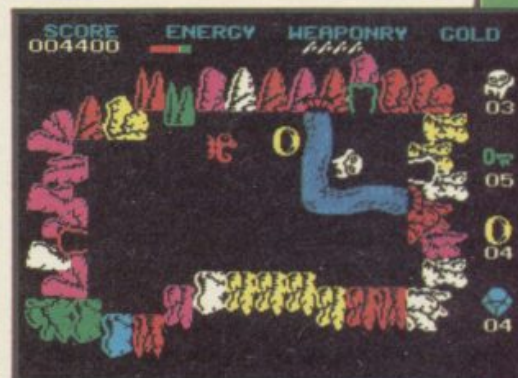
The status display around the edge of the screen is clearly laid out. At a glance you can tell how much in the way of weapons, energy and gold you

have left and objects collected.

Although the game is plagiaristic in the extreme, it is well programmed and enjoyable. The colour and graphics are as sharp and defined as **Atic Atac** and the few extra features, including a river which meanders through many screens, effectively dividing them, make the game more challenging.

Clare Edgeley

Publisher Bubble Bus Price £6.99
Memory 48K Joystick Sinclair, Kempston
★★★★



more software on page 26

THE SPECTRUM BASIC COMPILER



- ★ **BLAST!** is the first fully compatible OPTIMISING BASIC COMPILER for the Sinclair ZX Spectrum and Spectrum +.
- ★ **BLAST!** will compile ANY BASIC program, without alteration.
- ★ **BLAST!** will take your BASIC programs and transform them into super-efficient code running at up to forty times the speed of BASIC.
- ★ **BLAST!** can produce both native machine code and a compact p-code, for programs where space is at a premium.
- ★ When you have **BLASTED** your programs you are free to distribute or sell the results without any restriction.

SIMPLICITY ITSELF

Using **BLAST!** couldn't be simpler. Just load it with your BASIC program and press "C" to compile. In a few seconds the compiled program is ready. Just type RUN and see your software run up to forty times faster.

OPTIMISATION

BLAST! doesn't just compile your programs; it also applies a range of sophisticated optimisation techniques to enhance the performance of the compiled code. Any program can be compiled without alteration, but we think you will enjoy the wide range of extensions to BASIC built into **BLAST!** **BLAST!** features genuine integer variables, debugging facilities, program protection, and much more. It will operate in resident mode, or with tape or microdrive.

TOOLKIT INCLUDED

BLAST! provides the complete BASIC programmer's package. As well as a sophisticated compiler **BLAST!** includes a comprehensive toolkit with a full range of features including renumber, single-step, search and replace, and block handling operations. Use it to test and develop your BASIC programs before compiling them with **BLAST!**

STOP PRESS — OXFORD PASCAL

OXFORD PASCAL is now available for the SPECTRUM as well as the C64 and the BBC 'B'. To call us for details dial 100 and ask for FREEPHONE PASCAL.

Price/availability matrix		SPECTRUM	C64	BBC 'B'
BLAST BASIC		£24.95	N/A	N/A
OXFORD PASCAL	DISK	N/A	£49.95	£49.95
	CASSETTE	£24.95	£22.95	£39.95

All prices are inclusive of VAT
Please add £2.00 for postage and packing.

Please rush me my copy of

My computer is SPECTRUM ☐ BBC ☐ 64 ☐ Please supply CASSETTE ☐ DISK ☐

I enclose £..... including £2.00 p&p Please make cheques payable to OCSL Ltd.

Name:

Address:

Postcode:

Telephone:



Oxford Computer Systems (Software) Ltd.
Hensington Road, Woodstock, Oxford OX7 1JR, England
Telephone (0993) 812700 Telex 83147 Ref. OCSL

CUB AND QL— THE PERFECT PARTNERSHIP

This Cub medium resolution colour monitor is TOTALLY compatible with the Sinclair QL.

It combines outstanding graphics capabilities with the facility for displaying full 85 column text whilst doing full justice to the colour potential of the QL. Its new cabinet with Tilt and Swivel Plinth harmonises perfectly with the QL's simple yet functional appearance.

Best of all, a price of only

£ **295** Inc VAT

(inc. Tilt and Swivel Plinth) and VAT keeps your bank balance in the black too.

SPECIFICATION

Model — CUB 1451/DQ3

14" QL monitor

RGB/TTL input

Tube Resolution (pixels) — 653 (H)

Pitch — 0.43 mm

Bandwidth — 18 MHz

Antiglare CRT

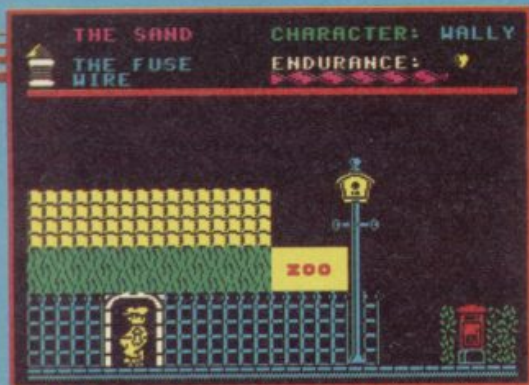


MICROVITEC
CUB
COLOUR MONITORS

Microvitec plc., Futures Way, Bolling Road,
Bradford, West Yorkshire BD4 7TU.
Tel: (0274) 390011/726500. Telex: 517717

AVAILABLE FROM HIGH STREET COMPUTER RETAILERS AND BRANCHES OF W. H. SMITH, BOOTS, JOHN LEWIS PARTNERSHIP, LASKEYS, CURRYS.
THE NAME 'CUB' IS A REGISTERED TRADE MARK OF MICROVITEC PLC.





Everyone's a Wally

EVERYONE'S a Wally continues Mikro-Gen's obsessive interest in this silly family.

Search through Wallyville for the scattered combination number of the Piggy Bank's safe in order to open it and pay the gang's wages.

Red herrings, empty oil cans, fuse wire and other objects litter the town and many are needed to perform tasks enabling you to discover yet more objects. You are required to play a few arcade-style games — found in telephone boxes — which uncover more secrets. It is an idea to note down locations of objects as each character can only carry two at a time.

Each family has a trade. You will need to make use of Wilma's shopping prowess and Dick's plumbing background. You take on the persona of each member of the gang to perform specific tasks.

It is easy to map the town and discover each location but difficult to get characters to perform functions, such as mending the fountain or building a brick wall. It is all a matter of

getting the right objects to the right place with the right person.

The graphics make the game — colourful and stylishly drawn. It is a pity that the background is marred by colour overflow.

Like its predecessor, *Pyjamarama*, *Everyone's a Wally* looks good but it seems that more has gone into the graphics than the plot. For all that, it is an enjoyable game and frustratingly difficult to complete.

A dubious extra is Mike Berry's song on the reverse side — marginally less painful on the ears than the Piman's tunes.

Clare Edgeley

Publisher Mikro-Gen Price £9.95
Memory 48K Joystick Sinclair, Kempston
★★★★

Herbert's Dummy Run

THE wally-lovers at Mikro-Gen continue their researches into suburban sub-culture with a visit to the department store in *Herbert's Dummy Run*. Herbert is the nappy-clad offspring of Wally, hero of *Pyjamarama* and *Everyone's a Wally*.

Herbert has become separated from his father, and must make his own way to the exit of an enormous department store. Being a toddler, he cannot always reach many of the objects he needs to escape without assistance, so plenty of thought and backtracking is required to complete the arcade-adventure.

Graphics are extremely colourful

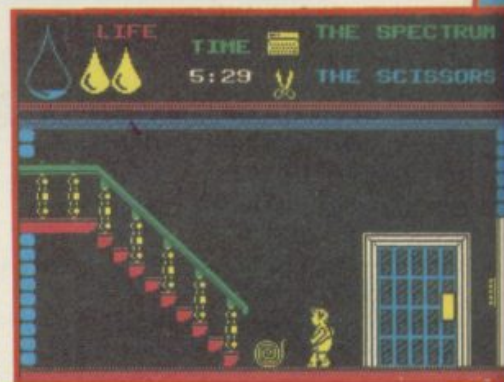
and pleasing, in the same style as the previous games. Colour clashes do still occur, but in general the cartoon-style decor of the store is sharp and clear. Mikro-Gen programmers seem to enjoy filling up the screen with furniture and decoration, and the department store setting suits that style very well.

Clever touches include the addition of several rooms with arcade-game sequences, satirising *Daley Thompson's Decathlon*, *Bomber* and *Break-out*, among others. Herbert should also proceed with care in the lift — if he forgets which floor it is at, he develops a parachute and floats down the shaft.

Although representing no great advance on the programming techniques and style of *Everyone's a Wally*, the game will nevertheless delight fans of

the series and provides plenty of humour and excitement for the arcade-adventure brigade. Chris Bourne

Publisher Mikro-Gen Price £9.95
Memory 48K Joystick Kempston, Sinclair
★★★★



Astrocalc

WHEN the moon is in the seventh hour and Jupiter aligns with Mars, when you are tired of the animated toilets and bored with beating up Gandalf, try your hand at 'serious' astrology with *Astrocalc*.

Whether you think it's a load of moonshine or not, serious practitioners will tell you there is a lot more to astrology than meeting tall dark handsome strangers on the cartoon page of the *Daily Mail*. What puts most people off is the sheer volume of calculations to be done to construct a complete birth-chart. *Astrocalc* provides a program aimed at beginners with a booklet outlining the principles of

interpretation.

You need to know the time, date and place of birth. Once those are entered, the calculations are a matter of seconds. The program produces positions for the sun, moon and planets, plus the mid-heaven and Ascendant, the sign on the eastern horizon.

The program also lists the main aspects formed between planets, with their degree of exactitude. *Astrocalc* produces suites of programs for professional astrologers with those and other features.

The accuracy of the calculations varies. Fast-moving features such as the Ascendant or moon may be as much as 1° out, but most features are accurate to about 4' of arc.

The booklet provides an explana-

tion of the principles behind astrology, and does explode some of the more feckless criticisms levelled against it. It is not a very readable piece, and becomes quite turgid when discussing interpretation.

Nevertheless, *Astrocalc* does provide, albeit unattractively presented, an easy introduction to the arcane secrets of the stars. Interested people should therefore be able to judge astrology's claims for themselves. As Newton once remarked to the astronomer Halley in defence of the subject, "I, sir, have studied it. You have not."

Chris Bourne

Publisher Astrocalc Price £11.50
Memory 48K
★★★

Formula One

OF ALL the daydreams which never see reality, Grand Prix racing must be a favourite. There are plenty of programs for budding drivers, but few which capture the atmosphere of the season rather than the skill of driving. **Formula One** from CRL redresses the balance with a fine simulation of the sport from the team manager's point of view.

You are asked to choose a team and a sponsor, and set a level of difficulty for the game. You then get to spend the loot — **Formula One** cars cost vast sums of money to design, and even a million will not go far. Money can be concentrated on engine design, hiring better drivers, better crews, or chassis design. If your cars are raceworthy then it's on to the grid for the first race of a 16 race season.

As in the granddaddy of sports simulations, **Football Manager**, **Formula One** shows you the highlights of the race. Unlike **Grand Prix Manager**, Silicon Joy's follow-up to their football game, **Formula One** does it very well indeed. Cars whizz past in the right order, and if you are quick you can spot the numbers — just like

the real thing. A leader board constantly updates the times and positions of the first six cars, and messages at the bottom of the screen inform you of shunts, punctures, and other setbacks to individual drivers.

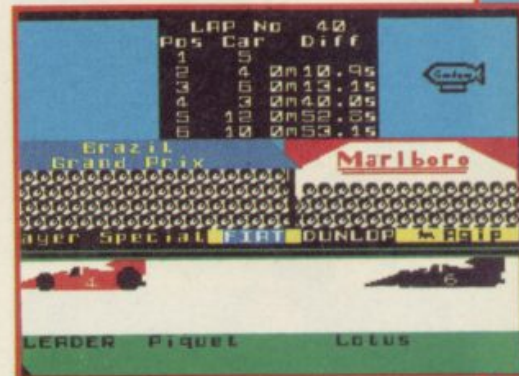
Pitstops are handled beautifully. You can either request them or be compelled to make them. A short arcade sequence involves sending a mechanic flying round the car changing the wheels as fast as he can. The better the crew the quicker he moves,



but you can lose precious seconds if you fail to line him up correctly.

You also have a choice of five different types of tyre and, as in the sport, you can win or lose races on the wrong choice. Weather is the factor here, and you get reports on that both before and during the race. At the end of each Grand Prix the tables are displayed for the Drivers' and Constructors' championship. Your aim is to be top of both.

As a simple game against the com-



puter, **Formula One** would be great fun, but in fact up to six players can take part. Once you get used to the pit stop procedure, it should not be too difficult to pass the joystick around swiftly enough to avoid argument; the other operations are performed without time limit. That opens up the game to a much richer form of entertainment.

Easy enough at novice level, very tough at expert level, **Formula One** is a rare example of a simulation which combines attractive displays, good game structure and an exciting theme. Please Mr Editor, just one more go?

Chris Bourne

Publisher CRL Price £7.95
Memory 48K Joystick Kempston
★★★★

Fantastic Voyage

FOR MANY moons now Quicksilver has been advertising a chilling program entitled **Blood and Guts** — 'A fantastic fight to the death within your own bloodstream!' The more squeamish amongst you might be relieved that the game has now been renamed **Fantastic Voyage**, after the sixties hokum pic in which Raquel Welch was injected into the body of a brain-damaged scientist — he should be so lucky.



Together with your specially designed submarine you are minaturised and implanted in the body of the boffin. Unfortunately the sub does not withstand the process and its component parts are liberally distributed throughout the anatomy.

Starting your voyage in the scientist's mouth, you have only 60 minutes in which to locate each segment of the disjointed craft and swim with it up into the brain, where it is deposited upon a mysteriously convenient ledge before final re-assembly and escape. Quicksilver is coy as to the escape route — but if the game follows the film you'll return to the outside world inside a poetic tear drop.

The ludicrous plot nevertheless makes for a tricky, entertaining and — dare one say it — educational game. Leaving the mouth with your first piece of sub, you swim down the throat, avoiding the wobbly, lethal, epiglottis (?) and into the bronchi. Turn into the right lung, being careful not to touch the pulsating sides, through the valve to the pulmonary vein, zapping the wall of yellow

cholesterol, then, in quick succession, the left atrium, left ventricle, the aorta and up into the brain. Drop the part and go in search of the next piece.

Actually it's not that simple. Just when you think you're doing well, the screen flashes with the news that an infection has broken out in some distant organ, and you have to rush to the scene of the disturbance and destroy the wiggly things darting about.

Your energy is draining all the time, and to replenish it you need to feast on any passing red cells. Without the bloody cells you fast become invisible, and play is then nigh impossible. White blood cells are useful for removing any growths you encounter.

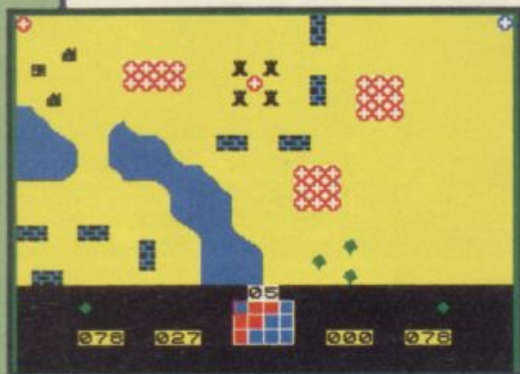
Graphics are adequate and mercifully abstract, otherwise you might be barfing all over your keyboard. All in all, an addictive and original entertainment. In these days of clone software, what more could you ask for?

Bill Scolding

Publisher Quicksilver Price £6.95
Memory 48K Joystick Kempston,
Cursor
★★★★

more software on page 28

Spectrum Software Scene



Overlords

A STRATEGY wargame which takes less time to finish than a war itself? With truly simultaneous movement on both sides? And no complicated rule-book?

Well, it seems to have finally happened. Lothlorien has produced **Overlords**, a two-player game combining frenzied arcade action with

deep strategy.

Loosely based on the classic board game *Campaign*, **Overlords** takes place across 12 screens of map. You have three types of piece — footsoldiers, generals, and the Overlord. You can choose different options for play — a short game, long game or all-out bloodbath.

The mechanics of the game have an original simplicity. Each player simultaneously moves a cursor around the screen to 'pick up' pieces and move them. The front lines become a mass of moving pieces as players jockey for position. The computer picks the screen for play at random, and sets a time limit on manoeuvres. The turn is punctuated by brief but vicious bursts of fire as units are destroyed.

Usually combat is decided by a straightforward count of the pieces bearing on a square, but generals have superior power and can be used to startling effect. A short game should take about half an hour. A duel to the

death could last longer.

The graphics are less original, being firmly based on the UDG format with coloured tokens representing trees, buildings, castles and rivers. Whereas some wargames involve complicated movement rules for different terrain, **Overlords** simply makes such squares impassable. That means to get a piece through a forest you have to dodge the trees, thus appreciably slowing down movement.

Speed of action is remarkable, given two independent cursors on screen. But Lothlorien has gone further than that in providing a variety of facilities. You can save the game to microdrive, use joystick/keyboard combinations, and even play the game across a network of two Spectrums. Would that more companies were so thoughtful.

Chris Bourne

Publisher Lothlorien **Price** £6.95
Memory 48K **Joystick** Kempston,
Sinclair, Cursor
★★★★

Paddington's Garden Game

COLLINS Soft was first off the mark about two years ago with a series of educational programs based on Paddington.

Those early programs were fairly unremarkable and rather dull. With **Paddington's Garden Game** Collins Soft has started afresh and produced a

program which is likely to be a hit with children between five and eight.

Paddington has to walk round his garden, catch butterflies and find marmalade sandwiches. He also has to avoid hedgehogs and wasps and not touch the flowers or borders.

All the ingredients of arcade action are included, several screens of action, three lives and a task, and the graphics are smooth. However the butterflies are released at the end of the game and

Paddington merely gets stung.

The joystick option means that the program is easy to operate and should satisfy the desire of younger members of the family to play computer games. In doing so it reinforces hand/eye co-ordination and most of all is entertaining and fun.

Theo Wood

Publisher Collins **Price** £6.95
Memory 48K
★★★★

Moon Cresta

GOOD shoot 'em up games are difficult to find these days, mainly because most companies have booted their aliens into orbit.

Incentive, however, has only just made it back from the Mountains of Ket, and do not know about such things. The company has just brought out a passable version of **Moon Cresta**.

The game is a clone of the original arcade machine hit from Nichibutsu.

The pace and plot can be described in a few sentences, consisting mainly of two-syllable words. Take your three-stage rocket into space. Blast as many types of alien as you can. Once a phase is over, grab a bonus by docking one section of your ship with another.

For those who still do not know **Moon Cresta**, after that brief description, it is a space invaders game where the invaders are fast but dumb. They do not fire back when you loose your laser bolts on them.

Once the first stage of your ship has been destroyed the second allows you the use of two blasters instead of one. They are both needed as there is no auto-repeat and firing at aliens is a real chore, except for those who are insensitive to pain. The same is true of the joystick fire button — and we thought joysticks made it easier.

The incentive of a video cassette recorder as a prize, if you are the first person to top the 30,000 point barrier, may enamour you to the game. If you are an arcade addict your furtive fingers will waltz to the prize. As a beginner you may also throw caution and your keyboard to the wind.

If, however, you already own a video recorder, or fear for the health of your joystick, then give the aliens a rest and go out and kill a few Hobbits for a change.

John Gilbert

Publisher Incentive **Price** £6.95
Memory 48K **Joystick** Kempston
★★★



more software on page 32

Coming Soon on:—

U.S. GOLD

STOP PRESS.

...COMING SOON....

Bally/MIDWAY SPY HUNTER

NEW!



STOP PRESS

G SOO

This fast action shooting and driving game puts you in command of an almost unlimited arsenal of weapons... machine guns, oil slicks, smoke screens, heat seeking missiles! Spyhunter, already a number one in arcades across America is now presented for the Spectrum where it is sure to be a winner too!

Available on

SPECTRUM 48K

£7.95

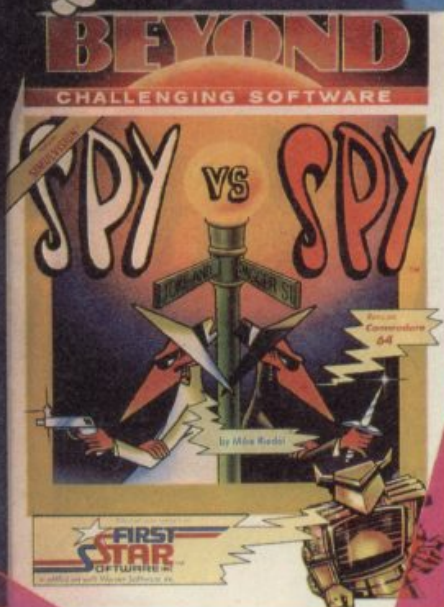
U.S. GOLD is available from all leading computer stores, and selected branches of:
BOOTS · WH SMITH · JOHN MENZIES · WOOLWORTHS · WILDINGS



BEYOND

CHALLENGING SOFTWARE

Now for
Spectrum 48K
and
Commodore 64



Spy vs Spy is two player cartoon fun!
The black and white spies chase each
other around the embassy.

They steal secrets and plant
traps, playing against each
other on a split screen display.

Available from software dealers everywhere or direct from
Beyond Competition House, Farndon Road, Market Harborough, Leicester LE16 9NR.
Access/Barclaycard telephone: 0858 34567. **Price £9.95** inc. P&P



COMPUTERS	
Sinclair Spectrum +	£129.95
Sinclair QL	£399.00

SOFTWARE
Full range of games and educational software,
catalogue available on request

SPECTRUM REPAIRS
£21.00 Including all parts and labour

ACCESSORIES	
Power Packs	£7.50
Sanyo DR101 Data Recorders	£34.95
Sanyo DR202 Data Recorders	£41.95
Network Data Recorders	£19.95
Datex DR6	£24.95
Dk'tronics Lightpen	£19.95
Currah Speech	£29.95
Currah Slot	£14.95
Dk'tronics 3 Channel Sound Synthesiser	£29.95

PRINTERS	
Alphacom 32	£69.95
Timex Thermal	£79.95
Brother HR5 Thermal	£159.95
Brother M1009	£199.95
Tractor Feed for Brother M1009	£15.00

LEADS
All Leads Extra
Price on Request

NEW HORIZON

COMPUTER CENTRES

Sinclair Flat Screen TV £97.95

KEYBOARDS	
Saga Emperor	£49.95
Dk'tronics + Dual Port	£38.00
Lo-Profile	£44.95

JOYSTICKS	
Quickshot II	£9.95
Gunshot II	£11.95
Arcade (Steel Shaft)	£17.95
Arcade Turbo	£22.95
Joycard	£9.95
Superchamp	£9.95
Competition Pro	£19.95
Quickshot II with Interface	£17.95

INTERFACES	
RAM Turbo	£22.95
Dk'tronics Programmable	£22.95
Dk'tronics Dual Port	£13.00
RAM MkII	£9.95
AGF Protocol Programmable	£29.95
Com Com	£19.95

All prices include post and packing
Cheques + PO's made payable to:
NEW HORIZON COMPUTER CENTRES

ACCESS AND BARCLAYCARD BY TELEPHONE WITH PLEASURE

1 GOODALL STREET, WALSALL WS1 1QG
TELEPHONE 0922 24821



**BUY SIX OF THE BEST TAPES
FOR THE PRICE OF ONE**

SPECTRUM SIX PACK

Including six of the most popular Spectrum
programs ever released, such as:
SCRABBLE, CHESS, CHEQUERED FLAG
and **MAKE A CHIP***

Now available for **ONLY £8.50**
(incl VAT) plus £1.50 P+P

Delivery: Usually 10-14 days. Maximum 28 days.
Offer valid only for UK and Eire.
Overseas buyers: please add £3.

TRADE AND EXPORT ENQUIRIES WELCOME

*These titles contained in six pack subject to variation and availability

Please send me ___ Spectrum Software Pack(s)
I enclose cheque/postal order/cash by registered post in
the sum of £___ payable to:
POLANGLIA LTD, 58 St Mary's Road, London, W5 5EX.

Name _____

Address _____

Postcode _____

POLANGLIA LTD
58 St Mary's Road, London W5 5EX

HIRE SPECTRUM SOFTWARE

OVER 280 different tapes for hire in-
cluding **ARCADE, ADVENTURE, BUS-
INESS, 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, Cheam, Surrey SM2 7NE

I 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 _____

SU5

Chaos

THE LIGHTNING powers of the black arts crackle brightly through the astral atmosphere, hurling toward their intended victim in **Chaos**.

In this new fantasy game you take on the mantle of a wizard and pit your wits against up to eight others which can either be controlled by human players or the computer.

Cast your spells of attack or protection and destroy the other mages to become a master of magic. Magic is death to all but the strongest, on the Chaos plane of Limbo.

Once you have chosen the number of wizards with which you want to do battle you can select their stance and colour. Be careful to choose one which is facing in the correct direction. Nothing dents a wizard's ego more than having to throw spells backward.

There are 50 spells within **Chaos** and you will have only a random selection of 10, some of which could

be duplicates. Spells include fighting figures such as unicorns, elves and golden dragons. You can also conjure fires, castles and magic forests.

All spells are either Lawful, Chaotic or Neutral. When chaotic spells are cast players will find it more difficult to cast Lawful or Neutral spells.

The state of the magical universe is also classed as Lawful, Chaotic or Neutral. A Chaotic universe is one in which there is no order. A Lawful universe is one in which evil is punished and structure can be seen in everything.

Each spell has a chance of success. The manual gives some examples of conjurations with their success factors shown as a percentage of chance. A Giant Rat spell will be 100 percent effective but your wizardly powers will only give you a ten percent chance of conjuring a Golden Dragon.

The movement of spell creatures and your wizard character is ordered under cursor control. The number of spaces which they can be moved



depends upon the spells which you have created. Wizards on foot may only move one space but if they are mounted on a spell creature they can move a maximum of six spaces.

Chaos is a fast moving and colourful game. The animation is good enough for a strategy game but the character-square graphics are simple and functional.

The game is sufficiently complex to appeal to dungeons and dragons fans and to strategy game players. So, if you've ever fancied the role of a wizard, give it a go.

John Gilbert

Publisher Games Workshop Price £7.95
Memory 48K Joystick Sinclair, Kempston
★★★★

Mr T Meets His Match

MR T is back again in this *Good Housekeeping* package aimed at 4-7 year olds. There are two games on the tape, both concentrating on 'look closely!' problems.

Rainy afternoons with the youngsters could be filled with the task of beating Mr T at matching pairs. There

are 12 cards which are turned over in turn, either by two children, or one child playing the computer.

There is plenty of button pushing to be done which should satisfy even the most eager of fingers. The game operates on four levels with either animals or mosaic shapes.

Switcheroo, the second game, requires a little bit of planning. At the easiest level you have to change one animal to another choosing an in-

termediate stage, either colour, size or animal with or without a bow tie. There are three intermediate stages to be chosen at the most difficult level.

The problem with such games is that they are so structured that they allow a child little feeling of control. Mr T could be a friendly playmate, or he could become a tyrant.

Theo Wood

Publisher Good Housekeeping/Ebury
Software Price £9.95 Memory 48K
★★★

Ski Star 2000

ONLY professional skiers need apply to race in Richard Shepherd's **Ski Star 2000** — the slalom is more like suicide than fun on the slopes.

You are given 18 options for the type of game you want to race, there are a number of courses to choose from and you can also design your

own course.

If you are a coward you will go for full visibility, a gentle, uncomplicated course and no snow fall. Even with the odds stacked in your favour you will probably end up on your head.

The screen is split into three sections, a large view of the course with flags marking the route and underneath, two small screens depicting your route and a display panel with a timer and speed gauge.

The game is played in exactly the same way as a flight simulation. As you bank to go round a flag the horizon tilts accordingly and straightens up as you go for the next flag in the zig-zag course. Those who have played a flight simulation will know how difficult it is to keep the plane steady and on a straight course. It is just as difficult in **Ski Star 2000** and it

is possible to turn 180 degrees and ski uphill to the start without knowing it!

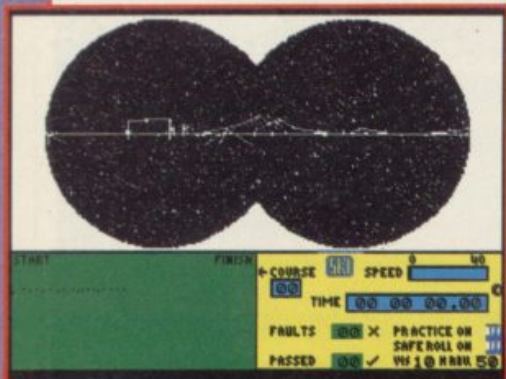
The graphics are minimal with a few line drawings depicting a mountainous horizon and flags. It is a pity the game does not show the skier as that would make play more interesting. On harder races you will come across moguls scattered along the route acting as obstacles. However, the game is incredibly slow with jerky movement.

Options allow changes in speed, rate of turn, maximum roll and although those make the game marginally more interesting it is a poor substitute for the real thing.

Clare Edgeley

Publisher Shepherd Price £7.95
Memory 48K Joystick Kempston,
Sinclair, Protek
★★

more software on page 34



MIRRORSOFT

has had a BRAINWAVE!

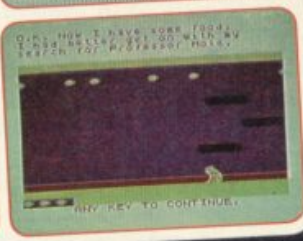
Introducing new BRAINWAVES – arcade/adventure programs for the under-12's. They require quite a lot of thought and planning, so get the old grey cells working for

PHINEAS FROGG Super Sleuth

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

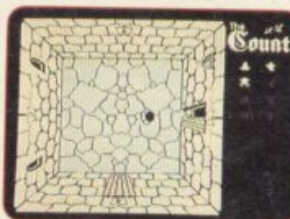
Cassette £7.95

Disk 10.95



ANCIENT QUESTS

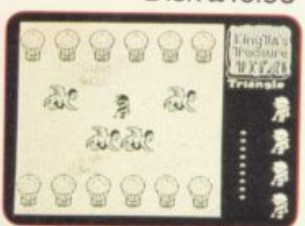
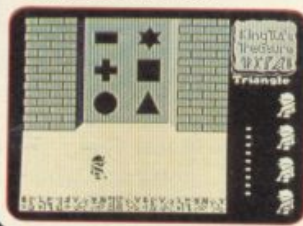
Two educational arcade action games In KING TUT'S TREASURE, you're an archaeologist, scouring the deserts of Egypt for the keys to the famous tomb. You are equipped with a metal detector to locate buried clues but you must watch out for the hazards that appear in different parts of the desert – you only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



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

Cassette £7.95

Disk £10.95



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

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

Bruce Lee

LEAPING from the big screen to the small screen, **Bruce Lee** encourages you to practice the ancient art of Kung-Fu from the safety of an armchair.

You would think that immortality on screen would be enough, but no, Bruce wants infinite wealth as well — no doubt to keep him going in the afterlife — from a wizard who dwells beneath a temple in the Himalayas.

In this exciting game from US Gold you have to pass through three screens on ground level to a secret entrance to the caverns below. To uncover the entrance all the lanterns in those screens must be collected. Lanterns play a key part throughout the game uncovering secret entrances.

It is no simple job penetrating the wizard's stronghold. All your skills as Kung-Fu expert are called to the fore in order to defeat the evil Green Yamo and deadly Ninja — the wizard's minions.

It is worth spending a few moments

before play to practice kicking and punching — very simple with joystick control — as the Yamo and Ninja will soon knock you out. The Yamo is a fat, wobbly giant but is a keen fighter and has to be knocked down three times before he collapses. The Ninja — no less deadly — needs to be knocked out only twice.

Once underground there are many traps to catch the uninitiated — exploding t'sung lin bushes and pan lights streaming across the ground are two such hazards.

Tunnels and passages have to be negotiated — watch out for electrical fields which must be dodged. Lanterns must be collected, ladders climbed and you will have to make use of a moving column of particles which change direction at random — a bit like running up a down escalator.

The graphics are decorative and clearly defined with good use of colour. Bruce Lee, the Ninja and Green Yamo — who incidentally is white in the Spectrum version — could be more clearly defined but are quite recognisable, and the lack of detail in

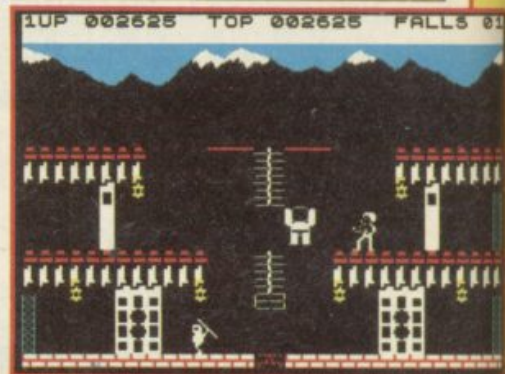
their make-up doesn't detract from the game.

The options at the start are many and varied — you can play against the computer or an opponent or two players against the computer.

There is little sound and more tasks could have been incorporated. However, there are a number of tricky obstacles to avoid and 20 chambers to get through. An enjoyable game and worth buying.

Clare Edgeley

Publisher US Gold **Price** £7.95
Memory 48K **Joystick** Sinclair, Kempston, Protek
★★★★



Dinosaurs

THE Piper/Piccolo **Dinosaurs** package includes the beautifully illustrated book and is aimed at nine year olds upwards. The book is well written with short sections full of interesting facts, ideally suited for this age group.

The four programs are designed to stimulate interest in the topic. Birth of Life is an evolution simulation where

you have to build at least four cells with adequate food and oxygen before they can split and evolve.

When that task has been completed you receive the code word and can go on to the second game, Life on Land. In this game you have to answer five questions before you can play the game, which is disappointing graphically and jerky in its movements.

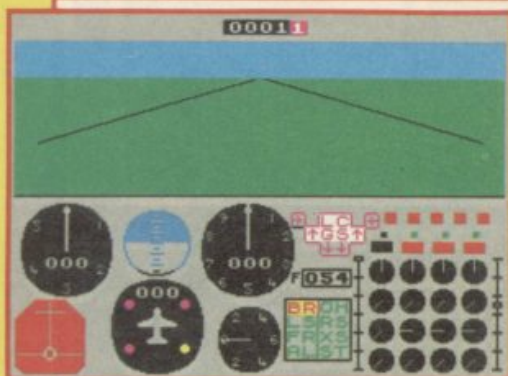
In Mission 1 you have to recognise dinosaur shapes, and in Mission 2

control a Pterosaur as it flies over the sea to catch fish.

The concept behind the package is good, but it is a shame that the games are not particularly exciting. One or two good games on the lines of Sinclair's **Science Horizons** would have been preferable to four mediocre ones.

Theo Wood

Publisher Piper **Price** £7.95
Memory 48K
★★★



747 Flight Simulator

BET YOU never knew that if you turn a jumbo jet upside down at 20,000 feet and then cut all the engines it makes a

noise like a rat with indigestion when it hits the ground.

Just one of the many features of the latest flight simulator from DACC, a company which claims to specialise in the horrid things. Don't misunderstand. Many of my best friends sit in front of the telly for hours watching the green horizon and flickering instruments while the rest of the family waits and wonders if they'll crash before the beginning of *Dynasty*.

The real trouble with Jumbo jets is there isn't a lot of scope for aerobatics and the like. Ponderous is a fairly kindly word to describe the grace and agility of the Jumbo. No doubt that is why DACC's flight simulator, in its pursuit of accuracy, is so much more boring than the faithful Psion **Flight**

Simulator or Digital Integration's excellent **Fighter Pilot**.

You get the normal array of obscure instruments, the usual bewilderingly boring manual, and a landing sequence which always seems to include two or three more operations than the brain can handle at a time. Drawbacks include the lack of a screen map with your position on it, and no landmarks on the ground apart from the runways, which are themselves simply parallel lines. You'll have more fun on a cold morning at Gatwick waiting for the fog to lift.

Chris Bourne

Publisher DACC **Price** £7.95
Memory 48K **Joystick** Cursor
★★

THE LIVING ADVENTURE MOVIE

With
**SENSORY
ANIMATION**

DRAGONTORC

THE LOST REALMS OF THE DRAGONTORC



Morag the Shapeshifter has seized the Crown of Dumnovia and is out to find the other four crowns that make up the Kingdom of Britain. The five crowns were struck from the legendary Dragontorc of Avalon in the distant past, and if brought together again will allow the keeper fantastic power. Morag intends to control this Torc of Power and subject Saxon Britain to decades of tyranny. However, you can take the role of Morag and Mage, seek out the remaining crowns, combat Morag and release your old tutor

Merlyn from her evil spell. On your travels through the strife torn kingdoms you can develop magical powers to help you understand and master the mysteries of landmarks like the Giant Ring of Stones, and the Secret Crypts. The leylines, which can be plotted on the accompanying map, will be your main route to the crowns. And for the first time in any adventure game you'll encounter Sensory Animation! This programming break-through has given lifelike

emotions to the multitude of characters in the game — cross them too often and any chance you have of beating Morag to the crowns may be dashed forever. Add to this a FREE map and scenario full of clues, hundreds of locations, all in 3D, over 200 different discoveries to make, and you have a stunning adventure it could take you a lifetime to complete! Dragontorc of Avalon — The Living Adventure Movie — Available for the 48K Spectrum and Spectrum +. Only £7.95.



Arcade Adventure with TECHNICIAN TED

Try to work through 50 screens of varying complexity, but watch out for the most unhelpful workmates you ever came across. Remember, you are working in a factory where nothing is quite what it seems! A unique animated loading screen with perfected collision detection plus detailed and colourful graphics has made Technician Ted one of 1985's top games. Clock in with Ted now.

For the 48K Spectrum and Spectrum +, £5.95.
For the Amstrad CPC 464, £7.95.



HEWSON CONSULTANTS

56B Milton Trading Estate, Milton, Abingdon, Oxon. OX14 4RX



AVALON — The 3D Adventure Movie

Can you get your astral projection Morag past the Gate House Level, through the Mines of Madness, and onwards to meet the Lord of Chaos himself? Astounding 3D graphics over 223 rooms, 27 spells and over 100 animated characters make this the adventure game of the decade. Can you master it sooner?

For the 48K Spectrum and Spectrum +, £7.95

YOU MARVELLED AT BEACH-HEAD...
 NOW ACCESS PRESENT THEIR LATEST MASTERPIECE:
RAID OVER MOSCOW



The Soviets launch a nuclear strike against major cities in the United States and Canada. With our own nuclear arsenal dismantled, in accordance with the Salt IV Arms Agreement, the Soviets believe their treachery will lead to total world domination. Our only hope is our space station equipped with stealth bombers, which can fly undetected in Soviet airspace.

As squadron leader, you must lead your commandos on a virtual suicide mission, knock out the Soviet launch sites, and then proceed into the city of Moscow. Armed with only the weapons you can carry, you must seek and destroy the Soviet defence centre to stop the attack! Top multi-screen action!

Available on **CASSETTE** & **7.95** SPECTRUM 48K



SPECTRUM 48K

**The most breathtaking
 3-D graphics yet seen on
 the Commodore 64!**

Gripping arcade action

**Multiple scrolling
 screens**



U.S. Gold is stocked by all leading computer stores including:
 BOOTS WH SMITH JOHN MENZIES
 WILDINGS WOOLWORTH

Dealers! For information on how to become a U.S. Gold Stockist write to: CentreSoft, Unit 10,
 The Parkway Industrial Centre, Heneage Street, Birmingham B7 4LY. Telephone: 021-359 3020. Telex: 337268.

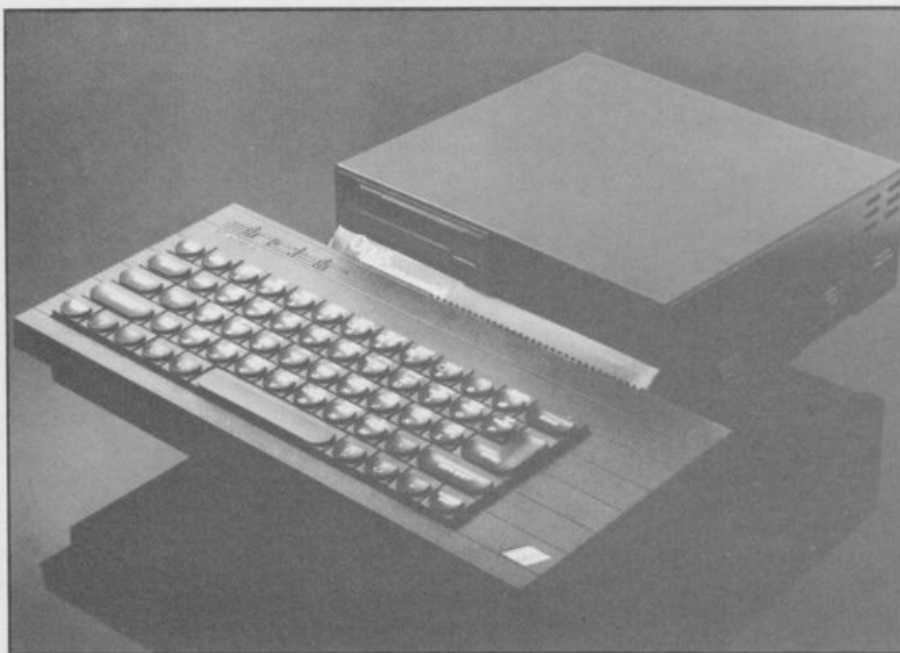
John Lambert looks at a disc system which could become a standard

OPUS SUPPLIES has just released its Discovery disc system and it has the distinction of being the first to be supported by major software houses, endorsed by a disc manufacturer, and sold through a high street chain. It could, consequently, become the standard system.

The level of support is due to four factors. The Discovery, at its lowest level, is completely compatible in Basic with the microdrive, and many existing programs will run on it without modification. It is supplied with a drive, so software houses can sell discs and know they will fit. The unit has both a printer port – Centronics – and a joystick port – Kempston – negating the need for at least some interfaces. Lastly, it uses very little of the Spectrum memory, making program conversion easier.

Moreover, the Discovery has improved on the Interface One microdrive set up, by including random access files and the option to set aside part of the Spectrum memory as a RAM disc, which works like an ordinary disc drive but is much faster. All the Basic errors in Interface One have been corrected and the syntax can be simplified.

The Discovery range comprises three units: Discovery One, which has a single sided, 40 track, 3½in drive (178K formatted); Discovery Two,



A voyage of Discovery

which has two drives – the maximum possible; and Discovery Plus which is the upgrade from One to Two.

Users with full-sized keyboards need not worry as the drives are high enough to clear the keyboard and those with a base similar to the Spectrum – Saga, Lo Profile and so on – fit easily.

The unit has a built-in power supply which is used to power the drives

and the Spectrum, through the edge connector. That means the on/off switch can be used to reset the computer. It also has the obligatory through port and, for the serious user, a monitor socket. That is taken from the edge connector and so will work only on issue three Spectrums onwards.

All internal hardware is memory mapped within the lower 16K and so should not clash with other add-ons which tend to be I/O mapped. It is compatible with the VTX5000 modem, something about which Interface One was temperamental. Naturally, it is not compatible with Interface One.

One feature not detailed in the otherwise comprehensive manual is that, with the upgrade, a RAM chip which fits in the interface is supplied. Once fitted that allows you to alter the disc settings of the number of tracks, sectors, and sides, the interleave, skew, and even the density. By playing with those I managed to get a system which gave 196K formatted and was 25 percent faster but which used 1K sectors. The RAM disc, which normally occupies the upper 32K, can also be moved around. For dedicated hackers that will provide hours of amusement; software houses

continued on page 38

Benchmarks – all times in seconds.

	M/Drive	Disc	RAM Disc
Capacity	95K	178K	31K
FORMAT	25	18	0
SAVE	231	37	9.5
LOAD in order	15	23	5
LOAD out order	212	23	5
ERASE in order	238	35	12
ERASE out order	238	23	4.5

Program used:

```
10 FOR n=1 TO 30
20 SAVE "*"m";1;"test"+STR$nCODE 30000,200
30 NEXT n
```

Filing:

PRINT	200	59	29
INPUT in order	68	83	64
INPUT out order	199	83	64

Line 20 was changed as required and line 10 to 30 TO 1 STEP-1 for the reverse order. The filing program opened a file, printed 1000 10-character strings and closed the file 15 times. A compatible Basic program with no disc access took 23 seconds.

As microdrives do not handle random access the reverse input gives a comparable timing. The cartridge/disc was reformatted before each test to optimise performance; in normal usage a microdrive cartridge uses odd blocks which effectively doubles the time taken per operation.



continued from page 37

need not worry as there are protection systems built in which, even with that information, are secure.

As with Interface One, Discovery works by using a system of channels and streams. A channel sends and receives information and a stream is the path along which it passes. For instance, the 'p' channel is the printer which usually has stream three assigned to it. With Discovery fitted a number of channels are created — 'm' for microdrive (in this case disc drive) and 't' and 'b' for the parallel port. The 't' channel is for text with options for printer width, ZX printer emulation, control of carriage returns and line feeds; 'b' is the binary channel and will accept information without modification.

The 'j' channel is for the joystick, which can be turned on and off; the 'd' channel is the drive and is used for commands which relate to the whole disc, such as backup and compact; the

'CAT' channel is the disc directory and can be treated as a file; the 'CODE' channel allows you to send information to, or from, memory.

Discovery normally uses 256 byte blocks — the RAM disc uses 32 bytes — and so when loading and saving it takes about 300 bytes. Once the disc has finished, however, that memory is reclaimed and the system takes up no memory. Interface One takes 600 bytes and does not give them back.

To be compatible with the microdrive the system will accept all its commands, using the same finger — knotting syntax; however, unless specified otherwise, the 'm' channel is assumed and can be omitted.

The few differences have been added to make the system more versatile. SAVE will automatically overwrite an existing file of the same name; the long version of MERGE — including the 'm' — will not auto-run but the short version, if not the end of a line, will; and INKEY\$# returns a null string at the end of a file (the microdrive stops with an error message). Files can be specified as read or write files by adding the keywords IN and OUT.

The extra random access commands, which can be applied to any

file, make ingenious use of existing Spectrum keywords. A random access file is opened using RND, the position is set with POINT and a file can be expanded using EXP. Provision has been made for End of File detection with a simple USR call.

The Discovery One costs £199.95. Compared to an Interface One and microdrive that might seem expensive, but taking into account the printer joystick and monitor ports, which would cost you around £50.00, it is a far better deal. Discovery Two is priced at £329.95, Discovery Plus at £139.95 and a printer lead at £9.95.

The Discovery range will be available from larger branches of Boots.

Further details from Opus Supplies Ltd, 158 Camberwell Road, London SE5 0EE. Tel. 01-701 8668.

Available Software

Mugsy/Sports Hero — Melbourne House
Designers Pencil — Activision
International ATC/Technician Ted — Hewson Consultants
Codename Mat/Jasper/Kentilla — Micromega
Mini Office — Database Publications.
All £14.95 a disc. To follow:
Trans Express — Romantic Robot.
Transform will be releasing versions of all its programs on disc plus a specially enhanced Sales Ledger/Invoicing.

MICRO-EXPORT

SINCLAIR
ACT, COMMODORE
ACORN, MSX, ATARI, ETC

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

send for comprehensive price list to:
Dept Y
MICRO-X LTD
765-767 HARROW ROAD, LONDON NW10 5NY
TELEPHONE 01-868 6622 TELEX 915866 MICROX G

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
JOB two program lines
KEYIN a string
KEYWORDS new keywords on/off
LISTLIST 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 versatile 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
XNG, YNG change PLOT scale

FUNCTIONS

AND (bit-by-bit)
BIN decimal to binary
CHARA number to 2 characters
COSE fast cosine
DEC hexadecimal to decimal
DPOKE double PEEK
FILL filled area

HEX9 decimal to hexadecimal
INSTR string search
MEM free memory
MEMORY all of memory as a string
MOD modulus
NUMBER 2 characters to number
OR (bit-by-bit)

RND random fast RND
SCRN recognises user graphics
SIN fast sine
STRNG repeats strings
TIME current time
USNGR formats 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.

Stick for tough guys

ARCADE freaks who wear out joysticks at a rate of knots and are looking for a cheap replacement should look at the new Gunshot from Vulcan. Unlike most low cost joysticks, such as the Quickshot, it uses leaf spring switches and so should last a little longer.

It has the standard features of two fire buttons, one on the stick and the other on the base, rubber suckers to hold it on the table and a moulded grip.



The feel of a joystick is a matter of personal taste. You have to move the Gunshot stick a long way before it registers and some might prefer a more delicate touch.

With the joystick Vulcan is marketing a Kempston compatible interface, priced £11.50. The Gunshot, priced £8.95, is available from high street stores.

Hold onto your Eprom

EPROM Services has brought out an Eprom holder for the QL which fits into the ROM cartridge slot. For those of you who are not into blowing your own Eproms, Eprom Services can supply a number of programs ready blown.

The advantage of programs in Eprom is that they are instantly available and unaffected by resetting the machine. The ones supplied by Eprom Services act as an extension to SuperBasic.

Utilities adds six commands. **CLOCK** gives a continuous display of the date and time in the top righthand corner of the screen, while **TIMER** shows elapsed time at the top centre. **CLOCK** can also be used while running the new version Psion programs if it is called before the program is booted.

The other commands are **DUMP** which dumps 2K of memory in Hex and ASCII to a channel; **XDIR** which gives an extended directory showing the length of the file and the name - microdrive only; **RPT** which sets the keyboard repeat and delay; and **MEM**. This allows you to create a file in memory, and then **LOAD**,

SAVE or **MERGE** programs to and from it.

Basic+1 contains more utilities, which fall into three areas: The first group allows you to list all the



variables, procedures, functions and keywords resident in the system. The second gives you random access of microdrive files by letting you **PUT** and **GET** bytes to and from them using **PTR** as a pointer to the position. Lastly there is an odd collection of functions which allow you to **TRACE** a Basic program, **RENAME** procedures, including SuperBasic keywords, find the cursor position and to convert from Hex and Binary to decimal.

Multi-tasking has a group of commands which give you control of multi-tasking jobs from Basic. You can list, start, stop or alter the priority of jobs, display the contents of the job registers or those handed to procedure from Basic, and call **TRAPs** directly with pre-

loaded registers. Most useful is a **SPOOL** routine which takes a file from microdrive and prints it while you are doing something else. Also included is **WSET** which allows you to set up a window using the cursor keys.

The price of the holder is £14.95 or £24.95 with one program, £29.95 with two and £34.95 for all three - remarkable value. The forthcoming programs are expected to be around £9.95 each - plus holder if necessary.

If you would rather use your own programs in Eprom the holder has two sockets which can accept Eproms of up to 8K.

Further details of this, and other QL products, can be obtained from Eprom Services, 3 Wedgewood Drive, Leeds LS8 1EF.

Re-usable grid sheets

ORION has released a re-usable graphics kit which is extremely simple. The Format 4 kit - the SP42 - has four plastic sheets with different sized grids and two water-soluble pens. Once you have perfected one design you simply wipe the plastic with a damp cloth and start on the next one.

The grids are two full-screen grids showing print positions, pixel positions, screen and attribute file addresses, a larger scale quarter screen and one with six, 4x4, enlarged character squares for UDGs. Also included is a pixel ruler.

It is available from Orion Software Products, Pippbrook Mill, Dorking, Surrey, priced £5.99, or the educational suppliers Griffin and George.

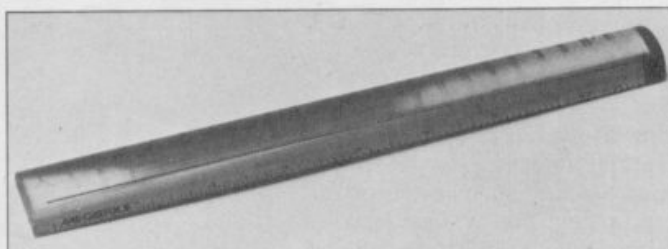
more hardware on page 40

Ruler of the galaxy

HAD Arthur Dent been at the launch of the *Heart of Gold* he might well have mistaken the Hoolooovoo for a Mega Rule.

The error would have been a natural one. A Mega Rule is a clear perspex ruler, with a hint of blue, which magnifies the text beneath it.

If Arthur had been in the habit of entering listings from magazines, rather than hitch-hiking round the galaxy, he would have found it just right for helping him



to read that miniscule printing and keep his place at the same time.

Mind you, he would have had to write to Dealer Deals Ltd at 20 Orange Street, London WC2H 7ED, with £2.99. If he had wanted to

telephone he could have called 01-930 1612.

An ideal present for intelligent computer users everywhere . . . and to all those out there with an Acorn, the secret is to bang the rocks together, guys.

Monitoring the design

THIS month we look at two monitors from Citadel Products, the 101QL and Multitech MVM12G, both 12in, green screen models.

The 101QL is the cheaper at £79.93 including VAT with a simple black and white plastic case. The only user control is an on/off/brightness switch under the carrying handle on the top.

It is to be hoped that you will never have to adjust the picture size or position as

those thumb wheel controls can only be reached with the back of the monitor casing removed and the tube exposed.

The socket into which the video lead plugs is of the 'bnc' type which is rarely used on home computers. A special lead can be supplied

for £5.95.

The MVM12G is a very professional looking monitor priced at £102.93 including VAT. It has a matt grey housing and is supplied with a swivel/tilt stand. On the front is a brightness control and power-on light.

At the back are the usual

adjustment controls, and the video socket. There is also a video out socket, plus mode switch, to allow a number of monitors to be chained together.

Both monitors were tested on the Spectrum and QL. On the Spectrum both displayed a series of bright white lines across the top of the picture and the MVM12G suffered excessive shimmering.

On the QL the picture was better, the MVM12G still shimmered but had quite good definition and gave a bright picture. The 101QL gave the best picture with negligible shimmer, but with a black screen a moving band of bars was noticeable on the lefthand side. The picture was also dull, which on the Psion programs made parts of the Prompts window difficult to read.

The 101QL is reasonable on the QL and adequate on the Spectrum and seems the better buy of the two.

For further details contact Citadel Products Ltd, 50 High Street, Edgware, Middlesex HA8 7EP. Tel: 01 951 1848.



Look, no interface

MONITORS are popular if Sinclair Surgery is anything to go by. Both the Spectrum — issue three onwards — and the QL are capable of driving a composite video monitor without the need for an extra interface, but both require a special lead.

Transform supply one for the Spectrum. It costs

£11.50 from Transform Ltd, Swatlands, Lucks Lane, Paddock Wood, Kent TN12 6QL. Tel: 089 283 4783.

CLPS produces QL leads, which can have a phono or aerial plug to the monitor. Both are priced £2.50 inc, from CLPS Ltd, address elsewhere on this page.

Sticks to the QL

A JOYSTICK on the QL is a useful addition. Dedicated joysticks fit directly into the CTRL port, and standard joysticks use an adaptor lead.

The joystick from Eidersoft is a standard Quickshot II with a QL-type lead. It costs £11.95, or if bought with the **QL Art** program, £9.56. Contact Eidersoft, PO Box 54, Ilford, Essex IG1 1BR. Tel 01 478 1291.

A cheaper alternative, if you already have a joystick, is an adaptor lead. One can be obtained, priced £4.95, from CLPS Ltd, Shire Hall, The Sands, Appleby-in-Westmorland, Cumbria CA16 6XN. Tel 0930 52204.

Talking to printers

DOWNSWAY Electronics has released an RS232 to Centronics converter for the QL. Unlike many of the other converters on the market it has a switchable baud rate, the default of 9600, and 19200 for fast printers.

It is the cheapest so far at £31.95. Downsway Electronics (UK) Ltd, is at Depot Road, Epsom, Surrey KT17 4RJ. Tel 03727 27222.

AS programs such as Tasword Two require good definition to give more than 32 characters across the screen, many users are turning to black and white monitors for a readable display. A special interface is not required for such monitors and they are a low cost alternative to RGB for the QL.

The Boxer 12 from Hantrex is a 12in high resolution, green screen, composite video monitor designed for the home computer user.

The usual controls — brightness, contrast, on/off



— are on the front, while others, such as picture size and position, are hidden under a flap, also on the front. It has an attractive silver grey casing.

The Boxer 12 costs £99.95 from Hantrex (UK) Ltd, Unit 2, Lower Sydenham Trading Estate, Kangley Bridge Road, London SE26 5BA. Tel: 01-778 1414.

**Crescent
£99.95
Quick Disk**

- 128K storage
- Reads and writes 65K in 4-8 secs
- 20 times faster than Sinclair Micro Drive
- Works with Spectrum Plus
- Full software support (plus Inner Circle Club)
- No power supply needed
- Quick disk interface
- Quick disk drive
- RS423 interface with 'D' type connector for all kinds of dial-up services
- RGB socket for colour monitor attachment
- 2nd Quick Disk expansion socket for disk copying and advanced programming
- ROM based software

A Real Disk Drive for Spectrum

...for under £100

Service Dynamics Limited.
 Brook Street, Mitcheldean, Gloucestershire, GL17 0SL.
 Tel: 0594 542021 Telex: 43586 SERDYN G. Dept. 54

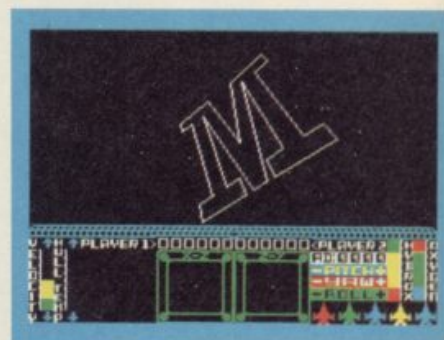
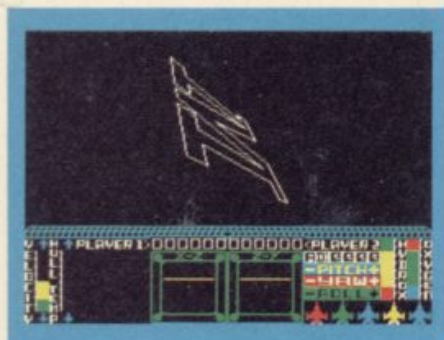
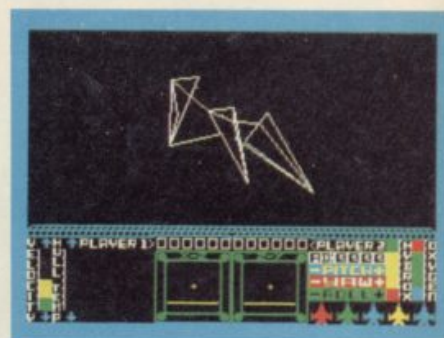
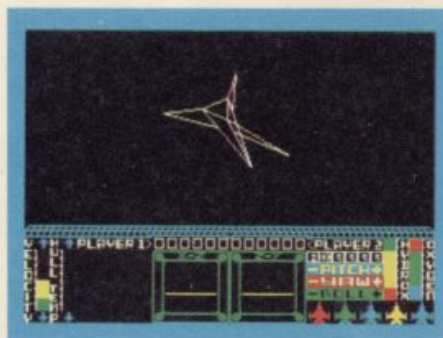
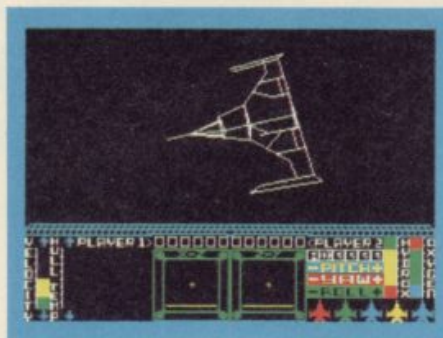
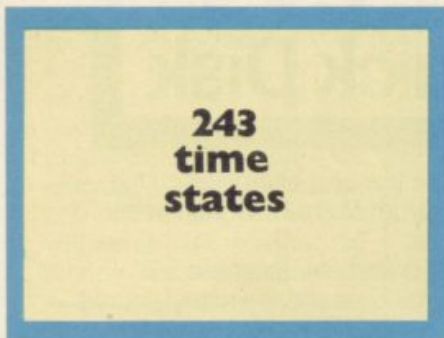
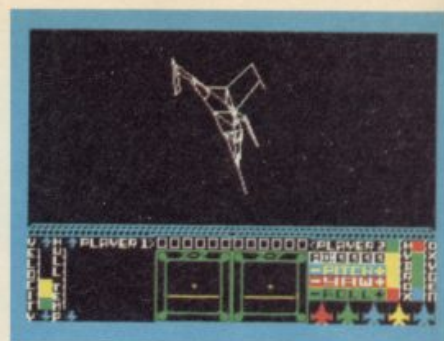
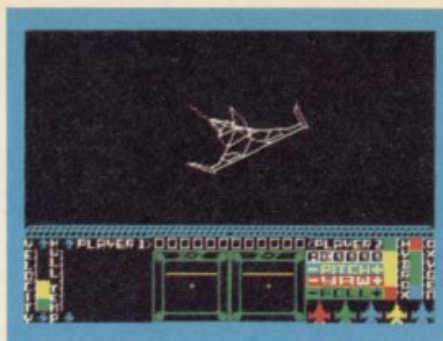
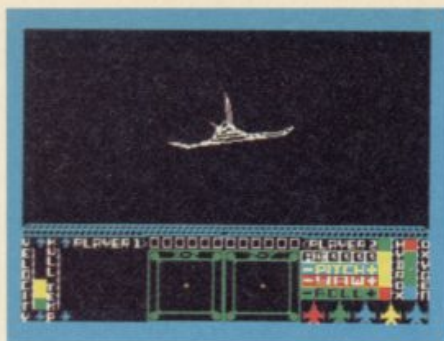
I enclose cheque for £..... or debit my credit card.

*The Crescent 128 is a drive unit only and designed as an expansion unit for disk copying and advanced programming. The Crescent 128 interfaces with the Crescent 128i to give the increased capacity of the Crescent 256i.

Signature _____

RESER





For the 48K SPECTRUM

Arcade space battles, 3D flight simulation, and mind-stretching strategy problems - take on these challenges and become ace space duellist STARION.

As pilot of the world's first space time transmuter, the USS Stardate, your quest is to fearlessly travel through the space time continuum. Recover the secret cargo, a feat which will not only test your fighting skills, but your wits; and escape

through the inter-dimensional timewarp and forward onto another time state.

But be warned! Your dexterity, cunning and combative skills will be tested to the full when battling against the enemy fleets and other hazards you will encounter.

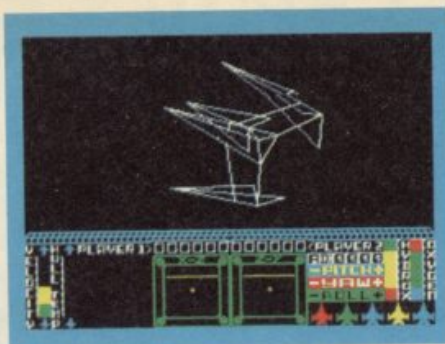
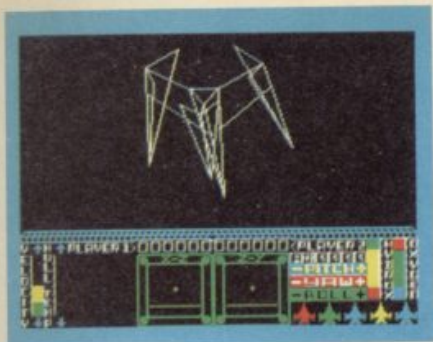
STARION has it all - amazing 3D space action, stunning graphics and high resolution colour. A game of almost unbelievable complexity,

designed to stretch your Spectrum beyond its limits to undreamt of capabilities.

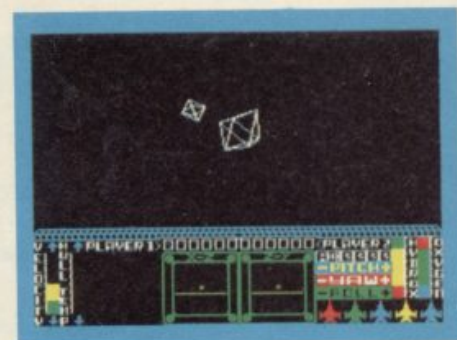
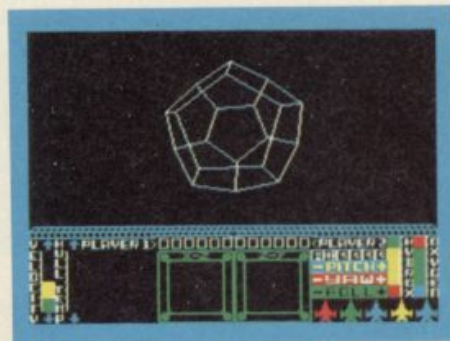
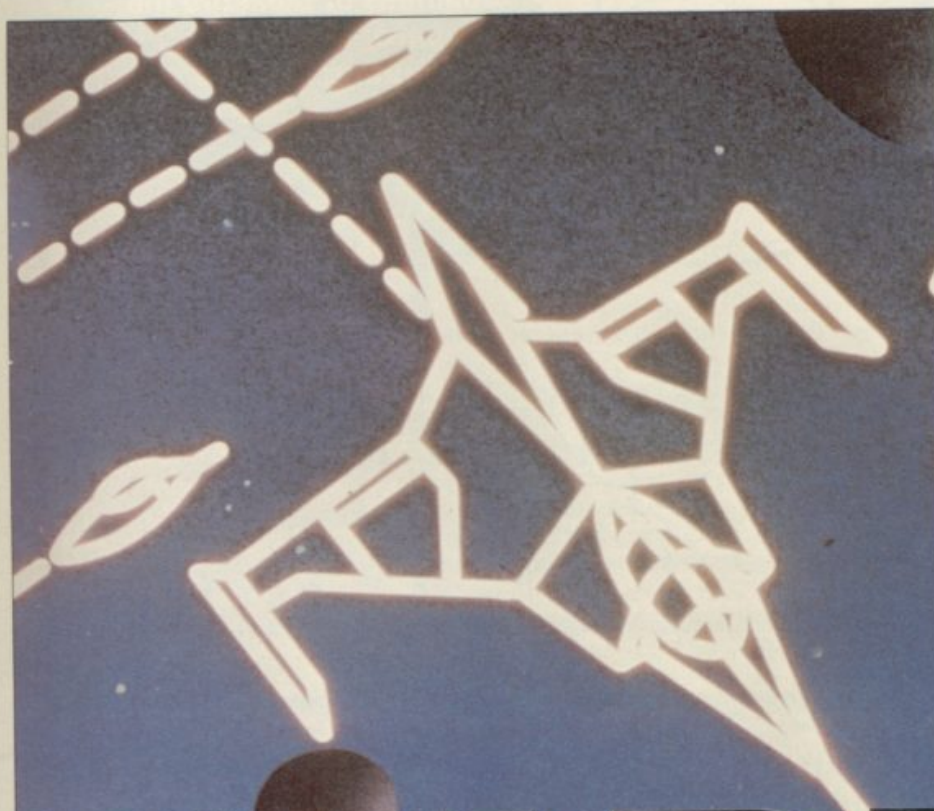
Don't just play it, experience it!

STARION is available for your 48K Spectrum and Spectrum+ at £7.95.

Barclaycard and Access orders can be accepted on our 24 hour ansaphone, just call (0235) 83 5001.



**Thrilling
space
battles**



STARION

from Melbourne House

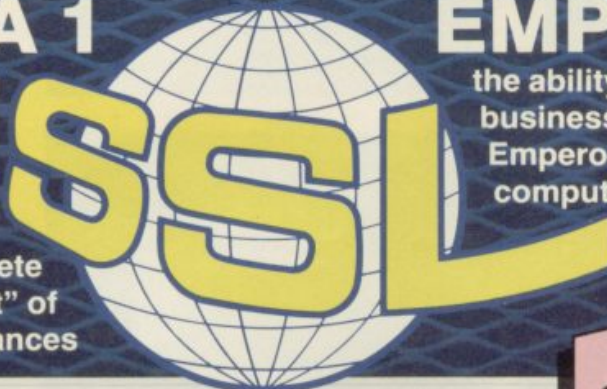


THERE ARE KEYBOARDS . . . AND THERE ARE SAGA KEYBOARDS

SPECTRUM* COMPATIBLE – THE KEYBOARD FOR ZX SPECTRUM COMPUTERS

THE SAGA 1

With 67 keys, the design incorporates 4 Symbol Shift and 2 Caps Shift keys allowing you easy access to every available function. The SAGA 1 Emperor makes obsolete the "Stretch Requirement" of other keyboards and enhances



EMPEROR

the ability to speed type. For business or pleasure the Emperor will make your computing time more productive and enjoyable.

AVAILABLE NOW
ONLY £49.95 INC VAT
+ £1.50 p&p



SOUNDBOOST
AMPLIFY YOUR SOUND
£9.50

SSL DUSTCOVER
BLACK VINYL
£4.00

Sheer Elegance

*SAGA 1 Emperor also compatible with Spectrum+

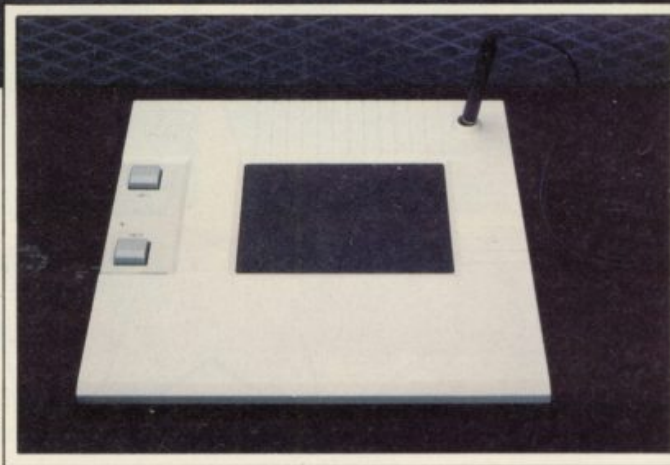
SAGA GP

SPECTRUM COMPATIBLE GRAPHICS TABLET

FACILITIES: CIRCLE, DRAW, BOX, TRIANGLE
FILL, LINE, TEXT, WINDOW, MAGNIFY, SAVE
SCREEN, MICRODRIVE COMPATIBLE

JOYSTICK AND SAGA GP COMPATIBLE INTERFACE AND S/W ONLY £29.95 inc
VAT + £1.00 P&P.

SAGA GP (requires interface plus S/W) only £69.95 exc VAT + £1.50 P&P



BBC

Add more speech to your speech synthesizer – write for details

SEND YOUR ORDERS TO:

Dept SU5
SAGA SYSTEMS LIMITED
2 Eve Road, Woking, Surrey

Please add the correct P&P and VAT.
(When ordering please state whether you wish
the keyboard to fit Spectrum or Spectrum+)

Please send me the following SAGA products



Name _____

Address _____

Total amount enclosed £ _____

Signature _____

Please allow 28 days delivery

FREE SSL SWEATSHIRT FOR EVERY 100th CUSTOMER WORTH OVER £10

SU5

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

Sinclair Surgery

Micro rejects printer

IN YOUR December 1984 issue you printed details on how to connect the Interface 1 to an OK1 Microline 82A dot matrix printer using the RS232 port. On connecting the computer to printer I am only able to use the LLIST command; COPY and LPRINT do not work.

**Alex Kachellek,
Chinnor,
Oxfordshire**

● Both LLIST and LPRINT send information to the printer via a pointer held in the channel information area. By changing that pointer full-sized printer interfaces, and Interface 1, can redirect output from those commands. COPY is implemented by a direct call to the ROM and can not be redirected; this is because different printers require different software to copy the screen.

As LLIST and COPY seem to work as they should, the problem is LPRINT. LPRINT is the same as PRINT #3. One possible solution would be to use a different stream. Try entering the following program:

10 OPEN #4; "I"

20 PRINT #4; "Anything"

30 CLOSE #4

If that does not work then there is a fault with either the Spectrum or Interface 1 and they will have to be repaired.

Tale of the leaping miner

I HAVE purchased the Interstate Pro interface from Bud and the Quickshot joystick.

I programmed it for Manic Miner — left, right and

jump. On the leaflet it states: "please note that the fire button takes priority over all other selections and will operate in ANY position." Therefore if you moved the joystick to the right and at the same time pressed the fire button — jump — Willy should jump to the right — in theory.

Did it do that? No! Willy jumped straight up into the air. I had many a go at this but each time the same thing happened. On all games if I accidentally moved the joystick into a position I had not programmed to do anything the whole game would stop dead until I let go of the joystick.

After spending over £30 I am quite disappointed.

**Jason Austin, Royston,
Hertfordshire**

● The answer to the Manic Miner problem is to program 'jump' as 'up' on the joystick.

ZX-81 out of control

I HAVE been given a ZX-81. I had it set up and working but on loading a game and when playing — the TV screen seems to jump a lot and rolls up. It cannot be controlled with the vertical hold.

Where — if at all — can I buy ZX-81 games. I can't find any in Croydon.

**Mrs D Williams,
Croydon**

● The problem is with the ZX-81. A different TV may solve it temporarily but the computer really needs repairing. It may be worthwhile finding a secondhand '81, or even a new one as some shops are selling them for as little as £20.00.

Finding software is a prob-

lem. Keep an eye on the adverts in Sinclair User, particularly those from Software Farm, or you could try the Buffer Micro shop in Streatham.

Micro learns to speak

I AM planning to purchase a speech unit for my 16K ZX-81. I have already considered a Cheetah speech unit, but do you recommend any others on the market?

Secondly, I wish to teach myself the art of programming Z80 machine code, for which I would need a book.

**D Green,
York**

● The majority of speech units use the same chip and so there is little to choose between them. The William Stuart Systems range may be of interest. The address is Quarley Down House, Cholderton, near Salisbury, Wiltshire SP4 0DZ. Tel. 098 064 235.

The best book is Mastering Machine Code on Your ZX-81 by Toni Baker, from Interface Publications, 9-11 Kensington High Street, London W8 5NP.

Confused by data line

I HAVE a 48K Spectrum. I noticed inside that it is an issue 3B, but when I tried PRINT IN 65278, as suggested in February's Sinclair User, in a repeat loop the answer scrolled was predominantly 255, but occasionally 191.

I am also having trouble keying asterisks, commas and full stops.

**K Williams,
Bridgwater,
Somerset**

● The main difference between issue 3 and issues 1 and 2, as far as software is concerned, is that data line D6 which previously was held high is now left to float. What that means is that it used to be kept at logic level 1 but now can be either 1 or 0. To see that print BIN 10111111, which gives 191, and then change bit 6, counting from the right, to 1, i.e. print BIN 11111111, which gives 255.

As for your keyboard, perhaps you should have it repaired. Technicon Services, Bristol. Tel 093484 3460.

Earthing cures dot crawl

WITH REFERENCE to Mr Duggan's letter on dot crawl in your February issue. I found little improvement by tuning VC1 as you suggested, but a good earth link from the mains lead earth-pin to the outer of the TV co-axial lead completely cured the problem.

**G M Paterson,
Putnoe,
Bedfordshire**

Upgrading and the guarantee

I HAVE just read that the Spectrum 48K is to be discontinued. As I have a two year extended guarantee, will it invalidate my guarantee if I send it away to be upgraded to the Spectrum Plus.

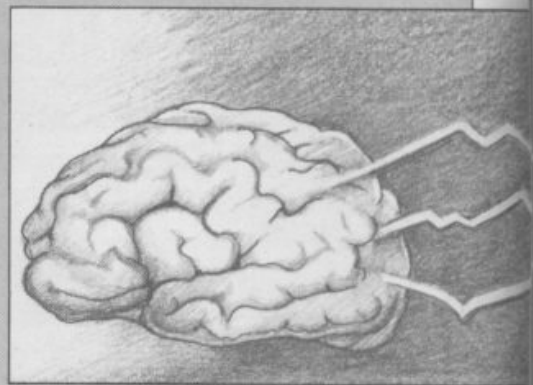
T D Brook,

March, Cambridgeshire

● Sinclair Research has confirmed that upgrading will not invalidate its own one year warranty but you will have to check with the shop where you bought the Spectrum as to any additional guarantee.

Learning the secret of mind over machine

Bored with Basic? Curious about code? Our new series introduces you to the mysterious language of the Z80. Marcus Jeffreys is your interpreter



ONCE proficient with Spectrum Basic, many users turn to Z80 machine code as the next language to learn, usually to increase speed and decrease program size.

It is all very well spending hours mapping out new arcade games, but not very useful if they are either too big to fit into memory or too slow to be playable. Unfortunately, Z80 is very different from Basic, and the majority soon become disillusioned with the language. However, with just a little perseverance, Z80 can easily be mastered.

In this series of articles, we hope to teach the main aspects of Z80 machine code. Do not expect to be able to program the world's greatest game immediately, but each article will include an example program, using the techniques learnt, which you will be able to incorporate into your own programs to speed them up.

Z80 programs are usually found in two forms: assembly code and machine code. When writing in machine code all instructions are stored as one or two numbers in the range 0 to 255. That, however, is not very convenient for the machine code programmer, so assembly language uses a program in the computer to convert three- or four-letter codes into the machine code numbers. A few of

those codes can be seen in figure four — LD, INC and DEC — and to the right of those are their numerical equivalents.

You'll have noticed that some of those numbers include the letters A to F as well as the digits 0 to 9. That is because the numbers are shown in hexadecimal form — hex — which uses base 16. Figure one shows how those digits are related to the normal decimal system — base 10. To convert a hex number to decimal, carry out the following operations:

Take a pair of hex digits — for instance, B1. Look up the first digit in figure one, and multiply its decimal equivalent by 16. So, B (in hex) is 11 (decimal) and

$$11 \times 16 = 176$$

Add the decimal equivalent of the second hex digit. Thus,

$$176 + 1 = 177$$

to give the answer.

The reverse operation can be carried out by dividing a decimal number by 16 to give the first hex digit, and using the remainder for the second hex digit.

Basic programmers are used to having a fairly sophisticated language with a large number of variables. When using machine code, there are only a limited number of variables, known as 'registers'.

The main Z80 register is the A register, also known as the accumulator. That is eight binary digits — bits — long, so it can only hold a number in the range 0 to 255. Eight bits is known as one byte of information when using the Z80 processor. It is for that reason that hex numbers usually consist of two hex-digits, since that will represent a number in the range 0 to 255.

The Z80 processor has a number of other registers, the most important of which are the ones labelled B, C, D, E, F, H and L, all of which are one byte long, as with the accumulator.

Your Spectrum has either 16K or 48K of memory. K stands for kilobyte, meaning 1000 bytes. In fact, a kilobyte normally refers to 1024 bytes, because that is the maximum range which can be stored as 10 bits of information. A 48K Spectrum has, in fact, 64K of memory, but 16K of that is ROM — Read Only Memory — and is used to instruct the computer what to do when you type in commands and run Basic programs.

Now, 64K is the range 0 to 65535, which is exactly the range of a number containing 16 bits of information. That is two bytes, and usually represented as a sequence of four hex digits. Consequently, all instructions which alter a particular byte in memory must use four hex digits to specify which byte is to be changed.

We are now in a position to understand a simple machine code instruction:

LD A, (6000h)

That is shown in assembly language, but could just as easily be shown in machine code hex numbers:

3A 00 60

The English translation of that would be "Load (LD) the accumulator (A) with the contents of the hex location 6000 (6000h)". The 'h' at the end of the number means the number is in hex form. The brackets surrounding the number specify that we are interested in the contents of location 6000h, not the number itself. Thus the instruction:

LD A, 1Fh

would load the number 1Fh (that is, 31) into the accumulator, but

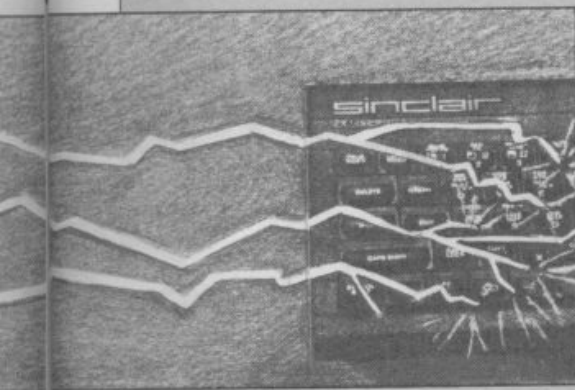
LD A, (1Fh)

would instead load the contents of the 31st byte of memory into the accumulator.

We already know that the registers can only hold numbers in the range 0 to 255, and that memory locations — addresses — are in the range 0 to 65535. That is most inconvenient, but

Hex	Decimal
0	0
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
A	10
B	11
C	12
D	13
E	14
F	15

Figure 1. Hexadecimal — decimal conversion



Number	Colour
0	black
1	blue
2	red
3	magenta (blue + red)
4	green
5	cyan (blue + green)
6	yellow (red + green)
7	white (blue + red + green)

Figure 3. Spectrum colours

we can fortunately combine some of the registers together to give the correct range. The registers are paired as B + C, D + E and H + L. So, the two instructions

```
LD HL, 6000h
```

```
LD A, (HL)
```

would be exactly the same as our first instruction. The number 6000h is loaded into the combined H and L registers, so that the accumulator is then loaded from the contents of address 6000h.

The difficulty with learning machine code is that it is easy enough to learn the instructions, but knowing what to do with them can be quite a problem. So we will look now at a typical application using some of the instructions we have already learnt. This short machine code routine can then be easily incorporated into your own programs.

First of all, type in and run the Basic program in figure two. The

```
30 CLS
40 FOR i=1 TO 704
50 PRINT CHR$(25*RND+65);
60 NEXT i
70 INPUT "Attribute value = ";
att
90 GO SUB 5000
100 GO TO 70
110:
120:
5000 REM Fill attribute screen
5010 FOR h=22528 TO 22528+767
5020 POKE h,att
5030 NEXT h
5040 RETURN
```

Figure 2. Basic colour change

program will fill the screen with random characters, then prompt you for a number. By entering numbers in the range 0 to 255, you can alter the foreground, background, brightness and flashing of the characters on the screen. You can form a number for a specific colour combination as follows.

Take a number from figure three for the foreground colour. Take another number for the background colour, multiply that figure by eight, and add it to the foreground colour number. Then add 64 if you want the

character to have brightness turned on. Add 128 if you want the character to be flashing.

Each character cell on the screen has an attribute value, as given above, to define its colour. All attribute values are held in memory, starting at location 22528. Consequently, the Basic program has a loop which fills those values with the number you type in. Unfortunately, you will notice that it takes quite a while to change the screen colour. What we really need is a routine which works almost instantaneously. The assembly code for such a routine is given in figure four.

```

: Place the code E into all attribute locations

ORG 60002      :Code starts at
LOAD 60002     :location 60002

EA62 210058    COLOUR LD HL,22528 ;HL = Start of attribute file
EA65 010003    LD BC,768 ;BC =Number of screen positions
EA68 ED5B60EA LD DE,(60000);E = Contents of 60000
                ; = Value of new attribute byte
EA6C 73        LOOP LD (HL),E ;Place attribute byte into file area
EA6D 23        INC HL ;HL = Next byte in file area
EA6E 0B        DEC BC ;Count the changed locations
EA6F 78        LD A,B
EA70 B1        OR C ;Jump to the label LOOP if BC is
EA71 20F9      JR NZ, LOOP ;still greater than zero
EA73 C9        RET ;Return to the BASIC program
                END
```

Figure 4. Assembly code colour change

The first instruction in the listing, LD HL, 22528 loads the first location of the attribute area into the double HL register pair. Remember, the actual value 22528 is used, because we have not used any brackets.

The instruction which follows loads

```

10 CLEAR 59999
20 GO SUB 1000
30 CLS
40 FOR i=1 TO 704
50 PRINT CHR$(25*RND+65);
60 NEXT i
70 INPUT "Attribute value = ";
att
80 POKE start,att
90 RANDOMIZE USR 60002
100 GO TO 70
110:
120:
1000 REM HEX CODE LOAD ROUTINE
1010 DEF FN p(x)=CODE h$(x)-48-7
*(CODE h$(x)>=65)
1020 LET byte=0
1030 RESTORE 2000
1040 READ start
1050 READ h$
1060 IF h$="*" THEN GO TO 1160
1070 IF LEN h$<>2*INT (LEN h$/2)
THEN PRINT "Odd number of hex
digits in: ";h$: STOP
1080 FOR i=1 TO LEN h$
1090 IF NOT ((h$(i)>="0" AND h$(i)<="9") OR (h$(i)>="A" AND h$(i)<="F")) THEN PRINT "Illegal hex digit: ";h$(i): STOP
1100 NEXT i
1110 FOR i=1 TO LEN h$ STEP 2
1120 POKE start+byte,16*FN p(i)+FN p(i+1)
1130 LET byte=byte+1
1140 NEXT i
1150 GO TO 1050
1160 PRINT "Code entered"
1170 PAUSE 150
1180 RETURN
2000 DATA 60000,"0000"
2010 DATA "210058","010003"
2020 DATA "ED5B60EA","73","23"
2030 DATA "0B","78","B1"
2040 DATA "20F9","C9","*"
```

Figure 5. Hex loader and colour change routine data.

the number 768 into the BC register pair — that is the number of locations which have to be changed. The next instruction is a little different, because we have used brackets. That will load the contents of location 60000 into the combined DE register pair. Now each register can hold a byte of information, so register E is loaded with the byte at location 60000, and register D is loaded with the next byte at location 60001.

In fact, the only byte we are interested in is the one we put into the E register — that will be the number to which all the attributes will be changed. Nevertheless, we have to use the double register instruction, because Z80 doesn't have the instruction

```
LD E, (60000)
```

All the load instructions are given in figure six, and we'll look at those in a moment.

On each execution of the main loop of the program, the number in the E

register is placed into the contents of the location in the HL register pair. That is the instruction

```
LD (HL), E
```

The first time that is executed, it will place a number into the location 22528 — the first byte of the attribute area

continued on page 48

Machine Code

continued from page 47

— and will colour the top left hand character on the screen. On subsequent loops, the HL register pair will be updated using

INCRement HL

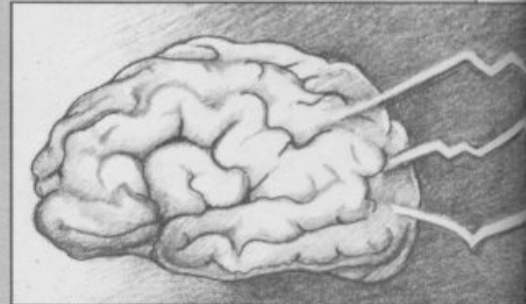
so that all characters on the screen are coloured. The last few instructions decide when to stop and the RETURN instruction passes control back to the main Basic program.

To implement this machine code routine, type in and run the Basic program given in figure five. Type in a few numbers — range 0 to 255 — when prompted, and you will see how

quickly the screen colour changes.

Looking closely at the data statements from line 2000 onwards, you will notice that the strings match the hex numbers in the assembly code listing. Those are decoded and placed into memory, starting at location 60000 — the first data item — by the hex loader routine — lines 1000 to 1180. It would be a good idea to save this to tape, because it will be used again in future articles

Most of the load instructions supported in Z80 machine code are given in figure six. The ones not given concern other parts of machine code



which we will cover in later articles. When using these, 'addr' stands for a two-byte location number (eg 60000); 'A' stands for the accumulator; 'rp' stands for register pair (BC, DE or HL); 'reg' stands for register (A,B,C,D,E,H or L); 'byte' is any number in range 0 to 255; 'word' is any number in the range 0 to 65535 (two-bytes).

So, for example, the instruction

LD HL, 22528

used in our colour program is an example of a load instruction of the type

LD rp, word

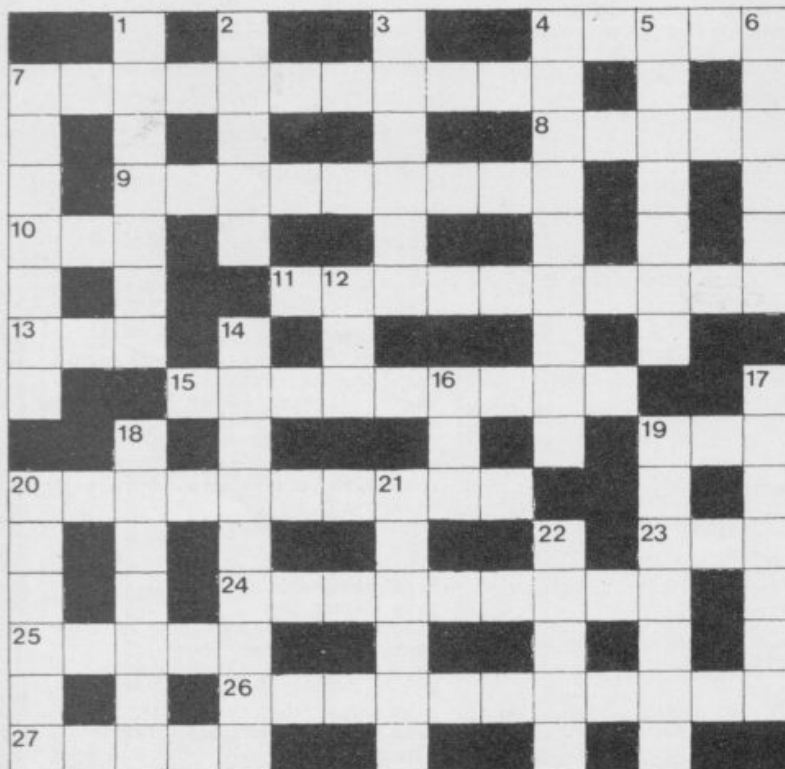
In the next article, we will be using more of these load instructions, and combining them with 'logical' instructions to perform some remarkable and useful screen colour alterations.

LD A, (addr)	— load accumulator with contents of address.
LD A, (rp)	— load accumulator with contents of address held in register pair.
LD reg, reg	— load first register from second register.
LD rp, (addr)	— load register pair with contents of address: C, E or L = (addr) B, D or H = (addr+1)
LD reg, byte	— load given byte into register
LD rp, word	— load register pair with 2-byte number.
LD reg, (HL)	— load contents of address held in HL register pair into a register.
LD (addr), A	— load accumulator into contents of address.
LD (addr), rp	— load contents of address with register pair: (addr) = C, E or L. (addr+1) = B, D or H.
LD (HL), byte	— load byte into the contents of the address held in the HL register pair
LD (HL), reg	— load register into the contents of the address held in the HL register pair.
LD (rp), A	— load the accumulator into the contents of the address held in the register pair.

Figure 6. Some Z80 load codes.

ZXWORD

by Henry Howarth



Solution on page 130

Across

- Pile up in memory area (5)
- Invention that should put Sinclair Research on the road! (11)
- Simulation barely seen on page three? (5)
- Too many GOTO statements in the bolognese! (9)
- Integration on a large scale (3)
- Beginner in cloth, oriental, finds software house in *The Hobbit* (10)
- Digit could be big, but less than a foot (3)
- Accumulator, perhaps, as transistor electrode (9)
- Proverbially, it's company . . . (3)
- Chooses beforehand (10)
- Some general information (3)
- Designing a crossword and translating it into machine code? (9)
- They provide the means of communication in some dialogues (5)
- Lay out page for software package (11)
- . . . Proverbially, it's a crowd (3)

Down

- Game weapon is miles off beam (7)
- Team race to get electrical control device (5)
- Express disapproval of code compiled from source (6)
- The character of half the large intestine? (9)
- Radon I'd use to construct an electronic human (7)
- Absolute unit of temperature measurement (6)
- Officer misses deadline to compare information (7)
- Pussycat's companion as BBC logo? (3)
- Not a capital way to put down the luggage? (5-4)
- Computer aided training, initially (3)
- Solder CCENNOT when they're sorted out (7)
- Redo DEC system for altering data from one format to another (7)
- Flip-flops got legs! (7)
- Quick message requesting input (6)
- Hire PC to crack code (6)
- Computer generation using valves as principle electronic component? (5)

With Quest the QL really means business



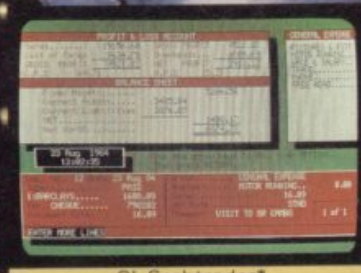
Executive Series



QL Expansion Console



Memory Expansion Board



QL Cashtrader*



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.

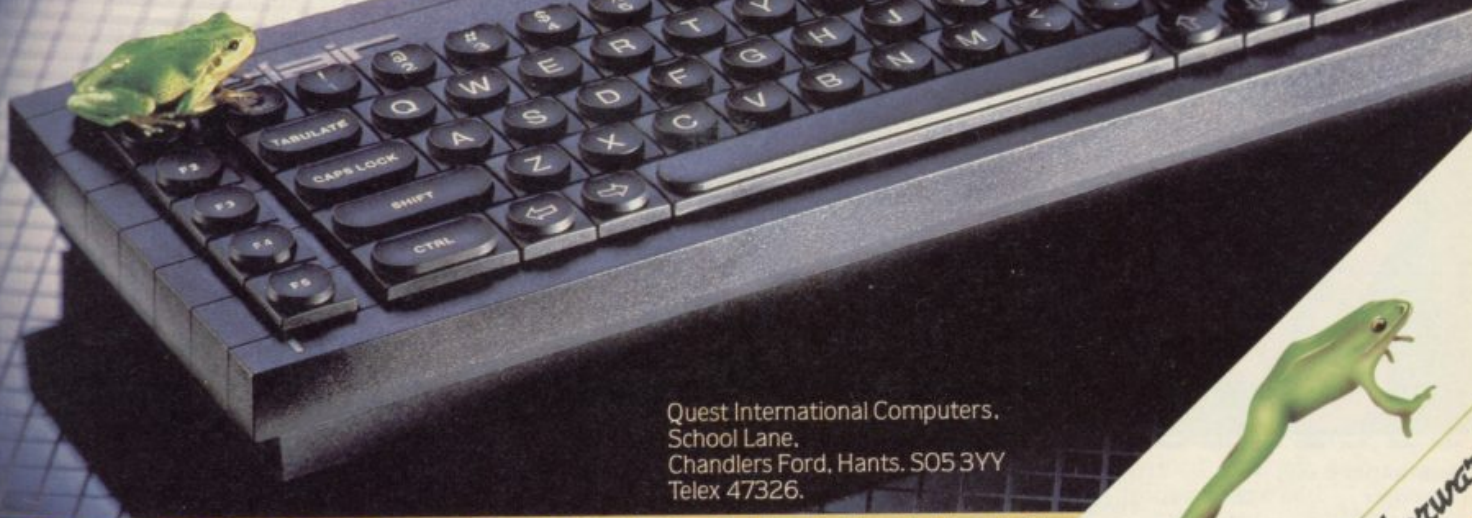
Post the coupon below to obtain details of a wide range of Quest Executive products including:

- 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

*Available from QL stockists or direct from
Sinclair Research Ltd.,
Camberley (0276) 68311



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

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!



TT RACER

Only the fastest win in

48K SPECTRUM

BY R.J. SWIFT

THE SUPREME MOTORCYCLE RACING SIMULATION FOR THE SPECTRUM. 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!



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

TM Trademark

Watchmoor Trade Centre,
Watchmoor Road, Camberley,
Surrey GU15 3AJ

AMSTRAD CPC 464

Fighter Pilot

☐ £8.95

COMMODORE 64

Fighter Pilot Disk

☐ £14.95

Fighter Pilot Cassette

☐ £9.95

LOADING TIMES

DISK - 147 SECS

CASSETTE - 300 SECS

SPECTRUM

Night Gunner

48K

☐ £6.95

Fighter Pilot

48K

☐ £7.95

Tomahawk

48K

Coming

TT Racer

48K

Soon

Cheques payable to Digital Integration Ltd

I enclose a cheque/P.O. for _____ Total

Name _____

Address _____

Or debit my Access Account No.



Tele Sales
(0276) 684959

Please send to Digital Integration, Dept SU 5

Watchmoor Trade Centre, Watchmoor Road, Camberley, Surrey GU15 3AJ.

Trade and Export enquiries welcome. Lifetime Guarantee.

TASWORD TWO has, justifiably, proved to be the most popular word processor program for the Spectrum. One of its attractive features is the ease with which you can modify it. The ideas which follow will allow you to customise Tasword in a number of ways and all will work on any version. They will also work if you have altered it to use Tasprint, the East London Robotics memory upgrade, microdrives and disc drives.

Throughout the article 'direct mode' denotes that commands can be entered directly from the keyboard and will give the OK report; 'Basic' is the Basic part of Tasword, reached by pressing STOP; and 'Tasword' denotes the code part of Tasword, reached by pressing Y from the STOP menu or RUN in direct mode. Sixty four mode denotes 64 characters per line and similarly 32 mode denotes 32 per line.

Changing the colours

As you might have discovered already, you can change the INK and PAPER colours used by Tasword simply by altering them in direct mode and running. That has disadvantages: the paper colour can only be 1, 3, 5 or 7 and the margins will be one less than that. To alter the colours in 64 mode enter, in direct mode

POKE 58512,54

POKE 58513,c

POKE 58521,54

POKE 58522,c

where c is $8 * \text{paper} + \text{ink}$. For example, to get blue paper with white ink use $c = (8 * 1 + 7) = 15$. To change the margin colour enter

POKE 58508,54

POKE 58509,c

where c is calculated as above. To change the border colour enter

POKE 64516,b

where b is between 0 and 7. To change the 32 mode border use

POKE 60641,b

calculating b as above.

Listing 1. word count data

```
10 LET clr=31940: LET t=0: FOR
n=1 TO 59: READ a: POKE (clr+n)
,a: LET t=t+a: NEXT n: IF t<>640
5 THEN PRINT "ERROR": STOP
20 SAVE "word"CODE clr+1,59
97 REM *****
98 REM WORD DATA
99 REM *****
100 DATA 42,181,253,221,42,11,9
2,221,94,4,221,86,5,25,235,33,0,
0,1,0,64,27,26,254,32,40,24
110 DATA 254,128,48,20
120 DATA 14,1,16,242,9,58,182,2
53,186,32,232,58,181,253,187,32,
```

Customising your word processor

John Lambert shows
how to squeeze more
from Tasword Two

Those POKES will not change the bottom two lines. To change those

POKE 64570,c

and for the second to the bottom line use

POKE 59993,c

calculating c as above. Note that on this line the top half is INK and the bottom PAPER. (To keep the same colours as above you should poke it $7 * 8 + 1 = 57$.)

When returning to Basic the INK and PAPER colours are restored to those used before running Tasword but the Border is not. To remedy that add a BORDER command on line 20 before the CLS. As those POKES are within Tasword they will be retained when the program is saved.

Lines, Characters, Words

When returning from Tasword, to the STOP menu, the program always goes

226,229,193,201,175,185,40,234,3
5,13,24,230

Listing 2. word count additional basic

```
1 DEF FN w(x)=USR 31941
15 SEE TEXT
174 IF b=119 THEN GO TO 4500
705 SEE TEXT
4500 CLS: GO SUB 4000: PRINT AT
11,5;"Number of Words = ";PRI
NT FN w(a)
4510 PRINT #0;" Press Any Key
To Continue": PAUSE 1: PAUSE 0:
GO TO 20
```

to line 20. When going to Tasword from the Basic part of the program there are two routes, from line 10 — the usual one — and line 3060 — in the process of using search and replace. That can be employed to add a count either of lines or characters used. To count lines add

79 PRINT #0;AT 1,0;a/64;" Lines Used - ";(PEEK 64150+256*PEEK 64151+22)-a/64;" Lines Free"

and to count characters add
79 PRINT #0;AT 1,0;ch;" Characters Used-";((PEEK 64150 + 256 * PEEK 64151 + 22) * 64) - ch; "Free"

Alter the USR statements in lines 10 and 3060 to be LET ch=USR, followed by the rest of the line, and add LET a=ch in line 20 after the CLS.

The fastest way to count words is to add a short machine code program. Enter listing one, run it and save the code on tape. Load a copy of Tasword and add the program lines in listing two — you will also have to alter the CLEAR address in line 15 to 31940 and add another LOAD CODE"". To ensure the code is saved automatically add

705 SAVE "word" CODE 31941,59
Alternatively provided you are only using Tasword from cassette add

705 POKE 23736,181: SAVE
"word" CODE 31941,59: POKE
23736,181

continued on page 53

Opus.

DISCOVERY 1

The Dawn of a new beginning for your Spectrum

Introducing Discovery 1 – quite simply the most advanced and comprehensive disc drive unit yet developed for the Spectrum and Spectrum + computers.

Discovery is the breakthrough in design, performance and price which promises to make other Spectrum solutions obsolete. Just look at its advanced features:

- The very latest 3 1/2 inch disc drive unit
- Peripheral through connector
- Parallel printer port
- Joystick interface
- Video monitor port
- On-board power supply



But the biggest discovery of all is the price – just £199.95

Upgrading to a dual-drive system is simple with the 'Discovery +' upgrade package – £139.95, or choose a purpose-built twin-drive unit, 'Discovery 2' – £329.95.

THE DISCOVERY RANGE

- Available exclusively through larger branches of Boots and supported by a brand new range of popular 3 1/2 inch disc software.

AVAILABLE FREE

- Memorex disc twin-pack + five free discount vouchers.

Further product information is available from

Opus.
Opus Supplies Ltd.

55 Ormside Way,
Holmethorpe Industrial
Estate, Redhill, Surrey.
TELEPHONE: 0737-65080

continued from page 51

That will stop the 'press any key' message appearing and save the three parts but will cause odd results if used with microdrives or disc drives.

Once that is done LOAD the word code and then save TASWORD in the usual way.

The routine searches through the file, taking the length from Basic and the start of the file from locations within Tasword, and counts a word as being a non-space followed by a space. It includes words which start at the end of a line, making it a true count.

A space is taken to be a character with a code of 32 or a graphics character with a code of 128 or more. If you do not want to include those graphics then change the four DATA statements in line 110 to zero. If you use **Tasprint** the tilde character — code 126 — is used to change text styles and is treated by Tasword as a space. In that case change the second DATA item in line 110 (128) to 126.

The method of calling the routine may be new to you and relies on the way in which the Spectrum treats user-defined functions and stores numbers. When a function is called the system variable DEFADD holds the address of the definition of that function.

If a single letter is used the memory locations 3 to 7 on from that hold the five byte floating point form of the variable being used. If that value is an integer — between -32767 and 32767 — it can be found in locations 4 and 5. Unfortunately the Spectrum takes a relatively long time to delve into the ROM but the method is useful for routines which require one, or more, parameters to be passed.

Machine code buffs might like to move the word count code to a REM statement for ease of loading and saving.

If you are familiar with the calculator routines in the ROM, you can make use of this method in your own programs; the INT-STORE routine in the ROM at 2D8Ch is particularly useful. For further discussion of the calculator see *Helpline* in *Sinclair User*, February.

Graphics and Pounds

If you are using a full-sized printer you can send control codes to it using the graphics characters. It is a good idea to add a space — 32 — to the sequence as otherwise the line, when printed, appears to have lost a character. That can be added before or after

Listing 3. Assembly listing of Listing 1.

```

HL=Word Count
DE=Position in File
B=64 (Characters per Line)
C=Flag 0=Space 1=Non-Space

EA60      100      ORG      60000      ;Arbitrary ORG
FDB5      110 FILEST EQU 64949      ;Address in Tasword
                                         ;that stores the
                                         ;start of the file
SC0B      120 DEFADD EQU 23563      ;System Variable
EA60 2AB5FD 130 INIT LD HL,(FILEST) ;Get start of file
EA63 DD2A0B5C 140 LD IX,(DEFADD) ;Pass the value of
EA67 DD5E04 150 LD E,(IX+4) ;a (file-length) to
EA6A DD5605 160 LD D,(IX+5) ;DE
EA6D 19 170 ADD HL,DE ;HL=start + length
EA6E EB 180 EX DE,HL ;Move it to DE
EA6F 210000 190 LD HL,0 ;HL=Word Count
EA72 010040 200 NXLINE LD BC,64*256+0 ;Load B,64 & C,0
EA75 1B 210 NXCHAR DEC DE ;Step through file
EA76 1A 220 LD A,(DE)
EA77 FE20 230 CP 32
EA79 2B18 240 JR Z,FNDSPC ;if Space -
EA7B FE80 250 CP 128 ;jump
EA7D 3014 260 JR NC,FNDSPC ;if Graphic -
EA7F 0E01 270 LD C,1 ;jump
EAB1 10F2 280 LINEND DJNZ NXCHAR ;set flag
                                         ;if not end of line
                                         ;get next char
                                         ;flag holds state of
                                         ;first char in line,
                                         ;add to count
EA83 09 290 ADD HL,BC ;find if address
                                         ;counter (DE) has
                                         ;reached the
EA84 3AB6FD 300 LD A,(FILEST+1) ;start of the
EA87 BA 310 CP D ;file - if so
EA8B 20EB 320 JR NZ,NXLINE ;then get next line
EA8A 3AB5FD 330 LD A,(FILEST) ;move word count
EA8D BB 340 CP E ;to BC
EA8E 20E2 350 JR NZ,NXLINE ;and return
EA90 E5 360 PUSH HL ;clear A
EA91 C1 370 POP BC ;is flag 0
EA92 C9 380 RET ;if so jump
EA93 AF 390 FNDSPC XOR A ;increase word count
EA94 B9 400 CP C ;zero flag
EA95 2BEA 410 JR Z,LINEND ;back to routine
EA97 23 420 INC HL
EA98 0D 430 DEC C
EA99 1BE6 440 JR LINEND

```

the sequence. As a matter of personal preference I tend to put it after, except for the underline codes. Code 140 should have it before and 131 after.

The pound sign has caused many headaches. The problem is that, as far as the Spectrum is concerned, the pound has a code of 96 whereas most printers use a code of 35. To further complicate matters the printer also uses 35 to denote the hash character.

It does that by having a number of alternative character sets and you have to switch between them, either using software or by setting switches in the printer. The code of 96 will be printed as a backward apostrophe.

The ideal solution would be to check all the characters being sent to the printer and make the necessary changes. This can be done in software but as it will vary according to the printer and interface used it is difficult to give a general method.

Two methods can be used. The first is to set the printer to use the USA character set so that it will print a hash when sent a code of 35. In that way the hash in listings will be printed correctly.

If one of the graphics characters — say 143 — is set to give the English character set and 128 to give the USA set you can alternate between them at will. You must however remember

whether the hash on screen will print as a pound or as a hash.

If you rarely use the hash character the other method will suffice. Set the printer to the English character set and alter the hash character so that it looks like a pound sign on screen. It will still have to be obtained by pressing Symbol Shift 3 but at least you can see what is happening. To do that enter, as a direct command

```
FOR n = 0 TO 7: POKE (61208 + n), PEEK (61696 + n): NEXT n
```

The pound sign on the keyboard will still give you a pound on screen so enter

```
FOR n = 0 to 7: POKE (61696 + n), 0: NEXT n: POKE 61697,4: POKE 61698,2
```

to change it to a backward apostrophe. Now you have only to remember to press the correct keys but at least what you see is what you get. If you want to use hash you will have to use the graphics characters to swap sets as before.

Help Pages

If you change the uses of the graphics characters you will need to alter the help pages accordingly. The easiest way is to move them into the text file to work on. Enter in direct mode

```
LET s = FN p(64949): FOR n = 0
```

continued on page 54

continued from page 53

TO 1407: POKE (s + n), PEEK (54784 + n): NEXT n which will move it into the file. To return it to its correct place — provided you have not moved it from the start of the file — go into direct mode and enter

LET s = FN p(64949): FOR n = 0 TO 1407: POKE (54784 + n), PEEK (s + n): NEXT n

To work on the Extended mode page replace the 54784 in the above with 56320.

Keyboard

Tasword uses two of the system variables to time its reading of the keyboard. REPDEL at 23561 stores the length of time a key must be held down before it repeats and is normally set to 35. That can be usefully changed to around 20 for fast typists.

One useful modification is to alter the sound made when a key is pressed, as on a rattly keyboard the original sound is usually lost. The BEEPER routine in the ROM at 03B5h is used which needs, on entry, the DE register holding the frequency × time and HL holding the length of the timing loop.

Tasword sets D to zero and E to the value of PIP (23609), normally 5 but set to 2 by line 15. The value of HL is held in 59161 and 59162; POKEing 59161,50 gives a loud(ish) typewriter click.

Headers, footers . . .

Listing four is a routine which allows you to add headers, footers and page numbers to a printed text file, and print as many copies as you want. Delete lines 200 to 300 from your original copy of Tasword and type in the listing. Due to memory limitations, headers and footers should be included in the listing as shown.

Lines 200 to 240 should be self-explanatory as they ask for input from the user. Line 250 calculates which part of the text file is to be printed and tells you, on screen, what is happening. Lines 255 and 260 are more calculation. Line 270 puts your header here — remember to allow for the margin. Line 275 is part of the original Tasword Basic and takes into account different printer interfaces; you may find that causes a blank line to be output.

Line 280 calls Tasword to do the printing. Line 285 is similar to 275. Line 290 checks if you want to quit printing; the RUN ensures that all the

additional variables created are CLEARed. Line 292 ensures that the page number is printed at the bottom of the page. Line 294 puts your footer here. Line 296 prints the page number; as most interfaces do not handle TAB correctly a number of spaces are LPRINTed. The number is positioned in the middle of the page. PEEK 60927 is the width of the margin.

The routine needs one memory location to store the number of text lines per page and I have used 31940 for that. You will have to alter the CLEAR in line 15 to 31939. Alternatively, you could use one of the unused locations in the system variables, 23681, 23728 or 23729, provided your printer interface does not use it.

The routine has been made as short as possible but if you use a microdrive or the Thurnall, Statacom or Watford disc systems you may find you get an 'out of memory' error. That is because those systems use memory when loading or saving. Using cassette, or the Technology Research disc system, does not.

Try the routine using a file which you have safely saved. If you do get the 'out of memory' report you will have to shorten the Tasword Basic. Two methods can be used, both of which are used in the routine. The first is to change all the numbers to use VAL — that is 123 becomes VAL "123" and so on — and that will save three bytes per number. It may not seem a great deal but in the routine 200 bytes are saved by this method.

The second method is to use variables in place of numbers. In the routine z is used for zero and u for one. If you add LET z=0: Let u=1 to line 10 and then change all occurrences — omitting line 15 and the subroutine at 4000 — you can save a further three bytes every time.

Depending on your version of Tasword you can save up to 1.5K which is more than enough for this routine and any of your own. As long as you have 700–800 bytes free you should not have any problems — to check the amount of free memory enter

PRINT 65535–USR 7962

Finally . . .

All the above will prove useful and enhance what is already an impressive program. If you have further ideas for improvements I would be pleased to hear from you c/o Sinclair User.

Listing 4. Print routine for headers, footers, page numbers and multiple copies

```
200>CLS : GO SUB VAL "4000": PR
INT AT VAL "4",VAL "8":PRINT OP
TIONS": PRINT " just press ENTE
R for default values given in
brackets": LET z=VAL "0": LET u
=VAL "1": LET gs=VAL "6000": LET
i=VAL "8": LET j=z: LET j0=VAL
"23": LET x=VAL "31940": LET a$=
"Text Lines per Page ": GO SUB V
AL "850": LET i=VAL "10": PRINT
AT i,z:"Line Spacing? (1)": GO S
UB gs: IF a$="" THEN LET a$="1"
210 POKE VAL "62235",VAL a$: LE
T i=VAL "12": PRINT AT i,z:"Star
t at line? (1)": GO SUB gs: IF a
$="" THEN LET a$="1"
220 LET c=VAL "64"*(INT VAL a$-
u): LET st=c+FN p("62216"):
LET i=VAL "14": PRINT AT i,z:"Fi
nish at Line? (last)": GO SUB gs
: IF a$="" THEN LET len=a-c: GO
TO VAL "230"
225 LET len=VAL "64"*INT VAL a$
-c
230 LET i=VAL "16": PRINT AT i,
z:"First Page Number (1)": GO SU
B gs: IF a$="" THEN LET a$="1"
240 LET pa=VAL a$-u: LET i=VAL
"18": PRINT AT i,z:"Number of Co
pies (1)": GO SUB gs: IF a$="" T
HEN LET a$="1"
250 LET co=VAL a$: LET end=st+l
en: LET pl=INT (PEEK VAL "31940"
/PEEK VAL "62235")*VAL "64": LET
tp=INT ((len/pl)+u): FOR n=u TO
co: LET fl=z: LET cp=pa: FOR f=
st TO end-u STEP pl: LET b=f: LE
T x=VAL "60045": GO SUB VAL "950
": LET cp=cp+u: RANDOMIZE USR VA
L "59806": RANDOMIZE USR (FN p(V
AL "62472")): CLS : PRINT AT VAL
"10",z:"Press the q key to quit
printing":AT VAL "14",z:"Printi
ng Copy Number":n:AT VAL "18",z:
"Page Number ":cp: IF end=f+pl T
HEN LET b=end-f: LET fl=u: GO TO
260
255 LET b=pl
260 LET x=VAL "60049": GO SUB V
AL "950"
270 REM LPRINT "Header"
275 LET c=PEEK VAL "62470": IF
c<>z THEN LPRINT CHR$ c
280 RANDOMIZE USR VAL "60038"
285 LET c=PEEK VAL "62471": IF
c<>z THEN LPRINT CHR$ c
290 RANDOMIZE USR VAL "59806":
IF INKEY$="q" THEN RUN
292 IF fl=u THEN FOR g=u TO (pl
-b)*PEEK VAL "62235"/VAL "64": L
PRINT : NEXT g
294 REM LPRINT "Footer"
296 FOR g=1 TO 25+PEEK 60927: L
PRINT " ": NEXT g: LPRINT "Page
No ":cp: of ":tp: LPRINT CHR$
12: NEXT f: NEXT n: RUN
Variables used in Listing 4.
st = start of file
len = length of the file
pa = first page number
co = number of copies
end = end of file
pl = length of page (to be printed)
tp = total number of pages
fl = flag
cp = current page
```

There is one problem, at least, to which I do not have the answer. The length of the text file (–22) is held in locations 64150 and 64151. Try POKEing 64150,122, RUN Tasword, clear the text file — E Mode X — and scroll through it. How do you get rid of line 357?

Carry on hacking. . .

SO WHO is 'Hugo Cornwall', author of *The Hacker's Handbook*?

Biographical details given include the astonishing career details of a man who has a First in Mathematics from Oxford, has worked in a 'government supported facility in Gloucestershire' and in the South Atlantic. He is now, apparently, living in Brecon, mid-Wales.

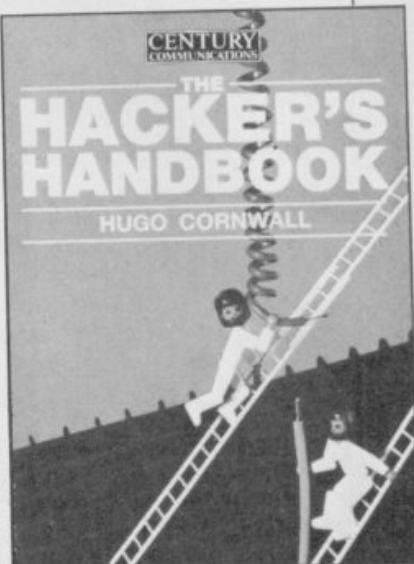
Those details are spice on

the cake as far as selling the book goes, and *The Hacker's Handbook* is crammed full of information and advice for would be hackers.

With worries about the security of data systems and computer fraud running at fever pitch, Cornwall insists that hackers are not intent on crime as such and states the hacker's aim, 'to boldly pass where no man has hacked before'.

The author is probably correct when he states that more information could be gleaned by judicious phone calls and contacts than ever would be gained by hacking round the networks. In fact, banks and such authorities as Prestel should thank hackers for pointing out the weak spots in their security systems.

The Hacker's Handbook is also a historical work detailing the results of famous hacks, like the Telecom Gold hack. It is an extremely useful handbook for anyone with a modem who wishes to explore a bit further than the pages of Micronet, containing as it does lists of protocols and radio frequencies together with advice from someone who is obviously an expert in network exploration.



Hugo Cornwall has laid down a challenge to his readers: who will be the first to hack his identity? That reminds me, I must contact my friends in mid-Wales.

Theo Wood

Publisher Century Communications
Price £3.95

. . .hack and hack again

HACKING is a popular topic and it is not unusual to find several books which cover the same subject. What is unusual about this book is that it is called *The Hacker's Handbook*.

This book is published by Longman, not Century Communications. It is not illegal for two books to have the same title but it can be confusing.

Luckily, the books differ in approach. This book, by Geoff Wheelwright and Ian Scales, deals with only the Spectrum and much of it is concerned with the Micronet information database to which Spectrum owners can connect using a VTX 5000 modem.

It gives an overview of the system and provides information on Prestel, and Homelink — the home banking database.

For those who are serious about hacking the authors provide information on the hardware and software which you will need to get into such databases.

Section one shows how modems work and examines terms such as baud rates, parity and duplex.

Section two takes a look at electronic mail and bulletin boards, which can be accessed over a telephone line with a modem and provides a list of British bulletin

boards with telephone numbers.

A glossary of terms completes what is a very interesting and practical book. They could have changed the title, though.

John Gilbert

Publisher Longman
Price £5.95

QL — official secrets

AT LAST it's here. *The QL Technical Guide*, by David Karlin and Tony Tebby, took more than a year to escape from the inner sanctum at Sinclair Research but, due to great public demand — and outrage — those guidelines have seen the light of day.

The neat A5 book, complete with hardy ring binder cover, is a pale imitation of the full QDOS specification which is available to software houses if they shout loud enough but it is certainly worth the wait, and worth its weight in gold. Not only does it cover the utilities available through QDOS but it provides blueprints of the memory map, information on system variables and, all the data you need on that nefarious subject, multi-tasking.

Skimming through the 195 pages of text and index gives a good idea of the IQ

rating necessary to understand most of the information in the manual. You do not have to be a genius but it does help. The technical manual is not meant for the SuperBASIC programmer. You do need some knowledge of 68000 code and general knowledge of traps and other interrupts. If you have the background the book will give you all you need to know about the internal workings of the QL.

One area that it purposely does not cover, however, is the hardware of the machine. No chip specifications are given and there is not one blueprint hidden within the volume. The authors explain that such design blueprints would be 'giving you a route to build products which rely on non-supported elements in the QL design.' In other words, you might start to use some

of those hardware functions within the 68008 which are not supported by the QL.

The book is expensive at £14.95 but there are factors which make it an imperative buy for a machine code programmer. On the QL you should always go through QDOS. Both authors are intimately connected with Sinclair and work on the QDOS operating system. The other reason for purchasing the manual is that it does not hold information back from the reader. If there is something that you need to know about QDOS it is likely to be in the manual.

The QL Technical Guide is a great box of assorted tricks. If you want to perform magic on your QL you should buy it.

John Gilbert

Publisher Sinclair Research
Price £14.95

THE FASTEST WAY TO GET THE BEST PROGRAMS

For nearly 3 years, we have been selling software as 'Software Supermarket'. But, because we have discovered at least two other companies (including Micronet!) using our name, we have changed it to Speedysoft. After all, it is the sheer speed of our delivery which our customers in over 40 countries seem to appreciate most. SPEEDYSOFT is a very different kind of software shop. First, we actually play all the programs ourselves and offer you only the best. Second, we send FREE with your order a 32-page catalogue which quotes all the reviews and even lists load times! (For a catalogue only, send £1.00 cash and we will send you a voucher for £1.00 off any order, plus your catalogue.) Third, WE ALWAYS TRY TO SEND OUT YOUR PROGRAM ON THE 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, 24hrs a day. ALL PROGRAMS FOR SPECTRUM AND SPECTRUM PLUS.

DRAGONTORC "SIMPLY BRILLIANT . . . if you enjoyed 'Avalon' you'll love this." (PersCompNews) Over 250 locations and more than 80 individual creatures from over a dozen different races to encounter in this magical sequel to 'Avalon'. A wonderful follow-up to a great graphic adventure. STICKS Kempston/Interface2/Cursor. (Hewson) CASSETTE £7.95

FORMULA ONE For 1 to 6 players. Each player controls 1 or 2 Formula One cars in this full simulation of a Grand Prix Racing Season. 16 races. Invest your sponsors' money in drivers, pit-crews, cars before each race: guess at the weather forecast's accuracy and choose your tyres. Then watch the races run in very good and big graphics. Enthralling simulation as enduring as the same company's golf and cricket simulations. STICKS Most: (CRL) CASSETTE £7.95

PAINT PLUS "I've never had so much fun with a utility program." (ZX Computing) "If you've been looking for a Spectrum graphics aid, this seems like one of the best." (PopCompWkly) The reviews refer to the original PAINTBOX. This new version has 24 new commands and a new 88-page manual illustrated in colour. It is also MICRODRIVE and GRAFPAD compatible. UDG Editor, Drawing Board, Sketch Pad, Precision Plotter and Screen Planner. AMAZING DEMO on flipside of the tape. The very best Spectrum graphics kit is now even better. STICKS Kempston/Cursor. (Print 'n' Plotter) CASSETTE £9.95

SPACE SHUTTLE "Activision have provided superb graphics, the cockpit vibrations during the launch really give the impression of taking off. This simulation is a certain winner." (HomeCompWkly) Fly the Space Shuttle DISCOVERY. Launch, rendezvous and dock with an orbiting satellite 210 miles above Earth, then return to Edward's Air Force Base. Progressive difficulty. DEMO. Great graphics and a very well illustrated manual. Take a photo of the final screen to earn your free 'wings'. STICKS: Kempston/Interface2/Cursor. (Activision) CASSETTE £8.00

SUPERCODE 3 "An excellent collection of routines and utilities that no serious user should be without." (C.T.W.) One of the very best Spectrum programming aids. Save/load to/from tape/Microdrive as you wish. 152 Machine-code utilities and routines. Clear and helpful instruction manual. It is the ultimate Spectrum Toolkit. 100% menu-driven. On-screen training. If you're writing in BASIC or m/c, you need this fast! NO STICKS. (CP Software) CASSETTE £12.95

AUTOMATA TEN! Staggering value-for-money as you get ten of Automata's famous games for only a quid each! PI-IN-'ERE : CRUSOE : DARTZ : NEW WHEELS, JOHN? : MORRIS MEETS THE BIKERS : PI-BALLED : PI-EYED : PIROMANIA : OLYMPIANIA : YAKZEE. Kempston stick works on the arcade games. (Automata) CASSETTE £10.00

TECHNICIAN TED "Some of the liveliest, detailed and imaginative graphics I've seen . . . it must be a game to add to your collection. Truly amazing, truly difficult, truly wonderful. 96%." (Crash) "Has the same touches that made JETSETWILLY so clever and professional: precise collision detection, very carefully constructed screens, nicely designed sprites." (PopCompWkly) 50 SCREENS. More difficult than MANIC MINER, with better animation and cleverer tricks! Time limits; continuous music; hints on inlay card! It's got everything. STICKS: Kempston/Interface2/Protek. (Quicksilver) CASSETTE £5.95

ALIEN 8 The beautifully graphical and extremely animated son of KNIGHT LORE. The same kind of totally amazing 3D graphics, but with brand-new puzzles in every room. The cassette card lists 50 different features. We have found it just as addictive as Knight Lore and, in fact, it's busy driving us crazy: there has to be a way to win. STICKS: Kempston/Interface2/Cursor. (Ultimate) CASSETTE £9.95

MATCH DAY "Must be the definitive football game for the Spectrum . . . This one has the best graphics, playability and atmosphere . . . a great sports simulation." (Crash) "Spectrum owners should be over the moon with this . . . marvel at the ball control of the smoothly moving players." (PopCompWkly) 3D Football simulation getting raves all round. Choose your team names and strips. Define your own keys or use Kempston stick. The best there is. (Ocean) CASSETTE £7.95

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, no wonder we've sold so many! (Database) CASSETTE £5.95

SYSTEM 15000 "One of the most gripping and compulsive Spectrum games so far . . . utterly absorbing and compelling . . . absolutely recommended." (SinclairUser) "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." (YrComputer) NO STICKS (Craig) CASSETTE £9.95

MACHINE CODE TUTOR "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. Clear, helpful manual. NO STICKS (NEW GENERATION) TWO CASSETTES £14.95

SPEEDYSOFT

VISA/ACCESS CALL 01-789 8546 (24 HRS)

POST TO: SPEEDYSOFT (SU30)
87 HOWARD'S LANE, LONDON SW15 6NU, ENGLAND.
For CATALOGUE ONLY, send £1 cash. Refunded with your first order.
I own a SPECTRUM. I enclose a cheque/PO payable to Speedysoft
OR charge my
VISA/ACCESS/EUROCARD/MASTERCARD

No.

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 Name	Price
Postage & Packing	UK add 75p per order
	Europe ADD £1.00 per program
	Outside Europe ADD £1.50 per program
	Total Order

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

THE VIDEO GAME OF THE
25TH CENTURY...

BUCK ROGERS™

PLANET OF ZOOM



It's the 25th Century.

You are Buck Rogers fighting the battle of Planet Zoom. Skillfully slip through zapping electron posts. Dodge and destroy deadly space hoppers and alien saucers. Your race against time has just begun! Prepare for battle with your most powerful enemy... the Mother Ship! You must hit the Mother Ship dead centre. Anything less will only waste fuel. Aim steady, but hurry... your fuel is dangerously low!

Available on

SPECTRUM 48K £7.95



ON THE SPECTRUM NOW!

PETE AUSTIN contemplates an empty beer mug in a High Wycombe pub, trying to decide whether he wants another half before he leaves. In doing so he displays the same measured concentration that his victims in alien worlds must employ to avoid sudden death from any one of a myriad traps.

For Pete is the king of British adventure, the driving force behind Level 9 Software. His company has won a name for text adventures in the classic tradition — **Colossal Adventure**, **Lords of Time**, **Snowball** — vast games of 200 or more locations, with more puzzles than was believed possible on a standard home micro.

Pete's interest in fantasy games goes back to the days of graph paper and dice. At school he became involved with table-top wargaming, sending battalions of Sherman tanks across the chipboard to flush out the German

Nick and Pete Austin, space pioneers



Another time, another space. Chris Bourne reaches Level 9

armoured defences.

Later, at Cambridge University, where he studied Psychology and later Computer Science, he discovered *Dungeons and Dragons*, the fantasy role-playing game.

You can tell from the way Pete talks about the game that he was once a dedicated fan, whatever occupies his time now. He and his friends also played a game called *Empire of the Petal Throne*. "In the evenings we either played D&D or we went down to the pub . . . and played Petal Throne."

Computing began with a course at Cambridge "which was really just an excuse to stay there for an extra year." On finally dragging himself away from the ivory towers, Pete set off in search of fame and fortune. He became a programming consultant and worked for 18 months on an enquiry package for banks and suchlike. No glittering prizes for young Pete Austin.

"You don't get much choice about your next package," he says. "I got put on an accounting package. There had already been 50 people working on it. You end up writing very defensive code. I didn't fancy that as a full-time job."

Pete moved to mainframe manufac-

turer Perkin-Elmer. He had lost touch with his D&D friends but discovered, to his lasting joy, a version of the original Crowther and Woods **Adventure** program on the main computer there. "We played it during the lunch hours. There had been a number of simpler games on the computer at Cambridge, based on the D&D format. **Adventure** was full of puzzles, many of which were extremely unfair. I cracked it in two weeks."

He smiles at the memory. Two weeks to beat **Adventure**? Most people take six months. Pete is still proud of the achievement.

Pete has two younger brothers, Nicholas and Michael, and a sister Margaret. While he was still working for Perkin-Elmer, he and the brothers formed Level 9 in order to utilise their combined computing expertise. Nicholas studied computer science at London university and Michael is currently reading engineering at Southampton. "He doesn't need to do it," says Pete. "He could teach it instead."

Margaret joined later to take over marketing, and recently their father

John, having retired from the BBC, came in on the act, soon to become managing director.

Do you remember the Nascom? It was one of the first home micros, in the days of kits and small RAMs. Pete bought a Nascom, and Level 9's first program was an extension to Nascom Basic. It sold well. In those days business was good with sales of 500 or more.

The first game, also for the Nascom, was called **Fantasy**. Pete says it was like **Valhalla** but with no graphics. "There were a lot of characters wandering around who changed according to your actions. What I did was to make it print out in proper English. I'm interested in the user interface, what used to be called front-end programming."

Indeed, the series of adventures which has since flowed from Level 9 is renowned for high standards of plot and literate description, in spite of notorious spelling mistakes. Pete is irked by 'climbable' which still remains in **Colossal Adventure**, despite numerous corrections to each new edition.

Colossal Adventure, a faithful version of the Crowther and Woods original, took about a year to produce, and was written for the BBC and Spectrum simultaneously. The cramped office at Level 9 has three BBC micros as well as an IBM PC. No Spectrums were in evidence, although Pete insisted there were plenty about.

Level 9 uses a standard adventure writing system for its products, which was designed by Pete himself. "Michael then coded it using the a-code language which he invented for the purpose. I did the text compression section. We brought out Colossal because there were no adventure games around of a decent size. I thought it must be possible to do it in less than 32K. I saw it as a way of getting back into fantasy wargaming."

To squeeze what was originally a 200K mainframe program into 32K, and then to add an extra 70 locations

We take out the arguments so that each Basic instruction only uses two or three bytes."

Colossal Adventure was followed by two sequels, **Adventure Quest** and **Dungeon Adventure**, collectively known as the Middle Earth Trilogy, referring to Tolkien's mythical setting for the *Lord of the Rings*. "Trilogies help. **Adventure Quest** sells as people play Colossal. Middle Earth was a convenient fantasy setting. It was a way of telling people the type of world they were getting."

For the next project, Pete decided to switch to science fiction, and began to create the Silicon Dreams trilogy. "There are far too many generalised fantasy games," he says. "The authors are OD-ing on sword and sorcery novels."

The first SF game, **Snowball**, featured 8000 locations and involved spaceperson Kim Kimberley in a giant

an engineering manual, but authors like Larry Niven — if you make certain assumptions about things like ramships then it all hangs together.

"A game is more like a play than a novel — it has a similar number of words. I would like to put more in than puzzles. Most other adventure descriptions just link puzzles together. It doesn't cost much in memory space to create a logical world."

Pete tells of one nit-picking reviewer who spotted an error in the detail. "Apparently Eden, the planet, is orbiting Eridani E instead of Eridani A," he says, explaining that Eridani E is the wrong type of star. Or is it A? "No one gives a damn except this reviewer. But **Worm in Paradise** will change that. I shall explain how the planet moved. The game ends with mankind getting to the stars via an alien transportation system."

Worm in Paradise is to be the final

On the level

just for the fun of it, was no mean feat. Pete's text compressor has been a feature of all Level 9's mammoth adventures. It works by running through all the messages and searching for common strings.

For example, 'ing' might occur frequently. The compressor replaces 'ing' with a single code wherever it occurs. That done, it goes through again, and again, each time saving more space. "It doesn't always pick up what you'd expect it to," explains Pete. In the phrase 'in the room' the compressor might decide that it was more efficient to use a code for 'n th' and 'e r' rather than pick out 'in' and 'the'. That is not something which occurs to the human mind.

The system has been rewritten to create graphics as well. Level 9 can now store a picture in about 30 bytes, using a similar method to the text compressor. That means a 200 location adventure — the minimum Pete will allow — can have a picture for each location for only another 6K of RAM.

Not content with these two areas, the a-code compiler even compacts Basic program lines. "Most Basic systems have keywords which use a single byte," explains Pete. "We go further.

space station dangerously out of control. Is the androgynous Kim a man or woman? Pete says she's a woman, while sister Margaret says he's a man. Pete considers the point. "No, there's a credit at the end for the design of 'Ms Kimberley's costume'."

Was the ambiguous picture of Kim in the instruction booklet deliberately vague? "It's very accurate," says Pete. "I got the artist, Tim, to draw women the way they are, not exaggerating various features. But it was a deliberately unisex name."

Pete explains that about a third of the people who write to the company are women. "I'm aware of the female audience. I always try to write non-sexist prose."

He goes into some detail on the design of Kim's costume, and why the leotard would make a fine spacesuit in the right sort of material. It is typical of the man that he should have considered such problems. The Silicon Dreams trilogy is meticulously plotted and designed, with features and history stretching well beyond the confines of the game itself.

"SF books I like the most are those where people have paid attention to detail. I don't mean like Arthur C. Clarke where what you get is more like

part of the trilogy, the second, **Return to Eden**, was released late last year. In that, Kim must battle against deadly plant life and evade the rogue robots of the colony planet, who believe her to be a saboteur for her attempts to save the space station in the first game, **Snowball**.

"Worm is set on Eden, about 50 years in the future," says Pete. "The player is not Kim — she becomes mayor and runs the place. She defeats the plans of the robots to make the colonists have lots of babies to colonise the Universe. I looked at the original and thought it was as anti-feminist as you could get, so I thought to redress the balance. Because you know less than real people would about our society, I have the player escape from an asylum. It explains why you don't know anything and have no possessions." Thoughtful of you, Pete.

Meanwhile, rather than become stuck in the rut of trilogies, with each game taking about six months to design and program, Level 9 has also been branching out into other areas. The light-hearted **Erik the Viking**, based on ex-Python Terry Jones' children's book, was written for Mosaic, a publishing house which is branching

continued on page 62

Hit Squad

continued from page 61

into software, "Erik was nice," says Pete. "It was a complete break for me."

"It was nicer for me," interjects Margaret. "I don't have to sell the thing."

Following the success of Erik, Mosaic has commissioned Pete to design a game based on the best-selling Diaries of Adrian Mole. How will Level 9 translate the obnoxiously sophisticated 13¾ year old to the digital screen?

"It will be a multi-part game with an enormous amount of text. This is not a promise, but I would like about half a megabyte of text. It will be on twin cassettes. The game will have to have a definite sense of time. You won't be able to go back and buy flowers for your mum if you forgot. People will behave in the same way from section to section, depending on your actions. The object of the game will be to make Adrian Mole popular — not just with his girlfriend Pandora but with the whole world."

If that sounds ambitious, Pete has even bigger plans for 1986. "By the end of this year I want to be much nearer to soap opera. I don't mean like Adrian Mole — those are caricatures.



I want characters to be more real, like Floyd in *Planetfall* by Infocom." That includes storylines which induce emotion, such as feeling sad if a character gets hurt.

In the meantime, releases for the near future include *Red Moon* and *The Price of Magic*. *Red Moon* will depart from the problem-solving style of Level 9 and use fantasy role-playing combat and magic systems to produce a more open-ended game. "It will

have an enormous number of pictures all fairly similar to each other. Players of *Runequest* will recognise it.

"*The Price of Magic* will be based on the Cthulhu mythos from the stories of H P Lovecraft. Your sanity decreases as you increase your score. You can only do certain things if you are sane. If you are too insane you won't be able to go outdoors."

It sounds like a description of a fanatic Level 9 adventurer . . .

SHARP'S INVADES ENGLAND!

WAR in the EAST

£9.95

The simplest of the four but our best seller. As commander of the German forces you must launch a surprise invasion of Russia, capture and hold Moscow before the weather and the Red Army overwhelms you. Effects of terrain, weather and fuel supply. Eleven types of divisions and brigades. 1½ hr. playing time. Also for 16K-ZX81.

FALL of the THIRD REICH

£9.95

As the German player your devastated army must hold off the Allies and Russians on two different fronts, and hold Berlin as long as possible. Effects of rivers, forts, and mountains. Multiple attacks are used on both sides. A real nightmare for the player. 1 hour playing time.

ARDENNES

£9.95

In a desperate attempt you have to break through the Allied lines, inflict heavy losses and capture as many towns as possible to prevent "Fall of the Third Reich". Scrolling map—brigade and regiment size. 2 hours playing time.

BRITAIN INVADED!

£9.95

The most advanced of the four games. The player must defend England in this hypothetical invasion during WW II. Effects of rail lines, weather, terrain & ports. Scrolling map, multiple attacks. Every German invasion is totally different. All this, and more makes this game a must! 1½ hr. playing time.

Each game has a hi-res. map in color with sound. These are true military recreations of what happened. The ending depends on you. These are not arcade or adventure games! No fast reflexes required. Not recommended for young children.

Spectrum 48K

No postage or handling required. All orders dispatched in 48 hrs. via air mail. Guaranteed satisfaction. Thousands sold in U.S.A. Order by check/P. O./Visa.

Now available to you only by:

SHARP'S
Rt. 10 Box 459
Mechanicsville, VA 23111
U.S.A.
Tel: (804) 730-9697

How to store and remove data from RAM.
John Gilbert explains the process

Stroll down memory lane

LAST MONTH I examined ways of entering information into, and getting information out of, the Spectrum. I also showed how that information, called data, is stored in the machine using the media of Random Access Memory and Read Only Memory.

During the course of that discussion it was revealed that the Spectrum cannot understand the Basic language in the form in which we enter it. It needs to translate Basic into its own language in order to execute your instructions.

A special translator program has been built into the ROM of the machine to do all the hard work and, if you looked at the results, all you would see is a long line of numbers. Each number is either part of an instruction which the computer can execute, or a datum which can be processed by the computer.

We are not concerned with the machine language instructions in this series, but the numeric representation of the data within RAM is of interest if we want to cram as much into memory as possible.

Each number will fit into one location in RAM which can be depicted as a honeycomb, as shown in figure one. The number must be whole and decimal. You can enter 23 but 2.3 will not fit.

The range of the number is important. Values should be below or equal to 255 but not less than -255. You therefore have a range of 256 values on the positive scale and 255 on the negative. We are taking zero to be a positive value although in real terms it is not.

Basic has not been built to do much manipulation of numbers within the RAM but there are two operations which you can perform and those are to put a number in and take it out to examine it. To do that you must know something of the structure of RAM.

Each memory location has a unique identifying number, called an address.

If you want to put in or look at a number you must reference the specific memory location required. That is done by using one of two Basic instructions. The POKE instruction will put a number into a RAM location, rather like INPUT. Its format is POKE address, value.

The location address must be a positive number between zero and 65535, and preferably between 16384 and 32767, which is within the Basic RAM area prescribed by the ZX Spectrum User Guide. In order to see the effect of POKE on a cell of RAM type NEW into the machine and then type:

POKE 16390, 15

The command will put the value 15 into the RAM cell with the 16390 address label.

To see if the number has been entered you must use the aptly named PEEK instruction which should be preceded by a PRINT command. The format is similar to POKE but only the address of the RAM cell need be specified:

PRINT PEEK address

Type in the instruction PRINT PEEK 16390 and you should get the number 15.

You might have noticed that the example POKE has an immediate effect on the screen display. A very small line, made up of a couple of pixel dots, is displayed near the top of the screen. You will only just see it.

Last month I explained that the screen display is stored in RAM. If you alter a value in that RAM you will produce a dot or line on the screen. I will be discussing the screen map in more depth in a later article but for now, if you can find the place in which the dots appear, run the short program below.

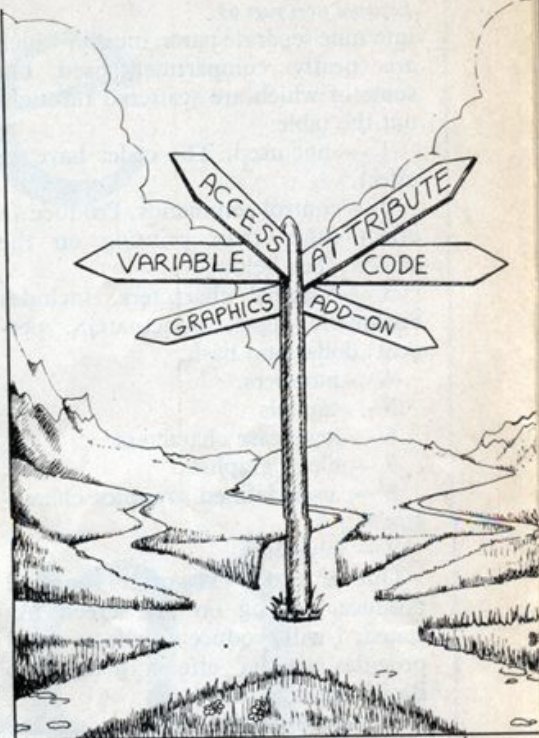
10 POKE 16390, 255

20 PAUSE 20

30 POKE 16390, 0

40 GOTO 10

The routine uses the highest and lowest values in the POKE range, zero



and 255. The bigger the number the longer the line drawn on the screen. If you could measure it you would find that 255 gives a line length which is just more than the width of a character. If 255 fills in a part of the screen with black INK then the zero at line 30 clears out the RAM cell so that nothing is shown on the screen. Line 40 loops back to line 10 where the process is repeated.

The above program shows the power of numbers and how the RAM is organised, to some extent, but there is more to this business than moving numbers around memory cells. The computer needs to represent alphabetic characters as well as numbers. To do that the Spectrum uses the positive scale zero to 255 to represent all the characters, printable or not, which the user and the machine will need.

Those representations form the character set and a full table of meanings is given in Appendix A of the ZX Spectrum Basic Programming manual. We are only interested in the first two columns of that table, the code and the character. The code is the number which represents the character to the Spectrum. For instance, code 65 represents a capital A to the computer.

You may have noticed that the range of codes 48 to 57 represent the digits. That is not so strange. The computer can use the digits to make up any number that it requires.

The character set table can be split

continued on page 64

continued from page 63

into nine separate parts, most of which are neatly compartmentalised but some of which are scattered throughout the table.

1 — not used. The codes have no effect.

2 — control commands. Produce an effect other than printing on the screen. (See below)

3 — special characters. Includes arithmetic signs, punctuation, percent, dollar and hash.

4 — numbers.

5 — capitals.

6 — lowercase characters.

7 — block graphics.

8 — user-defined graphics characters.

9 — keywords.

Out of those categories 1 and 2 produce nothing on the screen. As stated, 1 will produce no effects and 2 provides special effects using two Basic language functions.

Firstly, however, you can see the effect of those printable characters using the Basic function CHR\$ followed by one of the codes within brackets. If you wanted to print the letter A on the screen you would look up the code, which is 65 and type:

```
PRINT CHR$(65)
```

The letter A should then appear at the top of the screen.

You can chain groups of letters to form words by using the '+' sign, in a similar way to that shown in last month's article. The format then is PRINT CHR\$(code) + CHR\$(code) ... If you wanted to display 'Guide' you would type:

```
PRINT CHR$(71) + CHR$(117)
+ CHR$(105) + CHR$(100) +
CHR$(101)
```

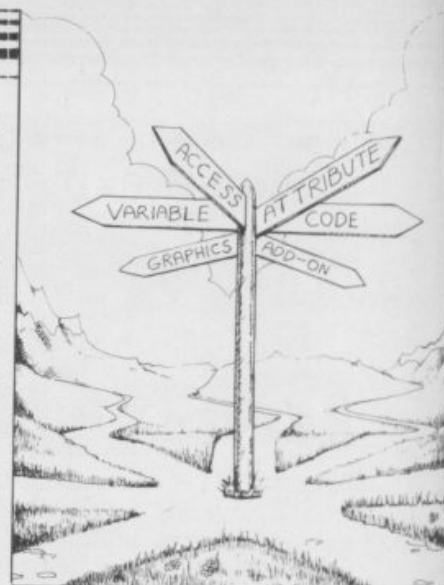
It is also possible to convert characters to their numeric code representations using another Basic function, CODE which contains the character in brackets and within quotation marks. The instruction PRINT CODE ("A") would display the number 65 on the screen.

As with most other Basic instructions constants can be replaced with variables. You could, therefore, have put a variable between those brackets. The program below demonstrates the point. It uses a simple loop to print out the alphabet and its corresponding codes.

```
10 CLS
20 FOR K= 65 TO 90
30 PRINT CHR$(K); "="; K
40 PRINT
50 NEXT K
```

The program demonstrates the conversion principle which is used in this month's Entry Program, listing one, where a block of text can be entered and stored in code form in memory. Such a block can be accessed from programs using the POKE instruction and memory saved by packing text and not using variables.

The non-printable characters, which were briefly discussed earlier, provide short ways of executing instructions which are usually the province of Basic instructions. They range between codes six and 23. They can be used with the ordinary CHR\$ instruction and put within any Basic print statement.



You may want to split the word GUIDE into two parts, the split taking place after the letter U. To do that type:

```
PRINT CHR$(71) + CHR$(117)
+ CHR$(13) + CHR$(105) + CHR$(100) + CHR$(101)
```

Put in the line and the display should look like

```
GU
IDE
```

The CHR\$(13) function performs an ENTER and the rest of the word is printed on the next line. The other codes perform in a similar manner but INK and PAPER require numbers to give the computer an instruction of the colour to be used by the function.

There is a lot of fun to be had experimenting with various code combinations and, looking at listing one, you will be able to work out uses for them. Whatever you do, however, you will soon find that numbers are all to the Spectrum.

Listing 1: The routine shows the way in which text can be broken down and stored as a block in RAM memory using the POKE, PEEK, CHR\$ and CODE instructions and functions. First each value is poked into a RAM cell and then the whole area of RAM is scanned and the numeric representation of the block of text is shown on the screen. You have ample opportunity to turn this simple routine into a code maker or code breaker program.

Line 5. The CLEAR instruction removes any values in the variables area of RAM and releases sections of memory which have been tied up for use by the operating system or in running other user programs. A safety measure which clears memory.

Line 10 clears the screen display and line 20 asks you to enter your block of text. Try short sentences for clearer results.

Line 20 puts the first RAM cell which is to be used into the variable A.

Line 30 starts a loop which is dependent upon the number of characters in the A\$ string. For instance, if A\$ contained HELP the loop would go around four times.

Line 40 contains the first POKE. It uses the current value of variable A as the address into which it puts the code number of the character sliced by the instruction A\$(K TO K) — see last month's article. For instance, if loop variable K contained 1 it would put the first character of the string A\$ into the RAM cell. The line could be made shorter by making A\$(K TO K) to A\$(K) — after all, you are looking for only one character not a range.

Line 50 adds one to the address number stored in A and line 60 loops back to 30 until the whole string has been scanned and translated. That is the end of the translation section of the routine and RAM now

```
5 CLEAR
10 CLS
20 INPUT "TEXT "; A$
25 LET A=32768
30 FOR K=1 TO LEN A$
40 POKE A, CODE (A$(K TO K))
50 LET A=A+1
60 NEXT K
70 FOR K=32768 TO 32768+LEN A$
-1
80 PRINT PEEK (K); " ";
90 NEXT K
```

contains a numeric representation of your string.

Lines 70 to 90 display those values on the screen. Line 70 starts a loop which uses 32768 as the base address — the one in which the first string character is stored — and will loop around until we reach the end of the original A\$ length. The -1 suppresses a zero from the end of the translation as it is shown on the screen.

Line 80 PEEKs the number stored at the address being scanned, putting a space between each value and line 90 NEXTs to line 70 where the process is repeated until the whole of the string numeric representation is displayed.

If you're into program writing...

If the programs you are writing involve sophisticated graphics, you have two choices, a severe headache or Touchmaster.

Obviously you'll want to consider the matter, so in the mean time send away for your free Touchmaster literature and find out more about the best value/performance graphics tablet available... or take two pain killers!

TOUCHMASTER
 Touchmaster Limited, PO Box 3,
Port Talbot, West Glamorgan, SA13 1WH.

To Touchmaster Limited, FREEPOST, Port Talbot, West Glamorgan, SA13 1ZZ.
Please send me free Touchmaster literature. SU 4/85

Name

Address

Make of
computer

FRANK



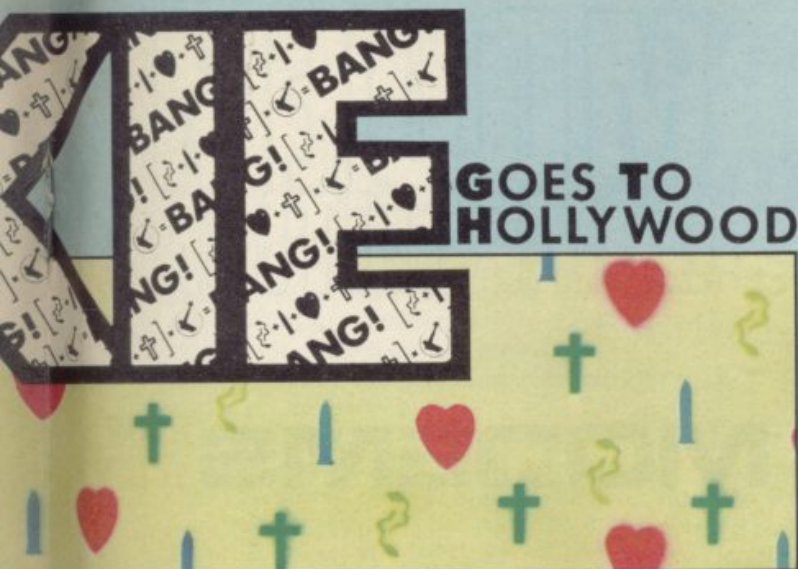
STREET HAWK



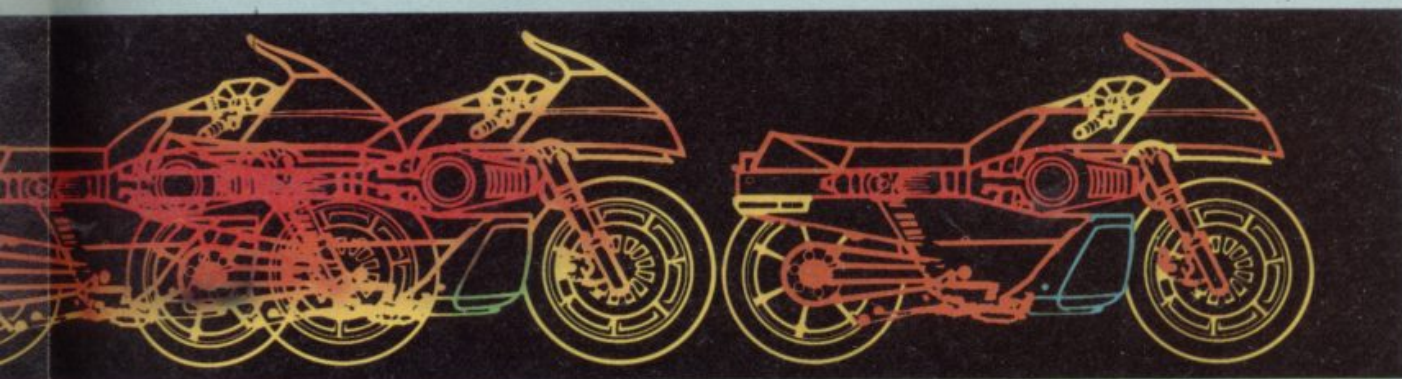
Daley Thompson's



SPECTRUM 48K · COMMODORE



BRAND
NEW
BIG
NAMES
BIG
GAMES



SUPER
TEST

Exciting
times ahead
from the
crew at...



Link to Giant Mainframes and network to thousands of Micro users via your 'phone with free Modems and Comms software in the British Telecom Modem competition.

British Telecom is offering 1000 free gift packs to plug direct into your home 'phone line.

British
TELECOM

MODEM COMPETITION

1000 FREE MODEMS

500 for Spectrum/Spectrum +
350 for BBC Model B
150 for Commodore 64

And if you haven't got a square-type BT phone socket, British Telecom will arrange to alter your installation at no charge!

HOW TO ENTER

(Monday 22nd April to Sunday 5th May 6pm to midnight)

For the 5 questions 'phone

01-627 3000 or
021-449 9944 or
031-225 8999

To get the Tiebreaker Sentence 'phone

01-627 1199 or
0532 455030 or
0632 324444

Complete the entry form using your skill and judgement, and send it off in the next post.

RULES OF THE BRITISH TELECOM MODEM COMPETITION

- 1) The dial-in is available from 6pm Monday 22nd April to midnight Sunday 5th May 1985, when the competition closes.
- 2) Entries must be postmarked the next working day after the questions and tiebreaker were obtained.
- 3) Entries can only be made on the official entry forms and become the property of British Telecommunications plc.
- 4) The competition is open only to residents of the United Kingdom over the age of 18 years. Employees of the Network Marketing Unit of British Telecommunications plc and PARKER REDMILE LTD. and their dependants are excluded. Only one winning entry per household.
- 5) Entries not reaching the competition address before midnight on Thursday 9th May 1985 will not be considered.
- 6) A list of winners will be provided at the competition address. Please send an SAE if you wish to receive it.
- 7) The winners will be picked as follows from entries received on time and properly completed -
The entries for each type of prize pack with all correct answers to the 5 questions and with the tiebreaker sentences judged most apt and humorous by the competition organisers will be chosen, subject to the stock of appropriate prize packs.
- 8) The decision of the competition organisers is final and no correspondence will be entered into. Winners will be notified automatically.
- 9) British Telecommunications plc offers winners requesting BT 'phone socket conversion on entry forms to waive the charge normally made for such work.
- 10) Details of how to get on Prestel/Micronet 800/Telecom Gold will be sent to winners. Subscriptions not included in prize.

OFFICIAL ENTRY FORM

A. Your answers:

- Q 1
Q 2
Q 3
Q 4
Q 5

B. Tiebreaker Sentence complete (25 words or less in total):

.....
.....
.....

C. If I win, I would like the prize pack for the

- ☐ SPECTRUM/SPECTRUM +
☐ BBC MODEL B (Tick Choice)
☐ COMMODORE 64

D. My home telephone line (* Delete as appropriate)

- (a) already has a square-type BT 'phone socket * or
(b) would need converting to square-type BT 'phone socket *

If (b), the person renting the line from British Telecom must fill in this declaration -
If this is a winning entry, I agree to ask British Telecom to convert my line to square-type BT 'phone socket at a convenient date before 1st July 1985. My line is on Residential rental, is not a coinbox and is not shared service. I understand British Telecom will not charge for doing the work.

Name (Block Capitals)

Telephone number

Signature

Date 1985

E. I have read the rules of the British Telecom Modem competition and agree to abide by them. I am over 18 years old.

Signature of entrant

Date 1985

Name (Block Capitals)

Address

Postcode

POST IMMEDIATELY TO:-

British Telecom Modem Competition
PO BOX 73
MITCHAM
SURREY
CR4 2XU su

(Postage stamp required)

WINNERS WILL BE NOTIFIED AUTOMATICALLY

THERE are two ways of writing a program, unstructured programming and structured programming. The second is preferable in terms of speed and accessibility. It also lends itself better to the principles of SuperBASIC which is one of the reasons why it was developed.

Unstructured programs are usually difficult to read, especially if they contain hundreds of instructions. Some REMark statements may have been put into the program but you will have to scan the whole listing in order to correct an error.

Alternatively, the simple techniques of structured programming ensure that you do not have to look through hundreds of lines of your program in order to find the parts which are giving you an error message. You may only have to look through five or six lines. Also, using structured techniques you should halve the number of errors which occur.

Even unstructured programs have a pattern. One line follows another and GOTO statements are used not once or twice but hundreds of times, usually to alter the flow of the program in order to get around errors or other problems.

```
10 AT 10,0:PRINT"DO YOU WANT INSTRUCTIONS (Y/N)"
20 INPUT AN$
30 IF AN$="Y" THEN GO TO 120
40 IF AN$="N" THEN GO TO 60
50 GO TO 10
60 PRINT"THIS IS THE MAIN CORE"
70 PRINT"OF THE PROGRAM IN WHICH"
80 PRINT"ALL THE INFORMATION IS"
90 PRINT"PROCESSED"
100 PRINT"IT FINISHES HERE"
110 GO TO 170
120 CLS:AT 0,10:PRINT"INSTRUCTIONS"
130 PRINT"THESE ARE THE INSTRUCTIONS"
140 PRINT"FOR THE PROGRAM"
150 PRINT"THEY WILL TELL YOU HOW IT WORKS"
160 PRINT"AND THEY FINISH HERE"
170 GO TO 10
```

Although there are no errors in it, the program above is difficult to read and unless it was made obvious, as it has been here, which part performs which task, those jobs would be difficult to work out.

The program starts simply enough by asking whether the user needs instructions and then goes to the instructions further down the listing if they are required. If no instructions are needed the QL will go on to the main part of the listing.

The listing is made confusing by placing the instructions in a seemingly random fashion following the main

Structure made simple

John Gilbert's forthcoming book draws a blueprint for programming

meat of the program. The program could, however, be rewritten using the structured technique with some of the instructions at your command in SuperBASIC.

Splitting into subroutines

SuperBASIC is a specially structured language and there are several ways in which the above program could be made to run faster and be easier to read.

The first action is to strip the program into subroutines. Look at the lines of the program and see what they are doing. Find out all the tasks which the computer has to do while the program is running and then separate those tasks so that each forms a routine. Those routines are put together within the program and executed one at a time.

The program asks you whether instructions are required. If they are not then it goes on to perform the main core which is to simply print out a few lines of text onto the screen.

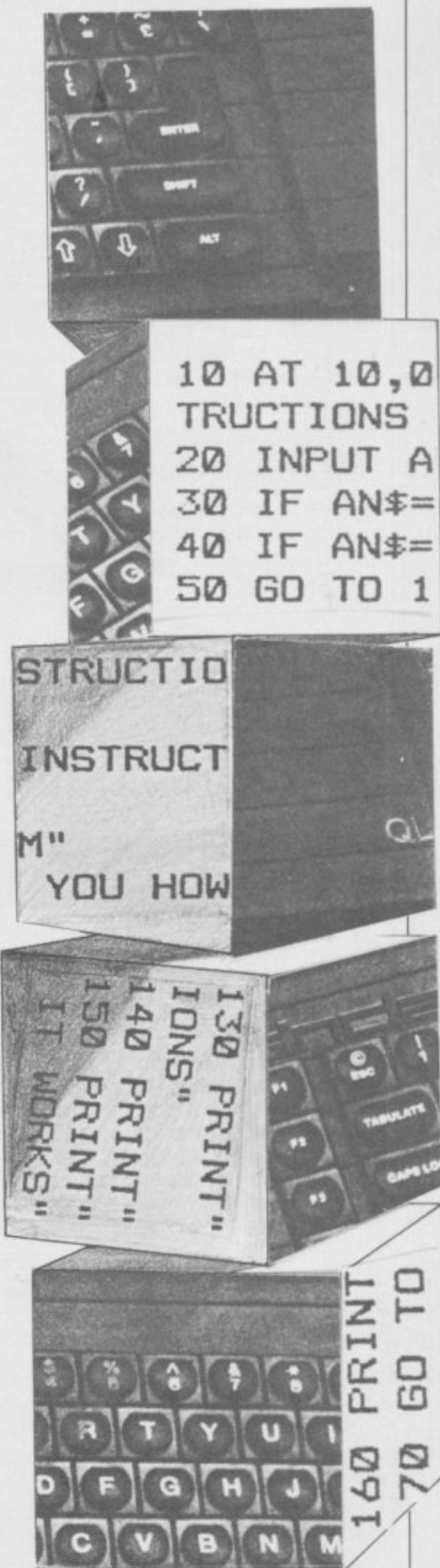
If instructions are required the computer will transfer control to line 120 and help is given on how to cope with the program.

If you are to make a good job of the program you will have to do more than structure it into subroutines, so you might as well tidy it and add a title page. Error trapping is noticeable by its absence so you could add that as well.

The first rough draft of the program would look like this:

1. Print a title page.
2. Ask user if instructions are required. (a) if they are go to subroutine 4 (b) if not go to subroutine 3 (c) if neither then ask again.
3. Main part of program in which some text will be printed onto the screen.

continued on page 71



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.

*We also produce our own Spectrum "48K Upgrade Kits" complete with fitting instructions....
£24.00 (VAT+P&P) inclusive.*

Switchable UHF — composite video can be fitted to your Spectrum for only £14.00+VAT+£2.00 P&P.

Trade enquiries welcome

NEW — FROM TALENT!

GRAPHIQL

Create superb colour pictures on your QL with TALENT's outstanding new graphics package. It's supplied on two microdrives — the first holds the master program and a printer dump utility, the second, three demonstration pictures. Backup copies can be made. GRAPHIQL comes with a detailed, clearly-written instruction manual, outlining the program's many facilities.

Features include:

- Freehand drawing, 8 colours, optional flash
- Rubber banding, rubber boxes, even rubber circles and ellipses
- Variable size texture definition
- Doodle pad
- Colour and texture fill of any shaped area
- User-definable paint brush — any colour or width
- Colour list for full colour control
- Re-colour facility
- Magnification with panning
- Mirroring and rotation of blocks of screen
- Air-brush effect
- On-line 'help' facility
- Full file-store access
- Printer dump utility

Text can be included in pictures. The characters can be single or double height with flash and underline.

GRAPHIQL pictures can be put into BASIC or assembler programs with the sample routines provided.

Available in March by mail order direct from:

£34.95

+ 50p postage & packing

TALENT

COMPUTER SYSTEMS

Curran Building,

101 St. James Road, Glasgow G4 0NS

Tel: 041-552 2128 (24-hour Credit Card Hot-Line)

SOFTWARE FROM SCOTLAND

continued from page 69

4. Print out the instructions on the screen. Then, return to 2 in case the user wants to see them again.

The tasks need not have been set out as they are in this example. The instructions could have been the second task and the main part of the program the third. It is a good idea to put the most important part of the program first, however, because they are handier to access when you ask for a LIST.

You can now expand on each of the tasks to see what instructions are needed to make the program work.

Section one is easy; you will need the instructions AT and PRINT in order to display the title.

In section two you will need an INPUT statement to ask whether instructions are needed, and a series of three IF statements to see what answer has been returned.

The third section requires just the PRINT statement in order to display the information which is set out in the main core of the program. The AT instruction may also be used if you want to display different parts of the text in different places on the screen.

Section four is almost the same as the third, main core, section of the program. It only requires the PRINT command and also, perhaps a couple of PRINT separators.

So, PRINT, AT and IF are the only statements required within the program. You can now start to build up each of the subroutines to suit the sections which you have listed.

The best way to plan subroutines is to start them in blocks, each block beginning with a line number which is a multiple of a thousand.

The first subroutine is to be used for the title page.

```
1000 REMark * TITLE
1010 CLS
1020 AT 50,50
1030 PRINT"THE TITLE"
1040 PAUSE 5*50
1050 RETURN
```

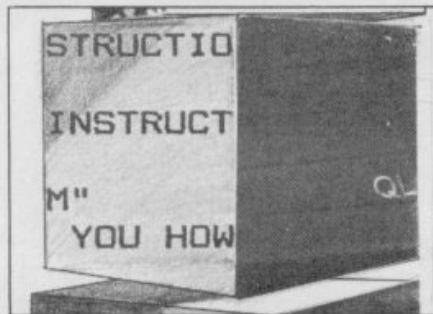
Everything within this listing should be familiar except for one instruction which is located on the last line, 1050. That is the end of the subroutine and the RETURN instruction tells the computer to return to the task which it was performing before it was called to perform the INSTRUCTIONS subroutine.

The next subroutine should ask whether instructions are required by the user. It follows the numbering system of the program and starts at 2000 with a REM statement.

```
2000 REMark * ASK IF INSTRUCTION
S ARE NECESSARY
2010 CLS
2020 AT 10,0
2030 PRINT "ARE INSTRUCTIONS REQ
UIRED (Y/N)?"
2040 INPUT INST$
2050 IF INST$="Y" THEN LET REC=1
2060 IF INST$="N" THEN LET REC=0
2070 RETURN
```

The RETURN command is used again to make the computer go back to the instruction which it was to perform next before it was called away to run the subroutine.

An interesting technique has been used in order that the QL can tell whether instructions are needed when it returns to its next task. A reply is required from the user and it is put into a string variable called INST\$. If the reply is 'Y' for 'yes' then the variable REC will contain the number



'1', but if the answer is 'N' for 'no' the REC variable will contain '0'.

Later the computer will be made to decide whether a yes or no answer has been given by looking at those values.

The next subroutine is the one which provides the instructions if they are needed.

```
3000 REMark * INSTRUCTIONS
3010 CLS: AT 0,10
3020 PRINT"INSTRUCTIONS"
3030 PRINT"\n"THESE ARE THE INSTR
UCTIONS"
3040 PRINT"FOR THE PROGRAM"
3050 PRINT"THEY WILL TELL YOU HO
W IT WORKS"
3060 PAUSE 10*50
3070 RETURN
```

There is nothing very magical about this program. It will print out the title INSTRUCTIONS at 0,10 on the screen followed by the main text which appears three lines down from the headline.

The position of the instructions has changed and it varies from the plan which was drawn up before. The reason for that is to show the versatility of programming using subroutines. You can put them anywhere in the program without altering anything else.

The routine will then make the computer pause for a few seconds,

giving the user time enough to read the instructions, and then RETURN to what it was doing before it was interrupted.

The main part of the program forms the next subroutine. In the example it is just five lines of text but it could be anything from calculations to an arcade or adventure game.

```
4000 REMark * MAIN CORE
4010 CLS
4020 PRINT"THIS IS THE MAIN CORE
"
4030 PRINT"OF THE PROGRAM IN WHI
CH"
4040 PRINT"ALL OF THE INFORMATIO
N IS"
4050 PRINT"PROCESSED."
4060 PRINT"IT FINISHES HERE."
4070 PAUSE 10*50
4080 RETURN
```

That is the last of the subroutines but it is not the end of the program or the last piece of code which you have to write in order to get it working.

Lines 10 to 1000 have not been used. That is because a block of lines has to be inserted at the start of the program.

In order to use subroutines you have to call them and that is done by using the GOSUB instruction. GOSUB is like GOTO. The statement has a line number after it and it is to this line the computer goes in order to execute the instructions there.

When it encounters the RETURN statement it knows the subroutine has finished and returns to execute the next line in the program.

In the case of the above program all that is needed to tie the subroutines together and get them working one after the other is to include GOSUB instructions and a series of IF ... THEN statements to see if the user wants to see some instructions.

```
10 GO SUB 1000:REMark *TITLE
20 GO SUB 2000:REMark *WANT INST
RUCTIONS
30 IF REC=1 THEN GO SUB 3000:REM
ark * IF INSTRUCTIONS NEEDED GO
SUBROUTINE 3000
40 GO SUB 4000:REMark * MAIN COR
E
50 GO TO 5000
```

Above is the control program, it calls all the subroutines, except of course the instructions which are called only if the condition in line 30 is met. The QL will go through each routine, one at a time, and go back to the control routine after it has executed one.

Line 50 tells the QL that once it has finished the program it should jump to the last line which is a REM state-

continued on page 72

continued from page 71
ment.

The REM is put at line 5000, but you could include a subroutine telling the user that the program has finished. All you would need to do is to put another GOSUB instruction on line 50 instead of the GOTO.

GOSUB

The power of the GOSUB statement and its counterpart RETURN is obvious and for the most part it can be substituted for the GOTO instruction.

SuperBASIC contains instructions such as GOTO because other computers use them. The BBC Micro has a language similar to that of the QL, so the listings written for it will be easiest to copy.

Of course, it would be foolish to ban the use of GOTO, advocating instead GOSUB. If you cannot find a better way of writing a particular program then you might have to use it. GOSUB should, however, be used as much as possible. It is the more powerful instruction and is the mark of a good programmer.

Using procedures

A procedure is like a subroutine in many respects. It is a separate section within a program and it can be called from another part of a program. It can be called using its name and does not require a command prefix. You do, however, have to tell the QL where a procedure starts and what its task is. This is called defining.

In order to define a procedure the statement

DEFine PROCedure

is used. The name of the procedure follows the word PROCedure. For instance, you may want to call a procedure Calculus, so you would define it with

DEFine PROCedure Calculus

The name must consist of one word and two will be regarded by the QL as an error.

If you wanted to add a procedure to a program to calculate the percentage of a number, which would be entered within the procedure, you would first define it with the name percent:

10 DEFine PROCedure PERcen-
tage

You can then enter the lines of the program which will find your percentage:

```
20 CLS
30 PRINT "PLEASE ENTER THE TOTAL
FIRST"
40 INPUT NUM1
50 PRINT "PLEASE ENTER THE PERCENTAGE"
60 PRINT "YOU WANT TO FIND OF THAT
```

```
NUMBER"
60 INPUT NUM2
70 PERCENT=(NUM2/100)*NUM1
80 PAUSE 1*50
90 CLS
100 AT 10,10:PRINTNUM2;"PERCENT
OF":NUM1;"IS":PERCENT
```

Just as you had to use RETURN in order to finish a subroutine so you need to use a terminating statement with a procedure:

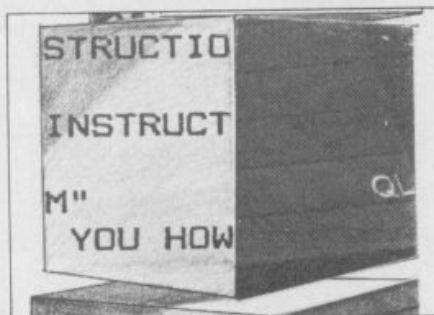
END DEFine

Executing procedures

To invoke a procedure you must type its name. In the program above you would have to add the line

110 PERcentage

The procedure is very much like the subroutine but it is more versatile.



You can use a subroutine by running part of a program but you can use a procedure in immediate mode without running a program. You must, however, have some SuperBASIC lines in order to tell the QL that there are some procedures there.

You might have the series of lines which make up the subroutine PERcentage within the QL. All you have to do to make the procedure work is to type its name.

If you have several procedures set up within a SuperBASIC program you could use each as a small program. You could RUN one by typing its name in immediate mode. The two procedures below will ask you for different input in different ways.

```
10 DEFine PROCedure NUMERIC
20 INPUT "ENTER A NUMBER":NUM
30 IF NUM < 5 THEN PRINT "THAT'S T
OO SMALL"
40 IF NUM > 5 THEN PRINT "THAT'S T
OO BIG"
50 IF NUM = 5 THEN PRINT "THAT'S J
UST RIGHT"
60 END DEFine NUMERIC
70 DEFine PROCedure CHARACTER
80 INPUT "ENTER A CHARACTER":CHAR
90 PRINT "THE CHARACTER WAS":CHAR
100 END DEFine CHARACTER
```

Do not run the program. Just type in one of the procedure names, NUMERIC or CHARACTER, and you will be asked for relevant input.

Local but variable

Both numeric and string variables can be used in procedures those variables can be created within the main body of the program.

There will be occasions when you might want to use the name of a variable which you have defined in the main body of the program but change the value in a procedure. You might, however, want the value of the original variable to remain the same.

You will know that, because of the way the QL identifies variables, you cannot have two with the same name in the same program. You can, however, give two variables the same name if you apply a special condition to the one in the procedure.

It is possible to make the one in the procedure a temporary variable whose effect is only limited or local to the procedure in which it is situated.

You may start your program with the lines

```
10 ANSWER$="YES"
20 PRINT ANSWER$
30 ANSWER$="NO"
40 PRINT:ANSWER$
```

You have changed the value of the string variable ANSWER\$ but you may want to keep the string 'NO' even though you are going to use the same variable name in the procedure which you to invoke on line 50:

50 USER

The procedure is a simple one:

```
60 DEFine PROCedure USER
70 LOCAL ANSWER$
80 INPUT ANSWER$
90 PRINT "YOUR ANSWER IS":ANSWE
R$
100 END DEFine USER
```

In the procedure USER the QL is informed that a local variable is to be set up. The instruction, LOCAL, in line 70 tells the computer which variable is to be called and then it can be set up in the line 80 when the user INPUTS a response.

The response is printed using line 90 and the procedure ends at line 100. As soon as the procedure has finished the computer will go to the instruction after the procedure call which, in this case, is line 110:

110 CLS: PRINT "THE
VARIABLE":ANSWER\$ \ "IS
STILL THERE"

The computer has forgotten the ANSWER\$ variable set up in the procedure and has reinstated the former value which is 'NO'.

An extract from *The QL Book*, copyright © John Gilbert 1985, by permission of Corgi Books. All rights reserved. To be published in June 1985, price £4.95

HISOFT



for the ZX Spectrum

Hisoft is pleased to announce a new compiler for this popular and effective systems programming language. Not a tiny-C but an extensive, easy-to-use implementation of the language. Allows direct execution of compiled statements. Supplied with function library. Available direct from Hisoft for £25, or write for further details.

All prices, UK delivered, relate to 48K ZX Spectrum versions. Our software is available for many other Z80 machines e.g. Amstrad CPC 464, MSX, Memotech, SHARP MZ700, New-Brain, CP/M etc. Please write for details.

HISOFT

ULTRAKIT £9.45

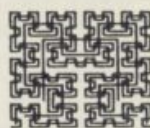
The most powerful toolkit yet for ZX BASIC. All the features you will ever need; AUTO insert, full RENUMBER, block DELETE, CLOCK, ALARM, error trapping, break trapping. Full TRACE with single-step and much, much more. Makes ZX BASIC easy-to-use and powerful.

DEVPAK £14

An excellent assembler, an advanced line-editor, a comprehensive disassembler and a superb 'front panel' debugger all in one package. Used by many leading software houses to write their games. "Buy it!" Adam Denning 1984.

PASCAL £25

A powerful and almost full implementation of Pascal - not a Tiny Pascal. A valuable educational and development tool, programs typically run 40 times faster than a BASIC equivalent. Spectrum version includes Turtle Graphics package. "I haven't seen any other compiler that could match Hisoft's Pascal"



HISOFT

180 High Street North
Dunstable, Beds. LU6 1AT
Tel: (0582) 696421



DEDICATED TO TOP
QUALITY QL SOFTWARE

DIGITAL PRECISION



THE ULTIMATE QL GAMES DESIGNER

NEW

QL SUPER SPRITE GENERATOR

THE COMPLETE SPRITE KIT

DIGITAL PRECISION

FOR THE SINCLAIR QL COMPUTER

RELEASE 2.0

£24.95 COMPLETE WITH EXTENSIVE MANUAL

INCLUDES:

- SUPERB SPEED SPRITE COMPILER
- SPRITE MANAGEMENT PROCEDURES
- ADVANCED SPRITE CREATION EDITOR
- LIBRARY OF SUPERBASIC EXTENSIONS
- DEMONSTRATION SPRITES AND
- A TOTAL OF 32 PROGRAMS PROVIDED!

HERE IT IS... THE PACKAGE YOU HAVE BEEN WAITING FOR! THIS COMPREHENSIVE SYSTEM WILL ALLOW YOU TO CREATE ALL THE SPECIAL EFFECTS OF ARCADE, ADVENTURE AND SIMULATION PROGRAMS. REQUIRES ABSOLUTELY NO 68000 MACHINE CODE KNOWLEDGE — THE COMPILER GENERATES OPTIMAL, HYPERCOMPACT CODE AUTOMATICALLY!

Features include:

- Easy drawing/amending of sprites
- No limit to the number of sprites
- Up to 16 different sprites on screen simultaneously
- Each sprite can have up to 16 different shapes
- "Frames" for animation
- Up to 256 different planes to control depth of movement
- Automatic real-time collision detection
- Both Sprite-Sprite (with identity) and Sprite — Object
- Sprite reversal
- Sprite inversion
- Comprehensive diagnostic run-time error trapping & processing systems
- Ultra high speed action — at top speed the motion is faster than the eye can see
- 100% Variable Speed
- Easy control from within your program, using SUPERBASIC keywords
- Library of preprogrammed sprites
- Easy to use
- Full instructions included
- All processes fully described + flowcharted for clarity
- Ultra large sprites possible
- Full over/under/behind logic
- Freeze Control
- Automatic Screen border detection
- Backup copy
- Full set up/Connect/Extend Test/Reply facilities
- Solid + "Ghastly" sprites and much, much more

CAN BE USED IN YOUR OWN PROGRAMS, WITHOUT ROYALTY RESTRICTIONS — PRODUCES SELF-CONTAINED 68000 MACHINE CODE TO EASILY COEXIST WITH SUPERBASIC FROM WHICH IT IS CALLED.

NEW

QL SUPER BACKGAMMON

FOR THE SINCLAIR QL COMPUTER

RELEASE 2.0

£15.95 COMPLETE WITH RULES & HISTORY OF BACKGAMMON

INTRODUCTORY OFFER!

★ £1 OFF IF YOU BUY 2 PROGRAMS ★ £3 OFF IF YOU BUY 3 PROGRAMS

MAIL ORDER: Just send cheque/postal order/cash to:
DIGITAL PRECISION, 91 Manor Road, London E17 5RY
Delivery will be by return of post. For orders from Europe add £1 per program. For
international orders from all other countries add £1.50 per program. All prices are in UK.

NEW

QL SUPER MONITOR

FOR THE SINCLAIR QL COMPUTER

RELEASE 2.0

£18.95 COMPLETE WITH MANUAL

A TOP FLIGHT FEATURE PACKED 68000 MACHINE CODE MONITOR, TO GET THE BEST OUT OF YOUR QL IN 100% MACHINE CODE. AMAZINGLY SMALLER, FASTER AND MORE COMPREHENSIVE THAN ANY OF ITS COMPETITORS.

FREE! A Full 68000 Standard Disassembler Program is 100% integrated with the Monitor — the combination occupies less than 8.5K! Absolutely incredible compactness!!

Features include:

- Edit/Jump/Trace/Set/Execute/Catalogue/Dump/Load/Save/Display + Set Registers/Debug/Disassemble/Hex + Modulo arithmetic/List + Set + Cancel breakpoints/Sing/Step/Page In + Out of SUPERBASIC/Backup Copy etc.

THE MACHINE CODE PROGRAM WILL ALLOW YOU TO TEST, DEBUG, CHECK AND CORRECT ANY MACHINE CODE PROGRAM — AND TO UNDERSTAND THE OPERATION OF ANYONE ELSE'S! This state-of-the-art product is written entirely in relocatable machine code and, occupying very little space, can reside in the QL at the same time as your other programs (BASIC and machine code) Features include:

DIGITAL PRECISION

IS DEDICATED TO TOP QUALITY SOFTWARE FOR THE QL

WE WILL BUY YOUR ROYALTIES FOR GOOD ORIGINAL CODE

The Band's On The Run!

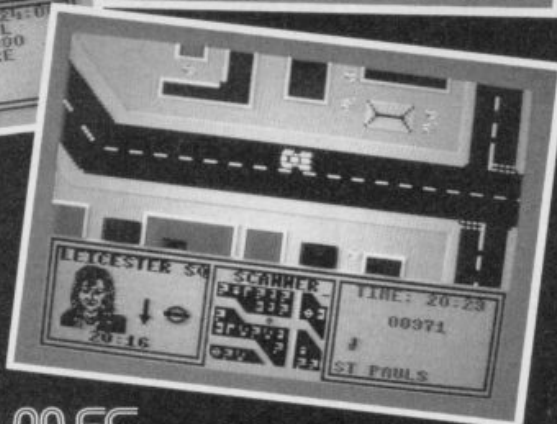
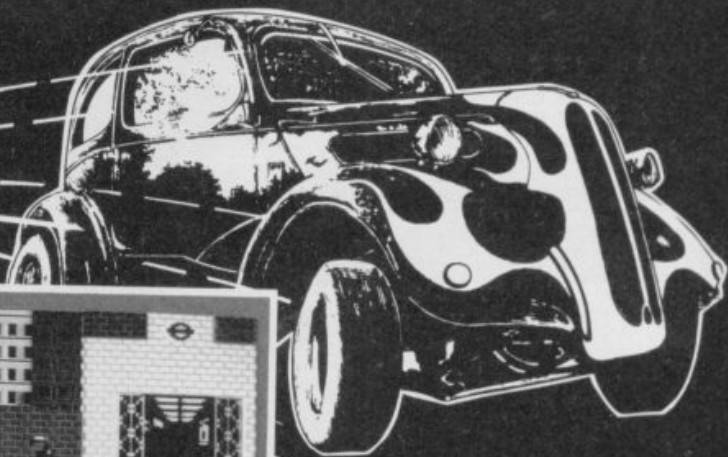
..7 busy characters, 10 lost chords, 15 hours, 48 Traffic Wardens,
95 London Tube Stations, 126,720 square feet of London,
7 million Londoners ... 943 action filled screens.

PAUL McCARTNEY'S *Give my regards to*

BROAD STREET

The new single is missing and the band have gone home for the weekend — leaving you just 15 hours to re-create the missing tune.

A race against time around London to find each member of the missing band. You have to watch out for blue meanies, wardens and Rath! A clever strategy game, full of excitement, brilliant graphics and all wrapped-up with McCartney music!



© 1985

MIND GAMES

Argus Press Software

Liberty House, 222 Regent Street, London W1R 7DB

For the Spectrum and Commodore £7.99

Available from W H Smith, Menzies, Laskys
and all good computer stores.



DAILY EXPRESS
says
'STUNNING'



AT LAST... THE AFFORDABLE ROBOT


The Zero 2 Robot has arrived. It's the first truly micro robotic system available and remarkably it costs less than £100.

Controlled electronically through a cable from your computer, it is equipped with wheels, pen, line follower and two tone horn. It will connect easily with the Spectrum, BBC B, Acorn, Commodore 64 and all other personal computers with a standard 'D' type RS 232 connector.

The Zero 2 Robot will add a new dimension to your computer. It is capable of precision movement to accuracies of 1mm and can be fitted with bump and hole sensors.

As a teaching aid it has endless applications and for P.C. users at home it's just great fun.

With additional software and some exciting new add-ons planned for later this year, the Zero 2 Robot will open up a whole new area of applications and games.



INTERGALACTIC ROBOTS LTD.,
UNIT 208, Highbury Workshop,
22 Highbury Grove, London N.5.

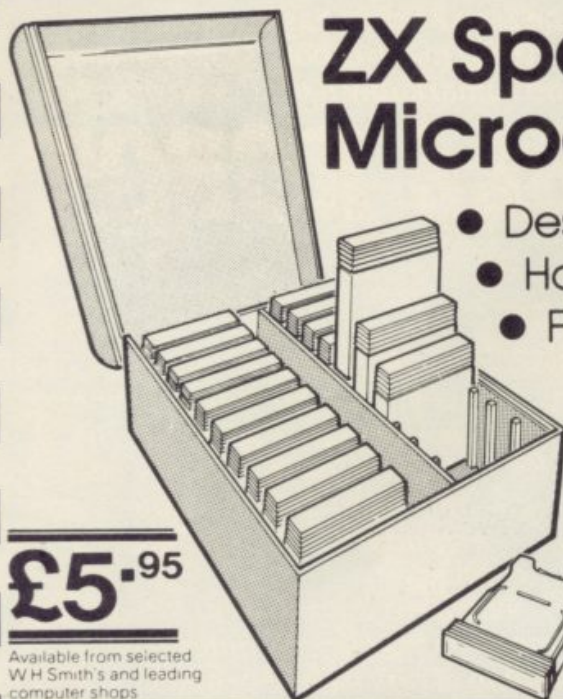
Please send me a free information pack.
INTERGALACTIC ROBOTS LTD., UNIT 208, Highbury Workshop,
22 Highbury Grove, London N.5.

Name _____

Address _____

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

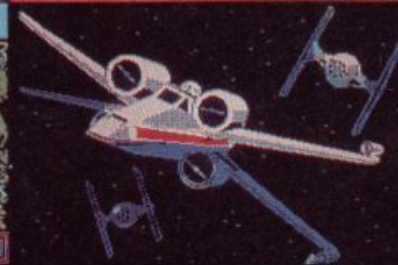
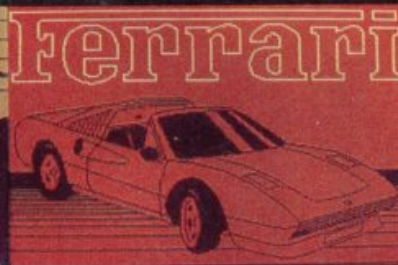
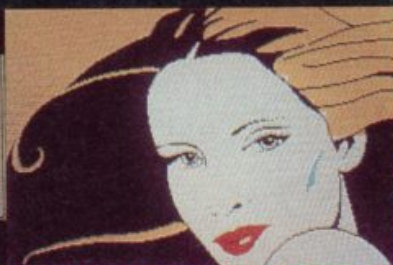


TRANSFORM LTD. (Dept. SU) 089 283 4783
 'Swatlands', Lucks Lane, Paddock Wood, Kent TN12 6QL.



48K SPECTRUM
 INCLUDES PROGRAM, DEMO,
 AND PRINT 'N' PLOTTER
 100 PAGE 'PICTURE BOOK'

Paint Plus and Designed to make superb graphics simple.



MASTERFILE

HOME & BUSINESS FILING SYSTEM

The most versatile database for the 48K Spectrum.

- Up to 36 User-Defined screen/print formats per file, and each can display different selection of fields, in different sequence.
- High efficiency data packing, no wasted filespace.
- Super fast, multi-level file search, record selection capability.
- Up to 51 columns, and 22 lines per record can be displayed.
- From 1 to 22 records at a time can be shown on screen.
- Up to 128 characters per field, 36 fields per record.
- Compatible with Tasman, Euroelectronics and Kempston printer interfaces, and adaptable for most disc systems.

"... the best database for the spectrum is now even better." Sinclair User, Jan '85.

Design your own print layout with MF-PRINT.

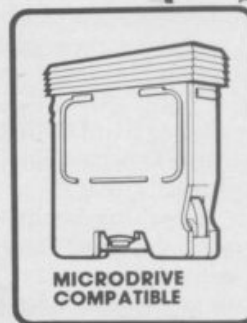
For Masterfile version 09; increases the number of columns to 136+, and has numeric editing and column totals. Almost no reduction in space available for data!

- Masterfile version 09 £14.95
- MF-Print £6.95
- Masterfile with MF-Print £19.95

All available for the 48k spectrum (+) Also available from leading computer stores.

- Enhanced version available for Amstrad at £24.95

The programs are sent on cassette by return post, 1st class, with detailed manual. Prices include VAT and P&P anywhere within Europe.



COMPATIBLE WITH
sinclair
ZX
Microdrives

- Expenditure.
- Data. Addr
- Customers.
- Inventions.
- Collection
- Records.
- obbies
- Sales. F
- Stamps
- Wine L
- Catal
- Telep
- Lists.
- Gar
- File

Campbell Systems

Campbell Systems (Dept. SU)
57 Trap's Hill, Loughton, Essex
IG10 1TD, England. Tel: 01 508 5058



Screen Machine.

If you're a 48K Spectrum owner, PAINTPLUS and SCREEN MACHINE can transform your graphics expertise in seconds! Just take a look at some of the things that are possible with a little practice!

YES they were all produced on a ZX Spectrum with no modification and using PAINTPLUS and SCREEN MACHINE.

These two packages are incredible... PAINTPLUS is a complete upgrade of our previous program Print'n'Plotter Paintbox but with more than 24 new commands and facilities to give you every possible graphic tool.

Some of the new commands are BOX DRAW, ENLARGE TO EDIT, PAPER WASH MODE, UDG GRABBING FROM SCREEN, AUTOMATIC MULTIPLE SCREEN FILES AND UDG BANKS ORGANISER and PAINT ROUTINES IN 5 PATTERNS AVAILABLE IN BOTH NORMAL AND OVER MODE!

SCREEN MACHINE allows you to take the results from PAINTPLUS and manipulate to save memory, recolour, enlarge and reduce, flip and relocate etc.

There's even a complete compiler for text!

Both programs now come with a copy of our 100 page colour book: PRINT'N'PLOTTER PICTURE BOOK and of course a fantastic Demo on side two of the cassette.

Everything is completely Microdrive compatible and easy to transfer to cartridge.

So if you want to produce superb graphics on your 48K Spectrum and you want to do it simply... simply send for a copy of PAINTPLUS and SCREEN MACHINE today or ask at your local computer shop.

Now with 100 page
Print'n'Plotter Picture Book
Full of Hints, Tips,
Programs, Instructions
and Colour Illustrations!

**Print'n'plotter
Products**



Send today or ask your local Computer Shop

Post to: Dept SU Print'n'Plotter Products Ltd. 19 Borough High Street, London SE1 9SE
(Credit Card order telephone 01-660 7231 other enquiries 01-403 3622)

Name

Address

I enclose remittance in full

Please bill my Access/Visa/Mastercard Number

Please send me the following

- ☐ PAINTPLUS at £9.95
- ☐ SCREEN MACHINE at £8.25
- ☐ ADVENTURE PLANNER at £4.50
- ☐ ZX SPECTRUM JOTTER PAD at £9.00
- ☐ ZX PRINTER PAPER 5 ROLLS at £12.00
- ☐ 10 ROLLS at £23.00

All prices include VAT and carriage for the U.K.
Overseas orders add 20% for additional handling (surface rates)

SINCLAIR USER May 1985

Mini Office

BUSINESS software has always tended to be more expensive than games software, partly because fewer copies are sold and partly because the development time is greater. So when someone offers you a complete office automation system with word processor, spreadsheet, database and graphics program for £5.95 you believe in 28 day delivery periods again.

With the release of **Mini Office** for the 48K Spectrum, Database Publications has done exactly that. What is, perhaps, more surprising is that the package represents excellent value for money. The individual programs are not the best you can buy, nor are they likely to tempt the serious user — indeed, you would not expect that. What they do provide is a good, simple introduction to office automation either for the classroom, or for the new user.

The **word processor** offers two typefaces and two character sizes —

The **database** is a much scaled down version. The first thing you notice is its limitations; a maximum of 12 fields with up to 21 characters in each. Using all of those would leave room for only 75 records. Fields can be either numeric or string, but numeric fields are really only useful in searches. Those can be performed for any sequence of characters in a string field, or for values equal to, less than, greater than or between two values.

Although a replace function allows all or parts of fields to be replaced, it is limited — at least with part of a field — to replacing the same number of characters. The database can also be sorted on up to four fields.

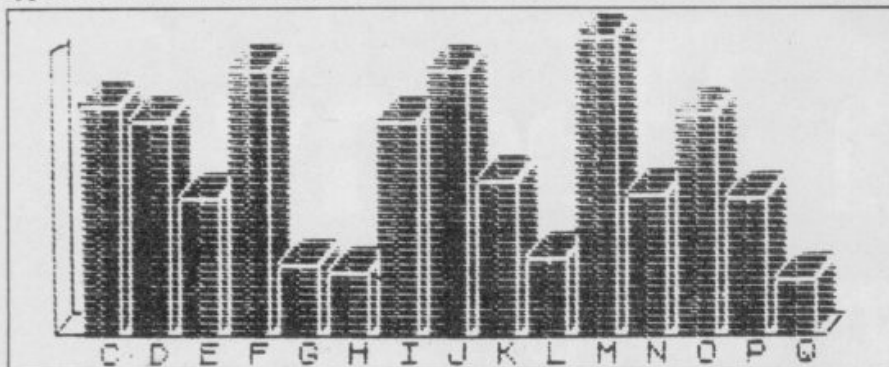
The **spreadsheet** contains most of the necessary elements. Formulae can be used to link boxes, and can also be copied from one box to another, updating for the new row or column in the process. Although the first row and column are reserved for labels of up to eight characters, those labels are not used to define rows or columns. One useful function brings back the previous number in the box. A major restriction is the size of the sheet,



been loaded, the row and then the individual columns of data to be used must be specified. An option does exist to change those to any other in the spreadsheet at any time.

Histograms, line graphs and pie charts can all be drawn. The histograms and line charts are both drawn to include negative values and in all cases the columns are referred to by their letters — A, B, C . . . and so on — rather than their labels. There is no method of altering any piece of data from within the program.

A version of **Mini Office** is being released on the Opus Discovery disc system. Unfortunately, Database Publications seems to have simply transferred the tape program to disc adding the option of loading from or saving to disc in the appropriate place. That means that to get from one program to



Bar chart produced from spreadsheet figures

normal and double-sized. One menu, which also acts as a return point for any illegal entry, runs the program.

The usual range of print, save, load, and verify options for text files is also offered. Left and right margins can be set prior to printing, as can the number of characters per line — up to 32 — and the number of lines per page.

Other facilities include tab stops, page end markers and copy. The last facility copies a letter at a time and is slower than a block copy but because of the way it has been implemented — only the starting point for the move is defined — it is nevertheless effective.

Excellent use of colour helps to distinguish between text which has been typed in and information, such as the number of words and the amount of free space for text.

which can only extend to a maximum of 30 rows by 20 columns.

The **graphics** program is, perhaps, the most disappointing. Data for the program must first be set up in the spreadsheet and saved, before it can be reloaded into the graphics program. Once the spreadsheet file has

A unique feature is the double size text option in both printer and edit mode — perfect for young children and people with poor vision.

Word processor produces a large typeface

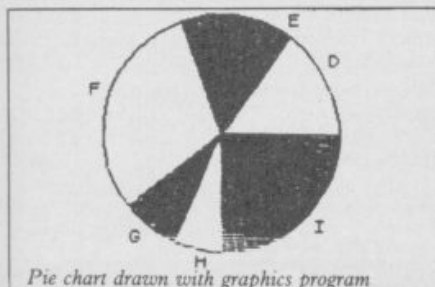


another — except from graphics to spreadsheet — the unit has to be switched off and the disc reloaded. Other routines which are usually a standard feature of disc-based software — such as the ability to list the files on a disc from within the programs — have also been omitted.

It is impossible to recommend **Mini Office** if you are looking for a complete working system unless finance precludes buying the best individual programs — **Tasword II** the word-processor, **Masterfile** the database, **Omnicalc** the spreadsheet and **Projector I** for the business graphics program. However, if you are looking for an inexpensive way of learning how a word processor, database and spreadsheet work then it is to be wholeheartedly recommended.

Mike Wright

Mini Office
Database Publications, Europa House,
68 Chester Road, Hazel Grove,
Stockport SK7 5NY. Price: £5.95



Personal Banking System

PERSONAL Banking System, written by Micromega and marketed by Hilton Computer Services Limited is yet another program designed to help you manage your personal accounts using a 48K Spectrum.

Personal Banking System has been available for some time but improvements to the latest version allows the transfer to, and use of, microdrives and 80-column printers. Further improvements include the use of Myrmidon Software's **Microprint** to give 51 characters per line, the speeding up of some routines by using machine code and the provision of an analysis code so that items of income and expenditure can be grouped together.

The program is menu driven by an eight option main menu which offers the usual options of displaying statements, entering new data, saving and loading data, searching for entries and setting standard orders. The other options allow the reconciliation of bank statements, system maintenance and a forward/back value option used to make changes to data or calculate a forward projection.

Entries can be made in a new calendar year only if an entry has already been made for December. To make data entry easier the amount is

entered in pence, omitting the decimal point.

Regular payments can be handled automatically using the standing order option. The frequency, number of the payments, starting date, as well as the usual entry details of up to 10 standing orders, can be set. The standing orders are then checked and applied, if appropriate, every time an entry is made.

Reconciliation of entries with a bank statement is a common feature but PBS goes one stage further in that bank statements are entered separately. The items are compared against the PBS data and discrepancies divided into types — uncleared cheques and unmatched items, either with a PBS entry or a statement entry. The program can show those items which are similar and could be the same except for an error.

Compared to OCP's **Finance Manager I** found PBS slow, especially when searching for items. Although it has clear, informative screen displays and is an excellent program I still have reservations. Despite my carping, this would figure in any list of recommended programs, and is well worth considering if you are looking for a program to manage your home finances.

Mike Wright

Personal Banking System
Hilton Computer Services, 14
Avalon Road, Orpington, Kent BR6
9AX
Price: £9.95

UNISTAT

FOR MANY years University Software has provided a range of high quality statistical programs for the Spectrum and ZX-81. Improved and revised versions of two of those — **Statistics** and **Super-Regression** — are now available for the 48K Spectrum as **UNISTAT**, a general purpose statistical package.

It contains cassette and microdrive versions of the programs and is priced at £60.00. The package is aimed at statisticians and students of statistics.

The package contains options to generate all the statistics, statistical tests, distributions and diagrams most users are likely to need. The multivariate regression program will cope with exponential and geometric equations as well as the more usual

linear equations.

The cartridge version allows the use of one or two microdrives and a full-sized printer with an RS232 interface, but no allowance has been made for Centronics interfaces.

About 2500 pieces of data can be handled but that is reflected in the poor error-trapping which are only partly due to the programs being written in Basic. They are also slow when handling large amounts of data. Menus are cramped into the bottom few lines of the screen with several options per line. However, if you are going to use the Spectrum for statistical work then **UNISTAT** offers the most complete package available.

Mike Wright

UNISTAT
University Software, 29 St Peter's
Street, London N1 8JP
Price: £60.00

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, superannuation 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

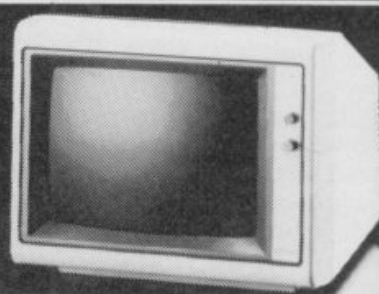
Blank micro-drive cartridges £4.95
Continuous paper £12.99
Printer ribbons from £3.50

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)

24, West Oak, Beckenham, Kent BR3 2EZ

01-658 6350



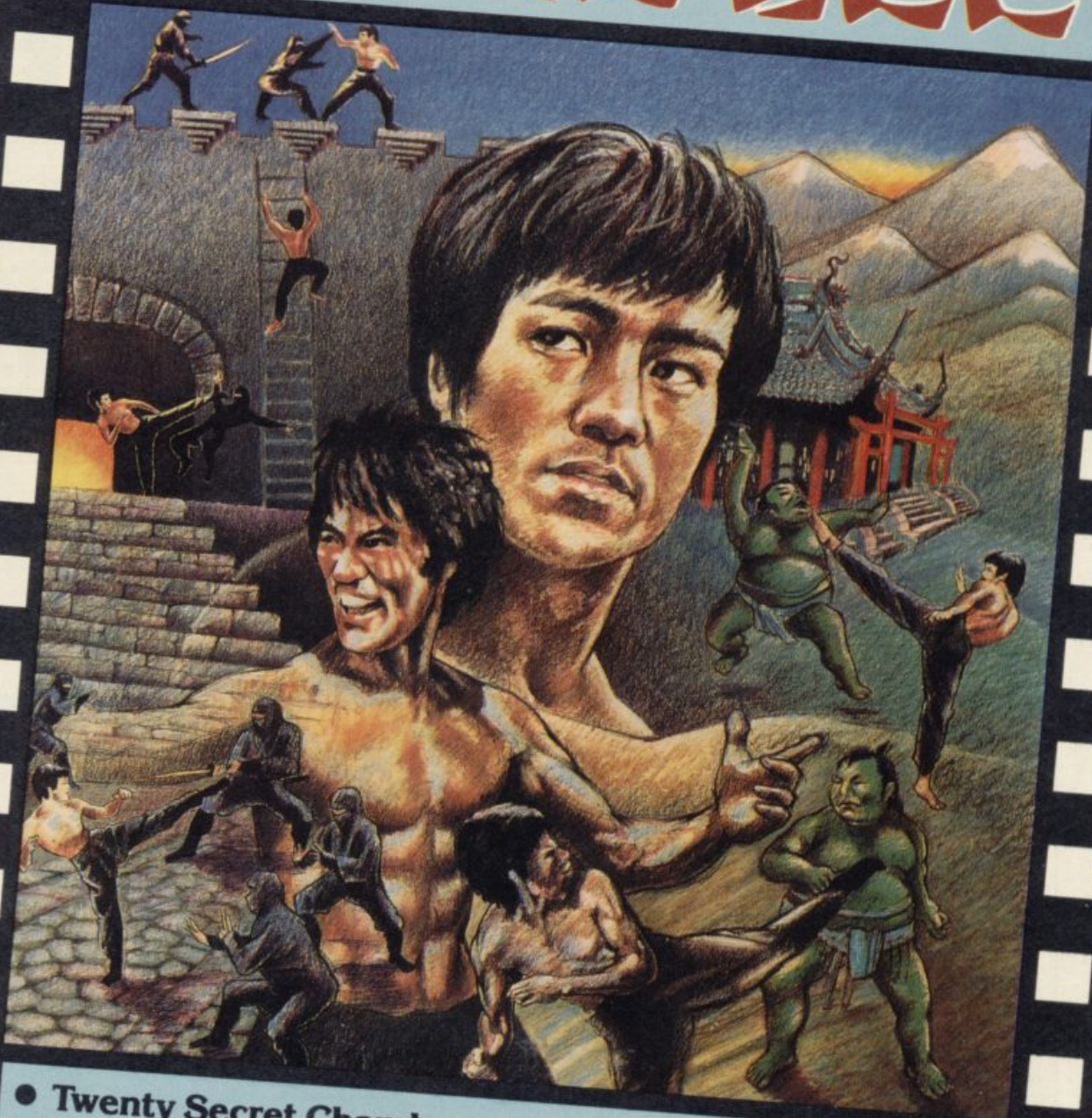
Your chance to relive the deadly skills and awesome power of

ATARI



THE LEGENDARY SPECTRUM

BRUCE LEE



- Twenty Secret Chambers.
- Dazzling Graphics and Animation
- Unique Multiple Player Options.

Spectrum 48K Disk and Cassette £7.95
Commodore Disk £14.95 Cassette £9.95
Atari Disk and Cassette £14.95



U.S. GOLD

All American Software

THE ULTIMATE IN AMERICAN SOFTWARE FOR
YOU IN U.S. GOLD.

U.S. Gold is stocked by all leading computer stores.
Dealers! For information on how to become a U.S. Gold stockist
write to: CentreSoft Ltd., Unit 10, The Parkway Industrial Centre,
Heneage Street, Birmingham B7 4LY. Telephone: 021-359 3020.
Overseas enquiries welcome.

Thinking so ... thi

THE TASWORD WORD PROCESSORS

The extensive features of the Tasword word processors are ideal for both the home and business user. Every Tasword comes complete with a comprehensive manual and a cassette or disc. The cassette or disc contains your TASWORD and TASWORD TUTOR. This teaches you word processing using TASWORD. Whether you have serious applications or simply want to learn about word processing, TASWORD and TASWORD TUTOR make it easy and enjoyable.

TASWORD TWO (Spectrum)

64 characters per line on the screen!

"Without doubt, the best utility I have reviewed for the Spectrum," HOME COMPUTING WEEKLY APRIL 1984

"If you have been looking for a word processor, then look no further," CRASH JUNE 1984

The cassette program is supplied with instructions for microdrive conversion.

TASWORD TWO* ZX 48K Spectrum
cassette **£13.90**
microdrive cartridge **£15.40**

TASWORD EINSTEIN

A sixty-four character per line display and the ability to hold over five hundred lines of text at any time are just some of the features of this, the most recent, of the Taswords. Full interaction with the disc system—e.g. Tasword detects the presence of added drives and allows their use.

TASWORD EINSTEIN Tatung Einstein
disc **£19.95**

TASWORD 464

"There is no better justification for buying a 464 than this program."

POPULAR COMPUTING WEEKLY NOVEMBER 1984

A particularly sophisticated yet easy to use program. Now available on disc. The cassette version is supplied with instructions for transferring to disc.

TASWORD 464* Amstrad CPC 464
cassette **£19.95**
disc **£22.95**

TASWORD MSX

With all the features of the Spectrum Tasword Two including the amazing sixty four character per line display. The Tasword MSX machine code program utilises the 32K of memory not normally available to Basic allowing over five hundred lines of text to be held in memory.

TASWORD MSX* 64K MSX Computers
Fully inclusive mail order price **£13.90**
(cassette/includes/both disc and tape versions)

THE TASCOPY SCREEN COPIERS

The TASCOPY screen copiers print high resolution screen copies with different dot densities and patterns for the various screen colours. This gives the screen copies a shaded effect which presents on a monochrome scale the colours on the screen. With TASCOPY you can keep a permanent and impressive record of your screen pictures and diagrams. TASCOPY supports all the printers mentioned under TASPINT.

TASCOPY (Spectrum + Interface 1)

The Spectrum TASCOPY is for use with the RS232 output on ZX Interface 1. It produces monochrome copies (in a choice of two sizes) as well as copies with the shaded "grey scale" effect described above.

TASCOPY ZX Spectrum cassette **£9.90**
microdrive cartridge **£11.40**

TASCOPY 464

Adds two new commands to the 464 Basic to give both a standard shaded screen copy as well as a "poster size" copy which is printed onto two or four sheets which can be cut and joined to make the poster.

TASCOPY 464 Amstrad CPC 464* cassette **£9.90**
disc **£12.90**

TASCOPY QL

TASCOPY QL adds new commands to QL Superbasic. Execute these commands to print a shaded copy of the screen contents. Print the entire screen or just a specified window. TASCOPY QL also produces large "poster size" screen copies on more than one sheet of paper which can then be cut and joined to make the poster, and high speed small copies.

TASCOPY QL Sinclair QL
microdrive cartridge **£12.90**

THE TASPINT STYLE WRITERS

A must for dot-matrix printer owners! Print your program output and listings in a choice of five impressive print styles. The Taspints utilise 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 simulation of Palace Script. A TASPINT gives your output originality and style! The TASPINTS drive all Epson compatible eight pin dot-matrix printers, e.g.

AMSTRAD DMP 1
EPSON FX-80
EPSON RX-80
EPSON MX-80 TYPE III
NEC PC-8023B-N

Five impressive print styles for your use:-

MANNESMANN TALLY MT-80
STAR DMP 501/515
BROTHER HR5
SHINWA CP-80
COSMOS-80
DATAC PANTHER
DATAC PANTHER II

COMPACTA - bold and heavy, good for emphasis

DATA-RUN - A FUTURAISTIC SCRIPT

LECTURA - clean and pleasing to read

MEDIAN - a serious business-like script

Palace Script - a distinctive flowing font

Typical Taspint output. Please note that different makes of printer produce different sized output.

TASPINT (Spectrum)

Drives all the printer interfaces compatible with TASWORD TWO and can be used to print TASWORD TWO text files as well as output from your own Basic programs.

TASPINT 48K Spectrum cassette **£9.90**
microdrive cartridge **£11.40**

TASPINT 464

Can be used to print AMSWORD/TASWORD 464 text files in addition to output from your own Basic programs. Drives the Amstrad DMP 1 in addition to the printers listed to the left.

TASPINT 464 Amstrad CPC 464 cassette **£9.90**
disc **£12.90**

TASPINT QL

TASPINT QL includes a screen editor used to modify files created by other commercial software, such as QUILL, or by the user from BASIC. These modified files include TASPINT control characters and may be printed, using TASPINT, in one or more of the unique TASPINT fonts.

TASPINT QL Sinclair QL
microdrive cartridge **£19.95**

ftware?...

nk Tasman

OTHER TASMAN PRODUCTS FOR THE ZX SPECTRUM

TASMERGE

The Mail Merger

Transfer data from MASTERFILE to TASWORD TWO. Letters and forms typed on TASWORD TWO 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 TWO and MASTERFILE by Campbell Systems (version 9 or later).

TASMERGE ZX 48K Spectrum **£10.90**

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!

TASWIDE ZX 16K + 48k Spectrum **£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 contains fast machine code high resolution full width SCREEN COPY SOFTWARE for Epson, Mannesmann Tally, Shinwa, Star, and Tandy Colour Graphic (in colour!) printers. TASCOPY, shaded screen copy software for this interface (value £9.90 – see description on left) is included in this package.

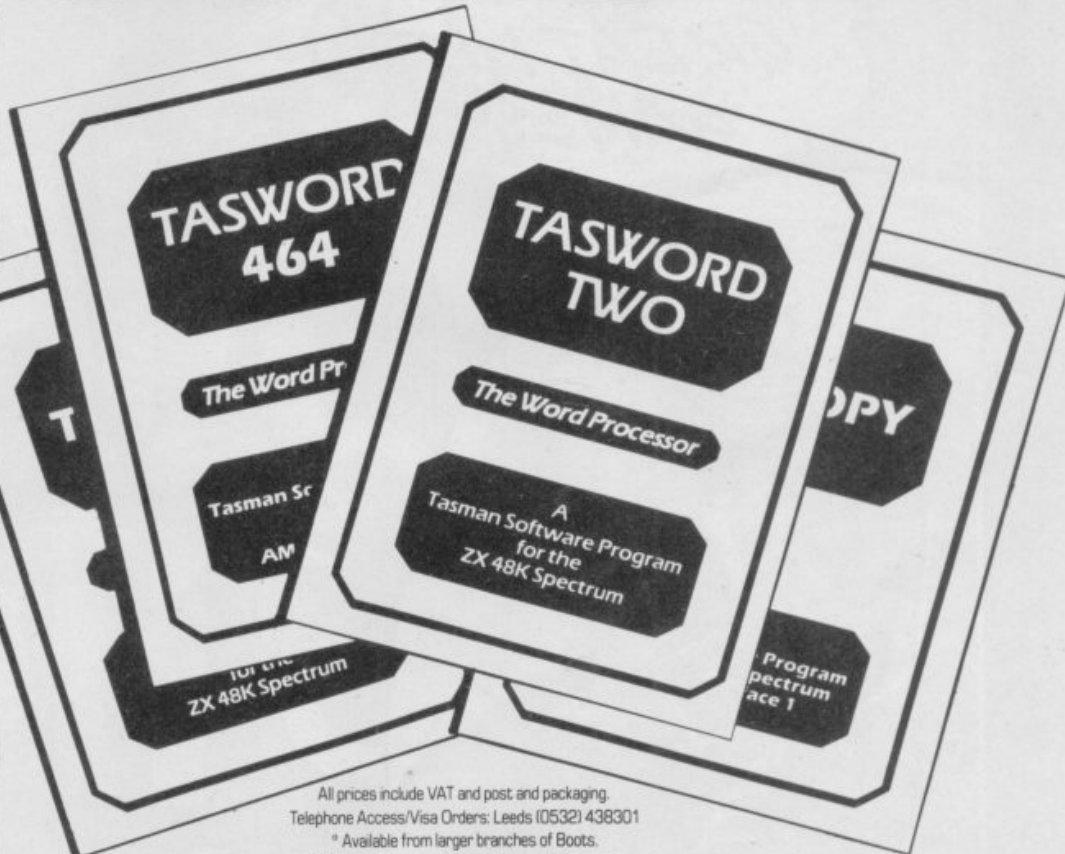
CENTRONICS INTERFACE ZX Spectrum **£39.90**

COMPUTER PRINTER CABLES

RS232 for ZX INTERFACE 1 **£14.50**

MSX CENTRONICS **£16.00**

AMSTRAD CPC 464 CENTRONICS **£9.90**



All prices include VAT and post and packaging.
Telephone Access/Visa Orders: Leeds (0532) 438301

* Available from larger branches of Boots.

QL is a trademark of Sinclair Research Limited.

Available from good software stockists and direct from:

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 or VISA number

NAME

ADDRESS

SUSSES

COMPUTER	ITEM	PRICE
		£ <input type="text"/>
		£ <input type="text"/>
		£ <input type="text"/>

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:

QL ☐ Tatung Einstein ☐ ZX Spectrum ☐ MSX ☐ Amstrad CPC 464 ☐

THE SMASH HIT COMPUTER GAMES PACK



SPECTRUM 48K

TAPE A

3D STARSTRIKE (Realtime Software)
BLUE THUNDER (Elite)
SON OF BLAGGER (Alligata)
AUTOMANIA (Mikro Gen)
BUGA-BOO (Quicksilver)

TAPE B

PSYTRON (Beyond)
WHEELIE (Microsphere)
FALL GUY (Elite)
BLADE ALLEY (P.S.S.)
PENETRATOR (Melbourne House)



COMMODORE 64

TAPE A

TALES OF THE
ARABIAN NIGHTS (Interceptor Micros)
POSTER PASTER (Taskset Ltd.)
FLIGHT PATH 737 (Anirog)
PSYTRON (Beyond)
SON OF BLAGGER (Alligata)

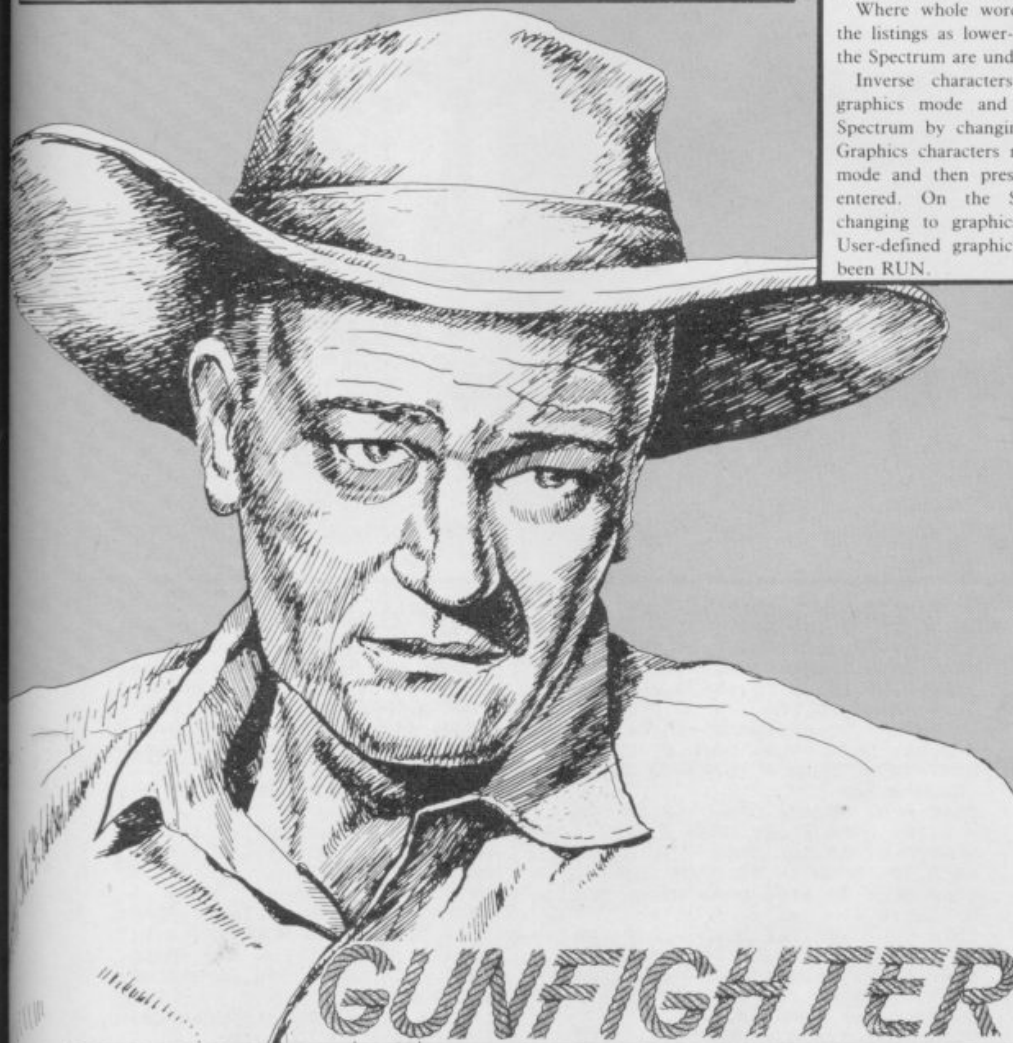
TAPE B

SUPER PIPELINE (Taskset Ltd.)
TROLLIE WALLIE (Interceptor Micros)
AUTOMANIA (Mikro Gen)
GHOULS (Micropower)
BOOGA-BOO (Quicksilver)

AVAILABLE AT:

W H SMITH BOOTS MENZIES F W WOOLWORTH GREENS RUMBELOWS LASKY'S CURRY'S H.M.V. ASDA TESCO
GRANADA CO-OP TIGER DEALERS AND ALL GOOD COMPUTER SHOPS

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.

JOHN WAYNE lives again in **Gunfighter** by Mark Hinchcliffe of Aberdeen. You must eliminate the Boot Hill Gang, who are holed up on a farm outside town. The gang members appear from behind cover and you must train your sights on them before they get you.

Gunfighter runs on the 48K Spectrum and contains two machine code routines. One scans the keyboard and allows you to fire on the move, the other produces the sound effects.

The program uses our special abbreviations for graphics characters, so please read the instructions above before entering the listing.

```
1 REM *****GUNFIGHT*****
by Mark Hinchcliffe
5 CLEAR 38990
10 BORDER 0: PAPER 6: CLS
30 PRINT INK 1: PAPER 5: AT 5,
10: "PLEASE WAIT": AT 6,11: "A MOMEN
T"
40 GO TO 5000
100 POKE 40000,16: POKE 40001,1
0: PRINT OVER 1: AT 10,16: CHR$ 1
44
110 RANDOMIZE USR 39000
120 GO SUB (con*10)+2000
124 REM Fire routine
125 IF f=1 THEN GO SUB 1000: G
O TO 110
130 IF PEEK 40010=1 THEN LET y
=PEEK 40000: LET x=PEEK 40001: G
O SUB 500: LET f=1: PRINT OVER
1: PAPER 6: INK 2: AT x,y: CHR$ 15
0: RANDOMIZE USR 39165: GO TO 14
0
135 GO TO 110
140 LET shots=shots-1
150 IF shots<12 THEN PRINT PA
PER 7: AT 20,(6+shots): "(sp)"
```

```
160 IF shots>11 THEN PRINT PA
PER 7: AT 21,(shots-6): "(sp)"
170 GO SUB 500: GO SUB 1000
180 GO TO 110
500 PLOT 135,16: DRAW OVER 1: (
(PEEK 40000)*8)-131,155-((PEEK 4
0001)*8)
510 RETURN
999 REM Gunfighter hit?
1000 IF x=xx AND y=yy AND con=3
THEN GO SUB 3000: GO TO 1040
1005 IF x=xx+1 AND y=yy AND con=
3 AND d=149 THEN GO SUB 3000: G
O TO 1040
1010 PRINT OVER 1: INK 0: PAPER
6: AT x,y: CHR$ 150: LET f=0: POK
E 40010,0
1015 IF hit=10 THEN GO TO 8000
1020 IF shots=0 AND con=3 THEN
GO SUB 3000: GO TO 8600
1025 IF shots=0 THEN GO TO 8600
1030 RETURN
1040 LET sc=sc+((INT (300/t))+1)
*100: LET con=0: LET t=0: LET hi
t=hit+1: PRINT #1: PAPER 7: INK
0: AT 1,(hit+5): CHR$ 146: PRINT
```

```
PAPER 7: AT 21,26: sc: GO TO 1010
1999 REM Gunfighter timing
2000 RANDOMIZE : LET del=INT (RN
D*100)+150/lev: LET con=1
2005 LET r=INT (RND*12)+1: LET x
=a(r,1): LET yy=a(r,2): LET c=a
(r,3): LET d=a(r,4)
2010 LET t=t+1: IF t=del THEN L
ET con=2: LET t=0: GO SUB 3000:
BEEP .05,xx
2015 RETURN
2020 LET del=INT (RND*(60/lev))+
90/lev: LET con=3
2029 REM Sheriff hit?
2030 LET t=t+1: IF t=del THEN L
ET con=0: LET t=0: RANDOMIZE USR
39165: GO SUB 3000: LET h=INT (
RND*(4-lev))+1
2040 IF h=1 THEN FOR n=7 TO 0 B
TEP -1: OUT 254,n: PAUSE 2: NEXT
n: LET lives=lives-1: PRINT #1:
PAPER 7: AT 1,(26+lives): "(sp)":
PRINT PAPER 6: AT 0,0: "(sp)": L
ET h=0
2050 IF lives=0 THEN GO TO 8300
2060 RETURN
2999 REM Print gunfighter
3000 PRINT OVER 1: PAPER 6: AT x
,y: CHR$ c: AT (xx+1),yy: CHR$ d
3010 RETURN
4999 REM UDG'S
5000 FOR n=0 TO 95
```

continued on page 86

continued from page 85

```

5010 READ a
5020 POKE (65368+n),a
5030 DATA 24,24,0,195,195,0,24,2
4,0,24,60,60,60,60,126,24,24,
126,24,24,60,126,0
5040 DATA 16,16,56,84,84,40,40,1
08,24,60,24,24,60,90,153,153,153
,60,60,102,102,102,102,231,132,1
08,127,62,124,124,150,1
5050 DATA 60,66,165,153,153,165,
66,60,56,70,161,149,161,171,69,8
2,66,36,36,36,36,37,35,34
5060 DATA 36,36,36,36,36,36,66,1
29,69,170,178,146,146,146,146,14
6
5070 NEXT n
5099 REM Gunsight control/Gunsho
t
5100 FOR n=0 TO 187
5110 READ a
5120 POKE (39008+n),a
5130 DATA 237,75,64,156,62,247,2
11,255,219,254,230,16,194,119,15
2,58,64,156,38,0,188,202,143,152
,61,50,64,156,195,143,152
5140 DATA 62,239,211,255,219,254
,230,4,194,143,152,58,64,156,38,
31,188,202,143,152,60,50,64,156,
62,239,211,255,219,254,230,8,194
,170
5150 DATA 152,58,65,156,38,0,188
,202,194,152,61,50,65,156,195,19
4,152,62,239,211,255,219,254,230
,16,194,194,152,58,65,156,38,19,
188
5160 DATA 202,194,152,60,50,65,1
56,62,239,211,255,219,254,230,1,
194,210,152,62,1,50,74,156,237,9
1,64,156,62,22,215,120,215,121
5170 DATA 215,62,21,215,62,1,215
,62,144,215,62,22,215,122,215,12
3,215,62,21,215,62,1,215,62,16,2
15,62,0,215,62,144,215,201
5180 DATA 33,0,0,14,0,22,1,126,2
30,24,211,254,65,16,254,35,21,32
,244,12,32,239,201
5190 NEXT n
5299 REM Gunfighter data
5300 DIM a(12,4)
5310 FOR n=1 TO 12: FOR m=1 TO 4
5320 READ a(n,m)
5330 NEXT m: NEXT n
5340 DATA 11,1,148,149,13,6,148,
32,13,9,148,149,17,12,148,149,10
,25,148,32,16,30,148,32,9,22,148
,32,4,29,147,32,2,22,147,32,2,8,
147,32,16,21,148,32,13,12,148,14
9
5399 REM Instructions
5400 CLS : BEEP .2,15
5410 PRINT AT 1,11;"GUNFIGHT"
5420 PRINT AT 5,1;"You are the l
ocal sheriff and";AT 6,1;"your t
own is being terrorized";AT 7,1;
"by the the Boot Hill Gang.";AT
8,1;"You have decided to go to t
heir";AT 9,1;"ranch for a showdo
wn"
5430 PRINT AT 11,1;"Your gunsigh
t is controlled by";AT 12,1;"the
cursor keys (5,6,7&8) for";AT 1
3,1;"left,down,up and right";AT
14,1;"respectively. The""0""key
fires";AT 15,1;"your gun"
5440 PRINT INK 5; PAPER 1;AT 18
,4;"PRESS ANY KEY TO START"
5450 IF INKEY="" THEN GO TO 54
50
5460 BEEP .2,15: CLS
5499 REM Draw scene
5500 FOR n=0 TO 31: PRINT AT 17,
n;CHR# 155;AT 18,n;CHR# 155: NEX
T n: PRINT AT 17,11;CHR# 138;CHR
# 32;CHR# 133;AT 18,11;CHR# 138;
CHR# 32;CHR# 133
5510 FOR n=0 TO 21: PRINT AT 2,n
;CHR# 155: NEXT n: PRINT AT 2,8;
CHR# 32
5515 FOR n=1 TO 17: READ a,b,c:
PRINT AT a,b;CHR# c: NEXT n

```



```

5520 DATA 12,25,151,12,22,151,0,
23,153,0,27,152,0,29,154,1,23,15
4,1,25,152,1,27,153,2,24,152
5525 DATA 2,25,153,2,27,154,2,28
,152,3,24,153,3,25,154,3,28,153,
4,24,154,4,28,154
5530 PLOT 95,56: DRAW -15,0: DRA
W 0,20: DRAW -9,0: DRAW 0,-20: D
RAW -31,0: DRAW 0,40: DRAW 55,0:
DRAW 0,-40
5540 PLOT 58,63: DRAW -12,0: DRA
W 0,10: DRAW 12,0: DRAW 0,-10
5550 PLOT 40,56: DRAW -24,16: DR
AW 0,40: DRAW 12,4: DRAW 12,-19
5560 PLOT 28,116: DRAW 55,0: DRA
W 12,-19
5570 PLOT 208,76: DRAW -32,0: DR
AW 0,11: DRAW 32,0: DRAW 0,-11
5580 PLOT 176,76: DRAW -12,8: DR
AW 0,11: DRAW 12,-8: DRAW 32,0:
DRAW -12,8: DRAW -32,0
5590 PLOT 196,87: DRAW 0,8: PLOT
170,82: DRAW -12,-10: PLOT 164,
72: DRAW -6,4
6010 FOR n=0 TO 127: POKE (23168
+n),56: NEXT n
6020 PRINT PAPER 7;AT 20,1;"AMM
O";AT 20,20;"LEVEL";AT 21,20;"SC
ORE"
6030 PRINT#1; PAPER 7; INK 0;AT
1,1;"HITS";AT 0,20;"HIGH";AT 1,
20;"LIVES"
6040 LET hs=0
6099 REM Start
6100 PRINT#1; PAPER 7;AT 1,6;"(
10*sp)": FOR n=20 TO 21: FOR m=6
TO 17: PRINT INK 1; PAPER 7;AT
n,m;CHR# 145: NEXT m: NEXT n
6200 PRINT INK 1; PAPER 5;AT 5,
7;"(2*sp)SELECT LEVEL(2*sp)":AT
6,9;"(2*sp)(1 TO 3)(2*sp)": BEEP
.1,10
6210 IF PEEK 23557<>5 THEN GO T
O 6210
6220 IF PEEK 23560<49 OR PEEK 23
560>51 THEN GO TO 6210
6230 LET lev=(PEEK 23560)-48
6240 PRINT PAPER 7;AT 20,26;lev
; PAPER 6;AT 5,7;"(16*sp)":AT 6,

```

```

9;"(12*sp)"
6500 LET xx=0: LET yy=0: LET h=0
: LET t=0: LET f=0: LET wo=0: LE
T hit=0: LET sc=0: LET shots=24:
LET lives=3: LET con=0: PRINT )
1; INK 2; PAPER 7;AT 1,26;CHR# 1
47;CHR# 147;CHR# 147; INK 0;AT 0
,26;hs: PRINT PAPER 7;AT 21,26;
"0(5*sp)"
6600 FOR n=0 TO 7: READ a,b: BEE
P a,b: NEXT n
6610 DATA .2,16,.2,21,.2,16,.2,2
1,.5,16,.4,12,.45,14,.45,9
6700 GO TO 100
7999 REM End routines
8000 PRINT FLASH 1; INK 1; PAPE
R 5;AT 5,11;"WELL DONE";AT 6,8;"
!!!You've won!!!": FOR n=0 TO 10:
BEEP .05,n: BEEP .05,(n*3): NEX
T n: PAUSE 100
8010 LET sc=sc+1000+(shots*200)+(
lives*500): GO TO 9010
8300 PRINT AT 5,11;"You have";AT
6,8;"been shot dead": GO TO 890
0
8600 PRINT AT 5,10;"You have no"
;AT 6,9;"bullets left": GO TO 89
00
8900 FOR n=0 TO 10: READ a,b: BE
EP a,b: NEXT n
8910 DATA .45,0,.3,0,.15,0,.45,0
,.3,3,.15,2,.3,2,.15,0,.3,0,.15,
-.1,.45,0
9010 PRINT PAPER 7;AT 21,26;sc
9020 IF sc>hs THEN LET hs=sc: P
RINT#1; PAPER 7; INK 0;AT 0,26;
hs
9030 PRINT INK 1; PAPER 5;AT 5,
9;"PRESS ANY KEY";AT 6,8;" TO C
ONTINUE "
9040 IF INKEY="" THEN GO TO 90
40
9050 PRINT PAPER 6;AT 5,9;"(13*
sp)":AT 6,8;"(15*sp)": RESTORE 8
910: RESTORE 6610: PRINT OVER 1
; PAPER 6;AT PEEK 40001,PEEK 400
00;CHR# 144: POKE 40010,0: GO TO
6100

```

The game, for the 16K ZX-81, uses machine code. Make sure you have the correct number of characters in the REM statements at the beginning. Then follow the following instructions to get a streamlined version of the program.

- 1 — GOTO 83
- 2 — BREAK when you see the title screen come up.
- 3 — Delete lines 7000 to 8740
- 4 — SAVE a copy
- 5 — GOSUB 9920, ignoring the error message. If you accidentally type RUN or CLEAR after this point, re-load the copy you SAVED at step 4 and start again from step 5.
- 6 — GOSUB 9920, ignoring the error message.
- 7 — Delete lines 100, 110, 115
- 8 — Delete lines 9240 to 9980
- 9 — Prepare the tape recorder for SAVEing.
- 10 — LET SA=1
- 11 — GOTO 90. The program will start to SAVE after a short pause.
- 12 — Stop the tape recorder after the title page is displayed.

moon patrol

[illegible][illegible]

```

1300 LET LINES=8
1301 GOSUB 1300
1302 GOSUB 1400
1303 LET DS=D$+1 TO )
1304 LET LINES=8
1305 GOSUB 1300
1306 GOSUB 1300
1307 LET LINES=8
1308 GOSUB 1400
1309 GOSUB 1500
1310 GOSUB 1500
1311 LET LINES=8
1312 GOSUB 1400
1313 GOSUB 1500
1314 GOSUB 1500
1315 RETURN
1316 PRINT AT 23,2;"PRESS ANY KE"
1317 GOTO 1400
1400 IF INKEY$="" THEN GOTO 1400
1410 IF INKEY$=")" THEN GOTO 1410
1411 PRINT AT 23,0,B$
1412 RETURN
1413 PRINT AT 3,1:
1414 LET START=1
1415 FOR L=L1 TO LINES
1416 LET LS=DS+1 TO CODE DS
1417 FOR K=2 TO LEN LS
1418 PRINT L$(K),
1419 NEXT K
1420 PRINT TAB 2,TAB 1:
1421 LET DS=DS+1 TO )
1422 NEXT L
1423 RETURN
1424 PRINT AT 23,0,B$
1425 FOR D=3 TO D$
1426 PRINT AT D,0,B$
1427 NEXT D
1428 RETURN
1429 GOTO 1300
1430 GOTO 1300
1431 GOTO 1300
1432 GOTO 1300
1433 GOTO 1300
1434 GOTO 1300
1435 GOTO 1300
1436 GOTO 1300
1437 GOTO 1300
1438 GOTO 1300
1439 GOTO 1300
1440 GOTO 1300
1441 GOTO 1300
1442 GOTO 1300
1443 GOTO 1300
1444 GOTO 1300
1445 GOTO 1300
1446 GOTO 1300
1447 GOTO 1300
1448 GOTO 1300
1449 GOTO 1300
1450 GOTO 1300
1451 GOTO 1300
1452 GOTO 1300
1453 GOTO 1300
1454 GOTO 1300
1455 GOTO 1300
1456 GOTO 1300
1457 GOTO 1300
1458 GOTO 1300
1459 GOTO 1300
1460 GOTO 1300
1461 GOTO 1300
1462 GOTO 1300
1463 GOTO 1300
1464 GOTO 1300
1465 GOTO 1300
1466 GOTO 1300
1467 GOTO 1300
1468 GOTO 1300
1469 GOTO 1300
1470 GOTO 1300
1471 GOTO 1300
1472 GOTO 1300
1473 GOTO 1300
1474 GOTO 1300
1475 GOTO 1300
1476 GOTO 1300
1477 GOTO 1300
1478 GOTO 1300
1479 GOTO 1300
1480 GOTO 1300
1481 GOTO 1300
1482 GOTO 1300
1483 GOTO 1300
1484 GOTO 1300
1485 GOTO 1300
1486 GOTO 1300
1487 GOTO 1300
1488 GOTO 1300
1489 GOTO 1300
1490 GOTO 1300
1491 GOTO 1300
1492 GOTO 1300
1493 GOTO 1300
1494 GOTO 1300
1495 GOTO 1300
1496 GOTO 1300
1497 GOTO 1300
1498 GOTO 1300
1499 GOTO 1300
1500 GOTO 1300
1501 GOTO 1300
1502 GOTO 1300
1503 GOTO 1300
1504 GOTO 1300
1505 GOTO 1300
1506 GOTO 1300
1507 GOTO 1300
1508 GOTO 1300
1509 GOTO 1300
1510 GOTO 1300
1511 GOTO 1300
1512 GOTO 1300
1513 GOTO 1300
1514 GOTO 1300
1515 GOTO 1300
1516 GOTO 1300
1517 GOTO 1300
1518 GOTO 1300
1519 GOTO 1300
1520 GOTO 1300
1521 GOTO 1300
1522 GOTO 1300
1523 GOTO 1300
1524 GOTO 1300
1525 GOTO 1300
1526 GOTO 1300
1527 GOTO 1300
1528 GOTO 1300
1529 GOTO 1300
1530 GOTO 1300
1531 GOTO 1300
1532 GOTO 1300
1533 GOTO 1300
1534 GOTO 1300
1535 GOTO 1300
1536 GOTO 1300
1537 GOTO 1300
1538 GOTO 1300
1539 GOTO 1300
1540 GOTO 1300
1541 GOTO 1300
1542 GOTO 1300
1543 GOTO 1300
1544 GOTO 1300
1545 GOTO 1300
1546 GOTO 1300
1547 GOTO 1300
1548 GOTO 1300
1549 GOTO 1300
1550 GOTO 1300
1551 GOTO 1300
1552 GOTO 1300
1553 GOTO 1300
1554 GOTO 1300
1555 GOTO 1300
1556 GOTO 1300
1557 GOTO 1300
1558 GOTO 1300
1559 GOTO 1300
1560 GOTO 1300
1561 GOTO 1300
1562 GOTO 1300
1563 GOTO 1300
1564 GOTO 1300
1565 GOTO 1300
1566 GOTO 1300
1567 GOTO 1300
1568 GOTO 1300
1569 GOTO 1300
1570 GOTO 1300
1571 GOTO 1300
1572 GOTO 1300
1573 GOTO 1300
1574 GOTO 1300
1575 GOTO 1300
1576 GOTO 1300
1577 GOTO 1300
1578 GOTO 1300
1579 GOTO 1300
1580 GOTO 1300
1581 GOTO 1300
1582 GOTO 1300
1583 GOTO 1300
1584 GOTO 1300
1585 GOTO 1300
1586 GOTO 1300
1587 GOTO 1300
1588 GOTO 1300
1589 GOTO 1300
1590 GOTO 1300
1591 GOTO 1300
1592 GOTO 1300
1593 GOTO 1300
1594 GOTO 1300
1595 GOTO 1300
1596 GOTO 1300
1597 GOTO 1300
1598 GOTO 1300
1599 GOTO 1300
1600 GOTO 1300
1601 GOTO 1300
1602 GOTO 1300
1603 GOTO 1300
1604 GOTO 1300
1605 GOTO 1300
1606 GOTO 1300
1607 GOTO 1300
1608 GOTO 1300
1609 GOTO 1300
1610 GOTO 1300
1611 GOTO 1300
1612 GOTO 1300
1613 GOTO 1300
1614 GOTO 1300
1615 GOTO 1300
1616 GOTO 1300
1617 GOTO 1300
1618 GOTO 1300
1619 GOTO 1300
1620 GOTO 1300
1621 GOTO 1300
1622 GOTO 1300
1623 GOTO 1300
1624 GOTO 1300
1625 GOTO 1300
1626 GOTO 1300
1627 GOTO 1300
1628 GOTO 1300
1629 GOTO 1300
1630 GOTO 1300
1631 GOTO 1300
1632 GOTO 1300
1633 GOTO 1300
1634 GOTO 1300
1635 GOTO 1300
1636 GOTO 1300
1637 GOTO 1300
1638 GOTO 1300
1639 GOTO 1300
1640 GOTO 1300
1641 GOTO 1300
1642 GOTO 1300
1643 GOTO 1300
1644 GOTO 1300
1645 GOTO 1300
1646 GOTO 1300
1647 GOTO 1300
1648 GOTO 1300
1649 GOTO 1300
1650 GOTO 1300
1651 GOTO 1300
1652 GOTO 1300
1653 GOTO 1300
1654 GOTO 1300
1655 GOTO 1300
1656 GOTO 1300
1657 GOTO 1300
1658 GOTO 1300
1659 GOTO 1300
1660 GOTO 1300
1661 GOTO 1300
1662 GOTO 1300
1663 GOTO 1300
1664 GOTO 1300
1665 GOTO 1300
1666 GOTO 1300
1667 GOTO 1300
1668 GOTO 1300
1669 GOTO 1300
1670 GOTO 1300
1671 GOTO 1300
1672 GOTO 1300
1673 GOTO 1300
1674 GOTO 1300
1675 GOTO 1300
1676 GOTO 1300
1677 GOTO 1300
1678 GOTO 1300
1679 GOTO 1300
1680 GOTO 1300
1681 GOTO 1300
1682 GOTO 1300
1683 GOTO 1300
1684 GOTO 1300
1685 GOTO 1300
1686 GOTO 1300
1687 GOTO 1300
1688 GOTO 1300
1689 GOTO 1300
1690 GOTO 1300
1691 GOTO 1300
1692 GOTO 1300
1693 GOTO 1300
1694 GOTO 1300
1695 GOTO 1300
1696 GOTO 1300
1697 GOTO 1300
1698 GOTO 1300
1699 GOTO 1300
1700 GOTO 1300
1701 GOTO 1300
1702 GOTO 1300
1703 GOTO 1300
1704 GOTO 1300
1705 GOTO 1300
1706 GOTO 1300
1707 GOTO 1300
1708 GOTO 1300
1709 GOTO 1300
1710 GOTO 1300
1711 GOTO 1300
1712 GOTO 1300
1713 GOTO 1300
1714 GOTO 1300
1715 GOTO 1300
1716 GOTO 1300
1717 GOTO 1300
1718 GOTO 1300
1719 GOTO 1300
1720 GOTO 1300
1721 GOTO 1300
1722 GOTO 1300
1723 GOTO 1300
1724 GOTO 1300
1725 GOTO 1300
1726 GOTO 1300
1727 GOTO 1300
1728 GOTO 1300
1729 GOTO 1300
1730 GOTO 1300
1731 GOTO 1300
1732 GOTO 1300
173
```

SINCLAIR USER May 1985

JOIN the Spectrum Golf Club and improve your handicap in a splendid simulation of the game by Guy Morgan of Llantrisant in Mid Glamorgan.

Hazards include rough, trees, streams and bunkers. You are allowed a full set of clubs and can input strength and direction for each stroke. Full instructions are provided within the game, which runs on the 48K Spectrum.

Golf Club uses our special abbreviations for graphics characters, so please read the instructions on the first page of Program Printout before entering the program.

You can easily design your own holes. For each hole the relevant DATA statements are lines 8000+hole number*10 and 8200+hole number*10.

To design a new hole first map it out on a grid based on the size of the screen. Decide on the number of yards and the par. Then use the following table to compile the DATA in the order shown. If you do not require an item use 9999.

The second DATA statement should contain the length of the hole in yards, the par, and a scale factor. Calculate the scale factor using a base of 500 yards which has a factor of one.

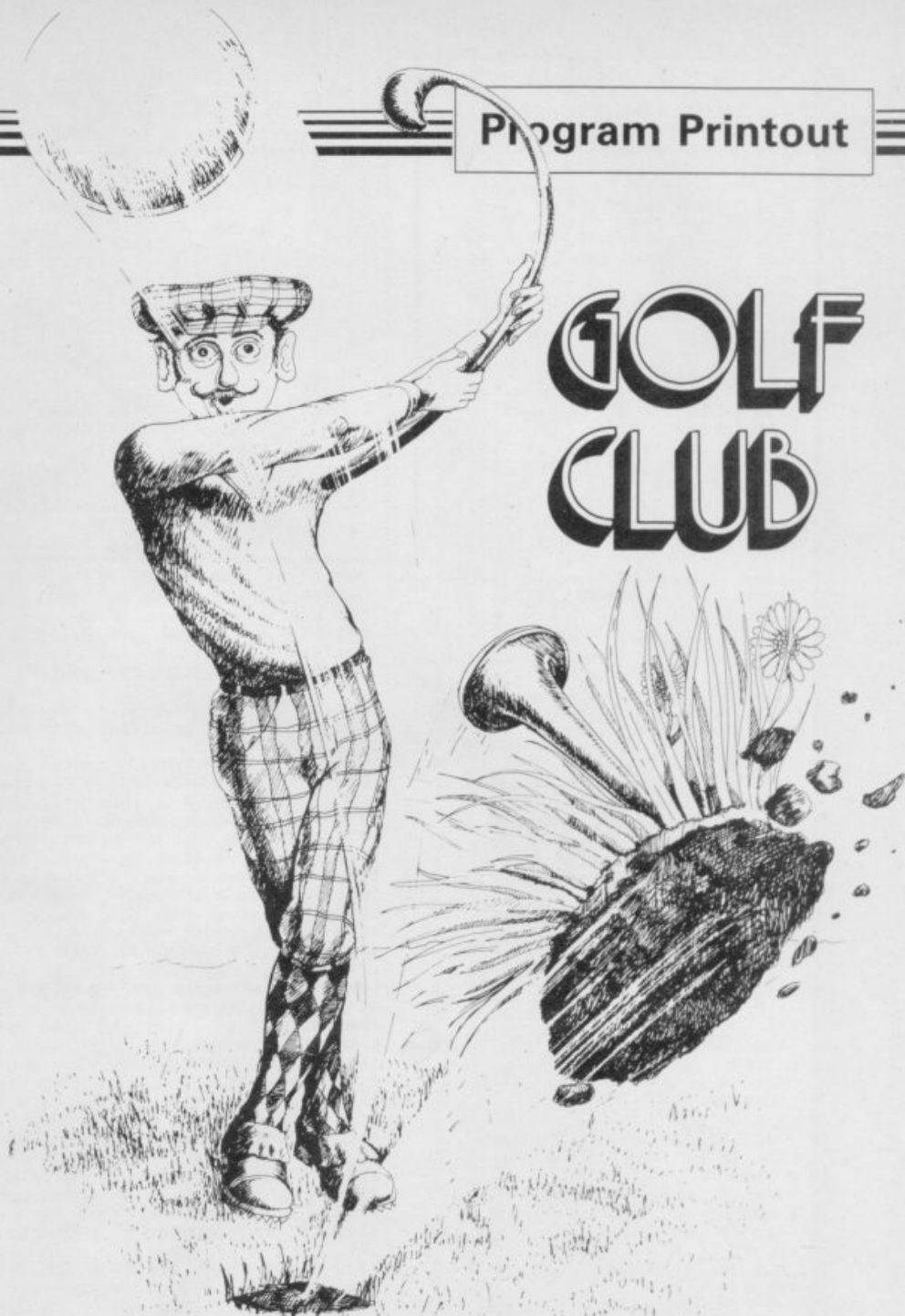
1 TEE	0401	CO-ORDS
2 GREEN	0326	CO-ORDS OF TOP LEFT CORNER
3 HOLE	0427	CO-ORDS
4 TREES 1	0110	START AND FINISH LINES
5 TREES 1	1219	START AND FINISH COLS
6 TREES 1	0100	TREE TYPE (0100 or 0200)
7 TREES 2	1020	START AND FINISH LINES
8 TREES 2	0031	START AND FINISH COLS
9 TREES 2	0100	TREE TYPE (0100 or 0200)
10 BUNKER 1	1313	CO-ORDS
11 BUNKER 2	1216	CO-ORDS
12 BUNKER 3	0720	CO-ORDS
13 LAKE	9999	CO-ORDS OF TOP LEFT CORNER
14 STREAM	9999	CO-ORDS OF START
15 STREAM	9999	CO-ORDS OF FINISH
16 TOP ROUGH	0200	END LINE, STEP
17 BOT ROUGH	1006	START LINE, STEP

The above values are those for the first hole of the course in the program.

```

1 REM initialise
5 POKE 23609,100: RANDOMIZE :
PAPER 7: INK 0: BRIGHT 0: OVER
0: FLASH 0: BORDER 7: CLS
7 PRINT AT 2,8: PAPER 1: INK
7: "WE WELCOME YOU": AT 5,12: "TO T
HE": AT 9,6: "SPECTRUM GOLF CLUB":
AT 11,1: "(Professional, Clive Si
nclair)"
10 DEF FN x(h)=(INT (h/100)):
DEF FN y(h,x)=(h-100*x)
15 DIM h(10): LET w$="<↑>E"
19 REM load holes
20 DIM h$(10,20,4): RESTORE
25 FOR m=1 TO 10
30 FOR n=1 TO 17: READ q: LET
h$(m,n)=STR$ q: NEXT n

```



Program Printout

GOLF CLUB

```

35 NEXT m
40 LET finish=4000: LET stream
=1600: LET print=1500: LET tee=1
000: LET bunker=1050: LET green=
1100: LET hole=1150
45 LET bot r=1300: LET top r=1
200: LET trees=1400: LET lake=15
50
50 DIM s(10): DIM l(10): DIM p
(10)
55 FOR n=1 TO 10
60 READ l(n): READ p(n): READ
s(n)
65 NEXT n
70 REM LOAD UDG
75 FOR n=USR "a" TO 65535: REA
D u: POKE n,u: NEXT n
79 REM start
80 LET hl=0
90 PRINT AT 14,1: "If you need
further advice on"" playing the
course then please"" press 1 o
therwise please"" press enter."
95 INPUT " 1 for Instructions
": q$
100 IF q$="1" THEN CLS: GO SU
B 2000
105 CLS: PRINT AT 2,1: "Please
inform the professional"" of yo

```

```

ur name and handicap."" (0 - 24
)"
110 INPUT "NAME ";n$
115 INPUT "HANDICAP "; LINE q$
120 IF q$<"0" OR q$>"9" THEN G
O TO 115
125 IF VAL q$<0 OR VAL q$>24 TH
EN GO TO 115
130 LET hc=VAL q$
135 PRINT AT 6,1: "Please press
any key when you "" are ready f
or the first hole."
145 PAUSE 0
149 REM main loop
150 PAPER 4: INK 0: BRIGHT 0: O
VER 0: FLASH 0: BORDER 7: CLS
155 LET hl=hl+1
160 IF hl=19 THEN GO TO finish
165 LET tl=0: LET obl=0: LET sc
=0: LET cg=163: LET cga=32: LET
sl=0: LET r1=0: LET t1=0: LET w1
=0: LET gl=0
169 REM print display
170 GO SUB top r
180 GO SUB bot r
190 LET tl=6: LET t2=4: LET t3=
5: GO SUB trees
200 LET t1=9: LET t2=7: LET t3=
8: GO SUB trees

```

continued on page 90

```

210 FOR n=10 TO 12: LET b1=n: G
0 SUB bunker: NEXT n
215 GO SUB lake
220 GO SUB stream
225 GO SUB green
230 GO SUB hole
235 GO SUB tee
240 GO SUB print
245 GO SUB 7050
299 REM hit ball
300 IF w1 THEN LET w1=0: GO TO
3150
305 INPUT "CLUB ? "; LINE 1$
307 IF 1$="" THEN GO TO 305
310 IF 1$(1)="(sp)" THEN GO TO
305
315 IF 1$(1)="p" THEN GO TO 33
00
320 IF 1$(1)="w" THEN LET c=10
: GO TO 360
325 IF LEN 1$>1 THEN IF 1$(1 T
0 2)="sw" AND s1<>1 THEN LET c=
12: GO TO 360
330 IF LEN 1$>1 THEN IF 1$(1 T
0 2)="sw" AND s1=1 THEN LET 12=
INT (RND*41): LET s1=0: GO TO 37
5
340 LET cw=0: IF LEN 1$>1 THEN
IF 1$(2)="w" THEN LET 1$=1$(1)
: LET cw=20
345 IF LEN 1$>1 THEN GO TO 305
350 LET c=VAL 1$(1)
360 LET 11=(220-c^2)-c*2+cw
370 LET 12=11-(hc/c)
375 INPUT "% SWING ? (30 TO 100
)": LINE s$
380 IF s$="" THEN GO TO 375
385 IF s$="100" THEN GO TO 390
387 IF s$(1)<"3" OR s$(1)>"9" T
HEN GO TO 375
388 IF VAL s$>100 THEN GO TO 3
75
390 LET sw=VAL s$
395 LET l=(12/20)*(sw/100)*s(h1
)
400 INPUT "direction. clock "d
$
405 IF d$="" THEN GO TO 400
410 IF d$<"1" OR d$>"9" THEN G
O TO 400
415 IF VAL d$>12 THEN GO TO 40
0
420 IF r1 THEN LET r1=0: GO SU
B 3050
425 IF s1 AND 1$<>"sw" THEN GO
TO 3000
430 GO SUB 3350
440 LET da=(VAL d$)*PI/6+da1
455 IF t1 THEN LET t1=0: GO SU
B 3020
460 LET yd=(1*SIN da)+by+wy*1/5
: LET xd=bx-(1*COS da)+wx*1/5
465 IF xd<1 THEN LET xd=1: LET
ob1=1
470 IF xd>20 THEN LET xd=20: L
ET ob1=1
475 IF yd<0 THEN LET yd=0: LET
ob1=1
480 IF yd>31 THEN LET yd=31: L
ET ob1=1
499 REM move ball
500 POKE 23693,cga
510 PRINT AT bx,by:CHR$ cg
515 IF ob1 THEN GO SUB 7000
520 LET x=xd: LET y=yd: GO SUB
7000
525 LET cg=i: LET cga=ATTR (xd,
yd)
530 PRINT AT xd,yd: BRIGHT 0; I
NK 7; PAPER 8;"H"
535 LET bx=xd: LET by=yd
540 IF CHR$ cg="H" OR CHR$ cg="
C" OR CHR$ cg="D" OR CHR$ cg="E"
OR CHR$ cg="F" OR CHR$ cg="G" O
R CHR$ cg="Q" OR CHR$ cg="U" THE
N LET g1=1
545 IF g1 THEN PRINT AT xd,yd:
OVER 1; PAPER 5; INK 7;"(sp)"
550 IF CHR$ cg="E" THEN LET s1
=1
555 IF CHR$ cg="E" THEN LET r1
=1
560 IF CHR$ cg="H" OR CHR$ cg="
N" THEN LET t1=1
565 IF CHR$ cg="S" OR CHR$ cg="
I" OR CHR$ cg="J" OR CHR$ cg="K"
OR CHR$ cg="L" THEN LET w1=1

```



```

580 IF s1 THEN PRINT AT xd,yd:
OVER 1; INK 7; PAPER 6;"(sp)"
585 LET sc=sc+1
595 PRINT AT 21,23; INK 0; PAPE
R 5;"score ";sc
600 IF CHR$ cg="Q" THEN GO TO
3250
610 GO TO 300
998 STOP
999 REM tee
1000 LET h=VAL h$(h1,1)
1010 LET x=FN x(h): LET y=FN y(h
,x)
1020 PRINT AT x,y; INK 0;"T"
1030 LET bx=x: LET by=y
1040 RETURN
1049 REM bunker
1050 IF h$(h1,b1)="9999" THEN R
ETURN
1060 LET h=VAL h$(h1,b1)
1070 LET x=FN x(h): LET y=FN y(h
,x)
1080 PRINT AT x,y; INK 6; PAPER
4;"E"
1085 RETURN
1099 REM green
1100 LET h=VAL h$(h1,2)
1110 LET x=FN x(h): LET y=FN y(h
,x)
1120 PRINT AT x,y; INK 5; PAPER
4;"C";AT x+1,y;"U";AT x+2,y;
"E"
1130 RETURN
1149 REM hole
1150 LET h=VAL h$(h1,3)
1160 LET x=FN x(h): LET y=FN y(h
,x)
1170 PRINT AT x+1,y; PAPER 5; IN
K 0;"Q"
1180 RETURN
1199 REM top rough
1200 IF h$(h1,16)="9999" THEN R
ETURN
1210 LET h=VAL h$(h1,16)
1220 LET x=FN x(h): LET y=FN y(h
,x)
1230 LET c1=31
1240 FOR r=0 TO x
1250 FOR c=0 TO c1
1260 IF RND>.2 THEN PRINT AT r,
c; INK 1; BRIGHT 0;"E"
1270 NEXT c
1280 LET c1=c1-y
1285 NEXT r
1290 RETURN
1299 REM bot rough
1300 IF h$(h1,17)="9999" THEN R
ETURN
1310 LET h=VAL h$(h1,17)
1320 LET x=FN x(h): LET y=FN y(h
,x)
1330 LET c1=y
1340 FOR r=x TO 21
1350 FOR c=0 TO c1
1360 IF RND>.2 THEN PRINT AT r,
c; INK 1; BRIGHT 0;"E"
1370 NEXT c
1380 LET c1=c1+y: IF c1>31 THEN
LET c1=31
1385 NEXT r

```

```

1390 RETURN
1399 REM trees
1400 IF h$(h1,t1)="9999" THEN R
ETURN
1410 LET p$="H"
1415 IF VAL h$(h1,t1)=100 THEN
LET p$="N"
1420 LET h=VAL h$(h1,t2)
1430 LET n1=FN x(h): LET n2=FN y
(h,n1)
1440 LET h=VAL h$(h1,t3)
1450 LET m1=FN x(h): LET m2=FN y
(h,m1)
1460 FOR n=n1 TO n2: FOR m=m1 TO
m2
1470 IF RND>.6 THEN PRINT AT n,
m; INK 2;p$
1480 NEXT m: NEXT n
1485 RETURN
1499 REM wind
1500 LET wn=INT (RND*4)+1
1510 IF wn=1 THEN LET wy=-1: LE
T wx=0
1515 IF wn=2 THEN LET wy=0: LET
wx=-1
1520 IF wn=3 THEN LET wy=1: LET
wx=0
1525 IF wn=4 THEN LET wy=0: LET
wx=1
1529 REM print
1530 PRINT AT 0,0; PAPER 5;" HOL
E ";h1;TAB 9;1(h1); " Yds";TAB 17
;"PAR ";p(h1);TAB 26;"WIND ";w$(
wn)
1540 RETURN
1549 REM lake
1550 IF h$(h1,13)="9999" THEN R
ETURN
1560 LET h=VAL h$(h1,13)
1570 LET x=FN x(h): LET y=FN y(h
,x)
1580 PRINT AT x,y; INK 7; PAPER
5; BRIGHT 1;"I";AT x+1,y;"S";
;AT x+2,y;"S";AT x+3,y;"S"
1590 RETURN
1599 REM stream
1600 IF h$(h1,14)="9999" THEN R
ETURN
1610 LET h=VAL h$(h1,14)
1620 LET x1=FN x(h): LET y1=FN y
(h,x1)
1630 LET h=VAL h$(h1,15)
1640 LET x2=FN x(h): LET y2=FN y
(h,x2)
1650 FOR n=x1 TO x2
1660 FOR m=y1 TO y2 STEP -1
1670 IF n+m=x1+y1 THEN PRINT AT
n,m; INK 7; PAPER 5; BRIGHT 1;"
S"
1680 NEXT m: NEXT n
1690 RETURN
1999 REM instructions
2000 POKE 23692,255
2005 PRINT AT 1,1;"The round of
golf that you will"" play is as
near as possible"" to a real g
ame. You will be"" asked to sta
te your handicap"" (0 to 24) an
d this will"" influence the len
gth and"" accuracy of your shot

```



```

S.
2010 PRINT " You will carry a no
rml bag of"" clubs consisting
of :-"
2020 PRINT AT 12,7;"Driver .....
....1w";AT 13,7;"
.2w";AT 14,7;"Spoon .....3w
";AT 15,7;"1 - 9 irons .....1 - 9
";AT 16,7;"wedge .....w";AT
17,7;"sand wedge .....sw";AT 18
,7;"putter .....p"
2030 PRINT AT 21,1;"(Any key to
continue)": PAUSE 0
2040 PRINT " If you attempt to
hit the ball"" off the screen y
ou will incur"" 2 penalty strok
es for going out"" of bounds an
d your ball will"" be replaced
on the edge of"" the screen. "
2050 PRINT " If you drive into
water you"" will incur 2 penalt
y strokes"" and your ball will
be replaced"" on the tee side o
f the water."
2060 PRINT "" For each hole you
will be told"" the yardage, pa
r, direction of"" wind and numb
er of strokes so"" far. This in
formation is"" displayed above
and below the"" plan of the hol
e."
2070 PRINT "TAB 1;"(Any key to c
ontinue)": PAUSE 0
2080 PRINT "" The direction of
your stroke"" is entered in te
rms of a clock"" face. The stre
ngth can be from"" 30% to 100%
of a full swing."" Information
about the result"" of the previ
ous stroke is shown"" below the
plan of the hole."
2085 PRINT " At the end of your
round you"" will be shown your
card for"" that round."
2090 PRINT "" AT 21,1;"(Any
key to continue)": PAUSE 0: RET
URN
2999 REM sand
3000 PRINT AT 21,0; PAPER 6;"Tak
e a sand wedge"
3010 PAUSE 100: GO SUB 7050: GO
TO 505
3019 REM trees
3020 LET da=da+(1-INT (RND*3))/1
0
3049 REM rough
3050 LET l=1-INT (RND*4)
3060 RETURN
3149 REM water
3150 LET yd=by-3: LET xd=bx
3160 LET w1=0
3170 PRINT AT 21,0; PAPER 6;"In
water "
3180 LET sc=sc+1
3190 PAUSE 100: GO SUB 7050: GO
TO 500
3249 REM hole
3250 PRINT AT 21,0; INK 0; PAPER
5; FLASH 1;"You have holed ou
t in ";sc;" strokes";"(sp)" AND sc
<10
3260 PAUSE 200
3265 LET h(hl)=sc
3270 GO TO 150
3299 REM putt
3300 INPUT "STRENGTH OF PUTT (1
- 3) "; LINE v$
3310 IF v$<"1" OR v$>"3" THEN G
O TO 3300
3320 LET wy=0: LET wx=0
3325 LET l=VAL v$
3330 GO TO 400
3349 REM random angle
3350 LET da2=(PI/18)*hc/12
3360 LET da1=da2*(INT (RND*3)-1)
3370 RETURN
3999 REM finish
4000 PAPER 7: INK 0: CLS
4005 LET pt1=0: LET pt2=0: LET h
t1=0: LET ht2=0: LET lt1=0: LET
lt2=0
4010 PRINT AT 1,7;"SPECTRUM GOLF
CLUB";AT 3,5;"LENGTH 6505 YDS
PAR 72"
4015 PRINT AT 5,0;" YDS PAR
SC YDS PAR SC"
4020 PLOT 3,44: DRAW 0,93: DRAW

```

```

249,0: DRAW 0,-93: DRAW -249,0
4025 PLOT 126,44: DRAW 0,93
4030 PLOT 22,44: DRAW 0,93: PLOT
60,44: DRAW 0,93: PLOT 93,44: D
RAW 0,93
4035 PLOT 148,44: DRAW 0,93: PLO
T 187,44: DRAW 0,93: PLOT 220,44
: DRAW 0,93
4040 FOR n=1 TO 9: PRINT AT n+6,
1;n;AT n+6,16;n+9: NEXT n
4043 PRINT AT 20,1;n$
4045 FOR n=1 TO 9: LET ht1=ht1+h
(n): LET ht2=ht2+h(n+9): LET lt1
=lt1+1(n): LET lt2=lt2+1(n+9): L
ET pt1=pt1+p(n): LET pt2=pt2+p(n
+9): PRINT AT n+6,4;1(n);AT n+6,
9;p(n);AT n+6,13;h(n);AT n+6,20;
1(n+9);AT n+6,25;p(n+9);AT n+6,2
9;h(n+9): NEXT n
4050 PRINT AT 17,0;"(3*sp)";lt1;
"(sp)";pt1;"(3*sp)";ht1;AT 17,16
;"(3*sp)";lt2;"(2*sp)";pt2;"(3*s
p)";ht2
4055 PRINT AT 19,18;"TOTAL ";ht1
+ht2;AT 20,15;"HANDICAP ";hc;AT
21,19;"NETT ";ht1+ht2-hc
4060 PRINT AT 20,1;n$
6090 STOP
6999 REM out of bounds
7000 PRINT AT 21,0; INK 0; PAPER
5;"Out of Bounds. "
7010 LET ob1=0
7020 LET sc=sc+2
7030 PAUSE 100: GO SUB 7050: RET
URN
7049 REM clear bottom line
7050 PRINT AT 21,0; PAPER 5;"(32
*sp)"
7060 RETURN
7999 REM data
8010 DATA 0401,0326,0427,0110,12
19,0100,1820,0031,0100,1313,1216
,0728,9999,9999,9999,0200,1606
8020 DATA 1201,0928,0929,0100,10
15,0100,1420,1631,0200,1210,1126
,0825,9999,9999,9999,1002,1403
8030 DATA 1101,0822,0823,0417,27
31,0200,9999,9999,9999,0720,0918
,1220,9999,9999,9999,0802,1405
8040 DATA 1801,0426,0527,1321,11
31,0100,9999,9999,9999,0330,0524
,0530,9999,9999,9999,1402,9999
8050 DATA 0401,1626,1628,0106,09
31,0200,0711,1831,0200,1427,1630
,1830,9999,9999,9999,0300,0702
8060 DATA 0801,1628,1729,0108,20
31,0200,1221,0011,0200,1214,1825
,1329,9999,0123,2103,0505,1203
8070 DATA 0201,1426,1428,0112,10
31,0100,9999,9999,9999,1411,1508
,1730,9999,9999,9999,9999,1610
8080 DATA 1501,0626,0727,0610,03
11,0200,1421,2131,0100,0425,0530
,1027,1210,9999,9999,1302,1711
8090 DATA 1701,1625,1626,0107,25
31,0100,0820,0821,0100,1429,1924
,1930,9999,9999,9999,1005,9999
8100 DATA 1001,0927,1028,1421,19
31,0200,9999,9999,9999,1024,1325
,1116,9999,9999,9999,0700,1304

```



```

8110 DATA 1802,0424,0426,0110,00
14,0100,1221,1731,0100,0225,0429
,0827,9999,9999,9999,9999,9999
8120 DATA 1302,0626,0727,0207,11
17,0200,1321,2231,0200,1214,1415
,0824,9999,9999,9999,1002,1631
8130 DATA 0302,1525,1626,9999,99
99,9999,9999,9999,9999,0713,0911
,1829,0922,0130,2011,0200,1931
8140 DATA 1701,1427,1328,1120,10
23,0200,0107,2131,0200,0716,0918
,1525,9999,9999,9999,1003,1831
8150 DATA 1001,1123,1125,0120,28
31,0100,0120,2831,0200,0925,1116
,1525,9999,9999,9999,0801,1207
8160 DATA 1002,0926,1027,9999,99
99,9999,9999,9999,9999,0728,0930
,1229,9999,0130,2011,0701,1311
8170 DATA 1101,0526,0527,0108,00
21,0100,1420,0026,0200,1017,1217
,0930,9999,9999,9999,0200,9999
8180 DATA 0202,1727,1828,0107,09
31,0200,0813,2031,0100,1527,1825
,1217,9999,9999,9999,9999,0702
8210 DATA 300,4,1.7
8220 DATA 500,5,1
8230 DATA 250,3,2.2
8240 DATA 400,4,1.5
8250 DATA 200,3,2.5
8260 DATA 350,4,1.4
8270 DATA 420,4,1.45
8280 DATA 480,5,1.15
8290 DATA 280,4,1.75
8300 DATA 330,4,1.6
8310 DATA 160,3,3.2
8320 DATA 450,4,1.3
8330 DATA 495,5,1
8340 DATA 400,4,1.5
8350 DATA 440,4,1.35
8360 DATA 190,3,2.8
8370 DATA 470,5,1.2
8380 DATA 390,4,1.6
8390 DATA 247,255,255,255,255,25
5,255,255,96,248,254,254,255,127
,127,30,3,15,31,63,127,127,255,2
55,192,240,252,254,254,255,255,2
55,255,255,255,127,63,31,31,7,25
5,254,254,254,252,248,224,192,25
5,255,255,254,255,255,255,255,0,
0,24,60,60,24,0,0,3,14,24,17,50,
36,109,192,192,32,24,198,34,35,1
45,73,146,137,72,36,35,16,24,7,7
3,137,17,34,66,4,28,240,8,8,28,2
8,62,62,8,8,28,62,127,127,127,62
,8,8,255,255,255,255,255,255,255
,247,0,82,34,0,0,74,68,0,0,0,24,
36,36,24,0,0,8,8,8,8,8,62,28,8,0
,48,73,134,0,48,73,134,126,1,57,
17,17,1,126,255,255,255,255,1
27,255,255,255
9000 LET i=CODE SCREEN$ (x,y): I
F i THEN RETURN
9010 POKE 23606,PEEK 23675: POKE
23607,PEEK 23676-1
9020 LET i=CODE SCREEN$ (x,y)+11
2
9030 POKE 23606,0: POKE 23607,60
: RETURN

```



BOMBER BORIS has a problem. All the bombs are ticking away and he must run around the minefield defusing them as quickly as he can. Watch out, though — Boris can only defuse the bomb which is actually at countdown stage, so he must be very careful which routes he takes through the minefield or he may find himself cut off.

The program was written by K P Holloway of Andover in Hampshire, and runs on any Spectrum.

Bomber Boris uses our special abbreviations for graphics characters, so please read the instructions on the first page of Program Print-out before entering the listing.

```

6 BORDER 0
7 PRINT AT 11,10; INK 6; FLAS
H 1; PAPER 0;" STOP TAPE "
8 GO SUB 800
9 GO SUB 900
10 LET u$="ABCDEFGHJIJ": LET t$
="PKLMNO"
15 LET sc=0: LET l=2
20 LET d=11: LET a=16: LET d1=
d: LET a1=a
25 LET hi=0
30 DIM r(8): DIM c(8)
100 BORDER 0: PAPER 1: INK 3: C
LS
110 FOR i=2 TO 20: PRINT INK 5
;AT i,1;"(30* )"; NEXT i
120 LET c=60
130 PRINT PAPER 0;AT 0,0; INK
3;"(32*sp)";AT 0,0;"(sp) (sp) (s
p) (sp)"; INK 6;"(4*sp)score:0(4*sp)
(sp) high:";hi
180 FOR i=1 TO 8: LET r(i)=INT
(RND*19)+2: LET c(i)=INT (RND*30
)+1
190 PRINT INK 6;AT r(i),c(i);"
I": NEXT i
195 LET b=1
196 PRINT AT 0,0; PAPER 0;"(2*
sp) AND l=2";"(4*sp)" AND l=1)
;"(6*sp)" AND l=0)
200 PRINT AT d,a; INK 3;" "
210 LET d1=d+(INKEY$="6")-(INKE
Y$="7")
215 LET a1=a+(INKEY$="8")-(INKE
Y$="5")
220 LET at=ATTR (d1,a1)
225 IF at=79 THEN LET b=b+1: L
ET sc=sc+c: LET c=60: IF b=9 THE
N GO TO 700
230 IF at=14 THEN GO TO 400
232 IF at=13 THEN LET sc=sc+1
235 IF at=11 THEN LET a1=a: LE
T d1=d
237 BEEP .01,5
240 PRINT AT d,a; INK 3;"(sp)";
AT d1,a1;" "
250 LET a=a1: LET d=d1
270 GO SUB 600
275 IF c=0 THEN GO TO 350
280 PRINT AT 0,16; INK 6; PAPER
0;sc
290 BEEP .01,-10
300 GO TO 200
350 REM out of time
360 FOR i=b TO 8: PRINT AT r(i)
,c(i); FLASH 1; PAPER 0; INK 2;"
I": NEXT i
370 LET l=0
400 REM bang
410 PRINT AT d,a; INK 3;"(sp)";
AT d1,a1; INK 2; FLASH 1;" "
420 BEEP 2,-25
430 PRINT AT d1,a1; INK 3;"(sp)
";AT 0,0;
450 RESTORE 460: FOR i=1 TO 14:
READ z,x: BEEP z,x: NEXT i

```

```

460 DATA .6,0,.4,0,.2,0,.6,0,.4
,0,.2,0,.6,0,.4,3,.2,2,.4,2,.2,0
,.4,0,.2,-1,.6,0
470 PRINT PAPER 0;AT 0,0;"(4*
sp)" AND l=2);"(6*sp)" AND l=1)
475 LET d1=INT (RND*19)+2: LET
a1=INT (RND*30)+1
480 LET d=d1: LET a=a1: LET l=1
-1
485 FOR i=b TO 8: PRINT AT r(i)
,c(i); INK 6;"I": NEXT i
490 IF l>=0 THEN GO TO 200
500 REM game over
505 PRINT AT 0,0; INK 6; PAPER
0;"(10*sp)score:";sc
510 FOR i=30 TO -30 STEP -1: BE
EP .01,i: NEXT i
520 PRINT AT 10,11; PAPER 0; IN
K 6; FLASH 1;"GAME OVER"
560 IF sc>hi THEN LET hi=sc: P
RINT AT 0,27; INK 6; PAPER 0; FL
ASH 1;hi
580 PRINT AT 12,9; PAPER 0; INK
6; FLASH 1;"Press any key"
590 IF INKEY$="" THEN GO TO 59
0
595 GO TO 15
600 REM countdown
610 LET c=c-1
620 LET t=INT (c/10): LET u=c-1
0*INT (c/10)
630 PRINT AT r(b),c(b); INK 7;
BRIGHT 1;t*(t+1); OVER 1;AT r(b)
,c(b);u*(u+1)
640 RETURN
700 REM all safe
710 PRINT AT 11,12; PAPER 0; IN
K 6; FLASH 1;"500 BONUS"
720 FOR i=1 TO 2: PAUSE 5: BEEP
.1,11: BEEP .1,11: BEEP .8,16:
BEEP .05,11: BEEP .05,16: BEEP .
05,11: BEEP .05,16: BEEP .8,20:
NEXT i
730 FOR k=-1 TO 0 STEP -.01: BE
EP k,20: NEXT k
740 LET sc=sc+500
750 GO TO 20
800 REM set up UDG's

```

```

802 RESTORE 810: FOR i=0 TO 159
: READ a: POKE (USR "I"+i),a: NE
XT i
805 RETURN
810 DATA 14,10,10,10,10,10,1
4,4,4,4,4,4,4,4,4,2,2,2,14,8,
8,14,14,2,2,2,14,2,2,14
820 DATA 8,8,8,10,10,14,2,2,14,
8,8,8,14,2,2,14,14,8,8,14,10,1
0,14,14,2,2,2,2,2,2
830 DATA 14,10,10,10,14,10,10,1
4,14,10,10,10,14,2,2,14,64,64,64
,64,64,64,64,64,224,32,32,32,224
,128,128,224
840 DATA 224,32,32,32,224,32,32
,224,128,128,128,160,160,224,32,
32,224,128,128,128,224,32,32,224
,224,160,160,160,160,160,224
850 DATA 126,219,255,102,60,60,
39,224,126,219,255,102,60,60,228
,7,0,60,126,126,126,126,60,0,0,6
0,66,90,90,66,60,0
900 REM instructions
905 PAPER 0: INK 0: CLS
915 PRINT
920 PRINT INK 6;"Race against
time to defuse all the mines bef
ore they explode. Use the curso
r keys (5 TO 8) to move your bom
b expert Boris "; INK 3;" "
930 PRINT INK 7;"Defuse a mine
by walking over it while it's co
unter is running. DO NOT walk o
ver a mine when it's counter
hasn't started "; INK 6;"I"; IN
K 7;"because it will explode,an
d Boris will lose a life."
940 PRINT INK 4;"If Boris fail
s to reach a mine before the co
unter reaches zero,then a chain
reaction will occur exploding all
of the remaining mines ,and en
ding the game."
945 PRINT INK 5;"PRESS ANY KEY
TO START...."
950 IF INKEY$="" THEN GO TO 95
0
960 RETURN

```



BOMBER BORIS

Full instructions are provided in the program — take care, because you may have to knock the champ down several times before you score a knockout.

351 PRINT AT 13.21: "THE CHAMP "

```

TAB 21;" U";TAB 21,N$
360 PRINT AT 17,22;" ■";TAB 22,
" ■";TAB 22," ■";
370 PRINT AT 17,24;" ■";TAB 24,
" ■";TAB 24," ■";
380 PRINT AT 17,26;" ■";TAB 26,
" ■";TAB 26," ■";
390 PRINT AT 17,28;" ■";TAB 28,
" ■";TAB 28," ■";
400 PRINT AT 17,30;" ■";TAB 30,
" ■";TAB 30," ■";
410 FOR N=12 TO 15
420 PRINT AT N,0;" ■";AT N,20;" ■";
430 NEXT N
440 FOR N=16 TO 19
450 PRINT AT N,0;" ■";
460 NEXT N
461 FOR N=0 TO 4
462 PRINT AT N,0;" ■";
463 NEXT N
470 REM *****
480 FOR N=0 TO 4000
490 PRINT AT 5,0;"SC=";SC1;" "
AT 5,16;"SC=";SC2;" "
500 PRINT AT 11,A;B$(1);TAB A,A
$(2);TAB A,A$(3);TAB A,A$(4);TAB
A,A$(5)
510 PRINT AT 11,B;B$(1);TAB B,B
$(2);TAB B,B$(3);TAB B,B$(4);TAB
B,B$(5)
520 IF INKEY$="I" THEN GOTO 100
530 IF INKEY$="Q" THEN GOTO 110
535 IF INT (RND*2)=0 AND B(A+
AND B,A-2 THEN GOTO 700

```

```

0 540 IF INKEY$="0" THEN GOTO 120
100 IF B<16 AND PUN=1 THEN GOTO
200 IF B<16 AND B<A+2 THEN GOTO
300 IF B<A+3 THEN GOTO 900
400 IF SC1=1 THEN GOTO 900
500 IF SC2=1 THEN GOTO 9500
600 NEXT N
700 PRINT AT 11,B;D$(1);TAB B;D
$(2);TAB B;D$(3);TAB B;D$(4);TAB
B;D$(5)
800 LET SC1=SC1-2
900 IF A=1 THEN LET A=A-1
1000 PRINT AT 11,A+1;"",TAB
A+1;"",TAB A+1;"",TAB A+
1;"",TAB A+1;"",TAB A+
1
1100 PRINT AT 11,B;B$(1);TAB B;B
$(2);TAB B;B$(3);TAB B;B$(4);TAB
B;B$(5)
1200 PRINT AT 11,A;A$(1);TAB A;A
$(2);TAB A;A$(3);TAB A;A$(4);TAB
A;A$(5)
1300 GOTO 570
1400 LET B=B+1
1500 IF PUN=0
1600 PRINT AT 11,B-1;"",TAB
B-1;"",TAB B-1;"",TAB B-
1;"",TAB B-1;"",TAB B-
1
1700 PRINT AT 11,B;B$(1);TAB B;B
$(2);TAB B;B$(3);TAB B;B$(4);TAB
B;B$(5)
1800 GOTO 570
1900 LET B=B-1
2000 PRINT AT 11,B+1;"",TAB
B+1;"",TAB B+1;"",TAB B+
1;"",TAB B+1;"",TAB B+
1
2100 PRINT AT 11,B;B$(1);TAB B;B
$(2);TAB B;B$(3);TAB B;B$(4);TAB
B;B$(5)
2200 GOTO 570
2300 IF A=1 THEN LET A=A-1
2400 IF A=1 THEN GOTO 545
2500 PRINT AT 11,A+1;"",TAB
A+1;"",TAB A+1;"",TAB A+
1;"",TAB A+1;"",TAB A+
1
2600 PRINT AT 11,A;A$(1);TAB A;A
$(2);TAB A;A$(3);TAB A;A$(4);TAB
A;A$(5)
2700 GOTO 545
2800 IF A=16 THEN LET A=A+1
2900 IF A=16 THEN GOTO 545

```

93

```

1120 PRINT AT 11,A:1,"      TAB
A:1,"      TAB A:1,"      TAB A:
1130 PRINT AT 11,A:$(1),TAB A:A
$(2),TAB A:$(3),TAB A:$(4),TAB
A:$(5)
1140 GOTO 545
1200 PRINT AT 11,A:$(1),TAB A:C
$(2),TAB A:C$(3),TAB A:C$(4),TAB
A:C$(5)
1210 IF A+3<B OR A:B+2 THEN GOTO
545
1211 LET SC2=SC2-2
1215 LET PUN=1
1220 IF A<17 THEN LET B=B+1
1230 PRINT AT 11,B-1,"      TAB
B-1,"      TAB B-1,"      TAB B-
1240 PRINT AT 11,B:$(1),TAB B:B
$(2),TAB B:$(3),TAB B:$(4),TAB
B:$(5)
1250 PRINT AT 11,A:$(1),TAB A:A
$(2),TAB A:$(3),TAB A:$(4),TAB
A:$(5)
1260 GOTO 545
5000 REM *****
5010 CLS
5020 PRINT AT 10,0:"
5025 PRINT AT 11,0:"
5030 PRINT AT 12,0:"
5035 PRINT AT 13,0:"
5040 PRINT AT 14,0:"
5045 PRINT AT 15,0:"
5050 PRINT AT 20,0:"ENTER YOUR N
AME BOX"
5060 INPUT N$
5070 CLS
5080 PRINT "
5085 PRINT
5090 PRINT "
5095 PRINT AT 3,8:"
5100 PRINT
5110 PRINT "SO YOU THINK YOU CA
BEAT THE WORLD CHAMPION,DO Y
OU
1130 PRINT "WELL THE KEYS TO 0
ARE - PUNCH- "
STEP BACK- "
STEP FORWARD- "

```

```

140 PRINT
150 PRINT "YOU ARE :-"
160 FOR N=1 TO 5
170 PRINT " ",A$(N)
175 NEXT N
180 PRINT
190 PRINT "GOOD LUCK"
200 PAUSE 4E4
210 CLS
220 PRINT "BEATING CHAMP"
230 PRINT
240 PRINT "THE CHAMP U. " ; N$
250 PRINT
260 PRINT
270 PRINT
280 PRINT
290 PRINT
300 PRINT
310 PRINT
320 PRINT
330 PRINT
340 PRINT
350 PRINT
360 PRINT
370 PRINT
380 PRINT
390 PRINT
400 PRINT
410 PRINT
420 PRINT
430 PRINT
440 PRINT
450 PRINT
460 PRINT
470 PRINT
480 PRINT
490 PRINT
500 PRINT
510 PRINT
520 PRINT
530 PRINT
540 PRINT
550 PAUSE 4E4
560 CLS
570 RETURN
580 STOP
590 FOR N=B TO 15
600 LET B=B+1
610 PRINT AT 11,B-1;" " ;TAB
-1;" " ;TAB B-1;" " ;TAB B-
620 PRINT AT 11,B,B$(1);TAB B,B
$(2);TAB B,B$(3);TAB B,B$(4);TAB
B,B$(5)
630 NEXT N
640 PRINT AT 11,A;" " ;TAB A;
;"TAB A;" ;TAB A;"
;TAB A;"
650 PRINT AT 13,A;" " ;TAB A;"
660 PRINT AT 15,A;" " ;TAB A;"
670 FOR N=1 TO 10
680 NEXT N
690 PRINT AT 13,A;" " ;TAB A;
;"TAB A;"
700 PRINT AT 15,A;" " ;TAB A;"
710 PRINT AT 15,A;" " ;TAB A;"
720 FOR N=1 TO 10
730 NEXT N
740 PRINT AT 5,9;N
750 IF N=5 AND SC1=0 AND KN1=2
THEN GOTO 9110
760 IF N=5 AND SC2=0 AND KN2=2
THEN GOTO 9110
770 FOR M=1 TO 15
780 NEXT M
790 NEXT N
800 NEXT N
810 IF SC1=0 AND KN1=2 THEN PRI
NT AT 6,9;" " ;TAB 5E 0000
8101 IF SC2=0 AND KN2=2 THEN PRI

```



```

NT AT 8,9: "SC=2"
9109 IF KN1/2 AND KN2/2 THEN PRINT AT 21,0: "PRESS A KEY TO GET U
9111 IF KN1/2 AND KN2/2 THEN PRINT AT 21,0: "PRESS A KEY TO GET U
9112 PAUSE 4E4
9113 CLS
9118 LET B=15
9119 LET A=2
9120 IF SC2=0 THEN GOTO 9570
9130 CLS
9131 LET KN1=KN1+1
9132 IF KN1=3 THEN GOTO 9140
9134 LET SC1=20
9135 LET SC2=16
9140 PRINT "SC=3",HE KNOCKE
YOU OUT "
9150 PRINT "THERE""S ALWAYS A AN
OTHER CHANCE"
9160 PAUSE 4E4
9170 RUN
9199 STOP
9500 FOR N=A TO 2 STEP -1
9510 LET A=A-1
9520 PRINT AT 11,A+1: "TAB
A+1: "TAB A+1: "TAB A+
1: "TAB A+1: "
9530 PRINT AT 11,A: A$ (1),TAB A: A
$ (2),TAB A: A$ (3),TAB A: A$ (4),TAB
A: A$ (5)
9540 NEXT N
9541 PRINT AT 11,B: "TAB B:
"TAB B: "TAB B: "
9542 PRINT AT 13,B: "TAB B:
"TAB B: "
9543 FOR N=1 TO 10
9544 NEXT N
9545 PRINT AT 13,B: "TAB B:
"TAB B: "
9547 PRINT AT 15,14: "
9550 GOTO 9050
9570 LET KN2=KN2+1
9575 LET SC1=16
9580 LET SC2=20
9585 IF KN2=3 THEN GOTO 9600
9586 GOTO 350
9590 PRINT "SC=3",YOU REALL
Y SHOULD HIM
9620 RUN
9630 STOP
9691 SAVE "BOXING"
9692 RUN

```

Gossamer

```

10 MODE 8
100 WINDOW 512,256,0,0:PAPER 0:C
LS: BORDER 16,0
110 OPEN#3,CON_512x256a0x0:PAPER
#3,0:CLS#3:BORDER#3,16,0
120 a=RND(1 TO 140):b=RND(1 TO 1
00):c=RND(3):d=RND(3):IF NOT c A
ND NOT d:GO TO 120
130 e=RND(1 TO 140):f=RND(1 TO 1
00):g=RND(3):h=RND(3):IF NOT g A
ND NOT h:GO TO 130
140 INK_CHANGE
150 FOR j=1 TO 300
160 LINE a,b TO e,f
170 LINE#3,(148-a),b TO (148-e),
f: REMark Remove this Line
for a non symmetrical

```

GLOSSAMER creates beautiful patterns for the QL using sets of straight lines to create spirals and helixes. For more complex patterns increase the value of j in line 50. For asymmetrical patterns delete line 170 from the listing.

Gossamer was written by Arthur Douglass from London.

```

pattern.
180 a=a+c:b=b+d:e=e+g:f=f+h
190 IF a>148 OR a<1:c=c*-1:INK_C
HANGE
200 IF b>100 OR b<1:d=d*-1:INK_C
HANGE
210 IF e>148 OR e<1:g=g*-1:INK_C
HANGE
220 IF f>100 OR f<1:h=h*-1:INK_C
HANGE
230 END FOR j
240 BEEP 10000,76:PAUSE 200:RUN
250 DEFine PROCedure INK_CHANGE
260 i=RND(1 TO 6)
270 INK i:INK#3,i
280 END DEFine

```

THE SOUND OF MUSIC



INCREASE the sensitivity of your eardrums and set the hills alive with a musical game for the QL by Frederic Huynh of Paris in France.

The Sound of Music plays a tune of eight notes and asks you to duplicate it from memory. At the end of the game you will be given a score based on the number of notes correct, and the computer will play both versions for comparison.

QL users may also find the numerical values for a scale useful, as the QL manual does not provide any information on the subject itself.

```
100 REMARK DOREMI v.2-1
110 MODE 8
120 OPEN #4,scr_:WINDOW #4,442,200,38,16
130 PAPER #1,0:PAPER #2,0:CLS:CLS #0
140 start
```

```
150 RESTORE :CLS
160 initialisation
170 CSIZE #0,3,1
180 octave
190 PAUSE 100: ecoute
200 PAUSE 100:CLS# 0: hasard
210 entree
220 CLS #0:compare
230 fin
240 IF ans=1 THEN PAUSE 10:PAUSE 10:PAUSE 10:RUN
250 END IF
260 PAUSE 5:PAUSE 5:CSIZE #0,2,0
:CLS:CLS#0:STOP
20000 DEFINE PROCEDURE initialisation
20010 RANDOMISE
20020 DIM a(9):DIM b(9):DIM resu
lta(9):DIM h(9):r=1:bon=0
20030 col=-30
20040 FOR i=1 TO 8
20050 READ a(i),b(i)
20060 END FOR i
20070 DATA 33,90,28,80,24,70,22,60,18,50,15,40,12,30,11,20
20080 RETURN
20090 DEFINE PROCEDURE octave
20100 AT #0,1,2:PRINT #0;" List
en to the scale"
20110 x=20
20120 FOR i=1 TO 8
20130 BLOCK 30,b(i),x,100-b(i),i
:x=x+50
20140 BEEP 10000,a(i):PAUSE 20
```

```
20150 END FOR i
20160 RETURN
20170 DEFINE PROCEDURE ecoute
20180 AT #0,1,4:PRINT #0;" One
more time "
20190 FOR i=1 TO 8
20200 BEEP 10000,a(i):PAUSE 20
20210 END FOR i
20220 RETURN
20230 DEFINE PROCEDURE hasard
20240 AT#0,1,4:PRINT #0;" Now ,
Listen to the score"
20250 FOR i=1 TO 8
20260 h(i)=INT(RND(1 TO 8))
20270 BEEP 10000,a(h(i)):FOR z=1
TO 200:NEXT z
20280 END FOR i
20290 PAUSE 100:AT #0,1,0:PRINT
#0;" Last audition ! "
20300 FOR i=1 TO 8
20310 BEEP 10000,a(h(i)):FOR z=1
TO 200:NEXT z
20320 END FOR i
20330 RETURN
20340 DEFINE PROCEDURE entree
20350 INK #0,3:AT #0,1,0:PRINT #
0;" Enter your solution ":INK
#0,7
20360 y=20
20370 BLOCK 30,5,y,100,2
20380 IF KEYROW(1)=16 AND y<370
THEN y=y+50:BLOCK 30,5,y-50,100,
0:BLOCK 30,5,y,100,2
20390 IF KEYROW(1)=2 AND y>20 TH
```

```

EN y=y-50:BLOCK 30,5,y+50,100,0:
BLOCK 30,5,y,100,2
20400 IF KEYROW(1)=8 THEN CLS:CL
S #0:STOP
20410 IF KEYROW(1)=1 THEN FOR zz
=1 TO 50:NEXT zz:GO TO 20430
20420 GO TO 20380
20430 note=((y-20)/50)+1
20440 col=col+50
20450 resulta(r)=note:r=r+1
20460 BLOCK 30,b(note),col,200-b
(note),note
20470 BEEP 10000,a(note)
20480 IF col>=370 THEN RETURN
20490 GO TO 20380
20500 RETURN
20510 DEFINE PROCEDURE compare
20520 PAUSE 100:PAUSE 10
20530 INK #0,2:AT #0,1,0:PRINT #
0;" Here are the results"
20540 PAUSE 150
20550 y=20
20560 SCROLL -105
20570 INK #0,1:AT #0,1,0:PRINT #
0;" Your score "
20580 FOR i=1 TO 8
20590 BEEP 10000,a(resulta(i)):P
AUSE 20
20600 END FOR i
20610 PAUSE 100
20620 CLS #0
20630 INK #0,4:AT #0,1,0:PRINT #
0;" And the computer's one"
20640 FOR i=1 TO 8
20650 BLOCK 30,b(h(i)),y,200-b(h
(i)),h(i)
20660 BEEP 10000,a(h(i)):PAUSE 2
0
20670 y=y+50
20680 IF resulta(i)=h(i) THEN bo
n=bon+1
20690 END FOR i
20700 RETURN
20710 DEFINE PROCEDURE fin
20720 PAUSE 100
20730 INK #0,7:AT #0,1,0:PRINT #

```

```

0;" Results of the test "
20740 PAUSE 100
20750 couic(5)
20760 FLASH #0,1:AT #0,1,0:PRINT
#0;" Good answers : ";bon:
PAUSE 100: couic(-5):FLASH #
0,0
20770 AT #0,1,0:PRINT #0;" Do yo
u want another play?":PAUSE 50:
couic(-5)
20780 FLASH #0,1:AT #0,1,0:PRINT
#0;" Press Y or N ":FL
ASH #0,0
20790 IF KEYROW(5)=64 THEN ans=1
:GO TO 20820
20800 IF KEYROW(7)=64 THEN ans=0
:GO TO 20820
20810 GO TO 20790
20820 couic(-5)
20830 RETURN
20840 DEFINE PROCEDURE couic(v)
20850 FOR i=1 TO 120
20860 PAN #0,v:END FOR i
20870 RETURN
20880 DEFINE PROCEDURE start
20890 CLS:CLS #4
20900 BORDER #4,3,1,4
20910 CLS #4
20920 INK #4,2:AT #4,0,11:PRINT
#4;"FFREDERIC HUYNH"
20930 INK #4,1:AT #4,3,15:PRINT
#4;"PRESENTS"
20940 INK #4,3:CSIZE #4,3,1:AT #
4,3,10:PRINT #4;"DO-RE-MI":CSIZ
E #4,2,0:INK #4,4
20950 AT #4,10,0:PRINT #4;" Thi
s program is very easy to use :
you will hear a series of notes
;then the principle of the game
is to remember them."
20960 AT #4,14,0:PRINT #4;" Use
the cursor keys to select theno
tes and then press <ENTER> to re
-cord them."
20970 music
20980 INK #4,3:CSIZE #4,3,1:AT #

```

```

4,3,10:PRINT #4;"DO-RE-MI":CSIZE
#4,2,0:INK #4,4
20990 INK #4,6:FLASH #4,1:AT #4,
18,12:PRINT #4;"PRESS <ENTER>":I
NK #4,4:FLASH #4,0
21000 IF KEYROW(1)=1 THEN PAUSE
10:PAUSE 10:RETURN
21010 IF KEYROW(7)=4 THEN GO TO
20890
21020 IF KEYROW(1)=8 THEN CLS:ST
OP
21030 GO TO 21000
21040 RETURN
21050 DEFINE PROCEDURE music
21060 RESTORE 21120
21070 FOR i=1 TO 64
21080 INK #4,1:CSIZE #4,3,1:AT #
4,3,10:PRINT #4;"DO-RE-MI":CSIZE
#4,2,0
21090 READ n,t:BEEP t+5000,n:PAU
SE 7*(t/1000)
21100 END FOR i
21110 :
21120 DATA 33,3000,28,1000,24,30
00,33,1000,24,2000,33,2000,24,40
00,28,3000,24,1000,22,1000,22,10
00,24,1000,28,1000,22,5000
21130 DATA 24,3000,22,1000,18,30
00,24,1000,18,2000,24,2000,18,40
00,22,3000,18,1000,15,1000,15,10
00,18,1000,22,1000,15,5000
21140 DATA 18,3000,33,1000,28,10
00,24,1000,22,1000,18,1000,15,50
00,15,3000,28,1000,24,1000,20,10
00,18,1000,15,1000,12,5000
21150 DATA 12,3000,24,1000,20,10
00,17,1000,15,1000,12,1000,11,50
00,12,1000,14,1000,15,2000,22,20
00,12,2000,18,2000,11,5000
21160 DATA 33,1000,28,1000,24,10
00,22,1000,18,1000,15,1000,12,10
00,11,1000
21170 RETURN
21180 END DEFINE
21190 STOP

```

LiNe TrAcE

```

10 REM ZX81 TRACE 1984
20 BLOW
30 PRINT TAB(3); "NOW LOADING AB
OVE RAMTOP"; "ZX81 TRACE"; "BY B
.NICHOLSON"; "COMMANDS: F1=TRAC
E OFF, RAND USR 32512=WHEN
SCREEN CLEARS, LOAD IN YOUR BASIC
PROGRAM."
40 REM
50 LET B=0
60 FOR I=0 TO 10000 STEP 100
70 FOR J=0 TO 10000 STEP 100
80 LET B=B+1
90 LET B=B+1
100 LET B=B+1
110 LET B=B+1
120 LET B=B+1
130 LET B=B+1
140 LET B=B+1
150 LET B=B+1
160 LET B=B+1
170 LET B=B+1
180 LET B=B+1
190 LET B=B+1
200 LET B=B+1
210 LET B=B+1
220 LET B=B+1
230 LET B=B+1
240 LET B=B+1
250 LET B=B+1
260 LET B=B+1
270 LET B=B+1
280 LET B=B+1
290 LET B=B+1
300 LET B=B+1
310 LET B=B+1
320 LET B=B+1
330 LET B=B+1
340 LET B=B+1
350 LET B=B+1
360 LET B=B+1
370 LET B=B+1
380 LET B=B+1
390 LET B=B+1
400 LET B=B+1
410 LET B=B+1
420 LET B=B+1
430 LET B=B+1
440 LET B=B+1
450 LET B=B+1
460 LET B=B+1
470 LET B=B+1
480 LET B=B+1
490 LET B=B+1
500 LET B=B+1
510 LET B=B+1
520 LET B=B+1
530 LET B=B+1
540 LET B=B+1
550 LET B=B+1
560 LET B=B+1
570 LET B=B+1
580 LET B=B+1
590 LET B=B+1
600 LET B=B+1
610 LET B=B+1
620 LET B=B+1
630 LET B=B+1
640 LET B=B+1
650 LET B=B+1
660 LET B=B+1
670 LET B=B+1
680 LET B=B+1
690 LET B=B+1
700 LET B=B+1
710 LET B=B+1
720 LET B=B+1
730 LET B=B+1
740 LET B=B+1
750 LET B=B+1
760 LET B=B+1
770 LET B=B+1
780 LET B=B+1
790 LET B=B+1
800 LET B=B+1
810 LET B=B+1
820 LET B=B+1
830 LET B=B+1
840 LET B=B+1
850 LET B=B+1
860 LET B=B+1
870 LET B=B+1
880 LET B=B+1
890 LET B=B+1
900 LET B=B+1
910 LET B=B+1
920 LET B=B+1
930 LET B=B+1
940 LET B=B+1
950 LET B=B+1
960 LET B=B+1
970 LET B=B+1
980 LET B=B+1
990 LET B=B+1
1000 LET B=B+1

```

TAKE THE PAIN out of de-bugging ZX-81 programs with *Line Trace* by Barry Nicholson of Tyne and Wear. The program is a short machine-code routine which uses interrupts to constantly monitor the operation of a Basic program.

First, enter POKE 16389,127 to lower RAMTOP. The LOAD the program and RUN it. The code will be POKed in and the program will then NEW. Now you can write your Basic program. Typing RAND USR 32512 will activate the routine, and when your program is RUN the line numbers will be printed at the bottom of the screen as they are executed. RAND USR 32517 turns the routine off.

The routine will happily deal with any Basic program unless it uses the commands FAST or PAUSE.

```

42380330C18F909C61CDD7700DD2379FE
0128031318E20E0205DC10FE0D28C318
77
100 REM (PRINT LEN A$)
SHOULD GIVE: - 450
105 REM *****
110 LET B=32512
120 FOR K=1 TO LEN A$ STEP 2
130 POKE B,16+(CODE A$(K)-28)+C
ODE A$(K+1)-28
140 LET B=B+1
150 NEXT K
160 NEW
170 SAVE "TRACE"
180 LET AT=32512
190 IF (PEEK 16388+255+PEEK 163
89)=AT THEN RUN
200 PRINT "RAMTOP NOT LOWERED T
O PART, PLEASE LOWER RAMTOP BY
POKE 16389,127...NEWLI
NE...FOLLOWED BY: NEW...NEWLI
NE...THEN RELOAD "TRACE""

```

Starting a business and know about balance sheets, profit, cash flow, bank loans.

ENTREPRENEUR

The best way to look ahead and plan your future.

FORECASTER

Need help with figures, work out VAT, PAYE, margins, interest, fractions, square roots.

NUMBERS AT WORK

Discover the constellations and learn the secrets of your universe.

STARWATCHER

Schedule work, meet deadlines and save time and money.

PROJECT PLANNER

Make the most of the opportunities and solve your problems.

DECISION MAKER

Get soft with your micro... and make the best of it with Brainpower

SEND FOR MORE BRAINPOWER TODAY.

Are you really making the best of your micro - are you still using too much of your own brainpower?

We at Collins Soft have some very good news, six simple to use software packages called Brainpower that puts you firmly in control and helps you realise your own full potential.

Skills that will help you make decisions skills that help you plan ahead skills which can help your business skills to discover the universe and skills which will organise your work.

With Collins range of Brainpower software you have a Teaching program and Book which show

you how easy Brainpower is to use on your BBC, Commodore 64 & Spectrum plus the main applications program itself.

Discover Brainpower at WH Smith, Boots, Menzies and all good Computer Shops or simply post the coupon for information - today.



Read what they say about Brainpower.

ENTREPRENEUR
If you intend to go into business, Entrepreneur is an essential investment - Practical Computing.

PROJECT PLANNER
The manual has a simplicity that is endearing - Mike Grace Commodore Horizon.

STAR WATCHER
The best star-gazing program so far available on microcomputer - John Walker - leading software writer.

FORECASTER
I found the theories of Prediction fascinating - Commodore Horizons.

DECISION MAKER
In many ways it has succeeded in an area that few other programs have even attempted - using the computer to educate adults - Popular Computing Weekly.

Collins Soft is a division of William Collins & Sons Co Limited
Brainpower is a trade mark of Tappin Publishing Limited.

Please send me my Collins Soft Brainpower brochure ☐ (please tick)

Name _____

Address _____

Post Code _____

SU 5/85

BRAINPOWER

Application through learning

Collins Soft, FREEPOST 30, London W1E 7JZ

TITLE	SOFTWARE HOUSE	REC.	OUR.
SHERLOCK	MELBOURNE HOUSE	14.95	12.50
THE HOBBIT	MELBOURNE HOUSE	14.95	12.50
GHOSTBUSTERS	ACTIVISION	9.99	8.65
AMERICAN FOOTBALL	ARGUS PRESS	9.99	8.99
DOOMDARKS REVENGE	BEYOND	9.95	8.65
LORDS OF MIDNIGHT	BEYOND	9.95	8.65
MUTANT MONTY	ARTIC	6.95	5.95
DARK STAR	DESIGN	7.50	6.50
DEUS DE MACHINE	AUTOMATA	15.50	12.50
AIR WOLF	ELITE	6.95	5.95
TIR NA NOG	GARGOYLE	9.95	8.95
KNIGHT LORE	ULTIMATE	9.95	8.50
UNDERWORLDE	ULTIMATE	9.95	8.50
ALIEN 8	ULTIMATE	9.95	8.50
SYSTEM 1500	CRAIG	9.95	8.65
KUNG FU	BUGBYTE	6.95	5.95
FULL THROTTLE	MICRO MEGA	6.95	5.95
SKOOL DAZE	MICROSPHERE	6.95	5.95
AVALON	HEWSON	7.95	6.95
ZAXXON	U.S.GOLD	7.95	6.95
D.T. DECATHALON	OCEAN	5.95	4.90
MATCH DAY	OCEAN	7.95	6.95
HUNCHBACK II	OCEAN	5.90	4.90
ERIC BRISTOWS DARTS	QUICKSILVA	6.95	5.95
GREAT SPACE RACE	LEGEND	14.95	12.50
COMPUTER RECORDS	SELECT 1	12.99	10.99
TASWORD II	TASMAN	13.90	11.90
C	HISOFT	25.00	19.95
PAINTBOX	PRINT 'N' PLOTTER	7.70	6.70
THE QUILL	GILSOFT	14.95	12.50

47 OXFORD ROAD, ACOCKS GREEN,
BIRMINGHAM, B27 6DS.
TELEPHONE 021 706 4054

4 Games for the ZX Spectrum

Order this new BASIC programming course for an introductory price of just £9.95 and you will receive these 4 great games absolutely **FREE**.

This new concept in computer education will take you beyond simple BASIC instructions, into the world of the professionals where you will learn their secret techniques. It comes on cassette, so you simply relax in front of your television and watch and listen as we show you how to get the most from your micro.

For 16K or 48K RAM

ATTRIBUTES
PEEK & POKE
PLOT & DRAW
ANIMATED GRAPHICS
PROGRAM STRUCTURE
HIGH RES. GRAPHICS
FULL COLOUR & SOUND

SPECTRUM HOLDINGS LTD., P.O. BOX 104, CRAWLEY, RH10 4FU

Make Cheque or Postal Order for £9.95 payable to: SPECTRUM HOLDINGS LTD.
and send to: P.O. BOX 104, CRAWLEY, RH10 4FU

Name _____

Address

Postcode _____ Tel: _____
Orders despatched within 7 days

PROFESSIONAL
SOFTWARE

CLASSIC BOOK-KEEPING

By A. G. Clough FCA

A fully flexible, complete Book-keeping system for the 48K SPECTRUM, two microdrives and an 80 column printer, suitable for any type of business or organisation.

Follows traditional double entry routines from prime entry to Trial Balance. All records printed as created, tangible and verifiable. Comprehensive backup. Once only entries.

THE RECORDS		CAPACITY
GENERAL LEDGER	Traditional debit, credit, balance	250 Accounts
SALES LEDGER	format, Open accounts, all	500 Accounts
BOUGHT LEDGER	transactions recorded	500 Accounts
CASH RECEIVED	Classic cash book layout, running	550 Items
BANK PAYMENTS	balance	(p.m. each)
PETTY CASH	Date, ref. code, gross, VAT if required, net, analysis	No practical limit
DAY BOOKS	Date, ref. a/c number, code,	700 invoices
SALES	gross, VAT, net invoice, separate	(per month)
PURCHASES	SR, 2R column analysis	each
JOURNAL	Ref. debit, credit, analysis	No problem

OTHER FEATURES

Auto-run from system management program — Interim listing of prime entries — Error control and prevention — Self Balancing ledgers — Allocation to a/c code at prime entry — No complicated syntax — STATEMENTS with aged balances, addressed for window envelopes — closing Journal entries allowed — multiple coding of invoices and other prime entries.

Supplied on three microdrive cartridges with manual and short demonstration printout. **\$69 Postage Paid**

A copy of the manual and demonstration printout may be obtained on payment of £5, deductible when the order is placed.

CASH BASIS ACCOUNTS

A shorter version of the above without Sales and Purchase Ledgers, Day Books and Statements. Very suitable for cash basis businesses, Personal Accounts, dealing with incomplete records. **£29 Postage Paid**

**MANX TAPES, GAREY VEG, GLEN AULDYN, RAMSEY
ISLE OF MAN, PHONE: 813071**

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			ADDITIONAL IDC		
2 x 23-way (ZX-81)	£1.85		56-way Card Edge for		
2 x 28-way (Spectrum)	£2.10		Extension Lead	£4.25	
DOUBLE SIDED PLUG BOARDS			SPECTRUM PROGRAMMABLE JOYSTICK INTERFACE		
ZX-81 23-way	£1.25		Will work with any Spectrum Software		
Spectrum 28-way	£1.50			£24.00	
D CONNECTORS			SPECTRUM JOYSTICK INTERFACE		
Solder Bucket	Male	Female	OUR PRICE ONLY		
9-way	.75	£1.00	BOTH INTERFACES HAVE RESET BUTTONS		
15-way	.95	£1.50	COMPUTER LEADS		
25-way	£1.50	£1.90	7 Pin DIN Plug to 2 x 3.5mm		
37-way	£2.40	£3.25	1 x 2.5mm Jack Plugs	£2.25	
WOODS .95			5 Pin DIN Plug to 2 x 3.5mm	£2.20	
PRINTER LEADS			1 x 2.5mm Jack Plugs	£2.20	
ALL 1 METRE LENGTH			6 Pin DIN Plug		
BBC	£9.95		6 Pin DIN Plug	£1.95	
BBC serial	£8.95		2 x 3.5mm Jack Plugs to		
AMSTRAD	£16.75		2 x 3.5mm Jack Plugs	£1.25	
MEMOTECH	£12.75		7 Pin DIN Plug to 5 Pin DIN		
EINSTEIN	£12.75		Plug	1.95	
IBM PC	£15.75		7 Pin DIN Plug to 3 Pin DIN		
SPECTRUM interface 1 to RS 232	£9.75		Plug & 2.5mm Jack Plug	£2.25	
SPECTRUM interface 1 to Centronics	£10.75		7 Pin DIN Plug to 7 Pin DIN Plug	£2.25	
CENTRONICS to Centronics	£15.20		5 Pin Domino Plug to 5 Pin Domino Plug	£1.95	
Centronics to Centronics	£9.95		Phono Plug to Coaxial TV Aerial Plug	95p	
OL	£10.75		TELEPHONE CONNS		
PLUG BOARDS			Surface master		
23-way ZX-81	£1.25		jack socket	£3.75	
28-way Spectrum	£1.50		Surface extn socket	£2.50	
IDC AMPHENOL			Double outlet adapter	£4.25	
(Centronics)			Line jack cord 3mtr	£1.85	
36-way plug	£4.95		4 core cable per metre	48p	
36-way socket	£5.95		All surface units shuttered BT approved.		
MONITOR LEADS			DIL PLUG (Headers) IDC		
BBC 6-pin to scart plug	£4.95		Pins		
BNC plug to phono plug	£2.95		14	90	
QL to scart plug	£4.95		16	£1.00	
QL to mono monitor	£1.25		20	£1.40	
IDC D CONNECTORS			24	£2.10	
9-way	Male	Female	COMPUTER CASSETTES		
15-way	£2.70	£3.20	HIGH GRADE		
25-way	£3.80	£4.45	C12 40p; C15 40p		
37-way	£5.90	£6.80	Qty price 100 off 32p each		
COMPUTER CASSETTES			5 Pin Domino Plug	50p	
37-way	£5.90	£6.80	6 Pin DIN Plug	50p	
HIGH GRADE			7 Pin DIN Plug	50p	
C12 40p; C15 40p			8 Pin DIN Plug	55p	
Qty price 100 off 32p each					
5 Pin Domino Plug	50p				
6 Pin DIN Plug	50p				
7 Pin DIN Plug	50p				
8 Pin DIN Plug	55p				

TRADE ENQUIRIES WELCOME
FREE P&P IN UK. Access & Visa accepted. Add 15% VAT to all orders
Cheques made payable to
RSD Connections Ltd, Dept SU5,
PO Box 1, Ware, Herts.
Tel: 0920 5285

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. SU, 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.

Now you can use your 48K Spectrum to write a letter or a report, to compile a mailing list or classify your record collection, to check your bank statement or sort out your family finances (and then translate them into colourful graphics) . . . all for just £5.95.

Quick to learn, easy to use, that's.

MINI OFFICE marks a long-awaited breakthrough in dramatically reducing the cost of personal computing.

For the first time it makes available to everyone an easy-to-operate version of four of the most popular business computing applications – and at a price anyone can afford.

Never before has a word processor been sold for anything as low as £5.95. Nor a database manager. Nor a spreadsheet. Nor a graphics program.

Yet Mini Office contains them all.

So how was it done?

It all started with a suggestion that we should prepare a package to give readers a gentle introduction to the kind of software that businesses were running on their computers.

At that stage there was no intention that it should be an ambitious package. Just a simple program that could be sold at a very low price.

We called in experts in

processing, database management, spreadsheets and graphics had been turned into a full scale suite of programs covering all four applications.

In fact the only part of the brief that remained was our original insistence that the package should be quick to learn and easy to use.

And despite all the extra sophistication that has been written into it, we decided that, as a service to our readers, the price should still be kept at the very low figure originally fixed.

How does Mini Office operate?

Using the **Word Processor** is simplicity itself. There are none of the cryptic coded instructions that had to be mastered by people learning the early word processors.

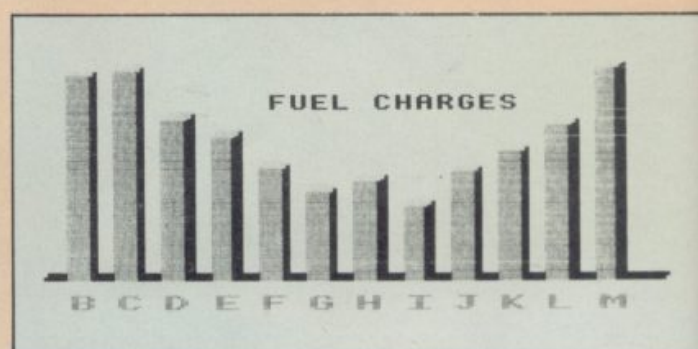
You start by selecting the size of type you prefer – either normal or double-size. The latter is a feature that you

people this could be the first time they can send out a perfectly typed letter without outside help.

Primary school teachers are also expected to make great

it again. It can also be printed out.

The **Database** program can be used to store a mass of information. It can be retrieved, in its entirety or just



Figures on the spreadsheet can produce a bar chart . . .

use of the double-size function, both on the screen and on hard copy printouts.

While you are using the word processor three useful pieces of information are displayed across the top of the screen.

They tell you how much time has elapsed since you started using it, the number of words you have written so far, and how many characters you can key in before the computer's memory is full.

At any time you can press a key which tells you your typing speed. This is a most useful function, and can play an important part in increasing your efficiency at the keyboard.

You can also decide the size of the margin, the line length and the tab positions. Text can be moved from one part of the document to another.

At any time you can preview the text to see how it would look when printed out.

As with all the other programs in Mini Office, your work can easily be saved and loaded when you want to use

the parts you require for a particular purpose, whenever you need it.

The operation is so simple that a useful database can be created in minutes rather than days – and you certainly don't need any computer experience to set it up.

The powerful search facility is very easy to use. You can search for a particular word or words or you can order a numeric search – such as telling the computer to find all the numbers greater or less than the one you provide.

You can carry out multiple sorts. For instance, if you have built up a mailing list containing a list of names, addresses, telephone numbers, occupations and ages you can ask the database to provide you with a list of teachers living in Liverpool whose ages range from 25 to 30.

One powerful option allows you to replace anything on the database without having to go through the whole lot making amendments yourself. You could, for instance, instruct it

A unique feature is the double size text option in both printer and edit mode – perfect for young children and people with poor vision.

The word processor – with double size characters

business software programming, told them what we wanted and sat back to await results.

What happened next was totally unexpected. For they all came back with ideas that were to considerably expand our original brief.

In the end what had been planned as little more than a beginners' guide to word

cannot find on any other word processor.

It is particularly suitable for the partially sighted – in many cases giving them their very first opportunity to use a word processor.

This means they can use a micro to compose a letter, using the double-size mode, and then print it out using normal size type. For many

Now on the
48K Spectrum
and Spectrum +



DATABASE SOFTWARE

to find each reference to "teacher" and replace it with "lecturer".

The **Spreadsheet** is our version of the program that marked a milestone in business computing—Visicalc.

It is often pointed out that this one program alone has helped to sell more personal computers than any other.

Certainly Visicalc and its derivatives have never been shaken from their position at the top of the list of best-selling business programs.

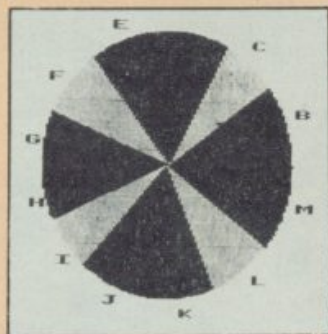
Yet the concept is very simple — a giant worksheet of rows and columns, only part of which can be seen on your screen at any one time. Into any position on the sheet you can put numbers, labels and mathematical formula.

And when you alter any figure its effect ripples through the rest of the sheet, changing any totals as may be necessary.

The Mini Office version is ideal for home finance, provid-

ing you with an effortless means of keeping tabs on your income and expenditure — and enabling you to work out your own budget.

In our Spreadsheet program — as well as in the Database — we have provided



... or a pie chart

a sample file so that you can experiment with it before entering your own data.

One feature we have included which to our knowledge does not exist in any other spreadsheet is a warning device to prevent you

accidentally erasing formula — a very useful precaution.

The **Graphics** program uses the standard business graphics — line, bar and pie charts — in full colour. Which is something not always available on far more expensive graphics packages.

The program uses data you have already prepared on the spreadsheet. You have to identify which set of information you require to see in graph form — such as by indicating which row or column — and then which of the graphs you require.

The graph is then automatically configured exactly as you require it. If you have suitable printer capable of

● Graphics illustrated here are from the Amstrad version and are slightly different on the Spectrum version.

producing graphics you can also print out hard copies for a permanent record.

Because our original intention was to produce a package for people new to all these applications, we have produced a fully-detailed, easy to understand manual.

This 32 page free booklet gives clear instructions about how to use all four programs and in itself forms a concise introduction for first-time users.

If you want to start doing more with your micro than just playing games, this package is your ideal introduction to the four most popular applications for professional computers.

- Cat. ☐ Please send me ___ copy/copies of 9001 Mini Office for 48K Spectrum
Payment: please indicate method (✓)
☐ Access/Mastercard/Eurocard
Card No. _____
☐ Barclaycard/Visa
Card No. _____
☐ Cheque/PO made payable to Database Publications Ltd.

**ONLY
£5.95**

YOU CAN ALSO
ORDER BY PHONE

Name _____ Signed _____
Address _____

Orders (24 hours)
061-480 0173

All other enquiries
061-480 0171

Send for it today

Also available from Comet, Currys, Dixons, Greens, John Menzies, Rumbelows, Boots, W.H. Smiths, Laskey's and other computer stores.

Send to: Database Software, FREEPOST, Europa House,
68 Chester Road, Hazel Grove, Stockport SK7 5NY.
(No stamp needed if posted in UK) Please allow 28 days for delivery

SU5



Win a walking
talking robot
in our great
Ultimate
competition

**Invite an
alien into
your home**

A robot of your own which can talk, understand spoken commands, take messages and objects around the house and even play your favourite music on cassette – that is the prize in our special Ultimate competition. Of course, Omnibot will not have to do anything important as saving an entire space colony, like the robot in the smash hit arcade-adventure Alien 8 from Ultimate.

Omnibot has a pre-programmable memory which retains data for seven days, an in-built cassette deck, a digital clock, full remote control with a microphone for spoken commands, and a rechargeable power unit. A detachable tray allows it to ferry drinks or sandwiches about the house and it can even be programmed to wake you up in the morning with a blast of music and a breakfast snack.

Not one but three Omnibots are going as prizes to the winners of our Ultimate competition. And those three will also receive a fabulous Ultimate goody bag, with an anorak, two T-shirts, a cap, a sweatshirt, and a hooded track-suit top, all with the Ultimate logo, plus eight posters and a voucher for a free Ultimate game of your choice. And even if you miss out on the first prize, the seven runners-up will all receive a goody bag anyway.



With the Omnibot retailing at £180, and the goody bag worth at least £70, that makes more than £1200 worth of prizes. So how do you get your hands on them?

All you have to do is find the titles of nine Ultimate games. Pretend for a moment that you are one of the space colonists in the game Alien 8. Before you joined the ship, you were just another asteroid belt smuggler hiding out in the warrens of Mars. Then you heard about a cheap passage going to a new star system. You arrange to meet the man with the ticket to sell in a dingy bar on Phobos spaceport...

Below are the words he spoke to you. Hidden within what



"Psst! One ticket for a lunar jet, man, going cheap. And since you're evidently from the underworld of Mars, you'll have to go by night. Law is inoperative once you're aboard. Flight ZX742, Trans-American Spaceways. Take a tip from an old space-hound, be a smart cookie. Before you board the jet, pack your light-sabre. Wulf the manic miner may be aboard; a dangerous man, most space-piratic. Attack him on sight if you smell a rat. Good luck!"

he said are the names of nine Ultimate games – beware, they are not always spelled correctly.

Write down the nine titles, correctly spelled, and then think of a suitable caption for the comical picture above.

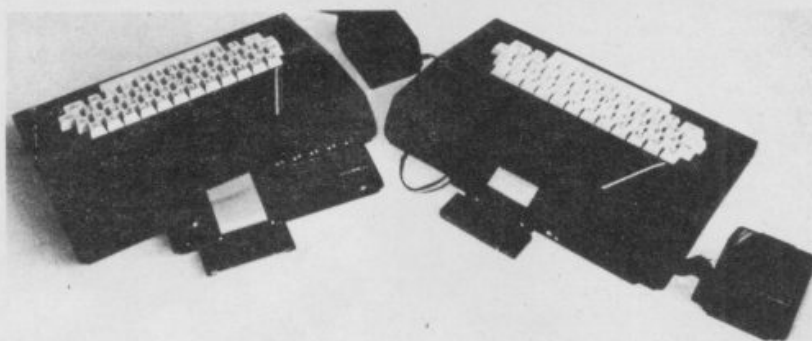
The competition will be judged by Ultimate, and the winners will be those who correctly identify the nine games, and in the opinion of the judges, provide the best caption to the picture. All entries must be sent to Ultimate Competition, Sinclair User, Priory Court, 30-32 Farringdon Lane, London EC1R 5BH.

Employees of EMAP, Ultimate, their friends and associates, are not allowed to enter. All entries should be received by Friday 17th May, and should be written on postcards.

FDS

for ZX SPECTRUM

Executive



- ★ The FDS EXECUTIVE uses high quality, gold plated, mechanical switches. It does not use a membrane pad like some other keyboards and so provides a positive tactile feedback.
- ★ The FDS EXECUTIVE has been designed to allow the user to plug the ZX Spectrum straight in without first removing it from its case.
- ★ Additional work has been carried out to provide the user with all the necessary cut-outs for the fitting of Interface 1 and Microdrives. Assembly is extremely simple requiring the use of only a Posidrive screwdriver and a sharp knife.
- ★ The FDS EXECUTIVE has, in addition to the standard 40 keys of the Spectrum, a further 11 keys providing the following single key functions:
 - * Full size Typewriter SPACE BAR
 - * Four CURSOR Control keys
 - * Single key FULL STOP and COMA keys
 - * E-MODE key; no more three finger contortions, for example; Press and release for PEEK press and hold for OUT
 - * DELETE key
 - * BREAK key
 - * Additional SHIFT key
- ★ The FDS EXECUTIVE is priced at £59.95 and is available from most good computer shops. It can be obtained Mail Order from Nordic Keyboards UK (please include £2.50 p&p).

NORDIC KEYBOARDS UK

Tarren Way East, Tarran Industrial Estate, Moredon, Wirral L46 4TT
Telephone: 051 606 9300

SPECTRUM LIGHT PEN ONLY £10.00



WORKS WITH ALL SPECTRUMS, CREATE PICTURES, SKETCHES, ANIMATIONS AND GRAPHS. PICK FROM MENU OF 16 ROUTINES. COMPLETE WITH INTERFACE CIRCUIT (PLUGS DIRECT IN TO USER PORT) AND SOFTWARE PROGRAM WITH COMPREHENSIVE INSTRUCTIONS, NO NEED TO KNOW ANYTHING ABOUT MACHINE CODE OR EVEN BASIC PROGRAMMING.

LIGHT PEN £10 inclusive VAT & PP

I enclose Cheque/Postal Order for £10 or Debit my Access/Barclay

card/Visa

No Expiry Date

Name

Address

Signature

CUSTOM CABLES INTERNATIONAL LTD., Units 3 & 4 Shire Hill Ind. Estate, Saffron Walden, ESSEX. CB11 3AQ.

SU/g



FREE SOFTWARE FOR LIFE!

New Gold Star life membership of The Software Library is your key to a vast treasure trove of tapes costing up to £18 each. They are yours whenever you want them, three at a time... and a full week's rental won't ever cost you a penny in hire fees!

Only the original Software Library has the resources to make such an amazing offer—free software for life! Our ten megabyte computer ensures fast service; our illustrated, descriptive catalogue makes it fun to choose from over 80 top arcade games, 124 Adventures, simulations and other games, and over 120 great utilities and serious applications; 65% are for the Spectrum, the rest divided between Commodore 64 and ZX81. New releases are constantly being added. Joining this money-saving scheme should cost you £24; as an introductory offer, you can join this month at **half price**—£12. From then on, you can take away three tapes from our shop whenever you wish; or if you order by post, all we ask is 30p post/packing per tape. The rental is perfectly free in either case.

What's more, you can sell your surplus software to other members (we have over 5,000!) and recoup the cost of membership in no time at all. We offer huge discounts on peripherals and tapes... and so much more. Phone us now on 0730 892732, quoting your Access number, or return the coupon without delay!



GUARANTEED to save you more than any other software library scheme!

SOFTWARE LIBRARY FARNHAM ROAD, LISS, HANTS GU33 6JU

Please enrol me at the introductory offer, and send my membership pack by return.

NAME I enclose cheque/P.O. for £

ADDRESS



OVERSEAS: join here for £18, or join one of our foreign branches:
Postfach 7806, 4800 Bielefeld, W. Germany, Jacobmittenstr. 75,
B-2400 Mol, Belgium (also covers Holland); 122 S Circular Road,
Dublin 8; Peder Lykkesvej 33, 2300 Copenhagen S; Box 1769,
Mancini, Swaziland. France & Italy soon. Branch terms vary.
All software hired with supplier's permission. SL





£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/P.O. to:—

Dept SU, Picturesque, 6 Corkscrew Hill, West Wickham, Kent BR4 9BB

PICTURESQUE
PICTURESQUE
PICTURESQUE
PICTURESQUE

AMERICAN & BRITISH COMPUTER BOOKS & MAGAZINES

We offer a World-Wide service for books from all publishers and more than 50 magazines. Please fill in the coupon and ask for monthly listing of NEW books and magazines. You may also subscribe to the following popular magazines starting from the current issues.

	Europe	Other
AMSTRAD CPC 464 USER	£19	£27
BYTE	£26	£32
COMMODORE USER	£18	£28
PERSONAL COMPUTER WORLD	£19	£28
QL USER	£18	£28
SINCLAIR PROGRAMS	£18	£28
SINCLAIR USER	£19	£29
YOUR COMPUTER	£21	£32

These are SPECIAL 6 months Trial Offer Prices.

Please fill the coupon and send it with your cheque to:

**COMPUTER BOOKS AND
MAGAZINES — HAULSTERM LTD**
91 Exeter House, Putney Heath, London SW15
Tel: 01-788 8746

Name Tel:

Address

I wish to subscribe for 6 months to the following magazines:

1 £
2 £
3 £

Enclosed please find a cheque for Total £ ☐ SU5

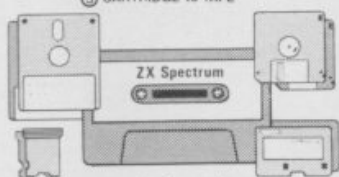
Please send me list of books and other magazines. ☐

ROMANTIC ROBOT present

New! TRANS-EXPRESS 85.2

The only fully automatic and professional utility for transferring Spectrum programs from:

- ① CARTRIDGE to CARTRIDGE or DISC to DISC or WAFFER to DISC or WAFFER
② TAPE to CARTRIDGE or DISC or WAFFER
③ CARTRIDGE to TAPE



"An ingenious piece of software."
"..... Features Performance" PCN
"A valuable utility for microdrive users." Sinclair User
"HIGHLY RECOMMENDED." PCN

NEW! Part ② now fully automatic—you just START/STOP the tape—transfers, modifies, relocates, re-structures & helps to RUN also hyper-turbo, headerless, extra-long (including 48K) parts, etc.

The best possible success ratio, the easiest & fastest in use.

Please send SAE for details.

I enclose a cheque/P.O. for £..... (European orders please add £1 overseas £2)

or debit my ☐ VISA ☐ No ☐

Name Card expiry.....

Address.....

Signature..... Date.....

Wiggler

A CRASH SMASH



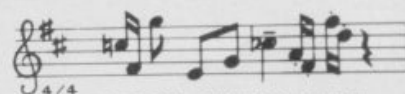
A novelty maze arcade game. Superb graphics and action. An extensive map, over 250 locations, full of features and creatures unseen as yet. New, funny, addictive, compelling.

Plus a bonus on side B.

"A WINNER." PCWeekly

THE MOONS OF JUPITER

New! MUSIC TYPEWRITER 85



COMPLETE MUSIC SYSTEM FOR THE ZX SPECTRUM

"A very professional piece of programming, easy to use, excellent screen presentation, error trapping and helpful prompts." ZX Computing
"Extremely user friendly, lets you get started within minutes." Crash
"The notation has to be seen to be believed."
"Puts many expensive professional systems to shame!" Your Spectrum
"Excellent aid to teaching the basics of music." Which Micro? "Great fun!" The Listener
"If you are interested in music and own a computer then get it." ZX Computing

NEW! Sheet music quality printout on dot matrix printers. NEW!

Microdrive compatible
!NEW SUPPLEMENT for £4.95 — DATA CONVERTER to use music in your own programs — MICRODRIVER puts MT onto m'drives. NEW!

Trade enquiries welcome.

Deliveries normally by return.

Please send me (tick as applicable) WRIGGLER £ 5.95 ☐

MUSIC TYPEWRITER £ 9.95 ☐ MT Supplement £ 4.95 ☐

TRANS-EXPRESS:

all parts on tape £ 9.95 ☐ or cartridge £ 14.95 ☐

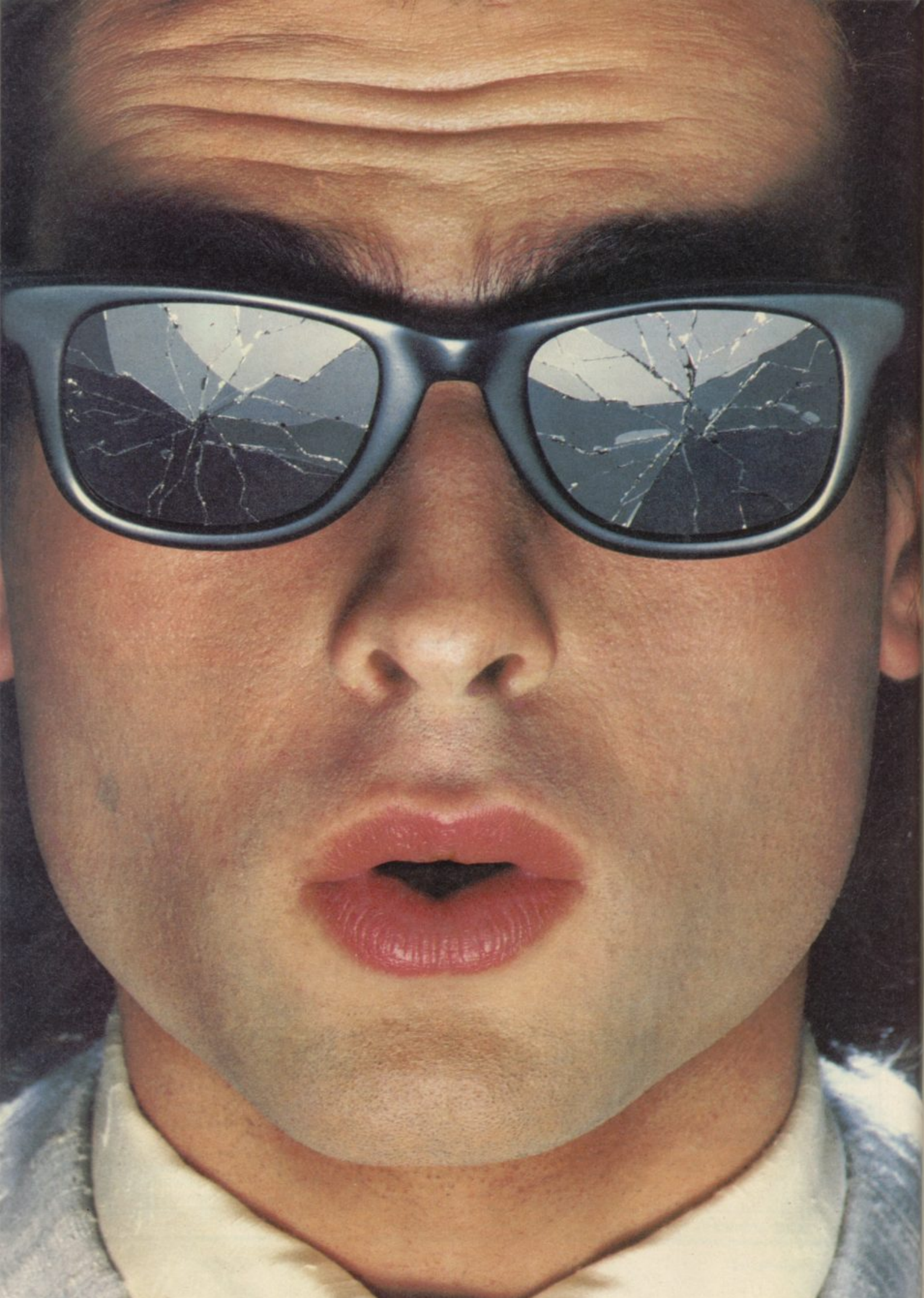
①+② on tape £ 7.50 ☐ or Rotronics wafer £ 12.95 ☐

Updates of TRANS-EXPRESS or MUSIC TYPEWRITER £ 3.50 ☐

TRANS-EXPRESS upgrades from tape to cartridge £ 6.95 ☐

ROMANTIC ROBOT 77 Dyne Road London NW6 7DR

24 hrs ☐ VISA ☐ orders 01-625 9463 ☐ SU



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

SU5

*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. Avon Computer Rentals, 16 West Street, Old Market. Tel: 0272 550600.
Bristol. Boots, 59 Broadmead. Tel: 0272 293631.
Bristol. Laskys, 16-20 Penn Street. Tel: 0272 20421.
Clevedon. Computer Centre, 12A Old Street, Clevedon. Tel: 0272 879514.

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. Hobbyte, Unit 16, The Arndale Centre. Tel: 0582 457195.
Luton. Terry More, 49 George Street. Tel: 0582 23391.

BERKSHIRE

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.

CAMBRIDGESHIRE

Cambridge. Boots, 65-67 Sidney Street and 28 Petty Curry Street. Tel: 0223 350213.
Cambridge. Cambridge Computer Store, 4 Emmanuel Street. Tel: 0223 358264.
Cambridge. Logic Laskys, Unit 6, Midgate Parade, Peterborough. Tel: 0733 49696.
Peterborough. Boots, 40-42 Bridge Street, Queensgate. Tel: 0733 63352.

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. Midshires Computer Centre, 68-78 Nantwich Road. Tel: 0270 211086.
Ellesmere Port. RFR TV & Audio, 1 Poolton 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. Peter's Gate. Tel: 061-429 8080.
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, Stramontgate. Tel: 0539 22559.
Penrith. Penrith Communications, 14 Castlegate. Tel: 0768 67146.
Whitehaven. P D Hendren, 15 King Street. Tel: 0946 2063.
Workington. Technology Store, 12 Finkle Street. Tel: 0900 66972.

DERBYSHIRE

Alfreton. Gordon Harwood, 67-71 High Street. Tel: 0733 836781.
Chesterfield. Boots, 35-37 Low Pavement, Market Place. Tel: 0246 203591.
Chesterfield. Computer Stores, 14 Stephenson Place. Tel: 0246 208802.
Derby. Boots, 1 Devonshire Walk. Tel: 0322 45886.

DEVON

Exeter. Boots, 251 High Street, Tel: 0392 32244.
Exeter. Open Channel, Central Station, Queen Street. Tel: 0392 218187.
Paignton. Computer Systems Ltd, 35 Hyde Road. Tel: 0803 524284.
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. Lansdowne Computer Centre, 1 Lansdowne Crescent, Lansdowne. Tel: 0202 20165.
Dorchester. The Paper Shop, Kings Road. Tel: 0305 64564.
Poole. Lansdowne Computer Centre, 14 Arndale Centre. Tel: 0202 670901.

ESSEX

Basildon. Basildon Software Centre, 78-80 Liberty Shopping Hall, East Square. Tel: 0268 27922.
Braintree. Mirage Microcomputers Ltd, 24 Bank Street. Tel: 0376 48321.
Chelmsford. Maxton Hayman, 5 Bromfield Road. Tel: 0245 354595.
Chelmsford. Way In Computers, 7 Village Square, Chelmer Village. Tel: 0245 467858.
Colchester. Boots, 5-6 Lion Walk. Tel: 0206 577303.
Colchester. Colchester Computer Centre, 3a Short Wyre Street. Tel: 0206 47242.
Grays. H. Reynolds, 28a Southend Road. Tel: 0375 31641.
Harlow. Harlow Computer Centre, 17 Staple Tye. Tel: 0279 22846.
Hornchurch. Compitel Computer Systems, 112a North Street. Tel: 0402 446741.
Ilford. Boots, 177-185 High Road. Tel: 01-553 2116.
Romford. Software Plus, 72 North Street. Tel: 70 65271.
Southend-on-Sea. Computarama, 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 57082.
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.
Waterlooville. GB Microland, 7 Queens Parade, London Road. Tel: 0705 259911.

HERTFORD

Hitchin. County Computers, 13 BUCKLESBURY. Tel: 0462 36757.
Potters Bar. the Computer Shop, 107 High Street. Tel: 0707 44417.
Stevenage. DJ Computers, 11 Town Square. Tel: 0438 65501.
Watford. SRS Microsystems, 94 The Parade, High Street. Tel: 0923 26602.
Watford. Watford Electronics, Cardiff Road. Tel: 0923 405588.
Welwyn Garden City. DJ Computers, 40 Fretherne Road. Tel: 96 28444.

HUMBERSIDE

Beverley. Computing World, 10 Swabys Yard, Dyer Lane. Tel: 0482 881831.

KENT

Ashford. DGH, 10 North Street. Tel: 0233 32597.
Ashford. Geerings of Ashford, 80 High Street. Tel: 0233 33366.
Bromley. Boots, 148-154 High Street. Tel: 01-460 6688.
Bromley. Computers Today, 31 Market Square. Tel: 01-290 5652.
Bromley. Walters Computers, Army & Navy, 64 High Street. Tel: 01-460 9991.
Chatham. Boots, 30-34 Wilmott Square, Pentagon Centre. Tel: 0634 405471.
Gravesend. Gravesend Home Computers, 39 The Terrace. Tel: 0474 23871.
Gillingham. Regal Software Supplies, 49 High Street. Tel: 0634 579634.
Maidstone. Kent Micros, 51 Union Street. Tel: 0622 52784.
Rainham. Microway Computers, 39 High Street. Tel: 0634 376702.
Sevenoaks. Ernest Fielder Computers, Dorset Street. Tel: 0732 456800.
Shortlands. The Village House of Computers, 87 Beckenham Lane. Tel: 01-460 7122.

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 Computers 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 59264.
Wigan. Wildings Computer Centre, 11 Mesnes Street. Tel: 0942 22382.

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. Laskys, 42 Tottenham Court Road. Tel: 01-636 0845.
W1. Lion House, 227 Tottenham Court Road. Tel: 01-637 1601.
W1. Sonic Foto Micro Center, 256 Tottenham Court Road. Tel: 01-580 5826.
W1. Tomorrows World Today, 27 Oxford Street. Tel: 01-439 7799.
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.
SE7. Vic Odds Micros, 5 London Bridge Walk. Tel: 01-403 1988.
SE9. Square Deal, 373-375 Footscray Road, New Eltham. Tel: 01-859 1516.
SE15. Castlehurst Ltd, 152 Rye Lane, Peckham. Tel: 01-639 2205.
EC2. Devron Computer Centre, 155 Moorgate. Tel: 01-638 3339.
N14. Logic Sales, 19 The Bourne, The Broadway, Southgate. Tel: 01-882 4942.
N22. Boots, 38-40 High Road, Wood Green. Tel: 01-881 0101.
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

Bolton. Computer World UK Ltd, 208 Chorley Old Road. Tel: 0204 494304.
Manchester. Boots, 32 Market Street. Tel: 061-832 6533.
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.
Manchester. Walters Computers, Kendal Milne, Deansgate. Tel: 061-832 3414.
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. Hargreaves, 31-37 Warbreck Moor, Walton. Tel: 051-525 1782.
Liverpool. Laskys, Dale Street. Tel: 051-236 3298.
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.
Harrow. Harrow Micro, 24 Springfield Road. Tel: 01-427 0098.

Hounslow. Boots, 193-199 High Street. Tel: 01-570 0156.
Southall. Twillstar Computers Ltd, 7 Regina Road. Tel: 01-574 5271.
Teddington. Andrews, Broad Street. Tel: 01-997 4716.
Twickenham. Twickenham Computer Centre, 72 Heath Road. Tel: 01-892 7896.
Uxbridge. JKL Computers, 7 Windsor Street. Tel: 0895 51815.

NORFOLK

Norwich. Adams, 125-129 King Street. Tel: 0603 22129.

NOTTINGHAMSHIRE

Sutton in Ashfield. HN & L Fisher, 87 Outram Street. Tel: 0623 54734.

OXFORDSHIRE

Abingdon. Ivor Fields Computers, 21 Stern Street. Tel: 0235 21207.
Banbury. Computer Plus, 2 Church Lane. Tel: 0295 55890.
Oxford. Absolute Sound & Video, 19 Old High Street, Headington. Tel: 0865 65661.
Oxford. Science Studio, 7 Little Clarendon Street. Tel: 0865 54022.

SCOTLAND

Aberdeen. Boots, 133-141 Union Street. Tel: 0224 585349.
Edinburgh. Boots, 101-103 Princes Street. Tel: 031-225 8331.
Glasgow. Boots, 200 Sauchiehall Street. Tel: 041-332 1925.
Glasgow. Boots, Union Street and Argyle Street. Tel: 041-248 7387.
Glasgow. Tom Dixon Cameras, 15-17 Queen Street. Tel: 041-204 0826.

SHROPSHIRE

Shrewsbury. Clairmont Enterprises, Hills Lane. Tel: 3647 52949.
Shrewsbury. Computarama, 13 Castlegate. Tel: 0743 60528.
Telford. Computer Village Ltd, 2/3 Hazeldine House, Central Square. Tel: 0952 506771.
Telford. Telford Electronics, 38 Mall 4. Tel: 0952 504911.

STAFFORDSHIRE

Newcastle-under-Lyme. Computer Cabin, 24 The Parade, Silverdale. Tel: 0782 636911.
Stafford. Computarama, 59 Foregate Street. Tel: 0785 41899.
Stoke-on-Trent. Computarama, 11 Market Square Arcade, Hanley. Tel: 0782 268524.

SUFFOLK

Bury St. Edmunds. Boots, 11-13 Cornhill. Tel: 0284 701516.
Bury St. Edmunds. Suffolk Computer Centre, 1-3 Garland Street. Tel: 0284 705503.

SURREY

Bagshot. P & H Electronics, 22-24 Guildford Road. Tel: 0276 73078.
Croydon. Laskys, 77-81 North End. Tel: 01-681 8443.
Croydon. The Vision Store, 53-59 High Street. Tel: 01-686 6362.
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.
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. Gamer, 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.
Eastbourne. Boots, 15 Eastbourne Arndale Centre. Tel: 03232 7742.

TYNE & WEAR

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, Treecynon. 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. Cardiff Microcomputers, 46 Charles Street. Tel: 0222 373072.
Cardiff. The Computer Shop, 41 The Hayes. Tel: 0222 26666.
Cardiff. Laskys, 32-36 Town Wall, St. Davids Centre. Tel: 0222 41619.
Cardiff. Randall Cox, 18/22 High Street Arcade. Tel: 0222 397162.
Mold. Clwyd Personal Computers, Unit 19, Daniel Owen Precinct. Tel: 0352 56842.
Newport. Gwent Computers, 92 Chepstow Road. Tel: 0633 841760.
Swansea. Boots, 17 St. Marys Arcade, The Quadrant Shopping Centre. Tel: 0792 43461.
Swansea. The Microstore, 35-36 Singleton Street. Tel: 0792 467980.

WARWICKSHIRE

Coventry. Coventry Micro Centre, 33 Far Gosford Street. Tel: 0203 58942.
Coventry. Impulse Computer World, 60 Hertford Street Precinct. Tel: 0203 553701.
Coventry. JBC Micro Services, 200 Earlsdon Avenue, North Earlsdon. 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. O.E.M., 9-11 Regent Street. Tel: 0788 70522.

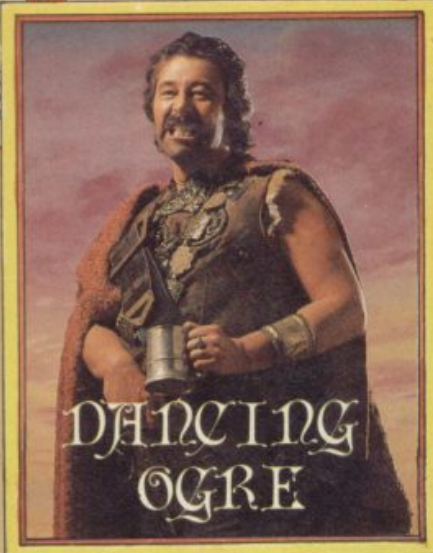
WEST MIDLANDS

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 Churchill 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. DS Peakman, 7 Queens Square. Tel: 021-525 7910.

YORKSHIRE

Bradford. Boots, 11 Darley Street. Tel: 0274 390891.
Leeds. Boots, 19 Albion Arcade, Bond Street Centre. Tel: 0532 33551.
Sheffield. Laskys, 58 Leopold Street. Tel: 0742 750971.
York. York Computer Centre, 7 Stonegate Arcade. Tel: 0904 641862.





Greetings from Greatbelly, friends! There are indeed some strange sights on the road to my destiny at Maru. About four days south of the Ogre, in the Urunnar plains below the Eshakani mountains, we came across seven men, clad all in white with red wigs, who sat in little white carts which moved as if by magic.

They told me they were acolytes of the monastery of Seefayv the Red One, who had bid them go forth into the world to tell men they need never walk again, nay not even unto the alehouse.

Regrettably, Zul and Zel, who led the baggage train behind me, being somewhat myopic failed to see them. Before I could shout they over-ran these holy men. Now there are only six to spread the joyful tidings. Fate is a harsh mistress — perhaps this martyrdom may toughen their resolve.

At Samarrak we stopped for the night at the Damaged Dragon, a poor place where the porridgey food would not sustain a flea. After eating, Zul and Zel found their way to the cow-byre whilst I joined some travellers coming up from Urtuun to the south.

As we caroused, Mangler Morrow of Liverpool and Ashen Face Ashley from Banbury bewailed their ill luck in finding their way to the **Lords of Time**. One could not recover some keys from beneath a door. A lodestone or magnet might be some help — some narcissistic whelp may offer one for a mirror or so I have heard.

The other sought a tiger's tooth. I suggested he seek a tiger — naturally — in the depths of prehistory. Aiding an animal with toothache can often bring useful results.

Along with these two rode Noel the Slayer of Kidderminster. Stumped he was in his **Dungeon Adventure** and unable to pass a giant rat. There is nothing so abhorrent to these rodents as rancid or stinking chips. Mere possession of one may well drive off the creature. He also wanted arrows for a

bow he had found. When I was there I swear there were none, though I will accept correction.

Farseeker Forsyth, boasting in his beer, claimed to us all that he had solved all the riddles of **System 15000**. He claims the title of Lord High Systems Breaker. Others will wish to prize some knowledge from him. Write to him, remembering to pay the courier's fee in advance, at 31 Somerset Road, Kingston, Surrey.

Fair Karen Mear asked advice of me about this ritual — she cannot force her way into the Midminster Bank. At Seastar Travel she will find a code to help her entry. Fair foreign exchange is no robbery.

An illegible hieroglyphic student from Sulgrave, Washington had been bemused and benighted on the **Invincible Island**. In his possession was a sword and skull but he could see no use for them. Perhaps he has had difficulty in escaping the angry islanders — he will be pleased to know that these items

Gordo witnesses death on the road to Maru. All, and more, is related

will give time to slip away in safety with the booty. He also could see no purpose in the boulders that bestrew the isle; well, dropping them in holes will show the presence of water, which could be dangerous.

Owen of the Oval Sphere from Bangor had tried long and hard to enter a town hall in ill-famed Scarthorpe home of the **Urban Upstart**. Beware bureaucrats young sir — all they need is red tape. Take some with you.

There were two far travellers at a corner table. Koster the Accoster of Rhenen in the Low Countries had wearied himself in pursuit of the **Golden Baton**. He could not take hold of a glowing crystal and was in despair. Fear not, says I. Have with you a staff and ring before entering the castle. Until you don a helm found inside the fortress, you may not read the runes inscribed upon the staff. When you read them they should spell 'Akyrz'. Waving the staff and saying this potent charm will cause the ball to dim and drop.

With Koster was one Caballero Carvalho of Lisbon. On learning my name he told me that Gordo in his tongue meant 'the fat one'. Stout is a word I might prefer . . .

At this point Sir Matthew Hill of 20 Mill Road Newthorpe in Nottingham got up upon a table and proclaimed, "I have attained **Hampstead**! Pippa and I would like to let you know we are settling in at our £100,000 cottage. I'm doing well in my work as advisor to the government and you may see me cycling along the Heath in my trusty tracksuit."

Though tankards were thrown there were many who pondered well these words. Richard the Evilcleaver of Poole (24 Hour Service) asked me in a whisper how to enter the gothic mansion owned by Pippa's father. Hark . . . when the toady butler speaks, merely ask to 'meet Chubby'. No second chance is given. Evilcleaver offers help with **Hampstead** and **The Hobbit**. Reach him at 81 Surrey Road, Branksome, Poole, Dorset.

Marauding Marc of Worcester had constantly tried to cross a river in search of the **Tower of Despair**. An angel of death blocks his path. Leaving by a back door may help. Search the bodies there and also the barrels — a key and holy dagger may appear and be of use. If all else fails then try sneak tactics and creep angel. Clear as day.

Gunman Guntrip of Abingdon has not rested from **Valkyrie 17**. He cannot obtain the lamb from the savage butcher. Do you remember a lead box, Gunman? Fatal to you, it may equally be so to this terrible tradesman.

There were a large group, including Ironfist Arends of Hitchen and Whetstone Sharp of York in trouble assisting **Sherlock Holmes**. Some could not enter Basil's house in London. On Tuesday or Wednesday this evildoer is in residence in the great city, and a window in the back yard should be open. Look through to see if Basil is asleep and enter safely.

Now the safe in Basil's other house. Wait for him to leave for London on Tuesday and force your way in. To those who ask me how to open the safe — why not say 'Open safe'?

A tiring night it had been. Besides, I hear that the Lady Marion has written letters to a certain Grand Elf. I am desolate. 'Til next moon, farewell companions of the road.

Greatbelly

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.

SOFT AID

Feed The World



Spellbound — Beyond
 Starbike — The Edge
 Kokotoni Wilf — Elite
 The Pyramid — Fantasy
 Horace Goes Ski-ing — Melbourne House/Psion
 Gilligan's Gold — Ocean
 Ant Attack — Quicksilva
 3D Tank Duel — Real-Time
 Jack and the Beanstalk — Thor
 Sorcery — Virgin
 and
Feed the World
 the hit single
 from Band Aid

Available from all good software stores now. Price £4.99.
 All proceeds to
 Bob Geldof Band-Aid Ethiopian Appeal Fund

BLOCKBUSTERS BLOCKBUSTERS

Blockbusters is the ratings-topping, button-popping, mind-stopping quiz game of the decade, and now it's been adapted for your micro computer!

Central TV's popular programme attracts around 12 million fans, and now it's all set to become number one in the personal computer charts as well! Blockbusters is 'edutainment' of the highest level for all the family, providing a perfect introduction to the home computer.

Two players pit their wits against each other and the clock in a game which tests mental agility and general knowledge – it's exciting, educational and intense with an appeal as wide as the micro itself.

If you've got a computer in the family you've got to get Blockbusters. And if you haven't, it's worth getting one just to play Blockbusters! Now available from High Street stockists or direct from Macsen Software –

just fill in the coupon below and try to contain your excitement – we'll deliver within 14 days!

This is what the experts have to say . . .
"A surprisingly addictive family game with considerable educational side-benefits" –
CRASH MICRO MAGAZINE

Macsen Software, GBA Limited, 17 Nott Square, Carmarthen, Dyfed, SA3 1PQ.
Please send me a Blockbusters programme for my
BBC-B ELECTRON ☐ **SPECTRUM 48K** ☐
COMMODORE 64 ☐ (Tick appropriate box)

Price **£7.95 + 60 pence p&p.**

I enclose Cheque/PO number _____
for **£8.55** made out to Macsen Software or please debit
my ACCESS/BARCLAYCARD, number _____

Signature (Mr/Mrs/Miss) _____

Address _____

Postcode _____ **SUS**



THE ULTIMATE CHALLENGE!



CENTRAL

B

S

C

T



Sleuthing by the sea

Richard Price unearths a devious detective puzzle

THE RAIN dribbled down the grimy windows as I sat at my VDU, listlessly dabbling in some computer saga of wizards and dark castles. The day had been empty of excitement. Suddenly the post boy appeared and threw a package onto my littered desk.

I felt a thrill of apprehension as I took the buff folder from the envelope and saw 'Confidential' stamped in red across it. Could this be it, I thought — had some disgruntled civil servant decided to leak the secrets of the nation's war games computer to me?

Not quite. The folder held a map of a seaside town called Fox Bay, a detective's notebook and a cassette. After playing for a short time I found I had one of the most entertaining Quilled programs since **Hampstead**.

Confidential

Confidential is a detective adventure. One of Fox Bay's prominent citizens has disappeared and his wife decides to hire you, Craig Adams, to track him down. From your seedy office you must seek out the man's associates and contacts to build a coherent picture of the facts surrounding the disappearance. This is not a simple matter. Besides gathering information, often from reluctant characters, there are the hazards of day to day life in the town.

Holiday caravans moulder on sites which are veritable labyrinths. Your car will run out of petrol if you are not

careful. You will leave some office in the town centre smugly thinking how good your interview was only to find a pair of yellow lines where the car had been. All right, stroll up to the local nick to get it back. Have you got your cheque book? You will have to find it then, won't you?

Radar Games has used the **Quill** with some originality and has developed a flair for making you think you're doing well and then bringing you up short with a new twist in the plot.

The screen presentation is attractive and makes full use of the various attributes on the **Quill**. There are small user-defined graphics which add to the professional feel of the game.

Movement is based on the road map provided and you are expected to pay close attention to it if you want to get around town successfully. This feature adds considerably to the atmosphere of the game. After a while you will begin to feel like a true, harassed, gumshoe — someone who no-one particularly likes or enjoys talking to.

Your problems begin the moment you start playing and there is no real let up. Some of the puzzles are relatively easy but they get tougher as you go along. What's really a change is that the game has continuity in its story line and doesn't simply expect you to be satisfied with just collecting objects or treasure.

As far as I know **Confidential** is only available by mail order — but do not let that put you off. It is far better

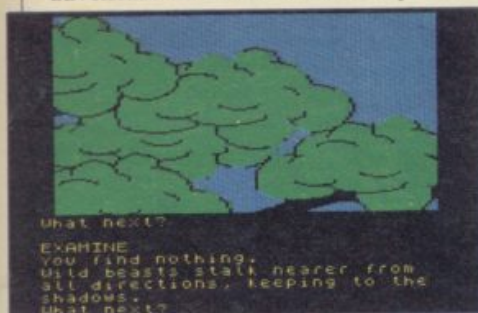
than a lot of the pap in the chain stores now. Write to: Radar Games, 53 Flavel Street, Woodsetton, Dudley DY1 4NU.

Emerald Isle

The Bermuda Triangle is a far call from the more prosaic charms of an English holiday resort. In **Emerald Isle** by Level 9 you find yourself hanging by your parachute cords after your plane has been destroyed by the strange forces at work in that part of the world.

Around you is the tropical forest of the island. Only one person may ever leave this place — the ruler of the land — and your aim is to amass the treasures needed to attain this pinnacle of social status. When you've collected them you must work out the correct method to become king.

The program is another graphic adventure in Level 9's new style and



boasts 200 pictures with a similar number of locations. To be frank, many of the pictures add precious little to the game and I could quite happily have done without graphics showing the bare walls of a room or an expanse of sand.

Despite the graphic overload there are still the kind of descriptions and complexities which adventure veterans expect from the company. Even though Level 9 state specifically that **Emerald Isle** is an easier game than usual — and costs correspondingly less — the clue sheet still runs to over 500 items.

After extricating yourself from the parachute you make your way to the royal palace in Tree City. There you will begin to get some idea of the way the island operates and should find the railway which can transport you to other parts.

I was quickly befuddled by the vast amount of detail — this initial sense of bewilderment seems to be one of Level 9's hallmarks. There is never a simple progression from one easily solved puzzle to another. You never

know whether an item you find will have one or many uses, and the wealth of information helps develop involvement and atmosphere.

The island setting is becoming a classic scenario for adventures but it is not often that you get quite so much for your money. As well as the mandatory volcano, natives, cannibals and coconuts to deal with, you will have to know what to do with carbide granules, ticket machines and lots more.

At £6.95 **Emerald Isle** is competitively priced and offers a style and sophistication hard to beat. If you're already a committed Level 9 fan you're unlikely to be disappointed, even if it is easier than usual. I'm still trying to read those damned foreign inscriptions.

Heroes of Karn

I loaded up **Heroes of Karn** from Interceptor with trepidation. I found the earlier program **Jewels of Babylon** about as exciting as Eastbourne on a Sunday night. Fortunately, the new adventure is a different kettle of fish, though with some reservations.

The setting is pretty typical — the mighty heroes of the title have been overwhelmed by the dark forces of chaos and magically imprisoned in various forms. You, a stranger from a world of thinking machines and the like, must rescue them from the thrall of darkness and restore them to their true likenesses. I'm unsure about the thinking machine bit but we all accept a modicum of poetic licence now and again, I suppose.

The game is a graphic adventure and there are some very smart pictures sprinkled around the locations — probably not as many as in the original CBM 64 version but beautifully drawn nevertheless. However, pictures still do not make an adventure.

You start in a field in a deserted landscape. Problems appear quickly and it is not too long before you run into what is undoubtedly the first of the metamorphosed heroes — a frog no less, who can be transformed in the time-honoured way after you have disposed of a particularly irritating swamp lizard. Within a score of moves you meet barrowwights, venal castle guards, a pirate and even a giant clam.

Like its bejewelled predecessor the program's general style can be aggravating. The description will scroll up, up and away as soon as you make an entry, making for a lot of retyping of



'Look' if you are of vaguely amnesiac dispositions. On the positive side, you can use prepositions such as 'with' enabling you to choose a weapon for a fight or offer items of bribery to creatures of all species.

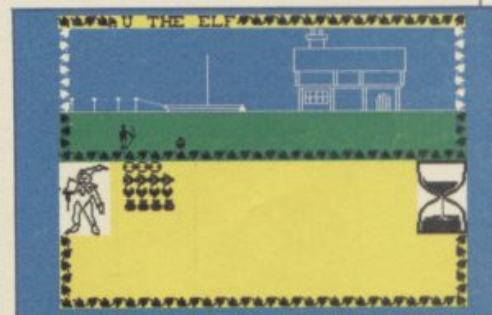
Allies can also be spoken to in an easier way than in truly 'interactive' games though the characters do not lead fully independent lives. I must admit that this is a bonus as I find the behaviour of characters in games like **The Hobbit** to be desperately unpredictable and annoying.

As far as action and events are concerned **Heroes of Karn** is an improvement on Interceptor's earlier offerings. It does not compare in complexity with the Level 9 style but should be quite appealing to adventurers in their novitiate.

The Talisman

Games Workshop define **The Talisman** as an interactive multi-player arcade adventure. Up to four players can take part, each one choosing a role from a set of 10 stock dungeons-and-dragons cast members — elf, assassin, sorceress, thief and so on. If you play on your own you can nominate up to three other computer-run characters or just go solo.

There are three playing speeds — laid back, moderate or speedy. In the speedy mode computer-run characters will zoom about like demented silent-



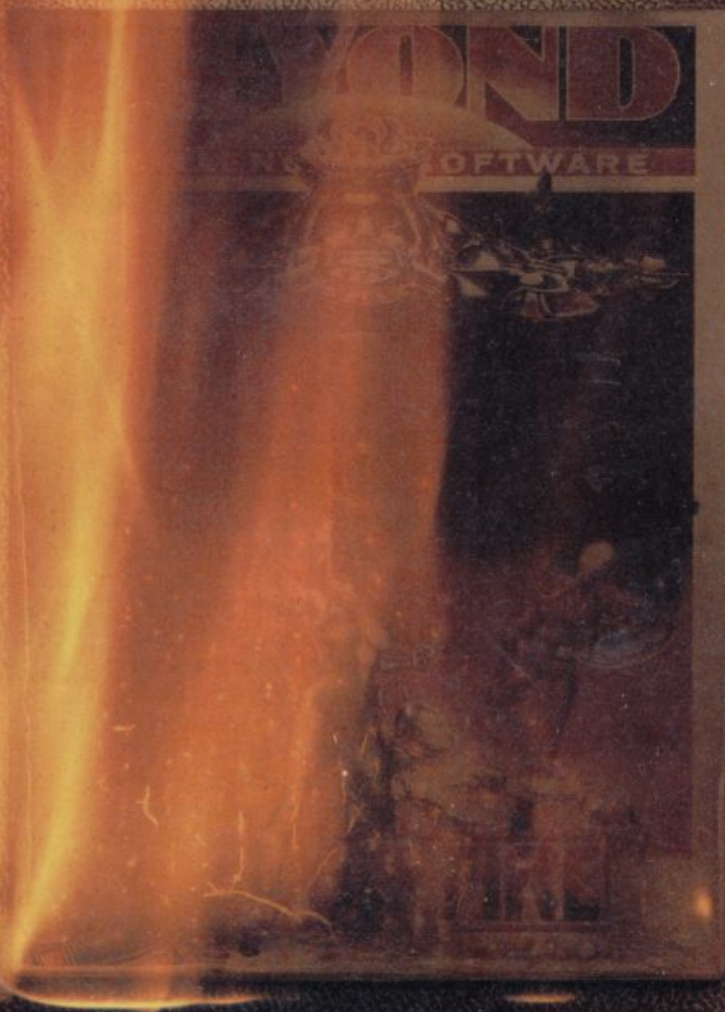
film stars and only experts should enter this fast motion world.

Although the cassette blurb likens the game to **Valhalla** there is no

continued on page 115

B E Y O N D

CHALLENGING SOFTWARE



WE'VE DESIGNED AN ADVENTURE
AND DESTROYED THE TEXT!

SHADOWFIRE
USES PICTURES NOT WORDS
TO ISSUE COMMANDS.

SHADOWFIRE

COMING SOON FOR SPECTRUM 48K
AND COMMODORE 64

continued from page 113

proper text input and most decisions and actions are performed by single key-presses.

The screen is split into two major sections. Up top is the location picture and the path on which the characters move about. Below are the various status indicators — strength, wealth, spells — an hourglass to time your move, along with the occasional reports and details of 'followers' — non-player characters who can be enlisted into your band.

You move your character, a small black silhouette, by a simple left/right cursor with the occasional choice of compass points if you reach an edge. There are about 50 locations, though some seem rather similar. They are not all labelled.

You do not have to stop in a location but if you do you may be able to pick up objects which are strewn about. By stopping you also open yourself to attacks from the multitude of monsters who dominate the land. Spells can be used as well as brute force. Spells seem a bit surer — when I chose to be a mighty warrior I was defeated by a farmer, of all things!

Although it is not as big and does not have the crowds of characters who

mill about in **Valhalla** it has a similar feel but with faster action. The graphics are limited and you should not expect something along the lines of **Knight Lore**.

What the game does provide is a relatively complete translation of D&D motifs to computer. If you have ever played board games like *Sorcerer's Cave* you will find this to be very similar. Learning to play properly will take practice as there is real-time action which needs fast responses. If you dither you are lost. Even with four players it is unlikely that anyone will be bored as the action can be quite entertaining, even to watch. This gives **The Talisman** an edge over text-based multiple player games. Very much for those who prefer arcade-style stimulation as there is no time for reflection once it is your turn.

Underworld

Finally, let us get back to text adventure and institutionalised burglary with **Underworld: The Village** produced by Orpheus. The approach is straightforward — you read a report of treasure being found in a sleepy village, drive out there and start getting as much of it as you can.

The game is in traditional format — you will win if you get 20 items. You will run into puzzles quickly and will find deep holes, mine shafts and fading batteries within a few moves.

The screen presentation is dull — black and white — and the response from the interpreter to valid 'Exam' queries is too limited. 'Can you be more specific?' flashed up far too often for my liking, and I would have appreciated more versatility to enliven my explorations. The writers have not really used the **Quill** to its full potential and I found that **Underworld** compared poorly with **Confidential**. It is not a bad game but neither is it desperately addictive or compelling.

CONFIDENTIAL 48K Spectrum
Publisher Radar Games Price £6.95
★★★★

EMERALD ISLE 48K Spectrum
Publisher Level 9 Price £6.95
★★★★

HEROES OF KARN 48K Spectrum
Publisher Interceptor Price £5.50
★★★

TALISMAN 48K Spectrum
Publisher Games Workshop
Price £7.95
★★★★

UNDERWORLD: THE VILLAGE 48K
Spectrum Publisher Orpheus
Price £4.95
★★★

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.

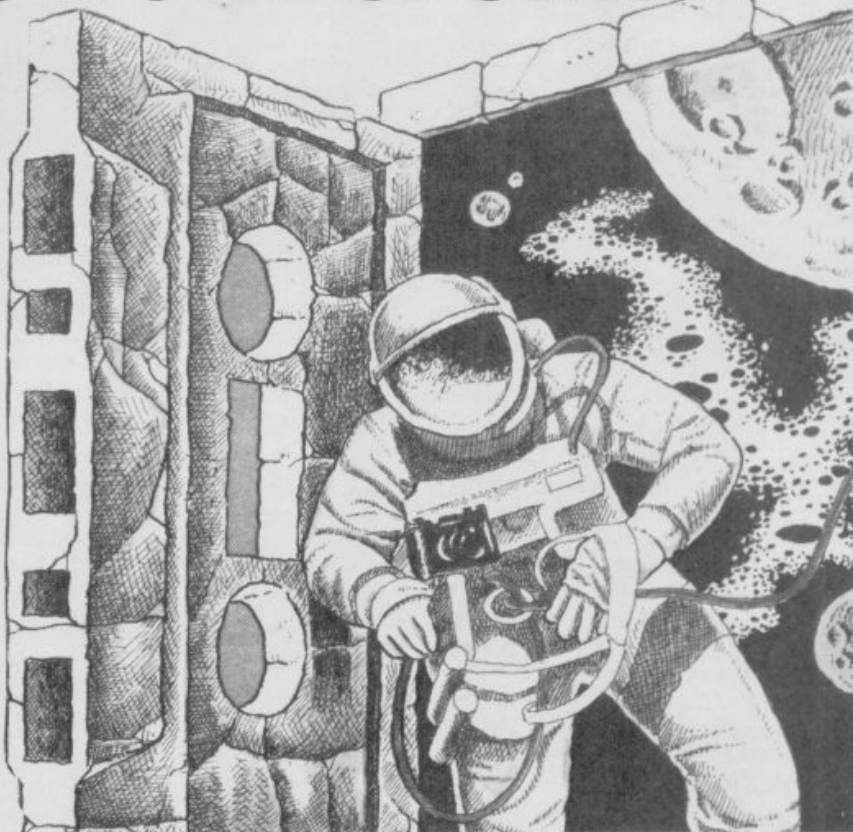
Sinclair User interviews key people within Sinclair Research, authors of top selling games plus regular features on the developments in the fast moving computer industry.

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 £15.00 UK rate including p&h. For overseas rate please

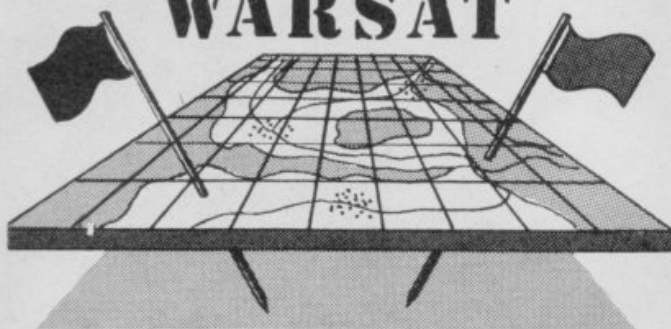
Name _____
Address _____
Signed _____
Date _____

Cheques should be made payable to Sinclair User
Publications Ltd, PO Box 100
30 St Helier Road, Lymington, Hampshire
SO41 3AU



ONE DAY THE WORLD MAY DEPEND ON ONE DECISION:

WARSAT



REAL TIME STRATEGY IN 48 K

1990: The Middle East. Following an American 'Stabilisation' of the Lebanon a Russian-backed counterforce has crossed the border and is heading towards a U.S. forward Command Post. With an already depleted force, fatigue setting in and the threat of Nuclear escalation, you **must** hold your position.

- *Continuous action across a map that enlarges to 9 screens *
- *Individual reports and orders from each vehicle plus continuous overall status reports*
- *Based on available specification of contemporary Russian and American Main Tanks*
- *STRATEGY WITH EXCITEMENT*

£7.00 + 50p p&p.

Also: CHARACTER DESIGNER. Create your own characters and typefaces for use in every kind of program. Written in Basic and very User-Friendly. Comes with example type-faces. 16/48K. Only £3.00 + 50p. p&p.

VIEW SOFTWARE (P. Duffin Sole Trader), 101 Millway Road, Andover, Hants. SP10 3AY.

Please supply me Warsat @ £7.50 / Character Designer @ £3.50

Cheque/P.O. payable to "VIEW SOFTWARE". (Allow 21 days delivery).

Name
Address

IT'S 1985 — THE YEAR OF COMMUNICATIONS

Why buy programmes for your Spectrum when a world of free 'telesoftware' is open to you. Discover Prestel, Micronet 800, Viewfax, bulletin boards and open a whole new world. Even user to user.

Everybody's doing it — linking their home computers to giant mainframes and networking to thousands of other 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 hour's entertainment.

Spectrum 16k, 48k, Spectrum + The **VTX 5000 Modem** comes complete with all the software (in ROM) required to access the world of electronic communications, networks, telesoftware and databases (both public and private.)

(User to user software on cassette £3.95 extra)

Terminal Emulation Software Package to link to commercial databases and bulletin boards which use ASCII format on cassette £6.95.

The **VTX 5000** requires no external power and fits under your Spectrum to become part of the machine. Only one lead links your computer to the outside world.

FOR THE SPECTRUM 16K, 48K AND SPECTRUM + THE VTX 5000 IS AVAILABLE AT A VERY SPECIAL PRICE

£49.95 inclusive of VAT and P&P for a limited period only.

SPECIAL, SPECIAL OFFER

Order your **VTX 5000 NOW** and get a **FREE** quarter's subscription to Micronet 800 and Viewfax.

All modems provide 1200/75 baud, enabling access to Prestel, Micronet 800, BT Gold, Farmlink, Citiservices, Homelink, and some free bulletin boards (some databases and networks require a small subscription). Fully BT Approved.

Simply clip the coupon and send it with a cheque (payable to Modem House) to:

MODEM HOUSE
Iolanthe Drive
Exeter,
Devon EX4 9EA
Tel: (0392) 69295

PRINTERLAND

UK'S LOWEST PRINTER PRICES
FULL PRINTER SUPPORT FOR SPECTRUM + QL
DOT MATRIX

	EX VAT	INC VAT
BROTHER HR5	£133.00	£152.95
SHINWA CPA80	£185.00	£212.75
EPSON RX80	£185.00	£212.75
EPSON RX80 F/T +	£212.00	£244.80
EPSON RX100	£347.00	£399.05
EPSON FX80	£314.00	£361.10
EPSON FX100	£425.00	£488.75

NEAR LETTER QUALITY

CANON PW 1080A (Special offer)	£245.00	£281.75
CANON PW 1156	£349.00	£401.35
KAGA KP 810	£245.00	£281.75
KAGA KP 910	£349.00	£401.35

DAISY WHEEL

DAISY STEP 2000	£225.00	£258.75
JUKI 6100	£325.00	£373.75

SPECTRUM ADD ONS

TASWORD TWO	£11.22	£12.90
TASPRINT	£7.74	£8.90
TASMAN PRINTERFACE	£32.18	£37.00

QL ADD ONS

MICROVITEC 1451 MONITOR	£220.00	£253.00
MICRO P DISK INTERFACE	£99.00	£113.85
Q-DISK DISK INTERFACE	£129.57	£149.00
3 1/2" SINGLE DISK DRIVE .75MB	£159.00	£182.85
3 1/2" DUAL DISK DRIVE 1.5MB	£298.00	£342.75
5 1/2" SINGLE DISK DRIVE 200K	£130.44	£150.00
5 1/2" DUAL DISK DRIVE 1.5	£347.83	£400.00

Educational, G'ment plus O'seas Orders Welcome
Delivery Printers (securicor) £10.00

Printerland, Unit 27, Estate Buildings, Railway St, Huddersfield HD1 1JP
Showroom open Mon-Fri 9-6pm Sat morn 9-1pm
Tel: Huddersfield (0484) 514105 or (0484) 512037



Please send to me:

- ☐ Spectrum Modem(s) £49.95
- ☐ User to user software £3.95
- ☐ Terminal

I enclose £

Name

Address

.....

Telephone

Please allow 28 day delivery

This offer applies only while stocks last.

TEN GAMES for the price of two, and every one a hit, in an unbeatable offer to our readers!

Mega Hits is a selection of ten smash games, compiled under licence from the original software houses.

3D Starstrike is a hair raising shoot-em-up with full 3D graphics from Realtime Software.

Blue Thunder from Elite takes you and your jetcopter on a dangerous rescue mission. **Fall Guy** from the same company follows the exploits of Colt Seavers, of the popular TV series.

Alligata's **Son of Blagger** is a levels and ladders game in which Slippery Sid tries to find the golden keys in the Security HQ.

Wally Week is the now infamous star of **Automania** from Mikrogen. Wally has six cars to assemble in his garage, but finds his shelves less than reliable – and what about those bouncing tyres?

Quiksilver produces **Bugaboo**, in which the cosmic flea leaps from ledge to ledge to escape the hungry monster.

Psytron combines arcade action with complex strategy in the most challenging space game of 1984. Beyond's game contains advanced graphics with split screen display and simulated windows.

Or try **Wheelie** from Microsphere, and drive the Zedexaki 500 bike into a world of giant hedgehogs and sudden death.

In **Blade Alley** the aliens are back again, and you must pilot your interceptor through the defensive trench to trigger the photon disruptors.

Finally, **Penetrator** from Melbourne House is still one of the nastiest, toughest, fastest arcade games around.

If you bought them separately, the ten games would cost you well over £70 in the shops. Beau Jolly have put all 10 on two cassettes, with each recorded in fast-load for

extra ease of playing. The package will retail at £19.99, but readers of *Sinclair User* can save £3.50 and buy it for £16.49, including postage and packing. Just fill out the coupon below.

To: **Mega Hits Special Offer, Sinclair User, Priory Court, 30-32 Farringdon Lane, London EC1R 3AU.**

BLOCK CAPITALS PLEASE

Please send me:

Qty			Total
	Mega Hits	@ £16.49	

I enclose a cheque/postal order for £..... made payable to Sinclair User magazine.

Please debit my Access/Visa account no. for £.....

Signed Date

Name

Address

Tel

Offer applies to UK readers. Allow 28 days for delivery. Offer applies while stocks last.

COMCON

Programmable
Joystick Interface for
the Spectrum

£19.95

(incl. VAT and P & P)



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 com-
patible with any add-ons including
Microdrives.

Select key functions anytime —
even when the game is already
loaded.

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

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

£21.95

(incl. VAT and P & P)

Dealer Enquiries Welcome
Phone Ludlow (0584) 4894

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	@ £21.95		

I enclose a cheque/postal order made payable to FREL LTD for. £

COMCON

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.G. (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

	W	D	L	F	A	Pts
1 Ipswich T.	15	5	5	41	28	54
2 Liverpool	15	5	5	31	31	63
3 Nottingham Forest	15	5	5	25	19	45
4 Birmingham						
5 West Ham						
6 Southampton						
7 Leicester						
8 Nottingham						
9 Wolves						
10 Tottenham						
11 Sunderland						
12 Q.P.R.						
13 Watford						
14 Everton						
15 Norwich						
16 Coventry						
17 Aston U.						
18 Man. Utd						
19 Luton T.						
20 U.S.A.						
21 Arsenal						
22 Stoke C						

£6.50

(incl. p. & p.)

direct from
CROSS SOFTWARE
72 Swanshope,
Burney Drive,
Loughton, Essex, IG10 2NB

CROSS
SOFTWARE

● Scale 90-minute game

● Individual player skills

● Full 22-team League

● 42-match season

● League table and
results on screen
and printer

● Save season to
date on tape

● Also form any league
of 22 teams and pick
your own players!

Also available from selected
stores in the London area
(including VIRGIN GAMES
CENTRE, Oxford Street, W.1)

MOUNT CHALLENGE

The story so far:

48K SPECTRUM

Earth, 1987. A strange protrusion emerges from shark
infested waters amidst a group of islands in the South Pacific.
Nobody has yet reached this object, which is possessed by an
evil force and guarded by deadly plants, murals, pigmen,
chasing ghouls and yellow horned demons.

Prof. Burk arrives on the scene, resplendent in his newly
invented space suit and jet pack able to withstand the forces
emanating from the green and red blocks which cover the
Mount. He intends to be first to the summit.

Woefully the jet pack cannot withstand all of the effects of the
coloured blocks and therefore great care has to be taken when
jumping from block to block, so as to ensure correct co-
ordination of the ENERGY LEVEL (On/Off) with the coloured
block being stood on.

Ignoring all advice against attempting his objective, the
fearless mountaineer states, "people risked their lives to
conquer Mount Everest, why not this challenge?"

Your mission is to help guide the determined Prof. Burk to
the top of Mount Challenge (you'll need to draw a rough map
as you go along). Good luck!

Extra info:

100% Machine Code

89 Screens

Keyboard OR
Kempston Joystick

Available from:

Aasvoguel Productions (B),
Blakemoor,
Marshbrook,
Nr. Church Stretton,
Shropshire SY6 6QA.
Tel: (069 46) 345

Cheques/P.O.'s for £6.95

PS: The first 1,000 tapes sold will receive a FREE GAME on the
B-side. Written by the same author. Take on three aliens at
dominoes and try and get to the final of 'Point-a-Spot'.

COMMUNICATION is the most important aspect of any adventure yet it is the one feature which is handled in an archaic and confused fashion.

Many adventure games still use sentence interpreters which only allow a verb-action and a noun-name to be entered and understood by the computer. For instance GO NORTH would be understood but PLEASE GO NORTH, or GO DOWN THE ROAD TO THE NORTH, would not. The number of verbs and nouns defined for use within such an adventure is similarly limited to a couple of hundred words in a database.

That program structure and database organisation is not good enough if you want to make communication between player and computer easy and comprehensive. For a start you will not be able to get characters talking to each other with a verb/noun structure. A new approach is required which can be developed and demonstrated through **The Crysan Incident**, an example adventure game which is being created in this series.

So far in this adventure we have done without communication between characters. Kagan and Marla, the heroes, have done battle with monsters in the depths of the ocean in a desperate search to find the Crysan clock, a device capable of controlling the flow of time.

They have killed the monsters and have entered the doorway of the sunken yacht. There is a whirl of colour and Kagan and Marla are transported through a time warp to an underground kingdom of Kelros.

Captured by the Kelrosians, they are lead to the city of Carvad where they await an audience with the ruler. Communication is required between characters if Kagan and Marla are to survive. Not only will you have to tell the computer where you want to go but also negotiate with the ruler.

As with all the techniques in this series we do not want to re-invent the wheel so it would be sensible to look at and use some of the research and techniques already used in adventure games.

When adventure games surfaced in the 1960s they were programmed on large mainframe computers which had vast amounts of memory but inefficient, turgid, operating systems. The games were simple by today's standards and had a word dictionary of only 100 words or less. Many of

Word play

John Gilbert
designs a phrase
book for computer
communication in
AI adventures

today's games are similar to those programs, where communication is concerned, and it is about time that players are able to enter full sentences rather than rigid formulae.

The old games took in a communication string such as GO NORTH and split it up into two parts. It then truncated each word so that it consisted of only two characters. The sentence GO NORTH would, therefore, be GO NO. Only then is the sentence translated.

Translation occurred in one of two ways. Either there was a central database containing all the words, or the words which could be used within a scenario were dealt with within that specific scene. The second required more memory to accommodate the vocabulary and the first was restrictive as different types of words had to be universally classified such as movement, object and combat words. Objects had to be put into a similar database so that they could be manipulated if required.

The second approach, while using more memory, was easier to code, especially in Basic, and restrictions were not so tight. For instance, an object would be located in a situation and you would need words which could be used to manipulate that object. The manipulation could also be specific to the type of object which had been located, so you might have wanted, for instance, to stroke the cat but you could not drown it as there was no water around. Taking it to a scene which included water and the word drown could be used within that scenario. The cat could then be drowned.

The advantage of the second approach is that you can tailor the

continued on page 120



Adventure Programming

continued from page 119

words needed to the situations. Conversely with the database approach you need to think of every possible word which might be used within the adventure and then find some way to execute them throughout the game in all situations.

Since the advent of the adventure game new ways have been introduced to make communication easier but many have restricted the way in which characters and players interact.

Typical of those techniques is the menu, or keyword system. For instance, a simple game may include the abilities to move and to take objects. You would press the 'G' key to enter the movement option and then, when prompted, enter the direction in which you wish to go. In a similar way you would press 'T', for take, then key and enter the name of the object which you wished to take. The system has been used in programs which opt for the universal word database method so that the options apply to all scenes within the adventure.

Each method has its pros and cons but all have some aspect which can be used in an artificially intelligent game. A definition of what we want to do, and how we want to do it, is in order.

We want a method which makes communication easy for the player and one which is adaptable to the adventure environment. It should also be possible to program easily and be easy to understand. Flexibility should be important so that the play can control the speed and form of communication without having to constantly refer to a help or instruction sheet.

We can establish two types of communication, one which is simple but limited and the other which allows the entry of full sentences and which can be adapted for each new scene so that some actions are possible in one place while not in another.

The menu, or keyword system can be used for the simple input routine and it can be universal so that the word understood can be applied to all scenes. A routine for GO, 'G', and TAKE, 'T', is shown in listing one.

The listing is open ended and you can add as many options as your adventure program requires. All you will need is a line to trap input after line 30 and a routine which should start as a clearly delineated section of the program structure.

For the purposes of the example an object has been placed in the scenario

object indicator variable at line 5. In a full adventure each scenario would have a different value for this variable. For instance it may contain bucket and spade at the seaside or sword outside the sunken yacht.

Line 10 enters a character and lines 20 and 30 check to see if they are either GO or TAKE instructions. If they are not the Spectrum continues to ask for input.

If the input trap is crossed then INKEY\$ will deposit a character in A\$. If that character is not 'G' or 'T' the Spectrum will print 'I CANNOT UNDERSTAND' at the bottom of the screen. If 'G' has been entered the computer enters the 'GO' routine at line 60.

Line 60 is the start of a scene control module. The variables N, S, E, W, U, D refer to directions and the numbers which they hold are the subroutines containing the next scene if the player goes off in a specific direction. A zero shows that you cannot go in that direction.

Line 70 calls a subroutine which allows a direction to be entered and then checks to see if it is a valid direction. If it is, then the number, including zero, is put into variable B and a return is made to the main part of scene routine at line 80. If the direction is not valid zero is put into B and a return is made.

Once we get back to the main routine a check is made to see if the value of B is equal to zero. If it is, a message is given to the player, telling him or her that a move cannot be made in that direction, and we again ask for an instruction at line 10. If, however, all the checks have been made successfully we move to the next scene routine pointed to by variable B.

The TAKE routine, entered from line 30 and starting at line 100, is even easier than the movement routine. The player is asked which object is to be taken. The variable O\$ contains the object which has been placed in the scene, a sword. If O\$ was empty line 110 would display a message saying that no object matching the description in A\$ can be found. A return is then made to line 10 where a further instruction is requested.

The rest of the routine informs the player that a 'take' is in operation and then adds the new item to the inventory string, I\$, where it is separated from the previous object in the variable with an asterisk. The inventory can be scanned when required, by

```

5 LET o$="sword": LET i$=""
10 PAUSE 0: LET a$=INKEY$: IF
a$="" THEN GO TO 10
20 IF a$="g" THEN GO TO 60
30 IF a$="t" THEN GO TO 100
40 PRINT "I CAN'T DO THAT"
50 GO TO 10
55 REM start of move routine
60 LET n=0: LET d=0: LET s=400
0: LET u=4050: LET w=5000: LET e
=5050
70 GO SUB 1000: REM check entr
y
80 IF b=0 THEN PRINT "YOU CAN
'T MOVE IN THAT DIRECTION": GO T
O 10
90 GO TO b
100 INPUT "TAKE WHAT ";a$
110 IF o$="" THEN PRINT "THERE
ARE NO OBJECTS HERE TO PICK UP"
: GO TO 10
115 IF a$<>o$ THEN PRINT "THAT
'S NOT HERE": GO TO 10
120 PRINT "TAKING THE ";o$
130 LET i$=i$+"*"+o$
140 GO TO 10
1000 INPUT "Where to ";b$: LET b
=b$(1)
1010 IF b$="n" THEN LET b=n: RE
TURN
1020 IF b$="s" THEN LET b=s: RE
TURN
1030 IF b$="e" THEN LET b=e: RE
TURN
1040 IF b$="w" THEN LET b=w: RE
TURN
1050 IF b$="u" THEN LET b=u: RE
TURN
1060 IF b$="d" THEN LET b=d: RE
TURN
1080 RETURN
4000 CLS: PRINT "You are in the
throne room. A huge throne,
upon which a vast creature rests
its glistening limbs, dominat
es the hall"
4010 GO TO 10
4050 CLS: PRINT "You push the K
elrosians back and race up the da
mp stairs only to be confronted
by an abyss. It looks like if
you've had your chips and the
Kelrosians are about to have
theirs"
4060 GO TO 10
5000 CLS: PRINT "You race toward
s and exit, hotly pursued"
5010 GO TO 10
5050 CLS: PRINT "You race to th
e door but are tripped as you
get there. You fall heavily"
5060 GO TO 10

```

Listing 1

using the techniques developed in last month's article.

When the inventory has been updated a return is made to line 10 and a request for more instructions given. The quick entry system for the adventure is therefore almost complete.

Next month we will take communications further when we go all out with full sentence translation and investigate how to get the Spectrum and QL to understand and generate speech for characters. Then, in the final part of the series, we will look at ways of putting the whole adventure together, in listing form, and how to get characters to interact while you are entering instructions.

LIGHTMAGIC

GRAPHICS
DESIGNER



£14.95

Lightmagic is the ultimate graphic design package giving you the ability to create stunning graphics and complete illustrations at your fingertips.

Now you can produce and edit complete screens and pictures. Use Lightmagic as a fascinating program in itself or as an exciting new dimension in your games and programming.

Just look at these features!

- *Fully integrated screen editor and UDG designer.
- *Drawing with pens.
- *Painting with brushes – 10 different effects in 20 sizes.
- *Illustrating with airbrush.
- *Cut and paste facility.
- *Lettering in upper and lower case characters, also double height facility.
- *User Defined Graphics – Choose from 147 pre-set graphics or define your own.
- *UDG Designer for creating and editing up to 7 sets of User Defined Graphics.
- *Facilities to mirror, invert, copy, move, enlarge, fill, rotate, etc.

A comprehensive manual with worked examples, gives you a step by step guide to Lightmagic through every stage of screen composition.

Full facilities are provided for tape storage of finished pictures and UDG's, together with a temporary memory storage facility.

So enter Lightmagic and start designing today!

The Complete Machine Code Tutor



NOMINATED FOR
MICRO
BRITISH COMPUTING
AWARDS
1985

£14.95

Specially written for BASIC programmers finding the prospect of machine code rather daunting!

Now there's a straightforward way to learn all about machine code and its many applications.

Here are just a few of Machine Code Tutor's many features:

- *A complete machine code tutorial on two cassettes with up to 100K of data depending on machine type.
- *Between 27 and 35 progressive lessons depending on machine type.
- *Full explanatory simulator – displays relevant registers and flags and their effect on the processor.
- *Runs a series of exercises for continuous assessment of your progress which can be modified or substituted.
- *No matter how much you experiment the safeguard system prevents crashing of the program.
- *Automatic error checking.
- *All machine code instructions are dealt with throughout the program and in the accompanying manual.
- *Comprehensive reference manual.

Machine Code Tutor really is the most complete instructor around. Learn from your computer rather than a book, and do it at your own pace.

Using the tutor you should be confident of writing complex machine code programs by the time you finish your last lesson.

New Generation Software

For 48K Spectrum
and Spectrum +

For 48K Spectrum and Spectrum +
Commodore 64 BBC Model B
32K Atari AND NOW
Amstrad CPC 464

Lightmagic and Machine Code Tutor are available from all good stockists, or direct by filling in the coupon below and returning to:
New Generation Software Ltd., FREEPOST, Bath BA2 4TD. For instant despatch phone your order now on 0225 316924 quoting your Access or Barclaycard number.

Please send me _____ Lightmagic(s) at £14.95 each, and _____ Machine Code Tutor(s) for the _____ Computer at £14.95 each. P&P FREE.

I enclose my cheque/postal order made out to New Generation Software Limited for £ _____ Cheque/Postal Order No. _____

Name _____ Address _____

Card No. _____ Signature _____

New Generation products are sold according to their terms of trade and conditions of sale.



SU5

Interactive BASIC Programming for 48K ZX Spectrum ATTENTION ALL SPECTRUM USERS!

You probably bought your Spectrum in order to find out about computing (remember?). But the manual isn't easy to follow and programming books are not much better. Now you can learn ZX BASIC programming with your Spectrum. 'Interactive BASIC Programming' is a unique package in twelve parts. Look at these features:

- * Plain English (yes, real English not jargonese).
- * Due to an amazing programming technique you will 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 (see some on this ad), colour, sound, motion, system variables, menus and much more, explained simply.
- * Problems are given with hints and answers in the form of programs that are put into BASIC for you to look at, run and alter.
- * You'll learn how to write your own games (by way of examples) and how to put your machine to serious use (e.g. graphs, problem solving, filing system).
- * The package has been written by a computer science teacher.
- * Low price, excellent value.
- * More than 250K (yes, two hundred and fifty kilobytes).
- * After sales support at no additional cost: write or telephone if you have any questions about Spectrum BASIC.
- * "An educational program which shows real inventiveness - better still it teaches Sinclair Basic."

- Popular Computing Weekly 7/3/85

Britain is the Software Capital of the World - far superior to the U.S.A. The computer revolution is just beginning and as the emphasis shifts from hardware to software WE are best placed to shape the future. The writing's on the wall: get actively involved while the industry is young.

(Amstrad, MSX, Atari 800XL, CBM 64, BBC/Electron versions are in preparation.)

To receive the whole package by return of post send £9.95 (p & p free) to:
EIGEN SOFTWARE 45 Bancroft Road, Widnes, Cheshire. WA8 0LR
Tel. 051-423 6201

$$\hat{H}\psi = E\psi$$

EIGEN SOFTWARE create reality



IS THE KEYBOARD ON YOUR ZX HOLDING YOU BACK? HERE IS THE ANSWER THE LAZER 62

**IS THE ONLY FULLY FUNCTIONABLE 62 KEY/
THAT WILL TRANSFORM YOUR SPECTRUM
KEYBOARD INTO A PROFESSIONAL USER COMPUTER
LOOK AT SOME OF ITS FEATURES**

THE LAZER 62

62 Full Travel Gold contact keys laid out to "Qwerty" standard for serious use by typists and programmers.

22 Keys are autoshifted giving single entry to Edit-Delete-Caps lock Etc. No more using 2 or 3 fingers.

Strong attractive low profile case actually houses the Spectrum PCB with built in on/off switch.

Compatibility with Interface 1 and Microdrive maintained.

Easy to assemble — no soldering.

FROM
MICROBOARD INTERNATIONAL

TELEPHONE
0483-38006 (SALES)
04862-24567 (TECHNICAL)

TRADE ENQUIRIES
WELCOME

NOW £59.95

(INC VAT)

Please send me Lazer 62 Keyboard(s)
@ £59.95 + P&P (UK £2.25 - Europe £6.75 - World £12.00)

I ENCLOSE CHEQUE/VISA NO _____

TO MICROBOARD INTERNATIONAL
SALES OFFICE, 12C WORPLESDON ROAD
GUILDFORD SURREY GU2 6RW
ENGLAND

EVERY month I have the uneasy feeling that this time I shall have run out of interesting things to write about.

Finding a theme this month was, however, made very much easier because a large batch of letters arrived enquiring about the Spectrum interrupt system. I dealt with the interrupt mechanism before but clearly more detail is required. But first I shall answer some fairly straightforward questions.

The first is from Simon Shaw of Maidstone who is worried that he has found a ghost haunting the top end of Spectrum memory. He writes: **Whilst experimenting with machine code routines I became aware that some of the memory addresses above 65000 were corrupting and were filled with what appeared to be random numbers. The op-codes corresponding to the numbers in those addresses seemed to be complete nonsense. The sequence of numbers varies, depending on what program is held in RAM, but the start address of the sequence is generally somewhere around 65300. What is going on?**

Fear not, Simon, your Spectrum is not inhabited by some alien presence. What you are observing is the remains of the machine stack, the GOSUB stack and the definitions of the user-defined graphics.

To understand what is happening turn to page 165 of the *Basic Programming* manual — Spectrum Plus owners should turn to page 48 of the *User Guide*. There you will observe the various divisions in memory established and maintained by the software in the Spectrum ROM.

At the bottom is the ROM itself and above that at the beginning of RAM is the display file, which is followed by the attributes, the printer buffer, the system variables and so on. About three quarters of the way up is an area enigmatically labelled 'spare' and by the look of the diagram it would be easy to imagine that this 'spare' memory amounts to no more than a couple of hundred bytes which happen to have no particular use.

Nothing could be more misleading because the 'spare' space is the key to the operation of the machine. In normal circumstances there is no other empty memory in the machine; thus whenever extra bytes are required in any given portion of memory everything is shuffled along into the spare

Ghosts in machine interrupt routine

Andrew Hewson explains why spare space appears to sit in memory



space and the system variables are adjusted appropriately.

That manipulation of memory takes place without the user being aware of it. For example, when the user selects the Edit facility he sees that the Basic line he requires is copied from the listing on the screen to the window at the bottom. He is unaware that the same copying process has occurred in memory — space is created in the editing area by shuffling the INPUT data area, the temporary work space and the calculator stack into the spare area. The contents of memory corresponding to the Basic line required is then copied into space which has been made available.

Now consider what happens when an area of memory is no longer required. That happens, for instance, at the end of the editing process when a reconstructed line is returned to the Basic program. This time the contents of memory are shuffled down to overwrite the contents of the Editing area and return the redundant memory to the spare area.

When the copying process is complete, the lowest part of the spare area will not now be filled with zeros, as it is when the Spectrum is first switched on. Instead it will contain an echo of its former use. For example, that part of memory which was previously allocated to the calculator stack but which, as a result of the shuffling process, is now spare will still contain calculator data.

Why, it may be asked, does the Spectrum ROM not fill the newly vacated memory with zeros as it does with all of memory when the machine is first switched on? The answer is that to do so would serve no purpose and would waste precious time. If the spare space is required again then the appropriate information will be copied into it and it does not matter to the copying process whether the material being overwritten is zero or not.

Once the machine has been used for two or three operations after switching it on it is surprising how much unseen garbage is left lying around. That is the origin of Simon Shaw's ghost. When RAMTOP is moved down, the old machine stack and GOSUB stack are left where they were but the contents are copied to a new location. Thus Simon is observing the remnants of the previous stack.

This discussion leads naturally into the following question from John Spinks of Harlow. He asks: **What are the machine stack and the GOSUB stack referred to in the Spectrum manual?**

Most readers will be familiar with the Basic GOSUB command. When the ROM encounters this command the Spectrum stores the number of the Basic line which it is currently considering, locates the line referred to in the GOSUB command and then continues execution from that point. When the next RETURN command is found, the stored Basic line is retrieved and execution recommences from immediately beyond the original departure point.

The GOSUB stack is the place

continued on page 124

continued from page 123

where the line numbers are stored away for later retrieval. It works in an upside down fashion in the sense that it grows downwards when a line number is added and shrinks upwards when a line number is deleted. Thus it grows downwards in the direction of the 'spare' space.

The machine stack lies under the GOSUB stack and immediately above spare memory. As a consequence, when GOSUB grows and shrinks the machine stack is copied up and down memory in step. Spectrum Plus owners will observe that the machine stack is not actually named in the memory map although there is a corresponding slot on the diagram.

The machine stack is the place where the Z80 microprocessor stores subroutine return addresses and it can be thought of as similar to the Basic GOSUB stack. The machine stack also serves a separate purpose as a temporary storage area for the contents of the various Z80 registers. There is a group of Z80 PUSH and POP instructions to enable data to be stored and retrieved. For example, PUSH BC stores the contents of the B and C registers on the bottom of the machine stack and POP BC retrieves the contents of the bottom of the stack and stores it in the B and C registers.

Let us now turn to the interrupt system. Thanks in particular go to Simon Durrant of Hemel Hempstead who martialled a long list of questions on the topic, including: **What is the non-maskable interrupt? What causes interruptions to take place? Does the keyboard force interruptions to take place? How does the processor determine whether to go to a maskable or non-maskable routine? Could you describe all three interrupt modes?**

The interrupt system, as its name implies, is a mechanism by which the processor can be diverted from the task it is currently undertaking in order to do something which is more urgent.

All computers have an interrupt system and on more sophisticated machines they allow the computer to maintain a priority system for all the tasks which it has in hand at any one moment. A low priority task is deferred in favour of a more urgent one. As each task is completed the machine reverts to a previous, half-completed job.

Two types of interrupts can occur in

the Z80. The more important is the Non-maskable Interrupt — or NMI — so-called because the programmer is unable to prevent, or mask, the Z80 from responding to such an interrupt when it occurs.

The maskable interrupt is of more interest both because it can be switched off — so that all subsequent interrupts are ignored — and because the Z80 can be set to respond to it in any one of three modes. In mode zero the processor simply waits until it is directed by an external device to execute a routine somewhere in memory. In the Spectrum there is no provision for the use of that mode.

The Spectrum is designed to operate in mode one all the time. In that

Priority tasks completed first as interrupt system takes control

mode the Z80 saves the contents of the program counter — so that it can later resume the task it was doing — and jumps to location 38h (56 decimal). The Spectrum hardware forces that jump to be made by generating an interrupt 50 times per second.

The ROM routine at that address updates the clock by incrementing the FRAMES systems variable held at 23672 to 23674 and then scans the keyboard to see if a key is being pressed. If so, the appropriate code is stored in the systems variables and various flags are altered. On completion of the keyboard routine all the registers are restored to their previous values and the processor resumes its previous task.

The final interrupt mode, mode two, is the most powerful. If the Z80 is interrupted while in that mode it saves the program counter as before and jumps to an address partly determined by software and partly by the hardware which caused the interrupt. The Z80 takes the value in the I register and the value generated by the external hardware and calculates an address from them as follows:

Address = 256 * I register + hardware

It then looks at the contents of the calculated address and the subsequent one and calculates a new address from them:

New address = Address + 256 * (Address + 1)

It then jumps to the new address. Thus if the I register contained 143 and the hardware generated the value 27 the Z80 would look at the contents of

$256 * 143 + 27 = 36635$ and 36636 If those two locations contained 137 and 93 respectively — PEEK 36635 = 137 and PEEK 36636 = 93 — it would then jump to location

$137 + 256 * 93 = 23945$

That rather complicated procedure is known, aptly, as an indirect jump and is not as cumbersome as it seems. It enables as many as 128 types of devices to be attached to the Z80, each type generating its own value to contribute to the indirect jump address. The programmer then constructs a table containing 128 addresses each held in two bytes and each pointing to the routine that handles a particular device. The I register points to the location of the beginning of the entire 256 byte table.

It should be realised that an interrupt can be generated by any piece of hardware which is attached to the correct line into the heart of the Z80. On the Spectrum the hardware generates an interrupt 50 times a second and then the ROM software looks to see if a key has been pressed and looks after the display refresh.

Finally, Stephen Carter of Chilwell, Nottinghamshire, writes: **I have implemented the clock routine listed in your column in the March issue using the Picturesque assembler, but when I try to trace through it using the monitor it crashes. Why?**

I am not familiar with the Picturesque assembler and monitor but I imagine the problem occurs because both the clock routine and the monitor are attempting to use the interrupt system without reference to the other routine.

My clock routine — which updates a screen display of the time every 50th of a second — makes use of interrupt mode two. That is how the machine is able to update the clock whilst still appearing to function as normal. The Picturesque monitor presumably also wishes to grab control of the machine every 50th of a second by using interrupt mode two and setting its own vector.

The only answer is not to attempt to run the monitor and look at the clock, or any other routine using IM 2.

● Please address problems and queries to Andrew Hewson, Helpline, Graham Close, Blewbury, Oxfordshire.

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
Alan Firminger, 171 Herne Hill, London SE24 9LR
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, Driffield YO25 8RG
Astrocalc, 67 Peascroft Road, Hemel Hempstead, Herts HP3 8ER
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
Bubble Bus Software, 87 High Street, Tonbridge, Kent TN9 1RX
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
Collins Soft, 8 Grafton Street, London W1
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
DACC Ltd, 23 Waverley Road, Hindley, Wigan, Lancashire WN2 3BN
Database Publications, Europa House, 68 Chester Road, Hazel Grove, Stockport, SK7 5NY
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
Firebird Software, Wellington House, St Martins Lane, London WC2
Fisher Software, 47 London Road, Buxton, Derbyshire
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
Imperial Software, Imperial House, 153 Churchill Road, Poole, Dorset
Incentive, 54 London Street, Reading, Berkshire RG1 4SQ
Inform Software, 3 Treesdale Close, Birkdale, Southport PR8 2EL
Interceptor Micros, Lindon House, The Green, Tadley, Hampshire
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

continued on page 126

Software Publishers

continued from page 125

Llainlan Software, Pontyberem, Llanelli, Dyfed, Wales
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 Billingham 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
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
Mind Games, Liberty House, 222 Regent Street, London W1
Mirrorsoft, PO Box 50, Bromley, Kent BR2 9TF
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
OCF, 4A High Street, Chalfont St Peter, Buckinghamshire SL9 9QB
Orpheus Ltd, Unit 1, Church Farm, Hatley St George, Near Sandy, Bedfordshire SG19 3HP
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
Pitch Associates, 39 Rockleigh Avenue, Leigh-on-Sea, Essex
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 1JG
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
Radar Games, 53 Flavel Street, Woodsetton, Dudley DY1 4NU
RAM Writer, 3 Vumba House, 2 Cedar Gardens, Sutton, Surrey
Ramtop Services, 5 Rue D'Artois, 75008, Paris, France
Realtime Software, Prospect House, 32 Sovereign Street, Leeds LS1 4BJ
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 1LW
Salamander Software, 27 Ditchling Rise, Brighton, East Sussex BN1 4QL
Sentient Software, Branch House, 18 Branch Road, Armley, Leeds LS12 3AQ
Scisoft, 5 Minister Gardens, Newthorpe, Eastwood, Nottingham NG16 2AT
SCR Adventures, 190 Shelbourne Road, Tottenham, London
SD Microsystems, PO Box 24, Hitchin, Hertfordshire SG4 0AE
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
Software 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
Software Supersavers, Bear Brand Complex, Allerton Road, Woolton, Liverpool, Merseyside L25 7SE
Spartan CC, 29 Feltham Avenue, East Moseley, Surrey KT8 9BJ
Spectadraw, 1 Cowleaze, Chinnor, Oxfordshire OX9 4TD
Spectrasoft, Capital House, Market Place, London W3 6AL
Spoof Software, 58 Railway Road, Urmston, Manchester M31 1XT
Star Dreams, 17 Barn Close, Seaford, East Sussex, BN25 3EN
Startersoft, 32 Parkfields, Chippenham, Wiltshire
Statesoft, Business and Technical Centre, Bessemer Drive, Stevenage, Herts SU1 2DX
Stell Software, 36 Limefield Avenue, Whalley, Lancashire BB6 9RJ
Sterling Software, Garfield House, 86/88 Edgeware Road, London, W2 2YW
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
The Edge, 31 Maiden Lane, Covent Garden, London, WC2E 8LH
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
V02, 9-10A The Bridge, Walsall, West Midlands
Vortex software, 280 Brooklands Road, Brooklands, Manchester M23 9HD
Widget 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

computer ONE

Software for the QL

A selection of quality software packages available directly from Computer One.



PASCAL	£39.95
FORTH	£39.95
ASSEMBLER	£29.95
MONITOR	£24.95
TYPING TUTOR	£19.95

£49.95
if ordered
together

Inclusive of VAT & P&P.

Please send for full details or phone (0223) 862616
To order, send name and address with cheque / to:

COMPUTER ONE LIMITED
SCIENCE PARK, MILTON ROAD, CAMBRIDGE CB4 4BH

Dealer enquiries welcome

Sinclair and QL are Trade Marks of Sinclair Research.

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.)



Boxed, with detailed instruction booklet

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 £15.00 (all inclusive)

AVAILABLE (RETURN OF POST) FROM ...



phone 24 hrs



phone 24 hrs

37 COUNCILLOR LANE, CHEADLE, CHESHIRE. ☎ 061-428 7425

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 SU5 Ram Electronics (Fleet) Ltd
106 Fleet Road, Fleet Hampshire GU13 8PA

Trade and export enquiries welcome



Sinclair Supermart

TO ADVERTISE IN THE SUPERMART CALL SINCLAIR USER ON 01-251 6222

POOLS PREDICTION

Outputs best draws, homes and aways. Features analytical draw finder. Prints team from comparison graphs. Analyses and graphs results every week. Takes full account of midweek games and "Cup" matches between main league teams. Promotion relegation option. (Can be used from season to season.) Easy to use, even for beginners. No fiddly database required. Gives paper printout of predictions if required. Full back-up service. All customers letters answered promptly. 36 wins (230 dividends) received by author so far.

"This is the best and most scientific of any program I have seen" - Mr R.A.P. (Secretary, Orpington Computer Club).

"Once again, thank you for one of the best investments I have made" - Mr D.L.B. (Feltham).

"I would like to congratulate you on your excellent service - it is a rare thing these days" - Mr L.G.P. (Shrewsbury).

RACING PREDICTIONS

An easy to use predictor, by the same author, for the flat racing season. No knowledge of racing required.

Input information from any daily newspaper. Holds data on draw advantage and ground conditions for 37 British courses. Self-teaching program is never out-of-date.

Ask for: British Pools @ £11.95
Australian Pool @ £11.95
Flat Racing @ £11.95

Allow 7 days for delivery. Cheques, P.O.'s payable to Rombest.
Overseas customers please add £1 for P&P.

ROMBEST, Dept SU,
2 Welland Croft, Bicester,
Oxon., OX6 8GD.

Available for 48K Spectrum only

MICRODRIVE OWNERS!

MICRODRIVE FASTLOAD An auto-run utility for Spectrum Microdrive users. Lists all files on cartridge. Single key selection to down-load file, give details of file size/ type, status of cartridge etc. Removes unwieldy syntax, self duplicating onto all your cartridges. £4.95 cheque/PO payable to Specialist Programs, 21A Alton Road, Fleet, Hants GU13 9HN.

48K SPECTRUM ADVENTURE! MEGALITH MAN

You are the Megalith Man, sent out to find all of the 12 megalithic sites of the HUGE landscape. You have no idea where they are, but you can make investigations and pick up useful items along the way. BUT BEWARE!!

2,500 LOCATIONS

13 Different types of character. 7 Different items to help you. Cassette saving routine. Simple, single key operation!

Price: £4.50

Send cheque or PO payable to:
GOLTEK PUBLICATIONS
PO Box 177, W-TON, WV11 2PE

PREMIER LEAGUE

A SUPERB NEW FOOTBALL MANAGEMENT STRATEGY GAME FOR THE 48K SPECTRUM

AT LAST! A football game for the serious enthusiast - Using the FULL memory of your Spectrum. FEATURES INCLUDE: Training, Team Selection, Substitutes, Half-time scores, Full squad details, Named Goal scorers, Team styles, Save Game, Financial problems, PLUS MANY, MANY MORE!

STOP SPECTATING - START MANAGING

Mail Order only - UNBEATABLE VALUE at £4.75

Or send SAE for full details to:

E & J SOFTWARE

59 Stainton Road, Enfield, Middx

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

PROGRAMMERS

You've seen Flyer Fox and Gandalf, does your skill match our requirements? We are looking for the best software in Britain, have you got a program you think fits the bill? If you have, then send for our software submission form. We'll evaluate your program and depending on suitability, make you an offer. We deal in outright purchase or alternatively offer very attractive royalty rates. Write or telephone now. Strictly professional ethics adhered to.

Telephone:

021-327 6637 and ask for the Software Development Manager of Tymac.

Address:

Tymac (UK) Ltd, Unit 78 Standard Way,
Gravelly Industrial Park, Tyburn Road,
Birmingham B24 8TL.

RACING LEAGUE

If you think that computer games are mostly variations on the same old theme then join the famous personalities in the RACING LEAGUE! This refreshing simulation game is for one to four players and makes good family entertainment. Features include buying and selling of horses, loans, betting, jockeys, racing sequences etc. As in real life you will need skill and luck to succeed. Can you become Top Owner? A Save Option keeps the game going as long as you like. For 48K Spectrum and STILL only £2.90 post free from.

R.L. Software, 22 Lindale Garth, Kirkhamgate,
Wakefield, West Yorkshire WF2 0RW

O'LEVELS

not just revision but also tuition for the Spectrum 48K

MATHEMATICS	8 PROGRAMS
PHYSICS	7 PROGRAMS
BIOLOGY	6 PROGRAMS
COMPUTER ST.	8 PROGRAMS
CHEMISTRY	8 PROGRAMS
FRENCH	8 PROGRAMS
ELECTRONICS	8 PROGRAMS

Each of the programs in a set are divided into between 4 and 14 tutorial sections, making as many as 70 overall. Each section consists of a number of pages of instructive text and diagrams, followed by questions, which where possible are randomly generated.

As used in schools and colleges.

Each subject only £12.95

BORED WITH BASIC?

Teaching versions of Pascal and C languages, including a screen editor and 48 page tutorial manual. Trace facilities are provided for easy tuition and debugging.

Each language only £7.95

GCE TUTORING

40 BRIMMERS HILL, WIDMER END
HIGH WYCOMBE, BUCKS HP15 6NP

FAST COMPUTER REPAIRS

VIDEO VAULT INTERNATIONAL 10★ REPAIR SERVICE

Spectrums repaired for £19.95 inc. Parts, Insurance and P & P No Hidden Extras. BBC, Commodore 64, Vic 20, Atari, Quoted for.

Are you fed up with waiting weeks for your Home Computer to be repaired!!! Why not try the Experts, we offer a full repair service on any Home Computer. All repairs carry a full 3 months guarantee, plus on every Spectrum repaired we send you a free game worth £5.95 for your enjoyment and pleasure.

★ While you wait Service by Professional Computer Engineers.

★ 3 Months written guarantee on all repairs.

★ International repair company.

★ All computers sent by mail order turned around in 24 hrs.

★ Most Spectrums repaired within 45 minutes.

★ All Micros insured for return journey.

★ Open 7 days a week.

★ School repairs undertaken-discounts available.

★ Free software with each Spectrum repaired worth £5.95.

★ Over 8 years experience working with computers.

ONLY GENUINE SINCLAIR PARTS USED.

Phone today for your free estimate or send your computer to us with £1.75 (UK EIRE I.O.M. C.I.) or £6.50 (Europe/Scandinavia) we will contact you the same day by phone or 1st class Mail should you require quotation first.

TRADE ENQUIRIES MOST WELCOME. ACCESS WELCOMED

VIDEO VAULT LTD Dept R20 THE LOGICAL CHOICE

VideoVault

Telephone: Glossop (STD 04574) 66555.
140 High St. West, Glossop, Derbyshire, England.

FREE GAME WORTH
£5.95 WITH
EACH SPECTRUM
REPAIR.

FULL SCREEN COPIER

Three Hi-Resolution routines include Full Size Double Size & Giant (7" x 10") 'pseudo colour' (shaded) copy. Unlike some copy routines this is a Full Screen copier (24 rows x 32 columns) or versatile Part Screen copier. For almost all combinations of full size Dot Matrix Printers/Interfaces & Spectrums. SAVE to Microdrive option. For professional Letterheads/ornate invitations/mail shots - illustrious presentation of graphics or just fun posters - Make your presentation more impressive. F.S.C. is £9.95

SPEEDY PRINT 15 FISHERTON STREET
SALISBURY WILTSHIRE SP2 7SU

SINCLAIR REPAIR SERVICE

- ★ All machines despatched in 48 hours.
- ★ Repairs guaranteed for 3 months.
- ★ Fully inclusive price, no extras to pay.
- ★ Spectrum: £16.95, ZX81 £12.75.
- ★ Commodore computers and Sinclair printers also repaired.

For a reliable service, send machine with description of fault and cheque or PO to:

C.E. SYSTEMS

(Computer Division)

32 CHURCHILL CRESCENT, WICKHAM MARKET,
SUFFOLK IP13 0RW. Tel: 0728 748759

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

SPECTRUM REPAIRS GUARANTEED SIX MONTHS

Expertly repaired and thoroughly overhauled by professional computer engineers using only top grade components. Manufacturers recommended modifications are fitted and all units are fully guaranteed for six months.

£20.00. All inclusive.

Send to:

MP ELECTRONIC SERVICES

The Laurels, Wending, Dereham, Norfolk NR19 2LZ
TEL: 0362 87327

BARGAINS

By Post

SOFTWARE

SINCLAIR SPECTRUM 48K and PLUS

Sinclair Six Pack£9.95
Valhalla (Legend, RRP £14.95)£4.95
The Great Space Race
(Legend, RRP £14.95)£4.95
The Database (MiCROL, £9.95)£2.95
The Word Processor
(MiC, £9.95)£2.95
Horizons (Sinclair/Psion)£0.75

HARDWARE

Sinclair QL (no credit cards)£369.00
Spectrum Plus with over £100-worth of software, including 6-pack£129.00
Sinclair Flat Screen Pocket TV
(RRP £99.95) 1 only—phone£84.95
ZX Spectrum Expansion System£94.00
ZX Interface 1 (RRP £49.95)£37.95
ROTRONICS Watadrive (£129)£114.95
Sinclair BASIC Programming Manual
(not supplied with Spectrum+)£1.50
Spectrum Power Pack 1400£5.00
Spectrum Cassette Leads£0.75

All offers subject to availability
Delivery normally 2-7 days

ACCESS/VISA orders,
phone 0223 312453

Send UK cheques, Money Orders
to:

SOFT SPOT

Dept SU, 10 Chapel Lane
Wicken, Nr Ely, Cambs. CB7 5XZ

SINCLAIR SERVICE CENTRE

We have spares for all repairs to:
Spectrum; ZX81; Interface 1; Micro drive and RAM pack. You pay £10.00 plus parts and return postage. All units repaired to original standard using genuine Sinclair spares by our HNC qualified staff. Also available Spectrum Memory Update 16K fitted by us for £28.50.

QUANTUM
33 City Arcade, Coventry
(0203) 24632

CAR CURE

CAR owners, let your home computer start saving you money. Use this revolutionary new tool CAR CURE to help you find faults on your car. EXPLORE 300 symptoms and 900 faults with the support of your own expert mechanic. TRACE symptoms, LOCATE faulty parts, DETERMINE corrective actions and much more. 48K SPECTRUM version available now.

£9.95

or send SAE (5" x 7") for detailed guide to the program.
SIMTRON, 4 Clarence Drive, East Grinstead,
W. Sussex RH19 4RZ. Tel: 0342 28188

Attention Spectrum Users!

SUPER SPECTRUM SOUND

'TELE-TALK' add-on unit produces high-quality sound through TV. Plugs direct into Spectrum. Ready built, no soldering.

£9.95 inc. VAT, p&p

(or see for full details of all our Spectrum/Inc add-ons)

REPAIR & SERVICING

Guaranteed repairs to any Spectrum. 48-hour service. Send computer by registered post or recorded delivery with £28 cheque/PO (includes labour, parts, ins. VAT, return postage). Include name and address, telephone number, and state fault. ZX81 repairs £14. For non-Sinclair computers, write for quote.

WALTHAM FOREST COMPUTERS
889 Lea Bridge Road, London E17 9DS

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.

SPECTRUM REPAIRS

We expertly repair Spectrums for £17 inclusive of parts and labour and return postage. Spectrums upgraded 48K £34. All keyboard faults only £12.

RA ELECTRONICS, 50 Kimberley Road
Lowestoft, Suffolk, NR33 0TZ
Tel: 0502 66289

SINCLAIR USER BINDER — NOW AVAILABLE

Each Binder holds six issues of "Sinclair User". The price per Binder is £3.99 or two Binders for £7.00 (this price is inclusive of postage and packaging). To order your Binder(s) just send your name and address with the number of Binders required and a cheque/postal order to:

**B. J. Binders, 81 Grosset Lane, Tile Cross,
Birmingham B33 9ST**
(Please make cheques payable to B. J. Binders)
Please allow 28 days for delivery

Reach an estimated readership of over 200,000 users per month for as little as £3.00*.

Or if you are starting your own small business advertise in the supermart for only £12.00.

Yes, all you have to do is fill in the coupon below including your name, address and telephone number and send to: Supermart, Sinclair User, EMAP, Priory Court, 30-32 Farringdon Lane, London EC1R 3AU

Maximum 30 words.

Your advert will appear in the earliest possible edition.

Name

Address

Tel:

Have you included the fee of £3.00 or £12.00?

Make cheques payable to EMAP PUBLICATIONS LTD

*for second hand sales only

Conditions

The Advertisement Manager reserves the right to alter, reject or suspend an advertisement without assigning any reason. Advertisements are accepted subject to approval of copy and to the right of the Advertisement Manager to alter, reject or cancel any order without explanation. The Proprietors are not liable for any loss from any cause whatever, nor do they accept liability for printers' errors. The Advertisers shall indemnify the Publishers in respect of any claim, cost and expenses arising out of any libellous or malicious matter or untrue statement in any advertisement published for the advertisers, or any infringement of copyright, patent or design therein. The placing of any order will be deemed to be an acceptance of these conditions.

48K SPECTRUM FLAT RACING "THE INTERROGATOR"

- * An illuminating insight into the theory of gambling on favourites.
- * 8,000 race database (up to date).
- * Race parameters include price, course, length and field size.
- * Parameters can be manipulated to investigate theories and maximise profitability.
- * An essential guide to informed gambling.

Price £9.95
Send cheque/PO to:

CLOVER SERVICES
11 Glendoher Road, Rathfarnham, Dublin 16

SPECTRUM SOFTWARE HIRE

FREE MEMBERSHIP

We offer prompt personal service, all top titles. Send SAE for Hire Details to:

SSH (SU),
21 Chaceley Way, Wilford
Nottingham NG11 7EG

MASSIVE CLEARANCE — 50,000 NEW GAMES

EX-CHART-TOPT TITLES

ONLY £1.99 EACH

These are all top price games CURRENTLY SELLING ELSEWHERE at £5.95 to £9.95 each.

SEND SAE FOR LIST OR SEND:

£5.75 FOR RANDOM SELECTION OF 3 TOP GAMES = £1.92 EACH
£10.95 FOR RANDOM SELECTION OF 6 TOP GAMES = £1.83 EACH
£20.95 FOR RANDOM SELECTION OF 12 TOP GAMES = £1.75 EACH

Please add 75p P&P to any order.

Only available from:

TEE-VEE'S SOFTWARE

96-98 Cannock Road, The Scotlands, Wolverhampton WV10 0AE. Tel: 731685

Cheques & POs made payable to TEE-VEE'S SOFTWARE (Callers welcome)

Established 10 Years — Trade Enquiries Welcome

(games available for Spectrum 16K/48K or ZX81 — please specify your model)

OUT FOR THE COUNT 48K SPECTRUM

ZAPPED BY ALIENS? TRY THIS CURE!

Make "Herbert" happy in this multiple choice fun/educational game. The quicker your wits, the more you score. EARLY INTERRUPTION feature. Where will you be in the Hall of Fame? Many attractive graphics routines.

QUESTION/ANSWER REVERSAL on up to 20 SUBJECTS.

Data file supplied contains 850 QUESTIONS. M/C editor to SET YOUR OWN QUESTIONS — 22K AVAILABLE. NO WASTED MEMORY. Present subjects include meanings of words, pop music, British monarchs, historical incidents, Football League and Cup champions, inventions and discoveries, cities/countries + 11 MORE!

Only £5.50 from:

LUNAR SOFTWARE

47 Ellesmere, Burnmoor,
Houghton-le-Spring,
Tyne & Wear, DH4 6EA.

HORSE RACING

THE CLASS PLAN WITH STAR RATINGS

Get the professional way using class as your guide. Class that elusive quality that sets the best above the rest.

A program for the 48K Spectrum.

Send £6 to:
J. Pooley, 68 Tilehurst Road, Reading, Berks.

LIVE IN LAS VEGAS

A NEW FRUIT MACHINE GAME FRUIT 2000

This is the most addictive fruit machine game ever devised. It incorporates: holds, roulette-style gambles, feature board, feature holds, super series, lines, multiple odds up to x12, and half game. Superb sound and brilliant graphics (729 pixels per fruit graphic!)

HOURS OF FUN FOR ONLY £3.99

— You'll be delighted —

Cheques or POs to:
ROSSWARE, 646 London Road, Westcliff,
Essex SS0 9HW

MICRODRIVE OWNERS. Collection of programs, 64 column word-processor, draw (many facilities), extended Basic (procedures, renumber, repeat — until, etc), disassembler. On cartridge, £9.60 for the lot. R. Chalder, 61 Sottery Green Road, Sheffield.

TELMAG. No. 3, monthly news, review, games, quiz's. With Doctor Who adventure by J. M. Good. Send £1.50 (p&p incl), payable to J. S. Lazenby, (Telzine), 18 Lynwood Crescent, Pontefract, West Yorkshire WF8 3DT.

"HIT FOR SIX" for the 48K Spectrum. Just £3.75 for six highly original and exciting games on one cassette. Send to Birdbrain Software, 207 Heage Road, Ripley, Derby, DE5 3GH.

ORIGINAL HANDWRITING PROGRAM on cassette. Use normal handwriting on your ZX Spectrum. Send only £1.50 + SAE with 18p stamp to Robert Courtney, 443 Twickenham Road, Isleworth, Middx. Please state if you have 16K or 48K computer.

QL GAMES COMPENDIUM! Including Link 4, Hangman's Noose, (three others), Cheque/PO for £9.95 including post/package to G. Campbell, 55 Lochview Crescent, Glasgow G33 1NX.

MAKE MONEY with your computer. Complete course for successful home-based computer business, £15 inclusive of p&p from: Bloxwich Business Books, Dept S, 55 Chestow Road, Bloxwich, Walsall, West Midlands, WS3 2ND.

SPECTRUM 48K in DK keyboard plus joystick and interface. Currah speech, DK sound synthesizer, 54 games, £250 or swap for BBC Model B plus DFS interface. Telephone: Holm Hale 440531.

HOW TO CUT your electricity and gas bills by one quarter. Send just £3 cheque payable to R. J. Bennett, Reception Chayofita, Costa Del Silencio, Arona, Tenerife, South Canary Islands.

QL. Powered up no more than a handful of times since new, November last. ZX81 Adventure also included. Accept £325 ono. Kingston, Surrey. 01-546 2376.

INTERFACE II to cursor key adaptor. Simply plug in the neat ADAPT II module to add standard "cursor key" joystick function to your interface II. Available at only £5 from: GMG Enterprise, 86 Roman Gardens, Kings Langley, Herts WD4 8LP. Tel: (09277) 69003.

SPECTRUM OWNERS: I would like to get in touch with parents with young children (1-7 years). Please state name/age. All answered, 38 Homedale House, 3 Brunswick Road, Sutton, Surrey SM1 4DG.

DO YOU HAVE a Buffer Micro Shop or Dean Electronics Keyboard. Buy a smart metal housing to upgrade it to a professional keyboard, £5 including p&p. 322 Guildford Road, Basing.

SPECTRUM MULTI-FUNCTION INTERFACE. 8 channel, 8 bit ADC/DAC, 240V relay, 16 bit P.I.O., power-on indicator, £24.95. Also joystick interface using Kempston Standard, £5.50. Cheque/PO to R. Chandler, 5 Norfolk Place, Leeds LS7 4PT. Tel: 693540.

SIMULATION by Philip Lawton. Introduces numerical integration at "O" level. Car, resistor-inductor, resistor-capacitor, resistor-inductor-capacitor, ribbon-cable. Notes and cassette, £2.95. 4 Templar Way, Rothley, Leicestershire LE17 7LN.

WANTED QL Newsletter, issues No. 1 to No. 6. Offer £1 for each, £7 for all. Tel: (0834) 860522 after 7 pm please.

QL (virtually unused) plus chess game and book available for purchase or swap with Spectrum 48K plus cash adjustment. No reasonable offer refused. Tel: King's Langley 62781.

SERIOUS ABOUT GAMES? Take up the challenge on your Spectrum. (48K) Frantic Fred £5.00, (any) Memory Challenge £4.50, together £8.50! Zen Software, Dept U, 105 Hayhill, Ayr KA8 0SL.

MICRODRIVE OWNERS our utilities take the hassle out of using those moody microdrives. Further details, SAE to: Dept SU, PO Box 249, Glasgow G14.

THE COMPLETE all in one Spectrum interface, includes 16 bits of input and output, an 8 bit A/D converter, an 8 bit D/A converter, joystick interface. All for an "incredible" £25.95. Send to J. Mather, 62 Shadwell Walk, Leeds LS17 6EG.

SPECTRUM PROGRAMMERS. Good quality business/utility software urgently required for professional marketing world-wide. Earning opportunities. Send tapes or SAE for details to S. D. Micro-Systems, Dept SS, PO Box 24, Hitchin, Herts.

EDUCATIONAL SOFTWARE for ZX Spectrum. Wide range available. For details SAE. Think Tank, Dept SU, 35 Wellington Road, Wimbeldon Park, London SW19 8EQ.

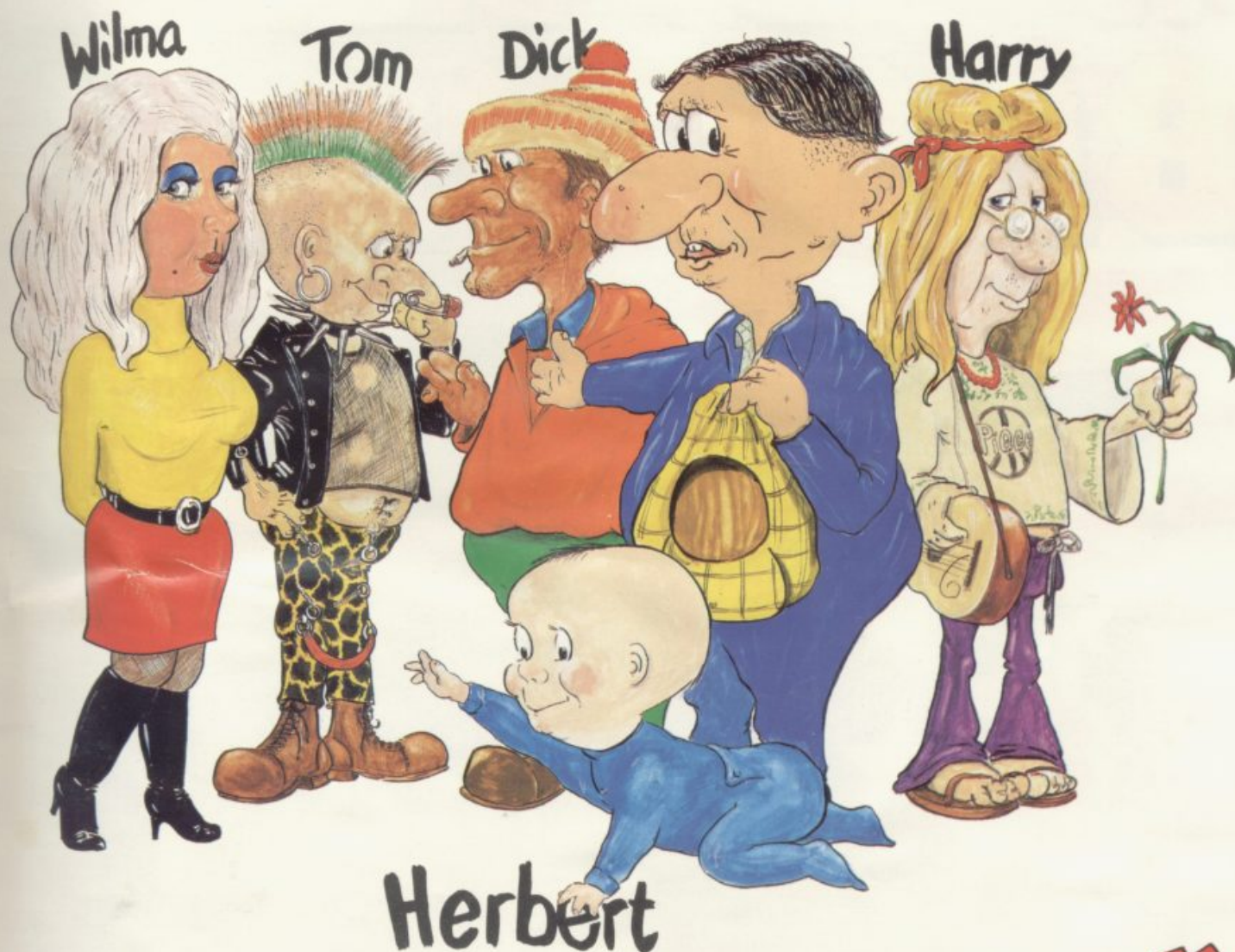
ESTIMATORS 48K Spectrum program to assist preparation of multi-tenders. For builders, joiners, plumbers etc. Many facilities, £19.50 or SAE for details to: 8 Loch Place, South Queensberry, Lothian.

Advertisement Index

Aasvoquelle	118
Argus Press	74
Beau Jolly	84
Betasoft	38
Beyond	30, 114
British Telecom	68
Cambridge Micro Electronics	11
Campbell Systems	77
Cheetah	4
Collins Soft	97
Computer One	127
CP Software	57
Cross Software	118
Custom Cables	104
Cumana	15
Database Publications	100, 101
Datarstar	12
DK Tronics	14
Digital Discounts	98
Digital Integration	50
Digital Precision	73
Eidersoft	11
Eigen Software	122
4-Systems	10
Frel	118
Haulstern	105
Hewson Consultants	35
Hi-Soft	73
Imagine	OBC
Incentive	19
Intergalactic Robots	75
Kempston	IFC
Macsen Software	111
Manx Tapes	98
Melbourne House	42, 43
Microboard	122
Micronet	106-108

Mikro Gen	I.B.C.
Microvitec	46
Micro-X	38
Mirror Soft	33
Modem House	116
National Software Library	31
New Generation	121
New Horizon Computers	31
Nordic	104
Ocean	66, 67
Opus	52
Oxford Computer Systems	24
Picturesque	105
Practical Software	11
Print & Plotter	76, 77
Printerland	116
Polanglia	31
Quest	49
Ram Electronics	99, 127
Romantic Robots	105
RSD	98
Saga Systems	44
Selec	127
Servicon Dynamics	41
Sharp's Inc.	62
Soft Aid	110
Software Library	104
Spectrum Holdings	98
Speedy Soft	56
Talent Computer Systems	10, 70
Tasman	82, 83
Thetford Micros	70
Touchmaster	65
Transform	76, 80
Ultimate	58
US Gold	29, 36, 59, 81
Virgin Games	20
View Software	116

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

AMSTRAD £6.95
ZX SPECTRUM £6.95
COMMODORE 64 £7.95

WORLD SERIES BASEBALL



COMING SHORTLY
WIZADORE for the BBC Micro
KEY TO SUCCESS for the COMMODORE 64